KOPPERS CO.

WOODTREATING CHEMICALS

TOLS011096

BZTO104(e)047929

PENTACHLOROPHENOL. Dark-colored flakes and sublimed needle crystals with a characteristic odor. Cl_5C_6OH, mw: 266.4, mp: 191°, bp: 310° (decomp), d: 1.978, vap. press: 40 mm @ 211.2°.

Acute tox data: Oral LD_{50} (rat) = 50 mg/kg; dermal LD_{50} (rat) = 105 mg/kg; ip LD_{50} (rat) = 56 mg/kg; sc LD_{50} (rat) = 100 mg/kg. [*3*]

THR = HIGH via oral, dermal, ip and sc routes. An exper neo via sc route. [*3*] Acute poisoning is marked by weakness and respiratory, blood pressure and urinary output changes. Also causes dermatitis, convulsions and collapse. Chronic exposure can cause liver and kidney injury. See also phenols. A fungicide. A contact herbicide, wood preservative, molluscicide.

Disaster Hazard: Dangerous; when heated to decomp, emits highly toxic fumes of chlorides.

TOLS011097

Wood Treating Chemicals

A complete line of high quality wood preservative chemicals for:

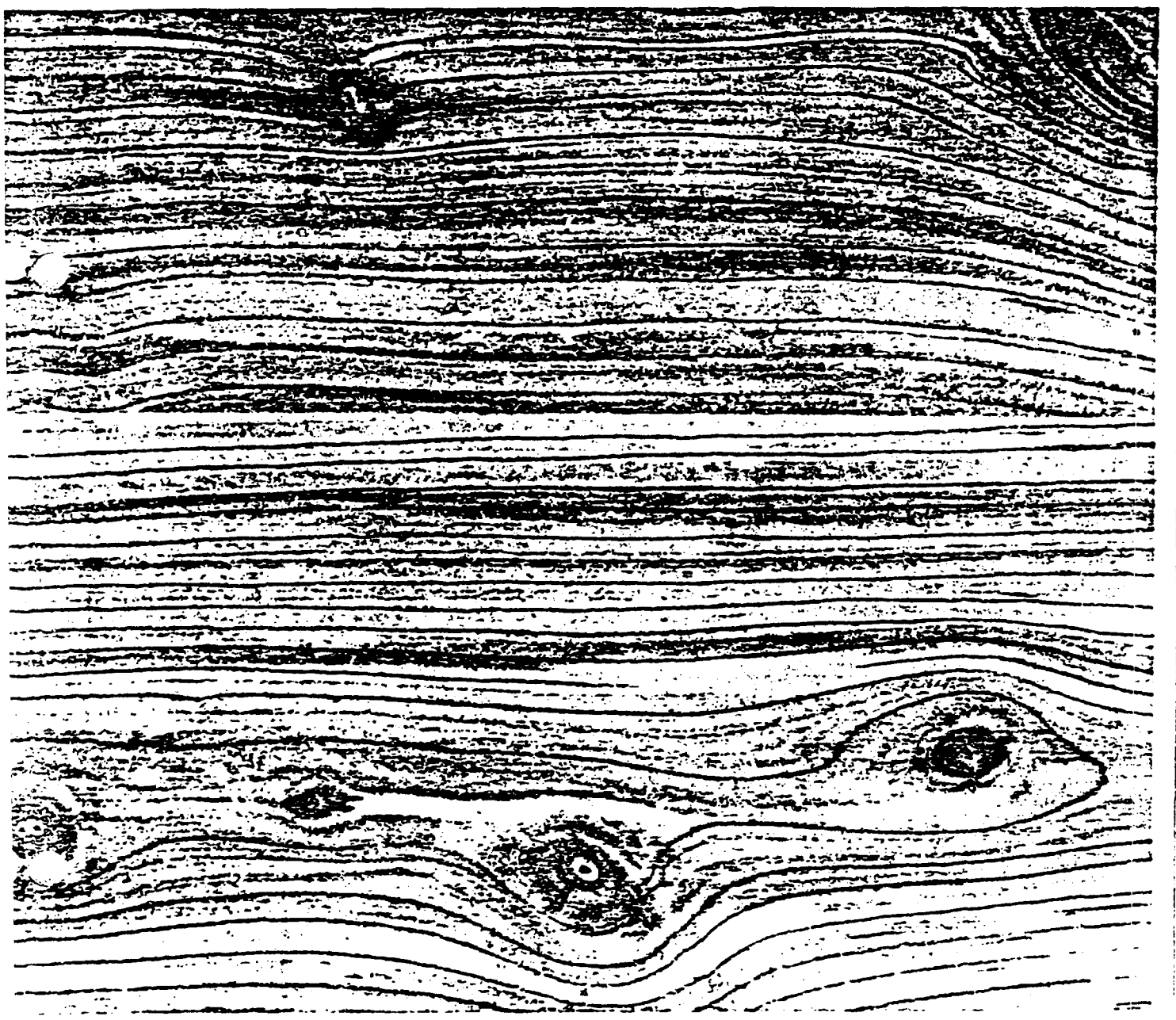
Lumber Industry

Industrial Products

Utility Industry

Commercial Wood Preserving Industry

KOPPERS



TOLS011098

Lumber Industry Chemicals

End Coatings

End Sealer. A fast-drying heavy wax emulsion, provides maximum protection for green lumber against end splitting and checking while drying during seasoning. Available in clear and a number of colors. Do not freeze.

End Spray 400 Green and Red. Pigmented color concentrate for application to lumber ends and plywood edges to give uniform color coating to enhance the product appearance. Water reducible—do not freeze. Can be applied to wood by brush or spray. Normally applied at ratio of 1 gallon 400 End Spray to 7-12 gallons of water, depending on the desired color intensity.

Wood Seal Wax. A light-lemon color, highly refined wax end sealer free of oil and tackiness. Provides maximum protection for green lumber against end splitting and checking during seasoning. Do not freeze.

Sap Stain Control

Liquid Azide 200. A 200-1 concentrate chemical specially designed to prevent "enzymatic brown stain" on sugar pine. Can be used alone or with other sap stain control chemicals adaptable for mixing with proportioning equipment.

Liquid Noxtane® SS-1. A specially formulated sapstain chemical concentrate for the prevention of blue stain end mold in lumber operations of southern and western wood species. Can be mixed with automatic proportioning equipment. Dilute before use either 100 to1, 66 to 1 or 50 to 1 depending on stain hazard.

Super Noxtane®. A dry powder. General purpose chemical to control sap stain and mold in freshly cut lumber. Buffered for dip tank use or used at double strength in spray systems.

Liquid Noxtane® 1. Liquid sapstain control chemical concentrate dilutable at a rate of 80 to1 or 50 to1, depending on stain hazard. Liquid Noxtane 1 contains sodium pentachlorophenate and sodium metaborate mixed in a water-organic hydrocarbon solvent system.

Dimension Lumber Protection

Lumbrella® Coating. A specially formulated weather protective coating. Provides water repellency and dimensional stability. Replaces paper wrap in protecting quality lumber from sawmill to building site or lumber yard. Available in clear, yellow, brown and redwood colors. Dilutable in water in accordance with the recommended mixtures.

Timbertreat™ Chemicals—Concentrate. Protects freshly cut logs and lumber against insect attack. Dilutes at a rate of one gallon to 160 gallons of water, specific protection against Ambrosia and Lyctus beetles. Active ingredient—Gamma Isomer of BHC.

Dowicide G-ST Beads—Sodium Pentachlorophenate. A water soluble fungicide for control of sap stain on lumber when used with buffering agents.

Industrial Products

Penta Stain® Coating. A top quality, quickly penetrating outdoor wood stain, containing 5% pentachlorophenol by weight. Also, contains quality resins to give good water repellency. Available in nine basic colors which can be intermixed by the buyer for wider color selection.

Penta Wood Preservative—Concentrate (East of the Rockies). A concentrated solution of pentachlorophenol to be diluted with fuel oil, kerosene, range oil, or diesel fuel. Contains 41% technical pentachlorophenol. Use on wood in contact with ground or other severe exposure applications.

Timbertox 40 Preservative—Concentrate (West of the Rockies). A concentrated solution of pentachlorophenol to be diluted with fuel oil, kerosene, range oil, or diesel fuel. Contains 40.5% technical pentachlorophenol. Use on wood in contact with ground or other severe exposure applications.

Penta Wood Preservative—Ready-to-Use. A clear, ready-to-use liquid containing 5% pentachlorophenol by weight. Solvents used are residual in the wood and do not provide a paintable surface. Use on wood in contact with ground or other severe exposure applications.

Woodtox® Preservative—Ready-to Use. A clear water repellent preservative. Use on wood where cleanliness and paintability are desired. Contains 5% pentachlorophenol by weight.

Woodtox® Preprime Preservative. A high quality water repellent preservative for treatment of millwork prior to factory paint priming. Available as a 1:4 concentrate or a ready-to-use solution. Meets National Woodwork Manufacturers Association Standards for water repellency and preservative effectiveness.

TOLS011099

KOPPERS

Woodtox® 140 Preservative. An economical water repellent preservative for dip treatment of millwork, boxes and pallets. Available in a 1:4 concentrate or ready-to-use solution. Meets Federal Specification TT-W-572B and National Woodwork Manufacturers Association Standards for water repellency and preservative effectiveness.

Woodtox® 152 Preservative—Ready-to-Use. Water repellent wood preservative with dark brown color added. For treatment of wood parts used in truck or wagon body construction, other miscellaneous fabricated lumber items.

Coppertreat® 00 Preservative. Copper naphthenate specially formulated to meet MIL-W-18142B, Amendment 3. Assay 2% copper metal by weight in ready-to-use solution. Use on wood in contact with ground or other severe decay hazard areas.

Utility Industry Chemicals

Pole-Life.® Ready-to-use, grease-like penetrating coating for ground line remedial treatment of standing poles, poles to be relocated, or poles stored for prolonged periods. Can also be used to treat piling cut-offs. Conforms to Bell Laboratories Specification for C Wood Preservative. There are two formulations: one contains 15% Sodium Fluoride and the other containing 15% Sodium Borate, in addition to 10% penta and 15% creosote.

Pole-Treat® 15. A preservative grease for use in ground line remedial treatment of standing poles, relocated poles held too long in storage, piling cut-offs, and other wood maintenance uses. Contains 15% pentachlorophenol and 15% creosote.

Tritox. Tritox Preservative Paste is a ready-to-use, grease-like preservative for remedial treatment of standing poles, relocated poles, poles stored too long, and piling cut-offs. It has a combination of oil soluble and water soluble preservative materials. The mixture of preservatives (10% penta, 35% creosote, 40% sodium fluoride) provides the combined preservative effect considered more effective by some authorities than a single preservative. The water soluble salts are considered necessary by many people for fast penetration results in poles with high moisture content.

Woodtreat® AA Preservative. A paste-like, tan colored emulsion preservative for remedial treatment of dry wood in buildings and structures. This product is useful for the treatment of gains and holes made in poles after treatment that expose untreated wood such as pile cut-offs; for treatment of bridge timbers and other uses where a "loading" of preservative is desired. This product contains 10% pentachlorophenol.

Groundline Treating Accessories. Kraft Paper and dating tags and nails, are available as accessories to groundline products.

Commercial Wood Preserving Industry

Prilled and Block Monsanto Pentachlorophenol. Highly toxic to fungi, termites, many forms of bacteria. Use for pressure and thermal treatment of utility transmission poles, fence posts, guard rails, timber and other industrial wood products. Meets American Wood Preservers' Specification and Fed. Spec. TT-W-570.

Flocculating Agents. WTC-71 and WTC-74 are products designed for the treatment of oil in water emulsions to allow the removal of oil, wood extractives and suspended solids from effluents found in recovery and waste disposal systems, wood treating plant operations.

WTC 7-11 Emulsion Prevention Aid. This product is designed to prevent the formation of oil-water emulsions in penta solutions used in pressure treating. It is added in small quantities to the treating solution.

WR-340. Straw-colored liquid containing a blend of resins and solvents. Combined with pentachlorophenol and mineral spirits, it produces a paintable preservative water-repellent solution.

Timbertox D-5. 5% penta in petroleum solvent which meets AWPA Standard P-9 hydrocarbon solvent Type A. Dark amber color solution.

LST Cosolvent II. Anti-blooming additive and co-solvent for light solvent pentachlorophenol solutions. Meets AWPA Standard P-9 for hydrocarbon solvent Type C cosolvent system.

Petroset II. This product is a blend of solubilizers, inhibitors and anti-oxidants designed to prevent the oxidation, sludging, polymerization, and darkening of pentachlorophenol solutions employed in thermal or pressure treating or Boulton drying of wood poles, piling, and lumber. This product is oil soluble and water insoluble.

TOLS011100

BZTO104(e)047933

Woodtox® Pre-Prime

Ready-to-Use

Product Data

Specialty Wood Chemicals Group
Forest Products Division
Koppers Company, Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110
Telephone: 314—772-2200

Product Description	Woodtox Pre-Prime Ready-to-Use is a liquid water repellent chemical. This water repellent wood preservative has been specially formulated for treatment of millwork prior to factory or field priming. Woodtox Pre-Prime Ready-to-Use meets National Woodwork Manufacturers Association (NWMA) standards.
Physical Description	Clear, light amber colored solution.
Penta Content	5.2% by weight technical pentachlorophenol meeting Federal Specification TT-W-570. Contains minimum of 154 gm of penta/gallon as determined by AWPA A-5, Section 5 method.
Flash Point	Minimum 100°F. (Tag Closed Cup) (Typical).
Dilution Data	DO NOT DILUTE. This is a 5% Ready-to-Use solution.
Swellometer Efficiency	Meets or exceeds NWMA Swellometer test of 60% minimum.
Paintability	Woodtox Pre-Prime has been specially formulated for maximum compatibility with paint primer and finish coatings applied at the factory. The mineral spirits carrier may be "trapped" when sash parts are bulk stacked or bundled too tightly and dip treated; doors or plywood flat stacked is another problem. However, where there is free air circulation to volatize the light solvent from the wood surfaces, Woodtox Pre-Prime open tank treated millwork, lumber or plywood can usually be finished within 24-60 hours after treatment.
Corrosion	Contains corrosion inhibitor to aid in the prevention of color formation in shipping containers or storage tanks, and to minimize corrosion and/or discoloration of metal fasteners.
Storage Precautions	None, other than to keep out water. Stable over the normal range of storage conditions.
Uses of WOODTOX PRE-PRIME Ready-to-Use	Woodtox Pre-Prime is used for the treatment of sash and other millwork to meet the Seal of Approval program of the NWMA for a preservative water repellent (IS-4). It is also useful for the treatment of other wood products where the benefits of a preservative and water repellent solution are desired that will help control stain, decay (rot), termites, and other wood boring insects; that will not cause grain raising, and that will leave the wood paintable.

TOLS011101

Treating Data	Woodtox Pre-Prime may be applied by the vacuum, immersion, brush, or spray methods. The effectiveness of the treatment is in proportion to the distribution and retention of solution in the treated item.
Safe Handling of Pentachlorophenol Solutions	See Koppers Company, Inc. Bulletin — "Safety Measures & Precautions for Handling Solutions Containing Pentachlorophenol".
Packaging	Bulk — 4,000 to 10,000 gallon tank cars; or in minimum tariff tank truck transports. Also available in 5 gallon and 55 gallon drums.
Shipping Classification	Chlorinated phenol petroleum solution — Wood Preservative Liquid, Not Exceeding 5% of chlorinated phenol by weight.
Production points and shipping points	St. Louis, Missouri, Portland, Oregon

KOPPERS
Chemicals and Coatings

The information given herein is based on our experience, represents our best judgment in the matter, and is intended to be helpful. But we cannot assume responsibility for any loss or accident that may result from its use.

Woodtox is a registered trademark of Koppers Company, Inc.

FP-879
October, 1976

Litho in U.S.A.

TOLS011102

WOOD TREATING CHEMICALS DEPT.

KOPPERS COMPANY, INC.

5137 SOUTHWEST AVENUE, ST. LOUIS, MISSOURI 63110

314-772-2200

PRODUCT INFORMATION DATA

WOODTOX* PRE-PRIME CONCENTRATE

October 1, 1969

Trade Name	Penta water repellent preservative concentrate
Wood Treating Name	Woodtox* Pre-Prime Concentrate
Chemical Name	Penta water repellent preservative concentrate
Description	Clear, medium amber color solution
Penta Content	21.2% by weight technical pentachlorophenol meeting Federal Specification TT-W-570
Non-Volatile Content	53.0% by weight
Specific Gravity	0.9784 at 15.5 deg. C. (typical)
Weight per Gallon	8.15 pounds at 15.5 deg. C. (typical)
Pour Point	Plus 18 deg. F.
Flash Point	100 deg. F. (Tag. Closed Cup) (minimum)
Dilution Instructions	Woodtox* Pre-Prime concentrate is readily miscible with mineral spirits or other light petroleum solvents without heat or special agitation. To cut back to the normal 5% pentachlorophenol ready-to-use strength, one gallon or part by volume of the concentrate should be diluted with four gallons or parts by volume of mineral spirits to make five gallons of Woodtox* Pre-Prime. Heavier petroleum solvents than mineral spirits are not recommended as diluents since paintability of the treated wood would be affected. Federal Specification TT-T-0291a, Grade 1, or ASTM Standard D-235-39 can be used for procurement of a suitable mineral spirits diluent. A distillation range of 330 to 385 deg. F. for this type of light petroleum solvent is typical of current refinery production, but in many areas and for a small price differential LEP mineral spirits with an end point as low as 350 deg. F. is readily available. The LEP mineral spirits is also readily miscible with Woodtox* Pre-Prime concentrate and the speed upon drying of the treated wood may be as much as 25%. Xylol and other lighter solvents are not recommended.

*Trade Mark Registered U.S. Patent Office

THE INFORMATION GIVEN HEREIN IS BASED ON OUR EXPERIENCE, REPRESENTS OUR BEST JUDGMENT IN THE MATTER, AND IS INTENDED TO BE HELPFUL; BUT WE CANNOT ASSUME RESPONSIBILITY FOR ANY LOSS OR ACCIDENT THAT MAY RESULT FROM ITS USE.

WOODTOX* PRE-PRIME CONCENTRATE

Swellometer Efficiency	This concentrate, when properly diluted, will make a water repellent solution having a swellometer efficiency of 60% minimum.
Paintability	The ready-to-use solution made with this concentrate dries to a firm film and contains a minimum of paraffin or other water repellent ingredients that tend to interfere with paintability. The length of time that should elapse between the time the wood is treated and the time that paint, varnish, or other finishes are applied depends upon how soon the excess mineral spirits used as a carrier can get out of the wood. The mineral spirits carrier may be "trapped" when sash parts are bulk stacked or bundled too tightly and dip treated; doors and plywood flat stacked are another problem. However, where there is free air circulation to volatilize the light solvent from the wood surfaces, Woodtox* Pre-Prime open tank treated millwork, lumber, or plywood can usually be finished within 48 to 72 hours after the treatment. Woodtox* Pre-Prime Concentrate meets paintability tests or standards of Federal Specification TT-W-00572a, the NWMA, and CS 262-63.
Storage Precautions	Some sedimentation may occur after long standing, but this is relatively insignificant on a weight basis and should not reduce the efficiency of the product after dilution. This concentrate thickens when exposed to low temperature, but returns to normal fluidity when stored at ordinary room temperatures. Containers should be thoroughly agitated before removing contents when temperature of the concentrate is below 40 deg. F.
Safe Handling of Pentachlorophenol	See Wood Treating Chemicals Co. Bulletin 1049 entitled "Safety Measures and Precautions for Handling Solutions Containing Pentachlorophenol."
Packaging	5 gallon and 55 gallon drums, and bulk shipments in tank cars
Shipping Class	Wood Preservative, Liquid NOIBN
Production Points	Saint Louis, Missouri and Portland, Oregon
Shipping Points	Saint Louis, Missouri and Portland, Oregon

Printed in U. S. A.

BZTO104(e)047937

Woodtox® 140 Ready-to-Use
Liquid Water Repellent Solution

Product Data

Specialty Wood Chemicals Group
Forest Products Division
Koppers Company, Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110
Telephone: 314—772-2200

Product Description	Woodtox 140 Ready-to-Use is a liquid water repellent solution. This water repellent wood preservative has been specially formulated for the treatment of ammunition boxes, millwork and other exterior wood. Woodtox 140 meets NWMA Standards and Federal Specification TT-W-572B.
Physical Description	Clear, light amber colored solution.
Penta Content	5:2% by weight technical pentachlorophenol meeting Specification TT-W-570.
Flash Point	Minimum 100°F (Tag Closed Cup)
Dilution Data	DO NOT DILUTE. This is a 5% Ready-to-Use solution.
Swellometer Efficiency	Meets or exceeds NWMA Swellometer test of 60% efficiency.
Paintability	Woodtox 140 Ready-to-Use has been formulated for good compatibility with most finishes, including those used for finishing by the millwork industry.
Corrosion	Contains corrosion inhibitor to aid in the prevention of color formation in shipping containers or storage tanks, and to minimize corrosion and/or discoloration of metal fasteners.
Storage Precautions	None other than to keep out water. Stable over the normal range of storage conditions.
Uses of Woodtox 140 Ready-to-Use	Woodtox 140 Ready-to-Use is used for the treatment of ammunition boxes, millwork and exterior wood, where the benefits of a preservative and water repellent solution are desired that will help control stain, decay (rot), termites, and other wood boring insects; that will not cause grain raising, and that will leave the wood still paintable.
Treating Data	Woodtox 140 Ready-to-Use may be applied by conventional methods such as vacuum, immersion, brush, etc. The effectiveness of the treatment is in proportion to the distribution and retention of solution in the treated item.

TOLS011105

Safe Handling of Pentachlorophenol Solutions	See Koppers Company, Inc., Wood Treating Chemicals Dept. Bulletin -- "Safety Measures & Precautions for Handling Solutions Containing Pentachlorophenol". Do not use this product indoors.
Packaging	Bulk – 4,000 to 10,000 gallon tank cars; or in minimum tariff tank truck transports. Also available in 5 gallon and 55 gallon drums.
Shipping Classification	Chlorinated phenol petroleum solution – Wood Preservative Liquid, Not Exceeding 5% of chlorinated phenol by weight.
Product Points and Shipping Points	St. Louis, Missouri Warehouse Portland, Oregon

Koppers Company, Inc.
Pittsburgh, Pa. 15219

KOPPERS
Chemicals and Coatings

The information given herein is based on our experience, represents our best judgment in the matter, and is intended to be helpful. But we cannot assume responsibility for any loss or accident that may result from its use.

Woodtox is a registered trademark of Koppers Company, Inc.

WOL-15
October, 1976

Litho in U.S.A.

TOLS011106

Woodtox® 140 Concentrate

Water Repellent Pentachlorophenol Preservative

Product Data

Specialty Wood Chemicals Group
Forest Products Division
Koppers Company, Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110
Telephone: 314—772-2200

Product Description	Woodtox 140 — Concentrate is a water repellent pentachlorophenol preservative.
Physical Description	Clear — Reddish-Amber colored solution.
Penta Content	22.0% by weight Technical Pentachlorophenol meeting Federal Spec. TT-W-570.
Specific Gravity	.959 at 15.5°C (60°F.) (Typical)
Weight per Gallon	7.99 lbs. at 15.5°C (60°F.) (Typical)
Pour Point	−1°C (30°F.)
Flash Point	43°C (110°F.) (Typical)
Dilution Data	Before using, dilute at the ratio of one part this product to four parts by volume of a mineral spirits, naphtha, or equivalent solvent weighing not more than 6.46 lbs/gal. to make a ready-to-use solution containing not less than 5.2% Technical Pentachlorophenol by weight. The diluent should have an end point no greater than 360°F. for quick drying and paintability. Agitate thoroughly before using. It is recommended that the solvent used should be L.A. Rule 66 exempt.
Swellometer Efficiency	Woodtox 140 Concentrate when diluted at the rate of one to four as suggested above and with a suitable mineral spirits will exceed swellometer efficiency of 60%.
Storage Precautions	As Woodtox 140 Concentrate is made with technical grade materials, upon long standing some sedimentation may occur. This sedimentation is relatively insignificant on a weight basis and does not reduce the efficiency of the product after dilution. This concentrate increases in viscosity when exposed to low temperatures, but returns to normal fluidity if stored or used at ordinary room temperatures.

TOLS011107

Use Data	This concentration is to be used for the preparation of a ready-to-use solution which conforms to NWMA IS-4 and Federal Specification TT-W-572B when diluted according to label directions.
Safe Handling of Pentachlorophenol	For additional information see: "Safety Measures & Precautions for Handling Solutions Containing Pentachlorophenol".
Packaging	55 gallon drums, 5 gallon drums and tank cars.
Shipping Classification	Wood Preservative, NOI LIQUID OR PASTE
Production Point	St. Louis, Missouri Portland, Oregon
Shipping Point	St. Louis, Missouri Portland, Oregon

Koppers Company, Inc.
Pittsburgh, Pa. 15219

KOPPERS
Chemicals and Coatings

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Woodtox is a registered trademark of Koppers Company, Inc.

WOL-14
October, 1976

Litho in U.S.A.

TOLS011108

BZTO104(e)047941

WOOD TREATING
CHEMICALS CO.

5137 Southwest Avenue / St. Louis, Missouri 63110 / 314 PR 2-2200

PRODUCT INFORMATION DATA

Sheet No. 125
March 15, 1967

WR CONCENTRATE 340

Trade Name	Water Repellent Concentrate
Wood Treating Name	WR CONCENTRATE 340
Chemical Name	Same as Trade Name
Description	Straw colored liquid containing the proper blend of water repellents and co-solvents so that when blended with Monsanto Penta and with mineral spirits, meeting specifications indicated below, a non-blooming, paintable preservative water repellent solution will result which will meet the requirements of Federal Specification TT-W-572 and AWPI Standard LP-3.
Penta Content	None
Specific Gravity	0.889 at 15.5° C. (60° F.) (typical)
Weight per Gallon	7.49 pounds at 15.5° C. (60° F.) (typical)
Pour Point	65° F. (approximate for homogeneity)
Flash Point	105° F. minimum - Tag. Closed Cup
Mixing Data	The following mixing instructions are given in units of 405 lbs. of WR CONCENTRATE 340 as that is the weight of the concentrate packed in 55-gallon drums:

WR CONCENTRATE 340	405 pounds
Monsanto Technical Penta	200 pounds
Mineral Spirits (500 Gals.)	3241 pounds

This will yield 566 gallons of water repellent solution containing 5% by weight of Pentachlorophenol if the Mineral Spirits has a weight of 6.5 lbs. per gallon which is typical. Weight of treating solution will be approximately 6.80 pounds per gallon. The volume yield will vary with the weight of the Mineral Spirits or equivalent light petroleum solvent used.

See Wood Treating Chemicals Company Bulletin 1108 and 1513

THE INFORMATION GIVEN HEREIN IS BASED ON OUR EXPERIENCE, REPRESENTS OUR BEST JUDGMENT IN THE MATTER, AND IS INTENDED TO BE HELPFUL; BUT WE CANNOT ASSUME RESPONSIBILITY FOR ANY LOSS OR ACCIDENT THAT MAY RESULT FROM ITS USE.

	for typical specifications for a suitable Mineral Spirits.
Mixing Procedure	Mixing will be facilitated by bringing the WR CONCENTRATE 340 to a temperature of 65° F., or higher, to insure homogeneity and to facilitate removal from drums or to pump from tank cars or storage tanks. In blending, first add Mineral Spirits or equivalent light petroleum solvent to the blending tank. Heat to 90° F., or higher; then add the WR CONCENTRATE 340 and before adding penta. Mix thoroughly and then add the Monsanto Penta. Mix until dissolved. Agitation and/or heating while mixing the penta will greatly hasten the rate of solution.
Treating Data	See Wood Treating Chemicals Co. Bulletin #1513 entitled "Pressure Treatment with Penta Water Repellent Preservative."
Safe Handling of Penta and Penta Solutions	See Wood Treating Chemicals Co. Bulletin #1049 entitled "Safety Measures And Precautions For Handling Solutions Containing Pentachlorophenol."
Packaging	8,000 gallon tank cars 6,000 gallon tank cars 4,000 gallon tank cars 55-gallon open-head drums (net 405 pounds)
Shipping Classification	Wood Preservative Liquid, N.O.I.
Production Point	St. Louis, Missouri
Shipping Point	St. Louis, Missouri

Printed in U.S.A.

TOLS011110

BZTO104(e)047943

Timbertox 40
Penta Wood Preservative Concentrate

Product Data

Specialty Wood Chemicals Group
Forest Products Division
Koppers Company, Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110
Telephone: 314—772-2200

Product Description Timbertox 40 Penta Wood Preservative Concentrate contains pentachlorophenol and solvents. This product was designed as a freight saving method of supplying pentachlorophenol so that ready-to-use penta solutions could be prepared with locally available diluents and without the necessity of heat or special mixing equipment.

Physical Description Timbertox 40 penta wood preservative concentrate is a clear-dark amber colored solution.

Penta Content 40.5% by weight technical pentachlorophenol meeting federal specification TTW-570.

Specific Gravity 1.12 at 15.5°C (60°F.) (Typical)

Weight per Gallon 9.32 lb./gallon at 15.5°C (60°F.) (Typical)

Pour Point Below −26°C (15°F.)

Flash Point 85°C (185°F.) (Typical)

Dilution Data The amount of diluent used with this concentrate depends upon the concentration of penta desired in the ready-to-use solution and on the weight per gallon of the diluent. Furthermore, the choice of diluent depends upon the end use for the diluted material. It should be recognized that if light oils such as mineral spirits are used as a diluent, the penta may bloom (crystallize on the surface of the wood). Any oil with over 50% of its distillation range falling under 500°F. will probably allow blooming.

Since a 5.2% solution is generally desired for wood preservation the following formulation will show how much diluent oil is required:

$$\frac{\text{\% active ingredient in concentrate} \quad \text{Minus} \quad \text{\% active ingredient desired}}{\text{\% of active ingredient desired}} \times$$

$$\frac{\text{Weight of concentrate per gallon}}{\text{Weight of solvent per gallon}} = \text{Gallons of solvent desired.}$$

TOLS011111

Dilution Data (Continued) Using the foregoing formula as an example, and using a fuel oil weighing 7.0 pounds per gallon, to make a 5.2% ready-to-use solution would require:

$$\frac{40.5 - 5.2}{5.2} \times \frac{9.32}{7.0} = 9.04 \text{ gallons of oil}$$

Timbertox 40 penta wood preservative concentrate is made with technical grade materials; therefore, when this concentrate is diluted with certain low aromatic petroleum products, a slight sedimentation in the finished solution may appear. This sedimentation is relatively insignificant on a weight basis, and if it is detrimental it can be removed by filtration or by settling for 48 hours and drawing it off the bottom of the container.

Uses Follow detailed instructions on the label for the use of Timbertox 40 penta wood preservative concentrate in wood preservation, and termite control.

Storage Timbertox 40 penta wood preservative concentrate has a very good low temperature stability. Its viscosity increases as the temperature decreases, and it finally becomes so viscous that it will not pour. Upon return to room temperature it again becomes fluid. If it is known that it has been chilled to, or near, the solidification point, it is always good practice to agitate the container (roll the drums) to insure uniformity of product each time before any product is withdrawn from the container.

Safe Handling For additional information please see Koppers bulletin titled "Safety Measures and Precautions for Handling Solutions Containing Pentachlorophenol".

Packaging 55 gallon drums and bulk shipment in tank trucks.

Shipping Classification Wood Preservative NOI Liquid or Paste

Production and Shipping Point Portland, Oregon

Koppers Company, Inc.
Pittsburgh, Pa. 15219
KOPPERS
Chemicals and Coatings

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WOL-22
January, 1977 1M

Litho in U.S.A.

TOLS011112

Safety Measures and Precautions for Handling Solutions Containing Pentachlorophenol

Safety Bulletin

Specialty Wood Chemicals Group
Forest Products Division
Koppers Company, Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110
Telephone: 314—772-2200

All users of Koppers pentachlorophenol solutions should give careful attention to these safe handling instructions to avoid unnecessary exposure that might cause skin irritation or other health hazards.

Chemicals which are sufficiently toxic to control various wood degrading organisms and insects may generally be considered as substances which should be handled with due care to avoid irritation or other harmful effects to human beings and to prevent contamination of food stuffs. Although millions of pounds of pentachlorophenol has been sold since its commercial manufacture was started in the United States in 1936, and billions of pounds of penta solutions have been used, occasionally troubles arise because of the improper handling of the dry chemical or solution. The purpose of this bulletin is to give information that will help prevent health hazards and to also suggest action to be taken if the product has caused a health hazard.

For toxicological information on pentachlorophenol crystals, or prills, refer to Monsanto Chemical Company — Technical Bulletin No. IC/PS-3 titled "Handling Precautions for Penta and Santobrite".

Safe Handling Penta Formulations
In general, there are two types of penta formulations, Concentrates and 5% Ready-to-Use Solutions. Most of these solutions contain alcohols and/or aromatic petroleum oils as the solvents and carriers, and these materials as well as the penta can cause health problems if not handled properly.

The greatest chance for harmful amounts of penta formulations to get into the body is through the skin. Of course, swallowing could occur, but this is rare. The oils and solvents used to dissolve penta are usually nasal or respiratory irritants, so they also often cause sneezing, coughing or eye irritation; so a person tends to get out of the areas causing these health discomforts. The chief method of body damage is apt to come from the solutions that get on the skin. Since individuals vary considerably as to their susceptibility to skin irritation, no set rules can be devised, but a very simple rule can be followed: Keep the solutions off the skin, and if they get on the skin wash them off with soap and water. Do not allow the solutions to saturate clothing and then continue to wear such contaminated clothing.

Koppers sells a number of penta formulations under such trademarks as Woodtox®, Timbertox®, Woodtreat® and Liquid Noxtane® to name some of the most common ones. These materials may be for use as preservatives in or on wood, as termite control materials, or for the control of other insects or fungi. Safe handling data can be divided into two parts — health and use practices.

Health and First Aid Measures in Connection With The Use of Penta Formulations
Users of any of Koppers formulations should give careful consideration to the safety measures and precautions given on the label for each product. Since these products are registered with the EPA under the Federal Insecticide, Fungicide and Rodenticide Act, the labels on each package must carry an approved caution statement. (Since penta is not defined as a highly toxic poison, the skull and cross bones marking is not required. This marking is a DOT requirement but is not required on EPA registered labels.) The precaution on any Penta containing product contains in essence all or some part of the following information, depending upon the product:

> Do not breathe vapor. Do not get in eyes, on skin or on clothing. Keep away from foodstuffs, children, pets and livestock. If swallowed, induce vomiting by administering emetic — call a physician. To remove from skin, wash with plenty of soap and warm water. Flammable — keep away from fire and flame.

Solutions of pentachlorophenol are irritating to the skin of most individuals and will be absorbed on contact, and if repeated contacts occur, the rate of absorption varies depending on the solvent used and the individual's susceptibility. Some

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of the lighter petroleum solvents are irritating to the skin with or without an admixture of pentachlorophenol to the oil solution. However, the safety and comfort of the worker handling pentachlorophenol solution such as Woodtox, Timbertox, Woodtreat or Liquid Noxtane will be assured if he follows such precautionary measures as his particular application makes necessary. These measures will vary from simple washing of the hands with soap and water at the completion of the handling operations to the wearing of protective garments and accessories for a workman continually on duty at a treating tank is subject to possible contact with the preservation formulations. Rubber gloves and protective clothing should be worn when handling the freshly treated wood.

Safe handling measures may be summarized briefly:

DO NOT SWALLOW

Solutions containing penta should not be taken internally. They should not be placed so that children or animals will get into them, and opened or discarded containers should not be left where the contents could cause a health hazard. If any penta solution is swallowed, vomiting should be induced by administering mustard and water, and a physician should be called.

PROTECT EYES, NOSE AND THROAT

Formulations containing penta should not be used in enclosed areas without adequate ventilation. Eyes should be protected from splash, drip or spray by the use of goggles. If any penta solutions get into the eyes, flood the eyes with water (do not rub the material into the eyes!), and if irritation continues after thorough bathing of the eyes, call a physician. Workmen handling penta solutions should be taught to cleanse the face and hands promptly after working with penta formulations to avoid having the material get in or on sensitive body parts or be absorbed by the skin.

DO NOT GET ON SKIN

Pentachlorophenol solutions are irritating to the skin of most individuals. Whether the irritation comes from the carriers or the penta is immaterial – penta formulations should not be left in contact with the skin. Long exposures or frequent short contacts can result in Penta being absorbed through the skin. This hazard can be avoided by the use of synthetic rubber gloves and/or other protective garments.

IT IS EASIER TO AVOID TROUBLE THAN CORRECT IT

Commercial wood treating plants, formulations manufacturers, and termite and other pest control operators are accustomed to handling chemicals and formulations of them, and usually take precautions to protect themselves, their workmen and their clients. The above precautionary measures are reviewed in order to help maintain the good records that have accompanied the successful use of penta formulations.

Simple precautions as given above include washing the exposed body parts with soap and water at the completion of a handling operation and the wearing of adequate protective garments. Clothing that becomes contaminated with solutions containing penta should be changed to avoid skin contamination.

Washing with soap and water should be routine practice before eating, drinking or smoking and at the close of the working period. It may be advisable at other times, under particular conditions, and should always be practiced in cases of contact. The secret of safe handling of penta preparation is simply to avoid direct physical contact with them.

PRECAUTIONS RELATIVE TO THE USE OF PENTA FORMULATIONS

Besides health hazards, there are problems that can arise because of the misuse of penta formulations. Know your product! Know what it was designed to be used for, and read the directions for use on the label. It is a violation of Federal Law to use any EPA registered product in a manner inconsistent with its labeling.

Wood preservations formulations can affect subsequent paint coats, therefore select the proper formulations and use them properly.

Termite control or wood preservation solutions containing penta can kill vegetation unless properly used. They may also impart odors. Follow the manufacturer's recommendations for use. Pentachlorophenol is toxic to fish, therefore, do not dispose of near water drainage to streams or bodies of water. Consult the label for pesticide disposal and container disposal directions.

Free access of air should be provided for all surfaces of wood after its treatment with pentachlorophenol solutions and before the wood is used so that the preservation liquids will not be on the wood surfaces when the wood is put in use.

Woodtox, Timbertox, Woodtreat and Noxtane are registered trademarks of Koppers Company, Inc.

FP-877

Litho in U. S. A. October, 1976

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Oil-Penta

1. **Fire Hazards:** This solution will burn if exposed to an open flame. Tanks or lines must be thoroughly cleaned before burning or welding may take place. Clean up spills promptly and observe good housekeeping practices.

   The location and operation of fire fighting equipment should be known to all employees. Definite procedures to be followed in case of a fire should be prepared and posted.

2. **Personnel Hazards:** Oil-Penta will cause skin irritation on contact. Oil-Penta solutions are more hazardous than penta alone.

3. **Protective Equipment:** Wear rubber gloves and goggles when handling Oil-Penta solutions. Rubber overshoes should be worn when foot contamination is possible.

4. **First Aid:** Eye Contact: Flush the eye with water and see a physician immediately.

   Skin Contact: Wash the affected area with soap and water. Launder clothing before re-use. Discard contaminated shoes.

See Pentachlorophenol.

Pentachlorophenol (Penta)

1. **Fire Hazards:** None

2. **Personnel Hazards:**

   A. *Do not swallow.* Penta should not be taken internally. If it is accidentally swallowed, either as a solid or in solution, vomiting should be induced by administration of mustard and water, or other emetic, and a physician should be called.

   B. *Protect eyes, nose, throat.* Penta dust is irritating to the mucous membranes of the eyes, nose and throat It may provide violent sneezing and coughing when inhaled. For prolonged exposure to the dust, a respirator or a folded gauze should be worn over the nose and mouth. The eyes should be protected by goggles. Indoors a forced-draft ventilating system is highly desirable. The worker should be taught to wash his face and hands promptly of any penta dust since this might later find its way into sensitive regions such as the eyes, or be absorbed by the skin.

   C. *Do not inhale vapors.* Penta formulations should not be breathed or allowed to contact mucous membranes of the eyes, nose, throat or skin. Where formulations are being used in weed control work, for example, the worker's respiratory system should be fully protected from inhalation of the spray and his body protected with suitable clothing.

   D. *Avoid skin contact.* Both the solid penta and its solutions are irritating to the skin of most individuals. They may be absorbed if contact is prolonged beyond five to ten minutes, or if repeated contacts occur for shorter periods.

3. **Protective Equipment:** Wear gloves whenever handling penta, penta solutions or penta treated wood. Wear goggles whenever there is the possibility of penta or penta solutions coming in contact with the eye. Wear a face mask when handling dry penta to prevent inhalation of the dust.

   Wear protective garments and accessories. Clothing which becomes wet with penta preparations should be promptly changed for clean items since skin absorption can take place even from diluted solutions.

   Finally, washing with soap and water should be routine practice before eating, drinking or smoking and at the close of the working period. The secret of safe handling of penta preparations is simply to avoid direct physical contact.

4. **First Aid:** For external exposure, wash affected area with soap and water. For internal exposure, induce vomiting if conscious. Contact a physician at once.

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MATERIAL SAFETY DATA SHEET

(Approved by U.S. Department of Labor "Essentially Similar" to Form LSB-005-4)

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Specialty Wood Chemicals

DATE OF PREP.
May 25, 1977

Section I — PRODUCT IDENTIFICATION

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
Koppers Company., Inc., Wood Treating Chemicals Dept.	314/772-2200

STREET ADDRESS
5137 Southwest Avenue

CITY, STATE, AND ZIP CODE
St. Louis, Missouri 63110

MANUFACTURER'S CODE IDENTIFICATION

PRODUCT CLASS	TRADE NAME
Wood Preservative (Water Repellent)	Woodtox Preprime T-RTU

Section II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	TLV PPM	TLV mg/M³	REMARKS
Pentachlorophenol	5		0.5	
Mineral Spirits	85	500	2000	

Section III — PHYSICAL DATA

BOILING RANGE 760 MM H_g: 300-700°F	FREEZING POINT: < -10°F
PERCENT VOLATILE BY VOLUME: 85	VAPOR PRESSURE AT 20° C: mineral spirits 2mm; pentachlorophenal <1mm
SPECIFIC GRAVITY (H_2O = 1): .808	EVAPORATION RATE (BUTYL ACETATE = 1): slower than ether
VAPOR DENSITY: heavier than air	SOLUBLE IN WATER - % WT.: Insoluble

APPEARANCE AND ODOR: Amber; mild solvent odor

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
115°F	mineral spirits	0.7	6.0

EXTINGUISHING MEDIA
Class B Extinguisher, Water fog, foam, Co_2, Dry Chemical

UNUSUAL FIRE AND EXPLOSION HAZARDS
NA

SPECIAL FIRE FIGHTING PROCEDURES
Wear full protection clothing. Do not allow any exposed body surfaces. Toxic vapors given off from a fire. Use self-contained breathing apparatus. Burning may produce hydrochloric acid, carbon monoxide.

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Product Safety Data Sheets

MATERIAL SAFETY DATA SHEET

Section V — HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
See Section II

EFFECTS OF OVEREXPOSURE
Sneezing, coughing, irritation of nose, throat, eyes, respiratory difficulty. This product is a metabolic stimulant, causes hyperthermia.

EMERGENCY AND FIRST AID PROCEDURES
In case of inhalation, remove to fresh air. In case of eye contact, flush eyes with water for at least 15 minutes. Get medical attention. Wash off skin immediately. If swallowed, induce vomiting by sticking finger down throat or giving mustard, soapy, or strong salty water. AVOID ASPIRATION. Repeat until vomit is clear. Get medical attention.

Section VI — REACTIVITY DATA

STABILITY (Check One)	☐	UNSTABLE	CONDITIONS TO AVOID: Keep contents and freshly treated articles away from flame, food,
	☒	STABLE	and living plants.

INCOMPATABILITY (materials to avoid)
Oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS
CO, CO_2, HCL, Phenolics

HAZARDOUS POLYMERIZATION (Check One)	☐	MAY OCCUR	CONDITIONS TO AVOID
	☒	WILL NOT OCCUR	

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove sources of ignition. Avoid contact, avoid breathing vapors, Use protective measures outlined in Section VIII below. Absorb spills with an absorbant such as Speedi-Dry processed clay. Large spills can be dixed and pumped into a waste container. See Section IX below.

WASTE DISPOSAL METHOD
Disposal must be carried out in accordance with local, state and federal regulations. Pentachlorophenol is toxic to fish. Do not dispose near water drainage to streams or bodies of water. Bury absorbant material in an approved chemical landfill, or high temperature incineration may be used. Do not incinerate closed containers.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)
U. S. Bureau of Mines approved organic vapor and particulate matter masks (Type BE)

VENTILATION	LOCAL EXHAUST: To control vapors to concentrations below TLV in Section II.	SPECIAL	
	MECHANICAL (General)	OTHER	

PROTECTIVE GLOVES: Rubber gloves	**EYE PROTECTION**: Chemical goggles

OTHER PROTECTIVE EQUIPMENT

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store in closed, properly labeled containers. Avoid prolonged and/or repeated breathing of mist, vapors, or substantially saturated atmosphere. Avoid contact with skin. Wear approved goggles. Do not atomize. Use only in well ventilated area. Keep contents and freshly treated articles away from flame, food and living plants.

OTHER PRECAUTIONS
Do not take internally. Wash contaminated clothing before reusing. Discard contaminated shoes. Approved (USBM) respirators can be used if oxygen level above 16% and vapor concentration below 2%, otherwise use self-contained units. Do not use when temperature exceeds 120°F. If spilled, blot up with an absorbant material such as Speedi-Dry absorbant, a processed clay sold by Mineral & Chemicals Co., Edison, N. J.

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MATERIAL SAFETY DATA SHEET

(Approved by U.S. Department of Labor "Essentially Similar" to Form LSB-00S-4)

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Specialty Wood Chemicals

DATE OF PREP.
May 25, 1977

Section I — PRODUCT IDENTIFICATION

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
Koppers Company, Inc., Wood Treating Chemicals Dept.	314/772-2200

STREET ADDRESS: 5137 Southwest Avenue

CITY, STATE, AND ZIP CODE: St. Louis, Missouri 63110

MANUFACTURER'S CODE IDENTIFICATION:

PRODUCT CLASS	TRADE NAME
Wood Preservative (Conc.)	Woodtox Preprime Conc. T

Section II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	TLV PPM	TLV mg/M³	REMARKS
Pentachlorophenol	22.5		0.5	
Solvents	70	500		
Ketone Mixture	<5	50	230	suggested

Section III — PHYSICAL DATA

BOILING RANGE (760 mm Hg): 175-700	FREEZING POINT: 10-15°F
PERCENT VOLATILE BY VOLUME: 75	VAPOR PRESSURE AT 20° C: Pentachlorophenol < 1mm
SPECIFIC GRAVITY (H_2O = 1): .97	EVAPORATION RATE (BUTYL ACETATE = 1): slower than ether
VAPOR DENSITY: > 4.7	SOLUBLE IN WATER - % WT.: Insoluble

APPEARANCE AND ODOR: Amber; mild solvent odor

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
120°	mineral spirits	0.7	6.0

EXTINGUISHING MEDIA: Class B Extinguisher, Water fog, foam, CO_2, Dry Chemical

UNUSUAL FIRE AND EXPLOSION HAZARDS: N.A.

SPECIAL FIRE FIGHTING PROCEDURES: Wear full protection clothing. Do not allow any exposed body surfaces. Toxic vapors given off from a fire. Use self-contained breathing apparatus. Burning may produce hydrochloric acid, carbon monoxide.

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MATERIAL SAFETY DATA SHEET

Section V — HEALTH HAZARD DATA

ESHOLD LIMIT VALUE
See Section II

EFFECTS OF OVEREXPOSURE
Sneezing, coughing, irritation of nose, throat, eyes, respiratory difficulty. This product is a metabolic stimulant, causes hyperthermia.

Solvents: irritating to eyes and mucous membranes. Inhalation may cause headache drowsiness, and nausea.

EMERGENCY AND FIRST AID PROCEDURES
In case of inhalation, remove to fresh air. In case of eye contact, flush eyes with water for at least 15 minutes, Get medical attention. Wash off skin immediately. If swallowed, induce vomiting by sticking finger down throat or giving mustard, soapy, or strong salty water. AVOID ASPIRATION. Repeat until vomit is clear. Get medical attention.

Section VI — REACTIVITY DATA

STABILITY (Check One)		CONDITIONS TO AVOID
	☐ UNSTABLE	Keep contents and freshly treated articles away from flame, food, and living plants.
	☒ STABLE	

INCOMPATABILITY (materials to avoid)
Oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS
CO, CO_2, HCL, Phenolics

HAZARDOUS POLYMERIZATION (Check One)		CONDITIONS TO AVOID
	☐ MAY OCCUR	
	☒ WILL NOT OCCUR	

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove sources of ignition. Avoid contact, avoid breathing vapors. Use protective measures outlined in Section VIII below. Absorb spills with an absorbant such as Speedi-Dry processed clay. Large spills can be diked and pumped into a waste container. See Section IX below.

WASTE DISPOSAL METHOD
Disposal must be carried out in accordance with local, state and federal regulations. Pentachlorophenal is toxic to fish. Do not dispose near water drainage to streams or bodies of water. Bury absorbant material in an approved chemical landfill, or high temperature incineration may be used. Do not incinerate closed containers.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)
U.S. Bureau of Mines approved organic vapor and particulate matter masks (Type BE)

VENTILATION		
LOCAL EXHAUST: To control vapors to concentrations below TLV in Section II.	SPECIAL	
MECHANICAL (General)	OTHER	

PROTECTIVE GLOVES: Rubber gloves

EYE PROTECTION: Chemical goggles

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OTHER PROTECTIVE EQUIPMENT

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store in closed, properly labeled containers. Avoid prolonged and/or repeated breathing of mist, vapors, or substantially saturated atmosphere. Avoid contact with skin. Wear approved goggles. Do not atomize. Use only in well ventilated area. Keep contents and freshly treated articles away from flame, food and living plants.

OTHER PRECAUTIONS
Do not take internally. Wash contaminated clothing before reusing. Discard contaminated shoes. Approved (USBM) respirators can be used if oxygen level above 16% and vapor concentration below 2%, otherwise use self-contained units. Do not use when temperature exceeds 120°F. If spilled, blot up with an absorbant material such as Speedi-Dry absorbant, a processed clay sold by Mineral & Chemicals Co., Edison, N.J.

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Chemicals and Coatings

MATERIAL SAFETY DATA SHEET

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Specialty Wood Chemicals

DATE OF PREP.: May 25, 1977

Section I — PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Koppers Company, Inc., Wood Treating Chemicals Dept.	EMERGENCY TELEPHONE NO.: 314/772-2200
STREET ADDRESS: 5137 Southwest Avenue	
CITY, STATE, AND ZIP CODE: St. Louis, Missouri 63110	
MANUFACTURER'S CODE IDENTIFICATION:	
PRODUCT CLASS: Wood Preservative (Water Repellent)	TRADE NAME: Woodtox 140T - Ready to Use

Section II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	TLV PPM	TLV mg/m³	REMARKS
Pentachlorophenol	5		0.5	
Mineral Spirits	85	500	2000	

Section III — PHYSICAL DATA

BOILING RANGE (760 mm Hg): 300-700	FREEZING POINT: < -10°F
PERCENT VOLATILE BY VOLUME: 85%	VAPOR PRESSURE AT 20° C: mineral spirits 2mm; pentachlorophenol <1mm
SPECIFIC GRAVITY (H_2O = 1): .837	EVAPORATION RATE (BUTYL ACETATE = 1): slower than ether
VAPOR DENSITY: heavier than air	SOLUBLE IN WATER - % WT.: Insoluble
APPEARANCE AND ODOR: Amber;mild solvent odor	

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	Lel	Uel
104° F PMCC (Mineral Spirits)	mineral spirits	0.7	6.0

EXTINGUISHING MEDIA: Class B: Water Fog, Alcohol Foam, CO_2, Dry Chemical

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

SPECIAL FIRE FIGHTING PROCEDURES: Wear full protection clothing. Do not allow any exposed body surfaces. Toxic vapors given off from a fire. Use self-contained breathing apparatus. Burning may produce hydrochloric acid, carbon monoxide.

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MATERIAL SAFETY DATA SHEET

Section V — HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
See section II.

EFFECTS OF OVEREXPOSURE
Sneezing, coughin, irritation of nose, throat, eyes, respiratory difficulty. This product is a metabolic stimulant, causes hyperthermia.

EMERGENCY AND FIRST AID PROCEDURES
In case of inhalation, remove to fresh air. In case of eye contact, flush eyes with water for at least 15 minutes. Get medical attention. Wash off skin immediately. If swallowed, induce vomiting by sticking finger down throat or giving mustard, soapy, or strong salty water. AVOID ASPIRATION. Repeat until vomit is clear. Get medical attention.

Section VI — REACTIVITY DATA

STABILITY (Check One)	☐	UNSTABLE	CONDITIONS TO AVOID: Keep contents and freshly treated articles away from flame, food, and living plants.
	☒	STABLE	

INCOMPATABILITY (materials to avoid)
Oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS
CO, CO_2, HCL, Phenolics

HAZARDOUS POLYMERIZATION (Check One)	☐	MAY OCCUR	CONDITIONS TO AVOID
	☒	WILL NOT OCCUR	

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove sources of ignition. Avoid contact, avoid breathing vapors. Use protective measures outlined in Section VIII below. Absorb spills with an absorbant such as Speedi-Dry processed clay. Large spills can be dike and pumped into a waste container. See Section IX below.

WASTE DISPOSAL METHOD
Disposal must be carried out in accordance with local, state and federal regulations. Pentachlorophenol is toxic to fish. Do not dispose near water drainage to streams or bodies of water. Bury absorbant material in an approved chemical landfill, or high temperature incineration may be used. Do not incinerate closed containers.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)
U. S. Bureau of Mines approved organic vapor and particulate matter masks (Type BE)

VENTILATION	LOCAL EXHAUST: To control vapors to concentrations below TLV in SectionII.	SPECIAL
	MECHANICAL (General)	OTHER

PROTECTIVE GLOVES: Rubber gloves	EYE PROTECTION: Chemical goggles

OTHER PROTECTIVE EQUIPMENT

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store in closed, properly labeled containers. Avoid prolonged and/or repeated breathing of mist, vapors, or substantially saturated atmosphere. Avoid contact with skin. Wear approved goggles. Do not atomize. Use only in well ventilated area. Keep contents and freshly treated articles away from flame, food and living plants.

OTHER PRECAUTIONS
Do not take internally. Wash contaminated clothing before reusing. Discard contaminated shoes. Approved (USBM) respirators can be used if oxygen level above 16% and vapor concentration below 2%, otherwise use self-contained units. Do not use when temperature exceeds 120°F. If spilled, blot up with an absorbant material such as Speedi-Dry absorbant, a processed clay sold by Mineral & Chemicals Co., Edison, N. J.

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MATERIAL SAFETY DATA SHEET

(Approved by U.S. Department of Labor "Essentially Similar" to Form LSB-005-4)

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Specialty Wood Chemicals

E OF PREP.
May 25, 1977

Section I — PRODUCT IDENTIFICATION

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
Koppers Company., Inc., Wood Treating Chemicals Dept.	314/772-2200

STREET ADDRESS: 5137 Southwest Avenue

CITY, STATE, AND ZIP CODE: St. Louis, Missouri 63110

MANUFACTURER'S CODE IDENTIFICATION:

PRODUCT CLASS	TRADE NAME
Wood Preservative (Water Repellent)	Woodtox 140T (Concentrate)

Section II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	TLV PPM	TLV mg/M³	REMARKS
Pentachlorophenol	22		0.5	
Mineral Spirits	20-30	500	2000	

Section III — PHYSICAL DATA

BOILING RANGE 760 MM H_g: 300 - 700	FREEZING POINT: 10-15°F
PERCENT VOLATILE BY VOLUME: 30	VAPOR PRESSURE AT 20° C: mineral spirits 2mm; pentachlorophenol <1mm
SPECIFIC GRAVITY (H_2O = 1): .97	EVAPORATION RATE (BUTYL ACETATE = 1): slower than ether
VAPOR DENSITY: heavier than air	SOLUBLE IN WATER - % WT.: Insoluble
APPEARANCE AND ODOR: Amber; mild solvent odor	

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
104°F PMCC (mineral spirits)	mineral spirits	0.7	6.0

EXTINGUISHING MEDIA:
Class B Extinguisher, Water fog, foam, CO_2, Dry Chemical

UNUSUAL FIRE AND EXPLOSION HAZARDS:
NA

ECIAL FIRE FIGHTING PROCEDURES:
Wear full protection clothing. Do not allow any exposed body surfaces. Toxic vapors given off from a fire. Use self-contained breathing apparatus. Burning may produce hydrochloric acid, carbon monoxide.

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MATERIAL SAFETY DATA SHEET

Section V — HEALTH HAZARD DATA

RESHOLD LIMIT VALUE
See Section II

EFFECTS OF OVEREXPOSURE
Sneezing, coughing, irritation of nose, throat, eyes, respiratory difficulty. This product is a metabolic stimulant, causes hyperthermia.

Solvents: dizziness, narcosis at high exposure levels

EMERGENCY AND FIRST AID PROCEDURES
In case of inhalation, remove to fresh air. In case of eye contact, flush eyes with water for at least 15 minutes. Get medical attention. Wash off skin immediately. If swallowed, induce vomiting by sticking finger down throat or giving mustard, soapy, or strong salty water. AVOID ASPIRATION. Repeat until vomit is clear. Get medical attention.

Section VI — REACTIVITY DATA

STABILITY (Check One)	☐	UNSTABLE	CONDITIONS TO AVOID: Keep contents and freshly treated articles away from flame, food,
	☒	STABLE	and living plants.

INCOMPATABILITY (materials to avoid)
Oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS
CO, CO_2, Phenolics

HAZARDOUS POLYMERIZATION (Check One)	☐	MAY OCCUR	CONDITIONS TO AVOID
	☒	WILL NOT OCCUR	

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove sources of ignition. Avoid contact, avoid breathing vapors. Use protective measures outlined in Section VIII below. Absorb spills with an absorbant such as Speedi-Dry processed clay. Large spills can be diked and pumped into a waste container. See Section IX below.

WASTE DISPOSAL METHOD
Disposal must be carried out in accordance with local, state and federal regulations. Pentachlorophenol is toxic to fish. Do not dispose near water drainage to streams or bodies of water. Bury absorbant material in an approved chemical landfill, or high temperature incineration may be used. Do not incinerate closed containers.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)
Normally not needed; USBM approved organic vapor and particulate matter masks (type BE)

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General)	OTHER

PROTECTIVE GLOVES: Rubber gloves

EYE PROTECTION: Chemical goggles

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OTHER PROTECTIVE EQUIPMENT

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store in closed, properly labeled containers. Avoid prolonged and/or repeated breathing of mist, vapors, or substantially saturated atmosphere. Avoid contact with skin. Wear approved goggles. Do not atomize. Use only in well ventilated area. Keep contents and freshly treated articles away from flame, food and living plants.

OTHER PRECAUTIONS
Do not take internally. Wash contaminated clothing before reusing. Discard contaminated shoes. Approved (USBM) respirators can be used if oxygen level above 16% and vapor concentration below 2%, otherwise use self-contained units. Do not use when temperature exceeds 120°F. If spilled, blot up with an absorbant material such as Speedi-Dry absorbant, a processed clay sold by Minerals & Chemical Co., Edison, N. J.

KOPPERS
Chemicals and Coatings

MATERIAL SAFETY DATA SHEET

(Approved by U.S. Department of Labor "Essentially Similar" to Form LSB-005-4)

WHILE THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN ARE BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF, KOPPERS COMPANY MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

Specialty Wood Chemicals

DATE OF PREP.
June 3, 1977

Section I — PRODUCT IDENTIFICATION

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
Koppers Company, Inc., Wood Treating Chemicals Dept.	314/772-2200

STREET ADDRESS: 5137 Southwest Avenue

CITY, STATE, AND ZIP CODE: St. Louis, Missouri 63110

MANUFACTURER'S CODE IDENTIFICATION:

PRODUCT CLASS	TRADE NAME
Water Repellent	WR 340 CONCENTRATE

Section II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	TLV PPM	TLV mg/M³	REMARKS
Ketone Mixture	95	200	700	These are suggested levels only

Section III — PHYSICAL DATA

BOILING RANGE 760 mm Hg: 216°F	FREEZING POINT:
PERCENT VOLATILE BY VOLUME: 95%	VAPOR PRESSURE AT 20° C:
SPECIFIC GRAVITY (H_2O = 1):	EVAPORATION RATE (BUTYL ACETATE = 1): Slower than ether
VAPOR DENSITY:	SOLUBLE IN WATER - % WT.: < 5%

APPEARANCE AND ODOR:

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
185°F PMCC	Lower: 15,000 ppm		

EXTINGUISHING MEDIA:
Dry Chemical, CO_2, Alcohol foam

UNUSUAL FIRE AND EXPLOSION HAZARDS:
None

SPECIAL FIRE FIGHTING PROCEDURES:
Self-contained breathing apparatus with a full facepiece operated in the pressure demand (positive pressure) mode.

TOLS011124

MATERIAL SAFETY DATA SHEET

Section V—HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
None established: See Section II

EFFECTS OF OVEREXPOSURE
mild skin and eye irritant. Inhalation: nose irritation, drowsiness, loss of consciousness

EMERGENCY AND FIRST AID PROCEDURES
Flush affected area with water, use soap or mild detergent. If swallowed, DO NOT induce omiting. For inhalation exposure, remove to fresh air. If breathing has stopped, use rtificial respiration. Get Medical attention.

Section VI—REACTIVITY DATA

			CONDITIONS TO AVOID
STABILITY (Check One)	☐	UNSTABLE	
	☒	STABLE	

INCOMPATABILITY (materials to avoid)
Avoid oxidizers and sources of igniting.

HAZARDOUS DECOMPOSITION PRODUCTS
Toxic gases and vapors (such as CO) released in fire.

			CONDITIONS TO AVOID
HAZARDOUS POLYMERIZATION (Check One)	☐	MAY OCCUR	
	☒	WILL NOT OCCUR	

Section VII—SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Wipe up spill or leaks on absorbant paper; burn paper in incinerator; absorb in vermiculite.

WASTE DISPOSAL METHOD
Incineration is best method, or absorb in vermiculite and dispose in landfill. Do not contaminate water.

Section VIII—SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)
Not necessary <200 ppm Organic vapor canister gas mask; self-contained or supplied air respirator.

VENTILATION		
LOCAL EXHAUST		SPECIAL
MECHANICAL (general)	XX	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Rubber gloves	Chemical goggles (splash safety)

OTHER PROTECTIVE EQUIPMENT

Section IX—SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid skin contact. Avoid prolonged breathing of vapors. Do not use near a source of ignition. Avoid contamination of feed or food stuffs. Store in tightly closed containers in a cool location. Ventilated area.

OTHER PRECAUTIONS
Launder contaminated clothing before reuse. Do not reuse containers. Read label thoroughly, this product is to be mixed with other toxic materials.

TOLS011125

KOPPERS
Chemicals and Coatings

MATERIAL SAFETY DATA SHEET

(Approved by U.S. Department of Labor "Essentially Similar" to Form LSB-005-4)

WHILE THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN ARE BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF, KOPPERS COMPANY MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

Specialty Wood Chemicals

DATE OF PREP.
May 25, 1977

Section I — PRODUCT IDENTIFICATION

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
Koppers Company, Inc., Wood Treating Chemicals Dept.	314/772-2200

STREET ADDRESS: 5137 Southwest Avenue

CITY, STATE, AND ZIP CODE: St. Louis, Missouri 63110

MANUFACTURER'S CODE IDENTIFICATION:

PRODUCT CLASS	TRADE NAME
Wood Preservative (concentrate)	Timbertox 40 Concentrate

Section II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	TLV PPM	TLV mg/M³	REMARKS
Pentachlorophenol	40		0.5	
Ketone Mixture	40	80	230	suggested
Hydrocarbon Solvent	20	500		

Section III — PHYSICAL DATA

BOILING RANGE 760 mm H_g: 175+	FREEZING POINT: >-10°F
PERCENT VOLATILE BY VOLUME: 60	VAPOR PRESSURE AT 20° C: pentachlorophenol < 1mm
SPECIFIC GRAVITY (H_2O = 1): 1.12	EVAPORATION RATE (BUTYL ACETATE = 1): slower than ether
VAPOR DENSITY: heavier than air	SOLUBLE IN WATER - % WT.: Insoluble

APPEARANCE AND ODOR: Dark; mild solvent odor

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
> 100°F	Mineral spirits	0.7	6.0

EXTINGUISHING MEDIA
Class B Extinguisher, Water fog, foam, CO_2, Dry Chemical

UNUSUAL FIRE AND EXPLOSION HAZARDS
Ketone vapors can form explosive vapors at elevated temperatures. Control all ignition sources when in use. Ketone vapors are heavier than air.

SPECIAL FIRE FIGHTING PROCEDURES
Wear full protection clothing. Do not allow any exposed body surfaces. Toxic vapors given off from a fire. Use self-contained breathing apparatus. Burning may produce hydrochloric acid, carbon monoxide.

TOLS011126

MATERIAL SAFETY DATA SHEET

Section V — HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
See Section II

EFFECTS OF OVEREXPOSURE
Sneezing, coughing, irritation of nose, throat, eyes, respiratory difficulty. This product is a metabolic stimulant, causes hyperthermia.

Solvents: irritating to eyes and mucous membranes. Inhalation may cause headache, drowsiness, and nausea.

EMERGENCY AND FIRST AID PROCEDURES
In case of inhalation, remove to fresh air. In case of eye contact, flush eyes with water for at least 15 minutes. Get medical attention. Wash off skin immediately. If swallowed, induce vomiting by sticking finger down throat or giving mustard, soapy, or strong salty water. AVOID ASPIRATION. Repeat until vomit is clear. Get medical attention.

Section VI — REACTIVITY DATA

STABILITY (Check One)			CONDITIONS TO AVOID
	☐	UNSTABLE	Keep contents and freshly treated articles away from flame, food
	☒	STABLE	and living plants.

INCOMPATABILITY (materials to avoid)
Oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS
CO, CO_2, HCL, Phenolics

HAZARDOUS POLYMERIZATION (Check One)			CONDITIONS TO AVOID
	☐	MAY OCCUR	
	☒	WILL NOT OCCUR	

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove sources of ignition. Avoid contact, avoid breathing vapors. Use protective measures outlined in Section VIII below. Absorb spills with an absorbant such as Speedi-Dry processed clay. Large spills can be diked and pumped into a waste container. See Section IX below.

WASTE DISPOSAL METHOD
Disposal must be carried out in accordance with local, state and federal regulations. Pentachlorophenol is toxic to fish. Do not dispose near water drainage to streams or bodies of water. Bury absorbant material in an approved chemical landfill, or high temperature incineration may be used. Do not incinerate closed containers.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)
U. S. Bureau of Mines approved organic vapor and particulate matter masks (Type BE)

VENTILATION			
	LOCAL EXHAUST: To control vapors to concentrations below TLV in Section II.		SPECIAL
	MECHANICAL (General)		OTHER

PROTECTIVE GLOVES	EYE PROTECTION	
Rubber gloves	Chemical goggles	TOLS011127

OTHER PROTECTIVE EQUIPMENT

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store in closed, properly labeled containers. Avoid prolonged and/or repeated breathing of mist, vapors, or substantially saturated atmosphere. Avoid contact with skin. Wear approved goggles. Do not atomized. Use only in well ventilated area. Keep contents and freshly treated articles away from flame, food and living plants.

OTHER PRECAUTIONS
Do not take internally. Wash contaminated clothing before reusing. Discard contaminated shoes. Approved (USBM) respirators can be used if oxygen level above 16% and vapor concentration below 2%, otherwise use self-contained units. Do not use when temperature exceeds 120°F. If spilled, blot up with an absorbant material such as Speedi-Dry absorbant, a processed clay sold by Mineral & Chemicals Co., Edison, N.J.

KOPPERS
Chemicals
and Coatings

MATERIAL SAFETY DATA SHEET

(Approved by U.S. Department of Labor "Essentially Similar" to Form LSB-005-4)

WHILE THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN ARE BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF, KOPPERS COMPANY MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

Specialty Wood Chemica

DATE OF PREP.
December 13, 1976

Section I — PRODUCT IDENTIFICATION

MANUFACTURER'S NAME
Koppers Company, Inc. - Wood Treating Chemicals Dept.

EMERGENCY TELEPHONE NO.
314-772-2200

STREET ADDRESS
5137 Southwest Avenue

CITY, STATE, AND ZIP CODE
St. Louis, Missouri 63110

MANUFACTURER'S CODE IDENTIFICATION

PRODUCT CLASS

TRADE NAME
PETROSET II

Section II — HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT	TLV PPM	TLV mg/M³	REMARKS
No hazardous ingredients as defined in section 0.57 of the regulations promulgated under				
Public Law 85-742 and incorporated in MIL - Standard - 1341A and Fed. Standard 313 or				
U.S. Department of Labor definition 29CFR 1501.2(S).				

Section III — PHYSICAL DATA

BOILING RANGE 760 MM Hg	Not defined	FREEZING POINT	Not defined
PERCENT VOLATILE BY VOLUME	Not defined	VAPOR PRESSURE AT 20° C	Not defined
SPECIFIC GRAVITY (H_2O = 1)	1.03	EVAPORATION RATE (BUTYL ACETATE = 1)	Not defined
VAPOR DENSITY	Not defined	SOLUBLE IN WATER - % WT.	Not defined

APPEARANCE AND ODOR: Dark Liquid

Section IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
(COL) 375° F.	Not defined		

EXTINGUISHING MEDIA
CO_2, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS
CO, Oxides of sulfur, Barium and Calcium may be formed

SPECIAL FIRE FIGHTING PROCEDURES

TOLS011128

MATERIAL SAFETY DATA SHEET

Section V — HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Not defined

EFFECTS OF OVEREXPOSURE
Not defined

EMERGENCY AND FIRST AID PROCEDURES
Not defined

Section VI — REACTIVITY DATA

STABILITY (Check One)	☐ UNSTABLE	CONDITIONS TO AVOID: Avoid excessive heat and strong oxidizers.
	XXX STABLE	

INCOMPATABILITY (materials to avoid)
Avoid strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION (Check One)	☐ MAY OCCUR	CONDITIONS TO AVOID
	XX WILL NOT OCCUR	under normal operating conditions.

Section VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Handle as an oil spill.

WASTE DISPOSAL METHOD
Incineration.

Section VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General) X	OTHER

PROTECTIVE GLOVES
Impervious Material

EYE PROTECTION
Face mask or safety goggles.

OTHER PROTECTIVE EQUIPMENT
Impervious outer clothing.

Section IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Standard Precautions should be observed when handling materials of this type.
Do not store at temperatures above 150°F.

OTHER PRECAUTIONS
Avoid prolonged or repeated contact with the skin.

TOLS011129

KB-3

EASTMAN KODAK COMPANY
APPROVED BY U.S. DEPARTMENT OF LABOR
"ESSENTIALLY SIMILAR" TO FORM OSHA-20

ECP 2079-1F (8-79)

MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME:	Solvent B-11	SIZE:	--
CHEMICAL NAME:	Mixture		
FORMULA:	Mixture		
MANUFACTURER:	Marketed by Eastman Chemical Products, Inc.		
ADDRESS:	Kingsport, Tennessee 37662		
FOR INFORMATION ON HEALTH HAZARDS CALL:	Monday thru Friday, 8 a.m.-5 p.m. (Eastern), (615) 247-0411, Ext. 3613; all other times (615) 247-0411, Ext. 4666.		
FOR OTHER INFORMATION CALL:	Same number as above Extension 5831	INFORMATION EFFECTIVE AS OF:	February, 1980

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZARDOUS COMPONENT (S)	%	TLV (Units)
None known to Eastman.		

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	Approx. 275-330°F (135-166°C)	SPECIFIC GRAVITY ($H_2O = 1$)	0.87-0.91 @ 20°/20°C
VAPOR PRESSURE (mm Hg.)	Not applicable.	PERCENT VOLATILE BY VOLUME (%)	Not applicable.
VAPOR DENSITY (AIR = 1)	Not applicable.	EVAPORATION RATE (—— —— —— = 1)	Not applicable.
SOLUBILITY IN WATER	Negligible.		
APPEARANCE AND ODOR	Yellow to dark brown liquid; slightly unpleasant odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	215°F (102°C) COC	FLAMMABLE LIMITS Not applicable.	Lel	Uel
EXTINGUISHING MEDIA	Foam, Water spray, Dry chemical, CO_2			
SPECIAL FIRE FIGHTING PROCEDURES	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin or eyes.			
UNUSUAL FIRE AND EXPLOSION HAZARDS	None known to Eastman.			

TOLS011130

BZTO104(e)047963

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Not established.

EFFECTS OF OVEREXPOSURE
May cause skin irritation or allergic skin reaction.

EMERGENCY AND FIRST AID PROCEDURES
Skin contact: wash thoroughly with soap and water.

SECTION VI REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		Not applicable.
	STABLE	X	

INCOMPATIBILITY (Materials to avoid) Oxidizing materials can cause a vigorous reaction.

HAZARDOUS DECOMPOSITION PRODUCTS As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur	Will Not Occur X	Not applicable.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Eliminate all ignition sources.
Flush spill away with water spray. Small spills may be collected with absorbent material.

WASTE DISPOSAL METHOD
Incineration.
Observe all Federal, state, and local laws concerning health and environment.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) An appropriate NIOSH-approved respirator for organic vapor should be worn if needed.

VENTILATION				
	LOCAL EXHAUST	As needed to control mist or vapor.	SPECIAL	None known to Eastman.
	MECHANICAL (general)	Recommended.	OTHER	None known to Eastman.

PROTECTIVE GLOVES Should be worn.

EYE PROTECTION Safety glasses should be worn in any type of industrial operation.

OTHER PROTECTIVE EQUIPMENT Eye bath; safety shower.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid prolonged or repeated contact with skin.
Use with adequate ventilation.

OTHER PRECAUTIONS
Good industrial hygiene practice should be followed which includes preventing eye contact, minimizing skin contact, and minimizing inhalation of mists and vapors. No eye hazard known to Eastman; however, any material gotten into the eye should be washed out immediately and medical attention obtained if symptoms persist after washing. Hazardous residue may remain in "empty" package; do not reuse or alter package without proper industrial cleaning.

The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: REICHHOLD CHEMICALS, INC.	EMERGENCY TELEPHONE NO.: (206) 572-5600
ADDRESS (Number, Street, City, State, and ZIP Code): 2340 Taylor Way (P. O. Box 1482), Tacoma, Wa. 98401	
CHEMICAL NAME AND SYNONYMS: Pentachlorophenol	TRADE NAME AND SYNONYMS: RCI 49 - 162 Pentachlorophenol
CHEMICAL FAMILY: Chlorinated phenols	FORMULA: C_6Cl_5OH

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.) 309° C.	754° F.	SPECIFIC GRAVITY (H_2O=1)	~1.86@25° C.
VAPOR PRESSURE (mm Hg.) 0.00011 20° C. (68° F.)		PERCENT, VOLATILE BY VOLUME (%)	Negative
VAPOR DENSITY (AIR=1)	-----	EVAPORATION RATE (- ---- --- =1)	Negative
SOLUBILITY IN WATER 14 ppm at	68° F.		
APPEARANCE AND ODOR Hollow shot or solid blocks Buff colored			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) >300° C. Tagged closed cup	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA *Foam, water or carbon dioxide*			
SPECIAL FIRE FIGHTING PROCEDURES Blanket with foam, water or carbon dioxide			
UNUSUAL FIRE AND EXPLOSION HAZARDS			

When subjected to high temperatures, decomposes. Decomposed products are acidic and corrosive. Volatile in steam.

(Continued on reverse side)

Form OSHA-20
Rev. May 72

Raw Material Safety Data Sheets

TOLS011132

BZTO104(e)047965

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: LD_{ca} ~ 29 mg/Kg man, LD_{50} ~ 146 mg/Kg Rats.

EFFECTS OF OVEREXPOSURE: Acute poisoning is marked by weakness, convulsion and collapse.

EMERGENCY AND FIRST AID PROCEDURES

EXTERNAL: Eyes–Immediately flush with copious quantities of clear water until physician arrives. Skin–Remove contaminated clothing; wash with copious amounts of soap and water. INTERNAL: Call a physician or poison Control Center immediately. CONTAMINATED CLOTHING: Thoroughly wash before re-use.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID: Decomposes at high temperatures; avoid exposure to temperatures above 300° C.
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*: Dissolves in alkaline solutions

HAZARDOUS DECOMPOSITION PRODUCTS: Acid fumes containing organic chlorides

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Wet down spilled material to prevent dusting. Sweep up and put back into container.

WASTE DISPOSAL METHOD: Take to chemical disposal area and cover with dirt.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*: Wear air purifying respirator for dust and vapors.

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL *(General)*	OTHER

Rubber gloves required.

Full safety goggles recommended.

PROTECTIVE GLOVES

EYE PROTECTION

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Avoid puncturing container. Avoid temperatures above 300° C.

OTHER PRECAUTIONS: KEEP OUT OF REACH OF CHILDREN

Form OSHA-20

This information is furnished without warranty, representation, inducement or license of any kind, except that it is accurate to the best of Reichhold Chemicals, Inc.'s knowledge, or obtained from sources believed by Reichhold Chemicals, Inc. to be accurate, and Reichhold Chemicals, Inc. does not assume any legal responsibility for use or reliance upon same. Customers are encouraged to conduct their own tests. Before using any product, read its label.

TOLS011133

BZTO104(e)047966

Penta Grills

Form Approved
Budget Bureau No. 44-R1387
Approval Expires April 30, 1971

Form No. LSB-005-4
May 1968

U.S. DEPARTMENT OF LABOR

WORKPLACE STANDARDS ADMINISTRATION

Bureau of Labor Standards

MATERIAL SAFETY DATA SHEET

SECTION I

MANUFACTURER'S NAME: MONSANTO COMPANY	EMERGENCY TELEPHONE NO.: (314) 694-1000
ADDRESS (Number, Street, City, State, and ZIP Code): 800 NORTH LINDBERGH BLVD., St. Louis, Mo. 63166	
CHEMICAL NAME AND SYNONYMS: Pentachlorophenol	TRADE NAME AND SYNONYMS: PENTA
CHEMICAL FAMILY: Phenol	FORMULA: $C_6 Cl_5 OH$

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III PHYSICAL DATA

BOILING POINT (°F.) °C at 760 mm	310 (Decomp)	SPECIFIC GRAVITY (H_2O=1)	>1
VAPOR PRESSURE (mm Hg.) at 50°C	<1mm	PERCENT VOLATILE BY VOLUME (%)	N.A.
VAPOR DENSITY (AIR=1)	N.A.	EVAPORATION RATE (BOAC =1)	<1
SOLUBILITY IN WATER at 25°C Negligible	16ppm		
APPEARANCE AND ODOR: Brown solid, characteristic odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used): N.A.	FLAMMABLE LIMITS: N.A.	Lel	Uel
EXTINGUISHING MEDIA: Water fog, foam, CO_2			
SPECIAL FIRE FIGHTING PROCEDURES: N.A.			
UNUSUAL FIRE AND EXPLOSION HAZARDS: N.A.			

TOLS011134

PENTACHLOROPHENOL

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 0.5 mg/cu.m.

EFFECTS OF OVEREXPOSURE: Sneezing, coughing, irritation of nose, throat, eyes, respiratory difficulty, liver damage.

EMERGENCY AND FIRST AID PROCEDURES: Wash off immediately with soap and water. Change out of contaminated clothing. If accidentally swallowed, cause vomiting and refer to physician for systematic treatment.

SECTION VI REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	x	

INCOMPATABILITY (Materials to avoid): None

HAZARDOUS DECOMPOSITION PRODUCTS: CO, CO_2, HCl, Phenolics

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	x	

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Sweep up and dispose of in approved chemical landfill in accordance with local and state regulations.

WASTE DISPOSAL METHOD: Bury in chemical landfill

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type): Bureau of Mines dust respirator

VENTILATION	LOCAL EXHAUST: To control dust (or vapors if in solution)	SPECIAL
	MECHANICAL (General)	OTHER

PROTECTIVE GLOVES: Rubber

EYE PROTECTION: Chemical goggles

OTHER PROTECTIVE EQUIPMENT: Do not wear contaminated clothing.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Keep off skin. Keep away from mouth. Avoid dust, vapor, mist (inhalation). Wear approved goggles

OTHER PRECAUTIONS:

TOLS011135

HOII:EPW

12/2/71

BZTO104(e)047968

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: Monsanto Industrial Chemical Co.	REGULAR TELEPHONE NO. / EMERGENCY TELEPHONE NO.: 314-694-1000
ADDRESS: 800 North Lindbergh Blvd., St. Louis, Missouri 63166	
TRADE NAME: Pentachlorophenol	
SYNONYMS: Penta, Technical Penta, PCP	
SHIPPING NAME[1]: DOT: Not Restricted	
IATA: Not Restricted	

II HAZARDOUS INGREDIENTS[2]

MATERIAL OR COMPONENT	CAS NO.	%	HAZARD DATA
Pentachlorophenol (and other chlorinated phenols)		96	29 CFR Part 1910 40 CFR Part 129

III PHYSICAL DATA

BOILING POINT, 760 MM HG	310°C (Decomp.)	MELTING POINT	174°C Min.
SPECIFIC GRAVITY (H_2O = 1)	1.8500	VAPOR PRESSURE	0.00011 mm Hg. @ 20°C
VAPOR DENSITY (AIR = 1)	Nagative	SOLUBILITY IN H_2O, % BY WT	14 ppm @ 20°C
% VOLATILES BY VOL.	Negative	EVAPORATION RATE (BUTYL ACETATE = 1)	<1
APPEARANCE AND ODOR	Brown Solid Chlorophenolic Odor	Ph (AS IS) Ph (1% SOLN.)	$Ka = .10^{-5}$ NA

IV FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD)	Negative	AUTOIGNITION TEMPERATURE	Negative
FLAMMABLE LIMITS IN AIR, % BY VOL.	Negative	LOWER	UPPER
EXTINGUISHING MEDIA	Water, Fog, Foam, CO_2		
SPECIAL FIRE FIGHTING PROCEDURES	Wear full protection clothing. Do not allow exposed body surfaces. Toxic vapors given off from a fire. Use self-contained breathing apparatus. Blanket with extinguishing media.		
UNUSUAL FIRE AND EXPLOSION HAZARD	When subjected to high temperatures it decomposes to hydrochloric acid and water. Highly toxic gases (Chlorides and Chlorine) can be evolved when burned.		

1. See references 1 and 2 2. See instructions and references 1 to 8.

TOLS011136

V HEALTH HAZARD INFORMATION

HEALTH HAZARD DATA	HAZARD CLASSIFICATION	BASIS FOR CLASSIFICATION	SOURCE
ROUTES OF EXPOSURE INHALATION	TLV 0.5 mg/cu. M Skin Notation		ACG, IH 29 CFR Part 191
SKIN CONTACT	(Mild) Sensitizer		16CFR 1500.3 (C)(5)
SKIN ABSORPTION	Toxic	200 < LD < 1000 mg/kg	ANSI 2-129.1 - 1976
EYE CONTACT	Mild Irritant		
INGESTION	Toxic	50 < LD_{50} < 500 mg/kg	ANSI 2-129.1 - 1976

EFFECTS OF OVEREXPOSURE

ACUTE OVEREXPOSURE: Sneezing, irritation of nose, throat, eyes, respiratory difficulty liver damage.
Hyperthemia, Liver, Kidney failure and death.

CHRONIC OVEREXPOSURE: Penta is expelled quite rapidly in sub acute doseages and chronic exposure over prolonged periods can lead to liver & kidney failure and death.

EMERGENCY AND FIRST AID PROCEDURES

EYES: Rinse eyes with clean water and apply eye ointment to prevent infection and ease irritation.

SKIN: Wash with plenty of soap and water.

INHALATION: Remove patient from source.

INGESTION: Induce vomiting by drinking mustard or salt water or finger in throat. Avoid Aspiration.

NOTES TO PHYSICIAN

This product is a metabolic stimulant. Causes hyperthemia treat symtomatically.

TOLS011137

VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

Stable at temperatures < 310°C.

INCOMPATIBILITY

Dissolves in alkaline solution

HAZARDOUS DECOMPOSITION PRODUCTS

CO, CO_2, HCL and phenolics

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

Will not occur.

VII DISPOSAL, SPILL OR LEAK PROCEDURES

AQUATIC TOXICITY (E.G. 96 HR. TLM):

Highly toxic to fish, especially sensitive species such as trout. Safe at 0.05 ppm in water.

WASTE DISPOSAL METHOD

Disposal must be carried out in accordance with local, state, and Federal regulations. Do not incinerate closed containers. Do not dispose near water drainage to stream or bodies of water. Bury in sanitary landfill and high temperature incineration (870°C Min.).

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

Wet down spilled material to prevent dusting and sweep up and dispose in approved manner. Avoid contact, avoid breathing vapors.

NEUTRALIZING CHEMICALS

None.

VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS

Not requiredin storage areas. In work areas use solvent type dust collectors. Maintain level below the TLV.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

Rubber Gloves, Chemical Goggles,

RESPIRATORY (SPECIFY IN DETAIL)

Bureau of Mines approved respirator (Type BE) Approved organic vapor and particulate mas

EYE

Chemical Goggles

GLOVES

Rubber, Neoprene

OTHER CLOTHING AND EQUIPMENT

Clean clothing fully covering body changed at least daily if in contact with penta.

Discard contaminated shoes.

TOLS011138

IX SPECIAL PRECAUTIONS

PRECAUTIONARY STATEMENTS

Keep out of reach of children. Avoid prolonged and/or repeated breathing of vapors or dust. Avoid contact with skin. Keep contents and freshly treated articles away from flame, food, and living plants. Do not use contaminated sawdust for animal bedding.

OTHER HANDLING AND STORAGE REQUIREMENTS

Store in closed, properly labeled containers.
Do not reuse containers. Drums should be returned to drum reconditioner.
Bags should be buried in sanitary landfill. Bags should be stored out of weather. Shelf life indefinite under good storage conditions.

ADDITIONAL REGULATORY CONCERNS

GENERAL:

FDA

USDA

CPSC

TSCA IS THIS PRODUCT, OR ALL ITS INGREDIENTS, BEING CERTIFIED FOR INCLUSION ON THE TOXIC SUBSTANCES CONTROL ACT INVENTORY OF CHEMICAL SUBSTANCES? As a registered pesticide, this product exempt

OTHER EPA { FWPCA / FIFRA

STATE: Water quality, Air quality and Health Departments in some states.

PREPARED BY J. M. Montgomery

TITLE: General Sales Manager

COMPANY: Koppers Company, Inc.

ADDRESS: 5137 Southwest Avenue
St. Louis, Missouri 63110

TOLS011139

Form Approved OMB
No. 44-R1387.
Approval Expires:
July 30, 1972

U.S. DEPARTMENT OF LABOR

Form No. OSHA-20
May, 1971

MATERIAL SAFETY DATA SHEET

SECTION I

MANUFACTURER'S NAME: MONSANTO COMPANY

EMERGENCY TELEPHONE NO.:

ADDRESS (Number, Street, City, State, and ZIP Code): 800 North Lindbergh Boulevard, St. Louis, Missouri 63166

CHEMICAL NAME AND SYNONYMS:

TRADE NAME AND SYNONYMS: MONSANTO HEAVY OXO [illegible] (HOE

CHEMICAL FAMILY: OXO ALCOHOL HIGH BOILERS

FORMULA:

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III PHYSICAL DATA

BOILING POINT (°F.) @ 20 mm Hg	290	SPECIFIC GRAVITY (H_2O=1) @ 25/25°C	0.857
VAPOR PRESSURE (mm Hg.)	<0.1	PERCENT VOLATILE BY VOLUME (%)	NA
VAPOR DENSITY (AIR=1)	NA	EVAPORATION RATE (_____=1)	< 1
SOLUBILITY IN WATER %	<0.1		

APPEARANCE AND ODOR: Clear, straw-colored liquid; mild characteristic odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used)	FLAMMABLE LIMITS	Lel	Uel
COC - 305°F			

EXTINGUISHING MEDIA: Dry powder, CO_2, Foam, Fog

SPECIAL FIRE FIGHTING PROCEDURES:

UNUSUAL FIRE AND EXPLOSION HAZARDS:

TOLS011140

BZTO104(e)047973

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

EFFECTS OF OVEREXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

SECTION VI REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY (Materials to avoid) Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Adsorb on clay, sawdust or filter-cel

WASTE DISPOSAL METHOD

Incinerate or dispose of in sanitary landfill according to local or state regulations.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General)	OTHER

PROTECTIVE GLOVES | EYE PROTECTION

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

OTHER PRECAUTIONS

While the information and recommendations set forth herein are believed to be accurate as of the date hereof, MONSANTO COMPANY MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

RWR 9/8/75

EASTMAN KODAK COMPANY
APPROVED BY U.S. DEPARTMENT OF LABOR
"ESSENTIALLY SIMILAR" TO FORM OSHA-20

MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME: Solvent KB-3	SIZE:
CHEMICAL NAME: Mixed Aliphatic Ketones	
FORMULA: Mixture	
MANUFACTURER: Marketed by Eastman Chemical Products, Inc.	
ADDRESS: Kingsport, Tennessee 37662	
FOR INFORMATION ON HEALTH HAZARDS CALL: Area 615-247-0411 Ext. 3613	
FOR OTHER INFORMATION CALL: Ext. 3103	SIGNATURE AND DATE: Information effective as of May, 1975

SECTION II HAZARDOUS INGREDIENTS OF MIXTURES

PRINCIPAL HAZARDOUS COMPONENT (S)	%	TLV (Units)

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	Approx. 175°C	SPECIFIC GRAVITY (H_2O = 1)	Approx. .863
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER	Slightly soluble in water		
APPEARANCE AND ODOR	Dark liquid - solvent odor		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	155°F C.O.C.	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA	Water, CO_2, Dry Chemical			
SPECIAL FIRE FIGHTING PROCEDURES	None			
UNUSUAL FIRE AND EXPLOSION HAZARDS	None			

TOLS011142

ECP 2079-1

BZTO104(e)047975

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Not established.

EFFECTS OF OVEREXPOSURE
Prolonged contact may cause skin irritation. Repeated contact may result in skin sensitization in susceptible individuals. High vapor concentrations may cause mucous membrane and respiratory tract irritation.

EMERGENCY AND FIRST AID PROCEDURES
Skin Contact: Flush affected areas thoroughly with water.
Eye Contact: Irrigate with water for 15 minutes and get medical attention.
Inhalation: Remove to fresh air.

SECTION VI REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATIBILITY (Materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur	Will Not Occur	

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Soak with absorbent material and incinerate.

WASTE DISPOSAL METHOD
Incinerate

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)
vapor at elevated temperatures

VENTILATION			
	LOCAL EXHAUST X if needed to control		SPECIAL
	MECHANICAL (general) X		OTHER

PROTECTIVE GLOVES X
EYE PROTECTION

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid eye contact and prolonged or repeated skin contact. Avoid inhalation of vapor.

OTHER PRECAUTIONS

TOLS011143

BZTO104(e)047976

Material Information Bulletin
Environmental Health & Toxicology

Chevron

Warning Statement	Name
DANGER! HARMFUL OR FATAL IF SWALLOWED COMBUSTIBLE	CHEVRON 325 SOLVENT

A. Typical Composition

	%
Paraffins (incl. naphthenes)	96%
Aromatics C_8^+	4%

B. Physiological Effects and Health Information

Threshold Limit Value (TLV)	The suggested TLV is 250 ppm (Parts of vapor per million parts of air) for a daily 8-hour exposure. No OSHA exposure standard has been established for this material.
Eye Irritation	This material is not a primary eye irritant. However, minor irritation may be noted following contact. Application of the material into the eyes of rabbits produced a slight degree of membrane irritation.
Skin Irritation	This material may cause skin irritation on prolonged or frequently repeated contact. Application of the material onto the skin of rabbits produced a moderate degree of erythema and edema. The primary irritation score was 3.7 on a scale of 0 to 8. Prolonged or frequently repeated skin contact may cause the skin be become dry or cracked from the defatting action of the material.
Systemic Effects	From the results of animal studies, this material is not expected to be toxic by ingestion or by skin contact. The acute oral LD_{50} for rats was greater than 15.3 g/Kg, and the acute dermal LD_{50} for rabbits was greater than 19.1 g/Kg. Prolonged exposure to high vapor concentrations of this material may cause signs and symptoms of central nervous system depression such as, headache, dizziness, loss of appetite, weakness, and loss of coordination. Affected persons normally experience complete recovery when removed from the exposure area. Aspiration of the liquid can lead to chemical pneumonitis. TOLS011144

Note Disclaimer of Warranty, Page 4

Chevron Environmental Health Center/225 Bush Street, San Francisco, CA 94104
J. A. Spence, Ph. D. Reference Phone Number (415) 232-1514, Ext. 4178 or 2027

(Approved by U.S. Department of Labor, "Essentially similar to Form OSHA 20, Material Safety Data Sheet")
Rev. No. 47 - 1975

BZTO104(e)047977

C. Emergency and First Aid Procedures

Eye Contact	Flush eyes with fresh water for at least 15 minutes. If irritation persists get medical attention.
Skin Contact	Use good personal hygiene practices while working with this material. Wash contaminated clothing before reuse.
Inhalation	If there are signs or symptoms of overexposure to mist or vapor of this material (as described in Section B - Systemic Effects), move the individual to an uncontaminated area. If breathing has stopped, apply artificial respiration. Get medical attention immediately.
Ingestion	If this material is swallowed and aspirated, chemical pneumonitis may result. If swallowed, DO NOT induce vomiting; get medical attention immediately.

D. Special Protection Information

Eye Protection	Avoid eye contact with this material. If the conditions or frequency of use increase the danger of exposure, eye contact can best be avoided by wearing chemical-safety goggles.
Respiratory Protection	The vapor or mist concentrations of this material must be kept below applicable standards (see Section B - TLV). If this cannot be achieved, the use of an approved respirator for organic vapor and mist, supplied-air or self-contained breathing equipment is recommended.
Skin Protection	Avoid prolonged or frequently repeated skin contact with this material. If the conditions or frequency of use increase the danger of exposure, skin contact can best be avoided by wearing impervious neoprene or rubber gloves.
Ventilation	Use adequate ventilation to keep the vapor or mist concentrations of this material below applicable standards.
Other	If eye or skin contact with this material can occur, washing facilities for eyes and skin should be available nearby.

E. Fire Protection Information

Flash Point (test method)	(TCC)100°F	Flammable Limits (by volume in air)	lower limit		upper limit	
Autoignition Temperature	610°F	Extinguishing Media	CO_2, Dry Chemical, Foam, Water Spray			
Special Fire Fighting Procedures	For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire Bulletin.					

F Reactivity Data

Stability (thermal, light, etc.)	Stable	X	Conditions to Avoid	
	Unstable			
Incompatibility (materials to avoid)	May react with strong oxidizing materials.			
Hazardous Decomposition Products	Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.			
Hazardous Polymerization	May Occur		Conditions to Avoid	
	Will not Occur	X		

G Environmental Protection

Environmental Impact	Certain geographical areas have air pollution restrictions concerning the use of thinners and solvents in work situations where the material would be released into the atmosphere. Air pollution regulations should be studied to determine if this material is exempt in that area where it is to be used.
Precautions if Material is Released or Spilled	Eliminate all sources of ignition in vicinity of spill or released vapor. Clean up spills as soon as possible, observing precautions in Section D. Absorb large spills with absorbent clay, diatomaceous earth or other suitable material. A fire or vapor hazard may exist since these cleanup materials will only absorb liquids and will not absorb the vapor.
Waste Disposal Methods	Place contaminated material in disposable containers and bury in an approved dumping area.

H Special Precautions

Handling and Storing	READ AND OBSERVE PRECAUTIONS ON PRODUCT LABEL Keep away from heat or open flame. KEEP OUT OF REACH OF CHILDREN.

TOLS011146

BZTO104(e)047979

II. Physical Properties

Boiling Point (°F)	302-370°F	Melting Point (°F)		Solubility Miscible with hydrocarbons; insoluble in water.
Vapor Pressure (mm Hg & temp)	6 mm Hg @ 100°F	Specific Gravity (H_2O = 1)	0.78	Appearance, Color, Odor, etc. Colorless liquid
Molecular Weight	139 (avg.)	Percent Volatile by Volume (%)	99%+	
Vapor Density (air = 1)	4.8	Evaporation (BuAc = 1)	0.24	Other Viscosity – <32 SUS @ 77°F

TOLS011147

The above information is based on data available to us and is believed to be correct. However, NO WARRANTY of MERCHANTABILITY, FITNESS for any use or any other warranty is expressed or to be implied regarding the accuracy of these data, the results to be obtained from the use thereof, the hazards connected with the use of the material, or that any such use will not infringe any patent. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar, we do not assume any responsibility for the results of its use. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

BZTO104(e)047980

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: Charter International Oil Company	EMERGENCY TELEPHONE NO.: AC 713 / 923-1651
ADDRESS (Number, Street, City, State, and ZIP Code): P. O. Box 5008; Houston, TX 77012	Medical Emergency No.: AC 713 / 225-0463
CHEMICAL NAME AND SYNONYMS: Aliphatic Petroleum Hydrocarbons	TRADE NAME AND SYNONYMS: Espesol 310-66 (Short Range Mineral Spirits)
CHEMICAL FAMILY: Aliphatic Petroleum Hydrocarbons	FORMULA: ----------

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS Espesol 310-66	100	100ppm	FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.) ASTM D-86°F	310/347	SPECIFIC GRAVITY (H_2O=1)	0.7669
VAPOR PRESSURE (mm Hg.) @60°F/100°F	2.0/8.5	PERCENT, VOLATILE BY VOLUME (%)	100%
VAPOR DENSITY (AIR=1)	4.73	EVAPORATION RATE (___n-BuAc___ =1)	0.22
SOLUBILITY IN WATER	Negligible		
APPEARANCE AND ODOR	Water White Liquid; mild aliphatic hydrocarbon odor.		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
TCC, °F 100		1.1	6.0

EXTINGUISHING MEDIA
(1) Mechanical Foam, (2) Dry Chemical, (3) Water Fog, (4) CO_2

SPECIAL FIRE FIGHTING PROCEDURES
A straight water stream would spread oil fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS
A vapor accumulation would flash and/or explode if ignited. Flash 100°F.

(Continued on reverse side)

TOLS011148

BZTO104(e)047981

Approval Expires April 30, 1971

U.S. DEPARTMENT OF LABOR

WAGE AND LABOR STANDARDS ADMINISTRATION

Bureau of Labor Standards

MATERIAL SAFETY DATA SHEET

SECTION I

6/2/75

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
Union Oil Company of California	(213) 486-7600

ADDRESS (Number, Street, City, State, and ZIP Code)
Union Oil Center, 461 So. Boylston Ave., Los Angeles, California 90017

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
N. A.	Aristowax
CHEMICAL FAMILY	**FORMULA**
Hydrocarbon	Petroleum Wax

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Product not hazardous as defined by Sections 1501.2, 1502.2, 1503.2 of the Code of Federal Regulations.		

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	over 600°	SPECIFIC GRAVITY (H_2O=1)	0.9
VAPOR PRESSURE (mm Hg.)	N. A.	PERCENT VOLATILE BY VOLUME (%)	N. A.
VAPOR DENSITY (AIR=1)	N. A.	EVAPORATION RATE (_____=1)	N. A.
SOLUBILITY IN WATER	Insoluble		
APPEARANCE AND ODOR	Water-white, odorless		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
490°F typical ASTM D 92, COC, Flash Point	N. A.		

EXTINGUISHING MEDIA
Foam, Carbon Dioxide, Dry Chemical, Vaporizing Liquid Type Extinguishers

SPECIAL FIRE FIGHTING PROCEDURES
None

TOLS011149

UNUSUAL FIRE AND EXPLOSION HAZARDS
Combination with paper, cloth, or wood wastes will increase flammability.

BZTO104(e)047982

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
100 ppm (ACGIH)

EFFECTS OF OVEREXPOSURE
to vapor might affect central nervous system and cause respiratory irritation.

EMERGENCY AND FIRST AID PROCEDURES
Skin contact - Wash with soap and water. An emollient cream or lotion is beneficial. Eye contact - Wash with plenty of water for five minutes. Inhalation - Provide fresh air and rest. Ingestion: Do no induce vomiting; call a physician.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*
Avoid strond oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Carbon monoxide is burned with insufficient air.

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Avoid open flame. Provide adequate ventilation. Collect and dispose of all spilled liquid.

WASTE DISPOSAL METHOD
Use the same precautions for disposal as you would for kerosene. Espesol 310-66 (Mineral Spirits) is a combustible hydrocarbon and will burn if ignited.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*
In inadequately ventilated space, use self-contained breathing apparatus.

VENTILATION		
	LOCAL EXHAUST: To a fire-safe area.	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Recommended.	Recommended.

OTHER PROTECTIVE EQUIPMENT
As required to avoid wetting clothes.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Handle as a combustible liquid.

OTHER PRECAUTIONS

TOLS011150

BZTO104(e)047983

TOXICOLOGICAL & HANDLING INFORMATION

PETROLEUM ADDITIVES

Edwin Cooper, Inc.
1700 South Second Street
St. Louis, Missouri 63104
(314) 421-3930

1. Product Name HITEC E515

2. Chemical and Physical Properties:

a)	Specific gravity	.87
b)	Vapor pressure (mm Hg)	NA
c)	Boiling point, °F	NA
d)	Flash point, °F	150
e)	Water solubility	Practically insoluble
f)	Hazardous polymerization	☐ Yes ☒ No
g)	Stable	☒ Yes ☐ No
h)	Shock sensitive	☐ Yes ☒ No

3. Physiological Properties:

a) Acute oral toxicity (LD50 if available): Oral MLD (rats) 25000-30,000 mg/Kg

b) Local effects on eyes: Slight irritant

c) Local effects on skin: Slight irritant

d) Absorption through skin: MLD (rabbits) 35-40,000 mg/Kg.

e) Inhalation effects (vapors or dust): NA

4. First Aid Treatment:

a) Skin contact: Wash thoroughly with soap and water.

b) Eye contact: Flush with copious quantities of water and consult physician immediately.

c) Ingestion: Induce vomiting and consult physician immediately.

5. Protective Equipment:
Normal usage requires: Gloves and protective face shield or goggles

NAME: David J. Pitt
TITLE: Plant Chemist
DATE: 7/27/72

Sel

TOLS011151

BZTO104(e)047984

NALCO CHEMICAL COMPANY
2901 BUTTERFIELD ROAD / OAK BROOK, ILLINOIS 60521

MATERIAL SAFETY DATA SHEET

Product 6SJ-743

SECTION 1 – PRODUCT IDENTIFICATION

Trade Name NALCO 6SJ-743 Formula No.

Synonyms Polyester

Chemical Family Organic

SECTION 2 – HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT	%
Butanol	10
Toluene	8

SECTION 3 – PHYSICAL PROPERTIES

Boiling Point, 760 MM HG	Melting Point
Specific Gravity (H_2O=1) .952 @ 60°F	Vapor Pressure
Vapor Density (Air=1)	Solubility in H_2O, % By Wt. Insoluble
% Volatiles By Vol.	pH (1% of solution) 6-8
Appearance and Odor Dark reddish-black liquid with slight alcohol odor	

SECTION 4 – FLAMMABILITY AND EXPLOSIVE PROPERTIES

Flash Point (Test Method) 105°F PMCC				
Flammable Limits in Air, % By Vol.	Lower		Upper	
Extinguishing Media Foam, CO_2, dry chemical				
Special Fire Fighting Procedures Fight as any hydrocarbon type fire				
Unusual Fire and Explosion Hazard May evolve toxic NO_2 fumes				

SECTION 5 – HEALTH HAZARD DATA

Threshold Limit Value None established for product. Butanol - skin (ceiling) 50 ppm. Toluene - Skin 100 ppm

Effects of Overexposure May cause cornea and skin irritation. Prolonged inhalation may result in nausea, headaches and dizziness. Narcosis may develop.

EMERGENCY AND FIRST AID PROCEDURES

Eyes Flush with water for 15 min. Call a physician.

TOLS011152

Skin Wash with soap and rinse with plenty of water.

Ingestion Do not induce vomiting. Give water or milk. Call a physician.

Inhalation Remove to fresh air.

FORM 507 (7/75)

(Continued on Reverse Side)

MATERIAL SAFETY DATA SHEET

NALCO CHEMICAL COMPANY
2901 BUTTERFIELD ROAD • OAK BROOK, ILLINOIS 60521

Product 6SJ-743

SECTION 6 – REACTIVITY DATA

Stability: Stable ☐ Unstable ☒ Conditions to Avoid

Materials to Avoid

Hazardous Decomposition Products: Unburned hydrocarbons

Hazardous Polymerization: Will Not Occur ☒ May Occur ☐ Conditions to Avoid

SECTION 7 – SPILL OR LEAK PROCEDURES

Steps to Take in Case Material is Released or Spilled: Contain with absorbent material. Use detergent and water to relieve slippery conditions.

Waste Disposal Method: Complete combustion

SECTION 8 – SPECIAL PROTECTION INFORMATION

Type of Respiratory Protection Required: Organic canister may be used

Ventilation: Local Exhaust ☒; Mechanical (General) ☐; Special (Specify) ; Other (Specify)

Protective Gloves: Rubber Eye Protection: Goggles

Other Protective Equipment: Impervious apron, eye wash fountains

SECTION 9 – SPECIAL PRECAUTIONS

Handling and Storage Precaution: Handle in adequately ventilated areas. Do not store near open flame.

Other Precautions: Avoid prolonged inhalation of fumes. Avoid eye and skin contact. Do not take internally. Launder contaminated clothing before reuse.

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Prepared By [signature] Title: Toxicology & Industrial Hygiene Consultant Date: 2/76

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PROCEDURES FOR ENTERING AND CLEANING TANKS AND OTHER ENCLOSED SPACES

A. Responsibility

Responsibility for safety rests with the SUPERVISOR at all times. This responsibility covers conditions of work for contractors' employees, workmen from other divisions, and his own men. He must make sure that adequate steps have been taken to eliminate or control the hazards. He must also make sure that all personnel understand the nature of such hazards which remain and the precautions to follow.

B. Description

"Enclosed spaces" is defined as, but not limited to, the following:

1. Enclosures with limited access openings for personnel, such as closed storage tanks, tank cars, process vessels (usually with only a man-hole for entering).
2. Tanks, pits, tubs, vaults, vessels, or other confined spaces with one side open to the air but so deep as to require entrance and aid of an assistant in case of emergency.
3. Confined spaces, such as ventilation or exhaust ducts, sewers, underground utility tunnels or pipelines.

C. Hazards

The hazards commonly encountered are:

1. Toxic vapors in fatal concentrations. This may result from known material in the tank, by gradual release from sludge or scale, or by leakage from interconnected systems due to failure to blank off or disconnect pipelines or ducts.
2. Inflammable gases, with potential of fire or explosion.
3. Lack of oxygen, causing asphyxiation. This may result from chemicals absorbing or replacing oxygen in the tank air, or from inert gas often used to exclude oxygen to reduce the possibility of explosions. Air in clean tanks closed for an extended period may become deficient in oxygen because of rusting (or oxidation) of the metal of the tank. Improper or inadequate ventilation during tank work may also result in a lack of oxygen.
4. Electric shock from portable lights, tools, or associated electrical equipment.
5. Injury from mechanical equipment such as mixers, conveyors, etc., that are inadvertently activated.
6. Bodily injury from direct contact with corrosives or dermatitis-producing chemicals.
7. Physical hazards such as slipping, falling, and falling objects.
8. Burns resulting from accidental opening of a steam valve in a line which has not been blanked off or disconnected.

D. Procedures

The hazards inherent in tank entry can be avoided or overcome if the following principles are applied properly each and every time a tank is entered.

No one is to be allowed to enter a treating cylinder, work tank or mix tank which has contained Cellon solution without prior permission from the Manager of Plant Operations, Manager of Engineering or the Division Safety Director. This permission may be requested verbally but written confirmation is to be made. At the conclusion of the project, a written report will be made to the Division Safety Director including the following information:

1. Description of the work done.
2. Names of employees involved.
3. Total exposure time of each employee.
4. Personal protective equipment that was used.
5. Any other pertinent comments or occurrences.

Provisions for bathing or showering must be provided. The use of the bathing facility is mandatory at the end of the shift or the finish of the job, whichever comes first.

1. Pre-Planning and Education

Survey all tanks requiring entry. Evaluate the hazard potential. All concerned should agree to the detailed standards and procedures established. Be sure everyone understands exactly what is meant.

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Worker and supervisor alike, should be fully informed both as to fundamentals and specific requirements. There should be appropriate follow-up to insure that the system is being followed exactly. It is not sufficient merely to set standards; follow-up is necessary for full compliance. Close liaison and job planning between various groups such as production and maintenance is essential. Have specific instructions and a pertinent check list printed on a permit which must be displayed at the job site.

2. Preparation of Tank

A. Cleaning: According to the nature of the product, clean and void the tank of residual product by hot or cold water flush, by steaming, by chemical neutralization or by air purge. Harmful vapors should be vented safely to the outdoors.

If the tank is steamed, allow it to cool before entry. Do not steam below liquid surfaces in tanks being cleaned. Non-miscible solvents sometimes stratify and bump out at almost explosive pressures due to the difference in boiling point temperatures between the water layer and the solvents.

After the material in the tank has been evacutated to a safe point of discharge, the sludge or incrustation should be removed, to the greatest degree, by operation from outside of the tank. If the tank contained radioactive materials, ascertain in the type and magnitude of radioactivity remaining after cleaning. A time limit for exposure may then be established. Protective clothing and respiratory protection should not be used as a substitute for cleaning and ventilating. Except in extreme emergency-for example, saving of a life-no one should enter a tank containing a flammable atmosphere or one which because of oxygen deficiency or contamination may be so immediately harmful as to prevent escape from the tank in case of failure of the respiratory equipment.

B. Ventilation: The tank should be thoroughly ventilated. Make sure that the mechanical exhaust ventilation is arranged to avoid recirculation of contaminated air. After the tank is cleaned and ventilated, keep the mechanical exhaust ventilation equipment operating to provide secondary protection in case of accidental introduction of harmful chemicals; to remove contamination that may be produced by work in the tank such as welding and cutting, painting, coating; and to cool the tank and improve working conditions.

Should decontamination involve flammable liquids, vapors, gases, or dusts, all sources of ignition should be eliminated. For example, to eliminate any accumulation of static electricity and prevent autogenous ignition of flammables which may be in the tank, steam should be introduced at relatively low pressure and velocity. Steam lines should be electrically bonded to the tank if it contains any flammable material.

C. Isolation: The tank should be completely isolated from all other systems and equipment. For example, lines connected to the tanks should be physically disconnected and blanked off. Positive and adequate measures must be taken to prevent harmful material-solid, liquid, or vapor-from entering the tank while workmen are inside or after cleaning. This work should be coordinated with cleaning operations to prevent re-contamination. In all cases where lines have contained hazardous fluids or inert gas, or where they contain fluids at high pressures or temperatures, the lines should be physically disconnected by removal of valves, spool pieces, or expansion joints, and blank flanges placed in the lines. Exceptions to normal blanking procedure, such as bleeder valves tagged in the open position, should be approved only

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by qualified supervision. Exceptions should be made only when thoroughly justified and not as a matter of expediency. In these cases, adequate alternative measures must be taken to protect the worker.

Experience has shown that valves although closed, may leak dangerous liquid or gas. This will require either disconnecting, capping, or blanking all service, process, vent, or overflow lines on a given unit to prevent entrance of material by leakage through (or accidental opening of) a valve. This should include steam connections to a jacket. In case of welding on the wall between the inner tank and jacket, it should also include water, brine, or air lines to the jacket. Open ends of disconnected lines should be blanked or capped to prevent any flow from the disconnected end of the line entering a tank opening or draining onto assistants on the outside. Blanks should be installed as close to the tank as practicable to prevent drainage from trapped sections. Drains or overflow lines should be disconnected or blanked if they extend into a sewer from which steam or fumes could be conducted back to the tank, or if they connect to other equipment or extend to a remote location. All blanks should be of materials which are not susceptible to corrosion by the chemicals to which they are exposed with different types adequately identified. Blanks should be of such thickness and tensile strength as to satisfy the maximum pressure which may be imposed upon them without distortion or failure.

D. Lock Out.(See MCA Safety Guide No. 8- Electrical Switch Lock-Out Procedure.) Line-disconnect switches supplying power to any mechanical apparatus in the tank such as mixers, conveyors, etc. should be tagged and locked in the "off" position. It is not adequate to lock a push button station as it still may be possible to energize the circuit. The key shuld be kept by the man in the tank, and he alone should be authorized to unlock the switch and remove the tag on completion of the job. Where more than one man is exposed, each should place his own lock on the switch. In certain cases it may be advisable, as further protection, to have a plant electrician pull the line fuses in the electrical circuit involved or take other positive steps to guard against accidental energization. Where there is a line shaft, the belt or chain drive should be removed or similar positive measures provided, such as mechanical latches.

E. **Testing:** If the tank has held any flammable or harmful product before flushing; if it contains any residue or sludge which may release flammable or harmful gases or vapors; or if oxygen deficiency or excess is suspected or even possible, a test of the atmosphere in the tank should be made immediately before entering and before performing any hot work such as the lighting of torches. Presence of flammable or toxic vapors, excess oxygen or oxygen deficiency should be determined by direct reading instruments or chemical analysis. Single-fluid instruments which absorb both oxygen and carbon dioxide should not be used for oxygen determination. Interim tests of the atmosphere in the tank should be made as often as necessary while the work is in progress. Continuous sampling and analysis with automatic alarm may be indicated.

3. **Issuance of Safety Work Permit for Entry**
The Safety Work Permit is authorization and approval in writing. It serves as a method of formalizing agreed upon procedures. It is also a check list to insure that all existing hazards are considered, evaluated, and correct protective measures taken.

No employee should enter any tank without reporting to and securing

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BZTO104(e)047989

approval from his immediate supervisor. The supervisor in turn secures entry approval from the supervisor to whom the tank is assigned. The tank supervisor should then discuss the project in detail with those entering the tank. He should review the hazards of the product or other materials to which they may be exposed and furnish all the safety information he may be able to provide. Then supervisors of the men involved should review and complete the permit form jointly. Appropriate supervisors must be certain by personal investigation, immediately before entry and before signing the permit, that the entry and its incidental work will be safe. If a pause of appreciable duration occurs during the carrying out of a job, the site must be re-investigated by the authorized signer before the job can be allowed to resume. Commencement of a new shift should always require re-investigation and a new permit. No permit should be valid except for the job, location, persons, and time specified.

E. Precautions

1. Tools

Hand tools should be clean, in good condition, and selected carefully according to the uses intended. Spark-resistant hand tools are preferred where a possibility of flammable vapors or gases exists unless the area is well wetted down with water. Portable power tools and equipment should be clean and in good condition. Electrical tools and equipment (such as hand lamps and extension cords) should be grounded. If the tank is a "Hazardous Location" under the definitions of the National Electrical Code, it should be of the explosion proof type. If any Class I exposure (also Class II in dangerous flammable dust concentrations) it may be found preferable to use air-operated power tools. Even in these circumstances, careful thought must be given to the possibility of fire or explosion arising from struck sparks, overheating of the tool (as in drilling), electrostatic generation from discharge of compressed air, or other mechanical sources. The use of low voltage (32 volts or less) lighting and electrical equipment serves to minimize further the possible hazard of electric shock.

Ladders used in tanks should be lashed at the top, and, if possible, at the bottom. Employees performing electrical welding in tanks should be provided and required to use rubber blankets and such other personal protective equipment as may be required. Welding and cutting torches must not be taken into the tank until ready to be used. They must be removed from the tank immediately after use. Cylinders of oxygen or other gas should never be taken into tanks, and should be turned off at the cylinder valve when not in use.

Special signs posted near the tank help keep unnecessary people away. They insure that potentially harmful operations will not be started independently nearby. And they help guide rescuers should they be necessary.

2. Personal Protective Equipment

Proper protection may range from complete coverage suits to chemical goggles, hard hats, gloves, and safety shoes.

Employees should never unduly expose the skin when working in tanks. They should wear full coverage of clothing at all times. When burning or welding is done inside a tank, supervision should consider the use of flame-proofed clothing by the employees involved. Working bareheaded, with shirt sleeves rolled up, or in an undershirt is considered hazardous.

Certified breathing air, from self-contained units, central systems such as cylinders of air, or suitable compressors should be supplied if a safe atmosphere cannot be guaranteed and if there is any possibility of air contamination or if there is oxygen deficiency while employees are within an enclosed vessel. The use of canister type masks (which operate on the principle of chemical absorption of mechanical filtration) may not afford adequate protection and should,

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therefore, not be used.

Equipment should bear Bureau of Mines approval. It should be suited specifically to the type of exposure and protect against the worst condition that might be encountered. For specifically recommended protection refer to MCA Chemical Safety Data Sheets or another authoritative source. The best type of respiratory protection should be ascertained in advance according to the specific exposure involved.

3. Emergency and Rescue

Where the potential exposure in the tank is acute, or requires an employee to wear respiratory protection, or rescue may be difficult, a body harness with lifeline must be provided. It is good practice to use a body harness for any vessel entry work. A safety harness or safety coveralls with a built-in harness and lifeline shall be used when tank space permits the safe emergency removal of personnel by standby manual personnel without requiring entry of the tank.

When the tank space does not meet this requirement a specific procedure for the rescue of personnel must be developed in the pre-planning stage of the tank entry work. It must be made a specific part of the Safety Work Permit. In some cases it is advisable to have a block and tackle positioned on a tripod or otherwise fastened above the manhole. For obvious reasons, manholes large enough to accommodate the man and his safety gear should be provided, such as a 24" diameter for circular ones. If manholes are smaller than 20" in the largest dimension, wrist harnesses often are practical.The free end of the lifeline should be secured to a fixed object. It should be attended by an observer who will keep the man in the tank always within his vision. The observer may pass tools. He must have no other job which will take his attention away from the man in the tank; which will interfere with his attempts to withdraw the victim by use of the lifeline; or which will require his leaving the vicinity of the tank for any time whatever.

In case of emergency, the outside observer must never enter the tank until he is relieved at his post. It is his job to summon aid immediately (various alarms, such as a whistle, may be used); to attempt to remove the victim by use of the lifeline, and to perform all other necessary rescue functions from outside. Upon the arrival of help, he may enter the tank for rescue work only when he is assured that his outside assistance is adequate. Such safety observers should be well trained in basic First Aid principles, such as rescue breathing techniques. Rescuers entering tank must be protected with the safety facilities required by the situation, i.e., lifeline and harness, and proper personal protective equipment. For rescue purposes at least one unit of self-contained breathing equipment should be located outside and convenient to the tank together with harness, rope, and such other emergency equipment as may be indicated. It is better to have too much equipment at the job site than too little-too late! Where hazardous chemicals may be contacted in the course of tank work or where the possibility of fire is involved, a charged hose line with spray nozzle should be available nearby. The number of men in a tank, particularly at the time of burning or welding, must be reduced to the absolute minimum necessary for the work itself.

The supervisors concerned must be trained to be on the alert, before and during the job to detect and correct immediately new and different hazards or to stop the work until the new hazards are corrected.

F. Cleaning Tanks Containing Flammable Materials

1. General Precautions

A. Workmen must be familiar with fire and accident prevention regulations and comply with them in every respect. These regulations cover fire, explosion, as-

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BZTO104(e)047991

phyxiation, and possible poisoning from toxic material.

B. Before tank cleaning operations are started, all sources of ignition such as open fires, trucks, automobiles, etc., must be removed or eliminated from the vicinity. Wind and weather conditions must be considered. Work must not be started if the wind might carry highly inflammable vapors into an area where they could create a fire hazard. No matches or lighters may be carried, and smoking must be strictly prohibited.

C. Workmen will be provided with proper equipment, including suitable clothing, proper eye or face protection, tools, safety belts, safety lines, and fresh air hose masks when required. The foreman should see that the equipment is of proper type, clean, and in good condition, and that the workmen are properly instructed in its use.

D. Workmen are not permitted to enter tanks until the tank has been tested and it is definitely determined that the vapor concentration has been reduced to the point where there is no danger. At all times flammable or toxic mixtures must be assumed to be present until tests have been proven otherwise.

NOTE: Tank vapor concentrations should be tested with an approved gas detector only such as the EXPLOSIMETER. See Proper Operation of Explosimeters.

E. While working in the tanks, the atmosphere inside must be rechecked periodically for dangerous vapor mixtures.

REMEMBER: Combustible mixtures may again be formed through admission of flammable vapors or liquids from other sources such as an unblanked line or connection, a break in the tank bottom, sludge, sediment, sidewall scale, etc.

F. Workers must always have a clear path of escape from the tank. They should bear in mind that they may have to use it in a hurry. Ladders should be used when a tank must be entered from above. They should be left secured until the last man is out of the tank.

G. A safety man (commonly called "fire watch") must be outside the tank anytime anyone is inside. In case of an emergency, the safety man must not enter the tank until he secures more help.

H. Where lights are needed, use only lights approved for combustible atmospheres by Underwriters Laboratories.

I. Where power tools are used to clean tanks, extreme care must be exercised to keep from damaging or marring the tank.

J. Goggles must be worn when cutting rivets, scraping scale, operating power tools, and digging residue with a pick or shovel.

K. Where gas or vapor may be present and where a spark may cause ignition, use tools and equipment of nonsparking material such as wood, fiber, bronze or beryllium copper.

L. Steam lines, if used for heating and ventilating the tank, must br grounded to the tank shell to prevent static accumulation.

M. Hot work (welding, riveting, etc.) shall be permitted in tanks only after the tanks are reasonably clean and tests have determined it to be free of flammable and toxic mixtures.

N. If a possibility of an oxygen deficiency exists in a tank, blow fresh air into it. When a tank has been closed for some time, rusting (oxidation) of the tank metal or materials in the tank may cause a deficiency. In that case, no one may enter the tank without a supplied air hose mask before the tank has been properly ventilated. Do not use Canister masks where there is a

TOLS011159

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possible oxygen deficiency.

O. Tank workers overcome by vapors must be removed to fresh air immediately and artificial respiration administered until breathing resumes. Call a doctor at once and keep the resuscitated man quiet and warm until breathing and circulation become normal.

P. Report all injuries to your foreman immediately.

Q. A work order must be properly authorized before work of any kind is performed where there is a possible explosive vapor concentration.

R. Adequate fire fighting equipment must be on hand for any fire which may result from any phase of the tank cleaning operation. **OBSERVE THE PLANT FIRE RULES.**

S. When the tank is clean, care must be exercised to see that all foreign material such as tools, pieces of pipe, etc., are removed from the tank before it is placed back in service.

2. Proper Use of Fresh-Air Hose Masks:

When fresh-air hose masks are used, the following safety precautions must be observed:

A. Approved fresh-air hose masks and lifelines must be worn by men entering tanks unless ventilation has reduced flammable vapors to 0.1%.

B. The mask must be thoroughly inspected and found to be in safe operating condition before using.

C. Hats or caps should be removed. The mouth shall be cleared of tobacco, etc., before adjusting mask to the head.

D. All fittings on the hose and mask must be tight. There should be no leaks around the face piece.

E. The air intake to the hose leading to the mask must be kept in fresh uncontaminated air.

F. Any person wearing the gas mask must be kept under constant observation by another man while he is in the tank. Two or more men should be available to aid in his rescue should he become unconscious.

G. If a workman is overcome by vapors, he must be removed to fresh air immediately. Artificial respiration must be administered until he resumes breathing.

H. A doctor must be called at once. The resuscitated man must be kept quiet and warm until breathing and circulation have become normal.

I. When it is necessary for the rescuer to go inside the tank, the rescuer first must get help and then equip himself with adequate respiratory protection before entering the tank.

J. Gas-mask face pieces must be cleaned and sterilized after use and put into condition for use again.

K. Workmen are not permitted to enter tanks containing toxic or inflammable mixtures without the expressed permission of the plant superintendent or a supervisor delegated by him.

L. All injuries must be reported to your foreman immediately.

3. Proper Operation of Explosimeters:

The individual making tests with the Explosimeter must be thoroughly familiar with the instrument and be satisfied that it is in proper working order. The following recommendations should be observed to insure proper operation of the Explosimeter:

A. The batteries in the Explosimeter should be replaced monthly with fresh batteries, or more often if used frequently.

B. The instrument should be checked before it is used by placing the open end of the sample line into the neck of a bottle containing benzol. (**CAUTION:** Do not allow the open end of the sample

TOLS011160

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line to touch the liquid benzol.) The aspirator bulb should be squeezed until the instrument definitely shows an explosive material. The sample line should then be removed to normal atmosphere and the instrument purged, by squeezing the aspirator, until the needle goes back to zero.

C. After checking the Explosimeter, the needle is again adjusted to zero, by means of the rheostat, and the tank is then tested.

D. Tank tests should not be made in the presence of steam.

E. After testing the tank, the Explosimeter should be again recalibrated and rechecked by sampling the benzol bottle.

4. Tank Preparation:

A. Contents of the tank must be pumped out as completely as possible through the regular pump-out line. When desirable, water can be added to raise the liquid level to the pump suction to remove additional or possibly all of the liquid contents.

B. Supply lines and swing lines must be thoroughly washed out and either blanked off close to the tank with slip blanks between flanges, or disconnected and provided with bull plugs or blank flanges. Do not rely on valves for positive shutoff.

C. The tank must be purged of all toxic or explosive vapors before workmen may enter the tank to remove residue, perform repair work, etc.

D. Preparing Underground Storage Tanks:

This type of vessel requires extra care to prevent leakage of flammable liquids or vapors from the outside ground area into the tank after it has been tested and found vapor-free. Lines into or from the tank should be isolated so that vapors cannot drift into the area or into the tank.

E. The safe practices outlined for shore tanks are not applicable for tank barges. Such vessels are all subject to the regulations of the U.S. Coast Guard for tank vessels.

F. Preparing Tank Cars:

The material in tank cars can be divided roughly into two divisions; those containing oils such as creosote, etc., and those containing the heavier material such as tars, pitches, etc.

The cars containing oils should be thoroughly steamed. Then the steam should be shut off; the tank car should be permitted to cool; it should be ventilated, and gas tests should be made.

Tank cars, which have been used for tar or similar material, should be ventilated for at least five hours before gas tests are made. Steaming should be used if desirable.

G. Tank cars must be steamed clean when welding and cutting operations are done inside the car. When welding is performed on the outside of the car, the tank should be live steamed for 20 minutes and steam should be left in car while welding.

H. A safety man must be placed in attendance until the operation is proven safe.

I. When the cars are not provided with a permanent inside ladder, a removable ladder must be used. It should be a well constructed, light metal ladder that will extend from the bottom of the car into the dome. However, it should not protrude through the hole in the dome of the car. This would not allow a man to enter through the dome into the car.

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5. Ventilating

Before workmen enter tanks, satisfactory ventilation must be established in the tank. Quite often natural ventilation is not satisfactory. This is true in underground storage tanks and tank cars which normally are equipped with one opening. Therefore, the use of wind sails, steam or air operated exhausters, or electrically driven blowers may be required. Air movers or exhausters should be bonded to the tank and all electric motors must be spark-proof.

Additional ventilation may be obtained in tank cars by the use of water. With a "bare-back" shell car, water may be sprayed on the outside of the car. With an insulated car, cold water may be sprayed on the inside of the car shell, or the car filled with cold water and then drained. Cold water running through steam coils in the cars will considerably reduce the temperature in the car.

6. Sweetening Tanks

After a tank has been purged and tested to be free of all dangerous gas, some plants have distributed slaked lime on the remaining residue (before workmen enter the tank) with good results. The slaked lime tends to rid the tank of undesirable odors. It has also been found desirable to add lime to the water when boiling out tanks.

7. Cylinder Entry

A. Entry of a cylinder is prohibited until the bridge rail has been removed or the track taken out of service by posting signs or blue flags.
B. The door secured to prevent closure.

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Occupational Health Guideline for Pentachlorophenol

INTRODUCTION

This guideline is intended as a source of information for employees, employers, physicians, industrial hygienists, and other occupational health professionals who may have a need for such information. It does not attempt to present all data; rather, it presents pertinent information and data in summary form.

SUBSTANCE IDENTIFICATION

- Formula: C_6Cl_5OH
- Synonyms: PCP; penta
- Appearance and odor: Light brown solid with a pungent odor when hot.

PERMISSIBLE EXPOSURE LIMIT (PEL)

The current OSHA standard for pentachlorophenol is 0.5 milligram of pentachlorophenol per cubic meter of air (mg/m^3) averaged over an eight-hour work shift.

HEALTH HAZARD INFORMATION

- Routes of exposure

Pentachlorophenol can affect the body if it is inhaled, if it comes in contact with the eyes or skin, or if it is swallowed. It may enter the body through the skin.

- *Effects of overexposure*

Exposure to pentachlorophenol may cause irritation of the eyes and respiratory tract. Bronchitis has been reported to occur. Systemic effects from either a large exposure or repeated smaller exposures include weakness, loss of appetite, nausea, vomiting, shortness of breath, chest pain, excessive sweating, headache, and dizziness. In fatal cases the temperature is often very high and death may occur as early as three hours after the onset of symptoms. The risk of serious intoxication is greater in hot weather. Persons with decreased liver or kidney functions are more susceptible to poisoning from this chemical. Repeated exposure to pentachlorophenol may cause an acne-like skin rash and liver damage. Commercial pentachlorophenol may be contaminated with dioxin compounds which are much more toxic than pentachlorophenol.

- Reporting signs and symptoms:

A physician should be contacted if anyone develops any signs or symptoms and suspects that they are caused by exposure to pentachlorophenol.

- Recommended medical surveillance

The following medical procedures should be made available to each employee who is exposed to pentachlorophenol at potentially hazardous levels:

1. Initial Medical Examination:

—A complete history and physical examination: The purpose is to detect pre-existing conditions that might place the exposed employee at increased risk, and to establish a baseline for future health monitoring. Examination of the cardiovascular system, eyes, upper respiratory tract, liver, and kidneys should be stressed. The skin should be examined for evidence of chronic disorders. Analysis of the urine for pentachlorophenol may be helpful in estimating the extent of absorption.

2. Periodic Medical Examination: The aforementioned medical examinations should be repeated on an annual basis.

- Summary of toxicology

Pentachlorophenol dust and mist cause irritation of the eyes and upper respiratory tract; absorption results in an increase in metabolic rate and hyperpyrexia; prolonged skin exposure causes an acneform dermatitis. Human exposure to dust or mist concentrations greater than 1 mg/m^3 causes pain in the nose and throat, violent sneezing, and cough; 0.3 mg/m^3 may cause some nose irritation; persons acclimated to pentachlorophenol can tolerate concentrations up to 2.4 mg/m^3. Pentachlorophenol readily penetrates the skin; systemic intoxication is cumulative and has been fatal. Intoxication is characterized by weakness, anorexia, weight loss, and profuse sweating; there also may be headache, dizziness, nausea, vomiting, dyspnea, and chest pain. In fatal cases, the body temperature is frequently extremely high and

These recommendations reflect good industrial hygiene and medical surveillance practices and their implementation will assist in achieving an effective occupational health program. However, they may not be sufficient to achieve compliance with all requirements of OSHA regulations.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service Centers for Disease Control
National Institute for Occupational Safety and Health

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death has occurred as early as 3 hours after the onset of symptoms. The risk of serious intoxication is increased during hot weather; persons with impaired liver or kidney function are more susceptible to the effects of pentachlorophenol. The dust, mist, and vapor cause eye irritation. Prolonged exposure of workers has caused an acneform dermatitis; 10 workers engaged in production of pentachlorophenol for 5 to 10 months developed a widely disseminated skin eruption characterized by small and large furuncles, brown pigmentation, and some cicatrization; 7 workers also developed severe bronchitis; all but 1 worker still showed signs of extensive acne more than a year after cessation of exposure, and 4 still complained of bronchitis. On the skin, solutions of pentachlorophenol as dilute as 1% may cause irritation if contact is repeated or prolonged.

CHEMICAL AND PHYSICAL PROPERTIES

- **Physical data**
  1. Molecular weight: 266.3
  2. Boiling point (760 mm Hg): 311 C (592 F) (decomposes)
  3. Specific gravity (water = 1): 2.0
  4. Vapor density (air = 1 at boiling point of pentachlorophenol): Not applicable
  5. Melting point: 182— 190 C (360— 374 F)
  6. Vapor pressure at 20 C (68 F): 0.00017 mm Hg
  7. Solubility in water, g/100 g water at 20 C (68 F): 0.002
  8. Evaporation rate (butyl acetate = 1): Not applicable
- **Reactivity**
  1. Conditions contributing to instability: None.
  2. Incompatibilities: Contact with strong oxidizers may cause fires and explosions.
  3. Hazardous decomposition products: Toxic gases and vapors (such as hydrogen chloride, chlorinated phenols, and carbon monoxide) may be released when pentachlorophenol decomposes.
  4. Special precautions: None.
- **Flammability**
  1. Not combustible
- **Warning properties**
  1. Odor Threshold: The AIHA *Hygienic Guide* states that pentachlorophenol has a characteristic odor. No quantitative information is available, however, concerning the odor threshold of this substance.
  2. Irritation Levels: The *Documentation of TLV's* states that "dusts are particularly irritating to the eyes and nose, in concentrations appreciably greater than 1 mg/m^3, but some irritation of the nose may occur at 0.3 mg/m^3. Hardened workers can tolerate up to 2.4 mg/m^3."
  3. Evaluation of Warning Properties: Through its irritant effects, pentachlorophenol can be detected within three times of the permissible exposure limit. For the purposes of this guideline, therefore, pentachlorophenol is treated as a material with good warning properties.

MONITORING AND MEASUREMENT PROCEDURES

- **General**

Measurements to determine employee exposure are best taken so that the average eight-hour exposure is based on a single eight-hour sample or on two four-hour samples. Several short-time interval samples (up to 30 minutes) may also be used to determine the average exposure level. Air samples should be taken in the employee's breathing zone (air that would most nearly represent that inhaled by the employee).

- **Method**

An analytical method for pentachlorophenol is in the *NIOSH Manual of Analytical Methods*, 2nd Ed., Vol. 4, 1978, available from the Government Printing Office, Washington, D.C. 20402 (GPO No. 017-033-00317-3).

• Gleason, M. N., Gosselin, R. E., Hodge, H. C., and Smith, R. P.: *Clinical Toxicology of Commercial Products* (3rd ed.), Williams and Wilkins, Baltimore, 1969.

RESPIRATORS

• Good industrial hygiene practices recommend that engineering controls be used to reduce environmental concentrations to the permissible exposure level. However, there are some exceptions where respirators may be used to control exposure. Respirators may be used when engineering and work practice controls are not technically feasible, when such controls are in the process of being installed, or when they fail and need to be supplemented. Respirators may also be used for operations which require entry into tanks or closed vessels, and in emergency situations. If the use of respirators is necessary, the only respirators permitted are those that have been approved by the Mine Safety and Health Administration (formerly Mining Enforcement and Safety Administration) or by the National Institute for Occupational Safety and Health.

• In addition to respirator selection, a complete respiratory protection program should be instituted which includes regular training, maintenance, inspection, cleaning, and evaluation.

PERSONAL PROTECTIVE EQUIPMENT

• Employees should be provided with and required to use impervious clothing, gloves, face shields (eight-inch minimum), and other appropriate protective clothing necessary to prevent any possibility of skin contact with pentachlorophenol or liquids containing pentachlorophenol.

• If employees' clothing has had any possibility of being contaminated with pentachlorophenol or liquids containing pentachlorophenol, employees should change into uncontaminated clothing before leaving the work premises.

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- Clothing which has had any possibility of being contaminated with pentachlorophenol should be placed in closed containers for storage until it can be discarded or until provision is made for the removal of pentachlorophenol from the clothing. If the clothing is to be laundered or otherwise cleaned to remove the pentachlorophenol, the person performing the operation should be informed of pentachlorophenol's hazardous properties.
- Where there is any possibility of exposure of an employee's body to pentachlorophenol or liquids containing pentachlorophenol, facilities for quick drenching of the body should be provided within the immediate work area for emergency use.
- Non-impervious clothing which becomes contaminated with pentachlorophenol should be removed immediately and not reworn until the pentachlorophenol is removed from the clothing.

Operation	Controls
Formulation of preservatives, pesticides, and fungicides	Process enclosure; local exhaust ventilation; personal protective equipment
Application as a preservative for wood, starch, paint, adhesives, leather, latex, and oils; use in slime-algae control; use as a pesticide, herbicide, and snail control agent	Personal protective equipment
Manufacture of pentachlorophenol	Process enclosure; local exhaust ventilation; personal protective equipment

- Employees should be provided with and required to use dust- and splash-proof safety goggles where there is any possibility of pentachlorophenol or liquids containing pentachlorophenol contacting the eyes.
- Where there is any possibility that employees' eyes may be exposed to pentachlorophenol or liquids containing pentachlorophenol, an eye-wash fountain should be provided within the immediate work area for emergency use.

SANITATION

- Skin that becomes contaminated with pentachlorophenol should be immediately washed or showered with soap or mild detergent and water to remove any pentachlorophenol.
- Workers subject to skin contact with pentachlorophenol or liquids containing pentachlorophenol should wash with soap or mild detergent and water any areas of the body which may have contacted pentachlorophenol at the end of each work day.
- Eating and smoking should not be permitted in areas where pentachlorophenol or liquids containing pentachlorophenol are handled, processed, or stored.
- Employees who handle pentachlorophenol or liquids containing pentachlorophenol should wash their hands thoroughly with soap or mild detergent and water before eating, smoking, or using toilet facilities.

COMMON OPERATIONS AND CONTROLS

The following list includes some common operations in which exposure to pentachlorophenol may occur and control methods which may be effective in each case:

EMERGENCY FIRST AID PROCEDURES

In the event of an emergency, institute first aid procedures and send for first aid or medical assistance.

- **Eye Exposure**

If pentachlorophenol or liquids containing pentachlorophenol get into the eyes, wash eyes immediately with large amounts of water, lifting the lower and upper lids occasionally. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.

- **Skin Exposure**

If pentachlorophenol or liquids containing pentachlorophenol get on the skin, immediately wash the contaminated skin using soap or mild detergent and water. If pentachlorophenol or liquids containing pentachlorophenol penetrate through the clothing, remove the clothing immediately and wash the skin using soap or mild detergent and water. If irritation is present after washing, get medical attention.

- **Breathing**

If a person breathes in large amounts of pentachlorophenol, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Get medical attention as soon as possible.

- **Swallowing**

When pentachlorophenol or liquids containing pentachlorophenol have been swallowed and the person is conscious, give the person large quantities of water immediately. After the water has been swallowed, try to get the person to vomit by having him touch the back of his throat with his finger. Do not make an unconscious person vomit. Get medical attention immediately.

- **Rescue**

Move the affected person from the hazardous exposure. If the exposed person has been overcome, notify someone else and put into effect the established emergency

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rescue procedures. Do not become a casualty. Understand the facility's emergency rescue procedures and know the locations of rescue equipment before the need arises.

SPILL AND DISPOSAL PROCEDURES

- Persons not wearing protective equipment and clothing should be restricted from areas of spills until cleanup has been completed.
- If pentachlorophenol is spilled, the following steps should be taken:

1. Ventilate area of spill.
2. Collect spilled material in the most convenient and safe manner and deposit in sealed containers for reclamation or for disposal in a secured sanitary landfill. Liquid containing pentachlorophenol should be absorbed in vermiculite, dry sand, earth, or a similar material.

- Waste disposal method:

Pentachlorophenol may be disposed of in sealed containers in a secured sanitary landfill.

REFERENCES

- American Conference of Governmental Industrial Hygienists: "Pentachlorophenol," *Documentation of the Threshold Limit Values for Substances in Workroom Air* (3rd ed., 2nd printing), Cincinnati, 1974.
- American Industrial Hygiene Association: "Pentachlorophenol and Sodium Pentachlorophenate," *Hygienic GuideSeries*, Detroit, Michigan, 1970.
- Baader, E. W., and Bauer, H. J.: "Industrial Intoxication Due to Pentachlorophenol," *Industrial Medicine and Surgery*, 20:286-290, 1951.
- Bergner, H., et al.: "Industrial Pentachlorophenol Poisoning in Winnipeg," *Canadian Medical Association Journal*, 92:448-451, 1965.
- Christensen, H. E., and Luginbyhl, T. L. (eds.): *NIOSH Toxic Substances List*, 1974 Edition, HEW Publication No. 74-134, 1974.
- Fairhall, L. T.: *Industrial Toxicology* (2nd ed.), Williams and Wilkins, Baltimore, 1957.
- Gleason, M. N., Gosselin, R. E., Hodge, H. C., and Smith, R. P.: *Clinical Toxicology of Commercial Products* (3rd ed.), Williams and Wilkins, Baltimore, 1969.

1969.

- Grant, W. M.: *Toxicology of the Eye* (2nd ed.), C. C. Thomas, Springfield, Illinois, 1974.
- Hayes, W. J., Jr.: *Clinical Handbook on Economic Poisons, Emergency Information for Treating Poisoning*, U.S. Public Health Service Publication No. 476, U.S. Government Printing Office, Washington, D.C., 1963.
- Hunter, D.: *Diseases of Occupations* (4th ed.), Little, Brown, Boston, 1969.
- International Labour Office: *Encyclopedia of Occupational Health and Safety*, McGraw-Hill, New York, 1971.
- Johnstone, R. T., and Miller, S. E.: *Occupational Disease and Industrial Medicine*, Saunders, Philadelphia, 1960.
- Patty, F. A. (ed.): *Toxicology*, Vol. II of *Industrial Hygiene and Toxicology* (2nd ed. rev.), Interscience, New York, 1963.
- Spector, W. S. (Vols. I, II), Negherbon, W. O. (Vol. III), Grebe, R. M. (Vol. IV), and Dittmer, D. S. (Vol. V) (eds.): *Handbook of Toxicology*, Saunders, Philadelphia, 1956-1959.
- Thienes, C. H., and Haley, T. J.: *Clinical Toxicology* (5th ed.), Lea and Febiger, Philadelphia, 1972.

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RESPIRATORY PROTECTION FOR PENTACHLOROPHENOL

Condition	Minimum Respiratory Protection* Required Above 0.5 mg/m³
Particulate or Vapor Concentration	
2.5 mg/m³ or less	Any chemical cartridge respirator with an organic vapor cartridge(s) and dust, fume, and mist filter(s), including pesticide respirators which meet the requirements of this class.** Any supplied-air respirator.** Any self-contained breathing apparatus.**
25 mg/m³ or less	Any chemical cartridge respirator with a full facepiece, an organic vapor cartridge(s), and dust, fume, and mist filter(s), including pesticide respirators which meet the requirements of this class. A gas mask with a chin-style or a front- or back-mounted organic vapor canister and dust, fume, and mist filter, including pesticide respirators which meet the requirements of this class. Any supplied-air respirator with a full facepiece, helmet, or hood. Any self-contained breathing apparatus with a full facepiece.
150 mg/m³ or less	

**If eye irritation occurs, full-facepiece respiratory protective equipment should be used.

TIME OIL COMPANY

2737 W. COMMODORE WAY, P.O. BOX 24447, TERMINAL ANNEX, SEATTLE, WA 98124

July 5, 1985

J.L. Patterson
Riedel Environmental Services, Inc.
Foot of N. Portsmouth Avenue
P.O. Box 5007
Portland, OR 97208

Dear Mr. Patterson:

Enclosed is signed agreement. Please note item 10 has been deleted and item 11 changed to item 10. These actions were concurred with by John Peterson, of your office, per telecon today.

Kindly initial changes and return one copy to this office at your earliest convenience.

Sincerely,

John P. Denham

John P. Denham
Environmental Manager

Enclosure a/s

JPD/ch

TOLS011168

BZTO104(e)048001

"Imagineering a cleaner world"

RIEDEL
ENVIRONMENTAL SERVICES, INC.

☑ Portland Division
Foot of N. Portsmouth Ave.
P.O. Box 5007
Portland, OR 97208
(503) 286-4656

☐ St. Louis Division
529 Spirit of St. Louis Blvd.
Chesterfield, MO 63017
(314) 532-7660

☐ San Francisco Division
230 Cutting Blvd.
Richmond, CA 94802
(415) 234-7400
or (415) 398-5351

☐ Seattle Division
901 Fairview Ave. No.
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

July 9, 1985

Mr. John P. Denham
Environmental Manager
Time Oil Company
2737 W. Commodore Way
P. O. Box 24447 Terminal Annex
Seattle, WA 98124

Dear Mr. Denham:

Enclosed please find the fully executed and initialed sampling and analysis agreement. Per your conversation today with John Ruddick of RES, also enclosed is Addendum 1 to the agreement; would you kindly sign and return one copy of the addendum. Thank you.

Sincerely,

J. L. Patterson
Vice President

JLP:kps
Enclosures

Done 7/15/85

TOLS011169

BZTO104(e)048002

AMENDMENT 1
TIME OIL CO. - RIEDEL ENVIRONMENTAL SERVICES, INC.
SAMPLING AND ANALYSIS AGREEMENT
DATED JUNE 28, 1985

The work scope is amended to include the following:

Riedel Environmental Services will return to Time Oil and resample the 9 marginal boundary areas, at Time's request, to prepare individual samples from each of the 81 sample sites used to prepare the composite samples described in the original work scope. Some or all of these samples will be analyzed based on analytical results of composite and/or individual samples.

The work under this Amendment will be performed utilizing RES' Standard Rate Schedule. The cost of this Amendment is estimated to be $5,000.00.

DATED this 9th day of July, 1985.

TIME OIL CO.

John P. Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

J. L. Patterson
Vice President

JR:kps

TOLS011170

BZTO104(e)048003

AGREEMENT

The parties to this agreement are Time Oil Co. (hereinafter termed Time) and Riedel Environmental Services, Inc. (hereinafter termed RES) whereas:

Time has a 70' x 70' (approximate) area of land located in Portland, Oregon and is desirous of having that area sampled and analyzed for pentachlorophenol concentration prior to earth removal.

RES is willing to undertake that task upon the terms and conditions set forth below.

The parties agree as follows:

1. This agreement covers the following work scope: RES agrees to obtain and analyze for pentachlorophenol, 3 composite samples from A 10' primary marginal boundary to the west, south and east of an approximately 70' x 70' area of land used for pentachlorophenol storage at Time Oil Co., Portland, Oregon. Seven additional composite samples will be obtained and retained, but not analyzed. One of these samples will be obtained at a site determined by Time to be representative of background PCP levels. The remaining six (6) samples will be composites of secondary and tertiary 10' marginal boundaries. If required by Time, additional sampling and/or analysis can be performed at RES's standard rate schedule and would be in addition to this agreement. RES will for the 70' x 70' area bounded by concrete containment walls to the east and west, by an existing building to the north and by an exposed pipeline to the south, prepare a sampling grid layout, effect drilling of 16 well holes, perform split spoon sampling at 6 depths (to be established by Time), analyze samples for PCP, plot PCP concentration contours, cause personnel and equipment decontamination and write a detailed report which is to include complete itemization of costs incurred. Should Time conclude that additional drilling and sampling is required, this work would be performed by RES per our standard rate schedule, but is in addition to this agreement.

2. Prior to work under this agreement, a representative of Time will meet with RES at the site to more specifically delineate items of concern.

3. The commencement date for work will be July 1, 1985 or such other date as may be agreed upon by the parties following coordination.

4. For this task, Time agrees to pay RES a sum not to exceed $18,600.00. All work is to be completed by July 30, 1985 or at another date as agreed upon by both parties. Payment will be made upon completion of work and receipt by Time of written report or at monthly progress intervals.

TOLS011171

5. RES indemnifies and agrees to defend and hold Time harmless from any and all costs, claims, liabilities and damages to persons or property arising out of RES negligence under this agreement. The parties recognize that even with the utmost care being exercised, escapement of polluting substances might occur while RES is rendering services under this Agreement. It is therefore agreed that to the extent escapement shall occur that the responsibility to governmental authorities for such escapement is that of Time, and that Time agrees to indemnify and hold RES harmless of and from any loss, damage, injury, liability or claim resulting from an aggravation of the existing pollution problem which is not caused or contributed to by the negligence of RES.

6. RES and its officers, employees and agents are not and shall not be considered employees of Time. RES shall be considered for all purposes of this agreement and otherwise as an independent contractor. No subcontractors to RES or such subcontractors, officers, employees or agents shall be considered employees of Time.

7. RES agrees at its expense to obtain all governmental permits, licenses and approvals and comply with all laws, rules, regulations and requirements now or hereafter existing necessary for the accomplishment of the work to be performed by RES under this agreement.

8. RES especially acknowledges its understanding that portions of the soil on site have been found to contain commercial pentachlorophenol in concentrations ranging from 0 ppm to 1820 ppm. RES agrees to take all necessary precautions for the protection of RES employees, subcontractor and property that may be required or prudent to safely accomplish work performed under this agreement.

9. RES agrees to maintain workmens' compensation insurance in the form and amounts required by the laws of the State of Oregon and broad form comprehensive public liability insurance with minimum limits of $1 million per person and $1 million per accident for bodily injury and $1 million per accident for property damage plus secondary coverage up to $5 million. RES shall promptly deliver to Time certificates of said insurance, naming Time as an additional insured before commencing work and such certificate shall provide that said insurance shall not be cancelled prior to 30 days by written notice to Time.

10. ~~RES agrees that before commencement of any work hereunder, it will promptly furnish Time with a faithful performance bond in an amount to $18,600.00 dollars guaranteeing completion of all work and performance of all obligations undertaken by RES under this agreement.~~ Time Oil will provide RES ~~with a~~ payment bond in the amount of $18,600.00.

TOLS011172

BZTO104(e)048005

10. 11. The nature, validity and interpretation of this contract shall be governed by the laws of the State of Washington.

Dated this 28th day of June, 1985.

TIME OIL COMPANY

by John P. Denham
John P. Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

7/2/85

JP/jaf

TOLS011173

BZTO104(e)048006

Certificate of Insurance

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES LISTED BELOW.

NAME AND ADDRESS OF AGENCY

ENVIRONMENTAL COMPLIANCE
SERVICES
P O BOX A
DOWNINGTOWN PA 19335

COMPANIES AFFORDING COVERAGES

COMPANY LETTER A — NATL UNION FIRE INS

COMPANY LETTER B

COMPANY LETTER C

COMPANY LETTER D

COMPANY LETTER E

NAME AND ADDRESS OF INSURED

RIEDEL ENVIRONMENTAL SERVICES, INC.
P. O. BOX 3320
PORTLAND, OR 97208-3320

This is to certify that policies of insurance listed below have been issued to the insured named above for the policy period indicated. Notwithstanding any requirement, term or condition of any contract or other document with respect to which this certificate may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions and conditions of such policies.

COMPANY LETTER	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE	POLICY EXPIRATION DATE	Limits of Liability in Thousands (000)		
						EACH OCCURRENCE	AGGREGATE
A	**GENERAL LIABILITY** [X] COMPREHENSIVE FORM [X] PREMISES OPERATIONS [X] EXPLOSION AND COLLAPSE HAZARD [X] UNDERGROUND HAZARD [X] PRODUCTS COMPLETED OPERATIONS [X] CONTRACTUAL [X] BROAD FORM PROPERTY DAMAGE [X] INDEPENDENT CONTRACTORS [X] PERSONAL INJURY	S9961733 Inception date	11/14/84	11/14/85	BODILY INJURY PROPERTY DAMAGE		
					BODILY INJURY AND PROPERTY DAMAGE COMBINED	1,000	1,000
					PERSONAL INJURY		1,000
	AUTOMOBILE LIABILITY [ ] COMPREHENSIVE FORM [ ] OWNED AUTOS [ ] HIRED AUTOS [ ] NON-OWNED AUTOS				BODILY INJURY (PER PERSON) BODILY INJURY (PER ACCIDENT)		
					PROPERTY DAMAGE		
					BODILY INJURY AND PROPERTY DAMAGE COMBINED		
	EXCESS LIABILITY [ ] UMBRELLA FORM [ ] OTHER THAN UMBRELLA FORM				BODILY INJURY AND PROPERTY DAMAGE COMBINED		
	WORKER'S COMPENSATION and EMPLOYER'S LIABILITY				STATUTORY		
							(EACH ACCIDENT)
	OTHER						

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

TIME OIL CO ADDED AS ADDITIONAL INSURED
AS RESPECTS WORK PERFORMED BY NAMED
INSURED

Cancellation: Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail 30 days written notice to the below named certificate holder, but failure to mai such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives

NAME AND ADDRESS OF CERTIFICATE HOLDER

TIME OIL CO
12005 N BURGARD ST
PORTLAND OR 97203

ISSUE DATE July 9, 1985 K

AUTHORIZED REPRESENTATIVE

GAIL E HODGEN

(8-84) 25

TOLS011174

BZTO104(e)048007

RIEDEL
ENVIRONMENTAL SERVICES, INC.

☑ Portland Division
Foot of N. Portsmouth Ave.
P.O. Box 5007
Portland, OR 97208
(503) 286-4656

☐ St. Louis Division
529 Spirit of St. Louis Blvd.
Chesterfield, MO 63017
(314) 532-7660

☐ San Francisco Division
230 Cutting Blvd.
Richmond, CA 94802
(415) 234-7400
or (415) 398-5351

☐ Seattle Division
901 Fairview Ave. No.
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

July 9, 1985

Mr. John P. Denham
Environmental Manager
Time Oil Company
2737 W. Commodore Way
P. O. Box 24447 Terminal Annex
Seattle, WA 98124

Dear Mr. Denham:

Enclosed please find the fully executed and initialed sampling and analysis agreement. Per your conversation today with John Ruddick of RES, also enclosed is Addendum 1 to the agreement; would you kindly sign and return one copy of the addendum. Thank you.

Sincerely,

J. L. Patterson
Vice President

JLP:kps
Enclosures

TOLS011175

BZTO104(e)048008

AMENDMENT 1
TIME OIL CO. - RIEDEL ENVIRONMENTAL SERVICES, INC.
SAMPLING AND ANALYSIS AGREEMENT
DATED JUNE 28, 1985

The work scope is amended to include the following:

Riedel Environmental Services will return to Time Oil and resample the 9 marginal boundary areas, at Time's request, to prepare individual samples from each of the 81 sample sites used to prepare the composite samples described in the original work scope. Some or all of these samples will be analyzed based on analytical results of composite and/or individual samples.

The work under this Amendment will be performed utilizing RES' Standard Rate Schedule. The cost of this Amendment is estimated to be $5,000.00.

DATED this 9th day of July, 1985.

TIME OIL CO.

John P. Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

J. L. Patterson
Vice President

JR:kps

TOLS011176

BZTO104(e)048009

AGREEMENT

The parties to this agreement are Time Oil Co. (hereinafter termed Time) and Riedel Environmental Services, Inc. (hereinafter termed RES) whereas:

Time has a 70' x 70' (approximate) area of land located in Portland, Oregon and is desirous of having that area sampled and analyzed for pentachlorophenol concentration prior to earth removal.

RES is willing to undertake that task upon the terms and conditions set forth below.

The parties agree as follows:

1. This agreement covers the following work scope: RES agrees to obtain and analyze for pentachlorophenol, 3 composite samples from A 10' primary marginal boundary to the west, south and east of an approximately 70' x 70' area of land used for pentachlorophenol storage at Time Oil Co., Portland, Oregon. Seven additional composite samples will be obtained and retained, but not analyzed. One of these samples will be obtained at a site determined by Time to be representative of background PCP levels. The remaining six (6) samples will be composites of secondary and tertiary 10' marginal boundaries. If required by Time, additional sampling and/or analysis can be performed at RES's standard rate schedule and would be in addition to this agreement. RES will for the 70' x 70' area bounded by concrete containment walls to the east and west, by an existing building to the north and by an exposed pipeline to the south, prepare a sampling grid layout, effect drilling of 16 well holes, perform split spoon sampling at 6 depths (to be established by Time), analyze samples for PCP, plot PCP concentration contours, cause personnel and equipment decontamination and write a detailed report which is to include complete itemization of costs incurred. Should Time conclude that additional drilling and sampling is required, this work would be performed by RES per our standard rate schedule, but is in addition to this agreement.

2. Prior to work under this agreement, a representative of Time will meet with RES at the site to more specifically delineate items of concern.

3. The commencement date for work will be July 1, 1985 or such other date as may be agreed upon by the parties following coordination.

4. For this task, Time agrees to pay RES a sum not to exceed $18,600.00. All work is to be completed by July 30, 1985 or at another date as agreed upon by both parties. Payment will be made upon completion of work and receipt by Time of written report or at monthly progress intervals.

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5. RES indemnifies and agrees to defend and hold Time harmless from any and all costs, claims, liabilities and damages to persons or property arising out of RES negligence under this agreement. The parties recognize that even with the utmost care being exercised, escapement of polluting substances might occur while RES is rendering services under this Agreement. It is therefore agreed that to the extent escapement shall occur that the responsibility to governmental authorities for such escapement is that of Time, and that Time agrees to indemnify and hold RES harmless of and from any loss, damage, injury, liability or claim resulting from an aggravation of the existing pollution problem which is not caused or contributed to by the negligence of RES.

6. RES and its officers, employees and agents are not and shall not be considered employees of Time. RES shall be considered for all purposes of this agreement and otherwise as an independent contractor. No subcontractors to RES or such subcontractors, officers, employees or agents shall be considered employees of Time.

7. RES agrees at its expense to obtain all governmental permits, licenses and approvals and comply with all laws, rules, regulations and requirements now or hereafter existing necessary for the accomplishment of the work to be performed by RES under this agreement.

8. RES especially acknowledges its understanding that portions of the soil on site have been found to contain commercial pentachlorophenol in concentrations ranging from 0 ppm to 1820 ppm. RES agrees to take all necessary precautions for the protection of RES employees, subcontractor and property that may be required or prudent to safely accomplish work performed under this agreement.

9. RES agrees to maintain workmens' compensation insurance in the form and amounts required by the laws of the State of Oregon and broad form comprehensive public liability insurance with minimum limits of $1 million per person and $1 million per accident for bodily injury and $1 million per accident for property damage plus secondary coverage up to $5 million. RES shall promptly deliver to Time certificates of said insurance, naming Time as an additional insured before commencing work and such certificate shall provide that said insurance shall not be cancelled prior to 30 days by written notice to Time.

10. ~~RES agrees that before commencement of any work hereunder, it will promptly furnish Time with a faithful performance bond in an amount to $18,600.00 dollars guaranteeing completion of all work and performance of all obligations undertaken by RES under this agreement.~~ Time Oil will provide RES ~~with a~~ payment bond in the amount of $18,600.00.

TOLS011178

BZTO104(e)048011

10. H. The nature, validity and interpretation of this contract shall be governed by the laws of the State of Washington.

Dated this 28th day of June, 1985.

TIME OIL COMPANY

by _____
John P. Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

_____ 7/2/85

JP/jaf

TOLS011179

CERTIFICATE # RES-54

Supercedes Cert.#E93-1&2 dated 7/2/85

Insurance/Surety Bonds
1600 S.W. Fourth Avenue
P.O. Box 8699
Portland, Oregon 97207
503/224-4155 Telex No. 360-546

CERTIFICATE OF INSURANCE

INSURED: RIEDEL ENVIROMENTAL SERVICES, INC., P.O. BOX 3320, PORTLAND, OR 97208

Corroon & Black of Oregon hereby certifies that insurance Policies, as indicated hereunder, are in full force and effect on the date of insurance of this certificate.

	COVERAGE	POLICY NO.	INSURER	EFFECTIVE DATE	LIMITS
I.	Comprehensive General Liability; including Watercraft,Operations, Contractual XCU Exclusion Deleted, Products, Personal Injury, BFPD	GLA 9601533	National Union Fire Insurance Co. of Pittsburgh	11-14-85 to 1-1-86	Bodily Injury and Property Damage Combined $1,000,000 Each Occurrence $1,000,000 Aggregate
	Certificate Holder is Additional Insured as respects operations described below:				Yes XX No ____
II.	Comprehensive Automobile Liability; including Owned, Non-Owned and Hired Vehicles	BA 9196359	National Union Fire Insurance Co. of Pittsburgh	1-1-85 to 1-1-86	Bodily Injury and Property Damage Combined $1,000,000 Each Occurrence $1,000,000 Aggregate
III.	Workers' Compensation On Shore Coverage All states except Wash., Nevada, N. Dakota, Ohio, W. Virginia, Wyom. & California	WC 1122507	National Union Fire Insurance Co. of Pittsburgh	1-1-85 to 1-1-86	Statutory
	U S L & H Employers Liability Including Marine				Statutory $1,000,000
IV.	Umbrella Liability	6584-2452	Granite State Insurance Co.	12-31-84 to 1-1-86	60% Participation Underlying
		85L1397/32	West Coast Marine Mgrs., Inc.	12-31-84 to 1-1-86	40% Participation

Limit of Liability
$ 4,000,000. Excess of Underlying

CANCELLATION CLAUSE:

It is hereby understood that there will be no cancellation or reduction of Liability Insurance Coverage until at least 30 days after Notice of such Cancellation of Coverage has been mailed to the Certificate Holder.

DESCRIPTION & LOCATION OF OPERATIONS: Site analysis for PCP Soil Contamination.

This Certificate of Insurance does not amend, extend or alter the coverage afforded by the policy or policies shown above.

CERTIFICATE ISSUED TO: Time Oil Co.
12005 N. Burgard Street
Portland, Oregon 97203

CORROON AND BLACK OF OREGON, INC.
By: Wade H Coykendall/jl
Date: 11/15/85 jeb

TOLS011180

BZTO104(e)048013

PHONE 285-2400
CABLE ADDRESS: TIMOIL

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
SAN PEDRO
LOS ANGELES

PRODUCTS TIME TESTED

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

August 8, 1986

Koppers Company, Inc.
Attn: Donald F. Marion
Koppers Building Room 750
Pittsburgh, PA 15219

Dear Don:

Per our telecon today, copy of amendment 2 to agreement with Riedel is attached.

Since EPA advised, in December 1985, that we could no longer remove contaminated dirt from the premises, we set aside the soil investigation and concentrated on learning if there was any ground water contamination and, if so, plume extent. We installed wells, developed them, had them sampled and analyzed. Results are favorable in that only .0022 ppm was found in one spot by corner of building. Map showing well locations is attached. We also determined water flow direction and checked water elevations several times.

Now we are attempting to somehow effect clean up of soil on site. Several areas are being investigated but we do not yet, in my opinion, have any really good solution. About the middle of next month, we should be in a more knowledgeable position regarding remedial actions. Still have more sampling to do under building if possible, more water measurements to be taken and more data to develop regarding available clean up processes. Will try to gather up everything by October 1 and send it along to you for your use.

Sincerely,

John P. Denham

John P. Denham
Environmental Manager

8/8/86

Robert - Don said check would be sent as soon as he receives this letter. Hope it works.

JPD

Enclosures a/s

JPD/ch

TOLS011181

BZTO104(e)048014

AMENDMENT 2
TIME OIL CO. - RIEDEL ENVIRONMENTAL SERVICES, INC.
SAMPLING AND ANALYSIS AGREEMENT
DATED JUNE 28, 1985

The work scope is amended to include the following:

1. Sandblasting and demolition of the impoundment wall (designated A in Figure 1). The cost of this procedure is estimated to be $5,568.01.

2. Drilling, sampling and installation of 3 monitoring walls angeled 45 degrees beneath the existing warehouse (listed as Wells 1, 2 & 3 in Figure 1). Also, the installation of a 40 foot vertical monitoring well, including sampling at 5 foot intervals, directly in front of the angled wells (listed as Well 4 in Figure 1). Analytical results for 12 PCP samples are included in the estimated cost of $12,667.07.

3. Drilling, sampling and installation of an additional 5, 20-foot monitoring wells (listed in Figure 1 as Wells 5, 6, 7, 8 & 9). Soil samples will be taken at 5 foot intervals and 5 analyses for PCP are included in the estimated cost of $6,595.50.

DATED this 5th day of November, 1985.

TIME OIL CO.

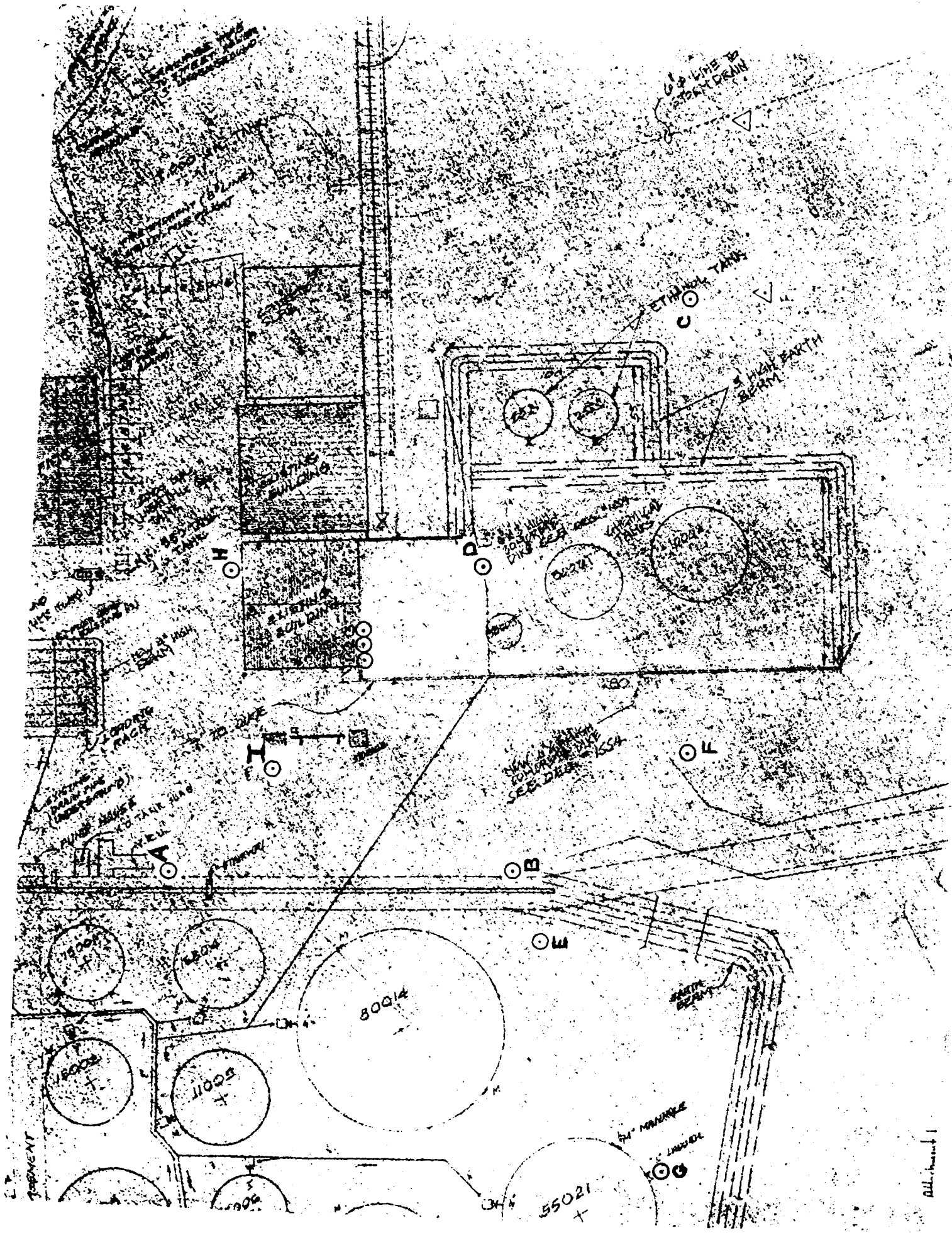
John Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

F.J. Bradach
President

RS:bw

TOLS011182



TOLS011183

BZTO104(e)048016

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P.O. Box 5007
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(503) 286-4656

☐ St. Louis Division
529 Spirit of St. Louis Blvd
Chesterfield, MO 63017
(314) 532-7660

☐ San Francisco Division
230 Cutting Blvd
Richmond, CA 94802
(415) 234-7400
or (415) 398-5351

☐ Seattle Division
901 Fairview Ave. No.
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

May 18, 1985

Mr. Neil Wallis
Time Oil Co.
P. O. Box 03137
12005 N. Burgard
Portland, OR 97203

Dear Neil:

The cost breakdown on our bid for sampling and analysis of PCP contaminated soil at your facility is as follows:

Drilling	$ 7,544
Analytical	4,956
Labor	3,985
Other Direct	2,115
	$18,600

If you have any questions, please don't hesitate to contact me.

Sincerely,

John Ruddick
Microbiologist

JR:kps

61

ENCL. 3

TOLS011184

BZTO104(e)048017

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Drilling	$ 7,544
Analytical	4,956
Labor	3,985
Other Direct	2,115
	$18,600

If you have any questions, please don't hesitate to contact me.

Sincerely,

John Ruddick
Microbiologist

JR:kps

TOLS011185

BZTO104(e)048018

#2 1st sentence

9 composites 3 on ea of N, E & S

surface soil samples

$1000

sampling & analysis (GC/MS)

#3 a. 20' internal sampling grid

~~b. Δ grid~~ 6 samples × depth of

ea sample

80' × 80' 16 holes, 6 samples

per hole = 96 samples @ $51.66 ea

= $4800

Call Swett & ~~[illegible]~~ Edwards-Kelso

Craig Wells (206) 423-3580

Labor direct

sampler & asst, draw plan

(chemists) hydrologist

write rpt

TOLS011186

BZTO104(e)048019

Other direct

Decontamination of equip
Samples jars
Safety gear
Disposal drums
Bentonite

Drilling hole, taking samples
decontamination of equip, moving
rig = 2½ hrs / hole x 16 holes
= 40 hrs 8 hrs/day
= $1,88.60/hr

---

time est 4 accomplishment - 5wks

then we will know how deep to
dig where

TOLS011187

4/30/85

John:

Attached proposal conveys EES' thoughts + remedies for soil sampling + analysis. After your review, pls. comment.

J Hibbs

TOLS011188

BZTO104(e)048021

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☐ Seattle Division
901 Fairview Ave. No.
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

RIEDEL
ENVIRONMENTAL SERVICES, INC.

April 25, 1985

Mr. Neil Wallis
Time Oil Company
P. O. Box 03137
12005 N. Burgard Street
Portland, OR 97203

Dear Neil:

Thank you for the opportunity to visit your plant and discuss with you the penta-chlorophenol sampling requirements you have at your northwest terminal wood treating site.

We propose that an initial composite sample survey be initiated to accurately define the boundaries of the PCP contamination zone. These surface samples would be collected to establish the actual area to be sampled later by coring at depth, and are warranted since the data indicates contamination at a site outside of your original proposed sampling plan. This task would be performed at a time and materials rate. It would be expected to be quite nominal relative to the core sampling, and will minimize the possibility of having to remobilize the drill rig to modify or extend the core sampling procedure in the future.

We will also review the sampling plan and, with DEQ approval, design a sampling plan that will meet their requirements while minimizing the number of holes needed. This task would also be billed at a time and materials rate and may utilize a triangular sampling matrix to improve coverage.

Riedel Environmental Services is prepared to perform the actual sampling and analysis including grid layout, drilling, sampling at six depths, analysis for PCP, decontamination of personnel and equipment, PCP concentration contour analysis, report and background level determination. The estimate for this task is $18,600, would require five days on site, and is based on an estimated sample area of 80' x 80'. If preliminary composite samples indicate a different area, this bid will be revised accordingly. If tetrachlorophenol analyses are also required, analytical costs will increase this bid by $5,000.

On the basis of the above results, RES can prepare an estimate for removal and disposal of the contaminated soils. We can also include monitoring or observation wells if required.

TOLS011189

BZTO104(e)048022

Please contact either myself or Rick Gariepy if you have any questions or would like additional information.

Sincerely,

RIEDEL ENVIRONMENTAL SERVICES, INC.

John H. Ruddick
Microbiologist

JHR:kps

TOLS011190

BZTO104(e)048023

TOLS011191

Rev. No.	Description	By	Date

RIEDEL INTERNATIONAL, INC.
P.O. BOX 3320, 4555 N. CHANNEL AVE. PORTLAND, OREGON 97208

TIME OIL CO. - PORTLAND OR

P.C.P. SAMPLING PLAN
SAMPLING GRID - LATERAL SAMPLES

Date: 7/2/85 By: JHR Scale: 1" = 10'

Approved: Dwg. No. RES 1-J-11

BZTO104(e)048024

TOLS011192

[redacted]

BZTO104(e)048025

TOLS011193

BZTO104(e)048026

TOLS011194

BZTO104(e)048027

TOLS011195

BZTO104(e)048028

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or (415) 398-5351

☐ Seattle Division
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P.O. Box 1730
Seattle, WA 98111
(206) 622-2836

RIEDEL
ENVIRONMENTAL SERVICES, INC.

July 3, 1985

Mr. John Denham
Time Oil Company
P. O. Box 24447
Terminal Station
Seattle, WA 98124

Dear John:

To follow up on our conversation of July 2nd regarding PCP sampling at Time Oil's Portland division, I have enclosed a copy of the print of the sampling plan used July 1st to evaluate the boundaries of the contamination zone.

As you can see, each individual sample site is marked by an "X", the composite samples correspond to the red latticed areas A through I. There are the following number of individual samples per composite:

Composite	Individual Samples
A	9
B	12
C	15
D	9
E	9
F	12
G	4
H	5
I	6
Total	81

The individual samples are taken every 10' beginning 5' from the edge of the marginal areas. Variations in individual sample numbers per composite are due to varying areas, tanks, etc.

To confirm our conversation, you would like RES to resample each point marked by an "X" and hold these samples for analysis. Following the results of composite samples A, D, and G, currently under analysis, you would like each individual sample from any positive composite area analyzed for PCP. Since no definition has been provided regarding what is considered positive, I would suggest analyzing individuals when the composite exceeds 1 ppm.

For Fast Emergency Response, Call Environmental Emergency Services Co.

24 HOUR HOTLINE / 1-800/334-0004 NATIONWIDE

TOLS011196

The marginal area immediately adjacent to a positive area would also be analyzed by having all of its individual samples analyzed at this time. Therefore, should areas A and D, for example, show composite sample results in excess of 1 ppm, individual samples from area A, B, D and E (a total of 39 samples) would be analyzed for PCP. Should areas A, D and G all have composite results exceeding 1 ppm, 48 samples from areas A, B, D, E, G and H would be analyzed.

The potential maximum cost of this approach, assuming all 81 samples are analyzed, will be approximately $5,000.00. This will include sampling, analysis and the construction and drafting of the detailed sampling plan layouts you requested.

If you have any questions, or would like to discuss this procedure further, please contact me directly.

Very truly yours,

RIEDEL ENVIRONMENTAL SERVICES, INC.

John H. Ruddick
Microbiologist

JHR:KPS
Enclosure

cc: Mr. J. L. Patterson, RES
Riedel Environmental Services, Inc.

Mr. Neil Wallis
Time Oil Co.
P. O. Box 03137
Portland, OR 97208 w/blueprint

TOLS011197

PURCHASE ORDER

TIME OIL CO.

P.O. BOX 03137 • ST. JOHNS STATION
12005 N. BURGARD STREET • PORTLAND, OREGON 97203
(503) 286-1611

No. 27526
PLACE THIS NUMBER ON YOUR INVOICE AND ALL CORRESPONDENCE

TO Riedel Environmental Services
PORTLAND DIVISION FT OF N. PORTSMOUTH AVE.
P. O. BOX 5007
PORTLAND, OREGON 97208

DATE June 26, 1985 SHIP BY

V	QUANTITY	PART NO.	DESCRIPTION	LIST UNIT PRICE	NET UNIT PRICE	AMOUNT
			Obtain and analyze three composite site surface samples. Time and material not to exceed $500.00			500.00

FOR RESALE ☐ TAXABLE ☐
WASHINGTON STATE RESALE CERTIFICATE #C178-47526

TIME OIL CO.
BY John L. Denham

THIS PURCHASE IS EXPENSE OF: ☒ T.O.C. ☐ OTHER

DATE WANTED

IF T.O.C.
DEPARTMENT: N. W. TML (St. Johns)
SERVICE STATION (SHOW ADDRESS AND OPERATOR):

EXPLANATION: PRELIMINARY BOUNDRY SAMPLES FOR WOODTREATING AREAS.

ACCOUNT NO. REQUESTED BY APPROVED BY

AUG - 5 1985

RECEIVING COPY

TOLS011198

BZTO104(e)048031

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Richmond, CA 94802
(415) 234-7400

☐ Seattle Division
901 Fairview Ave. No
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

August 15, 1985

Mr. John P. Denham
Environmental Manager
Time Oil Company
2737 W. Commodore Way
PO Box 24447 Terminal Annex
Seattle, WA 98124

Dear John:

Enclosed are the sample results and contour maps as you requested.

I hope to see you soon.

Sincerely,

John H Ruddick /tt

John H. Ruddick
Microbiologist

JHR:rrh
Enclosures

For Fast Emergency Response, Call Environmental Emergency Services Co.
on 24-Hour Hotline (800) 334-0004

TOLS011199

BZTO104(e)048032

TIME OIL CO. - PORTLAND, OREGON
PENTACHLOROPHENOL IN SOIL

Surface Contour Data

Sample #	Coordinates X	Coordinates Y	Concentration Mg/Kg
1	81	171	13500
2	71	171	29
3	71	161	500
4	71	151	5450
5	71	141	5560
6	71	131	8760
7	71	121	4870
8	71	111	92
9	71	101	20
10	81	181	16
11	71	181	7
12	61	181	9
13	61	171	95
14	61	161	175
15	61	151	18
16	61	141	229
17	61	131	88
18	61	121	6
19	61	111	3
20	61	101	2.5
21	61	91	5.2
37	81	95	857
38	91	96	1130
39	101	97	17
40	111	98	3.5
41	121	98	3.1
42	131	99	3.2
43	141	100	2.4
44	151	100	1.8
45	161	101	171
46	71	84	3
47	81	85	3.6
48	91	86	6.1
49	121	87	3.2
50	131	88	1.5
51	141	89	2.3
52	151	90	1.7
53	161	91	1.9
54	171	92	1.2

Core #	Coordinates X	Coordinates Y	Concentration Mg/Kg
J	142.5	161	1400
K	117.5	161	N/A
L	92.5	161	N/A
M	67.5	161	4720
N	155	143	4280
O	130	143	3000
P	105	143	N/A
Q	80	143	N/A
R	142.5	125	1712
S	117.5	125	522
T	92.5	125	123
U	67.5	125	26550
V	155	107	317
W	130	107	3385
X	105	107	N/A
Y	80	107	N/A
Z	80	179	21

N/A = Not Available

TOLS011200

BZTO104(e)048033

TIME OIL CO. - PORTLAND, OREGON
PENTACHLOROPHENOL IN SOIL

Two Foot Contour Data

Core #	Coordinates X	Coordinates Y	Concentration Mg/Kg
J	142.5	161	3
K	117.5	161	8.8
L	92.5	161	N/A
M	67.5	161	87
N	155	143	3.1
O	130	143	59
P	105	143	16
Q	80	143	N/A
R	142.5	125	34
S	117.5	125	252
T	92.5	125	123
U	67.5	125	44
V	155	107	260
W	130	107	15
X	105	107	4.5
Y	80	107	N/A
Z	80	179	14

N/A = Not Available

TOLS011201

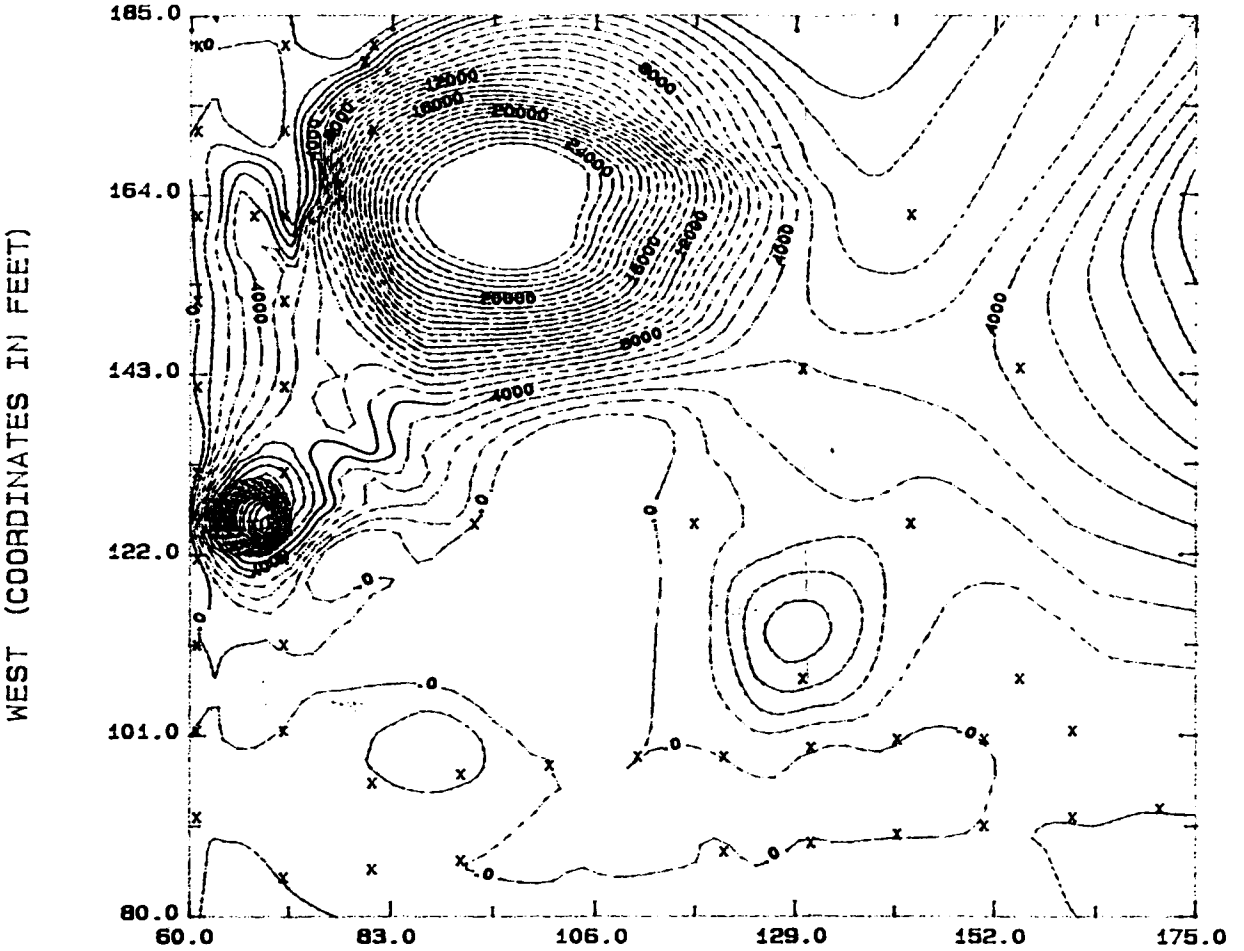
BZTO104(e)048034

TIME OIL CO. - PORTLAND, OREGON
PENTACHLOROPHENOL IN SOIL

Four Foot Contour Data

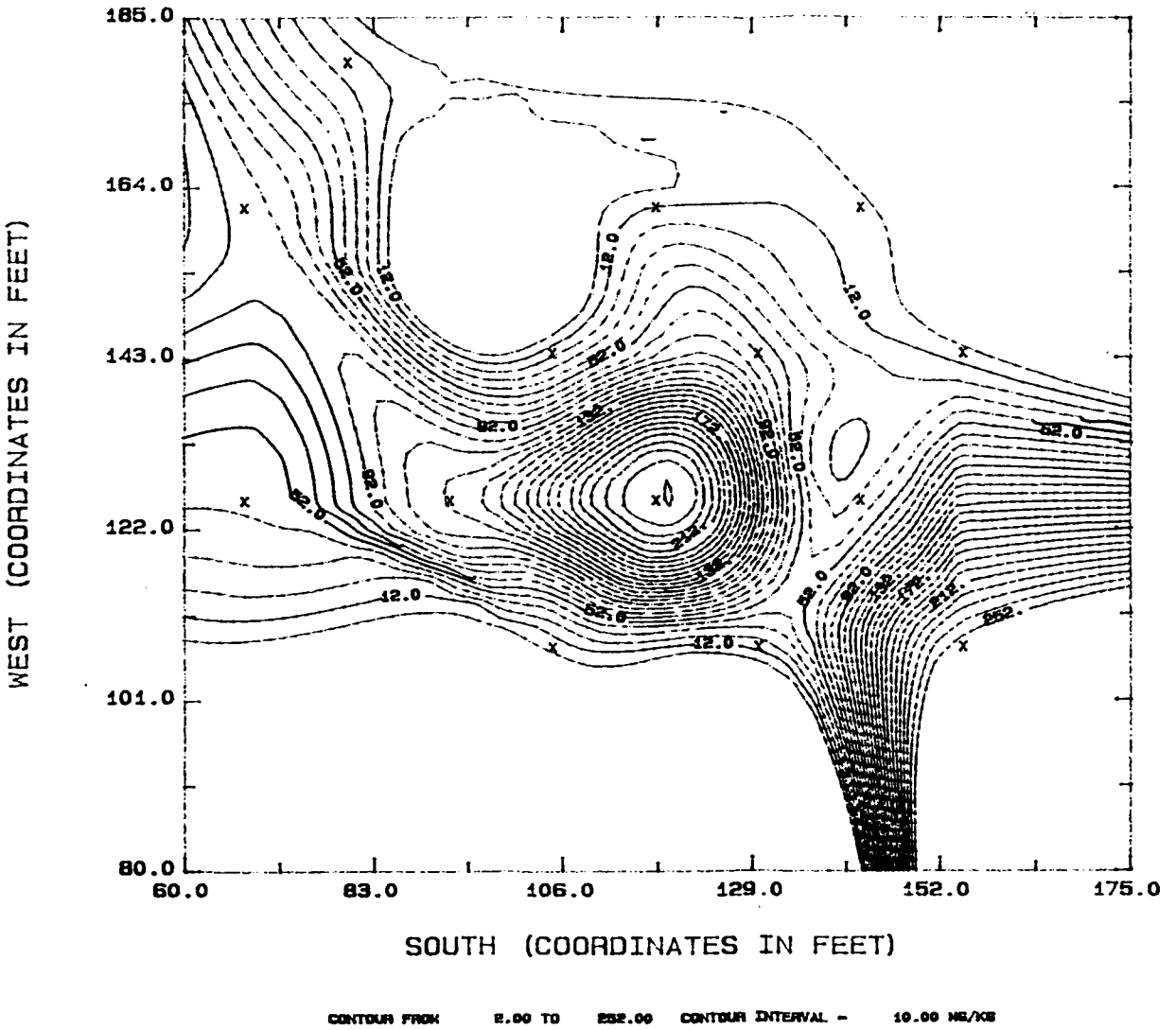
Core #	Coordinates X	Coordinates Y	Concentration Mg/Kg
J	142.5	161	3.6
K	117.5	161	10.5
L	92.5	161	7200
M	67.5	161	22
N	155	143	238
O	130	143	23
P	105	143	15
Q	80	143	2205
R	142.5	125	50
S	117.5	125	184
T	92.5	125	534
U	67.5	125	55
V	155	107	380
W	130	107	8.1
X	105	107	1.3
Y	80	107	598
Z	80	179	2

TIME OIL CO PCP SURFACE CONTOUR



BZTO104(e)048036

TOLS011203



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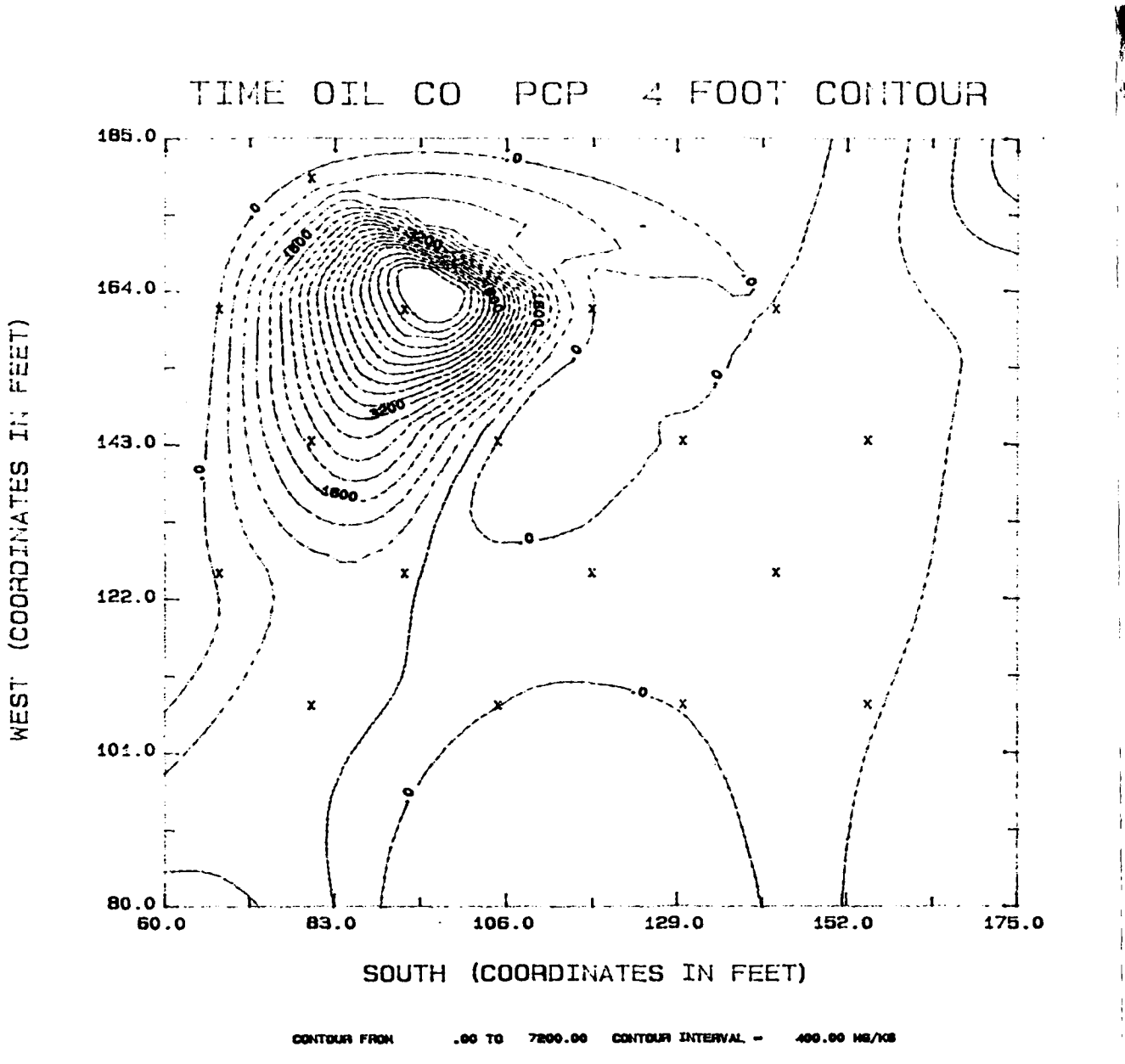
TOLS011204



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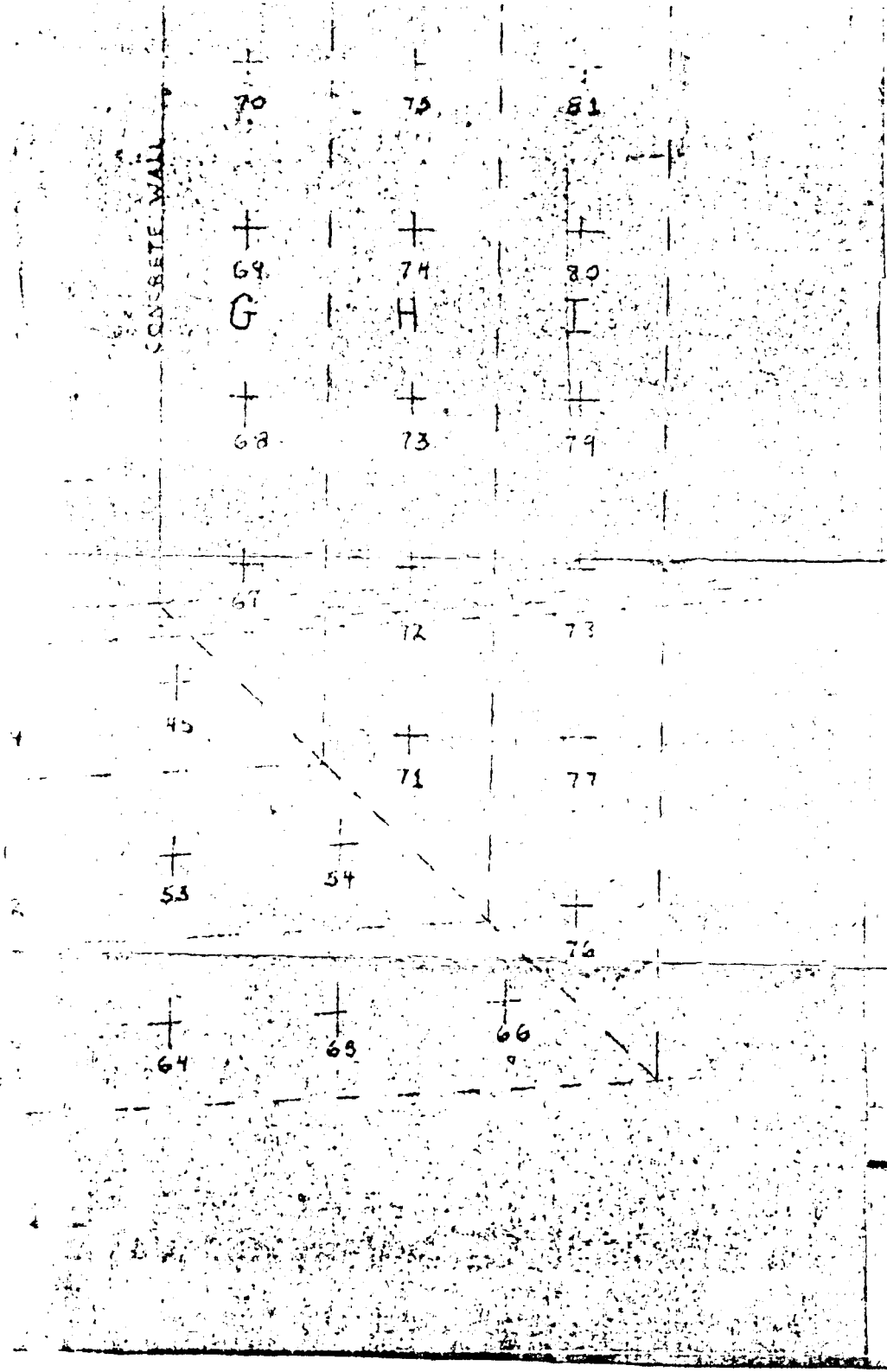
TOLS011205



Rev. No.	Description	By	Date
-J-11-A	IND. SAMPLE NOS. ADDED	JHR	

RIEDEL INTERNATIONAL, INC.
P.O. BOX 3320, 4555 N. CHANNEL AVE. PORTLAND, OREGON 97208

TIME OIL CO. - PORTLAND, OR.

PCP SAMPLING PLAN
SAMPLING GRID - LATERAL SAMPLES

Date: 7/2/85 By: JHR Scale: 1" = 10'

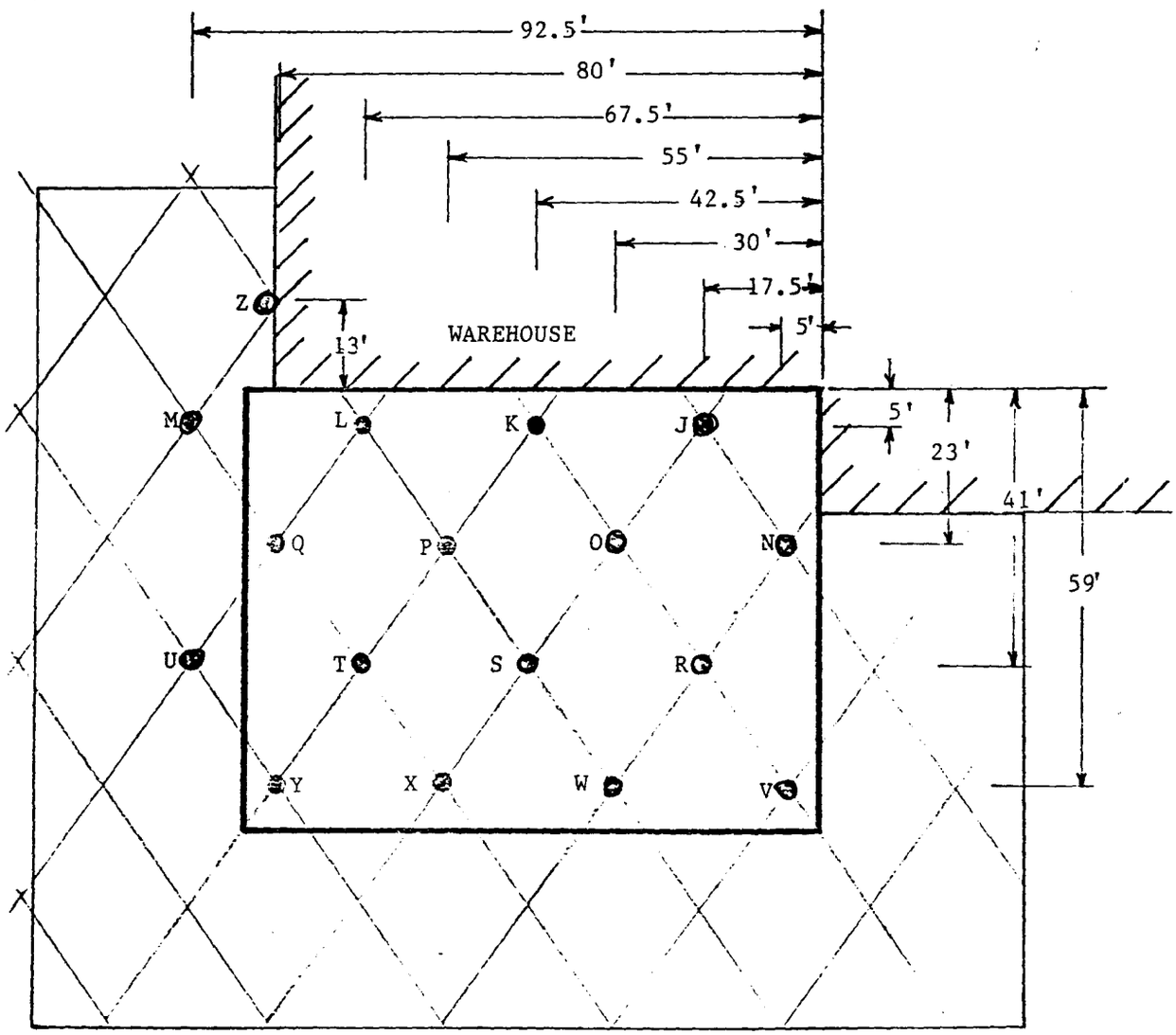
Approved: Dwg. No. RES 1-J-11

TOLS011206

BZTO104(e)048039

SPLIT SPOON SAMPLING PLAN

TRIANGULAR MATRIX
(Maximum Distance = 13.34')



TOLS011207

TIME OIL CO. - PORTLAND, OREGON
PENTACHLOROPHENOL IN SOIL

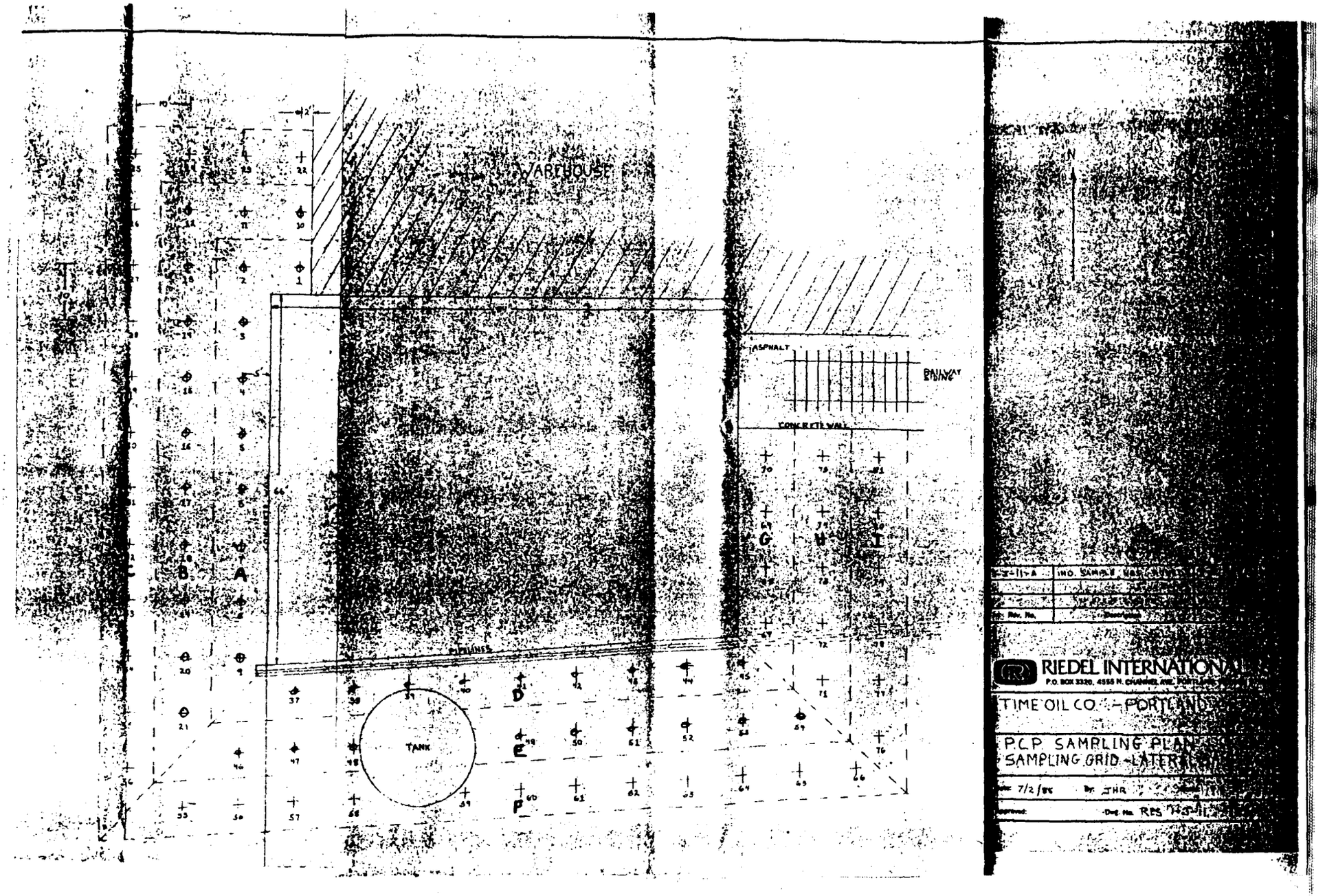
Surface Contour Data

	Sample #	Coordinates X	Coordinates Y	Concentration Mg/Kg
	1	81	171	13500
	2	71	171	29
	3	71	161	500
	4	71	151	5450
	5	71	141	5560
A	6	71	131	8760
	7	71	121	4870
	8	71	111	92
	9	71	101	20
	10	81	181	16
	11	71	181	7
	12	61	181	9
	13	61	171	95
	14	61	161	175
	15	61	151	18
B	16	61	141	229
	17	61	131	88
	18	61	121	6
	19	61	111	3
	20	61	101	2.5
	21	61	91	5.2
	37	81	95	857
	38	91	96	1130
	39	101	97	17
	40	111	98	3.5
D	41	121	98	3.1
	42	131	99	3.2
	43	141	100	2.4
	44	151	100	1.8
	45	161	101	171
	46	71	84	3
	47	81	85	3.6
	48	91	86	6.1
	49	121	87	3.2
	50	131	88	1.5
E	51	141	89	2.3
	52	151	90	1.7
	53	161	91	1.9
	54	171	92	1.2

Core #	Coordinates X	Coordinates Y	Concentration Mg/Kg
J	142.5	161	1400
~~K~~	117.5	161	N/A
~~L~~	92.5	161	N/A
M	67.5	161	4720
N	155	143	4280
O	130	143	3000
~~P~~	105	143	N/A
~~Q~~	80	143	N/A
R	142.5	125	1712
S	117.5	125	522
T	92.5	125	123
U	67.5	125	26550
V	155	107	317
W	130	107	3385
~~X~~	105	107	N/A
~~Y~~	80	107	N/A
Z	80	179	21

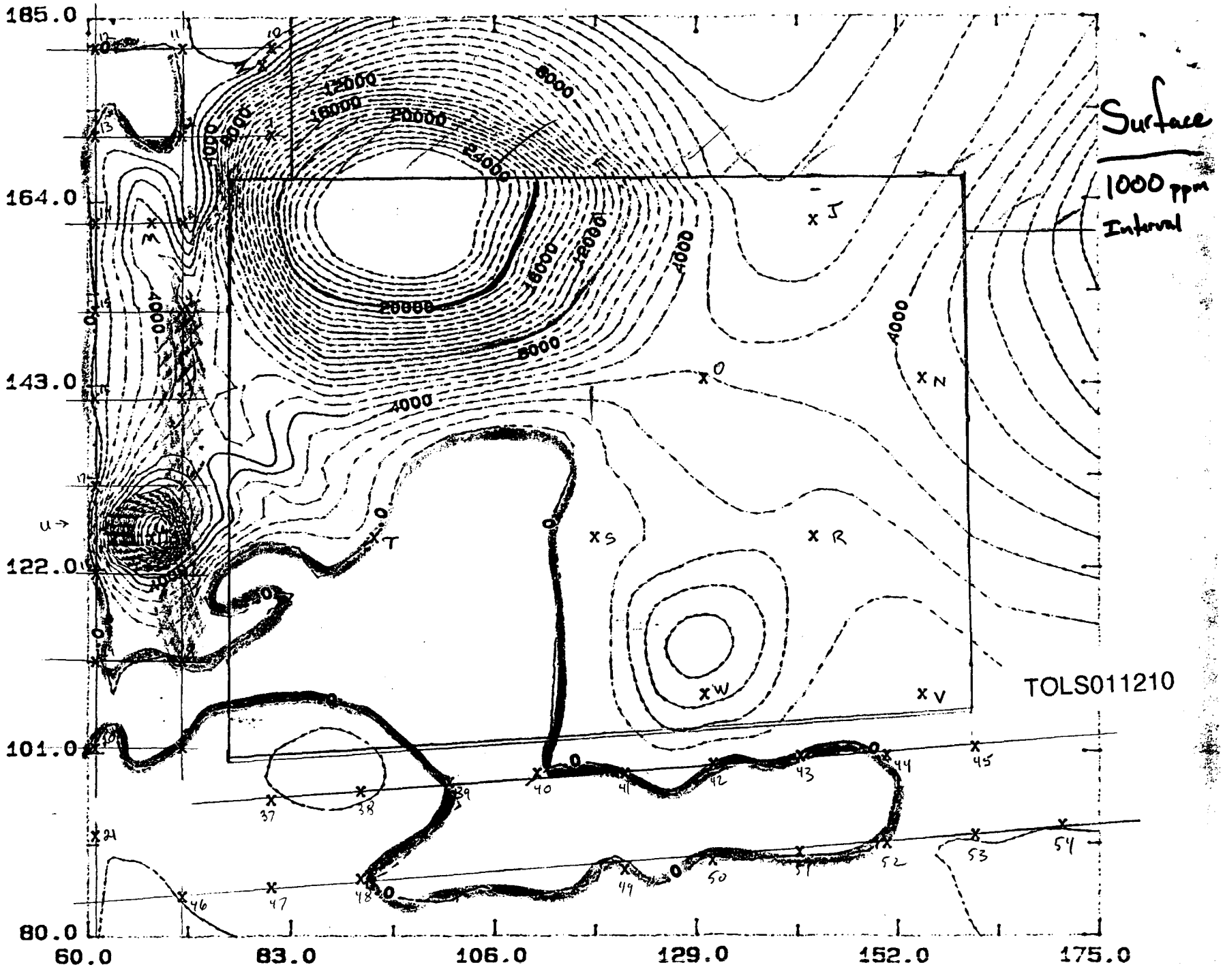
N/A = Not Available

TOLS011208



BZTO104(e)048042

TOLS011209



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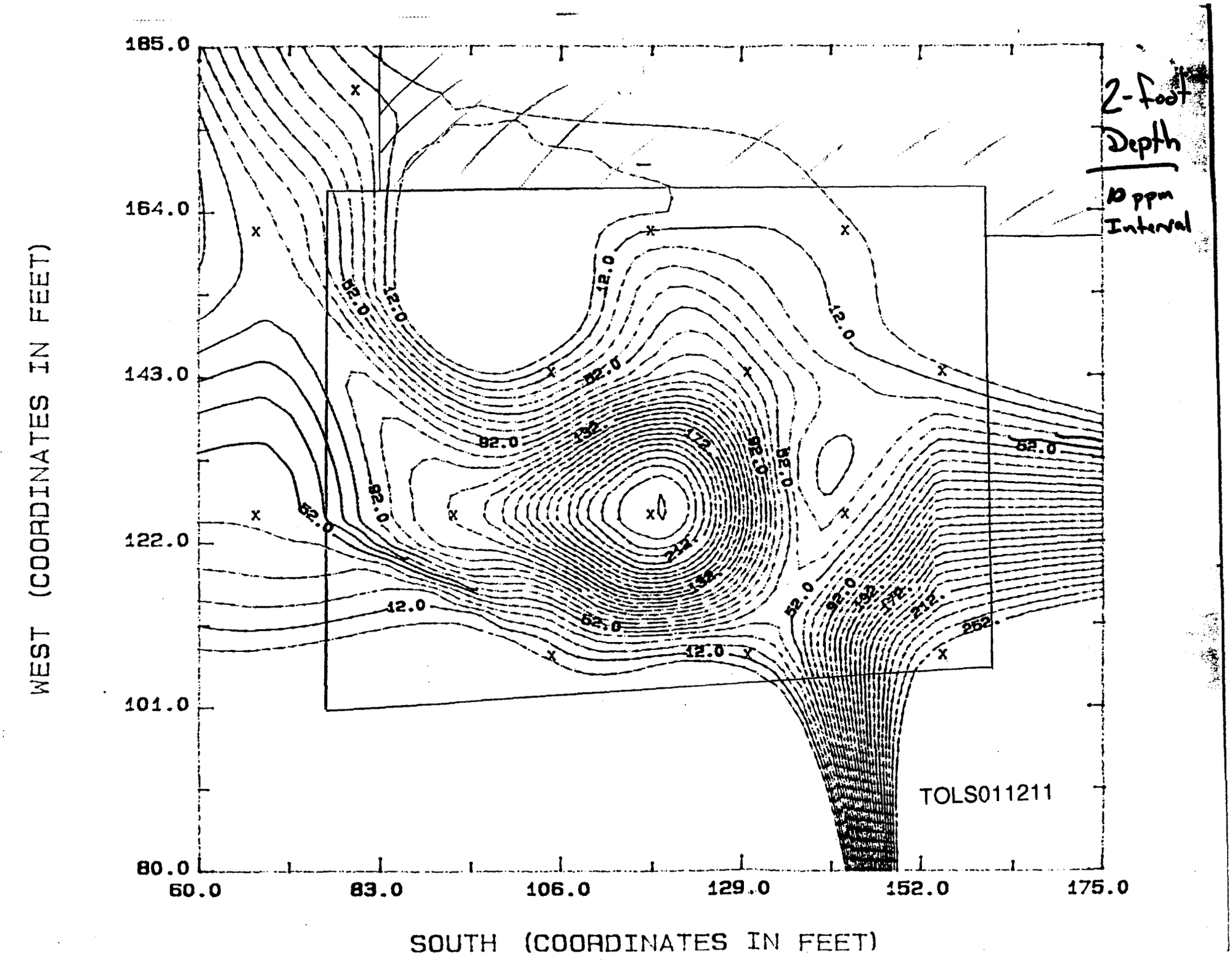
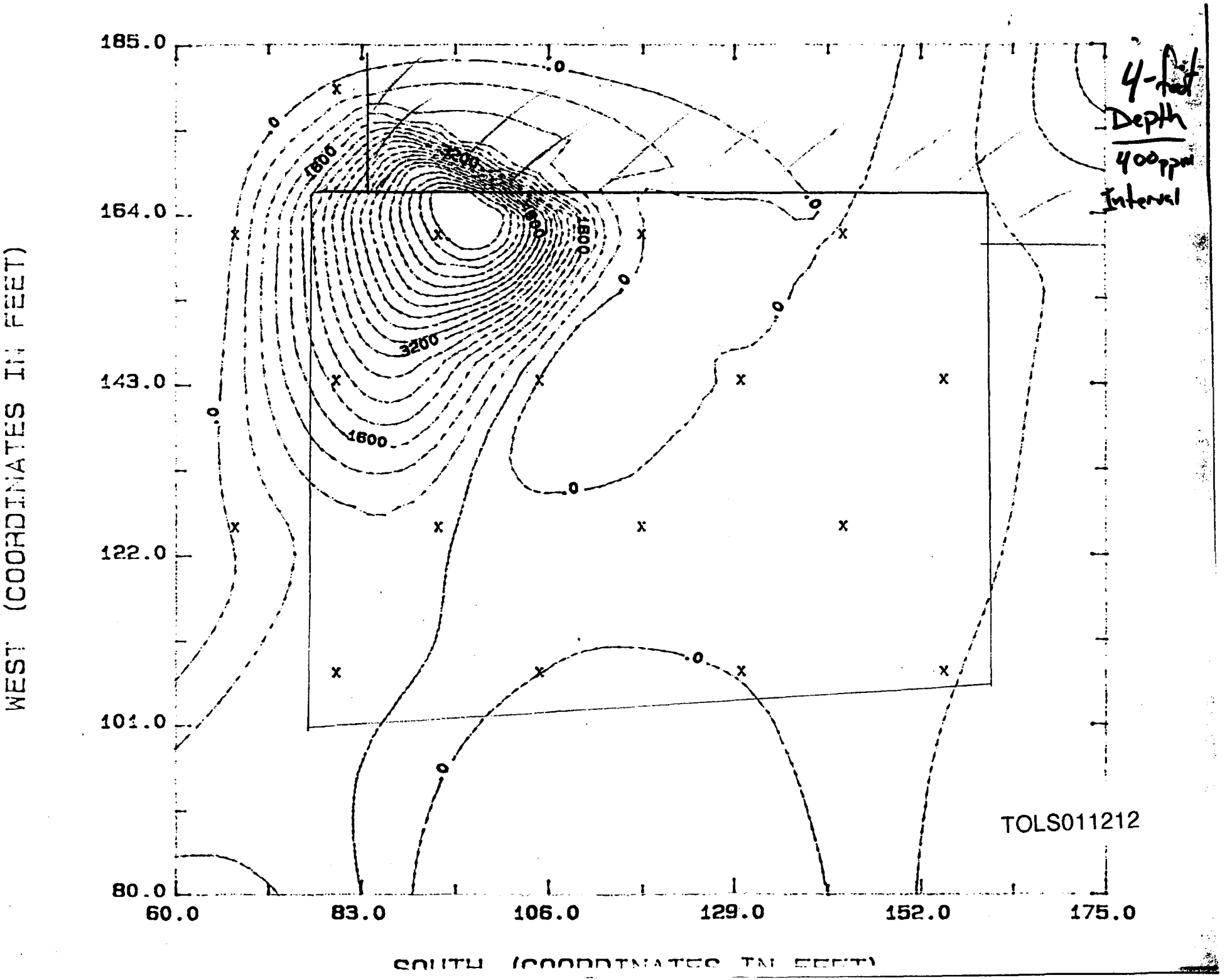


BZTO104(e)048044



BZTO104(e)048045

John Ruddick 8/29 ZLP

Analytical work not complete

Aware of problem w/ surface & 2'

4' is good

Has Analysis 7' per JPD and 10' ready middle of next week on his own initiative since 7' was high

2' point "V" is high - used for contractor's access - fill piled over pipes - contam material

Point 5

You can throw the 2' away

→ GW is at 11' - if 10' results are high then were probably in the GW

TOLS011213

10/85

BIODEGRADATION

Isolated bacteria for Time Oil site soil. Grew then by addition of nutrients and mutated then with Nitoso guanidine to increase growth rate and enzyme production.

These organisms utilize PCP as a carbon source and biodegrade it in the presence of suitable nutrients (i.e. nitrogen, phosphorus, potassium and emulsifier).

Can be done without moving soil. Soil turn-over needed to work.

TOLS011214

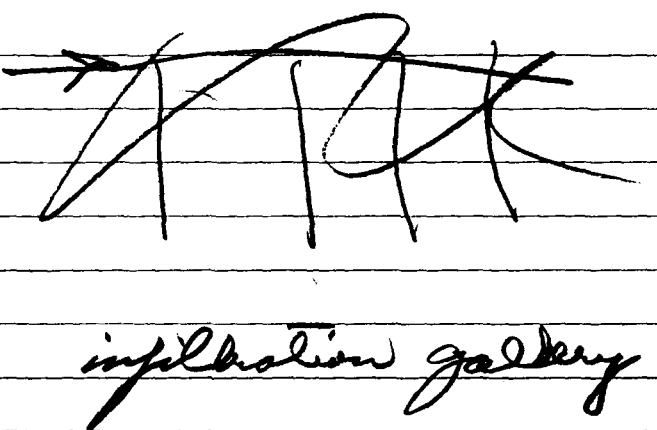
Biodegradation

Isolated bacteria for Time oil site soil. Grew them by addition of Nutrients and mutated them with Nitroso-guanidine to increase growth rate and enzyme production.

These organisms utilize PCP as a Carbon Source + biodegrade it in the presence of suitable nutrients (i.e. Nitrogen, Phosphorus, Potassium and emulsifier.

Can be done without moving soil. Soil turn-over needed to work.

TOLS011215



TOLS011216

Q_{10} rule

10° C 2 1/2

90

~ 30° C 1

20° C → 1/2

10° C 1/4

= 50° F

1/4 - 1/8

40%

~~3~~ wks (lab)
6 wks (field) 200pp → 10-20ppm

10 X

Hart May 86
Finish Oct 86
90 + % biodegradation

TOLS011217

BZTO104(e)048050

10/2/85

1. Initially took 9 composite samples, analyzed 3 times
2. Took individual samples of 10' segment per bolt (51)
3. Ran 1-21 & 37-54 = 38 samples for peripheral learned hot spots
4. TOC excavated
5. Made 17 borings to 12' depths triangular matrix inside
6. Contoured Benz concentration @ various depths
   0, 2', 4', 7', 12'
7. Saw 2 hot spots (1) 13500 @ surface down to 12' 2030 ppm NW corner (30' dia) (2) W wall (10' dia) 2650 ppm outside (2' depth approx)

   saturated soil → gw contamination

8. Excavation not solution. Diffusion is to SW Possible under bldg

Airport
Visit, Thurs 10TH - call John Ruddick

TOLS011218

"Imagineering a cleaner world"

RIEDEL
ENVIRONMENTAL SERVICES, INC.

☒ Portland Division
Foot of N. Portsmouth Ave.
P.O. Box 5007
Portland, OR 97208
(503) 286-4656

☐ St. Louis Division
529 Spirit of St. Louis Blvd
Chesterfield, MO 63017
(314) 532-7660

☐ San Francisco Division
230 Cutting Blvd.
Richmond, CA 94802
(415) 234-7400
or (415) 398-5351

☐ Seattle Division
901 Fairview Ave. No.
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

October 18, 1985

John Denham
Time Oil Company
2737 West Commodore Way
Seattle, WA 98134

Dear John:

Enclosed is the revised invoice for Phase One work at Time Oil's North Portland Terminal. This concludes this phase of the work at this site and represents the final billing for this work.

We will begin Phase Two immediately per our conversation of 10/18/85.

Sincerely,

John Ruddick

TOLS011219

INVOICE

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

"Imagineering a better world"

"COMPLETE OIL AND HAZARDOUS MATERIAL SPILL CLEANUP SERVICE"

ENVIRONMENTAL EMERGENCY SERVICES

A DIVISION OF RIEDEL ENVIRONMENTAL SERVICES
4555 N. CHANNEL AVENUE — P.O. BOX 3320 · PORTLAND, OREGON 97208-3320
24 HOUR SERVICE AND 2-WAY RADIO DISPATCHED SERVICE

HOT LINE: (800) 547-0792
BUSINESS PHONE: (503) 285-9111
TELEX: 151403

JOB LOCATION

DATE 10/18/85

SOLD TO TIME OIL COMPANY
P.O. BOX 03137
ST. JOHNS STATION
PORTLAND, OREGON 97203

YOUR NO.

INVOICE NO. 2017-10

JOB #8120/3011

ATTENTION: NIEL WALLIS

TERMS: Net 30 days from date of invoice.
SERVICE CHARGE: A service charge of two (2%) percent per month shall be charged to all balances not paid within the terms of sale.

TO INVOICE YOU FOR LABOR, EQUIPMENT, MATERIALS AND SUPPLIES NECESSARY TO SAMPLE AND ANALYZE SOIL SAMPLES AND MEET WITH TIME OIL TO DISCUSS RESULTS.

TOTAL AMOUNT DUE PER ATTACHED $18,741.55

Roland Miller
ROLAND MILLER, DIVISION MANAGER

CO.....DIV.....	☐
VEND.....	AUTH
INV.....	☐
PO.....	PRICE
DUE.....	☐
%.....MO.....	REC/
☐ DIST ATTACHED	SIG

Please Remit To:
Box 4500-67
Portland, OR 97208

ST. LOUIS, MO DIVISION
529 SPIRIT OF ST. LOUIS BLVD.
CHESTERFIELD, MO 63017 • 314-532-7660

RICH
230 C
RICHMOND, CA 94802 • 415-234-7400

RIEDEL ENVIRONMENTAL SERVICES IS A DIVISION OF RIEDEL INTERNATIONAL, INC.
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• Readymix Concrete • Sand and Gravel • Crushed Rock Fill Material Asphalt • Truck-Rail-Barge Delivery • Oil Spill Clean-up •

TOLS011220

BZTO104(e)048053

INVOICE

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A DIVISION OF RIEDEL ENVIRONMENTAL SERVICES
4555 N. CHANNEL AVENUE — P.O. BOX 3320 · PORTLAND, OREGON 97208-3320
24 HOUR SERVICE AND 2-WAY RADIO DISPATCHED SERVICE

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JOB LOCATION

DATE 10/18/85

SOLD TO TIME OIL COMPANY
P.O. BOX 03137
ST. JOHNS STATION
PORTLAND, OREGON 97203

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TOTAL AMOUNT DUE PER ATTACHED $18,741.55

Roland Miller

ROLAND MILLER, DIVISION MANAGER

ST. LOUIS, MO DIVISION
529 SPIRIT OF ST. LOUIS BLVD.
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• Readymix Concrete • Sand and Gravel Crushed Rock Fill Material • Asphalt · Truck-Rail-Barge Delivery • Oil Spill Clean-up •

TOLS011221

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Co
PO Box 03137
PDX 3
ATTN: Neil Wallis

DAY & DATE Thurs 10/10/85
P.O. #
EES JOB # 3011
JOB TIME: 8 TO 1

DESCRIPTION OF WORK Meeting Time Oil Co at Sheraton Airport PDX Discuss Results/ Billing/

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
R Smith	8-1	HG	5	55.-					275.-
J Ruddick	8-1	MB	5	62.50					312.50

'A' TOTAL $587.50

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Room Rental		72.50	72.50

TOLS011222

'C' TOTAL 72.50

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: J Ruddick DATE 10/11/85
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	587.50
'B' TOTAL	~~0~~
'C' TOTAL	72.50
GRAND TOTAL	$660.00

EES 002/5 10/82 OFFICE COPY

BZTO104(e)048055

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Tims Oil Co
PO Box 03137
Portland OR

ATTN: Neil Wallis

DAY & DATE 10/3/85

P.O. #

EES JOB # 3011

JOB TIME: 5P TO 5P

DESCRIPTION OF WORK Analysis of Boring Soil Samples
for PCP + Phenol Testing

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Jon Edman	3-5	Sci	2	17	34				34

'A' TOTAL 34

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Analysis of ~~30~~ 29 Soil Samples + 1 Drum Water Sample	30 EA	52.33	1570.20

TOLS011223

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: J Riddle DATE 10/3/85

CUSTOMER:

RECEIVED BY: DATE

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'A' TOTAL	34.00
'B' TOTAL	-0-
'C' TOTAL	1570.20
GRAND TOTAL	1604.20

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Co
PO Box 03137
Portland OR

ATTN: Niel Wallis

DAY & DATE Thurs 9/5

P.O. #

EES JOB # 3011

JOB TIME: 8 TO ~~5~~

DESCRIPTION OF WORK Recontour data

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J Ruddick	8-10 +3-5	mb	4	62.50					250.00

'A' TOTAL 250.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
	Computer Time	1	2 Hr	30.00	60.00

'B' TOTAL 60.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
TOLS011224			

'C' TOTAL ~~0~~

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: J Ruddick DATE 9/5/85

CUSTOMER:

RECEIVED BY: DATE

'A' TOTAL	250.00
'B' TOTAL	60.00
'C' TOTAL	~~0~~
GRAND TOTAL	310.00

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BZTO104(e)048057

Environmental Emergency Services Co.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Tesoro oil Co
PO Box 03137
Portland OR
ATTN: Neil Wallis

DAY & DATE 8/23/85
P.O. #
EES JOB # 3011
JOB TIME: 8 TO 11

DESCRIPTION OF WORK Data analysis, reduction, report Prep

LABOR

NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J Ruddell	8-11	Mb	3	62.50	187.50				187.50

'A' TOTAL 187.50

EQUIPMENT

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS

	NUMBER	PRICE	TOTAL AMOUNT
TOLS011225			

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: J Ruddell DATE 8/23/85
CUSTOMER: Tesoro oil Co
RECEIVED BY: DATE

'A' TOTAL	187.50
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	187.50

5 0012/5 10/82 OFFICE COPY

BZTO104(e)048058

Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time oil Co
PO Box 03137
Portland Or 97203
ATTN: Neil Wallin

DAY & DATE 8/21/85
P.O. #
EES JOB # 3011
JOB TIME: 8 TO 11

SCRIPTION OF WORK Datrik analysis & Reduction

ABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J Rudolph	8-11	Mb	3	62.50	187.50				187.50

'A' TOTAL 187.50

QUIPMENT QUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

PPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Drilling - Per Sweet Edwards Sub-Contract For Split Spoon Samples		4440	4440

TOLS011226

'C' TOTAL

ONMENTAL EMERGENCY SERVICES CO.

ARED BY: J Rudolph DATE 8/21/85

JMER:

VED BY: DATE

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'A' TOTAL	187.50
'B' TOTAL	
'C' TOTAL	4440
GRAND TOTAL	~~4627.50~~

BZTO104(e)048059

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE 8-2-85

P.O. #

EES JOB # 8121-3011

ATTN:

JOB TIME: 1500 TO 1700

DESCRIPTION OF WORK Empty liq tub of water and sand and take back to W.W. & D. from Time Oil tank farm Rivergate.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
D. Ruddick	1500-1700	MB	2	62.50	125.-				125.00
J.P. Rayton	1500-1700	PCST	2 1/4	33.-	74.25				74.25

'A' TOTAL $ 199.25

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-906	Flatbed Truck	1	1/2 hrs.	13.9/hr.	19.68

'B' TOTAL 19.68

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

TOLS011227

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: J.P. Rayton DATE 8-2-85

CUSTOMER:

RECEIVED BY: DATE

'A' TOTAL	199.25
'B' TOTAL	19.68
'C' TOTAL	~~0~~
GRAND TOTAL	218.93

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BZTO104(e)048060

Environmental Emergency Services Co.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Tim oil Co
PO Box 03137
Portland OR
ATTN: Niel Wallis

DAY & DATE 8/1/85
P.O. #
EES JOB # 8121/3011
JOB TIME: 8 TO 5

DESCRIPTION OF WORK Contour sample results, draft site plan, plot contours.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J. Ruddick	8-5	mb	9	62.50	562.50				562.50

'A' TOTAL 562.50

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
	Computer, Plotter		2 HR	30.00	60.00

'B' TOTAL 60.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Pentachlorophenol in Soil (Analyses)	81 EA	52.35	4240.35
81 samples (0', 2', + 4' cores + laboratory)			

TOLS011228

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: J. Ruddick DATE 9/5/85
CUSTOMER: Tim oil Co
RECEIVED BY: DATE
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'A' TOTAL	562.50
'B' TOTAL	60.00
	4240.35
'C' TOTAL	
GRAND TOTAL	4862.85

Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/235-9111

DAILY WORK REPORT

TO: Time Oil
PO Box 03137
PDX

ATTN:

DAY & DATE 7-25-85

P.O. #

EES JOB # 2121-3011

JOB TIME: 0730 TO 1200

DESCRIPTION OF WORK Decon Drilling equp secure site

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
R Schodin	0730/1200	Spcl	4½	33.00	148.50				148.50

'A' TOTAL 148.50

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
1-054	Pickup	1	4 hr	85.00/day	42.50
	Steamcleaner	1 hr		15.00/hr	15.00

'B' TOTAL 57.50

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek	1pr	4.00	4.00
Latex gloves	1pr	1.00	1.00

TOLS011229

'C' TOTAL 5.00

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: R Schodin DATE 7-25-85

CUSTOMER:

RECEIVED BY: DATE

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'A' TOTAL	148.50
'B' TOTAL	57.50
'C' TOTAL	5.00
GRAND TOTAL	211.00

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE 7-24-85

P.O. #

EES JOB # 8121/3011

ATTN:

JOB TIME: 0700 TO 1830

DESCRIPTION OF WORK Drilling Time Oil

LABOR

NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J. Rudolick	1000/200	MB	2	62.50	125.-				125.00
R. Scholich	0700/830	PCSTI	12	33.-	396.-				396.00
J. Tolston	0700/1830	PCSTII	11 1/3	27.-	305.91				305.91

'A' TOTAL 826.91

EQUIPMENT

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	Pickup		1 Day	85.-	85.-
	Steamcleaner		4 HR.	15.-/HR	60.-
	Garden Hose 50'	3		N/C	
	20' Round Tub		1 Day	10./Day	10.-
	Cat JD450	1	1 Day	350.-	350.-

TOLS011230

'B' TOTAL 505.-

SUPPLIES AND MATERIALS

	NUMBER	PRICE	TOTAL AMOUNT
Tyvek	4 pr.	4.-/ea.	16.-
Latex Gloves	4 pr.	1.-/pr.	4.-
Duct Tape	1 roll	3.65	3.65
Combo Cartridges	4 ea.	7.35/ea.	29.40
2 Full Face Respirators	2	12.50/day	25.00
Ice		1.99	1.99

'C' TOTAL 80.04

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: R. Scholich DATE 7-24-85

CUSTOMER:

RECEIVED BY: DATE

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'A' TOTAL	826.91
'B' TOTAL	505.-
'C' TOTAL	80.04
GRAND TOTAL	1,411.95

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/235-9111

DAILY WORK REPORT

TO: Time Oil
P.O. Box 03137
Portland, Oregon 97208
ATTN:

DAY & DATE 7-23-85
P.O. #
EES JOB # 8121/3011
JOB TIME: 0630 TO 1730

DESCRIPTION OF WORK Drilling Time Oil

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J. Ruddick	0830/1130	M.B.	5	62.50	312.50				312.50
T. Freitag	1400/1530	Casual	1½	15.	22.50				22.50
R. Schoelich	0630/1730	PCS	11.18	33	368.78				368.78
J. Tolston	0630/1730	PCS	11¼	27	303.75				303.75

'A' TOTAL 1,007.53

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	Pickup	1	1 Day	85	85.-
	Steam Cleaner	1	5 Hr.	15	75.-
	Gardenhose 50'	3	N/C	—	—
	Extention Cord 100'	1	N/C	—	—
	Ice Chest	1	N/C	—	—
70-284	Granada	1	1½ H	75/0	14.07

'B' TOTAL 174.07

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Sample Jars	4 doz.	6.90	27.60

TOLS011231

'C' TOTAL 27.60

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82 OFFICE COPY

'A' TOTAL	1007.53
'B' TOTAL	174.07
'C' TOTAL	27.60
GRAND TOTAL	1,209.20

BZTO104(e)048064

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil
PO Box 03137
Portland, Oregon 97208
ATTN: Neil Wallick

DAY & DATE 7-22-85
P.O. #
EES JOB # 8121/3011
JOB TIME: 0800 TO 1700

DESCRIPTION OF WORK Drill Soil Samples for PCP

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
R. Schoelich	0800/1700	PCS I	9 1/4	33.-	305.25				305.25
J. Tolston	0830/1700	PCS II	9	27.-	243.-				243.-
J. Ruddick	0800/1700	MB	9	62.50	562.50				562.50

'A' TOTAL 1,110.75

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
T-074	Pickup	1	1 Day	85.-	85.-
	Steam Cleaner	1	1 Hr.	15.-	15.-
	Extention Cord 100'	1	N/C		
	Garden Hose 200'		N/C		
	100' Teflon Tape	1		21.75	21.75

TOLS011232

'B' TOTAL 121.75

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Teflon	4 pr.	4.-/ea.	16.-
Safety Gloves	6 pr.	1.-/ea.	6.-
Combo Cartridges	3 pr.	7.35/ea.	44.10
Distilled Water	2 gal.	1.35/ea.	2.70
8 oz. Sample Bottles	4 Cs.	6.90	27.60
Isp.	5 lbs.	6.54	6.54

'C' TOTAL 102.94

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: DATE
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	1,110.75
'B' TOTAL	121.75
'C' TOTAL	102.94
GRAND TOTAL	1,335.44

EES 002/5 10/82 OFFICE COPY

BZTO104(e)048065

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil
P.O. Box 03137
Portland, Oregon
ATTN: Neil Walls

DAY & DATE Tue. 7/16/85
P.O. #
EES JOB # 8121/3011
JOB TIME: 1000 TO 1830

DESCRIPTION OF WORK Sample and analyze soil surface indiv. samples for PCP.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Reese, R	1000-1830	PCST	9	33.	297.-				297.-
Hammond, C.	1000-1700	PCST	7	27	189.-				189.-
Ruddick, G.	1000-1300	MB.	3	12.50	187.50				187.50

'A' TOTAL 673.50

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-907	Stake Bed	1	1 Day	105.-	105.-
	Respirator	1	1 Day	12.50	12.50
	Samples Equip	1	1 Day	15.-	15.-

TOLS011233

'B' TOTAL 132.50

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Sample Jars 8oz.	7 ea.	6.90	48.30
DI H2O	1 gal.	1.55	1.55
Hexane	1 Gal.	88.87	88.87
Combo Cartridge	2 ea.	7.35	14.70
Leather Gloves	4 pr.	1.-	4.-
Tyvek	1 pr.	4.-	4.-

'C' TOTAL 161.42

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: DATE

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'A' TOTAL	673.50
'B' TOTAL	132.50
'C' TOTAL	161.42
GRAND TOTAL	967.42

Environmental Emergency Services Co.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

TELEPHONE
503/285-9111

DAILY WORK REPORT

TO: Tite Oil
PO Box 03137
Portland OR
ATTN: Neil Wallie

DAY & DATE Mon. 7-15-85
P.O. #
EES JOB # 8121/3011
JOB TIME: 0930 TO 1130

DESCRIPTION OF WORK Purchase & Pick up Supplies From Rickes Container Co.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Dowell	0930-1130	WHS Mgr	2	27.00	54.00				54.00

'A' TOTAL 54.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
70-284	Granada	1	2 Hrs	75.00/day	18.76

'B' TOTAL 18.76

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

TOLS011234

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: Dowell DATE 7-15-85
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	54.00
'B' TOTAL	18.76
'C' TOTAL	
GRAND TOTAL	72.76

EES 002/5 10/82

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Environmental Emergency Services Co.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil
PO box 03137
PDX
ATTN: Neil Wallis

DAY & DATE Mon 7/15/05
P.O. #
EES JOB # 0121/3011
JOB TIME: 8 TO 10

DESCRIPTION OF WORK RESAMPLE OF PERIPHERAL AREAS — PLOW DRAG + CREW INST.

LABOR

NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J RUDDICK	0800/1000	MB	2	C2 30	125				125 00

'A' TOTAL 125

EQUIPMENT

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS

	NUMBER	PRICE	TOTAL AMOUNT

TOLS011235

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: J Ruddick DATE 7/15
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	125
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	125 00

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ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

ATTN:

DAY & DATE 7/13/85

P.O. #

EES JOB # 8121/3011

JOB TIME: 0800 TO 1400

DESCRIPTION OF WORK Report Development + misc. - advance work

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J Ruddick	8-2	Mb	6	62.50	375				375

'A' TOTAL 375

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

TOLS011236

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: J Ruddick DATE 7/13/85

CUSTOMER:

RECEIVED BY: DATE

'A' TOTAL	375
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	375

FS 002/5 10/82

OFFICE COPY

BZTO104(e)048069

Environmental Emergency Services Co.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil
PO Box 03137
PDX
ATTN: Neil Wallis

DAY & DATE 7/1/85
P.O. #
EES JOB # 8021/3011
JOB TIME: 1000 TO 1400

DESCRIPTION OF WORK Sample Soil For RCP

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J Ruddick	10-2	mb	4	62.50	250				250

'A' TOTAL 250

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

TOLS011237

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: J Ruddick DATE 7/1/85
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	250
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	250.00

02/5 10/82 OFFICE COPY

BZTO104(e)048070

Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Co
PO Box 03137
PDX
ATTN: Neil Wallis

DAY & DATE: WED 6/26/85
P.O. #:
EES JOB #: 8121/3011
JOB TIME: 1100 TO 1600

DESCRIPTION OF WORK: PREPARE SAMPLING PLAN FOR PDX JOB

LABOR

NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
JJ Ruddick	1100-1600	MB	5	62.50	312.50				312.50

'A' TOTAL 312.50

EQUIPMENT

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS

	NUMBER	PRICE	TOTAL AMOUNT
TOLS011238			

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: JJ Ruddick DATE 6/26/85
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	312.50
'B' TOTAL	—
'C' TOTAL	—
GRAND TOTAL	312.50

002/5 10/82 OFFICE COPY

BZTO104(e)048071

026514

TIME OIL CO.

155615

INVOICE	REFERENCE NO.	AMOUNT	INVOICE	REFERENCE NO.	AMOUNT
02017	110519	18,741.55			

TOP-120 REV. 3-84

CHECK DATE	12/05/85	DISCOUNT	.00
CHECK NO.	155615	TOTAL	18,741.55

WHEN DETACHED AND PAID, THIS CHECK BECOMES A RECEIPT IN FULL PAYMENT OF THE ITEMIZED ACCOUNT

155615

TIME

PRODUCTS TIME TESTED

TIME OIL CO.

CITIBANK (NEW YORK STATE), N.A.
NORTH AMERICAN BANKING GROUP

50-817
213

P.O. BOX 24447 TERMINAL STATION SEATTLE, WASHINGTON 98124-0447

12/05/85

PAY TO THE ORDER OF

PROTECTED AMOUNT	AMOUNT
$****18,741.55	$****18,741.55

ENVIRONMENTAL EMERGENCY
SERVICES
4555 N CHANNEL AVE PO BOX 3320
PORTLAND OR 97208

BY

VOID AFTER 6 MONTHS

BY

NOT NEGOTIABLE

TWO SIGNATURES REQUIRED

TOLS011239

BZTO104(e)048072

INVOICE

WE ARE AN EQUAL OPPORTUNITY EMPLOYER MHF

"Imagineering a better world"

"COMPLETE OIL AND HAZARDOUS MATERIAL SPILL CLEANUP SERVICE"

ENVIRONMENTAL EMERGENCY SERVICES

A DIVISION OF RIEDEL ENVIRONMENTAL SERVICES
4555 N. CHANNEL AVENUE — P.O. BOX 3320 · PORTLAND, OREGON 97208-3320
24 HOUR SERVICE AND 2-WAY RADIO DISPATCHED SERVICE

HOT LINE: (800) 547-0792
BUSINESS PHONE: (503) 285-9111
TELEX: 151403

JOB LOCATION

DATE 10/18/85

SOLD TO TIME OIL COMPANY
P.O. BOX 03137
ST. JOHNS STATION
PORTLAND, OREGON 97203

YOUR NO.

INVOICE NO. 2017-10

JOB #8120/3011

ATTENTION: NIEL WALLIS

TERMS: Net 30 days from date of invoice.
SERVICE CHARGE: A service charge of two (2%) percent per month shall be charged to all balances not paid within the terms of sale.

TO INVOICE YOU FOR LABOR, EQUIPMENT, MATERIALS AND SUPPLIES NECESSARY TO SAMPLE AND ANALYZE SOIL SAMPLES AND MEET WITH TIME OIL TO DISCUSS RESULTS.

TOTAL AMOUNT DUE PER ATTACHED $18,741.55

CO DIV
VEND AUTH
INV
PO PRICE
DUE
% MO
DIST
ATTACHED REC'D BY

Roland Miller
ROLAND MILLER, DIVISION MANAGER

Please Remit To:
Box 4500-67
Portland, OR 97208

ST. LOUIS, MO DIVISION
529 SPIRIT OF ST. LOUIS BLVD.
CHESTERFIELD, MO 63017 • 314-532-7660

RICH
230 C
RICHMOND, CA 94802 • 415-234-7400

RIEDEL ENVIRONMENTAL SERVICES IS A DIVISION OF RIEDEL INTERNATIONAL, INC.

• Ship Assisting • Towing Barging • Land and Water Cranes • Marine Salvage Hydraulic, Bucket and Clamshell Dredging • Cofferdams •
• Submarine Pipelines • Land Reclamation • Marine Construction • Piledriving • Intakes and Outfalls • Land and Water Substructures •
• Readymix Concrete • Sand and Gravel • Crushed Rock Fill Material Asphalt Truck-Rail-Barge Delivery • Oil Spill Clean-up •
• Building Materials Complete Environmental Services •

AC 126/2, 5-10-83

TOLS011240

BZTO104(e)048073

Environmental Emergency Services Co.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Co
PO Box 03137
PDX 9

DAY & DATE THURS 10/10/85
P.O. #
EES JOB # 3011
JOB TIME: 8 TO 1

ATTN: Neil Wallis

DESCRIPTION OF WORK Meeting at Time Oil Co at Sheraton Airport PDX Discuss Results/Billing/

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
R Smith	8-1	HS	5	55.-					275.-
J Ruddick	8-1	MB	5	62.50					312.50

'A' TOTAL $587.50

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Room Rental		72.50	72.50

'C' TOTAL 72.50

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: DATE 10/11/85
CUSTOMER:
RECEIVED BY: DATE

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'A' TOTAL	587.50
'B' TOTAL	-0-
'C' TOTAL	72.50
GRAND TOTAL	illegible

TOLS011241

BZTO104(e)048074

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Co
PO Box 03137
Portland OR

ATTN: Neil Wallis

DAY & DATE 10/3/85

P.O. #

EES JOB # 3011

JOB TIME: 5P TO 5P

DESCRIPTION OF WORK Analysis of Boring Soil Samples for PCP + Report Typing

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Judy Edwards	3-5	Sec	2	17	34				34

'A' TOTAL 34

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Analysis of ~~30~~ 29 Soil Samples + 1 Decon Water Sample	30 EA	52.35	1570.50

'C' TOTAL

VIRONMENTAL EMERGENCY SERVICES CO.

PARED BY: J Riddick DATE 10/3/85

STOMER:

EIVED BY: DATE

002/5 10/82

BILLING COPY

'A' TOTAL	34.00
'B' TOTAL	0
'C' TOTAL	1570.50
GRAND TOTAL	1604.50

TOLS011242

BZTO104(e)048075

Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
TELEPHONE 503/235-9111

DAILY WORK REPORT

TO: Time Oil Co
PO Box 03137
Portland OR
ATTN: Niel Wallis

DAY & DATE Thurs 9/5
P.O. #
EES JOB # 3011
JOB TIME: 8 TO ~~5~~

DESCRIPTION OF WORK Recontour date

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J Ruddick	8-12 + 3-5	mb	4	62.50					250.00

'A' TOTAL 250.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
	Computer Time	1	2 Hr	30.00	60.00

'B' TOTAL 60.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

'C' TOTAL -0-

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: J Ruddick DATE 9/5/85
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	250.00
'B' TOTAL	60.00
'C' TOTAL	-0-
GRAND TOTAL	310.00

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TOLS011243

BZTO104(e)048076

Division of [illegible] Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
TELEPHONE 503/235-9111

DAILY WORK REPORT

TO: Texaco oil Co
PO Box 03137
Portland OR
ATTN: Neil Wallis

DAY & DATE 8/23/85
P.O. #
EES JOB # 3011
JOB TIME: 8 TO 11

DESCRIPTION OF WORK Data analysis, Calculations, Report Prep

LABOR

NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J Rudisill	8-11	Mb	3	62.50	187.50				187.50

'A' TOTAL 187.50

EQUIPMENT

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS

	NUMBER	PRICE	TOTAL AMOUNT

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: J Rudisill DATE 8/23/85
CUSTOMER: Texaco oil Co
RECEIVED BY: DATE

'A' TOTAL	187.50
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	187.50

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TOLS011244

BZTO104(e)048077

Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time oil Co
PO Box 03137
Portland OR 97208

ATTN: Neil Wallis

DAY & DATE 8/21/85
P.O. #
EES JOB # 3011
JOB TIME: 8 TO 11

SCRIPTION OF WORK Data analysis + Reduction

ABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J Ruddick	8-11	Mb	3	62.50	187.50				187.50

'A' TOTAL 187.50

QUIPMENT QUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

PPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Drilling - Per Sweet Edwards Subcontract For Split Spoon Sampling		4440	4440

'C' TOTAL

ONMENTAL EMERGENCY SERVICES CO.	'A' TOTAL	187.50
ARED BY: J Ruddick DATE 8/21/85	'B' TOTAL	
MER:	'C' TOTAL	4440
VED BY: DATE		
2/5 10/82 OFFICE COPY	GRAND TOTAL	~~187.50~~ 4627.50

TOLS011245

BZTO104(e)048078

[illegible] Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
[illegible] TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE 8-2-85

P.O. #

EES JOB # 8121-3011

ATTN:

JOB TIME: 1500 TO 1700

DESCRIPTION OF WORK Empty liq tub of water and sand and take back to W.W.I.D. from Time Oil tank farm Rivergate.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J. Ruddick	1500-1700	MB	2	62.50	125.-				125.00
J.P. Rayton	1500-1700	PEST	2 1/4	33.-	74.25				74.25

'A' TOTAL $ 199.25

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-90a	Stakebed Truck	1	12 hrs.	1.31/HR	19.68

'B' TOTAL 19.68

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

'C' TOTAL

TOLS011246

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: J.P. Rayton DATE 8-2-85

CUSTOMER:

RECEIVED BY: DATE

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'A' TOTAL	199.25
'B' TOTAL	19.68
'C' TOTAL	-0-
GRAND TOTAL	218.93

BZTO104(e)048079

[illegible] International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
503/265-9111

DAILY WORK REPORT

TO: Tim oil Co
PO Box 03137
Portland OR
ATTN: Nil Wallin

DAY & DATE 8/1/85
P.O. #
EES JOB # 8121/3011
JOB TIME: 8 TO 5

DESCRIPTION OF WORK Contour sample results, draft site plan, plot contours.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J. Ruddick	8-5	mb	9	62.50	562.50				562.50

'A' TOTAL 562.50

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
	COMPUTER, PLOTTER		2 HR	30.00	60.00

'B' TOTAL 60.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
PENTACHLOROPHENOL IN SOIL (ANALYSES) 81 SAMPLES (0', 2', +4' CORES + LATERALS)	81 EA	52.35	4240.35

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: J. Ruddick DATE 9/5/85
CUSTOMER: Tim oil Co
RECEIVED BY: DATE

'A' TOTAL	562.50
'B' TOTAL	60.00
	4240.35
'C' TOTAL	
GRAND TOTAL	4562.85

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TOLS011247

BZTO104(e)048080

P.O. BOX 3320 • PORTLAND, OREGON 97208-3320 TELEPHONE 503/235-9111

DAILY WORK REPORT

TO: Time Oil
PO Box 03137
PDX
ATTN:

DAY & DATE 7-25-85
P.O. #
EES JOB # 2121-3011
JOB TIME: 0730 TO 1200

DESCRIPTION OF WORK Decon Drilling equp secure site

LABOR

NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
R Schodin	0730/1200	Spc1	4½	33.00	148.50				148.50

'A' TOTAL 148.50

EQUIPMENT

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
1-054	Pickup	1	4 hr	85.00/DAY	42.50
	Steamcleaner	1 hr		15.00/HR	15.00

'B' TOTAL 57.50

SUPPLIES AND MATERIALS

	NUMBER	PRICE	TOTAL AMOUNT
Tyvek	1pr	4.00	4.00
Haylex gloves	1pr	1.00	1.00

'C' TOTAL 5.00

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: R Schodin DATE 7-25-85
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	148.50
'B' TOTAL	57.50
'C' TOTAL	5.00
GRAND TOTAL	211.00

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TOLS011248

BZTO104(e)048081

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

O: Time Oil

DAY & DATE 7-24-85

P.O. #

EES JOB # 8121/3011

ATTN:

JOB TIME: 0700 TO 1830

SCRIPTION OF WORK Drilling Time Oil

ABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J. Rudolick	1000/1200	MB	2	62.50	125.-				125.00
R. Schoelich	0700/1830	PCS I	12	33.-	396.-				396.00
J. Tolston	0700/1830	PCS III	11 1/3	27.-	305.91				305.91

'A' TOTAL 826.91

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	Pickup		1 Day	85.-	85.-
	Steamcleaner		4 HR.	15.-/HR	60.-
	Garden Hose 50'	3		N/C	
	20' Round Tub		1 Day	10-/Day	10.-
	Cat JD450	1	1 Day	350	350.-

'B' TOTAL 505.-

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek	4 pr.	4.-/ea.	16.-
Latex Gloves	4 pr.	1.-/pr.	4.-
Duct Tape	1 roll	3.65	3.65
Combo Cartridges	4 ea.	7.35/ea.	29.40
2 Full Face Respirators	2	12.50/day	25.00
Ice		1.99	1.99

'C' TOTAL 80.04

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: R. Schoelich DATE 7-24-85

CUSTOMER:

RECEIVED BY: DATE

'A' TOTAL	826.91
'B' TOTAL	505.-
'C' TOTAL	80.04
GRAND TOTAL	1,411.95

TOLS011249

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BZTO104(e)048082

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/235-9111

DAILY WORK REPORT

TO: Time Oil
P.O. Box 03137
Portland, Oregon 97208
ATTN:

DAY & DATE 7-23-85
P.O. #
EES JOB # 8121/3011
JOB TIME: 0630 TO 1730

DESCRIPTION OF WORK Drilling Time Oil

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J. Ruddick	0830/1130	MB.	5	62.50	312.50				312.50
T. Freitag	1400/1530	Casual	1½	15.-	22.50				22.50
R. Schoelich	0630/1730	PCS	11.18	33	368.78				368.78
J. Tolston	0630/1730	PCS	11¼	27	303.75				303.75

'A' TOTAL 1,007.53

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	Pickup	1	1 Day	85	85.-
	Steam Cleaner	1	5 Hr.	15	75.-
	Gardenhose 50'	3	N/C	—	—
	Extention Cord 100'	1	N/C.	—	—
	Tee Chest	1	N/C	—	—
70-284	Granada	1	1½H	75.-/D	14.07

'B' TOTAL 174.07

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Sample Jars	4 doz.	6.90	27.60

'C' TOTAL 27.60

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: DATE

EES 12/5 10/82 OFFICE COPY

'A' TOTAL	1007.53
'B' TOTAL	174.07
'C' TOTAL	27.60
GRAND TOTAL	1,209.20

TOLS011250

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil
PO Box 03137
Portland, Oregon 97208
ATTN: Neil Wallick

DAY & DATE 7-22-85
P.O. #
EES JOB # 8121/3011
JOB TIME: 0800 TO 1700

DESCRIPTION OF WORK Drill Soil Samples for PCP

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
R. Schoelich	0800/1700	PCS I	9 1/4	33.-	305.25				305.25
J. Tolston	0830/1700	PCS II	9	27.-	243.-				243.-
J. Ruddick	0800/1700	MB	9	62.50	562.50				562.50

'A' TOTAL 1,110.75

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
TT-014	Pickup	1	1 Day	85.-	85.-
	Steam Cleaner	1	1 Hr.	15.-	15.-
	Extention Cord 100'	1	N/C		
	Garden Hose 200'		N/C		
	100' Teflon Tape	1		21.75	21.75

'B' TOTAL 121.75

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Jewek	4 pr.	4.-/ea.	16.-
Safety Gloves	6 pr.	1.-/ea.	6.-
Combo Cartridges	3 pr.	7.35/ea.	44.10
Distilled Water	2 gal.	1.35/ea.	2.70
8 oz. Sample Bottles	4 ea.	6.90	27.60
Sup.	5 lbs.	6.54	6.54

'C' TOTAL 102.94

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: DATE
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	1,110.75
'B' TOTAL	121.75
'C' TOTAL	102.94
GRAND TOTAL	1,335.44

EES 002/5 10/82 OFFICE COPY

TOLS011251

BZTO104(e)048084

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil
P.O. Box 03137
Portland, Oregon
ATTN: Neil Walls

DAY & DATE Tue. 7/16/85
P.O. #
EES JOB # 8121/3011
JOB TIME: 1000 TO 1830

DESCRIPTION OF WORK Sample and analyze soil surface
indiv. samples for PCP.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Reese, R	1000-1830	PCST	9	33.	297.-				297.-
Hammond, C.	1000-1700	PCST	7	27	189.-				189.-
Ruddick, J.	1000-1300	MB.	3	62.50	187.50				187.50

'A' TOTAL 673.50

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-907	Stake Bed	1	1 Day	105.-	105.-
	Respirator	1	1 Day	12.50	12.50
	Samples Equip	1	1 Day	15.-	15.-

'B' TOTAL 132.50

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Sample Jars 8oz.	7 ea.	6.90	48.30
D H2O	1 gal.	1.55	1.55
Hexane	1 Gal.	88.87	88.87
Combo Cartridge	2 ea.	7.35	14.70
Latex Gloves	4 pr.	1.-	4.-
Lysol	1 pr.	4.-	4.-

'C' TOTAL 161.42

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: DATE
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	673.50
'B' TOTAL	132.50
'C' TOTAL	161.42
GRAND TOTAL	967.42

EES 002/5 10/82 OFFICE COPY

TOLS011252

BZTO104(e)048085

P.O. BOX 3320 • PORTLAND, OREGON 97208-3320 TELEPHONE 503/235-9111

DAILY WORK REPORT

TO: Time Oil
P.O. Box 03137
Portland OR
ATTN: Neil Wallis

DAY & DATE Mon 7-15-85
P.O. #
EES JOB # 8121/3011
JOB TIME: 0930 TO 1130

DESCRIPTION OF WORK Purchase & Pick up Supplies from
Ricks Contract B.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
D Knuth	0930-1130	WHS WKR	2	27.00	54.00				54.00

'A' TOTAL 54.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
70-284	Chevy SA	1	2 HRS	75.00/DAY	18.76

'B' TOTAL 18.76

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: D Knuth DATE 7-15-85
CUSTOMER:
RECEIVED BY: DATE

FS 002/5 10/82 OFFICE COPY

'A' TOTAL	54.00
'B' TOTAL	18.76
'C' TOTAL	
GRAND TOTAL	72.76

TOLS011253

BZTO104(e)048086

Division of Integrated Logistics, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
TELEPHONE 503/235-9111

DAILY WORK REPORT

TO: Time Oil
PO box 03137
PDX
ATTN: Neil Willis

DAY & DATE Mon 7/15/05
P.O. #
EES JOB # 0121/3011
JOB TIME: 8 TO 10

DESCRIPTION OF WORK RESAMPLE OF PERIPHERAL AREAS — PLAN PREP + CREW INST.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J RUDDICK	0800/1000	M6	2	62.50	125				125.00

'A' TOTAL 125

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: J Ruddick DATE 7/15
CUSTOMER:
RECEIVED BY: DATE

S 007/5 10/82 OFFICE COPY

'A' TOTAL	125
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	125.00

TOLS011254

BZTO104(e)048087

Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
TELEPHONE 503/235-9171

DAILY WORK REPORT

TO: Time Oil

DAY & DATE 8/13/85

P.O. #

EES JOB # 8121/3011

ATTN:

JOB TIME: 0800 TO 1400

DESCRIPTION OF WORK Report Development Misc. - continue work

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
JR Riddick	8 ~~12~~	Mb	6	62.50	375				375

'A' TOTAL 375

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: J Riddick DATE 8/13/85

CUSTOMER:

RECEIVED BY: DATE

ES 602/5 10/82 OFFICE COPY

'A' TOTAL	375
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	375

TOLS011255

BZTO104(e)048088

Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208 3320
BUSINESS TELEPHONE • 503/235-9111

DAILY WORK REPORT

TO: Time Oil
PO Box 03137
PDX
ATTN: Neil Wallis

DAY & DATE 7/1/85
P.O. #
EES JOB # 5011/3011
JOB TIME: 1000 TO 1400

DESCRIPTION OF WORK Sample Soil For PCP

LABOR

NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J Ruddick	10-2	mb	4	62.50	250				250

'A' TOTAL 250

EQUIPMENT

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS

	NUMBER	PRICE	TOTAL AMOUNT

'C' TOTAL

RONMENTAL EMERGENCY SERVICES CO.
PARED BY: J Ruddick DATE 7/1/85
TOMER:
IVED BY: DATE
02/5 10/82 OFFICE COPY

'A' TOTAL	250
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	250.00

TOLS011256

BZTO104(e)048089

Division of [illegible] International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Co
PO Box 03137
PDX
ATTN: Neil Wallis

DAY & DATE Wed 6/26/85
P.O. #
EES JOB # 8121/3011
JOB TIME: 1100 TO 1600

DESCRIPTION OF WORK Prepare Sampling Plan For PDX Job

LABOR EQ	NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
	Ruddick	1100-1600	MB	5	62.50	312.50				312.50

'A' TOTAL 312.50

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: J. Ruddick DATE 6/26/85
CUSTOMER:
RECEIVED BY: DATE

'A' TOTAL	312.50
'B' TOTAL	—
'C' TOTAL	—
GRAND TOTAL	312.50

902/5 10/82 OFFICE COPY

TOLS011257

BZTO104(e)048090

RIEDEL ENVIRONMENTAL SERV

STATEMENT

ENVIRONMENTAL EMERGENCY SERVICES CO. DIV
P.O. BOX 3320
PORTLAND OR 97208-3320
(503) 285-9111

TIME OIL CO.
P.O. BOX 03137
ST. JOHNS STATION
PORTLAND, OR 97203

CUSTOMER NUMBER :12315

STATEMENT DATE :11-30-85
STATEMENT AMOUNT:$18,741.55

LAST STATEMENT DATE :10-31-85
LAST STATEMENT AMOUNT:$18,741.55

PGMAR405 11-30-85 12315 0 PAGE 1

ACT DATE	INVOICE #	TYP	REFERENCE INFORMATION	ACTIVITY AMOUNT
10-17-85	2017-10	REG	8120 -	18,611.61
10-24-85	2017A-10	REG	8120 -	129.94
			*** TOTAL STATEMENT AMOUNT ***	18,741.55

CURRENT ACTIVITY	31-60 BALANCE	61-90 BALANCE	OVER 90 BALANCE	FUTURE RET DUE
0.00	18,741.55	0.00	0.00	0.00

S T A T E M E N T

1

TOLS011258

BZTO104(e)048091

M E M O R A N D U M

November 25, 1985

TO: Neil Wallis Portland

FROM: John Denham Seattle

SUBJECT: CLEAN UP OF WOODTREATING SITE - PORTLAND

Attached for your file is signed copy of Ammendment 2 for this job.

Attachment a/s

JPD/ch

TOLS011259

"Imagineering a cleaner world"

RIEDEL
ENVIRONMENTAL SERVICES, INC.

☑ Portland Division
Foot of N. Portsmouth Ave
P.O. Box 5007
Portland, OR 97208
(503) 286-4656

☐ St. Louis Division
529 Spirit of St. Louis Blvd
Chesterfield, MO 63017
(314) 532-7660

☐ San Francisco Division
230 Cutting Blvd
Richmond, CA 94802
(415) 234-7400

☐ Seattle Division
901 Fairview Ave. No.
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

November 18, 1985

Time Oil Company
P.O. Box 24447
Terminal Annex
Seattle, Washington 98124

Dear Sir:

Enclosed is a copy of the signed Amendment 2 for the Sampling and Analysis Agreement between you and Riedel Environmental Services, Inc. dated June 28, 1985.

If you have any questions or if there is anything we can help with you with, please do not hesitate to call.

Sincerely,

RIEDEL ENVIRONMENTAL SERVICES, INC.

Jan Marie Dubiskas

Jan Marie Dubiskas
Executive Secretary

jmd

TOLS011260

BZTO104(e)048093

M E M O R A N D U M

November 8, 1985

TO: Robert Abendroth Seattle

FROM: John Denham Seattle

SUBJECT: CLEAN UP OF WOODTREATING SITE - PORTLAND

Attached is copy of Amendment 2 to scope of work being accomplished by Riedel Environmental Services. Believe you asked to see it. I should sign and return as soon as possible. Please advise.

Robert said OK - go
11/14/85
JPD

Attachment a/s

JPD/ch

TOLS011261

AGREEMENT

The parties to this agreement are Time Oil Co. (hereinafter termed Time) and Riedel Environmental Services, Inc. (hereinafter termed RES) whereas:

Time has a 70' x 70' (approximate) area of land located in Portland, Oregon and is desirous of having that area sampled and analyzed for pentachlorophenol concentration prior to earth removal.

RES is willing to undertake that task upon the terms and conditions set forth below.

The parties agree as follows:

1. This agreement covers the following work scope: RES agrees to obtain and analyze for pentachlorophenol, 3 composite samples from A 10' primary marginal boundary to the west, south and east of an approximately 70' x 70' area of land used for pentachlorophenol storage at Time Oil Co., Portland, Oregon. Seven additional composite samples will be obtained and retained, but not analyzed. One of these samples will be obtained at a site determined by Time to be representative of background PCP levels. The remaining six (6) samples will be composites of secondary and tertiary 10' marginal boundaries. If required by Time, additional sampling and/or analysis can be performed at RES's standard rate schedule and would be in addition to this agreement. RES will for the 70' x 70' area bounded by concrete containment walls to the east and west, by an existing building to the north and by an exposed pipeline to the south, prepare a sampling grid layout, effect drilling of 16 well holes, perform split spoon sampling at 6 depths (to be established by Time), analyze samples for PCP, plot PCP concentration contours, cause personnel and equipment decontamination and write a detailed report which is to include complete itemization of costs incurred. Should Time conclude that additional drilling and sampling is required, this work would be performed by RES per our standard rate schedule, but is in addition to this agreement.

2. Prior to work under this agreement, a representative of Time will meet with RES at the site to more specifically delineate items of concern.

3. The commencement date for work will be July 1, 1985 or such other date as may be agreed upon by the parties following coordination.

4. For this task, Time agrees to pay RES a sum not to exceed $18,600.00. All work is to be completed by July 30, 1985 or at another date as agreed upon by both parties. Payment will be made upon completion of work and receipt by Time of written report or at monthly progress intervals.

TOLS011262

BZTO104(e)048095

5. RES indemnifies and agrees to defend and hold Time harmless from any and all costs, claims, liabilities and damages to persons or property arising out of RES negligence under this agreement. The parties recognize that even with the utmost care being exercised, escapement of polluting substances might occur while RES is rendering services under this Agreement. It is therefore agreed that to the extent escapement shall occur that the responsibility to governmental authorities for such escapement is that of Time, and that Time agrees to indemnify and hold RES harmless of and from any loss, damage, injury, liability or claim resulting from an aggravation of the existing pollution problem which is not caused or contributed to by the negligence of RES.

6. RES and its officers, employees and agents are not and shall not be considered employees of Time. RES shall be considered for all purposes of this agreement and otherwise as an independent contractor. No subcontractors to RES or such subcontractors, officers, employees or agents shall be considered employees of Time.

7. RES agrees at its expense to obtain all governmental permits, licenses and approvals and comply with all laws, rules, regulations and requirements now or hereafter existing necessary for the accomplishment of the work to be performed by RES under this agreement.

8. RES especially acknowledges its understanding that portions of the soil on site have been found to contain commercial pentachlorophenol in concentrations ranging from 0 ppm to 1820 ppm. RES agrees to take all necessary precautions for the protection of RES employees, subcontractor and property that may be required or prudent to safely accomplish work performed under this agreement.

9. RES agrees to maintain workmens' compensation insurance in the form and amounts required by the laws of the State of Oregon and broad form comprehensive public liability insurance with minimum limits of $1 million per person and $1 million per accident for bodily injury and $1 million per accident for property damage plus secondary coverage up to $5 million. RES shall promptly deliver to Time certificates of said insurance, naming Time as an additional insured before commencing work and such certificate shall provide that said insurance shall not be cancelled prior to 30 days by written notice to Time.

10. ~~RES agrees that before commencement of any work hereunder, it will promptly furnish Time with a faithful performance bond in an amount to $18,600.00 dollars guaranteeing completion of all work and performance of all obligations undertaken by RES under this agreement.~~ Time Oil will provide RES ~~with a~~ payment bond in the amount of $18,600.00.

TOLS011263

BZTO104(e)048096

10. H. The nature, validity and interpretation of this contract shall be governed by the laws of the State of Washington.

Dated this 28th day of June, 1985.

TIME OIL COMPANY

by John P. Denham
John P. Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

7/2/85

JP/jaf

TOLS011264

BZTO104(e)048097

AMENDMENT 2
TIME OIL CO. - RIEDEL ENVIRONMENTAL SERVICES, INC.
SAMPLING AND ANALYSIS AGREEMENT
DATED JUNE 28, 1985

The work scope is amended to include the following:

1. Sandblasting and demolition of the impoundment wall (designated A in Figure 1). The cost of this procedure is estimated to be $5,568.01.

2. Drilling, sampling and installation of 3 monitoring walls angeled 45 degrees beneath the existing warehouse (listed as Wells 1, 2 & 3 in Figure 1). Also, the installation of a 40 foot vertical monitoring well, including sampling at 5 foot intervals, directly in front of the angled wells (listed as Well 4 in Figure 1). Analytical results for 12 PCP samples are included in the estimated cost of $12,667.07.

3. Drilling, sampling and installation of an additional 5, 20-foot monitoring wells (listed in Figure 1 as Wells 5, 6, 7, 8 & 9). Soil samples will be taken at 5 foot intervals and 5 analyses for PCP are included in the estimated cost of $6,595.50.

DATED this 5th day of November, 1985.

TIME OIL CO.

John Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

F.J. Bradach
President

RS:bw

TOLS011265

BZTO104(e)048098

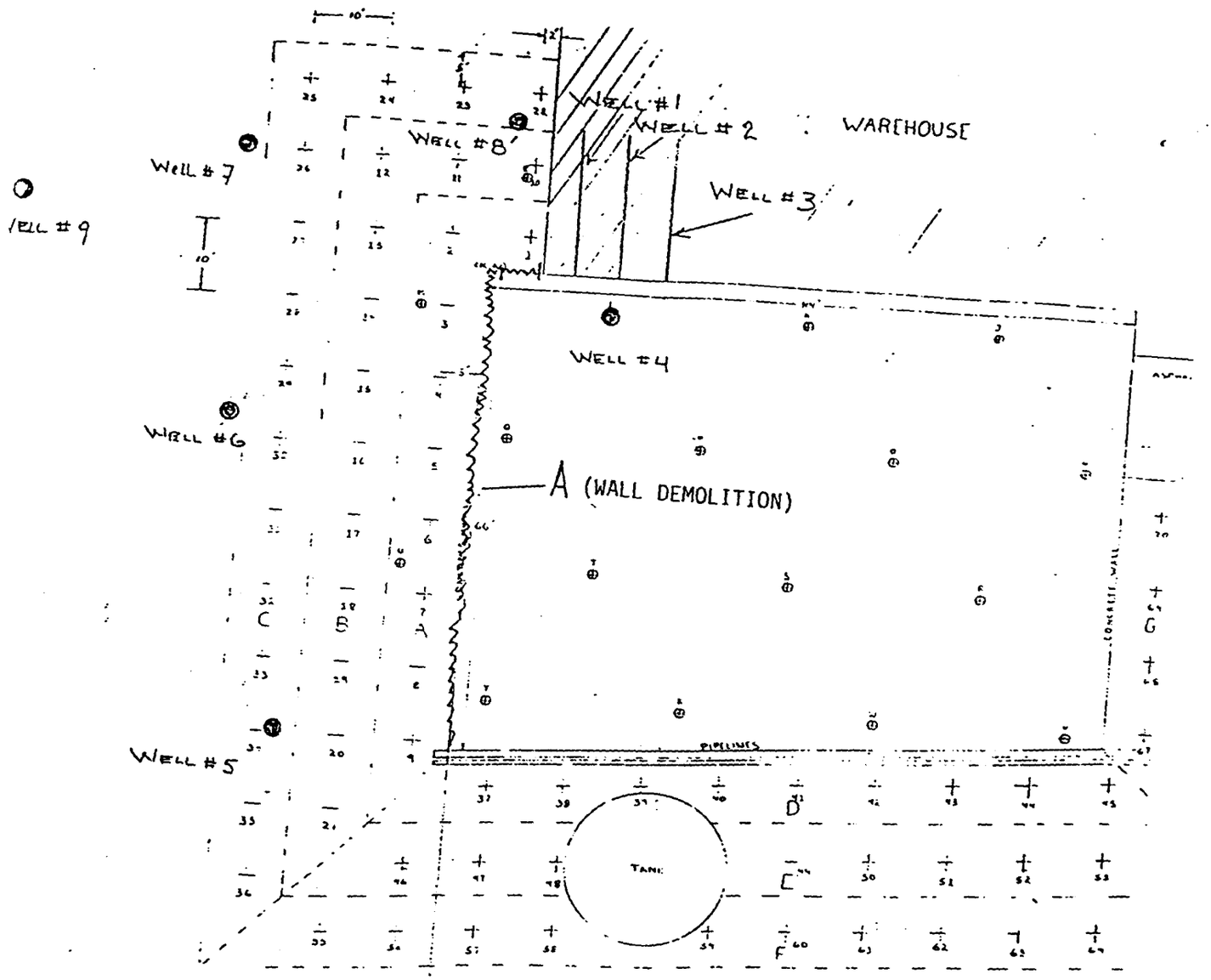

FIGURE 1

Location of Proposed Monitoring Wells

TOLS011266

Insurance/Surety Bonds
1600 S.W. Fourth Avenue
P.O. Box 8699
Portland, Oregon 97207
503/224-4155 Telex No. 360-546

CERTIFICATE #. 102

CERTIFICATE OF INSURANCE

INSURED: RIEDEL ENVIRONMENTAL SERVICES, INC. P.O. BOX 3320, PORTLAND, OREGON 97208

Corroon & Black of Oregon hereby certifies that Insurance Policies, as indicated hereunder, are in full force and effect on the date of insurance of this certificate.

	COVERAGE	POLICY NO.	INSURER	EFFECTIVE DATE	LIMITS
I.	Comprehensive General Liability; including Watercraft,Operations, Contractual, XCU, Completed Operations, Personal Injury, Broad Form Property Damage	GLA 1577822	National Union Fire Insurance Co. of Pittsburgh	1-1-86 to 1-1-87	Bodily Injury and Property Damage Combined $1,000,000 Each Occurrence $1,000,000 Aggregate
	Certificate Holder is Additional Insured as respects operations described below:				Yes XX No ____
II.	Comprehensive Automobile Liability; including Owned, Non-Owned and Hired Vehicles	BA 9198159	National Union Fire Insurance Co. of Pittsburgh	1-1-86 to 1-1-87	Bodily Injury and Property Damage Combined $1,000,000 Each Occurrence $1,000,000 Aggregate
III.	Workers' Compensation Statutory Coverage All states except Wash., Nevada, N. Dakota, Ohio, W. Virginia, Wyom. & California	WC 1122507	National Union Fire Insurance Co. of Pittsburgh	1-1-86 to 1-1-87	Statutory
	U S L & H Employers Liability Including Marine				Statutory $1,000,000

CANCELLATION CLAUSE:

It is hereby understood that there will be no cancellation or reduction of Liability Insurance Coverage until at least 30 days after Notice of such Cancellation of Coverage has been mailed to the Certificate Holder.

DESCRIPTION & LOCATION OF OPERATIONS: Site analysis for PCP Soil contamination

This Certificate of Insurance does not amend, extend or alter the coverage afforded by the policy or policies shown above.

CERTIFICATE ISSUED TO: Time Oil Co.
12005 N. Burgard Street
Portland, Oregon 97203

CORROON AND BLACK OF OREGON, INC.
By: Wade H. Cokendall Jr.
Date: 12/30/85 jeb

TOLS011267

BZTO104(e)048100

M E M O R A N D U M

November 8, 1985

TO: Robert Abendroth Seattle

FROM: John Denham Seattle

SUBJECT: CLEAN UP OF WOODTREATING SITE - PORTLAND

Attached is copy of Amendment 2 to scope of work being accomplished by Riedel Environmental Services. Believe you asked to see it. I should sign and return as soon as possible. Please advise.

Attachment a/s

JPD/ch

TOLS011268

BZTO104(e)048101

"Imagineering a cleaner world"

RIEDEL
ENVIRONMENTAL SERVICES, INC.

☑ Portland Division
Foot of N. Portsmouth Ave.
P.O. Box 5007
Portland, OR 97208
(503) 286-4656

☐ St. Louis Division
529 Spirit of St. Louis Blvd
Chesterfield, MO 63017
(314) 532-7060

☐ San Francisco Division
230 Cutting Blvd
Richmond, CA 94802
(415) 234-7400

☐ Seattle Division
901 Fairview Ave. No
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

November 5, 1985

Mr. John Denham
c/o Time Oil Co.
2737 W. Commodore Way
Seattle, WA 98199

Dear John,

Please find enclosed Amendment 2 to the June 28th scope of work. This includes:

1. Sandblasting and demolition of the impoundment wall.

2. Installation and sampling of 4 monitoring wells (3 of which are angled in at 45 degrees and 1 vertical).

3. Installation and sampling of 5 additional vertical ground-water monitoring wells.

Results obtained from geological and analytical data will assist in the final design of the 5 additional wells (mentioned in 3).

Results which are expected from these well installations and analytical results would be as follows:

1. Vertical and horizontal distribution of PCP beneath the warehouse in the vicinity of the back door (southeast corner).

2. Vertical and horizontal distribution of PCP in the soil beneath the ground-water table.

3. Concentration of PCP in the ground water and its distribution both vertically and horizontally.

The deep well (#4 on Figure 1) will be drilled to investigate whether the PCP (which has a specific gravity greater than water) migrated downward into the aquifer and if so how far. It is anticipated that wells 5, 6, 7, 8 and 9 will only be drilled to 5 feet below water table (about 20 feet) so lateral migration of PCP at the ground-water surface can be determined and monitored.

It is our understanding from the EPA that PCP contaminants, presently, will not be accepted by any disposal sites. What the choices have been for owners of contaminated sites are to excavate the material and store on site or construct a fence around the contaminated area, leaving the soil as is. Both choices are interim solutions until the regulatory agencies decide how PCP is to be handled.

As I mentioned on the phone, storage of excavated material on site would require construction of a lined storage cell, which we could design and construct for you. If you have any questions or suggestions regarding this project, costs, etc., don't hesitate to call me at 503-286-4656.

Sincerely,

RIEDEL ENVIRONMENTAL SERVICES, INC.

Roger N. Smith
Hydrologist

RNS:bw
Enclosure

TOLS011270

BZTO104(e)048103

AGREEMENT

The parties to this agreement are Time Oil Co. (hereinafter termed Time) and Riedel Environmental Services, Inc. (hereinafter termed RES) whereas:

Time has a 70' x 70' (approximate) area of land located in Portland, Oregon and is desirous of having that area sampled and analyzed for pentachlorophenol concentration prior to earth removal.

RES is willing to undertake that task upon the terms and conditions set forth below.

The parties agree as follows:

1. This agreement covers the following work scope: RES agrees to obtain and analyze for pentachlorophenol, 3 composite samples from A 10' primary marginal boundary to the west, south and east of an approximately 70' x 70' area of land used for pentachlorophenol storage at Time Oil Co., Portland, Oregon. Seven additional composite samples will be obtained and retained, but not analyzed. One of these samples will be obtained at a site determined by Time to be representative of background PCP levels. The remaining six (6) samples will be composites of secondary and tertiary 10' marginal boundaries. If required by Time, additional sampling and/or analysis can be performed at RES's standard rate schedule and would be in addition to this agreement. RES will for the 70' x 70' area bounded by concrete containment walls to the east and west, by an existing building to the north and by an exposed pipeline to the south, prepare a sampling grid layout, effect drilling of 16 well holes, perform split spoon sampling at 6 depths (to be established by Time), analyze samples for PCP, plot PCP concentration contours, cause personnel and equipment decontamination and write a detailed report which is to include complete itemization of costs incurred. Should Time conclude that additional drilling and sampling is required, this work would be performed by RES per our standard rate schedule, but is in addition to this agreement.

2. Prior to work under this agreement, a representative of Time will meet with RES at the site to more specifically delineate items of concern.

3. The commencement date for work will be July 1, 1985 or such other date as may be agreed upon by the parties following coordination.

4. For this task, Time agrees to pay RES a sum not to exceed $18,600.00. All work is to be completed by July 30, 1985 or at another date as agreed upon by both parties. Payment will be made upon completion of work and receipt by Time of written report or at monthly progress intervals.

TOLS011271

BZTO104(e)048104

5. RES indemnifies and agrees to defend and hold Time harmless from any and all costs, claims, liabilities and damages to persons or property arising out of RES negligence under this agreement. The parties recognize that even with the utmost care being exercised, escapement of polluting substances might occur while RES is rendering services under this Agreement. It is therefore agreed that to the extent escapement shall occur that the responsibility to governmental authorities for such escapement is that of Time, and that Time agrees to indemnify and hold RES harmless of and from any loss, damage, injury, liability or claim resulting from an aggravation of the existing pollution problem which is not caused or contributed to by the negligence of RES.

6. RES and its officers, employees and agents are not and shall not be considered employees of Time. RES shall be considered for all purposes of this agreement and otherwise as an independent contractor. No subcontractors to RES or such subcontractors, officers, employees or agents shall be considered employees of Time.

7. RES agrees at its expense to obtain all governmental permits, licenses and approvals and comply with all laws, rules, regulations and requirements now or hereafter existing necessary for the accomplishment of the work to be performed by RES under this agreement.

8. RES especially acknowledges its understanding that portions of the soil on site have been found to contain commercial pentachlorophenol in concentrations ranging from 0 ppm to 1820 ppm. RES agrees to take all necessary precautions for the protection of RES employees, subcontractor and property that may be required or prudent to safely accomplish work performed under this agreement.

9. RES agrees to maintain workmens' compensation insurance in the form and amounts required by the laws of the State of Oregon and broad form comprehensive public liability insurance with minimum limits of $1 million per person and $1 million per accident for bodily injury and $1 million per accident for property damage plus secondary coverage up to $5 million. RES shall promptly deliver to Time certificates of said insurance, naming Time as an additional insured before commencing work and such certificate shall provide that said insurance shall not be cancelled prior to 30 days by written notice to Time.

10. ~~RES agrees that before commencement of any work hereunder, it will promptly furnish Time with a faithful performance bond in an amount to $18,600.00 dollars guaranteeing completion of all work and performance of all obligations undertaken by RES under this agreement.~~ Time Oil will provide RES ~~with a~~ payment bond in the amount of $18,600.00.

TOLS011272

BZTO104(e)048105

10. H. The nature, validity and interpretation of this contract shall be governed by the laws of the State of Washington.

Dated this 28th day of June, 1985.

TIME OIL COMPANY

by John P. Denham
John P. Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

7/2/85

JP/jaf

TOLS011273

BZTO104(e)048106

AMENDMENT 1
TIME OIL CO. - RIEDEL ENVIRONMENTAL SERVICES, INC.
SAMPLING AND ANALYSIS AGREEMENT
DATED JUNE 28, 1985

The work scope is amended to include the following:

Riedel Environmental Services will return to Time Oil and resample the 9 marginal boundary areas, at Time's request, to prepare individual samples from each of the 81 sample sites used to prepare the composite samples described in the original work scope. Some or all of these samples will be analyzed based on analytical results of composite and/or individual samples.

The work under this Amendment will be performed utilizing RES' Standard Rate Schedule. The cost of this Amendment is estimated to be $5,000.00.

DATED this 9th day of July, 1985.

TIME OIL CO.

John P. Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

J. L. Patterson
Vice President

JR:kps

TOLS011274

BZTO104(e)048107

AMENDMENT 2
TIME OIL CO. - RIEDEL ENVIRONMENTAL SERVICES, INC.
SAMPLING AND ANALYSIS AGREEMENT
DATED JUNE 28, 1985

The work scope is amended to include the following:

1. Sandblasting and demolition of the impoundment wall (designated A in Figure 1). The cost of this procedure is estimated to be $5,568.01.

2. Drilling, sampling and installation of 3 monitoring walls angeled 45 degrees beneath the existing warehouse (listed as Wells 1, 2 & 3 in Figure 1). Also, the installation of a 40 foot vertical monitoring well, including sampling at 5 foot intervals, directly in front of the angled wells (listed as Well 4 in Figure 1). Analytical results for 12 PCP samples are included in the estimated cost of $12,667.07.

3. Drilling, sampling and installation of an additional 5, 20-foot monitoring wells (listed in Figure 1 as Wells 5, 6, 7, 8 & 9). Soil samples will be taken at 5 foot intervals and 5 analyses for PCP are included in the estimated cost of $6,595.50.

DATED this 5th day of November, 1985.

TIME OIL CO.

John Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

F.J. Bradach
President

RS:bw

TOLS011275

BZTO104(e)048108

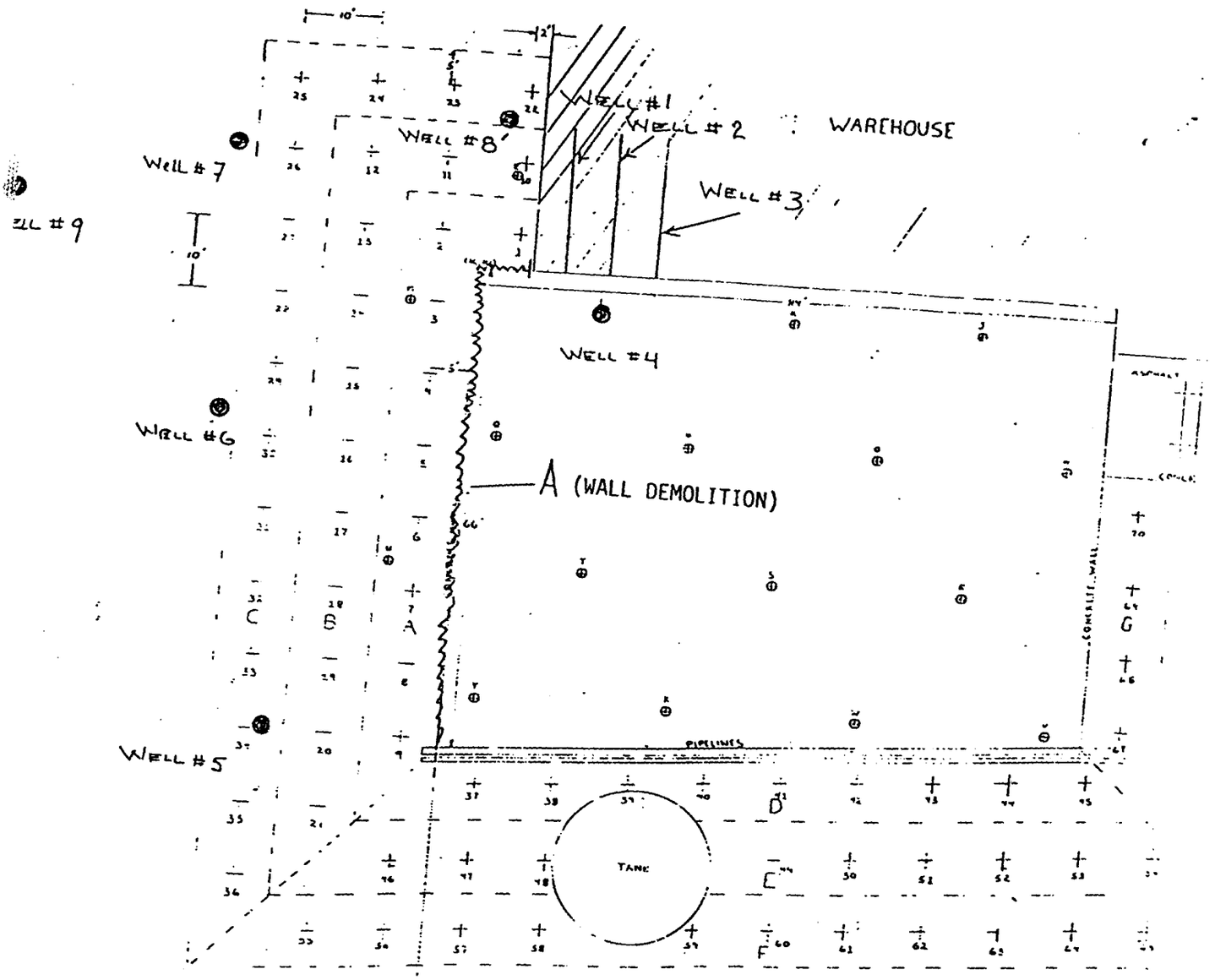

FIGURE 1

Location of Proposed Monitoring Wells

TOLS011276

M E M O R A N D U M

November 14, 1985

TO: Neil Wallis Portland

FROM: John Denham Seattle

SUBJECT: CLEAN UP OF WOODTREATING SITE - PORTLAND

Attached for your file is copy of agreed upon Ammendment 2 for this job.

Attachment a/s

JPD/ch

TOLS011277

PHONE 285-2400
CABLE ADDRESS: TIMOIL

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
SAN PEDRO
LOS ANGELES

PRODUCTS TIME TESTED

TIME OIL COMPANY

2737 W. COMMODORE WAY, P.O. BOX 24447, TERMINAL ANNEX, SEATTLE, WA 98124

November 14, 1985

Riedel Environmental Services, Inc.
Attn: Roger N. Smith
Foot of N. Portsmouth Avenue
P.O. Box 5007
Portland, OR 97208

Dear Mr. Smith:

Attached is signed copy of Amendment 2 to our June 28, 1985 agreement. Please have Riedel signature completed and return one copy to me.

Sincerely,

John P. Denham

John P. Denham
Environmental Manager

Attachment a/s

JPD/ch

TOLS011278

BZTO104(e)048111

AMENDMENT 2
TIME OIL CO. - RIEDEL ENVIRONMENTAL SERVICES, INC.
SAMPLING AND ANALYSIS AGREEMENT
DATED JUNE 28, 1985

The work scope is amended to include the following:

1. Sandblasting and demolition of the impoundment wall (designated A in Figure 1). The cost of this procedure is estimated to be $5,568.01.

2. Drilling, sampling and installation of 3 monitoring walls angeled 45 degrees beneath the existing warehouse (listed as Wells 1, 2 & 3 in Figure 1). Also, the installation of a 40 foot vertical monitoring well, including sampling at 5 foot intervals, directly in front of the angled wells (listed as Well 4 in Figure 1). Analytical results for 12 PCP samples are included in the estimated cost of $12,667.07.

3. Drilling, sampling and installation of an additional 5, 20-foot monitoring wells (listed in Figure 1 as Wells 5, 6, 7, 8 & 9). Soil samples will be taken at 5 foot intervals and 5 analyses for PCP are included in the estimated cost of $6,595.50.

DATED this 5th day of November, 1985.

TIME OIL CO.

John L. Denham

John Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

F.J. Bradach
President

RS:bw

TOLS011279

BZTO104(e)048112

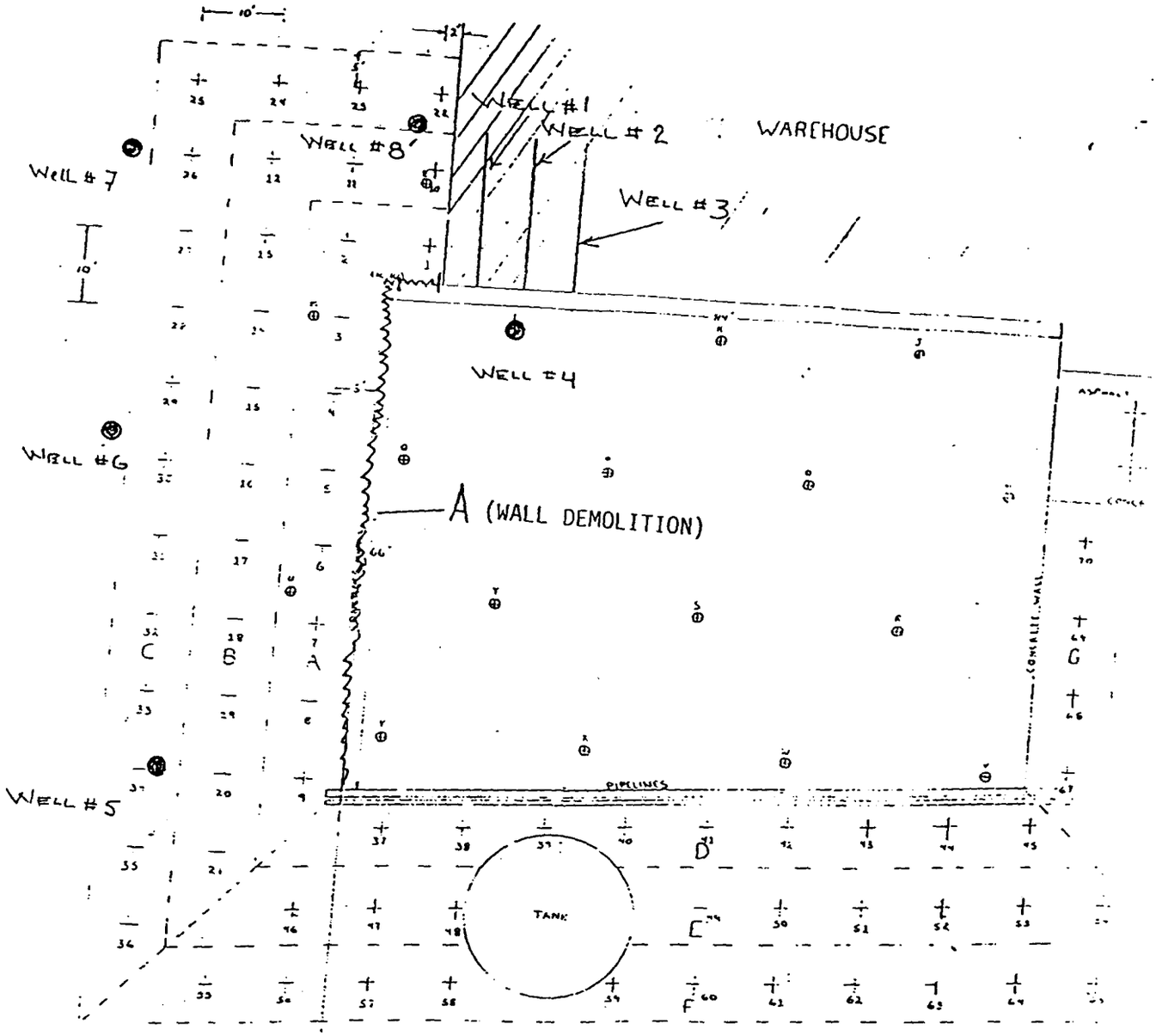

FIGURE 1

Location of Proposed Monitoring Wells

TOLS011280

BZTO104(e)048113

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(503) 286-4656

☐ St. Louis Division
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Chesterfield, MO 63017
(314) 532-7660

☐ San Francisco Division
230 Cutting Blvd.
Richmond, CA 94802
(415) 234-7400

☐ Seattle Division
901 Fairview Ave. No.
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

RIEDEL
ENVIRONMENTAL SERVICES, INC.

November 5, 1985

Mr. John Denham
c/o Time Oil Co.
2737 W. Commodore Way
Seattle, WA 98199

Dear John,

Please find enclosed Amendment 2 to the June 28th scope of work. This includes:

1. Sandblasting and demolition of the impoundment wall.

2. Installation and sampling of 4 monitoring wells (3 of which are angled in at 45 degrees and 1 vertical).

3. Installation and sampling of 5 additional vertical ground-water monitoring wells.

Results obtained from geological and analytical data will assist in the final design of the 5 additional wells (mentioned in 3).

Results which are expected from these well installations and analytical results would be as follows:

1. Vertical and horizontal distribution of PCP beneath the warehouse in the vicinity of the back door (southeast corner).

2. Vertical and horizontal distribution of PCP in the soil beneath the ground-water table.

3. Concentration of PCP in the ground water and its distribution both vertically and horizontally.

The deep well (#4 on Figure 1) will be drilled to investigate whether the PCP (which has a specific gravity greater than water) migrated downward into the aquifer and if so how far. It is anticipated that wells 5, 6, 7, 8 and 9 will only be drilled to 5 feet below water table (about 20 feet) so lateral migration of PCP at the ground-water surface can be determined and monitored.

It is our understanding from the EPA that PCP contaminants, presently, will not be accepted by any disposal sites. What the choices have been for owners of contaminated sites are to excavate the material and store on site or construct a fence around the contaminated area, leaving the soil as is. Both choices are interim solutions until the regulatory agencies decide how PCP is to be handled.

TOLS011281

BZTO104(e)048114

As I mentioned on the phone, storage of excavated material on site would require construction of a lined storage cell, which we could design and construct for you. If you have any questions or suggestions regarding this project, costs, etc., don't hesitate to call me at 503-286-4656.

Sincerely,

RIEDEL ENVIRONMENTAL SERVICES, INC.

Roger N. Smith
Hydrologist

RNS:bw
Enclosure

M E M O R A N D U M

November 8, 1985

TO: Robert Abendroth Seattle

FROM: John Denham Seattle

SUBJECT: CLEAN UP OF WOODTREATING SITE - PORTLAND

Attached is copy of Amendment 2 to scope of work being accomplished by Riedel Environmental Services. Believe you asked to see it. I should sign and return as soon as possible. Please advise.

Robert said OK - go
11/14/85
JPD

Attachment a/s

JPD/ch

TOLS011283

AMENDMENT 2
TIME OIL CO. - RIEDEL ENVIRONMENTAL SERVICES, INC.
SAMPLING AND ANALYSIS AGREEMENT
DATED JUNE 28, 1985

The work scope is amended to include the following:

1. Sandblasting and demolition of the impoundment wall (designated A in Figure 1). The cost of this procedure is estimated to be $5,568.01.

2. Drilling, sampling and installation of 3 monitoring walls angeled 45 degrees beneath the existing warehouse (listed as Wells 1, 2 & 3 in Figure 1). Also, the installation of a 40 foot vertical monitoring well, including sampling at 5 foot intervals, directly in front of the angled wells (listed as Well 4 in Figure 1). Analytical results for 12 PCP samples are included in the estimated cost of $12,667.07.

3. Drilling, sampling and installation of an additional 5, 20-foot monitoring wells (listed in Figure 1 as Wells 5, 6, 7, 8 & 9). Soil samples will be taken at 5 foot intervals and 5 analyses for PCP are included in the estimated cost of $6,595.50.

DATED this 5th day of November, 1985.

TIME OIL CO.

John Denham
Environmental Manager

RIEDEL ENVIRONMENTAL SERVICES, INC.

F.J. Bradach
President

RS:bw

TOLS011284

BZTO104(e)048117

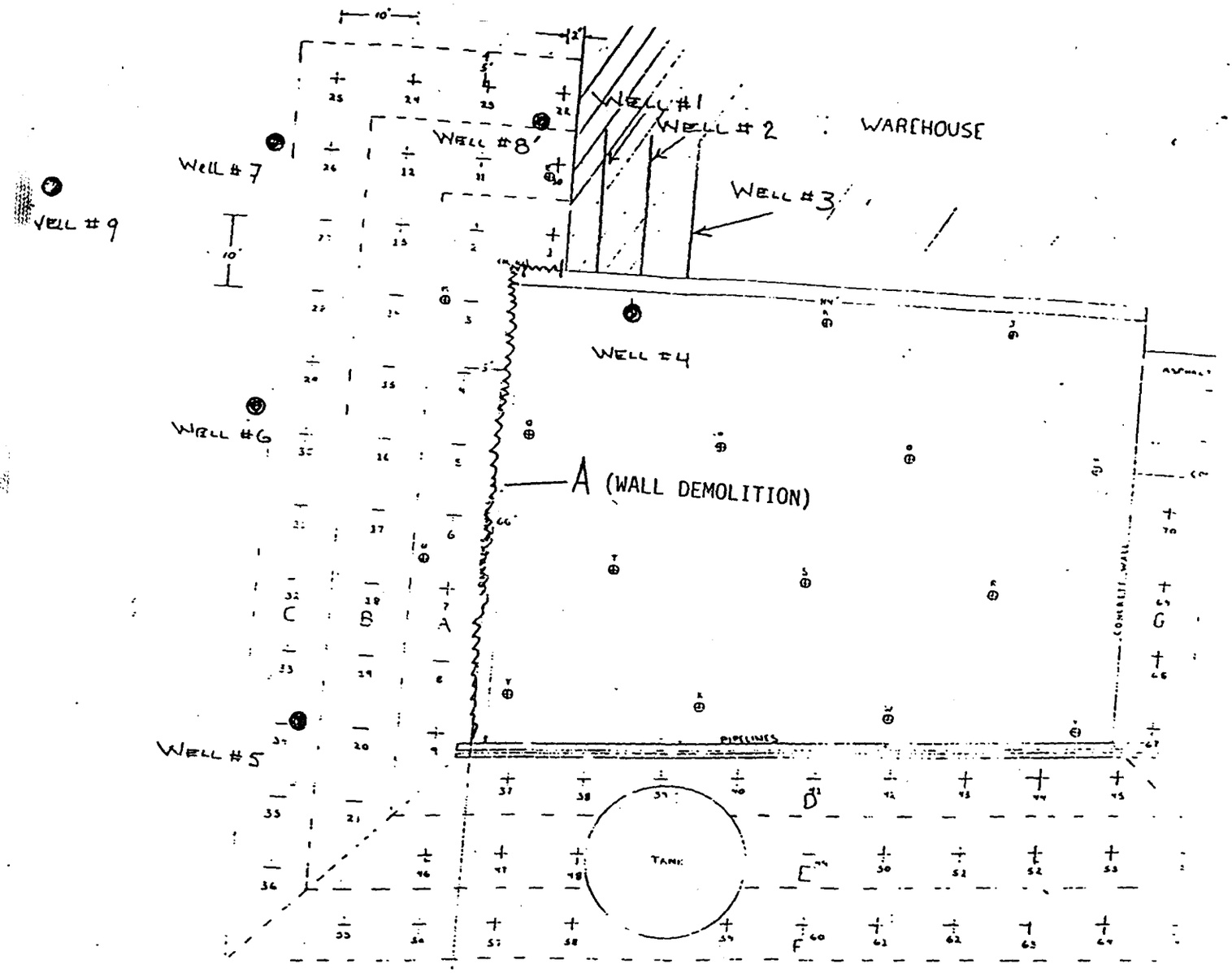


FIGURE 1

Location of Proposed Monitoring Wells

TOLS011285

AGREEMENT

The parties to this agreement are Time Oil Co. (hereinafter termed Time) and Riedel Environmental Services, Inc. (hereinafter termed RES) whereas:

Time has a 70' x 70' (approximate) area of land located in Portland, Oregon and is desirous of having that area sampled and analyzed for pentachlorophenol concentration prior to earth removal.

RES is willing to undertake that task upon the terms and conditions set forth below.

The parties agree as follows:

1. This agreement covers the following work scope: RES agrees to obtain and analyze for pentachlorophenol, 3 composite samples from A 10' primary marginal boundary to the west, south and east of an approximately 70' x 70' area of land used for pentachlorophenol storage at Time Oil Co., Portland, Oregon. Seven additional composite samples will be obtained and retained, but not analyzed. One of these samples will be obtained at a site determined by Time to be representative of background PCP levels. The remaining six (6) samples will be composites of secondary and tertiary 10' marginal boundaries. If required by Time, additional sampling and/or analysis can be performed at RES's standard rate schedule and would be in addition to this agreement. RES will for the 70' x 70' area bounded by concrete containment walls to the east and west, by an existing building to the north and by an exposed pipeline to the south, prepare a sampling grid layout, effect drilling of 16 well holes, perform split spoon sampling at 6 depths (to be established by Time), analyze samples for PCP, plot PCP concentration contours, cause personnel and equipment decontamination and write a detailed report which is to include complete itemization of costs incurred. Should Time conclude that additional drilling and sampling is required, this work would be performed by RES per our standard rate schedule, but is in addition to this agreement.

2. Prior to work under this agreement, a representative of Time will meet with RES at the site to more specifically delineate items of concern.

3. The commencement date for work will be July 1, 1985 or such other date as may be agreed upon by the parties following coordination.

4. For this task, Time agrees to pay RES a sum not to exceed $18,600.00. All work is to be completed by July 30, 1985 or at another date as agreed upon by both parties. Payment will be made upon completion of work and receipt by Time of written report or at monthly progress intervals.

TOLS011286

BZTO104(e)048119

5. RES indemnifies and agrees to defend and hold Time harmless from any and all costs, claims, liabilities and damages to persons or property arising out of RES negligence under this agreement. The parties recognize that even with the utmost care being exercised, escapement of polluting substances might occur while RES is rendering services under this Agreement. It is therefore agreed that to the extent escapement shall occur that the responsibility to governmental authorities for such escapement is that of Time, and that Time agrees to indemnify and hold RES harmless of and from any loss, damage, injury, liability or claim resulting from an aggravation of the existing pollution problem which is not caused or contributed to by the negligence of RES.

6. RES and its officers, employees and agents are not and shall not be considered employees of Time. RES shall be considered for all purposes of this agreement and otherwise as an independent contractor. No subcontractors to RES or such subcontractors, officers, employees or agents shall be considered employees of Time.

7. RES agrees at its expense to obtain all governmental permits, licenses and approvals and comply with all laws, rules, regulations and requirements now or hereafter existing necessary for the accomplishment of the work to be performed by RES under this agreement.

8. RES especially acknowledges its understanding that portions of the soil on site have been found to contain commercial pentachlorophenol in concentrations ranging from 0 ppm to 1820 ppm. RES agrees to take all necessary precautions for the protection of RES employees, subcontractor and property that may be required or prudent to safely accomplish work performed under this agreement.

9. RES agrees to maintain workmens' compensation insurance in the form and amounts required by the laws of the State of Oregon and broad form comprehensive public liability insurance with minimum limits of $1 million per person and $1 million per accident for bodily injury and $1 million per accident for property damage plus secondary coverage up to $5 million. RES shall promptly deliver to Time certificates of said insurance, naming Time as an additional insured before commencing work and such certificate shall provide that said insurance shall not be cancelled prior to 30 days by written notice to Time.

10. ~~RES agrees that before commencement of any work hereunder, it will promptly furnish Time with a faithful performance bond in an amount to $18,600.00 dollars guaranteeing completion of all work and performance of all obligations undertaken by RES under this agreement.~~ Time Oil will provide RES ~~with a~~ payment bond in the amount of $18,600.00.

TOLS011287

BZTO104(e)048120

P. H. The nature, validity and interpretation of this contract shall be governed by the laws of the State of Washington.

Dated this 28th day of June, 1985.

TIME OIL COMPANY

by John P. Denham
John P. Denham
Environmental Manager

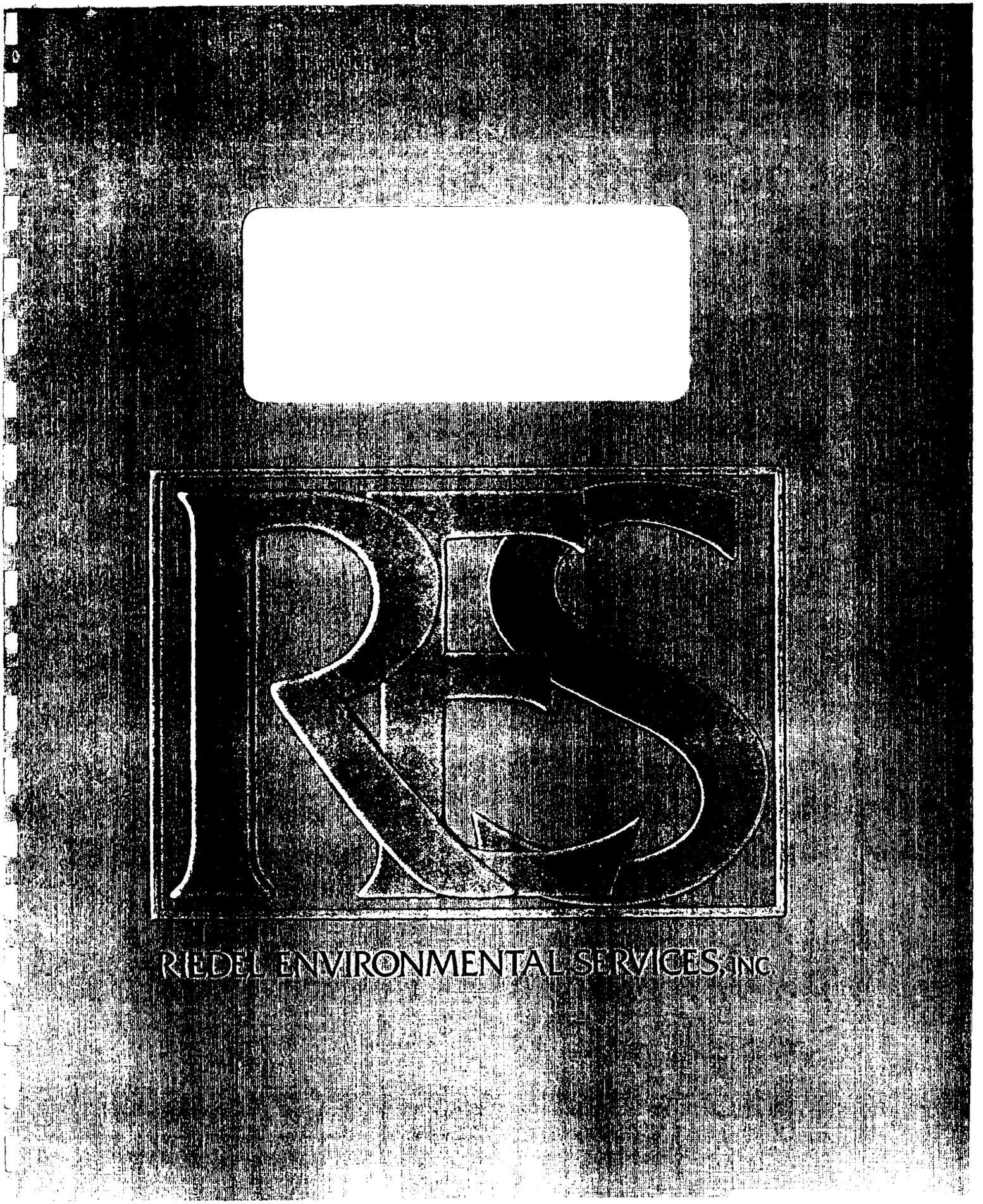
RIEDEL ENVIRONMENTAL SERVICES, INC.

7/2/85

JP/jaf

TOLS011288

BZTO104(e)048121



TOLS011289

BZTO104(e)048122

Rec'd 8/12/86 GPA

REPORT ON FIELD ACTIVITIES CONDUCTED IN LATE 1985 AT TIME OIL COMPANY 12005 NORTH BURGARD STREET PORTLAND, OREGON 97203

February 4, 1986

TOLS011290

BZTO104(e)048123

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☐ San Francisco Division
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Richmond, CA 94802
(415) 234-7400

☐ Seattle Division
901 Fairview Ave. No
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

RIEDEL
ENVIRONMENTAL SERVICES, INC.

February 4, 1986

Mr. John P. Denham, PE
Time Oil Company
2737 W. Commodore Way
Seattle, WA 98199

Dear John:

Enclosed for your consideration are analytical results from the November, 19[illegible] field investigation of Time Oil's facility at 12005 North Burgard Street in Portland, Oregon. Preliminary pentachlorophenol (PCP) concentration contour maps have been prepared. Well construction diagrams have been provided for existing Wells 1 through 4, and a preliminary field log has been prepared for Well 4.

Some preliminary conclusions are as follows:

- There are high levels of PCP below the southwest corner of the warehouse.
- The concentration of PCP in the soils is generally highest above the water table.
- Based on analyses of saturated soil samples, the concentration of PCP in groundwater appears highest at the water table and decreases with depth.

Table 1 contains the analytical data from soil samples gathered during the November field work. This data has been compiled with previous analytical data on the soil to produce the four PCP concentration contour plots contained in Figures 1, 2, 3 and 4. The contour lines of the plots are in mg/kg, or ppm (parts per million). The contour interval is 100 ppm.

The two-foot contour plot (Figure 1) identifies the highest PCP concentrations at that level as being near the southeast corner of the warehouse. The four-foot depth contouring is identified in Figure 2. The highest concentration of PCP (116,000 ppm) found anywhere on site was identified in the soil sample obtained from 2-1/2 to 4 feet below the land surface in Well 3. This is illustrated by the closely spaced contour lines depicted in Figure 2. The high levels of PCP identified at Well 3 fall off approximately 15 feet to the west at Well 1 (see Table 1). The seven-foot contour plot is shown in Figure 3. The figure illustrates a decrease in the PCP levels from the four-foot contour.

Figure 4 illustrates the PCP in the soil below the water table at a depth of 12 feet below the land surface. The approximate depth to groundwater is 10 feet. The concentration of PCP as shown in this plot is less than that identified above the water table in the contour plot of the 7 foot depth.

TOLS011291

BZTO104(e)048124

Well construction diagrams for existing Wells 1-4 are contained in Figures 6 and 7. Table 2 is a geologic log of Well 4.

PCP concentrations in the soil above the water table may decrease downward in areas of surface spillage where the spillage event occurred in sufficiently small quantities such that the spill does not completely saturate the unsaturated zone above the water table. This is the mechanism by which low volume spills may fail to directly reach the water table. A portion of the PCP in the unsaturated zone will be soluble in rainwater percolating through the soils.

Upon reaching the water table, PCP will be diffused as it is transported by groundwater flow and, to a lesser extent, by molecular diffusion and downward movement under gravity.

The rate and direction of movement of PCP in the groundwater environment is principally dependent on the natural flow of groundwater. Proposed Wells 5 through 9, depicted in Figure 5, are recommended for installation in order to determine the lateral direction of groundwater flow and the concentration of PCP in groundwater near the water table. Proposed monitoring Well 5 is placed away from the anticipated direction of groundwater flow to obtain background water quality. Proposed monitoring Wells 6 and 9 are placed outside of but adjacent to the zone of soil contamination and are located laterally to the anticipated groundwater flow direction. Proposed Wells 7 and 8 are planned to intercept groundwater flow leaving the area of soil contamination.

The proposed wells are planned to be constructed of 4" diameter polyvinylchloride (PVC) and have a locking cover placed over the exposed casing. Bumper posts would be placed around proposed Well 9, since this well is in a loading area.

Soil samples will be obtained at 5' intervals. The soil samples will be used to describe soil texture. The first soil samples would be taken at 2-1/2 feet below the land surface for PCP analysis. The second soil sample taken at each location will be obtained at a depth of 5' below the land surface. Additional soil samples will be taken at 5' intervals thereafter. The presence of PCP at the near surface depth would be used to identify areas of surface spillage and possible source areas for PCP in the groundwater.

The groundwater in existing Wells 1-4 would be sampled for PCP along with the sampling at proposed Wells 5 through 9. This would be done upon the completion of the installation of proposed Wells 5 through 9.

As we discussed on January 24th, I would like to meet with you to discuss the proposed monitoring well installation. The network can be expanded if you need to minimize the time spent defining the extent of PCP in the groundwater. The additional wells would be located based on best technical judgment using minimal preliminary groundwater information. This usually results in accelerating the definition of the contaminant spread but requires more wells due to their less efficient location.

Please contact me at your earliest convenience should you have any questions about this report.

Sincerely,

RIEDEL ENVIRONMENTAL SERVICES, INC.

Richard R. Ferguson
Hydrogeologist

RRF:kps

TOLS011293

TABLE 1

SOIL SAMPLE RESULTS

Well Number	Depth, in Feet	Pentachlorophenol, ppm
1	0 - 1-1/2	1690
1	2-1/2 - 4	16.8
1	7-1/2 - 9	ooo
1	16 - 17-1/2	110
2*		
3	0 - 1-1/2	65.3
3	2-1/2 - 4	116000
3	7-1/2 - 9	11000
3	17-1/2 - 19	1560
4	18-1/2 - 20	574
4	32-1/2 - 35	62.3
4	43-1/2 - 45	1.59
4	47-1/2 - 49	2.81

* Soil samples from Well 2 were not analyzed.

RRF:kps

TOLS011294

TABLE 2

Depth in Feet	Soil Description
0 - 1-1/2	Light brown gravelly sand, moderately compacted, moist (shovel sample)
3-1/2 - 5	Dark brown gravelly sand, moderately compacted, moist, split spoon sample (S.S. sample)
8-1/2 - 10	Light brown gravelly sand, in contact with blue gray gravelly sand, moderately compacted, moist (S.S. sample)
10 - 13	Gravelly sand
13-1/2 - 15	Light blue gray gravelly sand, moderate compaction, saturated (S.S. sample)
15 - 18-1/2	Gravelly sand
18-1/2 - 20	Light blue gray gravelly silty sand with a clay lens, moderately compacted, saturated (S.S. sample)
20 - 23-1/2	Gravelly silty sand with clay lens
23-1/2 - 25	Light gray gravelly silty fine sand with minor clay lens, moderately compacted, saturated (S.S. sample)
25 - 28-1/2	Fine sand
28-1/2 - 30	Light gray medium to fine sand, 3-1/2" thick clay lens, saturated (S.S. sample)
30 - 32-1/2	Medium to fine sand with clay lenses
32-1/2 - 35	Light gray medium to fine sand, minor clay lenses, saturated (S.S. sample)
35 - 37-1/2	Medium to fine grained sand
37-1/2 - 39	Light gray medium to fine sand (S.S. sample)
39 - 42-1/2	Light gray medium to fine sand
42-1/2 - 45	Light gray medium sand grading to fine sand with depth, minor clay lens (S.S. sample)
45 - 47-1/2	Fine sand, saturated
47-1/2 - 49	Light gray sandy silt grading to light gray silty fine sand (S.S. sample)

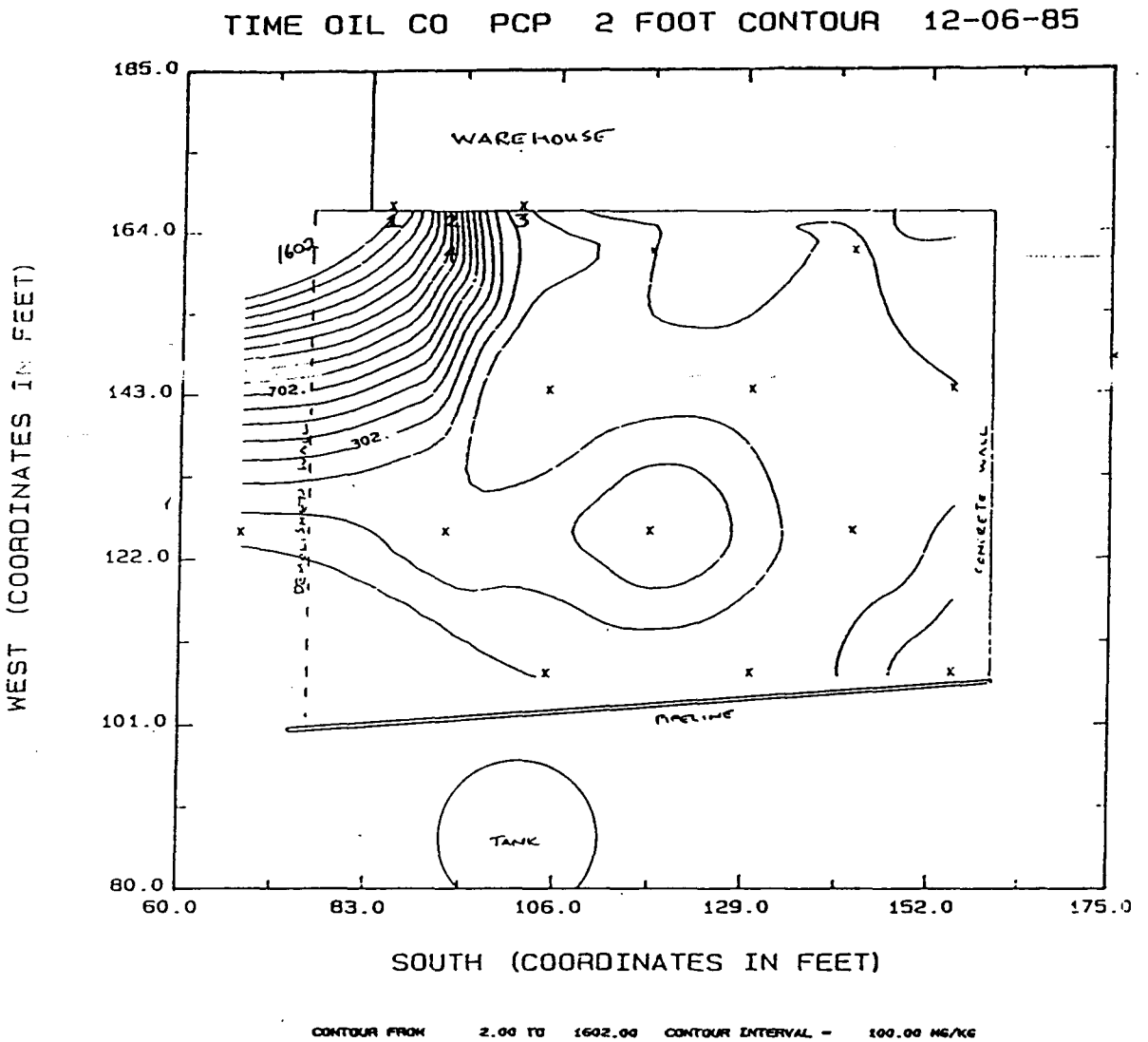


Figure 1: PCP in soil at a depth of 2 feet.

TOLS011296

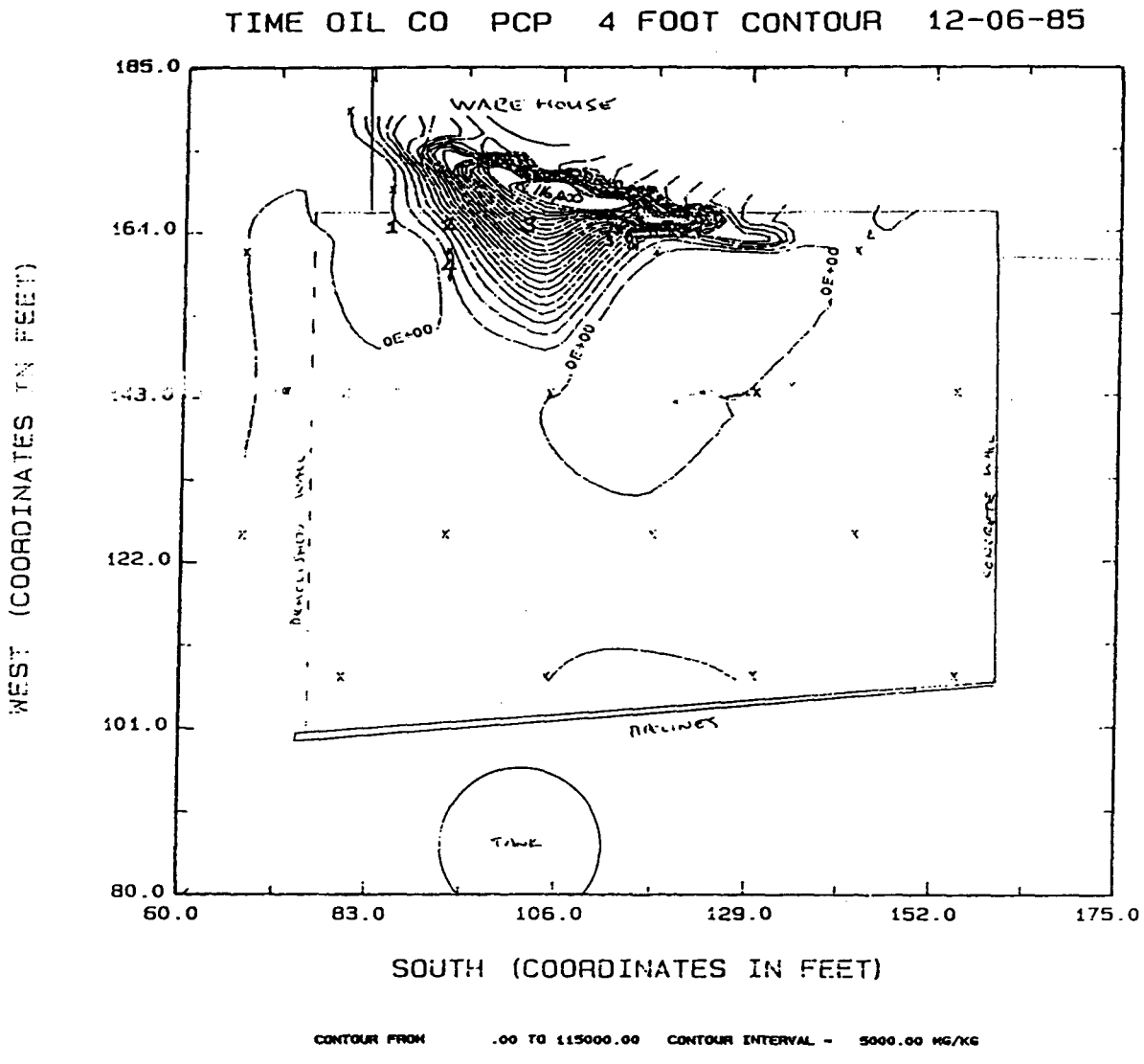


Figure 2: PCP in soil at a depth of 4 feet.

TOLS011297

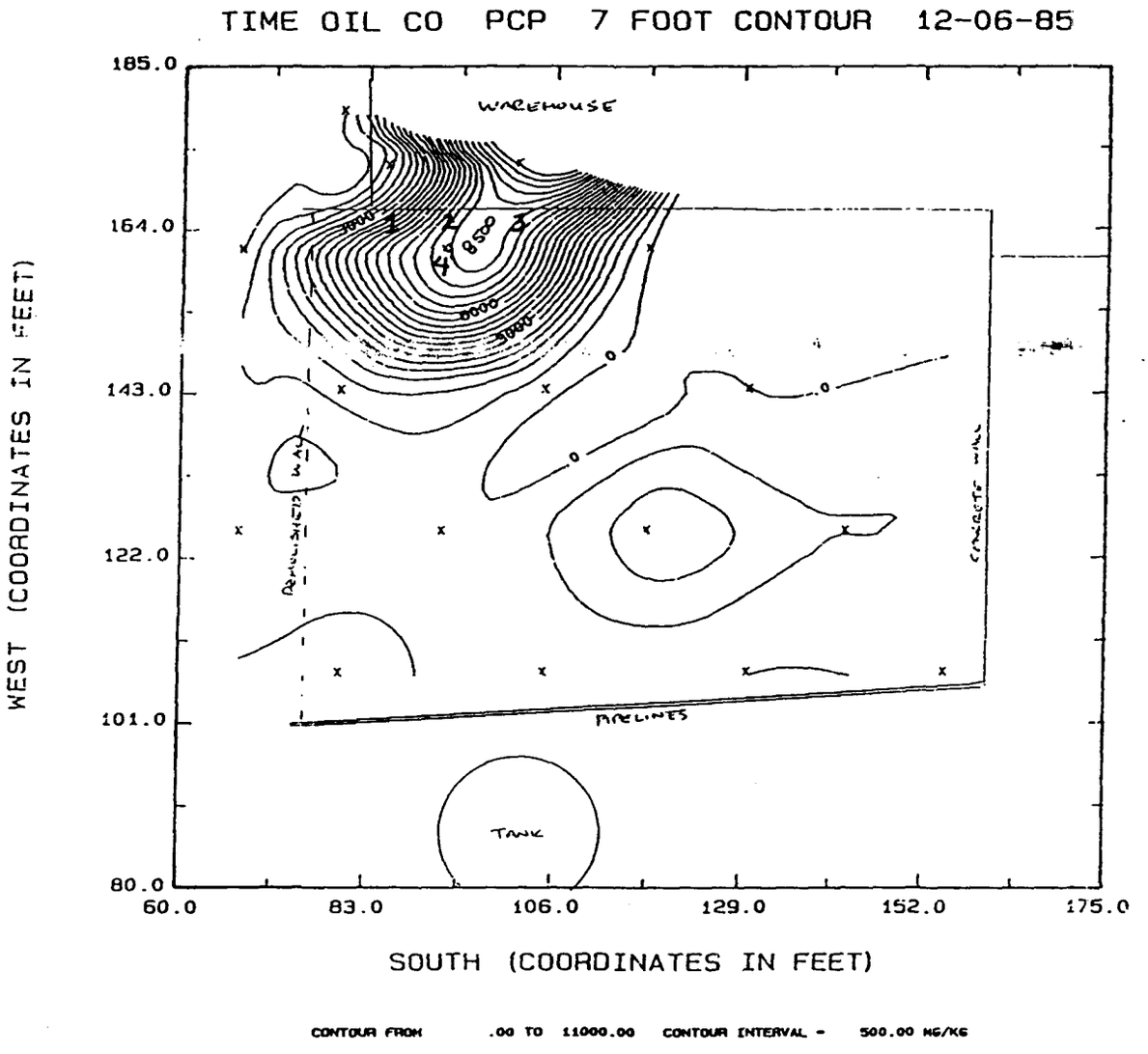


Figure 3: PCP in soil at a depth of 7 feet.

TOLS011298

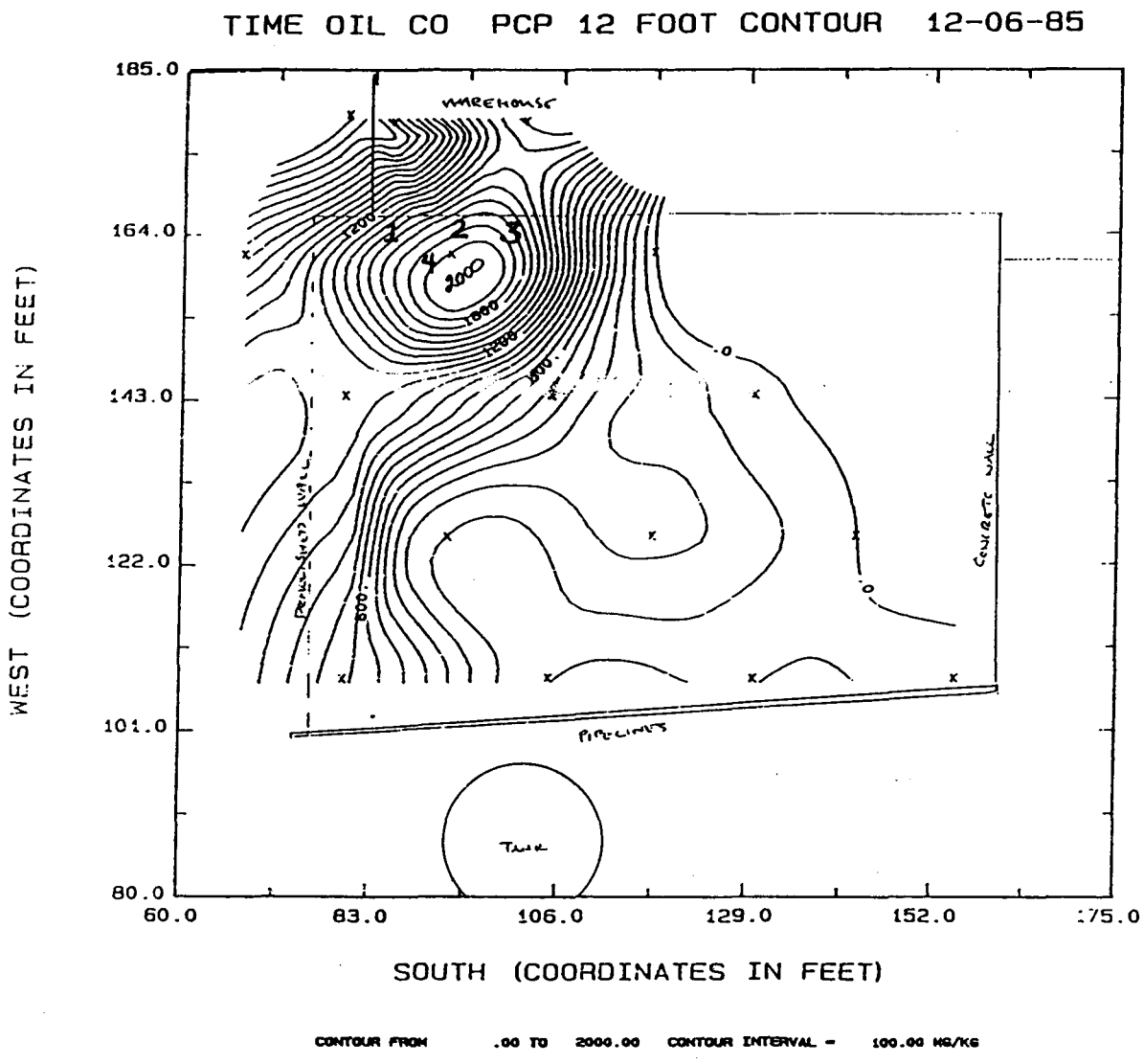


Figure 4: PCP in soil at a depth of 12 feet.

TOLS011299

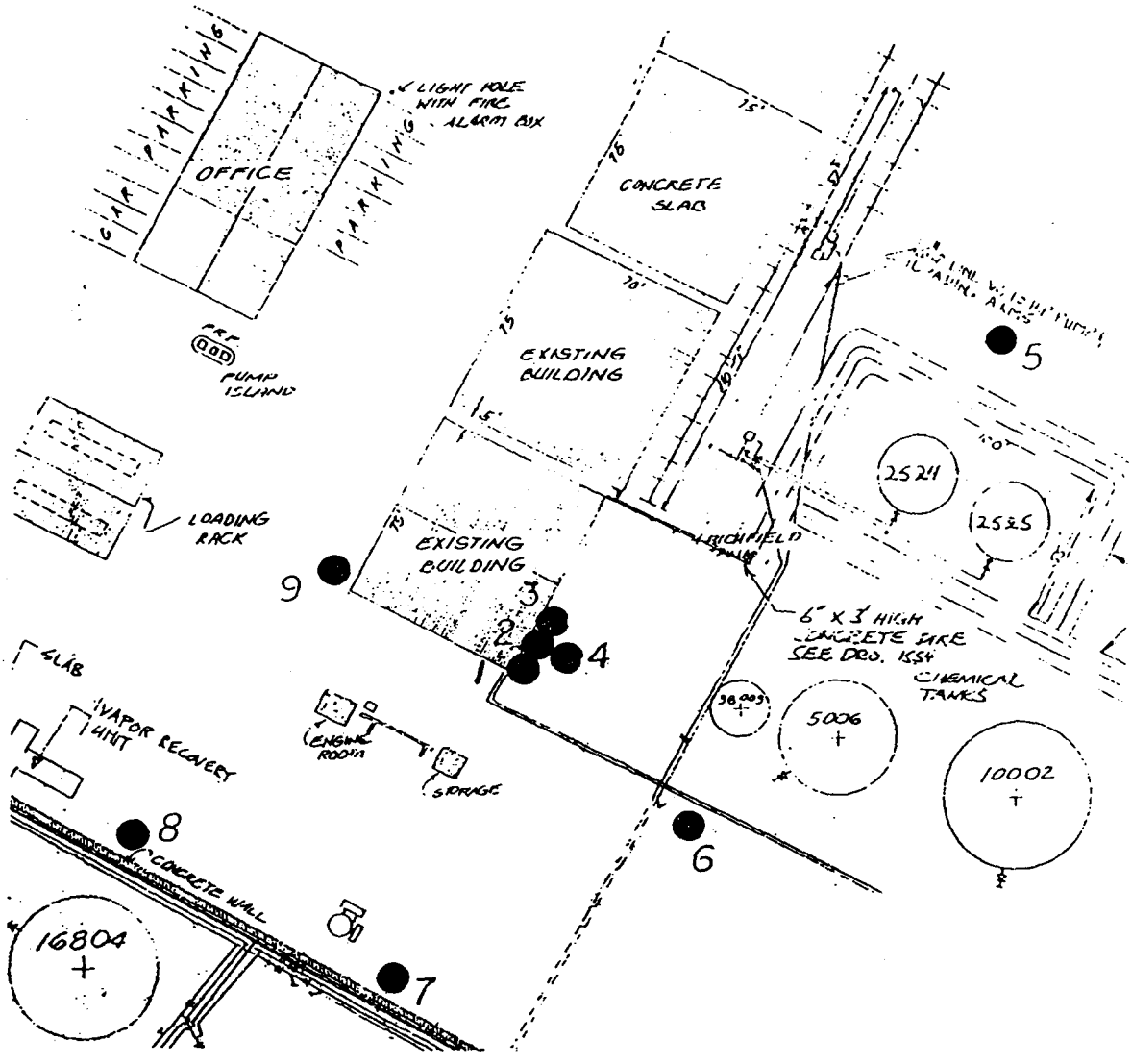


FIGURE 5

1-4: Existing Monitoring Wells

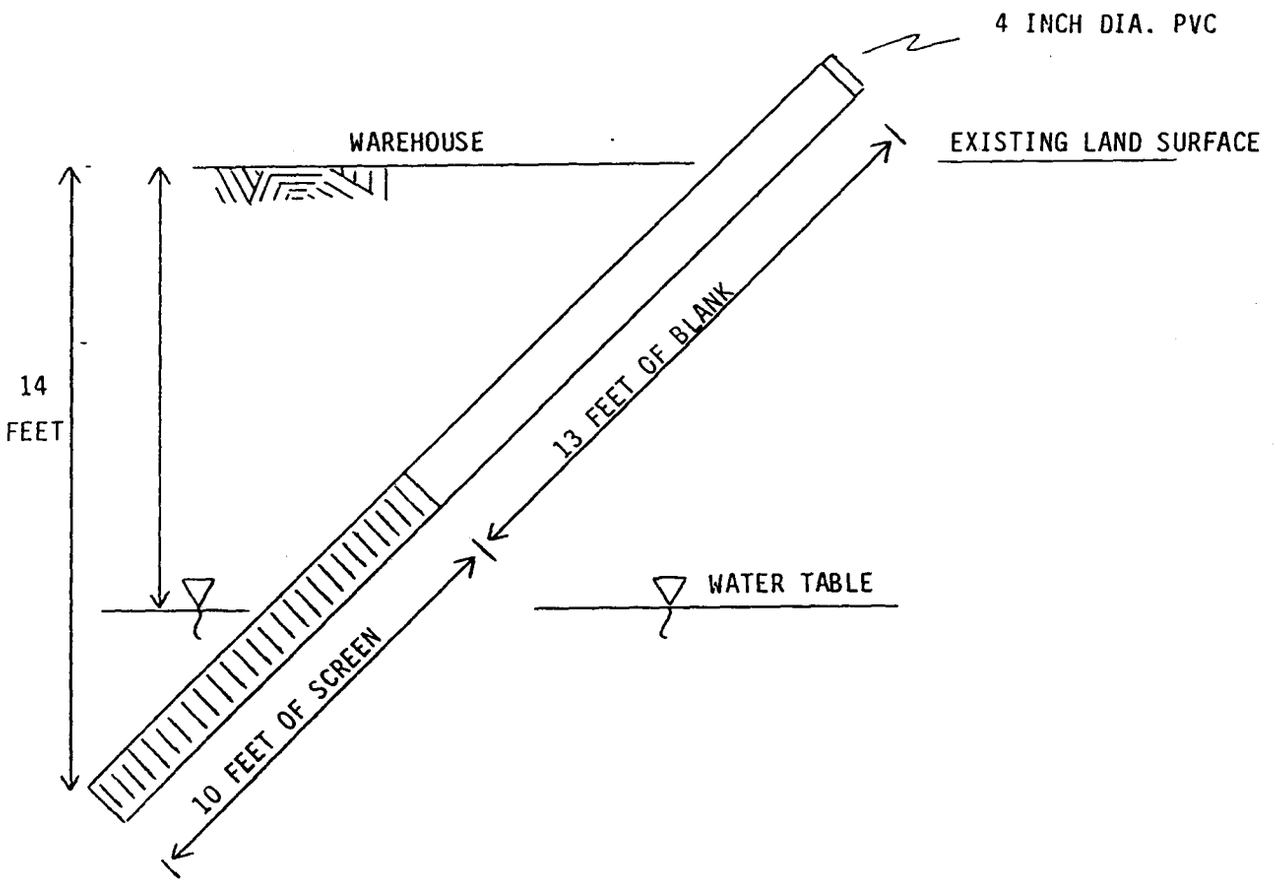
5-9: Proposed Monitoring Wells

TOLS011300

FIGURE 6

CONSTRUCTION DIAGRAM FOR

WELLS 1, 2 AND 3



TOLS011301

PHONE 285 2400
CABLE ADDRESS TIMOIL

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
SAN PEDRO
LOS ANGELES

TIME OIL COMPANY

2737 W. COMMODORE WAY, P.O. BOX 24447, TERMINAL ANNEX, SEATTLE, WA 98124

January 27, 1986

William J. Baldwin
Koppers Company, Inc.
436 Seventh Avenue
Pittsburgh, PA 15219

Dear Bill,

Enclosed is copy of the ATW Calweld data I promised on January 23, 1986 during our meeting at your Pittsburgh, PA offices. Calweld designed, developed and operates the equipment. ATW developed the waste treatment technology. Cary Jackson is the chemist who determines what is needed to treat whatever the problem, consistent with client desires. The proper person to contact is Franch Manchak. I have spoken with him. He has agreed to speak with you about our mutual problem.

Regarding the water treatment biodegradation process, the three basic chemicals are amonium nitrate, potassium sulfate and sodium phosphate. These fertilizer materials provide the chemical nutriants enabling bacteria to grow. Bacteria are added. The whole mixture is arable. Water is pumped from below ground to a surge tank to a 10' x 10' x 30' tank where the mixture exists. Discharge is either returned to the ground or to sewer as permitted.

Today I received the enclosed DEQ Hazardous Waste Enforcement Guidelines dated January 9, 1986. A copy is enclosed for your information. The thought I intend to convey here is related to our meeting discussion about the unknown amount of money (shown as a ?) on the "cost to date" paper presented. This is an unknown that I had no idea was in existance at the time of our meeting.

Hope this helps. It was a pleasure to see you again, to meet Dave and to provide a project status update.

Sincerely,

John P. Denham

John P. Denham
Environmental Manager

Enclosure a/s

cc: Robert Abendroth
Jim Garrity
Dave Kerschner
Don Marion
Templeton Smith

TOLS011302

PHONE 285-2400
CABLE ADDRESS: TIMOIL

TIME OIL COMPANY

2737 W. COMMODORE WAY, P.O. BOX 24447, TERMINAL ANNEX, SEATTLE, WA 98124

January 8, 1986

John H. Somes, General Manager
Northwest Vacuum Truck Service, Inc.
5555 North Channel, Bldg. 43
Portland, OR 97217

Dear Mr. Somes:

This is in reference to the contract negotiated between Time Oil Co. and Northwest Vacuum Truck Service, Inc. on February 19, 1985 for the purpose of removing a volume of earthen material from our Portland, Oregon site.

As you may recall, this was a three phase effort - the first being removal of earthen material to an agreed upon depth, the second being conduct of laboratory tests on remaining material and the third being removal of additional material as dictated by laboratory test results.

Phases 1 and 2 have been completed. When attempting to start up phase 3, coordination with Chem-Security Systems revealed they could not accept our soil without reauthorization from DEQ. The DEQ advised it could not authorize continuation of this project without EPA approval. Contact with EPA resulted in complete denial of permission to allow further removal due to soil contaminated with pentachlorophenol having been reclassified as F027 and placed in 40 CFR 261.3(a)(2)(w). This EPA action effectively precludes our soil being relocated as there are presently no commercial facilities in the United States that will accept F027.

As one result of above findings, our clean-up effort has been stopped, requiring far more costly techniques to now be researched, developed and put into effect. Another result is that continuation of this particular contract between Time Oil Co. and Northwest Vacuum Truck Service, Inc. appears unwarranted. Please accept this letter as cancellation of contract dated February 19, 1985.

Time Oil Co. thanks you for your cooperation and contract performance. It was excellent. We look forward to continuing our good working relationship in the future.

Sincerely,

John P. Denham

John P. Denham
Environmental Manager

cc: Robert Abendroth
Neil Wallis

TOLS011303

M E M O R A N D U M

February 13, 1986

TO: Northwest Terminal Woodtreating File

FROM: John Denham

SUBJECT: PENTACHLOROPHENOL CONTAMINATION - NORTHWEST TERMINAL

In regards to bugs:

100 lb/acre feet or 1600 cubic yards
cost is $40/lb or $4,000 x 3 applications (ave) = $12,000.

Purpose is to minimize the migration of contaminants.

JPD/ch

TOLS011304

M E M O R A N D U M

February 14, 1986

TO: File

FROM: Fred Proby

SUBJECT: NORTHWEST WOODTREATING

John Denham and I met today with John Ruddick [Portland (503) 224-4334] of Century Environmental Services (CES) to discuss the pentachlorophenol (PCP) problem. Discussion covered definition of the problem and alternative solutions.

Problem Definition

PCP was recently ruled to be "acutely hazardous" because EPA found that some percentage of samples contained dioxin. The acutely hazardous designation is a rebuttable presumption. However, even if it can be shown that there is no dioxin in Time Oil's soil, there is still a ban against PCP disposal at Arlington. The cost for a dioxin analysis is around $800.

PCP levels in the soil have been adequately described. Concentration of PCP in groundwater is unknown. The first action needed is to analyze a sample from the existing monitoring well. If a hazard is not indicated (15 ppm PCP was suggested by CES) then no further wells are needed. If PCP is greater than 15 ppm then at least two down-gradient and one up-gradient wells will be needed. CES is capable of collecting and analyzing the sample. The 15 ppm criterion is based on two assumptions: 0.15 ppm is the toxicity threshold for fish and the PCP plume is diluted by a factor of 100 when it discharges into the river.

Reidel's proposal to install additional monitoring wells is excessive and premature. Also, wells do not need to be 4-inch diameter. A 2-inch well can accomodate stacked piezometers which will allow a determination of vertical gradients of contamination.

Alternative Solutions

If soil contains dioxin then problem is magnified. The only authorized dioxin treatment method is incineration to 99.9999% destruction. Nearest approved facility is in Texas. Shipping and incinerating soil is very expensive. Better to extract PCP and dioxin from soil with sodium hydroxide solution or a solvent. Chemical and physical processes can then be employed to reduce volume of material for incineration. Still very expensive.

Laboratory studies indicate that PCP can be degraded by bacteria added to the soil if PCP concentration is 200 ppm or less. Proper concentrations can be obtained by blending with clean soil. To prevent leaching of PCP to the groundwater, biodegradation should be carried out on impervious surface. (eg. concrete over plastic liner) and covered with a tarp during rainy weather.

TOLS011305

Bacteria adapted to PCP are available off-the-shelf at a cost of approximately $40 per pound. Innoculation rate is one pound per 16 cubic yards. Three innoculations are usually needed, so cost of bacteria would be roughly $ 7.50 per cubic yard (figure soil volume at 1.3 times "bank cut" volume). Periodic rototilling, sampling and nutrient adjustment are required at additional expense. Biodegradation can be completed in one growing season (process is temperature-dependent). Dioxin can be biodegraded but it may be difficult to achieve the required 99.9999% destruction.

EPA and DEQ have banned land disposal. Remaining solutions include: 1. cap site to prevent PCP from migrating to groundwater, 2. solidify and tetoxify soil in place using ATW Caldwell technology, 3. excavate soil and store on-site until treatment or off-site disposal is available.

FLP/ch

JPD

M E M O R A N D U M

February 21, 1986

TO: Ken McAlpine — Gig Harbor
Neil Wallis — Portland

FROM: Fred Proby — Seattle

SUBJECT: NORTHWEST TERMINAL WELL POINTS

The following instructions are for installing well points to enable measuring water table elevations at Northwest Terminal:

1. Install well points to a total depth of 20' at locations A, B and C shown on attached map (attachment 1). Well should be vertical. If indicated locations are unsuitable due to underground lines or other obstructions show actual well location on blank map (attachment 2) and provide reference measurements.

2. Top of well should extend approximately 2 feet above ground surface. Cover well with threaded cap. Drive stakes around well and mark with colored surveyor's tape.

3. Affix well tags to three well points and existing 4" well using plastic tie bands.

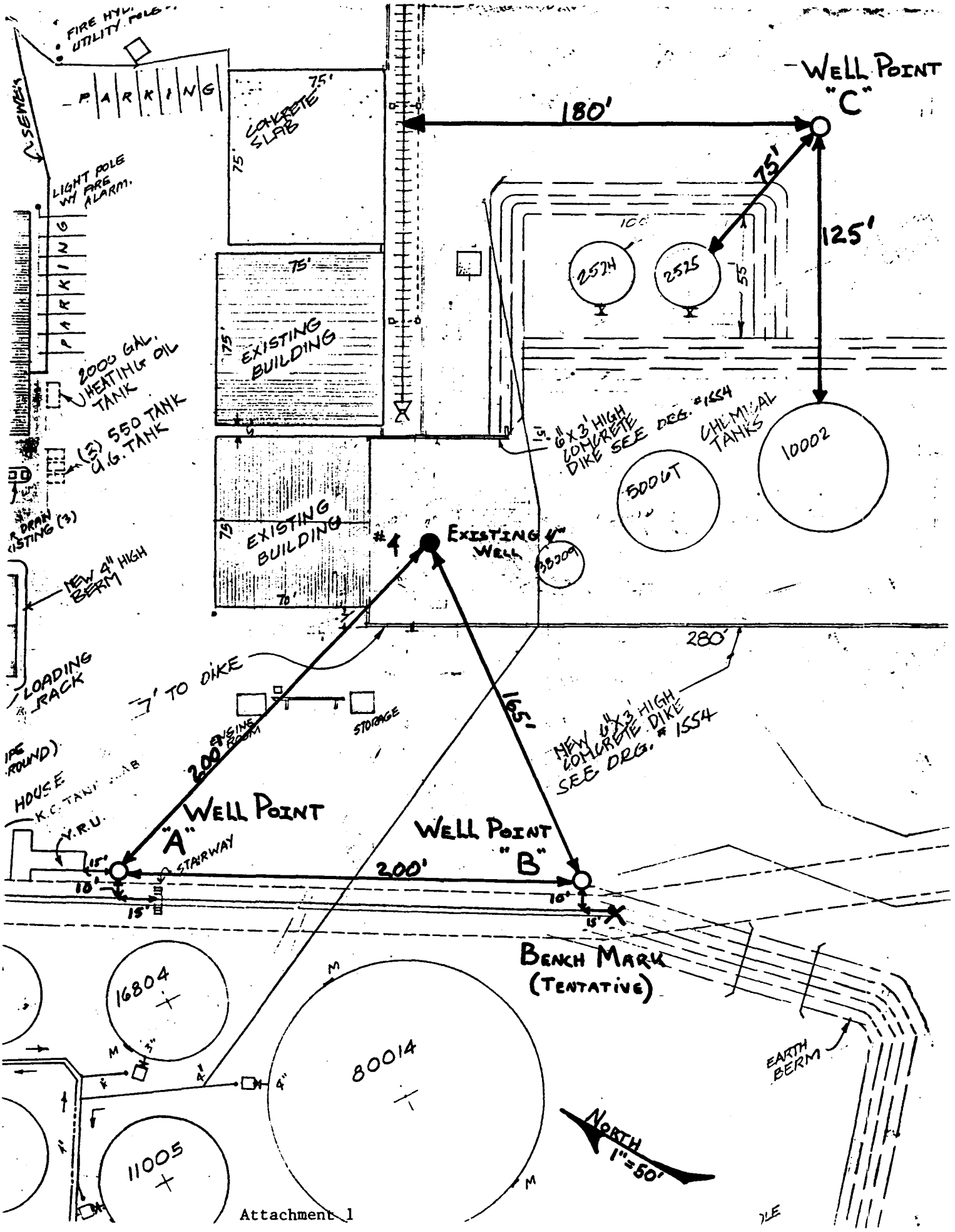
4. File small notch on north side of well rim for use as reference mark. Survey elevation of reference mark relative to common bench mark established for all wells. Arbitrarily designate bench mark elevation as 100.00'. Tentative bench mark location is shown on enclosed map (attachment 1). All four wells (three well points plus existing 4" well) need to be visible from bench mark. Bench mark location might have to be shifted to achieve this. Record reference elevations to nearest 1/100' on well tags and in field notes.

5. Let water stabilize for several hours following installation of well point then measure water level according to enclosed procedures (attachment 3).

attachment a/s

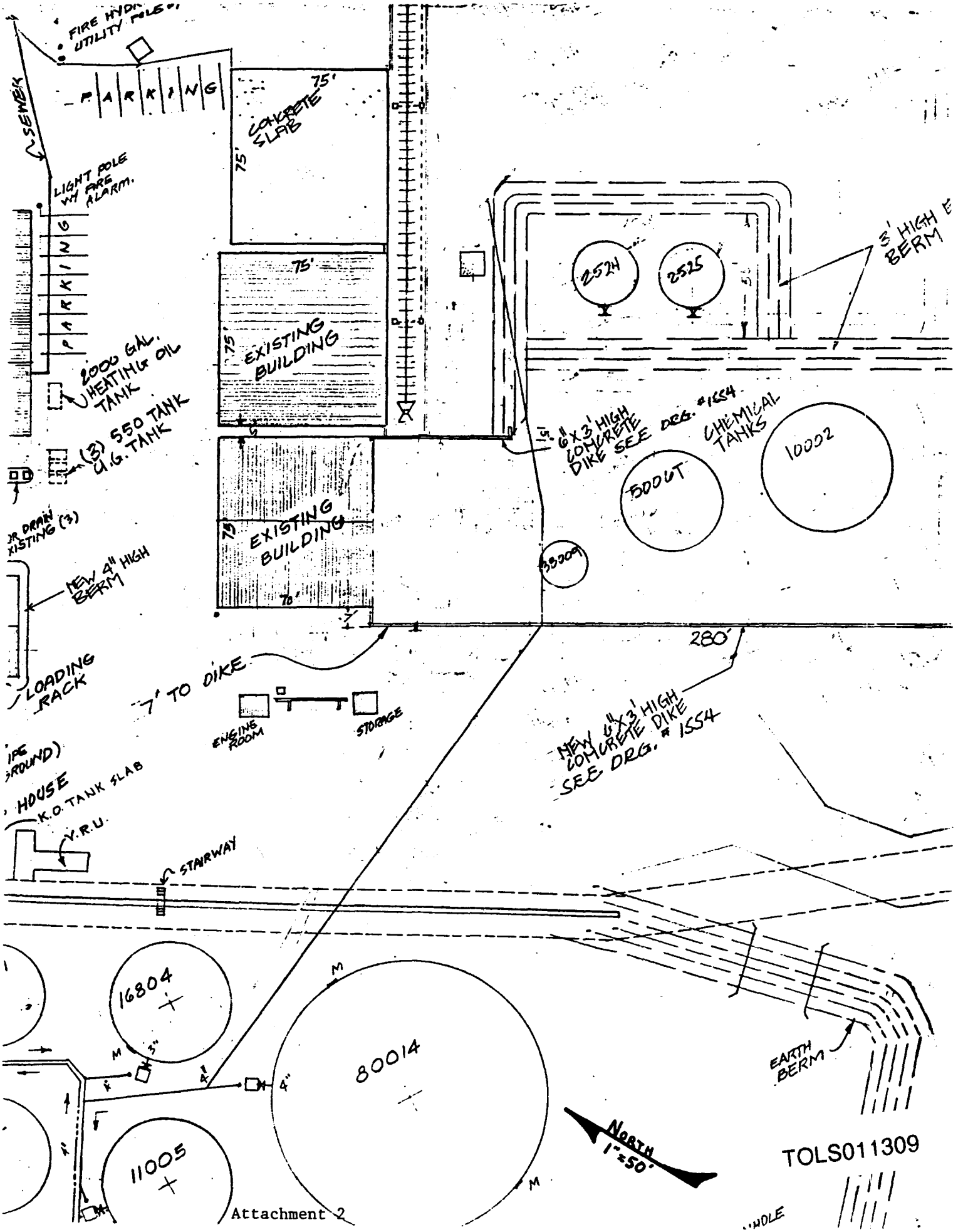
FLP/jam

TOLS011307



Attachment 1

TOLS011308



Attachment 2

WATER TABLE ELEVATION MEASUREMENT FOR MONITORING WELLS

The following procedure is to be followed when a tape and bob is used to measure water level in monitoring wells.

1. Rub a thin film of water indicating paste on the back of the tape from the one foot to the two foot mark.

2. Hold ungraduated side of tape in contact with the rim of the monitoring well at the reference point.

3. Lower tape and bob into well until bob touches surface of water.

4. When the bob is motionless, lower tape slowly until top of bob is submerged 6 to 10 inches below surface of water and an even "inch" graduation mark on the tape is at the reference point. Record tape reading at the reference point to the nearest 1/8 inch. This is the "reference reading".

5. Permit tape and bob to remain stationary in well from 15 to 20 seconds. More time may be required during cold weather. Paste will change color at cut line.

6. Withdraw tape and record "water cut" to the nearest 1/8 inch.

7. Subtract the water cut reading from the reference reading. This is the "depth to water". Example follows:

Reference reading	10 Ft. 4 In.
Water cut	1 Ft. 1 1/4 In.
Depth to water	9 Ft. 2 3/4 In.

8. REPEAT STEPS (1) THROUGH (7) UNTIL THE RESULTS OF TWO SUCCESSIVE GAUGINGS AGREE.

9. Subtract the "depth to water" from the "reference elevation" for that well. This is the "water table elevation". (The reference elevation is a surveyed elevation written on the well tag.)

10. Record results on Monitoring Well Water Level Report.

Attachment 3

TOLS011310

MONITORING WELL WATER LEVEL REPORT

LOCATION_____

1	2	3	4	5	6	7	8
GAUGER'S INITIALS	DATE	WELL NUMBER	REFERENCE READING	WATER CUT	DEPTH TO WATER (4-5)	REFERENCE ELEVATION	WATER TABLE ELEVATION (6-7)

TOLS011311

Century Environmental Sciences

February 19, 1986

Mr. John P. Denham
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

Dear John:

Thank you again for the fine lunch and the opportunity to discuss with you your concerns about your North Portland facility. I think you were wise to make every effort to continue to control the situation at that plant and to take charge of your own cleanup activities as you are doing.

To review our discussion of Thursday, there appears to be at least four areas of concern in the remediation of the pentachlorophenol spill. Based on the data you presented to me, the first and foremost consideration, in my appraisal, is the potential contamination of the groundwater in the vicinity of the spill. Since an adequately constructed well is already installed in the vicinity, groundwater sampling could be easily performed. Should groundwater in the vicinity prove to be contaminated with penta, an evaluation of the extent of that contamination in groundwater becomes the next concern.

The second major concern is the stabilization, removal or destruction of the pentachlorophenol contaminated soil both adjacent to the building and in the other two outlying areas near the containment facility. Since, at this time, excavation and off-site disposal is not an option, on-site or off-site treatment or stabilization are the only alternatives. Because of the dioxin issue, treatment alternatives are restricted and obtaining the permit to perform these functions may be quite arduous. As much as I hate to admit it, site stabilization measures appear to be "state-of-the-art" for these types of cleanups.

A third concern that was identified exists if groundwater contamination is detected and consists of groundwater stabilization or cleanup measures required to prevent any hazard or risk to either human or non-human receptors down gradient from the spill site.
The fourth concern which overshadows much of this discussion is the relationship of any action taken on the property to the laws, regulations, rules, or other guidance used by the agencies in regulating such cleanup activities. Our discussions on these lines of last week not withstanding, these issues can provide

One S.W. Columbia Street Suite 1222 Portland, Oregon 97258 Phone (503) 224-4334
Century Environmental Sciences Century West Engineering Corporation Century Testing Laboratories, Inc. Century West Development Services
Portland and Bend, Oregon Spokane and Pasco, Washington Bozeman, Montana

TOLS011312

BZTO104(e)048145

significant headaches and frustrations in performing what a logical man would do in these cases.

John, I believe there are several areas in this scenerio where Century Environmental can help you. After reviewing the current situation, my feeling is that much, if not most of the contamination can be stabilized by installation of a suitable impervious cap. I also believe that, if this concept is suitably fleshed out and appropriately worded, it can adequately be presented to the Department of Environmental Quality as a site mitigation measure. I would like, if you concur, to submit a proposal to you to provide a plan for evaluating this alternative relative to other measures and putting it in a format that can be presented to the agencies. As I suggested Thursday, I would recommend evaluating the groundwater quality of the existing well. I've checked our resources and Century has the capability to bail and sample those wells as well as analyze the groundwater for pentachlorophenol. If you would like, I can include these activities in the proposal.

John, let me know what your feelings are on these matters, or if you would simply care to discuss the situation further with me at any time. If you agree that a proposal is in order, let me know and I will prepare one for you immediately and can design it to cover the aspects we have previously discussed and limit the scope in any way that you feel best.

Sincerely yours,
CENTURY ENVIRONMENTAL SCIENCES

John Ruddick
Senior Scientist

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HOT LINE: (800) 547-0792
BUSINESS PHONE: (503) 285-9111
TELEX: 151403

JOB LOCATION

DATE 2/27/86

SOLD TO TIME OIL
2737 WEST COMMODORE WAY
SEATTLE, WA. 98199

YOUR NO.

INVOICE NO. 2-2040

JOB #8218

ATTENTION:

MR. J. DENHAM

TERMS: Net 30 days from date of invoice.
SERVICE CHARGE: A service charge of two (2%) percent per month shall be charged to all balances not paid within the terms of sale.

TO ISSUE YOU CREDIT FOR INVOICE #2046-12.
INVOICE ADJUSTMENTS ARE NECESSARY.

TOTAL CREDIT .....($22,272.52)

Roland Miller

ROLAND MILLER, DIVISION MANAGER

Please Remit To:
Box [illegible]
Portland, OR 97208

ST. LOUIS, MO DIVISION
529 SPIRIT OF ST. LOUIS BLVD.
CHESTERFIELD, MO 63017 • 314-532-7660

RICHM
230 CU
RICHMOND, CA 94802 • 415-234-7400

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TOLS011314

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SEATTLE, WA. 98199

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Roland Miller

ROLAND MILLER, DIVISION MANAGER

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529 SPIRIT OF ST. LOUIS BLVD.
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AC 126/2.5-10-83

TOLS011315

BZTO104(e)048148

RIEDEL ENVIRONMENTAL SERV

STATEMENT

ENVIRONMENTAL EMERGENCY SERVICES CO. DIV
P.O. BOX 3320
PORTLAND OR 97208-3320
(503) 285-9111

TIME OIL
2737 W. COMMODORE WAY
SEATTLE, WA 98199

CUSTOMER NUMBER :13204
STATEMENT DATE :01-31-86
STATEMENT AMOUNT:$22,272.52

LAST STATEMENT DATE :12-31-85
LAST STATEMENT AMOUNT:$22,272.52

PGMAR405 01-31-86 13204 0 PAGE 1

ACT DATE	INVOICE #	TYP	REFERENCE INFORMATION	ACTIVITY AMOUNT
12-19-85	2046-12	REG	8218 -	22,272.52
			*** TOTAL STATEMENT AMOUNT ***	22,272.52

CURRENT ACTIVITY	31-60 BALANCE	61-90 BALANCE	OVER 90 BALANCE	FUTURE RET DUE
0.00	22,272.52	0.00	0.00	0.00

S T A T E M E N T

AC-183/14-884

TOLS011316

BZTO104(e)048149

A/P VOUCHER

TIME OIL CO.

CO. DIV. AUTH.	
VENDOR PRICE	
INV. REC. SIG.	
P.O.	
DUE	
% MO.	
DIST. ATTACHED	
EXTENSIONS CHECKED	
ACCOUNTING	
REG. NO.	

					REG. TOTAL		

TOLS011317

PHONE 285-2400
CABLE ADDRESS TIMOIL

SEATTLE
TACOMA
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STOCKTON
RENO
RICHMOND
SAN PEDRO
LOS ANGELES

TIME OIL COMPANY

2737 W. COMMODORE WAY, P.O. BOX 24447, TERMINAL ANNEX, SEATTLE, WA 98124

January 20, 1986

Roland Miller, Division Manager
Environmental Emergency Services
4555 N. Channel Avenue
P.O. Box 3320
Portland, OR 97208-3320

Dear Mr. Miller:

This refers to EES invoice 2046-12 dated 12/16/85 pertaining to Job #8218.

I am having a lot of heartburn evaluating this invoice prior to submitting it to our management for payment for following reasons:

a. There has been no written report received here which says the work has been done - just an invoice for who knows what. Time Oil absolutely cannot pay without first receiving a report of actions (see item 4 of agreement).

b. My January 17, 1986 telecon with Rick Ferguson of your office revealed that items 1 and 2 in Amendment 2 work scope have not been completed yet invoice apparently pertains to this amendment and is a little over $4000 greater than the amount originally estimated by your office to accomplish these two items. Why? Invoice is more than 20% higher. This seems highly unreasonable when the cost of both doing the job and sending the report are part of the agreement.

c. Overtime rates are charged on 10/25/85, 10/26/85, 10/28/85, 10/29/85, 10/30/85, 10/31/85 and 11/05/85. Why? There has been no request for such an authorization to this office and none given. As a matter of fact, in my initial meeting with Roger Smith and John Ruddick, I specifically stated and both said they understood there was certainly no cause for overtime to be expended on this long term project. When I look at this type of presentation I simply cannot help but feel this invoice is very heavily padded.

d. Two men spent four days (10/21 - 10/24/85) removing and decontaminating one 3' x 70' concrete wall. Why? It seems to me a D-9 cat would have made short work of this task. Was this an error in planning on someones part? If so, why should Time Oil pay for a planning error in your firm?

e. Also on 10/24/85, one man spent four hours loading one 1 ton truck. That seems excessive to say the least.

f. On 10/29/85 (page 2), the "total amount" column of the Daily Work Report is partially obliterated.

TOLS011318

g. There is no accounting for the time charges of R.N. Smith listed on the 12/10/85 Daily Work Sheet. Work done on site per other Daily Work Sheets show only 11/1/85, 11/4/85 and 11/5/85 as dates that I could possibly tie in with Roger's time. Additionally, 11/2/85 was a Saturday, an unlikely day of the week for Roger to be working at our place since no crew was there. With nothing at all to go on and no report of any type on which to base an evaluation, it appears the time charged by Roger on 10/10/85, 10/11/85, 10/24/85, 11/2/85, 11/11/85, 11/12/85, 11/14/85 and 12/10/85 was spent filling out the 12/10/85 Daily Work Report. Certainly this did not take any 13 hours. According to our Terminal Manager on site, Roger only checked in one time and that was so long ago the date cannot be recalled.

h. On 12/11/85, there is a 10/10/85 parking fee charge. Why, since there is no charge for parking at either your place or ours? Also on 12/11/85 there are two laboratory charges. I have received neither the laboratory reports nor their analysis.

i. As an aside, I noted charges for two respirators on many Daily Work Reports. It would seem logical that the same respirators were used each day so no need exists to purchase new ones each time. This is particularly brought to the fore on 10/29/85, 10/30/85, 10/31/85, 11/01/85 and 11/04/85 when only one man was on the job. How could he use two respirators? The same principle applies to gloves on 11/04/85. How could one man use three complete sets of gloves in one day?

As you can see Roland, this invoice is questionable to a reader having no backup material on hand to support it. Request you look into the matter and give me a call. I would like to get it straightened out as soon as possible.

Sincerely,

John P. Denham

John P. Denham
Environmental Manager

JPD/ch

TOLS011319

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HOT LINE: (800) 547-0792
BUSINESS PHONE: (503) 285-9111
TELEX: 151403

JOB LOCATION

DATE 12-16-85

SOLD TO TIME OIL
2737 W. COMMODORE WAY
SEATTLE, WA. 98199

YOUR NO.

INVOICE NO. 2046-12

JOB #8218

ATTENTION: MR. J. DENAHM

TERMS: Net 30 days from date of invoice.
SERVICE CHARGE: A service charge of two (2%) percent per month shall be charged to all balances not paid within the terms of sale.

TO INVOICE YOU FOR SERVICES NECESSARY FOR DRILLING AND INSTALLATION OF MONITOR WELLS, REMOVAL OF CONTAMINATED CONCRETE WALL AND DRILLING AND SAMPLING FROM VERTICAL HOLE IN HIGHEST CONTAMINATION AREA.

TOTAL AMOUNT DUE PER ATTACHED $22,272.52

Roland Miller

ROLAND MILLER, DIVISION MANAGER

TOLS011320

ST. LOUIS, MO DIVISION
529 SPIRIT OF ST. LOUIS BLVD.
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ATTENTION: MR. J. DENAHM

TERMS: Net 30 days from date of invoice. SERVICE CHARGE: A service charge of two (2%) percent per month shall be charged to all balances not paid within the terms of sale.

TO INVOICE YOU FOR SERVICES NECESSARY FOR DRILLING AND INSTALLATION OF MONITOR WELLS, REMOVAL OF CONTAMINATED CONCRETE WALL AND DRILLING AND SAMPLING FROM VERTICAL HOLE IN HIGHEST CONTAMINATION AREA.

TOTAL AMOUNT DUE PER ATTACHED $22,272.52

Roland Miller

ROLAND MILLER, DIVISION MANAGER

ST. LOUIS, MO DIVISION
529 SPIRIT OF ST. LOUIS BLVD.
CHESTERFIELD, MO 63017 • 314-532-7660

RICHMOND, CA DIVISION
230 CUTTING BLVD.
RICHMOND, CA 94802 • 415-234-7400

RIEDEL ENVIRONMENTAL SERVICES IS A DIVISION OF RIEDEL INTERNATIONAL, INC.

• Ship Assisting • Towing • Barging • Land and Water Cranes • Marine Salvage • Hydraulic, Bucket and Clamshell Dredging • Cofferdams •
• Submarine Pipelines • Land Reclamation • Marine Construction • Piledriving • Intakes and Outfalls • Land and Water Substructures •
• Readymix Concrete • Sand and Gravel • Crushed Rock • Fill Material • Asphalt • Truck-Rail-Barge Delivery • Oil Spill Clean-up •
• Building Materials • Complete Environmental Services •

TOLS011321

BZTO104(e)048154

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-8111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Wed 12/11/85

P.O. #

EES JOB # 8218

ATTN:

JOB TIME: TO

DESCRIPTION OF WORK Items not billed yet

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

TOLS011322

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Columbia Labs - 12 Samples	1 Job	1304.10	1304.10
Parking Fee 10/10	1 ea	3.45	3.45
Federal Express Airbill # 045042270	1 Job	16.10	16.10
Pails/ Bentonite Pellets PO# 51754	5 ea	12.32	61.60
Coffee Labs - 18 Samples PO# 17694	1 Job	931.50	931.50

'C' TOTAL 2316.75

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82 OFFICE COPY

'A' TOTAL	0
'B' TOTAL	0
'C' TOTAL	2316.75
GRAND TOTAL	2316.75

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Co.
2737 W. Commodore Way
Seattle WA 98199
ATTN: Mr. J. Demaree

DAY & DATE 12/10/85
P.O. #
EES JOB # 8218
JOB TIME: ____ TO ____

DESCRIPTION OF WORK

LABOR Date	NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
10/10/85	R.N. Smith		Hydrologist/	3	60/hr	180				180 00
10/11/85	" "		Proj. Mngr	1	"	60				60 00
10/24	" "		" "	1½	60	90				90 00
			" "							
11/1	" "		" "	2	60	120				120 00
11/2	" "		" "	3	"	180				180 00
11/4	" "		" "	2	"	120				120 00
11/5	" "		" "	4	"	240				240 00
11/11	" "		" "	1	"	60				60 00
11/12	" "		" "	1	"	60				60 00
11/14	" "		" "	1	"	60				60 00
12/10	" "		" "	1½	"	90				90 00
								'A' TOTAL		1,260 00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
				'B' TOTAL	0

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
TOLS011323			
		'C' TOTAL	0

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: R. N. Smith DATE 12/10/85

EES 002/5 10/82

OFFICE COPY

'A' TOTAL	1,260 00
'B' TOTAL	0
'C' TOTAL	0
GRAND TOTAL	1,260 00

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Tuesday, 11/05/85

P.O. #

EES JOB # 8212

ATTN:

JOB TIME: TO

DESCRIPTION OF WORK Page 2

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

TOLS011324

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Rubber Boots	4	30.50	122.00
4" PVC Casing (Perforated)	5 FT	5.46	27.30
4" PVC Casing (Blank)	38 FT	1.79	68.02
4" PVC Caps	2	5.58	11.16
Monterey Sand (100 lb)	25	5.50	137.50
Cement (96 lb bags)	2	5.26	10.52
Bentonite (50 lb)	3	7.25	21.75
		'C' TOTAL	398.25

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: Stu Rynnon DATE 11/05/85

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82 OFFICE COPY

'A' TOTAL	0
'B' TOTAL	0
'C' TOTAL	398.25
GRAND TOTAL	398.25

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ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Tuesday, 11/05/85

P.O. #

EES JOB # 8212

ATTN:

JOB TIME: 0730 TO 1730

DESCRIPTION OF WORK Place PVC casing and sandpack in vertical well, decon equipment and move off site.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
STU Ryman		Foreman	8	40.00	320.00	1½	52.00	78.00	398.00
Dan Nelson	1300/1800	SPC 1	5	33.00	165.00				165.00

'A' TOTAL 563.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	Utility Truck	1	1 Day	85.00/day	85.00
92-101	Drill Rig	1	6 hrs	140.00	840.00
95-042	Steam Cleaner	1	3 hrs	15.00/hr	45.00
-931	Boom Truck	1	½ Day	105.00/day	52.50
	Decontamination Trailer	1	1 Day	75.00/day	75.00
			TOLS011325		
					1097.50

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Acid Suits (Non-exploded)	2	50.00	100.00
Tyvek	7	4.00	28.00
Respirators	2	12.50	25.00
Cartridges (sets)	4	7.35	29.40
Outer Gloves	4	4.00	16.00
Inner Gloves	6	1.00	6.00
Foul Weather Gear	2	4.60	9.20
		'C' TOTAL	213.60

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: Stu Ryman DATE 11/05/85

CUSTOMER:

RECEIVED BY: DATE

'A' TOTAL	563.00
'B' TOTAL	1097.50
'C' TOTAL	213.60
GRAND TOTAL	1874.10

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ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-8111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Monday, 11/04/85

P.O. #

EES JOB # 8218

ATTN:

JOB TIME: 0730 TO 1630

DESCRIPTION OF WORK Page 2

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Rubber Boots	3	N/C	N/C
Split Spoon Sampler (Soil Sampler)	1/day	50.00	50.00
	TOLS011326		

'C' TOTAL 50.00

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: SDU Ryman DATE 11/04/85

CUSTOMER:

RECEIVED BY: DATE

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'A' TOTAL	0
'B' TOTAL	0
'C' TOTAL	50.00
GRAND TOTAL	50.00

ENVIRONMENTAL EMERGENCY SERVICES CO.
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BUSINESS TELEPHONE 503/285-8111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Monday 11-04-85

P.O. #

EES JOB # 8218

ATTN:

JOB TIME: 0730 TO 1630

DESCRIPTION OF WORK Drilling vertical hole in high contamination area.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu Ryman	0800-1630	Foreman	8	40.-	320.-				320.00

'A' TOTAL $ 320.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	Utility Truck	1	1 Day	85.00/d	85.00
92-101	Drill Rig	1	7 hrs.	140.-	980.00
95-042	Steam Cleaner	1	1 hr.	15.00/d	15.00
—	Decon Trailer	1	1 Day	75.00/d	75.00

TOLS011327

'B' TOTAL $ 1,155.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Acid Suit (non-expended)	2	N/C.	N/C.
Tyvek	6	4.00	24.00
Respirators	2	12.50	25.00
Foul weather gear	1	4.60	4.60
Outer gloves	3	4.00	12.00
Inner gloves	6	1.00	6.00
Respirator Cartridges (sets)	4	7.35	29.40

'C' TOTAL $ 101.00

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: DATE

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'A' TOTAL	$ 320.00
'B' TOTAL	1,155.00
'C' TOTAL	101.00
GRAND TOTAL	$ 1576.00

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ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Friday, 11/01/85

P.O. #

EES JOB # 8218

ATTN:

JOB TIME: 0730 TO 1700

DESCRIPTION OF WORK Page 2

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Split Spoon Sampler (Soil Sampler)	1/day	50.00	50.00
Sample Jars (32 oz)	22	.82	18.04

TOLS011328

'C' TOTAL 68.04

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: Stu Ryman DATE 11/01/85

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82 OFFICE COPY

'A' TOTAL	-0-
'B' TOTAL	-0-
'C' TOTAL	68.04
GRAND TOTAL	68.04

ENVIRONMENTAL EMERGENCY SERVICES CO.
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P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Friday, 11/01/85

P.O. #

EES JOB # 8218

ATTN:

JOB TIME: 0730 TO 1700

DESCRIPTION OF WORK Drill and sample vertical hole in highest contamination Area

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
STU Ryman	0800/1630	Foreman	8	40.00	320.00				320.00

'A' TOTAL 320.00

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	Utility Truck	1	1 DAY	85.00	85.00
95-042	STEAM Cleaner	1	1 HR	25.00	25.00
92-101	Drill Rig	1	8 HR	140.00	1120.00
	Decontamination Trailer	1	1 DAY	75.00	75.00

TOLS011329

'B' TOTAL 1295.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Aerin Suit (Non-Expended)	2	N/C	N/C
Tyvek	6	4.00	24.00
Respirator	2	12.50	25.00
Cartridges	4	7.35	29.40
Inner Gloves	6	1.00	6.00
Outer Gloves	3	4.00	12.00
Rubber Boots	3	N/C	N/C

'C' TOTAL 96.40

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: STU Ryman DATE 11/01/85

CUSTOMER:

RECEIVED BY: DATE

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'A' TOTAL	320.00
'B' TOTAL	1295.00
'C' TOTAL	96.40
GRAND TOTAL	1711.40

BZTO104(e)048162

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Thursday, 10/31/85

P.O. #

EES JOB # 8218

ATTN:

JOB TIME: 0730 TO 1730

DESCRIPTION OF WORK Page 2

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

TOLS011330

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Monterey Sand	11	5.50	60.50
Bentonite	4 1/2	7.25	32.63
Cement	2	5.26	10.52
4" Perf. PVC casing	10'	5.46	54.60
4" Blank PVC casing	13'	1.79	23.27
4" PVC cap	2	5.58	11.16
Split spoon samplers (Soil Samplers)	1/day	50.00	50.00
		'C' TOTAL	242.68

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: Stu Ryman DATE 10/31/85

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82 OFFICE COPY

'A' TOTAL	~~0~~
'B' TOTAL	~~0~~
'C' TOTAL	242.68
GRAND TOTAL	242.68

BZTO104(e)048163

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Sine Oil

DAY & DATE Thursday 10/31/85

P.O. #

EES JOB # 8218

ATTN:

JOB TIME: 0730 TO 1730

DESCRIPTION OF WORK Drill third 45° angle hole beneath building. Place and pack 4" PVC casing

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu Ryman	0800/1700	Foreman	8	40.-	320.-	1/2	52.-	26.-	346.00

'A' TOTAL $346.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	Utility Truck	1	1 Day	85.-	85.00
95-042	Steam Cleaner	1	1 Hr.	15.-	15.00
92-101	Drill Rig	1	8 Hr.	140.-	1,120.00
	Decon Trailer	1	1 Day	75.-	75.00

TOLS011331

'B' TOTAL $1,295.-

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Acid Suit (non-expended)	2	N/C	N/C
Tyvek	6	4.-	24.-
Respirator	2	12.50	25.-
Cartridges	4	7.35	29.40
Inner Gloves	6	1.-	6.-
Outer Gloves	3	4.-	12.-
Rubber Boots	3	N/C	N/C

'C' TOTAL $96.40

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82 OFFICE COPY

'A' TOTAL	$346.00
'B' TOTAL	1,295.00
'C' TOTAL	96.40
GRAND TOTAL	$1,737.40

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-8111

DAILY WORK REPORT

TO: Time Oil

ATTN:

DAY & DATE Wednesday, 10/30/85

P.O. #

EES JOB # 8218

JOB TIME: 0730 TO 1800

DESCRIPTION OF WORK Page 2

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

TOLS011332

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Monterey Sand	9	5.50	49.50
Bentonite	2	7.25	14.50
Cement	2	5.26	10.52
4" Perforated PVC casing	10 Foot	5.46	54.60
4" Blank PVC casing	13 Foot	1.79	23.27
4" PVC caps	2	5.58	11.16
Split Spoon Sampler (Soil Sampler)	1 / 1 day	50.00	50.00
		'C' TOTAL	213.55

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: Stu Ryman DATE 10/30/85

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82 OFFICE COPY

'A' TOTAL	-0-
'B' TOTAL	-0-
'C' TOTAL	213.55
GRAND TOTAL	213.55

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Wednesday 10/30/85

P.O. #

EES JOB # 8218

ATTN:

JOB TIME: 0730 TO 1800

DESCRIPTION OF WORK Drilling second 45° hole under building. Place and pack 4" PVC casing.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu Ryman	0730/1730	Foreman	8	40.00	320.00	1½	52.00	78.00	398.00
								'A' TOTAL	398.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
91-054	Utility Truck	1	1 DAY	85.00	85.00
95-042	Steam Cleaner	1	1 Hr	25.00	25.00
92-101	Drill Rig	1	8 Hr	140.00	1120.00
	Decontamination Trailer	1	1 DAY	75.00	75.00
					1295.00

TOLS011333

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Acid Suit (Non-Expended)	2	15.00	30.00
Tyvek	6	4.00	24.00
Respirator	2	12.50	25.00
Cartridges (Sets)	4	7.35	29.40
Rubber Boots	3	30.50	91.50
Inner Gloves	6	1.00	6.00
Outer Gloves	3	4.00	12.00
		'C' TOTAL	217.90

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: Stu Ryman DATE 10/30/85

CUSTOMER:

RECEIVED BY: DATE

EES 002/S 10/82 OFFICE COPY

'A' TOTAL	398.00
'B' TOTAL	1295.00
'C' TOTAL	217.90
GRAND TOTAL	1910.90

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ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Tuesday, 10/29/85

P.O. #

EES JOB # 8218

ATTN:

JOB TIME: 0730 TO 1800

DESCRIPTION OF WORK Page 3

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Cement (Bags)	2	5.26	10.52
	TOLS011334		

'C' TOTAL 10.52

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: Stu Ryman DATE 10/29/85

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82 OFFICE COPY

'A' TOTAL	~~0~~
'B' TOTAL	~~0~~
'C' TOTAL	10.52
GRAND TOTAL	10.52

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil
2737 W. Commodore Way
Seattle, WA. 98199
ATTN: John Denahm

DAY & DATE Tuesday 10-29-85
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1800

DESCRIPTION OF WORK

Page 2

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL -0-

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

TOLS011335

'B' TOTAL -0-

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Outer gloves	3	4.00	12.00
#8 Monterey Sand	10 Bags	5.50	55.00
4" Perforated PVC Casing	10 ft.	5.46	54.60
4" Blank PVC Casing	13 ft.	1.79	23.27
4" PVC Caps	2	5.58	11.16
Split Spoon Sampler (Soil)	1 day	50.00	50.00
Bentonite (Bags)	2	7.25	14.50

'C' TOTAL $ 170.53

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: DATE

EES 002/S 10/82 OFFICE COPY

'A' TOTAL	
'B' TOTAL	
'C' TOTAL	
GR	

BZTO104(e)048168

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P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-8111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, WA. 98199
ATTN: J. Denahm

DAY & DATE 10/29/85
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1800

DESCRIPTION OF WORK Drill Angle hole beneath building, place PVC casing

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu Rymer	0730-1730	Foreman	8	40.-	320.-	1	52.-	52.-	372.00

'A' TOTAL $372.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-034	Utility Truck	1	1 Day	85.-	85.-
95-042	Steam Cleaner	1	3 hrs.	15.-	45.-
92-101	Drill Rig	1	8 hrs.	140.-	1,120.-
	Deion Trailer	1	1 Day	75.-	75.-

TOLS011336

'B' TOTAL $1,325.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Acid Suit	2	50.00	100.00
Jyvek	6	4.00	24.00
Respirator	2	12.50	25.00
Cartridges (sets)	4	7.35	29.40
Foul Weather Gear	1	4.60	4.60
Rubber boots	3	32.00	96.00
Inner Gloves	6	1.00	6.00

'C' TOTAL $285.00

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82 OFFICE COPY

'A' TOTAL	$372.00
'B' TOTAL	1,325.00
'C' TOTAL	285.00
GRAND TOTAL	$1,982.00

BZTO104(e)048169

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/286-9111

DAILY WORK REPORT

TO: Tosco Oil Co.
2737 W. Commodore Way
Seattle, WA 98199
ATTN: J. Denham

DAY & DATE 10/28/85
P.O. #
EES JOB # 8218
JOB TIME: 0800 TO 1700

DESCRIPTION OF WORK Prepare Site & Set up Drill Rig.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Joe McAllum	0800/1700	Spc 1	8	33.00	264.00	1/2	42.00	21.00	306.00
Stu Ryman	0800/1700	Foreman	8	40.00	320.00	1/2	26.00	26.00	372.00
							'A' TOTAL		678.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
F/-054	Utility Truck	1	1 Day	85.00	85.00
	Decon Trailer	1	1 Day	75.00	75.00
95.042	Steam cleaner	1	1 hr	15.00	15.00
				'B' TOTAL	175.00

TOLS011337

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Case 450 Crawler Tractor (Rental)	1	241.50	241.50
Tyvek	4	4.00	16.00
Respirator	2	12.50	25.00
Rubber Gloves	4	1.00	4.00
Cloth Gloves	4	4.00	16.00
Rubber Boots	2	30.50	61.00
Cartridges	4	7.35	29.40
		'C' TOTAL	392.90

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: K. A. Smith DATE 12/8/85

EES 002/5 10/82

OFFICE COPY

'A' TOTAL	678.00
'B' TOTAL	175.00
'C' TOTAL	392.90
GRAND TOTAL	1,245.90

BZTO104(e)048170

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-8111

DAILY WORK REPORT

TO: TIME OIL

DAY & DATE Sat 10/26/85

P.O. #

EES JOB # 8121-3011

ATTN:

JOB TIME: 1000 TO 1500

DESCRIPTION OF WORK Decontaminate Equipment used for removal of concrete wall

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
C. HAMMOND	1000/1500	PCS II	—	—		5	27.00	135.00	135.00

'A' TOTAL 135.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-907	1 TON STAKE BED TRUCK	1	2 HRS	10.63	21.26
	5 KW GENERATOR	1	5 HRS.	8.13	40.65
	LANDA STEAM CLEANER	1	5 HRS	25.00	125.00

TOLS011338

'B' TOTAL 186.91

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
TYVEK COVERALLS	1	4.00	4.00
OUTER GLOVES	1 PR	4.00	4.00
ACID BOOTS	1 PR	1.00	1.00
GARDEN HOSE	150'	N/C	N/C
~~5 KW GENERATOR~~	1	N/C	N/C
EXTENSION CORD	200'	N/C	N/C

'C' TOTAL 9.00

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: C. Hammond DATE

CUSTOMER:

RECEIVED BY: [signature] DATE 10/28/85

EES 002/5 10/82 OFFICE COPY

'A' TOTAL	135.00
'B' TOTAL	186.91
'C' TOTAL	9.00
GRAND TOTAL	330.91

BZTO104(e)048171

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

ATTN:

DAY & DATE: Friday 10-25-85

P.O. #

EES JOB #: 8121/3011

JOB TIME: 0800 TO 1430

DESCRIPTION OF WORK: Load equip & set up for drilling operation

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
McCallum	0800-1200 1230-1430	PCSI	6.0	33.00	198.00				198.00

'A' TOTAL 198.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-931	Boom Truck	1	2.0HR	13.13	26.26

'B' TOTAL 26.26

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

TOLS011339

'C' TOTAL 0

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: [signature] DATE 10-25-85

CUSTOMER:

RECEIVED BY: [signature] DATE 11/2/85

'A' TOTAL	198.00
'B' TOTAL	26.26
'C' TOTAL	0
GRAND TOTAL	224.26

EES 002/5 10/82

OFFICE COPY

BZTO104(e)048172

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil

DAY & DATE Friday 10/2-85

P.O. #

EES JOB # 8121-3011

ATTN:

JOB TIME: [illegible] TO [illegible]

DESCRIPTION OF WORK Remove existing wall (concrete) and stockpile on site.

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
C. Hammond	0800/1800	PCS II	8	27.00	216.00	2	36.00	72.00	288.00
T. Layton	0800/1800	PCS III	8	27.00	216.00	2	36.00	72.00	288.00
Haz Pay	—	—	14	2.50	35.00				35.00

'A' TOTAL 611.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-907	1 Ton Stake Bed truck	1	2 HRS	10.63	21.26
(Est)	Case 450C Loader (Power Rents PO# 51733)	1	1 day	201.25	201.25
72-202	Decon Trailer	1	7 hrs	9.38	65.66
	Full Face Respirator	2	1 day	12.50	25.00
Est	Chop Saw	1	1 day	31.05	31.05
	Hand Tools	1	2 mcn	1.00	2.00
	Cutting Torch Set	1	1 day	N/C	N/C

TOLS011340

'B' TOTAL 346.22

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek Coveralls	4	4.00	16.00
Combo Cartridges	4	7.35	29.40
Inner Gloves	4	1.00	4.00
Outer Gloves	2	4.00	8.00
Boots	2	30.50	61.00
Duct Tape	½ roll	4.20	2.10
Chop Saw Blades (Interstate Rental) (Est)	4	10.29	41.16

'C' TOTAL 161.66

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: DATE

CUSTOMER:

RECEIVED BY: [signature] DATE 12/9/85

EES 002/5 10/82

OFFICE COPY

'A' TOTAL	611.00
'B' TOTAL	346.22
'C' TOTAL	161.66
GRAND TOTAL	1118.88

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Co.
2737 W. Commodore Way
Seattle WA. 98199
ATTN: John Denahm

DAY & DATE 10/24/85
P.O. #
EES JOB # 8218
JOB TIME: 1230 TO 1630

DESCRIPTION OF WORK Assemble materials for Job and Load Truck

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Joe McCallum	1230/1630	Spec I	4	33	132				132 00

'A' TOTAL 132 00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL 0

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
	TOLS011341		

'C' TOTAL 0

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: DATE
CUSTOMER:
RECEIVED BY: [signature] DATE 10/10/85

'A' TOTAL	132 00
'B' TOTAL	0
'C' TOTAL	0
GRAND TOTAL	132 00

EES 002/5 10/82 OFFICE COPY

BZTO104(e)048174

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: TIME OIL
12005 N BURGARD RD
PORT OR
ATTN:

DAY & DATE 10/24/85 THURS
P.O. #
EES JOB # 8121-3011
JOB TIME: 0800 TO 1630

DESCRIPTION OF WORK Sandblast and remove existing concrete wall

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
C HAMMOND	0800/1630	PCS III	8	33.00	264.00				264.00
B MATSON	0800/1630	PCS III	8	27.00	216.00				216.00
Haz Pay	—	—	12	2.50	30.00				30.00

'A' TOTAL 510.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-907	1 Ton Stake BED Truck	1	2 hrs.	10.63	21.26
(Est)	Case 580D Backhoe (Stan Rentals)	1	1 DAY	201.25	201.25
	Jack Hammer	1	1 DAY	10.35	10.35
	Air Compressor	1	1 DAY	90.00	90.00
(Est)	Sand Blaster	1	1 DAY	46.00	46.00
(Est)	Chop-saw (Interstate)	1	1 DAY	31.05	31.05
72-202	Decon Trailer	1	6 hrs	9.38	56.28
	Full Face Respirator	2	1 day	12.50	25.00
	Hand Tools	2	1 day	1.00	2.00
	Air Hose	100ft	1 day	30.00	30.00
	Cutting Torch Set	1	1 day	N/C	N/C

'B' TOTAL 513.19

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
4 TYVEK Coveralls	4	4.00	16.00
4 PR Inner Gloves	4	1.00	4.00
2 PR Outer (PVC) Gloves	2	4.00	8.00
4 combo cartriges	4	7.35	29.40
Duct Tape	½ roll	4.20	2.10
TOLS011342			

'C' TOTAL 59.50

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: [signature] DATE 10/24/85

CUSTOMER:

RECEIVED BY: [signature] DATE 11/2/85

EES 002/8 10/82 OFFICE COPY

'A' TOTAL	510.00
'B' TOTAL	513.19
'C' TOTAL	59.50
GRAND TOTAL	1082.69

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-8111

DAILY WORK REPORT

TO: TIME OIL CO

DAY & DATE WED 10-23-85

P.O. #

EES JOB # 8121-3011

ATTN:

JOB TIME: 0800 TO 1630

DESCRIPTION OF WORK Clean & Remove contaminated wall

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
D. NELSON	0800/1630	PCS I	8	33.00	264.00				264.00
C. HAMMOND	0800/1630	PCS II	8	27.00	216.00				216.00
Haz Pay	—	—	14	2.50	35.00				35.00

'A' TOTAL 515.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-907	ITOH ~~STAKE BED~~ TRUCK	1	2 hrs	10.63	21.26
72-202	Decon Trailer	1	7 hrs	9.38	65.66
	Full Face Respirator	2	1 day	12.50	25.00
	Hand Tools	2	1 day	1.00	2.00
	Air Compressor	1	1 day	90.00	90.00
(Est)	Sand blaster	1	1 day	46.00	46.00
	Jack hammer	1	1 day	10.35	10.35
	Air hose	100 ft	1 day	30.00	30.00
	~~Torch~~ CUTTING Torch Set	1	1 day	N/C	N/C

'B' TOTAL 290.27

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
BLASTING SAND	20 BAGS	3.62	72.40
Trucks	4	4.00	16.00
Inner gloves	4	1.00	4.00
Outer gloves	2	4.00	8.00
Duct Tape	½ roll	4.20	2.10
Cumbo Cartridges	4	7.35	29.40

TOLS011343

'C' TOTAL 131.90

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: D. Nelson DATE 10-23-85

CUSTOMER:

RECEIVED BY: [signature] DATE 11/2/85

EES 002/5 10/82

OFFICE COPY

'A' TOTAL	515.00
'B' TOTAL	290.27
'C' TOTAL	131.90
GRAND TOTAL	937.17

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: TIME Oil CO

DAY & DATE TUES 10-22-85

P.O. #

EES JOB # 8121-3011

ATTN:

JOB TIME: 0800 TO 1630

DESCRIPTION OF WORK CLEAN PCB CONTAMINATED WALL

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
D NELSON	0800/1630	PCS I	8	33.00	264.00				264.00
C HAMMOND	0800/1530	PCS III	7	27.00	189.00				189.00
Haz Pay	—	—	10	2.50	25.00				25.00

'A' TOTAL 478.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-157	4X4 Pick up	1	2 HR	10.63	21.26
	2" TRASH PUMP w/hose	1	1 HR	7.50	7.50
72-202	Decon Trailer	1	5 hrs	9.38	46.90
(Est)	Air Compressor (Interstate Rental)	1	1 day	90.00	90.00
(Est)	Sand Blaster " "	1	1 day	46.00	46.00
	Air Hose " "	100 ft	1 day	30.00	30.00
	Jack hammer (MAINE Manor warehouse)	1	1 day	10.35	10.35
	—	—	—	—	—
	Full Face Respirators	2	1 day	12.50	25.00
	Hand Tools	2 men	1 day	1.00	2.00
	combo Cartridges	1	1 day	7.35	29.40
	Cutting Torch Set	1		'B' TOTAL	308.41

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Visqueen	1 roll	38.00	38.00
Blasting Sand (Main warehouse)	10	3.62	36.20
Tyvek	4	4.00	16.00
Inner gloves	4	1.00	4.00
outer gloves	2	4.00	8.00
Duct Tape	½ roll	4.20	2.10
		'C' TOTAL	104.30

TOLS011344

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: D. Nelson DATE

CUSTOMER:

RECEIVED BY: [signature] DATE 11/2/85

EES 002/5 10/82

OFFICE COPY

'A' TOTAL	478.00
'B' TOTAL	308.41
'C' TOTAL	104.30
GRAND TOTAL	890.71

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-8111

DAILY WORK REPORT

TO: TIME OIL CO

ATTN:

DAY & DATE MON OCT 21-85

P.O. #

EES JOB # 8121-3011

JOB TIME: 0800 TO 1630

DESCRIPTION OF WORK Remove contaminated soil from base of wall

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
D NELSON	0800/1630	PCS I	8	33.00	264.00				264.00
C. HAMMOND	0800/1600	PCS III	8	27.00	216.00				216.00
Crew Haz. Pay.	—	—	10 hrs.	2.50	25.00				25.00
								'A' TOTAL	505.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
21-151	4x4 PICK UP	1	2 HR	10.63	21.26
72-202	DECON TRAILER	1	4 HR	9.38	37.52
	Hand Tools	2	1 men	1.00	2.00
		—	—	—	—
	Full Face Respirator	2 ea	½ day	12.50	12.50
	Cutting Torch Set	1	½ day	—	N/C
				'B' TOTAL	73.28

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
		—	—
Tyvek's coveral	4	4.00	16.00
Acid suites	2	50.00	100.00
Inner gloves	4	1.00	4.00
outer Gloves TOLS011345	2	4.00	8.00
Combo Cartridges	4	7.35	29.40
Duct Tape	½ roll	4.20	2.20
		'C' TOTAL	159.60

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: D Nelson DATE 10/21/85

CUSTOMER:

RECEIVED BY: [signature] DATE 11/2/85

EES 002/5 10/82

OFFICE COPY

'A' TOTAL	505.00
'B' TOTAL	73.28
'C' TOTAL	159.60
GRAND TOTAL	737.88

TIME OIL CO.

P.O.BOX 24447 TERM. STATION - SEATTLE WA 98124-0447
2737 WEST COMMODORE WAY - SEATTLE WA 98199-1233
PHONE (206) 285-2400

INVOICE 091868

DATE 03/06/86
REF. 03-03028 JKJ

CUSTOMER #: 03/05505623

ACCOUNT:
KOPPERS COMPANY INC
ATTN: DONALD F. MARION
KOPPERS BUILDING ROOM 750
PITTSBURGH PA 15219

657 60 123 27831.21
120 9 14250.00

TO CHARGE YOU FOR 1/2 OF THE FOLLOWING PER MUTUAL AGREEMENT IN REFERENCE TO CLEAN UP COSTS AT 12005 N. BURGARD RD., PORTLAND, OREGON.

EXPENDITURES

4/26/85 CHEM-SECURITY SYSTEMS	
(LABORATORY ANALYSIS OF SOIL SAMPLES)	150.00
7/10/85 NORTHWEST VACUUM TRUCK SERVICE	
(RELOCATING 242.76 TONS OF SOIL TO ARLINGTON)	9,000.00
7/29/85 CHEM-SECURITY SYSTEMS	
(RECEIVING 243.30 TONS OF SOIL AT ARLINGTON)	27,270.88
8/8/85 ENVIRONMENTAL EMERGENCY SERVICES	
(OBTAIN AND ANALYZE 3 COMPOSITE SAMPLES)	← 500.00
12/31/85 ENVIRONMENTAL EMERGENCY SERVICES	
(PRIMARY SAMPLING AND ANALYSIS PLUS REPORT)	18,741.55 ✓
	55,662.43

COMMITTMENTS

DEQ PER OAR 240-102-065	3,500.00
*RIEDEL ENVIRONMENTAL SERVICES (ADMENDMENT 2)	25,000.00+
	84,162.43
50% =	42,081.21

*NAME CHANGE FROM ENVIRONMENTAL EMERGENCY SERVICES

INVOICE TOTAL $42,081.21

TOLS011346

OFFICE/INVENTORY

TDP 190 REV. 8/82

BZTO104(e)048179

TIME OIL CO.

P.O.BOX 24447 TERM. STATION - SEATTLE WA 98124-0447
2737 WEST COMMODORE WAY - SEATTLE WA 98199-1233
PHONE (206) 285-2400

INVOICE 091868

DATE 03/06/86
REF. 03-03028 JKJ

CUSTOMER #: 03/05505623

ACCOUNT: 657 60 123 27831.21
KOPPERS COMPANY INC 120 9 14250.00
ATTN: DONALD F. MARION
KOPPERS BUILDING ROOM 750
PITTSBURGH PA 15219

- -

TO CHARGE YOU FOR 1/2 OF THE FOLLOWING PER MUTUAL AGREEMENT IN REFERENCE TO CLEAN UP COSTS AT 12005 N. BURGARD RD., PORTLAND, OREGON.

EXPENDITURES

4/26/85 CHEM-SECURITY SYSTEMS		
(LABORATORY ANALYSIS OF SOIL SAMPLES)	150.00	
7/10/85 NORTHWEST VACUUM TRUCK SERVICE		
(RELOCATING 242.76 TONS OF SOIL TO ARLINGTON)	9,000.00	
7/29/85 CHEM-SECURITY SYSTEMS		
(RECEIVING 243.30 TONS OF SOIL AT ARLINGTON)	27,270.88	
8/8/85 ENVIRONMENTAL EMERGENCY SERVICES		
(OBTAIN AND ANALYZE 3 COMPOSITE SAMPLES)	← 500.00	
12/31/85 ENVIRONMENTAL EMERGENCY SERVICES		
(PRIMARY SAMPLING AND ANALYSIS PLUS REPORT)	18,741.55	
	55,662.43	

COMMITTMENTS

DEQ PER OAR 240-102-065	3,500.00	
*RIEDEL ENVIRONMENTAL SERVICES (ADMENDMENT 2)	25,000.00+	
	84,162.43	
50% =		42,081.21

*NAME CHANGE FROM ENVIRONMENTAL EMERGENCY SERVICES

INVOICE TOTAL $42,081.21

TOLS011347

SEE REVERSE SIDE FOR GENERAL TERMS AND CONDITIONS

ORIGINAL

BZTO104(e)048180

PHONE 285-2400
CABLE ADDRESS: TIMOIL

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
SAN PEDRO
LOS ANGELES

PRODUCTS TIME TESTED

TIME OIL COMPANY

2737 W. COMMODORE WAY, P.O. BOX 24447, TERMINAL ANNEX, SEATTLE, WA 98124

February 19, 1986

Koppers Company, Inc.
Attn: Donald F. Marion
Forest Products Group
Koppers Building, Room 750
Pittsburgh, PA 15219

Dear Don:

This refers to our mutual problem of pentachlorophenol contamination at 12005 North Burgard Road in Portland Oregon.

During our January 23, 1986 meeting at your offices in Pittsburgh, you mentioned that Koppers would agree to paying half the clean-up costs incurred/committed to date and that further coordination between Koppers and Time would be appropriate for future committments. Time concurs with this approach.

In this light, the below accounting to date will be followed by an invoice two weeks from today unless we hear some objections from you before then.

EXPENDITURES

4/26/85	Chem-Security Systems (Laboratory Analysis of soil sample)	150.00
7/10/85	Northwest Vacuum Truck Service (Relocating 242.76 tons of soil to Arlington)	9,000.00
7/29/85	Chem-Security Systems (Receiving 243.30 tons of soil at Arlington)	27,270.88
8/8/85	Environmental Emergency Services (Obtain and analyze 3 composite samples)	500.00
12/5/85	Environmental Emergency Services (Primary sampling and analysis plus report)	18,741.55
		$55,662.43

TOLS011348

BZTO104(e)048181

COMMITTMENTS

DEQ per OAR 240-102-065	3,500.00
* Riedel Environmental Services (Amendment 2)	25,000.00 +
	$84,162.43
50% =	$42,081.21

* Name change from Environmental Emergency Services

Should you have any questions regarding the above, please give me a call.

Sincerely,

Robert D. Abendroth
Operations Manager

RDA/ch

TOLS011349

BZTO104(e)048182

1/22/86

EXPENDITURES

7/10/85	Northwest Vacuum Truck Service	9000.00
7/29/85	Chem-Security Systems	27270.88
8/8/85	Environmental Emergency Services	500.00
12/5/85	Environmental Emergency Services	18741.55
		55512.43

Due:

DEQ per OAR 340-102-065	3500.00
Riedel Environmental Services (Amendment 2)	25000.00
Whatever is necessary to finish job	??

Total ~~$84,012.43~~ 42,006.43

TOLS011350

BZTO104(e)048183

PHONE 285 [illegible]
CABLE ADDRESS TIMCO

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
SAN PEDRO
LOS ANGELES

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

March 25, 1986

Roland Miller, V.P.
Regional Manager
Environmental Emergency Services
Box 4500 - 67
Portland, OR 97208

Dear Mr. Miller:

The enclosed check 160461, in the amount of $17,252.67, is forwarded as payment in full for services rendered as stated on your invoice 3-2044, dated 3/11/86.

Thank you for the work done.

Sincerely,

John P. Denham

John P. Denham
Environmental Manager

Enclosure a/s

JPD/ch

TOLS011351

160461

17,252.67

03/24/96 .00
160461 TOTAL 17,252.67

160461

PRODUCTS TIME TESTED

03/24/96

****17,252.67 ****17,252.67

ENVIRONMENTAL EMERGENCY
SERVICES
BOX 4500-07
PORTLAND OR 97208

VOID AFTER 6 MONTHS

⑈00160461⑈ ⑆021308176⑆ 30991597⑈

TOLS011352

TIME OIL CO.
SEATTLE, WASHINGTON

CHECK REQUEST

DATE: March 18, 1986

ISSUE CHECK TO COVER THE FOLLOWING:

PAYEE: Environmental Emergency Services $ 17,252.67

ADDRESS: P.O. Box 4500-67
Portland, OR 97208

REASON FOR PAYMENT:

Amendment II of the Agreement with Riedel (Koppers Co.).

REQUESTED BY: John L. Denham CHARGE ACCOUNT NO. _____

PAYMENT SCHEDULE

TODAY (or) ☐

SPECIFY DATE March 25, 1986 [X]

CHECK # _____

VOUCHER # _____

_____
APPROVED

_____
APPROVED

Please send check to Colleen. Thanks!!

TAP 140 REV. 3-82

TOLS011353

BZTO104(e)048186

INVOICE

"Imagineering a better world"

"COMPLETE OIL AND HAZARDOUS MATERIAL SPILL CLEANUP SERVICE"

ENVIRONMENTAL EMERGENCY SERVICES

A DIVISION OF RIEDEL INTERNATIONAL, INC. • 4555 N. CHANNEL AVE. PORTLAND, OR 97208
REMIT TO: P O. BOX 3320
24 HOUR PHONE SERVICE AND 2-WAY RADIO DISPATCHED SERVICE
HOT LINE: OUTSIDE OREGON (800) 547-0792
OREGON ONLY (800) 452-0769
BUSINESS PHONE: (503) 285-9111
TELEX. 151403

TIME OIL
2737 WEST COMMODORE WAY
SEATTLE, WA. 98199

DATE: 3/11/86

YOUR NO:

INVOICE NO: 3-2044

JOB NO: 8218

ATTENTION: MR. J. DENHAM

TERMS: NET CASH

TO INVOICE YOU FOR SERVICES PER AMENDMENT II OF THE AGREEMENT BETWEEN TIME OIL COMPANY AND RIEDEL ENVIRONMENTAL SERVICES TO ACCOMPLISH TASKS 1 (SANDBLASTING AND DEMOLITION OF IMPOUNDMENT WALL) AND TASK 2 (DRILLING, SAMPLING AND INSTALLATION OF 3 MONITORING WELLS AND ONE 40' VERTICAL WALL).

TASK 1: SANDBLASTING & DEMOLITION OF IMPOUNDMENT WALL $4,620.57

TASK 2: DRILLING, SAMPLING AND INSTALLING WELLS.....$12,632.10

TOTAL AMOUNT DUE THIS INVOICE $17,252.67

TOLS011354

Roland Miller
ROLAND MILLER; V.P., REGIONAL MANAGER

Please Remit To:
Box 4500-67
Portland, OR 97208

ST. LOUIS, MO DIVISION
529 MERCURY BLVD.
CHESTERFIELD, MO 63017 • 314-532-7660

RICHMOND, CA DIVISION
230 CUTTING BLVD.
RICHMOND, CA 94802 • 415-234-7400

WESTERN-PACIFIC CONSTRUCTION MATERIALS CO. • WILLAMETTE TUG & BARGE CO. • WESTERN-PACIFIC DREDGING CO. • WESTERN-PACIFIC FOUNDATIONS CO.
HYDRAULIC & BUCKET DREDGING • MARINE CONSTRUCTION • PILEDRIVING • SUBMARINE PIPELINES • INTAKES AND OUTFALLS • LAND SUPPLIES
READY-MIX CONCRETE • SAND AND GRAVEL • CRUSHED ROCK • FILL MATERIAL • TRUCK-RAIL-BARGE DE...
LAND & WATER CRANES • SHIP ASSISTING • TOWING • BARGING • MARINE SALVAGE • GENERAL CARGO B...

BZTO104(e)048187

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 W. Commodore Way
Seattle, Washington 98199
ATTN: John Denham

DAY & DATE Saturday 10/26/85
P.O. #
EES JOB # 8218
JOB TIME 1000 TO 1500

DESCRIPTION OF WORK Decontaminate job equipment and Return to Yard

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
C. Hammond	1000-1500	PES III	5	27.00	135.00				135.00

'A' TOTAL 135.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-907	1 ton Stake Bed Truck	1 Ea	2 hr	10.63	21.26
	5 Kw generator	1 Ea	4 hr	8.13	32.52
	High Pressure Washer	1 Ea	4 hr	15.00	60.00

'B' TOTAL 113.78

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek Undergarment	1 Ea	4.00	4.00
Gloves, Outer, PVC	1 Pr	4.00	4.00
Acid Suit, Disposal of Following Job	2 Ea	50.00	100.00
St. 14" Rubber Boots, Disposal of following job	2 Pr	32.00	64.00
			TOLS011355

'C' TOTAL 172.00

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: [signature] DATE 3/10/86
CUSTOMER: Time Oil Co
RECEIVED BY: DATE

EES 002/5 10/82 CUSTOMER COPY

'A' TOTAL	135.00
'B' TOTAL	113.78
	0
'C' TOTAL	172.00
GRAND TOTAL	420.78

BZTO104(e)048188

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 W. Commodore Way
Seattle, Washington 98199
ATTN:

DAY & DATE Friday 10/25/85
P.O. #
EES JOB # 8218
JOB TIME: 0800 TO 1800

DESCRIPTION OF WORK Breakup wall at site and stockpile

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Chris Hammond	0800/1800	RS III	8	27.00	216.00				216.00
Ted Layton	0800/1800	RS III	8	27.00	216.00				216.00

'A' TOTAL 432.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-907	1 ton Stake Bed Truck	1 Ea	2hr	10.63	21.26
	Case 450C loader	1 Ea	1 day	535.67	535.67
72-202	Decon trailer	1 Ea	7 days	9.38	65.66
	Full face respirator	2 Ea	1 day	7.50	15.00
	Hand tools	2 men	1 day	1.00	7.00

TOLS011356

'B' TOTAL 639.59

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek undergarment	4 Ea	4.00	16.00
Respirator Cartridges, GMC-H	4 Ea	7.35	29.40
Gloves, Outer, PVC	2 Pr	4.00	8.00
Gloves, Inner, Layton	4 Pr	1.00	4.00
Duct tape	½ Rl	4.20	2.10

'C' TOTAL 59.50

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: Roland Mills DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE
EES 002/5 10/82 CUSTOMER COPY

'A' TOTAL	432.00
'B' TOTAL	639.59
	—
'C' TOTAL	59.50
	—
GRAND TOTAL	1131.09

BZTO104(e)048189

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 W. Commodore Way
Seattle, Washington 98199
ATTN: John Denham

DAY & DATE Thursday 10/24/85
P.O. #
EES JOB # 8218
JOB TIME: 0800 TO 1630

DESCRIPTION OF WORK Sandblast concrete wall and breakup into sections

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Chris Hammond	0800-1630	PCS III	8	27.00	216.00				216.00
Bob Matson	0800-1630	PCS III	8	27.00	216.00				216.00
								'A' TOTAL	432.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-907	1 ton Stake Bed Truck	1 Ea	2 hr	10.63	21.26
	Case 580D Backhoe	1 Ea	1 day	308.48	308.48
	Jack Hammer	1 Ea	1 day	10.35	10.35
	Sandblaster, air compressor, hose	1 Ea	1 day	83.99	83.99
72-202	Decon Trailer	1 Ea	6 hr	9.38	56.28
	Full face respirator	2 Ea	1 day	7.50	15.00
	Hand tools	2 mm	1 day	1.00	2.00
				'B' TOTAL	497.36

TOLS011357

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek Undergarment	4 Ea	4.00	16.00
Gloves, PVC outer	2 Pr	4.00	8.00
Gloves, Latex inner	4 Pr	1.00	4.00
Respirator Cartridges, GMC-H	4 Ea	7.35	29.40
Duct tape	½ Roll	4.20	2.10
		'C' TOTAL	59.50

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: DGrille DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE

EES 002/5 10/82

CUSTOMER COPY

'A' TOTAL	432.00
'B' TOTAL	497.36
	—
'C' TOTAL	59.50
	—
GRAND TOTAL	988.86

BZTO104(e)048190

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 W. Commodore Way
Seattle, Washington 98199
ATTN: John Denham

DAY & DATE Wednesday 10/23/85
P.O. #
EES JOB # 8218
JOB TIME: 0800 TO 1630

DESCRIPTION OF WORK Sandblast contaminated Concrete wall

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Dan Nelson	0800-1630	PCS I	8	33.00	264.00	—	—	—	264.00
Chris Hammond	0800-1630	PCS III	8	27.00	216.00	—	—	—	216.00

'A' TOTAL 480.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-907	1 ton Stake Bed truck	1 Ea	2 hrs	10.63	21.26
72-202	Decon trailer	1 Ea	7 hrs	9.38	65.66
	Full face Respirators	2 Ea	1 day	7.50	15.00
	Hand tools	2 men	1 day	1.00	2.00
	Air Compressor, Sandblaster, hoses	1 Ea	1 day	83.99	83.99
	Jack Hammer	1 Ea	1 day	10.35	10.35

TOLS011358

'B' TOTAL 198.26

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Sandblasting Sand	20 Bag	3.62	72.40
tyvek undergarment	4 Ea	4.00	16.00
Gloves, PVC Outer	2 Pr	4.00	8.00
Gloves, Laytex Inner	4 Pr	1.00	4.00
Duct tape	1/2 Rl	4.20	2.10
Respirator Cartridges, GMC-H	4 Ea	7.35	29.40

'C' TOTAL 131.90

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: R Eriller DATE 3/10/86
CUSTOMER: Time Oil Co
RECEIVED BY: DATE

'A' TOTAL	480.00
'B' TOTAL	198.26
	—
'C' TOTAL	29.40
	—
GRAND TOTAL	707.66

EES 002/5 10/82

CUSTOMER COPY

BZTO104(e)048191

ENVIRONMENTAL EMERGENCY SERVICES CO.

Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham

DAY & DATE Tuesday 10/22/85
P.O. #
EES JOB # 8218
JOB TIME: 0800 TO 1630

DESCRIPTION OF WORK Sandblast and clean contaminated concrete wall

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Dan Nelson	0800-1630	PCS I	8	33.00	264.00				264.00
Chris Hammond	0800-1630	PCS III	7	27.00	189.00				189.00

'A' TOTAL 453.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-151	4X4 ½ ton Pickup	1 Ea	2 hr	10.63	21.26
	2" trash pump w/hoses	1 Ea	1 hr	7.50	7.50
72-202	Decon trailer	1 Ea	½ day	75.00	37.50
	Air compressor, air hose and Sand blaster	1 unit	1 day		83.99
	Jack Hammer	1 Ea	1 day	10.35	10.35
	Full face respirators	2 Ea	1 day	7.50	15.00
	Hand tools	2 men	1 day	1.00	2.00

TOLS011359

'B' TOTAL 177.60

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Visqueen	1 Rl	38.00	38.00
Sand Blasting Sand	10 Bg	3.62	36.20
Tyvek Undergarment	4	4.00	16.00
Gloves, PVC outer	2	4.00	8.00
Gloves, Latex Inner	4	1.00	4.00
Duct Tape	½ Rl	4.20	2.10
Respirator Cartridges, GMCH	4 Ea	7.35	29.40

'C' TOTAL 133.70

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: [signature] DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE

EES 002/5 10/82

CUSTOMER COPY

'A' TOTAL	453.00
'B' TOTAL	177.60
	—
'C' TOTAL	133.70
	—
GRAND TOTAL	764.30

BZTO104(e)048192

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Texaco Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham - 206-483-2057

DAY & DATE 10/21/85 Monday
P.O. #
EES JOB # 8212
JOB TIME: 0800 TO 1630

DESCRIPTION OF WORK Excavate Contaminated Soil away from concrete Wall to facilitate Sandblasting work

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Dan Nelson	0800-1630	PCS I	8	33.00	264.00				264.00
Chris Hammond	0800-1630	PCS III	8	27.00	216.00				216.00

'A' TOTAL 480.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-151	½ ton 4X4 Pickup	1 Ea	2 hr	10.63	21.26
72-202	Decon trailer	1 Ea	4 hrs	9.38	37.52
	Full face respirator	2 Ea	½ day	7.50	7.50
	Hand Tools	2 men	1 day	1.00	2.00

TOLS011360

'B' TOTAL 68.28

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek undergarment	4 Ea	4.00	16.00
Gloves, PVC outer	2 Pr	4.00	8.00
Gloves, Surgeon liners	4 Pr	1.00	4.00
Respirator Cartridges, GMCH	4 Ea	7.35	29.40
Duct tape	½ Rl	4.20	2.20

'C' TOTAL 59.60

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: R Schuller DATE 3/10/86
CUSTOMER: Texaco Oil Co
RECEIVED BY: DATE

EES 002/5 10/82 CUSTOMER COPY

'A' TOTAL	480.00
'B' TOTAL	68.28
	—
'C' TOTAL	59.60
	—
GRAND TOTAL	607.88

BZTO104(e)048193

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham 206-285-2400

DAY & DATE 12/11/85
P.O. #
EES JOB # 8218
JOB TIME: — TO —

DESCRIPTION OF WORK Laboratory analysis work for liquid and Soil Samples

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL Ø

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL Ø

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Columbia Laboratory - Analysis of 12 Samples	1 Job	1304.10	1304.10
Coffee Laboratory - Analysis of 18 Samples	1 Job	931.50	931.50

TOLS011361

'C' TOTAL 2235.60

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: P.E. Miller DATE 3/10/86
CUSTOMER: Time Oil Company
RECEIVED BY: DATE

EES 002/5 10/82 CUSTOMER COPY

'A' TOTAL	Ø
'B' TOTAL	Ø
	Ø
'C' TOTAL	2235.60
	Ø
GRAND TOTAL	2235.60

BZTO104(e)048194

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham 206-285-2400

DAY & DATE 11/5/85 Tuesday
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1730

DESCRIPTION OF WORK

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu Ryman	0800-1630	Forman							N/C
Greg Westling	0800-1630	Driller							Drill crew
Joe McCallum	0800-1630	Helper							Charged to
									Drill Rig
									Cost

'A' TOTAL 0

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	½ ton Utility Truck	1 Ea	½ day	85.00	42.50
92-101	Cooper Drill Rig	1 Ea	6 hr	140.00	840.00
73-931	2½ ton Crane Truck	1 Ea	½ day	105.00	52.50
72-741	Decon trailer	1 Ea	½ day	75.00	37.50
95-042	High Pressure Washer	1 Ea	3 hr	15.00	45.00
	Respirator, full face	2 Ea	½ day	7.50	7.50

TOLS011362

'B' TOTAL 1025.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Acid Suits, expended and disposed on job	3 Ea	50.00	150.00
14" S.T. Rubber Boots, expended and disposed on job	3 PR	32.00	96.00
Tyvek undergarment	7 Ea	4.00	28.00
Respirator Cartridge, GMCH	4 Ea	7.35	29.40
Gloves, Outer, PVC	4 Pr	3.00	12.00
Gloves, Inner, Nylon	6 PR	1.00	6.00
4" PVC Perforated Casing	5 feet	5.46	27.30

'C' TOTAL 348.70

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: Roland Miller DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE

EES 002/5 10/82 CUSTOMER COPY

'A' TOTAL	0
'B' TOTAL	1025.00
	0
'C' TOTAL	348.70
Pg 2	246.95
GRAND TOTAL	1622.65

BZTO104(e)048195

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham

DAY & DATE 11/5/86 Tuesday
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1730

DESCRIPTION OF WORK Pg 2

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL ~~0~~

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

TOLS011363

'B' TOTAL ~~0~~

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
4" PVC Blank Casing	38 ft	1.79	68.02
4" PVC Caps	2 Ea	5.58	11.16
#8 Monterey Sand (100# Bag)	25 Bag	5.50	137.50
Cement (96# Bag)	2 Bag	5.26	10.52
Bentonite (50# Bag)	3 Bag	7.25	21.75
		'C' TOTAL	248.95

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: [signature] DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE

'A' TOTAL	~~0~~
'B' TOTAL	~~0~~
	~~0~~
'C' TOTAL	248.95
	~~0~~
GRAND TOTAL	248.95

EES 002/5 10/82 CUSTOMER'S COPY

BZTO104(e)048196

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Texaco Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham 206-285-2400

DAY & DATE 11/4/85
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1630

DESCRIPTION OF WORK Drill vertical hole in high contamination area for sampling

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu Ryman	0800-1630	Foreman							N/C
Greg Whetting	0800-1630	Driller							Drillers
Joe McCallum	0800-1630	Helper							Charged to
									drill rig
									cost

'A' TOTAL 0

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	½ ton Utility Truck	1 Ea	1 day	85.00	85.00
92-101	Cougar Drill Rig	1 Ea	7 hr	140.00	980.00
72-741	Decon Unit	1 Ea	1 day	75.00	75.00
95-042	High Pressure Washer	1 Ea	1 hr	15.00	15.00
	Respirator, full face	2 Ea	1 day	7.50	15.00

TOLS011364

'B' TOTAL 1170.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek undergarment	6 Ea	4.00	24.00
Gloves outer, PVC	3 Pr	4.00	12.00
Gloves Inner, Latex	6 Pr	1.00	6.00
Respirator Cartridges, GMCH	4 Ea	7.35	29.40

'C' TOTAL 71.40

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: Roland Miller DATE 3/10/86
CUSTOMER: Texaco Oil Co.
RECEIVED BY: DATE

'A' TOTAL	0
'B' TOTAL	1170.00
	0
'C' TOTAL	71.40
	0
GRAND TOTAL	1241.40

EES 002/5 10/82 CUSTOMER'S COPY

BZTO104(e)048197

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham 206-285-2400

DAY & DATE 11/1/85 Friday
P.O. #
EES JOB # 8212
JOB TIME: 0730 TO 1700

DESCRIPTION OF WORK Drill and Sample Vertical holes in high contamination area

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu Ryman	0800-1630	Forman							N/C
Greg Westling	0800-1630	Driller							Drillcrew
Joe McCallum	0800-1630	Helper							Charged to
									Drill Rig
									Costs

'A' TOTAL Ø

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	½ ton Utility truck	1 Ea	1 day	85.00	85.00
92-101	Auger drill truck	1 Ea	8 hr	140.00	1120.00
72-741	Decon unit	1 Ea	1 day	75.00	75.00
92-042	High Pressure Washer	1 Ea	1 hr	15.00	15.00
	Respirator, full face	2 Ea	1 day	7.50	15.00

TOLS011365

'B' TOTAL 1310.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek, undergarment	6 Ea	4.00	24.00
Respirator Cartridge, GMCH	4 Ea	7.35	29.40
Gloves, Playtex liners	6 PR	1.00	6.00
Gloves, PVC outer	3 PR	4.00	12.00
Sample jars, 32oz	22 Ea	.82	18.04

'C' TOTAL 89.44

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: [illegible] DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE

EES 002/5 10/82 CUSTOMER'S COPY

'A' TOTAL	Ø
'B' TOTAL	1310.00
	Ø
'C' TOTAL	89.44
	Ø
GRAND TOTAL	1399.44

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham 206-285-2400

DAY & DATE 10/31/85
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1730

DESCRIPTION OF WORK Drill Third 45° angle well under building, place 4" PCV Casing and pack

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu Ryman	0730-1730	Forman	—	—	—	—	—	—	N/C
Greg Westling	0730-1730	Driller	—	—	—	—	—	—	drill crew
Joe McCallum	0730-1730	Helper	—	—	—	—	—	—	Charged to
									drill rig
									Costs

'A' TOTAL Ø

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	1/2 ton Utility truck	1 Ea	1 day	85.00	85.00
92-101	Auger drilling truck	1 Ea	8 hr	140.00	1120.00
72-741	Decon Trailer	1 Ea	1 day	75.00	75.00
95-042	High Pressure washer	1 Ea	1 hour	15.00	15.00
	Respirator, full face	2 Ea	1 day	7.50	15.00

TOLS011366

'B' TOTAL 1310.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
tyvek undergarment	6 Ea	4.00	24.00
6MCH Respirator cartridges	4 Ea	7.35	29.40
Gloves, Kaytex inner	6 PR	1.00	6.00
Gloves, PVC outer	3 PR	4.00	12.00
#8 Monterey Sand	11 Bag	5.50	60.50
Bentonite	4	7.25	29.00
Cement	2	5.26	10.52

'C' TOTAL 171.42

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: R Ehller DATE 3/10/86
CUSTOMER: Time Oil Co
RECEIVED BY: DATE

'A' TOTAL	Ø
'B' TOTAL	1310.00
	—
'C' TOTAL	171.42
Pg 2	89.03
GRAND TOTAL	1570.45

EES 002/5 10/82

CUSTOMER'S COPY

BZTO104(e)048199

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham 206-285-2400

DAY & DATE 10/31/85
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1730

DESCRIPTION OF WORK Drill Third 45° angle Well under Building, place 4" PVC casing and pack Pg 2

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
								'A' TOTAL	0

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
				'B' TOTAL	0

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
4" Perforated PVC casing	10'	5.46	54.60
4" Blank Casing	13'	1.79	23.27
4" PVC Caps	2 Ea	5.58	11.16
	TOLS011367		
		'C' TOTAL	89.03

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: [illegible] DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE

'A' TOTAL	0
'B' TOTAL	0
	0
'C' TOTAL	89.03
	0
GRAND TOTAL	89.03

EES 002/5 10/82 CUSTOMER'S COPY

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham 206-285-2400

DAY & DATE 10/30/85
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1800

DESCRIPTION OF WORK Drill second angle well under building and install 4" PVC casing and gravel pack

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu Ryman	0730/1730	Foreman							N/C
Joe McCallum	0730/1730	Helper							drill
Greg Westling	0730/1730	Driller							crew
									charged to
									drill rig
									costs

'A' TOTAL Ø

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	1/2 ton Utility truck	1 Ea	1 day	85.00	85.00
92-101	Auger drilling truck	1 Ea	8 hr	140.00	1120.00
72-741	DeCon trailer	1 Ea	1 day	75.00	75.00
95-042	High pressure washer	1 Ea	1 hr	15.00	15.00

TOLS011368

'B' TOTAL 1295.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek undergarment	6 Ea	4.00	24.00
Respirator, full face	2 Ea	7.50	15.00
Cartridges, respirator	4 Ea	7.35	29.40
Gloves, inner, latex	6 Pr	1.00	6.00
Gloves, outer, PVC	3 pr	4.00	12.00
#8 Monterey Sand	9 Bag	5.50	49.50
Bentonite	2 Bag	7.25	14.50

'C' TOTAL 150.40

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: [signature] DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE

EES 002/5 10/82 CUSTOMER'S COPY

'A' TOTAL	Ø
'B' TOTAL	1295.00
	Ø
'C' TOTAL	150.40
Pg 2 total	99.55
GRAND TOTAL	1544.95

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham 206-285-2400

DAY & DATE 10/30/85
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1800

DESCRIPTION OF WORK Drill second angle well under bldg., install 4" PVC casing & gravel Pack Pg 2

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
								'A' TOTAL	Ø

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
				'B' TOTAL	Ø

TOLS011369

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Cement	2 Bag	5.26	10.52
4" Perforated PVC Casing	10 ft	5.46	54.60
4" Blank PVC Casing	13 ft	1.79	23.27
4" PVC Caps	2 Ea	5.58	11.16
		'C' TOTAL	99.55

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: [signature] DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE

'A' TOTAL	Ø
'B' TOTAL	Ø
	Ø
'C' TOTAL	99.55
	Ø
GRAND TOTAL	99.55

EES 002/5 10/82 CUSTOMER'S COPY

BZTO104(e)048202

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denham 206-285-2400

DAY & DATE 10/29/85
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1800

DESCRIPTION OF WORK: Drill angle hole (well) under building and install PVC casing

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu Reyman	0730-1730	Forman							N/C
Greg Westling	0730-1730	Driller							Drill crew
Joe McCallum	0730-1730	Helper							charged to
									Drill Rig
									costs

'A' TOTAL Ø

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	½ ton Utility truck	1 Ea	1 day	85.00	85.00
92-101	Auger drilling truck	1 Ea	8 hrs	140.00	1120.00
95-042	High Pressure Washer	1 Ea	3 hrs	15.00	45.00
72-741	Decon trailer	1 Ea	1 day	75.00	75.00

TOLS011370

'B' TOTAL 1325.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Tyvek undergarment	6 Ea	4.00	24.00
Respirator, full face	2 Ea	7.50	15.00
Cartridge for respirator	4 Ea	7.35	29.40
Nitrile inner gloves	6 PR	1.00	6.00
PVC outer gloves	3 PR	4.00	12.00
#8 Monterey Sand	10 Bags	5.50	55.00
4" Perforated PVC Casing	10 ft	5.46	54.60
		'C' TOTAL	196.00

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: Driller DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE

'A' TOTAL	Ø
'B' TOTAL	1325.00
Page 2	59.45
'C' TOTAL	196.00
GRAND TOTAL	1580.45

EES 002/5 10/82 CUSTOMER'S COPY

BZTO104(e)048203

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320
BUSINESS TELEPHONE 503/285-8111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denhams 206-285-2400

DAY & DATE 10/29/85
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1800

DESCRIPTION OF WORK Drill angle well under Bldg. and install PVC casing — Page 2

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT

'A' TOTAL —0—

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

TOLS011371

'B' TOTAL —0—

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
4" Blank PVC Casing	13ft	1.79	23.27
4" PVC Caps	2Ea	5.58	11.16
Bentonite	2 Bag	7.25	14.50
Cement	2 Bag	5.26	10.52

'C' TOTAL 59.45

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: [illegible] DATE 3/10/86
CUSTOMER: Time Oil Co
RECEIVED BY: DATE

'A' TOTAL	——
'B' TOTAL	——
	——
'C' TOTAL	59.45
	——
GRAND TOTAL	59.45

EES 002/5 10/82 CUSTOMER'S COPY 2

BZTO104(e)048204

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199
ATTN: John Denbach 206-285-2400

DAY & DATE 10/28/85
P.O. #
EES JOB # 8218
JOB TIME: 0730 TO 1800

DESCRIPTION OF WORK Set up drill rig on site, locate decon unit and equipment, layout well locations

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Stu. Lipman	0800-1700	Forman	8	40.00	320.00				320.00
Joe McCallum	0800-1700	PCS1	8	33.00	264.00				264.00

'A' TOTAL 584.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
71-054	½ ton Utility truck	1 Ea	1 day	85.00	85.00
72-741	Decon trailer	1 Ea	1 day	75.00	75.00
95-042	High Pressure Washer	1 Ea	1 hr	15.00	15.00

TOLS011372

'B' TOTAL 175.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Case 450 Crawler Tractor	1 Ea	241.50	241.50
Tyvek undergarment	4 Ea	4.00	16.00
Respirator, full face	2 Ea	7.50	15.00
rubber gloves outer	4 PR	4.00	16.00
Inner gloves, latex	4 PR	1.00	4.00
Respirator Cartridges	4 Ea	7.35	29.40

'C' TOTAL 321.90

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: R Schuller DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE
EES 002/5 10/82 CUSTOMER'S COPY

'A' TOTAL	584.00
'B' TOTAL	175.00
	—
'C' TOTAL	321.90
	—
GRAND TOTAL	1080.90

BZTO104(e)048205

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Tesoro Oil Company
2737 W. Commodore Way
Seattle, Washington 98199
ATTN: John P. Denham 206-285-7400

DAY & DATE 10/25/86
P.O. #
EES JOB # 8218
JOB TIME: 0800 TO 1430

DESCRIPTION OF WORK Drive to downtown Portland at various dealers, pickup materials for job (Pipe, well screen, Monterey Sand, Bentonite) load other supplies for job start up

LABOR

NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Joe McCallum	0800-1430	PS1	6	33.00	198.00				198.00

'A' TOTAL 198.00

EQUIPMENT

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
73-931	2½ ton Crane Truck	1Ea	2h	13.13	26.26

'B' TOTAL 26.26

SUPPLIES AND MATERIALS

	NUMBER	PRICE	TOTAL AMOUNT
	TOLS011373		

'C' TOTAL 0

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: [signature] DATE 3/10/86
CUSTOMER: Tesoro Oil Co.
RECEIVED BY: DATE

EES 002/5 10/82

CUSTOMER'S COPY

'A' TOTAL	198.00
'B' TOTAL	26.26
'C' TOTAL	
GRAND TOTAL	224.26

BZTO104(e)048206

ENVIRONMENTAL EMERGENCY SERVICES CO.
Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil Company
2737 W. Commodore Way
Seattle, Washington 98199
ATTN: John P. Denham 206-483-3057

DAY & DATE 10/24/85
P.O. #
EES JOB # 8218
JOB TIME: 1230 TO 1630

DESCRIPTION OF WORK Put together pumps and equipment, load decontamination unit and hook up to truck

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
J. McCallum	1230/1630	RS1	4	33.00	132.00				132.00

'A' TOTAL 132.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL Ø

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT

TOLS011374

'C' TOTAL Ø

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: [signature] DATE 3/10/86
CUSTOMER: Time Oil Co.
RECEIVED BY: DATE

'A' TOTAL	132.00
'B' TOTAL	Ø
	Ø
'C' TOTAL	Ø
	Ø
GRAND TOTAL	132.00

EES 002/5 10/82 CUSTOMER'S COPY

BZTO104(e)048207

PHONE 285-2400
CABLE ADDRESS: TIMOIL

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
SAN PEDRO
LOS ANGELES

PRODUCTS TIME TESTED

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

August 8, 1986

Roland Miller, V.P.
Regional Manager
Riedel Environmental Services, Inc.
P.O. Box 5007
Portland, OR 97208

Dear Mr. Miller:

Enclosed is check 27165 as payment in full for services rendered per your invoice 7-2041 dated 7/30/86.

These actions complete the activities envisioned in our agreement dated June 28, 1985 as amended. We truly appreciate your excellent work in bringing this agreement to a satisfactory conclusion and thank you for your efforts.

Sincerely,

John P. Denham

John P. Denham
Environmental Manager

Enclosure a/s

JPD/ch

TOLS011375

27165

CITIBANK (NEW YORK STATE), N.A.
NORTH AMERICAN BANKING GROUP

50-817
213

TIME OIL CO.

P.O. BOX 24447 TERMINAL ANNEX SEATTLE, WASHINGTON 98124

PAY TO THE ORDER OF

8/08/86

PROTECTED AMOUNT	AMOUNT
$ **4,452.81**	$**4,452.81**

RIEDEL ENVIRONMENTAL SERVICES, INC.
PORTLAND DIVISION
PO BOX 5007
PORTLAND, OR 97208

BY _____

BY _____

TWO SIGNATURES REQUIRED

⑈027165⑈ ⑆021308176⑆ 30991597⑈

TIME OIL CO.

27165

INVOICE	REFERENCE NO.	AMOUNT	INVOICE	REFERENCE NO.	AMOUNT

TAP 110 4/81

CHECK DATE	8/08/86	DISCOUNT	
CHECK NO.	27165	TOTAL	$4,452.81

WHEN DETACHED AND PAID, THIS CHECK BECOMES A RECEIPT IN FULL PAYMENT OF THE ITEMIZED ACCOUNT

TOLS011376

BZTO104(e)048209

INVOICE

"Imagineering a cleaner world"

☒ Portland Division
Foot of N. Portsmouth Ave.
P.O. Box 5007
Portland, OR 97208
(503) 286-4656

☐ St. Louis Division
529 Spirit of St. Louis Blvd.
Chesterfield, MO 63017
(314) 532-7660

☐ San Francisco Division
230 Cutting Blvd
Richmond, CA 94802
(415) 234-7400

☐ Seattle Division
901 Fairview Ave. No.
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

RIEDEL ENVIRONMENTAL SERVICES, INC.

DATE: 7-30-86

INVOICE: 7-2041

JOB NUM. 8218

P.O. NUM.

TERMS: NET 30 DAYS
2% on all unpaid balances per ~~month~~

TO: TIME OIL
PO BOX 03117
PORTLAND, OR 97203

ATTN: NEIL WALLACE

BILLING FOR DISCUSSION OF REPORT, INSTALLATION OF MONITORING WELLS, OFFICE TIME FOR PROJECT MANAGEMENT AND ASSESSMENT, SITE INSPECTION AND ASSESSMENT OF SOIL CONTAMINATION.

	COST	BILLED
GROUT SEAL WELL #4	$3,997.00	-0-
ADDITIONAL MONITORING WELLS:		
TOTAL LABOR		$1,570.00
TOTAL EQUIPMENT		2,715.00
TOTAL MATERIALS		167.81
TOTAL AMOUNT DUE		$4,452.81

Invoice pertains to amendment 2 of June 28, 1985 agreement covering sampling and analysis work at Northwest Terminal in Portland, Oregon at pentachlorophenol site.

AUG 6 REC'D

CO. DIV.
VEND.
INV.
PO
DUE
% MO
DIST
ATTACHED

AUG 6 REC'D

Please Remit To:
Box 500-67
Portland, OR 97208

PAID

RETURN CHECK TO JOHN DENHAM

ROLAND MILLER, V.P., REGIONAL MANAGER

0 6945-41

For Fast Emergency Response, Call Environmental Emergency Services Co.
on 24-Hour Hotline (800) 334-0004

TOLS011377

BZTO104(e)048210

INVOICE

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RIEDEL
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(415) 234-7400

☐ Seattle Division
901 Fairview Ave. No.
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

DATE: 7-30-86

INVOICE: 7-2041

JOB NUM. 8218

P.O. NUM.

TERMS:
NET 30 DAYS
2% on all unpaid balances per month

TO: TIME OIL
PO BOX 03117
PORTLAND, OR 97203

ATTN: NEIL WALLACE

BILLING FOR DISCUSSION OF REPORT, INSTALLATION OF MONITORING WELLS, OFFICE TIME FOR PROJECT MANAGEMENT AND ASSESSMENT, SITE INSPECTION AND ASSESSMENT OF SOIL CONTAMINATION.

	COST	BILLED
GROUT SEAL WELL #4	$3,997.00	-0-
ADDITIONAL MONITORING WELLS:		
TOTAL LABOR		$1,570.00
TOTAL EQUIPMENT		2,715.00
TOTAL MATERIALS		167.81
TOTAL AMOUNT DUE		$4,452.81

Please Remit To:
Box 4500-57
Portland, OR 97208

Roland Miller

ROLAND MILLER, V.P., REGIONAL MANAGER

For Fast Emergency Response, Call Environmental Emergency Services Co.
on 24-Hour Hotline (800) 334-0004

TOLS011378

BZTO104(e)048211

RIEDEL ENVIRONMENTAL SERVICES, INC.
Division of Riedel Environmental Technologies, Inc.
P.O. BOX 5007 • PORTLAND, OREGON 97208-5007

BUSINESS TELEPHONE 503/286-4656

DAILY WORK REPORT

TO: Time Oil
P.O. Box 03117
Portland, OR 97203
ATTN: Neil Wallace

DAY & DATE May 86
P.O. #
RES JOB # 8218 Time Oil
JOB TIME: 5-13-86 TO 5-16-86

DESCRIPTION OF WORK Working of well #4 (See next page for credit)

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
John Cradwell	5-13-86	geologist	1	50.00	50.00				50.00
〃	5-15-86	〃	1	〃	〃				50.00

'A' TOTAL 100.00

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
	72 Stake Drilling Rig w/2 man crew	1	3.5 days	100/hr.	2800.00
	16000 International flatbed trk	1	〃	105/day	367.50
	grout mixer & pump	1	〃	25/day	87.50

'B' TOTAL 3255.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
Cement	120 sk	5.35/sk	642.00

TOLS011379

'C' TOTAL 642.00

RIEDEL ENVIRONMENTAL SERVICES, INC.
PREPARED BY: K J [illegible] DATE 5/26
CUSTOMER:
RECEIVED BY: DATE

RES-028/5-4/86 CUSTOMER COPY

'A' TOTAL	100.00
'B' TOTAL	3255.00
'C' TOTAL	642.00
GRAND TOTAL	3997.00

BZTO104(e)048212

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P.O. BOX 5007 • PORTLAND, OREGON 97208-5007
BUSINESS TELEPHONE 503/286-4656

DAILY WORK REPORT

TO: Time Oil
P.O. Box 03117
Portland, OR 97203
ATTN: Neil Wallace

DAY & DATE May 86
P.O. #
RES JOB # 8218 Time Oil
JOB TIME: 5-13-86 TO 5-16-86

DESCRIPTION OF WORK reworking of well #4

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
John Cardwell	5-13-86	geologist	1	50.00	50.00				50.00
	5-15-86	"	1	"	"				50.00
							'A' TOTAL		100.00

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
	72 star drilling rig w/2 man crew	1	3.5 days	100/hr	2800.00
	1600 international flat bed truck	1	3.5 days	105/day	367.50
	grout mixer & pump	1	3.5 days	25.00/day	87.50
				'B' TOTAL	3255.00

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
cement	120 sk	5.35/sk	642.00
		'C' TOTAL	642.00

TOLS011380

RIEDEL ENVIRONMENTAL SERVICES, INC.
PREPARED BY: John Cardwell DATE 5/86
CUSTOMER:
RECEIVED BY: DATE

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'A' TOTAL	100.00
'B' TOTAL	3255.00
'C' TOTAL	642.00
GRAND TOTAL	3997.00

BZTO104(e)048213

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Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT — LABOR

TO: Time Oil Company
2737 W. Commodore Way P.O. Box 03117
Seattle, WA 98199 Portland OR
ATTN: John Denham, PE 97203

DAY & DATE 2/19/86
P.O.# _____
EES JOB # 8218
JOB TIME: Time Oil TO _____

DESCRIPTION OF WORK Discussion of report, and proposed work

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Richard R Fergusson	9⁰⁰ am - 9⁵⁰	Senior Hydrogeologist	1/2	55⁰⁰/hr	27⁵⁰				27⁵⁰

TOLS011381

LABOR TOTAL 27⁵⁰

SUBSISTENCE

SUBSISTENCE & LODGING

SUBSISTENCE/LODGING TOTAL —

LABOR	
SUBSISTENCE	
GRAND TOTAL	27.50

PREPARED BY: Richard R Fergusson DATE 2/19/86
CUSTOMER: _____
RECEIVED BY: _____ DATE _____

EES 013/1 5-582 CUSTOMER COPY

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BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil
P.O. Box 03117
Portland, OR 97203
ATTN: Neil Wallace

DAY & DATE Wednesday Jan 8, 1986
P.O. #
EES JOB # 8218
JOB TIME: Time Oil TO

DESCRIPTION OF WORK Discussion with Roger Smith regarding wells, consideration of next phase of work

LABOR

NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Richard Jorgensen		Sr Hydro	1	55					55.00

'A' TOTAL 55.00

EQUIPMENT

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS

	NUMBER	PRICE	TOTAL AMOUNT
	TOLS011382		

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: Richard R Jorgensen DATE 1/8/86

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82

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'A' TOTAL	55.00
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	55.00

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BUSINESS TELEPHONE 503/288-4656

DAILY WORK REPORT

TO: Time Oil
P.O. Box 03117
Portland, OR 97203
ATTN: Neil Wallace

DAY & DATE 5-7-86
P.O. #
RES JOB # 8209 Time Oil
JOB TIME: TO

DESCRIPTION OF WORK installation of (3) monitoring wells, office time for project management and assessment

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
John Cardwell	5-7-86	Geologist	8	50.00	400.00				400.00
	5-8-86	"	8	"	400.00				400.00
Terry Johnsen	5-7-86	Driller							charge included with equip.
	5-8-86	"							
	5-9-86	"							
Don Johnsen	5-7-86	Driller	See below						
	5-8-86	"							
	5-9-86	"							
Rick Ferguson	5-2-86	Hydrologist	1/2	55.00	27.50				27.50
	5-5-86	"	2	"	110.00				110.00
	5-6-86	"	2	"	110.00				110.00
	5-7-86	"	1	"	55.00				55.00
	5-8-86	"	1	"	55.00				55.00
							'A' TOTAL		1157.50

EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT
	flat bed truck	1	3 days	105/day	315.00
	2 man crew, drilling, misc. tools	1	3 days	100/hr	2400.00
	includes: Pipe sockets				
	drill stems				
	(2) bits & wrenches				
	sand pumps (2)				
	samplers, split spoon				
	drive bloecks				
	casings & clamps				
	Lifting bails (2)				
	Hammer & anvil				
				'B' TOTAL	2715.00

TOLS011383

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
16/30 sand	9 sk	5.50	49.50
Bentonite	3 sk	7.20	21.60
cement	5 sk	5.25	26.25
2" slotted PVC	30 ft	1.26 ft	37.80
2" blank PVC	30 ft	1.05 ft	31.50
2" slip cap	2	0.58 ea	1.16
		'C' TOTAL	167.81

RIEDEL ENVIRONMENTAL SERVICES, INC.

PREPARED BY: John Cardwell DATE 5/86

CUSTOMER:

RECEIVED BY: DATE

RES-028/5-4/86

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'A' TOTAL	1157.50
'B' TOTAL	2715.00
'C' TOTAL	167.81
GRAND TOTAL	4040.31

BZTO104(e)048216

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BUSINESS TELEPHONE 503/285-9111

DAILY WORK REPORT

TO: Time Oil
PO Box 03117
Portland OR 97203
ATTN: Neil Wallace

DAY & DATE: Tuesday, Jan 7, 1986
P.O. #:
EES JOB #: 8218
JOB TIME: Time Oil TO:

DESCRIPTION OF WORK: site inspection, review location of well casings

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Richard Ingersoll	1[00]-5[00] pm	Sr Hydro	4	55					220

'A' TOTAL 220

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
TOLS011384			

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.
PREPARED BY: Richard R. Stevenson DATE 1/86
CUSTOMER:
RECEIVED BY: DATE

EES 002/5 10/82

CUSTOMER'S COPY

'A' TOTAL	220[00]
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	220[00]

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Division of Riedel International, Inc.
P.O. BOX 3320 • PORTLAND, OREGON 97208-3320

BUSINESS TELEPHONE 503/285-8111

DAILY WORK REPORT

TO: Time Oil
P.O. Box 03117
Portland, OR 97203
ATTN: Neil Wallace

DAY & DATE Jan 6, 1986, Monday
P.O. #
EES JOB # 8218
JOB TIME: Time Oil TO

DESCRIPTION OF WORK assessment of soil contamination

LABOR NAME	TIME WORKED	OCCUPATION	STRAIGHT TIME HOURS	STRAIGHT TIME RATE	STRAIGHT TIME AMOUNT	OVERTIME HOURS	OVERTIME RATE	OVERTIME AMOUNT	TOTAL AMOUNT
Richard L Ferguson		Sr Hydrol	2	55					110

'A' TOTAL 110

EQUIPMENT EQUIP. NO.	DESCRIPTION	NUMBER USED	USAGE	RENTAL RATE	TOTAL AMOUNT

'B' TOTAL

SUPPLIES AND MATERIALS	NUMBER	PRICE	TOTAL AMOUNT
TOLS011385			

'C' TOTAL

ENVIRONMENTAL EMERGENCY SERVICES CO.

PREPARED BY: Richard L Ferguson DATE 1/6/86

CUSTOMER:

RECEIVED BY: DATE

EES 002/5 10/82

CUSTOMER'S COPY

'A' TOTAL	110.00
'B' TOTAL	
'C' TOTAL	
GRAND TOTAL	110.00

BZTO104(e)048218

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(415) 234-7400

☐ Seattle Division
901 Fairview Ave. No.
P.O. Box 1730
Seattle, WA 98111
(206) 622-2900

October 23, 1985

Mr. John Denham
Time Oil Company
2737 W. Commodore Way
Seattle, WA 98124

Dear Mr. Denham:

Enclosed for your review is the Pentachlorophenol Sampling & Analysis report on your north Portland terminal. If you have any questions or comments, please do not hesitate to contact us.

Sincerely,

Roland E. Miller
kps

Roland E. Miller
Western Regional Manager

REM:kps
Enclosures (2) (one copy to Neil Wallis)

For Fast Emergency Response, Call Environmental Emergency Services Co.
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TOLS011386

BZTO104(e)048219

July, 1985
Samples by Riedel
after soil removal

TOLS011387

BZTO104(e)048220

RIEDEL
ENVIRONMENTAL SERVICES, INC.

FOOT OF N. PORTSMOUTH AVE.
P.O. BOX 5007
PORTLAND, OREGON 97208

PENTACHLOROPHENOL SAMPLING & ANALYSIS

TIME OIL COMPANY
Portland, Oregon

October 18, 1985

RES 007/5-485

TOLS011388

BZTO104(e)048221

TIME OIL COMPANY
PORTLAND, OREGON

PENTACHLOROPHENOL SAMPLING & ANALYSIS

Prepared by
RIEDEL ENVIRONMENTAL SERVICES
P.O. Box 5007
Portland, Oregon 97208

October 18, 1985

TOLS011389

BZTO104(e)048222

Introduction

Between 1967 and 1982 Time Oil Company operated a pentachlorophenol (PCP) facility at its North Portland, Oregon, terminal. This facility consisted of blending and storage operations used to prepare commercial pentachlorophenol solutions. The facility consisted of various storage and mixing tanks, a warehouse, a bermed, unpaved containment area, various pumps and a truck loading area.

The facility geography is essentially flat and is located less than 1/4 mile from the Willamette River. The soil is principally fine to medium sand with some silt. Ground water is reportedly found from 10 to 20 feet below the surface in this area. During June of 1985, a portion of visibly contaminated soil in the containment area was excavated and disposed of as a hazardous waste. This excavation left a depression in the northwest corner of the containment area sloping gradually to approximately four feet below the adjacent grade. Surface soil was disturbed during this process and, as such, surface sampling was not expected to be representative of conditions existing prior to excavation.

During the years of operation, several intermittent PCP discharges were known to occur, especially during mixing and transfer operations. These discharges resulted in soil contamination in and around the containment area. Initial site visits in April 1985 indicated visible PCP contamination of soils in this vicinity. A sampling plan for surface and subsurface soils extending through the vadose zone was designed and initiated in July 1985.

This sampling and analytical protocol was designed to estimate the spatial limits of PCP contaminant migration in the vadose zone of the soil in and immediately adjacent to the PCP containment area facility. As such, a systematical gridding array was used in lieu of random or other types of probability sampling. No attempt was made to sample underneath structures or paved areas. The protocol was not intended to determine the average concentration of PCP in soil at the facility since the area sampled was not expected to be homogeneous nor to represent a specific population of PCP concentrations. Therefore, statistical evaluations such as mean and standard deviation, have only academic significance in respect to these data.

However, since the origin points in the regular sampling arrays were randomly selected (i.e., a systematic random sampling procedure), there is no reason why some or all of this data could not be used for this purpose at a future time.

Sampling

All sampling was performed in accordance with EPA publication SW846, "Test Methods for Evaluating Solid Waste". Surface soil sampling was achieved using a small trier and/or sampling scoop. Subsurface samples were obtained using a 6" continuous flight hollow stemmed auger fitted with a 2" split-spoon sampler. All sampling equipment was decontaminated between samples with a trisodium phosphate wash, water rinse, hexane wash and a triple rinse with distilled, deionized water. Auger flights were decontaminated by high pressure steam cleaning between bore holes.

Samples were obtained from two areas. Area 1 consisted of a peripheral surface margin surrounding the containment areas on all of the available sides (see Figure 1). Area 2 consisted of the area inside the containment wall. All samples from each site were placed in new 16-ounce wide-mouthed glass jars previously washed with laboratory cleaner, water rinsed, hexane washed, air dried and rinsed three times with distilled, deionized water, then fitted with teflon-lined caps under clean conditions. Samples were labelled with client identification, sample number, date, time, sampler's name, sample location, and other pertinent information. Containers were sealed and placed in portable, refrigerated ice chests for transportation to the laboratory. Samples were delivered to the laboratory by RES courier within 48 hours after collection. Chain of custody forms accompanied all samples from original field sampling to final analysis and are included in this report (Appendix A). A field log of each sample was generated on site during sampling and retained for future reference.

Preliminary surface sampling in Area 1 was performed by preparation of a composite sample obtained from sub-areas A, D and F by pooling grab samples taken with triers or spoons at 10-foot intervals, five feet away from the containment area.

Secondary surface sampling was conducted in Area 1 by obtaining individual grab samples using triers or spoons. The sample sites are numbered 1-81 and are indicated on Figure 1. Secondary samples were obtained in response to the detection of significant concentrations of PCP in preliminary composite samples from sub-areas A and D, above, and were used solely to estimate the limits of contamination beyond the containment area. As stated earlier, no attempt was made in this sampling and analytical protocol to determine average (mean) values of PCP contamination.

Sampling in Area 1, peripheral samples, was performed to ascertain the surface margins of the contaminated area. It was arbitrarily assumed that the area within the containment walls was contaminated with PCP and the peripheral margins of this area established as consisting of the warehouse south wall, the east and west concrete walls and the southern edge of a pipeline transecting the containment area as indicated in Figure 1. Three concentric, 10-foot-wide marginal strips were staked out surrounding this boundary and are indicated by broken lines in Figure 1. The 10 foot marginal strips were subdivided into areas A, B and C to the west, D, E and F to the south, and G, H, and I to the east (see Figure 1).

Sampling of Area 2, the containment area proper, was performed to evaluate PCP concentrations at the surface and at depth in subsoils to the saturated zone. Grab samples were obtained from a 2-foot x 2-inch split spoon sampler pressed through a 6-inch hollow-stem augered bore hole, and were placed in 16-ounce sample containers as previously described. Decontamination procedures, chain of custody, labelling and logging were identical to Area 1 samples. Auger flights were decontaminated at the completion of each coring to prevent cross contamination. Samples were taken at a maximum depth of 0, 2, 4, 7 and 12 feet below the surface elevation of the unexcavated portion of the containment area.

Due to the sloping contour of the containment area caused by the excavation, the surface elevation below grade was measured from a string line pulled tightly between two unexcavated surface points and spanning the sampling point. Elevation of sampling site surfaces below this grade line was measured using a rigid ruler and is shown in Table I. Data from this table was used to calculate the actual auger depth below the surface required to obtain the split spoon samples to align all samples in the same respective horizontal plane. This data is listed in Table II and indicates the actual depth drilled below the surface required to obtain a sample at the nominal depth listed (0, 2, 4, 7, or 12 feet). In cases where it was deemed practical, soil was hand excavated to the depth corresponding to the first sampling depth indicated and the sample obtained manually with a small trier or spoon.

The horizontal array of borings was selected to minimize the maximum distance from any given point in the sampling area to the nearest boring. To do this most effectively, a triangular grid was staked off. The array was based on a

triangle with an east-west base of 25 feet and a north-south height of 18 feet. The maximum distance from any point on the grid to the nearest sample point in this case is 13.34 feet as opposed to 14.14 feet for a standard 20-foot x 20-foot rectangular array. This selection allowed for the placement of additional wells just outside the containment wall without increased cost, thereby improving coverage with fewer sampling points (reference: Parkhurst, D.F., Optimal Sampling Geometry for Hazardous Waste Sites; Environmental Science & Technology, 18 No. 7, p. 521 [1984]). The triangular grid is indicated on Figure 1. Bore holes are indicated by the symbol "⊠" and are labeled with alpha symbols J-Z. A table of samples so obtained is given in Table III.

Following sampling, borings were sealed with bentonite grout in accordance with state well sealing standards under the direction of a registered geologist. Decontamination water, collected into tubs, was analyzed and, following receipt of negative results for PCP, disposed of on site.

Results

Samples were analyzed by Coffee Laboratories, Portland, Oregon, using EPA SW-846 protocols. Soil samples were Sohxlet extracted using EPA protocol #3540. Procedure #8040 was utilized with electron capture quantification for PCP analysis. Results are expressed in milligrams of PCP per kilogram soil (ppm, dry weight). At sites where results could be expected to approach zero (based on results from adjacent sites), samples were held but not analyzed. The results are listed in Table IVA-E. Preliminary composite results are shown in Table IVF and confirm PCP contamination beyond the containment wall.

These tables list PCP concentrations at each sample site as well as the X and Y coordinates used to locate these sites on the plan drawing (Figure 1). These coordinates are tied to an arbitrary grid as shown on Figure 1. The northwest corner of the containment wall is located at coordinates X=76, Y=166 (76,166), for sake of reference. Each sampling depth is listed on a separate table. Copies of the laboratory reports are listed in Appendix B.

The coordinate data and concentration results were plotted using an interpolating contouring program (In-Situ Corp., Laramie WY). This package performs smoothed contouring of the data using a triangularization method and bivariate interpolation. Contours were generated from surface samples (regardless of elevation below grade) and 2-, 4-, 7- and 12-foot depths below grade. The contours are plotted on Figures 2A-E. These contour diagrams have been reduced and printed on mylar sheets in addition to the attached figures.

TABLE I

TIME OIL CO. - PORTLAND, OREGON

Depth of Boring Site Surface Sample Below Grade
(Horiz. String Line)

Boring	Depth
J	0
K	6"
L	3'
M	0
N	0
O	0
P	1'8"
Q	2'6"
R	0
S	0
T	2'
U	0
V	0
W	0
X	2'
Y	3'
Z	0

TOLS011394

TABLE II

TIME OIL CO. - PORTLAND, OREGON

Actual Split-Spoon Sample Depths Below Grade

	Nominal Depth				
Boring	0	2	4	7	12
J	0	0-2'	2-4'	5-7'	10-12'
K	NA	0-1 1/2	1 1/2-3 1/2	4 1/2-6 1/2	9 1/2-11 1/2
L	NA	NA	Surf (11")	2-4'	7-9'
M	0	0-2'	2-4'	5-7'	10-12'
N	0	0-2'	2-4'	5-7'	10-12'
O	0	0-2'	2-4'	5-7'	10-12'
P	NA	Surf (4")	0-2'	3-5'	8-10'
Q	NA	NA	0-1 1/2	2 1/2-4 1/2	7 1/2-9 1/2
R	0	0-2'	2-4'	5-7'	10-12'
S	0	0-2'	2-4'	5-7'	10-12'
T	NA	Surf	0-2'	3-5'	8-10'
U	0	0-2'	2-4'	5-7'	10-12'
V	0	0-2'	2-4'	5-7'	10-12'
W	0	0-2'	2-4'	5-7'	10-12'
X	NA	Surf	0-2'	3-5'	8-10'
Y	NA	NA	Surf (11")	2-4'	7- 9'
Z	0	0-2'	2-4'	5-7'	10-12'

NOTE:

Actual depths indicate depth of bottom of split-spoon.

NA = Not available

Surf = Surface sample obtained by hand excavation at depth indicated in parentheses

TOLS011395

BZTO104(e)048228

TABLE III

TIME OIL CO. - PORTLAND, OREGON

Nominal Split-Spoon Sample Depths

Boring	0 Surface	2 0-2'	4 2-4'	7 5-7'	12 10-12'
J	X	X	X	X	X
K	-	X	X	X	X
L	-	-	X	X	X
M	X	X	X	X	X
N	X	X	X	X	X
O	X	X	X	X	X
P	-	X	X	X	X
Q	-	-	X	X	X
R	X	X	X	X	X
S	X	X	X	X	X
T	-	X	X	X	X
U	X	X	X	X	X
V	X	X	X	X	X
W	X	X	X	X	X
X	-	X	X	X	X
Y	-	-	X	X	X
Z	X	X	X	X	X

NOTE: X = Sample

\- = Not available due to excavation

ND = Not sampled due to presence of groundwater

TOLS011396

BZTO104(e)048229

TABLE IVA
TIME OIL CO. - PORTLAND, OREGON
PENTACHLOROPHENOL IN SOIL

Surface Contour Data

Sample #	Coordinates X	Coordinates Y	Concentration Mg/Kg
1	81	171	13500
2	71	171	29
3	71	161	500
4	71	151	5450
5	71	141	5560
6	71	131	8760
7	71	121	4870
8	71	111	92
9	71	101	20
10	81	181	16
11	71	181	7
12	61	181	9
13	61	171	95
14	61	161	175
15	61	151	18
16	61	141	229
17	61	131	88
18	61	121	6
19	61	111	3
20	61	101	2.5
21	61	91	5.2
37	81	95	857
38	91	96	1130
39	101	97	17
40	111	98	3.5
41	121	98	3.1
42	131	99	3.2
43	141	100	2.4
44	151	100	1.8
45	161	101	171
46	71	84	3
47	81	85	3.6
48	91	86	6.1
49	121	87	3.2
50	131	88	1.5
51	141	89	2.3
52	151	90	1.7
53	161	91	1.9
54	171	92	1.2

Core #	Coordinates X	Coordinates Y	Concentration Mg/Kg
J	142.5	161	1400
K	117.5	161	N/A
L	92.5	161	N/A
M	67.5	161	4720
N	155	143	4280
O	130	143	3000
P	105	143	N/A
Q	80	143	N/A
R	142.5	125	1712
S	117.5	125	522
T	92.5	125	123
U	67.5	125	26550
V	155	107	317
W	130	107	3385
X	105	107	N/A
Y	80	107	N/A
Z	80	179	21

N/A = Not Available

TOLS011397

BZTO104(e)048230

TABLE IVB

TIME OIL CO. - PORTLAND, OREGON
PENTACHLOROPHENOL IN SOIL

Two Foot Contour Data

Core #	Coordinates X	Y	Concentration Mg/Kg
J	142.5	161	3
K	117.5	161	8.8
L	92.5	161	N/A
M	67.5	161	87*
N	155	143	3.1
O	130	143	59
P	105	143	16
Q	80	143	N/A
R	142.5	125	34
S	117.5	125	252
T	92.5	125	123
U	67.5	125	44
V	155	107	260
W	130	107	15
X	105	107	4.5
Y	80	107	N/A
Z	80	179	14*

N/A = Not Available
* = Data points omitted from contouring program to reduce extrapolation error

TABLE IVC

TIME OIL CO. - PORTLAND, OREGON
PENTACHLOROPHENOL IN SOIL

Four Foot Contour Data

Core #	Coordinates X	Y	Concentration Mg/Kg
J	142.5	161	3.6
K	117.5	161	10.5
L	92.5	161	7200
M	67.5	161	22
N	155	143	238
O	130	143	23
P	105	143	15
Q	80	143	2205
R	142.5	125	50
S	117.5	125	184
T	92.5	125	534
U	67.5	125	55
V	155	107	380
W	130	107	8.1
X	105	107	1.3
Y	80	107	598
Z	80	179	2

TOLS011399

BZTO104(e)048232

TABLE IVD

TIME OIL CO. - PORTLAND, OREGON

Pentachlorophenol in Soil

7 Foot Contour Data

CORE #	COORDINATES X	COORDINATES Y	CONCENTRATION mg/kg
J	142.5	161	(NA)
K	117.5	161	3
L	92.5	161	8400
M	67.5	161	1
N	155	143	(NA)
O	130	143	13
P	105	143	130
Q	80	143	700
R	142.5	125	500
S	117.5	125	1130
T	92.5	125	75
U	67.5	125	5
V	155	107	1
W	130	107	1
X	105	107	1.9
Y	80	107	700
Z	80	179	7

TABLE IVE

TIME OIL CO. - PORTLAND, OREGON

Pentachlorophenol in Soil

12 Foot Contour Data

CORE #	COORDINATES		CONCENTRATION
	X	Y	mg/kg
J	142.5	161	NA
K	117.5	161	2.3
L	92.5	161	2030
M	67.5	161	690
N	155	143	NA
O	130	143	38
P	105	143	450
Q	80	143	1150
R	142.5	125	1
S	117.5	125	217
T	92.5	125	90
U	67.5	125	NA
V	155	107	3.4
W	130	107	1.9
X	105	107	1.0
Y	80	107	720
Z	80	179	1.0

TOLS011401

BZTO104(e)048234

TABLE IVF

TIME OIL CO. - PORTLAND, OREGON
PENTACHLOROPHENOL IN SOIL

Preliminary Surface Composites

Area	PCP (mg/kg)
A	660
D	860
G	17

TOLS011402

The scale on the mylar prints is such that the contours are superimposable on Figure 1 (site plan). This allows for facile comparison of PCP concentration profiles at depth with surface features of the facility. A reference point on Figures 1 and 2(a-e) is located at (76,166) for ease of alignment.

Conclusions

As seen in Tables IVA-E, PCP concentrations range from 1 ppm to 26,550 ppm. Two foci of contamination are seen at the surface. One is located at coordinates (83,168) in the northwest corner of the containment area. A second focus occurs just outside the containment wall to the west at coordinates (65,125). Additional minor contamination sites occur at the surface in various positions throughout the sample area; however, no prominent concentration peaks are evident. This may be due, in part, to the partial excavation mentioned previously or to vehicle traffic or other activity in this area.

No evidence of penetration of the "loading area" focus below 2 feet was observed. Note that the results of the 2-foot contouring fail to demonstrate a continuation of the foci found at the surface. This is due, in part, to the excavation which removed the 2-foot material and to the definition of surface samples as surface material regardless of relationship to elevation (i.e. surface samples are not equivalent to "Ø foot" samples). This phenomenon is indicated by the lack of sample sites on the 2-foot contour at boring sites L, M, Q, Y and Z. The lack of high PCP concentrations at boring site U, 2-foot contour, implies that no significant penetration occurred at this site and that PCP contamination at this site is restricted to narrowly distributed but high concentration surface contamination.

Contours at 4, 7 and 12 feet indicate appreciable attenuation of PCP concentrations with increasing depth. The maximum concentration at 12 feet is 2030 ppm located at boring "L". Note that no samples were analyzed at boring sites "J" and "N" at 7- or 12-foot depths, since concentrations above these depths indicated that concentrations near zero could be expected. No sample was obtained at "U" due to loss of sample when groundwater was encountered.

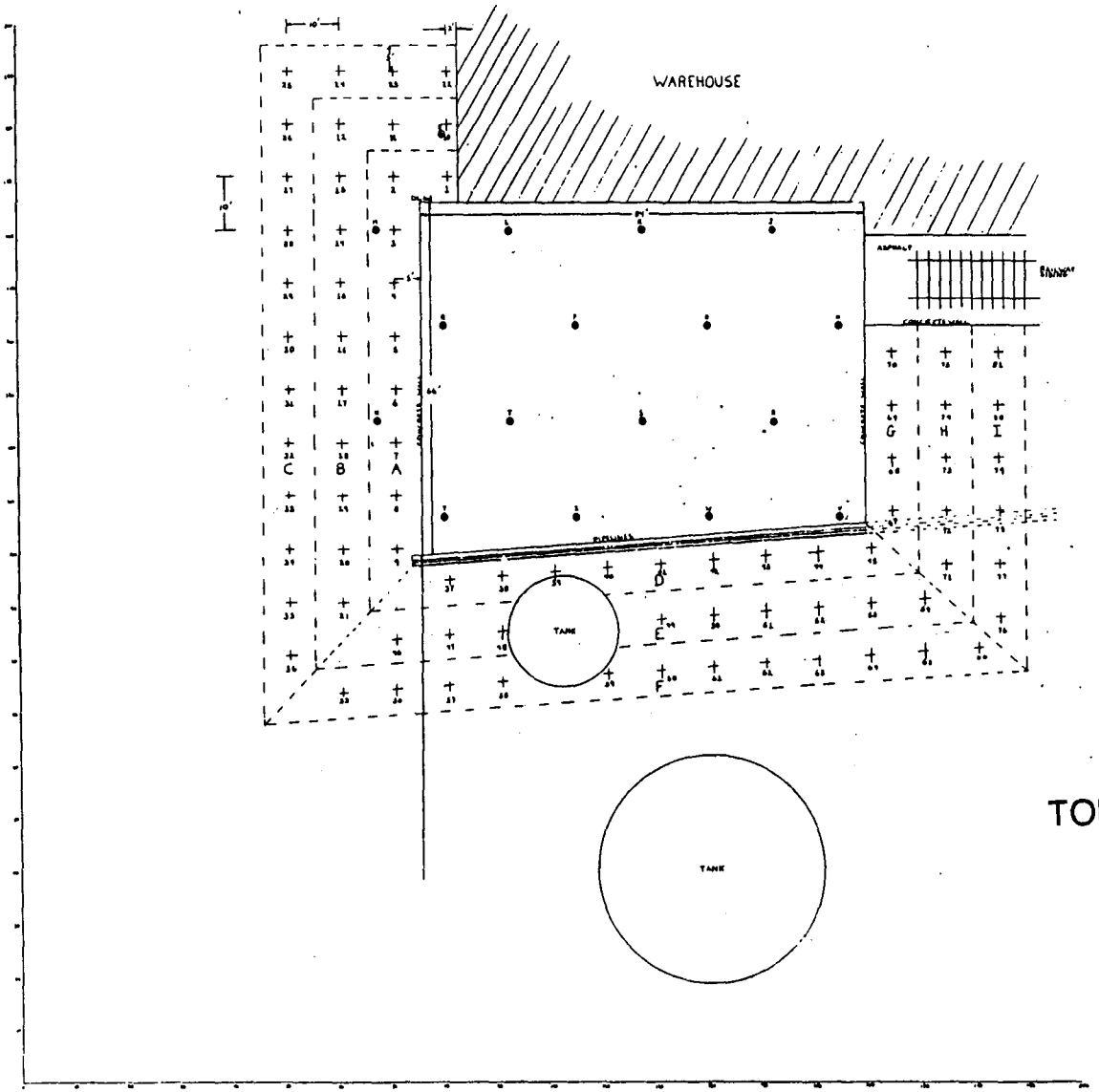
The slight tendency of the PCP plume to tail off to the south implies that groundwater flux may be diffusing the plume in this direction. This conclusion can only be substantiated by hydrogeologic evaluations of the site, however.

The contaminant plume may be restricted at the surface by the presence of the warehouse foundation. This structure could be expected to prevent diffusion of the PCP plume to the north by presenting a physical barrier to contaminant migration. Identification of concentrations of PCP beneath the building on contour plots is a function of the contouring program and may not be indicative of actual plume morphology in this area.

Summary

Significant PCP concentrations were detected in soil at Time Oil Co.'s north Portland operation. Contamination was pronounced at two focal sites, one at the northwest corner of the containment area and one at the west side of the containment area. Surface concentrations ranged from 1.2 mg/kg to 26,500 mg/kg. Sampling at depth indicated significant PCP concentrations at the northwest focus descending to the saturated zone and approximately 8-12 feet. Concentrations at 12 feet ranged from 1.0 mg/kg to 2,030 mg/kg. Analytical data from surface, 2-, 4- 7- and 12-foot samples were contoured and plotted and may be related to an area plan drawing of the same scale.

FIGURE 1



TOLS011405

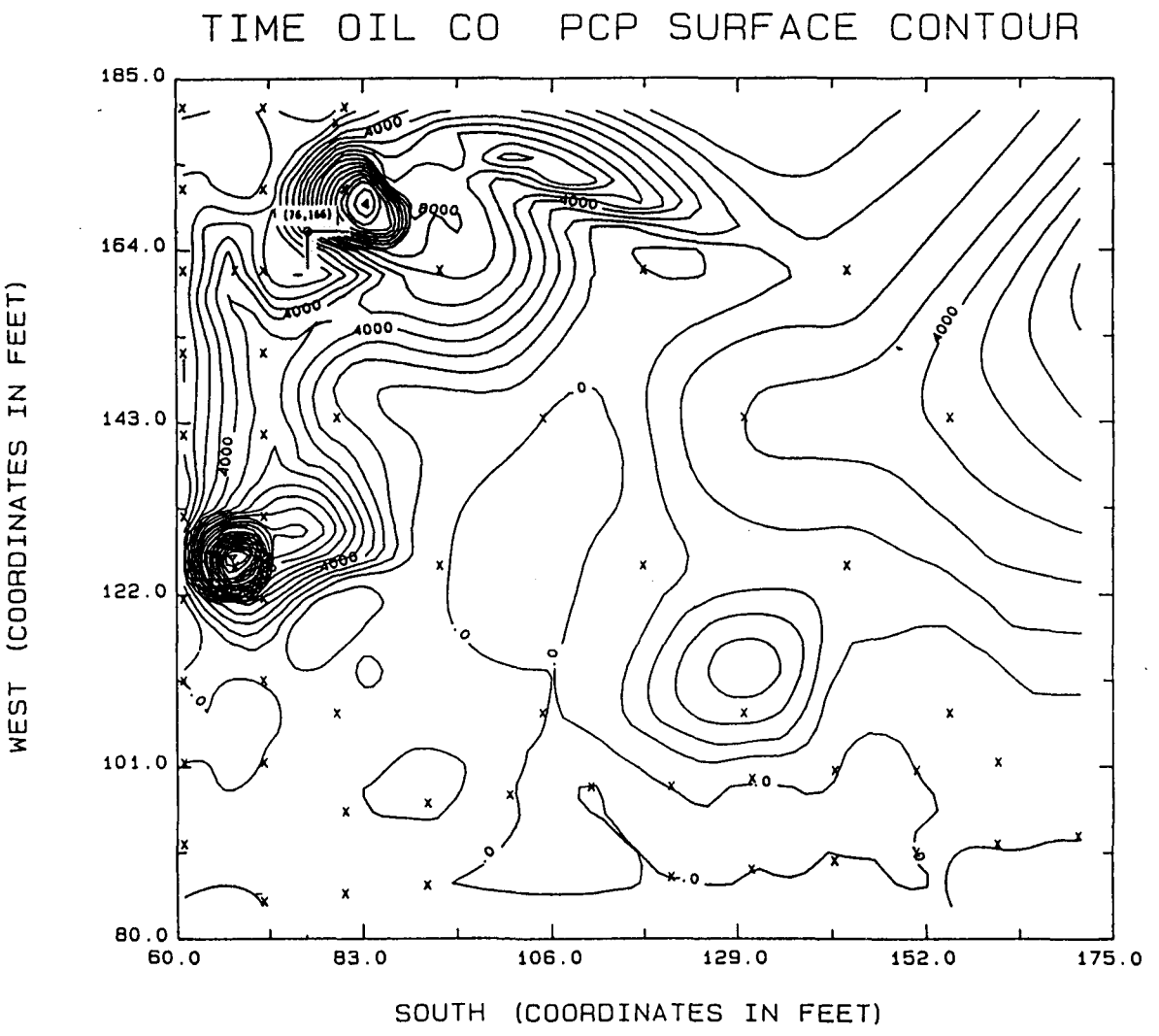
RIEDEL INTERNATIONAL, INC.

TIME OIL CO. - PORTLAND, OR.

P.C.P. SAMPLING PLAN
SAMPLING GRID - LATERAL SAMPLES

BZTO104(e)048238

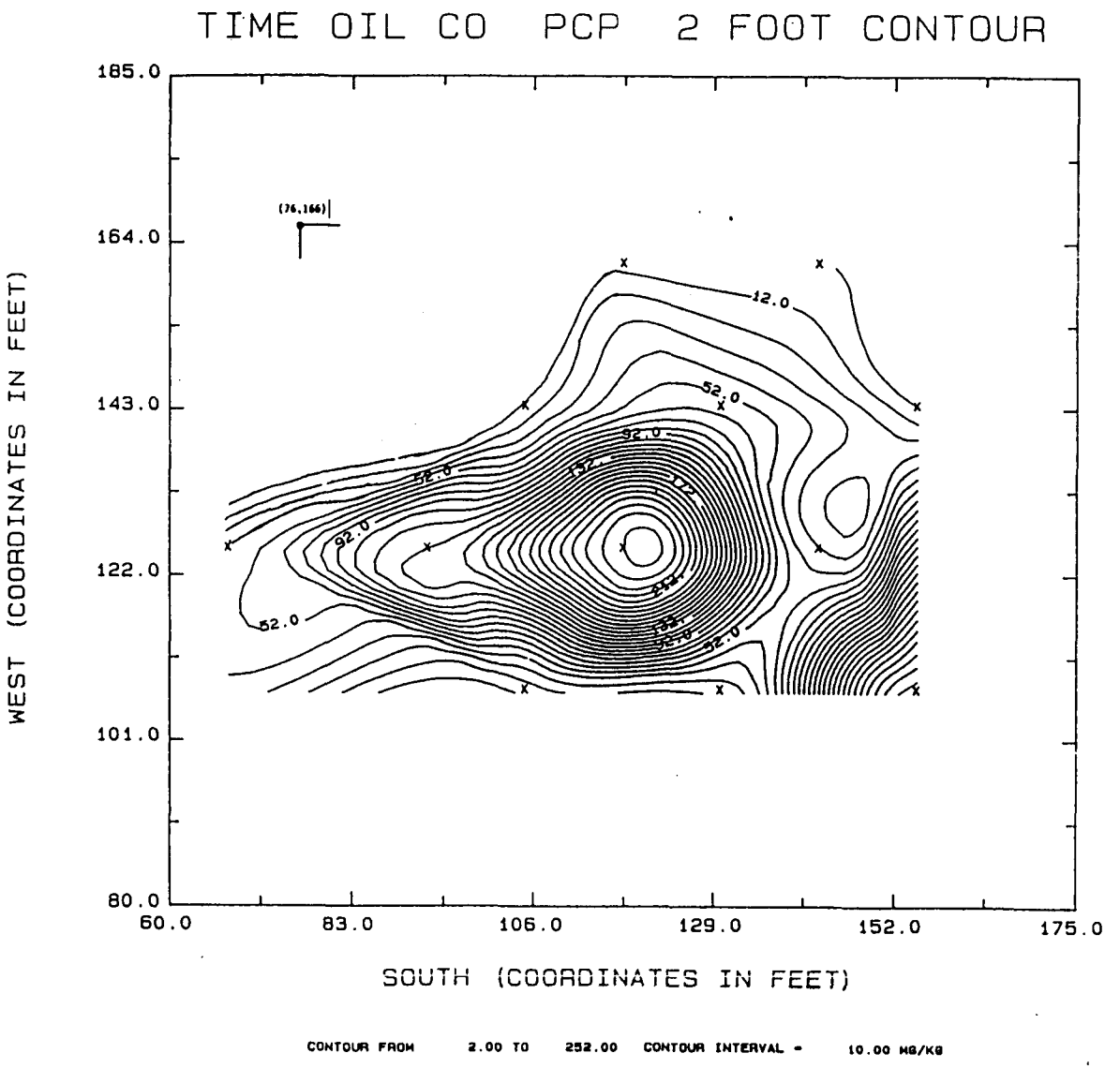
FIGURE 2A



BZTO104(e)048239

TOLS011406

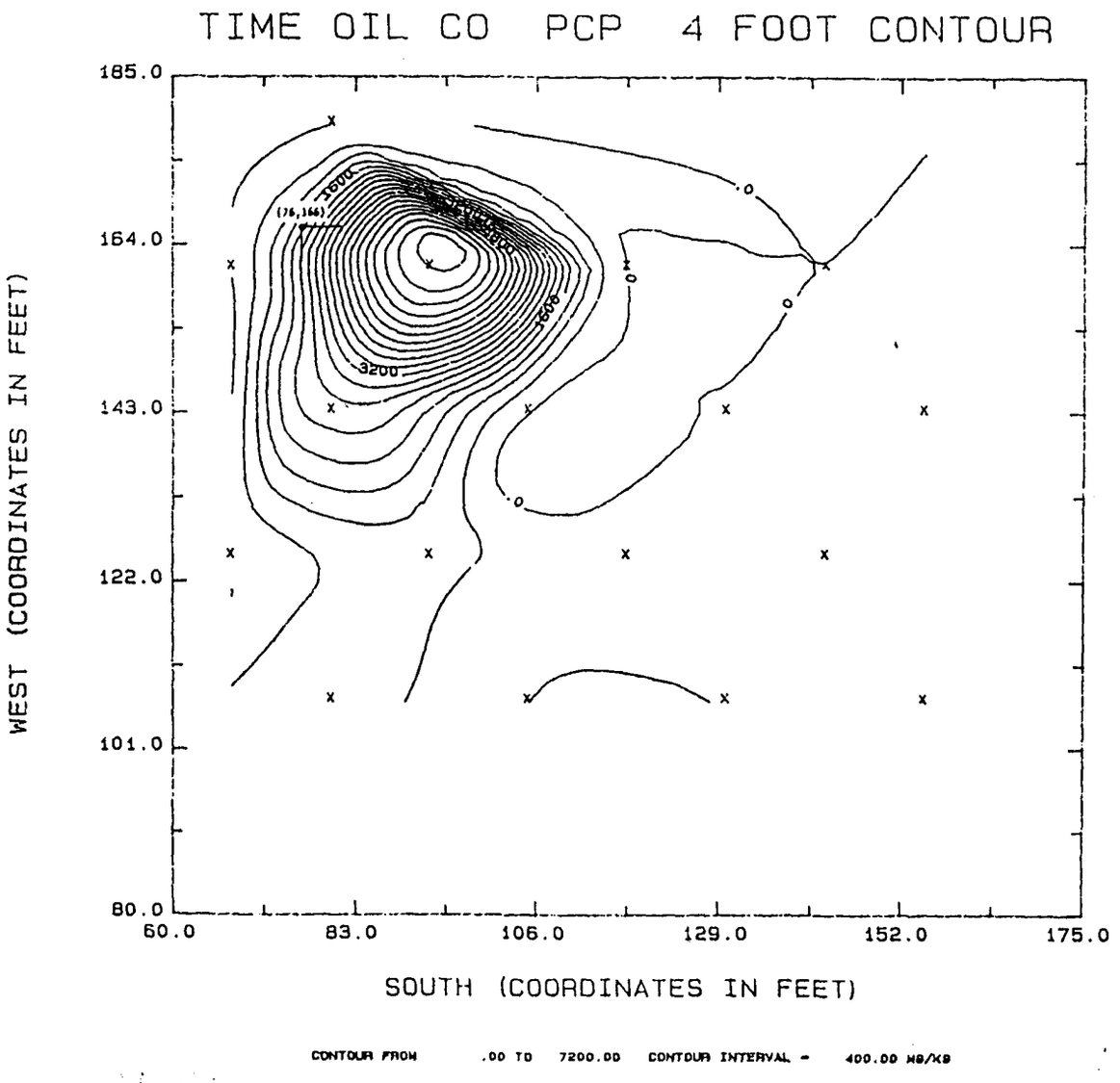
FIGURE 2B



BZTO104(e)048240

TOLS011407

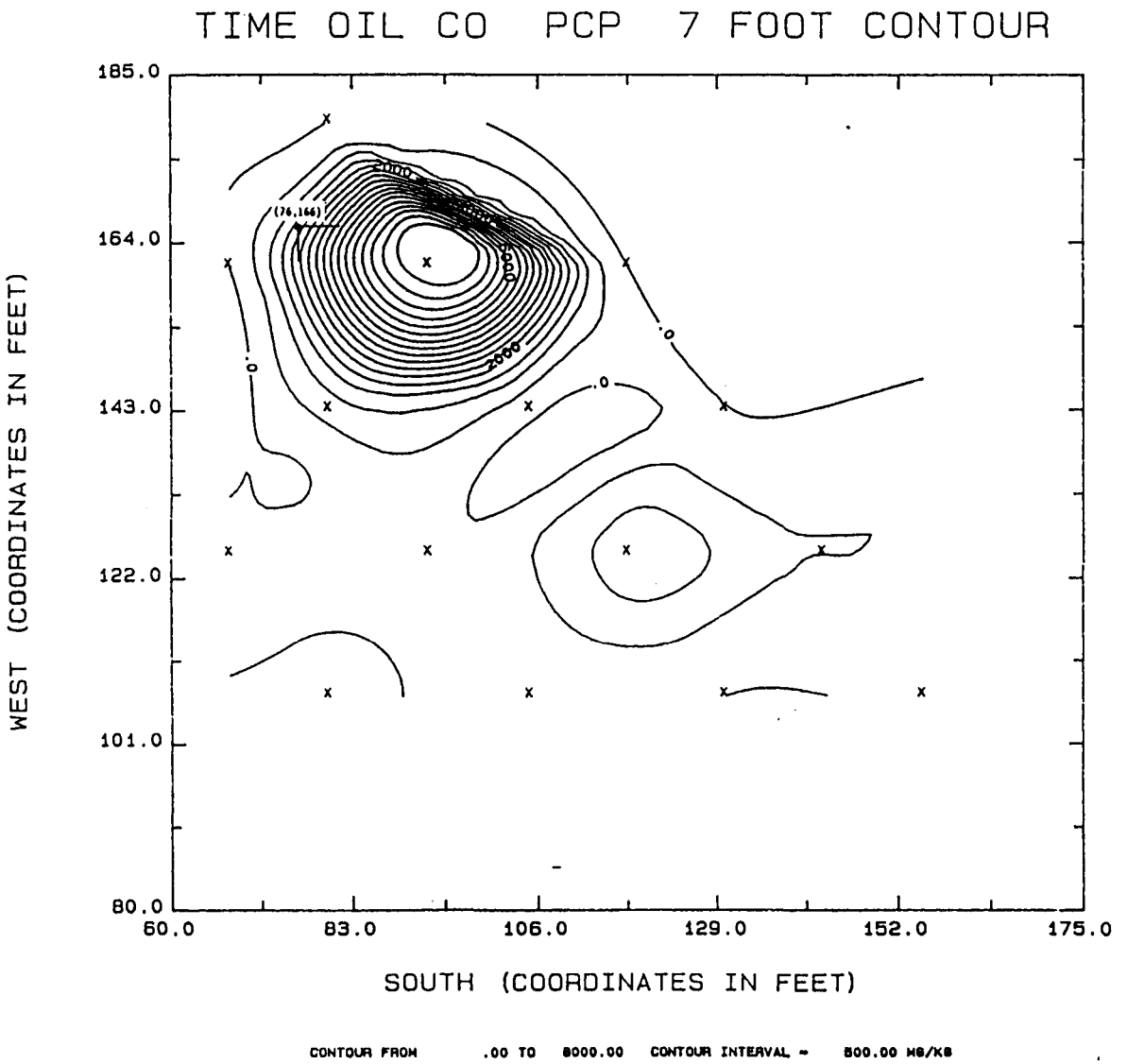
FIGURE 2C



BZTO104(e)048241

TOLS011408

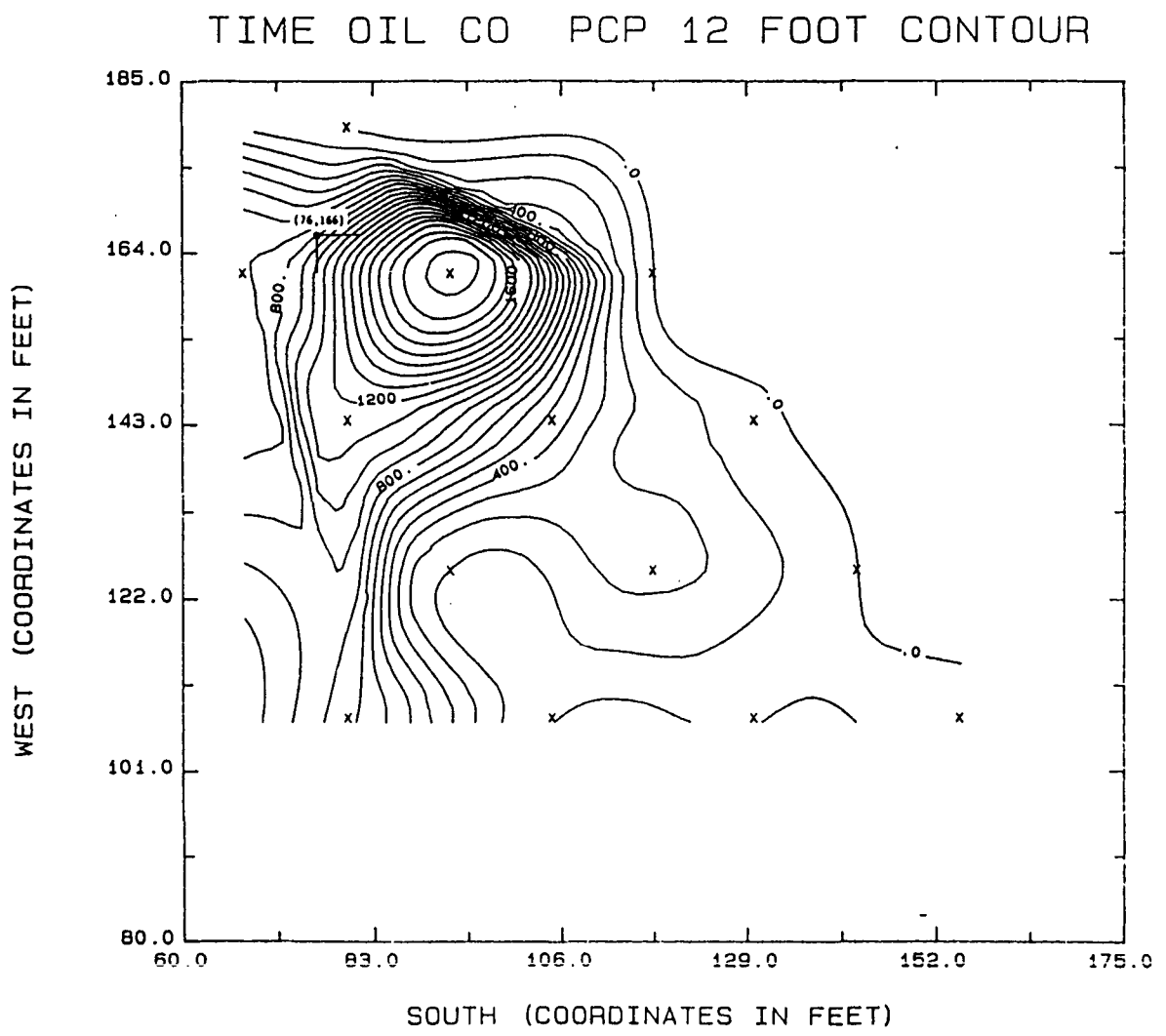
FIGURE 2 D



BZTO104(e)048242

TOLS011409

FIGURE 2E



BZTO104(e)048243

TOLS011410

APPENDIX A

CHAIN OF CUSTODY RECORDS

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO. 8121/3011

PROJECT NAME: Time Oil PCP Sampling

SAMPLERS: (Signature) Robert L Keese

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS						REMARKS
1	7/16	12:00			Area "A"							
2		12:02										
3		12:04										
4		12:06										
5		12:08										
6		12:10										
7		12:12										
8		12:14										
9		12:16										
10		12:18			Area "B"							
11		12:20										
12		12:22										
13		12:24										
14		12:26										
15		12:28										

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	7/16/85 1549	[signature]	[signature]	7-17-85 10:35	Susan M. Coffey
[signature]	7/16 1716	[signature]			
[signature]	7/17 0925	[signature]			

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-0605

Figure 3. Example of chain-of-custody record.

TOLS011412

BZTO104(e)048245

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
8121/3011	Time 0.1 PCP Sampling

SAMPLERS: (Signature) Robert L Keese

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
16	7/16	12:30			Area B		
17		12:32					
18		12:34					
19		12:36					
20		12:38					
21		12:40					
22		12:42			Area C		
23		12:43					
24		12:44					
25		12:46					
26		12:48					
27		12:50					
28		12:52					
29		12:54					
30		12:56					

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Heil Wallis	7/16/85 1549	R. L. Keese	Scott	7-17-85 10:35	Susan M. Coffey
R. L. Keese	7/16 1716	J. L. Ruddick			
J. Ruddick	7/17 0935	Scott			

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-0605

Figure 3. Example of chain-of-custody record.

TOLS011413

BZTO104(e)048246

ENVI[illegible]MENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO. 8124/3004 | PROJECT NAME Time 0:1 PCP Sampling | NO. OF CONTAINERS | REMARKS

SAMPLERS: (Signature) Robert Kovacs

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION
31	7/16	12:58			Area C
32		13:00			
33		13:02			
34		13:04			
35		13:06			
36		13:08			
37		13:30			Area D
38		13:32			
39		13:34			
40		13:36			
41		13:38			
42		13:40			
43		13:42			
44		13:44			
46		13:46			

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Neil Wallis	7/16/85 1549	R. L. Kovacs		7-17-85 1035	Susan M. Coffey
R. L. Kovacs	7/16 1716	[illegible]			
[illegible]	7/17 0935	[illegible]			

Relinquished by: (Signature) | Date / Time | Received [illegible] by: (Signature) | Date / Time | Remarks

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3- 0605

Figure 3. Example of chain-of-custody record.

BZTO104(e)048247

ENVIR[illegible]NTAL PROTECTION AGENCY
[illegible]fice of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO. 8121/3011

PROJECT NAME: Time Oil - PCP Sampling

SAMPLERS: (Signature) Robert L. Keese

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS
46	7/16	13:48			Area F								
47		13:50											
48		13:52											
49		13:54											
50		13:56											
51		13:58											
52		14:00											
53		14:02											
54		14:04											
55		14:06			Area F								
56		14:08											
57		14:10											
58		14:12											
59		14:14											
60		14:16											

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Neil Wallis	7/16/85 1549	R. L. Keese	[illegible]	7-17-85 1035	Susan M. Coffey
R. L. Keese	7/16 1716	[illegible]			
J. Ruddick	7/17 0935	[illegible]			

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3- 0605

Figure 3. Example of chain-of-custody record.

TOLS011415

BZTO104(e)048248

ENVIR[illegible]NTAL PROTECTION AGENCY
[illegible]fice of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO. 8121/3011

PROJECT NAME: Tire Oil - PCP Sampling

SAMPLERS: (Signature) Robert L. Keese

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS						REMARKS
61	7/16	14:18			Area F							
62		14:20										
63		14:22										
64		14:24										
65		14:26										
66		14:28										
67		14:30			Area G							
68		14:32										
69		14:34										
70		14:36										
71		14:38			Area H							
72		14:40										
73		14:42										
74		14:44										
75		14:46										

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Neil Wallis	7/16/85 1549	R. L. Keese	[illegible]	7-17-85 1035	Susan M. Coffey
R. L. Keese	7/16 1716	J. Ruddick			
J. Ruddick	7/17 0935	Received for ~~Laboratory by:~~ (Signature) [illegible]	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3- 0605

Figure 3. Example of chain-of-custody record.

TOLS011416

BZTO104(e)048249

ENVIR ENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO. 8121/8011 PROJECT NAME Tire Oil PCP Sampling

SAMPLERS: (Signature) Robert L. Keese

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS						REMARKS
76	7/16	14:48			Area I							
77	↓	14:50										
78		14:52										
79		14:59										
80		14:56										
81		15:00										

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Neil Wallis	7/16/85 1549	R. L. Keese	Rowell	7-17-85 1035	Susan M. Coffey
R. L. Keese	7/16 1716	J. Ruddick			
J. Ruddick	7/17 0935	Received for Laboratory by: (Signature) Rowell			

Remarks

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3- 0605

Figure 3. Example of chain-of-custody record.

TOLS011417

BZTO104(e)048250

ENV[illegible]NMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3011	Time Oil

SAMPLERS: (Signature) R Schultz

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
R-2	7-23	1555					
R-4	7-23	1600					
R-7	7-23	1610					light sample (not much)
R-12	7-23	1620					water 11'
W-2	7-24	0800					
W-4	7-24	0810					
W-7	7-24	0820					
W-12	7-24	0830					water 11'
S-2	7-24	0900					
S-4	7-24	0910					
S-7	7-24	0915					
S-12	7-24	0920					water 11"

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
R Schultz	7-25-85 1000	[illegible]			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-0605

Figure 3. Example of chain-of-custody record.

TOLS011418

BZTO104(e)048251

EN ONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3011	Time 0,1

SAMPLERS: (Signature) R Schoelin

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
T-0	7-24						Not Applicable Below grade
T-2	7-24	0930					
T-4	7-24	0955					
T-7	7-24	0995					
T-12	7-24	955					water apprx 8½ 9'
Y-4	7-24	1045					
Y-7	7-24	1050					water 8½ - 9'
Y-12	7-24	1100					
X-2	7-24	1115					
X-4	7-24	1120					
X-7	7-24	1150					
X-12	7-24	1140					

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
RSchoelin	7-25 1000	QS			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3 - 0605

Figure 3. Example of chain-of-custody record.

BZT0104(e)048252

CHAIN OF CUSTO[illegible]RECORD

PROJECT NAME: Time Oil

SAMPLERS: (Signature) R Zelenka

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
V-0	7-24	1605				1	
V-2	7-24	1620				1	
V-4	7-24	1625				1	
V-7	7-24	1640				1	
V-12	7-24	1650				1	Water Sand/Brown/Black grey
water rinse	7-25	0930				1	Decon Water

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
R Zelenka	7-25-85 1000				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-0605

Figure 3. Example of chain-of-custody record.

BZTO104(e)048253

TOLS011420

ENV VMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3011	Time Oil

SAMPLERS: (Signature)

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
P-2	7-24	1330					
P-4	7-24	1405					
P 7	7-24	1410					
P-12	7-24	1420					water 10½ - 11 ft.
L-4	7-24	1345					
L-7	7-24	1505					
L-12	7-24	1515					
	~~7-24~~						water sample in Prop 7½ - 9'
Q-4	7-24	1435					Sample appears wet sediment was brown to black
Q-7	7-24	1445					Sample looks like water
Q 12	7-24	1455					water white sample

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
R Sebelius	7-25 1000				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3 - 0605

Figure 3. Example of chain-of-custody record.

TOLS011421

BZTO104(e)048254

EN[illegible]MENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3011	Time Oil

SAMPLERS: (Signature) [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS
Z-0	7-22-85	1505				1							
Z-2	7-23	0820				1							
Z-4	7-23	0830				1							
Z-7	7-23	838				1							Into Water
Z-12	7-23	846				1							
R-0	7/22	1440				1							
W-0	7/22	1500				1							
S-0	7/22	1515				1							

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	7-23-85 1500	[signature]			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
[signature]	7/23/85 1540	[signature]			

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-0605

Figure 3. Example of chain-of-custody record.

TOLS011422

BZTO104(e)048255

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3011	Time Oil

SAMPLERS: (Signature) Ron Schoelich

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
M-0	7-22	1500		X		1	
M-02	7-23	0720		X		1	
M-04	7-23	0735		X		1	
M-7	7-23	0750		X		1	
M-12	7-23	0800		X		1	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
R Schoelich	7-23-85 / 1500	Todd Freitag			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
Todd Freitag	7/23/85 / 1540				

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-- 0605

Figure 3. Example of chain-of-custody record.

TOLS011423

BZT0104(e)048256

EN ONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3011	Time Oil

SAMPLERS: (Signature) R Schoelich

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS						REMARKS
K-0	7-23	1405		X								NA Below Grade
K-2	7-23	1415		X								
K-4	7-23	1420		X								
K-7	7-23	1425		X								
K-12	7-23	1435		X								Water Aprox 11½'

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
R Schoelich	7-23-85 1500	Todd Freitag			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
Todd Freitag	7/23/85 1540	[illegible]			

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-- 0605

Figure 3. Example of chain-of-custody record.

TOLS011424

BZTO104(e)048257

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO. 3011 | PROJECT NAME Time Oil

SAMPLERS: (Signature) R Schaller

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
0-0	7-22	1445		X		1	
0-2	7-23	1115		X		1	Asphalt/Rock 6-8" below Surface
0-4	7-23	1315		X		1	
0-7	7-23	1325		X		1	
0-12	7-23	1340		X		1	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
R Schaller	7-23-85 1500	Jeff Freitag			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
Jeff Freitag	7/23/85 1540	K. Schultz			

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-0605

Figure 3. Example of chain-of-custody record.

TOLS011425

BZT0104(e)048258

E' ONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3011	Time-Oil

SAMPLERS: (Signature)
R Sebolich

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
J-0	7-22	1440		X		1	
J-2	7-23	1035		X		1	
J-4	7-23	1040		X		1	
J-7	7-23	1045		X		1	
J-12	7-23	1055		X		1	water aprox 11'

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
R Sebolich	7-23-85 1500	Jack Fraley			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
Jack Fraley	7/23/85 1540	A. Schultz			

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-0605

Figure 3. Example of chain-of-custody record.

BZT0104(e)048259

TOLS011426

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3011	Time Oil

SAMPLERS: (Signature)
R Schoelich

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
N-0	7-22	1430		X		1	
N-2	7-23	0750		X		1	
N-4	7-23	1005		X		1	
N-7	7-23	1015		X		1	
N-12	7-23	1025		X		1	water 10-11'

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
R Schoelich	7-23-85 1500				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
	7/23/85 1540				

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-0605

Figure 3. Example of chain-of-custody record.

TOLS011427

BZTO104(e)048260

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
3011	TIME OIL CO

SAMPLERS: (Signature) Ron Schedlich

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
U-0	7/22	0920		X	SURFACE SAMPLE HOLE "U"	1	
U-2	"	1435		X		1	
U-4	"	1445		X		1	
U-7	"	1455		X		1	
U-12	"	1515		X	WATER	1	water
U-17	"	1535		X	WATER	1	hit water

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
NEIL WITTEN R Schedlich	7-23-85 1500				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
	7/23/85 1540				

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-0605

Figure 3. Example of chain-of-custody record.

BZTO104(e)048261

TOLS011428

APPENDIX B

LABORATORY RESULTS

Time Oil

RECEIVED
JUL 19 1985
Foot of North Portsmouth

COFFEY LABORATORIES, INC.

4914 N.E. 122ND AVE.
PORTLAND, OREGON 97230
(503) 254-1794

July 17, 1985

Log #A850701-E

PRELIMINARY SURFACE SAMPLING

Riedel Environmental Services
P. O. Box 3320
Portland, Oregon 97023
Attention: John Ruddick

Analyses Requested: Pentachlorophenol

SAMPLE ID	RESULTS
A-West Primary Lateral	560 mg/Kg
B-South Primary Lateral	860 mg/Kg
C-East Primary Lateral	17 mg/Kg

Sincerely,

Susan M. Coffey

Susan M. Coffey
President

SMC/sb

TOLS011430

BZTO104(e)048263

COFFEY LABORATORIES, INC.

4914 N.E. 122ND AVE.
PORTLAND, OREGON 97230
(503) 254-1794

RECEIVED
SEP 27 1985

Foot of North Portsmouth
July 25, 1985
Log #A850717-L

Riedel Environmental Services
P.O. Box 3320
Portland, Oregon 97023
Attention: John Ruddick

Analysis Requested: Pentachlorophenol (PCP) Analysis of Soil Samples

Method: EPA SW 846 with Electron Capture Quantitation

SAMPLE ID		RESULTS	SAMPLE ID		RESULTS
STATION	TIME	PCP mg/Kg	STATION	TIME	PCP mg/Kg
Area A			Area C		
1	12:00	13,500	23	12:43	Hold
2	12:02	29	24	12:44	Hold
3	12:04	500	25	12:46	Hold
4	12:06	5,450	26	12:48	Hold
5	12:08	5,560	27	12:50	Hold
6	12:10	8,760	28	12:52	Hold
7	12:12	4,870	29	12:54	Hold
8	12:14	92	30	12:56	Hold
9	12:16	20	31	12:58	Hold
Area B			32	13:00	Hold
10	12:18	16	33	13:02	Hold
11	12:20	7	34	13:04	Hold
12	12:22	9	35	13:06	Hold
13	12:24	95	36	13:08	Hold
14	12:26	175	37	13:30	857
15	12:28	18	Area D		-
16	12:30	229	38	13:32	1,130
17	12:32	88	39	13:34	17
18	12:34	6	40	13:36	3.5
19	12:36	3	41	13:38	3.1
20	12:38	2.5	42	13:40	3.2
21	12:40	5.2	43	13:42	2.4
			44	13:44	1.8
			45	13:46	171

THIS REPORT CONTINUES

TOLS011431

COFFEY LABORATORIES, INC.

4914 N.E. 122ND AVE.
PORTLAND, OREGON 97230
(503) 254-1794

Riedel Environmental Services
Page Two
Attention: John Ruddick

July 25, 1985
Log #A850717-L

Analysis Requested: Pentachlorophenol (PCP) Analysis of Soil Samples

Method: EPA SW 846 with Electron Capture Quantitation

SAMPLE ID		RESULTS	SAMPLE ID		RESULTS
STATION	TIME	PCP mg/kg	STATION	TIME	PCP mg/kg
Area E			Area G		
46	13:48	3.0	67	14:30	Hold
47	13:50	3.6	68	14:32	Hold
48	13:52	6.1	69	14:34	Hold
49	13:54	3.2	70	14:36	Hold
50	13:56	1.5	Area H		
51	13:58	2.3	71	14:38	Hold
52	14:00	1.7	72	14:40	Hold
53	14:02	1.9	73	14:42	Hold
54	14:04	1.2	74	14:44	Hold
Area F			75	14:46	Hold
55	14:06	Hold	Area I		
56	14:08	Hold	76	14:48	Hold
57	14:10	Hold	77	14:50	Hold
58	14:12	Hold	78	14:52	Hold
59	14:14	Hold	79	14:54	Hold
60	14:16	Hold	80	14:56	Hold
61	14:18	Hold	81	15:00	Hold
62	14:20	Hold			
63	14:22	Hold			
64	14:24	Hold			
65	14:26	Hold			
66	14:28	Hold			

Sincerely,

Susan M. Coffey,
President

SMC/gs

TOLS011432

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

July 30, 1985
Log #A850723-Z

Riedel Environmental Services
P.O. Box 3320
Portland, Oregon 97023
Attention: John Ruddick

Analysis Requested: Pentachlorophenol (PCP) Analysis of Soil Samples

Method: EPA SW 846 with Electron Capture Quantitation

SAMPLE ID		RESULTS	SAMPLE ID		RESULTS
STATION	TIME	PCP mg/kg	STATION	TIME	PCP mg/kg
S-0	1505	522	O-0	1445	3000
R-0	1440	1712	O-2	1115	59
W-0	1500	3385	O-4	1315	23
			O-7	1325	Hold
Z-0	1505	21	O-12	1340	Hold
Z-2	0820	14			
Z-4	0830	2	J-0	1440	1400
Z-7	0838	Hold	J-2	1035	3.0
Z-12	0846	Hold	J-4	1040	3.6
			J-7	1045	Hold
M-0	1500	4720	J-12	1035	Hold
M-2	0720	87			
M-4	0735	22	N-0	1430	4280
M-7	0750	Hold	N-2	0950	3.1
M-12	0800	Hold	N-4	1005	208
			N-7	1015	Hold
K-0	1405	No Sample Taken	N-12	1025	Hold
K-2	1415	3.8			
K-4	1420	10.5	U-0	1420	29,550
K-7	1425	Hold	U-2	1435	44
K-12	1435	Hold	U-4	1445	55
			U-7	1455	Hold
			U-12	1515	Hold
			U-17	1530	Hold

Sincerely,

Susan M. Coffey,
President

SMC/gs

TOLS011433

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

August 1, 1985
Log #A850725-Z

Riedel Environmental Services
P.O. Box 3320
Portland, Oregon 97023
Attention: John Ruddick

Analysis Requested: Pentachlorophenol (PCP) Analysis of Soil Samples

Method: EPA SW 846 with Electron Capture Quantitation

SAMPLE ID		RESULTS	SAMPLE ID		RESULTS
STATION	TIME	PCP mg/Kg	STATION	TIME	PCP mg/Kg
P-2	1330	16	S-2	0900	252
P-4	1405	15	S-4	0910	184
P-7	1410	Hold	S-7	0915	Hold
P-12	1420	Hold	S-12	0920	Hold
L-4	1345	7200	T-0		No Sample
L-7	1505	Hold	T-2	0930	123
L-12	1515	Hold	T-4	0935	534
			T-7	0945	Hold
Q-4	1435	2205	T-12	0955	Hold
Q-7	1445	Hold			
Q-12	1455	Hold	Y-4	1045	598
			Y-7	1050	Hold
R-2	1555	34	Y-12	1100	Hold
R-4	1600	50			
R-7	1610	Hold	X-2	1115	- 4.5
R-12	1620	Hold	X-4	1120	1.3
			X-7	1130	Hold
W-2	0800	15	X-12	1140	Hold
W-4	0810	8.1			
W-7	0820	Hold	V-0	1605	317
W-12	0830	Hold	V-2	1620	260
			V-4	1625	380
Water Tub	0930	106 µg/l	V-7	1645	Hold
			V-12	1650	Hold

Results in mg/kg unless otherwise stated.

Sincerely,

Susan M. Coffey

Susan M. Coffey,
President

SMC/gs

TOLS011434

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

RECEIVED
SEP 27 1985
Foot of North Portsmouth

August 27, 1985
Log #A850813-F

Riedel Environmental Services
P. O. Box 5007
Portland, Oregon 97208
Attention: John Ruddick

Sample ID: Time Oil Sample Description: Soil

Analysis Requested: Pentachlorophenol

SAMPLE NUMBER	PENTACHLOROPHENOL
K-7	3
L-7	8,400
M-7	< 1.0
O-7	13
P-7	150
Q-7	700
S-7	1,130
T-7	75
U-7	5
Y-7	700
Z-7	7

Results in mg/Kg

< denotes "less than"

Sincerely,

Susan M. Coffey

Susan M. Coffey,
President

SMC/db

TOLS011435

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

September 5, 1985
Log #A850723-Q

Riedel Environmental Services
P.O. Box 5007
Portland, Oregon 97208

Attention: John Ruddick

Analysis Requested: Pentachlorophenol (PCP)

Sample Description: Time-Oil Site

SAMPLE ID	PCP
R7	500
V7	1.0
W7	< 1.0, < 1
X7	1.9
K12	2.3
L12	2030
M12	690
O12	38
P12	450
Q12	1150
R12	< 1
S12	212, 222
T12	90
V12	3.4
W12	1.9
X12	1.0
Y12	720
Z12	1.0

$\bar{x} = 217$

< denotes "less than"

Results in mg/Kg

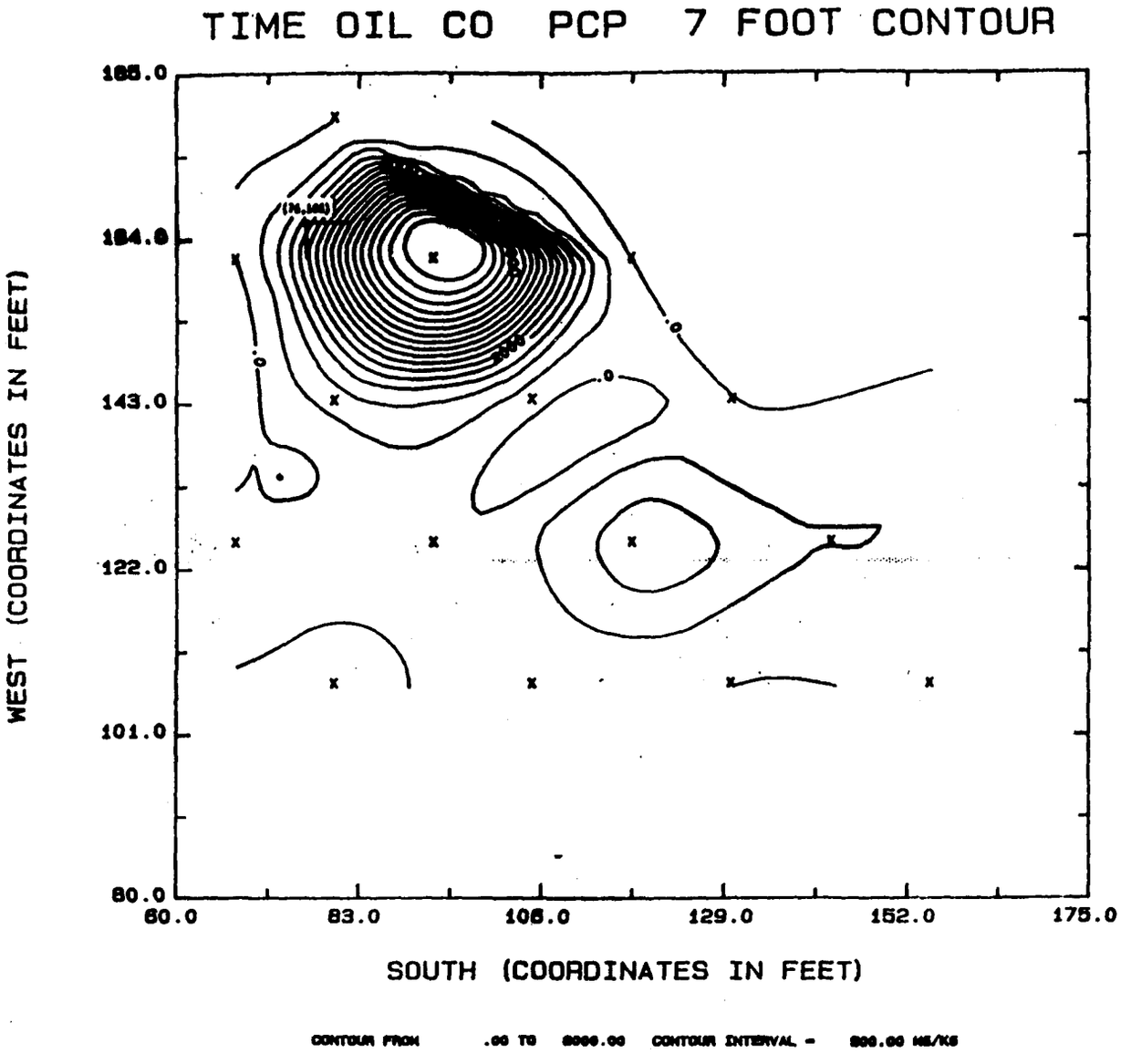
Sincerely,

Susan M. Coffey

Susan M. Coffey
President

SMC/gs

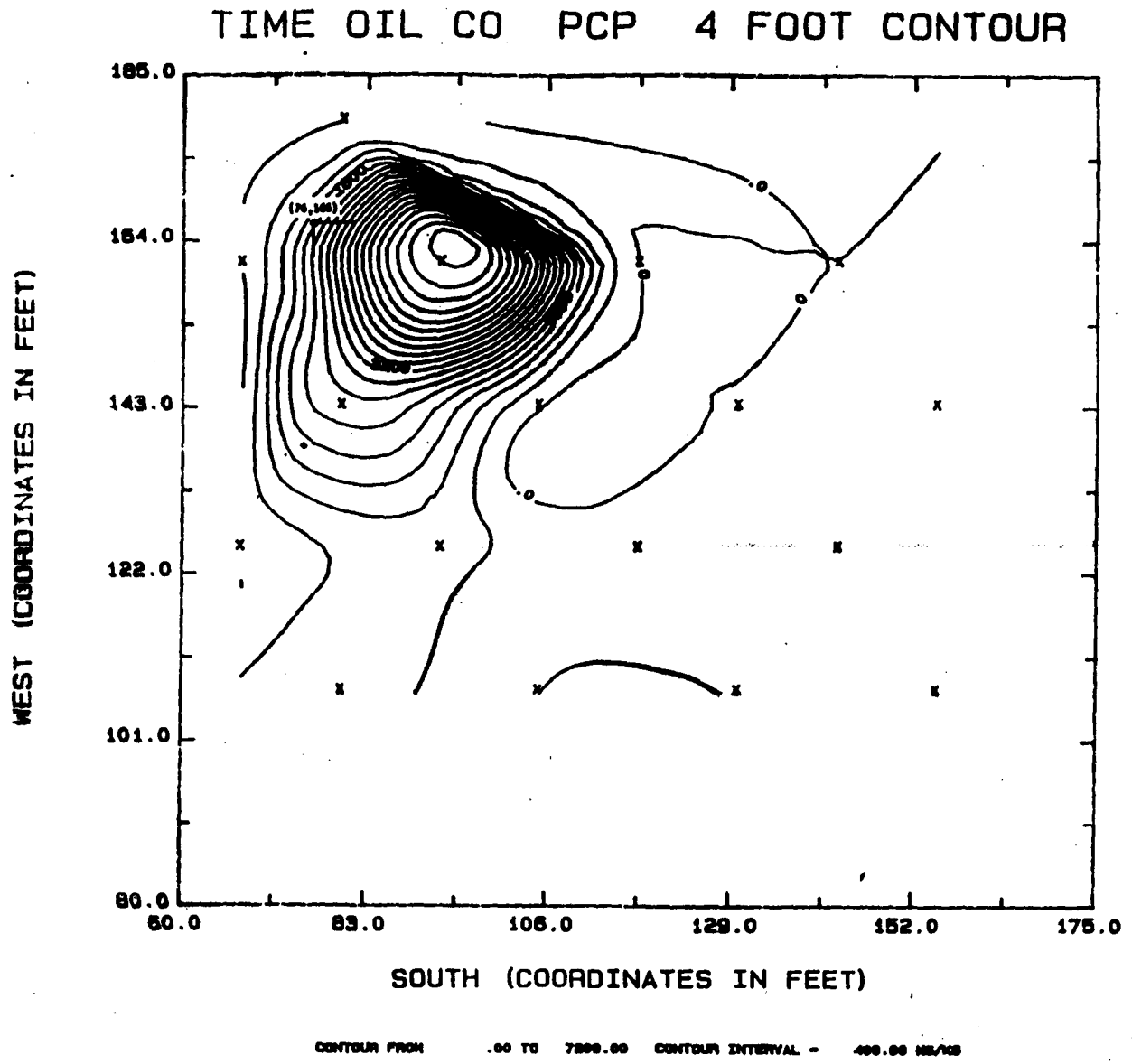
TOLS011436



TOLS011437

BZTO104(e)048270

1"=20'

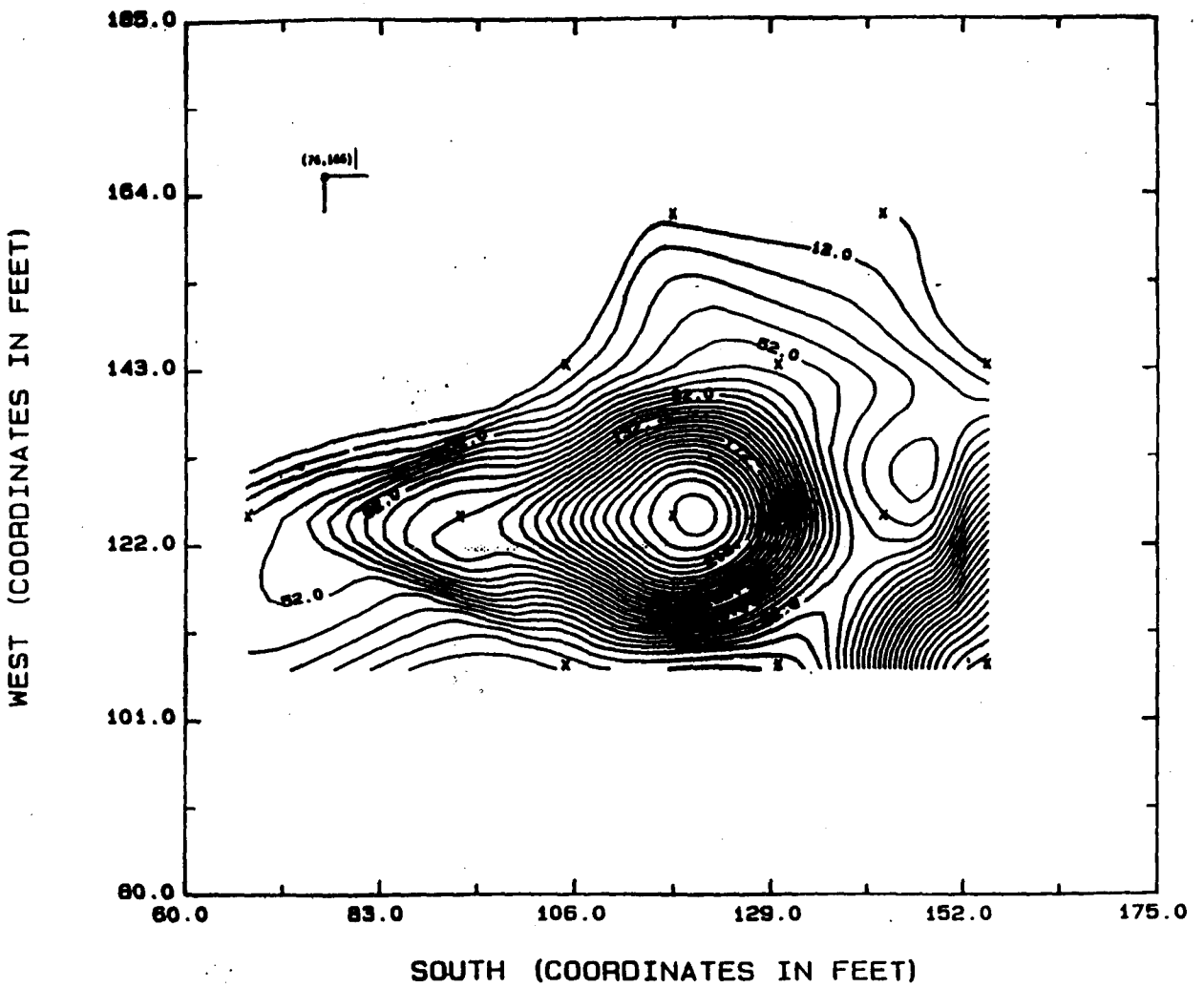


TOLS011438

BZTO104(e)048271

1"=20'

TIME OIL CO PCP 2 FOOT CONTOUR



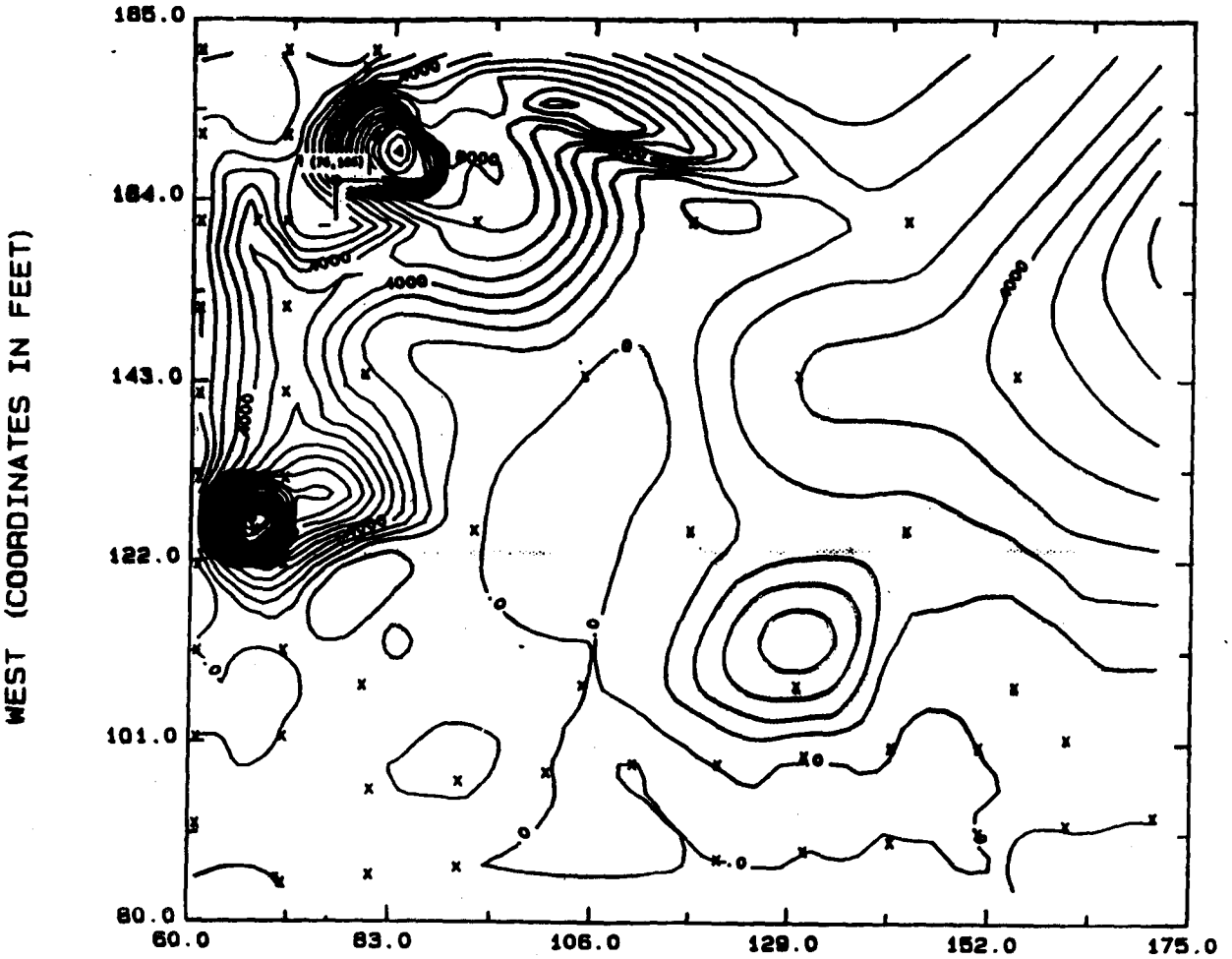
CONTOUR FROM 2.00 TO 252.00 CONTOUR INTERVAL = 10.00 MG/KG

BZTO104(e)048272

TOLS011439

1"=20'

TIME OIL CO PCP SURFACE CONTOUR



TOLS011440

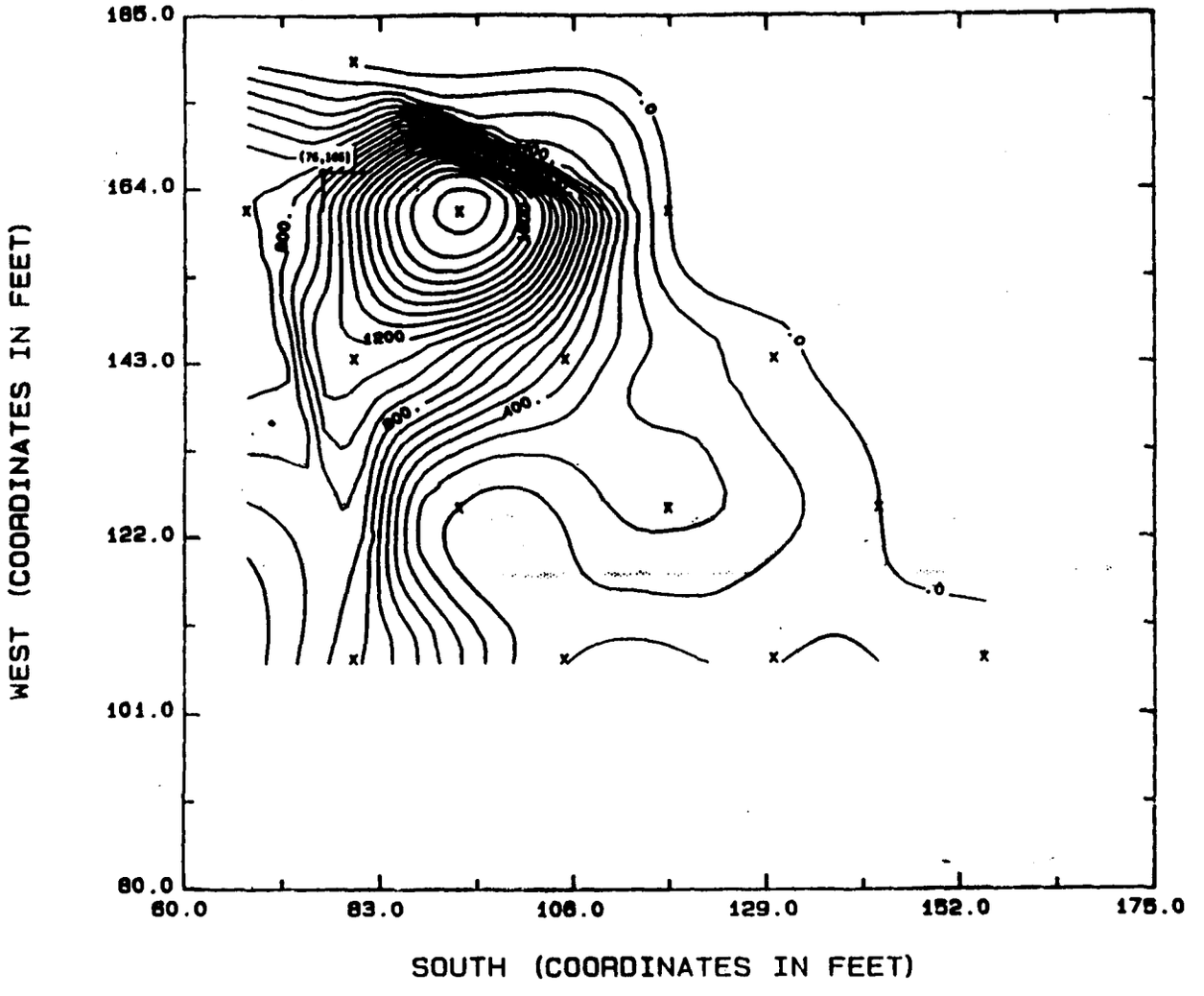
1"=20'

BZTO104(e)048273

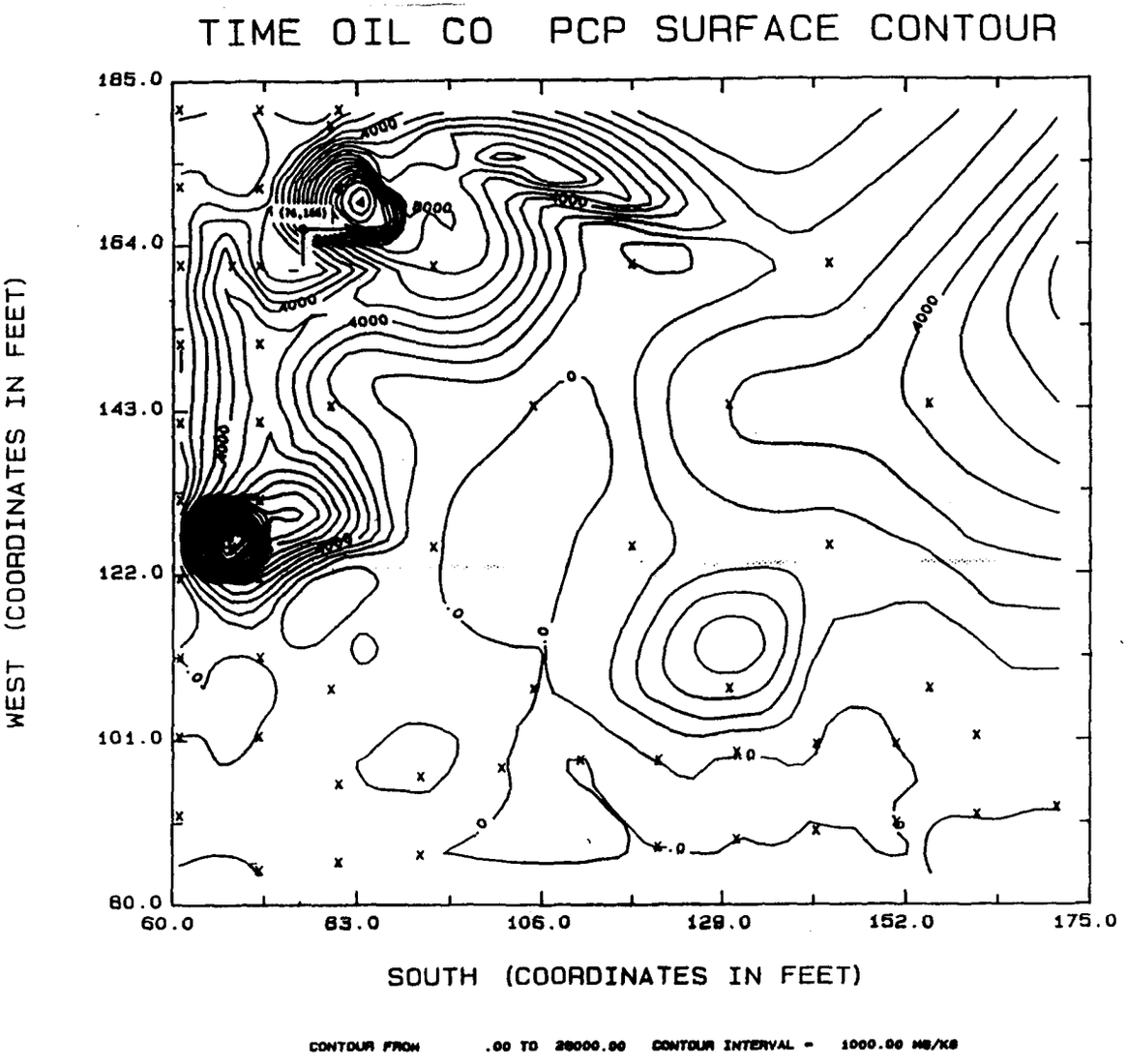
TOLS011441

BZTO104(e)048274

TIME OIL CO PCP 12 FOOT CONTOUR



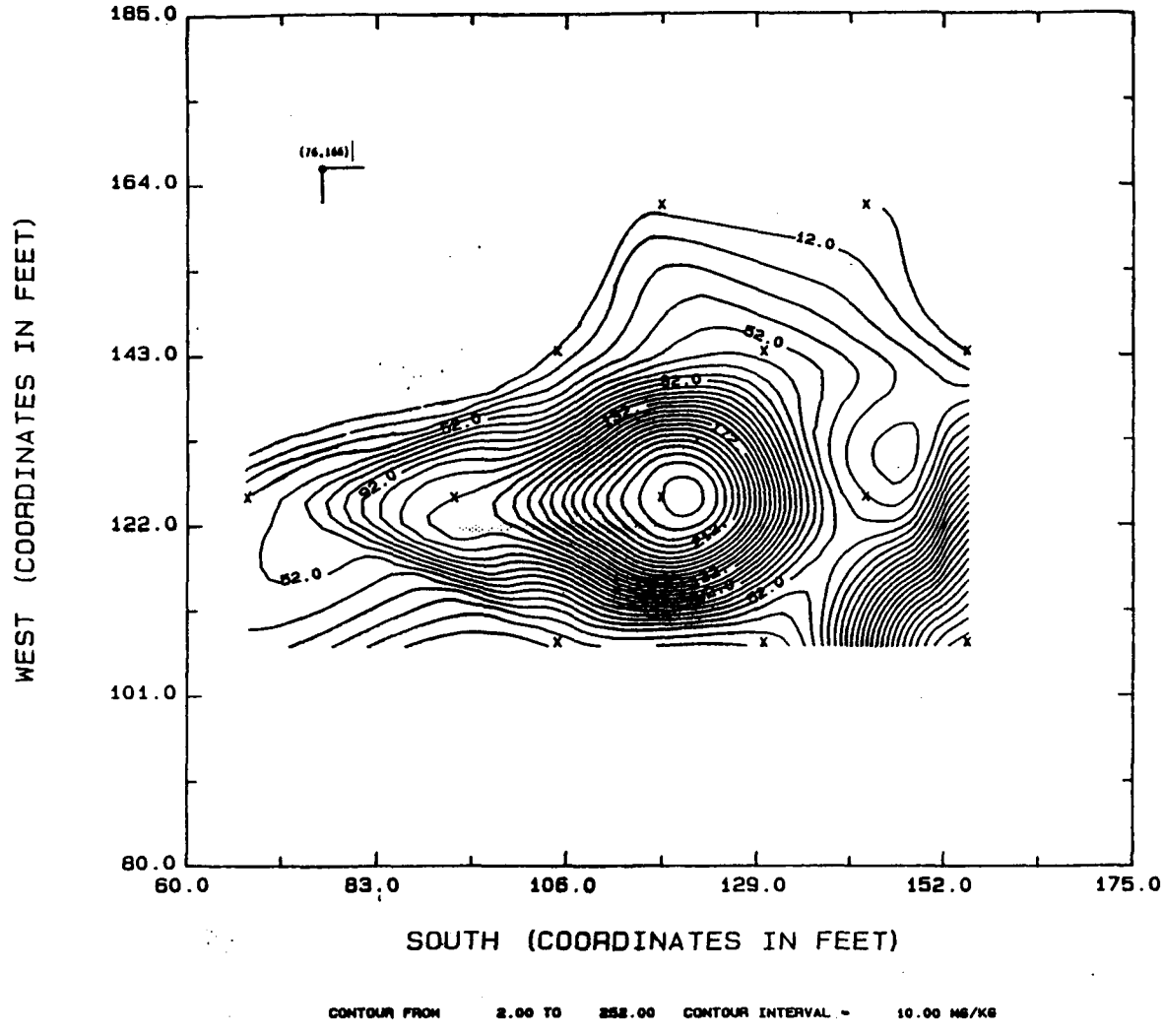
CONTOUR FROM .00 TO 2000.00 CONTOUR INTERVAL = 100.00 MB/KB



BZTO104(e)048275

TOLS011442

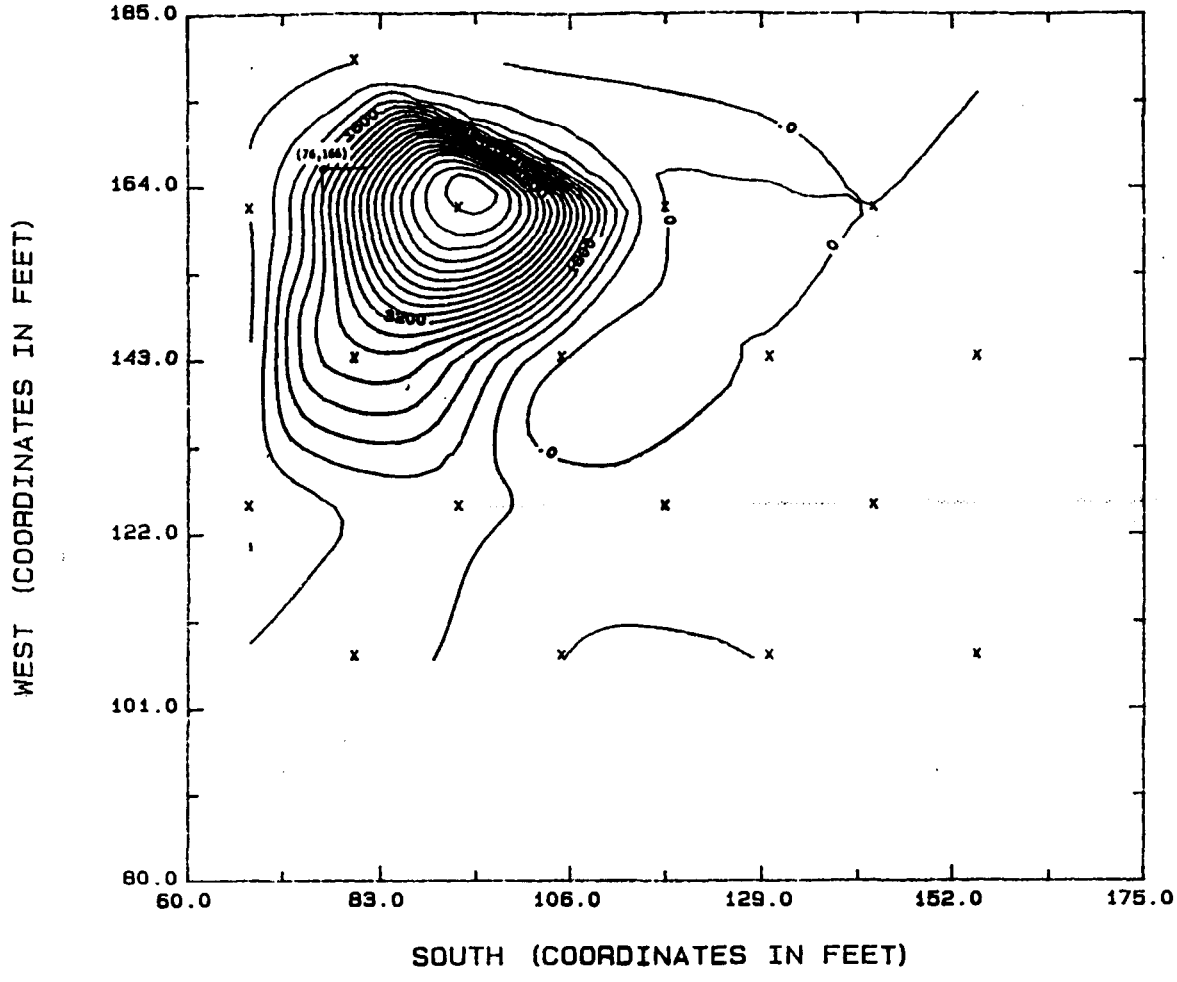
TIME OIL CO PCP 2 FOOT CONTOUR



BZTO104(e)048276

TOLS011443

TIME OIL CO PCP 4 FOOT CONTOUR

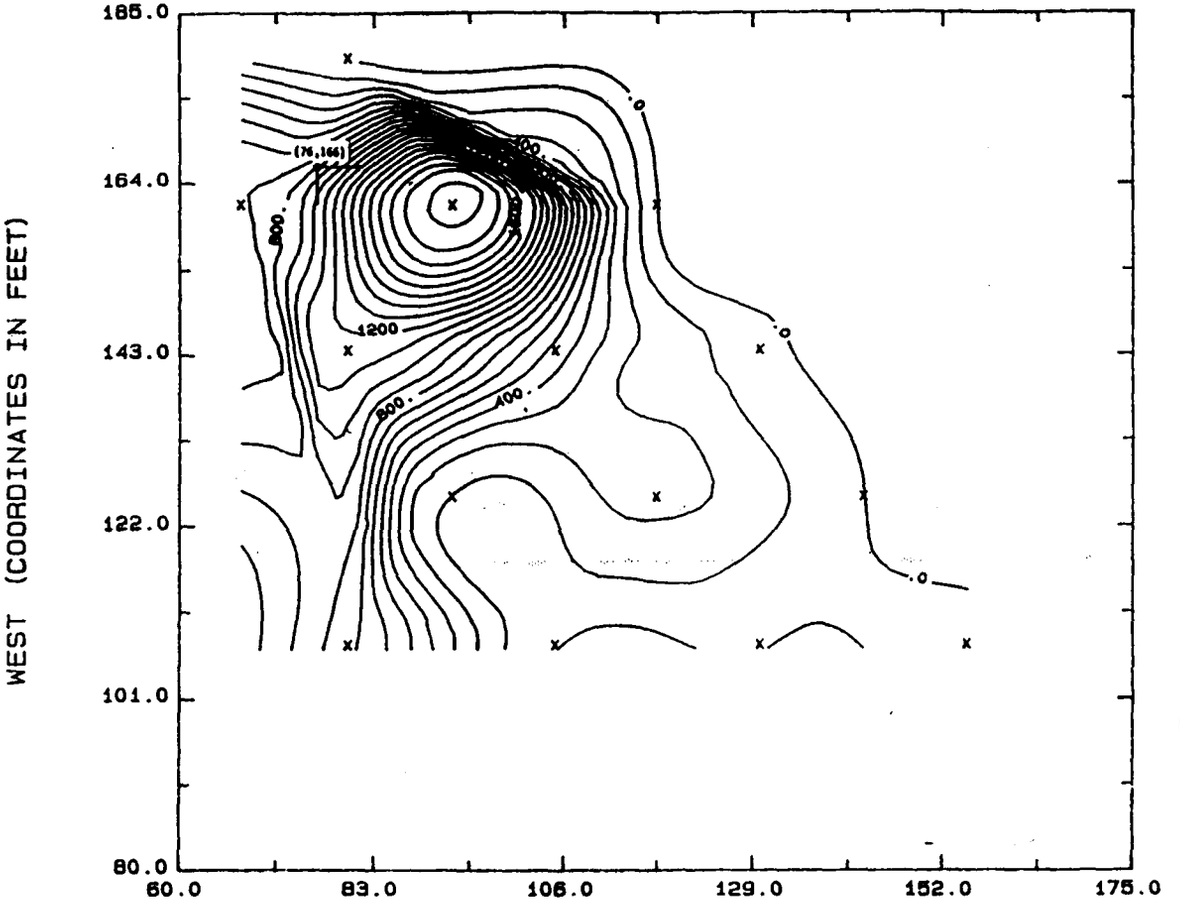


CONTOUR FROM .00 TO 7000.00 CONTOUR INTERVAL = 400.00 MB/KB

TOLS011444

BZTO104(e)048277

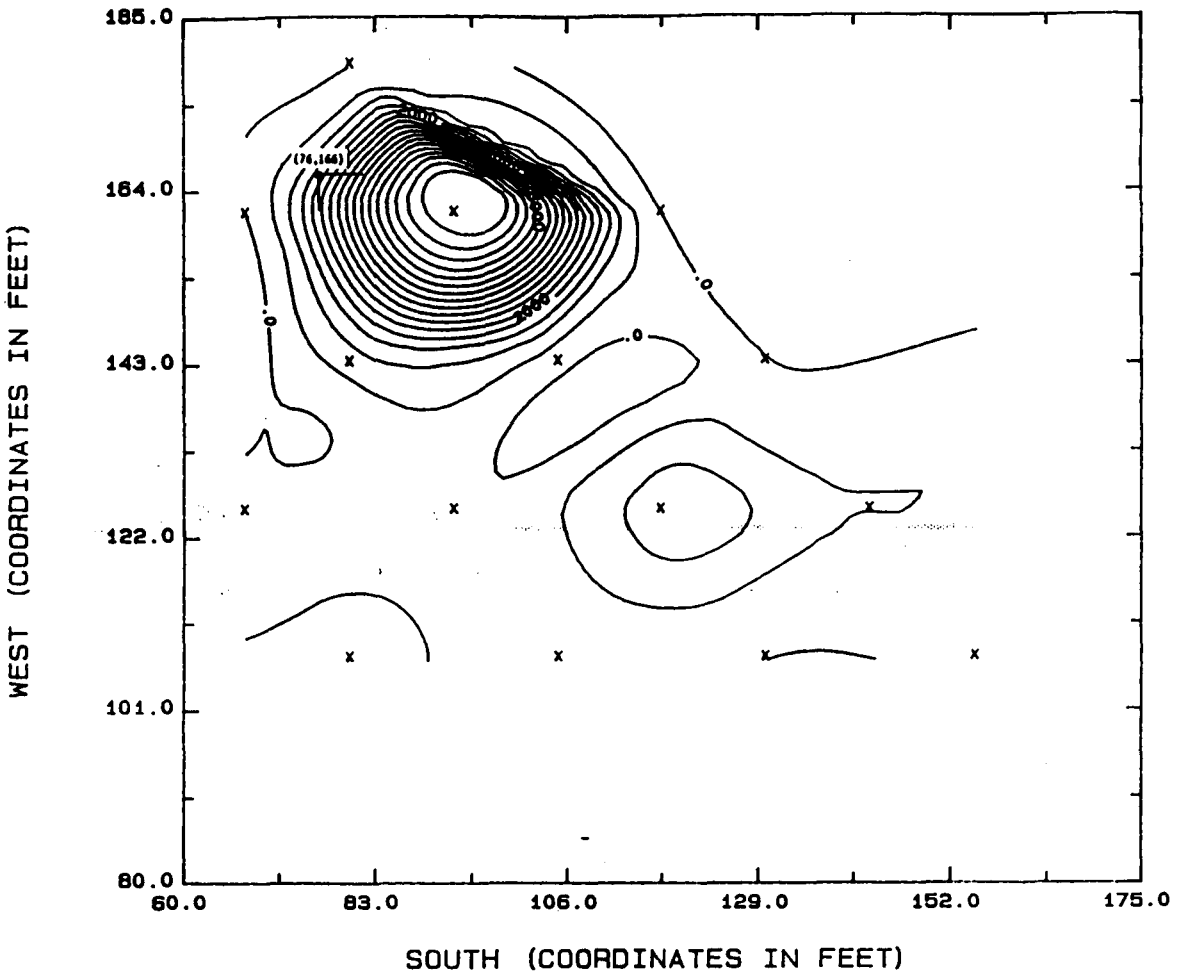
TIME OIL CO PCP 12 FOOT CONTOUR



BZTO104(e)048278

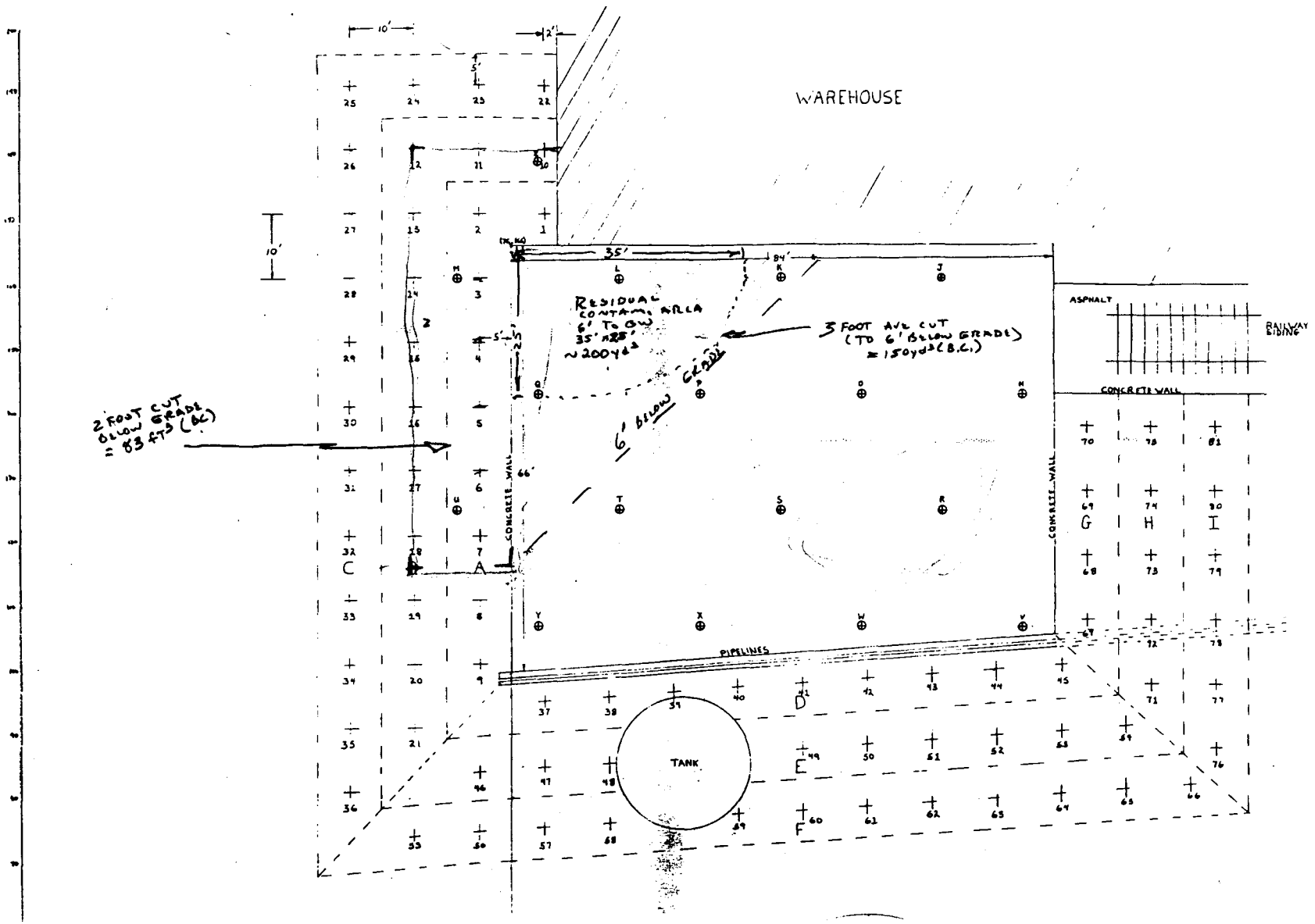
TOLS011445

TIME OIL CO PCP 7 FOOT CONTOUR



BZTO104(e)048279

TOLS011446



230 y³ / 15 Trucks = 940,000 Disp cost.
342 Tons

TOLS011447

BZTO104(e)048280

PRELIMINARY ASSESSMENT / DATA EVALUATION AND PROPOSED REMEDIATION PLAN

FOR PENTACHLOROPHENOL CONTAMINATED SOIL AT TIME OIL CO. - NORTHWEST TERMINAL

VOLUME I - REPORT

Prepared by: ECOVA Corporation

TOLS011448

BZTO104(e)048281

PRELIMINARY ASSESSMENT / DATA EVALUATION AND PROPOSED REMEDIATION PLAN FOR PENTACHLOROPHENOL CONTAMINATED SOIL AT:

TIME OIL CO.

NORTHWEST TERMINAL
12005 NORTH BURGARD ROAD
PORTLAND, OREGON

VOLUME I - REPORT

ECOVA Corporation
18640 NE 67th Court
Redmond, WA 98052

Project No. 1067

December, 1991

ECOVA

TOLS011449

PRELIMINARY ASSESSMENT / DATA EVALUATION AND PROPOSED REMEDIATION PLAN FOR PENTACHLOROPHENOL CONTAMINATED SOIL AT:

TIME OIL CO.

NORTHWEST TERMINAL
12005 NORTH BURGARD ROAD
PORTLAND, OREGON

VOLUME II - APPENDICES

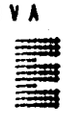
(Reproducion of Time oil correspondence files)

ECOVA Corporation
18640 NE 67th Court
Redmond, WA 98052

Project No. 1067

December, 1991

ECOVA



TOLS011450

PRELIMINARY ASSESSMENT / DATA EVALUATION AND PROPOSED REMEDIATION PLAN FOR PENTACHLOROPHENOL CONTAMINATED SOIL AT:

TIME OIL CO.

NORTHWEST TERMINAL
12005 NORTH BURGARD ROAD
PORTLAND, OREGON

VOLUME III - WORK PLAN

(copy of Ecova report in Time Oil files)

ECOVA Corporation
18640 NE 67th Court
Redmond, WA 98052

Project No. 1067

December, 1991

ECOVA

TOLS011451

BZTO104(e)048284

PHONE 285-2400
CABLE ADDRESS: TIMOIL
(FAX) 206-283-8036

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
LOS ANGELES

TIME
PRODUCTS TIME TESTED
TEN TO ONE IT'S TIME

TIME OIL CO.

2737 WEST COMMODORE WAY
P.O. BOX 24447

SEATTLE, WA 98199-1233
SEATTLE, WA 98124-0447

December 5, 1991

Mr. Mike Kortenhof
Environmental Cleanup Division
Department of Environmental Quality
811 SW Sixth Avenue
Portland, OR 97204-1390

RE: Pentachlorophenol cleanup at Time Oil Co. Northwest Terminal, Portland

Dear Mr. Kortenhof:

Transmitted herewith is Time Oil Co's "Preliminary Assessment / Data Evaluation and Proposed Remediation Plan for Pentachlorophenol Contaminated Soil at Time Oil Co. Northwest Terminal." Our purpose in submitting this document is to provide the Department of Environmental Quality with appropriate background information so that we may be able to efficiently reach an agreement regarding Time's future pentachlorophenol remediation efforts at this site.

This document consists of three binders. "Volume I - Report" summarizes our investigation and remediation efforts from discovery of the problem in 1983 through Ecova's full-scale field trials of a soil washing and bioremediation system. In so far as possible, we have attempted to follow the DEQ's format in presenting this information. "Volume II - Appendices" presents key supporting documentation for the Report. "Volume III - Work Plan" is a reproduction of Ecova's September 12, 1988 bioremediation work plan. It is our intention to follow this plan, but some revisions may be in order depending on the cleanup level selected.

As we have discussed, I will be pleased to provide a tour of our facility. Just let me know when it would be convenient for you and I will make the necessary arrangements. It is my hope that we will be able to establish an open dialogue on this project, so please do not hesitate to call if you have any questions; my direct line is (206) 286-6444.

Sincerely,

Fred Proby
Environmental Specialist

enclosures a/s

C:\WP51\FLP\DEC91\DEQTRANS.LTR

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PRELIMINARY ASSESSMENT / DATA EVALUATION AND PROPOSED REMEDIATION PLAN FOR PENTACHLOROPHENOL CONTAMINATED SOIL AT:

TIME OIL CO.

NORTHWEST TERMINAL
12005 NORTH BURGARD ROAD
PORTLAND, OREGON

ECOVA Corporation
18640 NE 67th Court
Redmond, WA 98052

Project No. 1067

ECOVA

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TABLE OF CONTENTS

EXECUTIVE SUMMARY v

PAI - PRELIMINARY ASSESSMENT PART I

I. GENERAL SITE DATA
- A. Site Name 2
- B. Street Address 2
- C. Site Contact 2
- D. Current Legal Owner 2
- E. Current Operator 2

II. SITE DESCRIPTION
- A. Legal Description 3
- B. Coordinates 3
- C. Directions to the site 3
- D. Total area of site 3
- E. Surrounding Land Uses 3

III. OWNERSHIP INFORMATION
- A. Past Legal Owners 4
- B. Type of Ownership 4
- C. Past Lessees/Operators 4

IV. SITE HISTORY AND POTENTIAL PROBLEMS
- A. Site Operations 5
- B. Emergency/Remedial Actions 6
- C. Description of Prior Spills 11
- D. Sampling and Analysis Data 12
- E. Bibliography of Files/Reports 12

V. HAZARDOUS SUBSTANCE/WASTE CHARACTERIZATION
- A. Hazardous Materials and Types 14
- B. Waste Generation 14
- C. Waste Treatment Systems 14
- D. Permits 15
- E. Permit Violations 15
- F. Hazardous Waste Disposal 15

VI. WASTE CONTAINMENT 16

VII. USGS TOPOGRAPHIC MAP 17

VIII. SITE MAP 18

IX. SUMMARY AND RECOMMENDATIONS 19

PAII - PRELIMINARY ASSESSMENT PART II

I. SOIL PATHWAY
- A. Observed Releases 21
- B. Accessibility 24
- C. Containment 24
- D. Hazardous Substances Characteristics 24
- E. Soil/Geology 25
- F. Targets 25

II. GROUNDWATER PATHWAY
- A. Observed Releases 26
- B. Route Characteristics 28
- C. Containment 29
- D. Hazardous Substances Characteristics 29
- E. Targets 29

III. SURFACE WATER PATHWAY 31

IV. AIR PATHWAY 32

V. SUMMARY AND RECOMMENDATIONS 33

PAIII - WORK PLAN

I. BACKGROUND AND OBJECTIVES
- A. Site Description/History/Operating Practices 35
- B. Summary of Sampling Information 37
- C. Objectives of Proposed Sampling and Analysis 38

II. PROJECT ORGANIZATION 39

III. SOILS
- A. Proposed Soil Borings 41
- B. Soil Types 41

IV. GROUNDWATER
- A. Well Installation 42
- B. Proposed Analytical Parameters 43
- C. Hydrogeologic Characterization 44

V. SURFACE WATER 45

VI. AIR 45

VII. SAMPLING AND ANALYSIS PLAN
- A. Sample Locations 46
- B. Sample Collection Procedures 46
- C. Sample Handling Requirements 47
- D. Analytical Methods 47
- E,F,G. Data Quality 48

VIII. HEALTH AND SAFETY PLAN 49

IX. MAPS 50

PAIV - DATA EVALUATION REPORT

I. SITE BACKGROUND AND OBJECTIVES 52

II. SOILS 53

III. GROUNDWATER 54

IV. SURFACE WATER 55

V. AIR 55

VI. SUMMARY AND RECOMMENDATIONS 56

ECOVA

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APPENDICES

APPENDIX A Supporting Historical Documentation
APPENDIX B Site Maps
APPENDIX C Koppers Product Description and Material Safety Data Sheets
APPENDIX D Soil Analytical Summary
APPENDIX E Groundwater Analytical Summary
APPENDIX F Well Logs
APPENDIX G Toxicity and Persistence Evaluation
APPENDIX H Health and Safety Plan
APPENDIX I Pre-Excavation Sampling
APPENDIX J Quality Assurance and Control

EXECUTIVE SUMMARY

Since the 1940's, Time Oil Co. has operated a petroleum products terminal in the Rivergate area of northwest Portland, Oregon, which provides tank storage facilities for its products. Time Oil Co. has, on occasion, leased tanks to outside customers for storage of their (customers') products; in these cases, Time Oil Co. has also provided product handling and distribution services. In an arrangement of this type, Time Oil Co. ran a Pentachlorophenol (PCP) blending operation for Koppers Company on a portion of the subject property from March 1, 1967 to March 31, 1982. This operation consisted of heating and mixing PCP granules with paraffin wax, mineral spirits and other similar solvents to yield various woodtreating products per Koppers' specifications. These products were then stored in tanks on site and later shipped to Koppers' customers in 55 gallon drums.

PCP is a light brown material in the solid form, and with a melting point of 360 degrees F., is a solid under most conditions. It is largely water insoluble, although it can be dissolved in water with the pH elevated to 10 or more. Its primary use is as a wood preservative when blended with various types of oil products. Details of its characteristics, as well as the characteristics of the various solvents it was blended with, are given in the Material Safety Data Sheets included in Appendix C.

At some time during the lease agreement between Time Oil Co. and Koppers, PCP was released into the soil adjacent to the warehouse in the Mixing Area. This material was probably released in combination with the various solvents used in the process. The primary cause for these releases appears to have been intermittent spillage from hoses, mixing vessels and daily operations, rather than a specific, large spill event.

Since the termination of the agreement between Time Oil Co. and Koppers, Time Oil Co. has been actively pursuing remediation of the contaminated area.

In 1984 the Oregon Department of Environmental Quality inspected this site. At that time samples were taken from throughout the site which showed no lead contamination, no pesticide contamination, no PCP contamination outside the limits of the PCP Mixing Area and warehouse, and very limited contamination by selected hydrocarbon compounds.

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In 1985 Time Oil Co. began a program to excavate the contaminated soil for disposal at an appropriate landfill. Early in that year, approximately 290 cubic yards of the most contaminated soil were removed from the site and disposed of at Arlington, Oregon. Investigations continued to determine the exact extent of the contamination. However, before the remaining contaminated soil could be removed, PCP was reclassified as a hazardous waste bearing the number F027, and thus became ineligible for disposal at hazardous waste facilities in the United States.

Pending resolution of acceptable soil disposal techniques, Time Oil Co. switched their focus to determining if the groundwater had been contaminated. This involved installing an extensive network of groundwater monitoring wells and repeated sampling and analysis. This work indicated low levels of groundwater contamination, however, the results are somewhat inconclusive. In an effort to limit any possible continuation of groundwater contamination, the contaminated soil was excavated and stock piled in a bermed, lined area, and covered.

Since 1988 Time Oil Co. has been working with ECOVA Corp. to remediate the contaminated soil on site. Efforts originally were focused on soil washing techniques. These efforts were halted when it became apparent that meeting a "background" cleanup level of 0.5 mg/kg would not be practicable.

Currently, Time Oil Co. would like to work with the Oregon Department of Environmental Quality to set an achievable cleanup level that would be considered safe to both the environment and personal health, so that the contamination problem at the site can be remediated.

From the time significant contamination at the site was verified, Time Oil Co. has continuously pursued voluntary cleanup of the site, and compliance with environmental regulations. This report is submitted in furtherance of that policy.

This document is divided into four sections. The Preliminary Assessment Part I is a general site overview discussing the site history, and a description of the contamination problem.

The Preliminary Assessment Part II is a more detailed analysis of the situation. Descriptions of soil and groundwater contamination are given along with the available analytical information that was obtained prior to 1989.

The Preliminary Assessment Part III is an account of the work ECOVA Corporation has performed on site since 1989 and describes the objectives of the current site activities.

The Preliminary Assessment Part IV is a recommendation of future actions.

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PAI - PRELIMINARY ASSESSMENT PART I

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I. GENERAL SITE DATA

A SITE NAME

Time Oil Co. Northwest Terminal

B SITE ADDRESS

12005 North Burgard Road
Portland, Oregon 97203

C SITE CONTACT

Dick Basney
Terminal Manager
12005 North Burgard Road
Portland, Oregon 97203
(503) 286-1611

D CURRENT LEGAL OWNER AND OPERATOR

Property is owned by Northwest Terminal Co., a wholly-owned subsidiary of Time Oil Co. located at 2737 West Commodore Way Seattle, Washington 98199-1233. Improvements are owned by Time Oil Co., which also operates the terminal. Contact for environmental affairs is Mr. Fred Proby at (206) 286-6444.

Northwest Terminal Co. has owned the property since 1943.

E CURRENT OPERATOR

Time Oil Co.

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II. SITE DESCRIPTION

A LEGAL DESCRIPTION

The subject property is comprised of four parcels situated in Section 35 of Township 2N Range 1W: tax lot #18 (12.47 acres), #31 (32.40 acres), #63 (0.22 acres) and #38 (6.04 acres). Tax lots #18, #31, and #63 (45.09 acres total) are referred to as the "Northwest Terminal" and tax lot #38 is referred to as the "Bell Terminal"; both are operated by Time Oil Co.

B COORDINATES

The Time Oil Co. facilities are located at approximately the following (unsurveyed) coordinates:

Longitude	122 degrees, 47 minutes West
Latitude	45 degrees, 37 minutes North

C ROAD DIRECTIONS

From St. Johns, go north on Lombard, and turn left onto Burgard Road at the bend where Lombard turns into Columbia. Stay to the right at the first fork (approximately 1 block from Lombard), and follow the road around to the left (west). Where the road turns north, go straight (west) down driveway to Time Oil Co.

D TOTAL AREA OF SITE

The Time Oil Co. facilities cover an area that is approximately 51 acres, but the area of contamination covered an area that originally was approximately 100 feet by 100 feet.

E DESCRIPTION OF LAND USES IMMEDIATELY SURROUNDING SITE BOUNDARIES

The land surrounding the subject site is the Rivergate Industrial area. It is occupied by the Port of Portland facilities and heavy industrial complexes.

III. OWNERSHIP INFORMATION

A **PAST LEGAL OWNER(S)**

Northwest Terminal Co. acquired title to the approximately 12.5 acres on which the warehouse and Mixing Area is located from Oregon Shipbuilding Corp. on December 2, 1943. The current address, telephone number and years of ownership of Oregon Shipbuilding Corp. are not known.

The approximately 40 acres to the east of the Mixing Area was acquired from the United States of America on May 20, 1950.

The property comprising the Bell Oil Terminal was acquired from William Shenker and others on September 9, 1953. His current address, telephone number and years of ownership are not known.

B **TYPE OF OWNERSHIP**

Corporate, government and private

C **PAST LESSEES OR OPERATORS**

Unknown

IV. SITE HISTORY AND POTENTIAL PROBLEMS

A SITE OPERATIONS

Since the 1940's, Time Oil Co. has operated a petroleum products terminal in the Rivergate area of northwest Portland, Oregon, that provides tank storage facilities for its products. Time Oil Co. has, on occasion, leased tanks to outside customers for storage of their (the customers') products; in these cases, Time Oil Co. has also provided handling and distribution services. In an arrangement of this type, Time Oil Co. ran a PCP blending operation for Koppers Company on a portion of the subject property from March 1, 1967 to March 31, 1982. This operation consisted of heating and mixing PCP granules with paraffin wax, mineral spirits and other similar solvents to yield various woodtreating products per Koppers' specifications. These products were then stored in tanks on site and later shipped to Koppers' customers in 55 gallon drums. The 1972 site map in Appendix B, Figure 1, illustrates the Time Oil Co. facilities configuration and shows the contaminated site at the time of these operations. Tanks No. 20001, 20002, and 20003 were leased to Koppers, as well as several smaller, above ground, horizontal tanks.

At some time during the lease agreement between Time Oil Co. and Koppers, PCP was released into the soil adjacent to the warehouse and Mixing Area. This material was probably released in combination with the several hydrocarbon solvents used in the process. The primary cause for these releases appears to have been intermittent spillage from hoses, mixing vessels and daily operations, rather than a specific, large spill event.

Following termination of Time Oil Co.'s agreement with Koppers on March 31, 1982, the tanks, piping, and related equipment were removed and soil samples were collected. These samples indicated that PCP had been released.

Upon removal of the equipment used in the PCP operation, plans were made to excavate and dispose of the contaminated soil. This was to be a three phase effort, fully coordinated with the Oregon Department of Environmental Quality (ODEQ). Phase I consisted of initial soil excavation and transport to an authorized disposal facility. Phase II involved a thorough investigation to determine the extent of PCP contamination. Phase III planned the removal and disposal of all contaminated soil with concentrations above acceptable limits.

Phases I and II were completed, but the ban on landfilling PCP contaminated materials impeded progress toward completion of Phase III.

B SITE EMERGENCY/REMEDIAL ACTIONS

No "emergency" operations have been undertaken on the site with respect to the PCP operations. Remedial actions that have occurred at the site, and a summary of analytical information, are described in the following historical summary. A more thorough discussion of analytical information is included in Preliminary Assessment II under Soil Pathway and Groundwater Pathway.

1983

April

Bioassay tests indicated that surface soil from the PCP mixing area was toxic to juvinile Rainbow trout at soil concentrations of 100 and 1000 mg/l. The PCP concentration of this soil sample was not determined.

1984

April

Oregon Department of Environmental Quality (ODEQ) advised Time Oil Co. that the Northwest Terminal was to be inspected as part of ODEQ/EPA "hit list" of 44 companies.

October

ODEQ inspected the site and determined that soil samples should be collected and analyzed.

December

ODEQ collected 12 soil samples throughout the entire Mixing Area, of which one sample was in PCP area.

1985

January

Time Oil Co. received results of ODEQ soil sampling, showing 1820 mg/kg PCP in woodtreating area.

All 12 soil samples tested for EP Toxicity lead showed concentration of less than 0.1 mg/l.

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All 12 soil samples were tested for 14 pesticides and showed concentrations of less than 5 mg/kg (the detection limit).

Samples tested for acid extractables (phenols) showed 10 of the 12 sites to contain less than 1 mg/kg (the detection limit). One sample contained 515 mg/kg PCP and 12 mg/kg tetrachlorophenol (this sample was taken near the site of tanks leased to Crosby and Overton).

The second sample which tested over the detection limit contained 1820 mg/kg PCP and 71 mg/kg tetrachlorophenol (this sample was taken at the site of the tanks leased to Koppers).

All 12 soil samples were tested for base-neutral extractables. Of these, nine of the 12 contained less than the detection limit (1 mg/kb).

February

On February 4, 1985, Time Oil Co. reiterated to the ODEQ its intent to excavate PCP contaminated soil and dispose of it at an approved disposal facility. This was done via a status update letter to ODEQ (Janet Gillespie).

Letter from John Smits of ODEQ to EPA describes history of site, waste handling practices, and recommendations for future actions (this letter is included in Appendix A).

May

DEQ approved "Disposal Request" for PCP contaminated soil at the hazardous waste facility at Arlington, Oregon.

June

"Waste Transportation and Disposal Agreement" executed with Chem-Security Systems, Inc. for disposal of soil at Arlington.

Between June 25 and June 28, 1985, 288 cubic yards (242 tons) of soil were removed and shipped to Arlington as part of the Phase I excavation described earlier. The soil was excavated to a depth of 2 to 4 feet in the northwest corner of the Mixing Area (documentation included in Appendix A).

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On June 28, 1985, Time Oil Co. received a letter from the ODEQ laboratory concerning a previous interpretation by the agency. This letter stated that 600 mg/kg of total chlorophenols in soil and 0.15 mg/l in water represented the hazardous waste threshold. This conclusion was based on extraction and bio-toxicity tests performed by ODEQ. The letter did state that this was only to be used as guidance and did not necessarily reflect specific clean up requirements.

August

Following completion of the Phase I excavation, site characterization by Riedel Environmental Services showed that not all of the PCP contaminated soil had been removed. Samples were taken from 22 locations around the outside of the perimeter of the PCP Mixing Area south of the pentachlorophenol warehouse in an effort to determine the extent of contamination. Three composite samples were also taken in this area which showed concentrations up to 860 mg/kg. Additional samples were then taken from 81 sites just outside of the PCP Mixing Area and analyzed. Results indicated that PCP contamination was localized to the west and south of the warehouse, with little or no contamination occurring to the east of the site.

Soil was then collected from 14 locations at various depths from within the Mixing Area. Contamination contour maps indicated a maximum concentration of 26,500 mg/kg at the surface of the area where the loading of trucks had occurred during the Phase I excavation. A second point of high concentration was at the southwest corner of the PCP warehouse. These contour maps are presented in Appendix D. Analytical information for soil and groundwater is summarized in more detail in PA II under "Observed Releases" for Soil Pathway and Groundwater Pathway respectively.

November

Time Oil Co. retained Riedel Environmental Services to install four groundwater monitoring wells near the southwest corner of the PCP warehouse building (Wells 1, 2, 3 and 4). Soil samples were taken to expand the data from earlier analyses. Wells 1, 2 and 3 were slanted under the warehouse in an effort to determine the extent of contamination in that direction. Samples from the slant borings indicated PCP concentrations as high as 116,000 mg/kg at 2.5 to 4 feet below the surface; concentrations decreased with depth. A map of the well locations is provided in Appendix B, Figure 2.

December

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On December 10, 1985, the Environmental Protection Agency, Region X, advised Time Oil Co. that soil contaminated with PCP had been reclassified from U242 to a hazardous waste bearing number F027. The EPA further advised that at that time there were no commercial hazardous waste facilities in the United States that would accept waste designated as F027.

Pending resolution of acceptable disposal techniques, Time Oil Co. switched the focus of its attention to determining if groundwater had been contaminated.

1986

January

In order to identify groundwater flow direction and gradient in the area of the site, Time Oil Co. installed well points at three locations surrounding the PCP warehouse and Mixing Area. On February 12 the report was received on the operations associated with those wells. Two of the wells (A and B) were installed to a depth of 20 feet, and two wells were installed at location C to a depth of 8 feet. Water level measurements were taken on nine occasions in Wells A, B, C1, C2, and 4. The data indicated unexpectedly lower water levels in Well 4.

To further the investigation, three additional well points, four observation pits and a river level reference point were installed by Time Oil Co. in March, 1986. Wells E, F, and G were 20, 19, and 13 feet deep, respectively. Well C2 was removed. Water levels were again measured and supported the data of the previous water level measurements.

Analysis of the data indicated a strong likelihood that Well 4 had penetrated a low permeability zone and had not been completed in such a way as to prevent the perched water table from draining through the well bore.

May

In May, 1986, at Time's direction, three additional groundwater monitoring wells were installed by Riedel (Wells D, H, and I). The purpose of these wells was to further define the upper piezometric surface and to obtain data on groundwater quality.

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Time Oil Co. also retained Century Environmental Sciences to perform groundwater sampling and analysis. Water level readings in Wells 4, A, B, C, E, F, and G indicated a persistent zone of depression around Well 4. Well 4 was subsequently over-drilled and sealed.

Analysis of water samples from Wells 4, B, and F indicated PCP concentrations of 6.1, 2.6, and 1.4 ppb respectively. A second group of water samples was taken from Wells A, B, D, E, F, H, and I. The only well which indicated PCP concentrations above detection limits was Well I, with a concentration of 2.2 ppb.

August

In August of 1986 SRH Associates was retained to perform additional sampling and analysis of soil and groundwater at the Time Oil Co. facility. Time Oil Co. had regraded the surface of the Mixing Area gathering all suspected contaminated surface soil into a centralized area, reducing the area to about 60 feet by 60 feet. SRH then collected surface soil samples from the same 14 locations in the Mixing Area which had previously been sampled by Riedel. Additionally, six holes were drilled through the warehouse floor and sampled soil beneath the building. Groundwater samples were also obtained from seven existing monitoring wells and analyzed. The results of this work are summarized in Appendix D, pages 14 to 26.

October

SRH Associates, Inc. evaluated twelve alternative cleanup technologies and recommended soil washing as the most logical clean-up approach, followed by Surface Mounted Thermal Extraction and In-Situ Thermal Extraction. The report recommended performing bench and pilot scale evaluations. At the time, these technologies were still in the experimental stage, so Time Oil Co. chose to seek other treatment approaches.

1988

September

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Time Oil Co. received a work plan from ECOVA for soil and groundwater remediation using biological treatment in above-ground reactors. Three alternative clean up levels were evaluated - 500, 100, and 50 mg/kg.

Time Oil Co. contacted ODEQ (Ed Woods and Tom Miller) to determine DEQ's role and was advised that ODEQ did not necessarily need to approve the treatment process, but would need to sign-off that the cleanup had been effectively completed.

October

ECOVA's Work Plan was amended to set a final cleanup level of 0.5 mg/kg PCP, the practical quantitation limit using standard test procedures. This concentration was selected to reflect ODEQ's goal of remediating to "background" levels.

December

Received notification from ODEQ (letter dated 11/30/88) that facility was listed on "Inventory of Confirmed Releases", site identification number 170.

1989

April - October

To reduce the potential for groundwater contamination, the contaminated soil was excavated and stock piled in a bermed, lined storage area next to site of original contamination. ECOVA performed biological slurry treatment on 10 yards of soil from the stock pile, and achieved reduction of PCP from approximately 250 to 50 mg/kg. Further biodegradation was inhibited by the presence of mineral spirits and related solvents used in the PCP formulation.

1990

January - March

Field studies by ECOVA indicated that, under the existing soil conditions, biodegradation of PCP to 0.5 mg/kg would not be practical. The lowest concentration that could be practically achieved was determined to be 100 mg/kg.

1991

December

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Time Oil Co. submits plan to ODEQ for soil cleanup under the voluntary cleanup program.

C DESCRIPTION OF PRIOR SPILLS

As mentioned above, at some time during the lease agreement between Time Oil Co. and Koppers, PCP were released into the soil adjacent to the warehouse and Mixing Area. This material was probably released in combination with the minieral spirits and other solvents which were used in the process. The primary cause for these releases appears to have been intermittent spillage from hoses, mixing vessels and daily operations, rather than a specific, large spill event.

During an October 25, 1984 site visit by the ODEQ, the 20,000 gallon storage tanks were inspected. There was obvious visual contamination of the soil by incidental spills in this former handling area. The tanks were later removed.

D SAMPLING AND ANALYSIS DATA

Copies of all supporting documentation including sampling and analyses are contained in Appendix A in chronological order and are described briefly above in PA I, Section IV, Subsection B. Detailed descriptions of soil and groundwater sampling and analyses are included in PA II, Sections I and II.

E BIBLIOGRAPHY OF ALL FILES, REPORTS REVIEWED

The following documentation is included in Appendix A in support of this report under the referenced subsections of that appendix:

A "Northwest Terminal Woodtreating Chronology of Events"

A-1 Department of Environmental Quality "Request for Analysis" for samples taken, December 12, 1984.

A-2 Letter from John L. Smits (ODEQ) to Debbie Flood (EPA Region X) describing site conditions, February 12, 1985.

A-3 Letter from ODEQ (Richard F. Gates) to Time Oil Co. giving 600 mg/kg as the hazardous waste threshold, June 28, 1985.

A-4 Results of sample analysis for North West Vacuum Truck Service, February 19, 1985. Documentation for excavation of 240 tons of contaminated soil by Chem-Security systems, July 29, 1985.

A-5 Letter from Riedel Environmental Services. Inc. to Time Oil Co. giving sample results, August 15, 1985.

Report to Time Oil Co. from Riedel Environmental Services, October 18, 1985.

A-6 Letter from George C. Hofer (EPA - RCRA Permits Section) to Time Oil Co. giving notice that PCP will no longer be accepted at hazardous waste facilities, December 10, 1985.

A-7 Report to Time Oil Co. from Riedel Environmental Services, February 4, 1986.

A-8 Time Oil Co. internal memo from Fred Proby on groundwater investigation, May 2, 1986.

A-9 Report to Time Oil Co. from Century Environment Sciences, June 4, 1986.

A-10 Report to Time Oil Co. from SRH Associates, Inc., October 1, 1986.

A-11 Report to Time Oil Co. from SRH Associates, Inc., November 5, 1987.

V. HAZARDOUS WASTE CHARACTERIZATION

HAZARDOUS MATERIALS AND TYPES

PCP is a light brown material in the solid form, and with a melting point of 360 degrees F., is a solid under most conditions. It is largely water insoluble, although it can be dissolved in water with the pH elevated to 10 or more. Its primary use is as a wood preservative when blended with various types of oil products.

Appendix C describes all of the chemicals used in the wood treating operation. It contains the following:

- An industry brochure distributed by Koppers which describes the products which were produced at the site.
- A safety bulletin which describes "Safety Measures and Precautions for Handling Solutions Containing Pentachlorophenol."
- Material Safety Data Sheets for all of the Koppers products and ingredients, which includes formulas for their wood treating products. As these chemicals were used in the PCP operations on the site, they were released as part of the PCP mixture, and thus are be present in the PCP contamination areas.

B WASTE GENERATION

The volumes of hazardous materials and wastes generated annually is unknown. The total volume of PCP contaminated soils is estimated to be 3000 cubic yards based on a survey of the stock piled soil.

C WASTE TREATMENT SYSTEMS

No PCP waste treatment systems were in operation at the site.

D **PERMITS**

On August 11, 1980, Time Oil Co. completed EPA form 8700-12, Notification of Hazardous Waste Activity, as required by RCRA Section 3010. On February 22, 1982, Time Oil Co. requested assignment of a generator identification number by correspondence with the Department of Environmental Quality.

E **PERMIT VIOLATIONS**

There have been no known violations of the above-noted permits.

F **HAZARDOUS WASTE DISPOSAL**

On June 25, and 28, 1985, 243 tons of the most heavily contaminated soil were removed from the surface of the PCP mixing area. The Uniform Hazardous Waste Manifests documenting the removal and proper disposal of this material are provided in Appendix A, with the letter dated July 29, 1985 from Time Oil Co. to Chem-Security Systems, Inc. This constitutes the only removal of PCP contaminated soil from the site by Time Oil Co.

VI. WASTE CONTAINMENT

The PCP arrived at the site in granular form in 55 gallon drums. The solvents arrived in hogsheads. Materials were blended per Koppers specifications (Appendix C), and were stored in tanks 20001, 20002, and 20003, which were 20,000 gallon tanks, and several smaller horizontal, rectangular tanks. These tanks were located to the south of the PCP warehouse in the PCP Mixing Area, as shown on the map in Appendix B, Figure 1. All of these tanks and their associated piping were removed in 1984.

The area containing the PCP solution storage tanks was surrounded by a concrete bulkhead, which was approximately three feet high. This Mixing area was approximately 60 feet in the north-south direction, and 80 feet in the east-west direction. The wall on the west side was decontaminated and demolished in November, 1985, after the tanks were removed. This was the only known secondary containment structure.

The total volume of PCP material spilled at the site can not be accurately determined, since it was the result of an accumulation of small incidents, not a documented event. Excavation activities, subsequent sample taking and analysis, and surveying of the stock piled soil give an approximate volume of 3000 cubic yards of soil that have been impacted.

In July of 1985 Riedel International performed sampling and analysis services at the site. The results of this work is included in Appendix D. Using this data as a basis, an average concentration of 945 mg/kg has been calculated.

The activities that resulted in the contamination under investigation consisted of a simple operation wherein solvents were heated and mixed with PCP to produce a variety of wood treating products. The finished product was stored in tanks, as described above, and then shipped to customers of Koppers. The only waste materials produced by this operation were empty packaging, tanks, drums and buckets with residual PCP and the soil contaminated by spilled PCP.

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VII. USGS TOPOGRAPHIC MAP

Topographic maps for the Time Oil Co. site and the surrounding region are included in Appendix B, Figures 3 and 4.

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BZTO104(e)048310

VIII. SITE MAPS

Detailed maps of the Time Oil Co. Northwest Terminal showing the location of the PCP blending area are included as Appendix B, and are described below:

- Figure 1 is a drawing from 1972 of the site which shows the PCP Mixing Area as it existed during the blending operations.
- Figure 2 is a drawing showing the area of contamination and the location of monitoring wells.
- Figures 3 and 4 are topographic maps showing the immediate vicinity around the Northwest Terminal Site.

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IX. SUMMARY AND RECOMMENDATIONS

Pentachlorophenol has been spilled on the facilities of Time Oil Co. and has created a contaminated site. Work performed by several consulting groups consistently indicates that the extent of PCP contamination is limited to the PCP mixing area.

Time Oil Co. has, from the early stages of this problem, taken an active, self-motivated approach to cleaning up their facilities. The site has been thoroughly characterized and full-scale field trials have demonstrated that soil washing and biological degradation is an effective remediation method. It is therefore recommended that this method be used to remediate PCP contaminated soils to a level acceptable to the ODEQ.

PAII - PRELIMINARY ASSESSMENT PART II

I. SOIL PATHWAY

A OBSERVED RELEASES

As mentioned in PAI - Section VI Waste Containment, no specific incidents of PCP spills have been documented at the site. Accordingly, "observed releases" is best described through a discussion of analytical information indicating the extent of contamination. The following discussion summarizes the sampling and analytical work which was performed on the Time Oil Co. site prior to 1988. Work done on the site after 1988 by ECOVA is included in Preliminary Assessment Part III.

Analytical work began with fish bioassay tests performed in February of 1983. These tests indicated that the soil from the former PCP mixing area was toxic at the 100 to 1000 mg/kg levels.

During an October 25, 1984 site visit by Oregon Department of Environmental Quality, there was visual evidence of soil contamination in the former PCP Mixing Area. On that date, the DEQ advised their intent to collect soil samples throughout the facility. ODEQ laboratory personnel collected twelve soil samples on December 12, 1984 from the entire facility, using a soil core. The sample locations are shown on Figure 6 in Appendix B. Soil for a composite at each location was sampled at the ground surface, and at 1, 2, and 3 foot intervals. Analysis performed on each sample included base-neutral extractables, pesticides/PCBs, acid extractables, pesticides and EP Toxicity for lead. An effort was also made to identify and quantify any other organic chemicals observed with the extraction GC/MS (gas chromatograph/mass spectrometer) procedures.

All 12 soil samples showed concentrations of lead of less than 0.1 mg/l, the detection limit. Concentrations of 5 mg/l or greater for EPA Toxic lead are classified as hazardous waste.

Of 12 soil samples tested for fourteen pesticides(RCRA method 625, extracted by RCRA method 3540), all showed concentrations of less than 5 mg/kg, the detection limit for these pesticides.

Samples for acid extractables (RCRA method 625, extracted by RCRA method 3540) showed all 12 sites to contain less than the 1 mg/kg detection limit for these phenol species except for two samples from the PCP storage area - samples 9 and 10. The results are summarized in the following table.

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ODEQ ANALYSIS FOR ACID AND BASE-NEUTRAL EXTRACTABLES

	Sample 4	Sample 8	Sample 9	Sample 10
ACID EXTRACTABLES				
Pentachlorophenol	-	-	515 mg/kg	1820 mg/kg
Tetrachlorophenol	-	-	12 mg/kg	71 mg/kg
BASE-NEUTRAL EXTR.				
Isophorone	1 mg/kg	-	-	-
2,4-dinitrotoluene	3 mg/kg	-	-	-
Fluorene	1 mg/kg	13 mg/kg	-	-
n-nitrosodiphenylamine	2 mg/kg	-	-	-
Phenanthrene	1 mg/kg	14 mg/kg	-	-
Anthracene	1 mg/kg	105 mg/kg	-	-
Chrysene	-	-	1 mg/kg	-
bis(2-ethyhexyl)phthalate	-	-	3 mg/kg	-

Also summarized in the above table are the results of the base-neutral extractables, method 625, extracted by RCRA method 3540. All showed non detectable concentrations except for samples 4, 8, and 9. Although polychlorinated biphenyls (PCBs) were detected at several soil sample sites, total PCBs were well below the 50 mg/kg concentration which requires handling. The analytical results from these samples are included in Appendix A.

Following coordination with the DEQ, the Arlington landfill, and local contractors, 24.76 tons (7781 cubic feet, or 288 cubic yards) of PCP contaminated soil were hauled to Arlington, Oregon. The contamination level of a sample of this soil was 1820 mg/kg PCP. Documentation of the soil removal is included in Appendix A. Continuation of this effort was later halted due to a moratorium on landfilling of PCP contaminated soils.

In October of 1985 Riedel Environmental Services submitted a report (included in Appendix A) detailing the results of their soil sampling operations conducted in July of 1985. A summary of the analytical results is also provided in Appendix D, pages 1 through 13. This contains a list of PCP concentrations in the samples and a contour map showing PCP distribution at various depths.

This data shows high concentrations of PCP immediately to the southwest of the PCP warehouse and a second area which was used as a loading area for blended products. PCP concentrations at these two areas were 13,500 and 26,550 mg/kg respectively. Page 13 gives the analytical results of three preliminary surface composite samples taken from outside the perimeter of the Mixing Area. The samples were collected from the west, south, and east directions and analysis indicated PCP concentrations of 660, 860, and 17 mg/kg respectively.

In February of 1986 Riedel Environmental Services submitted a report (included in Appendix A) on a November 1985 field investigation in which four wells were installed near the southwest corner of the PCP warehouse. Soil samples were taken during installation. The samples from Wells 1, 3, and 4 were analyzed for PCP. The results are summarized below. PCP concentrations are presented in parts per million.

Depth (feet)	Well #1	Well #3	Well #4
0 - 1.5	1690	65.3	-
2.5 - 4	16.8	116000	-
7.5 - 9	886	11000	-
16 - 17.5	110	-	-
17.5 - 19	-	1560	-
18.5 - 20	-	-	574
32.5 - 35	-	-	62.3
43.5 - 45	-	-	1.59
47.5 - 49	-	-	2.81

In August, 1986, Time Oil Co. re-graded the contaminated area in an effort to consolidate the contaminated soil and keep it localized. After re-grading, SRH Associates took samples from the same 14 locations in the Mixing Area as Riedel. SRH also drilled six holes in the warehouse floor and collected samples underneath the warehouse. The results of the analysis are given in Appendix D, pages 14 to 26. This analysis indicates that although the soil does contain some amounts of PCP, these amounts are very low - average concentration for 30 samples is .5 ppm with only 5 samples having detectable amounts of PCP.

Later, in 1989, Time Oil Co., through the services of ECOVA Corporation, excavated approximately 3,000 yards of contaminated soil and placed it in a bermed, protected area. Sampling of the excavated pit at the time indicated that all of the contaminated soil had be removed, except for soil under the southwest corner of the warehouse. This soil remained unexcavated due to fear of structural damage to the warehouse. This work is described in detail in Section PAIII.

B ACCESSIBILITY

Time Oil Co. site in Portland is a restricted access area. The site is completely fenced and access is controlled by a gate which can be opened only with a pass card. The site has a 24 hour guard and operations typically may occur at all hours of the day.

Currently, the possibility of exposure to contaminated soil is limited, since the contaminated soil has been excavated, placed in a lined, bermed, storage area and covered with a tarp.

Although site personnel have access to the area, there are no routine operations that would expose workers to the contaminants.

C CONTAINMENT

There were no containment facilities to prevent spilled PCP mixtures from reaching the soil. A cement bulkhead surrounding the PCP Mixing Area had served to contain spills to that immediate area.

Currently the contaminated soil is covered in a bermed and lined storage area.

D HAZARDOUS SUBSTANCE

The hazardous substances of concern at the site are PCP and various petroleum based solvents used in the blending process for making wood treating products. The solvents include mineral spirits, ketones, and other hydrocarbon products. Product and Material Safety Data Sheets are located in Appendix C. Also included with this material is "Safety Measures and Precautions for Handling Solutions Containing Pentachlorophenol."

PCP was the most hazardous substance used at the facility. A toxicity/persistence evaluation of the characteristics of PCP was conducted using the method described in Appendix G. PCP's combined toxicity/persistence rating factor, using that method, is 15. Persistence of each hazardous substance is evaluated on its biodegradability. PCP exhibits a ring compound structure, and is assigned a persistence value of 2. Toxicity of each hazardous substance being evaluated is given a value using the rating scheme of Sax or the National Fire Protection Association (NFPA). PCP has a rating of Level 3, and is assigned a toxicity value of 3. These values for toxicity and persistence give a combined rating of 15.

PCP's IDLH level (Immediately Dangerous to Life or Health) is 150 mg/m3. It is not considered a carcinogen by the National Institute for Occupational Safety and Health.

E SITE/SOIL GEOLOGY

It is believed that much of the site has been built up with hydraulic fill from dredging the Willamette River. Soil type consists of fine to medium grained sands and minor amounts of silts and gravels. These soils are normally associated with a former river channel deposit of the Willamette River. Little clay appears to be present near the surface, although lenses may occur at depth. Well Completion Forms for ECOVA Wells J1, J2, J3, B1, B2, G1, and G1A provide a more detailed description of subsurface soils (Appendix F).

F TARGETS

1 On-site Population

The total number of people employed at the Time Oil Co. Portland is approximately ten. Personnel do not routinely work or reside on or near the area of PCP contamination.

2 One Mile Population

United States Geological Survey Topographic Maps were inspected to determine the number of residences in the vicinity. The total residential population within a one-mile radius of the site is estimated at 35 people (approximately 15 residences), and appears to be concentrated near Harborton, on the opposite bank of the Willamette River. There are no residences on the contaminated property.

3 Terrestrial Sensitive Populations

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The entire site has been disturbed, so there are no natural flora or fauna resident on the site, other than opportunistic species such as mice, rabbits, and birds.

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II. GROUNDWATER PATHWAY

A OBSERVED RELEASES

The following discussion summarizes groundwater sampling and analysis work that has been conducted on the Time Oil Co. site prior to 1988. Work conducted after 1988 by ECOVA Corporation is included in Preliminary Assessment Part III.

1985

November, Riedel Environmental Services

In November, 1985 Riedel Environmental Services installed three shallow and one relatively deep well (Well 4) near the southwest corner of the PCP warehouse. A detailed evaluation of the boring log data for Well 4 showed that a series of clay lenses and silty sands were encountered between depths of 18.5 and 35 feet. This zone of low permeability (an aquitard) appeared to be separating a perched upper water-bearing zone from a separate underlying aquifer.

The boreholes were drilled with a 16-inch-diameter hollow-stem auger. Each well was constructed using 4-inch PVC casing and screen. Unfortunately, during construction of Well 4, the annular space was filled with coarse sand to a level extending above the aquitard. This provided a pathway for potentially contaminated water from the upper perched zone to flow into the lower aquifer. This also appeared to have altered the natural direction of groundwater flow within a zone of influence surrounding Well 4. Although the observed water table depression could represent a strong, natural vertical gradient in the vicinity of Well 4, the influence of this well on adjacent wells indicated a strong probability of an induced groundwater sink caused by the unsealed annulus of Well 4. This conclusion was reached by Time Oil Co. upon evaluation of the piezometric surface of the perched water, which indicated that wells in close proximity to Well 4 were apparently influenced by Well 4, showing water level depressions, while wells distant from Well 4 were unaffected. The water level in Well 4 was also found to fluctuate with levels in the Wilamette River, whereas water in the other wells did not.

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In an effort to reinstate natural groundwater flow patterns in the area and to eliminate possible intercommunication between upper and lower water bearing zones, Well 4 was removed by overdrilling and the hole sealed on May 14, 1986.

1986

April, Century Environmental Sciences

Century Environmental Services performed water level measurements and collected samples for PCP analysis on wells which had been installed by Time Oil Co. The results are summarized in the table at the end of this section.

May 28, Century Environmental Sciences

Following abandonment of Well 4, a second group of groundwater samples were collected from Wells A, B, D, E, F, H, and I. Of the seven wells sampled, only Well I showed a detectible PCP concentration (2.2 ppb). The analytical results are listed in the table at the end of this section.

August 29, SRH Associates

Groundwater was sampled at seven monitoring points and was analyzed for pH and PCP. Static water levels were determined in these wells and at a monitoring station for the measurement of Willamette River level elevations. Of the seven wells sampled, only Well D showed detectable PCP concentrations (44 ppb). Wells C and G were dry and could not be sampled. The sample analytical data are included in Appendix E and are summarized in the table at the end of this section.

1987

August 20, SRH Associates

Groundwater was sampled at the nine monitoring points (Wells A through I) and analyzed for PCP. Static water levels were determined in these wells and at a monitoring station for the measurement of Willamette River water elevations. A PCP concentration of 2300 ppb was detected in Well B. No contamination was observed in Wells A, D, F, H, and I. Wells C, E, and

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G were dry and could not be sampled. Results of the sampling analyses are provided in Appendix E and are summarized in the table at the end of this section.

October 16, SRH Associates

Well B was resampled to verify the August 20 analysis. A PCP concentration of 1000 ppb was subsequently determined.

SUMMARY OF WELL SAMPLING AND GROUNDWATER ANALYSIS

Well No.	April '86	May '86	Aug '86	Aug '87
A	-	N.D.	N.D.	N.D.
B	2.6	N.D.	N.D.	2300
C	-	N.D.	N.A.	N.A.
D	-	N.D.	44	N.D.
E	<1.0	N.D.	N.D.	N.A.
F	1.4	N.D.	N.D.	N.D.
G	-	-	N.A.	N.A.
H	-	N.D.	N.D.	N.D.
I	-	2.2	N.D.	N.D.
4	6.1	-	-	-
RIVER	-	-	N.S.	N.S.

B ROUTE CHARACTERISTICS

Shallow groundwater exists in the alluvial sands of two aquifers underlying the site. An unconfined upper zone of perched groundwater occurs at a depth interval between about 13 and 18 feet below ground surface. A silt to clay aquitard, about two feet thick, separates the perched zone from a lower, confined zone that maintains an average water level of approximately 20 feet below ground surface. Groundwater flow is towards the Willamette River, with fluctuations related to tides and seasonal river stages. The aquitard appears to pinch out or terminate toward the river. It is likely that the perched water flows somewhat downward and laterally before entering the river.

As subsurface soils appear to be generally quite permeable, groundwater flow can be expected to be fairly rapid (100-200 feet/year). In August and October 1987, water levels and groundwater samples were obtained from the site wells. These measurements confirmed that groundwater was flowing in a southerly direction under an average gradient of 0.008 ft/ft. The estimated annual net precipitation averaged over 20-30 years is approximately 36 inches.

The physical state of the PCP-containing wood-treating chemical at the time of release was that of a liquid, approximately the consistency of a light oil.

C CONTAINMENT

To halt the migration of PCP contamination from the contaminated soil into the groundwater, ECOVA Corporation excavated the contaminated soils. The soils were screened and placed in lifts on a stockpiled area lined with a 12 mil polyethylene plastic liner. A low earthen berm surrounds the stockpile and contains any contaminated rainfall runoff, and a plastic lined sump area catches and accumulates water. Any captured groundwater is pumped into the recovered groundwater storage tank. An equipment decontamination area is located within the bermed, lined area to provide for cleaning of the earthmoving equipment. A steamcleaner is used to assure that decontamination is thorough. Decontamination fluids accumulated in the sump will be treated in the treatment system after startup.

The stockpiled soil was covered by six mil polyethylene plastic sheeting to control airborne dust emissions during storage. The sheeting has been carefully weighted to prevent damage by the high winds occurring periodically in the Willamette River valley.

D HAZARDOUS SUBSTANCES

PCP is the most hazardous substance at the facility. Its presence in the groundwater is low and inconsistent. The mobility of PCP in groundwater is limited to the mobility of the solvents, as it is generally not water soluble at a pH less than 10.

E TARGETS

The shallow water-bearing sediments directly underlying the site are not a source of drinking water in the area. Monitoring well data indicates that groundwater in the shallow units appears to flow toward the

Willamette River. Users of water from the Willamette may, therefore, be indirect receptors of any site groundwater contamination. The potential for vertical (downward) migration of groundwater contaminants is not known.

There are three possible alternatives for attaining groundwater standards at the site:

- Maintain present PCP concentrations
- Reduce levels of PCP concentration
- Prevent any contaminant migration

Present concentrations in the site groundwater pose no direct threats to human health and the environment. The degree of variation in current levels is unknown due to the lack of long-term monitoring data; it is expected that these levels will decline as the source (soil) is treated.

III. SURFACE WATER PATHWAY

The major surface water feature of the site is the adjacent Willamette River. No tributary streams run through the site and/or drain to the Willamette. Other than the immediate shoreline area, no portion of the site drains to the Willamette River.

The area of contamination is approximately 1/4 of a mile from the banks of the Willamette River. Because the site is composed of sandy soils of high permeability, all surface waters percolate into the soil and become groundwater immediately.

There have been no direct releases to surface water features (the Willamette River) at the site. Therefore, any communication between the area of contamination and the river must occur via groundwater pathways.

Due to the lack of surface water features at the site, there are no direct receptors of potentially contaminated surface water runoff.

No analytical testing for hazardous substances has been performed on any adjacent water features.

IV. AIR PATHWAY

PCP is a solid at room temperature. Possibility of air borne contaminants come primarily from wind blown particles such as dust. The stock piled, contaminated soil is currently covered and poses no threat to air quality.

No program of ambient (background) air quality monitoring has been performed for the site. The currently stock piled soil has been covered by six mil polyethylene plastic sheeting to control airborne dust emissions during storage. The sheeting has been carefully weighted to prevent damage by the high winds occurring periodically in the Willamette River valley.

With regard to on-site volatile organic emissions and possible fugitive dust, the long-term objective is to keep any air contaminant concentrations to background concentrations. During remedial actions, however, the objective will be to limit concentrations to OSHA standards.

As mentioned earlier, the only potential targets for volatile emissions are the staff of Time Oil Co. who work on site. Their exposure is being minimized by covering the contaminated soil with tarps.

V. SUMMARY AND RECOMMENDATIONS

Time Oil Co. owns and operates a petroleum products terminal in Portland, Oregon, that provides tank storage facilities for its own and customers' products. From 1967 to 1982 Time Oil Co. ran a PCP blending operation for Koppers Company on a portion of Portland facility. PCP was heated and mixed with a variety of petroleum based carriers to meet Koppers' specifications; the finished product was then shipped off-site.

Following an inspection of the overall facility in 1984, the Oregon DEQ collected and analyzed soil samples from twelve locations including the PCP mixing area.

In 1985, 288 cubic yards of soil were removed from the PCP area and disposed of at the hazardous waste landfill in Arlington, Oregon. Further site sampling revealed that not all of the PCP contaminated soil had been removed. Before additional quantities could be excavated and disposed of, however, the EPA banned the landfill of PCP contaminated soils (1985).

In 1986 and 1987, Time Oil Co. installed groundwater monitoring wells in the area surrounding the PCP Mixing Area to investigate possible groundwater contamination, performed additional soil sampling and initiated an evaluation of site cleanup alternatives. Analysis of water samples indicated limited, low, and inconsistent concentrations of groundwater contamination.

Sample analyses have shown that PCP contamination in soil is limited to the mixing area. This area was excavated in 1989 and approximately 3,000 cubic yards of contaminated soil has been stockpiled in a bermed and line area on site.

Sufficient site characterization has been performed to identify all contaminants and pathways and it has been determined that exposure is limited to on site personnel. Remediation will reduce this exposure to an acceptable level.

PAIII - WORK PLAN

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I. BACKGROUND AND OBJECTIVES

The Preliminary Assessment - PAIII - Work Plan describes the activities undertaken by Time Oil Co. and ECOVA Corporation toward the objective of reducing PCP concentrations in site soils to levels that would be considered environmentally safe. A history of site activities and a description of early efforts to determine the extent of contamination at the site were presented in Section PAI/II.

Discussions with Oregon Department of Environmental Quality (ODEQ) representatives indicated that through an examination of the details concerning contamination at the subject site, and a review of Records of Decisions regarding cleanup levels at other sites, an achievable, environmentally safe, site specific cleanup level for the soil at the subject property could be agreed upon by ODEQ and Time Oil Co.

This section, PAIII - Work Plan, summarizes the activities of ECOVA at the site from 1989 to the present, and the following section, PA IV - Data Evaluation Report, provides a discussion and proposal of potential cleanup levels.

A SITE DESCRIPTION / HISTORY / OPERATING PRACTICES

Time Oil Co. owns and operates a petroleum products terminal in Portland, Oregon, that provides tank storage facilities for its own and customers' products. From 1967 to 1982 Time Oil Co. ran a PCP blending operation for Koppers Company on a portion of the Portland facility site. PCP was heated and mixed with a variety of carriers to meet Koppers' specifications; the finished product was then shipped off-site. Following an inspection of the overall facility in 1984, the Oregon DEQ required the collection and analysis of soil samples from various locations throughout the facility, including the PCP Mixing Area. In 1985, 288 cubic yards of soil were removed from the PCP area and disposed of at the hazardous waste landfill in Arlington, Oregon. Further site sampling revealed that not all of the PCP-contaminated soil had been removed. Before additional quantities could be excavated and disposed of, however, the EPA banned the landfill of PCP-contaminated soils (1985). In 1986 and 1987 Time Oil Co. installed groundwater monitoring wells in the PCP area and initiated an evaluation of site cleanup technologies. A report by SRH Associates evaluated the following technologies:

Adsorption onto Polymers or Activated Carbon
Biodegradation

Capping in Place
Chemical Reduction
Closure in Place with Monitoring (No remedial actions)
Encapsulation
Excavation and Disposal
High Temperature, Catalyzed Oxidation
Incineration
In-Situ Soil Washing and Surface Mounted Soil Washing
In-Situ Thermal Extraction and Surface Mounted Thermal Extraction
Sodium Dehalogenation

In 1988 ECOVA was retained to evaluate the feasibility of biologically treating the PCP-contaminated soils. Initial treatability experiments indicated PCP could be degraded in this manner.

Bench scale tests indicated that soil washing might be an effective method of removing the PCP from the soil. Bioremediation methods could then be used to degrade the resultant contaminated liquor.

Full Scale operations were initiated to process the contaminated soil with a target cleanup goal of 0.5 mg/kg, the detection limit for PCP. During scale up operations, several soil washing experiments were carried out using different types of mechanical and chemical (high pH) agitation. It was found that PCP could be readily biodegraded, however, the 0.5 mg/kg cleanup level was not achievable within a practical time frame. Further analysis indicated the presence of mineral spirits, paraffin and other previously unknown solvents. It was believed that these materials were inhibiting the soil washing and biodegradation process. A recent article in the journal "Remediation", summer 1991, describes in detail the work performed at this site. That article is reproduced here as Appendix K.

Further discussions with ODEQ personnel and an investigation of existing environmental policies, indicated that required cleanup levels were determined on a case by case basis. It was believed that the published cleanup level of "background" served as a basis to work from, and that it was possible to negotiate an appropriate cleanup level which reflected the conditions at the site of contamination. An investigation of

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Records of Decisions indicated that, in the past, ODEQ had authorized high PCP cleanup levels at other Oregon sites.

Time Oil Co. excavated as much contaminated soil as possible, and stock piled the soil in a bermed, lined area. This decision was made in order to isolate the contaminated soil from groundwater, and limit any personnel exposure.

B SUMMARY OF SAMPLING INFORMATION

Prior to excavation of the contaminated soil, ECOVA performed final sampling and analysis of the PCP-contaminated area to determine the extent of contamination. This was due, in part, to the fact that Time Oil Co. had regraded the area, and transported the contaminated soil into a localized area over the original "hot spot" near the southwest corner of the PCP warehouse. This was done in order to limit the spread of contamination and to reduce leaching of contamination into groundwater.

Previous efforts at sampling and analysis had focused on contamination within the confined PCP Mixing Area and the immediately surrounding area. This pre-excavation sampling determined the limits of contamination. Furthermore, as excavation proceeded, continuous sampling helped determine the vertical limits of contamination.

Surface samples taken throughout the tank farm area south of the Mixing Area and the area to be used for stockpiling the soon to be excavated soil indicated on drawing 1E in Appendix I. These samples indicated non detectable amounts of PCP, except for samples taken to the west side of tanks 38009, 5006 and 10002.

Appendix I contains the information pertinent to this sampling and analysis activity. Figures 1A, 1B, 1C, 1D, and 1E are maps of the PCP Warehouse and Mixing Area and the surrounding facilities. Noted on the figures are the locations, depths, and PCP concentrations of samples which were taken during the first four months of 1989 during soil excavation, as described below. Table 1 in Appendix I contains a summary of this information and is followed by a written description of those samples.

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The remaining samples were taken in the excavation pit during excavation in an effort determine the extent of contamination.

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C **OBJECTIVES OF PROPOSED SAMPLING AND ANALYSIS**

Contaminated soils, within the limits of the facilities and structures on location, have been excavated and stockpiled safely. There is no question that some soils PCP-contaminated soils remain unexcavated. However, soils in place with large total amounts of contamination are capped (by the warehouse). Other sources of contaminants in place are believed to be a combination of relatively low concentrations of PCP and low volumes of soils. While it may be desirable to treat these soils in situ at a later date, or excavate them in some way, the focus of this report is to emphasize the need to determine an achievable and appropriate, site specific, cleanup level for the stock piled soil. Once this level has been agreed to and processing of the stock piled soil begun, efforts toward treating in situ soils can be assessed, if desired.

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II. PROJECT ORGANIZATION AND RESPONSIBILITIES

The following Figure 1 contains the organization chart for this project.

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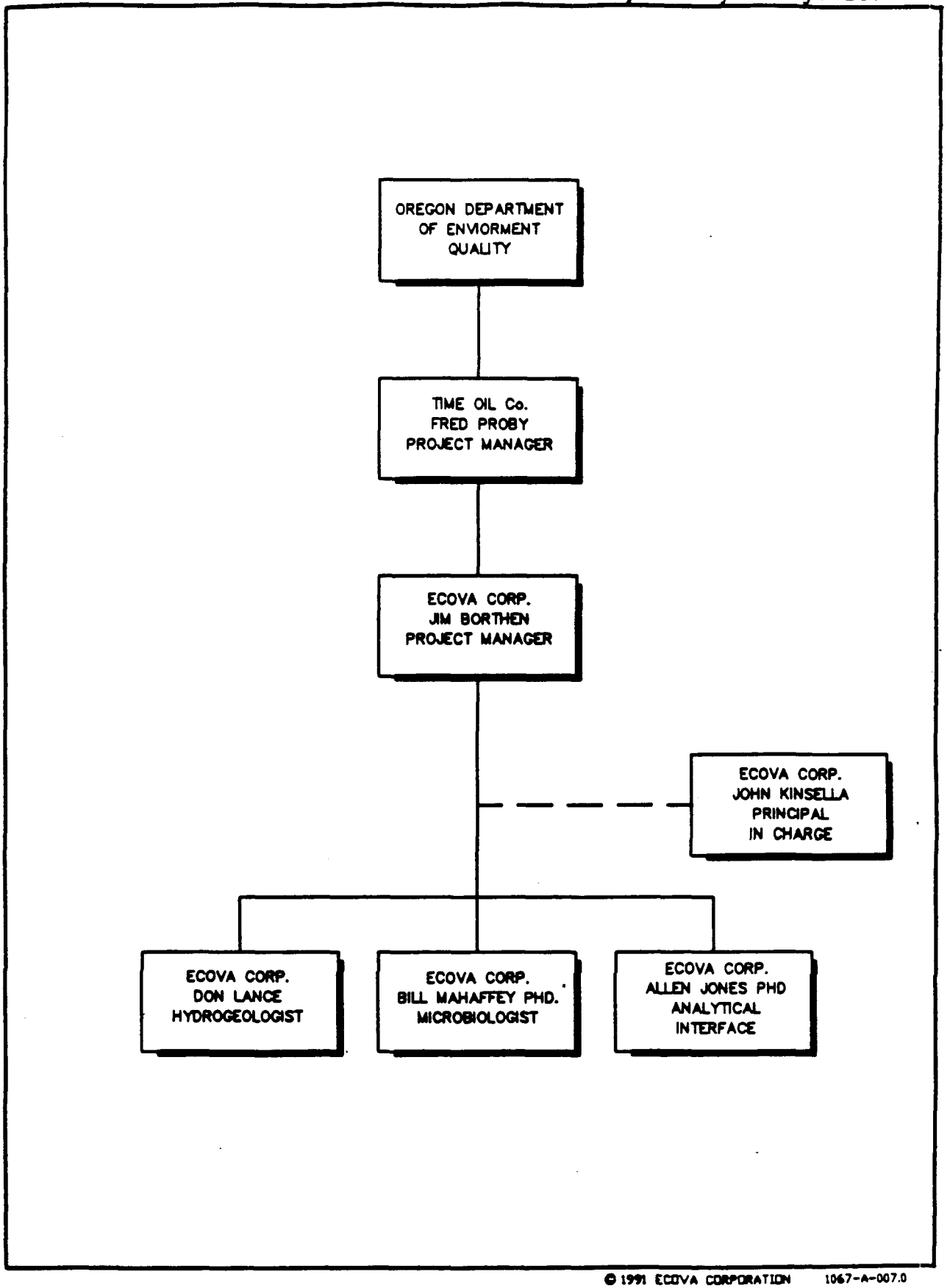
FIGURE 1. TIME OIL Co. – Northwest Teminal Project Project Organization



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TOLS011502

III. SOILS

A PROPOSED SOIL BORINGS

At this juncture, it is not our recommendation that further sampling be performed on site. Contaminated soil has been excavated to the extent of contamination or to the limits imposed by on-site structures.

The focus of current efforts is toward establishing an achievable cleanup level so that processing of currently stockpiled soil can begin. Once a cleanup level is determined, and soil has begun processing, areas of contamination can be re-examined, and the cleanup level can be used as a guide as to which areas of contamination require attention.

It is also noteworthy that current facilities for stockpiling soils are full. If additional soil is found to require treatment, excavation will have to wait for removal of soil from the stockpile.

B SOIL TYPES

Soil types are described for previously drilled soil borings in Appendix F. They are visual - manual descriptions performed by licensed geologists. The results of OVA analyses of the excavation at the 4 foot level are described in Section I.

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IV. GROUNDWATER

A WELL INSTALLATION

ECOVA installed six groundwater monitoring wells at the subject site from November 1988 to January 1989. The purpose of the wells was to characterize subsurface conditions and help define the lateral and vertical extent of site contamination. A site map showing all monitoring well locations at the site is included in Appendix B, Figure 2. Geologic logs, including well completion diagrams for all Ecova wells are included in Appendix F.

A well cluster of three wells (Well J1, J2, J3) was installed immediately downgradient from the former PCP mixing area. Well J1 was completed in the shallow water-bearing zone; Well J2 was completed just below the silty "confining" layer; and Well J3 was completed in the lower water-bearing zone.

A second well cluster, consisting of two wells (Wells B1, B2) was installed to replace Well B. Well B1 was completed in the shallow zone; Well B2 was completed in the deeper zone.

A single well (Well G1A) was installed to replace Well G. The shallow and deep zones appear to interfinger and do not exist as distinct units at this location.

The table below lists well depths, well diameters, and screen lengths for all six ECOVA well installations.

Well #	Well Diameter	Well Depth	Screen
J1	4"	20' 0"	10'
J2	4"	41' 11"	10'
J3	4"	35' 1"	5'
B1	4"	20' 6"	10'
B2	4"	41' 9"	10'
G1A	2"	35' 0"	10'

The shallow wells were drilled using the hollow stem auger method. At the completion depth, PVC flush joint, threaded casing and screen were installed through the auger stem. The screens were machine-slotted

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(.020"), and the annular space filled with a graded filter sand; the remaining annular space above the screen was sealed with bentonite and grouted to surface. All wells are of 4-inch diameter, with the exception of Well G1A, which is of 2-inch diameter.

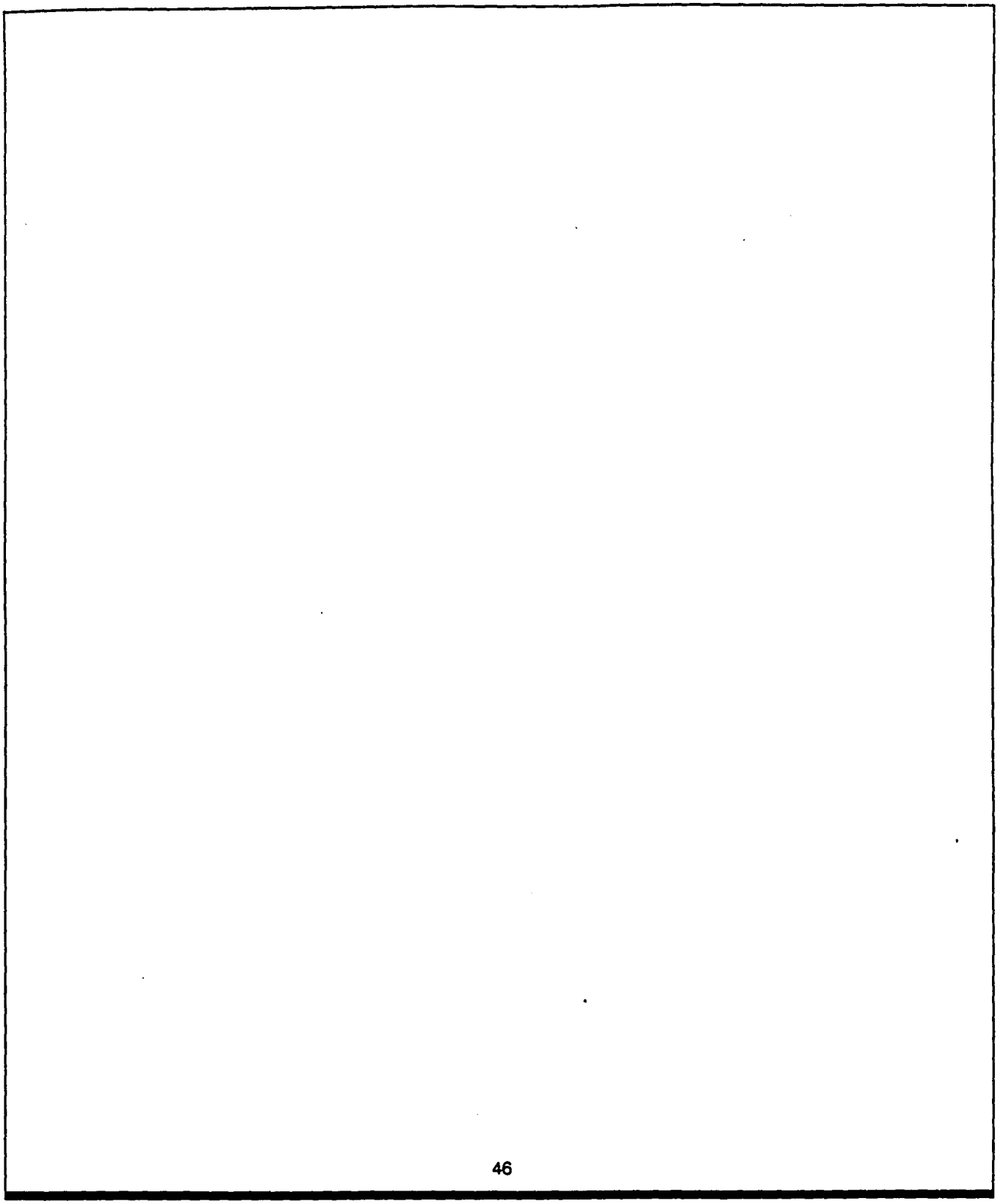
For the deeper wells, 10-inch surface casings were installed to the top of the aquitard and grouted in place in 14-inch holes drilled using the hollow stem auger method. After allowing the grout to set up, the borings were advanced to final depth using mud rotary and cable tool drilling methods. The 4-inch wells were installed to final depth as the temporary drive casing was withdrawn. This construction sequence ensured that no contaminants from the shallow zone would be carried down into the deeper layers.

All wells were developed using a surge block technique. Well casing elevations were surveyed relative to MSL and water levels were obtained. Three to five casing volumes of water were evacuated from the well bore prior to sampling.

B PROPOSED ANALYTICAL PARAMETERS

Groundwater samples were analyzed by EPA-approved Method 8270.This method is a stringent analytical procedure, and satisfies the level of quality required for samples from this site. The most recent sampling event occurred on March 13, 1991. The results of analyses of the water samples for PCP are reported below (the detection limit is 1 mg/kg):

Well #	PCP (parts per million)
K	ND
I	ND
H	ND
L	ND
J1	60
J2	1
J3	ND
B1	ND
B2	1
M	4
G	1



ECOVA

a:1067/TIMEODEQ.RPT/N07/JB:dc/4

TOLS011506

BZTO104(e)048339

C HYDROGEOLOGIC CHARACTERIZATION

On August 20, 1987, and again on October 16, 1987, water levels were obtained from the site wells. These measurements confirmed that groundwater was flowing south under an average gradient of 0.008 ft/ft.

An aquifer pumping test was conducted at the site in July 1989 to define aquifer parameters. Well J1 was pumped for 24 hours at an average rate of 19 gallons per minute. Drawdown was monitored continuously in the pumped well and in Wells B1 and 1 (see Appendix B, Figure 2) using a pressure transducer system. Periodic measurements were made in other selected site wells (J2, J3, B2, G1, and D) using an electrical water level sounder. No significant drawdown was measured in any of the observation wells.

Following the pumping phase of the test, recovery to static conditions was monitored in the pumped well. This information was used to calculate aquifer parameters. Calculated values are shown below:

Transmissivity:	8,360 gpd/ft
Permeability:	1,114 gpd/(ft*ft)

TOLS011507

BZTO104(e)048340

V & VI. SURFACE WATER & AIR

Surface water and air contamination are not considered a significant problem, assuming safe operating and work habits, as the contaminated soil has been placed in a lined, bermed, storage area and covered with a tarp.

TOLS011508

BZTO104(e)048341

VII. SAMPLING AND ANALYSIS PLAN (SAP)

The Sampling and Analysis Plan provides documentation for sampling and analytical procedures, data quality requirements, and data assessment performed by ECOVA in the past. The guidelines may be applied to any future sampling/analytical events.

A SAMPLE LOCATIONS

Prior to excavation and stock piling of contaminated soil, ECOVA sampled the area in locations described in PAIII, Part I, Section B (Summary of Sampling Information). The location of future soil samples and sampling frequency are presently undetermined, and remain dependent upon the specific soil treatment option undertaken.

In addition, PCP-contaminated soil remains unexcavated in areas below the warehouse and adjacent to Tank 38009 (see Appendix B, Figure 1). The soil was not excavated, as it provides structural support for the warehouse building and tank. The future status of this soil has not yet been determined and will be further discussed in Part IV; current cleanup efforts primarily focus on the stockpiled soil.

Groundwater samples in the past have been collected from the existing groundwater monitoring wells at the site. In the future, the groundwater will continue to be sampled at regular intervals to monitor contamination levels. Current cleanup efforts have focused on contaminated soil. Later phases will address groundwater, if necessary.

B SAMPLE COLLECTION PROCEDURES

Soil sampling in the excavation area was accomplished through common surface sampling techniques. Surface samples were collected with a hand auger. Deeper samples required some backhoe excavation prior to sampling. Samples were transferred to the appropriate containers quickly to maintain sample integrity.

Water sampling was performed following purging of three to five casing volumes of water from each well. Teflon bailers were used as the sample collection device. The bailer was slowly lowered on a nylon line to about the midpoint of standing water, then slowly hauled to the surface. The slow movement of the

TOLS011509

BZTO104(e)048342

bailer was necessary to avoid disturbances that can cause aeration or pressure variations in the water. At the well head, the water was transferred from the bailer to the appropriate sample containers.

Following the completion of all soil and water sampling activities at each location, all sampling equipment was thoroughly decontaminated according to the procedures and considerations described below. Bailer cord was disposed of after each round of sampling and new cord was used for each subsequent well.

Decontamination Procedures:

1. Disassemble equipment to maximum practical extent. Brush off any clinging soil material.
2. Wash items in a solution of Alconox detergent and tap water.
3. Rinse in tap water.
4. Rinse in distilled or deionized water.
5. Let dry in air.

The use of this method greatly reduces the likelihood of any possible cross-contamination.

C SAMPLE HANDLING REQUIREMENTS

Water samples were collected using amber glass containers (with teflon-lined caps) of at least one liter in volume. Soil samples were collected using glass containers (with teflon caps) of at least 8 ounces. All samples were preserved at 4 degrees Celsius.

Samples were then sealed in coolers and accompanied by a chain-of-custody form and request-for-analysis form (see Appendix J for sample forms, labels and custody seals). The samples were hand-delivered or express-mailed to the analytical laboratory.

D ANALYTICAL METHODS

Samples were analyzed for PCP using EPA Method 8270 by GC/MS, as defined in Test Methods for Evaluating Solid Waste, SW-846.

TOLS011510

BZTO104(e)048343

E,F,G DATA QUALITY

A Quality Control Summary - Semivolatile Data Package has been provided by the analytical laboratory (PNELI) and is included in Appendix J. The ten-step quality control approach insures a high level of accuracy in sample data.

VIII. HEALTH AND SAFETY PLAN

ECOVA established a Health and Safety Plan (HASP) for all employees engaged in field activities at the Time Oil Co. property in Portland, Oregon. A copy of ECOVA's original Health and Safety Plan is attached in Appendix H.

This site specific plan assesses site hazards, and discusses site health and safety training issues, personal protective equipment requirements, a medical surveillance program, decontamination procedures and other site controls, emergency response plans, and an environmental monitoring plan.

IX. MAPS

A site map of the subject property is located in Appendix B, Figure 5. It indicates the area of soil excavation, and the location of the stock piled soil which is currently being considered for cleanup action.

TOLS011513

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PAIV - DATA EVALUATION REPORT

TOLS011514

BZTO104(e)048347

I. BACKGROUND AND OBJECTIVES

The purpose of the Data Evaluation Report in this document, and in fact, the purpose of this entire submittal, is to determine, with support from proper authorities, a cleanup level for PCP at the Time Oil Co. - Portland Terminal site.

Much of the contaminated soil containing PCP and associated solvents has been excavated, and there is little room to stock pile additional soil, if necessary. Some PCP-contaminated soil was left in place, as its removal may have destabilized nearby structures. It is assumed that this unexcavated soil also contains solvents.

Time Oil Co.'s primary interest, as it has been since the PCP-contaminated soil was discovered in 1984, is to remediate the site. Time Oil Co. would like to establish an achievable and appropriate cleanup level which reflects the safety and health conditions at the site so that soil processing can begin. If further sampling and analysis is deemed necessary, it can be performed after processing of the stockpiled soil has begun.

The following discussion proposes potential soil cleanup levels for the Time Oil Co. site. Site location, potential for contaminant migration, and remediation feasibility are among the considerations essential to establishing an appropriate cleanup level.

II. SOILS

Time Oil Co. would like to work with ODEQ to establish a cleanup criteria for soil at this site which is safe to health and the environment, that is based on the characteristics that exist at the site and that is consistent with cleanup levels established at other similar sites.

The Time Oil Co. Northwest Terminal has restricted access, 24 hour a day security and is completely surrounded by low population density industrial areas.

PCP is a non volatile compound with very low solubility in water. It is our understanding that a health-based cleanup level for PCP as established by Oregon's Department of Environmental Quality in soils is currently 2000 mg/kg.

There has been a precedent set at other Oregon and national sites to treat or remove PCP contaminated soils to less than 500 mg/kg. In a similar situation concerning Cascade Wood Products, a cleanup level was authorized which seemed technically achievable and environmentally safe. They were required to excavate and dispose of all soil with greater than 500 mg/kg PCP (prior to the restriction on land disposal of PCP) and consolidate and cap soil between 20 mg/kg and 500 mg/kg.

Based on full scale treatment tests at the site, it has been demonstrated that PCP can be biodegraded to at least as low as 500 mg/kg. Time Oil Co. therefore proposes that the soil stockpile at the Northwest Terminal site be treated to a level no greater than 500 mg/kg and that the residual soil then be left on site. Soil washing in conjunction with a biological process will be utilized to achieve that cleanup level.

III. GROUNDWATER

Groundwater sampling has indicated no widespread contamination. However, there does appear to be some consistent contamination of groundwater immediately downgradient of the contaminated area. Therefore, quarterly groundwater monitoring is proposed for one year following treatment.

TOLS011517

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IV & V. SURFACE WATER AND AIR

As mentioned in Part III, surface water and air contamination does not appear at this time to be a significant problem, assuming reasonable safety precautions are taken. Currently the contaminated soil has been placed in a lined, bermed, storage area and covered with a tarp.

TOLS011518

BZTO104(e)048351

VI. SUMMARY AND RECOMMENDATIONS

Time Oil Co. has identified and excavated approximately 3000 yards of PCP-contaminated soil. This soil has been stored in a bermed, lined, and covered area awaiting processing. While portions of the soil had contained high concentrations of PCP, the process of excavation and stock piling has blended the soil to an average concentration in the range of 950 mg/kg.

Concerted efforts were made to excavate all soils with PCP contamination, yet some contaminated soil remains. Some of this soil lies beneath the PCP Warehouse. Removal of this soil would require demolition of the warehouse. However, this soil is effectively capped and should be safe from leaching by surface waters. Other soil of a lesser degree of contamination was left in situ near Tank 38009. This low volume of soil remains unexcavated for fear of causing structural damage to the tank.

There does appear to be evidence of groundwater contamination at the site; it is limited to low concentrations in wells directly down gradient from the contaminated site.

Time Oil Co. recommends the following:

- The excavated soil should be treated to 500 mg/kg PCP concentration.
- Soil cleanup should be performed through biological remediation methods.
- The soil should be left on site after remediation.
- Groundwater should be monitored on a quarterly basis for one year.

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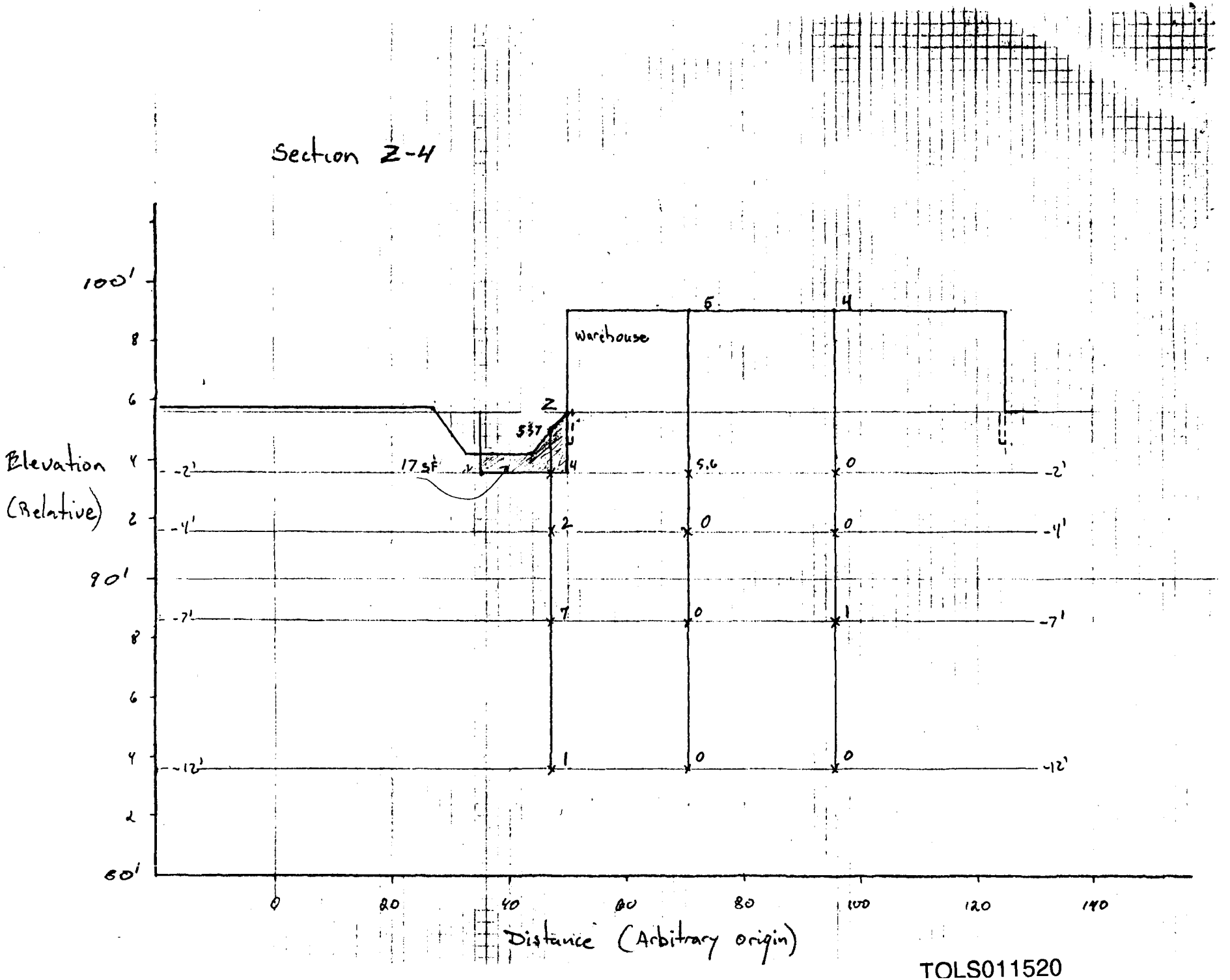

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TOLS011520

1/5/08 FLP

NW Terminal Penta

Calculation of Excavation Volume

A. 2' to 12' deep = 1,020 cy (Attachments 1 & 2)

B. 0' to 2' deep (Attachment 3)

Section	Area SF	Average	× Δ Dist	= Cubic feet
null	0			
Z-4	17.0	8.5	7'	59.5
m-J	58.2	37.6	18'	676.8
Q-N	84.0	71.1	18'	1279.8
U-R	124.1	104.0	18'	1872.0
Y-V	93.2	108.6	18'	1954.8
Null	0	46.6	7'	326.2
			Total CF	6169.1
			÷ 27 =	228 cy

C. 0' to top of Pile (Attachment 3)

Section	Area SF	Average	× Δ Dist	= Cubic feet
m-J	0			
Q-N	67.5	33.8	18'	608.4
U-R	151.3	109.4	18'	1969.2
Y-V	0	75.6	18'	1360.8
			Total SF	3938.4
			÷ 27 =	145.8 cy

Total A+B+C = 1,394 cy

Say 1,500 cubic yards

TOLS011521

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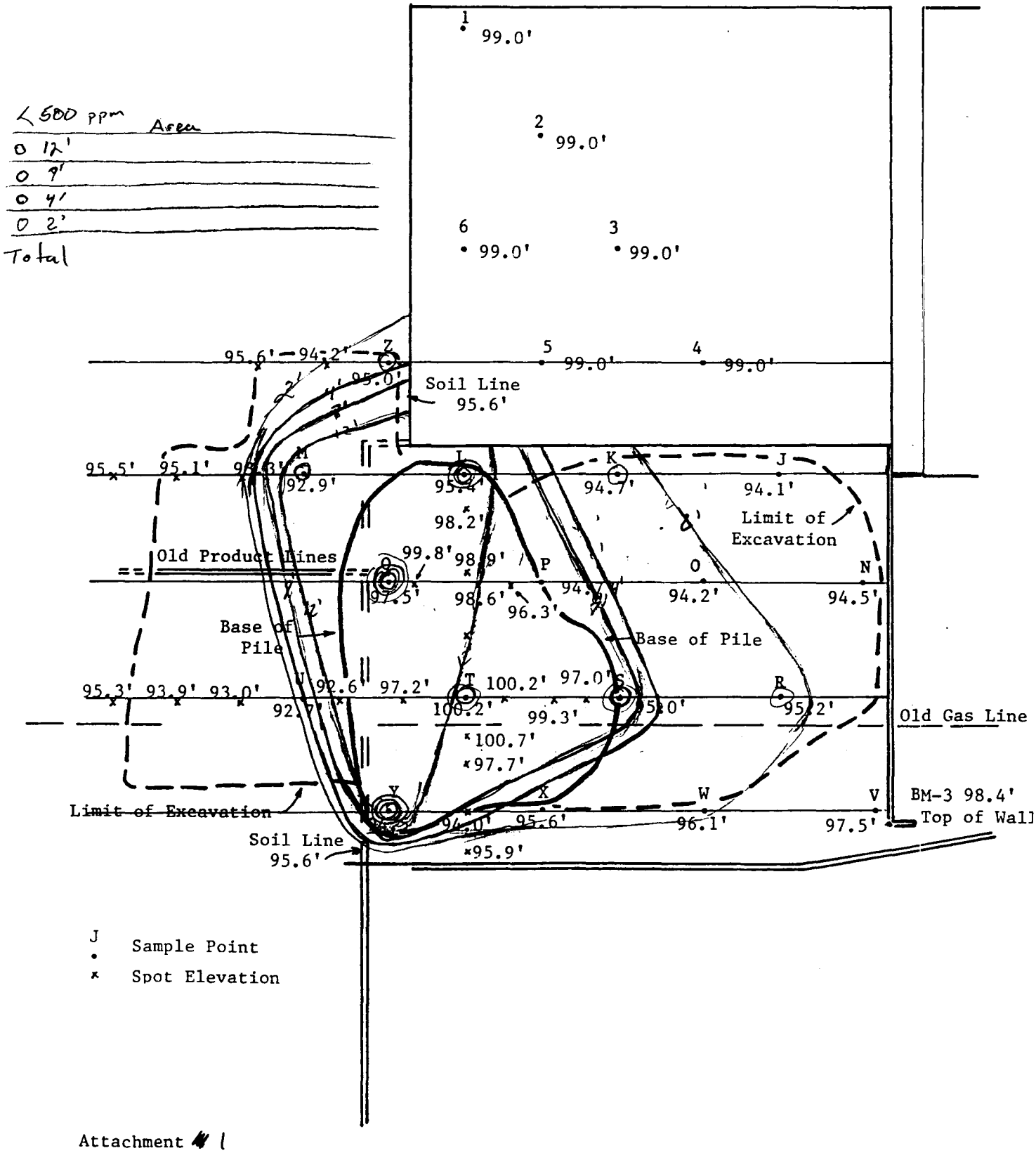
SURFACE ELEVATIONS
8/21/86

(Referenced to Temporary Benchmark)

NORTH
1"=20'



Attachment # 1

TOLS011522

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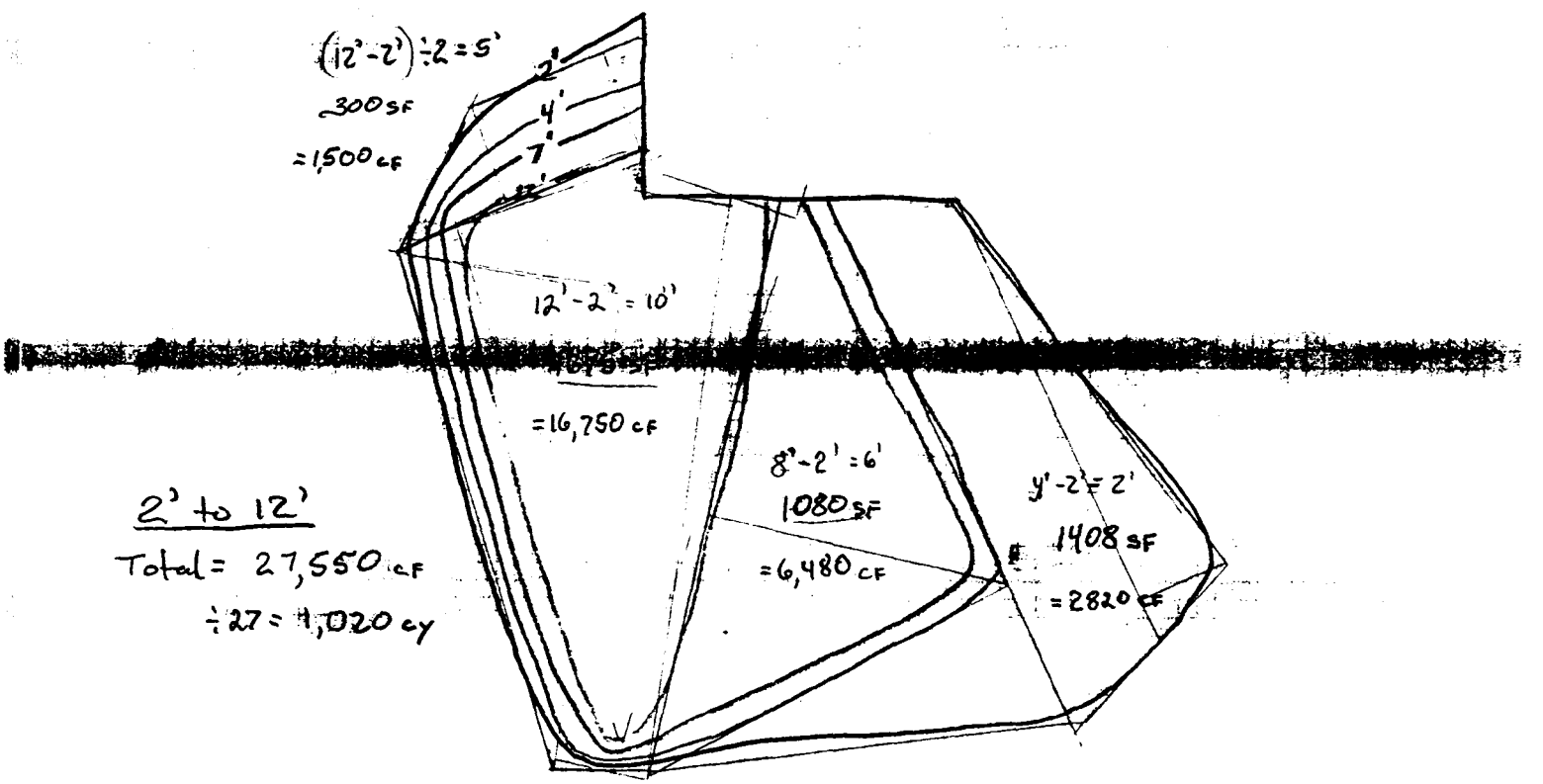
NW Penta

Excavation Areas 2' to 12' deep



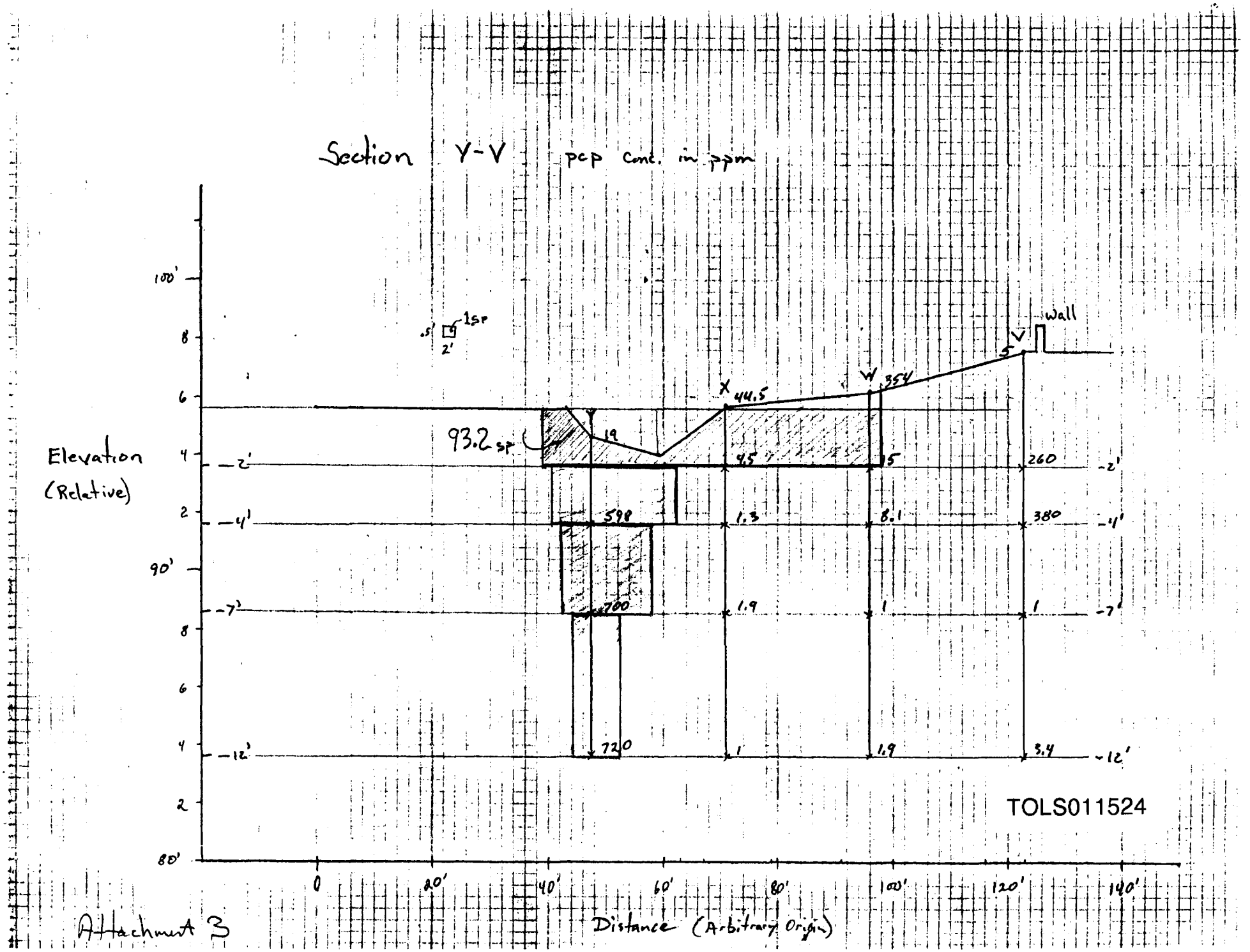
2' to 12'

Total = 27,550 CF

÷ 27 = 1,020 CY

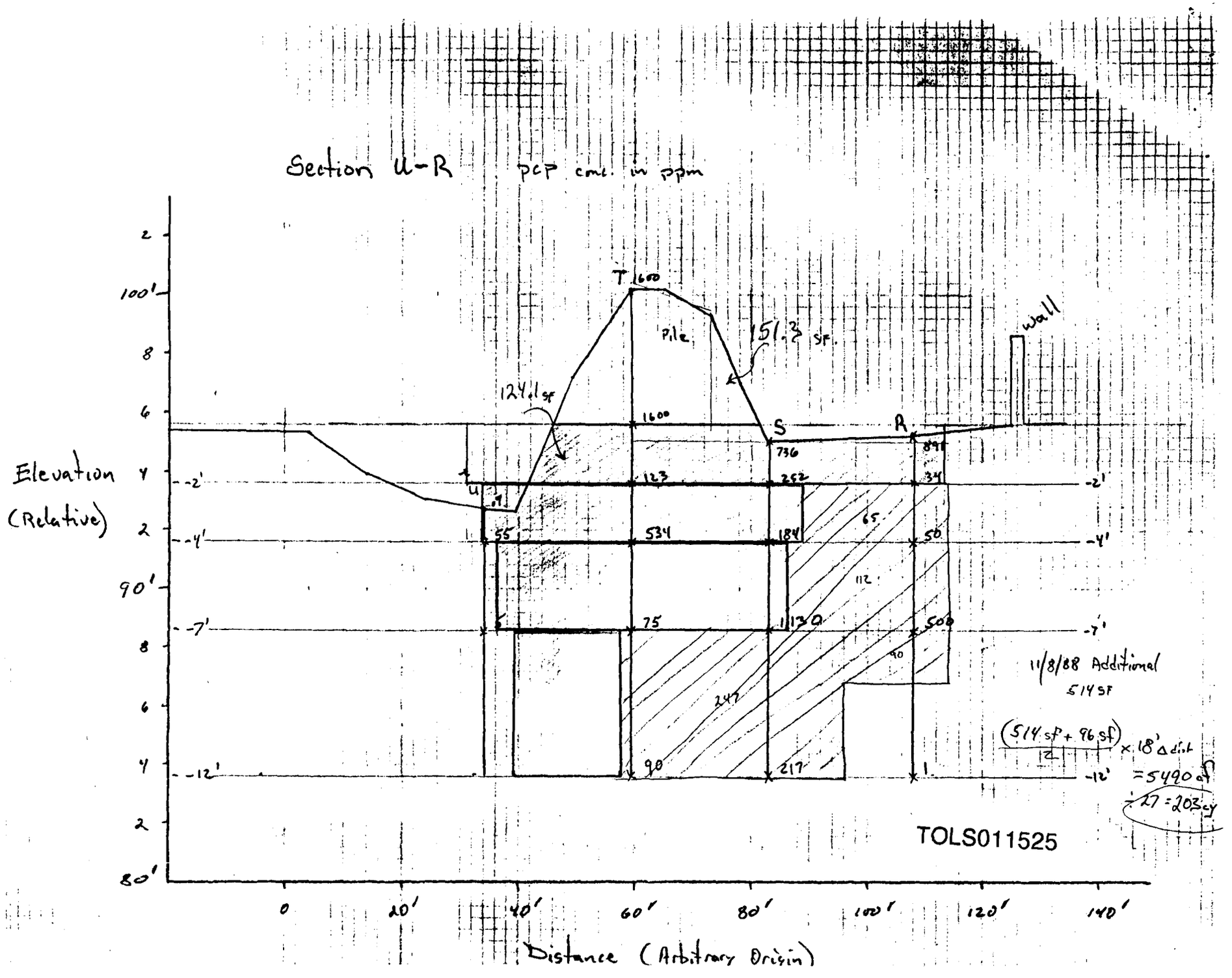
Attachment 2

TOLS011523

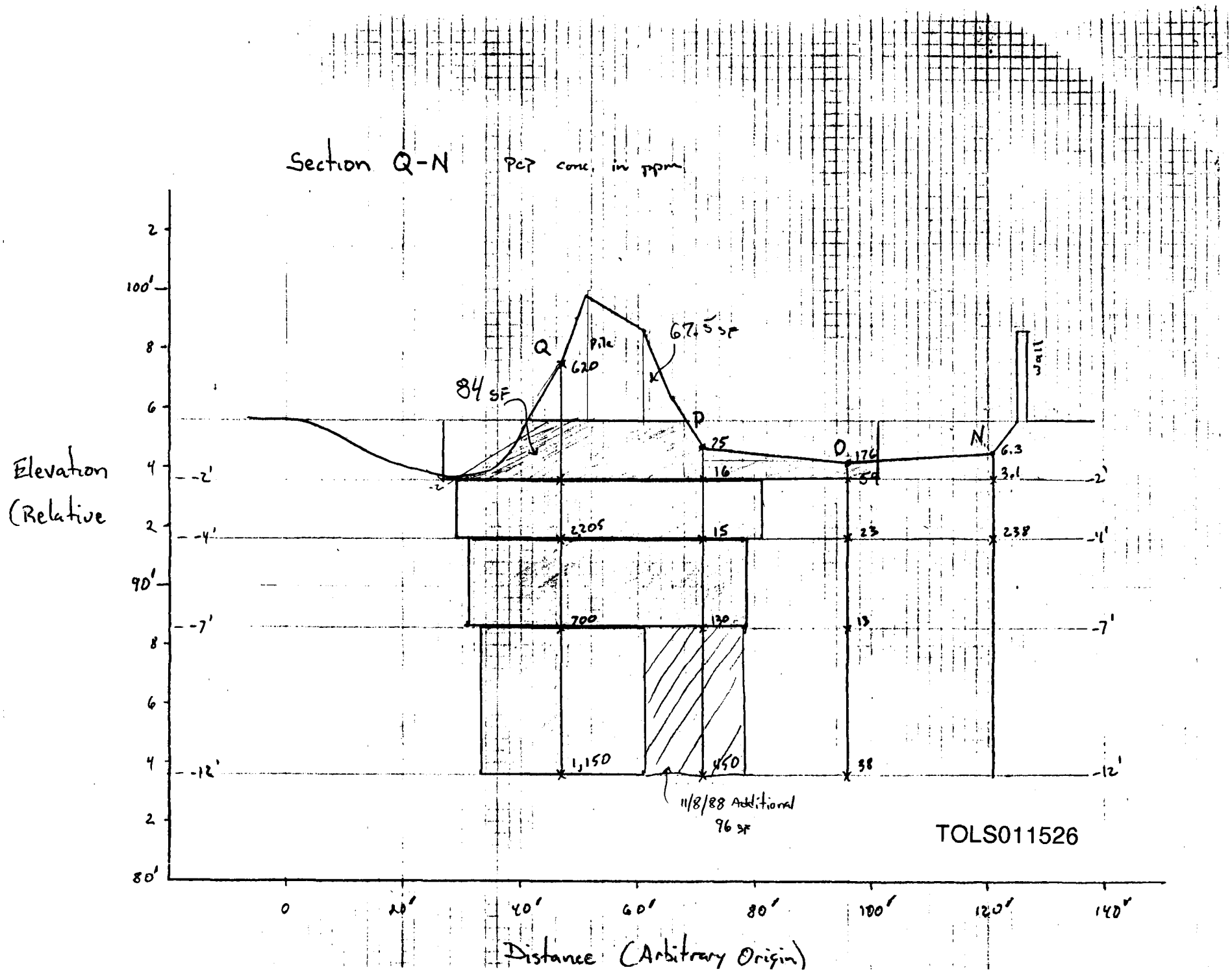


Attachment 3

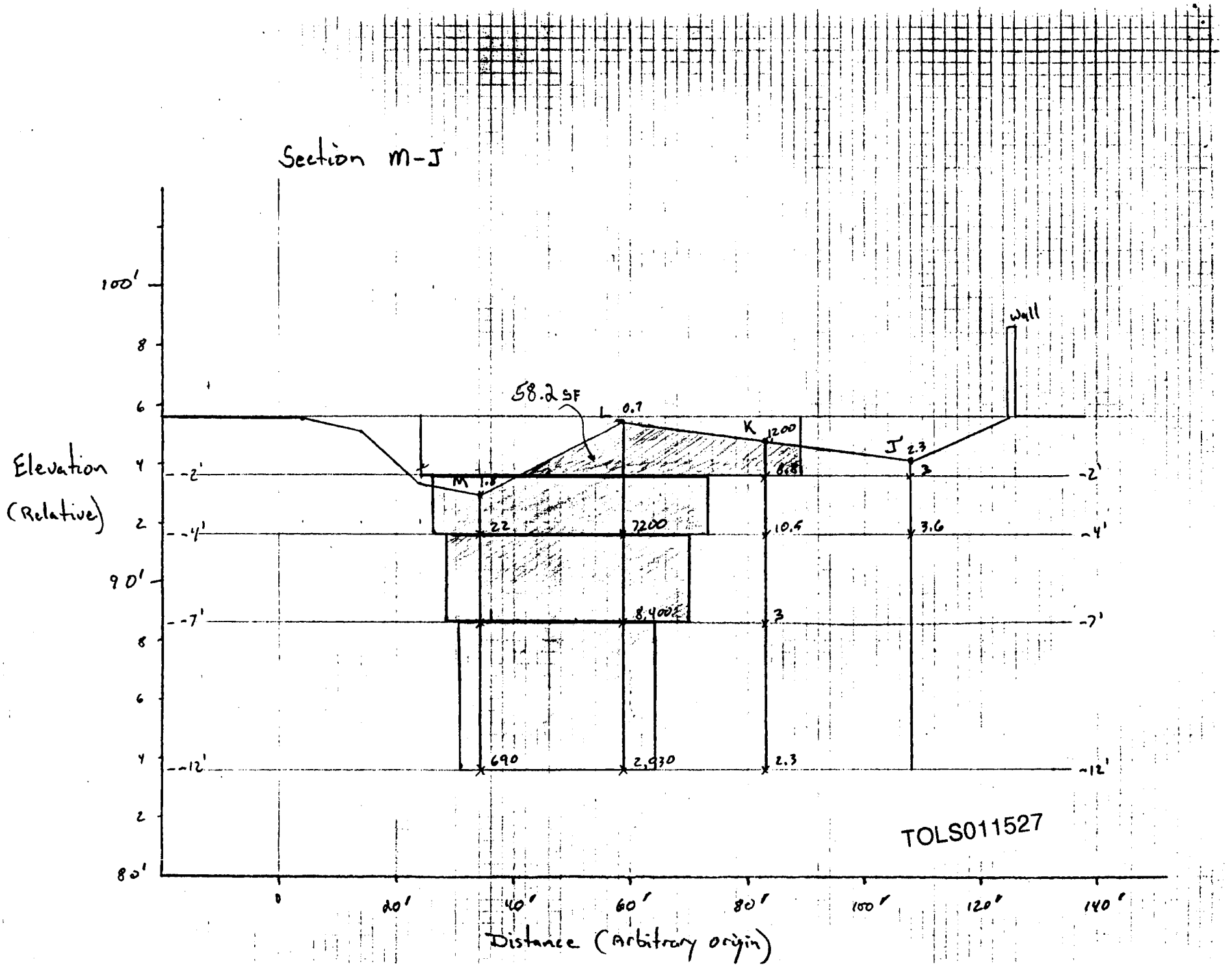
BZT0104(e)048357



BZTO104(e)048358



BZTO104(e)048359



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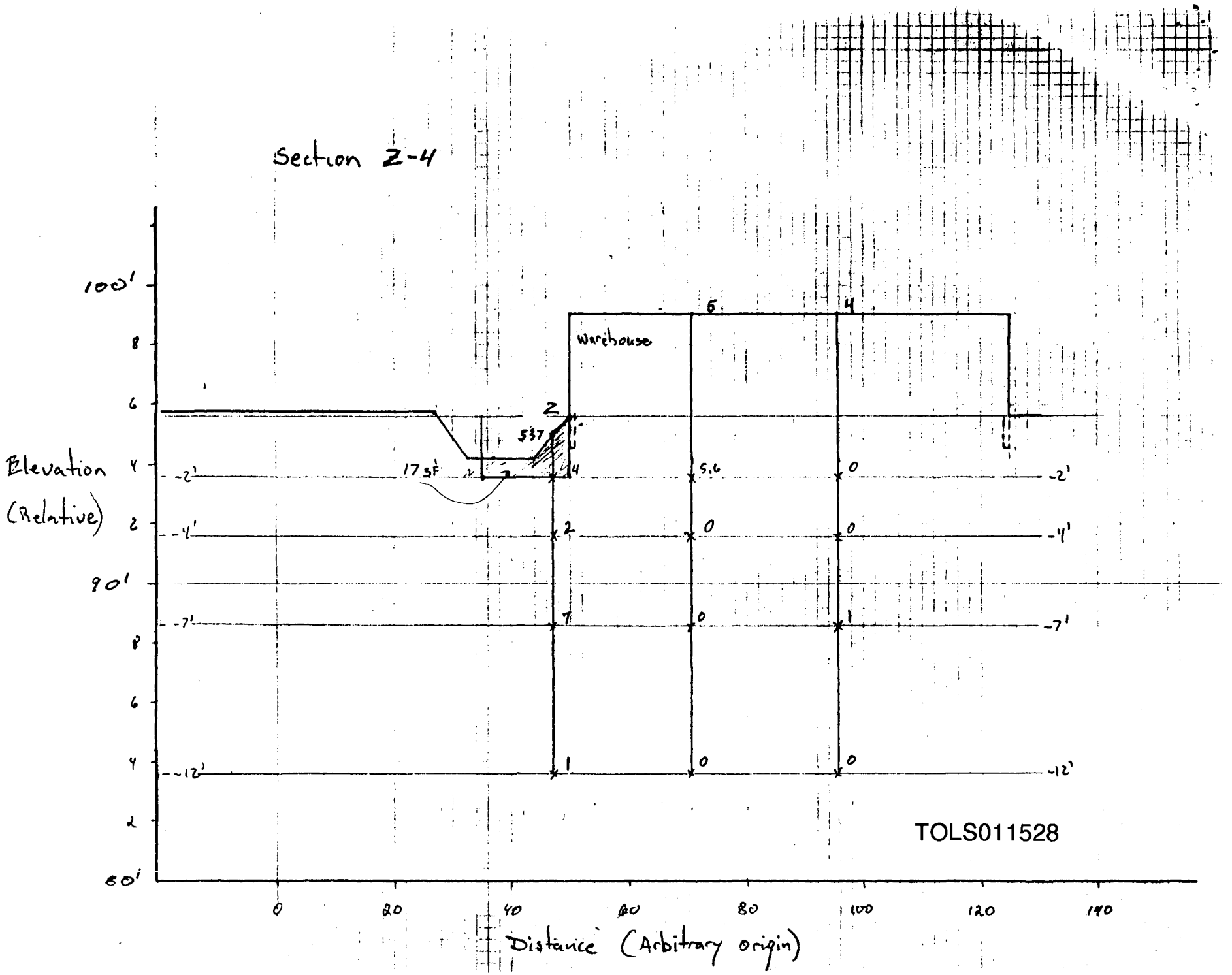

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1/7/08 FLT

NW Penta

Robert wants to put soil in tanks

Neel

- 2 80s & 5 12s at Bell 12001 thru 12005
- Only one junk tank at NW other than C&O tanks and that's not accessible.

Dimensions	dia	high	
Sea 12001 thru 12005 (Bell)	540"	x 504"	} gave data to John R
5006 C&O	480"	x 276"	
10002 C&O	648	x 300"	

Steve Lorks

TOLS011529

as proposed. Dan Steve 1/13/88

Preparing the stock pile area
labor 5300
Material 8000 bottom liner
Mgt Engr 1900

Excavating the soil + Transporting to stock pile area.
labor 7900
Equip 8000
support. 6000 decon tom. safety etc.
Lab Testing 2100
Mgt/Engr 1900

stock pile cover & stabilization
labor 700
Material 2300

Back fill of excavation area
labor 2300
Material 11,200 sand from on site / gravel delivered.
@ 16 cu yd delivered.
sand 2, yd for moving it.
Mgt/engr. 1300

TOLS011530

To put it into a Tank,

approx 400 cu yd a day.
Excavation goes from 5 To 9 days.

equip	3600	conveyor.
labor	2200	
scope loader	1800	
labor	3600	
protection of area	300	Material
labor	800	

Total labor.	7300
equip	5400
Material	300

Excavating up To.	40,860	because of Time.
Filling Tanks	13,000	
Backfill.	-15,000	

+

Preparing Tanks
decontamination of equip.
Need 35000 BBL of Tankage.
removal from Tank.
Need larger conveyor than supplied.

TOLS011531

PHONE 285-2400
CABLE ADDRESS: TIMOIL
(FAX) 206-283-8036

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
LOS ANGELES

TIME
PRODUCTS TIME TESTED

TEN TO ONE IT'S TIME

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

July 21, 1988

Ecova Corporation
Attn: April Rivkin
3820 159th Avenue NE
Redmond, WA 98052

Dear Ms. Rivkin:

Time Oil Co. is presently cleaning up an area of our "Northwest Terminal" in Portland Oregon that is contaminated with pentachlorophenol. The next task to be accomplished is to excavate approximately 2,700 cubic yards of soil and stockpile it on a liner to prevent further leaching into the groundwater. It will also be necessary to install several additional monitoring wells. Our ultimate goal is to treat the soil and groundwater (if needed) on site. We have been considering a "soil washing" approach to concentrate the penta in a more easily handled solution. We are open to consider other technologies.

Enclosed is a summary of data on the extent of soil and groundwater contamination at the site. Enclosure 1 shows the area involved and our sampling grid. Enclosures 2 and 3 depict surface elevations following initial soil removal and subsequent consolidation of remaining shallow contamination into one pile. Enclosure 4 represents pentachlorophenol concentrations (in ppm) at the surface and at three depths. Enclosure 5 is the tabular data from which the contour maps in enclosure 4 were prepared. Enclosure 6 is a map of monitoring well locations and enclosure 7 presents construction details of the wells. Enclosure 8 lists groundwater sampling results.

I would be grateful if you could review the enclosed information, including the draft contract (enclosure 9), and prepare a cost proposal to perform the necessary work for this stage of our project. It would be most helpful if you could submit your proposal within three weeks. I will, of course, be available to discuss any aspects of this project about which you may have further questions.

Sincerely,

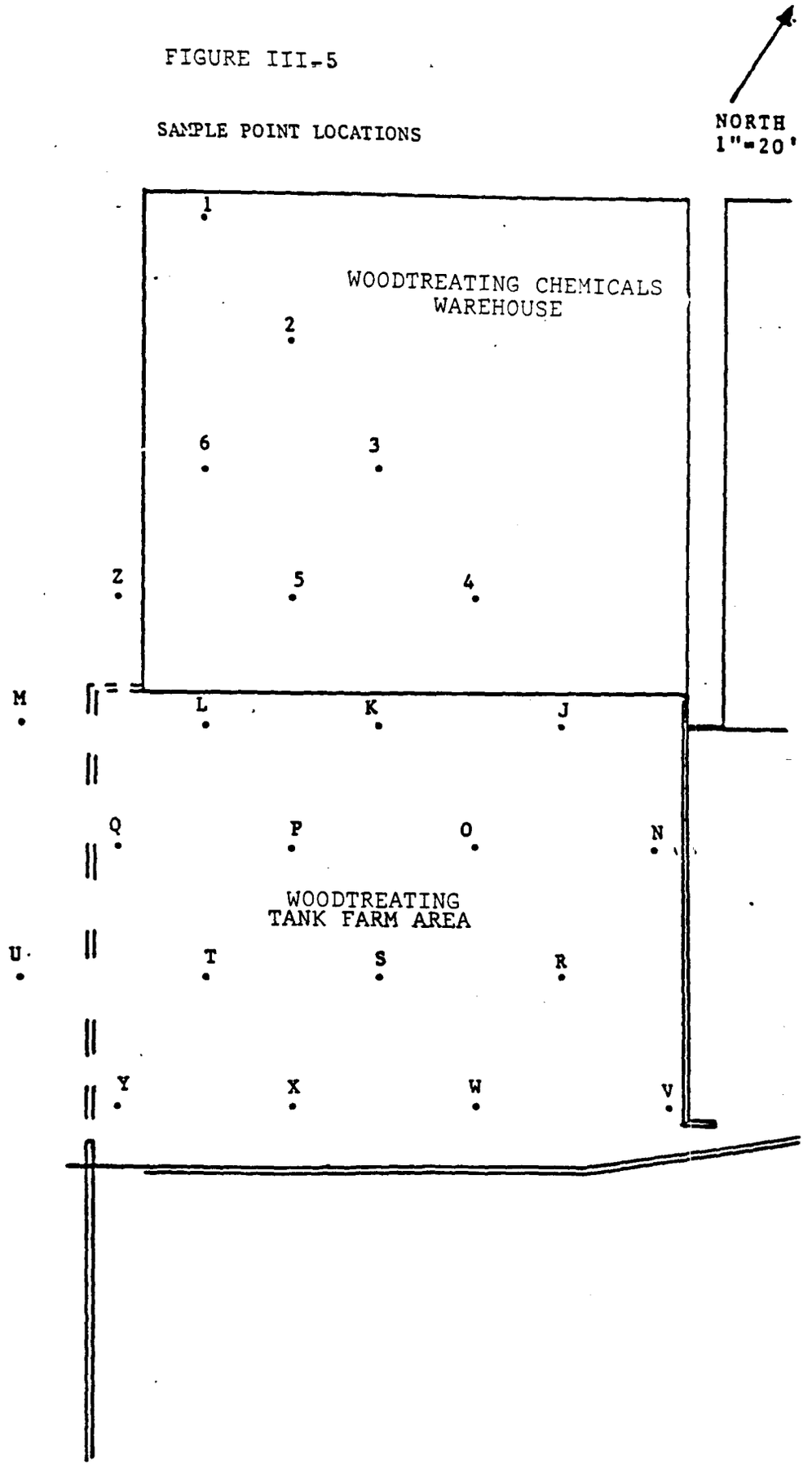
Fred Proby
Environmental Specialist

Enclosures a/s

TOLS011532

FIGURE III-5

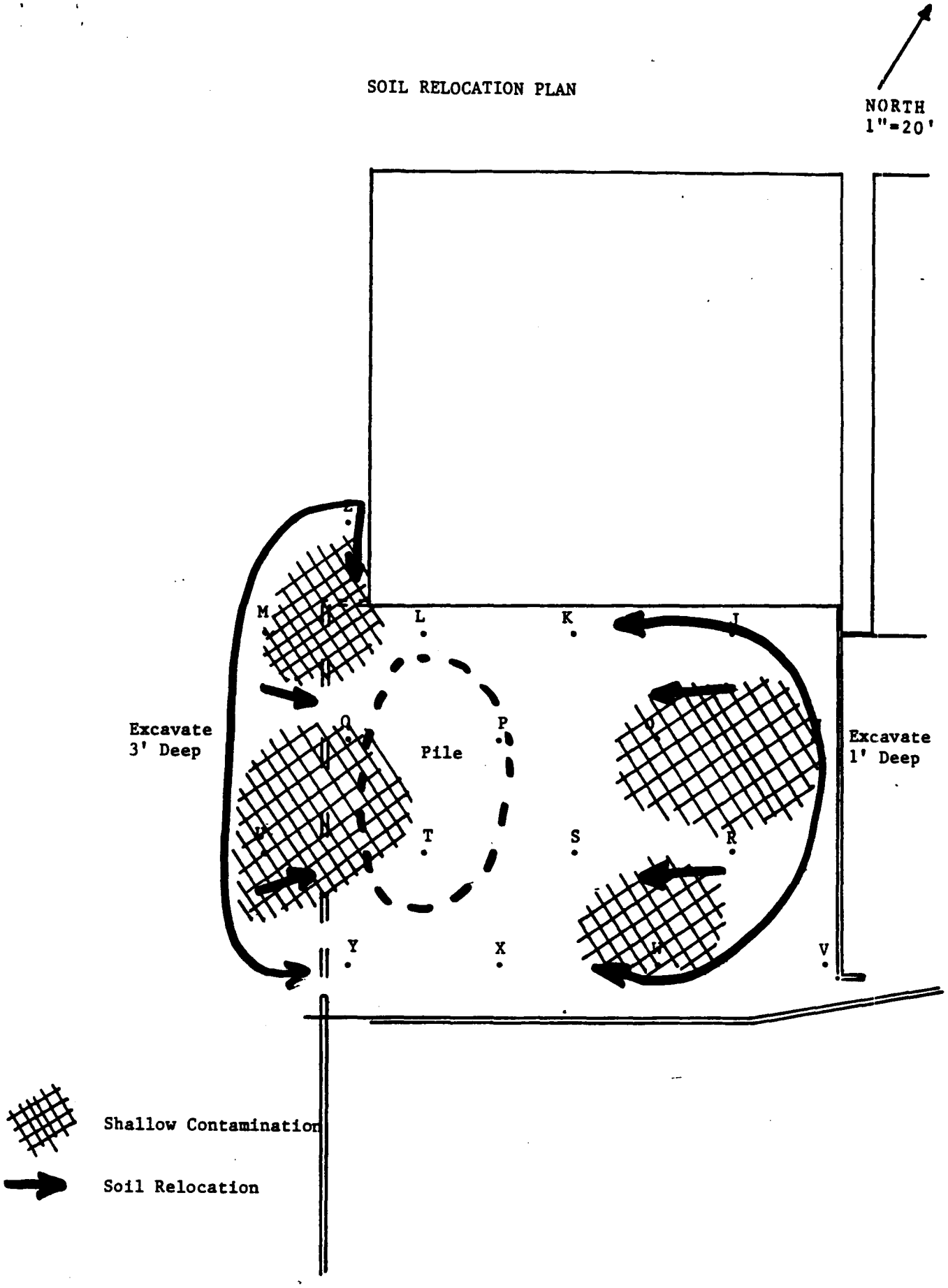
SAMPLE POINT LOCATIONS



Encl 1

TOLS011533

SOIL RELOCATION PLAN

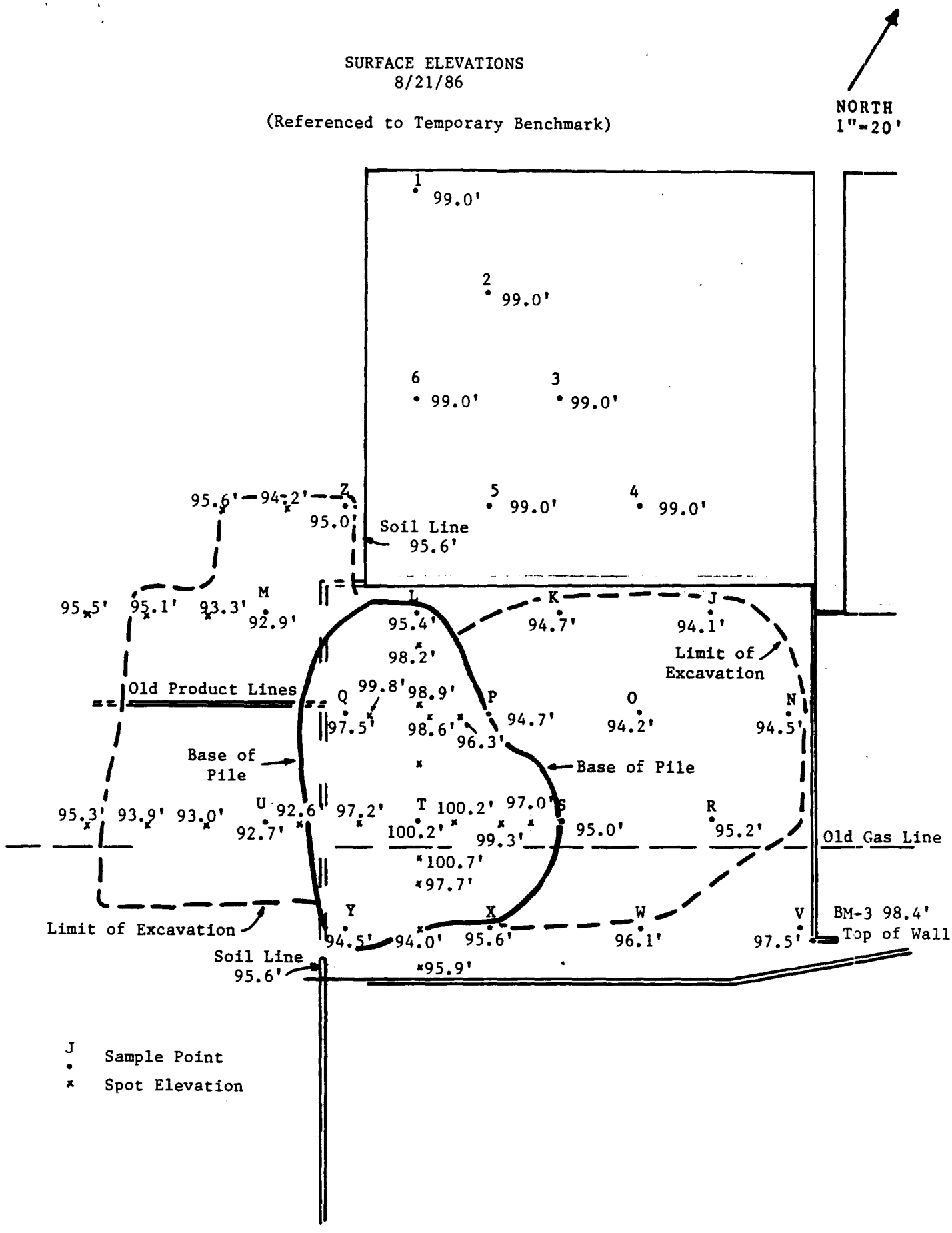


Encl 2

TOLS011534

SURFACE ELEVATIONS
8/21/86

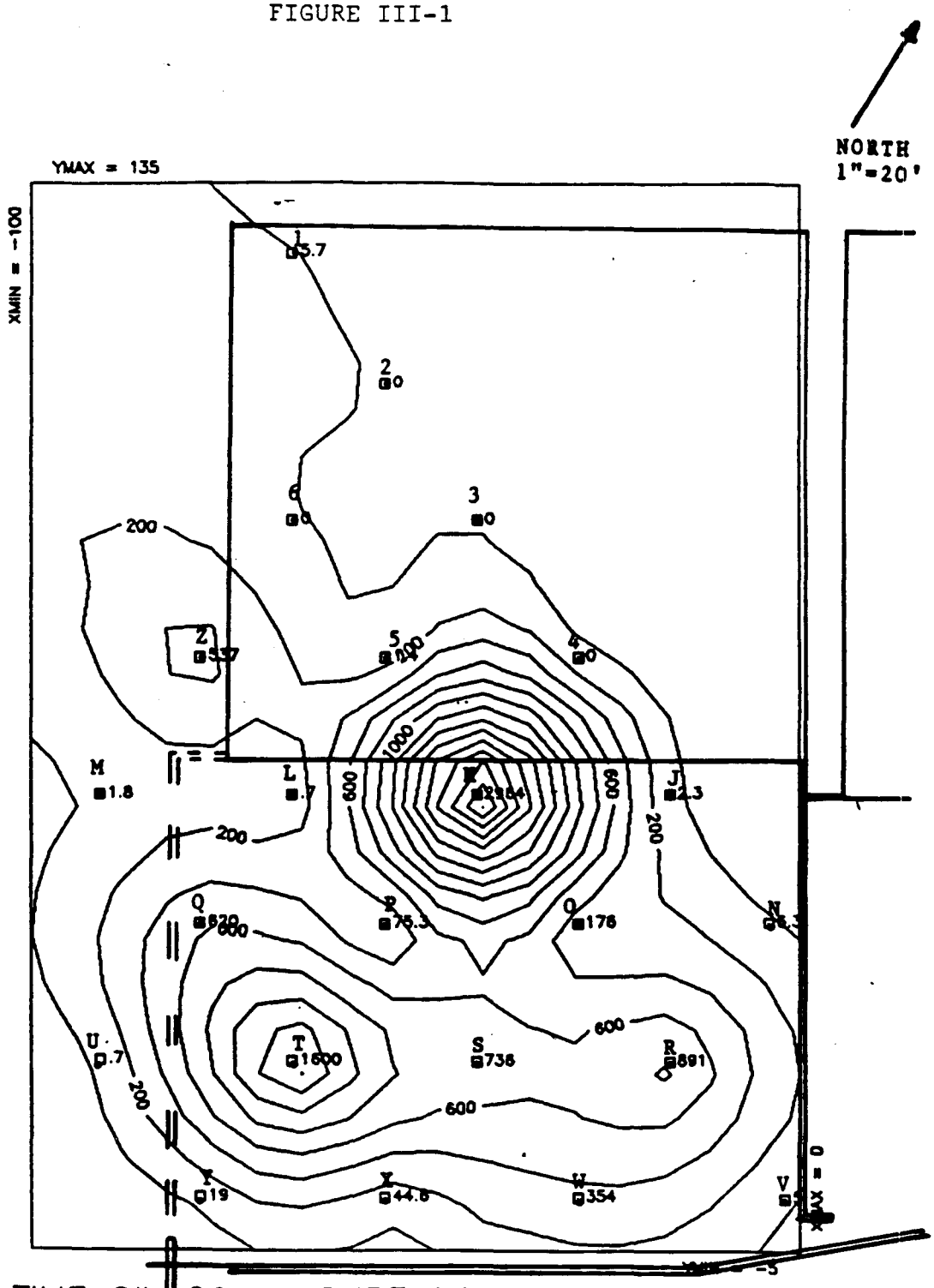
(Referenced to Temporary Benchmark)



Encl 3

TOLS011535

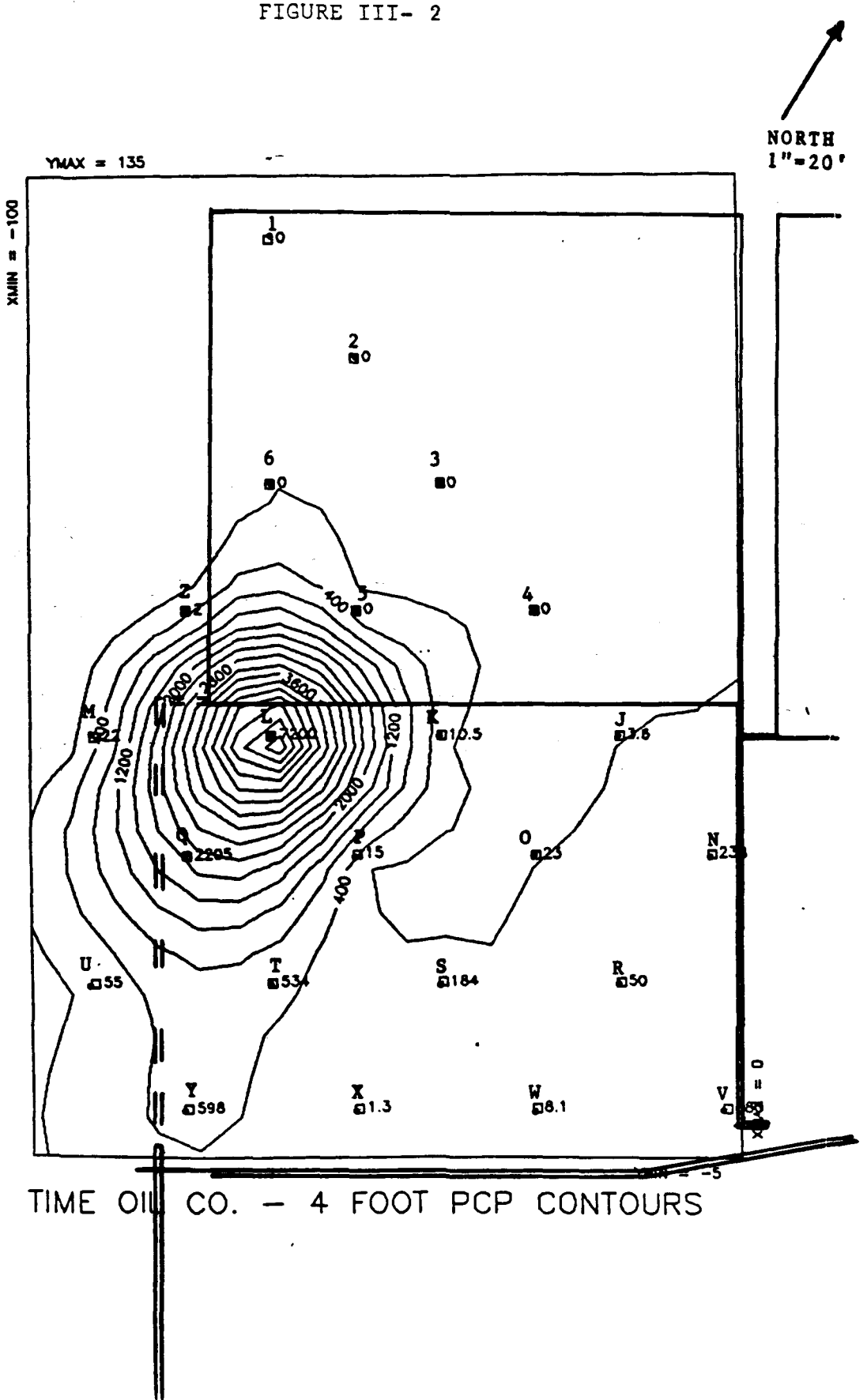
FIGURE III-1



Encl 4

TOLS011536

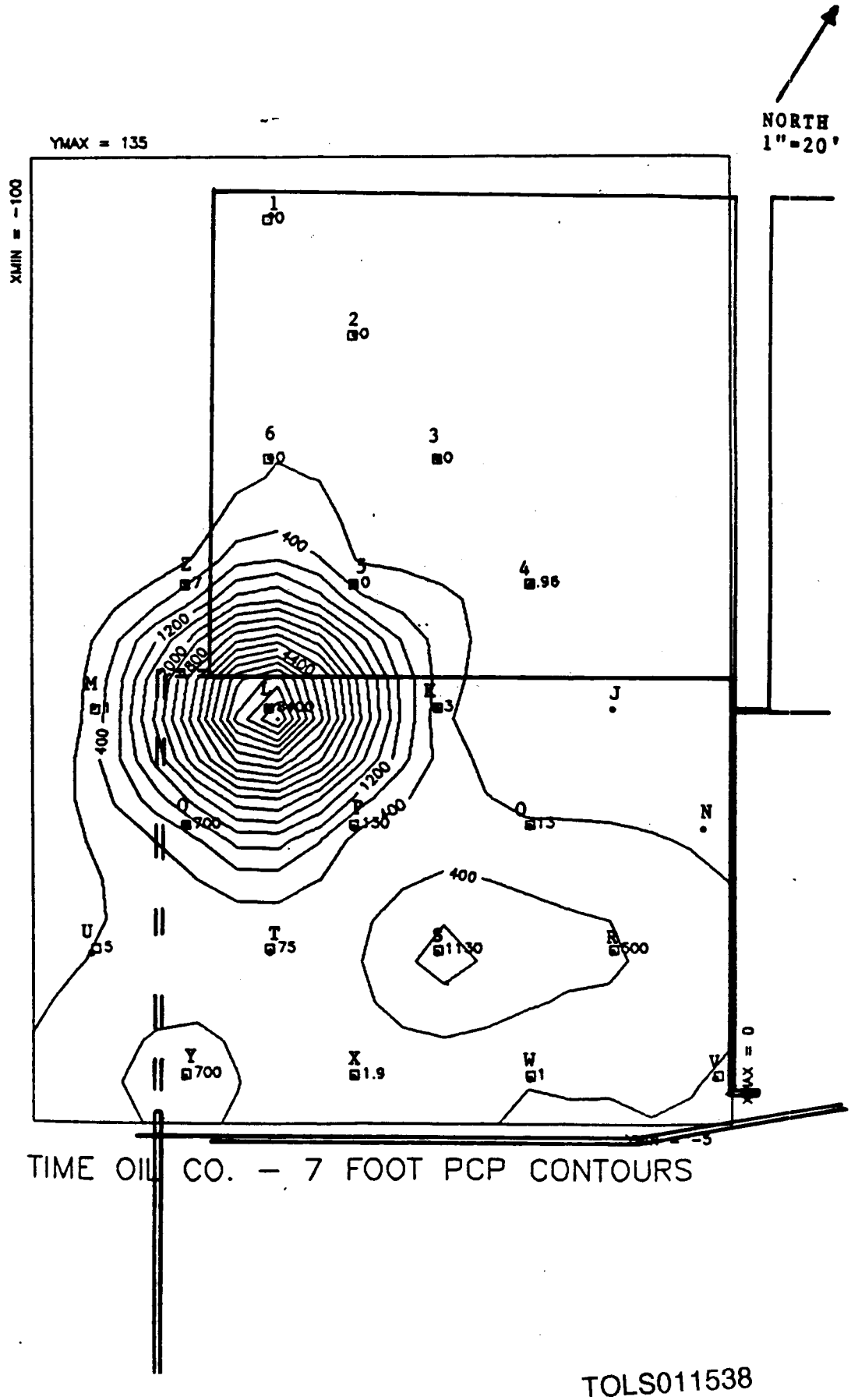
FIGURE III- 2



TIME OIL CO. — 4 FOOT PCP CONTOURS

TOLS011537

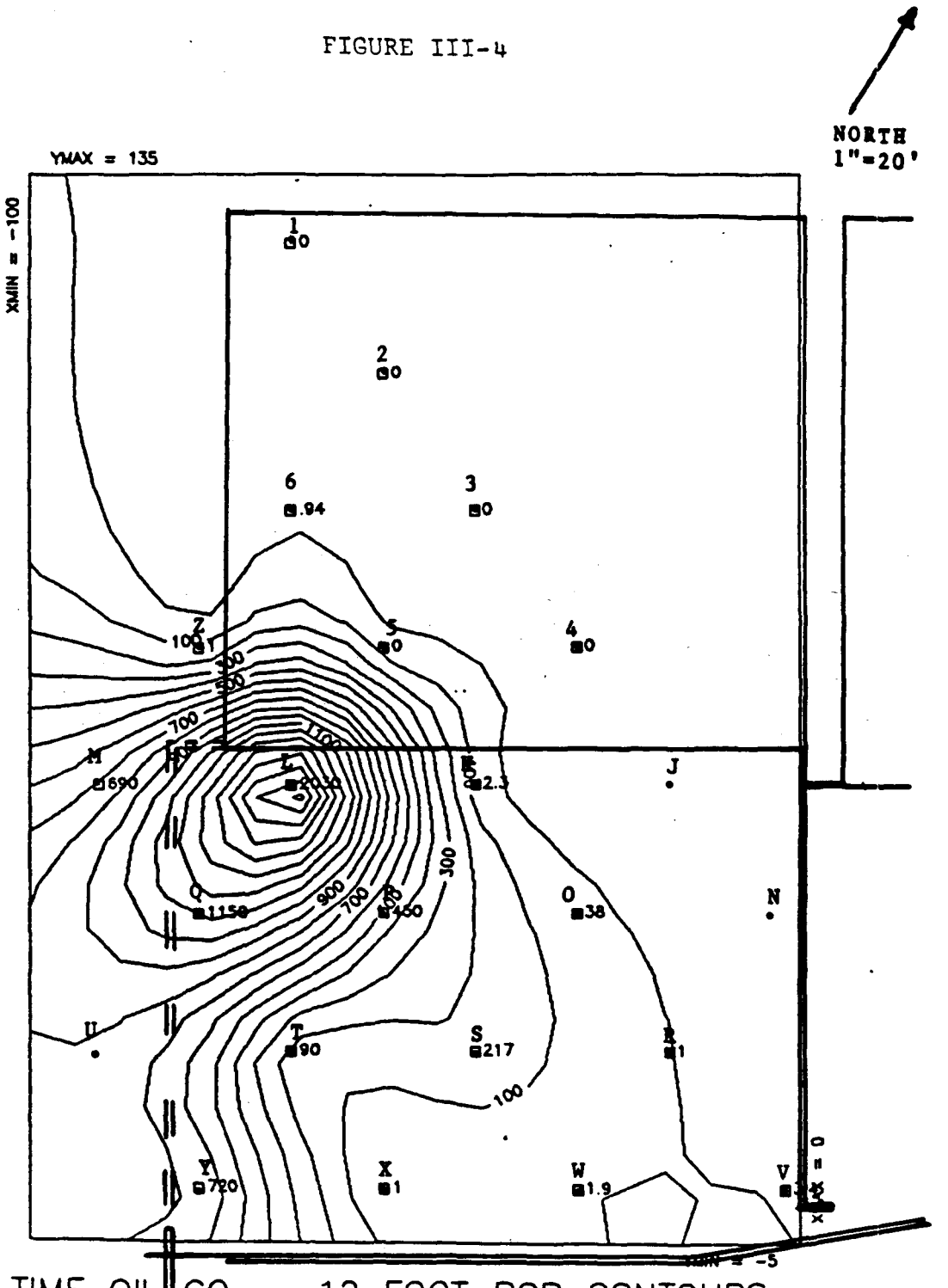
FIGURE III- 3



TIME OIL CO. — 7 FOOT PCP CONTOURS

TOLS011538

FIGURE III-4



TIME OIL CO. – 12 FOOT PCP CONTOURS

TOLS011539

TABLE III-1

TIME OIL CO.

COORDINATES - SURFACE PCP CONTOUR

CODE	X	Y	[PCP]
J	-17	55	2.3
K	-42	55	1200
L	-66	55	0.7
M	-91	55	1.8
N	-4	38	6.3
O	-29	38	176
P	-54	38	75.3
Q	-78	38	620
R	-17	20	891
S	-42	20	736
T	-66	20	1600
U	-91	20	0.7
V	-2	2	5
W	-29	2	354
X	-54	2	44.5
Y	-78	2	19
Z	-78	73	537
6	-66	91	0
5	-54	73	1.4
4	-29	73	0
3	-42	91	0
2	-54	109	0
1	-66	126	5.7

NOTE: [PCP] = CONCENTRATION OF PCP (mg/Kg) or (ppm)

Encl 5

TOLS011540

BZTO104(e)048373

TABLE III-3

TIME OIL CO.

COORDINATES - 4 FOOT PCP CONTOURS

CODE	X	Y	[PCP]
J	-17	55	3.6
K	-42	55	10.5
L	-66	55	7200
M	-91	55	22
N	-4	38	238
O	-29	38	23
P	-54	38	15
Q	-78	38	2205
R	-17	20	50
S	-42	20	184
T	-66	20	534
U	-91	20	55
V	-2	2	380
W	-29	2	8.1
X	-54	2	1.3
Y	-78	2	598
Z	-78	73	2
6	-66	91	0
5	-54	73	0
4	-29	73	0
3	-42	91	0
2	-54	109	0
1	-66	126	0

NOTE: [PCP] = CONCENTRATION OF PCP (mg/Kg) or (ppm)

TABLE III-4

TIME OIL CO.

COORDINATES - 7 FOOT PCP CONTOURS

CODE	X	Y	[PCP]
K	-42	55	3
L	-66	55	8400
M	-91	55	1
O	-29	38	13
P	-54	38	130
Q	-78	38	700
R	-17	20	500
S	-42	20	1130
T	-66	20	75
U	-91	20	5
V	-2	2	1
W	-29	2	1
X	-54	2	1.9
Y	-78	2	700
Z	-78	73	7
6	-66	91	0
5	-54	73	0
4	-29	73	0.96
3	-42	91	0
2	-54	109	0
1	-66	126	0

NOTE: [PCP] = CONCENTRATION OF PCP (mg/Kg) or (ppm)

TABLE III-5

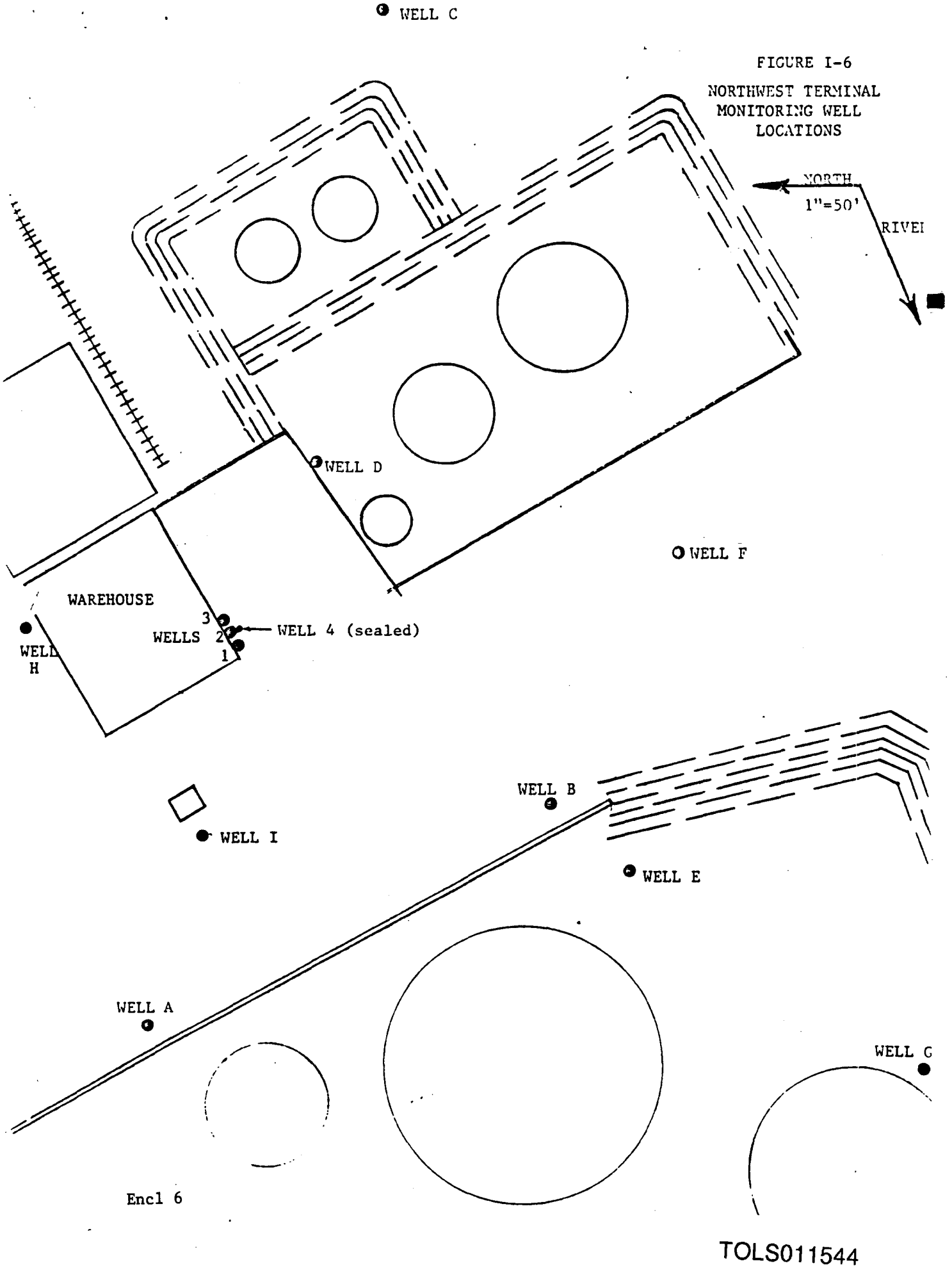
TIME OIL CO.

COORDINATES - 12 FOOT PCP CONTOURS

CODE	X	Y	[PCP]
K	-42	55	2.3
L	-66	55	2030
M	-91	55	690
O	-29	38	38
P	-54	38	450
Q	-78	38	1150
R	-17	20	1
S	-42	20	217
T	-66	20	90
V	-2	2	3.4
W	-29	2	1.9
X	-54	2	1
Y	-78	2	720
Z	-78	73	1
6	-66	91	0.94
5	-54	73	0
4	-29	73	0
3	-42	91	0
2	-54	109	0
1	-66	126	0

NOTE: [PCP] = CONCENTRATION OF PCP (mg/Kg) or (ppm)

TOLS011543



Encl 6

TOLS011544

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NORTHWEST TERMINAL MONITORING WELLS
CONSTRUCTION DETAILS

WELL	REFERENCE ELEVATION	GROUND ELEVATION	CASING HEIGHT	CASING LENGTH	SCREEN LENGTH	WELL DEPTH	DEPTH TO WATER 4/86
A	97.14	96.24	0.90	20.9	2.3	20.0	12.34
B	96.83	95.84	0.99	21.1	2.3	20.1	12.45
C	96.73	94.57	2.16	10.5	2.3	8.3	8.69
D	97.93	95.94	1.99	21.1	10.0	19.1	12.28
E	97.83	98.83	-1.00	22.0	8.5	20.0	12.67
F	97.97	95.97	2.00	21.1	8.5	19.1	12.73
G	98.05	96.05	2.00	14.9	8.5	12.9	14.60
H	94.75	95.46	-0.71	18.4	10.0	19.1	9.07
I	98.00	96.08	1.92	20.3	10.0	18.4	19.66
4	96.48	94.18	2.30	43.1	5.0	40.8	17.81

NOTES:

1. Wells A, B and C are 1.5" dia driven well points.
2. Wells E, F and G are 2.0" dia driven well points.
3. Wells D, H and I are 2.0" dia drilled monitoring wells.
4. Well 4 has been over-drilled and grouted.
5. Reference elevations are based on temporary benchmark.

Encl 7

TABLE III-6

TIME OIL CO.

GROUNDWATER ANALYTICAL RESULTS

(AUGUST 29, 1986)

WELL NUMBER	STATIC WATER LEVEL (FT BELOW TOP OF CASING)	pH	[PCP] (ppm)
MW-A	14.06	6.80	N.D.
MW-B	15.07	6.70	N.D.
MW-C	DRY	N.A.	N.A.
MW-D	14.48	6.53	.044
MW-E	15.22	6.54	N.D.
MW-F	15.44	6.57	N.D.
MW-G	DRY	N.A.	N.A.
MW-H	11.28	6.91	N.D.
MW-I	14.75	6.77	N.D.
RIVER	25.70	N.A.	N.A.

NOTES:

[PCP] = CONCENTRATION OF PENTACHLOROPHENOL
ppm = PARTS PER MILLION
N.A. = NOT AVAILABLE
N.D. = NOT DETECTED

Encl 8

TOLS011546

BZTO104(e)048379

TABLE 1 - GROUNDWATER SAMPLE RESULTS

Sample	ug/l PCP (1)	ug/l PCP (2)	pH	Depth to Water, Ft*		Static Water Level (ft. MSL) ** (1)	Static Water Level (ft. MSL) ** (2)
MW-A	<20	NA	6.61	13.78	14.74	83.36	82.40
MW-B	2300	1000	6.57	14.79	15.54	82.04	81.29
MW-C				(Dry)			
MW-D	<20	NA	6.60	14.29	15.24	83.64	82.69
MW-E				(Dry)			
MW-F	<20	NA	6.43	15.27	16.02	82.70	81.95
MW-G				(Dry)			
MW-H	<20	NA	6.64	13.78	12.10	83.71	82.65
MW-I	<20	NA	6.38	14.57	15.23	83.43	82.77
River				25.67	24.67		

(1) As measured on 8/20/87

(2) As measured on 10/16/87

* Distance from well stickup (or pier reference point) to water.

** Relative to TBM established by TOC

NA = Not Analyzed

DRAFT

CONSTRUCTION CONTRACT

ENVIRONMENTAL CLEAN-UP

THIS CONTRACT is made as of the _____ day of _____, 19___ at Seattle, Washington, by and between Time Oil Co., a Washington corporation ("Time" herein), located at 2737 West Commodore Way, Seattle, Washington 98199, and _____ ("Contractor" herein), located at _____ for work relating to environmental clean-up at 12005 North Burgard Road, Portland, OR ("Northwest Terminal").

IT IS AGREED by and between the parties hereto as follows:

1. WORK TO BE PERFORMED: The Contractor hereby agrees to perform services in accordance with the following Scope of Work. Contractor admits that the Scope of Work is sufficient for their intended purpose, and that work can be successfully executed in accordance therewith. Time may make any alterations, deviations, additions or omissions from the aforesaid Scope of Work, without affecting or making void this contract, however, no work other than as provided herein or specifically authorized by Time in writing shall become a part of this contract. Additional work is to be authorized only in writing.

   a. Before the initiation of the following tasks, prepare a detailed work plan for Time's approval.

   b. Excavate soil contaminated with pentachlorophenol (PCP) in excess of 500 ppm and place it on an impervious liner located in a secure area of the terminal such that the excavated soil is isolated from the environment and ceases to release PCP. Install an infiltration gallery in the excavated site for the purpose of enhanced bioremediation. Backfill with clean soil from a borrow site located on the terminal property.

   c. Replace existing well points A, E and G with 2" PVC monitoring wells. Replace existing well point B with a 6" diameter well suitable for groundwater recovery. Install a cluster of 6" diameter PVC wells located between existing points B and 4 having completion depths of 15, 25 and 35 feet below ground to determine the vertical extent of PCP contamination.

   d. Conduct tests to determine the optimum extraction solution for "washing" PCP from the soil at Northwest terminal.

2. PRICE: Time agrees to pay contractor _____ dollars, plus state sales tax, if applicable, which amount shall be referred to herein as the "contract price". Any change to the contract price may only be made by written change order or other writing executed by both parties hereto. Any work performed which is not covered by a written change order shall be considered fully paid for upon payment of the contract price.

3. TERMS OF PAYMENT: Progress billings are to be made after each 30 day period of this contract for work completed as of that date. Time will pay such billings less ten percent retainage. Final payment is to be made after acceptance of the completed project by Time.

4. BOND: Contractor agrees that before commencement of any work hereunder it will promptly furnish Time with a faithful performance bond issued by a surety company acceptable to Time in an amount equal to the total contract price guaranteeing completion of all work and performance of all obligations hereunder. Said bond shall cover any subsequent changes, modifications or amendments to this contract without the prior consent of the surety.

5. TIME FOR PERFORMANCE: All work shall be completed within ten weeks from the date of this contract, exclusive of permit approval by government agencies.

6. INSURANCE: Until completion of its performance hereunder, Contractor agrees to maintain Workmen's Compensation Insurance in the form and amounts required by state law, and Broad Form Comprehensive Public Liability with minimum limits of $1,000,000.00 per person and $1,000,000.00 per accident for bodily injury and $500,000.00 per accident

Encl 9

TOLS011548

for property damage. Contractor shall promptly deliver to Time certificates of said insurance naming Time as an additional insured before commencing work and such certificates shall provide that said insurance shall not be cancelled prior to thirty (30) days written notice to Time.

7. PERMITS: Contractor agrees, at his expense, to obtain all governmental permits, licenses and approvals, and to comply with all laws, rules, zoning ordinances, regulations and requirements, now or hereafter existing, of all governmental authorities concerned therewith, applicable to Contractor's activities pursuant to the Scope of Work. Contractor shall furnish Time with written evidence of all such necessary permits, licenses and approvals before commencing work. Time shall have the right to withhold from any payments due hereunder an amount sufficient to compensate it for any damages it may incur as a result of Contractor's failure to secure any necessary permit or comply with any law or regulation.

8. ASSIGNMENT: Contractor shall not assign or transfer this contract, or any interest therein or any part thereof, without the consent in writing of Time.

9. GUARANTEE: Contractor agrees to perform all work in a workmanlike manner and guarantees all work will be free from defects in material and labor for a period of one year after completion. No payment made under this contract shall be construed to be an acceptance of defective work or improper materials. Contractor further guarantees that it is familiar with the work site and scope of work and is competent to perform the work described within the time stated herein.

10. LIENS: Contractor covenants that no liens will attach against the subject premises for material or labor arising from the work herein contemplated. If at any time there shall be evidence of lien or claim for which, if established, Time may become liable, and which is chargeable to Contractor, Time shall have the right to retain out of any payment then due, or thereafter to become due, an amount sufficient to completely indemnify Time against such lien or claim, should there prove to be any such claim.

11. INDEMNITY: Contractor agrees to indemnify Time and hold Time harmless from any and all claims, liabilities, demands, actions, costs and expense (including attorneys' fees) of whatsoever nature, arising out of any acts or omissions of contractor, its agents or employees, hereunder. The parties recognize that even with the utmost care being exercised, escape of polluting substances might occur while Contractor is rendering services under this Agreement. It is therefore agreed that to the extent such escape shall occur that the responsibility to governmental authorities for such escapement is that of Time, and that Time agrees to indemnify and hold Contractor harmless of and from any loss, damage, injury, liability or claim resulting from an aggravation of the existing pollution problem which is not caused or contributed to by the negligence of Contractor.

12. REMEDIES: All rights and remedies of Time herein shall be cumulative, and no right or remedy shall be exclusive of any other, and the pursuit of any such right or remedy shall not be deemed a waiver of any other or different remedy or relief which Time might otherwise be entitled by law or in equity.

13. FORCE MAJEURE: Contractor shall not be held liable for delays resulting from fire, earthquakes, war, or acts of any government, whether foreign or domestic, or any other cause beyond his control. However, contractor has specifically taken into account and shall be held liable for potential delays caused by labor disturbances, material availability, and weather.

14. INTERPRETATION: This contract will be deemed executed and shall become binding and of full force and effect when signed by Time at its office by its authorized representative. This contract incorporates the entire agreement between the parties except as modified by written change order or other written agreement signed by both parties.

15. APPLICABLE LAW: The nature, validity and interpretation of this contract shall be governed by the laws of the State of Washington.

DATED_____ DATED_____

TIME OIL CO. DRAFT CONTRACTOR

By: _____ By: _____

TOLS011549

7/22/88 FLP

Ecova - NW Woodtreating 9:30
April Rivkin Mark Anderson John Kinsella

Alternative Treatment Approaches
Incineration $250-500 $/Ton or $/cy
Off-site Disposal $200-400 " "
On-Site Treatment $50-150 " "

Bioremediation of gasoline-contaminated soil ca $40/yd
Spread out on site - more expensive if area is limited
Larger site in CA costing ± $60/yd

Designs & Builds various mobile units in-house
Bob Sheck / Jeff Powell

lots of idle oilfield equipment avail in TX & OK - very adaptable for bioremediation eg mud tanks

Bioreactors - mud slurry up to 40% solids

To control emissions, build big greenhouse over spreading area.

TOLS011550

BZTO104(e)048383

ECOVA

July 26, 1988

Mr. Fred Proby
Time Oil Company
2737 Commodore Way
Seattle, WA 98199

Dear Fred:

On behalf of Time Oil Company, Ecova is pleased to provide the following summary of proposed activities to support the onsite cleanup of your Northwest Terminal in Portland, Oregon. This includes a:

- o Site walk
- o Soil and groundwater evaluation
- o Preliminary work plan

In order to develop a work plan to bioremediate 2,700 cubic yards of pentachlorophenol contaminated soil and groundwater, Ecova proposes to conduct a site walk of the Terminal to inspect the existing gasoline tanks and obtain soil and groundwater samples to evaluate in our laboratory. The existing gasoline tanks will be inspected for structural integrity to determine their suitability for conversion to slurry bioreactors.

Our initial soil and groundwater evaluation will include running tests to determine the physical slurry properties of the soil, including percent solids versus plastic viscosity, sieve size analysis, and settling rates. Standard fate testing protocols will be used to evaluate the use of indigenous and other microbial organisms under varied controlled environmental conditions to enhance and optimize biodegradation. This will include looking for unique degrading organisms and their tolerance level for pentachlorophenol, determining the extent of detoxification and inhibition, and identifying degradation rates.

This information will be used to develop a preliminary work plan detailing the process design for the slurry biotreatment system for the treatment of contaminated soils and groundwater. Costs will be included for treating contaminated material to 500, 100 and 50 ppm pentachlorophenol. The work plan will also include the conceptual engineering design of the system, including preliminary design of the air manifold system and retrofitting the existing tanks.

Corporate Office
3820 159th Avenue NE
Redmond, WA 98052
(206) 883-1900
(206) 867-2210 FAX

Gulf Coast Region
12790 Merit Drive #220
Lock Box 145
Dallas, TX 75251
(214) 404-7540
(214) 404-7545 FAX

Eastern Region
500 Fifth Avenue
Suite 935
New York, NY 10110
(212) 840-1042
(212) 840-1663 FAX

TOLS011551

BZTO104(e)048384

Upon notification to proceed, Ecova will coordinate the site walk with you for this week or early next week. The preliminary work plan can be provided to you within one month from that date. Full scale cleanup can be initiated immediately thereafter upon approval from the Oregon Department of Environmental Quality.

Should I be able to provide any additional information, please feel free to call me at (206) 883-1900. We are confident that we can develop a cost-effective approach to remediating the Northwest Terminal site, and look forward to working with you on this effort.

Sincerely,

April Rivkin

April Rivkin
Account Manager

P122/521401.AR:ch/2

[July/Aug '88]

Ecova - Mark Anderson

Re: Lower treatment level

Detection @ 500 ppb will be GC/FID for soil
probably can still use "UV" for water → Don't need GC/MS

500 ppb is a good detection limit
No problem reaching it w/ treatment process

Need more time to treat

Soil excavation was based on 500 ppm
+ a lower excavation level will be covered by the
incremental cost per yd³

TOLS011553

BZTO104(e)048386

FACSIMILE TRANSMITTAL

TIME OIL CO.
P.O. BOX 24447 TERMINAL STATION
SEATTLE, WASHINGTON 98124-0447

FAX NUMBER (206) 283-8036

CONFIRMATION NUMBER (206) 285-2400 EXT #223

FROM: Fred Proby

TO: Mark Anderson

COMPANY Ecova

DATE 2/3/23

ADDRESS

NO. OF COPIES INCLUDING COVER 2

CITY/STATE Redmond, WA

0004T

RECEIVING FAX #(206) 367-2210

TOLS011554

TIME OIL CO. NORTHWEST TERMINAL PENTA AREA - WELL #4 BORING LOG

TABLE 2

Depth in Feet	Soil Description
0 - 1-1/2	Light brown gravelly sand, moderately compacted, moist (shovel sample)
3-1/2 - 5	Dark brown gravelly sand, moderately compacted, moist, split spoon sample (S.S. sample)
8-1/2 - 10	Light brown gravelly sand, in contact with blue gray gravelly sand, moderately compacted, moist (S.S. sample)
10 - 13	Gravelly sand
13-1/2 - 15	Light blue gray gravelly sand, moderate compaction, saturated (S.S. sample)
15 - 18-1/2	Gravelly sand
18-1/2 - 20	Light blue gray gravelly silty sand with a clay lens, moderately compacted, saturated (S.S. sample)
20 - 23-1/2	Gravelly silty sand with clay lens
23-1/2 - 25	Light gray gravelly silty fine sand with minor clay lens, moderately compacted, saturated (S.S. sample)
25 - 28-1/2	Fine sand
28-1/2 - 30	Light gray medium to fine sand, 3-1/2" thick clay lens, saturated (S.S. sample)
30 - 32-1/2	Medium to fine sand with clay lenses
32-1/2 - 35	Light gray medium to fine sand, minor clay lenses, saturated (S.S. sample)
35 - 37-1/2	Medium to fine grained sand
37-1/2 - 39	Light gray medium to fine sand (S.S. sample)
39 - 42-1/2	Light gray medium to fine sand
42-1/2 - 45	Light gray medium sand grading to fine sand with depth, minor clay lens (S.S. sample)
45 - 47-1/2	Fine sand, saturated
47-1/2 - 49	Light gray sandy silt grading to light gray silty fine sand (S.S. sample)

TOLS011555

ECOVA

August 5, 1988 P.N. 521402

Mr. Fred Proby, Environmental Specialist
Time Oil Company
2737 Commodore Way
Seattle, Washington 98199

Dear Fred:

RE: GROUNDWATER RECOVERY AT THE NORTHWEST TERMINAL, PORTLAND, OREGON

As requested at our July 29, 1988 meeting and discussion, we are submitting a Statement of Work to define the vertical extent of pentachlorophenol (PCP) groundwater contamination at the site and install a recovery system.

Background

A total of nine groundwater monitoring wells have been installed at the Northwest Terminal. We understand that these wells are constructed of black steel (or similar material) casings and screens. Six of the wells are driven 1.5 and 2.0 inch diameter wells; three wells are 2.0 inch diameter drilled wells. The majority of the wells are 20 feet deep, have an average screen length of 6 feet and intercept the water table at approximately 15 feet below ground surface. The wells are located in the vicinity of and down gradient from the defunct PCP mixing operation.

Shallow groundwater flow beneath the site is south towards the Willamette River. Visual inspection of the site soils reveals them to be fine/medium sands containing some silt. Groundwater flow can be expected to be fairly rapid (100-200 feet/year) in such materials. While installating the monitoring wells, an aquitard was found at around 20 feet depth suggesting the presence of multiple aquifers.

On August 20, 1987, and again on October 16, 1987, water levels and samples were obtained from the site wells. These measurements confirmed that groundwater was flowing south under an average gradient of 0.008 ft/ft. Water from well MW-B was analyzed on August 20, 1987, for PCP and contained 2300 ug/L. It is apparent that a PCP plume, originating from the mixing area, is migrating towards the river. Immediate project objectives are to define the vertical extent of the plume and to halt its movement via an interceptor trench/well.

Corporate Office
3820 159th Avenue NE
Redmond, WA 98052
(206) 883-1900
(206) 867-2210 FAX

Scope of Work

Ecova proposes to execute this project in two phases: Phase I will involve well installation and sampling; Phase 2 will involve plume recovery. At this time, we will not implement Phase II until the results of Phase I have been assessed.

TOLS011556

BZTO104(e)048389

Phase I - Well Installation and Sampling

To define vertical PCP plume concentrations, Ecova will install a cluster of three monitoring wells between the mixing area and well MW-B. The wells will be screened at discrete 5-foot intervals approximately 25, 35, and 45 feet below land surface. Final depths and completion details will depend on subsurface soil conditions. To ensure that representative water samples are obtained from each well, the following construction techniques will be used:

- At the shallow well location, a soil boring will be advanced and soil samples obtained using split spoon/shelby tube samplers. The strata will be logged and examined for visual contamination by the onsite Ecova Geologist. The depth to the upper aquitard (approximately 27 feet below grade) will be confirmed.

- The shallow boring will be advanced by hollow stem auger. At the required completion depth, 4-inch diameter PVC casing, screen, and sump will be installed. The screen will be machine- slotted and surrounded with filter sand; the remaining annular space will be sealed with bentonite and grouted to surface.

- For the two deeper wells, 12-inch surface casings will be installed to the top of the aquitard and grouted in-place. The borings will then be advanced to final depth and 4-inch wells installed inside the surface casings. This construction sequence will ensure that no contaminants from the shallow zone are carried down into the deeper layers.

- The wells will be developed (surge block/air) and capped. The well casing elevations will be surveyed relative to MSL and water levels and samples obtained. The samples will be shipped to Ecova's Analytical Laboratory in Redmond and analyzed for PCP.

- Following sample collection, the shallowest well will be pump-tested to determine optimum operating recovery rates, extent of drawdown cone, and degree of vertical interconnection with deeper wells. The two deeper wells will not be pumped at this time to prevent the possibility of contamination from being inadvertently "pulled down" to deeper zones.

We are currently locating a drilling subcontractor with the appropriate equipment.

TOLS011557

BZTO104(e)048390

Phase II - Plume Recovery

Following analysis of the analytical lab tests (3-week turnaround) and results of the limited test pumping, a recovery system may be installed. This system would consist of a recovery trench (French drain) laid across the plume path. Water from the drain would feed into a sump and the sump pumped directly (via existing piping) to Tank No. 5313 or other available tank.

A drain may not be appropriate if the contamination is found to extend a significant depth below the water table. In this situation, a simple recovery well system will ensure plume capture. The new monitoring wells will readily accommodate submersible pumps to function as part of the recovery well system.

Project Budget - Phase I

We are currently soliciting costs to drill and install the wells; we have not costed out the Phase II work in detail at this stage. Our anticipated budget is as follows:

	Item	Cost ($)
•	Drill, Sample, Install, and develop three 4-inch diameter wells (two double cased)	$ 7,700.00
•	Geological Supervision, Expenses, and Completion Report	3,000.00
•	PCP Water Analysis (shipping and chain-of-custody, and blank included)	360.00
	TOTAL	$11,060.00

We are ready to mobilize immediately upon your approval and anticipate being in the field within a week. Please contact us at (206) 833-1900 should you have any questions or concerns.

Sincerely,

Mark Anderson,
Project Manager

John V. Kinsella,
Vice President Geosciences

cc: File

AF1/PROP-TOC.01

TOLS011558

E C O V A

Revised 10/18/88

August 11, 1988

Mr. Fred Proby
Environmental Specialist
Time Oil Company
2737 Commodore Way
Seattle, Washington 98199

RE: GROUNDWATER RECOVERY AT THE NORTHWEST TERMINAL,
PORTLAND, OREGON

Dear Fred:

In response to your comments of Monday, August 8, we are submitting a revised Work Plan defining those tasks necessary to delineate the extent of pentachlorophenol (PCP) groundwater contamination at the Northwest Terminal site in Portland, Oregon. Estimated costs for completion of this work is also included.

Background

A total of nine groundwater monitoring wells have been installed at the Northwest Terminal. Six of the wells are driven 1.5 and 2.0 inch diameter wells; three wells are 2.0 inch diameter drilled wells. The majority of the wells are 20 feet deep, have an average screen length of 6 feet, and intercept the water table at approximately 15 feet below ground surface. The wells are located in the vicinity of and down gradient of the defunct PCP mixing facility.

Shallow groundwater beneath the site flows south toward the Willamette River. Site soils consist of fine to medium sand containing minor amounts of silt. Groundwater flow can be expected to be fairly rapid (100-200 feet/year) in such materials. While installing the monitoring wells, lower permeability strata (aquitard) were encountered at a depth of around 20 feet suggesting the presence of multiple water bearing zones.

On August 20, 1987, and again on October 16, 1987, water levels and groundwater samples were obtained from the site wells. These measurements confirmed that groundwater was flowing in a southerly direction under an average gradient of 0.008 ft/ft. Water from well MW-8 was analyzed on August 20, 1987 for PCP and was found to contain 2300 ug/L. It is apparent that a PCP plume, originating from the mixing area, is migrating toward the river.

Corporate Office
3820 159th Avenue
Redmond, WA 9805
(206) 883-1900
(206) 867-2210 FAX

TOLS011559

AUG 11 '88 11:42 ECOVA P.2

BZTO104(e)048392

Scope of Work

Immediate project objectives are to define the extent of the contaminant plume and to halt its movement. Ecova proposes to execute these objectives in two phases. Phase I will consist of well installation and sampling. Phase II will consist of design and installation of a system to recover the contaminated groundwater plume. Phase II will be implemented after the results of Phase I have been assessed.

Phase I - Well Installation and Sampling

The Phase I investigation will define the lateral and vertical extent of site contamination. To define the vertical PCP plume concentrations, Ecova will install a cluster of three monitoring wells between the mixing area and well MW-B. The wells will be screened over discrete 5-foot intervals at approximately 25, 35, and 45 feet below land surface. In addition, Ecova will install three shallow wells to replace existing (non-functional) wells A, E, and G. Final depths and completion details of all wells will depend on subsurface conditions encountered at the site. To ensure that representative water samples are obtained from each well, the following construction techniques will be used:

- At the first well location, a soil boring will be advanced using a rotary drilling method and soil samples will be obtained using a split spoon sampler. The strata will be logged and examined for visual contamination by the onsite Ecova Hydrogeologist. The depth to the upper aquitard (approximately 20 feet below grade) will be confirmed.

- For the two deeper wells, 12-inch surface casings will be installed to the top of the aquitard and grouted in-place in 14-inch holes drilled using the mud rotary drilling method. After allowing the grout to set up, the borings will be advanced to final depth using a hollow stem auger and 4-inch wells will then be installed inside the surface casings. This construction sequence will ensure that no contaminants from the shallow zone will be carried down into the deeper layers.

- The additional shallow borings will be drilled by hollow stem auger. At the required completion depth (approximately 20 feet), a 4-inch diameter PVC casing and screen will be installed. The screen will be machine-slotted and the annular space filled with a

graded filter sand; the remaining annular space will be sealed with bentonite and grouted to surface.

- The wells will be developed using a surge block technique. Well casing elevations will be surveyed relative to MSL and water levels obtained. To assure representative ground water samples, wells will be allowed to stabilize for at least 24 hours following well development prior to obtaining a groundwater sample. Three to five casing volumes of water will be evacuated from the well bore prior to sampling. The samples will be shipped to Ecova's Analytical Laboratory in Redmond and analyzed for PCP.

- Following sample collection, the shallowest well will be pump-tested to determine optimum operating recovery rate, extent of the drawdown cone, and degree of vertical interconnection with deeper wells. The two deeper wells will not be pumped at this time to prevent the possibility of contamination from the shallow zone from inadvertantly being "pulled down" to deeper zones.

As discussed in our recent conversation, additional deep wells may be required if contamination is found in the deeper wells in the newly installed well cluster. Two options are available in making this determination. A field decision can be made to install the wells while the drilling rig is still onsite. This would require rapid lab turnaround at a premium price. As a second option, the decision to install additional deeper wells can be made at a later date once all of the analytical data has been received from the lab (in approximately three weeks). This would require a second rig mobilization. The rapid lab turnaround required for the first option requires the dedication of equipment and manpower to analysis of the single sample. The cost to obtain this analysis in less than five days would be approximately $500.00. In comparison, the cost to remobilize a drilling rig is $150.00.

Phase II - Plume Recovery

Following analysis of the analytical lab tests (standard 3-week turnaround) and results of the limited test pumping, a recovery system may be installed. This system will consist of a recovery trench (French drain) laid across the plume path. Water from the drain would feed into a sump and be pumped directly (via existing piping) to Tank No. 5313 or other available tank.

However, if contamination is found to extend to a significant depth below the water table, a drain may not be appropriate for contaminant recovery. In this situation, a simple recovery well system will ensure plume capture.

The new monitoring wells have been designed to accommodate submersible pumps and can be utilized as part of the recovery well system.

Estimated Costs - Phase I

Total estimated costs for the Phase I program are detailed below. These costs assume installation and development of one well per day.

Ecova Costs:

o Drilling Supervision and Sampling	$ 3,120
o Pump Testing and Analysis	$ 520
o Field Expenses and Equipment	$ 900
o Analytical (6 samples plus QA/QC sample)	$ 630
o Summary Report	$ 600

Subcontractor Costs:

o Drilling, well installation, and well development (six 4-inch wells; Three two double cased)	$ 6,500
o Well Materials	$ 3,900
Project Total:	$16,170 ← 16,100

Fred, the bottom line number has obviously increased over our original estimate. However, you will see that we have trimmed any "fat" from all items. This program does have the advantage of providing you with a ready-made recovery system that will allow you to begin site remediation immediately. If it does become part of the final site system, we could credit these costs to the overall site remediation budget.

We have located a drilling firm able to perform the work required, drilling equipment will be available August 17. Rapid approval of this work plan will allow us to confirm arrangements with the driller. If you have any questions concerning the proposed work, please call us at (206) 883-1900.

Sincerely,

Eric J. Paulstaitis,
Senior Hydrogeologist

J. Kinsella EJP

John Kinsella,
Vice President Geosciences

cc: Mark Anderson
File

AF1/PROP-TOC.01

INVOICE

TO: Time Oil Company
P.O. Box 24447
Terminal Station
Seattle, WA 98124-0447

FROM: ECOVA CORPORATION
P.O. Box 94081
Seattle, WA 98124-9481

RE: PO# 72738

OUR REFERENCE: 821401
INVOICE DATE: August 31, 1988
INVOICE # 101544

Item	Quantity	Description	Unit Price	U/M	Extended Price
		For Professional Services through August 31, 1988:			
		LUMP SUM BILLING:			
		PREPARATION OF WORK PLAN			6,000.00
		INVOICE TOTAL			6,000.00

CO.....DIV.....
VEND.....
INV.....
PO 72738
DUE.....
%.....MO.....
DIST ATTACHED
AUTH
PRICE
REC/ SIG

RECEIVED
SEP 23 1988

mmx

TOLS011564

PURCHASE ORDER

TIME OIL CO.

BILL TO:
P.O. BOX 24447, TERMINAL STATION
SEATTLE, WASHINGTON 98124-0447

SHIP TO:
2737 WEST COMMODORE WAY
SEATTLE, WASHINGTON 98199-1233

PHONE (206) 285-2400

No. 72738

PLACE THIS NUMBER ON YOUR INVOICE AND ALL CORRESPONDENCE

TO Ecova

3820 159th Ave NE

Redmond, WA 98052

DATE July 27, 1988

SHIP BY

✓	QUANTITY	PART NO.	DESCRIPTION	LIST UNIT PRICE	NET UNIT PRICE	AMOUNT
			Prepare preliminary Work Plan for bioremediation			
			of pentachlorophenol-contaminated soil at			
			12005 N. Burgard, Portland, OR per proposal			
			dated 7/26/88			$6,000.00

FOR RESALE ☐ TAXABLE ☐

WASHINGTON STATE RESALE CERTIFICATE #C178-47526

TIME OIL CO.

BY [signature]

THIS PURCHASE IS EXPENSE OF: ☒ T.O.C. ☐ OTHER

DATE WANTED

IF T.O.C.	DEPARTMENT	EXPLANATION
	SERVICE STATION (SHOW ADDRESS AND OPERATOR)	NW Terminal Penta Clean-up
		03-657-60-123

ACCOUNT NO. REQUESTED BY APPROVED BY [signature]

TAP-130 7/87

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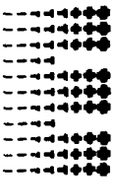
E C O V A



WORK PLAN FOR

SOIL AND GROUNDWATER REMEDIATION
TIME OIL NORTHWEST TERMINAL
PORTLAND, OREGON

TIME OIL COMPANY

THE ONSITE
HAZARDOUS WASTE
MANAGEMENT COMPANY

TOLS011566

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ECOVA

September 12, 1988

E-TO-001
J.N. 821401

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, WA. 98199

Dear Fred:

RE: Ecova Work Plan for PCP Remediation at the Time Oil Northwest Terminal, Portland, Oregon

On behalf of Ecova, we are pleased to pleased to submit this Final Work Plan for Soil and Groundwater Remediation at Time Oil's facility in Portland, Oregon. Ecova's work plan has been developed to provide the most cost-effective treatment system possible. The remediation program will optimize the chemical and biological degradation of pentachlorophenol by implementing a soil slurry technology. This technology provides flexible remediation options that can simultaneously treat contaminated soil and groundwater.

Ecova's project team will work closely with Time Oil to develop and use existing resources. For example, Ecova proposes to use onsite personnel from Time Oil to periodically monitor equipment during normal operations. In addition, Ecova intends to use the existing 38,000 gallon tank and another horizontal tank, (formerly used as petroleum storage tanks) for an aqueous bioreactor and liquid surge control.

Our Work Plan assumes that Time Oil will allow the treatment equipment to remain onsite for a short period of time until it can be mobilized for another project elsewhere. In this manner, demobilization charges can be greatly reduced and the savings passed on to Time Oil.

Three schedules for completion of the project have been prepared in Section 3.0. These schedules differ by considering the different treatment times necessary to achieve each level of soil cleanup for 50 ppm, 100 ppm or 500 ppm.

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New York, NY 10110
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Ecova is very excited about working with Time Oil on this remediation effort. The program we have developed provides the most cost effective approach to cleanup site contamination. We look forward to meeting with you to initiate this work. If you have any questions about our Work Plan or if you require any additional information, please feel free to call either of us.

Very truly yours,

April Rivkin

April Rivkin
Account Manager

Mark W. Anderson

Mark W. Anderson
Senior Project Manager

P133/ETO001.MA:ch/1

TOLS011568

Work Plan
for
Soil and Groundwater Remediation
Time Oil Northwest Terminal
Portland, Oregon

to

TIME OIL COMPANY

Submitted by:

ECOVA CORPORATION
3820 159th Avenue NE
Redmond, Washington 98052
Project Number: 821401

September 12, 1988

ECOVA

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BZTO104(e)048402

NONDISCLOSURE STATEMENT

The following information, furnished in connection with the Preliminary Work Plan for Soil and Groundwater Remediation, Time Oil Northwest Terminal, Portland, Oregon, specifically identified in Section 2.2 - Conceptual Engineering Design, 4 - Project Costs, Appendix C - Ecova PCP Research, and Appendix D - Analytical Data Report of this Work Plan, constitutes trade secrets or confidential commercial and financial information which the Offeror believes to be exempt from disclosure. The Offeror requests that this information not be disclosed to the public, except as may be required by law. The Offeror requests that this information not be used in whole or part by Time Oil for any purpose other than to evaluate the Work Plan, except that if a contract is awarded to the Offeror as a result of or in connection with the submission of the Work Plan, Time Oil shall have the right to use the information to the extent provided in the contract.

TABLE OF CONTENTS

		Page
1. INTRODUCTION		1-1
1.1	Site Background	1-1
1.2	Site Characteristics	1-1
2. SCOPE OF WORK		2-1
2.1	Overview	2-1
2.2	Conceptual Engineering Design	2-3
2.3	Work Program	2-10
3. SCHEDULE		3-1
4. PROJECT COSTS		4-1
5. PROJECT MANAGEMENT		5-1
5.1	Project Organization and Personnel	5-1
5.2	Support Services	5-3
6. EXPERIENCE		6-1
6.1	Technology Development and Capabilities	6-1
6.2	References	6-2

APPENDIXES

APPENDIX A. Soil Boring Analysis	A-1
APPENDIX B. Resumes	B-1
APPENDIX C. Ecova PCP Research	C-1
APPENDIX D. Analytical Data Report	D-1
APPENDIX E. Treatment Study Report	E-1

TABLES

TABLE 1-1. Pentachlorophenol (PCP) Concentrations in Soil Samples	1-3
TABLE 2-1. Design Basis Parameters For Soil Bioslurry Treatment System Time Oil Company	2-3
TABLE 4-1. Project Costs for Cleanup Levels	4-1

FIGURES

FIGURE 1-1. Site Layout - Time Oil Company	1-2
FIGURE 2-1. Work Breakdown Structure	2-2
FIGURE 2-2. Block Flow Diagram	2-4
FIGURE 2-3. Process Flow Diagram	2-5
FIGURE 5-1. Project Organization	5-2
FIGURE A-1. Excavation Plan 0 - 2' Depth	A-3
FIGURE A-2. Excavation Plan 2 - 5 1/2' Depth	A-4
FIGURE A-3. Excavation Plan 5 1/2 - 9 1/2' Depth	A-5
FIGURE A-4. Excavation Plan 9 1/2 - 12' Depth	A-6

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1. INTRODUCTION

Ecova Corporation was retained by Time Oil Company to develop a Preliminary Work Plan for remediating soil and groundwater contaminated with pentachlorophenol (PCP) at its "Northwest Terminal" in Portland, Oregon. This work plan outlines the approach that Ecova proposes to follow in conducting the work, including design and installation of the slurry/liquid treatment facilities, biodegradation of PCP contamination, dewatering of the slurries after treatment, and final disposal of treated soil and groundwater. The work plan also addresses Ecova's participation in support of regulatory agency approval of the remediation plan. Included in this work plan are descriptions of the individual tasks to be performed, the management team assigned to carry out the project activities (Section 3.0), the project schedule showing task duration and milestones (Section 4.0), and the project costs provided in Section 5.0.

1.1 SITE BACKGROUND

Time Oil operates a petroleum products terminal in Portland, Oregon, that provides tank storage facilities for its products as well as custom storage for outside customers. Until recently, Time Oil also operated a PCP mixing facility at the Northwest Terminal to produce products for a woodtreating chemicals manufacturing and distributing firm. Operations included melting blocks of virgin PCP, mixing with mineral spirits, and repackaging the mixture for shipment. Operations were discontinued at the plant several years ago.

During the time of plant operation, soils beneath and nearby the processing units became contaminated with the PCP product, especially around the drum or tank loading area near the woodtreating chemicals warehouse. Since the decommissioning of the plant, all of the PCP processing units have been removed.

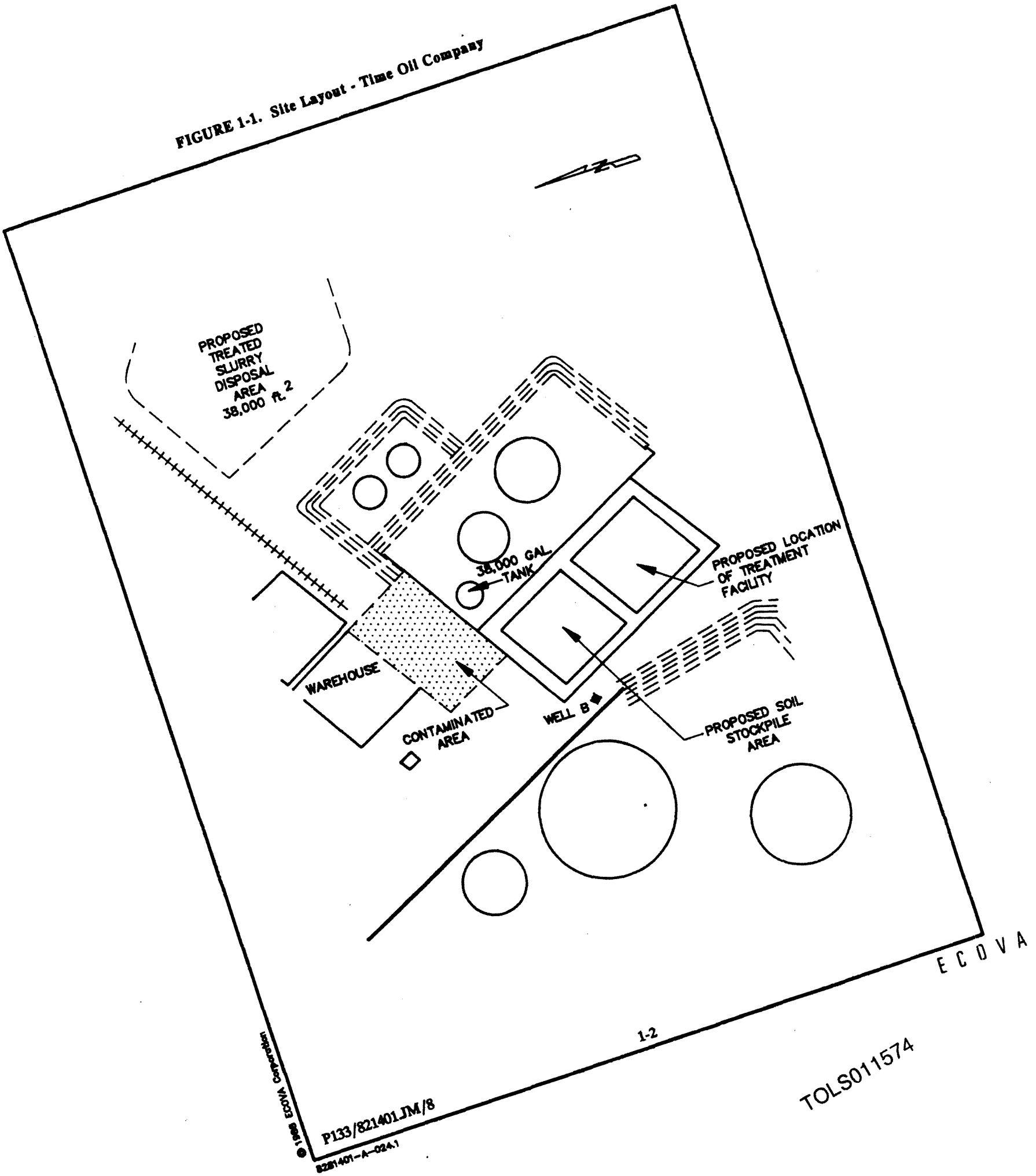
Time Oil has conducted a number of investigations of the extent of PCP contamination in the soils surrounding the facility and in downgradient groundwater. As a result of their confirmation of the presence of PCP in these media, Time Oil retained Ecova to study the information available and to develop this preliminary work plan for cleanup actions. At present, there is no active enforcement action being taken relative to the site by any regulatory agency.

1.2 SITE CHARACTERISTICS

The site is located on the northern bank of the Willamette River, in the city of Portland, Oregon. The layout of the site is illustrated in Figure 1-1, Site Layout. Time Oil has identified approximately 2,700 cubic yards of soil with PCP contamination exceeding 500 ppm. From information provided by Time Oil, concentrations of PCP have ranged to 8400 ppm in the soil around the loadout area near the southern corner of the warehouse for the plant. Concentrations declined rapidly a few feet away from the "hot spot", generally decreasing to concentrations of under 1500 ppm which is approximately the average concentration reported by Time Oil.

Soil type is generally mixed sands, silts and gravels normally associated with a former river channel environment. Little clay appears to be present near the surface, although lenses may occur at depth. With little clay present, the PCP tends to be mobile, migrating downward into the soil vadose zone and entering the groundwater underlying the site, some 18 to 20 ft below ground level.

FIGURE 1-1. Site Layout - Time Oil Company



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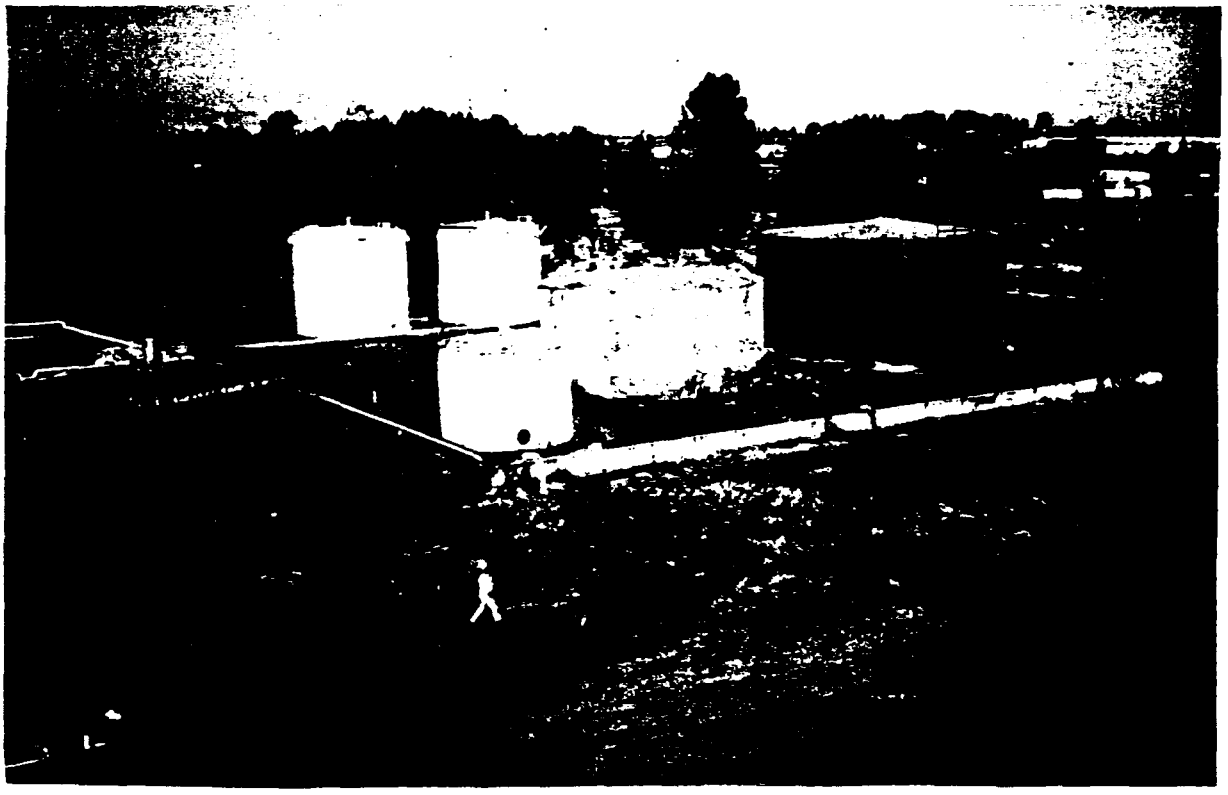

Time Oil Northwest Terminal Site
Portland, Oregon

ECOVA

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As a confirmation of the levels of PCP in the site soils, Ecova conducted a sampling of the pile on July 29, 1988. Analyses of these samples were conducted by Ecova Analytical Services (EAS). The results of these analyses are presented in Table 1-1. These data confirm the levels of PCP reported by Time Oil and also confirm that there are significant variations in PCP concentrations within the pile of contaminated soil.

A background soil sample was collected from the site as a check for background concentrations of PCP. This soil sample was a composite collected from several locations around the terminal property. The analysis of the sample suggests that it is representative of PCP concentrations in soils surrounding the site. A sample of groundwater was taken from Well B at the site which did not show PCP contamination. However, analytical problems relating to poor spike and surrogate recoveries indicate a need to re-extract and reanalyze.

TABLE 1-1. Pentachlorophenol (PCP) Concentrations in Soil Samples

Sample	Concentration (ppm)
W-1	250
E-1	2000
S-1	2.2
N-1	720
Composite	680
Background	0.131

In addition to the sampling data, other information on PCP was examined. Time Oil has provided Ecova with exceptionally detailed in-house soil boring and groundwater data indicating the distribution of PCP in the soils around the site. Ecova has reviewed this information carefully to determine the following:

1) The volume of soil to be excavated
2) The approach for conducting the excavation
3) The average PCP concentration in the excavated soil.

The results of this investigation, included in Appendix A, Soil Boring Analysis, indicate that approximately 3440 bank cubic yards of soil, containing an average of 668 ppm of PCP would have to be removed. Soil within each soil horizon sampled that will need to be excavated is illustrated on the PCP concentration plots given in Appendix illustrations A-1 through A-4. The average concentration of 668 ppm is consistent with the composite sample shown in Table 1-1. This data will be included in the system design basis parameters presented in Section 2.2, Conceptual Engineering Design.

Since the soil boring study was conducted, Time Oil has had earthmoving equipment push the surface contaminated soils into a pile over the hot spot in the approximate center of the former plant site. This resulted in covering the most contaminated soils while achieving a degree of mixing of the

different contamination levels. While the boring data and excavation approach outlined in Appendix A do not reflect the current location of contaminated soil at the surface or ground level, the data is taken to be representative of PCP contamination distribution at depth.

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2. SCOPE OF WORK

2.1 OVERVIEW

Ecova has developed a remediation program incorporating physical, chemical, and biological treatment technologies aimed at eliminating the PCP contaminants in the soil and groundwater. Contaminants will be separated from the soil media and biodegraded in solution to complete mineralization until the target levels are achieved.

The goal of this program has been to develop a cost-effective remediation strategy based upon biological degradation technologies which will reduce the PCP concentration to the levels acceptable to the appropriate regulatory agency, which is assumed to be Oregon Department of Environmental Quality (ODEQ). The program has been developed considering the following objectives:

- o Optimize the chemical and biological degradation of the PCP through use of soil slurry technologies;
- o Develop flexible remediation options that can treat both contaminated soil and groundwater;
- o Minimize the potential for migration of contaminants beyond the treatment area;
- o Develop options that can be implemented and completed in timely manner.
- o Use, to the extent practicable, Time Oil resources available on-site;

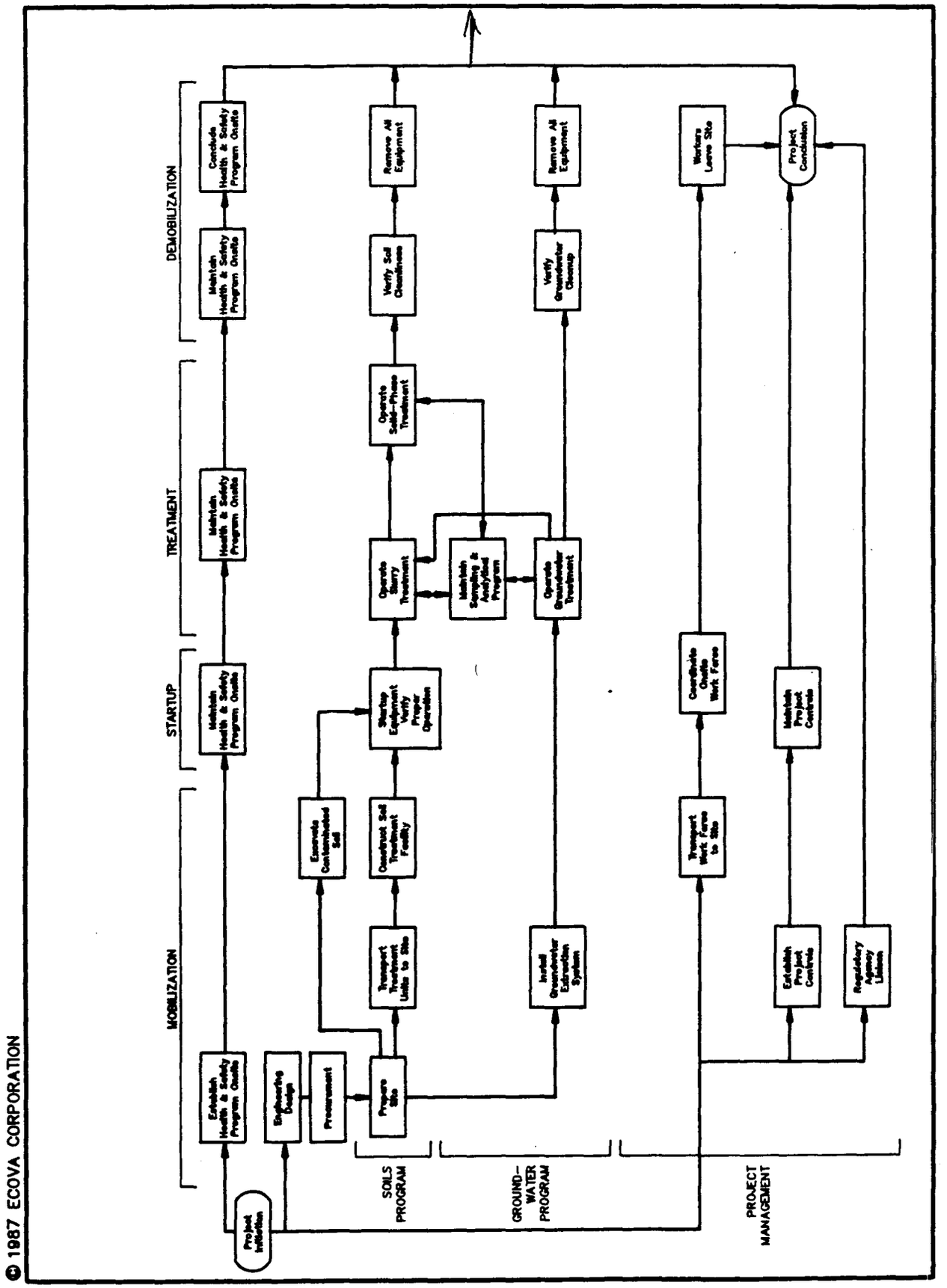
The proposed treatment program is conceptually illustrated in Figure 2-1, Work Breakdown Structure. As shown in this figure, work on the project will commence immediately upon receiving authorization to proceed. Work will start with the engineering design and procurement of equipment needed for remediation. Time Oil will secure approval of the treatment program by ODEQ. Ecova will support Time Oil in its negotiations with ODEQ as directed by Time Oil's project manager and outlined in Section 2.3.2, Regulatory Authorization.

Following completion of the engineering of the treatment system and regulatory authorization, Ecova will mobilize to the Portland site and commence construction activities. While the treatment system is being constructed, the contaminated soil will be completely excavated and stockpiled on a plastic liner. The excavation will then be filled with borrow material obtained from the land treatment area.

Upon completion of construction of all of the treatment facilities, the treatment system will be operated on a batch basis until the stockpiled soil has been fully treated. Groundwater will be pumped by the groundwater extraction system and treated at the plant until the negotiated target cleanup concentrations have been reached. With completion of all treatment operations, the system will be decommissioned and the site cleaned of any remaining trash and debris. Removal of the treatment equipment units will proceed as discussed in Section 2.3.7, Demobilization.

As shown in Figure 2-1, an onsite worker health and safety program will be implemented and conducted throughout the remediation program.

FIGURE 2-1. Work Breakdown Structure



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The conceptual engineering design of the treatment system proposed for the remediation project is discussed below, followed by a detailed discussion of each task in the program.

2.2 CONCEPTUAL ENGINEERING DESIGN

Ecova has prepared a conceptual engineering design which fulfills the program objectives discussed in the overview. Figures 2-2, Block Flow Diagram, and 2-3, Process Flow Diagram, illustrate this design for the onsite treatment system at the Time Oil Northwest Terminal site for complete remediation of the PCP contamination present in soils and groundwater.

Initial design parameters were determined from the data provided by Time Oil and Ecova treatability test results as presented in Appendixes A, B, C, and D. A summary of the primary design parameters is detailed in Table 2-1.

TABLE 2-1. Design Basis Parameters For Soil Bioslurry Treatment System Time Oil Company

Assumed Parameters

Contaminated Soil to be Treated:	3440 cubic yards
Percentage Oversize (20 mesh):	15%
Average PCP Concentration:	680 ppm, dry soil
Slurry Solids Percentage:	35%
Contaminant Half Life:	1.4 days
Slurry Tank Volume (2 units):	50,000 gallons
Number of Batches:	32
Soil Treated Per Batch Cycle:	108 cu.yd.
Mixer Horsepower Requirements:	1.0 hp/1000 gals
Solid Phase Treatment/Disposal Area Size:	38,000 square feet
Depth of Solid Phase:	2.5 feet

	Target Cleanup Criteria (PCP Concentration in Dry Soil)		
Derived Parameters	500 ppm	100 ppm	50 ppm
Reactor Retention Time:	0.6 days	3.9 days	5.3 days
Batch Cycle Time:	Continuous	5.0 days	7.0 days
Approx. Treatment Duration:	46 days	160 days	224 days

As discussed in the Introduction a composite PCP concentration of 680 ppm was obtained from the July samples obtained by Ecova from the site. In examining the soil boring data and interpretation provided by Time Oil, we conclude that this concentration is approximately equal to the average concentration that would be obtained from a blended feedstock made up from stockpiled soil following the plan shown in Appendix A, Soil Boring Analysis. The average concentration is the key parameter in the design basis since this value determines the feed rate to and residence time in the bioreactors. The quantity of contaminated soil present determines the capacity of bioreactor needed, the length of time needed for treatment given the average concentration and degradation rate, and the size of land treatment/disposal area needed.

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FIGURE 2-2. Block Flow Diagram

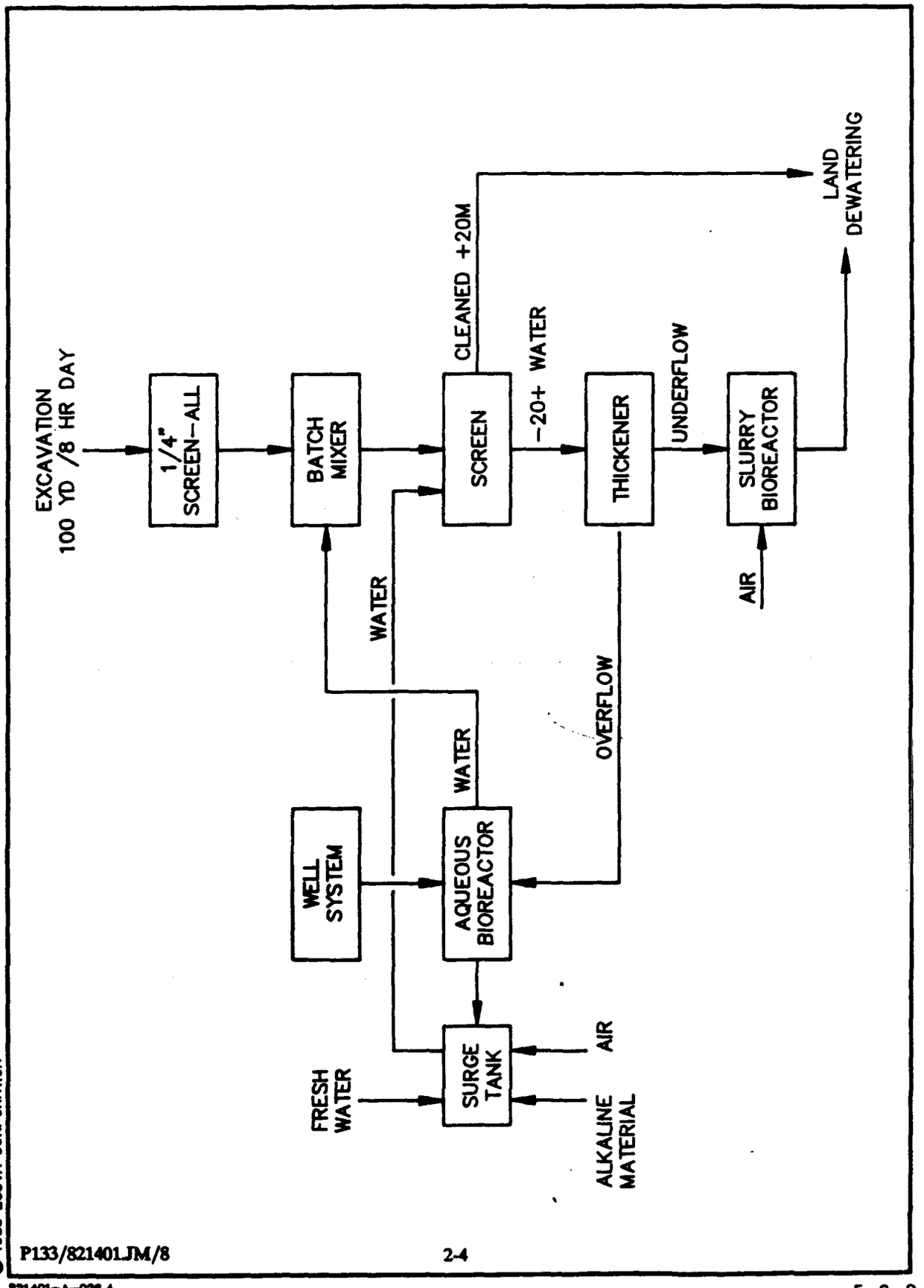

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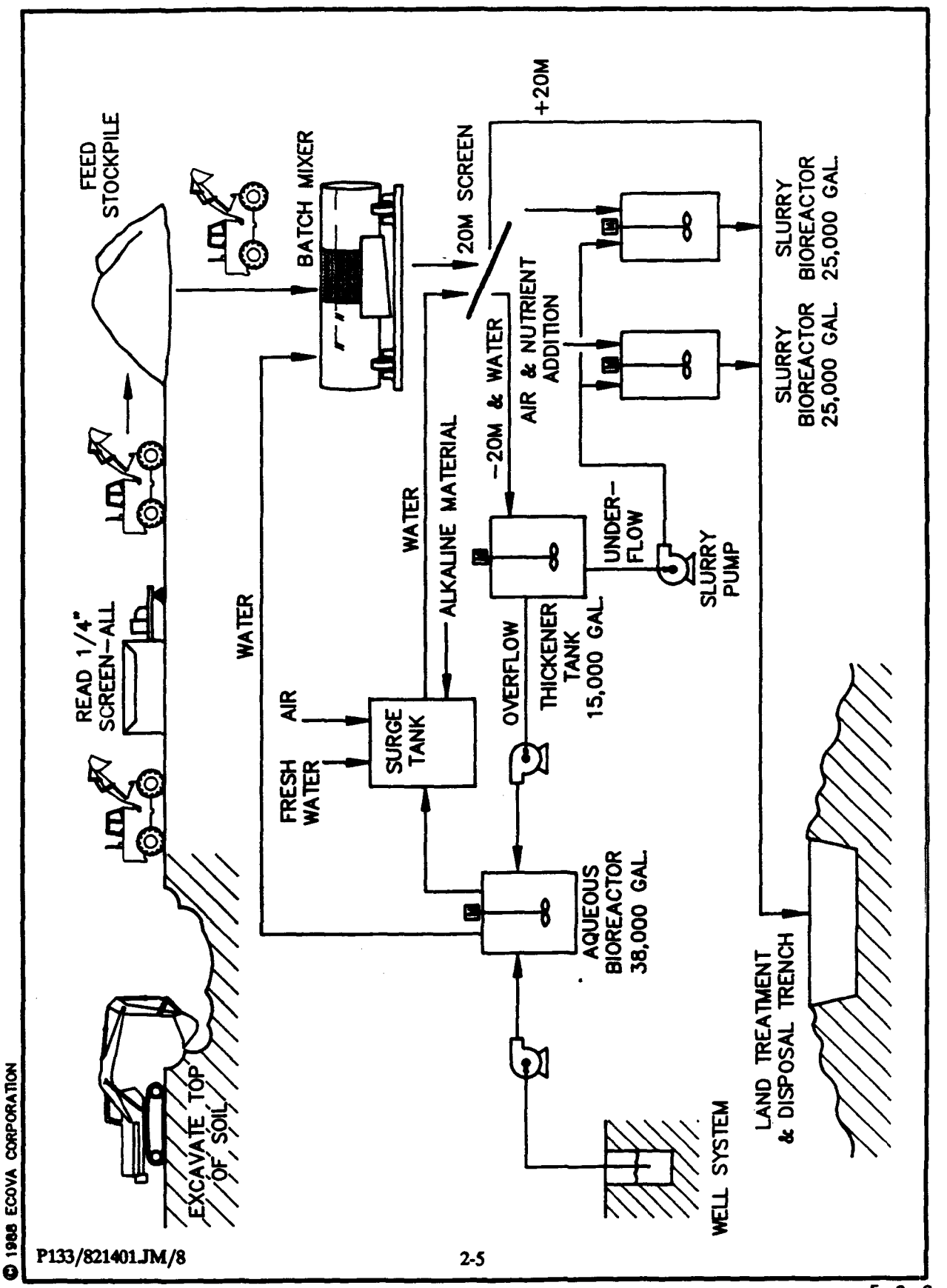
FIGURE 2-3. Process Flow Diagram



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The treatment system consists of the following major subsystems as discussed in detail below:

- o Excavation/Screening/Stockpiling Operation
- o Batch Mixer Unit and Feed Hopper/Conveyor
- o Shale Shaker Screen Unit
- o Thickener Unit
- o Slurry Bioreactor Unit
- o Groundwater Extraction System
- o Aqueous Bioreactor Unit
- o Liquid Surge Tank
- o Solid Phase Treatment/Land Disposal Unit
- o Miscellaneous Pumps, Piping, Etc.

2.2.1 EXCAVATION/SCREENING/STOCKPILING OPERATION

To halt the migration of PCP contamination from the contaminated soil into the groundwater and to provide a blended feedstock for the treatment operation, Ecova will excavate and remove the contaminated soils. The contaminated soils will then be screened, blended and stockpiled until the slurry treatment system is ready to accept them as feed material. Excavation will follow the plan developed during the engineering phase as previously described.

During construction of the treatment system the contaminated soil will be completely excavated, screened to minus 0.25 inch to remove construction debris or other oversize material, and stockpiled on a bermed plastic liner. The pile will be covered with polyethylene sheeting until reclaim operations for input to the treatment system commence. This step will result in a prepared and blended feedstock for the treatment system. The stockpile will also provide containment for rainfall runoff to prevent any further contaminant migration.

Removal operations will be performed with two pieces of standard earthmoving equipment: a three cubic yard front end loader (wheeled) and a backhoe. Soil will be removed until soils that are not contaminated (through testing) are encountered or until the groundwater table is reached. The threshold criteria used to distinguish contaminated from uncontaminated soils will be established by agreement with ODEQ and Time Oil before excavation commences.

The removed soils will be passed over a coarse screen located in the excavation area. A two-stage Read Screen-All unit equipped with minus 2 inch and minus 0.25 inch screens will be used to remove construction debris, gravel and other oversize material. In Ecova's experience, this is an essential step to minimize downstream operating problems that oversize debris can cause for materials handling equipment such as pumps, conveyors and mixers. Oversize materials can be directly disposed in the solid phase treatment/disposal area or can undergo additional washing in the batch mixer to remove surface PCP contamination which might be present.

Screened soil will be placed in lifts on a stockpiled area lined with a 12 mil polyethylene plastic liner. A low earthen berm will surround the stockpile to contain any contaminated rainfall runoff and a plastic lined sump area will be provided to catch and accumulate water. Any water captured will be pumped into the recovered groundwater storage tank. An equipment decontamination area will be included within the bermed, lined area to provide for cleaning of the earthmoving equipment after excavation of the contaminated soil is complete. A steamcleaner will be used to assure that decontamination is thorough. Decontamination fluids accumulated in the sump will be treated in the treatment system after startup.

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Blending the excavated soil is important since the boring data indicate that there are significant hot spots. If these hot spots were to be fed into the bioreactor, they could result in the kill-off the microorganisms and severely disrupt the biodegradation process. Blending assures a slurry feedstock very close to the overall average PCP concentration. The screening operation will achieve some blending of the contaminated soil. Distributed placement of the soils in the stockpile area will also facilitate the blending operation.

After placement in the stockpile, the soil will be covered by six mil polyethylene plastic sheeting to control airborne dust emissions during storage. The sheeting will be carefully weighted to prevent damage by the high winds occurring periodically in the Willamette River valley.

The excavation will be backfilled with borrow material obtained on-site. Borrow material will be obtained from the decontaminated slurry disposal landfill area (solid phase treatment), the construction of which shall be phased to coincide with the excavation operations.

2.2.2 BATCH MIXER UNIT AND FEED HOPPER/CONVEYOR

The first step in the treatment process operation will be to reclaim from the stockpile and feed the blended soil into a hopper/conveyor and into the batch mixer unit. In the batch mixer, the soil is tumbled to break up lumps and sprayed with water to form a thin slurry. Coarse screening of the feed material will have already been performed during the excavation, so the primary purpose of the batch mixer is to form the thin slurry for further screening in the shale shaker screen. Makeup water will come from the aqueous bioreactor tank with alkaline adjustment to raise the soil pH from around 5 to approximately 7.2 prior to feeding into the next units.

The batch mixer unit is a rotating drum unit that has low energy requirements, and is inexpensive to operate, reliable, and commonly available. The unit is portable and requires no concrete foundations for mounting. The unit will only be operated while charging the slurry bioreactor with a new batch of feed.

2.2.3 SHALE SHAKER SCREEN UNIT

After formation of the thin slurry, additional fine screening of the material will take place in the shale shaker unit mounted above the thickener tank. A shale shaker screen is a multideck, vibrating box screen used extensively in the oil drilling industry to remove rock and gravel from drilling muds. These have several screen decks which will successively remove oversize material from 0.25 to 0.033 inch (standard 20 mesh screen). Minus 20 mesh particle size is optimum for maintaining a thick slurry with minimum mixer horsepower requirements and no sanding/settling problems. The unit discharges into the thickener tank.

Oversize screened material is expected not to be contaminated, and therefore would be disposed directly in the solid-phase treatment land disposal area.

2.2.4 THICKENER UNIT

Finely screened thin slurry from the shale shaker screen is thickened by removing excess water up to the necessary density for feed to the slurry bioreactor. The design basis density is 35 percent solids which is an optimum slurry density for the type of soils found at the site. Overflow clarified water

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is pumped to the aqueous bioreactor unit; underflow thickened slurry is pumped to the slurry bioreactor units.

The Ecova thickener unit is a rectangular box tank that operates under a zone gravitational settling regime. The unit is fed from one end and overflows from the opposite end. Thickened slurry is withdrawn from the bottom of the tank. The unit is a 15,000-gallon, transportable, modular steel tank that is mobilized to the site on a self-loading flatbed trailer. It requires no concrete foundation, normally being placed for operation on an asphalt or gravel pad. The unit comes equipped with plumbing and liquid pump for transport of the clarified liquid.

2.2.5 SLURRY BIOREACTOR UNIT

The Ecova Slurry Bioreactor unit is also a rectangular box tank that is equipped with three electric motor-driven slow speed mixer units. The mixer blades provide agitation to keep the slurry in suspension, well mixed and operating under aerobic conditions. Additionally, the unit is equipped with air sparge to provide oxygen in solution.

Like the thickener unit, the bioreactor unit is a transportable, modular steel tank that is mobilized to the site on a self-loading flatbed trailer. Nominally, the unit has approximately a 25,000 gallon capacity. It also requires no concrete foundation, normally being placed for operation on an asphalt or gravel pad.

Consideration was given to modifying the existing 38,000-gallon steel tank located at the site. While this is potentially feasible because the tank appears to be structurally sound, there are a number of possible complications that could make this conversion more costly than mobilizing a modular tank. The tank was engineered for holding oil or water liquids rather than high density slurries. This would undoubtedly reduce the capacity of the tank to that comparable to a standard Ecova bioreactor unit. The capital cost of modifying this tank is probably not warranted when the duration of operation is to be short (a few months). Finally, the unknown condition of the steel wall introduces some risk for slurry application. Therefore, an additional Ecova bioreactor will be mobilized.

2.2.6 GROUNDWATER EXTRACTION SYSTEM

In a separate letter dated August 11, 1988, Ecova proposed a program to install additional monitoring wells at the site. If appropriate, these wells could be used as groundwater extraction wells. The proposed program also included an evaluation of the overall groundwater situation and subsequent design of the extraction system for recovery of PCP contaminated groundwater. Pending additional study of the extent of groundwater contamination, the needed rate of groundwater pumping, and installation of any additional recovery wells or trenches, detailed design of the groundwater treatment component of this scope of work is not possible.

However, the soil treatment system uses extensive quantities of water for slurry makeup and therefore large quantities of contaminated groundwater can simultaneously be treated in the slurry bioreactors, if available. It is likely that groundwater extraction and treatment may continue after completion of soil treatment. Therefore provisions for continued groundwater treatment have been included in the conceptual design.

It is recommended that the groundwater study program proceed as quickly as possible to gather the needed data on quantities and contaminant concentrations.

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2.2.7 AQUEOUS BIOREACTOR UNIT

A provision for an aqueous bioreactor unit has been included in the conceptual design of the treatment system. There are several purposes for inclusion of this unit. First, the unit provides overflow capacity for storing water from the thickener unit. Overflow water from the thickener will have solubilized some PCP from the slurried soil and the bioreactor unit will provide capacity for treating this flow. Second, the unit provides additional bioreactor capacity for treating both overflow water and extracted groundwater. Groundwater would be pumped directly to this unit. Liquid bioreactors are capable of higher rates of degradation for PCP than are slurry- or solid-phase treatment operations. Third, the bioreactor unit will serve as a source of decontaminated recycle water and biomass for fresh slurry makeup when preparing another batch for the slurry bioreactor. Further, since the treatment of groundwater may need to continue after completion of the soil treatment phase, this bioreactor unit will provide the capacity.

The aqueous bioreactor will be constructed from the 38,000 gallon tank currently on site. Modifications necessary to convert the tank to this service include: 1) Thorough cleaning and patching as needed; 2) Equipping the tank for compressed air sparge; 3) Modifying the piping to allow connection to the rest of the treatment system and pumps; and 4) Flow and level control instrumentation. Overflow from this tank will be sent to the surge tank for temporary storage.

2.2.8 LIQUID SURGE TANK

Provision has been included for an additional surge tank which will primarily be used to temporarily contain excess water which may accumulate in the system, such as during the rainy season, when higher groundwater extraction rates are needed, or if there are restrictions on fresh makeup water availability during the summer dry season.

Currently we anticipate this tank to consist of one of the existing horizontal tanks located on site (formerly buried gasoline tanks). These tanks are the approximate capacity needed and appear to be in adequate shape. Capacity needed for the surge tank is expected to be between 5000 to 10,000 gallons. Modifications include flushing, leak repair, and piping connection. These horizontal tanks will have to be moved from their present location to allow construction of the treatment system. The tank selected for service as the surge tank will be relocated onto a gravel pad which will serve as a supporting foundation.

2.2.9 SOLID PHASE TREATMENT/LAND DISPOSAL UNIT

After each batch of soil has finished slurry treatment, the bioreactors will be emptied via pumping through a pipeline to the solid-phase treatment/land disposal unit that is located north of the treatment system. This unit will consist of an excavation of approximately 38,000 square feet of clean soil to a depth of 2.5 ft. As discussed previously, clean soil from this excavation will be used as borrow material for filling the contaminated excavation near the warehouse at the site.

This unit will not be lined with either a clay or membrane liner. By not using a lining, excess water from the treated slurry disposal will percolate into the groundwater up-gradient from the contaminated site carrying PCP-degrading microorganisms into the contaminated area. This also serves to eliminate excess decontaminated water from the system. However, decanted water forming on the surface of the impoundment may be pumped back into the surge or aqueous bioreactor tanks, if needed.

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2.2.10 MISCELLANEOUS PUMPS, PIPING, ETC.

Other equipment will be needed to fill out the necessary equipment list for operation of the treatment system. Included on this list are:

- o Piping to connect the processing units and pumps to each other;
- o Slurry and liquid pumps needed to move the materials through the piping and treatment units;
- o Air compressor to provide for bioreactor air sparging;
- o Leased earthmoving equipment for excavation and reclaiming operations;
- o Office and Lab trailer;
- o Gravel as a base for under the processing units;
- o Plastic liner for the stockpile only (12 mil black polyethylene proposed)
- o Clean sand to protect the liner during stockpile construction;
- o Electrical materials needed to provide electrical service to the treatment units;
- o Small hand tools;
- o Personal protective equipment including coveralls, gloves, etc.

2.3 WORK PROGRAM

Following the development of the conceptual treatment system as previously discussed, a planned program for implementing the installation and operation of this system onsite was prepared and as discussed below as illustrated in Figure 2-1, work breakdown structure.

2.3.1 TASK ONE - TREATMENT SYSTEM DESIGN

Upon authorization to proceed, Ecova will refine the conceptual engineering design as discussed in Section 2.2. The site will be surveyed by an Oregon licensed surveyor to provide an accurate base map. The engineering effort will focus primarily upon the civil design and construction of the materials handling, treatment and disposal subsystems for the soil slurry system.

The excavation plan will be prepared in detail for:

1) Removal of the contaminated soil including special operating considerations for shoring around the warehouse foundations to prevent structural damage;
2) Materials handling including screening, blending, and transport operations;
3) Layout and design of the stockpile area including the runoff water sump, berms, and liner;
4) Removal and construction of the solid phase treatment/disposal area; and
5) Backfilling sequence for borrow material.

Design drawings will be prepared showing the equipment layout, cut and fill locations, and other information needed in the engineering effort.

2.3.2 TASK TWO - SECURING REGULATORY AUTHORIZATION

As the engineering design work progresses, it is assumed that Time Oil will conduct negotiations with ODEQ to secure approval of the treatment program. Ecova anticipates providing support to Time Oil in this effort in the form of professional consulting services, attending meetings with ODEQ, preparing and revising any needed submittal documents, etc. This support will be performed

Proprietary information subject to information on the cover page of this Work Plan. E C O V A

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as directed by Time Oil on a time and material basis. It is impossible to adequately anticipate the necessary level of effort required in negotiating with ODEQ.

We propose that Ecova services for this activity be provided on a change order basis. As an activity is identified that needs services provided by Ecova, a short change order would be prepared by the Ecova Project Manager and sent by facsimile for review and approval by Time Oil. This change order would provide a short description of the specific service requested, the anticipated costs (not to exceed) to perform this activity, and the expected schedule. Change Orders such as these typically do not exceed one page in length and represent modifications to the contracted work. A copy of the change order would be signed by the Time Oil Project Manager and returned to Ecova which would authorize the work. A separate breakout of costs for this element would be provided on the invoice from Ecova. Using this system, Time Oil has full control of any time and material costs that are outside the contract scope.

Securing regulatory approval is a milestone in the remediation program since mobilization and construction of treatment equipment should not commence until all regulatory constraints have been identified.

2.3.3 TASK THREE - MOBILIZATION AND CONSTRUCTION

With a final engineering design, an approved work plan, and equipment procured, Ecova will mobilize its construction and installation team to the Portland site to build the treatment systems. The mobil office/lab trailer will be set up. The treatment units will be mobilized by truck to the site and assembled. Gravel pads will be laid for placement of the tanks and treatment units. Piping and electrical connections will be made. Modifications to the 38,000 gallon tank needed to convert it to aqueous bioreactor service will be made. Connection to utilities will be made.

Again, activities under this task would be sequenced to coincide with Task Four, Excavation of Contaminated Soil, so that the stockpile of contaminated soil is ready when the treatment system is ready to commence operations.

2.3.4 TASK FOUR - EXCAVATION OF CONTAMINATED SOIL

Task Four will consist of the activities previously described in the Excavation/Screening/Stockpiling Operation in the Conceptual Engineering Design.

2.3.5 TASK FIVE - STARTUP AND SHAKEDOWN

Upon completion of the installation of all processing equipment and construction of the disposal area, startup and shakedown of the treatment system will commence. Since the treatment operations are expected to be operated in batch mode, careful monitoring of several initial batches will be followed to insure that biological activity is progressing as expected and that optimum biodegradation rates are obtained. During the first batch, an acclimated culture is being built up from the Ecova proprietary strain which will provide the optimum PCP biodegradation. After initial culture development, subsequent batches will be inoculated with the initial culture during recharge of the bioreactors.

Startup and shakedown operations are expected to occur over approximately a one month period (two to four batches).

2.3.6 TASK SIX - TREATMENT OPERATIONS

After establishment of an acclimated culture and verification of complete biodegradation, treatment operations can proceed on a routine basis. As each batch completes the treatment cycle, the slurry reactors will be emptied and recharged with a fresh soil slurry. Treated slurry will be pumped to the disposal landfill area. Sequential batches will be run until the stockpile has been completely treated.

The biotreatment system will operate in largely unattended operation mode during each batch. Ecova will rely upon Time Oil personnel onsite to periodically monitor the rotating and moving equipment in the process for normal operation. In this manner, the system will not have to be continuously manned, with subsequent cost savings to Time Oil. (In the event of equipment failure, an Ecova maintenance team would be mobilized to correct the problem.) The Ecova operations team will mobilize to Portland after completion of the biotreatment process for each batch. The operations team for routine batch reactor operation will consist of two Ecova technicians from the Redmond office.

After arriving at the site, the operations team will check out the operating equipment and commence pumping the treated slurry out of the bioreactors into the landfill disposal (solid phase treatment) area.

2.3.7 TASK SEVEN - DEMOBILIZATION

At the completion of all treatment activities, the treatment system will be decommissioned and the site cleaned of all trash. All decontaminated materials placed in the disposal area will be levelled and dewatered.

As part of this work plan, we propose that all equipment owned by Ecova be allowed to remain on site after completion of the treatment activities (without imposition of a storage charge by Time Oil) until such time as it becomes necessary to mobilize it to another project site. This period would not exceed one year. By allowing storage of our equipment, Ecova is able to pass along the savings in demobilization charges to Time Oil which would otherwise be incurred. Demobilization charges would be incurred by the next project for which the equipment is used.

SECTION 3

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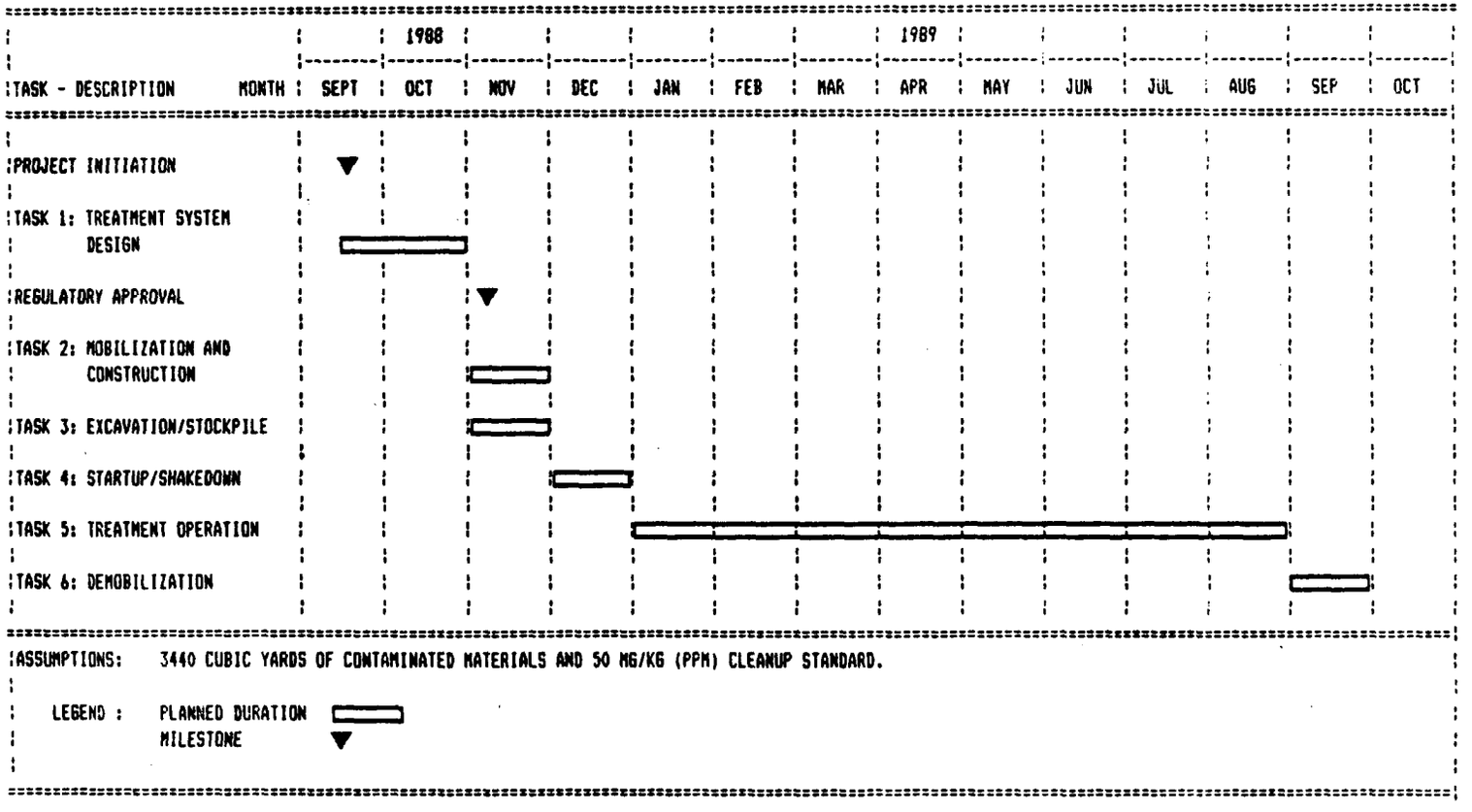
PROJECT NO. 821401
CLIENT : TIME OIL COMPANY
LOCATION : PORTLAND - OREGON
FILENAME: TOSCH50

ECOVA CORPORATION
SEPTEMBER - 1988

PROJECT SCHEDULE
TIME OIL COMPANY
50 PPM CLEANUP STANDARD



12½ mos
8 mos (front)

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ECOVA
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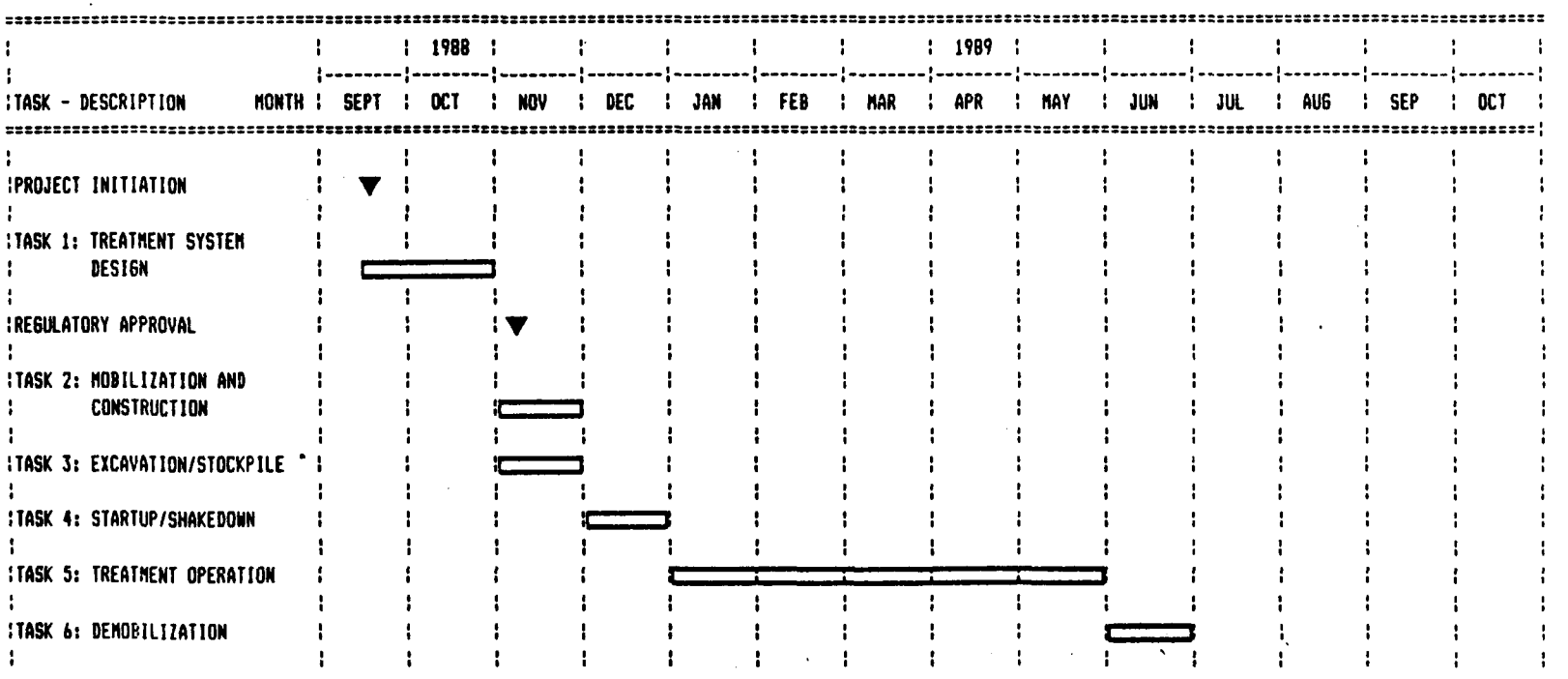
PROJECT NO. 821401
CLIENT : TIME OIL COMPANY
LOCATION : PORTLAND - OREGON
FILENAME: TOSCH100

ECOVA CORPORATION
SEPTEMBER - 1988

PROJECT SCHEDULE
TIME OIL COMPANY
100 PPM CLEANUP STANDARD



ASSUMPTIONS: 3440 CUBIC YARDS OF CONTAMINATED MATERIALS AND 100 MG/KG (PPM) CLEANUP STANDARD.

LEGEND : PLANNED DURATION
MILESTONE

9 1/2 mos
5 mos (treat)

P133/821401JM/8

3-2

ECOVA

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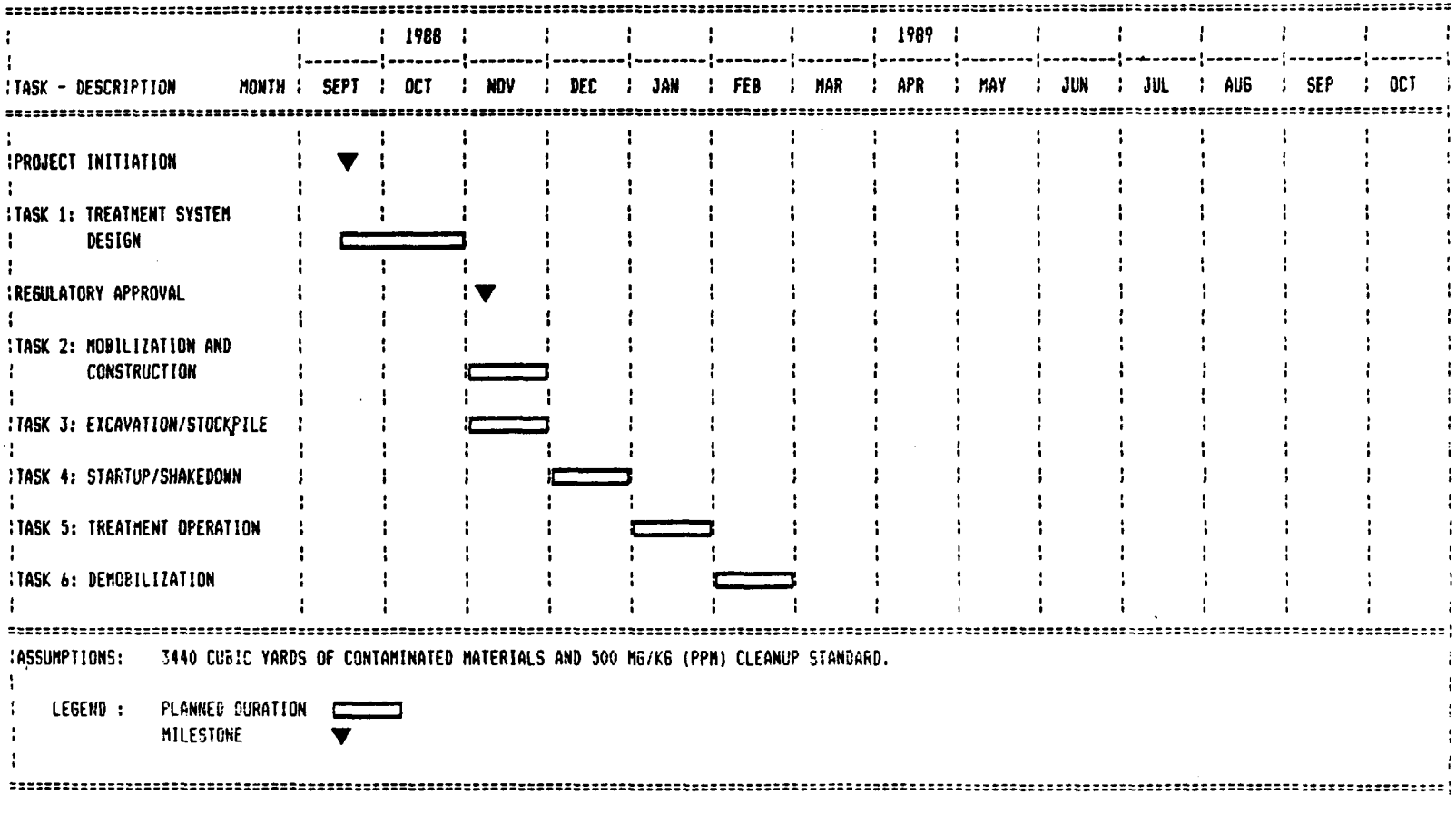
P133/821401JM/8

PROJECT NO. 821401
CLIENT : TIME OIL COMPANY
LOCATION : PORTLAND - OREGON
FILENAME: TOSCH500

ECOVA CORPORATION
SEPTEMBER - 1988

PROJECT SCHEDULE
TIME OIL COMPANY
500 PPM CLEANUP STANDARD



5½ mos
1 mos

3-3

ECOVA

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4. PROJECT COSTS

Costs have been estimated for the remediation program and are presented in Table 4-1. As requested by Time Oil Company, costs have been prepared for each cleanup scenario 500 ppm, 100 ppm, and 50 ppm.

Costs were developed based on remediating 3440 cubic yards of contaminated soil Cost have also been provided in Table 4-1 for treating additional soil in excess of the 3440 cubic yards, should such soil be identified. All costs were developed based on a starting assumption of 680 ppm PCP from the blended stockpile. This assumption is based on soil samples obtained by Ecova and upon our evaluation of the soil boring data provided by Time Oil. Obviously the total volume of soil needing treatment (and hence total costs) will be affected by cleanup levels mandated by ODEQ.

Included in the cost basis are engineering design, mobilization; excavation, blending and stockpiling of contaminated soil; construction and startup of treatment facilities; soil treatment; and equipment decontaminantion after treatment.

Costs have not been included for negotiations and document preparation to secure ODEQ approval. As discussed in the text, these costs would be charged on a time and materials basis with an accompanying approved Change Order.

Additionally, costs do not include demobilization of the treatment equipment. As discussed in Section 2.3.7, Task Seven-Demobilization, Time Oil will provide storage for this equipment for up to one year in lieu of demobilization costs.

TABLE 4-1. Project Costs for Cleanup Levels (50,100 + 500 ppm)
Time Oil Site Remediation - Portland, Oregon

Activity	50 ppm	100 ppm	500 ppm
Total Project Costs	$ 348,839	$ 311,538	$ 220,265
Total Onsite Treatment Costs per cubic yard	101	91	64
Additional Treatment and Excavation Costs per cubic yard	66	55	30

Assumptions:

1. Based on 3440 cubic yards of PCP contaminated soil
2. Based on a starting assumption of 680 ppm from the blended stockpile
3. Based on a half-life of 1.4 days
4. For 50 and 100 ppm cleanup levels, operation is based on using two bioreactors operating on batch mode. For a 500 ppm cleanup level, operation is based on using one big reactor fed continuously.

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5. PROJECT MANAGEMENT

5.1 PROJECT ORGANIZATION AND PERSONNEL

Ecova has assembled an experienced project team to manage the onsite cleanup of soil and groundwater at the Time Oil Northwest Terminal site. Team members represent the engineering and scientific disciplines necessary to accomplish the goals of the project.

Technical responsibility for engineering, scientific and professional disciplines will rest with lead engineers and scientists. Key team members and their responsibilities are summarized below. The project organization is illustrated in Figure 5-1. Full resumes are provided in Appendix B.

Mark Anderson, Sr. Project Manager, will oversee all project efforts. He has over 13 years of project management and engineering experience in the hazardous waste industry with extensive experience managing the cleaning of soil and groundwater. As Project Manager, Mr. Anderson will direct all aspects of day-to-day management on technical, business, contractual, and administrative issues. Mr. Anderson will ensure that personnel and resources are available and fully utilized. He will analyze project requirements and maintain an up-to-date status of each phase of the project. Mr. Anderson will manage field, engineering and laboratory activities. He will be responsible for ensuring project safety and reporting contractual data in support of all project requirements. Mr. Anderson will be Time Oil's day-to-day point of contact.

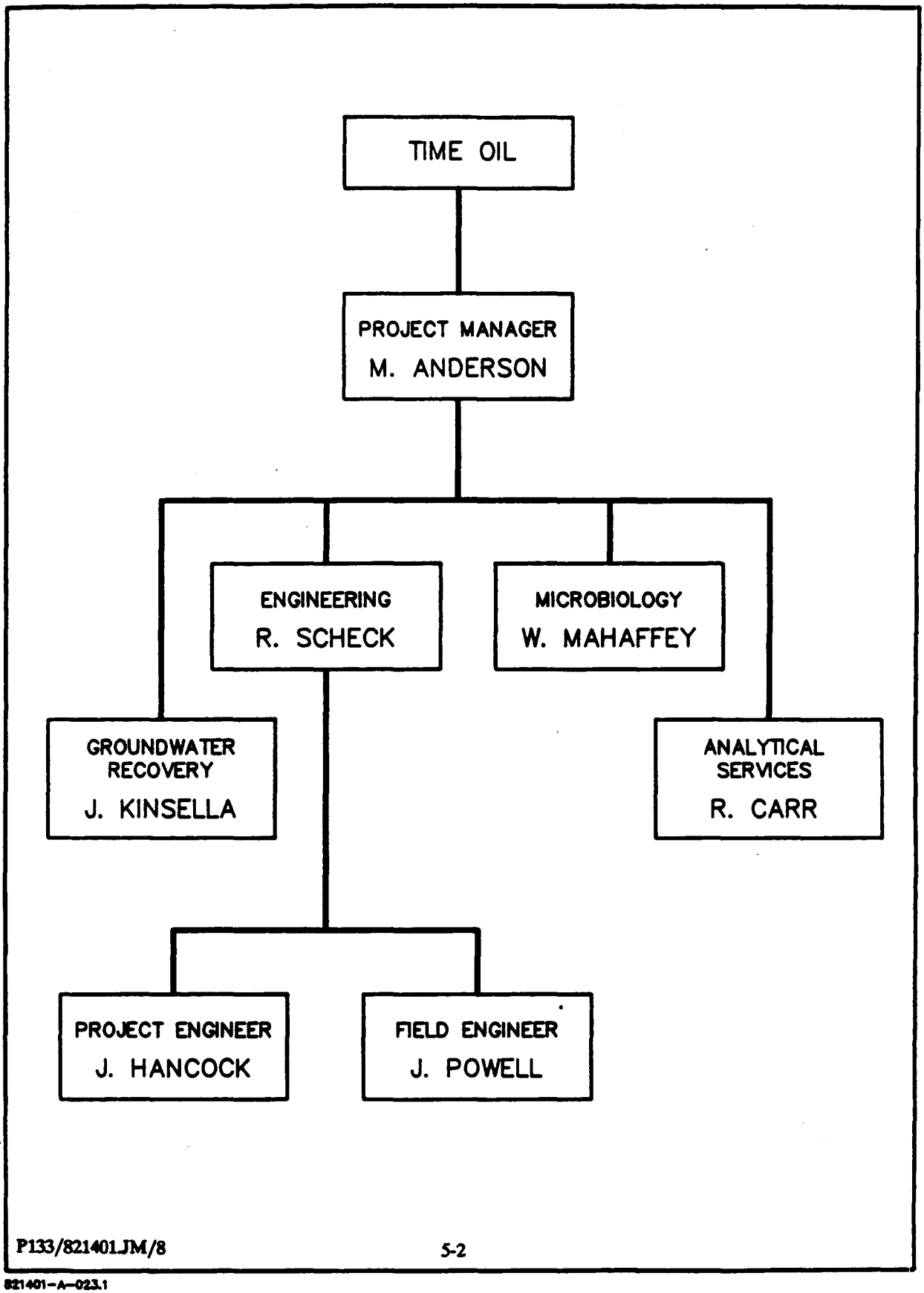
Robert Scheck, Director Engineering, will oversee all engineering aspects of this project. His qualifications include 20 years of engineering process design and management. For this project he will analyze parameters for treatment system, manage the system operations, design efforts, and oversee the transfer of engineering parameters to the field. Mr. Scheck has designed soil and groundwater remediation systems of similar size and complexity to that at Time Oil in accordance with federal, state, and local regulations.

John Hancock, Project Engineer, will design the soil treatment system. He will also be responsible for the preparation of engineering cost and manpower estimates. Mr. Hancock is a petroleum engineer and chemist who specializes in the design and maintenance of fluid systems adapted for soil and groundwater treatment.

Jeffrey Powell, Field Engineer, will supervise the fabrication, installation, and operation of the soil and groundwater treatment systems. He will modify any Time Oil equipment that will be used in the treatment program, direct the work of the field crews, and provide onsite equipment maintenance support. Mr. Powell has nine years of experience in field equipment fabrication, startup, and operation.

John Kinsella, Vice President, Geosciences and Field Operations, will support this project by serving as the groundwater recovery expert. He will manage the integration of the site groundwater recovery system into the soil treatment program. Mr. Kinsella has conducted numerous similar site remediation projects. He is also experienced in permit applications for groundwater restoration programs and negotiation with federal, state, and local agencies.

FIGURE 5-1. Project Organization



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William Mahaffey, Ph.D., Project Scientist, will direct the operations of biological processes in the field, interpret microbiological data, and determine all microbiological operating parameters. Dr. Mahaffey specializes in microbial biochemistry and has 10 years' experience in biological degradation of organic chemicals. He has extensive experience in the biodegradation of pentachlorophenol, petroleum hydrocarbons, chlorinated compounds, and other contaminants. Dr. Mahaffey is responsible for research efforts involving the isolation and enrichment of microorganisms collected from the field for use in promoting biodegradation.

Rod Carr, Director of Analytical Services, will coordinate the services provided by Ecova's analytical chemistry laboratory. Mr. Carr has 20 years of experience in managing laboratory facilities, and manages the Ecova analytical laboratory in Redmond, Washington.

5.2 SUPPORT SERVICES

The project team will receive full support from the Ecova corporate headquarters in Redmond, Washington. Corporate accounting, administration, and personnel functions will provide administrative support to the project throughout its duration. The Redmond headquarters will also serve as a source of scientific and engineering expertise to the project. Ecova is a complete hazardous waste research center and maintains ongoing waste remediation development work. Ecova's analytical laboratory, technology development laboratories, and engineering design and fabrication capabilities will support all aspects of the project. Corporate support services are described below.

5.2.1 RECORDS MANAGEMENT

Written documentation prepared during the course of the project will be clearly marked with the date and project number. Originals of all reports and correspondence will be kept in the central project file. All files generated as a result of this project will be available for review by Time Oil. Records originated during the course of the project will be controlled and retained in the project central files, laboratory files, and the Ecova corporate permanent storage files, as appropriate. Proprietary information will be marked "CONFIDENTIAL" and distribution will be limited.

5.2.2 MICROBIOLOGY

The Ecova Microbiology Group conducts research concerning interactions of microorganisms with ecological processes and environmental pollutants in complex ecosystems. The group consists of a nationally recruited scientific staff with training in molecular biology, microbial ecology, microbial genetics, plasmid ecology, microbial biochemistry, and environmental chemistry. The group's research and development interests are focused on the application of the mechanisms of biodegradation on toxic and hazardous waste.

Research and development of treatment processes is conducted at the Ecova Technology Development Center in Redmond, Washington. This facility contains a number of highly specialized laboratories that occupy 16,000 square feet of a 40,000 square feet building of which Ecova Corporation is the sole occupant. The facility was designed specifically to meet the needs of a large capacity research, development, and analytical program.

Ecova's research and development program is designed to respond to client research needs through practical application of innovative, independent investigations to complex problems. The group has a highly specialized group of scientists who work closely with research associates and environmental

engineers assigned to other groups within the company. This group will be available to provide technical and scientific advice to the project team.

5.2.3 ENGINEERING

Waste treatment processes and facilities are designed by registered professional engineers assigned to the Engineering Group. In-house staff expertise includes environmental, chemical, civil, mechanical, electrical, and construction engineering disciplines.

Ecova engineers work closely with the firm's geologists, microbiologists, chemists, and regulatory affairs specialists in the design of treatment systems. They also assist in system fabrication, installation, startup, and operation. The firm's Fabrication Engineering group constructs the specialized treatment equipment and facilities that are typically not available "off the shelf" and is responsible for onsite installation and maintenance.

5.2.4 ANALYTICAL SERVICES

Ecova Analytical Services (EAS) is a full-service analytical laboratory specializing in the chemical analysis of environmental and hazardous waste samples. The laboratory is approved for work by the U.S. EPA under the Contract Lab Program (CLP) and by the U.S. Army Corps of Engineers. It currently provides comprehensive environmental analytical services to government and commercial clients and supports all Ecova remediation projects.

EAS is staffed with highly qualified and experienced chemists. All laboratory personnel are experienced in analyzing toxic and hazardous waste samples. Through this experience, EAS provides clients with accurate, consistent, and reliable analytical services and reporting. Procedures, methods, and practices meet or exceed standards for environmental samples established by U.S. Environmental Protection Agency. In addition to standard analyses, the laboratory develops, validates, and performs custom analyses as required to meet a client's needs.

5.2.5 QUALITY ASSURANCE/QUALITY CONTROL

Ecova has a comprehensive Quality Assurance/Quality Control Program, which provides for uniformity and control of services. This program includes defined policies for:

- Sampling and sampling control (chain-of-custody)
- Laboratory procedures
- Analytical services
- Preparation of calculations, drawings, and reports
- Control of computer data reduction software including verification and data management
- Peer review
- Personnel quality assurance/quality control responsibilities
- Preparation and control of quality assurance documents
- Personnel training
- Record preparation, collection and maintenance

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6. EXPERIENCE

The bioremediation system proposed for cleanup of the Time Oil Company Site was developed within Ecova's ongoing hazardous waste treatment research and development program. This section provides an overview of Ecova's development of the bioremediation techniques and the constituents that can be treated. This section is followed by Ecova project summaries of site remediations that are similar in size and complexity to the Time Oil site.

6.1 TECHNOLOGY DEVELOPMENT AND CAPABILITIES

Ecova's corporate policy is to develop and deliver multiple processes for the treatment of hazardous waste, based on an understanding of the science behind the process. In bioremediation this involves an application of microbiological research and development with environmental and hydrogeological engineering. Ecova is the only commercial company with this level of expertise. Microbiologists at Ecova have determined the limiting physiological and environmental factors affecting the rate and extent of biodegradation of pentachlorophenol. This knowledge will be incorporated into the remediation of the Time Oil site.

The bioremediation operating parameters to be used at the Time Oil site incorporate processes developed for the biological remediation of pentachlorophenol, creosote, and other wood treating wastes developed by Ecova. This technology was developed during a 20-month treatment study Ecova conducted on behalf of a client responsible for the cleanup of a wood treating site, an NPL site in the Western United States (detailed on page 7-5). Ecova's work determined operating parameters, rates, and cleanup levels for a full-scale remediation program incorporating slurry-phase and other bioremediation processes. Research and development work from this project including data demonstrating the complete mineralization of pentachlorophenol is also included in Appendix C.

The slurry-phase bioremediation techniques to be used at the Time Oil site were first used by Ecova at a client site in North Dakota in which more than 10,000 cubic yards of soil contaminated with high concentrations of chlorinated pesticides (up to 13,000 ppm 2,4-D) were remediated using both slurry- and solid-phase systems. On this project, three slurry-phase bioreactor units, each capable of treating 26,000 gallons of fluid, were mobilized to the site. Material was withdrawn from a stockpile of highly contaminated soil and placed in a trommel unit that slurried the soil and separated out stones and rubble. The slurry was then pumped into the bioreactors for treatment. This project is described more fully on page the following page.

Since this initial application, Ecova developed modifications to the slurry systems for the handling of petroleum-contaminated soil and hydrocarbon sludges, including those contaminated with penta-chlorophenol.

6.2 REFERENCES

The following client references are provided from projects of scope and size similar to that at Time Oil. Full descriptions of these projects are provided on pages 6-3 to 6-8.

6.2.1 WOOD TREATING WASTE BIOREMEDIATION DEVELOPMENT

Ecova conducted a 20-month treatment study to develop advanced biological treatment techniques for the cleanup of pentachlorophenol and other wood treating wastes at a Superfund site in the western United States. The program encompassed basic laboratory research, bench-scale work, systems design, and follow-on field pilot demonstrations.

Client Reference:

Mr. Keith Piontek
CH2M Hill
P.O. Box 22508
Denver, Colorado
(303) 771-0900

6.2.2 SOIL ENHANCED SLURRY-PHASE BIOREMEDIATION

Ecova managed soil and groundwater cleanup at a site in North Dakota that was contaminated as a result of a fire at a chemical storage facility. Slurry and solid-phase treatment technologies were used to treat more than 10,000 cubic yards of soil contaminated with chlorinated pesticides within a two-month time frame. A groundwater pump and treat system was implemented to remediate contaminated groundwater.

Client Reference:

Mr. Rick Anderson
Westchem Agricultural Chemicals
P.O. Box 31772
Billings, Montana
(406) 245-4171

6.2.3 CONTAMINANT VOLATILIZATION/BIOREMEDIATION

At a Superfund site in California, Ecova operated a groundwater decontamination system that removed both chlorinated hydrocarbons and soluble organics. A two-step process employing air stripping in conjunction with a bioreactor was implemented. A bench-scale model of the treatment system was developed to evaluate and define the operating parameters of the treatment system.

Client Reference:

Mr. Dan McCaskill
Sr. Vice President
Van Waters & Rogers
2600 Campus Drive
San Mateo, California
(408) 435-8700

IN SITU PROCESS DEVELOPMENT PROGRAM FOR WOOD TREATING WASTE

PROJECT LOCATION:	NPL Site - Wyoming
CLIENT:	Confidential
INDUSTRY:	Transportation (Railroad)
CONTAMINANTS:	Pentachlorophenol, Polynuclear Aromatic Hydrocarbons

PROBLEM:

A former railroad tie-treating plant has been named to the NPL list due to significant creosote contamination. The 100-acre plus hazardous waste site holds creosote-contaminated soil and groundwater in unlined surface impoundments containing approximately 1 million cubic feet of waste. Pentachlorophenol (PCP) was found to be in excess of 150 ppm, significantly above the acceptable limit. The client is looking for an alternative to incineration.

SOLUTION:

Ecova Corporation was hired to conduct a 20-month treatability study and process development program to develop advanced in situ treatment techniques for this site. The study is designed to determine the rate and ultimate cleanup levels achievable with a full-scale bioremediation program. Currently in the final phases of the program, Ecova has successfully proven and demonstrated that the wastes can be bioremediated and PCP can be reduced to 2 ppm. The study included basic laboratory research and bench-scale work systems design. The contamination remediation techniques examined are:

- Surface and subsurface soil bioremediation techniques
- Soil wash leachate and groundwater treatment evaluation

Laboratory bench-scale studies, begun in the fall of 1986, include a thorough analysis of site soils and a series of micro column studies to determine the increased effectiveness of enhanced in situ biotreatment techniques. Bacterial formulations capable of recolonizing waste soils and degrading residual contaminants are being tested extensively. Soil microcosm studies are also being undertaken to evaluate the effectiveness of bacterial and nutrient systems on target contaminants degradation and the conditions that promote biodegradation.

Comprehensive pilot demonstrations, planned to begin after completion of the bench-scale work, will verify the effectiveness of the treatment techniques and will provide design criteria, schedule, and budget for full-scale field work. The pilot demonstration will also verify the results of the micro column studies under actual field conditions.

REMEDIATION OF HYDROCARBON-CONTAMINATED GROUNDWATER

PROJECT LOCATION:	California
CLIENT:	Confidential
INDUSTRY:	Chemical Solvent Manufacturer
CONTAMINANTS:	Chlorinated Hydrocarbons and Soluble Organics, Aromatic Compounds, Ketones, Alcohols, and Glycols

PROBLEM:

Underground storage tanks containing chemical solvents have contributed to large-scale groundwater contamination with chlorinated hydrocarbon and soluble organic materials. An existing air stripping system was not effective in bringing the groundwater into compliance limits. The National Priority List site is subject to cleanup standards and discharge limits as *established by the regional office of the U.S. EPA and the California Regional Water Quality Control Board.*

SOLUTION:

Ecova Corporation was contracted to operate a groundwater decontamination system using a two-step process employing air stripping in conjunction with a bioreactor system. This system, currently in operation by the client, combines physical and biological technologies to remove a complex mix of contaminant from site groundwater. The site is a chemical blending, storage, and distribution facility. Groundwater and soil investigations conducted previously revealed that the groundwater beneath the facility was contaminated with volatile organic compounds (VOCs) and soluble organic compounds including chlorinated hydrocarbons, aromatic compounds and various ketones, alcohols, and glycols. Ecova designed and constructed a bench-scale air stripper and conducted biological treatability studies in the corporate laboratories using water from the site. These preliminary tests provided essential information for design of the full-scale treatment system, such as expected stripping efficiency and biodegradation rates. the laboratory study also developed the microbial inoculum used in the full-scale field bioreactor.

The treatment system includes seven groundwater recovery wells and a hydraulic control system, an air stripper to remove VOCs of low solubility, and a biological treatment system to remove soluble organic compounds. The air stripper is a 35-ft high column with internal packing that increases air-to-liquid surface contact. Contaminated groundwater enters the top of the unit and forms a cascading film as it drops through the packing material. Simultaneously, air is blown upward from the bottom of the columns, thus "stripping" volatile hydrocarbon molecules from the water. The air stripper has a working capacity of 50 gallons per minute (gpm).

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Following removal of the volatile organics, groundwater is transferred to the bioreactor for degradation
of the soluble organics. The bioreactor is a 10,000-gallon tank seeded with a microorganism/nutrient inoculum specifically acclimated to biodegrade the remaining soluble organic contaminants. The bioreactor contains an agitator to provide aeration and instrumentation for monitoring contaminant levels and biodegradation. Ecova met with California regulatory agencies to gain approval of system design and achievable treatment levels.

The system initially operated on a batch discharge basis; the effluent was collected in tanks and discharged to the storm sewer only after sampling confirmed that all discharge requirements were met (chlorinated hydrocarbons <5 ppb and soluble organics <1 ppm). The system was put on continuous discharge to the storm sewer under a NPDES permit in July 1987, after sample results proved that contaminant levels were consistently reduced below discharge limits at a process flow rate of 18 gallons per minute.

BIOREMEDIATION OF SOIL AND GROUNDWATER

PROJECT LOCATION:	North Dakota
CLIENT:	Confidential
INDUSTRY:	Agricultural Chemical Distribution
CONTAMINANTS:	Pesticides - 2,4-D, Alachlor, Trifluralin, Carbofuran, MCPA

PROBLEM:

On April 7, 1987, a warehouse fire at a major agricultural distributorship ignited stored pesticides, completely destroying the facility. Firefighters responding to the scene used water to extinguish the flames, spreading pesticides into the surrounding soil, groundwater and a nearby creek.

SOLUTION:

Ecova Corporation managed soil and groundwater bioremediation at the site. The remediation program involved extensive material handling, soil and material segregation, and the use of several biological techniques. Ecova designed and constructed a five-acre, clay-lined treatment bed at the site, and also delivered mobile bioslurry and liquid-phase bioremediation units to the treatment location. Contaminated soil from the burn site and along the length of the contaminated creek was excavated and transported to the treatment location. The soil was tested for contaminant levels, separated according to the extent of contamination, and prepared for treatment by the removal of rocks and debris.

Solid-phase treatment of approximately 12,000 cubic yards of less contaminated soil (containing less than 200 ppm of contaminants) was performed on the 5-acre, lined treatment bed. The soil was processed daily and a microbial inoculum was applied to assist the biological breakdown of the contaminants.

A mobile soil slurry bioreactor system was used to treat soils with contamination exceeding 200 ppm. This process consisted of aerobic treatment of soil mixed with water in 26,000 gallon bioreactor tanks. The slurry mixture was inoculated with pesticide-degrading bacteria and with nutrients that optimize the ability of bacteria to degrade the contaminants. The microbial inoculum and nutrient additions were developed in Ecova's corporate laboratories. Some groundwater was treated by pumping from subsurface contaminated areas and using it as makeup water in the soil biotreatment processes.

Groundwater was treated with innovative in situ bioremediation techniques which reduced the treatment time in half. An upgradient injection gallery was established to flush treated water and nutrients, as required, through the contaminated plume. Downgradient recovery wells and trenches recover treated groundwater. During treatment, the groundwater was monitored to guard against off-

site migration. During the winter of 1987, more than five million gallons of groundwater was treated. The site has been restored to its original condition and a site closure plan prepared in accordance with appropriate regulations.

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APPENDIX

APPENDIX A. Soil Boring Analysis

E C O V A

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Soil Boring Analysis

Key information in the design and operation of any remediation program is the amount of contaminated material present to be treated and the level of contamination. To assess this information for the Time Oil site in Portland, Oregon, several sources of information were assessed. First, Ecova obtained samples of the contaminated soil for laboratory analysis. This data is reported in Appendix B, and indicates that an expected wide variation in PCP concentrations was observed with up to 2000 ppm PCP detected. We recognize that the soils with the highest PCP levels were deliberately buried to minimize exposure. The composite PCP concentration reported was 680 ppm.

Next, soil boring information provided by Time Oil was reviewed and analyzed. This detailed information provides PCP concentration for four vertical levels at each boring location within the sample grid. The reported levels were surface, and 4 ft, 7 ft, and 12-ft below grade. The bottom level is near the groundwater table.

Soil boring PCP concentration data also show wide variation, with hot spot concentrations of up to 8400 ppm. Determining average PCP concentrations within soil that shows nearly three orders of magnitude variation in concentration is a difficult task. It is clear from the data that much of the soil is well below 1000 ppm. Time Oil has estimated that the average concentrations may approximate 1500 ppm for the 2700 cubic yards that they estimate would be removed in excavating soil containing over 500 ppm.

Ecova used the Golden Software program SURFER to plot PCP concentrations for each soil boring horizon sampled by Time Oil. These plots agreed very well with similar plots provided by Time Oil. Using these plots, a hypothetical excavation (or "mine") plan was prepared to determine quantities of soil that would need to be removed and the overall PCP concentration in the excavated soil. These plots are illustrated in Appendix figures C-1 through C-4. The excavation plan was developed from the 12-ft plot and extended upward through the next three layers to remove the minimum amount of soil exceeding 500 ppm. The plot for the 12-ft horizon was assumed to be representative of soil in a layer from 12 ft below grade upward to 9.5 ft. The plot for 7 ft was assumed to represent soil in the 9.5 to 5.5 ft layer. The plot for 4' was assumed to represent soil in the 5.5 to 2 ft layer. Finally, the surface plot was assumed to represent the 2' to the surface layer.

The area of the "mine plan" contours for each layer were planimetered to determine area and subsequent volume of soil. Based upon this calculation, approximately 3440 cubic yards of contaminated soil must be excavated.

Next, the "volume" under the PCP concentration surface to the zero ppm level was determined using the SURFER volume calculation subroutine for each layer. Dividing that "volume" by the number of cubic yards within that layer yields the average PCP concentration for the soil within that layer. Calculating an average weighted by the amount of soil in each layer, the final average PCP concentration in the excavated soil was estimated to be 668 ppm. This agrees well with the composite analytical result and appears reasonable from close examination of the data.

Several points were observed in this study that are important to note. First, the depth of contaminated soil was assumed to be 12 ft. In actuality, the depth of contamination should extend deeper to the water table, especially in the area of the hot spots. This could increase the volume of soil that needs to be excavated by a considerable margin.

Second, the assumption was used that only soil exceeding 500 ppm would be excavated. From the soil boring data, the 500 ppm concentration isopleth was not completely contained in the plots at the 4 ft, 7 ft or the 12 ft depths. The cause of this was that PCP concentrations in the boring on the southern edge of the grid exceeded

500 ppm. This is especially important at the 12-ft depths since a much larger volume of soil must be excavated above this layer to get access to the lower layer. Since the 500 ppm contour was not bounded within the soil boring data, the exact quantity of soil exceeding 500 ppm cannot accurately be determined.

Finally, the use of a 500 ppm cutoff limit for PCP contamination may be considerably higher than that allowable by a regulatory agency. If a lower cutoff concentration were to be used, excavated soil volumes could be greatly increased.

E C O V A

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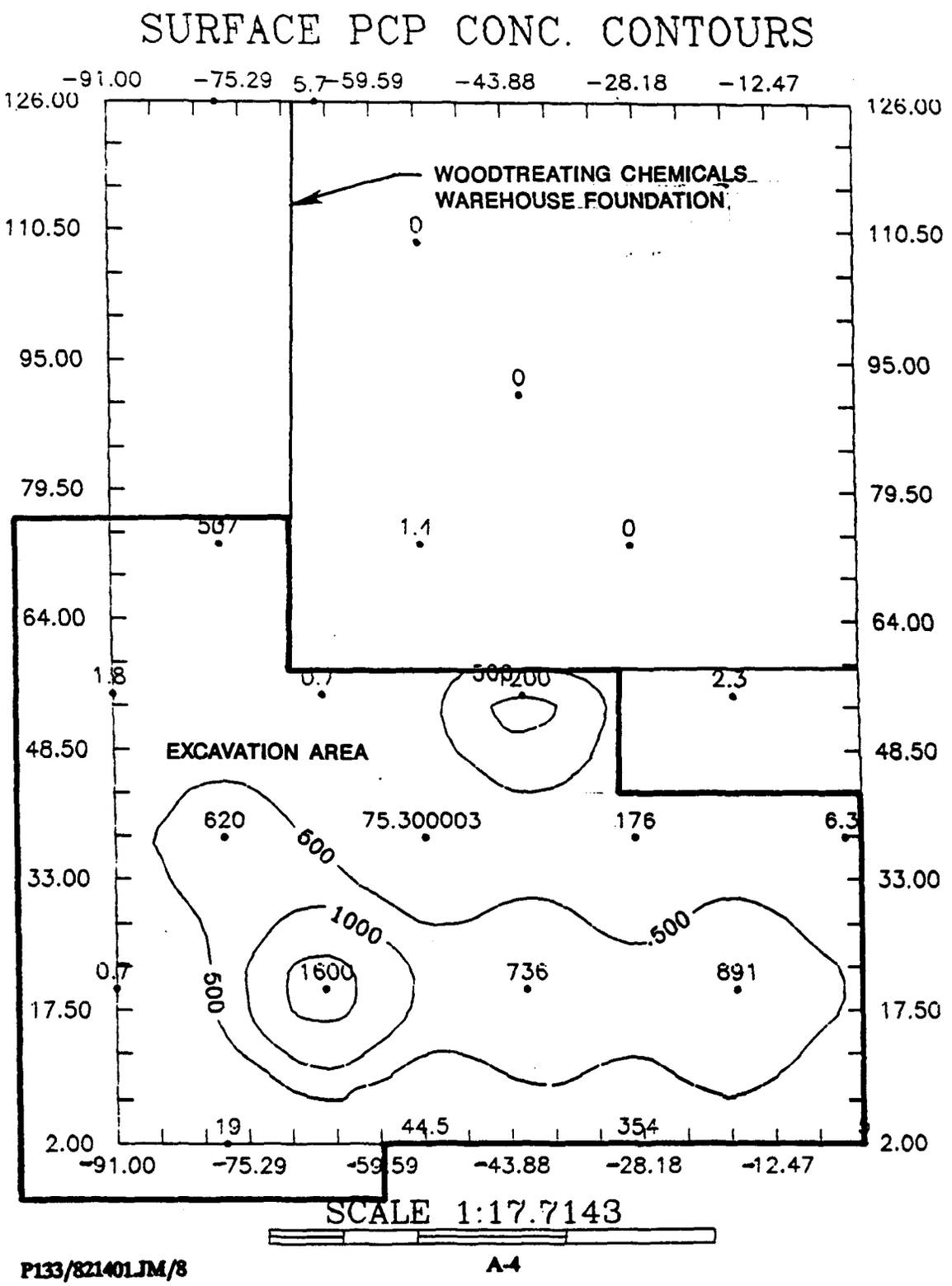
FIGURE A-1.
APPENDIX A-1. Excavation Plan 0-2' Depth



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A-4

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FIGURE A-2.
APPENDIX A-2. Excavation Plan 2'-5-1/2' Depth

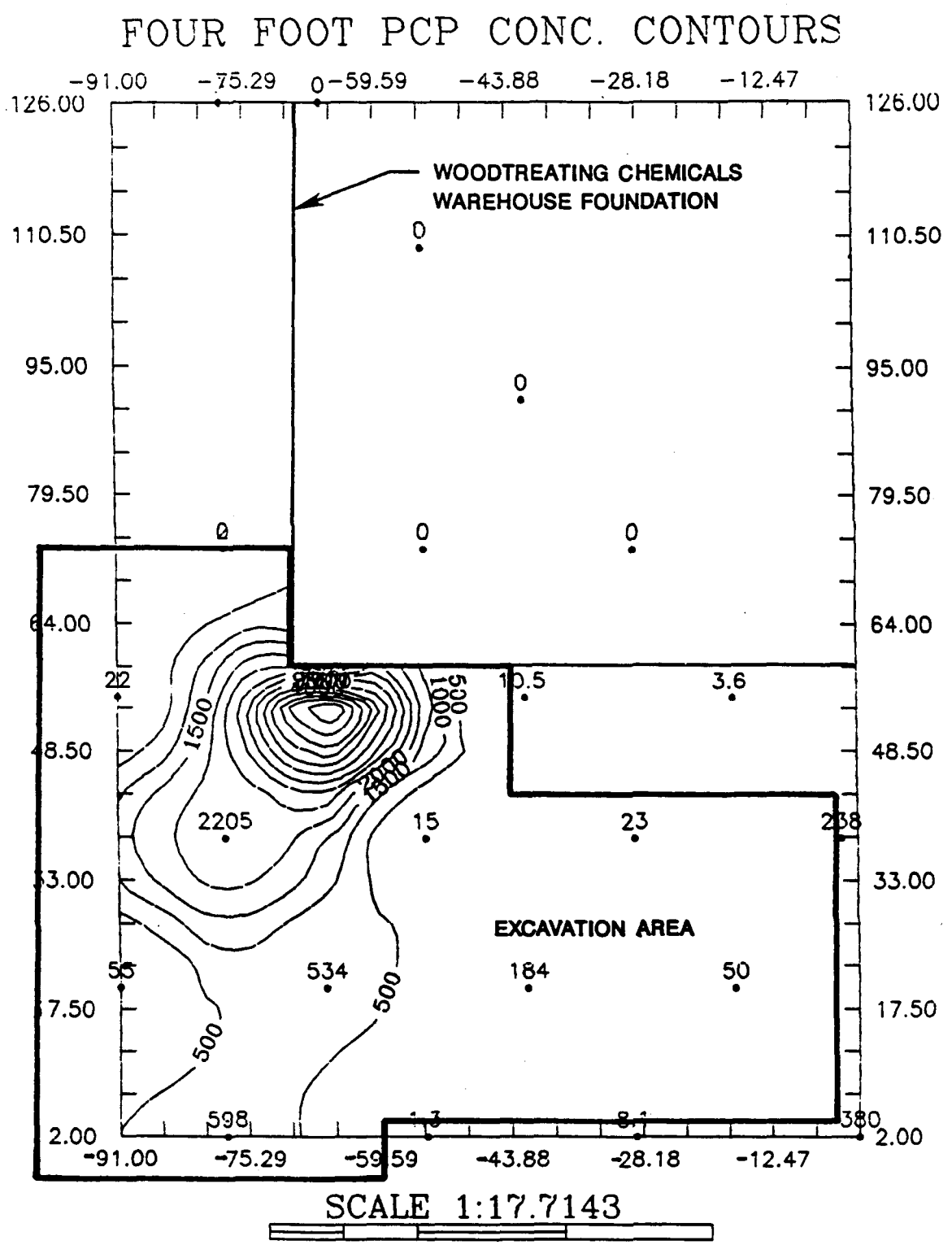

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FIGURE A-3.
APPENDIX A-3. Excavation Plan 5-1/2'-9-1/2' Depth

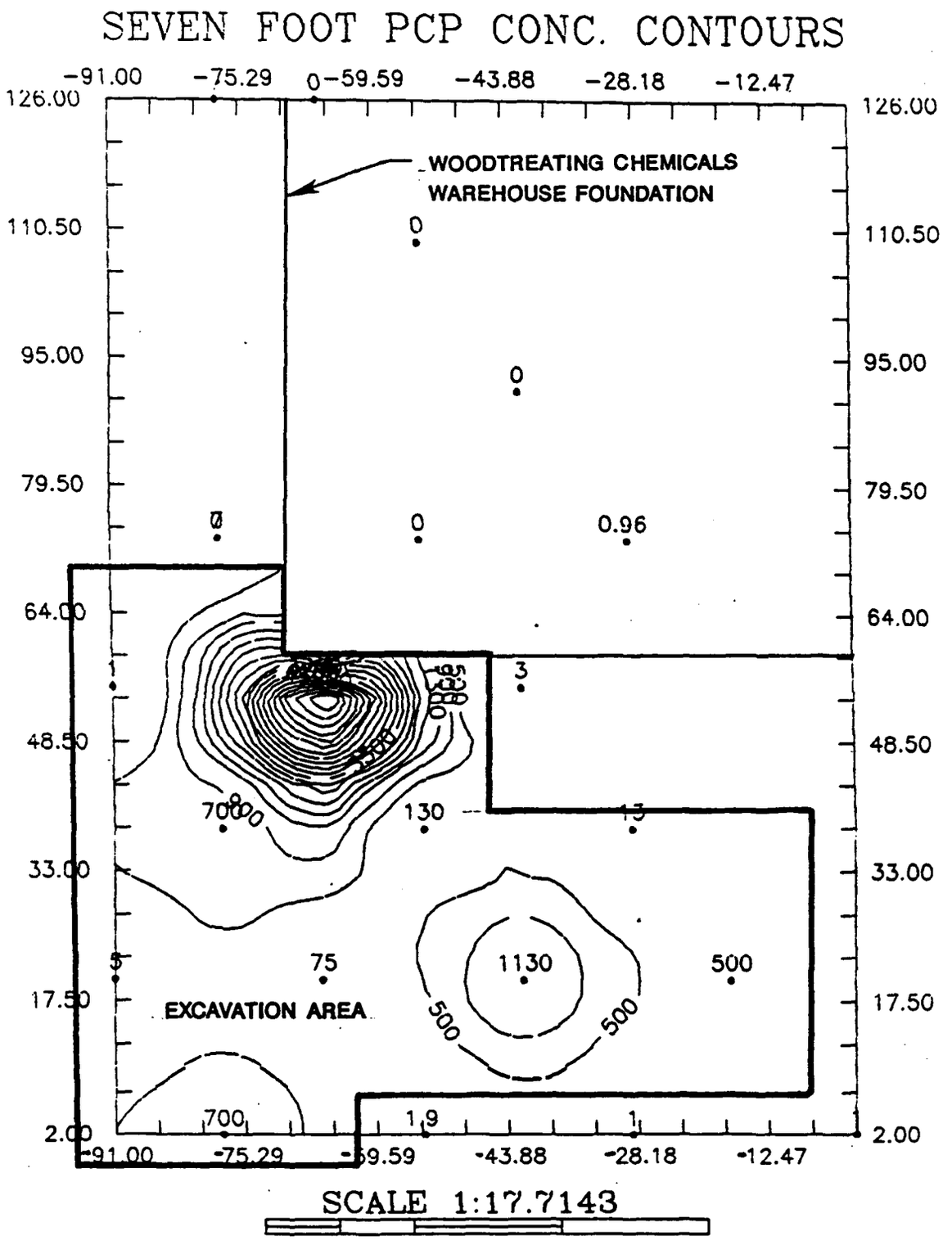

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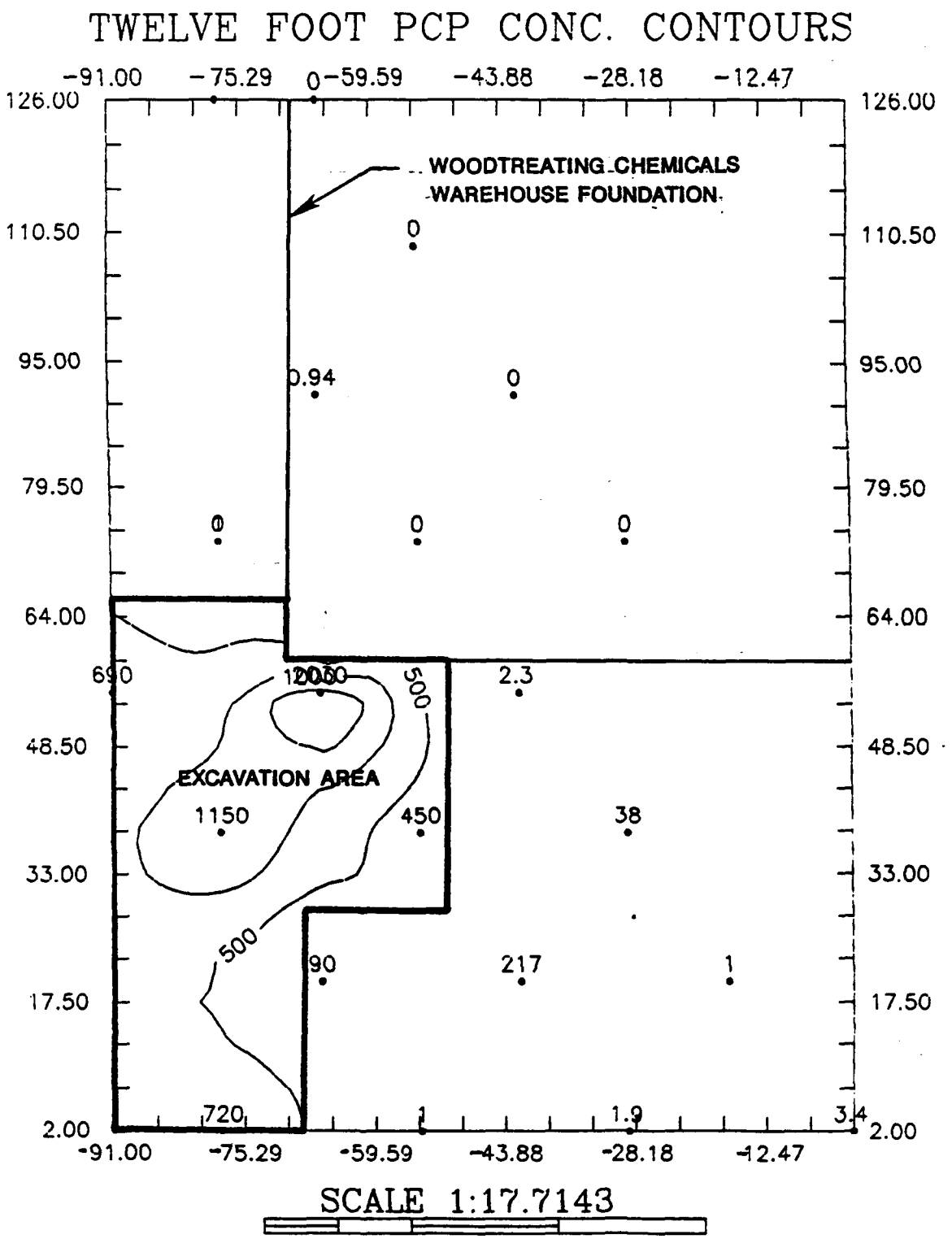
FIGURE A-4.
APPENDIX A-4. Excavation Plan 9-1/2'-12' Depth



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SOIL BORING ANALYSIS

TIME OIL - PORTLAND,OR
PROJECT NO. 821401
SEPTEMBER 1988
SOIL BORING ANALYSIS

PLANIMETER CALCS.-CONTOURS

CONTOUR MAP NAME	AREA (FT^2)	VOLUME (FT^3)	VOLUME (YD^3)
SURFACE	2851.4	5702.9	211.2
4 FOOT	1832.5	6413.6	237.5
7 FOOT	3017.6	12070.4	447.1
12 FOOT	2283.6	11418.0	422.9
SUM	9985.1	35604.8	1318.7

PLANIMETER CALCS.-MINE PLAN

DEPTH PROFILE (FT)	AREA (FT^2)	VOLUME (FT^3)	VOLUME (YD^3)
0 - 2	9557.5	19114.9	708.0
2 - 5.5	8584.7	30046.4	1112.8
5.5 - 9.5	7068.8	28275.2	1047.2
9.5 - 12	3082.1	15410.2	570.7
SUM	28293.0	92846.7	3438.8

CONCENTRATION VOLUME/LEVEL

DEPTH PROFILE (FT)	0 - 2	2 - 5.5	5.5 -9.5	9.5 - 12
VOLUME CALC				
TRAP. RULE	370636.4	643602.9	758708.3	567716.0
SIMPSON'S RULE	349528.5	622479.8	778037.7	523785.1
3/8 SIMPS. RULE	356926.3	621843.4	754541.9	536940.5
AVERAGE	359030.4	629308.7	767096.0	542815.2
SDEV	10710.0	12383.0	11831.0	22545.0
YARDS OF SOIL	708.0	1112.8	1047.2	570.7
PPM/YD^3	507.1	565.5	732.5	951.1
	359030.4	629308.7	767096.0	542815.2

AVERAGE CONC./YD^3: 668.3 PPM

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APPENDIX B. Resumes

E C O V A

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MARK W. ANDERSON
Project Manager

Mr. Mark Anderson has over 13 years of experience with project management, environmental engineering and permitting assistance in waste management for manufacturing, chemical, petroleum, and state agency clients in the western United States and Alaska. As a project manager for Ecova, Mr. Anderson is responsible for overseeing the design and construction of onsite treatment systems and provides day-to-day management of their operation. He also provides the main point of contact for clients and is responsible for analyzing the requirements and status of field operations, site construction, laboratory support, and project safety.

Education and Affiliations:

M.B.A., Oklahoma City University, Oklahoma City, Oklahoma (High honors)
B.S., Environmental Engineering, Montana College of Mineral Science & Technology, Butte, Montana, 1978
B.S., Atmospheric Science, University of California, Davis, California, 1973
P.E. No. 13740, State of Oklahoma

Corporate Experience:

1988 - Present	Ecova Corporation	Senior Project Manager
1985 - 1988	Dames & Moore, Inc.	Senior Project Manager
1981 - 1985	Kerr McGee Corp.	Senior Staff Engineer
1980 - 1981	Camp Dresser & McKee	Program Manager
1978 - 1980	Consolidated Cooper Co.	Director of Environmental Affairs
1974 - 1977	ASARCO, Inc.	Station Chief

Related Project Experience

- Project Manager for the cleanup of diesel-contaminated soil at a former service station site in Tacoma, Washington.

- Project Manager of the Remedial Investigation/ Feasibility Study (RI/FS) for a Superfund site (battery recycling facility and secondary lead smelter) in Portland, Oregon. Work included preparation of work plans; agency presentation and negotiations; sampling of wastes, surface and subsurface soil, groundwater, surface water, sediment and ambient air; identification and evaluation of appropriate remedial technologies which included conducting fixation/solidification tests of wastes and contaminated soils for inorganic contaminants; drilling of groundwater monitoring wells; and hydrogeologic modelling.

- Project Manager for the clenaup of perchloroethylene contaminated soil using a 13-well extraction and treatment system.

- Project Manager for an environmental audit of two aluminum master alloy manufacturing facilities in the States of Washington and Kentucky.

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- Project Manager for a study to develop treatment, storage, and disposal alternatives for radioactive mixed wastes from active generating facilities at the Hanford Site, Richland, Washington. Work included identifying waste streams, assessing TSD technologies, and estimating costs for recommended alternatives.

- Project Manager of a site study and feasibility analysis of a proposed gravel quarry and landfill operation in King County, Washington. Work included geological evaluation of the site and identification of permitting requirements.

- As Project Engineer, evaluated wastewater treatment plant performance at the Boeing Corporation facility at Auburn, Washington.

- As Environmental Engineer, assessed air, water, and hazardous waste compliance problems for chemical manufacturing plants in California, New Mexico, Idaho, Nevada, Mississippi, and Alabama; coal mining operations in Wyoming and Illinois; oil refineries in Oklahoma, Louisiana, California, and Texas; gas processing plants in Oklahoma, Texas, and North Dakota; nonferrous metal mining and smelting plants in Arizona and Montana; and nuclear facilities in New Mexico and Oklahoma.

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ROBERT SCHECK
Engineering Manager

Robert Scheck has over 20 years of engineering and related experience with over 15 years of specialized experience in the environmental field, including hazardous waste treatment, air correction/flue gas desulfurization, and resource recovery. Mr. Scheck's management experience includes process design, technical management, construction management, and staff supervision.

Education and Affiliations:

B.S., Professional Degree in Extractive Metallurgy, Colorado School of Mines, 1967
Business Management Program, Alexander Hamilton Institute

American Institute of Chemical Engineers
American Institute of Mining Engineers

Corporate Experience:

1986 - Present	Ecova Corporation	Director of Engineering
1986 - 1986	Morrison-Knudsen Engineers	Process Design Manager
1982 - 1984	Sterns Catalytic Corp.	Project Manager
1967 - 1982	Sterns Roger Corp.	Project Manager/Project Engineer

Related Project Experience

- Engineered a transportable slurry bioreactor system to remediate 1,000 yards of 2,4-D-contaminated soil. Horizontal reactors incorporated agitators, air spargers, interconnecting piping, and transfer/recirculation slurry pumps, and can be operated in series, parallel, batch, or continuously.

- Designed granular activated carbon (GAC) absorption system to treat 100 GPM of 2,4-D-contaminated groundwater. Units incorporated programmable logic controls, alarm auto dialing, filtration, ozonation, GAC, and surge tankage. Units contain 3,000 lb of GAC in a transportable and explosion-proof container.

- Performed technical management and supervision on a CERCLA project of approximately $1 billion. Contaminants included nerve agents, pesticides, unexploded ordnance, heavy metals, miscellaneous organics, and fluoride in the groundwater. Initiated and coordinated remedial action planning which included groundwater treatment, incineration, landfill, and demolition.

- Designed groundwater intercept system and prepared well water pump specifications for multiple pumps. Considered water hammer, incorporated freeze protection down to -50°F, and automatic drainage in case of power outage.

- Coordinated a team investigation of hydrocarbon and TCA contamination of a shallow aquifer. The investigation continued with a feasibility study indicating bioreclamation to be the technology of choice. Work also included evaluation of a leaking underground storage tank.

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- Developed data base for the several thousand incidents of spills, releases, and discharges for the last 40 years over a 25-square-mile site. With consultants, developed a system for ranking the hazardous substances based on their hazardous nature and the specifics of the site.

- Performed a feasibility study to remove chlorinated hydrocarbons from an aquifer and soils for a chemical plant. Detailed the groundwater intercept systems, GAC/air stripper, facility demolition, and soil decontamination.

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JOHN P. HANCOCK
Project Engineer

John Hancock is a project engineer specializing in the design of remediation systems for the cleanup of soil and groundwater contaminated with hazardous waste.

Education:

B.S., Petroleum Engineering, University of Tulsa, 1987
B.S., Chemistry, Hendrix College, 1979
Engineer-in-Training

Corporate Experience:

1988 - Present	Ecova Corporation	Project Engineer
1986	Conoco, Inc.	Student Engineer
1985	Rio Grande Drilling	Student Engineer
1981 - 1984	Arkansas Highway Dept.	Chemist
1979 - 1981	Arkansas Dept. of Pollution Control and Ecology	Chemist

Related Project Experience:

- Project Engineer for an Ecova mobile treatment system designed to neutralize ash produced at a wood products manufacturing facility. Designed equipment and flow processes; coordinated with field crew during installation and operation; provided troubleshooting expertise.

- Production Engineer responsible for maintaining production of oil and gas wells; maintenance and repair of high pressure pipelines and vessel, rotating equipment, and gas turbines; well testing; supervision and safety of contract employees on offshore platform.

- Drilling Engineer responsible for maintenance of drilling rig, assembly of special drilling tools, maintenance and repair of drilling fluids and high pressure equipment including positive displacement pumps.

- Chemist for quality control analysis of highway construction materials, water quality analysis for environmental projects, training of technicians, identification of general unknowns, physical and chemical testing of paint, extensive use of computer-interfaced analytical instruments (IR, AA, HPLC, UV-VIS).

- Chemist for analysis of high volume particulate air samples, maintenance and calibration of continuous air chemistry monitors (NOx, SOx, HC, ozone), member of emergency response team (UV-VIS, IR, AA, Technician).

JEFFREY POWELL
Field Engineer

Jeffrey Powell has eight years of experience in process system design, fabrication, startup, and operation. He is responsible for the design and fabrication of biological, chemical, and physical treatment systems and has developed modular pilot systems for onsite use for the remediation of hazardous waste sites. Systems developed by Mr. Powell include a modular fermenter/bioreactor; a pilot air stripper used to test process modifications and to predict cleanup levels achievable in full-scale operations; a modular air management system for an enclosed land treatment area; a bench-scale bioreactor to model energy requirements for a pilot scale bioreactor; and an oil/water separation system for the treatment of groundwater contaminated with diesel fuel. In addition, Mr. Powell is responsible for the installation and maintenance of systems installed onsite.

Education:

Challa Gardens Electrical & Mechanical Technical College, Australia,
Graduated 1965

Corporate Experience:

1986 - Present	Ecova Corporation	Field Engineer
1981 - 1986	Jordon & Ste. Michelle Winery	Production and Maintenance Manager
1978 - 1981	Walter Reynell Winery	Maintenance Manager
1974 - 1978	Lawson & Jones Lithographers	Electrical Foreman
1970 - 1973	Drake & Gorham Construction	Electrical Supervisor
1968 - 1970	O'Donnell & Griffin Contract.	Electrical Foreman

Related Project Experience:

- Managed the Ecova Facilities Engineering Shop. Supervised welders, metal workers, electricians, machinists and technicians in the fabrication of soil slurry systems, portable fermentation units, mobile treatment containers, oil/water separators, and carbon adsorption units.
- Directed construction and maintenance of soil handling and microbiological equipment used to treat soil and groundwater at a Superfund site on the Gulf Coast.
- Coordinated the installation and startup of soil treatment, bioslurry and groundwater treatment systems for the cleanup of a large chemical spill in North Dakota.
- Designed and constructed soil handling equipment, including transportation units, conveyor systems, stackers, auto train loaders, and bucket wheel reclaimers.
- Designed various microbiological systems, including reverse osmosis processes, and computer programs for sequencing production equipment.

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- Managed maintenance of all production equipment including fermentation and production piping, heating, and refrigeration systems.

- Directed maintenance and repair of tanks, piping, conveyor systems, heating and refrigeration systems, and production facilities. Designed and implemented computer program for sequencing production equipment.

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WILLIAM MAHAFFEY, Ph.D.
Project Biochemist

William Mahaffey is a Senior Research Biochemist who specializes in microbial biochemistry. He is responsible for research efforts involving isolation and enrichment of microorganisms for promoting biodegradative abilities. Dr. Mahaffey conducts research on bacteria capable of degrading hydrocarbons, including heavy oils and tars, creosoles, and creosote; solvents; and a variety of other contaminants. He has 12 years of experience in the biodegradation of hazardous wastes.

Education:

Ph.D., Microbial Biochemistry, University of Texas at Austin, 1986
M.S., Microbial Ecology, State University of New York at Brockport, 1978
B.S., Microbiology, State University of New York at Brockport, 1976

Corporate Experience:

1987 - Present	Ecova Corporation	Senior Research Biochemist
1986 - 1987	Phillips Petroleum Co.	Senior Research Chemist
1976 - 1985	University of Texas	Research Assistant; Graduate Research Assistant

Related Project Experience:

- Managed the development of microbiological operating procedures for field implementation in soil and ground water hazardous waste cleanup projects.

- As a Research Biochemist, was responsible for use of chemostats and continuous culture techniques for the isolation of pesticide degrading microorganisms. Studied the effects of chlorinated compounds on microbial metabolism, specifically ketone and pentachlorophenol.

- Developed research program on aromatic hydrocarbon metabolism by bacteria and fungi. Optimized fermentor growth conditions for maximum cell yield and enzymatic activity. Immobilized bacterial cells for biocatalysis. Used halogenated substrate carcinogenic polycyclic aromatic hydrocarbons. Isolated and characterized metabolic intermediates using HPLC, mass spectrometry, UV/VIS and CD spectroscopy, and nuclear magnetic resonance spectroscopy. Maintained laboratory microbial stock culture and metabolite collection.

- Conducted graduate studies involving bacterial metabolism of dibenzothiophene and benz(a)anthracene. Isolated and characterized metabolic intermediates formed by whole cell biotransformation. Purified enzymes and clarified the metabolic pathways for both of the above substrates. Reported on the ring cleavage of a polycyclic aromatic hydrocarbon with more than three rings.

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- As a Staff Research Chemist, studied fermentation process development of genetically engineered yeast for the production of recombinant peptides and proteins. Analytical biochemistry work included characterization of recombinant proteins to determine host modifications or identity with the native protein. Dr. Mahaffey developed analytical techniques for monitoring production of recombinant proteins and peptides.

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JOHN KINSELLA, P.G.
Vice President, Geosciences and Field Operations

As Vice President of Geosciences and Field Operations, Mr. Kinsella directs the activities of the firm's engineers, hydrogeologists, and geophysicists in support of all remediation projects. He has ten years of experience as a professional hydrogeologist, including four years as regional manager of a major consulting firm. He has supervised and designed soil borings, well installations, aquifer tests, and borehole/surface geophysical surveys. Mr. Kinsella has managed Superfund RI/FS and RCRA projects, prepared hazardous and solid waste permit applications, and negotiated settlements for compliance orders.

Health and Safety Training, Hazardous Waste Operations and Emergency Response; 29 CFR 1920.210

Education and Affiliations:

M.Sc., Hydrogeology, University College/London, 1978
B.A., Geology, Trinity College/Dublin, 1977

Professional Geologist (North and South Carolina)
Certified Geologist (U.K.)

Corporate Experience:

1988 - Present	Ecova Corporation	V.P., Geosciences & Field Operations
1984 - 1988	Geraghty & Miller, Inc.	Associate & Office Manager
1981 - 1984	IT Corporation	Project Engineer
1978 - 1981	Thames Water Authority	Assistant Hydrogeologist

Related Project Experience:

- Directed hydrogeologic evaluation of a closed 30 acre RCRA hazardous waste landfill. Defined landfill hydraulic characteristics via a water-balance and tracer methodologies. Lithium, oxygen isotope and barium tracers were used in conjunction with a historical photo search to map contaminant migration pathways and locate boring/well locations.

- Installed shallow and deep monitoring well networks for hazardous waste facility in Emelle, Alabama. Deep wells (950 ft) had unique two-pump system to enable effective purging and sampling.

- Assessed the extent of contamination resulting from the failure of an injection well at a chemical plant in New Orleans, Louisiana. Detailed samples revealed that pressurized contaminants had entered the aquifer at 200 ft below surface and penetrated two shallow water-bearing zones.

- Prepared RCRA Part B closure document for Mississippi wood-treating plant. Also prepared a detailed report on PNA/PAH contaminant migration characteristics for client.

- Evaluated the rate and extent of BTX contamination from a series of underground tanks at chemical manufacturing facility, Los Angeles, California. Floating free-phase product and dissolved plumes were mapped. Interceptor wells coupled with air stripping/carbon adsorption recommended.

- Defined the rate and extent of organic and inorganic plumes originating from a spill and a closed RCRA landfill at an Illinois facility. The plumes (primarily chloride and VOCs) are moving at a rate of 300 ft/year through glacial gravels. Detailed computer modeling was used to design a 180-gpm recovery well system that discharged to an air stripper/carbon adsorption unit; Illinois EPA approved complete CAP.

- Evaluated the source and extent of soil and groundwater contamination originating from subsurface tanks beneath a New Jersey warehouse.

RODERICK CARR
Director, Analytical Services

Roderick Carr is a laboratory manager with 22 years of experience in technical project management, research and development, and chemical analysis of hazardous materials and wastes. He has published extensively on analytical methods development, specializing in the area of heavy metals. Mr. Carr manages daily laboratory operations for organic and inorganic analyses of wastes, soils, and water.

Education:

M.A.T., Environmental Chemistry Education, Harvard University, 1966.
B.A., Physics/Chemistry Education, The George Washington University, 1965.

Corporate Experience:

1988 - Present	Ecova Corporation	Director, Analytical Services
1985 - 1988	RAMP Corporation	President
1979 - 1985	SCS Engineers	V.P., Pacific Northwest Operations
1976 - 1979	Versar, Inc.	Senior Project Manager
1966 - 1976	U.S. Naval Research Laboratory	Research Chemical Oceanographer

Related Project Experience:

- Managed services for organic and inorganic sample analysis and classical wet chemistry. Managed the development and implementation of analytical services for site investigations and remediation activities. Responsible for the overall direction of laboratory growth, staff development, and regulatory compliance.
- Responsible for daily operation of a trace element analytical laboratory at the U.S. Naval Research Laboratory, Washington, D.C.
- Established a program in priority pollutant analysis for the U.S. Environmental Protection Agency. Managed the utilization of subcontractor laboratories in support of this project.
- Responsible for administration of major projects from design through implementation. Interfaced with state and federal regulatory agencies to establish investigation criteria and guidelines. Developed special or new services for national analytical capabilities.
- Led mercury task force, developed cold-vapor atomic absorption methodology for determining part-per-billion concentrations of mercury directly in seawater.
- Developed methods for concentrating toxic heavy metals for analysis from marine waters.

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- Participated in laboratory studies which followed mercury through the food chain using carrier free radioactive mercury and clean-room procedures.

- Reported directly to CEO for in-house environmental analysis chemical laboratory; managed teams of up to 15 professionals and staff. Provided technical support to EPA in its development of hazardous material regulations such as polychlorinated biphenyls (PCBs).

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APPENDIX C. Ecova PCP Research

E C O V A

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ISOLATION AND CHARACTERIZATION OF A PENTACHLOROPHENOL-DEGRADING MICROBIAL CONSORTIUM

Andrew J. Strehler, Donald R. Smallbeck, and Derek Ross, Ph.D

Ecova Corporation

15555 Northeast 33rd

Redmond, Washington 98052

C-2

E C O V A

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INTRODUCTION

Pentachlorophenol (PCP) is one of the most widely used biocides in the United States (U.S.). Approximately 2.3 x 10^6 kilograms of PCP are manufactured per year in the U.S., about 80% of which is used as a pesticide by the wood-preserving industry (1). PCP is an inhibitor of oxidative phosphorylation, and is lethal to a wide variety of organisms, both plant and animal (2). Because of its toxicity and recalcitrance in the environment, PCP is considered a serious environmental pollutant, and has been placed on the U.S. Environmental Protection Agency's list of priority pollutants (3).

Ecova Corporation is currently developing bioremediation processes to clean-up contaminated soil and groundwater at a tie-treating plant in the Western United States. The site is 100 acres in size and listed under the Comprehensive Environmental Response and Compensation and Liability Act of 1980. An integral part of developing the bioremediation processes is the development of inocula which can degrade the contaminants present at the site. PCP is one of the major contaminants present at the site (Table 1).

The feasibility of using biological processes to treat PCP-contaminated wastewaters has been the subject of a number of investigations (4-6). Furthermore, Edgehill and Finn have demonstrated that the direct inoculation of PCP-degrading bacteria into PCP-contaminated soil may be a feasible method for minimizing the migration of PCP from wood treating sites into the environment (7). Ecova is performing a laboratory evaluation to assess the existing PCP biodegradation potential at the tie-treating plant, with a view to utilizing the existing PCP biodegradation potential to develop treatment systems to remediate the site. This chapter describes the isolation and partial characterization of a PCP-degrading microbial consortium, which will be used to clean-up PCP-contaminated

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soil and groundwater during the site remediation.

ASSESSMENT OF THE EXISTING PCP BIODEGRADATION POTENTIAL AT THE SITE

The biodegradation of PCP is documented in the literature (1-13). Watanabe (12) and Suzuki (13) isolated Pseudomonas species which could degrade PCP. Crawford and his colleagues have isolated Flavobacterium strains that degrade PCP (2). While Finn and his colleagues have isolated a strain of Arthrobacter (ATCC 33790) which can utilize PCP as a sole source of carbon and energy (6, 11). A microbiological evaluation was performed to determine if PCP-degrading microorganisms were present in contaminated soil and groundwater at the tie-treating plant. Aerobic laboratory culture techniques were used to assess the existing PCP biodegradation potential in soil and groundwater samples removed from the site. Fifty-ml aliquots of basal medium (Table 2) were inoculated with 30% (w/v) or (v/v) of contaminated soil or groundwater, respectively. Inoculated flasks were incubated at 25°C for four weeks on a rotary shaker set at 165 rpm. Contaminant degradation was monitored by gas chromatography/mass spectroscopy (GC/MS) according to EPA method 625.

The microbiological evaluation demonstrated that the site contains microorganisms which can degrade the contaminants present at the tie-treating plant. The PCP biodegradation potential detected at the site was highly variable. The percent biodegradation of PCP ranged from 12% to 84%, with an average value of 63%. The highest PCP biodegradation potential was detected in the saturated soil, while the lowest PCP biodegradation potential was detected within area G at the tie-treating plant (Figure 1, Table 3). The data demonstrated that a significant PCP biodegradation potential does exist at the tie-

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treating plant, but that this potential is not evenly distributed throughout the site.

ISOLATION AND CHARACTERIZATION OF THE PCP-DEGRADING MICROBIAL CONSORTIUM

Description of Continuous Culture Apparatus

The continuous culture apparatus illustrated in Figure 2 was used to isolate the PCP-degrading microbial consortium. The apparatus consisted of a 500-ml glass growth vessel, and 10 liter glass medium and effluent reservoirs. The growth vessel, and medium and effluent reservoirs were wrapped with aluminum foil to prevent photo-decomposition of the PCP. Air was supplied to the growth vessel at a rate of 650 ml min^{-1}, the agitation rate was 250 rpm, and the pH was maintained between 7.3 and 7.5 by the automatic addition of 10% (w/v) potassium hydroxide solution. The continuous culture was routinely operated at ambient temperature, approximately 25°C. At a retention time of 24 hours, the flow rate was 0.347 ml min^{-1}, and the dilution rate was 0.042 $hours^{-1}$. At a retention time of 12 hours, the flow rate and dilution rate were 0.690 ml min^{-1} and 0.083 $hours^{-1}$, respectively.

Isolation of the PCP-Degrading Microbial Consortium

An inoculum was developed from the aerated shake flasks established during the microbial evaluation. The inoculum was added to the 500-ml growth vessel at a concentration of 2% (v/v), which was then immediately operated as a continuous culture. Initially basal medium containing 500 ppm nutrient broth and 10 ppm PCP was added to the growth

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vessel to allow the inoculum to adapt to the PCP. The nutrient broth concentration was then gradually decreased to zero while the PCP concentration was increased to 50 ppm. PCP (Sigma Chemical Company) was supplied as the sodium salt. PCP concentration was measured by UV absorption at 320 nm (11). After 4 weeks of operation the consortium was able to utilize PCP as its sole source of carbon and energy, and greater than 98% of the added PCP was degraded (Table 4).

Influence of PCP Concentration on the Stability of the Microbial Consortium

After the chemostat had stabilized at an influent PCP concentration of 50 ppm, the PCP concentration was increased to 100 ppm and then subsequently to 150 ppm. At all of the PCP concentrations tested, greater than 98% of the added PCP was degraded (Table 5). GC/MS analysis demonstrated that the PCP concentration in the growth vessel was reduced to less than 300 ppb, and no intermediate metabolic products were detected. However, at a PCP concentration of 150 ppm, the chemostat became unstable and breakthrough of PCP occurred. Consequently, the chemostat was routinely operated at a PCP concentration of 100 ppm. Removal efficiencies of greater than 99% were maintained for several months in the continuous culture system, indicating that once established, the microbial consortium was very stable.

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Dechlorination of PCP by the Microbial Consortium

Dechlorination of PCP by the microbial consortium was determined by measuring the chloride concentration in the growth vessel. Chloride concentration was measured by mercuric nitrate titration (14). The microbial consortium completely dechlorinated PCP. Approximately five moles of chloride were released for every mole of PCP degraded (Table 6).

Mineralization of PCP by the Microbial Consortium

Radiotracer techniques were used to demonstrate the mineralization of PCP by the microbial consortium. 5-ml aliquots were removed from the growth vessel and placed in the incubation vessel illustrated in Figure 3. Approximately 0.5 microcuries of uniformly labelled PCP (Pathfinder Laboratories) was added to each sample. Samples were incubated for twenty-four hours at 25°C. After which, 0.5-ml of 1% (v/v) sulfuric acid was added to terminate the reaction and drive carbon dioxide (CO_2) out of solution. The released ^{14}C-labelled CO_2 was trapped on a filter paper wick containing 0.5-ml of phenethylamine, a CO_2 trapping agent. To maximize $^{14}CO_2$ adsorption by the wick, the incubation vessel was gently shaken overnight in a 35°C water bath. The wick was subsequently removed and transferred to a scintillation vial containing 3-ml of Beckman Ready-Safe scintillation cocktail. $^{14}CO_2$ was measured by liquid scintillation counting. ^{14}C-labelled compounds in the aqueous phase were measured by counting a 0.1-ml aliquot of that phase. All experiments were run in replicate. The experiments included acid-killed controls to monitor abiotic affects.

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The radiotracer analysis demonstrated that the consortium mineralized the PCP to carbon dioxide. The average percent mineralization of ^{14}C-labelled PCP to $^{14}CO_2$ was 25% ($n = 5$, $x = 25.3 \pm 1.5$).

Composition of the PCP-Degrading Microbial Consortium

The PCP-degrading microbial consortium consisted of six bacteria. The API Rapid NFT test procedure (15) was used to identify the bacteria to the species level. Five of the isolates were Pseudomonas species, the sixth member of the consortium could not be identified by the API NFT test procedure (Table 7). Pseudomonas species which can degrade PCP have been isolated previously by Watanabe (12) and Suzuki (13).

PCP Degradation by the Microbial Consortium in the Presence of Diesel Fuel

In addition to PCP, the contaminated soil and groundwater at the tie-treating plant contains a wide range of other contaminants, mostly polynuclear hydrocarbons (Table 1). To determine the selectivity of the microbial consortium for PCP, the continuous culture apparatus was operated with 100 ppm of PCP and 1,000 ppm of diesel fuel. Diesel fuel was selected because it is used as a carrier for PCP. The rate of PCP degradation in the presence of diesel fuel was similar to the rate achieved when PCP was supplied as the sole source of carbon and energy. Furthermore, the microbial consortium continued to completely dechlorinate the PCP. (Table 8). The data indicated that the microbial consortium selectively degraded the PCP, even in the presence of more readily utilizable carbon and energy sources. These studies are directly applicable to the development of

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bioremediation systems for the treatment of PCP in complex waste environments.

SUMMARY AND CONCLUSIONS

Continuous culture techniques were used to isolate a PCP-degrading microbial consortium from PCP-contaminated soil and groundwater at a tie-treating plant. The consortium utilized PCP as a sole source of carbon and energy at influent PCP concentrations of up to 150 ppm. However, at a PCP concentration of 150 ppm, the chemostat became unstable, and breakthrough of PCP occurred. Consequently, the chemostat was routinely operated at an influent PCP concentration of 100 ppm. At a concentration of 100 ppm, greater than 99% of the added PCP was degraded. GC/MS analysis demonstrated that the PCP concentration in the growth vessel was reduced to less than 300 ppb, and no intermediate metabolic products were detected. The consortium completely dechlorinated the PCP, five moles of chloride were released per mole of PCP. Radiotracer analysis demonstrated that the consortium mineralized the PCP to CO_2. The microbial consortium consisted of six bacteria, five of which were Pseudomonas species. The consortium selectively degraded PCP, even in the presence of more readily utilizable carbon and energy sources (diesel fuel).

ACKNOWLEDGEMENTS

We thank our colleagues in the Microbiology, Analytical Chemistry, Project Management, and Technical Writing divisions of Ecova Corporation for their contributions to this work.

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Table 1. Concentration of Predominant Site Contaminants

(Location)

Compound	Groundwater	Saturated Soil	Unsaturated Soil	Pond Bottom	Pond Periphery	Area G	Retort Area
			Concentration (ppm)				
Acenaphthene	(4) 171	(4) 780	(5) 2.9	(4) 810	(5) 130	(5) 145	(5) 75
Anthracene	(7) 57	(8) 329	(7) 1.7	(6) 440	(6) 79	(6) 99	(4) 140
Dibenzofuran	(5) 105	(6) 445	(8) 1.4	(7) 310	(7) 63	(7) 59	(6) 27
Fluoranthene	(3) 216	(3) 903	(4) 3.5	(3) 1000	(2) 380	(2) 230	(2) 230
Naphthalene	(2) 239	(2) 1136	(6) 2.6	(8) 72	(8) ND	(8) 11	(7) ND
Pentachlorophenol	(8) 39	(7) 393	(3) 5.2	(2) 1300	(3) 363	(4) 190	(1) 234
Phenanthrene	(1) 389	(1) 1573	(2) 7.7	(1) 1600	(1) 587	(1) 320	(3) 51
Pyrene	(4) 145	(5) 680	(1) 9.4	(5) 670	(4) 350	(3) 205	(2) 230

Notes:

1. Contaminant concentrations were determined by GC/MS according to EPA method 625
2. ND = Not Determined

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Table 2. Composition of Basal Medium

K_2HPO_4	0.450 grams
$NaH_2PO_4 \cdot 2H_2O$	0.085 grams
$CaSO_4 \cdot 2H_2O$	0.025 grams
$MgSO_4 \cdot 7H_2O$	0.250 grams
$FeSO_4 \cdot 7H_2O$	0.005 grams
$(NH_4)_2SO_4$	0.500 grams
Deionized water	1000 ml
pH	7.3-7.5

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Table 3. Percent Reduction of the Most Abundant Contaminants in Soil and Water Samples

Compound	Groundwater	Saturated Soil	Unsaturated Soil	Pond Bottom	Pond Periphery	Area G	Retort Area	Mean	
			(% Reduction)						
Acenaphthene	91	84	85	77	79	73	86	84	18
Anthracene	86	84	72	96	77	86	90	82	24
Dibenzofuran	90	84	ND	97	90	95	90	89	13
Fluoranthene	67	82	51	76	81	61	33	67	49
Naphthalene	99	97	73	85	ND	79	ND	88	26
Pentachlorophenol	39/68	84	55	66	59	12	49	63	56
Phenanthrene	83	75	80	99	99	95	89	85	24
Pyrene	78	81	71	57	41	56	48	66	40

Notes:

1. Aerated shake flasks were incubated at 25°C for four weeks on a rotary shake set at 165 rpm
2. ND = Not Determined.

12 — 84

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Table 4. PCP Degradation by the Microbial Consortium in the Presence of Nutrient Broth

Day	Influent PCP Concentration (ppm)	Effluent PCP Concentration (ppm)	% Reduction
2	50	26	48
6	50	9	82
7	50	<1	>98

Notes:

1. Day refers to number of days after increasing PCP concentration from 10 ppm to 50 ppm
2. Nutrient broth concentration was 500 ppm
3. PCP concentration was measured by UV absorption at 320 nm
4. Retention time was 24 hours
5. Flow rate was 0.347 ml min^{-1}
6. Dilution rate was 0.042 hr^{-1}

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Table 5. PCP Degradation by the Microbial Consortium With PCP as a Sole Source of Carbon and Energy

Influent PCP Concentration (ppm)	Effluent PCP Concentration (ppm)	% Reduction
50	<1	>98
100	<1	>99
150	<1	>99

Notes:

1. PCP concentration was measured by UV absorption at 320 nm
2. Retention time was 12 hours
3. Flow rate was 0.690 ml min^{-1}
4. Dilution rate was 0.083 hr^{-1}

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Table 6. Dechlorination of PCP by the Microbial Consortium with PCP as a Sole Source of Carbon and Energy

Influent PCP Concentration (ppm)	Theoretical Chloride Release (ppm)	Measured Chloride Release (ppm)	Moles of Chloride Released per Mole of PCP
100	66.5	74.0 n = 3 $\bar{x}$ = 74.0 ± 1.1	5.25

Notes:

1. PCP concentration was measured by UV absorption at 320 nm
2. Chloride concentration was measured by mercuric nitrate titration
3. Retention time was 24 hours
4. Flow rate was 0.347 ml min^{-1}
5. Dilution rate was 0.042 hr^{-1}

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Table 7. Composition of PCP-Degrading Microbial Consortium

Pseudomonas aeruginosa
Pseudomonas fluorescens
Pseudomonas stutzeri
Pseudomonas maltophilia
Pseudomonas mendocina
Unidentified Gram-Negative Rod

Note:

Microorganisms were identified with the API Rapid NFT test procedure

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Table 8. Dechlorination of PCP by the Microbial Consortium in the Presence of Diesel Fuel

Influent PCP Concentration (ppm)	Theoretical Chloride Release (ppm)	Measured Chloride Release (ppm)	Moles of Chloride Released per Mole of PCP
100	66.5	65.7 n = 3 $\bar{x}$ = 65.7 ± 1.5	4.75

Notes:

1. PCP concentration was measured by UV absorption at 320 nm
2. Chloride concentration was measured by mercuric nitrate titration
3. Diesel fuel concentration was 1000 ppm
4. Retention time was 24 hours
5. Flow rate was 0.347 ml min^{-1}
6. Dilution rate was 0.042 hr^{-1}

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Figure 1. Site Map

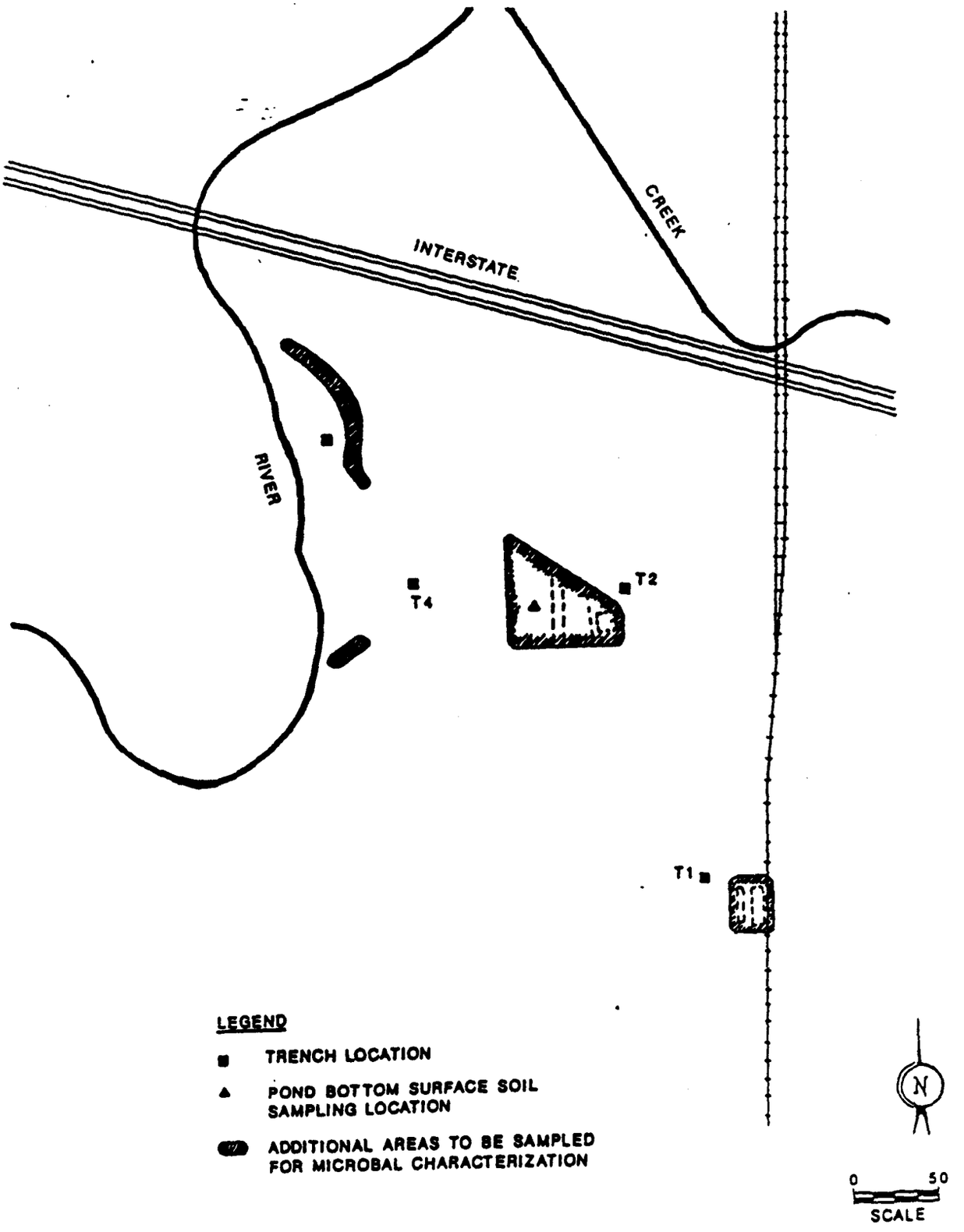

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Figure 2. Continuous Culture Apparatus

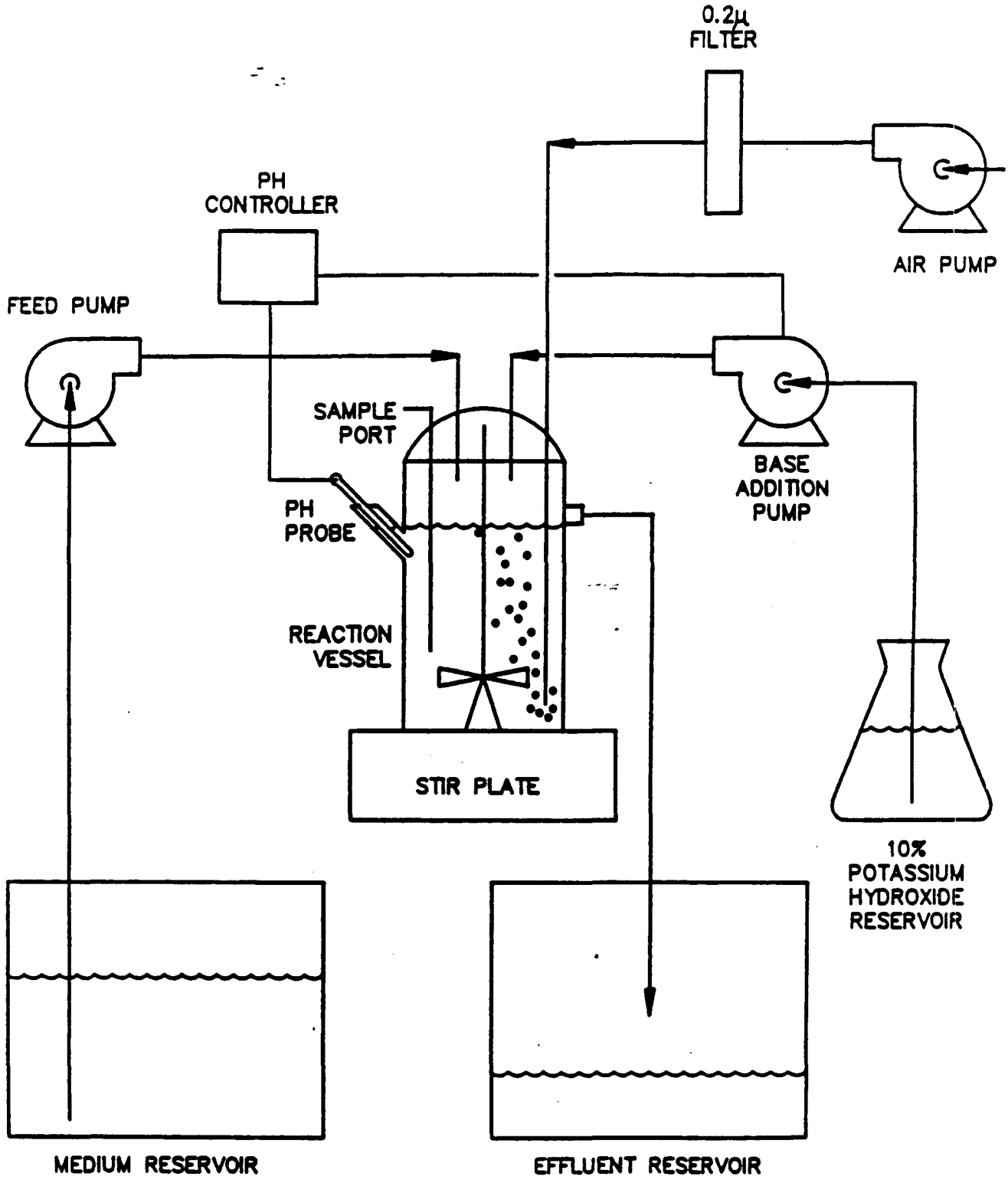

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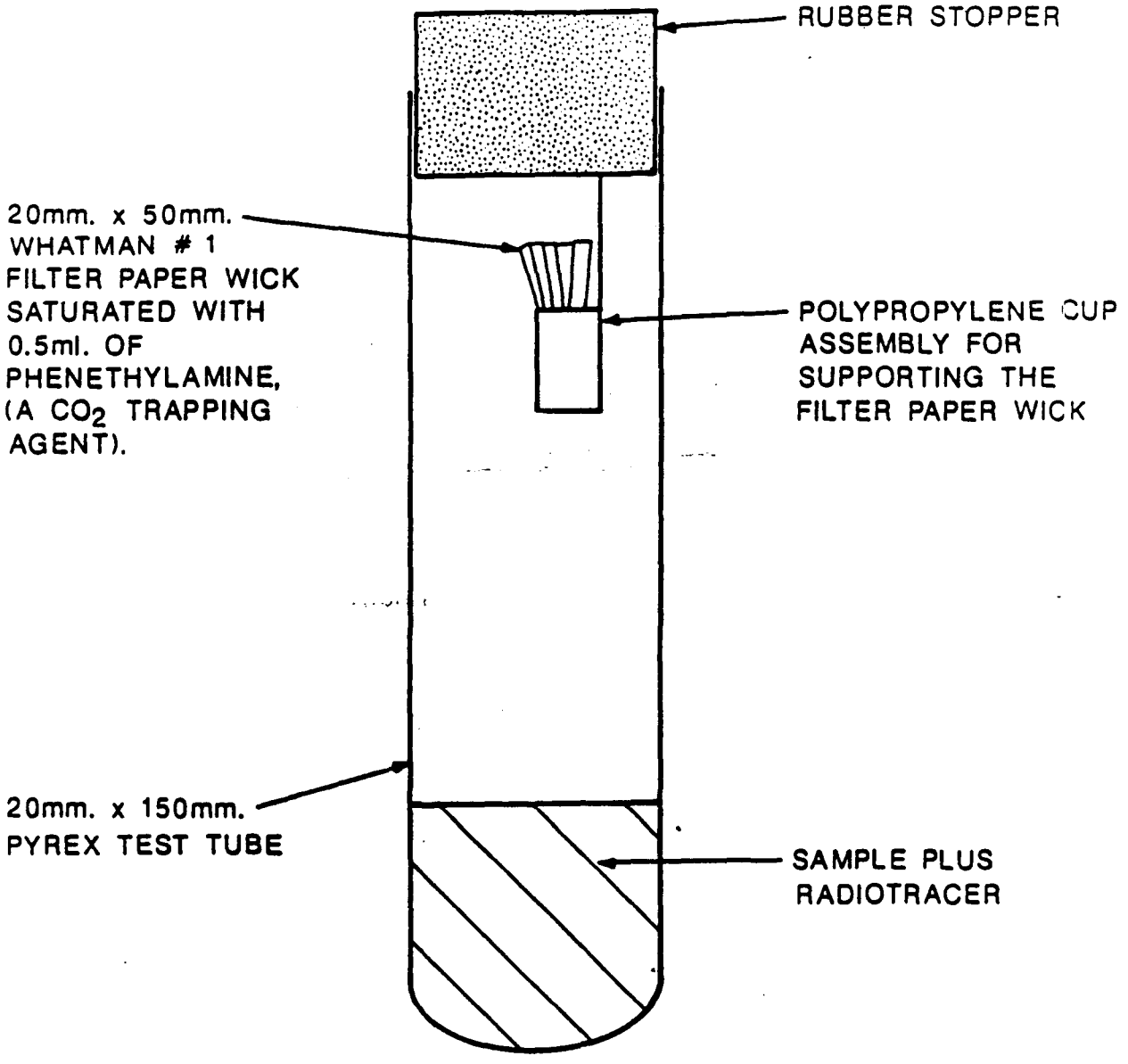
Figure 3. Incubation Vessel for Radiotracer Studies



APPENDIX D. Analytical Data Report

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SERVICES

ANALYTICAL DATA REPORT NARRATIVE

To: B Mahaffey/M Anderson
Project No: 821401

Date: 09/02/88
EAS Batch No: 973

SAMPLE RECEIPT INFORMATION

No. of Samples: 6

Received on: 08/02/88

Comments: None.

DATA & DETECTION LIMIT COMMENTS/ADDITIONAL INFORMATION

None.

Were any Nonconformance Memos submitted for these samples? [x] Yes [ ] No

If yes, explain:

The method blank extracted with water sample EAS 973-01 contained phthalate contamination. There was no sample remaining to re-extract. The concentration for bis(2-ethylhexyl) phthalate in sample EAS 973-01 is considered a qualified value.

Signature: Linda Johansen Date: 9/2/88

68/1401-NAR.973

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Project No: 821401

INORGANIC ANALYSIS REPORT

Customer #	**Background**	**W-1, E-1, S-1, N-1**
EAS #	**973-02**	**973-C**
Sample Description	**Background Soil**	**Composite**
Matrix	**Soil**	**Soil**
Date Received	**08/02/88**	**08/02/88**
Date Analyzed		

Parameters			**Units**
Total Organic Carbon	1060	7090	mg/kg
Nitrate (as NO_3-N)	5.77	4.69	mg/kg
Nitrite (as NO_2-N)	0.13	0.05	mg/kg
Ortho-Phosphorus (as PO_4-P)	28	52	mg/kg

Data Release Authorized: Donald Sutton

Date: 8-27-88

67/1401-IAR.973

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DATA REPORTING QUALIFIERS

Project No: 821401

B - Indicates compound was found in the associated blank as well as in the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a target compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

U - Indicates compound was analyzed for but not detected at the given detection limit. The sample quantitation limit was corrected for dilution and for percent moisture, when applicable.

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Water
Concentration: Low Dilution Factor: 1.0000
Sample wt/vol: 1000 ml
Date Extracted: 08/05/88
Date Analyzed: 8/30/88 14:58

Lab Sample ID: EAS973-01
Customer Sample: Well B
Sample Description: Well B
Date Collected: NA
Time Collected: NA
Date Received: 08/02/88
Data Release Authorized:

C.A.S. Number		ug/L	
108-95-2	Phenol	10.	U
111-44-4	bis(2-Chloroethyl)ether	10.	U
95-57-8	2-Chlorophenol	10.	U
541-73-1	1,3-Dichlorobenzene	10.	U
106-46-7	1,4-Dichlorobenzene	10.	U
100-51-6	Benzyl alcohol	10.	U
95-50-1	1,2-Dichlorobenzene	10.	U
95-48-7	2-Methylphenol	10.	U
39638-32-9	bis(2-chloroisopropyl)ether	10.	U
106-44-5	4-Methylphenol	10.	U
621-64-7	N-Nitroso-di-n-propylamine	10.	U
67-72-1	Hexachloroethane	10.	U
98-95-3	Nitrobenzene	10.	U
78-59-1	Isophorone	10.	U
88-75-5	2-Nitrophenol	10.	U
105-67-9	2,4-Dimethylphenol	10.	U
65-85-0	Benzoic acid	50.	U
111-91-1	bis(2-Chloroethoxy)Methane	10.	U
120-83-2	2,4-Dichlorophenol	10.	U
120-82-1	1,2,4-Trichlorobenzene	10.	U
91-20-3	Naphthalene	10.	U
106-47-8	4-Chloroaniline	10.	U
87-68-3	Hexachlorobutadiene	10.	U
59-50-7	4-Chloro-3-methylphenol	10.	U
91-57-6	2-Methylnaphthalene	10.	U
77-47-4	Hexachlorocyclopentadiene	10.	U
88-06-2	2,4,6-Trichlorophenol	10.	U
95-95-4	2,4,5-Trichlorophenol	50.	U
91-58-7	2-Chloronaphthalene	10.	U
88-74-4	2-Nitroaniline	50.	U
131-11-3	Dimethylphthalate	10.	U
208-96-8	Acenaphthylene	10.	U
99-09-2	3-Nitroaniline	50.	U

C.A.S. Number		ug/L	
83-32-9	Acenaphthene	10.	U
51-28-5	2,4-Dinitrophenol	50.	U
100-02-7	4-Nitrophenol	50.	U
132-64-9	Dibenzofuran	10.	U
121-14-2	2,4-Dinitrotoluene	10.	U
606-20-2	2,6-Dinitrotoluene	10.	U
84-66-2	Diethylphthalate	10.	U
7005-72-3	4-Chlorophenyl-phenylether	10.	U
86-73-7	Fluorene	10.	U
100-01-6	4-Nitroaniline	50.	U
534-52-1	4,6-Dinitro-2-methylphenol	50.	U
86-30-6	N-Nitrosodiphenylamine (1)	10.	U
101-55-3	4-Bromophenyl-phenylether	10.	U
118-74-1	Hexachlorobenzene	10.	U
87-86-5	Pentachlorophenol	50.	U
85-01-8	Phenanthrene	10.	U
120-12-7	Anthracene	10.	U
84-74-2	Di-n-butylphthalate	2.	J
206-44-0	Fluoranthene	10.	U
129-00-0	Pyrene	10.	U
85-68-7	Butylbenzylphthalate	10.	U
91-94-1	3,3'-Dichlorobenzidine	20.	U
56-55-3	Benzo(a)anthracene	10.	U
117-81-7	bis(2-Ethylhexyl)phthalate	3.	JB
218-01-9	Chrysene	10.	U
117-84-0	Di-n-octylphthalate	10.	U
205-99-2	Benzo(b)fluoranthene	10.	U
207-08-9	Benzo(k)fluoranthene	10.	U
50-32-8	Benzo(a)pyrene	10.	U
193-39-5	Indeno(1,2,3-cd)pyrene	10.	U
53-70-3	Dibenzo(a,h)anthracene	10.	U
191-24-2	Benzo(g,h,i)perylene	10.	U

(1)-Cannot be separated from diphenylamine

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SEMIVOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Soil
Concentration: Low Dilution Factor: 1.0000
Sample wt/vol: 28.95 g Dry Weight
Date Extracted: 08/08/88
Date Analyzed: 8/29/88 17:05

Lab Sample ID: EAS973-02
Customer Sample: Background
Sample Description: Background Soil
Date Collected: NA
Time Collected: NA
Date Received: 08/02/88
Data Release Authorized:

C.A.S. Number		ug/Kg	
108-95-2	Phenol	350.	U
111-44-4	bis(2-Chloroethyl)ether	350.	U
95-57-8	2-Chlorophenol	350.	U
541-73-1	1,3-Dichlorobenzene	350.	U
106-46-7	1,4-Dichlorobenzene	350.	U
100-51-6	Benzyl alcohol	350.	U
95-50-1	1,2-Dichlorobenzene	350.	U
95-48-7	2-Methylphenol	350.	U
39638-32-9	bis(2-chloroisopropyl)ether	350.	U
106-44-5	4-Methylphenol	350.	U
621-64-7	N-Nitroso-di-n-propylamine	350.	U
67-72-1	Hexachloroethane	350.	U
98-95-3	Nitrobenzene	350.	U
78-59-1	Isophorone	350.	U
88-75-5	2-Nitrophenol	350.	U
105-67-9	2,4-Dimethylphenol	350.	U
65-85-0	Benzoic acid	1700.	U
111-91-1	bis(2-Chloroethoxy)Methane	350.	U
120-83-2	2,4-Dichlorophenol	350.	U
120-82-1	1,2,4-Trichlorobenzene	350.	U
91-20-3	Naphthalene	350.	U
106-47-8	4-Chloroaniline	350.	U
87-68-3	Hexachlorobutadiene	350.	U
59-50-7	4-Chloro-3-methylphenol	350.	U
91-57-6	2-Methylnaphthalene	350.	U
77-47-4	Hexachlorocyclopentadiene	350.	U
88-06-2	2,4,6-Trichlorophenol	350.	U
95-95-4	2,4,5-Trichlorophenol	1700.	U
91-58-7	2-Chloronaphthalene	350.	U
88-74-4	2-Nitroaniline	1700.	U
131-11-3	Dimethylphthalate	350.	U
208-96-8	Acenaphthylene	350.	U
99-09-2	3-Nitroaniline	1700.	U

C.A.S. Number		ug/Kg	
83-32-9	Acenaphthene	350.	U
51-28-5	2,4-Dinitrophenol	1700.	U
100-02-7	4-Nitrophenol	1700.	U
132-64-9	Dibenzofuran	350.	U
121-14-2	2,4-Dinitrotoluene	350.	U
606-20-2	2,6-Dinitrotoluene	350.	U
84-66-2	Diethylphthalate	350.	U
7005-72-3	4-Chlorophenyl-phenylether	350.	U
86-73-7	Fluorene	350.	U
100-01-6	4-Nitroaniline	1700.	U
534-52-1	4,6-Dinitro-2-methylphenol	1700.	U
86-30-6	N-Nitrosodiphenylamine (1)	350.	U
101-55-3	4-Bromophenyl-phenylether	350.	U
118-74-1	Hexachlorobenzene	350.	U
87-86-5	Pentachlorophenol	130.	J
85-01-8	Phenanthrene	86.	J
120-12-7	Anthracene	350.	U
84-74-2	Di-n-butylphthalate	350.	U
206-44-0	Fluoranthene	290.	J
129-00-0	Pyrene	520.	
85-68-7	Butylbenzylphthalate	350.	U
91-94-1	3,3'-Dichlorobenzidine	690.	U
56-55-3	Benzo(a)anthracene	150.	J
117-81-7	bis(2-Ethylhexyl)phthalate	350.	U
218-01-9	Chrysene	280.	J
117-84-0	Di-n-octylphthalate	350.	U
205-99-2	Benzo(b)fluoranthene	200.	J
207-08-9	Benzo(k)fluoranthene	160.	J
50-32-8	Benzo(a)pyrene	170.	J
193-39-5	Indeno(1,2,3-cd)pyrene	150.	J
53-70-3	Dibenzo(a,h)anthracene	350.	U
191-24-2	Benzo(g,h,i)perylene	180.	J

(1)-Cannot be separated from diphenylamine

TOLS011660

BZTO104(e)048493

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Soil
Concentration: Low Dilution Factor: 50.0000
Sample wt/vol: 27.27 g
Date Extracted: 08/08/88
Date Analyzed: 8/31/88 15:07

Lab Sample ID: EAS973-03
Customer Sample: W-1
Sample Description: Soil Pile - Westside
Date Collected: NA
Time Collected: NA
Date Received: 08/02/88
Data Release Authorized:

C.A.S. Number		ug/Kg	
108-95-2	Phenol	18000.	U
111-44-4	bis(2-Chloroethyl)ether	18000.	U
95-57-8	2-Chlorophenol	18000.	U
541-73-1	1,3-Dichlorobenzene	18000.	U
106-46-7	1,4-Dichlorobenzene	18000.	U
100-51-6	Benzyl alcohol	18000.	U
95-50-1	1,2-Dichlorobenzene	18000.	U
95-48-7	2-Methylphenol	18000.	U
39638-32-9	bis(2-chloroisopropyl)ether	18000.	U
106-44-5	4-Methylphenol	18000.	U
621-64-7	N-Nitroso-di-n-propylamine	18000.	U
67-72-1	Hexachloroethane	18000.	U
98-95-3	Nitrobenzene	18000.	U
78-59-1	Isophorone	18000.	U
88-75-5	2-Nitrophenol	18000.	U
105-67-9	2,4-Dimethylphenol	18000.	U
65-85-0	Benzoic acid	92000.	U
111-91-1	bis(2-Chloroethoxy)Methane	18000.	U
120-83-2	2,4-Dichlorophenol	18000.	U
120-82-1	1,2,4-Trichlorobenzene	18000.	U
91-20-3	Naphthalene	18000.	U
106-47-8	4-Chloroaniline	18000.	U
87-68-3	Hexachlorobutadiene	18000.	U
59-50-7	4-Chloro-3-methylphenol	18000.	U
91-57-6	2-Methylnaphthalene	18000.	U
77-47-4	Hexachlorocyclopentadiene	18000.	U
88-06-2	2,4,6-Trichlorophenol	18000.	U
95-95-4	2,4,5-Trichlorophenol	92000.	U
91-58-7	2-Chloronaphthalene	18000.	U
88-74-4	2-Nitroaniline	92000.	U
131-11-3	Dimethylphthalate	18000.	U
208-96-8	Acenaphthylene	18000.	U
99-09-2	3-Nitroaniline	92000.	U

C.A.S. Number		ug/Kg	
83-32-9	Acenaphthene	18000.	U
51-28-5	2,4-Dinitrophenol	92000.	U
100-02-7	4-Nitrophenol	92000.	U
132-64-9	Dibenzofuran	18000.	U
121-14-2	2,4-Dinitrotoluene	18000.	U
606-20-2	2,6-Dinitrotoluene	18000.	U
84-66-2	Diethylphthalate	18000.	U
7005-72-3	4-Chlorophenyl-phenylether	18000.	U
86-73-7	Fluorene	18000.	U
100-01-6	4-Nitroaniline	92000.	U
534-52-1	4,6-Dinitro-2-methylphenol	92000.	U
86-30-6	N-Nitrososdiphenylamine (1)	18000.	U
101-55-3	4-Bromophenyl-phenylether	18000.	U
118-74-1	Hexachlorobenzene	18000.	U
87-86-5	Pentachlorophenol	250000	
85-01-8	Phenanthrene	18000.	U
120-12-7	Anthracene	18000.	U
84-74-2	Di-n-butylphthalate	18000.	U
206-44-0	Fluoranthene	18000.	U
129-00-0	Pyrene	18000.	U
85-68-7	Butylbenzylphthalate	18000.	U
91-94-1	3,3'-Dichlorobenzidine	37000.	U
56-55-3	Benzo(a)anthracene	18000.	U
117-81-7	bis(2-Ethylhexyl)phthalate	18000.	U
218-01-9	Chrysene	18000.	U
117-84-0	Di-n-octylphthalate	18000.	U
205-99-2	Benzo(b)fluoranthene	18000.	U
207-08-9	Benzo(k)fluoranthene	18000.	U
50-32-8	Benzo(a)pyrene	18000.	U
193-39-5	Indeno(1,2,3-cd)pyrene	18000.	U
53-70-3	Dibenzo(a,h)anthracene	18000.	U
191-24-2	Benzo(g,h,i)perylene	18000.	U

(1)-Cannot be separated from diphenylamine

ECOVA

TOLS011661

BZTO104(e)048494

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Soil
Concentration: Low Dilution Factor: 500.000
Sample wt/vol: 27.57 g
Date Extracted: 08/08/88
Date Analyzed: 8/31/88 16:12

Lab Sample ID: EAS973-04
Customer Sample: E-1
Sample Description: Soil Pile - Eastside
Date Collected: NA
Time Collected: NA
Date Received: 08/02/88
Data Release Authorized:

C.A.S. Number		ug/Kg	
108-95-2	Phenol	180000	U
111-44-4	bis(2-Chloroethyl)ether	180000	U
95-57-8	2-Chlorophenol	180000	U
541-73-1	1,3-Dichlorobenzene	180000	U
106-46-7	1,4-Dichlorobenzene	180000	U
100-51-6	Benzyl alcohol	180000	U
95-50-1	1,2-Dichlorobenzene	180000	U
95-48-7	2-Methylphenol	180000	U
39638-32-9	bis(2-chloroisopropyl)ether	180000	U
106-44-5	4-Methylphenol	180000	U
621-64-7	N-Nitroso-di-n-propylamine	180000	U
67-72-1	Hexachloroethane	180000	U
98-95-3	Nitrobenzene	180000	U
78-59-1	Isophorone	180000	U
88-75-5	2-Nitrophenol	180000	U
105-67-9	2,4-Dimethylphenol	180000	U
65-85-0	Benzoic acid	910000	U
111-91-1	bis(2-Chloroethoxy)Methane	180000	U
120-83-2	2,4-Dichlorophenol	180000	U
120-82-1	1,2,4-Trichlorobenzene	180000	U
91-20-3	Naphthalene	180000	U
106-47-8	4-Chloroaniline	180000	U
87-68-3	Hexachlorobutadiene	180000	U
59-50-7	4-Chloro-3-methylphenol	180000	U
91-57-6	2-Methylnaphthalene	180000	U
77-47-4	Hexachlorocyclopentadiene	180000	U
88-06-2	2,4,6-Trichlorophenol	180000	U
95-95-4	2,4,5-Trichlorophenol	910000	U
91-58-7	2-Chloronaphthalene	180000	U
88-74-4	2-Nitroaniline	910000	U
131-11-3	Dimethylphthalate	180000	U
208-96-8	Acenaphthylene	180000	U
99-09-2	3-Nitroaniline	910000	U

C.A.S. Number		ug/Kg	
83-32-9	Acenaphthene	180000	U
51-28-5	2,4-Dinitrophenol	910000	U
100-02-7	4-Nitrophenol	910000	U
132-64-9	Dibenzofuran	180000	U
121-14-2	2,4-Dinitrotoluene	180000	U
606-20-2	2,6-Dinitrotoluene	180000	U
84-66-2	Diethylphthalate	180000	U
7005-72-3	4-Chlorophenyl-phenylether	180000	U
86-73-7	Fluorene	180000	U
100-01-6	4-Nitroaniline	910000	U
534-52-1	4,6-Dinitro-2-methylphenol	910000	U
86-30-6	N-Nitrosodiphenylamine (1)	180000	U
101-55-3	4-Bromophenyl-phenylether	180000	U
118-74-1	Hexachlorobenzene	180000	U
87-86-5	Pentachlorophenol	2000000	
85-01-8	Phenanthrene	180000	U
120-12-7	Anthracene	180000	U
84-74-2	Di-n-butylphthalate	180000	U
206-44-0	Fluoranthene	180000	U
129-00-0	Pyrene	180000	U
85-68-7	Butylbenzylphthalate	180000	U
91-94-1	3,3'-Dichlorobenzidine	360000	U
56-55-3	Benzo(a)anthracene	180000	U
117-81-7	bis(2-Ethylhexyl)phthalate	180000	U
218-01-9	Chrysene	180000	U
117-84-0	Di-n-octylphthalate	180000	U
205-99-2	Benzo(b)fluoranthene	180000	U
207-08-9	Benzo(k)fluoranthene	180000	U
50-32-8	Benzo(a)pyrene	180000	U
193-39-5	Indeno(1,2,3-cd)pyrene	180000	U
53-70-3	Dibenzo(a,h)anthracene	180000	U
191-24-2	Benzo(g,h,i)perylene	180000	U

(1)-Cannot be separated from diphenylamine

TOLS011662

BZTO104(e)048495

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Soil
Concentration: Low Dilution Factor: 1.0000
Sample wt/vol: 27.36 g Dry Weight
Date Extracted: 08/08/88
Date Analyzed: 8/29/88 18:12

Lab Sample ID: EAS973-05
Customer Sample: S-1
Sample Description: Soil Pile - Southside
Date Collected: NA
Time Collected: NA
Date Received: 08/02/88
Data Release Authorized:

C.A.S. Number		ug/Kg	
108-95-2	Phenol	370.	U
111-44-4	bis(2-Chloroethyl)ether	370.	U
95-57-8	2-Chlorophenol	370.	U
541-73-1	1,3-Dichlorobenzene	370.	U
106-46-7	1,4-Dichlorobenzene	370.	U
100-51-6	Benzyl alcohol	370.	U
95-50-1	1,2-Dichlorobenzene	370.	U
95-48-7	2-Methylphenol	370.	U
39638-32-9	bis(2-chloroisopropyl)ether	370.	U
106-44-5	4-Methylphenol	370.	U
621-64-7	N-Nitroso-di-n-propylamine	370.	U
67-72-1	Hexachloroethane	370.	U
98-95-3	Nitrobenzene	370.	U
78-59-1	Isophorone	370.	U
88-75-5	2-Nitrophenol	370.	U
105-67-9	2,4-Dimethylphenol	370.	U
65-85-0	Benzoic acid	1800.	U
111-91-1	bis(2-Chloroethoxy)Methane	370.	U
120-83-2	2,4-Dichlorophenol	370.	U
120-82-1	1,2,4-Trichlorobenzene	370.	U
91-20-3	Naphthalene	370.	U
106-47-8	4-Chloroaniline	370.	U
87-68-3	Hexachlorobutadiene	370.	U
59-50-7	4-Chloro-3-methylphenol	370.	U
91-57-6	2-Methylnaphthalene	370.	U
77-47-4	Hexachlorocyclopentadiene	370.	U
88-06-2	2,4,6-Trichlorophenol	370.	U
95-95-4	2,4,5-Trichlorophenol	1800.	U
91-58-7	2-Chloronaphthalene	370.	U
88-74-4	2-Nitroaniline	1800.	U
131-11-3	Dimethylphthalate	370.	U
208-96-8	Acenaphthylene	370.	U
99-09-2	3-Nitroaniline	1800.	U

C.A.S. Number		ug/Kg	
83-32-9	Acenaphthene	370.	U
51-28-5	2,4-Dinitrophenol	1800.	U
100-02-7	4-Nitrophenol	1800.	U
132-64-9	Dibenzofuran	370.	U
121-14-2	2,4-Dinitrotoluene	370.	U
606-20-2	2,6-Dinitrotoluene	370.	U
84-66-2	Diethylphthalate	370.	U
7005-72-3	4-Chlorophenyl-phenylether	370.	U
86-73-7	Fluorene	370.	U
100-01-6	4-Nitroaniline	1800.	U
534-52-1	4,6-Dinitro-2-methylphenol	1800.	U
86-30-6	N-Nitrosodiphenylamine (1)	370.	U
101-55-3	4-Bromophenyl-phenylether	370.	U
118-74-1	Hexachlorobenzene	370.	U
87-86-5	Pentachlorophenol	2200.	
85-01-8	Phenanthrene	370.	U
120-12-7	Anthracene	370.	U
84-74-2	Di-n-butylphthalate	370.	U
206-44-0	Fluoranthene	44.	J
129-00-0	Pyrene	80.	J
85-68-7	Butylbenzylphthalate	370.	U
91-94-1	3,3'-Dichlorobenzidine	730.	U
56-55-3	Benzo(a)anthracene	37.	J
117-81-7	bis(2-Ethylhexyl)phthalate	40.	J
218-01-9	Chrysene	82.	J
117-84-0	Di-n-octylphthalate	370.	U
205-99-2	Benzo(b)fluoranthene	50.	J
207-08-9	Benzo(k)fluoranthene	38.	J
50-32-8	Benzo(a)pyrene	370.	U
193-39-5	Indeno(1,2,3-cd)pyrene	370.	U
53-70-3	Dibenzo(a,h)anthracene	370.	U
191-24-2	Benzo(g,h,i)perylene	370.	U

(1)-Cannot be separated from diphenylamine

TOLS011663

BZTO104(e)048496

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Soil
Concentration: Low Dilution Factor: 200.000
Sample wt/vol: 27.72 g Dry Weight
Date Extracted: 08/08/88
Date Analyzed: 8/29/88 20:27

Lab Sample ID: EAS973-06
Customer Sample: N-1
Sample Description: Soil Pile - Northside
Date Collected: NA
Time Collected: NA
Date Received: 08/02/88
Data Release Authorized:

C.A.S. Number		ug/Kg	
108-95-2	Phenol	72000.	U
111-44-4	bis(2-Chloroethyl)ether	72000.	U
95-57-8	2-Chlorophenol	72000.	U
541-73-1	1,3-Dichlorobenzene	72000.	U
106-46-7	1,4-Dichlorobenzene	72000.	U
100-51-6	Benzyl alcohol	72000.	U
95-50-1	1,2-Dichlorobenzene	72000.	U
95-48-7	2-Methylphenol	72000.	U
39638-32-9	bis(2-chloroisopropyl)ether	72000.	U
106-44-5	4-Methylphenol	72000.	U
621-64-7	N-Nitroso-di-n-propylamine	72000.	U
67-72-1	Hexachloroethane	72000.	U
98-95-3	Nitrobenzene	72000.	U
78-59-1	Isophorone	72000.	U
88-75-5	2-Nitrophenol	72000.	U
105-67-9	2,4-Dimethylphenol	72000.	U
65-85-0	Benzoic acid	360000.	U
111-91-1	bis(2-Chloroethoxy)Methane	72000.	U
120-83-2	2,4-Dichlorophenol	72000.	U
120-82-1	1,2,4-Trichlorobenzene	72000.	U
91-20-3	Naphthalene	72000.	U
106-47-8	4-Chloroaniline	72000.	U
87-68-3	Hexachlorobutadiene	72000.	U
59-50-7	4-Chloro-3-methylphenol	72000.	U
91-57-6	2-Methylnaphthalene	72000.	U
77-47-4	Hexachlorocyclopentadiene	72000.	U
88-06-2	2,4,6-Trichlorophenol	72000.	U
95-95-4	2,4,5-Trichlorophenol	360000.	U
91-58-7	2-Chloronaphthalene	72000.	U
88-74-4	2-Nitroaniline	360000.	U
131-11-3	Dimethylphthalate	72000.	U
208-96-8	Acenaphthylene	72000.	U
99-09-2	3-Nitroaniline	360000.	U

C.A.S. Number		ug/Kg	
83-32-9	Acenaphthene	72000.	U
51-28-5	2,4-Dinitrophenol	360000.	U
100-02-7	4-Nitrophenol	360000.	U
132-64-9	Dibenzofuran	72000.	U
121-14-2	2,4-Dinitrotoluene	72000.	U
606-20-2	2,6-Dinitrotoluene	72000.	U
84-66-2	Diethylphthalate	72000.	U
7005-72-3	4-Chlorophenyl-phenylether	72000.	U
86-73-7	Fluorene	72000.	U
100-01-6	4-Nitroaniline	360000.	U
534-52-1	4,6-Dinitro-2-methylphenol	360000.	U
86-30-6	N-Nitrososdiphenylamine (1)	72000.	U
101-55-3	4-Bromophenyl-phenylether	72000.	U
118-74-1	Hexachlorobenzene	72000.	U
87-86-5	Pentachlorophenol	720000.	
85-01-8	Phenanthrene	72000.	U
120-12-7	Anthracene	72000.	U
84-74-2	Di-n-butylphthalate	72000.	U
206-44-0	Fluoranthene	72000.	U
129-00-0	Pyrene	72000.	U
85-68-7	Butylbenzylphthalate	72000.	U
91-94-1	3,3'-Dichlorobenzidine	140000.	U
56-55-3	Benzo(a)anthracene	72000.	U
117-81-7	bis(2-Ethylhexyl)phthalate	72000.	U
218-01-9	Chrysene	72000.	U
117-84-0	Di-n-octylphthalate	72000.	U
205-99-2	Benzo(b)fluoranthene	72000.	U
207-08-9	Benzo(k)fluoranthene	72000.	U
50-32-8	Benzo(a)pyrene	72000.	U
193-39-5	Indeno(1,2,3-cd)pyrene	72000.	U
53-70-3	Dibenzo(a,h)anthracene	72000.	U
191-24-2	Benzo(g,h,i)perylene	72000.	U

(1)-Cannot be separated from diphenylamine

TOLS011664

BZTO104(e)048497

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Soil
Concentration: Low Dilution Factor: 200.000
Sample wt/vol: 27.48 g Dry Weight
Date Extracted: 08/08/88
Date Analyzed: 8/29/88 21:33

Lab Sample ID: EAS973-C
Customer Sample: W-1, E-1, S-1, N-1
Sample Description: Composite
Date Collected: NA
Time Collected: NA
Date Received: 08/02/88
Data Release Authorized:

C.A.S. Number		ug/Kg	
108-95-2	Phenol	73000.	U
111-44-4	bis(2-Chloroethyl)ether	73000.	U
95-57-8	2-Chlorophenol	73000.	U
541-73-1	1,3-Dichlorobenzene	73000.	U
106-46-7	1,4-Dichlorobenzene	73000.	U
100-51-6	Benzyl alcohol	73000.	U
95-50-1	1,2-Dichlorobenzene	73000.	U
95-48-7	2-Methylphenol	73000.	U
39638-32-9	bis(2-chloroisopropyl)ether	73000.	U
106-44-5	4-Methylphenol	73000.	U
621-64-7	N-Nitroso-di-n-propylamine	73000.	U
67-72-1	Hexachloroethane	73000.	U
98-95-3	Nitrobenzene	73000.	U
78-59-1	Isophorone	73000.	U
88-75-5	2-Nitrophenol	73000.	U
105-67-9	2,4-Dimethylphenol	73000.	U
65-85-0	Benzoic acid	360000.	U
111-91-1	bis(2-Chloroethoxy)Methane	73000.	U
120-83-2	2,4-Dichlorophenol	73000.	U
120-82-1	1,2,4-Trichlorobenzene	73000.	U
91-20-3	Naphthalene	73000.	U
106-47-8	4-Chloroaniline	73000.	U
87-68-3	Hexachlorobutadiene	73000.	U
59-50-7	4-Chloro-3-methylphenol	73000.	U
91-57-6	2-Methylnaphthalene	73000.	U
77-47-4	Hexachlorocyclopentadiene	73000.	U
88-06-2	2,4,6-Trichlorophenol	73000.	U
95-95-4	2,4,5-Trichlorophenol	360000.	U
91-58-7	2-Chloronaphthalene	73000.	U
88-74-4	2-Nitroaniline	360000.	U
131-11-3	Dimethylphthalate	73000.	U
208-96-8	Acenaphthylene	73000.	U
99-09-2	3-Nitroaniline	360000.	U
83-32-9	Acenaphthene	73000.	U
51-28-5	2,4-Dinitrophenol	360000.	U
100-02-7	4-Nitrophenol	360000.	U
132-64-9	Dibenzofuran	73000.	U
121-14-2	2,4-Dinitrotoluene	73000.	U
606-20-2	2,6-Dinitrotoluene	73000.	U
84-66-2	Diethylphthalate	73000.	U
7005-72-3	4-Chlorophenyl-phenylether	73000.	U
86-73-7	Fluorene	73000.	U
100-01-6	4-Nitroaniline	360000.	U
534-52-1	4,6-Dinitro-2-methylphenol	360000.	U
86-30-6	N-Nitrosodiphenylamine (1)	73000.	U
101-55-3	4-Bromophenyl-phenylether	73000.	U
118-74-1	Hexachlorobenzene	73000.	U
87-86-5	Pentachlorophenol	680000.	
85-01-8	Phenanthrene	73000.	U
120-12-7	Anthracene	73000.	U
84-74-2	Di-n-butylphthalate	73000.	U
206-44-0	Fluoranthene	73000.	U
129-00-0	Pyrene	73000.	U
85-68-7	Butylbenzylphthalate	73000.	U
91-94-1	3,3'-Dichlorobenzidine	150000.	U
56-55-3	Benzo(a)anthracene	73000.	U
117-81-7	bis(2-Ethylhexyl)phthalate	73000.	U
218-01-9	Chrysene	73000.	U
117-84-0	Di-n-octylphthalate	73000.	U
205-99-2	Benzo(b)fluoranthene	73000.	U
207-08-9	Benzo(k)fluoranthene	73000.	U
50-32-8	Benzo(a)pyrene	73000.	U
193-39-5	Indeno(1,2,3-cd)pyrene	73000.	U
53-70-3	Dibenzo(a,h)anthracene	73000.	U
191-24-2	Benzo(g,h,i)perylene	73000.	U

(1)-Cannot be separated from diphenylamine

ECOVA

TOLS011665

BZTO104(e)048498

QUALITY CONTROLS

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Soil
Concentration: Low Dilution Factor: 10.0000
Sample wt/vol: 30 g
Date Extracted: 08/08/88
Date Analyzed: 8/29/88 15:58

Lab Sample ID: EAS973-00MB
Customer Sample: NA
Sample Description: Method Blank
Date Collected: NA
Time Collected: NA
Date Received: 08/02/88
Data Release Authorized:

C.A.S. Number		ug/Kg	
108-95-2	Phenol	3300.	U
111-44-4	bis(2-Chloroethyl)ether	3300.	U
95-57-8	2-Chlorophenol	3300.	U
541-73-1	1,3-Dichlorobenzene	3300.	U
106-46-7	1,4-Dichlorobenzene	3300.	U
100-51-6	Benzyl alcohol	3300.	U
95-50-1	1,2-Dichlorobenzene	3300.	U
95-48-7	2-Methylphenol	3300.	U
39638-32-9	bis(2-chloroisopropyl)ether	3300.	U
106-44-5	4-Methylphenol	3300.	U
621-64-7	N-Nitroso-di-n-propylamine	3300.	U
67-72-1	Hexachloroethane	3300.	U
98-95-3	Nitrobenzene	3300.	U
78-59-1	Isophorone	3300.	U
88-75-5	2-Nitrophenol	3300.	U
105-67-9	2,4-Dimethylphenol	3300.	U
65-85-0	Benzoic acid	17000.	U
111-91-1	bis(2-Chloroethoxy)Methane	3300.	U
120-83-2	2,4-Dichlorophenol	3300.	U
120-82-1	1,2,4-Trichlorobenzene	3300.	U
91-20-3	Naphthalene	3300.	U
106-47-8	4-Chloroaniline	3300.	U
87-68-3	Hexachlorobutadiene	3300.	U
59-50-7	4-Chloro-3-methylphenol	3300.	U
91-57-6	2-Methylnaphthalene	3300.	U
77-47-4	Hexachlorocyclopentadiene	3300.	U
88-06-2	2,4,6-Trichlorophenol	3300.	U
95-95-4	2,4,5-Trichlorophenol	17000.	U
91-58-7	2-Chloronaphthalene	3300.	U
88-74-4	2-Nitroaniline	17000.	U
131-11-3	Dimethylphthalate	3300.	U
208-96-8	Acenaphthylene	3300.	U
99-09-2	3-Nitroaniline	17000.	U

C.A.S. Number		ug/Kg	
83-32-9	Acenaphthene	3300.	U
51-28-5	2,4-Dinitrophenol	17000.	U
100-02-7	4-Nitrophenol	17000.	U
132-64-9	Dibenzofuran	3300.	U
121-14-2	2,4-Dinitrotoluene	3300.	U
606-20-2	2,6-Dinitrotoluene	3300.	U
84-66-2	Diethylphthalate	3300.	U
7005-72-3	4-Chlorophenyl-phenylether	3300.	U
86-73-7	Fluorene	3300.	U
100-01-6	4-Nitroaniline	17000.	U
534-52-1	4,6-Dinitro-2-methylphenol	17000.	U
86-30-6	N-Nitrosodiphenylamine (1)	3300.	U
101-55-3	4-Bromophenyl-phenylether	3300.	U
118-74-1	Hexachlorobenzene	3300.	U
87-86-5	Pentachlorophenol	17000.	U
85-01-8	Phenanthrene	3300.	U
120-12-7	Anthracene	3300.	U
84-74-2	Di-n-butylphthalate	3300.	U
206-44-0	Fluoranthene	3300.	U
129-00-0	Pyrene	3300.	U
85-68-7	Butylbenzylphthalate	3300.	U
91-94-1	3,3'-Dichlorobenzidine	6700.	U
56-55-3	Benzo(a)anthracene	3300.	U
117-81-7	bis(2-Ethylhexyl)phthalate	3300.	U
218-01-9	Chrysene	3300.	U
117-84-0	Di-n-octylphthalate	3300.	U
205-99-2	Benzo(b)fluoranthene	3300.	U
207-08-9	Benzo(k)fluoranthene	3300.	U
50-32-8	Benzo(a)pyrene	3300.	U
193-39-5	Indeno(1,2,3-cd)pyrene	3300.	U
53-70-3	Dibenzo(a,h)anthracene	3300.	U
191-24-2	Benzo(g,h,i)perylene	3300.	U

(1)-Cannot be separated from diphenylamine

TOLS011667

BZTO104(e)048500

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Water
Concentration: Low Dilution Factor: 1.0000
Sample wt/vol: 1000 ml
Date Extracted: 08/05/88
Date Analyzed: 8/30/88 12:39

Lab Sample ID: EAS973-00MB
Customer Sample: NA
Sample Description: Method Blank
Date Collected: NA
Time Collected: NA
Date Received: 08/02/88
Data Release Authorized:

C.A.S. Number		ug/L	
108-95-2	Phenol	10.	U
111-44-4	bis(2-Chloroethyl)ether	10.	U
95-57-8	2-Chlorophenol	10.	U
541-73-1	1,3-Dichlorobenzene	10.	U
106-46-7	1,4-Dichlorobenzene	10.	U
100-51-6	Benzyl alcohol	10.	U
95-50-1	1,2-Dichlorobenzene	10.	U
95-48-7	2-Methylphenol	10.	U
39638-32-9	bis(2-chloroisopropyl)ether	10.	U
106-44-5	4-Methylphenol	10.	U
621-64-7	N-Nitroso-di-n-propylamine	10.	U
67-72-1	Hexachloroethane	10.	U
98-95-3	Nitrobenzene	10.	U
78-59-1	Isophorone	10.	U
88-75-5	2-Nitrophenol	10.	U
105-67-9	2,4-Dimethylphenol	10.	U
65-85-0	Benzoic acid	50.	U
111-91-1	bis(2-Chloroethoxy)Methane	10.	U
120-83-2	2,4-Dichlorophenol	10.	U
120-82-1	1,2,4-Trichlorobenzene	10.	U
91-20-3	Naphthalene	10.	U
106-47-8	4-Chloroaniline	10.	U
87-68-3	Hexachlorobutadiene	10.	U
59-50-7	4-Chloro-3-methylphenol	10.	U
91-57-6	2-Methylnaphthalene	10.	U
77-47-4	Hexachlorocyclopentadiene	10.	U
88-06-2	2,4,6-Trichlorophenol	10.	U
95-95-4	2,4,5-Trichlorophenol	50.	U
91-58-7	2-Chloronaphthalene	10.	U
88-74-4	2-Nitroaniline	50.	U
131-11-3	Dimethylphthalate	10.	U
208-96-8	Acenaphthylene	10.	U
99-09-2	3-Nitroaniline	50.	U

C.A.S. Number		ug/L	
83-32-9	Acenaphthene	10.	U
51-28-5	2,4-Dinitrophenol	50.	U
100-02-7	4-Nitrophenol	50.	U
132-64-9	Dibenzofuran	10.	U
121-14-2	2,4-Dinitrotoluene	10.	U
606-20-2	2,6-Dinitrotoluene	10.	U
84-66-2	Diethylphthalate	10.	U
7005-72-3	4-Chlorophenyl-phenylether	10.	U
86-73-7	Fluorene	10.	U
100-01-6	4-Nitroaniline	50.	U
534-52-1	4,6-Dinitro-2-methylphenol	50.	U
86-30-6	N-Nitrosodiphenylamine (1)	10.	U
101-55-3	4-Bromophenyl-phenylether	10.	U
118-74-1	Hexachlorobenzene	10.	U
87-86-5	Pentachlorophenol	50.	U
85-01-8	Phenanthrene	10.	U
120-12-7	Anthracene	10.	U
84-74-2	Di-n-butylphthalate	10.	U
206-44-0	Fluoranthene	10.	U
129-00-0	Pyrene	10.	U
85-68-7	Butylbenzylphthalate	10.	U
91-94-1	3,3'-Dichlorobenzidine	20.	U
56-55-3	Benzo(a)anthracene	10.	U
117-81-7	bis(2-Ethylhexyl)phthalate	5.	J
218-01-9	Chrysene	10.	U
117-84-0	Di-n-octylphthalate	10.	U
205-99-2	Benzo(b)fluoranthene	10.	U
207-08-9	Benzo(k)fluoranthene	10.	U
50-32-8	Benzo(a)pyrene	10.	U
193-39-5	Indeno(1,2,3-cd)pyrene	10.	U
53-70-3	Dibenzo(a,h)anthracene	10.	U
191-24-2	Benzo(g,h,i)perylene	10.	U

(1)-Cannot be separated from diphenylamine

APPENDIX E. Treatment Study Report

TOLS011669

BZTO104(e)048502

Project No: 821401 September 6, 1988

Client: TIME OIL

Project Title: TREATMENT STUDY OF PCP CONTAMINATED SOILS

To: Mark Anderson

From: Bill Mahaffey

cc: Al Bourquin
John Kinsella

OBJECTIVE:

Time Oil Company has identified a site with extensive pentachlorophenol (PCP) contamination in the soil (up to 8000 ppm). The company has indicated that it has considered investigating soil washing treatment and is seeking cost effective alternative technologies. Ecova has acquired soil samples for evaluating potential treatment technologies which may be applied at the site for subsequently preparing a remediation proposal for the contaminated soils. Candidate technologies which were evaluated were variations of soil slurry biotreatment and soil washing.

SOIL CHARACTERIZATION:

The soil samples acquired from the Time Oil site were sandy in texture. Four individual samples were composited and analyzed. Soils were extracted following EPA standard methodology (Method #720). The PCP concentration in the composited soil was determined to be 680 mg/kg by gas chromatography and mass spectral analysis. Individual soil samples ranged in concentration from 2.2 ppm to 2000 ppm. pH of the composite soil was low.

A. SLURRY TREATMENT:

Composited soil was placed in duplicate flasks at concentrations (weight of soil per slurry weight, w/w) of: 5 %, 15 %, 25 % and 40 % in the appropriate volume of an inorganic nutrient solution. This solution (pH 7.2) contains sufficient levels of nitrogen and phosphorous to sustain microbial growth on the mineralizable carbon in the soil. Soil slurries were placed on a shaker and incubated for one week at constant temperature. After one week, the PCP concentration and pH of the 15 - 40 % slurries were determined. The pH of these slurries had decreased to pH < 6 which may not be conducive to optimal microbial activity. To determine if pH impacted the biodegradation of PCP the pH of the 5 %, 15 % and 40 % soil slurries were readjusted to pH = 7.2. It was determined that 0.01 equivalents of base per kg of soil was required to obtain a pH of 7.2 in the 40 % slurries. The amount of base added to the 15 % and 5% slurries was adjusted accordingly and a pH of 7.2 confirmed by direct measurement. The

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25 % slurries were left unchanged and served as a control. Slurry flasks were incubated on the shaker an additional week and PCP concentrations again determined. No PCP degrading organisms were found in the original soil samples. Therefore an inoculum of proprietary Ecova PCP degrading organisms was added. After four and ten days of incubation following the inoculum addition, PCP levels were once again determined.

PCP ANALYSIS:

To obtain rapid and accurate evaluation of PCP degradation in the slurry evaluations, a UV/Vis spectrophotometric analysis was employed. Aliquots of the aqueous portion of the slurry scanned from 220 nm to 400 nm. PCP concentrations were calculated on the basis of the absorption at 320 nm after subtracting the baseline correction absorption at 360 nm. A standard curve for absorption vs PCP concentration was linear to 1.0 ppm (mg/l). Method interferences are additive for spectrophotometric methods and therefore ND (non detected) means concentrations can be no higher than the detection limit.

RESULTS:

Results of the slurry experiments are summarized in the table below and in the attached figure. As can be seen from the data on the 40 % slurry the UV/Vis method of PCP analysis (248 mg/l) is in very good agreement with the theoretical values calculated from the GCMS analysis of the composited soil (272 mg/l).

PCP Concentration mg/l (% reduction)

SAMPLE	THEORETICAL	7 DAYS	13 DAYS**	17 DAYS	23 DAYS
40 % w/w	272(248)*	276	250(10%)	190(24%)	ND(100%)
25 % w/w @	170	145	130(10%)	--	33(75%)
15 % w/w	102	100	76(24%)	10(86%)	ND(100%)
5 % w/w	34	---	ND	--	ND

* Time 0 PCP concentration of 40 % slurry measured by UV/VIS spectroscop all other values extrapolated from PCP value of 680 ppm in composited soil
** Inoculum added to slurries on Day 13.
@ 25 % slurries pH < 6. Other slurries adjusted to pH = 7.2.
ND - non detected. Detection limit = 1.0 ppm.

Although some reduction may have occurred during the first two weeks, there was little evidence for the existance of any significant biological activity for PCP degradation in the Time Oil soils. Attempts to isolate PCP degrading microbes from the slurries were unsuccessful. A PCP degrading culture from the Ecova culture collection adapted to growth on 1000 mg/l PCP was

four day period: 86.8% and 24.0% reduction in the 15 % and 40 % w/w slurries respectively. This reduction was complete (100%) after 10 days inoculation in both the 15 % and 40 % slurries. The rates of PCP removal before and after inoculation are the following:

Slurry Concentration	Before Inoculation Rate Constant	T1/2 (Days)	After Inoculation Rate Constant	T1/2 (Days)
40 %	k=0.016	42	k=0.5	1.4
25 % *	k=0.018	38	k=0.137	5.0
15 %	k=0.046	15	k=0.5	1.4

* 25 % slurry pH < 6.0. Other slurries adjusted to 7.2.

Conclusions:

1. The level of natural microbiological PCP degrading activity was low in Time Oil slurries. Based on the rate of PCP removal with the natural microbial population the treatment time would be quite long. There is no indication that target levels of PCP could be achieved using these organisms.

2. The introduction of an inoculum from Ecova's culture collection was effective in enhancing the biological removal of PCP from the soil slurries in four days and was able to reduce the 40 %, 15% and 5 % slurries to non-detectable levels in 10 days post inoculation.

3. Rate of biodegradation is significantly affected by pH. Natural soil pH is quite low and therefore will require adjustment to neutral conditions to accomodate optimum microbial activity.

4. Rate of biodegradation is not affected significantly by slurry concentrations. Engineering constraints on maintaining slurry suspensions are more significant.

5. From a biological perspective slurry treatment is effectively given the proper population of microorganisms is introduced and maintained.

6. The use of a UV/Vis spectrophotometric analysis of PCP is a valid, cost effective method which allows rapid sample turnaround for process monitoring.

B. SOIL WASHING TREATMENT:

After receiving the Time Oil soils it was noted that their sandy texture and low clay content might favor soil washing followed by biological treatment of the leachate. To evaluate

this alternative a separate composited soil sample was prepared and washed with various volumes of a basic solution. The PCP concentration in this composite was found to be 1180 mg/kg soil. A wash consisted of shaking a mass of soil with a volume of base solution in a ratio of 1:2 (w/v) for 3 minutes. Soil was allowed to gravity settle and the supernatant solution decanted. After several washings, the soil was extracted using standard EPA protocols (Method 720) for PCP extraction. Wash solutions and final soil extracts were evaluated by UV/Vis spectrophotometry which provided a rapid sensitive method for PCP analysis.

Findings: Results are summarized in the table below:

	RESIDUAL SOIL PCP CONCENTRATION
SAMPLE	UV/VIS METHOD*
2 x WASH	210 mg/l
4 x WASH	26 mg/l

* Method involves screening basic aqueous extract of the soil at 320 nm.

It is evident that soil washing would be quite effective at removing most of the residual PCP from the soil. This could be advantageous from a treatment perspective as it is easier to treat a liquid than a soil slurry. Materials handling is easier in that the treatment system can be run with a continuous feed, which may be difficult with a soil treatment system. Also retention times can be reduced considerably. For example Ecova is currently operating a laboratory bioreactor with a microbial population which is capable of growing on 1000 mg/l/day PCP and will tolerate concentrations up to 3000 mg/l/day. If the washing effectively reduces the PCP concentration in the soil to delisting concentrations then this alternative should be evaluated seriously.

CONCLUSIONS:

1. Soil washing can effectively reduce PCP concentrations to low levels.

2. In previous studies, Ecova has demonstrated that wash leachates can be rapidly treated in a continuous feed reactor, with minimal neutralization required.

3. In addition to tankage requirements large quantities of alkali are required for soil washing.

E C O V A

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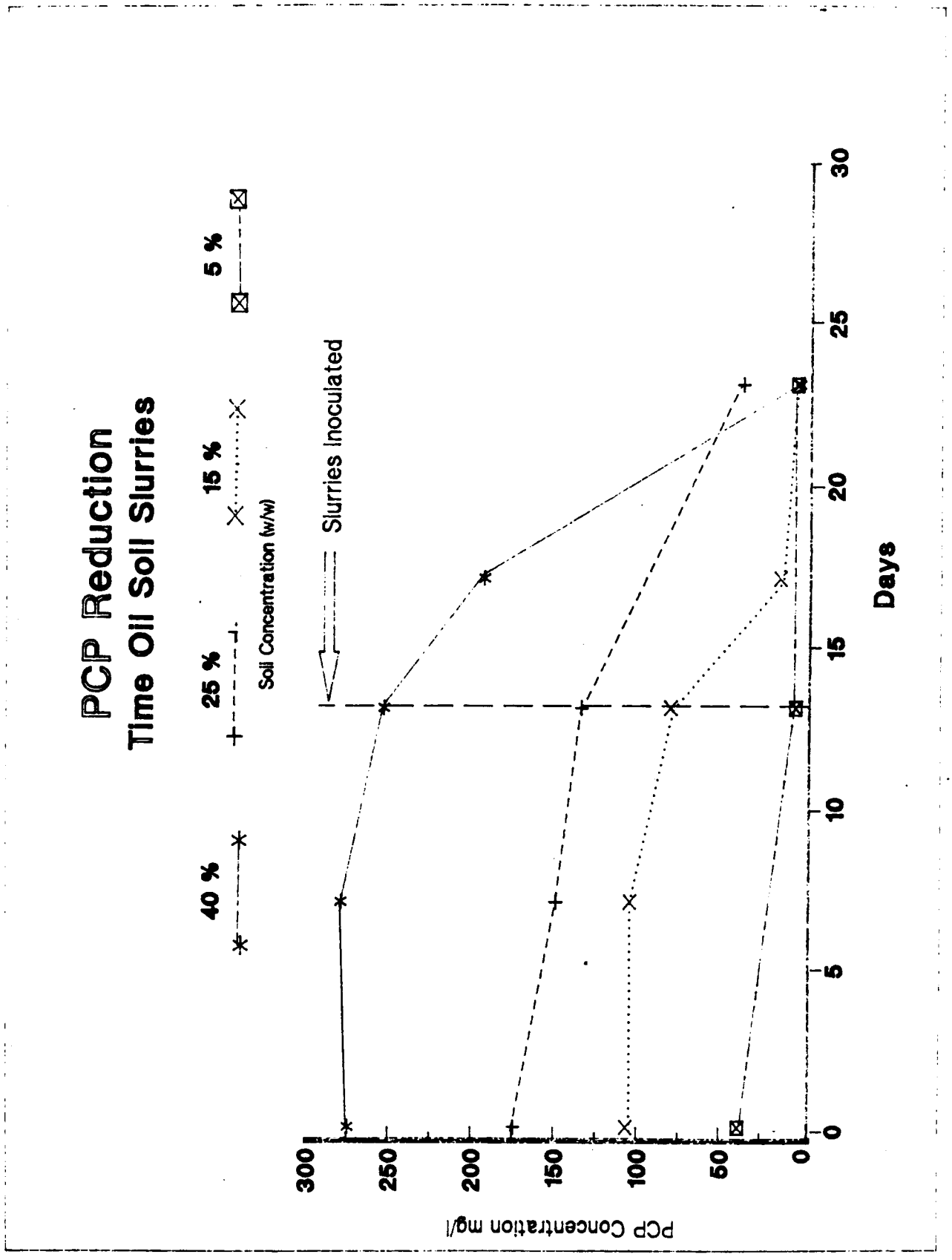

ECOVA

TOLS011674

BZTO104(e)048507

9/13/82/FT

Ecova Workplan for NW Terminal - Mark Anderson

Cleanup	Res. Time (Days)	Batch-ing	$ for 3440 cy	$/Xtra cy
500	.6	continuous	220.3K	64	210
100	3.9	5	311.5K	91	55
50	5.3	7	~348.8K	101	66
ND	10	12	~400K	?

1. Excavate & stockpile. Sample & analyze on site as we go to identify extent of contam. Dig up to cleanup level. Screen soil to remove rocks, etc. This will mix soil to achieve "average" concentration
2. Excavate borrow pit to fill contam. site
3. Pump groundwater - will be recycled in bioreactor & treated - might need to store if high volume

"Extra Costs"
Regulatory Authorization - T&M on work orders
Well Installation

9/14 Response

Assumptions
pg 2-7 over-size material not contaminated - [can be washed if it is - no more cost]
pg 4-1 3440 ~~yd³~~ ($10/yd if more or less - measure the pile, could weigh it
680 ppm blended concentration } - Ecova assumes risk of variation
1.4 days half-life

M E M O R A N D U M

September 14, 1988

TO: Robert Abendroth Seattle

FROM: Fred Proby Seattle

SUBJECT: NW WOODTREATING CLEAN-UP WORK PLAN

Attached is Ecova's work plan for pentachlorophenol clean-up at Northwest Terminal. Work plan presents a preliminary engineering design, schedule and costs for reducing penta concentration to a level acceptable to the Oregon Department of Environmental Quality (DEQ). Ecova proposes to treat 3,440 cubic yards of soil, reducing the penta concentration from an initial average of 668 ppm to a final concentration of 50 ppm, for a cost of $348,839. That works out to $101 per cubic yard. Treatment of more than 3,440 cubic yards would cost an additional $66 per cubic yard. A higher clean-up goal (100 ppm) would cost about $37,300 less. Clean-up to a "non-detectable" level would cost about $50,000 more.

The first step of the project will be to negotiate a clean-up level with the DEQ. It is anticipated that the goal will be less than 100 ppm. As soon as a standard is reached, we can begin excavating the soil and stockpiling it on plastic. This will stop further leaching to the groundwater and will make it easier to feed soil into the treatment vessels. On-site analytical equipment will be employed to monitor soil concentrations to determine when enough soil has been removed. A borrow pit will be excavated to backfill the site.

The soil to be treated will be placed in reactor vessels and mixed with groundwater already contaminated with penta to form a slurry. Nutrients, air and specially cultured bacteria will be added and the slurry mixed until the desired clean-up level is reached. It has been determined that 50 ppm can be achieved in 5.3 days. Each batch of 108 cubic yards will take one week to treat. (If reduced to a "non-detectable" level, batch time increases to about 12 days.) Total clean-up time to reach 50 ppm would be about seven months.

The clean slurry will be pumped to a settling pond upgradient from the woodtreating site (near the rail loading rack). Clean water, still containing bacteria and nutrients, will percolate into the soil and "sweep" contaminated groundwater into the recovery wells. As the settling pond fills up, clean soil will be transferred to the borrow pit.

Not included in this proposal from Ecova is the installation and testing of recovery wells and additional monitoring wells. Ecova prepared a separate proposal for $16,170 to cover this work. A second bid was received from SRH Assoc. for $14,800. In both bids, the drilling cost was $10,400 (different drillers). Recommend that SRH be used for well installation and Ecova for clean-up.

Note:
Use Ecova for drilling per Robert A 9/21/88

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NW Terminal New Monitor Wells

Bid Comparison

		SRH Pitcher Pump & Drilling Co	ECOVA Driller Geotech Explor.
Drill 3 6"-well cluster (15+25+35 @ 100) + 3 2" monitor wells (20 @ 100) = 6 wells = 160'		10,400 ($65/ft)	10,400
Oversight & Report		3,140	4,620
Lab Analysis	6 PCP samples	660	630
Pump Test		600	520
		14,800	16,170
			+1320
Extra 5" well if needed 20'		1600	

well specs

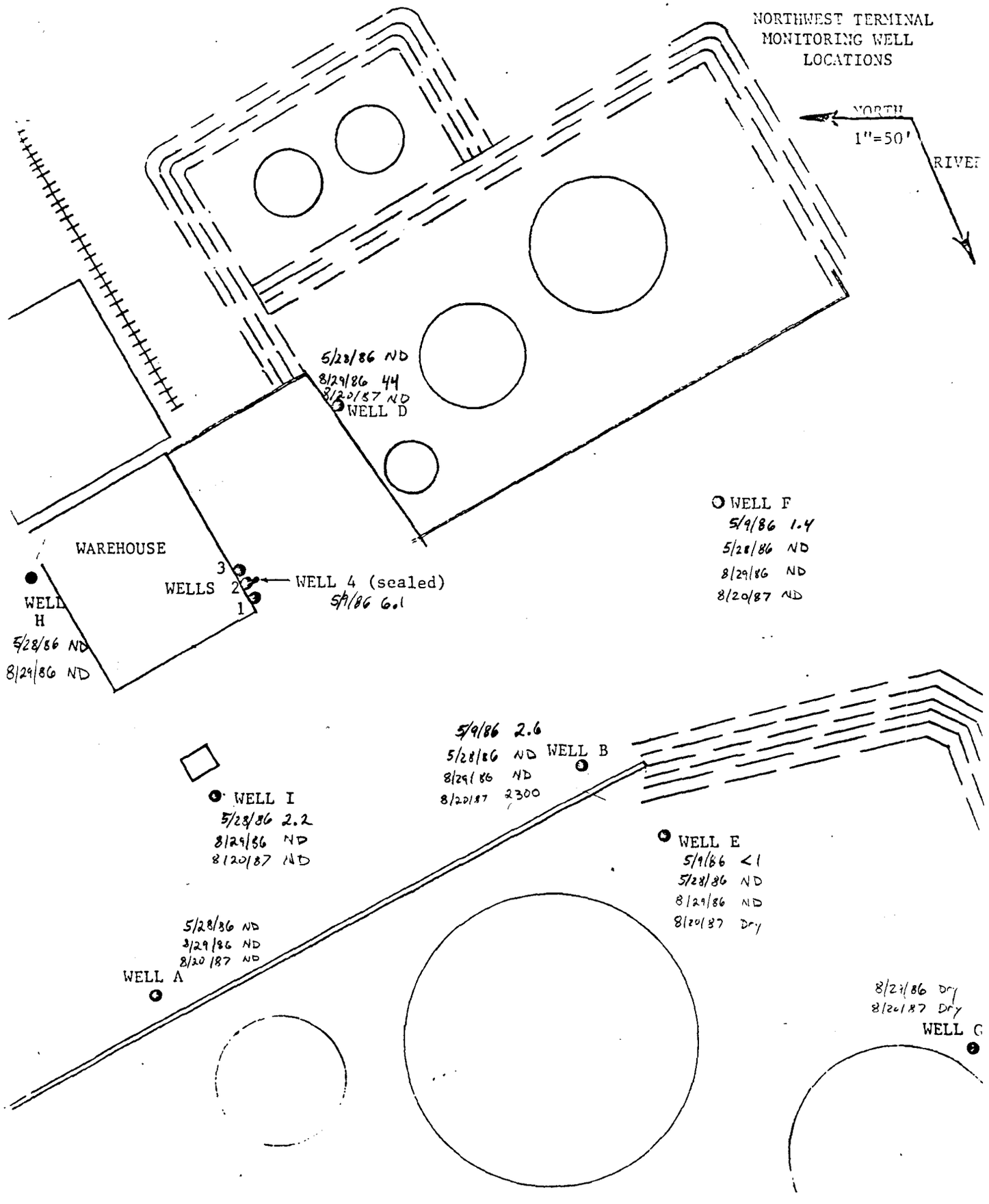
3, 2" PVC wells 20' deep 10' screen
1, 6" PVC well 15' deep 5' screen
2 6" PVC Double-Cased @ 25' & 35'
Raised casings w/ security casing
Pump test

TOLS011677

Pentachlorophenol (ppb) in water

FIGURE I-6

NORTHWEST TERMINAL MONITORING WELL LOCATIONS



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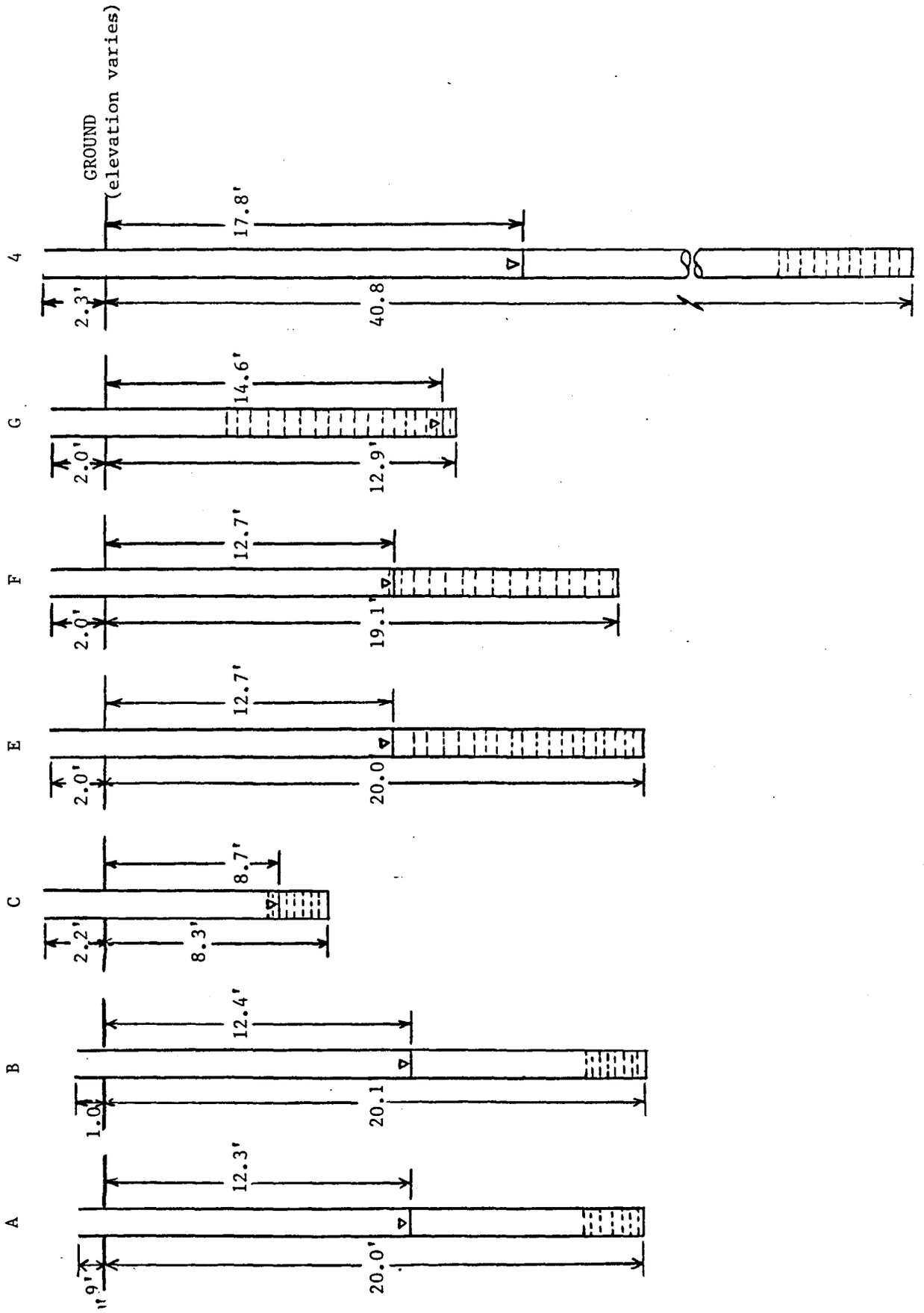
WELL CONSTRUCTION DETAILS



Attachment 3

TOLS011679

WELL 4 BORING LOG

Depth in Feet	Soil Description
0 - 1-1/2	Light brown gravelly sand, moderately compacted, moist (shovel sample)
3-1/2 - 5	Dark brown gravelly sand, moderately compacted, moist, split spoon sample (S.S. sample)
8-1/2 - 10	Light brown gravelly sand, in contact with blue gray gravelly sand, moderately compacted, moist (S.S. sample)
10 - 13	Gravelly sand
13-1/2 - 15	Light blue gray gravelly sand, moderate compaction, saturated (S.S. sample)
15 - 18-1/2	Gravelly sand
18-1/2 - 20	Light blue gray gravelly silty sand with a clay lens, moderately compacted, saturated (S.S. sample)
20 - 23-1/2	Gravelly silty sand with clay lens
23-1/2 - 25	Light gray gravelly silty fine sand with minor clay lens, moderately compacted, saturated (S.S. sample)
25 - 28-1/2	Fine sand
28-1/2 - 30	Light gray medium to fine sand, 3-1/2" thick clay lens, saturated (S.S. sample)
30 - 32-1/2	Medium to fine sand with clay lenses
32-1/2 - 35	Light gray medium to fine sand, minor clay lenses, saturated (S.S. sample)
35 - 37-1/2	Medium to fine grained sand
37-1/2 - 39	Light gray medium to fine sand (S.S. sample)
39 - 42-1/2	Light gray medium to fine sand
42-1/2 - 45	Light gray medium sand grading to fine sand with depth, minor clay lens (S.S. sample)
45 - 47-1/2	Fine sand, saturated
47-1/2 - 49	Light gray sandy silt grading to light gray silty fine sand (S.S. sample)

"CONFINING LAYER"

Attachment 2

Attachment 5

E C O V A

September 16, 1988

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

Dear Fred:

As per our telephone conversation, I have broken out labor costs and equipment costs for each activity of the proposed remediation program. The enclosed tables break out the costs for the specified cleanup levels of 50, 100, and 500 ppm.

I have also enclosed a work plan with confidential information deleted for your submittal to Koppers Company. I'm sure you can understand why we prefer to have information like costs and resumes held as confidential.

I hope this detail supports your management in their decision-making process. We are very excited about this program and look forward to initiating remediation activities. If I can provide any additional information, feel free to call me.

Sincerely,

John Kinsella
Vice President, Operations

109/920999-3.916:ch/2
Enclosures

cc: Mark Anderson
April Rivkin

Corporate Office
3820 159th Avenue NE
Redmond, WA 98052
(206) 883-1900
(206) 867-2210 FAX

Gulf Coast Region
12790 Merit Drive #220
Lock Box 145
Dallas, TX 75251
(214) 404-7540
(214) 404-7545 FAX

Eastern Region
500 Fifth Avenue
Suite 935
New York, NY 10110
(212) 840-1042
(212) 840-1663 FAX

TOLS011681

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TABLE 1
Detailed Cost Breakdown
Time Oil Company
50 PPM Cleanup Standard

ACTIVITY	LABOR COST	MATERIALS & ODC COSTS	TOTAL COST
Treatment System Design	$ 10,535	$ 440	$ 10,975
Mobilization and Construction + Excavation	58,480	73,494	131,974
Treatment Operation	84,720	114,450	199,170
Demobilization (Decon Only)	5,970	750	6,720
TOTAL COST	$ 159,705	$ 189,134	$ 348,839

TOLS011682

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TABLE 2
Detailed Cost Breakdown
Time Oil Company
100 PPM Cleanup Standard

ACTIVITY	LABOR COST	MATERIALS & ODC COSTS	TOTAL COST
Treatment System Design	$ 10,535	$ 440	$ 10,975
Mobilization and Construction	58,480	73,494	131,974
Treatment Operation	74,720	87,774	161,869
Demobilization (Decon Only)	5,970	750	6,720
TOTAL COST	$ 149,080	$ 162,458	$ 311,538

TOLS011683

BZTO104(e)048516

TABLE 3
Detailed Cost Breakdown
Time Oil Company
500 PPM Cleanup Standard

ACTIVITY	LABOR COST	MATERIALS & ODC COSTS	TOTAL COST
Treatment System Design	$ 10,535	$ 440	$ 10,975
Mobilization and Construction	57,380	70,494	127,874
Treatment Operation	44,750	29,946	74,696
Demobilization (Decon Only)	5,970	750	6,720
TOTAL COST	$ 118,635	$ 101,630	$ 220,265

TOLS011684

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Penta Clean-up

9/18/88/RLP

Oregon DEQ – Chuck Clinton (503) 229-5263

9/19 Has a new Environmental Clean-up Division will check w/ them to see who has our project & will call me back

9/20 Ed Woods

OR has a new clean-up law & more formal* method/process for clean-ups

Need to talk to [redacted] Envir Cleanup Div

*Will sign a consent agreement

The state has not yet worked out a cleanup level for penta – "shooting for background"

We'd have to demonstrate that something higher was not a problem

The DEQ has lots of new people & its a new law so it will take "a long time" – maybe six months

9/22 Tom Miller

- We have the option of not involving the DEQ at all then take the risk that they'll accept it when we're done
- The DEQ has to recover its costs: even consultation. Requires a deposit up front of $5000 to cover their "oversight" costs
- Alt is Consent Decree, under which the DEQ "certifies" the remedy

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- They're getting inundated w/ requests for determinations that property is clean
- The non-involvement option is very risky since the DEQ isn't there during data gathering & selection of procedures & protocols. If data is high-quality, EPA protocol and well-documented, there shouldn't be a problem.
- The new law requires an "Endangerment Risk Analysis" and a "Natural Resource Damage Assessment"
- He has a question whether the DEQ is mandated by law to be involved since it may be a "hazardous waste" which is being "treated". - Will look into it & call me back
- They use EPA procedures for RI/FS
- will send copy of policy, etc

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E C O V A

September 23, 1988

Mr. Fred Proby
Environmental Specialist
Time Oil Company
2737 W. Commodore Way
Seattle, Washington 98199

Dear Mr. Proby:

On behalf of Ecova Corporation, I am pleased to provide this services agreement for our services at your facility in Portland. As we discussed today, completing a services agreement is to our mutual benefit, because it resolves contractual matters before we provide our services. With a services agreement in place between Ecova and Time Oil, we have the ability to respond immediately upon request.

Please review the document and let me know if there are any changes you would like to see.

We appreciate the opportunity to provide our services. If you have any questions or would like additional information, please call me at (206) 883-1900.

Sincerely,

Mark Anderson

Mark Anderson
Project Manager

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(206) 867-2210 FAX

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TOLS011687

MASTER SERVICES AGREEMENT

This Agreement, dated as of September 26, 1988, is made and entered into by and between Ecova Corporation ("Ecova") and Time Oil Company, 2737 West Commodore Way, Seattle, Washington 98199 ("Client"). The parties agree as follows:

1. Services.

1.1 Ecova will perform for Client such services (the "Services") as may be agreed upon in writing from time to time by the parties pursuant to a proposal, purchase order or other instrument that specifically references this Agreement (an "Order"). The Services may include, but are not necessarily limited to, technical, analytical, engineering, consulting, and other services in support of the Client's assessment, treatment, and cleanup of contamination (a "Project") at a site designated by Client (a "Site").

1.2 Ecova will use commercially reasonable efforts to commence, prosecute, and complete all Services in accordance with any schedule therefore set forth in the applicable Order. Ecova will promptly notify Client of any delay in performance of the Services, the reasons for the delay, the anticipated duration of the delay and the steps being taken by Ecova to mitigate or overcome the delay.

1.3 The parties will cooperate and coordinate the Services with any related activities of Client and Client's consultants, contractors, and representatives. Client will furnish Ecova with such documents, data, information, and other items which are available to Client and which are necessary or useful for Ecova's performance of the Services (e.g., relating to a particular Project or Site). Except to the extent otherwise specified by Client in writing upon Ecova's receipt of any such items, Ecova will be entitled to rely upon the same.

1.4 All Services will be subject to inspection and testing by Client. Client will notify Ecova of any defect, deficiency or error in any Services as soon as practicable after Client discovers or receives knowledge of the same.

1.5 If any Services are to be performed at any Site or location other than Ecova's place of business, Client will furnish any and all access rights, permits, licenses, and other authorizations required (e.g., by any governmental authority or owner of the Site) for performance of such Services.

1.6 Client may, at any time, terminate the Services remaining to be performed under any Order by giving Ecova reasonable advance written notice of such termination. In the

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event of any such termination, Client will pay Ecova for all: (a) Services performed prior to Ecova's receipt of notice of termination; (b) Services performed after such receipt in accordance with Client's instructions or as reasonably required to effect an orderly termination; and (c) costs reasonably incurred by Ecova on account of the termination (e.g., based on commitments made by Ecova to its suppliers and other third parties in anticipation of performing the terminated Service, but excluding any costs based on loss of profit or revenues that would otherwise have been earned on terminated Services).

2. Compensation.

2.1 Client will pay Ecova the fees, charges, reimbursable expenses and other compensation specified in the Orders. Unless otherwise specified in the applicable Order, Ecova will issue an invoice for the Services performed during any calendar month promptly after the end of the month. Client will pay each of Ecova's invoices within thirty (30) days after receipt. Ecova will promptly furnish such documents, information, and other items as Client may reasonable request to verify any invoice. Any amount which is not paid when due will bear interest at the rate of twelve percent (12%) per annum or the highest rate permitted by applicable usury law, whichever is less, computed daily and compounded monthly from the date due until the date paid.

2.2 Unless otherwise specified in the applicable Order, the compensation specified in any Order does not include any applicable sales, use, excise or other taxes (except federal income taxes and Washington business and occupation taxes payable by Ecova), and Client will pay before delinquency, or reimburse Ecova on demand for, any such taxes.

3. Confidential and Proprietary Information.

3.1 In connection with the Services, the Orders or this Agreement, either party ("Disclosing Party") may disclose certain information that is confidential or proprietary to the Disclosing Party (whether of a technical, business or other nature, "Confidential Information"). Confidential Information may include, but is not necessarily limited to, any information that is disclosed by Client to Ecova under paragraph 1.3 or that is disclosed by Ecova with regard to its means, methods, processes, techniques, procedures, technology, know-how and trade secrets used in performance of the Services. The Disclosing Party will conspicuously mark or otherwise identify its Confidential Information as such prior to, upon or promptly after disclosure to the Receiving Party.

3.2 The Receiving Party will treat all Confidential Information as confidential and proprietary of the Disclosing Party and will use the Confidential Information solely for the purposes for which it is provided by the Disclosing Party.

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Without limiting the generality of the foregoing, the Receiving Party will take reasonable precautions to prevent any unauthorized use or disclosure of Confidential Information.

3.3 The obligations under paragraph 3.2 will not apply to any: (a) information that is or becomes part of the public domain through no fault of the Receiving Party; (b) information that is obtained by the Receiving Party from a third party other than in connection with the Services, the Orders or this Agreement and without any obligation to treat the same as confidential or proprietary; (c) information that is independently developed by the Receiving Party without reference to any Confidential Information; (d) any disclosure required by legal process or applicable law, provided that the Receiving Party will use reasonable efforts to give advance notice to, and cooperate with, the Disclosing Party in connection with any such disclosure; and (e) any disclosure with the consent of the Disclosing Party.

4. Indemnity and Insurance.

4.1 Ecova will defend and indemnify Client against any suit, arbitration, or other proceeding to the extent based upon any: (a) negligence or strict liability of Ecova; or (b) infringement or misappropriation of any patent, copyright, trade secret or other intellectual property right of any third party by any Services (e.g., as a result of any means, methods, processes, techniques, procedures, technology, know-how or trade secret used by Ecova in performance of the Services).

4.2 Client will defend and indemnify Ecova against any suit, arbitration or other proceeding to the extent based upon any: (a) any negligence or strict liability of Client; (b) infringement or misappropriation of any patent, copyright, trade secret or other intellectual property right of any third party by any items furnished by Client; or (c) Project, Site or Services, except to the extent indemnified by Ecova under paragraph 4.1.

4.3 The obligation to indemnify under paragraph 4.1 or 4.2 includes the obligation to pay any and all costs, damages, interest, and attorneys' fees awarded against the indemnified party in the applicable proceeding or incurred by the indemnified party in the defense or settlement of the proceeding.

4.4 Any party seeking indemnification under paragraph 4.1 or 4.2 will: (a) give the indemnifying prompt written notice of the proceeding for which indemnification is sought; (b) permit the indemnifying party to participate in the defense and settlement of the proceeding; (c) cooperate with the indemnifying party in connection with the defense and settlement of the proceeding; (d) provide, at the indemnifying party's expense, such assistance in the defense and settlement of the proceeding s the indemnifying party may reasonably request; and (e) not settle the proceeding without the prior written consent of the indemnifying party, which consent will not be unreasonably withheld.

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4.5 In the event of any contamination or damage to the environment or any other property caused by the negligence of Ecova or for which Ecova may have strict liability, Client will promptly notify Ecova of the same and provide Ecova the opportunity to correct or otherwise remedy the contamination or damage at Ecova's expense.

4.6 Each party will ensure that any policy of insurance that it carries providing coverage related to bodily injury, death, or damage to any environment or other property in connection with the Services, any Project or any Site will either name the other party as an additional insured or contain a waiver of the insurer's rights of subrogation against the other party. To the extent permitted by such policies, each party hereby waives such rights of subrogation.

5. Compliance with Laws.

5.1 Each party will comply with and perform its obligations under all applicable laws, regulations, rules, orders, and other requirements, now or hereafter in effect, of governmental authorities having jurisdiction.

5.2 To the extent applicable, Ecova will comply with Executive Order No. 11246, the Rehabilitation Act of 1973, the Vietnam Era Veterans' Readjustment Assistant Act of 1974, and the regulations and rules promulgated thereunder. Upon Client's request, Ecova will furnish Client with certificates or other evidence of such compliance.

5.3 In performance of the Services, Ecova will comply with the applicable provisions of the Fair Labor Standards Act of 1983, as amended.

6. Miscellaneous.

6.1 Neither party will be liable for, or be considered to be in breach of or default under this Agreement or any Order on account of, any delay or failure to perform to the extent caused or contributed to by any condition, circumstance, event or occurrence beyond such party's reasonable control. This paragraph will not apply to any monetary obligation.

6.2 Except to the extent indemnified under paragraph 4.1 or 4.2, neither party will be liable to the other for any indirect, incidental, special or consequential damages or any loss of profit, revenue or use. This paragraph will not apply to any infringement or misappropriation of any patent, copyright, trade secret or other intellectual property right.

6.3 Ecova reserves all right, title and interest in and to the means, methods, processes, techniques, procedures, technology, know-how, and trade secrets used in performance of the Services, whether developed prior to or during performance of

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the Services, together with any and all patent, copyright, trade secret, and other intellectual property rights associated with the same. No title, right or license to the same is transferred to Client under or by virtue of this Agreement.

6.4 Client reserves all right, title, and interest in and to any and all soil, rock, water, and other samples from any Site. Unless otherwise specified in the applicable Order, all such samples will be returned to Client at the Site from which they were obtained.

6.5 Each party is engaged in an independent business and will perform its obligations under this Agreement and all Orders as an independent contractor and not as an agent or representative of the other party. Neither party will have any right or authority to create any obligation or make any representation or warranty in the name or on behalf of the other party. This Agreement will not be interpreted or construed to create an association, joint venture or partnership between the parties or to impose any partnership obligation or liability upon either party.

6.6 This Agreement will be fully binding upon, inure to the benefit of, and be enforceable by the parties in their respective successors and assigns.

6.7 This Agreement and the Orders set forth the entire Agreement, and supersede any and all prior Agreements, of the parties with regard to the Services. Unless otherwise specifically agreed to by the parties, any preprinted other standardized terms and conditions accompanying any Order will not constitute a part of this Agreement or any Order and will not be binding upon either party. In the event of any conflict or inconsistency between any provision of this Agreement and the provision of any Order, the provision of this Agreement will control, unless the provision of the Order is expressly stated as an amendment of the pertinent provision of this Agreement. No amendment or modification of this Agreement will be valid unless set forth in the written instrument signed by the party to be bound thereby.

6.8 This agreement will be interpreted, construed and enforced in accordance with the local laws of the State of Washington without reference to its choice of law rules and except to the extent preempted by the laws of the United States.

Ecova:	Client:
Ecova Corporation	_____
By_____	By_____
Title _____	Title_____

TOLS011692

BZTO104(e)048525

ECOVA

October 12, 1988

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

RE: Revised Scope of Work for ECOVA Proposal to Provide Remediation Services Dated September 12, 1988

Dear Fred:

Following up on our telephone conversation yesterday, I have recalculated the estimated costs for performing the work in the subject proposal. The revised costs for 3440 cubic yards are as follows:

Total Project Costs.....$428,900

Additional Treatment and
Excavation Costs per cubic yard.....$90

This cost estimate assumes that a new cleanup criteria of 0.5 ug/g (ppm) will be attained for the contaminated soil, on a dry basis. A cleanup criteria of 0.5 ug/L (ppm) will also be attained for any groundwater treated in the bioreactor. We propose to determine that the cleanup criteria have been reached for each batch based on a GC/FID analytical method.

Also, the incremental costs will apply for soil up to 5000 cubic yards. If additional soil above 5000 cubic yards must be treated, we propose to provide a revised cost estimate. Economies of scale will apply and, in Time Oil's best interests, ECOVA can quote a lower treatment cost per yard for unexpectedly high quantities of contaminated soil that might be encountered.

As we discussed, the current scope of work does not include any work for implementing a system for cleanup of the groundwater. We have assumed that groundwater would be available for slurry makeup only, without including any provision for recovery or reinjection of water. Currently we anticipate letting excess water seep back into the groundwater in the disposal area, recovering any decanted water needed for additional slurry makeup. ECOVA will work cooperatively with whomever is selected to implement the groundwater system.

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In order to achieve this level of cleanup, the batch time for the bioreactors must be increased to approximately 14.5 days. This results in a treatment period of 15 months, using the two ECOVA bioreactors originally included in our proposal. This is a significantly longer batch cycle since the cleanup criteria is two orders of magnitude lower than we originally estimated.

The method you have proposed for determining the volume of soil to be treated (calculating the average of the excavated hole volume and the volume of the stockpiled soil) is perfectly satisfactory. Also, the performance bond requirement that we discussed (bonding up to the contract amount) is acceptable.

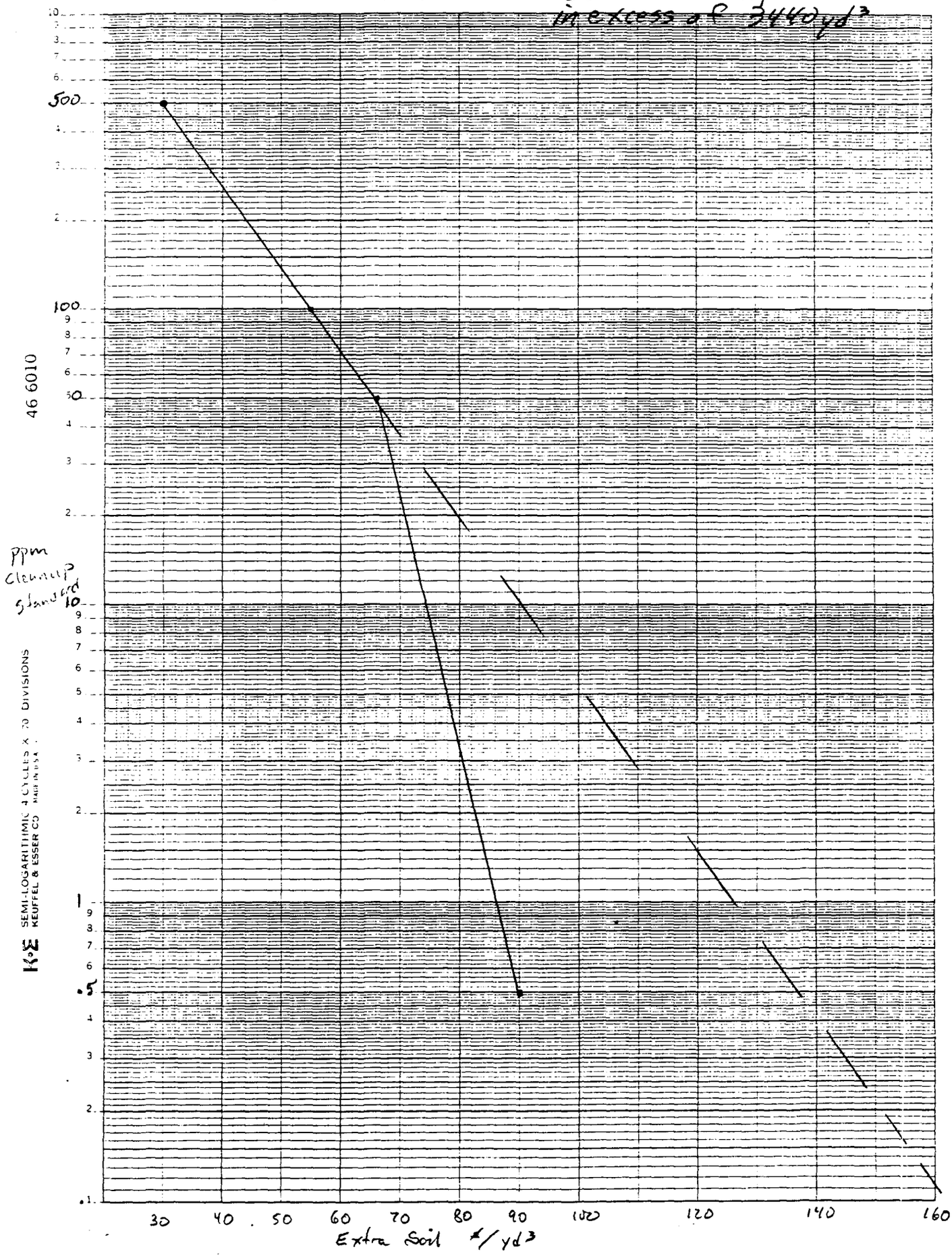
We are prepared to commence work on this project immediately upon receiving authorization, and as I mentioned before, we are very excited about working with you. If you need any additional information, I will be happy to provide it.

Sincerely,

Mark W. Anderson

Mark W. Anderson
Project Manager

Ecova Proposal · Cost for cleanup in excess of 3440 yd³



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ECOVA

BY EJP DATE 10/14 1988 SHEET 1 OF 1

CKD. _____ DATE _____ JOB NO. _____

PROJECT Time Oil SUBJECT PORTLAND, OREGON

ITEM Drilling / Pump Testing

FRED -

I'VE WORKED UP SOME COSTS FOR THE WORK AS WE DISCUSSED. I'M STILL WAITING TO HEAR FROM MY DRILLERS ON COSTS FOR POSSIBLE ALTERNATIVE METHODS. WE WILL SUBMIT A MORE FORMAL PROPOSAL ON MONDAY EXPLAINING THE COSTS SHOWN BELOW.

ECOVA SERVICES

Drilling supervision (assumes 6 wells)	$3120
pump test supervision + analysis (assumes 2 - 24 hour tests)	$4650
Expenses	$1850
Report	600
	$10,220

SUBCONTRACTORS

Drilling	$4485
well materials	$4625
pump test	$ 800
	$ 9910

TOTAL $20,130

I will talk to you on Monday to discuss the drilling options.

Eric J. Pankstaitis
Senior Hydrogeologist
ECOVA Corporation

Ei

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OCT 14 '88 16:35 ECOVA P.2

BZTO104(e)048529

E C O V A

October 18, 1988

Mr. Fred Proby
Environmental Specialist
Time Oil Company
2737 Commodore Way
Seattle, Washington 98199

Dear Fred:

SUBJECT: **PROPOSAL TO PROVIDE GROUNDWATER MONITORING SERVICES AT THE TIME OIL NORTHWEST TERMINAL, PORTLAND, OREGON**

Following up our meeting of this date, we are pleased to submit a revised Statement of Work to define the extent of pentachlorophenol (PCP) groundwater contamination at the site.

Background

A total of nine groundwater monitoring wells have been installed at the Northwest Terminal. Six of the wells are driven 1.5 and 2.0 inch diameter wells; three wells are 2.0 inch diameter drilled wells. The majority of the wells are 20 feet deep, have an average screen length of 6 feet and intercept the water table at approximately 15 feet below ground surface. The wells are located in the vicinity of and down gradient from the former PCP mixing operation.

Shallow groundwater beneath the site flows south towards the Willamette River. Site soils consist of find/medium sand containing some silt and clay. Groundwater flow can be expected to be fairly rapid (100-200 feet/year) in such materials. While installing the monitoring wells, an aquitard was found at around 20 feet depth suggesting the presence of multiple aquifers.

On August 20, 1987, and again on October 16, 1987, water levels and samples were obtained from the site wells. These measurements confirmed that groundwater was flowing south under an average gradient of 0.008 ft/ft. Water from well MW-B was analyzed on August 20, 1987, for PCP and contained 2300 ug/L. It is apparent that a PCP plume, originating from the mixing area, is migrating towards the river.

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Scope of Work

Immediate project objectives are to define the extent of the contaminant plume and to halt its movement. ECOVA proposes to execute this project in two phases. Phase I will consist of well installation, groundwater sampling, and pump testing. Phase II will consist of design and installation of a system to recover the contaminated groundwater plume. Phase II will be implemented after the results of Phase I have been assessed.

Phase I - Well Installation and Sampling

The Phase I investigation will characterize subsurface conditions beneath the site and define the vertical extent of site contamination. ECOVA will install a cluster of three monitoring wells between the former PCP mixing area and well MW-B. These wells will be referred to as J-1, J-2, and J-3, and are expected to be screened over discrete 5-foot intervals respectively as follows:

- Above the aquitard (nominally at 20' depth below land surface);
- Just below the aquitard (nominally at 25' depth); and
- At a greater depth below the aquitard (nominally at 40' depth).

A two well cluster will be installed to replace the single shallow well MW-B. These two wells will consist of a shallow (nominally at 20' depth) 4-inch diameter well to replace MW-B and a new deep (nominally at 40' depth) 4-inch diameter well. In addition, ECOVA will install a shallow (nominally at 20' depth) 2 inch diameter well to replace MW-G. Final depths and completion details of all wells will depend on subsurface conditions encountered at the site. However, to ensure that representative water samples are obtained from each well, the following construction techniques will be used:

- At the first two well locations, a soil boring will be advanced using a mud rotary or hollow stem auger drilling method. Soil samples will be obtained using a split spoon sampler. The strata will be logged and examined for visual contamination by the onsite ECOVA Geologist. The depth to the upper aquitard (approximately 20 feet below grade) will be confirmed.

- For the deeper wells, 10-inch surface casings will be installed to the top of the aquitard and grouted in place in 14-inch holes drilled using the mud rotary drilling method. After allowing the grout to set up, the borings will be advanced to final depth using an air rotary rig equipped with a casing advance system. The 4-inch wells will be installed to final depth as the temporary drive casing is withdrawn. This construction sequence will ensure that no contaminants from the shallow zone are carried down into the deeper layers.

- The shallow borings will be drilled by hollow stem auger. At the required completion depth (approximately 20 feet), PVC flush joint, threaded casing and screen will be installed through the auger stem. The screen will be machine-slotted and the annular space filled with a graded filter sand; the remaining annular space above the screen will be sealed with bentonite and grouted to surface. Shallow wells at the first two locations will be 4-inch diameter, and the third location will be 2-inch diameter.

- All wells will be developed using a surge block technique. Well casing elevations will be surveyed relative to MSL and water levels obtained. Three to five casing volumes of water will be evacuated from the well bore prior to sampling. The samples will be shipped to ECOVA's Analytical Laboratory in Redmond and analyzed for PCP.

- An aquifer testing program will be designed and implemented based on observations made during drilling, results of laboratory analyses of groundwater samples, and anticipated aquifer yields estimated during well development. The pump test(s) will provide sufficient information on aquifer characteristics to serve as a basis for design of the groundwater remediation system. At a minimum, one eight hour pump test will be conducted to define aquifer parameters beneath the site.

As we have previously discussed, additional deeper wells may be required if contamination is found in the deeper wells in the newly installed well clusters. A field decision should be made whether to install the wells while the drilling rig is on site.

Phase II - Plume Recovery

Following analysis of the analytical lab tests (3-week turnaround) and results of the test pumping, a recovery system may be installed. If contamination is confined to the upper zone, the system will consist of a recovery trench (French drain) laid across the plume path. Water from the drain would feed into a sump and be pumped directly (via existing piping) to Tank No. 5313 or other available tank.

If the contamination is found to extend a significant depth below the water table a drain may not be appropriate for contaminant recovery. In this situation, a simple recovery well system will be used for plume capture. The new monitoring wells have been designed to accommodate submersible pumps to function as part of the recovery well system.

Estimated Costs - Phase I

Total estimated costs for the Phase I program are detailed below. These costs assume installation and development of one well per day.

o Drilling Supervision and Sampling	$ 3,120
o Pump Testing and Analysis	$ 520
o Field Expenses and Equipment	$ 900
o Analytical (6 samples plus QA/QC sample)	$ 600
o Summary Report	$ 600
Subcontractor Costs:	
o Drilling, well installation, and well development (five 4-inch wells and one 2-inch well; three double cased)	$ 6,500
o Well materials	$ 3,900
TOTAL (Rounded)	$16,100

We have located a drilling firm able to perform the work required. Drilling equipment will be available in early November. Rapid approval of this work plan will allow us to confirm arrangements with the driller. If you have any questions concerning this work plan, please feel free to contact Eric Paukstaitis, ECOVA Senior Hydrogeologist at (206) 883-1900.

Sincerely,

Mark W. Anderson,
Project Manager

John V. Kinsella,
Vice President, Operations

cc: File

MWA/PROP-TOC.01

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BZTO104(e)048534

E C O V A

November 10, 1988

Mr. Fred Proby
Environmental Specialist
Time Oil Co.
2737 W. Commodore Way
Seattle, Washington 98199

Dear Fred:

Based upon our discussion of this afternoon, I understand your concerns and would like to assure you that we are confident of our ability to successfully perform the Portland project for Time Oil. However, I agree that your concerns need to be addressed regarding your access to project related data which you will need to continue work on the site in the unlikely event ECOVA does run into unforseen financial difficulty. Therefore, Ecova will provide authorization to Time Oil for the disclosure of any confidential information which ECOVA may provide to Time Oil during the conduct of environmental cleanup work at 12005 North Burgard Road, Portland, Oregon as agreed to in an agreement between Time Oil and ECOVA dated the 9th day of November, 1988, provided:

1. Disclosure of such information by Time Oil is reasonably necessary to enable Time Oil to continue with the work contracted for under the above referenced agreement; and

2. ECOVA is financially unable to perform the work covered by the said referenced agreement.

Sincerely,

Joseph M. Bolton
President

JMB:ss:SS004

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Fred

Here is language that can
be added to contract or
be included in a letter that references
the contract. Rick could help you w/ that.

Terry

Ecova consents to the disclosure for use of any confidential information by Time Oil Co. if such disclosure or use is reasonably necessary by Time Oil or Time Oil's contractors to continue with the work contracted for under the above referenced agreement in the event contractor fails or is unable to perform the work under that agreement.

0297C

E C O V A

July 14, 1989 P.N. 821401

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

Dear Fred:

Subject: Results of Chemical Analyses of Samples Obtained on June 29-30 from the Time Oil Northwest Terminal, Portland, Oregon

On June 29-30, Mr. Kevin Murphy, from your office, and I travelled to the Portland Northwest Terminal site to investigate contaminated soil discovered by ECOVA personnel while excavating soil from the trenches to be used for disposal for the PCP treatment operations. While on site, we collected a number of soil and water samples from a series of test pits dug with a backhoe around the location where contaminated soil had been discovered. This letter presents the chemical analyses from these samples which ECOVA was directed to perform.

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Total Petroleum Hydrocarbons (TPH) Analyses

Table 1 presents the analytical results for TPH determinations based upon infrared determination. It is important to note that the IR method does not discriminate among different types of organic compounds, it merely detects the presence of carbon-hydrogen bonds. Thus, for soils which have high natural organic matter present, this method will have high interference levels. For low organic content soils (such as subsurface soils), this method is quite useful. ECOVA has observed natural organic background levels in soils at up to 200 ppm. This level may be appropriate for the soils obtained in this sampling exercise.

Hole #1, the point of initial discovery of the contamination, was observed to have moderate levels of contamination at around 1000 ppm. Hole #6 was observed in the field to have the highest levels of contamination

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based upon odors emanating from the excavation. This is confirmed by the TPH-IR analyses for this data. Holes #5 & #7 appear to have moderate levels of contamination, as well.

Hole #3 and DPDD have low to moderate levels of TPH, but were observed in the field to have a peculiar, distinct odors. These samples were subjected to additional analyses by GC mass spectroscopy.

TABLE 1

Total Petroleum Hydrocarbon Analyses
(IR)

Sample	ppm
Hole 1A	1,201
Hole 1B	1,047
Hole 2A	307
Hole 2B	436
Hole 3A	541
Hole 3B	305
Hole 4A	269
Hole 4B	174
Hole 5A	236
Hole 5B	978
Hole 6A	6,427
Hole 6B	9,002
Hole 7 (Water)	N/D
Hole 7 (Soil)	1,660
Hole 8 (Water)	N/D
Hole 8 (Soil)	415
Hole 9 (Water)	N/D
Hole 9 (Soil)	401
Hole 11 (Water)	N/D
Hole 14 (Soil)	210
DDPD (Soil)	788

GC Mass Spectroscopy

Four soil samples were analyzed by GC-MS, Holes #1, #3, and #14, and Sample #DDPD. Since no water samples analyzed for TPH-IR were observed to have over 10 ppm, no GC-MS samples were run on these samples.

Hole #1

This sample was run on a rush basis to qualitatively and quantitatively determine the nature of the organic contaminants present at the disposal pit. The analysis confirmed that the contaminants were most likely to be mineral spirits, which was in agreement with the nature of the odor observed emanating from the backhoe pit.

Hole #3

This sample showed moderate levels of contamination based on the TPH-IR analysis. There was a clear match for phenol on the GC-MS run. Also 7-8% of the organic contamination consisted of very heavy hydrocarbons (over C30) with extensive carbon molecule branching and double bonds.

Hole #14

The following matches to the GC-MS library were observed:

Decahydro-2-methyl-napthalene
2,6Bis(1-1,dimethylethyl)-4 methyl phenol
1,4-Dimethoxy anthracene
2,2'-methylenebis[6-(1,1-dimethylethyl)-4-ethyl phenol
Numerous C10-C36 hydrocarbons

These results show the presence of PNAs which appear to be breakdown products of napthalene.

Sample #DDPD

The following matches to the GC-MS library were observed:

1,2,3,4 tetrahdro-1,6 dimethyl-4-(1-methylethyl)-, (1S-cis)-naphthalene
1,4-dimethoxy-anthracene

2,2'-methylenebis[6-1(1,1-dimethylethyl)-4-ethyl-phenol
Numerous C10-C36 hydrocarbons

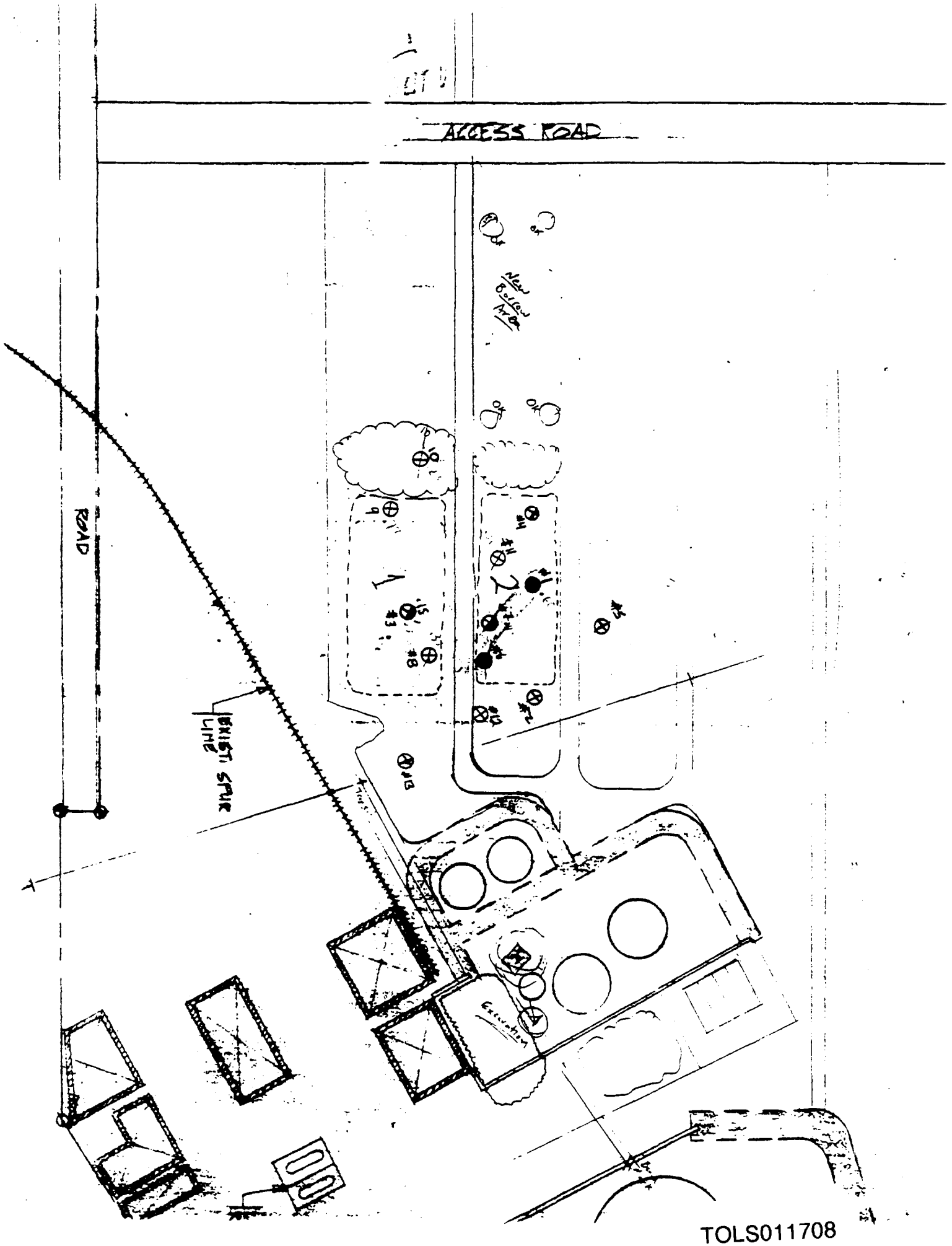
These results show the presence of PNAs which appear to be breakdown products of napthalene.

We appreciate the opportunity of serving you on this project. If you have any questions over any of this information, please do not hesitate to give me a call.

Sincerely,

Mark W. Anderson, P.E.
Senior Project Manager

cc: Kevin Murphy, Time Oil Company
J. Kinsella
Files



TOLS011708

CORROON & BLACK, INC.

Date: July 27, 1989

To: Mr. Fred Proby
Time Oil Company
2737 W. Commodore Way
Seattle, WA 98199

Re: Ecova Corporation

Gentlemen:

We are pleased to enclose documents indicated below:

X	Certificate of Insurance
	Memorandum of Insurance
	Original Policy (As Captioned)
	Copy of Policy (As Captioned)
	Loss Payable and/or Mortgage Clause
	Contract of Sale Clause
	Cover Note and/or Binder
	Other

The enclosed is issued in connection with:

Evidence of insurance coverage

We trust you will find the enclosures to be entirely satisfactory.

Very truly yours,

By: Jennifer L. Flath

Jennifer L. Flath
(206) 443-6629

cc: Ecova Corporation
Natl. Union Fire Ins. c/o C & B Milwaukee

P.O. Box C-34201 Zip 98124
2911 Second Avenue Seattle, WA 98121 (206) 443-2300
Telex: 160565 FAX: (206) 443-6631
Insurance • Bonds • Benefits • Risk Management

TOLS011709

ACORD. CERTIFICATE OF INSURANCE

ISSUE DATE (MM/DD/YY)
7-27-89 jlf

PRODUCER

CORROON & BLACK, INC.
P.O. Box 34201
Seattle, WA 98124

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW

COMPANIES AFFORDING COVERAGE

CODE SUB-CODE

INSURED

ECOVA CORPORATION
3820 - 159th Ave. NE
Redmond, WA 98052

COMPANY LETTER A National Union Insurance Company
COMPANY LETTER B
COMPANY LETTER C
COMPANY LETTER D
COMPANY LETTER E

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	ALL LIMITS IN THOUSANDS	
	GENERAL LIABILITY				GENERAL AGGREGATE	$ 1,000
A	X COMMERCIAL GENERAL LIABILITY				PRODUCTS-COMP/OPS AGGREGATE	$ 1,000
	X CLAIMS MADE OCCUR.	GLCM 8019516	10/30/88	10/30/89	PERSONAL & ADVERTISING INJURY	$ 1,000
	OWNER'S & CONTRACTOR'S PROT.				EACH OCCURRENCE	$ 1,000
	X WA Stop Gap				FIRE DAMAGE (Any one fire)	$ 50
					MEDICAL EXPENSE (Any one person)	$ 5
	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT	$
	ANY AUTO					
	ALL OWNED AUTOS				BODILY INJURY (Per person)	$
	SCHEDULED AUTOS					
	HIRED AUTOS				BODILY INJURY (Per accident)	$
	NON-OWNED AUTOS					
	GARAGE LIABILITY				PROPERTY DAMAGE	$
	EXCESS LIABILITY				EACH OCCURRENCE $	AGGREGATE $
	OTHER THAN UMBRELLA FORM					
	WORKER'S COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY	
					$	(EACH ACCIDENT)
					$	(DISEASE—POLICY LIMIT)
					$	(DISEASE—EACH EMPLOYEE)
	OTHER					

TOLS011710

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/RESTRICTIONS/SPECIAL ITEMS

Re: Job No. 821401 - Pentachlorophenol Remediation
The Certificate Holder is added as an additional insured as respects their interest in the above contract.

CERTIFICATE HOLDER

Time Oil Company
2737 W. Commodore Way
Seattle, WA 98199
Attn: Fred Proby

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

ACORD 25-S (3/88)

©ACORD CORPORATION 1988

PHONE 285-2400
CABLE ADDRESS: TIMOIL
(FAX)206-283-8036

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
LOS ANGELES

TIME
PRODUCTS TIME TESTED

TEN TO ONE IT'S TIME

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

CONTRACT CHANGE ORDER

Contractor: ECOVA Corporation
3820 159th Avenue NE
Redmond, WA 98052

Change Order Number: 1
Date: October 30, 1989

Project: Northwest Terminal
Pentachlorophenol Cleanup

Contract Date: November 9, 1988

Description of Extra Work	Actual Cost
1. Survey reference elevations of existing wells	$ 330.00
2. Use gasoline-compatible liner on Tank 38002	$ 670.00
3. Characterize contamination encountered in clean soil borrow area	$ 3,960.00
4. Evaluate additional solvents (eg. KB3) encountered during penta excavation:	
Collect additional samples	$ 930.00
Sample analysis	$ 3,620.00
Revise Health and Safety Plan	$ 360.00
5. Analyze water from Time Oil "slop tank"	$ 110.00
6. Additional effort on groundwater study:	
Extra pump test	$ 1,500.00
Analyze water for solvents	$ 300.00
7. Provide consultation on Oregon DEQ rules	$ 360.00
Total	$ 10,790.00
Less credit for power drop paid for by Time	$(4,763.00)
Total this Change Order	$ 6,027.00
Revised Contract Price	$451,027.00

Requested By: _____

Approved By: _____

Contractor: Roderick A Carr
Contract Administrator
ECOVA Corp.

TOLS011711

PHONE 285-2400
CABLE ADDRESS: TIMOIL
(FAX) 206-283-8036

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TIME
PRODUCTS TIME TESTED

TEN TO ONE IT'S TIME

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

CONTRACT CHANGE ORDER

Contractor: ECOVA Corporation
3820 159th Avenue NE
Redmond, WA 98052

Change Order Number: 2
Date: October 31, 1989

Project: Northwest Terminal
Pentachlorophenol Cleanup

Contract Date: November 9, 1988

Description of Extra Work	Actual Cost
1. Collect eight soil samples for PCB analysis outside of Crosby & Overton dike wall	$ 700.00
Total this Change Order	$ 700.00
Revised Contract Price	$451,727.00

Requested By: [signature]

Approved By: [signature]

Contractor: Roderick S. Carr
Contract Administrator
ECOVA CORP.

TOLS011712

BZTO104(e)048545

PHONE 285-2400
CABLE ADDRESS: TIMOIL
(FAX) 206-283-8036

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RENO
RICHMOND
LOS ANGELES

TIME
PRODUCTS TIME TESTED
TEN TO ONE IT'S TIME

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

CONTRACT CHANGE ORDER

Contractor: ECOVA Corporation
3820 159th Avenue NE
Redmond, WA 98052

Change Order Number: 3
Date: October 31, 1989

Project: Northwest Terminal
Pentachlorophenol Cleanup

Contract Date: November 9, 1988

Reason For Schedule Change	Weeks Added
1. Power drop to site delayed by Portland Electric due to bad weather	5
2. Discovery of solvents in excavation	3
3. Delay in locating clean soil for backfilling	5
Total Weeks Added to Schedule	13
Performance Period Extended To	September 9, 1990
Impact on Contract Price	None

Requested By: _____

Approved By: _____

Contractor: Roderick A. Carr
Contract Administrator
ECOVA CORP.

TOLS011713

PHONE 285-2400
CABLE ADDRESS: TIMOIL
(FAX)206-283-8036

SEATTLE
TACOMA
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STOCKTON
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RICHMOND
LOS ANGELES

TIME
PRODUCTS TIME TESTED
TEN TO ONE IT'S TIME

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

August 8, 1989

Ecova
Attn: John Kinsella
3820 159th Avenue NE
Redmond, WA 98052

Dear John:

I appreciate your informing me of the imminent departure of Mark Anderson, Ecova's project manager for our penta cleanup at the Northwest Terminal. As agreed, we will meet this Thursday, August 10, at 2:30 in your offices to discuss the implications of this change. I am confident that Mark's designated replacement, Dave Edwards, is capable of bringing this project to a successful conclusion. However, the trend of employee loss that I have seen gives me a serious concern regarding Ecova's overall ability to perform in a timely manner. Accordingly, I would like to be provided with a complete listing of Ecova's personnel, their qualifications and experience, tenure with Ecova and current project assignments.

Sincerely,

Fred Proby
Environmental Specialist

TOLS011714

8/10/89 FGP

Ecova deliverables/Questions - Pre-Meeting Notes

✓ discussed

Done ✓ ○ Post-excavation topo survey and quantity calculation

✓ ○ Demonstration that all chlorinated phenols are mineralized.

✓ ○ Bond - we need evidence that there are no outstanding liens. (The $160K was paid in absence of such proof)

✓ ○ Insurance - Contract calls for Comprehensive General liability and Workmans Comp - we've only been given a cert. for general.

✓ ○ Permits - Need evidence of permits obtained by Ecova.

✓ ○ Task List w/milestones

✓ ○ QA/QC data for soil results prior to backfilling (6/16/89 memo)

✓ ○ Project Schedule: 19 months from 11/9/88 is June 1990

Ecova will pay ok ✓ ○ Portland electric bill

✓ ○ Pile Stabilization
- Ecova will reshape pile & consider - put up sprinklers

TOLS011715

BZTO104(e)048548

8/10 Thurs 89 FLP

NW Penta
States Meeting
Eric, April, John K, Dave E, Mark A, Jim Barthen, Site Supervisor since 6/28/89, Bill Mahaffey

Change Orders - FLP verbal authorization [so claims ECOVA]

1.	Disposal Pit Cleanup	8120 spent to date
2.	Solvents	11,660
3.	Slop tank pump over	2110
4.	Groundwater pump test	1800
	Total	23,690

Discussion

1. Disposal Pit - "Hot Spots"
   - ★ a. Response & analysis - not in scope need to add analyses
   - b. Collecting additional backfill - should be in contract scope

2. Solvents
   - a. Solvent made soil more difficult to handle -
     - This is only valid as excess yardage above 3,440 yd³
   - b. Solvent sampling & analyses - done separately from PeP samples
     - Valid extra cost.
   - c. Revise H&S plan - ~~extra cost~~
   - d. Pump pit - Not valid extra cost
   - e. Repumping - valid extra cost

3. Slop Tank
   Who did transfer? Ecova?

TOLS011716

BZTO104(e)048549

Need better justification for 25 man-hours to pump water

4. Ground Water Study
   a. Pump test - 8 hr proposed @ $20. Did 24 hr - 20 gpm shallow test and 12 hr 10 gpm deep well test - recovery monitored in each case
      - Need a better cost breakdown
   b. Solvent analyses - valid extra cost.

Proposed Change Orders

1. Treatment of groundwater (in T1)
   Will run slurry batch w/ high penta & solvent, using slop water. Do this instead of lab evaluations at no additional cost.

How much water is in tank T680?
~200,000 gal H2O
16

2. Soil Borings for solvent contam
   → Fred needs to look into soil vapor survey
   Ecova will provide KB3 sample.
3. Groundwater Modeling
   Shallow aquifer only based on
   → Need more data

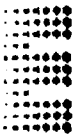
4. Dioxin
   We need it

TOLS011717

5. Treatment of contaminated soil in former pit "hot spot"
   Pit #1 may have contaminated soil
   Pit #2 has a lot
   Pit #3 looks clean

SCHEDULE
- soil washing speeds up process

E C O V A



FAX TRANSMITTAL COVER SHEET

WE ARE TRANSMITTING 7 **PAGES, INCLUDING THIS COVER PAGE.**

DATE: 8/7/89 **FAX NUMBER:** 283-8036

TO: Fred Proag (NAME) Tmi Oil (COMPANY)

FROM: Eric Pankstaitis (NAME)

REMARKS:

IF YOU DID NOT RECEIVE THIS TRANSMISSION CLEARLY, OR HAVE ANY QUESTIONS, CONTACT OUR OFFICE.

Redmond, WA

AUG 07 '89 15:53 ECOVA

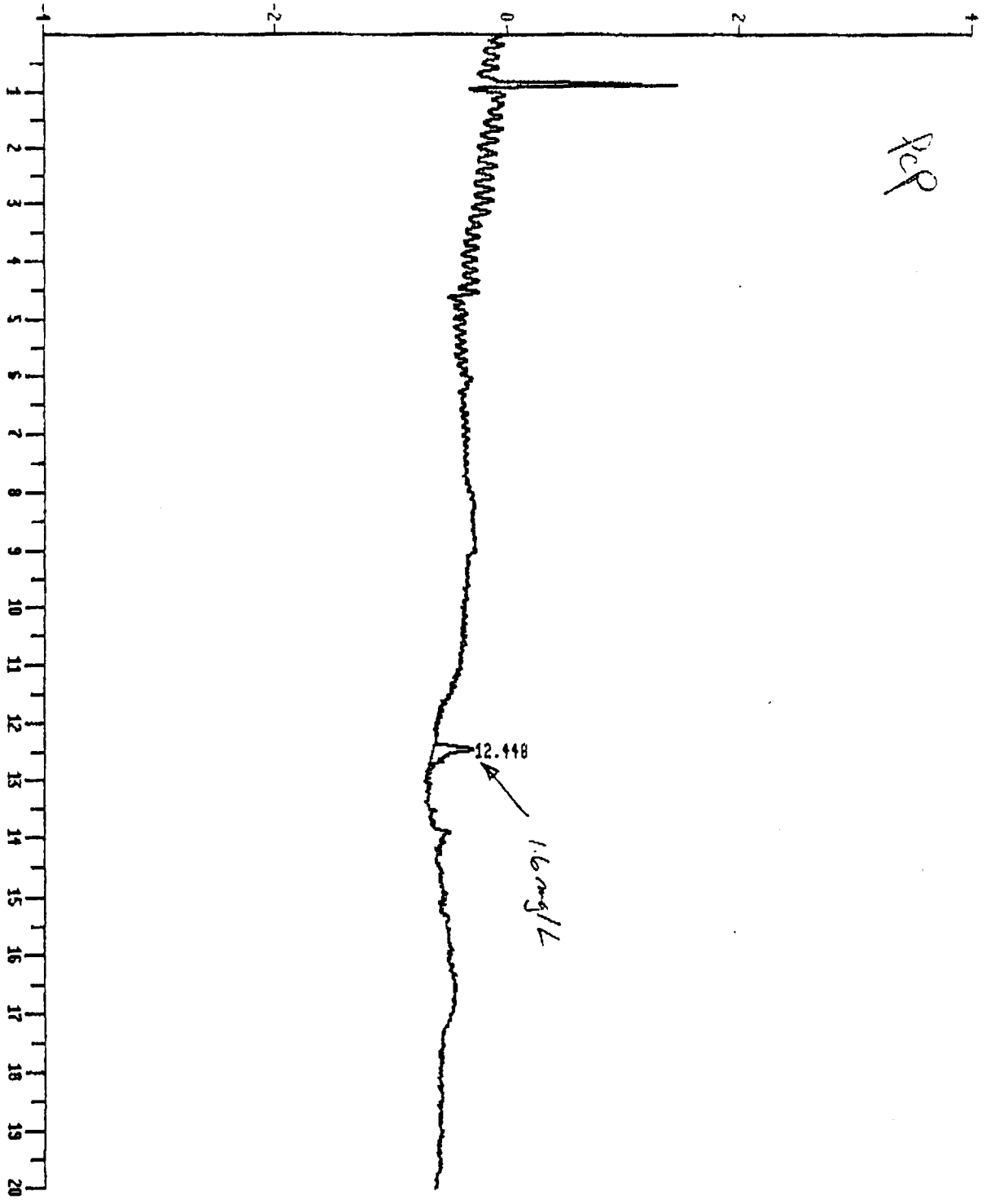
P.1

TOLS011719

BZTO104(e)048552

223-6056

1: LC A 305,4 550,100 of 0804A05A.D



B1

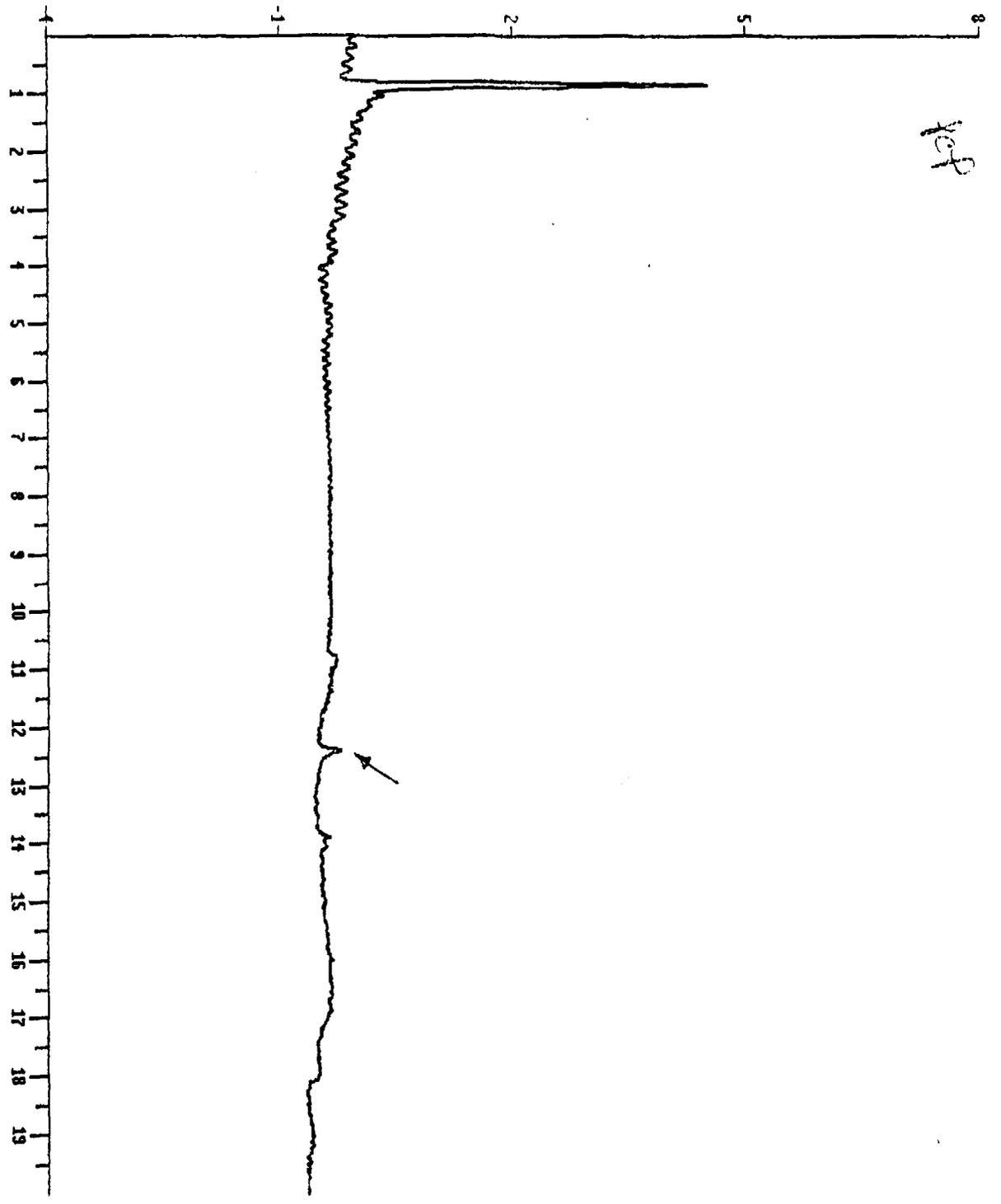
PCP

End of plot. Time = 0.01 to 19.98 minutes Chart speed = 1.00 cm/min

TOLS011720

AUG 07 '89 15:53 ECOVA P.2

1: LC A 305,4 550,100 of 0804A04A.D



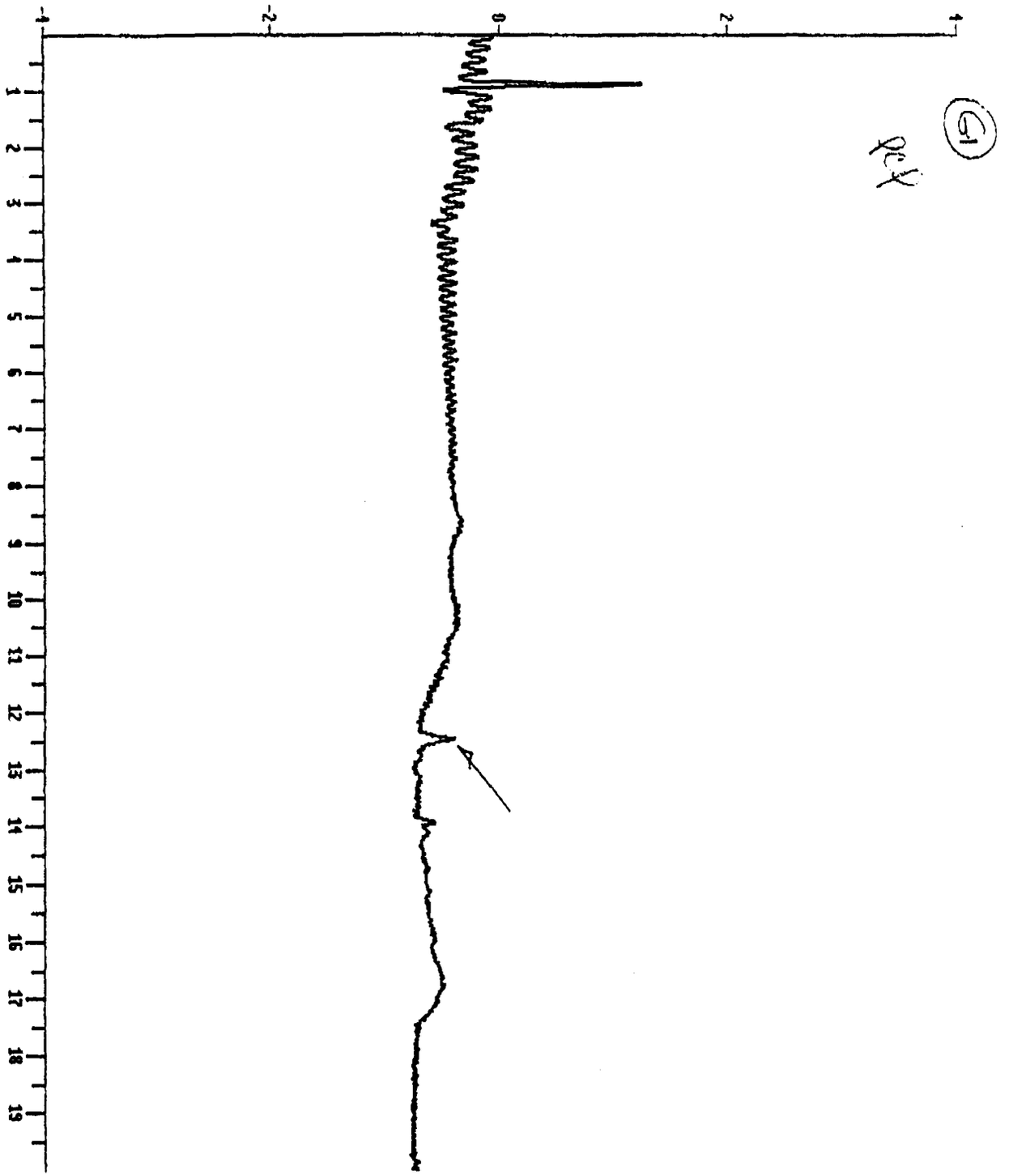
End of plot. Time = 0.00 to 19.98 minutes Chart speed = 1.00 cm/min

TOLS011721

AUG 07 '89 15:53 ECOVA

P.3

1: LC A 305,4 550,100 of 0804A06A.D



End of plot. Time = 0.01 to 19.98 minutes Chart speed = 1.00 cm/min

TOLS011722

AUG 07 '89 15:54 ECOVA P.4

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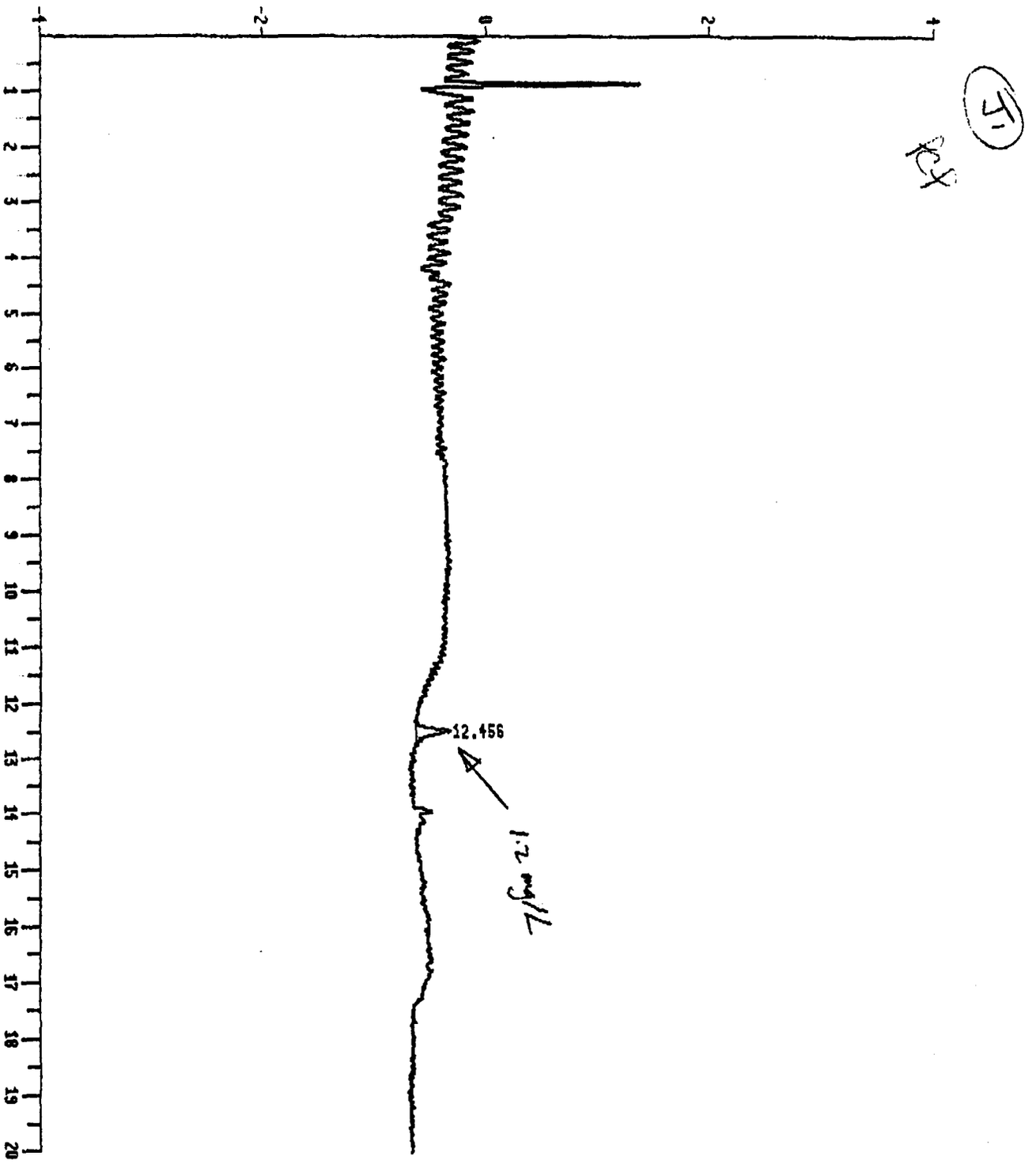

End of plot. Time = 0.01 to 19.99 minutes Chart speed = 1.00 cm/min

TOLS011723

AUG 07 '89 15:54 ECOVA P.5

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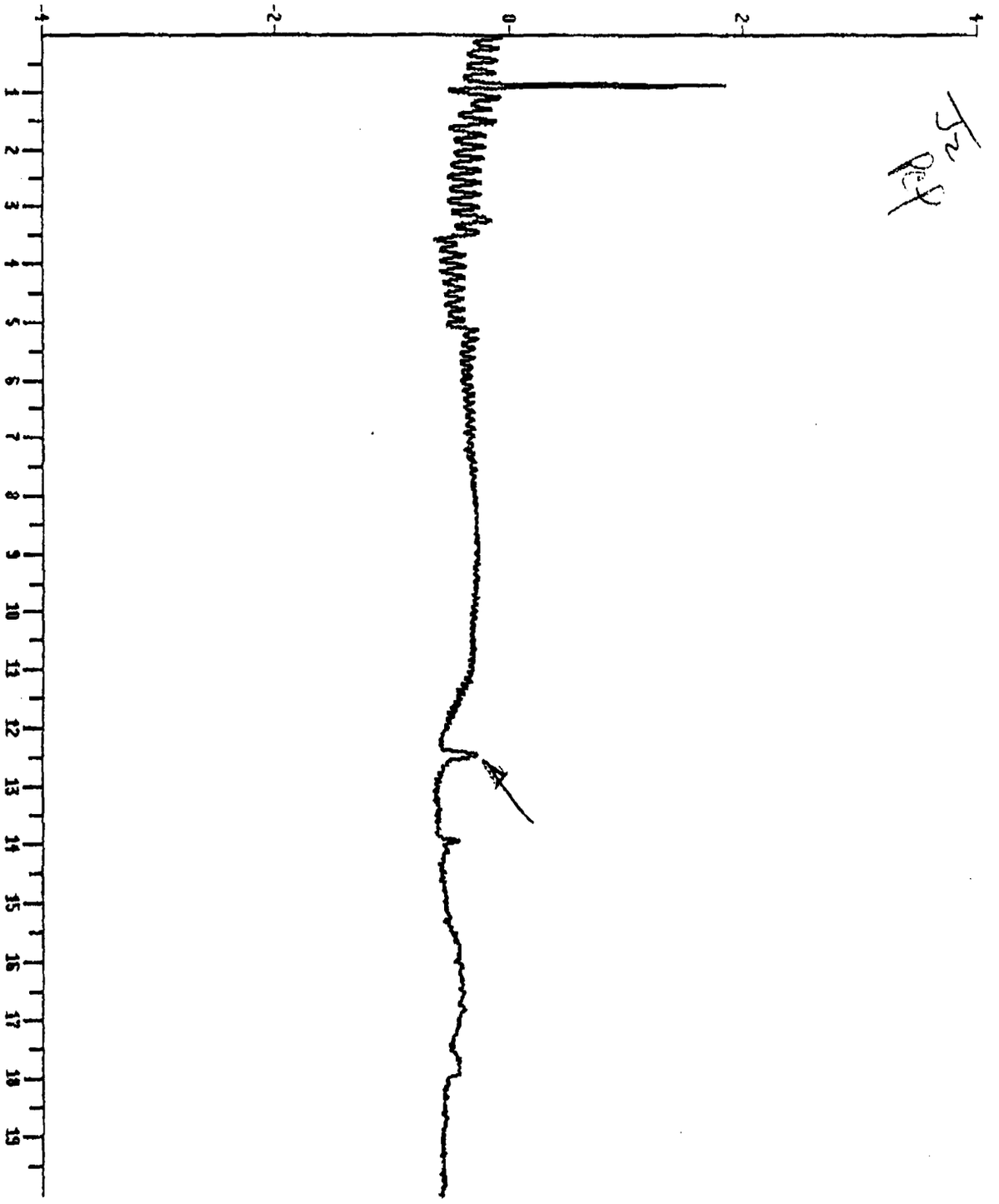

End of plot. Time = 0.00 to 18.98 minutes Chart speed = 1.00 cm/min

TOLS011724

AUG 07 '89 15:55 ECOVA

P.6

BZTO104(e)048557

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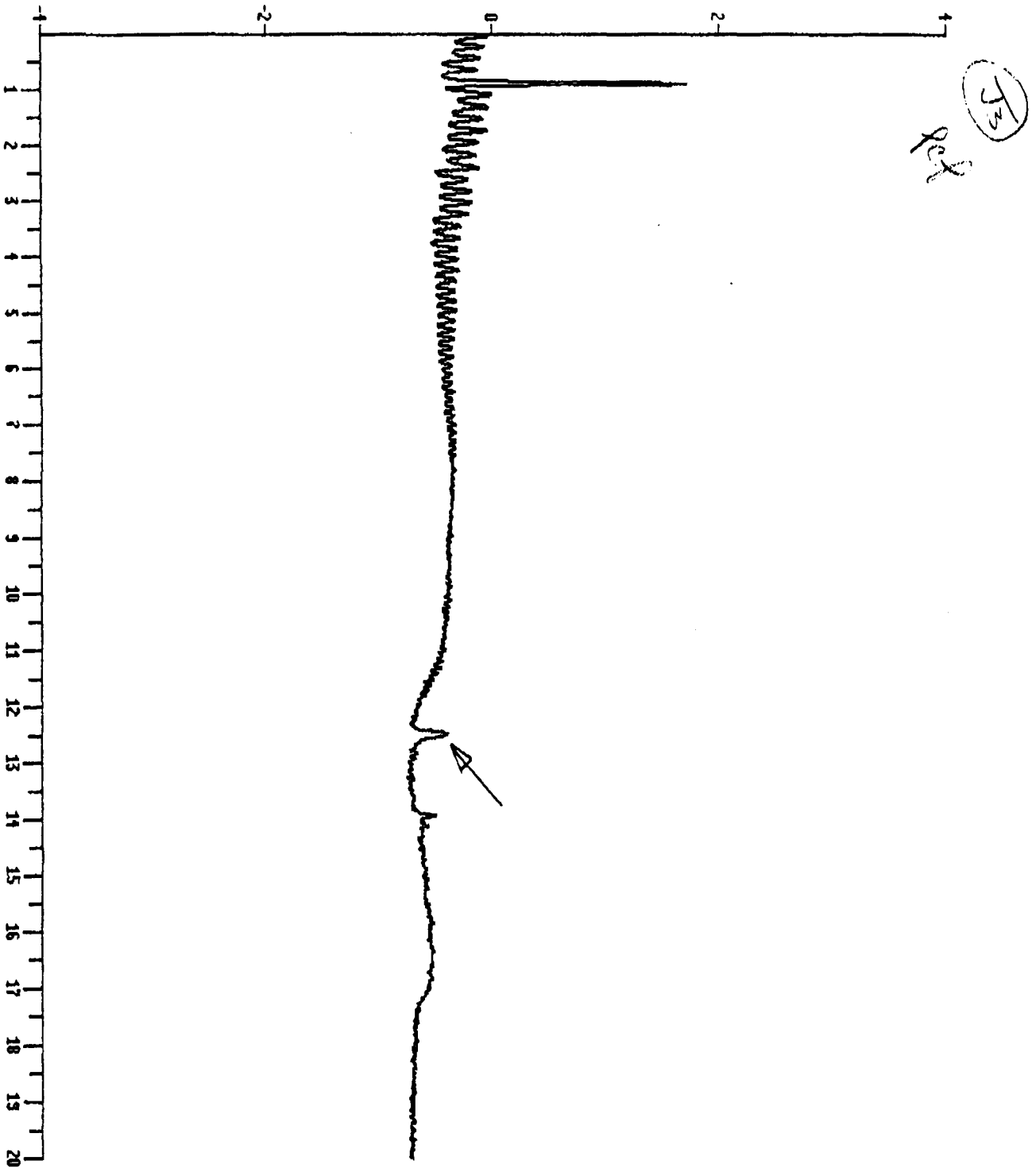

End of plot. Time = 0.01 to 19.98 minutes Chart speed = 1.00 cm/min

TOLS011725

AUG 07 '89 15:55 ECOVA

P.7

BZTO104(e)048558

PHONE 285-2400
CABLE ADDRESS: TIMOIL
(FAX) 206-283-8036

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PRODUCTS TIME TESTED
TEN TO ONE IT'S TIME

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

August 4, 1989

ECOVA
Attn: Rod Carr
3820 159th Avenue NE
Redmond, WA 98052

Dear Rod:

Enclosed is a $711.69 bill from Portland General Electric for the month of June, 1989 for electrical service on Ecova's treatment system at our Northwest Terminal. Time Oil Co. paid two previous bills (copies attached) which totaled only $32.36. It was not until the large bill appeared that the situation was brought to my attention. I believe that electrical power is Ecova's responsibility. Accordingly, please pay the enclosed bill and make arrangements for future billings on this meter to be directed to Ecova. If it is not possible for billings to be directed to Ecova, or so doing would forfeit a discount, then you may make alternate arrangements with me.

Sincerely,

Fred Proby
Environmental Specialist

Enclosure

flp.11

[redacted] TOLS011726

PLEASE FOLD BEFORE TEARING STUB

When making inquiries contact our office at:
121 SW SALMON ST
PORTLAND OR 97204
TELEPHONE 228-6322

TIME OIL CO
12005 N BURGARD ST
PORTLAND OR 97203

YOUR ACCOUNT NUMBER
1-0598-5890-0
YEAR 1989

METER NUMBER	RATE	SERVICE PERIOD FROM	TO	BILLING DAYS	METER READINGS PREVIOUS	PRESENT	METER MULTIPLIER	KILOWATT HOURS USED (KWH)	AMOUNT
K07720X	32	06/07	07/07	30	0000	0144	100	14400	

DEMAND LEVEL II	CUSTOMER CHARGE =	17.00
SUMMER RATE	10000 KWH x 4.103 CENTS =	410.30
	4400 KWH x 3.816 CENTS =	167.90
DEMAND CHARGE FOR	50 KW =	97.60
REACTIVE DEMAND CHARGE FOR	50 KVAR =	10.00
	METER TOTAL	702.80
	POWER COST ADJUSTMENT	6.48
	MULTNOMAH COUNTY TAX	2.41

CK DW new service

THIS BILL INCLUDES A PRICE DECREASE WHICH BEGAN JUNE 25. PGE LOWERED PRICES AN AVERAGE 2% FOR COMMERCIAL AND INDUSTRIAL CUSTOMERS BY DISCONTINUING THE POWER COST ADJUSTMENT. COST SAVINGS MAY VARY, BASED ON YOUR ENERGY USE PATTERNS. IF YOU HAVE QUESTIONS, PLEASE CALL THE PGE PHONE NUMBER PROVIDED ABOVE.

Temp Service
for 2yrs For Cleanup
By BCOVA per Neal Wallace

AS A REMINDER, A LATE PAYMENT CHARGE OF 1.5% MAY BE APPLIED TO ANY UNPAID BALANCE CARRIED FORWARD TO NEXT MONTH'S BILL.

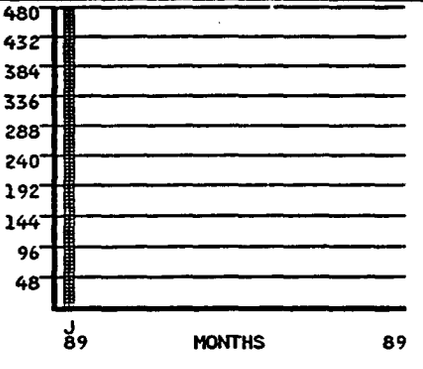
PREVIOUS MONTHS AMOUNT DUE	ACTIVITY SINCE LAST BILLING: PAYMENTS AND CREDITS (-)	CHARGES AND DEBITS (+)	BALANCE FORWARD	CURRENT BILLING	TOTAL AMOUNT DUE
10.54	10.54		.00	711.69	711.69

CUSTOMER INFORMATION

PERIOD ENDING	LOCAL AVG DAILY TEMPERATURE	YOUR AVG KWH PER DAY	AVG COST PER DAY
JUL 1989	62	480	$23.64
JUL 1988	N/A	N/A	

N/A = NOT AVAILABLE

THEFT OF ELECTRICITY COSTS EVERYONE MONEY
IF YOU HAVE REASON TO BELIEVE SOMEONE IS STEALING ELECTRIC SERVICE OR TAMPERING WITH THEIR METER, PLEASE CALL 1-800-962-8184. YOUR CALL WILL BE APPRECIATED AND WILL BE HANDLED IN THE STRICTEST CONFIDENCE.



YOUR AVERAGE DAILY KWH BY MONTHS

Portland General Electric

KEEP THIS PORTION FOR YOUR RECORDS

[redacted] TOLS011727

BZTO104(e)048560

When making inquiries contact our office at:

121 SW SALMON ST
PORTLAND OR 97204
TELEPHONE 228-6322

TIME OIL CO
12005 N BURGARD ST
PORTLAND OR 97203

YOUR ACCOUNT NUMBER
1-0598-5890-0

YEAR 1989

METER NUMBER	RATE	SERVICE PERIOD FROM	TO	BILLING DAYS	METER READINGS PREVIOUS	PRESENT	METER MULTIPLIER	KILOWATT HOURS USED (KWH)	AMOUNT
K07770X	32	05/08	06/07	30	0000	0000	100	0	

DEMAND LEVEL I — CUSTOMER CHARGE = 10.50
SUMMER RATE — 0 KWH x 5.366 CENTS = .00
MINIMUM BILL — 0 KWH x 4.127 CENTS = .00
REACTIVE DEMAND CHARGE FOR 0 KVAR = .00

METER TOTAL 10.50

POWER COST ADJUSTMENT .00
MULTNOMAH COUNTY TAX .04

0661007

3-68060-123

AS A REMINDER, A LATE PAYMENT CHARGE OF 1.5% MAY BE APPLIED TO ANY UNPAID BALANCE CARRIED FORWARD TO NEXT MONTH'S BILL.

PREVIOUS MONTHS AMOUNT DUE	ACTIVITY SINCE LAST BILLING: PAYMENTS AND CREDITS (-)	CHARGES AND DEBITS (+)	BALANCE FORWARD	CURRENT BILLING	TOTAL AMOUNT DUE
21.82	21.82		.00	10.54	10.54

CUSTOMER INFORMATION

PGE Portland General Electric

YOUR AVERAGE DAILY KWH BY MONTHS

KEEP THIS PORTION FOR YOUR RECORDS

TOLS011728

BZTO104(e)048561

When making inquiries contact our office at:
121 SW SALMON ST
PORTLAND OR 97204
TELEPHONE 228-6322

TIME OIL CO
12005 N BURGARD ST
PORTLAND OR 97203

YOUR ACCOUNT NUMBER
1-0598-5890-0
YEAR 1989

METER NUMBER	RATE	SERVICE PERIOD FROM	TO	BILLING DAYS	METER READINGS PREVIOUS	PRESENT	METER MULTIPLIER	KILOWATT HOURS USED (KWH)	AMOUNT
K07770X	32	03/06	05/08	63	0000	0000	100	0	21.75

REACTIVE DEMAND OF 0 KVAR

POWER COST ADJUSTMENT .00
MULTNOMAH COUNTY TAX .07

PRORATED BILL - CALCULATION DETAILS AVAILABLE UPON REQUEST.

Temp Service
for Cleanup for about 2 yrs

0661007
3-680-60-123

KOVA Cleanup
Neal Wallace initiated

RECEIVED MAY 1 2 1989

AS A REMINDER, A LATE PAYMENT CHARGE OF 1.5% MAY BE APPLIED TO ANY UNPAID BALANCE CARRIED FORWARD TO NEXT MONTH'S BILL.

PREVIOUS MONTHS AMOUNT DUE	ACTIVITY SINCE LAST BILLING: PAYMENTS AND CREDITS (-)	CHARGES AND DEBITS (+)	BALANCE FORWARD	CURRENT BILLING	TOTAL AMOUNT DUE
			.00	21.82	21.82

CUSTOMER INFORMATION

PAID

PGE Portland General Electric

YOUR AVERAGE DAILY KWH BY MONTHS

KEEP THIS PORTION FOR YOUR RECORDS

A

CO.

VENDOR

INV. REC. SIG.

P.O.

DUE

% MO. 05

DIST. ATTACHED

EXTENSIONS CHECKED

ACCOUNTING DCS LHC

REG. NO. 004809

POSTED
MAY 2 4 1989
TIME OIL CO.

PAID

REG. TOTAL 21.82

21.82

TOLS011729

BZTO104(e)048562

ECOVA

July 20, 1989

Mr. Fred Proby
TIME OIL COMPANY
2737 West Commodore Way
Seattle, Washington 98199

Dear Fred:

Attached is a graph of the residual PCP concentrations found in the material introduced to the T1 bioreactor on June 29, 1989. An approximate half life of seven (7) days can be observed in the data as presented.

The July 17, 19899 analytical data point is reported as not detected (N.D.). My inspection of the chromatograms leads me to conclude that a detection limit where quantitation would be possible is at most 0.1 ppm, well below the clean-up target of 0.5 ppm.

Based on this information, ECOVA has demonstrated the ability of the process to remediate the existing PCP to the criteria of 0.5 ppm and request release of the $160,000 which required this proof of process.

Sincerely,

Mark Anderson
Project Manager

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Redmond, WA 98052
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(206) 867-2210 FAX

Gulf Coast Region
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(214) 404-7545 FAX

Eastern Region
500 Fifth Avenue
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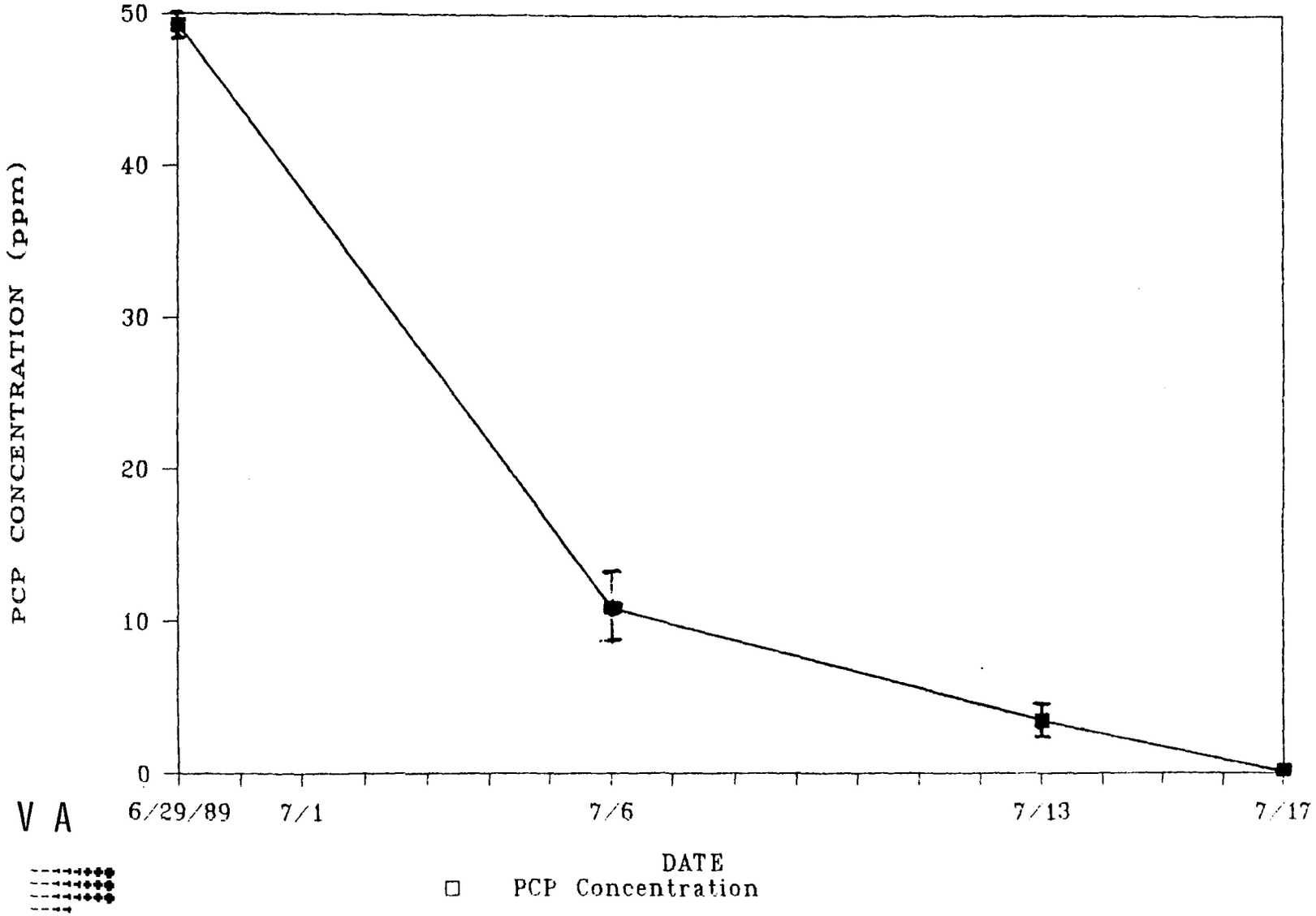
New York, NY 10110
(212) 840-1042
(212) 840-1663 FAX

PCP CONCENTRATION IN T1 BIOREACTOR



ECOVA

TOLS011731

BZTO104(e)048564

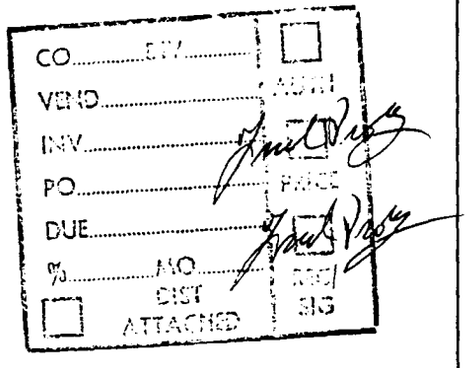
INVOICE

TO: Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, WA 98199

FROM: ECOVA CORPORATION
P.O. Box 94081
Seattle, WA 98124-9481
(206) 883-1900

OUR REFERENCE: 821401
INVOICE DATE: March 14, 1989
INVOICE # 101802

Item	Quantity	Description	Unit Price	U/M	Extended Price
		For Professional Services through March 14, 1989:			
		Services in Support of Project Design, Mobilization, Excavation and Well Installation Per Section 3 "Terms of Payment" of the Construction Contract for Environmental Clean-Up			160,000.00
		INVOICE TOTAL			$160,000.00
		TERMS: NET 30 DAYS 1.5% PER MONTH OVER 30 DAYS			



mmx

TOLS011732

PHONE 285-2400
CABLE ADDRESS TIMOIL
(FAX)206-283-8036

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
LOS ANGELES

TIME
PRODUCTS TIME TESTED
TEN TO ONE IT'S TIME

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

April 11, 1989

Riviera Financial Services
Attn: Mr. Chris Wilson
P.O. Box 141
Santa Clara, CA 95052

Dear Mr. Wilson:

I am writing in response to your request for information concerning our contract with Ecova, a copy of which is enclosed. Your attention is directed to paragraph 3, "Terms of Payment". At such time as Ecova has completed the project design, mobilization, excavation and well installation tasks, their March 14, 1989 invoice in the amount of $160,000.00, less retainage, will become due and payable. Their work to date has been progressing well and I see no difficulty in meeting the project schedule.

Sincerely,

Fred Proby
Environmental Specialist

FLP/ch

Enclosure a/s

cc: John Kinsella, Ecova

TOLS011733

E C O V A

To: Fred Proby

From: John Kinsella

Date: April 7, 1989

Re: RIVERIA FINANCIAL

Fred, I understand from our accounting department that there is a problem with Riveria Financial (the company that is funding our working capital needs.)

As we discussed several weeks ago, we are experiencing start-up costs on a number of remediation projects including the Portland site. To cover these costs we have been extended credit through Riveria. They advance credit on the basis of outstanding invoices. By sending our invoice ($160,000) to you for the mobilization at Portland, we are not requesting payment of the invoice at this time. What we do need you to confirm with Riveria is that the mobilization invoice is a legitimate invoice and that it will be paid by you in the normal course of business. With this confirmation Riveria will then be in a position to provide us funding. At the time the payment is made it will be made directly to Riveria.

Fred, if at all possible, if you could please call Chris Wilson at (408) 727-8611 and confirm the above, I would be grateful.

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TOLS011734

APR 07 '89 15:03 ECOVA P.2

E C O V A

July 14, 1989 P.N. 821401

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

Dear Fred:

Subject: Status of Remediation Project at Time Oil Northwest Terminal, Portland, Oregon

This letter documents the current status of the ECOVA project to remediate pentachlorophenol (PCP) soil at the subject site.

Work Completed To Date

Major tasks completed on the project to date include:

- Engineering and design of the treatment system, including additional laboratory confirmation testing of soil washing procedures;
- Mobilization of treatment and excavation equipment to the site;
- Setup and operation of an on-site laboratory for PCP determination using a GC with FID detector;
- Construction of lined stockpile and treatment area;
- Initial excavation, screening and stockpiling of contaminated soil from the PCP mixing facility area;
- Initial excavation of the disposal pits;
- Construction of the treatment system, including modification of the 38K tank for use as an aqueous bioreactor;

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TOLS011735

BZTO104(e)048568

- Testing of soil and groundwater for unknown solvents encountered during excavation;
- Pumping of accumulated contaminated groundwater from the excavated pit into nearby tanks;
- Testing of contaminated soil in the disposal pits for unknown organic contaminants;
- Preparation of a large volume of microbial inoculum at the site for addition to a large scale bioreactor;
- Charging and operating one slurry bioreactor with straight soil feed to demonstrate biodegradation on large scale with presence of solvents.
- Backfilling of the excavation pit with clean soil obtained from the disposal pit areas and elsewhere on Time Oil property as directed by Mr. Neil Wallis.

Problems Encountered

As you are aware, the project has not proceeded according to the original plan. A number of factors account for this. Problems encountered to date on the project include:

- Obtaining power to the treatment site. According to the original schedule, power was needed about the third week in January. Power was not available until the end of February.
- Severe winter weather during February and March which slowed excavation operations and caused equipment demobilization problems at an ECOVA site in Tacoma (equipment destined for use at the Portland site);
- Difficulties associated with excavation of the warehouse foundation caused an alteration of the excavation plan and retention of a geotechnical subcontractor. The foundation of the warehouse is in very poor condition, with extensive pre-existing cracking. Final excavation around this

A

foundation is likely to cause additional cracking.

- Additional soil contaminated with PCP was identified that is outside the original excavation area. Soil with up to 6000 ppm PCP was detected in the soil in front of the manhole cover at the 38,000 gallon tank in the tank farm area adjacent to the excavation. Also, soil samples obtained from about a depth of 5' in the excavation for the stockpile area sump showed PCP and the presence of unknown organic solvents. Since this contaminated soil is in the middle of the stockpile facility, it was not possible to excavate the soil during the main excavation effort. This will need to be excavated at a later date when the stockpile has been largely treated.

- Unknown solvents and free solvent product floating on the groundwater surface were encountered during the excavation in the southeast corner of the pit.

- While completing the excavation of the disposal pit areas, additional contaminated soil was encountered. An expedited site assessment and laboratory analyses of collected samples was performed.

Out of Scope Items

A number of work items not covered by our contract have been discussed in previous letters to you. The following is ECOVA's current list of significant work items that need to be addressed by a Change Order:

1) Items included on the original Change Order that you have been holding, including the PGE power drop.

2) Excavation and backfill of PCP-contaminated soil under the septic tank in the stockpile area. It is not possible to estimate these costs at this time, and we propose to conduct this excavation on a time and materials basis.

TOLS011737

3) Excavation and backfill of PCP-contaminated soil next to the 38K bioreactor tank. It is not possible to estimate these costs at this time, and we propose to conduct this excavation on a time and materials basis.

4) Quantity measurement (surveying) and biological treatment of contaminated soil from Items 2 & 3. Costs for this measurement and treatment would be determined at the time the soil is excavated and stockpiled.

5) Additional laboratory analyses for the unknown solvents in soil. Costs were $2050 (fast turnaround on five GC-MS runs).

6) Additional laboratory analysis for the unknown solvents in the groundwater sample to be taken. Cost incurred were $712.

7) Costs incurred in modifying the site Health & Safety Plan to take into consideration the unknown solvents encountered.

8) Additional ECOVA labor incurred in pumping contaminated water from the leaking Crosby & Overton tanks into another Time Oil tank.

9) Time and expenses incurred for regulatory preparation. To date approximately $360 have been incurred in procuring and reviewing Oregon DEQ regulations. Additional preparation is anticipated for the upcoming meeting with ODEQ in Portland.

10) Treatment of 100,000 gallons of diesel & gasoline contaminated water from slop tank at the site. Also, one GC analysis of the slop tank water for petroleum hydrocarbons was performed at a cost of $110.

11) Groundwater modelling of the site. Based on the results of the aquifer testing being conducted at the site and a review of the available data, ECOVA will construct a groundwater model of the

Time Oil property potentially impacted by PCP. The purpose of the model is to provide a basis for design of a groundwater treatment system at the site to control the migration of PCP in groundwater. The Prickett-Lonnquist (PLASM) groundwater flow model coupled to the Random Walk contaminant transport model will be used for the simulation. Because of the immediate need for the model results, a simplified case assuming homogeneous aquifer conditions will be used as a base case and be calibrated based on presently available information. The model can be modified for a more sophisticated simulation if needed. Costs are estimated at:

Senior Hydrogeologist	60 hrs @ $95	$5,700
Project Hydrogeologist	40 hrs @ $60	2,400
Drafter (with CAD)	36 hrs @ $50	1,800
Word Processor	8 hrs @ $30	240
Total Estimated Costs		$10,140

12) Excavation and biological treatment of mineral spirits contaminated soil from the disposal pit area. A separate letter proposal has been prepared that addresses this work item.

Revised Schedule

The revised schedule anticipated for the project is as follows:

Startup/Shakedown of
Treatment Operations.....June 26 - August 15

Pump Testing of
Monitoring Wells.....July 18 - 21

Modeling of Groundwater
Flow & Treatment Design.....July 19 - August 2

Proposed Oregon DEQ Meeting.....August 7

Soil Treatment Operations.....August 15 - April 15

Second Excavation and
Backfill.....October 1 - 30

Demobilization.....April 15 - 30, 1990

This schedule anticipates that the overall quantity of soil needing remediation does not increase significantly from the 3440 cubic yards originally forecast and that weather conditions do not cause major problems.

We have appreciated the opportunity of serving you on this project. If you have any questions over any of this information, please do not hesitate to give me a call.

Sincerely,

Mark W. Anderson, P.E.
Senior Project Manager

cc: R. Carr
J. Kinsella
Files

NW PENTA CLEANUP RATE

Contract Yards	3440
Excess Yards	0
Total Yards	3440

	Begin	End	
Treatment Period	08/15/89	04/15/90	
Months	8.0	/week	/day
Yards per Month	431	99	14

Contract Cost	$285,000
Excess Treatment	0
Total T'ment Cost	$285,000

Cost per Month	$35,674
Cost per Yard	$82.85

TOLS011741

E C O V A

July 14, 1989 P.N. 821401

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

Dear Fred:

Subject: Results of Chemical Analyses of Samples Obtained on June 29-30 from the Time Oil Northwest Terminal, Portland, Oregon

On June 29-30, Mr. Kevin Murphy, from your office, and I travelled to the Portland Northwest Terminal site to investigate contaminated soil discovered by ECOVA personnel while excavating soil from the trenches to be used for disposal for the PCP treatment operations. While on site, we collected a number of soil and water samples from a series of test pits dug with a backhoe around the location where contaminated soil had been discovered. This letter presents the chemical analyses from these samples which ECOVA was directed to perform.

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Total Petroleum Hydrocarbons (TPH) Analyses

Table 1 presents the analytical results for TPH determinations based upon infrared determination. It is important to note that the IR method does not discriminate among different types of organic compounds, it merely detects the presence of carbon-hydrogen bonds. Thus, for soils which have high natural organic matter present, this method will have high interference levels. For low organic content soils (such as subsurface soils), this method is quite useful. ECOVA has observed natural organic background levels in soils at up to 200 ppm. This level may be appropriate for the soils obtained in this sampling exercise.

Hole #1, the point of initial discovery of the contamination, was observed to have moderate levels of contamination at around 1000 ppm. Hole #6 was observed in the field to have the highest levels of contamination

based upon odors emanating from the excavation. This is confirmed by the TPH-IR analyses for this data. Holes #5 & #7 appear to have moderate levels of contamination, as well.

Hole #3 and DPDD have low to moderate levels of TPH, but were observed in the field to have a peculiar, distinct odors. These samples were subjected to additional analyses by GC mass spectroscopy.

TABLE 1

Total Petroleum Hydrocarbon Analyses
(IR)

Sample	ppm
Hole 1A	1,201
Hole 1B	1,047
Hole 2A	307
Hole 2B	436
Hole 3A	541
Hole 3B	305
Hole 4A	269
Hole 4B	174
Hole 5A	236
Hole 5B	978
Hole 6A	6,427
Hole 6B	9,002
Hole 7 (Water)	N/D
Hole 7 (Soil)	1,660
Hole 8 (Water)	N/D
Hole 8 (Soil)	415
Hole 9 (Water)	N/D
Hole 9 (Soil)	401
Hole 11 (Water)	N/D
Hole 14 (Soil)	210
DDPD (Soil)	788

GC Mass Spectroscopy

Four soil samples were analyzed by GC-MS, Holes #1, #3, and #14, and Sample #DDPD. Since no water samples analyzed for TPH-IR were observed to have over 10 ppm, no GC-MS samples were run on these samples.

Hole #1

This sample was run on a rush basis to qualitatively and quantitatively determine the nature of the organic contaminants present at the disposal pit. The analysis confirmed that the contaminants were most likely to be mineral spirits, which was in agreement with the nature of the odor observed emanating from the backhoe pit.

Hole #3

This sample showed moderate levels of contamination based on the TPH-IR analysis. There was a clear match for phenol on the GC-MS run. Also 7-8% of the organic contamination consisted of very heavy hydrocarbons (over C30) with extensive carbon molecule branching and double bonds.

Hole #14

The following matches to the GC-MS library were observed:

Decahydro-2-methyl-napthalene
2,6Bis(1-1,dimethylethyl)-4 methyl phenol
1,4-Dimethoxy anthracene
2,2'-methylenebis[6-(1,1-dimethylethyl)-4-ethyl phenol
Numerous C10-C36 hydrocarbons

These results show the presence of PNAs which appear to be breakdown products of napthalene.

Sample #DDPD

The following matches to the GC-MS library were observed:

1,2,3,4 tetrahdro-1,6 dimethyl-4-(1-methylethyl)-, (1S-cis)-naphthalene
1,4-dimethoxy-anthracene

ECOVA

2,2'-methylenebis[6-1(1,1-dimethylethyl)-4-ethyl-phenol
Numerous C10-C36 hydrocarbons

These results show the presence of PNAs which appear to be breakdown products of napthalene.

We appreciate the opportunity of serving you on this project. If you have any questions over any of this information, please do not hesitate to give me a call.

Sincerely,

Mark W. Anderson, P.E.
Senior Project Manager

cc: Kevin Murphy, Time Oil Company
J. Kinsella
Files

TOLS011745

TOLS011746

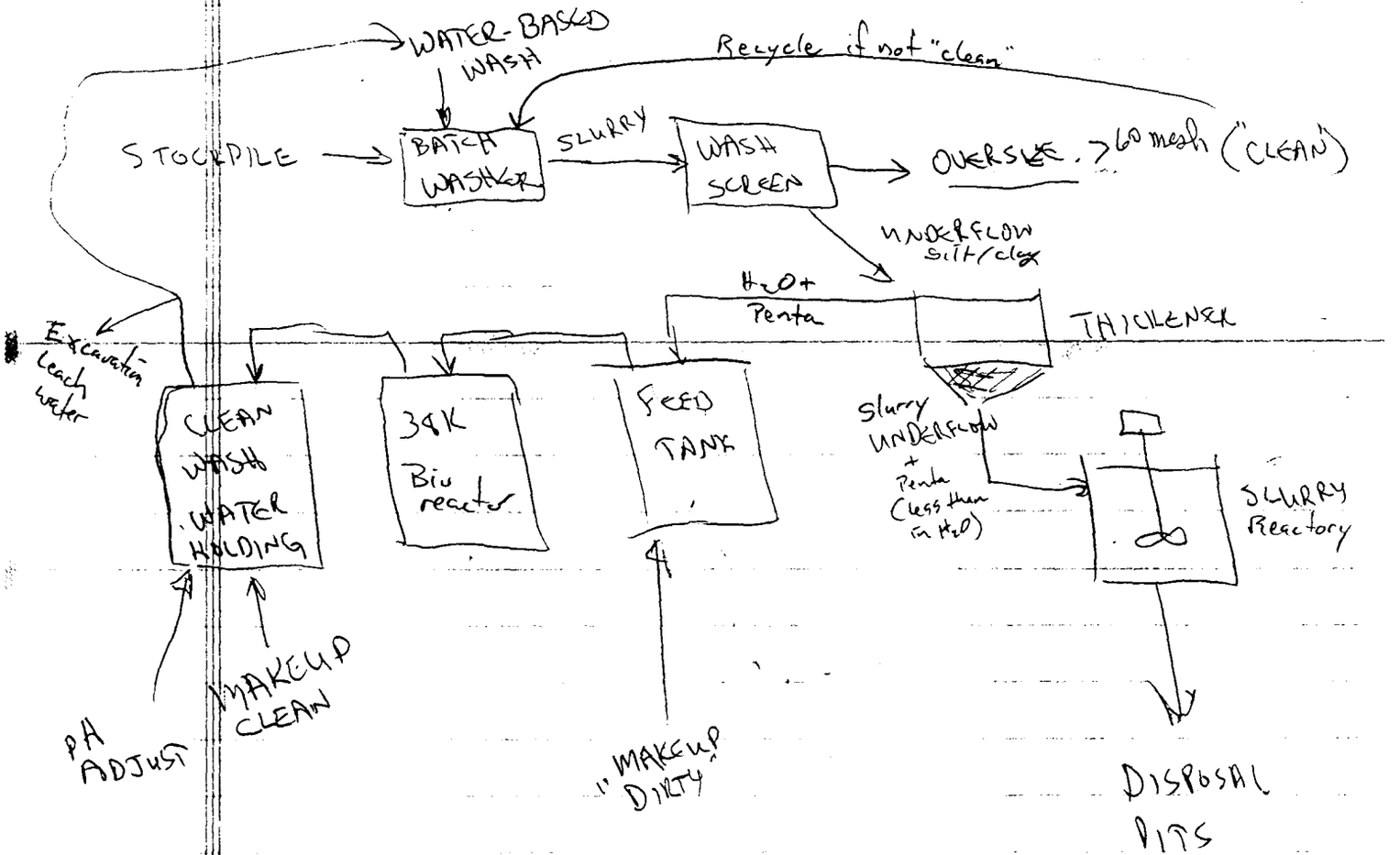
BZTO104(e)048579

7/11/89 FLP

NW Term Penta Status

Meeting w/ Mark A & Joe

20 yd 40 yd cap in TH Tank - not high in solvent want to make sure it runs w/ Penta (PCP ≠ 50 ppm) 20% reduction in ca 6 days - slow start is normal Sampled daily during startup.



TOLS011747

BZTO104(e)048580

Excavation is completly filled.

- Dirty area at 38k tank & sump will be excavated this fall
- Under warehouse - have only ~ 1' under building dirty - will put in leach line to wash it out. (& Will pull out diagonal wells)
  Still need to excavate up to edge of foundation - ca 6' wide strip

- Fire line would best go thru center of excavation - want be disturbed.

☆ Pump test is next step - Eric will do it
Then do modeling to show hydro control.

"New" contam:
Hit a gray layer (sand & clay) in every test pit - appears to be an original surface layer - septic odor.
Contaminated in some spots w/ mineral spirits (#6 w/ acms)

☆ Need a monitoring well between disposal pits & excavation

Contaminated soil (mineral spirits) can be spread on plastic & biotreated in a few weeks.
Also black oily soil near excavation

TOLS011748

Need Ecova to prepare an investigation / cleanup proposal

* TOC needs to develop site history - dredging, land use, etc

Mineral spirit water can be pumped out & treated in 38 k tank.

Deliverables
1. Schedule
2. Proposal to deal w/ disposal pit mineral spirits (change order)
3. Proposal to investigate rest of terminal A - Open Areas B - Tank farms
4. Analytical results from test pits

↳ TOC needs to provide RFP w/ site maps
After we get analytical results

* TOC Needs to process old change orders

TOLS011749

BZTO104(e)048582

Sample #	Test reqd	Subsequent test/N
DDPD (soil)	TPH/IR, GC/MS	N/A
#7 (H_2O)	TPH/IR;	GC/ms if IR > 10 ppm
#7 (Soil)	TPH/IR	
#8 (H_2O)	TPH/IR	GC/ms if IR > 10 ppm
#8 (Soil)	TPH/IR	
# 9 (H_2O)	TPH/IR	GC/ms if IR > 10 ppm
# 9 (soil)	TPH/IR	
# 11 (H_2O)	TPH/IR	GC/ms if IR > 10 ppm
# 14 (soil	TPH/IR, GC/ms	

9 samples

9 TPH/IR

2 GC/MS certain

4 potential GC/MS

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

TOLS011750

Time Oil

3 GC/MS
DOPD GC/MS
14 GC/MS

All sample: TPH/IR
all sample (H_2O) > 10 ppm TPH get BTX.

List of all samples to:

→ 521401-2-175-77.

14
12

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

M E M O R A N D U M

July 7, 1989

TO: File

FROM: Kevin Murphy Seattle

SUBJECT: NORTHWEST TERMINAL SITE INVESTIGATION, ECOVA OPERATION

On June 28 we were informed that contaminated soil had been encountered in one of the "borrow" excavations being utilized in the Pentachlorophenol remediation being performed by Ecova. In excavating borrow pit #2 contaminated soil was unearthed at a depth of six and one half feet. At that time the excavation was halted and a TOC representative was contacted. Excavation to determine the extent of the contamination was supervised by this office on June 29 through 30. Fourteen observation pits were excavated and sampled. Visual and olfactory observation indicate that the contamination was present in two locations within these borrow areas. These areas did not appear to be directly connected to the penta cleanup area to the southwest. Contamination was not evident in the excavations between the existing Penta cleanup area and the newly discovered contamination.

The purpose of the fourteen excavations was to determine the extent of the contamination located in the borrow pit. The initial discovery area in borrow pit number two was excavated down to groundwater. This hole, labled #1, was sampled and analyzed for soil and/or groundwater contamination. Immediately to the southwest hole #6 contained strong evidence of contamination. The water and soil samples from each of these holes were analyzed for total petroleum hydrocarbon. The most contaminated sample was from hole #6 which contained 2000 ppm TPH. Mass spectrum analysis gave no indication of chlorinated chemicals, and indicated that the constituents of the product in the sample were straight chain hydrocarbons, probably mineral spirits. Excavations #2 through #14 were performed to delineate the extent of the contamination. From these exploratory excavations it is presumed that the contamination encountered is from an area used for dumping and it is not a migration of of the contaminents encountered in the Penta clean-up operation. Analysis will be performed on all of the samples collected during this reconnaissance and the results will be interpretted upon completion of the analysis by Ecova's lab.

In the excavation of hole #3 an unknown chemical odor was encountered that was not immediately recognized, a sample was taken for further analysis. In the excavation of hole #14, the top 14 inches of the soil were found to be saturated with very heavy black product. These samples will also be analyzed to determine the nature of the contaminents.

A fourth area of contamination was unearthed in the excavation of additional fill material in the far northwest corner of the property. A sample of this contaminated soil has been retained for analysis.

TOLS011752

BZTO104(e)048585

IBM — Ask Jay Kraft

Bench mark 4.49'

hole #	Side of excavation Before Excavation	Base of Hole - 20	GW Level	1st Clay layer	Encountered Grey Sand	2nd Clay layer
1	9.54'/6.10' rattle Bottom pit		18.60'			
2	10.39'	19.8'	Cave in			
3			18.15'			15.84
4	11.08'		18.20'			17.7
5	10.42'		19.60' Water Running in			
6	12.23' in Excavation		Fluid running in from above + soaking in		15.31	
7			18.44'			
8			18.33'			
9			18.79'	11.27		
10	10.59'		18.23			
11	13.44		18.31			
12	10.04					
13			Caved in	15.29		19.30
14			Caved in			

TOLS011753

TPH on all w+s ✓ Price

Site support work 40.00 hour

~ 25.00 each

Not EPA Price

Mass spec

TPH 10 PPM

BTX+E water only

BTX+E + TPH water only on High TPA

Soil

Water

21 Total

10 water

11 soil

Cave in

10

9

soil

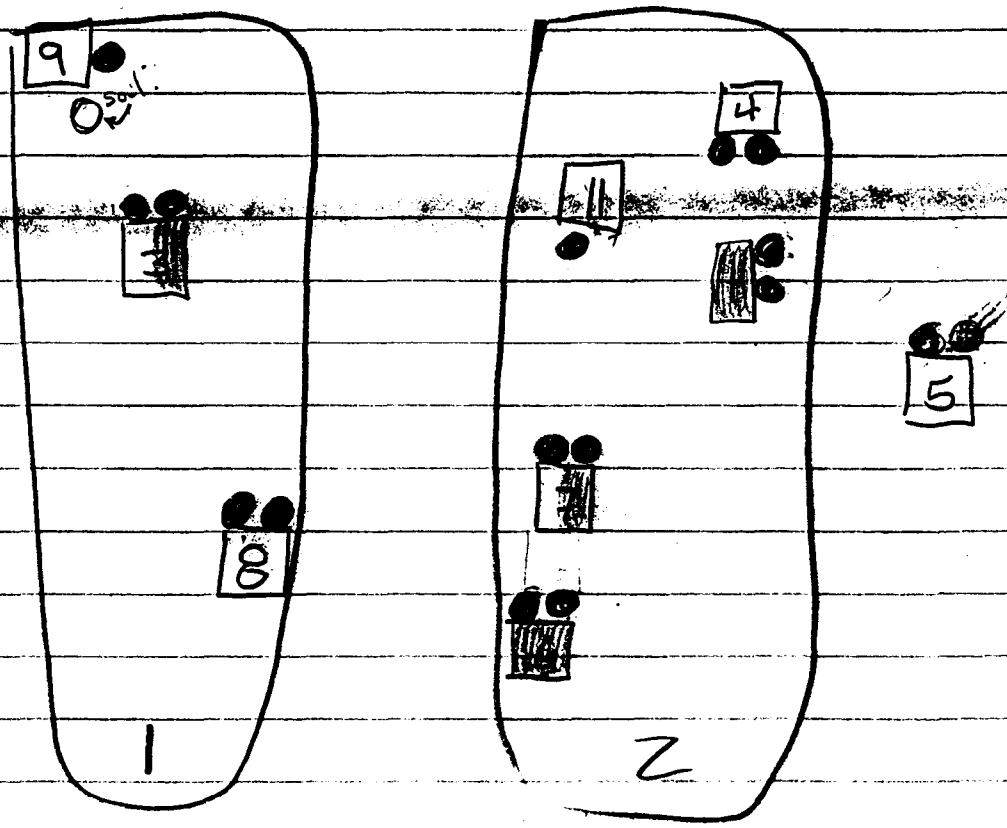
3

8

1

4

11



5

7

2

12

2

13

Mass Spec

Cave in

TOLS011754

BZTO104(e)048587

7/3 883-1900

John Ennis — Ecova Quick + Dirty

TPH IntRod - 6 samples 2000ppm

Mass spec. - No Chlorinated
Straight Chain Hydrocarbons

Probably Mineral spirits.

1 water + 1 soil 6 samples (Holes 1-6

TPH IR

Mass spec work up → Volatiles on water BTXE
→ BNA Search -

7 1 Soil + Water
8 1 Soil 1 Water
9 1 Water sample taken -
10 No Samples
11 1 water sample taken -
12 1 Water + Soil ?
13 - 1 water 1 soil ?
14A - 1 soil - surface
DDPD 1 Soil

TOLS011755

E C O V A

June 16, 1989 P.N. 821401

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

Dear Fred:

Subject: Sampling and Analysis of Excavation Pit at Time Oil Northwest Terminal, Portland, Oregon

Per our discussion, this letter provides you with the results of the confirmation sampling at the Portland site.

Sampling Program

On April 24-25, 1989, ECOVA mobilized a sampling team to the site for the purpose of sampling the soil on the side walls of the excavation pit. It was desired to demonstrate that all soils contaminated with high levels of pentachlorophenol (PCP) on the northeast (along the concrete wall towards the railcar loading facility) and southeast walls (along the pipeline and tank farm) of the rectangular pit had been removed. (For the purpose of excavation, soil over 100-500 ppm was removed.)

Soils on the northwest wall (next to the warehouse foundation) and the southwest wall (towards the monitoring wells) were not sampled because of additional excavation that will be performed in those areas after the main pit is backfilled. However, check samples were gathered at two stations near the ramp that leads down into the pit on the southwest wall.

Access to the sampling points on the pit walls was attained by use of an aluminum boat in the pond of groundwater that has formed in the bottom of the pit. Samples were obtained at each of three vertical locations on the pit wall (nominally every 2-3 feet above groundwater level) at each station along the two

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walls of the pit. Samples were obtained above groundwater only since soil below groundwater will be left in place for in situ treatment. The attached diagram shows the location of the sampling stations along the pit walls.

Analytical Program

All soil samples were analyzed for PCP at the on-site laboratory using an analytical procedure developed by ECOVA. Each soil sample was treated with sodium sulfate and subjected to an extraction for PCP using a mixture of acetone and methylene chloride. The extractant was analyzed for PCP using standard gas chromatograph (GC) methods on a Hewlett Packard GC equipped with a Flame Ionization Detector (FID). Quality control was maintained by:

1) GC calibration before and during the analyses with a 500 ppm standard prepared at the ECOVA Analytical Services Laboratory in Redmond, Washington. A minimum of six calibration runs were made;
2) A method blank was analyzed which showed no detectable PCP.
3) A Matrix Spike was prepared and analyzed for percent recovery. A value of 66% was obtained, which was deemed low but within the acceptable range.

Results

The results of the confirmation sampling and analysis are presented in Table 1.

No contamination was found on the two stations sampled on the southwest wall. This is encouraging for moving in clean fill through this area of the ramp during backfilling operations.

Residual PCP contamination was observed at stations 3 and 4 along the southeast wall near the 38K tank. This area will need additional excavation. See the discussion below for proposed backfilling approach.

Residual solvent contamination above groundwater was observed at station 9 on the northeast wall, the station nearest the warehouse. A positive value at the 7' depth

is suspect since there were numerous peaks associated with the solvent contamination. This appears to be a localized hot spot that will be checked again during backfilling operations. If confirmed, this point can be removed while excavating the soil next to the warehouse foundation after backfilling the main pit.

The remaining areas of the two pit walls appear to be very clean and no additional excavation is needed.

Proposed Backfilling Program

In ECOVA's opinion, the main pit area can now be backfilled with clean soil obtained on site. Upon receipt of approval from Time Oil, the backfilling operation will proceed as follows:

1. Clean soil from the stockpile made while constructing the disposal area east of the excavation will be trucked over to the edge of the excavation.

2. Two remaining piles of contaminated soil located on the southwest bench of the excavation will be moved up the ramp into the lined contaminated soil stockpile area.

3. Remaining groundwater in the pit area will be rapidly pumped out to the Time Oil tank provided.

4. As soon as the water is completely removed, clean soil will be backfilled from the southwest wall into the pit to a level several feet above groundwater.

5. Backfilling of the first layer of clean soil will proceed easterly toward the opposite (northeast) wall.

6. Backfilling will proceed in layers of approximately one foot until grade is reached.

7. An open pit will be maintained from sampling station 4 towards the southwest corner of the current excavation and along the southwest wall of the excavation. This will allow excavation of the contaminated soil located between

sampling stations 3 & 4 and the southwest side of the 38K Tank. From previous sampling, this soil was observed to be highly contaminated.

8. The "dog-leg" portion of the pit on the southwest side of the warehouse will be filled to grade.

Final Excavation

After backfilling of the main portion of the pit has been completed, the second stage of excavation will commence. Soil remaining to be excavated includes the strip approximately 6' wide next to the warehouse foundation and the portion next to the 38K Tank described above. This excavation can proceed as soon as the main pit has been backfilled. The portion next to the 38K Tank will be excavated and immediately backfilled with clean soil first to allow use of the tank in the treatment operations.

The third and final stage of excavation will remove the soil under the stockpiled contaminated soil. This, of course will be excavated at a later date after the treatment opertions have treated most of the stockpile. However, backfilling of clean soil along the southwest wall and south corner of the pit will leave a trench along the area remaining to be excavated.

Revised Schedule

A revised schedule anticipated for the project is as follows:

Pumping of Ponded Groundwater.....June 10 - June 20
Stockpiling of Clean Backfill.....June 19 - June 21
Approval from Time Oil to Proceed
with Backfill.....June 16
Initiation of Backfilling Operations..June 22
Completion of Backfill.....June 27
Second Stage of Excavation.....June 27 - July 3
Startup of Initial Batch Treatment
Operations.....June 14 - July 7
Startup of Full Scale Soil
Treatment Operations.....July 21
Soil Treatment Operations.....July - March 15
Third Excavation and Backfill.....November 1 - 30
Demobilization.....March 15 - April 1

This schedule obviously anticipates that the overall quantity of soil needing remediation does not increase significantly from the 3440 cubic yards originally anticipated and excludes water and in situ treatment.

Out of Scope Items

Additional significant items that will need to be addressed by a Change Order over and above the Change Orders previously discussed include:

1) Treatment of the 100,000 gallons of diesel and gasoline contaminated water from the slop tank. As we discussed, we don't see any problem with being able to biodegrade the contaminants in this water, however, it will add additional organic carbon load to the bioreactors. The PCP microorganisms should be able to degrade these compounds, but they do this preferentially to degrading the PCP, thus slowing down the whole treatment process somewhat. This is the same effect that we expect to see with the solvents. Obviously, from our perspective it causes less operational problems to use clean water in mixing the slurry. But from your perspective, it is convenient to use the aqueous bioreactor to handle this water to allow discharge to the POTW.

2) Treatment of the volume of solvent-contaminated groundwater that is being removed from the pit. Similar concerns to those expressed in 1).

3) I have discussed the in situ groundwater treatment system requirements with John Kinsella, ECOVA Operations VP. We are preparing a proposed approach for your review and discussion.

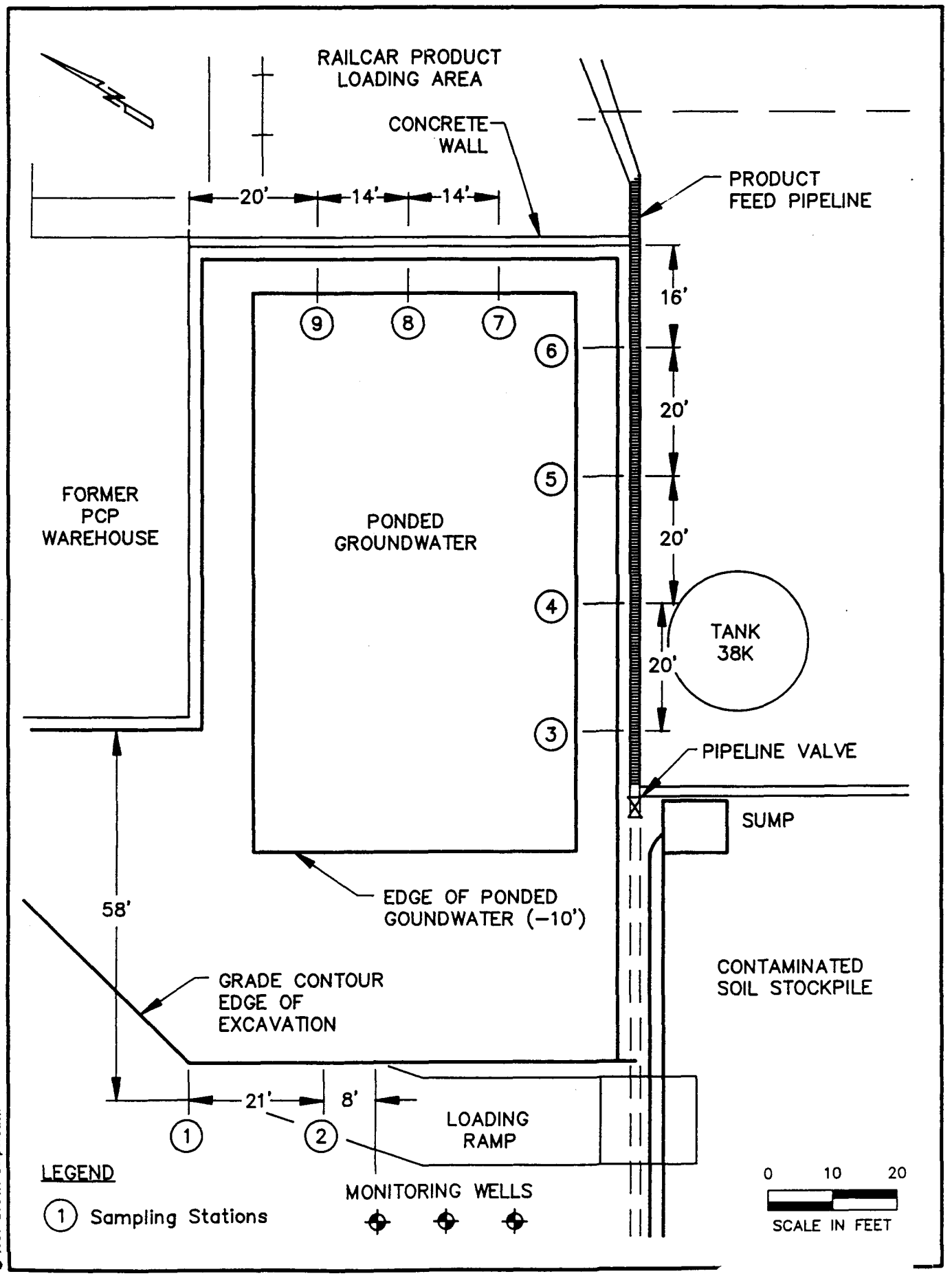
As we discussed on the telephone today, I would like to get Time Oil's authorization to proceed with backfilling by June 16. I will be happy to meet with you at your convenience to go over the data and answer any questions that you may have. With the above program, I think we will have the project back on track. While there are a number of details that we must work through, I believe that we can successfully complete the soil remediation project within the original schedule completion date.

Sincerely,

Mark W. Anderson
Senior Project Manager

cc: J. Bolton
J. Kinsella
R. Carr
Project Files

Time Oil – Confirmation Sampling Locations



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821401–A–016.0

TOLS011762

BZTO104(e)048595

E C O V A

TABLE 1

Results of Excavation Pit Sampling & Analysis
Project No. 821401

Station #	Sample #	Depth from Surface(ft)	PCP (ppm)
1	CA54	2′	ND
1	CA55	5′	ND
1	CA56	8′	ND
2	CA57	2′	ND
2	CA58	5′	ND
2	CA59	6′	ND
3	CA60	4′	220 #
3	CA61	7′	1006 #
3	CA62	9.5′	304 #
4	CA63	4′	ND
4	CA64	7′	289 #
4	CA65	9.5′	ND
5	CA66	4′	6 J
5	CA67	7′	3 J
5	CA68	9.5′	2 J
6	CA69	4′	ND
6	CA70	7′	2 J
6	CA71	9.5′	ND
7	CA75	7′	2 J
7	CA72	9′	ND
8	CA76	7′	24
8	CA73	9′	3 J
9	CA77	7′	244 *
9	CA74	9′	78 #

ND - No peak detected
J - Estimated value (measured peak value too low for reliable determination from calibration standard used).
* - False positive value suspected, numerous peaks observed from solvent contamination present in sample.
\# - Other detectable compound peaks observed in sample.

TOLS011763

BZTO104(e)048596

E C O V A

June 13, 1989 P.N. 821401

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

Dear Fred:

Subject: Tank Problems, Remediation Project at Time Oil Northwest Terminal, Portland, Oregon

I have tried--unsuccessfully--in reaching you today. We have encountered a new problem at the Northwest Terminal site. We have been pumping water out of the excavation and into the tank provided by Time Oil (the tank previously used by Crosby & Overton) since Saturday, June 10. As of today, we have pumped about 50,000 gallons. We continue to observe the free reddish-colored product flowing into the pit with new water.

This afternoon, however, the site supervisor, Jay Kraft, has reported that this tank is now leaking from underneath. Several hundred gallons are reported to have leaked onto the surrounding ground. I have advised Jay Kraft to talk with Neil Wallis to see if another tank can be made available, in which case we will pump the water out of the leaking tank. If not, then he is instructed to pump into our treatment system tanks until either they are full or the leaking tank is emptied. We have stopped pumping water out of the excavation anyway.

Bill Mahaffey and I have been scheduled for several days to go to the site tomorrow and startup the 250 gallon fermentor in the lab unit in preparation for treating the first tank of soil slurry. We will continue this trip, despite the fact that we may not be able to put soil into the tanks since they may shortly be filled with water. We may be able to help brainstorm a solution to this predicament, and we may actually start up the treatment system treating the contaminated excavation water first.

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TOLS011764

E C O V A

We are in receipt of the water sample from the "slop oil pit" and we are running a GC analysis. Also the GC-MS run of the soil with solvents is nearly complete. We should have results of both analyses on Thursday, June 15.

This project continues to be a challenge. If you have any questions over any of this information, please do not hesitate to give me a call at the site tomorrow at (503) 286-8620.

Sincerely,

Mark W. Anderson
Senior Project Manager

cc: J. Bolton
J. Kinsella
Files

TOLS011765

5/9/89 FLP

NW Penta

Meeting on 5/2/89 Letter

Mark Anderson, Monica, ?

Health & Safety

Surveyor who complained of lung problems stayed outside of exclusion zone

Ecova will be modifying H&S plan

Has found up to 10,000 ppm "solvents" in soil

? Some solvents appear to be heavier than water ?

The predominant odor on site is clearly KB-3

Fred - check out

- Can one of our tanks be made available to store solvent/water ?
- That would allow Ecova to backfill hole & start treating soil w/o solvent.
- Washing tests & solvent treatibility can be done concurrently

★ Need to review DEQ regs for solvent cleanup level.

★ Mark will give me proposal for analysis of unknowns and soil borings to map extent of solvent

★ Have SRH come out to test their capability for soil vapor

~ 3000 yd3+ on pile

TOLS011766

ECOVA

May 2, 1989 P.N. 821401

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

Dear Fred:

Subject: Remediation Project at Time Oil Northwest Terminal, Portland, Oregon

The presence of large quantities of unknown solvents and other organic compounds--more than just "mineral spirits"--that we have encountered in the excavation at the site has us very concerned. From our letters dated March 14 and April 24, 1989, and from our meetings on March 9 and April 24, 1989, you know that we have been evaluating what these compounds may be and the effects they may have upon our remediation program. Three specific areas of concern are raised by these unknown compounds which need to be addressed quickly:

1) Scope of Work
2) Health & Safety
3) Extent of Contamination

Each of these concerns is discussed below.

Scope of Work

The treatability study and the subsequent contract that we negotiated with Time Oil to provide remediation services was based upon bioremediating soil and groundwater contaminated with PCP. "Mineral spirits" was mentioned as possibly being present, and this material does not normally pose a problem to biotreatment.

The unknown organic compounds that we have encountered were not reported in the previous sampling data (your letter of July 21, 1988) and were not present in the original samples from the site that we obtained in August 1988 for the treatability tests. They have only shown up at depth in the excavation, although the odor that seems to be characteristic of Kodak "Solvent KB-3" was detectable prior to excavation. The mixing formulae and the

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MSDS's for the compounds used in the original PCP mixing facility (including Solvent KB-3) which you provided us in February 1989, confirmed the historical use of a number of compounds in addition to mineral spirits.

To date, the following tasks have been performed to attempt to identify the unknown compounds:

- ECOVA Analytical Services performed GC/FID analyses on the free product and soil samples from the area in which the organics were observed. Large numbers and significant concentrations of unknown organic comounds with higher range boiling points (than PCP) were observed. One sample showed 185 separate chromatogram "peaks", or separate compounds;

- EAS performed GC/MS analysis on the organic fraction for both volatiles and semi-volatiles. From the resulting data, we performed a library search for the 40 highest peaks observed in the semi-volatile analysis;

- We contacted Kodak and obtained new MSDS's and samples of their compounds "Solvent KB-3" and "Solvent B-11" both used in the Time Oil PCP mixing facility. EAS then performed GC/FID analyses on these compounds to assess their makeup.

- EAS performed a GC/FID analysis on a sample of mineral spirits for comparison with the other analyses.

The most immediate problem stems from the way we have constructed our treatment system. Our treatment system is engineered to effectively treat PCP; we do not presently know whether or not the unknown organic compounds can be effectively washed from the soil and completely biodegraded, either exclusively or in conjunction with PCP. Additional testing is required to determine if our equipment is suitable.

After review of the GC/MS data mentioned above, we tentatively concluded that "most, if not all, of these compounds appear to be potentially biodegradable." This still appears to be the case. Based on this judgment, we originally concluded that we could attempt a biodegradation test in a bioslurry reactor at the site. However, upon additional reflection, we now conclude that a field test of this nature would be inappropriate because of the large quantities of contaminated material involved. Should the test not be successful, we would be faced with a large quantity of hazardous material needing disposal.

The presence of the unknown compounds has also delayed us in completing the excavation and backfilling tasks of the project. As we encountered soil contaminated with the unknown organic compounds, we excavated the material above the water table, and some below the water table. We have left the excavation open while we have attempted to resolve the unknown solvent situation. On April 24-25, we tested the side walls of the excavation for PCP only and have determined that, except for the soil on the west (toward the Willamette River) side of the 38,000 gallon tank, the soil on the east and south walls of the pit are free of significant PCP contamination. Additional testing for the organic contaminants is necessary.

Health & Safety

During the initial excavation work in December 1988, our field technicians complained of headaches and dizziness after working in the contaminated area. These symptoms were not consistent with PCP exposure, but of some volatile organic compound exposure. Although followup medical exams did not indicate any medical problems, use of respirators in the excavation area was added to the work procedures. On April 27, 1989, ECOVA was informed by Chase, Jones & Associates, the surveying firm that we used at the site, that one of their employees is experiencing difficulty in breathing (65% lung capacity was reported), and has attempted to obtain a copy of the Health & Safety Plan for the site from the Oregon Department of Environmental Quality. ODEQ does not have a copy on file, and Chase, Jones then called ECOVA at our Portland site office. We are following up with this complaint.

The presence of the unknown compounds, especially volatile ones, directly impacts the Health & Safety program at the site. In order to continue working at the site, several actions must be implemented:

1) The Health & Safety Plan must be updated to include operating procedures for handling material contaminated with the unknown organic compounds.

2) The stockpile must be covered to reduce voltilization.

3) Health & Safety procedures in the Exclusion Zone must be upgraded to Level B. This calls for supplied air respirators to be used by all employees entering the area, Saranex coveralls, gloves and rubber boots.

4) The ECOVA employees must be given another physical examination to cover their potential exposure to volatile organic compounds.

5) Additional air sampling must be performed in the work area to assess airborne contamination. 3M badges will be used for this assessment.

ECOVA is implementing these changes to the Health & Safety Plan.

Extent of Contamination

Additional investigation work needs to be performed to complete the characterization and distribution of contamination at the site that was initiated by Time Oil. Insufficient data exists to determine the extent of contamination at the site. For example, we have observed contamination present in the following site locations:

- Under the stockpile sump outside the excavation area (both PCP and solvents)
- In the J-1 well during well development
- In the new Well G during well installation (observed to be petroleum-type contamination)

Also, from the Time Oil data, it is clear that the extent of contamination on the west side of the excavation (toward the Willamette River) has not been delineated. It is not possible to accurately predict the quantity of soil that will ultimately need remediation.

While our contract includes the necessary cleanup level for PCP (0.5 ppm in both water and soil) no limits have been (or can yet be) set for the unknown organic contaminants. Without better data on the nature of the contaminants, it is impossible to set cleanup limits and determine if they are being met. It is not advisable to discharge any material to an uncontaminated area without determining these parameters.

Proposed Program

From our discussion above, we believe it is necessary to immediately make some major changes to the project scope of work and schedule. Following is our proposal for revising the project:

1) Stop work on construction of the treatment system pending the gathering of additional information about the nature of the contamination needing treatment.

2) Backfill the present excavation with clean soil from the disposal site to minimize the hazards, both chemical and physical. Organic contamination present will be below the groundwater table and is expected to be handled by in situ methods.

3) Immediately undertake a sampling and chemical characterization task aimed at determining and quantifying all contaminants present at the site. Attached is our proposed scope of work for this task.

4) Immediately undertake an additional soil washing and biotreatability assessment in the laboratory to verify the treatability of the unknown organic compounds.

5) Implement the changes to the Health & Safety Plan discussed above. Once chemical characterization has been completed, modify the Plan accordingly.

6) Once chemical characterization has been completed, plan and undertake a soil and groundwater sampling program aimed at defining the extent of contamination present at the site.

7) Once the additional data has been gathered, revise the engineering design of the treatment plant, if necessary, to allow for the successful completion of remediation of the soil and groundwater.

We are recommending that our contract be amended to allow these changes to the work scope to be included. Additionally, we are requesting payment for work performed on the project to date and for progress billing based on costs incurred in the immediate future until treatment operations commence.

Fred, we are at a significant point in the project; once identification and degradability of the unknown compounds is achieved, we can implement an effective and more comprehensive treatment program. We are committed to working with Time Oil to achieve timely and cost-effective site remediation.

Sincerely,

Mark W. Anderson

Mark W. Anderson, P.E.
Senior Project Manager

cc: J. Bolton
J. Kinsella
R. Carr
J. Hancock
Files

CHEMICAL CHARACTERIZATION
OF UNKNOWN ORGANIC COMPOUNDS
AT THE TIME OIL NORTHWEST TERMINAL SITE
PORTLAND, OREGON

The following plan is proposed for qualitatively and quantitatively identifying the unknown organic compounds that have been observed at the site during the excavation task. This program is intended to provide a complete list of contaminants present so that an appropriate sampling and analysis plan can be prepared for additional investigations of extent of contamination (ie., investigations to identify a potential groundwater plume and additional contaminated soil in the vadose zone.)

SOIL SAMPLING

Some variation of contamination was visually observed by ECOVA personnel during excavation activities. In order to assess the variation in the contaminants that may be present at the site, a representative number of soil samples must be obtained. All samples will be gathered following EPA approved methods following all chain of custody, preservation, and QA procedures.

Limits of Contamination in Pit - In order to check for presence of organic compounds in the south and east walls of the excavation, 12 samples from each wall (3 elevations at 4 distances along the wall face) will be sampled.

Stockpiled Soil - To assess the organic contamination in the soil already excavated, 8 samples will be obtained by hand auger from the stockpile of excavated soil. Each core will be sectioned into 3 discrete samples, making a total of 24 samples. This will allow quantification of the volatilization of compounds since stockpiling.

Sediment - Two samples of sediment will be collected from the pit.

WATER SAMPLING

All samples will be gathered following EPA approved methods following all chain of custody, preservation, and QA procedures.

Water in Pit - Two samples of water from the pit will be obtained for analysis. One sample will be from the top layer of water to catch any floating organic materials. The second sample will be obtained from several inches beneath the surface of the water and will test for any dissolved organic materials.

Wells - One water sample each will be gathered from wells J-1, J-2, and J-3 on the western edge of the pit.

TOLS011772

ANALYSIS OF SAMPLES

Each of the samples (both water and soil) will be analyzed by gas chromatograph (GC) for initial screening (total of 42 samples). This can be done quickly in the field using the GC at the site.

Those samples showing the greatest spectrum of contaminants will be shipped to ECOVA Analytical Services laboratory in Redmond, WA. Each will be analyzed for ultimate fingerprint identification of the individual components by GC/MS. It is expected that two samples will undergo this sampling, one water sample and one soil sample.

In addition, the samples of Solvent KB-3 and Solvent B-11 received from Kodak will be analyzed by GC/MS. This will assist in the fingerprinting of the field samples.

One sample of known high concentration of PCP will be sent to a laboratory specializing in dioxin analysis for this determination.

PROPOSAL OUTLINE FOR TREATABILITY TESTING

Recent analytical results for soil samples at the Time Oil facility in Portland indicate a significant amount of undefined petroleum hydrocarbon type contamination which may also contain the solvents KB-3 and B-11. The following treatability testing is being proposed to ascertain the impact of this material on the present treatment process and determine what specific modifications may be required to achieve remediation of the contaminated soils.

I. Soil washing and oil/water separation

A. water
B. alkaline water
C. Analytical
   1. GC analysis of soil and pregnant wash
   2. GCMS on soils (contingency)

Rationale: A significant volume of the hydrocarbon material may be separated from the soil by washing the soil with water and decanting the liquid phase to an oil water separator. If analysis of the washed soil indicates residual PCP contamination then a subsequent wash with alkaline water can be implemented and the soils treated according to the initial process design.

II. Slurry-phase biotreatability of contaminated soils and or liquids (4 weeks, 2 replicates, 5 time points)

A. Treatments
   1. Unamended
   2. Nutrient amended
   3. Nutrient plus inoculum (PCP degraders)

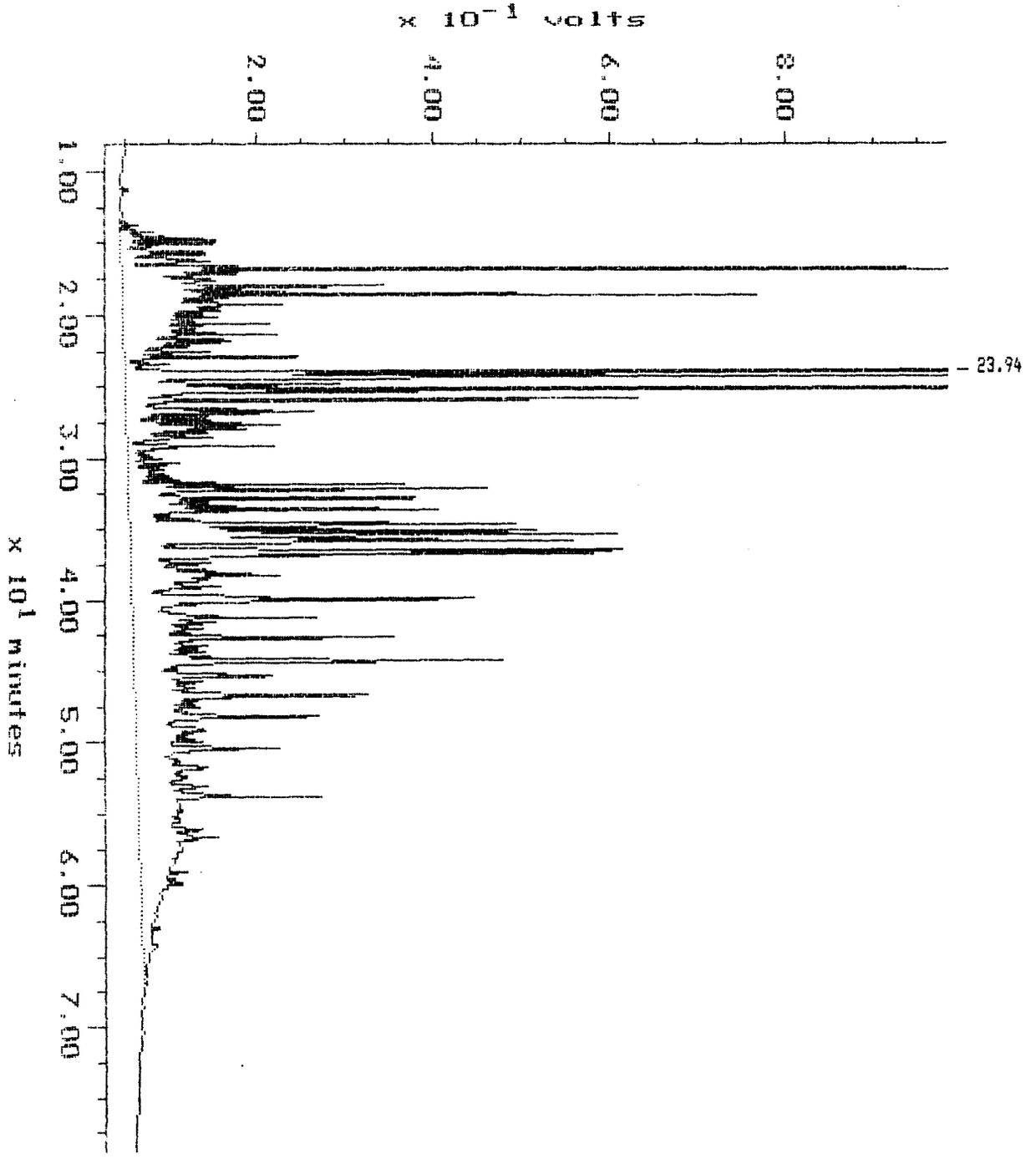
B. Analytical methods
   1. GC/MS Initial and final time points
   2. TPH/IR all time points (0, 1, 2, 3, 4 weeks)

Rationale: Soil washing with oil/water separation will yield aqueous liquids which will require treatment. The treatability study will determine the efficacy of biological treatment of these materials by indigenous microorganisms and determine the effects of the petroleum contaminants on the PCP degrading inoculum.

TOLS011774

BZTO104(e)048607

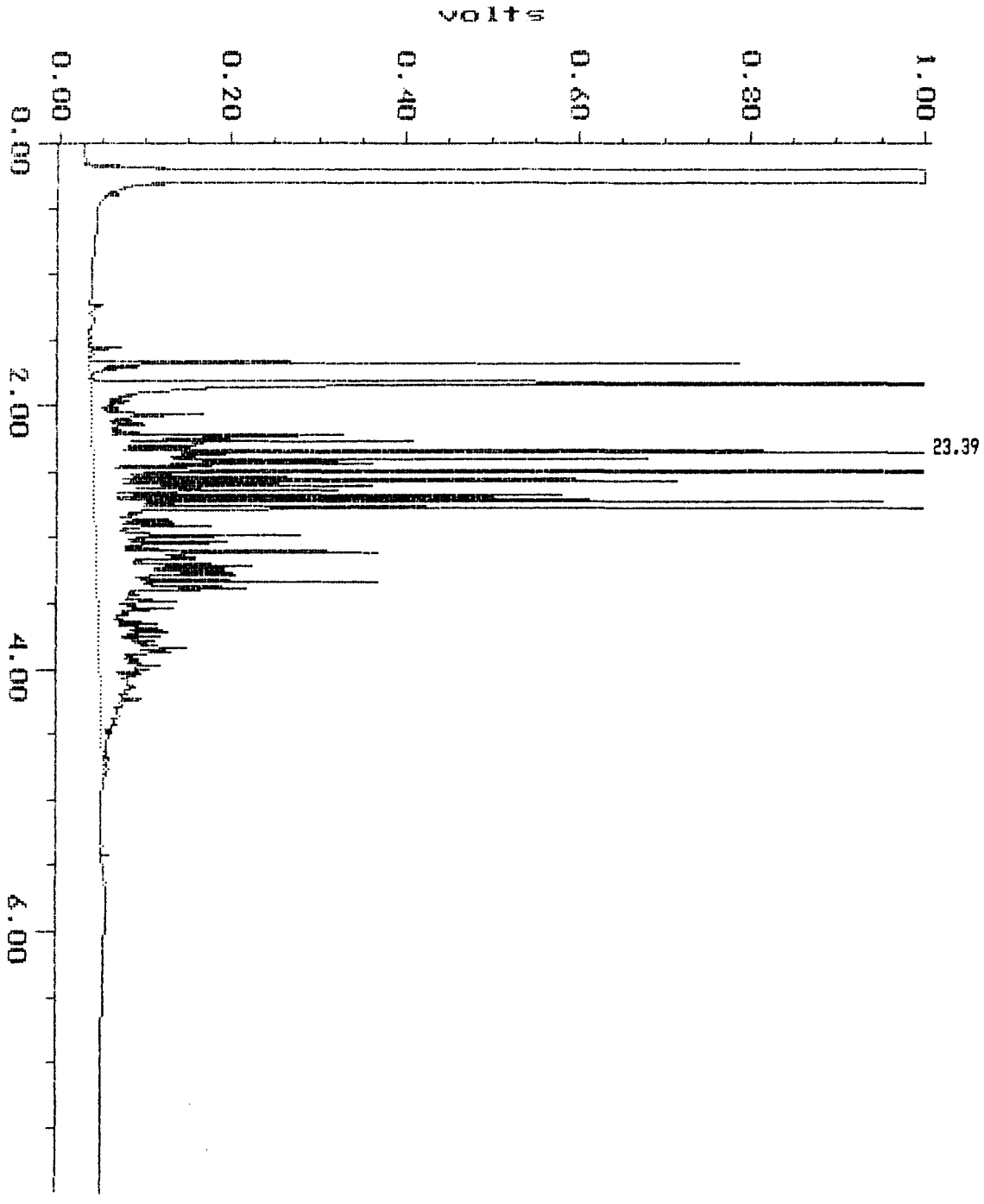
Sample: SITE SAM CA-77 Channel: TPH I.D. Filename: CA-77
Acquired: 28-APR-89 13:15 Method: C:\MAX\DATA2\TPH-ID Operator: MLA
Comments: SITE SAMPLE CA-77 FIRST RUN. 4-28-89



Soil from Site

TOLS011775

Sample: 5000 PPM B-11 Channel: TPH I.D. Filename: TPM429C
Acquired: 29-APR-89 18:59 Method: C:\MAX\DATA2\TPH-ID Operator: MLA
Inj Vol: 5.00



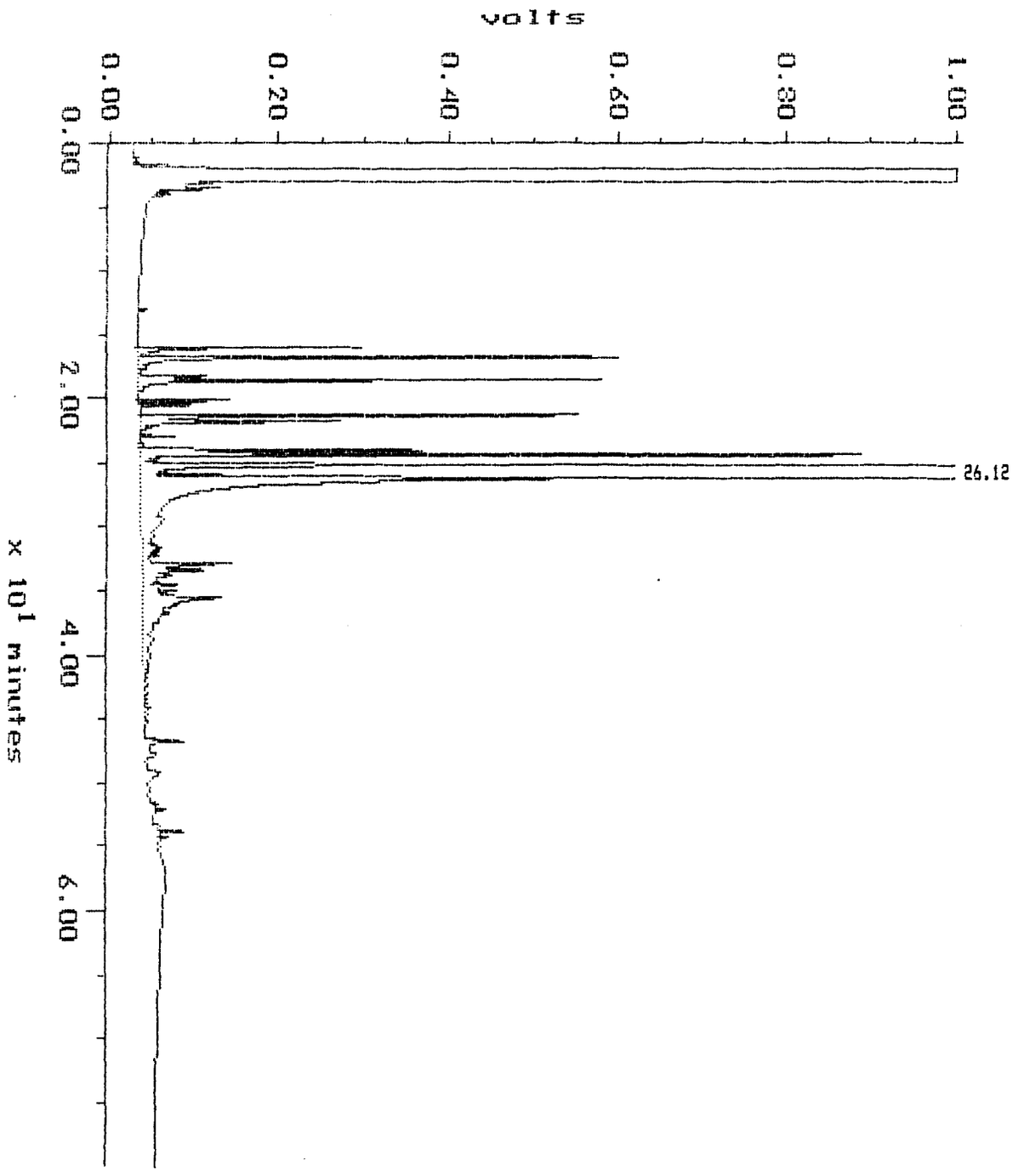
Solvent B-11

TOLS011776

Sample: 2000 PPM KB-3
Acquired: 29-APR-89 16:01
Inj Vol: 5.00

Channel: TPH I.D.
Method: C:\MAX\DATA2\TPH-ID

Filename: TPM429A
Operator: MLA



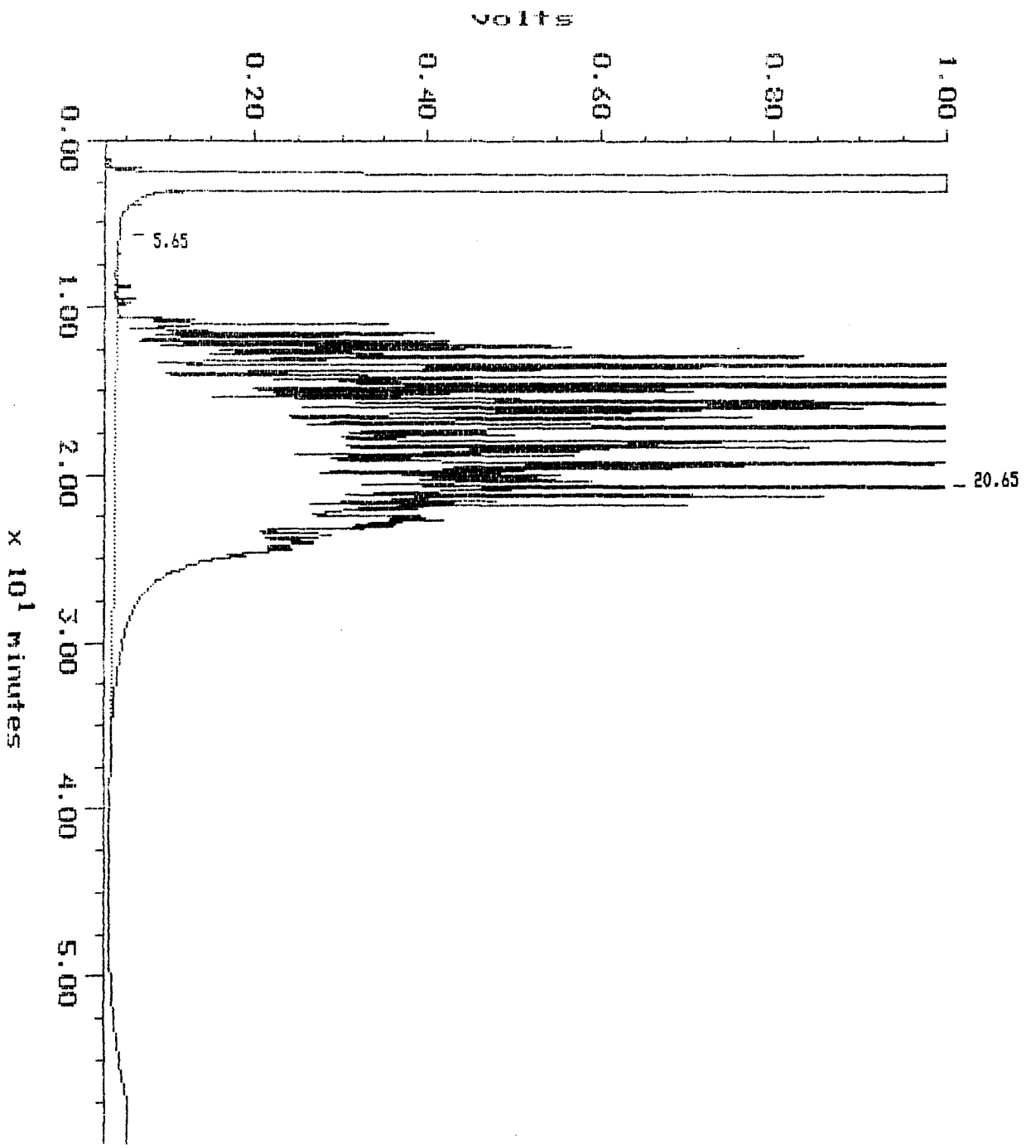
Solvent KB-3

TOLS011777

Sample: 5000 PPM MS
Acquired: 29-APR-89 17:23

Channel: TPH I.D.
Method: C:\MAX\DATA2\TPH-ID

Filename: TPM429B
Operator: MLA



MINERAL SPIRITS

TOLS011778

ECOVA

April 24, 1989 P.N. 821401

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

Dear Fred:

Subject: Status of Remediation Project at Time Oil Northwest Terminal, Portland, Oregon

This letter will serve to update you of work performed by ECOVA on our project to remediate pentachlorophenol (PCP) soil at the subject site since our last report dated March 14, 1989. It will also present our plans for work in the immediate future at the site.

Work Completed Since Last Report

Work completed on the project has primarily focused on treatment system equipment installation, location and procurement of suitable batch mixing and screening units, excavation of additional soil in the disposal areas, and a review of the situation in the excavation area that has resulted from the unexpected large quantities of solvents encountered.

Problems Encountered in March & April

Schedule Delay

Two primary factors have contributed to a delayed startup schedule: power and equipment.

Power availability continues to be the major source of delay to treatment system startup. While PGE has provided a power drop, delays associated with connecting this to ECOVA equipment have prevented equipment startup. In part, this is due to the electrical code for the City of Portland which is more restrictive than other sites at which we have worked. Equipment modifications have been necessary. We have been working steadily at making these modifications and expect that power will be available to the treatment system by May 1, 1989.

Delayed delivery of two major units of treatment equipment to the site has delayed completion of the treatment system installation. This is an internal ECOVA problem which we are working to resolve. These units are expected to be available by May 10, 1989.

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Well Testing Program

Lack of tankage has delayed the pump testing of the wells. The well tests are expected to produce about 25,000 gallons of contaminated water. Our intention has been to pump this to either our treatment unit tanks or the 38,000 gallon tank. Since we have not yet completed the installation of the treatment system, our treatment tanks have not yet been available. Also, since the excavation has been delayed by the solvents encountered, backfilling of the hole has been delayed. For safety reasons, we have not wanted to fill the 38,000 gallon tank until the backfilling has been performed next to the tank.

Two major sources of water need to be considered, the well test water and the contaminated water in the bottom of the excavation. Before the excavation can be backfilled, we intend to quickly pump the contaminated water out of the pit. Since the 38,000 gallon tank cannot be used, this water must be pumped to the treatment system tanks, as yet not available. Once in the tanks, the floating solvent can either be biodegraded or absorbed onto absorbent pads.

Excavation Activities

Per our letter of March 14, we intended to continue excavation for all solvent and PCP contaminated soils; shortly after this date, however, we halted excavation of the main body of contamination. This was done for several reasons. First, this allowed us to review the situation with the solvents encountered and the information obtained in the onsite analytical program. Second, the solvents encountered could have represented an explosion hazard and we pulled all excavation equipment out of the hole while we checked this with a combustible gas test instrument. The solvents have formed a layer on the surface of the water present in the excavation. The water present in the hole has changed to a dark blackish color suggesting that oxidation of some contaminants is occurring.

Enclosed for your information are plots showing location and analyses of samples taken during the excavation operation. All analyses were performed by the onsite laboratory. We believe that the main part of the excavation has now been completed down to groundwater on the north and east sides of the pit. Although we have confirmed that contaminated soils exist below groundwater, this contamination will be left in place for treatment by in situ methods. We will be taking additional samples along the walls on those sides to verify that all PCP contaminated soils have been removed. This sampling and analysis will be performed on April 24-25, 1989.

Assuming that these samples confirm that PCP contaminated soils have been removed, we will commence backfilling the pit with clean soil from the disposal pit area after surveying the pit limits. Backfilling will move from north to south until the pit area next to the 38,000 gallon tank has been filled. Since we have encountered solvents in the south area of the pit towards the groundwater monitoring wells, this area will be left open for near future. Excavation of the contaminated material next to the warehouse foundation will commence after backfilling has been completed.

The majority of solvent contaminated soil that we have encountered appears to be located in the south end of the pit. We recommend that several soil borings be made in the area south of the existing pit to better quantify the extent of solvent contaminated soil that will need to be excavated and treated.

Also, we have been in contact with Kodak, manufacturer of the KB-3 solvent that was used at the PCP mixing facility. Kodak has recently provided us with a sample of the KB-3. We have wanted to test this sample in our lab to compare with the previous compounds that showed up in the solvent samples taken at the site.

In our March 14 letter, we indicated that, per your consent, we would attempt a biodegredation of the solvent and PCP contaminated soil in a
bioslurry reactor at the earliest convenience. We still intend to proceed
with this course of action when the treatment equipment can be made available.

As discussed in our March 14 letter, excavation of the contaminated soil next to the foundation (but not under) will take place in a series of narrow sections with combined use of trench boxes. We have scheduled this excavation to take place after excavation and backfilling of the remainder of the contaminated area. Since you have not informed me of any Time Oil concerns over this excavation approach, we will proceed with this plan. As I pointed out in the March 14 letter, while we will be working very carefully around the foundation, some additional damage to the foundation of the warehouse may still occur.

Revised Schedule

The revised schedule anticipated for the project is as follows:

Completion of Initial Excavation and Backfill...May 12
Startup/Shakedown of Treatment Operations.....May 1 - May 31
Treatment Operations.....June 1 - January 31, 1990
Second Excavation and Backfill.....November 1 - 30
Demobilization.....February 1 - 14, 1990

This schedule obviously anticipates that the overall quantity of soil needing remediation does not increase significantly from the 3440 cubic yards originally anticipated.

Out of Scope Items

Additional significant items that will need to be addressed by a Change Order over and above the Change Order that you are currently holding and those Change Orders mentioned in the March 14 letter include:

1) Additional laboratory analyses of the KB-3 sample and comparison with the site samples. Costs currently estimated at $820 (fast turnaround on 2 GC-MS runs).

2) Any additional soil borings, sampling, and analysis for assessing extent of solvent contamination above the groundwater in the area south of the existing excavation.

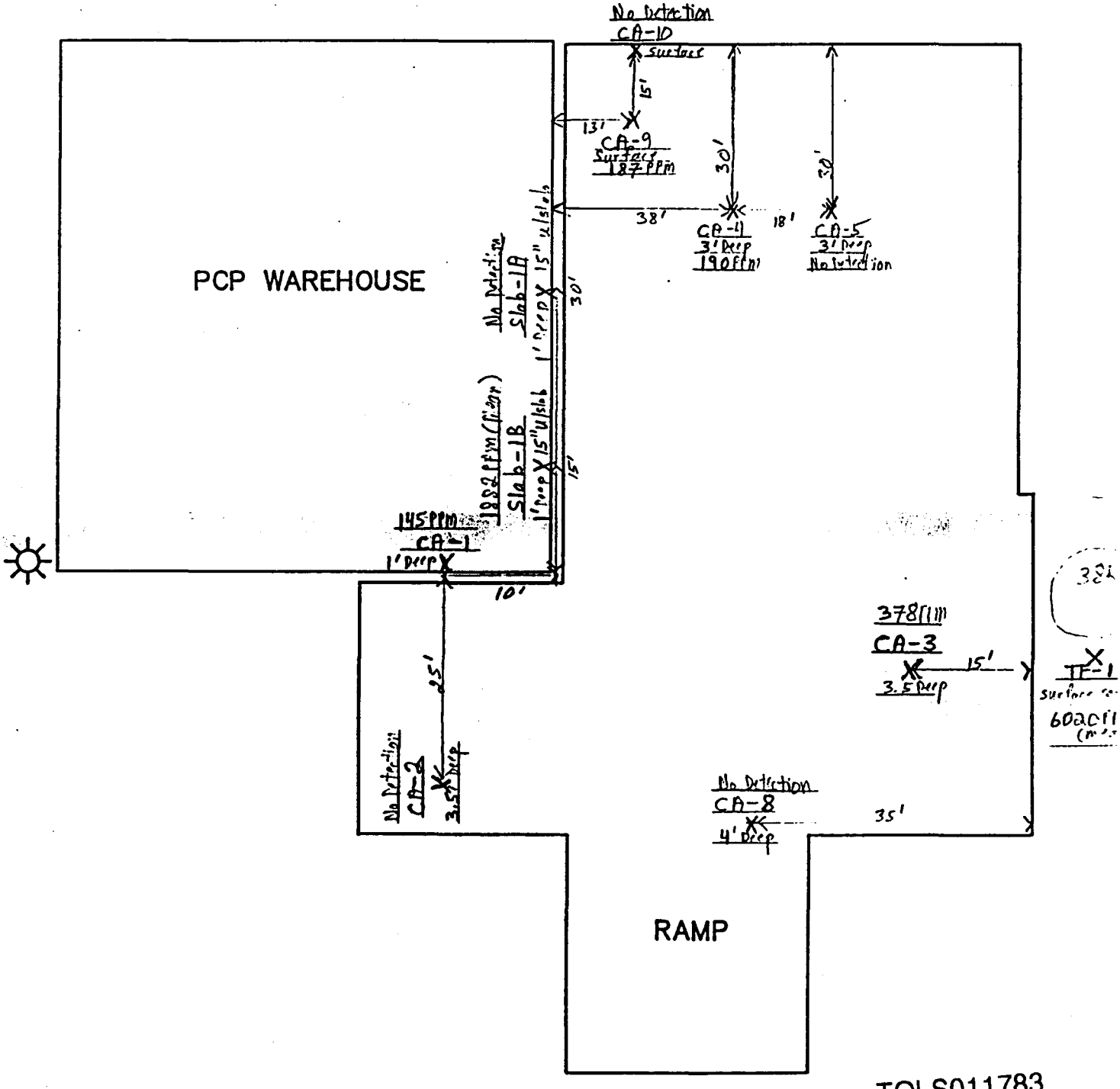
This project continues to be a challenge. We are all anxious to get into the treatment phase of the work. If you have any questions over any of this information, please do not hesitate to give me a call.

Sincerely,

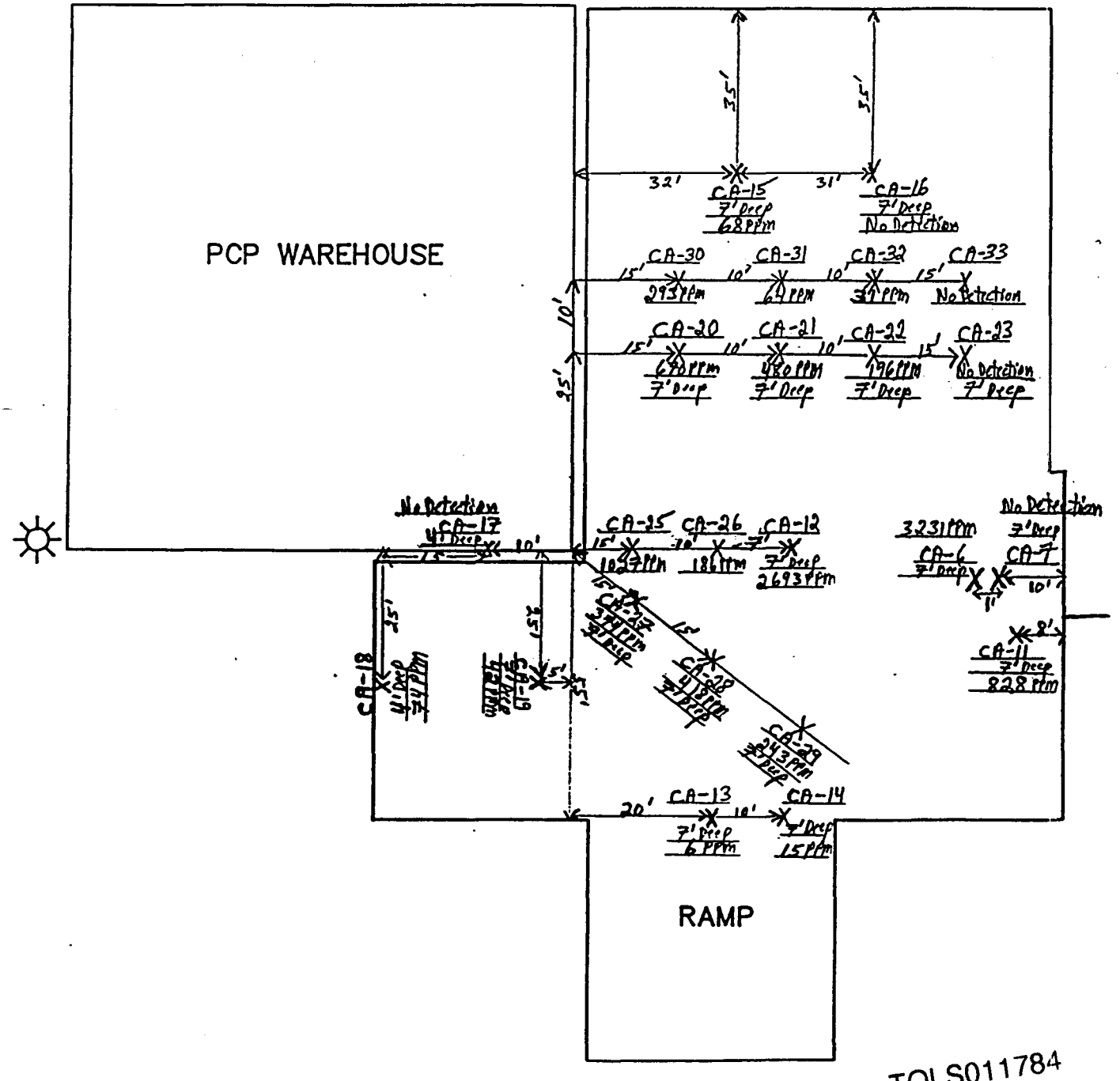
Mark W. Anderson
Senior Project Manager

cc: J. Bolton
J. Kinsella
Files

TOLS011782

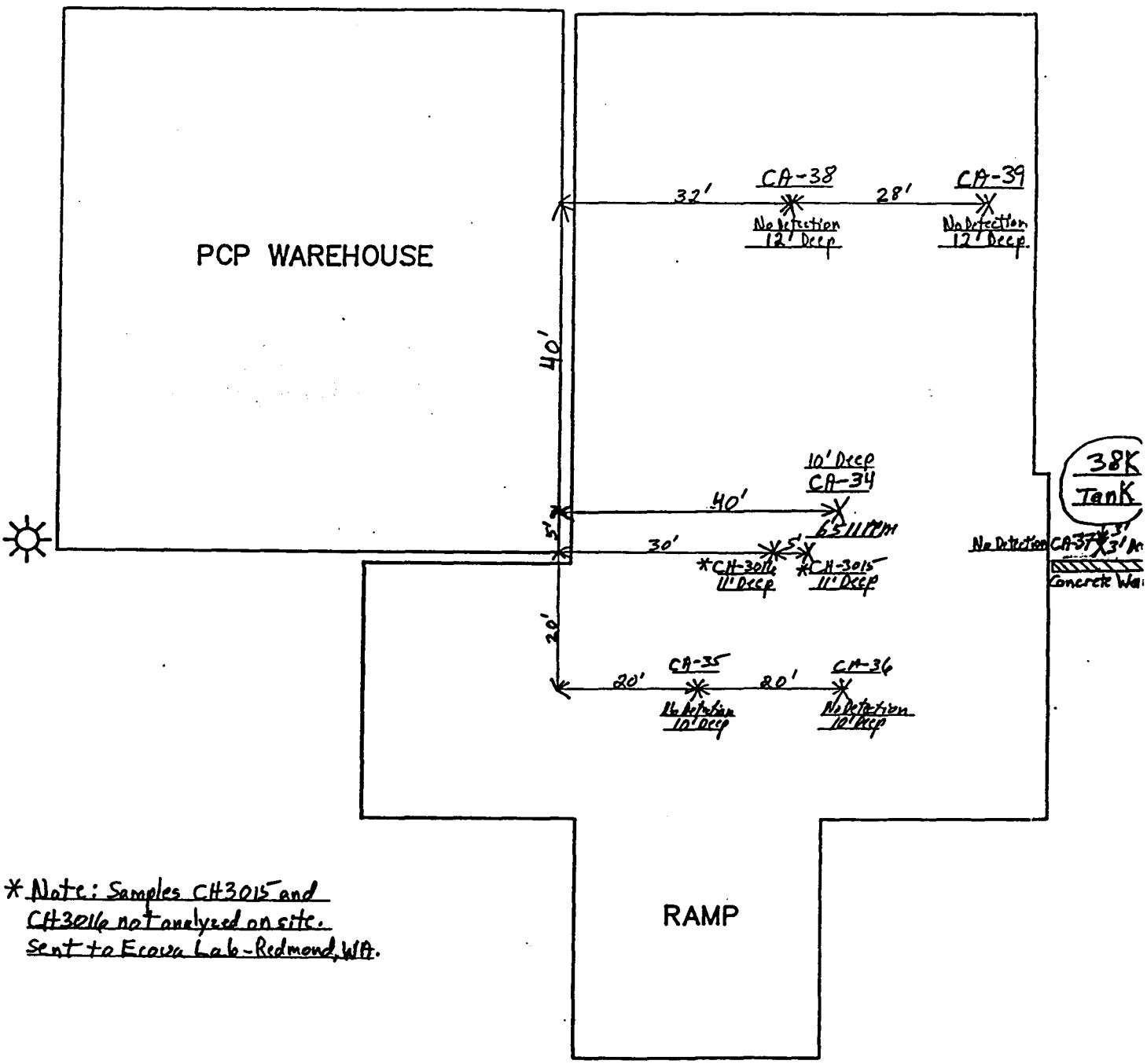


Surface = 4.0' ... Samples - Surface Grade & 4' Grade



TOLS011784

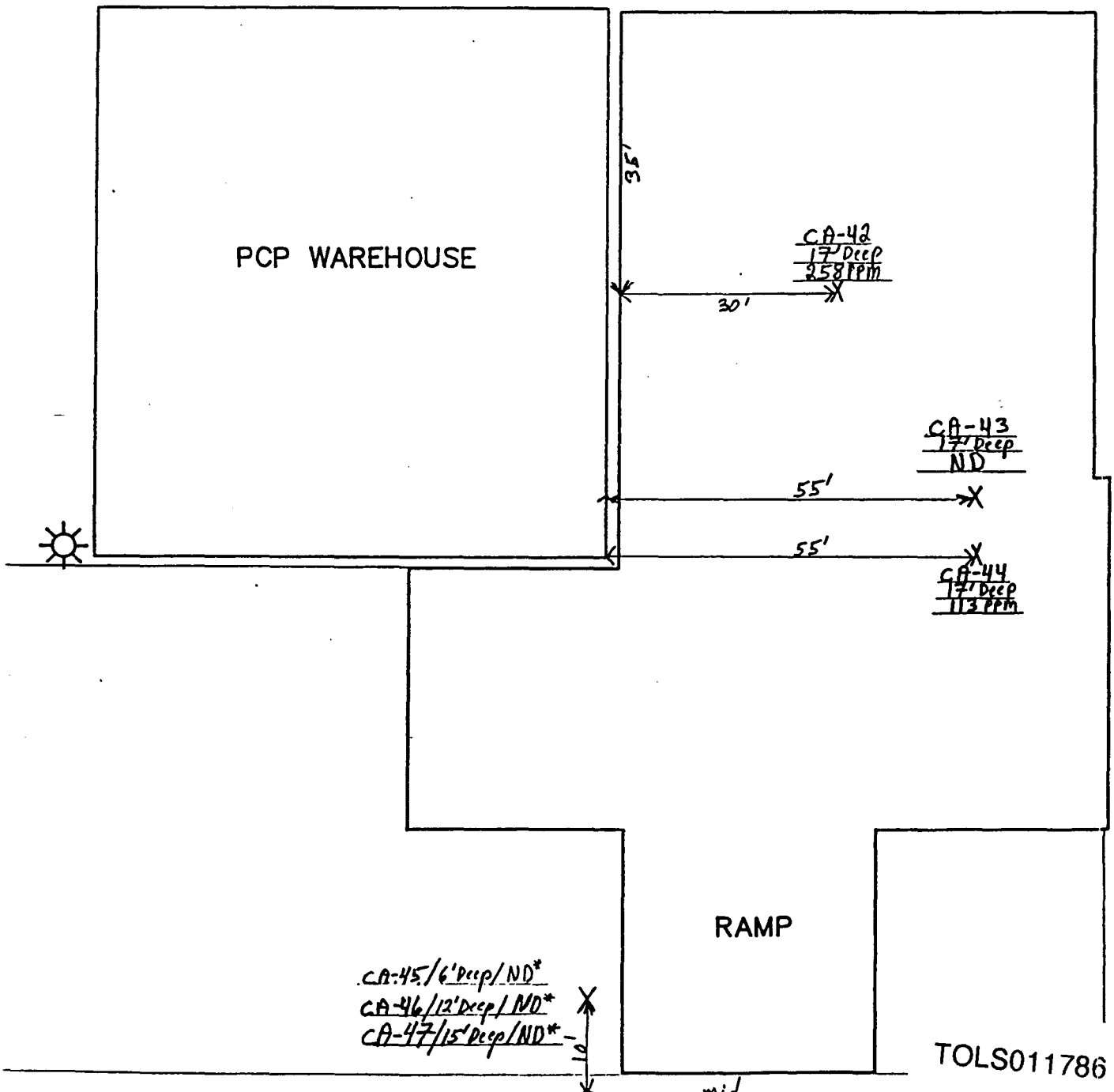
7' Grade Samples (Note: some 4' Grade samples included)



*Note: Samples CH3015 and CH3016 not analyzed on site. Sent to Ecovea Lab - Redmond, WA.

TOLS011785

12' Grade Samples (Note: some 10'-11' Grade samples included)



*Note-ND= No Detection

17' Depth Samples + 6', 12', 15' Depth Samples-North Monitor Well

E C O V A

March 14, 1989 P.N. 821401

Mr. Fred Proby
Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

Dear Fred:

Subject: Status of Remediation Project at Time Oil Northwest Terminal, Portland, Oregon

This letter will apprise you of the current status of the ECOVA project to remediate pentachlorophenol (PCP) soil at the subject site.

Work Completed To Date

Work commenced on the project immediately after the contract start date of November 9, 1988. During the initial engineering and process optimization phase, a decision was made to modify the treatment process to allow for enhanced soil washing. This modification should allow for an expedited remediation program, reducing the overall time from 19 months to approximately 12 months or less.

Work onsite commenced in December with establishment of an office and initial excavation of the disposal pit areas. In January 1989, work continued with drilling of the additional wells, construction of the soil stockpile and treatment areas, establishment of the onsite laboratory, and commencement of excavation, screening and stockpiling of contaminated soil. Modification of the 38,000 gallon tank commenced with installation of a new tank lining. PGE initiated construction of the power transmission line. Treatment equipment was mobilized to the site.

In February, additional equipment was delivered to the site. Excavation of the contaminated area continued at the beginning of the month, but was halted when unexpectedly large quantities of unknown organic solvent

Corporate Office
3820 159th Avenue I
Redmond, WA 9805
(206) 883-1900
(206) 867-2210 FA

Gulf Coast Region
12790 Merit Drive #22(
Lock Box 145
Dallas, TX 75251
(214) 404-7540
(214) 404-7545 FAX

Eastern Region
500 Fifth Avenue
Suite 935
New York, NY 10110
(212) 840-1042
(212) 840-1663 FAX

material were encountered at depth in the excavation. Laboratory analysis was conducted to identify these unknown materials.

To date in March, excavation has commenced again after discussions with you, and assembly of the treatment system was initiated.

Problems Encountered

Initial problems were encountered in obtaining power to the site. According to the original schedule, power was needed about the third week in January. Power was not available at this time. However, because of severe weather and equipment problems encountered by ECOVA at a site elsewhere (equipment slated for use at the Portland site), delivery of some treatment equipment to the Portland site was delayed well into February. In any event, the severe weather would have delayed startup of the bioreactor systems, even if the systems had been available for treatment. The severe weather and lack of tankage has delayed the pump testing of the wells, as well. These are the kinds of problems encountered when starting up a project in the wintertime.

Excavation of Warehouse Foundation

Extensive study has been made of the problem facing us with the excavation of contaminated soil around and under the foundation of the former PCP warehouse building. Applied Geotechnology Inc., Bellevue, WA, was retained as a geotechnical subcontractor to assist us in arriving at a satisfactory and safe solution. The foundation of the warehouse is in very poor condition, with extensive pre-existing cracking. Excavation around this foundation is likely to cause additional cracking. We understand from both you and Neil Wallis that Time Oil is not concerned over the potential damage, however, we wish to minimize it to the extent possible and ensure a safe excavation.

We have decided to abandon excavation under the foundation in favor of an in situ approach involving installation of an injection system next to the foundation to wash the contaminants into the groundwater where they can be recovered by the groundwater wells. Excavation of the contaminated soil next to the foundation (but not under) will take place in a series

of narrow sections at a time with combined use of trench boxes (closed end) to provide stability to the adjacent soil. Clean soil will be backfilled while removing the trench box.

We have scheduled this excavation to take place after excavation and backfilling of the remainder of the contaminated area. If you have any concerns over this excavation approach, please let me know soon, or we will proceed with this plan. It is important to point out that, while we will be working very carefully around the foundation, some additional damage to the foundation of the warehouse may still occur.

Additional PCP Contaminated Soil

Additional soil contaminated with PCP has been identified that is outside the original excavation area. First, soil with up to 6000 ppm PCP was detected in the soil in front of the manhole cover at the 38,000 gallon tank in the tank farm area adjacent to the excavation. This contamination appears to be localized and, per our discussion with you, we will excavate and treat this additional soil.

Second, soil samples obtained from about a depth of 5' in the excavation for the stockpile area sump showed PCP and the presence of unknown organic solvents. Since this contaminated soil is in the middle of the stockpile facility, it will not be possible to excavate the soil during the main excavation effort. This will need to be excavated at a later date when the stockpile has been largely treated. Other soil samples taken at the surface in the stockpile and treatment areas (under the liners) did not detect any PCP present.

Unknown Solvents in Excavation

The problem with the unknown solvents first became suspected when our operators complained of headaches in January. We tested the air and soil at that time, but could not find any compounds that were of concern. Our operators have not complained of any symptoms since. At that time both you and Neil Wallis provided us with formulae and MSDSs for the materials originally used in

the PCP mixing process at the site. When we encountered free liquid product at depths of 7 to 9 feet along with strong solvent odors and stained soil, we halted excavation. ECOVA Analytical Services, per your request, engaged upon a series of analyses to identify these compounds. These analyses, copies of which were given to you on Thursday, March 9, 1989, indicate that, in addition to "mineral spirits" which were originally believed to be present, a number of heavier aliphatic, ketone and ester/olefin/alcohol type compounds (such as would be expected to be found in the Kodak proprietary compound KB-3) were present. In our meeting of March 9, we stated that:

1) These new compounds were largely insufficiently volatile for removal with vacuum vapor extraction technologies;

2) These new compounds seem to occur both with and without the presence of PCP;

3) Free product may be present on the surface of the groundwater table; and

4) It appears to our microbiologists that most, if not all, of these additional compounds_appear to us to be potentially biodegradable.

The following actions were agreed to in that meeting:

1) Continue excavation for all solvent and PCP contaminated soils;

2) Attempt a biodegredation of the solvent and PCP contaminated soil in a bioslurry reactor at the earliest convenience; and
3) Notify you as soon as possible if it appears that significant additional quantities of soil will need to be excavated.

As we discussed today, we encountered free solvent product floating on the groundwater surface while continuing the excavation in the southeast corner of the pit. We agreed to obtain the hydrocarbon-absorbing pads to attempt to absorb this free product. The contaminated pads will be placed in barrels for later treatment (hopefully in a bioreactor).

Also, a water sample from the closest well to the excavation will be obtained and analyzed for the solvents by GC-MS method.

Revised Schedule

The revised schedule anticipated for the project is as follows:

Completion of Initial Excavation and Backfill.....April 14
Startup/Shakedown of Treatment Operations.....March 27 - May 1
Treatment Operations.....May 1 - December 15
Second Excavation and Backfill.....October 1 - 30
Demobilization.....January 2 - 14

This schedule obviously anticipates that the overall quantity of soil needing remediation does not increase significantly from the 3440 cubic yards originally anticipated.

Out of Scope Items

Additional significant items that will need to be addressed by a Change Order over and above the Change Order that you are currently holding include:

1) Excavation and backfill of soil under the septic tank in the stockpile area. It is not possible to estimate these costs at this time. This item can wait until later in the project.

2) Additional laboratory analyses for the unknown solvents in soil. Costs currently estimated at $2050 (fast turnaround on five GC-MS runs).

3) Additional laboratory analysis for the unknown solvents in the groundwater sample to be taken. Cost estimated to be $712.

This project has certainly been a challenge, and it has certainly been a pleasure working with you. If you have any questions over any of this information, please do not hesitate to give me a call.

Sincerely,

Mark W. Anderson

Mark W. Anderson
Senior Project Manager

cc: J. Bolton
J. Kinsella
Files

3/8/89 PLT

NW Penta – "solvent"
Meeting w/ Mark Anderson

Ran GC/MS on sample of product
lots of semi-volatile compounds – all appear to be biodegradable
* None on priority list
Although it can be biodegraded, it "could" affect the clean-up level we can attain on Penta – end point limiting
– Best thing to do is run a batch & see – no point doing a treatability test at this stage.
★ 1st batch will be high solvent + high penta concentration
Some soil has solvent, but no penta
How is Ecova to handle this?
Can segregate into a 2nd pile – this would allow excavation to continue.

Planned penta tmt involved a washing step first
Use NaOH or surfactant mixture developed by Ecova (forms micelles) – the surfactant might work on the solvent

TOLS011793

BZTO104(e)048626

SEMI VOLATILE
TENTATIVELY IDENTIFIED COMPOUNDS

Laboratory Name: Ecova Corporation
Lab Sample ID: EAS1279-01
Sample Matrix: LIQUID
Concentration: LOW
Sample wt/vol: 1.0 G
Date Extracted: NA
Date Analyzed: 03/01/89 16:57

Project Number: NA
Customer Sample Number: NA
Sample Description: TIME OIL EXTRACT
Date Collected: NA
Time Collected: NA
Date Received: 03/01/89
Data Release Authorized:

	C.A.S. Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration uG/KG	Q
1.		aliphatic hydrocarbon (C10H22)	BN/A	13.11	2200000	JI
2.		aliphatic hydrocarbon (C10H22)	BN/A	13.65	2300000	JI
3.		aliphatic hydrocarbon (C10H22)	BN/A	13.80	2200000	JI
4.		alicyclic hydrocarbon (C10H20)	BN/A	13.85	3400000	JI
5.		aliphatic hydrocarbon (C10H22)	BN/A	14.03	3800000	JI
6.		aliphatic ketone	BN/A	14.49	8300000	JI
7.		aliphatic hydrocarbon (C10H22)	BN/A	14.73	8200000	JI
8.		aliphatic hydrocarbon (C11H24)	BN/A	15.26	3900000	JI
9.		trimethyl or ethyl-methyl benzene	BN/A	15.42	4000000	JI
10.		aliphatic hydrocarbon	BN/A	15.53	1800000	JI
11.		alicyclic hydrocarbon (C10H20)	BN/A	15.64	3800000	JI
12.		trimethyl cyclohexanone	BN/A	15.78	4300000	JI
13.		2,7-octanedione	BN/A	15.96	4200000	JI
14.		aliphatic hydrocarbon (C11H24) and aromatic (C10H14)	BN/A	16.03	2500000	JI
15.		aliphatic hydrocarbon and aromatic (C10H14)	BN/A	16.19	2400000	JI
16.		aliphatic hydrocarbon (C11H24)	BN/A	16.35	3800000	JI
17.		methyl-propyl benzene	BN/A	16.65	1900000	JI
18.		unknown	BN/A	16.79	2600000	JI
19.		aliphatic hydrocarbon (C11H24)	BN/A	16.99	6000000	JI
20.		aliphatic substituted cyclohexane (i.e. pentacyclohexane)	BN/A	17.93	2000000	JI
21.		5-dodecanone	BN/A	19.36	6500000	JI
22.		aliphatic hydrocarbon (C12H26)	BN/A	19.91	9300000	JI
23.		aliphatic ketone (C11H22O)	BN/A	20.54	7400000	JI
24.		aliphatic ketone	BN/A	21.70	6500000	JI
25.		3,4-dihydro-2,5-dimethyl-2H-pyran-2-carboxaldehyde	BN/A	21.78	4600000	JI
26.		unknown	BN/A	23.38	5300000	JI
27.		aliphatic phthalate ester	BN/A	24.48	7400000	JI
28.		tetrachlorophenol	BN/A	26.08	15000000	JI
29.		unknown	BN/A	26.39	6200000	JI
30.		aliphatic acid or ester	BN/A	28.35	4400000	JI
31.		unknown (aliphatic alcohol, olefin, or ester)	BN/A	30.18	5800000	JI
32.		aliphatic acid or ester	BN/A	31.10	5500000	JI
33.		unknown (aliphatic alcohol, olefin, or ester)	BN/A	32.11	16000000	JI
34.		aliphatic ester	BN/A	32.78	4600000	JI
35.		aliphatic acid or ester	BN/A	33.66	10000000	JI
36.		unknown (aliphatic alcohol, olefin, or ester)	BN/A	34.61	10000000	JI
37.		aliphatic hydrocarbon (C23H48)	BN/A	35.65	5800000	JI
38.		aliphatic acid or ester	BN/A	35.98	6900000	JI
39.		aliphatic hydrocarbon	BN/A	36.78	6200000	JI
40.		aliphatic hydrocarbon	BN/A	40.68	4500000	JI

TOLS011794

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: NA
Sample Matrix: LIQUID
Concentration: LOW Dilution Factor: 200.00
Sample wt/vol: 1.0 G
Date Extracted: NA
Date Analyzed: 03/01/89 16:57

Lab Sample: EAS1279-01
Customer Sample: NA
Sample Description: TIME OIL EXTRACT
Date Collected: NA
Time Collected: NA
Date Received: 03/01/89
Data Release Authorized:

Gary Nocle

C.A.S. Number		UG/KG	C.A.S. Number		UG/KG
87-86-5	Pentachlorophenol	99000000.			

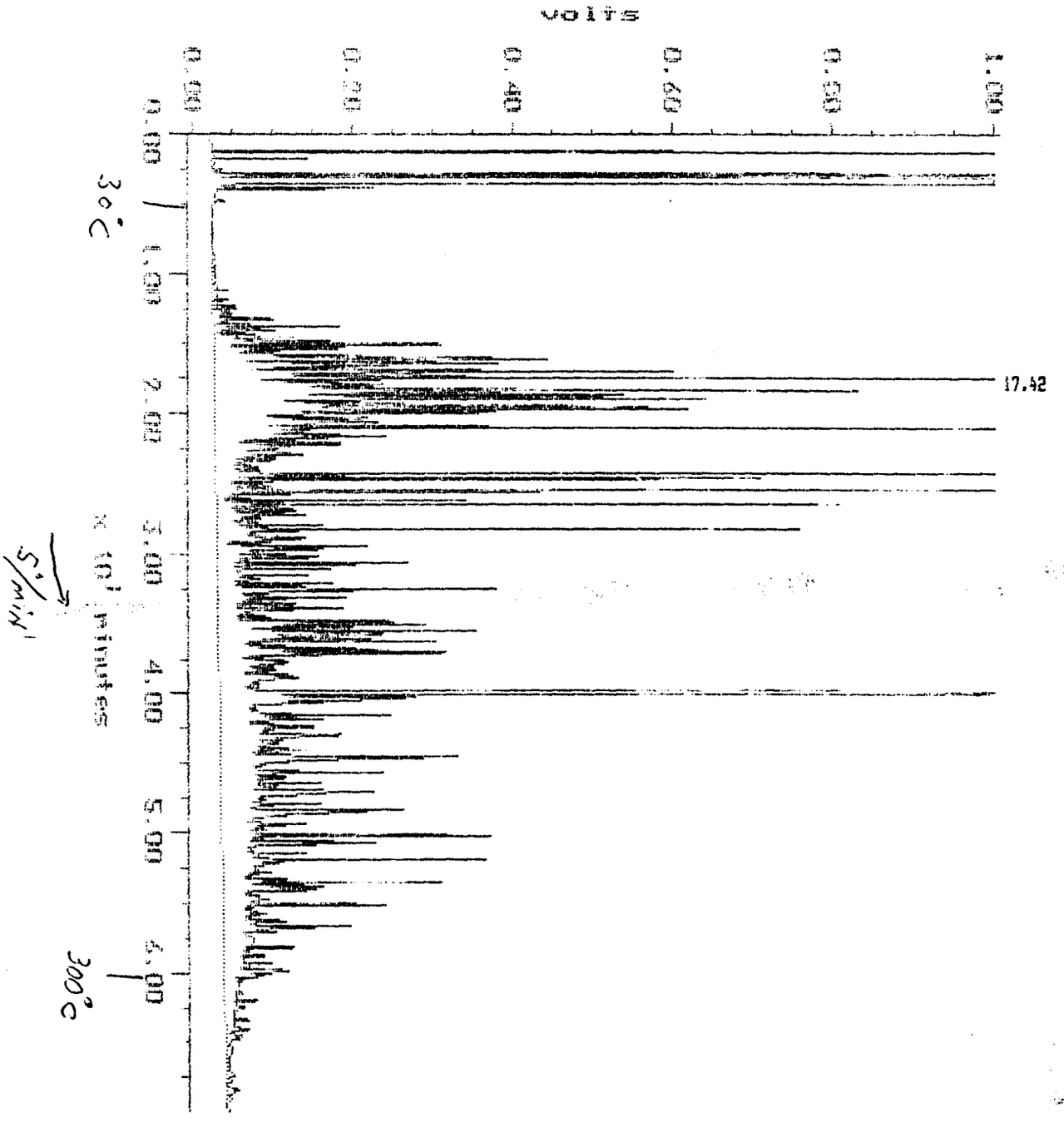
TOLS011795

BZTO104(e)048628

Sample: TIME UNKNOWN
Acquired: 23-FEB-89 17:06
Inj Vol: 2.00

Channel: TPH I.D.
Method: C:\MAX\DATA2\TPH-ID

Filename: TPM223
Operator: MLA



TOLS011796

BZTO104(e)048629

ECOVA ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS DATA SHEET
(GC/MS PURGE AND TRAP)
Project No:

Lab Sample ID: EAS1272-01
Sample Matrix: SOIL
Concentration: LOW
Sample Weight: 1.65 G
Percent Moisture: **
Date Extracted: NA
Date Analyzed: 2/17/89
Instrument ID: VOA #1

Customer Sample No: TO-1
Sample Description: SOIL
Date Collected: NA
Time Collected: NA
Date Received:
Data Release Authorized:

C A S. Number	Compound	ug/Kg	Q
74-87-3	Chloromethane	30.	U
74-83-9	Bromomethane	30.	U
75-01-4	Vinyl Chloride	30.	U
75-00-3	Chloroethane	30.	U
75-09-2	Methylene Chloride	3.	J
67-64-1	Acetone	5600.	D
75-15-0	Carbon Disulfide	15.	U
75-35-4	1,1-Dichloroethene	15.	U
75-34-3	1,1-Dichloroethane	15.	U
540-59-0	1,2-Dichloroethene (total)	15.	U
67-66-3	Chloroform	15.	U
107-06-2	1,2-Dichloroethane	15.	U
78-93-3	2-Butanone	19.	J
71-55-6	1,1,1-Trichloroethane	15.	U
56-23-5	Carbon Tetrachloride	15.	U
108-05-4	Vinyl Acetate	30.	U
75-27-4	Bromodichloromethane	15.	U
78-87-5	1,2-Dichloropropane	15.	U
10061-01-5	cis-1,3-Dichloropropene	15.	U
79-01-6	Trichloroethene	15.	U
124-48-1	Dibromochloromethane	15.	U
79-00-5	1,1,2-Trichloroethane	15.	U
71-43-2	Benzene	15.	U
10061-02-6	trans-1,3-Dichloropropene	15.	U
75-25-2	Bromoform	15.	U
108-10-1	4-Methyl-2-Pentanone	3.	J
591-78-6	2-Hexanone	7.	J
127-18-4	Tetrachloroethene	15.	U
79-34-5	1,1,2,2-Tetrachloroethane	15.	U
108-88-3	Toluene	15.	U
108-90-7	Chlorobenzene	5.	J
100-41-4	Ethylbenzene	15.	U
100-42-5	Styrene	15.	U
133-02-7	Xylene (total)	5.	J

** DATA REPORTED ON A WET WEIGHT BASIS
* See footnote page for data qualifiers (Q)

FA2319

PRELIMINARY

TOLS011797

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ECOVA CORPORATION

Matrix: (soil/water) SOIL — Lab Sample ID: EAS1272-01

Sample wt/vol: 1.65 (g/mL) G — Lab File ID: >A2319

Level: (low/med) LOW — Date Received: NA

% Moisture: not dec.** — Date Analyzed: 2/17/89

Column: PACK — Dilution Factor: 1.00000

Number TICs found: 11 — CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN METHYLATED CYCLOPENTANE	26.96	7.	J
2.		UNKNOWN DIMETHYL CYCLOHEXANE	28.39	11.	J
3.	3073663	Cyclohexane, 1,1,3-trimethyl	29.13	110.	J
4		Unknown	29.90	15.	J
5.		Unknown	30.60	39.	J
6.		Unknown	31.33	27.	J
7.		Unknown	33.62	49.	J
8.		UNKNOWN TRIMETHYLCYCLOHEXANE	35.01	17.	J
9.		Unknown	35.75	100.	J
10.		Unknown	37.69	42.	J
11.		UNKNOWN METHYLATED BENZENE	40.88	92	J
12.					
13.					
14.					
15.					
16.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

** DATA REPORTED ON A WET WEIGHT BASIS

FORM I VOA-TIC UA2319

TC

PRELIMINARY

TOLS011798

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Soil
Concentration: LOW Dilution Factor: 2.0000
Sample wt/vol: 27.2 G Dry Weight
Date Extracted: 2/17/89
Date Analyzed: 2/17/89 21:15

Lab Sample: EAS1272-01
Customer Sample: TO-1
Sample Description: Soil Sample
Date Collected: NA
Time Collected: NA
Date Received: 2/16/89
Data Release Authorized:

C.A.S. Number		UG/KG	
108-95-2	Phenol	740.	U
111-44-4	bis(2-Chloroethyl)Ether	740.	U
95-57-8	2-Chlorophenol	740.	U
541-73-1	1,3-Dichlorobenzene	740.	U
106-46-7	1,4-Dichlorobenzene	740.	U
100-51-6	Benzyl Alcohol	740.	U
95-50-1	1,2-Dichlorobenzene	740.	U
95-48-7	2-Methylphenol	740.	U
39638-32-9	bis(2-chloroisopropyl)Ether	740.	U
106-44-5	4-Methylphenol	740.	U
621-64-7	N-Nitroso-Di-n-Propylamine	740.	U
67-72-1	Hexachloroethane	740.	U
98-95-3	Nitrobenzene	740.	U
78-59-1	Isophorone	740.	U
88-75-5	2-Nitrophenol	740.	U
105-67-9	2,4-Dimethylphenol	740.	U
65-85-0	Benzoic Acid	3700.	U
111-91-1	bis(2-Chloroethoxy)Methane	740.	U
120-83-2	2,4-Dichlorophenol	740.	U
120-82-1	1,2,4-Trichlorobenzene	740.	U
91-20-3	Naphthalene	740.	U
106-47-8	4-Chloroaniline	740.	U
87-68-3	Hexachlorobutadiene	740.	U
59-50-7	4-Chloro-3-Methylphenol	740.	U
91-57-6	2-Methylnaphthalene	740.	U
77-47-4	Hexachlorocyclopentadiene	740.	U
88-06-2	2,4,6-Trichlorophenol	740.	U
95-95-4	2,4,5-Trichlorophenol	3700.	U
91-58-7	2-Chloronaphthalene	740.	U
88-74-4	2-Nitroaniline	3700.	U
131-11-3	Dimethylphthalate	740.	U
208-96-8	Acenaphthylene	740.	U
99-09-2	3-Nitroaniline	3700.	U

C.A.S. Number		UG/KG	
83-32-9	Acenaphthene	740.	U
51-28-5	2,4-Dinitrophenol	3700.	U
100-02-7	4-Nitrophenol	3700.	U
132-64-9	Dibenzofuran	740.	U
121-14-2	2,4-Dinitrotoluene	740.	U
606-20-2	2,6-Dinitrotoluene	740.	U
84-66-2	Diethylphthalate	740.	U
7005-72-3	4-Chlorophenyl-phenylether	740.	U
86-73-7	Fluorene	83.	J
100-01-6	4-Nitroaniline	3700.	U
534-52-1	4,6-Dinitro-2-Methylphenol	3700.	U
86-30-6	N-Nitrosodiphenylamine (1)	740.	U
101-55-3	4-Bromophenyl-phenylether	740.	U
118-74-1	Hexachlorobenzene	740.	U
87-86-5	Pentachlorophenol	19000.	E
85-01-8	Phenanthrene	210.	J
120-12-7	Anthracene	740.	U
84-74-2	Di-n-Butylphthalate	3900.	
206-44-0	Fluoranthene	95.	J
129-00-0	Pyrene	130.	J
85-68-7	Butylbenzylphthalate	740.	U
91-94-1	3,3'-Dichlorobenzidine	1500.	U
56-55-3	Benzo(a)Anthracene	740.	U
117-81-7	bis(2-Ethylhexyl)Phthalate	640.	J
218-01-9	Chrysene	59.	J
117-84-0	Di-n-octylphthalate	740.	U
205-99-2	Benzo(b)Fluoranthene	740.	U
207-08-9	Benzo(k)Fluoranthene	740.	U
50-32-8	Benzo(a)Pyrene	740.	U
193-39-5	Indeno(1,2,3-cd)Pyrene	740.	U
53-70-3	Dibenzo(a,h)Anthracene	740.	U
191-24-2	Benzo(g,h,i)Perylene	740.	U

(1)-Cannot be separated from diphenylamine

TOLS011799

BZTO104(e)048632

ECOVA
ANALYTICAL
SERVICES

DATA REPORTING QUALIFIERS

Project No:

A - This flag indicates that a TIC is a suspected aldol-condensation product.

B - Indicates compound was found in the associated blank as well as in the sample.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a target compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

U - Indicates compound was analyzed for but not detected at the given detection limit. The sample quantitation limit was corrected for dilution and for percent moisture, when applicable.

X - Other specific flags and footnotes may be required to properly define the results. If more than two qualifiers are required for a sample result, the "X" flag combines several flags, as needed. For instance, the "X" flag might combine the "A," "B," and "D" flags for some sample.

* - Indicates spiked compounds used for MS/MSD analysis.

TOLS011800

GE

RPORATE RECEIVABLES
LAND GENERAL ELECTRIC
BOX 4403
LAND, OREGON 97254

TELEPHONE 464-7725
(503) 226-

INVOICE DATE March 2, 1989

Time Oil Company
P. O. Box 24447
Seattle, Washington 98124-0447

OICE NO. 107260 AMOUNT DUE $ 4,763.04 PAYMENT DUE DATE 30 days

RECEIVED MAR 7 1989

Cost to provide overhead service of limited duration at
12005 N. Burgard, Portland, Oregon per your PO #69824 APR 20 1989

Job P2695

PAID

MAR 14 1989

CO ____ DIV ____
VEND ____
INV. ____ ____
PO 69824 ____
DUE ____
% ____ MO ____
☐ DIST ATTACHED

AUTH
PRICE
REC/ SIG

Power drop for ECOVA soil treatment - NW + Bell

3-189-02-1807

TOLS011801

PGE PORTLAND GENERAL ELECTRIC COMPANY, P.O. BOX 4403, PORTLAND, OREGON 97254

CUSTOMER COPY

DIST. ATTACHED							
EXTENSIONS CHECKED				TIME OIL CO.			
ACCOUNTING							
REG. NO. 35375						REG. TOTAL	4763 04

BZTO104(e)048634

0661007" **TIME OIL CO.** 216081

INVOICE	REFERENCE NO.	AMOUNT	INVOICE	REFERENCE NO.	AMOUNT
07260	035375	4,763.04	00000	041413	2,245.11

Power dep for Ecova

TDP-120 REV. 6-88

UTILITIES 3

CHECK DATE	04/21/89	DISCOUNT	.00
CHECK NO.	216081	TOTAL	7,008.15

WHEN DETACHED AND PAID, THIS CHECK BECOMES A RECEIPT IN FULL PAYMENT OF THE ITEMIZED ACCOUNT

216081

Citibank Delaware
A subsidiary of Citicorp

62-20
311

TIME OIL CO.
P.O. BOX 24447, TERMINAL STATION SEATTLE, WASHINGTON 98124-0447

04/21/89

PAY TO THE ORDER OF

PROTECTED AMOUNT	AMOUNT
$****7,008.15	$****7,008.15

PORTLAND GENERAL ELECTRIC CO
PO BOX 4403
PORTLAND OR 97254

Give Copy of Check to Fred Graby

⑈216081⑈ ⑆031100209⑆

TOLS011802

TIME OIL CO.

PURCHASE ORDER

P.O. BOX 24447 • TERMINAL ANNEX
2737 WEST COMMODORE WAY • SEATTLE, WASHINGTON 98124-0447
(206) 285-2400

No. 69824
PLACE THIS NUMBER ON YOUR INVOICE AND ALL CORRESPONDENCE

TO P. G. E.
3700 S.E. 17th AVE.
Portland, OREGON 97202

DATE 1/16/89

SHIP BY

V	QUANTITY	PART NO.	DESCRIPTION	LIST UNIT PRICE	NET UNIT PRICE	AMOUNT
			Install 277/480 V Temporary Service.			
			(Capacity for 600 AMP).			
			TOTAL →			$4763.04

FOR RESALE ☐ TAXABLE ☐
WASHINGTON STATE RESALE CERTIFICATE #C178-47526

TIME OIL CO.
BY [signature]

THIS PURCHASE IS EXPENSE OF: ☒ T.O.C. ☐ OTHER

DATE WANTED

IF T.O.C.

DEPARTMENT NW + Bell

EXPLANATION Power for ECOVA project at NW + Bell

SERVICE STATION (SHOW ADDRESS AND OPERATOR) Portland Oregon

ACCOUNT NO.

REQUESTED BY [signature]

APPROVED BY

TAP-130 12/85

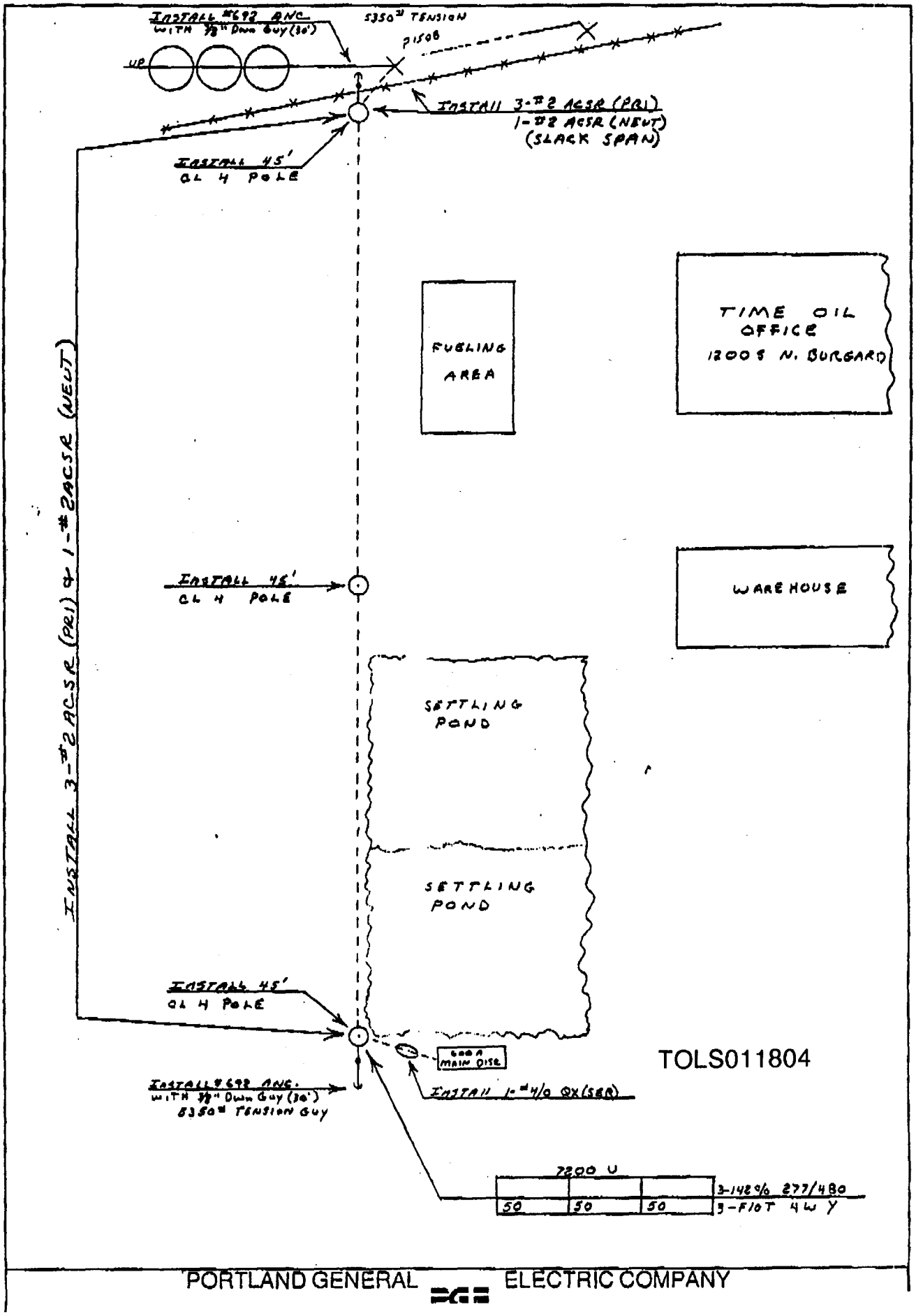
TOLS011803

BZTO104(e)048636

FROM 01/14/87 08:08 P. 1

10. J. JEREIDE
FROM: N. WALLIS

4678



TOLS011804

PORTLAND GENERAL ELECTRIC COMPANY

BZTO104(e)048637

NW + BELL - 1/13/89

ECOVA - PENTA WORK

P.G.E. price #4763-04
to Run Power to Weatherhead.
2½ - 3 wks to install after
receipt of P.O.

per
Jim VanKleek of P.G.E.
(503) 464-7739

INFO From Neil

TOLS011805

ECOVA. Power Supply

1/11/89

Reid Gibson E.C.

1. Run service as Temporary

2. Do not do as add-on to exist. service.

   a. can then have power co do it for free (or at low cost) using hi voltage primary wire. (we would have to do secondary wiring which would be much bigger & would not be reusable).

3. Power co. puts in a pole mounted transformer. (put in 2 poles total).

4. E.C. puts in a small pole + temp service by trailer. Power co. hooks to it.

5. Power Co. 12,500 V. line runs bet load rock + ofc Bldg. on 45' poles - 38' to top. ∴ prob. 30'-34' elev. at nadir of catenary.

TOLS011806

BZTO104(e)048639

DATE _____ HOUR _____

TO _____

WHILE YOU WERE OUT

M Jock

OF Bcova's Elec.

PHONE _____
AREA CODE PHONE NUMBER

TELEPHONED		RETURNED CALL		LEFT PACKAGE	
PLEASE CALL		WAS IN		PLEASE SEE ME	
WILL CALL AGAIN		WILL RETURN		IMPORTANT	

MESSAGE 4763*04 to where Chas Says

2-3 wks f/PO

SIGNED

Form No. 4 TAGUE STATIONERY CO. 762-4940

TOLS011807

Jan '89

Ecova Extra Work Change Order #1

3. Sample outside C & O disc wall - 4 locations @ surface and 4' depth — $500

2. Gasoline & alcohol - compatible liner for tank 38002 $670

1. Survey reference elevations on wells installed by Time Oil Co. - $330

$1500

Other Notes

- Ecova will do further characterization & cleanup of PCP contam @ sump at conclusion of project
- Ecova will give me a memo on analytical results in sump area & inside C & O area.
- Will provide me a print of site plan showing clean soil disposal area

TOLS011808

BZTO104(e)048641

NOTICE OF THE RIGHT TO LIEN

WARNING: READ THIS NOTICE. PROTECT YOURSELF FROM PAYING ANY CONTRACTOR OR SUPPLIER TWICE FOR THE SAME SERVICE.

TO: Northwest Terminal Co.
2737 W. Commodore Way
Seattle, Washington 98199

This is to inform you that United Equipment, INc.

has begun to provide Equipment Rental

ordered by ECOVA Corporation

for use on, or to be used in, the construction, alteration or repair of the improvement now occupying or being erected upon the property described as follows, of which you are the owner or reputed owner, contract purchaser or lease holder. The property is located at:

12005 N. Burgard Avenue in Portland
Tax Lots 18 & 31, Sec. 35, Twp. 2 N., Rge. 1 W., W.M.
as further described in Deed Book & Page 1220-2361

County of Multnomah State of Oregon

THIS IS NOT A LIEN. It is a notice sent to you for your protection in compliance with the construction lien laws.

It is NO REFLECTION ON THE INTEGRITY OR CREDIT STANDING OF EITHER YOURSELF OR YOUR CONTRACTOR.

Even if you or your mortgage lender have made full payment to the contractor who ordered these materials or services, your property may still be subject to a lien unless the supplier providing this notice is in fact paid.

A lien may be claimed for all materials, labor and services furnished after a date that is 8 days before this notice was mailed to you, not including Saturdays, Sundays and other holidays as defined in ORS 187.010. No further notice of this or any subsequent delivery of materials or services to you is neccessary.

IMPORTANT INFORMATION FOR YOUR PROTECTION

Under the law, those who work on your property or provide materials and are not paid have a right to enforce their claim for payment against your property. This claim is known as a construction lien.

If your contractor fails to pay subcontractors, material suppliers or laborers or neglects to make other legally required payments, the people who are owed money can look to your property for payment, **even if you have paid your contractor in full.**

The law states that all people hired by a contractor to provide you with materials, labor or services must give you a notice of the right to lien to let you know what they have provided.

WAYS TO PROTECT YOURSELF ARE:

—RECOGNIZE that this notice of delivery of materials, labor or services may result in a lien against your property unless all those supplying a notice of the right to lien have been paid.

—LEARN more about the lien laws and the meaning of this notice by contacting the Builders Board, an attorney or the firm sending this notice.

— ASK for a statement of the labor, materials, or services provided to your property from each party that sends you a notice of the right to lien.

— WHEN PAYING your contractor for materials, labor or services you may make checks payable **jointly** to the contractor and the firm furnishing materials, labor or services for which you have received a notice of the right to lien.

— OR use one of the methods suggested by the "Information Notice to Owners." If you have not received such a notice, contact the Builders Board.

— GET EVIDENCE that all firms from whom you have received a notice of the right to lien have been paid or have **waived** the right to claim a lien against your property.

—CONSULT an attorney, a professional escrow company or your mortgage lender.

If you have any questions concerning this notice, please feel free to contact us for any information which you may require.

This notice has been sent to you by:. **Capital Building Dealers Service Co.**
P.O. Box 13545 • Portland, Oregon 97213
Telephone: 282-4558

R. Lundquist AGENT
853008

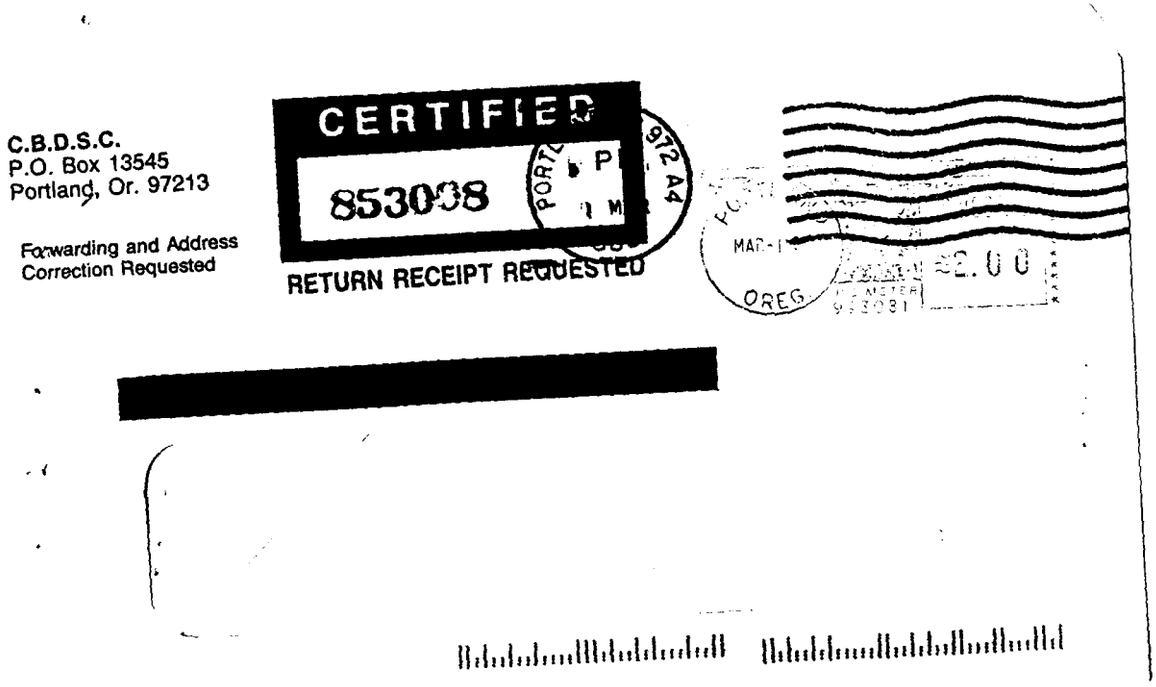
Job # 1019 Mailed On March 1 19 89 Certified #

kg

TOLS011809

BZTO104(e)048642

1019



TOLS011810

NOTICE OF THE RIGHT TO LIEN

WARNING: READ THIS NOTICE. PROTECT YOURSELF FROM PAYING ANY CONTRACTOR OR SUPPLIER TWICE FOR THE SAME SERVICE.

TO: Time Oil Co.

2737 W. Commodore Way

Seattle, Washington 98199

This is to inform you that Pacific Rock Products, a Division of Eucon Corporation

has begun to provide Pea Rock

ordered by ECOVA Corporation

for use on, or to be used in, the construction, alteration or repair of the improvement now occupying or being erected upon the property described as follows, of which you are the owner or reputed owner, contract purchaser or lease holder. The property is located at:

12005 N. Burgard Street in Portland

Tax Lots 18 & 31, Sec. 35, Twp. 2 N., Rge. 1 W., W.M.

as further described in Deed Book & Page 1220-2361

County of Multnomah State of Oregon

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A lien may be claimed for all materials, labor and services furnished after a date that is 8 days before this notice was mailed to you, not including Saturdays, Sundays and other holidays as defined in ORS 187.010. No further notice of this or any subsequent delivery of materials or services to you is neccessary.

IMPORTANT INFORMATION FOR YOUR PROTECTION

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If your contractor fails to pay subcontractors, material suppliers or laborers or neglects to make other legally required payments, the people who are owed money can look to your property for payment, **even if you have paid your contractor in full.**

The law states that all people hired by a contractor to provide you with materials, labor or services must give you a notice of the right to lien to let you know what they have provided.

WAYS TO PROTECT YOURSELF ARE:

—RECOGNIZE that this notice of delivery of materials, labor or services may result in a lien against your property unless all those supplying a notice of the right to lien have been paid.

—LEARN more about the lien laws and the meaning of this notice by contacting the Builders Board, an attorney or the firm sending this notice.

— ASK for a statement of the labor, materials, or services provided to your property from each party that sends you a notice of the right to lien.

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— OR use one of the methods suggested by the "Information Notice to Owners." If you have not received such a notice, contact the Builders Board.

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—CONSULT an attorney, a professional escrow company or your mortgage lender.

If you have any questions concerning this notice, please feel free to contact us for any information which you may require.

This notice has been sent to you by:. **Capital Building Dealers Service Co.**
P.O. Box 13545 • Portland, Oregon 97213
Telephone: 282-4558

R. Lundquist
AGENT

Job # 702 Mailed On February 17 19 89 Certified # 852512

kg

TOLS011811

BZTO104(e)048644

C.B.D.S.C.
P.O. Box 13545
Portland, Or. 97213

Claim Check
Forwarding & Address
Correction Requested

548773

☐ Hold

Date

2-21.

1ST Notice

2ND Notice

Return

Detached from
PS Form 3849-A,
Oct. 1985

CERTIFIED

852512

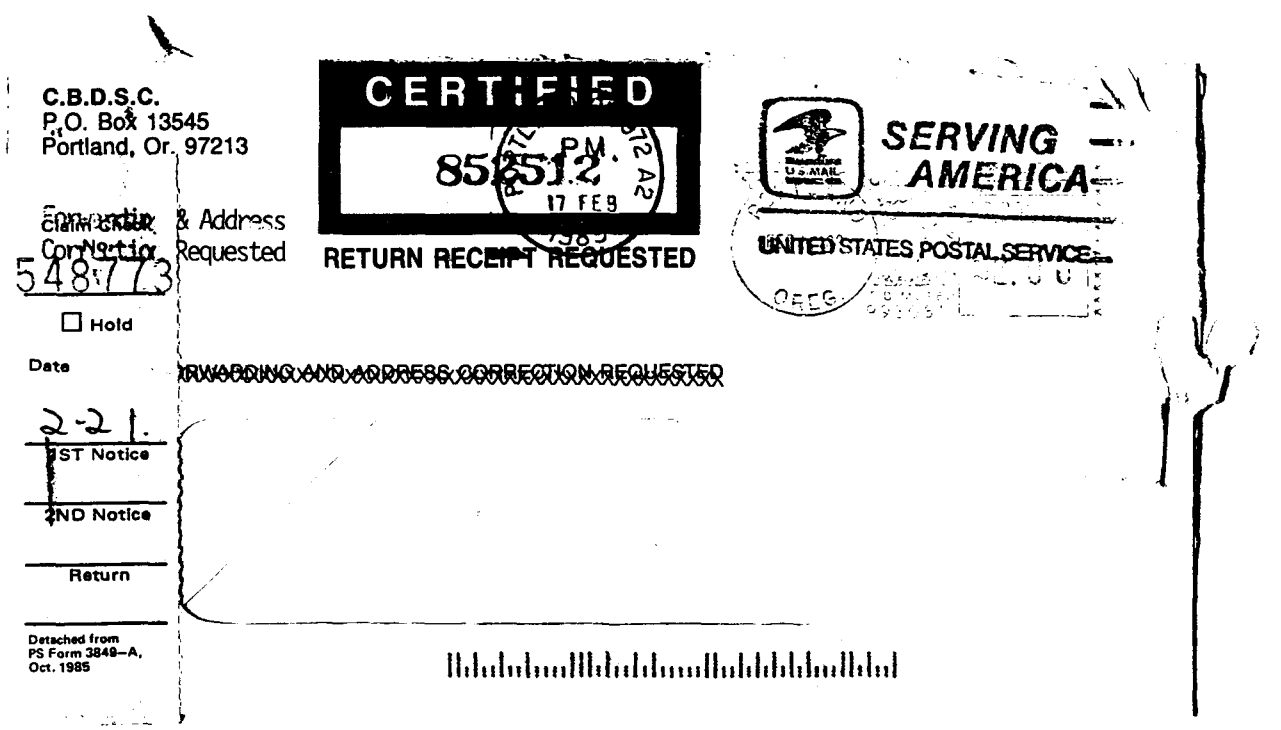
PM
17 FEB

RETURN RECEIPT REQUESTED

SERVING AMERICA

UNITED STATES POSTAL SERVICE

~~FORWARDING AND ADDRESS CORRECTION REQUESTED~~



TOLS011812

BZTO104(e)048645

Is your RETURN ADDRESS
completed on the

Return Receipt Service

702

TOLS011813

NOTICE OF THE RIGHT TO LIEN

WARNING: READ THIS NOTICE. PROTECT YOURSELF FROM PAYING ANY CONTRACTOR OR SUPPLIER TWICE FOR THE SAME SERVICE.

TO: Northwest Terminal Co.
2737 W. Commodore Way
Seattle, Washington 98199

This is to inform you that Pacific Rock Products, a Division of Eucon Corporation

has begun to provide Pea Rock

ordered by ECOVA Corporation

for use on, or to be used in, the construction, alteration or repair of the improvement now occupying or being erected upon the property described as follows, of which you are the owner or reputed owner, contract purchaser or lease holder. The property is located at:

12005 N. Burgard Street in Portland
Tax Lots 18 & 31, Sec. 35, Twp. 2 N., Rge. 1 W., W.M.
as further described in Deed Book & Page 1220-2361

County of Multnomah State of Oregon

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The law states that all people hired by a contractor to provide you with materials, labor or services must give you a notice of the right to lien to let you know what they have provided.

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— OR use one of the methods suggested by the "Information Notice to Owners." If you have not received such a notice, contact the Builders Board.

— GET EVIDENCE that all firms from whom you have received a notice of the right to lien have been paid or have waived the right to claim a lien against your property.

—CONSULT an attorney, a professional escrow company or your mortgage lender.

If you have any questions concerning this notice, please feel free to contact us for any information which you may require.

This notice has been sent to you by:. **Capital Building Dealers Service Co.**
P.O. Box 13545 • Portland, Oregon 97213
Telephone: 282-4558

R. Lundquist
AGENT

Job # ~~702~~ Mailed On ~~February 17~~ 19 ~~89~~ Certified # 852511

kg

TOLS011814

BZTO104(e)048647

702

Portland, Or. 97213

Forwarding & Address
Correction Requested

CERTIFIED

852511 PM
17 FEB

RETURN RECEIPT REQUESTED

ALWAYS USE
ZIP CODE

FORWARDING AND ADDRESS CORRECTION REQUESTED

TOLS011815

2/24/89

Ecova - "Solvent" sample f/ NW Terminal

Getting 40 peaks on a GC - heavy material not subject to vapor extraction.
Looks like 3 or 4 products

Penta - high levels
Aliphatic - gasoline or diesel
Possibly some chlorinated compounds (or high penta)
No priority pollutants came up w/ GC/MS - trashed the column
No "light solvents"

Has found free product - reddish in color - flowing out of the soil
Has stopped excavating until they identify health & safety concerns

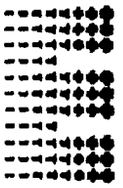
Wood tox 140 is reddish-amber in color high bp.

Will try to get a sample of KB 3 from Kodak

TOLS011816

BZTO104(e)048649

ECOVA



FAX TRANSMITTAL COVER SHEET

WE ARE TRANSMITTING 7 PAGES, INCLUDING THIS COVER PAGE.

DATE: 2/24/89 FAX NUMBER: (206) 283-8036

TO: FRED PROBY (NAME), TIME OIL (COMPANY)

FROM: MARK ANDERSEN (NAME)

REMARKS:

Fred

Here is the preliminary lab data on the NW Terminal samples. Note that the plots are different samples than the tables.

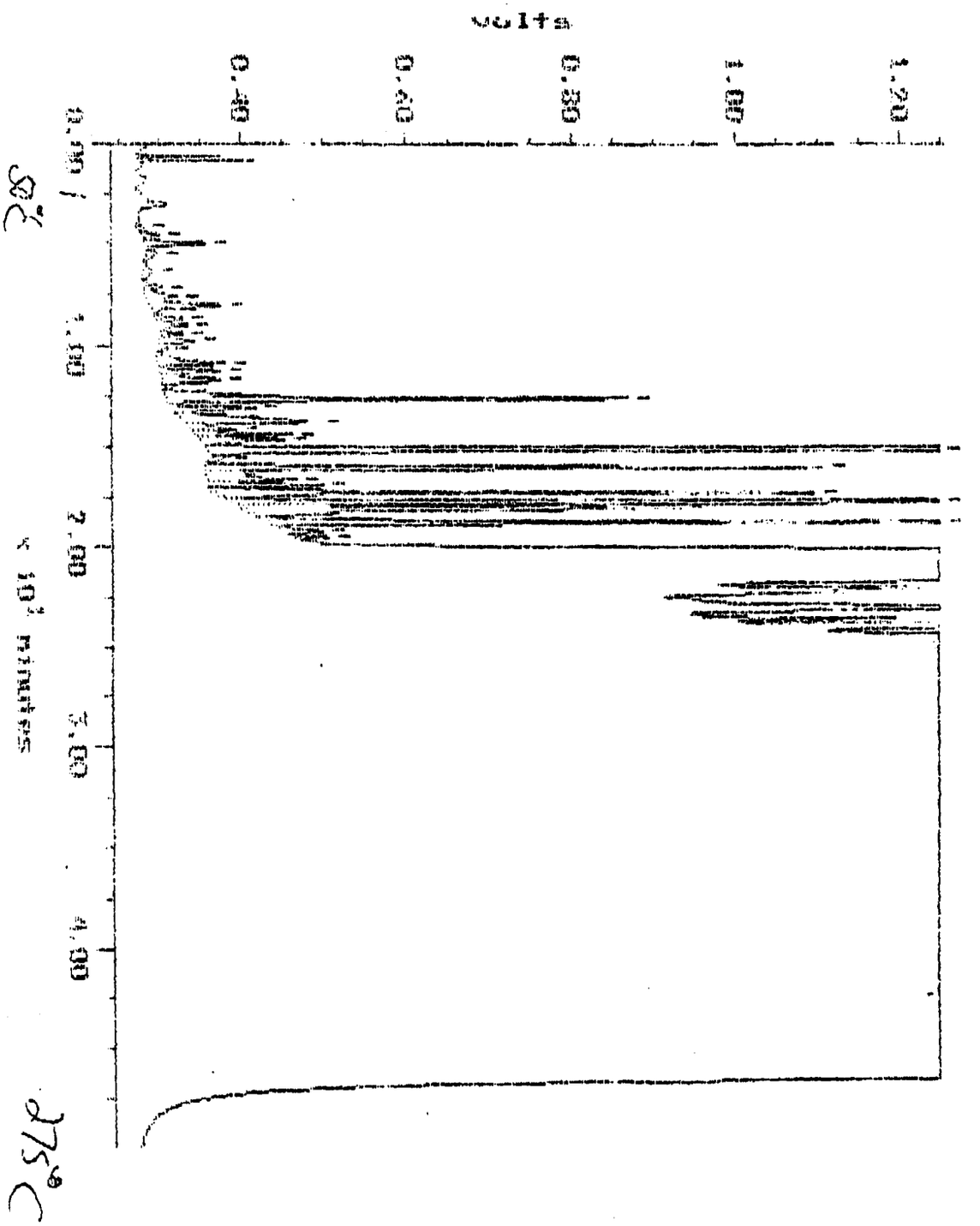
Mark

IF YOU DID NOT RECEIVE THIS TRANSMISSION CLEARLY, OR HAVE ANY QUESTIONS, CONTACT OUR OFFICE.

CORPORATE OFFICE
3820 159TH AVENUE NE
REDMOND, WA 98052
(206) 883-1900
(206) 867-2210 FAX

TOLS011817

Sample: TINE UNKNOWNEC Channel: SIDE A (DB-609) Filename: TPN22SEC
Acquired: 23-FEB-89 17:33 Method: C:\MAX\DATA1\TPH-EC Operator: MJN

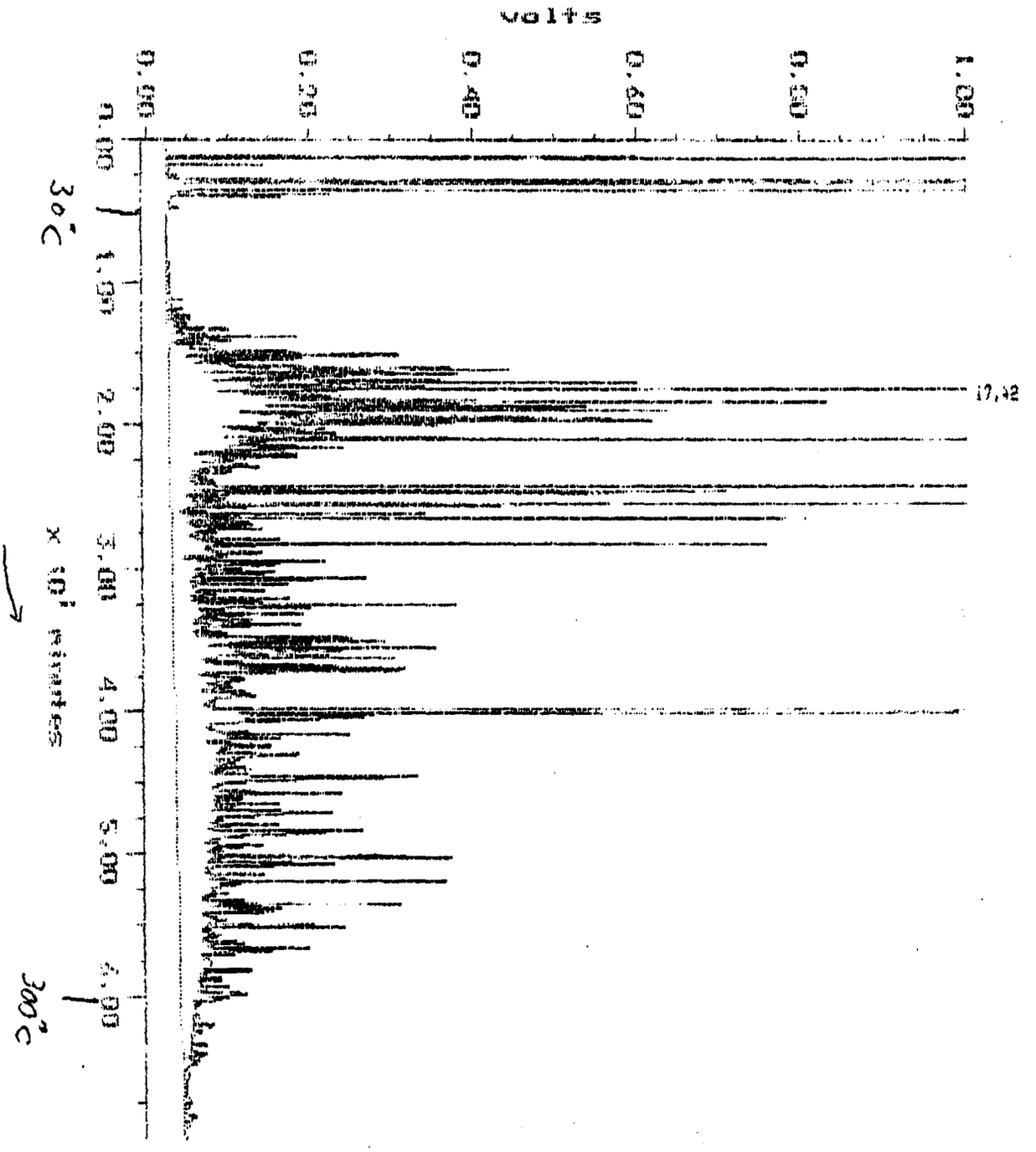


TOLS011818

Sample: TIME UNKNOWN
Acquired: 23-FEB-89 17:06
Inj Vol: 3.00

Channel: TPH I.D.
Method: C:\MAX\DATA2\TPH-ID

Filename: TPH223
Operator: MLA



30°C
5°/min
300°C

TOLS011819

ECOVA ANALYTICAL SERVICES

VOLATILE ORGANICS ANALYSIS DATA SHEET
(GC/MS PURGE AND TRAP)
Project No:

Lab Sample ID: EAS1272-01
Sample Matrix: SOIL
Concentration: LOW
Sample Weight: 1.65 G
Percent Moisture: **
Date Extracted: NA
Date Analyzed: 2/17/89
Instrument ID: VOA #1

Customer Sample No: TO-1
Sample Description: SOIL
Date Collected: NA
Time Collected: NA
Date Received:
Data Release Authorized:

CAS Number	Compound	ug/Kg	Q
74-87-3	Chloromethane	30.	U
74-83-9	Bromomethane	30.	U
75-01-4	Vinyl Chloride	30.	U
75-00-3	Chloroethane	30.	U
75-09-2	Methylene Chloride	3.	J
67-64-1	Acetone	5600.	D
75-15-0	Carbon Disulfide	15.	U
75-35-4	1,1-Dichloroethene	15.	U
75-34-3	1,1-Dichloroethane	15.	U
540-59-0	1,2-Dichloroethene (total)	15.	U
67-66-3	Chloroform	15.	U
107-06-2	1,2-Dichloroethane	15.	U
78-93-3	2-Butanone	19.	J
71-55-6	1,1,1-Trichloroethane	15.	U
56-23-5	Carbon Tetrachloride	15.	U
108-05-4	Vinyl Acetate	30.	U
75-27-4	Bromodichloromethane	15.	U
78-87-5	1,2-Dichloropropane	15.	U
10061-01-5	cis-1,3-Dichloropropene	15.	U
79-01-6	Trichloroethene	15.	U
124-48-1	Dibromochloromethane	15.	U
79-00-5	1,1,2-Trichloroethane	15.	U
71-43-2	Benzene	15.	U
10061-02-6	trans-1,3-Dichloropropene	15.	U
75-25-2	Bromoform	15.	U
108-10-1	4-Methyl-2-Pentanone	3.	J
591-78-6	2-Hexanone	7.	J
127-18-4	Tetrachloroethene	15.	U
79-34-5	1,1,2,2-Tetrachloroethane	15.	U
108-88-3	Toluene	15.	U
108-90-7	Chlorobenzene	5.	J
100-41-4	Ethylbenzene	15.	U
100-42-5	Styrene	15.	U
133-02-7	Xylene (total)	5.	J

** DATA REPORTED ON A WET WEIGHT BASIS
* See footnote page for data qualifiers (Q)

FA2319

PRELIMINARY

TOLS011820

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ECOVA CORPORATION

Matrix: (soil/water) SOIL — Lab Sample ID: EAS1272-01

Sample wt/vol: 1.65 (g/mL) G — Lab File ID: >A2319

Level: (low/med) LOW — Date Received: NA

% Moisture: not dec.** — Date Analyzed: 2/17/89

GC Column: PACK — Dilution Factor: 1.00000

Number TICs found: 11 — CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1		UNKNOWN METHYLATED CYCLOPENTANE	26.96	7.	J
2.		UNKNOWN DIMETHYL CYCLOHEXANE	28.39	11.	J
3.	3073663	Cyclohexane, 1,1,3-trimethyl	29.13	110.	J
4		Unknown	29.90	15.	J
5.		Unknown	30.60	39.	J
6.		Unknown	31.33	27.	J
7.		Unknown	33.62	49.	J
8.		UNKNOWN TRIMETHYLCYCLOHEXANE	35.01	17.	J
9.		Unknown	35.75	100.	J
10.		Unknown	37.69	42.	J
11		UNKNOWN METHYLATED BENZENE	40.88	92	J
12.					
13.					
14.					
15.					
16.					
18.					
19.					
20					
21					
22.					
23.					
24.					
25.					
26.					
27					
28.					
29.					
30					

** DATA REPORTED ON A WET WEIGHT BASIS

FORM I VOA-TIC UA2319

TC

PRELIMINARY

TOLS011821

SEMI VOLATILE
ORGANICS ANALYSIS DATA SHEET

Laboratory Name: Ecova Corporation
Project Number: 821401
Sample Matrix: Soil
Concentration: LOW Dilution Factor: 2.0000
Sample wt/vol: 27.2 G Dry Weight
Date Extracted: 2/17/89
Date Analyzed: 2/17/89 21:15

Lab Sample: EAS1272-01
Customer Sample: TO-1
Sample Description: Soil Sample
Date Collected: NA
Time Collected: NA
Date Received: 2/16/89
Data Release Authorized:

C.A.S. Number		UG/KG	
108-95-2	Phenol	740.	U
111-44-4	bis(2-Chloroethyl)Ether	740.	U
95-57-8	2-Chlorophenol	740.	U
541-73-1	1,3-Dichlorobenzene	740.	U
106-46-7	1,4-Dichlorobenzene	740.	U
100-51-6	Benzyl Alcohol	740.	U
95-50-1	1,2-Dichlorobenzene	740.	U
95-48-7	2-Methylphenol	740.	U
39638-32-9	bis(2-chloroisopropyl)Ether	740.	U
106-44-5	4-Methylphenol	740.	U
621-64-7	N-Nitroso-Di-n-Propylamine	740.	U
67-72-1	Hexachloroethane	740.	U
98-95-3	Nitrobenzene	740.	U
78-59-1	Isophorone	740.	U
88-75-5	2-Nitrophenol	740.	U
105-67-9	2,4-Dimethylphenol	740.	U
65-85-0	Benzoic Acid	3700.	U
111-91-1	bis(2-Chloroethoxy)Methane	740.	U
120-83-2	2,4-Dichlorophenol	740.	U
120-82-1	1,2,4-Trichlorobenzene	740.	U
91-20-3	Naphthalene	740.	U
106-47-8	4-Chloroaniline	740.	U
87-68-3	Hexachlorobutadiene	740.	U
59-50-7	4-Chloro-3-Methylphenol	740.	U
91-57-6	2-Methylnaphthalene	740.	U
77-47-4	Hexachlorocyclopentadiene	740.	U
88-06-2	2,4,6-Trichlorophenol	740.	U
95-95-4	2,4,5-Trichlorophenol	3700.	U
91-58-7	2-Chloronaphthalene	740.	U
88-74-4	2-Nitroaniline	3700.	U
131-11-3	Dimethylphthalate	740.	U
208-96-8	Acenaphthylene	740.	U
99-09-2	3-Nitroaniline	3700.	U

C.A.S. Number		UG/KG	
83-32-9	Acenaphthene	740.	U
51-28-5	2,4-Dinitrophenol	3700.	U
100-02-7	4-Nitrophenol	3700.	U
132-64-9	Dibenzofuran	740.	U
121-14-2	2,4-Dinitrotoluene	740.	U
606-20-2	2,6-Dinitrotoluene	740.	U
84-66-2	Diethylphthalate	740.	U
7005-72-3	4-Chlorophenyl-phenylether	740.	U
86-73-7	Fluorene	83.	J
100-01-6	4-Nitroaniline	3700.	U
534-52-1	4,6-Dinitro-2-Methylphenol	3700.	U
86-30-6	N-Nitrosodiphenylamine (1)	740.	U
101-55-3	4-Bromophenyl-phenylether	740.	U
118-74-1	Hexachlorobenzene	740.	U
87-86-5	Pentachlorophenol	19000.	E
85-01-8	Phenanthrene	210.	J
120-12-7	Anthracene	740.	U
84-74-2	Di-n-Butylphthalate	3900.	
206-44-0	Fluoranthene	95.	J
129-00-0	Pyrene	130.	J
85-68-7	Butylbenzylphthalate	740.	U
91-94-1	3,3'-Dichlorobenzidine	1500.	U
56-55-3	Benzo(a)Anthracene	740.	U
117-81-7	bis(2-Ethylhexyl)Phthalate	640.	J
218-01-9	Chrysene	59.	J
117-84-0	Di-n-octylphthalate	740.	U
205-99-2	Benzo(b)Fluoranthene	740.	U
207-08-9	Benzo(k)Fluoranthene	740.	U
50-32-8	Benzo(a)Pyrene	740.	U
193-39-5	Indeno(1,2,3-cd)Pyrene	740.	U
53-70-3	Dibenzo(a,h)Anthracene	740.	U
191-24-2	Benzo(g,h,i)Perylene	740.	U

(1)-Cannot be separated from diphenylamine

TOLS011822

BZTO104(e)048655

ECOVA
ANALYTICAL
SERVICES

DATA REPORTING QUALIFIERS

Project No:

A - This flag indicates that a TIC is a suspected aldol-condensation product.

B - Indicates compound was found in the associated blank as well as in the sample.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a target compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

U - Indicates compound was analyzed for but not detected at the given detection limit. The sample quantitation limit was corrected for dilution and for percent moisture, when applicable.

X - Other specific flags and footnotes may be required to properly define the results. If more than two qualifiers are required for a sample result, the "X" flag combines several flags, as needed. For instance, the "X" flag might combine the "A," "B," and "D" flags for some sample.

* - Indicates spiked compounds used for MS/MSD analysis.

GLASS **TANK LINERS, Inc.**

3410 N.W. 264th Street • Hillsboro, Oregon 97124-5714 • 503-648-7212

January 9, 1989

ECOVA
Mr. Mark Anderson
FAX NO. (206) 867-2210

Not compatible w/ gasoline - Methanol or ethanol

Dear Mr. Anderson:

Tank Liners, Inc. is pleased to submit the following bid proposal to apply an Ameron Coal Tar epoxy system to the interior of one (1) 21' diameter by 15'6" high waste water treatment tank located at Time Oil's Bulk Plant, 14005 N. Burgard Road in Portland, Oregon.

$673 more for compatible epoxy "Devoe 253"

Tank Liners, Inc. will furnish labor, material, and equipment to do the following:

1) Sandblast all tank interior with the exception of the roof and roof support structure.

2) Remove all spent sand and dust free.

3) Ultrasonic thickness gauge tank floor.

4) Apply Ameron 78HB at 8 to 10 mils.

5) Spark test wall prior to second coat at 8 to 10 mils, wet.

6) Following removal of scaffold, apply 16 to 20 wet mils to floor.

7) Clean job site.

Following completion of work by TLI tank must cure for six to eight days.

The above work will take approximately five (5) working days to complete.

All work will be done in a workmanship like manner for a total cost of $7,715.00 plus taxes, if applicable.

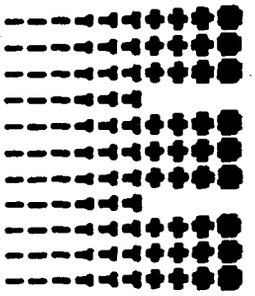
Thank you for thinking of Tank Liners, Inc.

Sincerely,

Albert L. Knopf
Vice-President

ALK/tlu

TOLS011824



ECOVA CORPORATION

TOLS011825

ECOVA, CORPORATION
Project Coordination Meeting

TIME OIL
PORTLAND TERMINAL

August 10, 1989
Redmond, Washington

TOLS011826

MEETING AGENDA

Time Oil - Portland Terminal

August 10, 1989

Introduction of Ecova Team Members

- Distribution of Resumes
- Personnel Qualifications

Change Orders

- Past Change Orders - Unresolved
- Change Orders for Completed Work
- Discussion of Change Orders Anticipated in the Future
- Establishment of Change Order Procedures

Schedule

Unresolved Items

- Monthly Progress Reports
- Electric Service Installation and Monthly Bills
- Chromatograms
- Certifications of Insurance, Permits, Licences, and Approvals

TOLS011827

BZTO104(e)048660

SECTION I

INTRODUCTION OF ECOVA TEAM MEMBERS

TOLS011828

TIME OIL - PORTLAND TERMINAL

Project 821401 - Personnel

Name	Title	% Total Time Available	Role
Dave Edwards	Project Manager	30	Technical and Operational Mgr.
Rod Carr	Contracts Mgr.	20	Contract Admin.
W. Mahaffey	Senior Micro.	20	Bioremediation Technical Support
E. Paukstaitis	Senior Hydro.	20	Hydrogeology Technical Support
Jim Borthen	Project Engr.	100	Site Operations Supervisor
Dan Schweigel	Site Operator	100	Site Operator
Support Personnel			
John Kinsella	V.P. Operations	10	Technical/Admin Support
April Rivkin	Director, Proj. Development	5	Administrative Support
C. Skogerson	Site Operator	30	Site Operator
Jack Kash	Operations Mgr.	10	Material Handling Technical Support

Ecova has four Senior Microbiologists (all with Ph.D.'s and at least 8 years experience each), four Senior Engineers (two P.E.'s, a Ph.D. and 60 years experience between them) and four Senior Geologists (three P.G.'s and over 50 years experience between them).

TOLS011829

DAVID EDWARDS, Ph.D., P.E.
Senior Chemical Engineer

As a Senior Project Engineer, Dr. Edwards specializes in developing and evaluating onsite remedial systems for hazardous waste sites. Dr. Edwards has over 30 years of experience in management and supervision of engineering and hazardous waste projects. He has designed, constructed, installed and operated 16 vapor extraction systems for the removal of volatile organic compounds (VOC) and total petroleum hydrocarbons (TPH) from vadose zone soils and surfacial groundwater contamination.

Education and Affiliations:

Ph.D., Chemical Engineering, University of Southern California, 1977
M.S., Chemical Engineering, University of Idaho, 1963
B.S., Chemical Engineering, Michigan Tech., 1956
Professional Engineer (Idaho, Oregon, California)

American Chemical Society
American Institute of Chemical Engineers

Health and Safety Training, Hazardous Waste Operations and Emergency Response; 29 CFR 1910.210.

Corporate Experience:

Present:	ECOVA Corporation	Sr. Engineer
1984 - 1988:	Edward's & O'Keefe Consultants	Sr. Chemical Engineer
1980 - 1984:	Pentech	Product Development Manager
1974 - 1980:	Foreman Chemical Company	Technical Service Manager
1972 - 1974:	Armour Pharmaceutical Company	Manager, Chemical Manufacturing
1963 - 1968:	Lane Consultants	Manager, Process Investigations

Related Project Experience:

- Design, construction, installation, start-up, and operation of 16 vapor extraction systems in the U.S., Australia, and Puerto Rico. One such system removed 15 tons of volatile organic compounds from an underground storage tank site. Contaminants treated included VOCs in ranges from 60,000-4,000 ppm and TPHs in ranges from 8,000-1,000 ppm. Systems included both mobile and permanent treatment configurations for the chemical manufacturing, semiconductor, petroleum and major aircraft manufacturing industries. Dr. Edwards has worked closely with the regulatory community to insure air emission standards were maintained throughout these projects.

- Chemical engineering expertise and project management experience in design, construction, and operation of remedial action treatment systems for the pulp and paper, pharmaceutical, chemical, foods, offshore oil drilling and electronics industries. Of particular emphasis was the evaluation of methods to increase production and process capabilities with minimized environmental impact. He developed company RCRA compliance programs for the handling of solid and liquid hazardous waste.

- Design, construction, installation and operation of industrial wastewater and seawater recovery systems. Experienced in reverse osmosis and ultrafiltration treatment systems.

- Underground storage tank projects included the development and management of extensive site investigation, characterization and leak detection programs.

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RODERICK CARR
Director, Analytical Services

Roderick Carr is a laboratory manager with 23 years of experience in technical project management, research and development, and chemical analysis of hazardous materials and wastes. He has published extensively in analytical methods development, specializing in the area of heavy metals. Mr. Carr manages daily laboratory operations for organic and inorganic analyses of wastes, soils and water.

Education:

M.A.T., Environmental Chemistry Education, Harvard University, 1966.
B.A., Physics/Chemistry Education, The George Washington University, 1965

Corporate Experience:

1988 - Present	Ecova Corporation	Director, Analytical Services
1985 - 1988	RAMP Corporation	President
1979 - 1985	SCS Engineers	V.P., Pacific Northwest Operations
1976 - 1979	Versar, Inc.	Senior Project Manager
1966 - 1976	U.S. Naval Research Laboratory	Research Chemical Oceanographer

Related Project Experience:

- Managed services for organic and inorganic sample analysis and classical wet chemistry. Managed the development and implementation of analytical services for site investigations and remediation activities. Responsible for the overall direction of laboratory growth, staff development and regulatory compliance.
- Responsible for daily operation of a trace element analytical laboratory at the U.S. Naval Research Laboratory, Washington, D.C.
- Established a program in priority pollutant analysis for the U.S. Environmental Protection Agency. Managed the utilization of subcontractor laboratories in support of this project.
- Responsible for administration of major projects from design through implementation. Interfaced with state and federal regulatory agencies to establish investigation criteria and guidelines. Developed special or new services for national analytical capabilities.
- Led mercury task force, developed cold-vapor atomic absorption methodology for determining part-per-billion concentrations of mercury directly in seawater.
- Developed methods for concentrating toxic heavy metals for analysis from marine waters.
- Participated in laboratory studies which followed mercury through the food chain using carrier free radioactive mercury and clean-rom procedures.
- Reported directly to CEO for in-house environmental analysis chemical laboratory; managed teams of up to 15 professionals and staff. Provided technical support to EPA in its development of hazardous material regulations such as polychlorinated biphenyls (PCB's).

Ordnance/ Munitions Experience:

Mr. Carr's experience with ordnance and munitions dates from his assignment as Chief Chemist responsible for monitoring of the ocean in the vicinity of the area where the Liberty Ship BRIGGS was scuttled with its cargo of nerve gas containing antipersonnel rockets. As he directed six separate NACIP Initial Assessment Studies, concern for ordnance and ordnance components were of a high priority, especially in work done on the bombing ranges associated with Marine Corps Air Station, Yuma, Arizona. Recently he was a senior investigator for a quality control/quality assurance audit and efficiency study conducted at Pine Bluff Arsenal, where major programs in ordnance production and testing are monitored by the Quality Assurance Laboratory.

Site Remediation Experience:

Mr. Carr's most recent experiences in site remediation have ranged from the initial directing of the NACIP Confirmation Study at Whidbey Island Naval Air Station, to development of recommendations for protection of the fragile environments associated with the Devil's Hole area of SUBASE Bangor. Under the Army Defense Environmental Restoration Program (DERP), Mr. Carr directed a project in which site assessments were accomplished for several of the Aleutian Islands, and plans and specs developed for remediation of both hazardous material contamination and restoration of civil infrastructure.

Laboratory Operations and Management Experience:

While employed by U.S. Naval Research Laboratory, Mr. Carr was responsible for daily operation of a trace element analytical laboratory. At Versar, Inc. he established a program in priority pollutant analysis for EPA, and was designated Corporate Quality Assurance Officer for the laboratory, reporting directly to the Chief Executive Officer. He has maintained his interest and capability in laboratory operations by the continuing utilization of subcontractor laboratories in support of the projects he has managed and directed.

Specific Project Experience:

Submarine Base Bangor:

- Environmental Assessment for $30 million in military construction at Submarine Base Bangor, included habitat analysis, three construction options and compliance with SUBASE Master Plan and Master EIS. Effort required preliminary site reconnaissance, test boring, and hydrogeological studies. Much data placed in computerized geographical information system for retrieval and investigation of management options. Facility Maintenance Management Plan - for Subase Engineering, developed basewide plan for management and execution of facilities maintenance.

Ordnance/ Munitions Related Experience

- Mr. Carr served as Chief Chemist at the mid-Atlantic site of a disposal of an entire Liberty Ship load of nerve gas containing anti personnel rockets. Specifics of the assignment remain classified.

- At Pine Bluff Arsenal, he served as a Senior Investigator on a team which was charged with review and audit of the Quality Assurance Laboratory function.

Navy-Wide Project Experience

- Directed Initial Assessments at six naval installations as part of the Naval Assessment and Control of Installation Pollutants Program for the U.S. Navy. Assessments were completed at: Whidbey Island Naval Air Station, Oak Harbor, Washington; Naval Undersea Warfare Engineering Station, Keyport, Washington; Marine Corps Air Station, Yuma, Arizona; Pacific Missile Test Center, Pt. Mugu, California; Naval Construction Battalion Center, Port Hueneme, California; Naval Industrial Reserve Ordnance Plant, Magna, Utah. Work consisted of survey of past operations for hazardous material disposal and dump sites, preparation of plans and specifications for confirmation studies and eventual site-specific remedial action.

- Performed NACIP Confirmation Study at Naval Air Station Whidbey Island, Oak Harbor, Washington. Used results of initial assessment to identify locations for sampling and analysis. Then developed plans and specifications for remedial action and site cleanup.

- For Naval Civil Engineering Laboratory developed microcomputer model for projection of installation maintenance and operations costs under direction of Dr. George Warren of Structures Division, NCEL.

U.S. Naval Research Laboratory, Washington, D.C.

- Led mercury task force, developed cold-vapor atomic absorption methodology for determining part-per-billion concentrations of mercury directly in seawater.
- Developed methods for concentrating toxic heavy metals for analysis from marine waters.

- Participated in laboratory studies which followed mercury through the food chain using carrier free radioactive mercury and clean-room procedures.

Other Hazardous Waste and Site Restoration Projects

- PCB Siting Study for Lewis County Firm - Carried out environmental assessment and siting study for PCB handling facility to be built in Lewis County, Washington. Work included review of current operations and of impact of TSCA regulations, and Washington DOE regulations on future of PCB handling operations.

- PCB Management Manual for National Rural Electric Cooperative Association, Washington, D.C. - Produced a PCB Management and Guidance Manual used by members of the Rural Electric Cooperatives in managing PCB's as required by TSCA and other regulatory guidelines. Over 10,000 copies of the first edition were sold, nationwide.

- DERP Nike Site Reconnaissance - Provided site reconnaissance and analysis of abandoned Bainbridge Island Nike site as part of Defense Environmental Restoration Program.

- U.S.Army Site Restoration Program - Performed facility and site assessments on Amchitka and Atka Islands in the Aleutian Chain. Work included survey for abandoned tanks and electrical equipment, sampling and testing for POL, PCBs and asbestos, and development of remedial action plans and specifications for clean-up.

- Washington Department of Health and Human Services - Performed state-wide survey of all Department facilities for PCBs and PCB equipment. Developed management plan, equipment and fluid disposal options and a series of cost scenarios for each option or combination thereof.

- Arlington, Oregon Client - Performed economic assessment of closure plan for chemical waste facility for the purpose of establishing bonding requirements.

WILLIAM MAHAFFEY, PH.D.
Senior Research Biochemist

Dr. Mahaffey is a Senior Research Biochemist who specializes in microbial biochemistry. He is responsible for research efforts involving isolation and enrichment of microorganisms for promoting biodegradative abilities. Dr. Mahaffey conducts research on bacteria capable of degrading hydrocarbons, including heavy oils and tars, creosoles, and creosote; solvents, and a variety of contaminants.

Education and Affiliations

Ph.D., Microbial Biochemistry, University of Texas, 1986
M.S., Microbial Ecology, State University of New York, 1978
B.S., Microbiology, State University of New York, 1976
American Society for Microbiology
American Chemical Society
American Association for the Advancement of Science

Corporate Experience

1988 - Present	Ecova Corporation	Senior Scientist
1986 - 1988	Phillips Petroleum Co.	Staff Research Chemist
1981 - 1985	University of Texas	Graduate Research Associate
1976 - 1981	U.S. E.P.A.	Research Associate

Related Experience

- Project Manager for a major biotreatability study for a wood treating plant in the Western United States. This project included bench-scale evaluations of both in situ and aboveground bioremediation processes for the cleanup of creosote, pentachlorophenol and various hydrocarbon wastes in water and soil.

- Project Manager to develop biological treatment processes for the cleanup of soil and water contaminated with polyaromatic hydrocarbons (PAH) and volatile hydrocarbons at a former coal gasification site in Seattle, Washington.

- Managed a laboratory evaluation to determine the feasibility of using biological treatment processes to clean up soil and groundwater contaminated with pentachlorophenol at a wood treating site in Illinois.

- As a Research Biochemist, was responsible for use of chemostats and continuous culture techniques for the isolation of pesticide degrading microorganisms. Studied the effects of chlorinated compounds on microbial metabolism, specifically ketone and pentachlorophenol.

- Developed research program on aromatic hydrocarbon metabolism by bacteria and fungi. Optimized fermentor growth conditions for maximum cell yield and enzymatic activity. Immobilized bacterial cells for biocatalysis. Used halogenated substrate carcinogenic polycyclic aromatic hydrocarbons. Isolated and characterized metabolic intermediates using HPLC, Mass spectrometry, UV/VIS and CD spectroscopy and nuclear magnetic resonance spectroscopy. Maintained laboratory microbial stock culture and metabolite collection.

- Conducted graduate studies involving bacterial metabolism of dibenzothiophene and benz(a)anthrancene. Isolated and characterized metabolic intermediates formed by whole cell biotransformation. Purified enzymes and elucidized the metabolic pathways for both of the above substrates. Reported on the ring cleavage of a polycyclic aromatic hydrocarbon with more than three rings.

- As a Staff Research Chemist, studied fermentation process development of genetically engineered yeast for the production of recombinant peptides and proteins. Analytical

TOLS011835

BZTO104(e)048668

biochemistry work included characterization of recombinant proteins to determine host modifications or identity with the native protein. Dr. Mahaffey developed analytical techniques for monitoring production of recombinant proteins and peptides.

Publications

Bourquin, A.W., P.H. Pritchard, and W.R. Mahaffey. 1978. Effects of kepone on estuarine micro-organisms. Dev. Ind. Microbiol. 19:489-497.

Mahaffey, W.R., A.W. Bourquin, and P.H. Pritchard. 1979. Phenylacetic acid metabolism by three aquatic bacteria isolated from continuous culture enrichment. Dev. Ind. Microbiol. 20:489-495.

Mahaffey, W.R., P.H. Pritchard, and A.W. Bourquin. 1982. Effects of kepone on growth and respiration of several estuarine bacteria. Appl. and Environ. Microbiol. 43(6):1419-1424.

Cerniglia, C.E., W.R. Mahaffey, and D.T. Gibson. 1980. Fungal oxidation of Benzo(a)pyrene by Cunninghamella elegans. Biochem. Biophys. Res. Commun. 94:226-231.

Nelson, M.J., S.O. Montgomery, W.R. Mahaffey, and P.H. Pritchard. 1987. Biodegradation of trichloroethylene and the involvement of an aromatic biodegradative pathway. Submitted 12/86 Appl. and Environ. Microbiol.

Mahaffey, W.R., C.E. Cerniglia, and D.T. Gibson. 1987. Production of an isomeric mixture of ortho hydroxy polyaromatic acids from the carcinogen: benzo(a)anthracene. Submitted 3/87 Appl. and Environ. Microbiol.

Mahaffey, W.R. and D.T. Gibson. 1987. Metabolism of dibenzothiophene by a Beijerinckia: Identification of a major and minor pathway. In preparation for Appl. and Environ. Microbiol.

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BZTO104(e)048669

ERIC J. PAUKSTAITIS, P.G.
Senior Project Hydrogeologist

Mr. Paukstaitis, with over 12 years of professional experience in consulting and industry, is Senior Project Hydrogeologist for ECOVA Corporation. He has worked in groundwater related aspects of construction, mining, energy development, and hazardous waste investigations and remediation. Mr. Paukstaitis is responsible for supervision of geosciences staff in performance of hydrologic and geologic investigations at hazardous waste sites to determine the location and extent of contamination and subsurface conditions affecting the transport of contaminants. Mr. Paukstaitis also conducts groundwater modeling for ECOVA to optimize design of groundwater recovery and treatment systems.

Education and Affiliations:

M.S., Geology, Oklahoma State University, 1981
B.S., Geology, Rutgers University, 1973
Professional Geologist (California, Idaho, North Carolina)

Association of Ground Water Scientists and Engineers
Association of Engineering Geologists
Northwest Geology Society

Health and Safety Training, Hazardous Waste Operations and Emergency Response; 29 CFR 1910.210.

Corporate Experience:

1987 - Present:	ECOVA Corporation	Senior Hydrogeologist
1986 - 1987:	International Technology	Senior Hydrogeologist
1985 - 1986:	CH2M Hill	Senior Hydrogeologist
1981 - 1985:	Mobil Alternative Energy	Project Hydrogeologist
1979 - 1981:	Espey Huston & Associates	Staff Hydrogeologist
1977 - 1979:	Oklahoma State University	Graduate Student
1973 - 1977:	Edwards & Kelcey, Inc.	Field Geologist

Related Project Experience:

- Conducted assessments at various locations across the country to define the nature of soil and groundwater contamination. Design of remediation systems is presently being conducted for several of these sites.

- Modified the EPA BioPlume groundwater model to utilize information from laboratory studies and relate it to rates of in situ degradation of site contaminants under simulated field conditions. This model is being used by ECOVA to optimize design of groundwater treatment systems.

- Conducted an investigation for a major agricultural company to define subsurface conditions and extent of contamination at a herbicide formulation facility. Designed an in situ groundwater treatment system based on computer simulation of contaminant movement. Supervised installation of the groundwater extraction/recharge system for enhanced in situ biological degradation of herbicide contamination.

P106/500814-A.309:ch/7

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- Supervised installation of a pilot-scale system to prove feasibility of bioremediation of petroleum hydrocarbons and chlorinated solvents in a low permeability formation in the San Francisco Bay area. Project is ongoing.

- Project Manager and Senior Hydrogeologist on a series of projects for a major oil company, involving hydrocarbon recovery and groundwater cleanup resulting from leakage of underground storage tanks. Projects included the successful in situ bioremediation of a large gasoline leak in California, and installation of groundwater recovery systems and air strippers at two sites in northern California.

- Conducted a series of subsurface investigations on Superfund sites in various parts of the country contaminated with petroleum products, volatile organics, heavy metals, PCB's, and radioactive wastes. Responsibilities included design and implementation of subsurface investigations in support of remedial investigation and feasibility study (RI/FS) reports.

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BZTO104(e)048671

JAMES BORTHEN
Project Engineer

James Borthen is a project engineer specializing in field construction, hazardous waste and contaminated soil and water cleanup, and heavy equipment operation. He has more than 10 years of project management, field work and computer service experience with advanced technologies in oil exploration, geophysics, seismics and cartographic applications. He currently supervises field activities for the remediation of soil and groundwater at a Portland, Oregon, site contaminated with pentachlorophenol.

Education:

M.B.A., Finance, University of Washington, 1978
B.S., Chemical Engineering, University of Washington, 1974
Value Engineering Certification, Society of American Value Engineers

Corporate Experience:

1989 - Present:	Ecova Corporation	Project Engineer
1987 - 1989:	Abide American, Inc.	Project Manager
1979 - 1985:	Schlumberger, Ltd.	Project Engineer
1977 - 1978:	The Boeing Company	Materials Engineer

Related Project Experience:

- Supervises field activities for the remediation of soil and groundwater at a Portland, Oregon, site contaminated with pentachlorophenol. Directs the operation of equipment used for soil washing and biological treatment. This project requires the mobilization and use of heavy special purpose equipment on the site, management of multi-shift field crews, excavation of soil and construction of a bermed and lined treatment complex containing large-capacity bio-slurry tanks and mobile laboratory and field support facilities.

- Managed data conversion project for USDA Forest Service using Intergraph Microstation CAD software. Responsibilities included maintaining software format conversion program, hardware and software system programming and configuration, quality control and Forest Service liaison.

- Project engineer for construction management services team on variety of projects, providing progress inspection, cost estimating and schematic layout design.

- Special Services engineer providing coordination, supervision and performance of seismic operations in offshore and artic regions. Responsibilities included field interpretation of seismic results, particularly for oil exploration ventures.

- Project engineer-in-charge for regional engineering field office in Cody, Wyoming. Duties included operations management and administration of cost control, equipment maintenance and training programs.

- Field engineer responsible for coordinating, supervising, and performing geophysical measurement services to the oil exploration industry. Work involved use of computer-controlled measuring equipment, radioactive materials and explosives and heavy equipment.

TOLS011839

BZTO104(e)048672

- Materials engineer for installation of materials in commercial aircraft. Interfaced with design, manufacturing and quality assurance groups to ensure production goals and compliance with FAA regulations.

TOLS011840

BZTO104(e)048673

DANIEL E. SCHWEIGEL, JR.
Equipment Operator

Mr. Schweigel is responsible for operation and maintenance of equipment used at bioremediation sites managed by Ecova. He also collects soil and water samples and prepares them for shipment to Ecova's analytical laboratory. His experience includes operating and maintaining bioslurry equipment, conveyor systems, piping and vessels for liquids, mobile fermentors, trucks, bulldozers, backhoes, Terragators, water trucks and irrigation systems. Mr. Schweigel also has a strong background in construction.

Education and Professional Affiliations:

Columbus High School, Montana, 1985
Marine Reserves Infantry Training School, 1985
U.S. Army (Honorable Discharge), 1987

Health and Safety Training, Hazardous Waste Operations and Emergency Response: 29 CFR 1910.210, 40 Hours, 1989

First Aid and CPR Training, 8 Hours, 1989

Related Project Experience:

Equipment operation and maintenance for biological cleanup of 3,700 cubic yards of soil and groundwater contaminated with pentachlorophenol at an oil terminal in Portland, Oregon. Responsibilities included slurry tank set-up and operation, maintenance of pumps and air compressors and operation of the excavation conveyor, 953 and 943 Hydrostatic Cat and boom and dump trucks. Additional duties included welding, pipefitting, cutting and threading.

Oversees operation and equipment maintenance for remediation of tar and copper contaminated soils at a site neat Kalama, Washington. Approximately 12,000 cubic yards of toxic residual material is being treated with methylene chloride to extract tar and copper for recycling.

Experience includes carpenter and bricklayer for construction of buildings and other structures.

Served as driver/operator and equipment maintenance for various tractors and loaders, including John Deere 7520, John Deere 9020 with loader and Versatile 6880. Capabilities include welding, equipment set-up and instrument maintenance.

Operation and maintenance responsibilities for pH reduction process in caustic boiler ash for a pulp and paper company. Fly ash is processed in an onsite liquid slurry system to remove soluble alkalinity and adjust ash below 12.5. System components include a feed-conveyor system, a trommel classifier, a clarifier, an acid polish tank, a belt filter press and a clean ash staging area. Mr. Schweigel operated the belt press and backhoes, provided pipefitting and maintenance on pumps and operated the slurry tanks.

TOLS011841

BZTO104(e)048674

JOHN KINSELLA, P.G.
Vice President, Operations

Mr. Kinsella directs the activities of the firm's engineers, hydrogeologists, and geophysicists in support of all remediation projects. He has over ten years of experience as a professional hydrogeologist, including four years as regional manager of a major environmental consulting firm. Mr. Kinsella has managed Superfund RI/FS and RCRA projects, prepared hazardous and solid waste permit applications, and negotiated settlements for compliance orders. He is currently involved in several in situ groundwater remediation projects where ECOVA has developed expertise in the degradation of hydrocarbons, solvents and PNAs.

Education and Affiliations:

M.Sc., Hydrogeology, University College/London, 1978
B.A., Geology, Trinity College/Dublin, 1977
Registered Professional Geologist
American Institute of Professional Geologists
Certified Geologist (United Kingdom)
Association of Ground Water Scientists and Engineers
Fellow, Geological Society

Health and Safety Training, Hazardous Waste Operations and Emergency Response; 29 CFR 1920.210.

Corporate Experience:

1988 - Present:	Ecova Corporation	Vice President, Operations
1984 - 1988:	Geraghty & Miller, Inc.	Associate & Office Manager
1981 - 1984:	Golder Associates	Senior Hydrogeologist
1978 - 1981:	Thames Water Authority	Hydrogeologist

Related Project Experience:

- Directed environmental site assessment of a chemical plant located in Republic of Ireland. Plant currently being purchased by U.S. Corporation, advised client on current environmental status and liability regarding EEC Regulations.
- Directed collection of field data in assessing the impact of gravel mining on groundwater conditions, S.E. England.
- Supported legal counsel in negotiating a site investigation and monitoring plan for a landfill in Arkansas. Negotiations with state attorneys involved formulating a site investigation that both sides would agree to. Case was successfully settled.
- Managed the investigation of several plant facilities nationwide (Illinois, California, New Jersey) for a major chemical corporation. Worked closely with corporate counsel and environmental management in negotiating cleanup programs with state and federal agencies.
- Evaluated the rate and extent of BTX contamination from a series of underground tanks at chemical manufacturing facility, Los Angeles, California. Floating free-phase product and dissolved plumes were mapped. Interceptor wells coupled with air stripping/carbon adsorption recommended; site currently shut-down and awaiting regulatory decision.
- Supervised the assessment and definition of a subsurface diesel plume, (dissolved and free-phase) beneath a trucking terminal in Dallas, Texas. Subsequently designed an onsite oil-water separation and carbon adsorption unit that has been permitted by city and state agencies.

- Defined the rate and extent of organic and inorganic plumes originating from a spill and a closed RCRA landfill at an Illinois facility. The plumes (primarily chloride and VOCs) are moving at a rate of 300 ft/year through glacial gravels. Detailed computer modeling was used to design a 180-gpm recovery well system that discharged to an air stripper/carbon adsorption unit; Illinois EPA approved complete CAP.

- Directed an independent geoengineering assessment on behalf of an insurance company to investigate the extent of diesel contamination in soil and groundwater at a spill site in eastern Washington state.

- Responsible for the preparation of a regulatory agency-enforced Remedial Action Plan at a former fuel oil distribution center in Seattle, Washington. Managed the preparation of plans for site cleanup, regulatory liaison and public involvement.

- Directed the design, fabrication, startup and operation of a wastewater treatment system used to remove chlorinated pesticides from an industrial waste stream in Montana. This project involved substantial client and regulatory agency interface.

- Working under an emergency order issued by the State of North Dakota and the U.S. EPA, directed the treatment of 11,000 cubic yards of soil and 6,000,000 gallons of groundwater contaminated with chlorinated pesticides.

- Installed shallow and deep monitoring well networks for hazardous waste facility in Emelle, Alabama. Deep wells (950 ft) had unique two-pump system to enable effective purging and sampling.

- Assessed the extent of contamination resulting from the failure of an injection well at a chemical plant in New Orleans, Louisiana. Detailed samples revealed that pressurized contaminants had entered the aquifer at 200 ft below surface and penetrated two shallow water-bearing zones.

- Managed an ongoing project in California to develop an in situ groundwater treatment system. A proprietary process developed by Ecova microbiologists successfully reduces TCE groundwater concentrations to approved cleanup levels. The process will be implemented during a pilot field program following approval by the Regional Water Quality Control Board.

- Designed remedial action program for abandoned wood-treating plant, Washington State. Major contaminants are creosote, pentachlorophenol and polynuclear aromated hydrocarbons. Program will involve solid-phase soil biotreatment; recovery, separation, and recycling of NAPLs; and recovery and treatment of dissolved groundwater plumes.

Selected Reports:

East Landfill Seepage Pathways and Proposed Remedial Program, Kaiser Aluminum and Chemical Corporation, January 1988.

Enhanced Biotransformation of Soils Enriched with Triazine, Ciba Geigy Corporation, December, 1987.

Hydrogeological Characterization of the Sunray Landfills, Kawneer, Inc., September, 1987.

Waste Management Feasibility Study, Allied Corporation, April, 1987.

Lagoon Area Geophysical Survey, W.R. Grace, August, 1986.

Selected Presentations:

Underground Storage Tanks: A Management Problem, American Society of Mechanical Engineers Northwest Hazardous Waste Conference & Exhibition, Tacoma, Washington, October 24-27, 1988.

Hazardous Waste, Detection, Control, Treatment, World Conference on Hazardous Waste, Budapest, Hungary, October 25-31, 1987.

Solving Ground-Water Problems with Computer Models, American Water Resources Association, Baton Rouge, September 24-25, 1987.

The Fundamentals of Ground-Water Contamination, Geraghty and Miller, Inc., New Orleans, October 9-10, 1986.

Ground Water Monitoring and Protection, Department of Civil Engineering, Louisiana State University, November 5, 1985.

The Detection and Monitoring of Ground Water Pollutants, Water Pollution Control Association Annual Meeting, Myrtle Beach, South Carolina, November 2, 1983.

Introduction to Hydrogeology, Department of Geology, Georgia State University, June, 1983.

Selected Publications:

The Impact of the Chemical Industry on Ground-Water Quality: Three Case Histories, Hazardous Waste: Detection, Control, Treatment, edited by R. Abbou, Elsevier Science Publishers B.V., Amsterdam, 1988 – Printed in The Netherlands.

Ground-Water Modeling – A Decision Making Tool for Environmental Managers and Regulators, Ram, R.S., Erutun, K., Kinsella, J.V., and Cospelich, C. Second Industrial Waste Conference, LWPCA, April, 1987.

Hydrogeologic Controls on Plume Migration in a Glacial Aquifer, Kinsella, J.V., Cospelich, W.C., and Ram, R.S. Proceedings American Geophysical Union, Spring Meeting, Baltimore, 1987.

The Hydrologic and Stratagraphic Relationships of Tertiary and Younger Sediments of Northwestern Allendale County, S.C., Knox, R.L., Kinsella, J.V., and Padgett, A.G. Proceedings of Ground Water Resources of Georgia and Adjacent Areas, Georgia Institute of Technology, October, 1983.

TOLS011844

BZTO104(e)048677

JACK KASH
Field Superintendent

Jack Kash is a field superintendent and equipment operator with six years of experience in environmental management and the cleanup of hazardous waste and contaminated soil and water. He has supervised heavy equipment operations and material handling; performed underground storage tank (UST) removals and replacements; managed operations, fire and security field crews at hazardous material spill sites; supervised hazardous waste site health and safety; maintained air monitoring systems; collected soil and water samples for analysis; and classified, packaged and manifested hazardous waste shipments.

Education:

General Coursework, Cerro Casa Community College, California, 1980-1985
Hazardous Materials Management, University of California, Davis, Certificate Program, 1985
Hazardous Materials Management Course, California Highway Patrol, 1984
Management and Disposal of Hazardous Waste Classes, Baker Chemical Company, 1984

Health and Safety Training, Hazardous Waste Operations and Emergency Response; 29 CFR 1910.210, 40 hours basic and 8 hours Supervisory Training

Corporate Experience:

1989 - Present:	Ecova Corporation	Field Superintendent
1988 - 1989:	MP Vacuum Truck Service	Project Coordinator
1987 - 1988:	Golden State Environmental Services	Self-Employed, Waste Cleanup Services
1986 - 1987:	Dwight Trucking Service	Environmental Specialist
1982 - 1986:	Kerr McGee Chemical Corp.	Sr. Environmental Technician

Related Project Experience:

- Managed the removal and disposal of 22 underground storage tanks located in the Sequoia and Kings Canyon National Parks. Performed the removal of 11 underground storage tanks located on the Elk Hills Naval Petroleum Reserve.

- Supervised field personnel and equipment on hazardous waste soil vacuum extraction projects. Operated and supervised the operation of heavy equipment. Arranged for agency inspections to approve work performed; acquired samples; prepared waste profiles and arranged for disposal of wastes at hazardous waste facility. Prepared reports for tank closures and clean-up projects.

- Supervised and performed decontamination of underground storage tanks that previously contained hazardous materials. Washed tanks utilizing high pressure water. Arranged for waste disposal at hazardous waste facility. Completed disposal manifests for rinsate water and tanks. Coordinated regulatory inspections (Fire and Health Departments). Acquired soil and water samples in accordance with EPA SW 846 methods. Transported samples to laboratory for analysis and prepared final closure reports for presentation to client and Health Department.

- As an environmental technician, inspected storage areas for compliance with hazardous materials storage regulations. Classified, packaged, marked, labeled, and manifested hazardous waste shipments. Responded with fire and security personnel to hazardous materials incidents. Notified County, State, and Federal agencies of releases of hazardous materials.
- Supervised field crews in the cleanup and remediation of petroleum hydrocarbons at spill sites. Conducted training of personnel in soil excavation and handling, and hazardous waste hauling to disposal sites.

- Packaged, sampled, profiled and disposed of hazardous wastes at a manufacturing facility. Removed asbestos contaminated soils. Performed major clean-up of PCB contaminated soils at remote locations.

- As an environmental technician for Kerr McGee Corporation, performed various clean-up projects. Supervised the removal and disposal of contaminated soils and packaging of hazardous wastes. Crushed unwanted drums using heavy equipment. Packaged and prepared wastes for disposal. Identified unknown wastes utilizing Hazcat identification.

CRAIG D. SKOGERSON
Project Hydrogeologist

Mr. Skogerson provides geological assessments of hazardous waste sites, including site characterization, seismology, geologic modeling and geomechanics. He determines the site-specific geological characteristics that influence the fate and transport of onsite contaminants, and is responsible for field exploration and subsurface investigations.

Education:

Monterey Peninsula College, Monterey, CA, Major: Geology
Richland Community College, Richardson, TX, Major: Geology
Saddleback Junior College, Mission Viego, CA, Major: Oceanography

Corporate Experience:

1989 - Present:	Ecova Corp.	Project Hydrogeologist
1987 - 1989:	Monterey County Flood Control & Water Conservation District	Engineering Aide
1982 - 1986:	Sun Exploration & Production Co.	Engineering/Geological Technician
1976 - 1980:	U.S. Coast Guard	Marine Science Tech.

Related Project Experience:

Supervised and implemented geologic field data gathering programs for coalbed methane recovery projects. Responsibilities included drilling, mapping, sampling, logging, geological analyses and data interpretation. Assisted in natural gas resource delineation, prospect identification, evaluation and production testing programs. Additional duties included design, procurement, transport, set-up, operation and evaluation of field test equipment; coordination of field operations for logistics support and cost efficiency; and research analysis for quality control of laboratory results.

Field hydrologic measurements, construction engineering, cost analysis, field data collection and hydrologic interpretations for the Monterey County Flood Control and Water Conservation District.

As an engineering technician, was responsible for set-up, operation, troubleshooting and maintenance of field instruments. Also responsible for data entry, computer programming, computer graphics and data interpretation for use with IBM PC's and mainframes.

Drilling, monitoring and sampling numerous wells as part of the coalbed methane recovery program. Supervised desorption sampling to evaluate methane content of coals from three core holes in the Sage Point/Dugout Canyon area near Price, Utah.

As marine science technician, conducted weather observations and generated weather maps, charts and specialized meteorological data. Also assisted U.S. Antarctic Research Program, National Science Foundation and New Zealand Antarctic Research Program scientists with all operations, including general oceanography, geology, seimology, bathymetry and marine biology research. Additional functions included coordination of weather satellite photography and implementation of plans and procedures for oil spill cleanup operations.

SECTION II

CHANGE ORDERS

TOLS011848

1. COST ESTIMATES FOR CHANGE ORDERS

Disposal Pit Clean Up

Summary:

The area where we were supposed to obtain clean soil to fill in the excavated PCP area, turned out to be contaminated with solvents and other "mineral" spirits.

Upon discovery of contaminants, work on the pit was halted, and several holes were dug with a back hoe so that samples could be obtained for analysis.

Cost Break Down:

Taking Samples

Back Hoe Rental	3 days x 8 hrs x $50.00/hr	$1200.00
M. Anderson	3 days x 8 hrs x $75.00/hr	1800.00
Operator	3 days x 8 hrs x $40.00/hr	960.00

Additional time necessary to collect clean soil

Two Trucks	4 days x $100/day	800.00
Loader	4 days x $180/day	720.00
Two Operators	4 days x 11 hours x 30.00	2640.00
		$8120.00

TOLS011849

2. Solvents Discovered in PCP Contaminated Soils

Summary:

During excavation of the area south of the PCP warehouse, where it was believed that only PCP's would be found, solvents were discovered.

Cost Break Down:

Added time to excavate soil

Two Operators	4 days x 11 hours x $40.00/hr	$3520.00
Loader	4 days x $180.00	720.00

Taking Solvent Soil Samples

2 Operators	1 day x 11 hours x $40.00/hr	880.00
1 boat*	1 day x $50.00/day	50.00

Soil/water Sample Analysis

4 samples GC/MS/Library Search	$700.00 per sample	$2800.00
Kodak KB-3 and B-11 samples	.....	$820.00

Administrative

Changes to Health and Safety Plan	.....	$360.00

Elimination of Contaminated Water in Pit

2 Operators	25 hours x $40.00/hour.....	$2000.00
Testing of Sample	.....	$110.00

Re-Pumping to new tank because first tank leaked

2 Operators	5 hours x $40.00/hours.....	$400.00

$11,660.00

* The boat was required because the excavated pit had filled with water, and obtaining samples from the side walls was not possible otherwise.

TOLS011850

3. Sump "Slop" Tank Water

Summary:

Time Oil had a tank near the water front which contained 100,000 gallons of water contaminated with diesel, gasoline and other hydrocarbons. We were asked to pump this water over to a storage tank next to our site, and later to clean this mixture.

Cost Break Down:

Pumping solution to new tank

2 Operators 25 hours x $40.00/hour ..... $2000.00 ?

Sample Analysis

GC analysis ..... $110.00 yes

$2110.00

TOLS011851

4. Ground Water Study

Summary:

The original contract required that Ecova perform a pump test on the groundwater system and that the water be tested for PCP. Later, a second pump test was requested, and upon discovery of solvents in the soil, the water samples were tested for solvents.

Cost Break Down:

Additional Pump Test (Time, expenses & equipment)	$1500.00 a. ?
Solvent Analysis HPLC 6 samples x $50.00/sample	$300.00 b. yes
Total	$1800.00

TOLS011852

Proposed Change Orders

1. Treatment of Contaminated Waters

The original contract called for elimination of PCP from soils. Since the project began, liquids from various sources have been accumulated; groundwater contaminated with solvents and "mineral spirits", contaminated water from the excavation pit, and contaminated water from other Time Oil operations (the "Slop" tank). These liquids should be cleaned for disposal.

It is our position, at this time, that bio-remediation will be effective in this cleanup. However, laboratory evaluations will have to conducted to ensure this. Also, if these fluids are to be cleaned in the PCP remediation system, the effect these fluids will have on the process will have to be determined before they can be added.

For that reason, at this time, we can not give a price estimate for this work.

2. Soil Borings in South End of Pit
To determine extent of solvent contamination in the area of the PCP contamination
.....$5000.00

3. Groundwater Modeling

Based upon limited and existing analysis
.....$4500.00

4. Dioxin Analysis ...One Sample - 26 isomers.....$1800.00

5. Treatment of Contaminated Soil in Excavation Pit.....$83,460,00

TOLS011853

Proposal for Bioremediation of Contaminated Soil From Disposal Pit Area At The Time Oil Portland Facility

Ecova Corporation, proposes to bioremediate mineral spirits contaminated soil at the Portland, Oregon facility. This document summarizes the work to be performed by Ecova, the schedule, costs for cleanup, and the qualifications of the Company and the employees assigned to this project.

1. **SCOPE OF WORK**

Ecova's responsibilities on this project will be to perform bioremediation of approximately 200 - 400 cubic yards of soil contaminated with mineral spirits solvent. Contamination levels in the soil range from 1,000 up to 8,000 parts per million (ppm). Ecova will also be responsible for design and construction of the soil treatment area, excavation and transportation of contaminated soil to the treatment area, and spreading the soil to the predetermined depth on the treatment area. It is understood that the treatment area will be lined and bermed to allow for proper leachate drainage and recovery.

Tasks to be performed include:

- Excavation and backfilling of contaminated locations
- Disposal of non-contaminated soil
- Design and construction of treatment area
- Initial material characterization
- Soil biotreatment
- Sampling and analysis to verify that cleanup criteria have been met
- Placement of contaminated soil on the treatment area
- Post-treatment restoration
- Work plan and reports

After the soil is spread on the treatment area, Ecova will sample the soil prior to beginning the treatment process. Samples will be collected for analysis of TPH to establish baseline chemical characteristics. Analysis of the samples will be performed by Ecova's laboratory in Redmond. Treatment will commence with the addition of nutrient amendments to the contaminated soil, following the parameters developed by Ecova. It should be understood that parameters developed for the biotreatment of diesel-contaminated soil will be utilized on these soils. The assumptions are that mineral spirits are a lower boiling point petroleum fraction and therefore readily biodegradable provided that adequate nutrients and moisture content are maintained.

TOLS011854

BZTO104(e)048687

Ecova employees from the Portland site will be utilized to process the soil on a weekly basis. Soil will be processed in order to bring microorganisms, contaminants, and oxygen into contact with each other. All three components of the microbial process must be present in proper amounts for biodegradation to take place effectively.

During the treatment period, Ecova will monitor the degradation process in the soil, making moisture and nutrient control adjustments as needed. Soil samples will be collected periodically to evaluate the extent of contaminant biodegradation. Treatment system performance will be routinely monitored until TPH levels reach the acceptable target levels. At the conclusion of the treatment period, verification that soil cleanup meets regulatory quality assurance criteria will be determined by analyzing for TPH. All chemical analysis used to demonstrate compliance will be performed by Ecova Analytical Services using full quality assurance and quality control procedures established by the EPA.

2. MANAGEMENT

Ecova offers an experienced project team to implement biological cleanup techniques at the Portland site. The project will be headed by an experienced Project Manager, Dr. Dave Edwards. He will be supported by Dr. Bill Mahaffey, Sr. Microbiologist for bioremediation, who will oversee all microbiological aspects of the soil treatment, evaluate results, and interpet analytical data. He will also coordinate the analysis of soil samples through the Ecova analytical laboratory. Full resumes of each key team member are attached to this proposal. Mr. James Borthen, Ecova Site Supervisor for the Portland facility will be responsible for the management of the daily operations of the treatment.

3. SCHEDULE

Beginning with the assumptions that the contaminants are strictly mineral spirits and that they are as biodegradable as diesel fuel, it is anticipated that the treatment time will be approximately 28 - 42 days for 400 cubic yards of soil. Among the factors which will contribute to extended treatment time are; initial concentration of hydrocarbon, target cleanup level, metals contamination, rainfall and ambient temperature.

4. COSTS

Cost estimates are provided for remediating the first 400 cubic yards of soil. It is estimated that for each additional 400 cubic yards of soil that must be treated a batch cost of $12,000 should be added to the total program cost. This results in significantly lower costs per cubic yard due to economy of scale.

TOLS011855

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ACTIVITY 150: Work Plan	$2670
ACTIVITY 200: Material Characterization	$3100
ACTIVITY 500: Mobilization	$4180
ACTIVITY 600: Site Operations	$51260
ACTIVITY 620: Analysis	$10800
ACTIVITY 650: Demobilization	$2100
ACTIVITY 700: Final Report	$3050
ACTIVITY 800: Project Management	$6300
TOTAL PROGRAM COST	$83460

TOLS011856

BZTO104(e)048689

SECTION III

SCHEDULE

TOLS011857

TIME OIL - PORTLAND TERMINAL

Project Schedule

Startup/Shakedown of Treatment Operations	June 26 - Aug 15
Pump Testing of Monitoring Wells	July 18 - 21 (completed)
Modeling of Groundwater Flow and Treatment....	Awaiting Authorization
Proposed Oregon DEQ Meeting.....	Awaiting GW Modeling
Begin Soil Treatment Operations.....	August 15
Second Excavation and Backfill	October

TOLS011858

SECTION IV

UNRESOLVED ITEMS

TOLS011859

TIME OIL - PORTLAND TERMINAL

Unresolved Items

MONTHLY PROGRESS REPORTS

ELECTRIC SERVICE INSTALLATION AND MONTHLY BILLS

CHROMATOGRAMS

CERTIFICATION OF INSURANCE, PERMITS, LICENCES, AND APPROVALS

TOLS011860

P. Sol
Accounts Payable Specialist

TOLS011861

BZTO104(e)048694

August 15, 1989 J.N. 821401

MEMORANDUM

TO: FRED PROBY, TIME OIL

FROM: ROD CARR, ECOVA CORP. RSC

SUBJ: PORTLAND GENERAL ELECTRIC BILLING ROUTING

1. The billing for electric power used at the Northwest Terminal remediation site will now be mailed directly to Ecova Corporation to my attention to allow immediate payment of that utility service. This arrangement should provide for more timely payment for the service and eliminate extra handling of the billing.

2. Per your letter of August 4, 1989, I am in complete agreement that the charge for electricity utilization is Ecova's responsibility under terms of our current contract.

3. Thank you for your assistance in this matter.

4. I have in my file a copy of the insurance certificate mailed to you on July 27, 1989 by Corroon and Black, our agent, naming Time Oil as an additional insured. Please let me know if you have not gotten a copy.

5. Attached to this memo is a copy of the evidentiary letter supplied by the Department of Labor and Industries attesting to our compliance and participation in the Worker's Compensation Insurance.

6. At the present time we are making copies of all the relevant permits and licenses as required in Article 8 of our Contract. These will be forwarded as soon as possible. Attached herein are copies of Ecova's registration with the Secretary of State as a foreign business corporation, and our City Business License for the city of Portland.

cc. David Edwards, PE, Ecova

STATE OF WASHINGTON

DEPARTMENT OF LABOR AND INDUSTRIES

July 31, 1989 *General Administration Building • Olympia, Washington 98504-4401*

TO WHOM IT MAY CONCERN

Account ID: 463,298-01-8
Ecova Corporation

Dear Business Person:

Please be advised that the above referenced business person is currently registered with the Department of Labor and Industries and has been assigned the above referenced account ID number.

In cases of work being done by contract, all parties should be aware of the provisions of the Industrial Insurance Laws with respect to liability for premiums. RCW 51.12.070 provides that:

> The provision of this title shall apply to all work done by contract; the person, firm, or corporation who lets a contract for such work shall be responsible primarily and directly for all premiums upon the work. The contractor and any subcontractor shall be subject to the provisions of this title and the person, firm, or corporation letting the contract shall be entitled to collect from the contractor the full amount payable in premiums and the contractor in turn shall be entitled to collect from the subcontractor his proportionate amount of payment.

In administering this section of the law the Department requires each contractor to pay premiums. Payment of premiums by the prime contractor would be made only if the subcontractor fails to make their own premium payments.

A contractor registered under Chapter 18.27 RCW (General Contractors & Specialty Contractors) or licensed under Chapter 19.28 RCW (Electrical Contractors) shall not be responsible for any premiums upon the work of any subcontractor if:

(1) the subcontractor is currently engaging in business which is registered under Chapter 18.27 RCW or licensed under Chapter 19.28 RCW.

TOLS011863

BZTO104(e)048696

(2) the subcontractor has a principal place of business which would be eligible for a business deduction for Internal Revenue Service tax purposes other than that furnished by the contractor for which the business has contracted to furnish services.

(3) the subcontractor maintains a separate set of books or records that reflect all items of income and expenses of the business.

(4) the subcontractor has contracted to perform:

(a) the work of a contractor as defined in RCW 18.27.010; or current or installing apparatus to be operated by such current as it pertains to the electrical industry as described in Chapter 19.28 RCW.

There is no limitation of coverage and no policy period or cancellation date is issued by the Industrial Insurance Laws of the State of Washington.

Very truly yours,

Kaye Kjorlaug
Administrative Assistant
Contractor Compliance Unit
Phone: (206) 753-4398

CCU1E. KK: lcd. 34

cc to

Ecova Corporation
382820 - 159th Avenue NE
Redmond, WA 98052

Submit the Original and One True Copy with an Original Certificate of Existence (831.115) $440.00

SECRETARY OF STATE
CORPORATION DIVISION
158 12th Street NE
Salem, OR 97310

THIS SPACE FOR OFFICE USE ONLY

FILED
IN THE OFFICE OF THE SECRETARY OF STATE OF THE STATE OF OREGON.
MAY 12 1989
CORPORATION DIVISION

Oregon Registry Number: 157495-83
(Office Use Only)

FOREIGN BUSINESS CORPORATION
APPLICATION FOR AUTHORITY TO TRANSACT BUSINESS

PLEASE TYPE OR PRINT LEGIBLY IN BLACK INK

1. Name of the corporation: Ecova Corporation

   Note: The name must contain the word "Corporation," "Company," "Incorporated," or "Limited" or an abbreviation of one of such words.

2. State or country of incorporation: Delaware

3. Date of incorporation: 10/25/85 Duration, if not perpetual: _____

4. Name of Oregon registered agent: Stuart Stout

   Address of Oregon registered office (This must be a **street** address in Oregon which is identical to the registered agent's business office):

12005 North Burgard Road,	Portland	OREGON	97203
Street and Number	City		Zip Code

5. Address of the principal office of the business: (C/O:) Ecova Corporation (Attn:) Rod Carr

3820 159th Avenue NE	Redmond	Washington	98052
Street and Number	City	State	Zip Code

6. Mailing address Corporation Division may use for notices (If different from the principal office address):

Street and Number or PO Box	City	State	Zip Code

7. Name and address of president and secretary:

Joseph M. Bolton	3820 159th Avenue NE, Redmond, WA 98052
President	Address
Joseph P. Sambataro, Jr.	3820 159th Avenue NE, Redmond, WA 98052
Secretary	Address

05098901323 831.115 440.00

Execution: _____ Joseph P. Sambataro, Jr. Secretary
Signature Printed Name Title

Person to contact about this filing: Rod Carr (206) 883-1900
Name Daytime Phone Number

Submit the original and a true copy to the Corporation Division, 158 12th Street NE, Salem, OR 97310, with the fee of $400.00 and the surcharge of $40.00 -- Total $440.00. Include an ORIGINAL CERTIFICATE OF EXISTENCE, current within 60 days of delivery to this division, authenticated by the official having custody of the corporate records in the jurisdiction of incorporation. PLEASE DO NOT SEND CASH. If you have questions, call (503) 378-4166.

FBC-1 (5/88) **831.115 ($440.00)**

Office Use Only

TOLS011865

BZTO104(e)048698

CITY BUSINESS LICENSE

Issued pursuant to application and under the terms and conditions of license ordinances of the City of Portland

PORTLAND, OREGON

DATE 04/20/89 LOCATION

ACCOUNT NO. 394186-00 92

LICENSE NO. 110828

ECOVA CORPORATION
3820 159TH AV NE
REDMOND, WA 98052

IS LICENSED TO DO BUSINESS IN THE CITY of PORTLAND

LICENSE EXPIRES
12/31/89

THIS LICENSE MUST BE RENEWED WITHIN 4 MONTHS AFTER 12/31/89

PURPOSE OF LICENSE: City of Portland, Business License Fees are for revenue purposes only. Possession of a Business License does not entitle a licensee to carry out any business not in accordance with all the requirements of the Code of the City of Portland and all other applicable laws and regulations. Checks accepted subject to payment.

L-14 (0402) NOT TRANSFERABLE

TOLS011866

BZTO104(e)048699

PHONE 285-2400
CABLE ADDRESS: TIMOIL
(FAX)206-283-8036

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
LOS ANGELES

TIME
PRODUCTS TIME TESTED

TEN TO ONE IT'S TIME

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

August 18, 1989

Ecova Corporation
Attn: Mr. Dave Edwards
3820 159th Avenue NE
Redmond, WA 98052

Dear Dave:

As we discussed this morning, the lab analyses on the first batch of treated soil from reactor T1 indicate that the cleanup level specified in our contract has been achieved. Accordingly, you may discharge the treated soil to the "settling pond" prepared for that purpose. In the future, kindly provide better QA/QC data for the samples used to verify cleanup prior to discharge. This should include method blank, duplicate and matrix spike analyses reported on the same lab document as the sample results. Chromatograms and all lab notes should also be maintained for this project.

Sincerely,

Fred Proby
Environmental Specialist

flp.25

TOLS011867

BZTO104(e)048700

PHONE 285-2400
CABLE ADDRESS: TIMOIL
FAX) 206-283-8036

SEATTLE
TACOMA
PORTLAND
STOCKTON
RENO
RICHMOND
LOS ANGELES

TEN TO ONE IT'S TIME

PRODUCTS TIME TESTED

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

August 22, 1989

Ecova
Attn: Rod Carr
3820 159th Avenue NE
Redmond, WA 98052

Dear Rod:

Enclosed for your payment is the July electric bill for Ecova's treatment plant at our Northwest Terminal in Portland. I understand that you are making arrangements for Portland General Electric to bill Ecova directly for service on this meter (Number K07770X).

Sincerely,

Fred Proby
Environmental Specialist

flp.23

TOLS011868

Portland General Electric

YOUR ACCOUNT NUMBER
1-0598-5890-0

12105985890090001213770001925460 7

TIME OIL CO
PO BOX 99007 MAGNOLIA ST
SEATTLE WA 98199

Portland General Electric
P.O. BOX 4403
PORTLAND, OREGON 97254-0003

12005 N BURGARD ST
PORTLAND OR 97203 1

DUE DATE FOR CURRENT BILL	PLEASE PAY THIS AMOUNT
08/25/89	1925.46

CHECK FOR NAME / ADDRESS CORRECTION. (SEE REVERSE SIDE)

PLEASE RETURN THIS STUB IF PAYMENT IS BY MAIL — BRING ENTIRE BILL IF PAYING IN PERSON

PLEASE FOLD BEFORE TEARING STUB

When making inquiries contact our office at:
121 SW SALMON ST
PORTLAND OR 97204
TELEPHONE 228-6322

TIME OIL CO
12005 N BURGARD ST
PORTLAND OR 97203

YOUR ACCOUNT NUMBER
1-0598-5890-0
YEAR 1989

METER NUMBER	RATE	SERVICE PERIOD FROM	TO	BILLING DAYS	METER READINGS PREVIOUS	PRESENT	METER MULTIPLIER	KILOWATT HOURS USED (KWH)	AMOUNT
K07770X	32	07/07	08/08	32	0144	0401	100	25700	

DEMAND LEVEL II — CUSTOMER CHARGE = 17.00
SUMMER RATE — 10000 KWH x 4.103 CENTS = 410.30
15700 KWH x 3.816 CENTS = 599.11
DEMAND CHARGE FOR 70 KW = 158.60
REACTIVE DEMAND CHARGE FOR 70 KVAR = 14.00
METER TOTAL 1199.01

MULTNOMAH COUNTY TAX 4.08
BALANCE FORWARD 711.69
LATE PAYMENT CHARGE (711.69 x 1.5%) 10.68

Clean up by ~~EGOVA~~
Per Neil Wallace

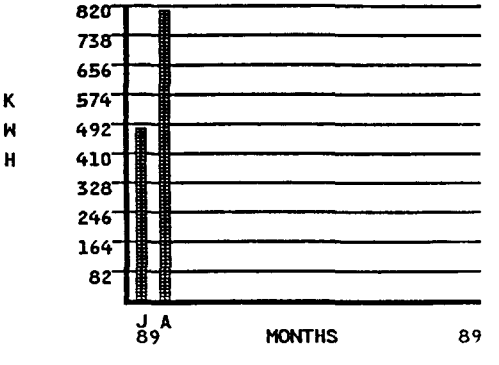
AS A REMINDER, A LATE PAYMENT CHARGE OF 1.5% MAY BE APPLIED TO ANY UNPAID BALANCE CARRIED FORWARD TO NEXT MONTH'S BILL.

PREVIOUS MONTHS AMOUNT DUE	ACTIVITY SINCE LAST BILLING: PAYMENTS AND CREDITS (-)	ACTIVITY SINCE LAST BILLING: CHARGES AND DEBITS (+)	BALANCE FORWARD	CURRENT BILLING	TOTAL AMOUNT DUE
711.69			711.69	1213.77	1925.46

CUSTOMER INFORMATION

PERIOD ENDING	LOCAL AVG DAILY TEMPERATURE	YOUR AVG KWH PER DAY	AVG COST PER DAY
AUG 1989	64	803	$37.47
AUG 1988	N/A	N/A	

N/A = NOT AVAILABLE



YOUR AVERAGE DAILY KWH BY MONTHS

Portland General Electric

TOLS011869

BZTO104(e)048702

Rcd 9/12/89

ECOVA

The Time Oil Company
2737 West Commodore Way
Seattle, WA 98199

ATTN: Mr. Fred Proby

Dear Fred:

Attached is the Monthly Report covering operations at the Northwest Terminal Site, ECOVA J.N. 821401.

It is my intention to provide a summary Change Order request next week for your review and concurrence. Based on your recent meeting with Dave Edwards I believe most of the items on the Change Order have been agreed to and we can discuss any which need fine tuning.

Please call me at 883-1900 if I can be of additional assistance.

Sincerely yours,

Roderick A Carr

Roderick A. Carr
Contract Administrator

Encl. (1)

Corporate Office
3820 159th Avenue NE
Redmond, WA 98052
(206) 883-1900
(206) 867-2210 FAX

Gulf Coast Region
12790 Merit Drive #220
Lock Box 145
Dallas, TX 75251
(214) 404-7540
(214) 404-7545 FAX

Eastern Region
500 Fifth Avenue
Suite 935
New York, NY 10110
(212) 840-1042
(212) 840-1663 FAX

TOLS011870

BZTO104(e)048703

To: Dave Edwards
John Kinsella
et al

From: Jim Borthen

RE: August Monthly Report - Time Oil Portland

The following summarizes the activities of the Time Oil Portland project for the month of August.

August 1 to August 13

The project was on hold until a consensus could be reached on what to do with the test phase slurry from T1. The slurry was clean with respect to PCP, but questions were still unanswered about the dumping of fluids in an area where the ground water was contaminated.

August 14

With permission to proceed with processing, we began preparing T2 and T3. This included pumping contaminated water from T2 and T3 to a storage tank, filling them with relatively clean water, wiring them for electrical power, and obtaining the Kabota (small, front end loader).

August 19

Jack Kash visited the site to give his ideas on how we could handle our material more efficiently. He gave some good suggestions which are being considered.

August 22

T3 was charged with 20 yards of contaminated soil and approximately 200 gallons of "bugs". This mixture showed significant signs of progress during the first 5 days, with ph going from 7.5 on 8/25 to 6.86 on 8/29. The last 2 days it has leveled off.

Samples were taken and are being analyzed for PCP content.

August 24

Tank T1 and it's test phase slurry was pumped to the disposal pit.

August 23 and August 25

Tanks T2 and T1 (respectively) were loaded with 20 yards each of dirt (total of 40 yards). At this time (8/31 @ 10:00 a.m.) they are not charged with bugs, as I am waiting for a culture to grow to a large enough bio-mass. This will hopefully be tomorrow or

/

the next day.

I have kept the ph high on these tanks (at times above 9.0). This, I hope, will indicate the feasibility of "washing" the PCP off the soil. If "washing" is successful then we would like to proceed with some type of wash processing.

August 29

We stood the Thickener up on the cement slab. This equipment has no current use, so we have plumbed it with air and have turned it into a large bio-reactor. This should reduce future delays due to not having proper bug cultures, it will provide added cultures to supply processing in tanks, and can be used to pour over the pile in an effort to "farm" the pile in place.

Problems Encountered

The conveyor, which is owned by Ecova, has proved to be too short for adding soil to the tanks. I also have questions about it's safety. I have rented a conveyor locally (on an as needed, weekly basis) for loading the tanks. The Ecova owned conveyor may still be used later as our processing evolves.

My biggest current problem is generating bug cultures that will optimize processing. That is why I set the Thickener up as a bio-reactor.

September Plans

Our primary activity will be to process soil slurries in T1, T2, and T3, and determine their effectiveness.

Efforts which are currently being made to speed up processing include:

* Heating the processing tanks

  During the first week of September we will plumb the air compressor so that the compressed air is not cooled by a radiator. Currently, air from the compressor makes the pipes too hot to touch, until the air passes though a radiator. By taking the radiator out of the flow line and insulating the pipes some of the heat can be used for heating the slurries. Currently the slurries are at 69 degrees F.

  Also, we are looking into obtaining heat exchangers for keeping the slurries warm. More on this later.

* Removing the sand from the slurries

TOLS011872

BZTO104(e)048705

The original design called for washing the soil, and then removing the soil from the slurry leaving the PCP in the water.

We are working towards that design, but are doing so tentatively to avoid costly expenditures on equipment that might not work, or may be unneeded.

We are considering the following:

Use of a DMS screen proposed by Jack Kash

Mounting the existing "grizzly" on top of T12. This appears to be a reasonable alternative, although it requires some further discussions.

Questions, comments, and ideas are very welcome.

TOLS011873

BZTO104(e)048706

ECOVA

August 29, 1989

Mr. Fred Proby
TIME OIL COMPANY
2737 Commodore Way
Seattle, Washington 98119

Re: Portland - North Terminal - Hydrogeology

Dear Fred:

This letter report summarizes the results of the aquifer pump tests conducted at the Time Oil North Terminal site. The primary purpose of the tests was to define basic aquifer parameters for design of a groundwater recovery and treatment system to control and remediate subsurface contamination.

WELL INSTALLATION

As per our revised workplan, dated October 18, 1989, ECOVA installed six groundwater monitoring wells at the North Terminal site. The purpose of the wells was to characterize subsurface conditions and help define the lateral and vertical extent of site contamination.

A well cluster of three wells was installed between the former PCP mixing area and well MW-G (see Figure 1). J1 was completed in the shallow waterbearing zone; well J2 was completed just below the silty "confining" layer; and J3 was completed in the lower waterbearing zone. Geologic logs, including well completion diagrams are included in Appendix A.

A second well cluster, consisting of two wells, was installed to replace well MW-B (See Figure 1). Well B1 was completed in the shallow zone; well B2 was completed in the deeper zone. Well completion logs are included in Appendix A.

A single well was installed to replace well MW-G (see Figure 1). The shallow and deep zones appear to interfinger and do not exist as distinct units at this location. The geologic/well log for this location is also included in Appendix A.

Corporate Office
3820 159th Avenue NE
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(206) 883-1900
(206) 867-2210 FAX

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Dallas, TX 75251
(214) 404-7540
(214) 404-7545 FAX

Eastern Region
500 Fifth Avenue
Suite 935
New York, NY 10110
(212) 840-1042
(212) 840-1663 FAX

TOLS011874

BZTO104(e)048707

It should be noted that the deeper wells which penetrate the "confining" layer are double cased to prevent cross-contamination between aquifers (see completion diagrams).

AQUIFER TESTING PROGRAM

Two aquifer pumping tests were conducted (July 19-22, 1989) at the site to define aquifer parameters. Well J1 was pumped for 24 hours at an average rate of 19 gallons per minute (gpm). Drawdown was monitored continously in the pumped well and in wells B1 and MW-1 using a pressure transducer system. Periodic measurements were made in other selected site wells (J2, J3, B2, G1, and MW-D) using an electrical water level sounder. No significant drawdown was measured in any of the observation wells.

Following the pumping phase of the test, recovery to static conditions was monitored in the pumped well. This information was used to calculate aquifer parameters (see Figure 2). Calculated values are shown below:

Transmissivity: 8,360 gpd/ft

Permeability: 1,114 gpd/ft^2

During the second pump test, well J2 was pumped at a rate of approximately 10 gpm for 12 hours. Based on observations of the deviations in water level recorded in the production well during the night of the test, it appears that fluctuations in discharge occurred during pumping, presumably from surges in electrical power to the pump.

These unanticipated fluctuations were not measured and therefore could not be quantified. Wells J1, J2, and B2 were monitored continuously throughout the test using the pressure transducer system; other selected wells were monitored periodically with the electrical sounder. No significant drawdowns were observed in any of the deep wells, although a small diurnal tidal fluctuation was recorded. A small (0.25 ft), but steady decline in the water level in shallow well J1 was observed. Since the two waterbearing units do not appear to be hydraulic communication (see discussion below), it is unclear whether this decline is attributable to pumping of the deep well.

Recovery data from the pumped well is frequently used for calculation of aquifer parameters when data from nearby observation wells is not available. Recovery to full static conditions was recorded in the pumped well following the pump test. However, anomalous data prevents a meaningful estimate of aquifer parameters.

Following shutdown of the pump, the water level in the well recovered at a very slow rate over several hours followed by a nearly instantaneous recovery to static conditions.

ANALYTICAL

An analytical screening was performed to evaluate the presence of high levels of contamination in the subsurface beneath the site. Groundwater samples were obtained from each newly installed well for laboratory analysis. A minimum of three casing volumes was removed from each well prior to sampling to ensure a representative sample of formation water. Samples were transported to ECOVA's field operations laboratory under full chain-of-custody documentation. Samples were analyzed for total petroleum hydrocarbons (TPH) by infrared spectroscopy (EPA method 418.1) and for pentachlorophenol by high pressure liquid chromatography (HPLC). Analysis results are shown on Table 1; copies of the original laboratory results are included in Appendix B.

Laboratory results indicate the presence of pentachlorophenol in the shallow zone downgradient of the former mixing area. A small peak on each of the chromatograms from the other wells indicates the possible presence of PCP in the part per billion range (ppb). This low level in not quantifiable by the screening methods used. A more sophisticated analysis (Gas Chromatograph) will be needed if quantification down to the ppb range is required.

The presence of high levels of organic solvents was not indicated by the laboratory analyses. TPH concentrations are below 20 ppm at all locations sampled.

SITE HYDROGEOLOGY

Information gathered during review of previous site work, well installation, and aquifer testing was used to develop a conceptual model of the hydrogeologic system beneath the site. It should be noted that this model is based on relatively sparse and somewhat contradictory data and will require confirmation or modification through additional site work.

Water levels measured in site wells were used to develop potentiometric maps for both the shallow (Figure 3) and deep (Figure 4) hydrostratigraphic units. This information, when used in conjunction with the geologic information obtained during drilling of the wells, indicated the presence of a dual aquifer system comprised of a perched water table aquifer overlying a deeper

regional aquifer. These units are separated by a silt layer which had been referred to as the "confining" layer. Although this layer separates the two hydrostratigraphic units, information obtained during the site investigation indicates that the water level within the deeper aquifer occurs below the bottom of the "confining" layer and that the deeper water exists as free surface water table aquifer. However, earlier water levels indicate that this situation may vary seasonally.

Figure 3 indicates that flow within the shallow unit is to the south, toward the river. However, the stratigraphic section depicted by the log of well G1 indicates that this unit may pinch out somewhere between wells B1 and G1. Interfingering of sands and silts in this area may allow water from the shallow zone to move downward into the deeper zone.

The potentiometric surface pf the deeper zone shown in Figure 4 was generated from three data points. Based on this sparse data, groundwater flow within this unit appears to be to the east. However, tidal effects and the disappearance of two distinct aquifer units in the vicinity of well G1 may lead to erroneous conclusions concerning the lower unit. Additional work will be required in this are to provide a better understanding of the groundwater flow regime within the lower unit.

RECOMMENDATIONS

To obtain the information necessary to confirm or modify the conceptual model of the hydrogeologic regime beneath the North Terminal site, Ecova recommends the following tasks to be performed:

1) Develop a groundwater computer model based on the present conceptual model of the site. The model would evaluate proposed disposal options and be used in placement of additional wells and design of the groundwater recovery system. The model would be developed with enough flexibility for modification as new site data is acquired.

2) Install additional wells at the locations shown in Figure 5. The purpose of the wells would be to characterize the hydrogeologic system at each location:

TOLS011877

a) to determine the relationship between the two aquifers

b) to better define the flow system of each aquifer and help determine the ultimate fate of site contaminants

c) and to become part of the groundwater recovery system to contain migration of contaminants from the site.

3) Sample new wells for chemical analysis of compounds of concern. Sample selected existing wells for analysis by GC methods to quantify low levels of contamination in deeper and more distant shallow wells.

4) Conduct pump tests in the new E series wells using the B and G wells as nearby observation wells to measure drawdown and evaluate boundary conditions related to the pinching out of the aquifer. Long term monitoring of the wells would be conducted prior to the pump tests to evaluate tidal effects.

5) Modify the computer model to reflect the new data; run simulations to show containment of site contamination.

6) Prepare a written report for submittal to the DEQ which documents the results of the groundwater model and operation of the groundwater recovery system.

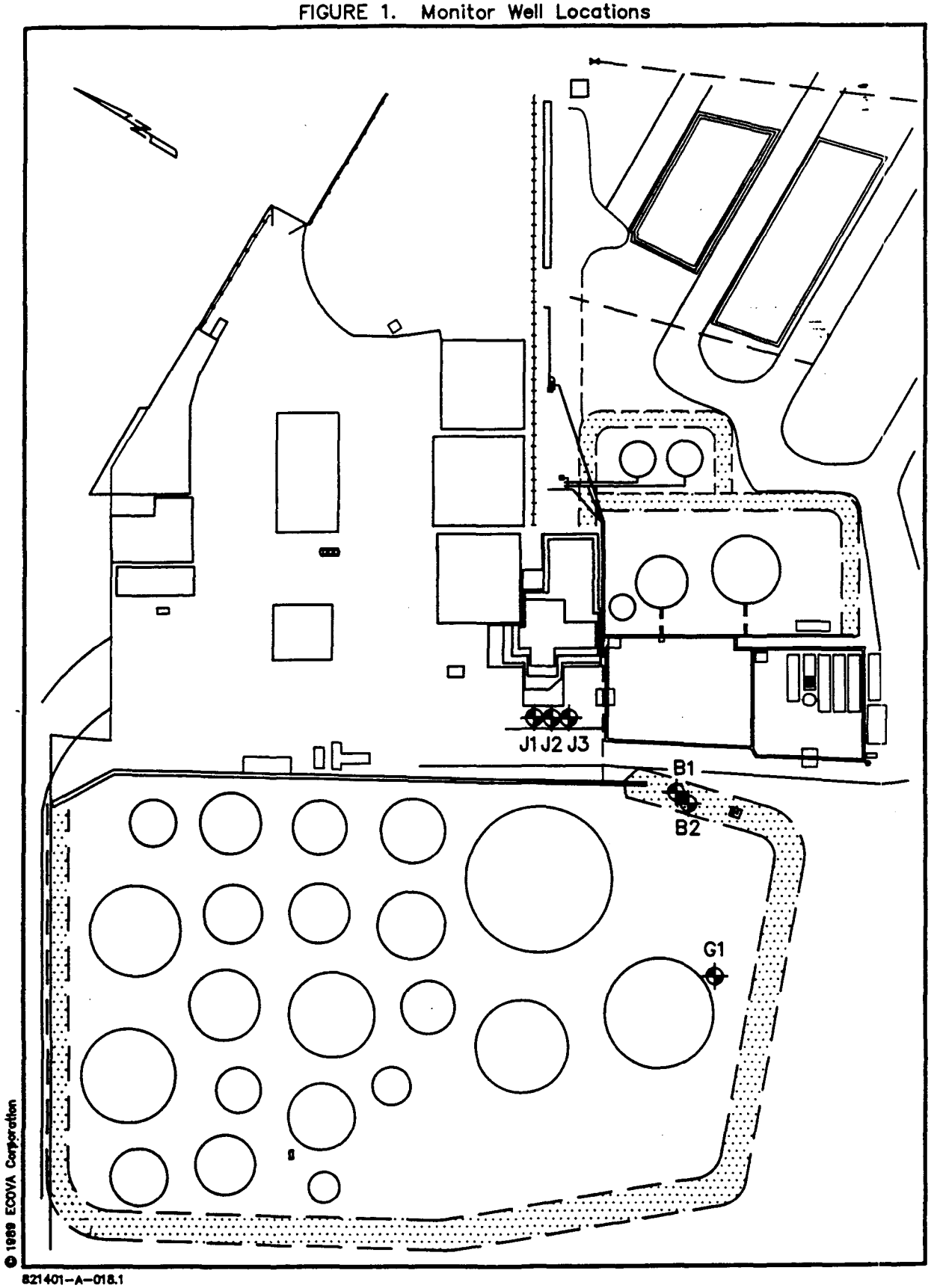
If you have any questions concerning the information provided, please call me at (206) 883-1900.

Sincerely,

Eric J. Paukstaitis, P.G.
Senior Hydrogeologist

EJP:tc

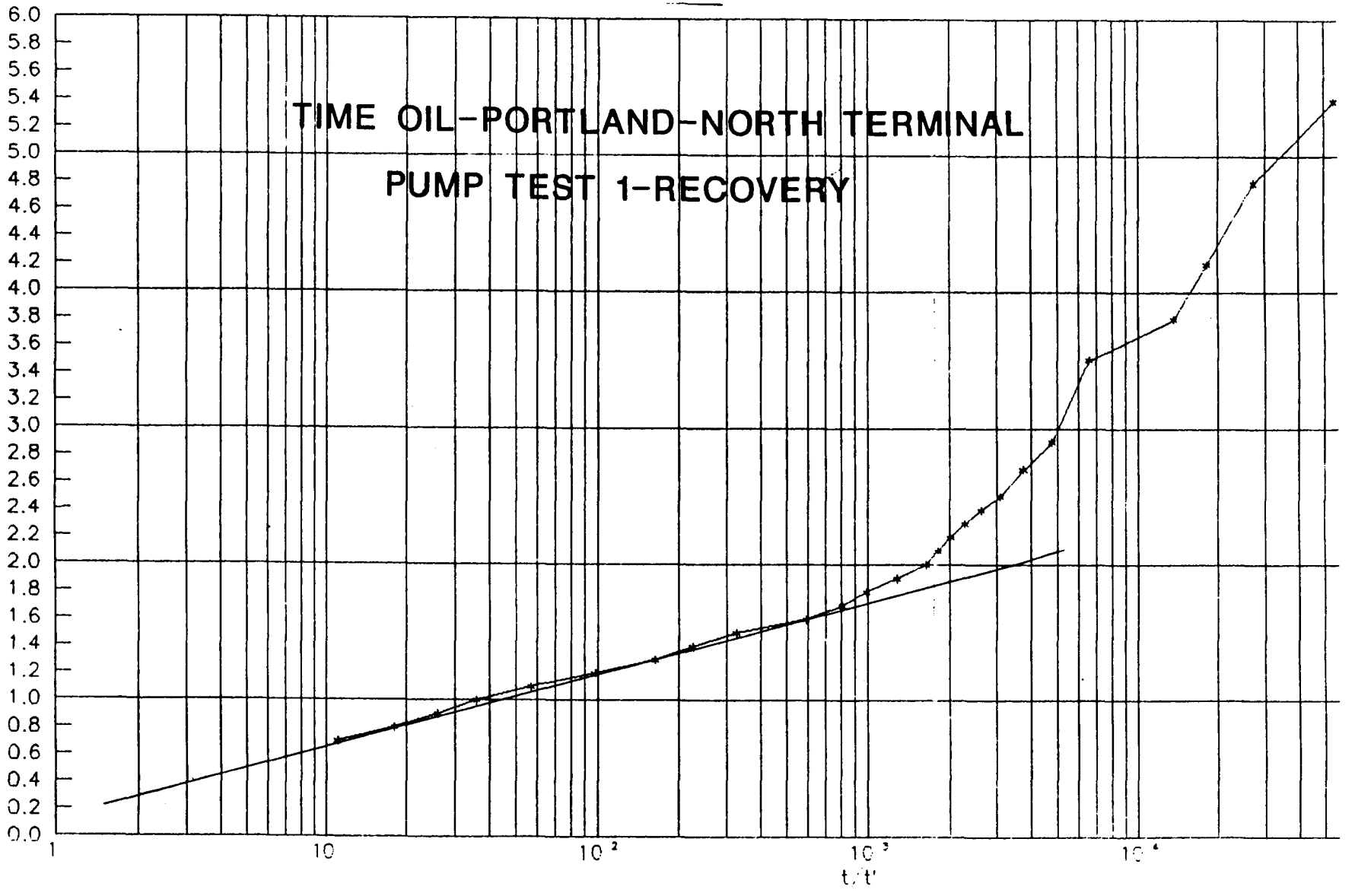
FIGURE 1. Monitor Well Locations



TOLS011879

BZTO104(e)048712

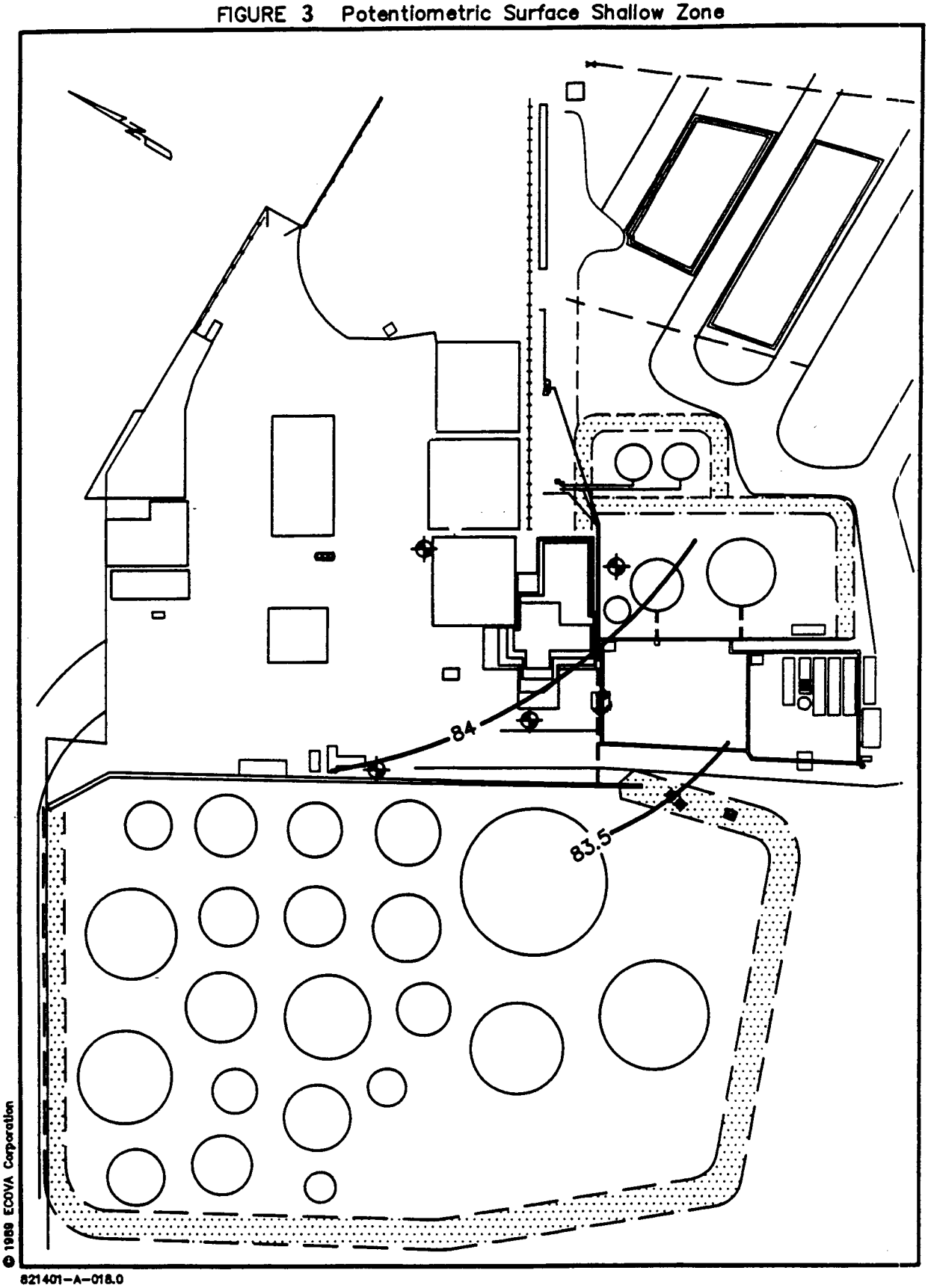
FIGURE 2.



TOLS011880

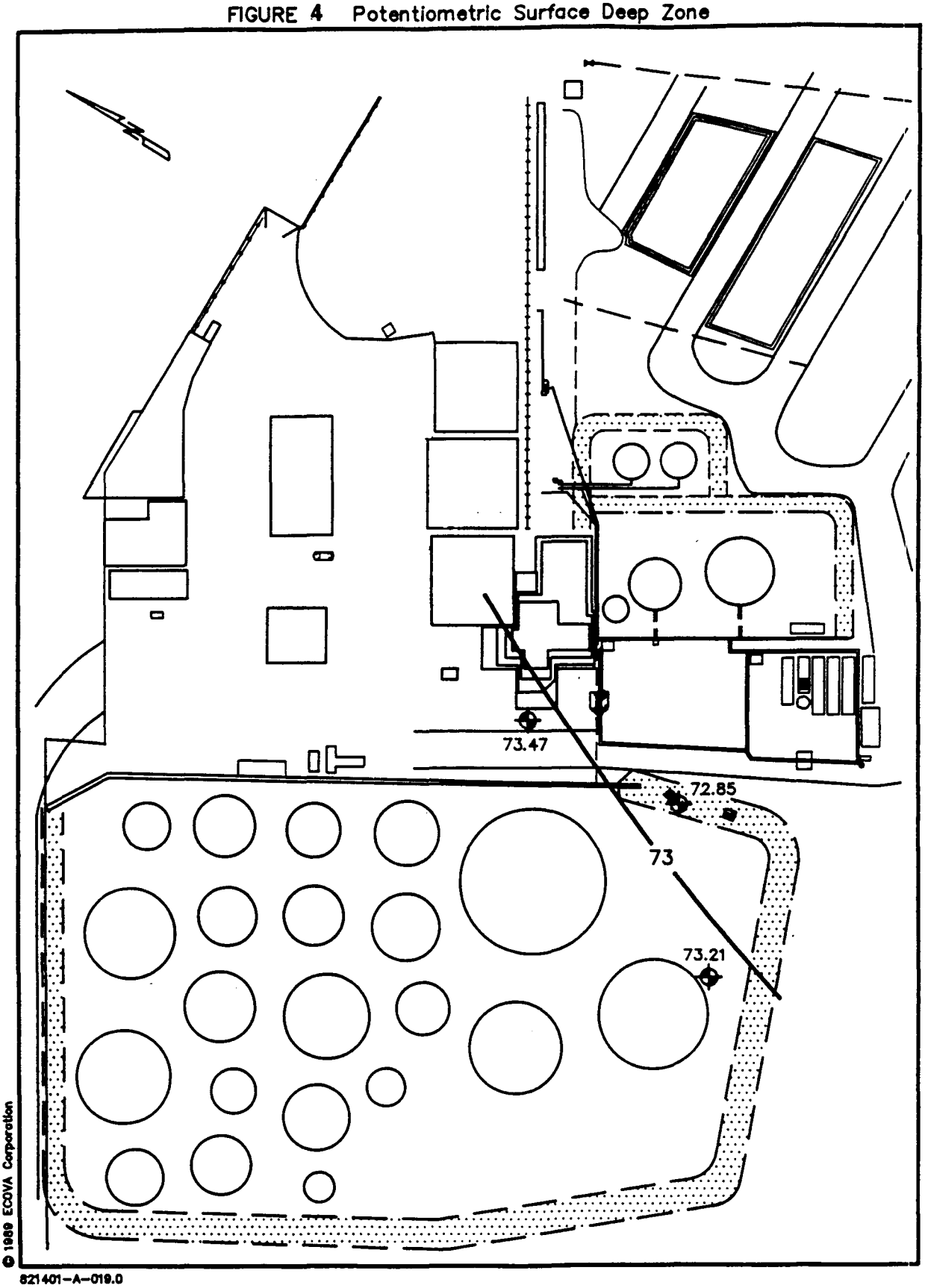
BZTO104(e)048713

FIGURE 3 Potentiometric Surface Shallow Zone



TOLS011881

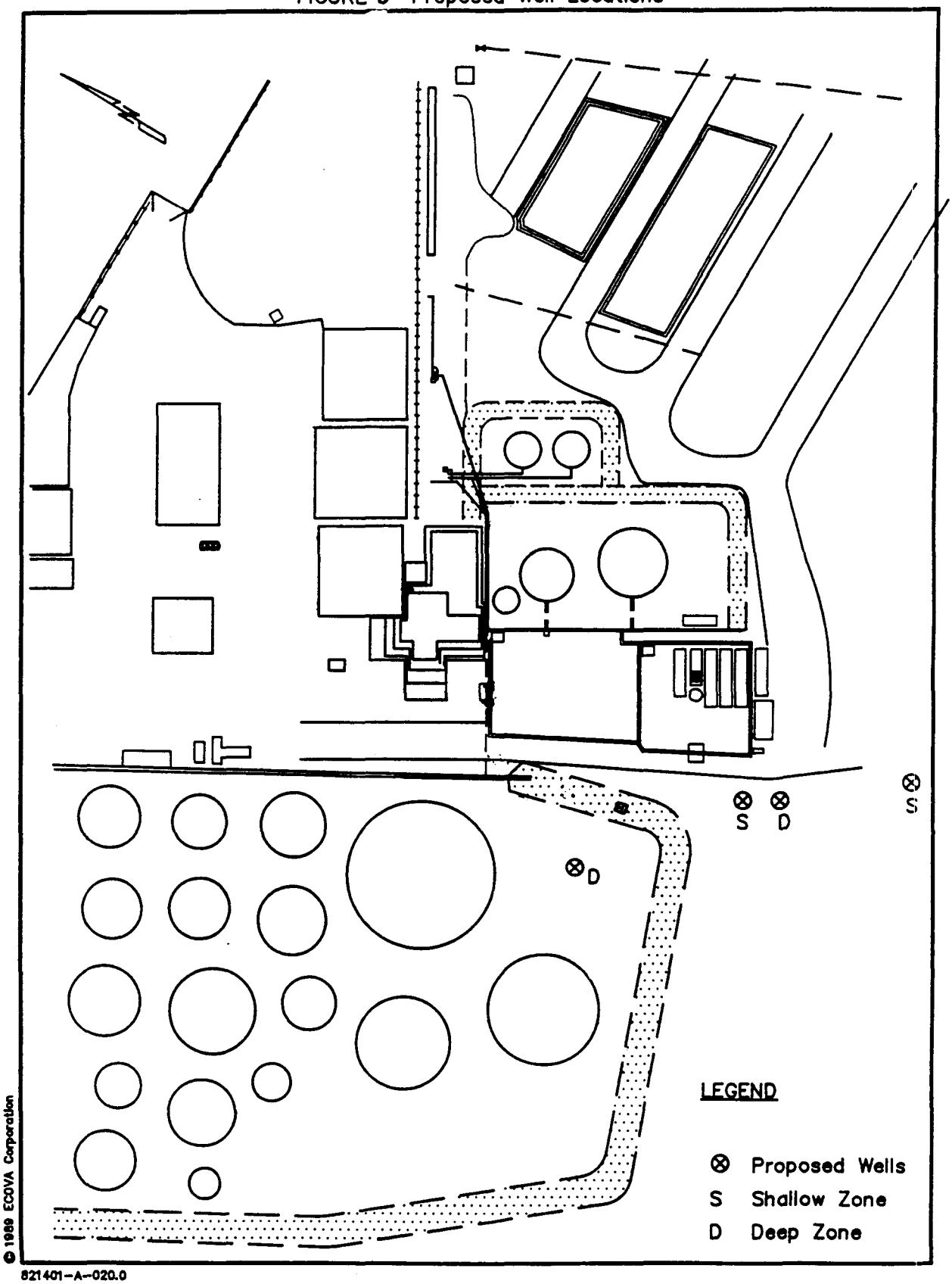
FIGURE 4 Potentiometric Surface Deep Zone



TOLS011882

BZTO104(e)048715

FIGURE 5 Proposed Well Locations



TOLS011883

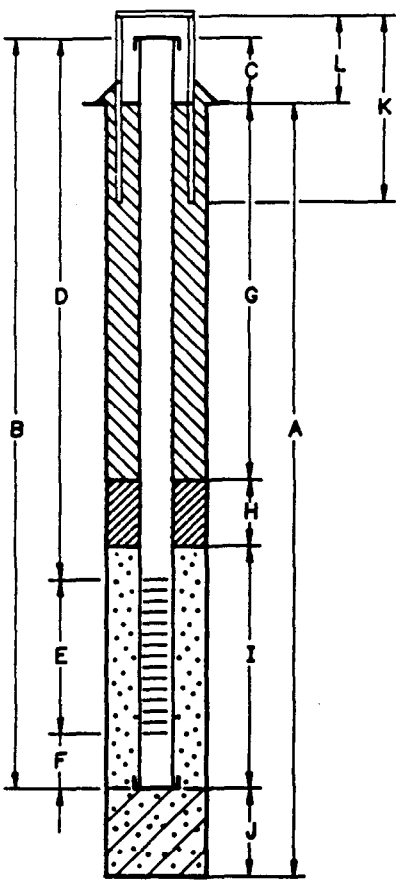
BZTO104(e)048716

WELL COMPLETION FORM

DRILLING METHOD Hollow STEM AUGER DATE 11/29/88

WELL COMPLETION

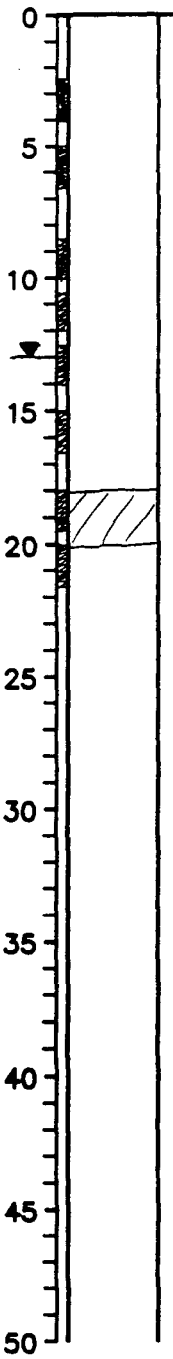
TOP OF CASING ELEVATION 97.48 ft



A BORING DEPTH 20 FT.
BORING DIAMETER 14 IN.
B WELL DEPTH 20 FT.
C WELL STICKUP 19 FT.
D BLANK INTERVAL 0 FT. TO 10 FT.
BLANK DIAMETER 4 IN.
E SCREEN INTERVAL 10 FT. TO 20 FT.
SCREEN DIAMETER 4 IN.
TYPE/SLOT SIZE .020" SLOTTED
F SILT TRAP LENGTH N/A FT.
G WELL SEAL 7 FT.
MATERIAL: TYPE II CEMENT
H BENTONITE SEAL 7 FT. TO 8.5 FT.
I SANDPACK 8.5 FT. TO 20 FT.
TYPE/SIZE AQUA 8
J BOTTOM SEAL ___ FT. TO ___ FT.
MATERIAL: None
K PROTECTIVE CASING W/ LOCKING CAP 4 FT.
L STICKUP 1.6 FT.

GEOLOGIC LOG

GROUND SURFACE ELEVATION _____



ROAD GRAVEL
lt. brown to greenish gray med-fine SAND; minor rock fragments (basalt) poorly graded, damp
same, some staining and solvent odor
same, stronger odor
same
same; petroleum odor (diesel)
gray to gray brown SILT to very fine SAND; minor flecks of natural organics; petroleum odor
TOTAL Depth 21.5 ft.

ECOVA

TIME oil - PORTLAND - North TERMINAL

JOB NUMBER 821401 WELL/BORING NUMBER 41

DRAWN DMC APPROVED DATE ENGINEER/GEOLOGIST/HYDROLOGIST

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\STD\F30F

TOLS011884

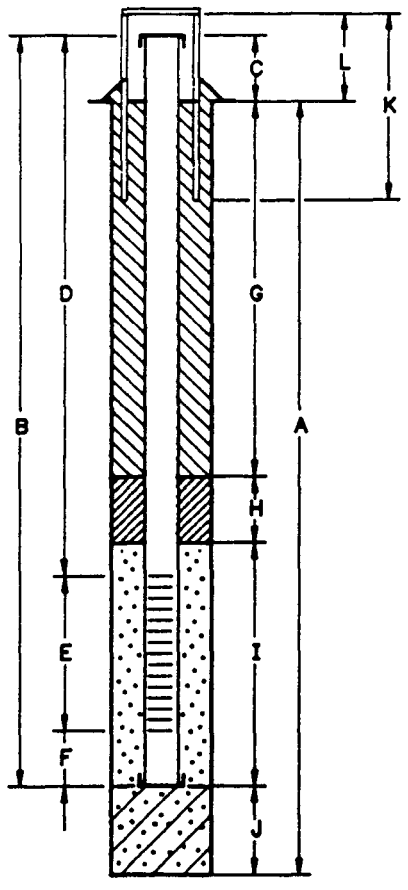
BZTO104(e)048717

WELL COMPLETION FORM

DRILLING METHOD Hollow STEM AUGER DATE 1/3/85

WELL COMPLETION

TOP OF CASING ELEVATION 97.44



A BORING DEPTH 40.5 FT.
BORING DIAMETER 8 IN.
B WELL DEPTH 42 FT.
C WELL STICKUP 1.4 FT.
D BLANK INTERVAL FT. TO FT.
BLANK DIAMETER IN.
E SCREEN INTERVAL 30 FT. TO 40 FT.
SCREEN DIAMETER 4 IN.
TYPE/SLOT SIZE .020" SLOTTED
F SILT TRAP LENGTH N/A FT.
G WELL SEAL 20 FT.
MATERIAL: TYPE II CEMENT
H BENTONITE SEAL 20 FT. TO 27.5 FT.
I SANDPACK 27.5 FT. TO 40 FT.
TYPE/SIZE AQUA B
J BOTTOM SEAL FT. TO FT.
MATERIAL: NONE
K PROTECTIVE CASING 4 FT.
W/ LOCKING CAP
L STICKUP 1.6 FT.

GEOLOGIC LOG

GROUND SURFACE ELEVATION

0 ROAD GRAVEL

gray brown to brown fine to med SAND; minor PEBBLES + ROCK FRAGMENTS; DAMP

PETROLEUM ODOR

CHANGE to GRAY

15 gray SILT to very fine SAND; minor ORGANICS

20 gray silty fine to med. SAND w/ SILT INTERBEDS.

25 ▼

30

35

40 TOTAL DEPTH: 40 FT.

45

50

TIME OIL - PORTLAND

JOB NUMBER 821401 WELL/BORING NUMBER J2

DRAWN DML APPROVED DATE ENGINEER/GEOLOGIST/HYDROLOGIST

ECOVA

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\STD\F30F

TOLS011885

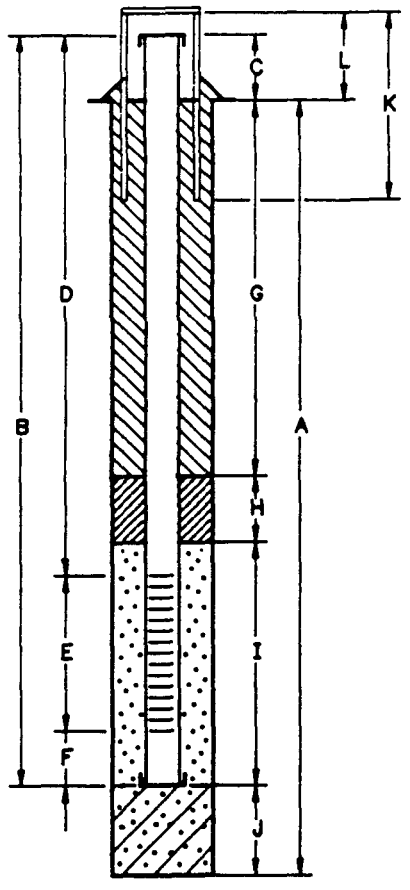
BZTO104(e)048718

WELL COMPLETION FORM

DRILLING METHOD Hollow Stem Auger DATE 12/1/88

WELL COMPLETION

TOP OF CASING ELEVATION 97.39



A BORING DEPTH 33.5 FT.
BORING DIAMETER 8 IN.
B WELL DEPTH 35.1 FT.
C WELL STICKUP 1.7 FT.
D BLANK INTERVAL 1.7 FT. TO 28 FT.
BLANK DIAMETER 4 IN.
E SCREEN INTERVAL 28 FT. TO 33 FT.
SCREEN DIAMETER 4 IN.
TYPE/SLOT SIZE .020" SLOTTED
F SILT TRAP LENGTH N/A FT.
G WELL SEAL 19.5 FT.
MATERIAL: TYPE II CEMENT
H BENTONITE SEAL 25 FT. TO 27 FT.
I SANDPACK 27 FT. TO 33.5 FT.
TYPE/SIZE AQUA B
J BOTTOM SEAL FT. TO FT.
MATERIAL: NONE
K PROTECTIVE CASING 4 FT.
W/ LOCKING CAP
L STICKUP 1.8 FT.

GEOLOGIC LOG

GROUND SURFACE ELEVATION

0 ROAD GRAVEL

gray brown to brown fine to medium SAND; minor rock fragments; well sorted; damp

PETROLEUM ODOR

15

gray SILT to very fine SAND; minor organics

20

gray f. sandy SILT w/ brown organic streaks
slight PETROLEUM ODOR

25

gray, fine to medium SAND

30

TOTAL DEPTH 33.5 FT.

35

40

45

50

ECOVA

TIME Oil - PORTLAND

JOB NUMBER 821401 WELL/BORING NUMBER J3

DRAWN DML APPROVED DATE ENGINEER/GEOLOGIST/HYDROLOGIST

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\STD\F30F

TOLS011886

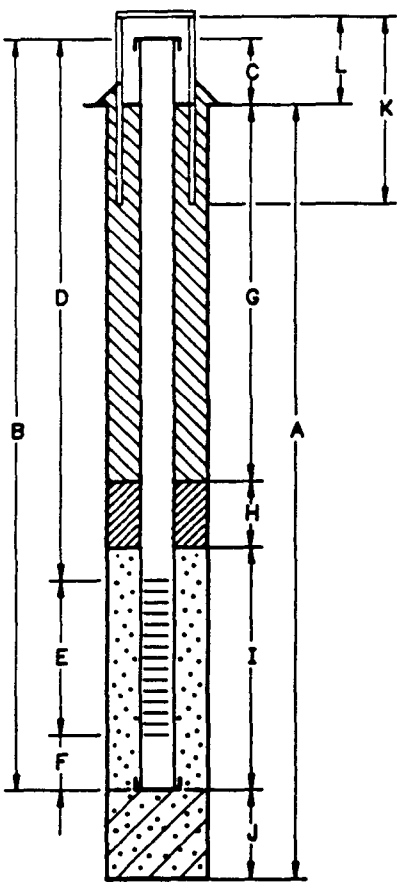
BZTO104(e)048719

WELL COMPLETION FORM

DRILLING METHOD Hollow Stem Auger DATE 11/30/88

WELL COMPLETION

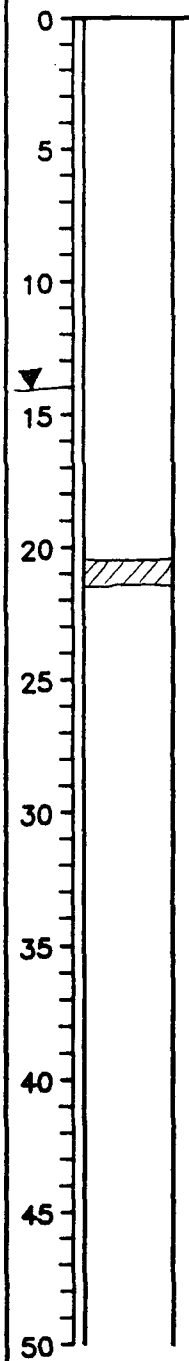
TOP OF CASING ELEVATION 97.54



A BORING DEPTH 22 FT.
BORING DIAMETER 14 IN.
B WELL DEPTH 20.5 FT.
C WELL STICKUP 1.4 FT.
D BLANK INTERVAL 0 FT. TO 10.5 FT.
BLANK DIAMETER 4 IN.
E SCREEN INTERVAL 10.5 FT. TO 20.5 FT.
SCREEN DIAMETER 4 IN.
TYPE/SLOT SIZE .020" SLOTTED
F SILT TRAP LENGTH N/A FT.
G WELL SEAL 8 FT.
MATERIAL: TYPE II
H BENTONITE SEAL 8 FT. TO 9.5 FT.
I SANDPACK 9.5 FT. TO 20.5 FT.
TYPE/SIZE AQUA B
J BOTTOM SEAL FT. TO FT.
MATERIAL: NONE
K PROTECTIVE CASING 4 FT.
W/ LOCKING CAP
L STICKUP 1.5 FT.

GEOLOGIC LOG

GROUND SURFACE ELEVATION



ROAD GRAVEL
dk gray to brown-gray fine to medium SAND; minor rock fragments; well sorted; damp

strong petroleum odor

same

gray brown silt to very fine SAND; minor organics
TOTAL Depth: 22 ft.

ECOVA

JOB NUMBER 821401 WELL/BORING NUMBER B1

DRAWN DML APPROVED DATE ENGINEER/GEOLOGIST/HYDROLOGIST

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\STD\F30F

TOLS011887

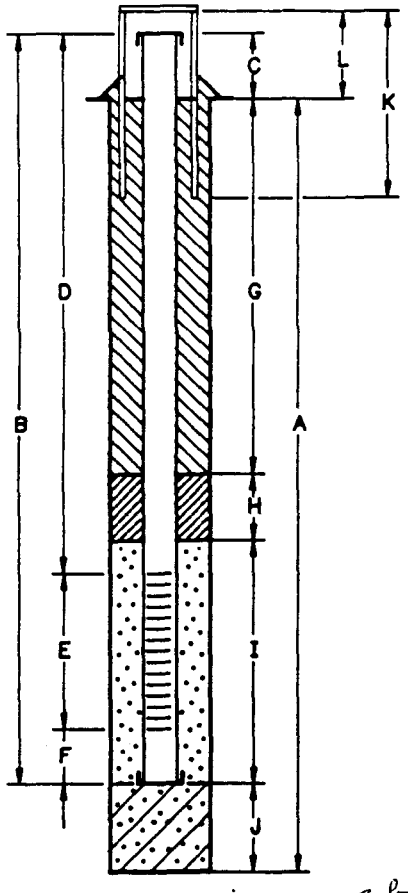
BZTO104(e)048720

WELL COMPLETION FORM

DRILLING METHOD Hollow STEM Augers DATE 11/30/88

WELL COMPLETION

TOP OF CASING ELEVATION 98.02



CONDUCTOR CASING 0 - 19 FT.

A	BORING DEPTH	FT.
	BORING DIAMETER	IN.
B	WELL DEPTH	FT.
C	WELL STICKUP	FT.
D	BLANK INTERVAL FT. TO	FT.
	BLANK DIAMETER	IN.
E	SCREEN INTERVAL FT. TO	FT.
	SCREEN DIAMETER	IN.
	TYPE/SLOT SIZE	
F	SILT TRAP LENGTH	FT.
G	WELL SEAL	FT.
	MATERIAL:	
H	BENTONITE SEAL FT. TO	FT.
I	SANDPACK FT. TO	FT.
	TYPE/SIZE	
J	BOTTOM SEAL FT. TO	FT.
	MATERIAL:	
K	PROTECTIVE CASING W/ LOCKING CAP	FT.
L	STICKUP	FT.

GEOLOGIC LOG

GROUND SURFACE ELEVATION

0 ROAD GRAVEL

dk gray to brown-gray fine to MEDIUM SAND; minor rock fragments well sorted; damp.

5 STRONG PETROLEUM ODOR

10 SAME

15

gray-brown SILT to very fine SAND; trace organics

20 gray SILT AND SAND layers

25

becoming sandier

30 gray INTERBEDDED SILTS AND SANDS 1/4" to 6" thick

35

40 TOTAL DEPTH: 40 FT.

45

50

ECOVA

TIME Oil - PORTLAND

JOB NUMBER 821401 WELL/BORING NUMBER BL

DRAWN DML APPROVED DATE ENGINEER/GEOLOGIST/HYDROLOGIST

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\STD\F30F

TOLS011888

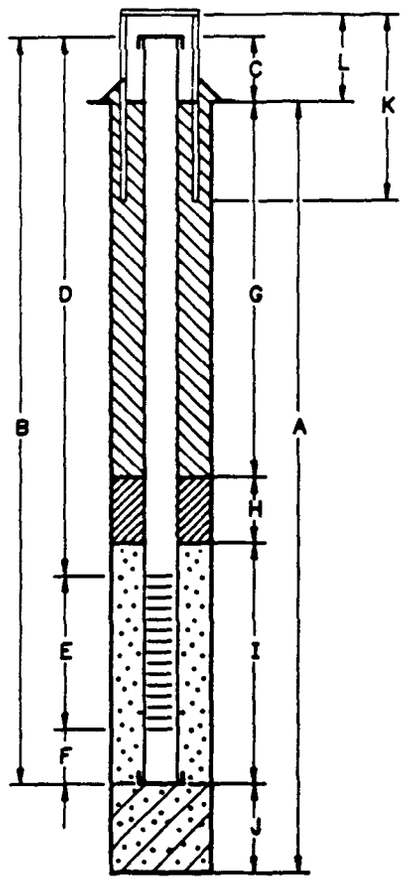
BZTO104(e)048721

WELL COMPLETION FORM

DRILLING METHOD _____ DATE _____

WELL COMPLETION

TOP OF CASING ELEVATION _____



A	BORING DEPTH	35	FT.
	BORING DIAMETER	6	IN.
B	WELL DEPTH	35	FT.
C	WELL STICKUP	1.5	FT.
D	BLANK INTERVAL 0 FT. TO 25		FT.
	BLANK DIAMETER	2	IN.
E	SCREEN INTERVAL 25 FT. TO 35		FT.
	SCREEN DIAMETER	2	IN.
	TYPE/SLOT SIZE	.020 SLOTTED	
F	SILT TRAP LENGTH	N/A	FT.
G	WELL SEAL	22	FT.
	MATERIAL:	TYPE II CEMENT	
H	BENTONITE SEAL 22 FT. TO 24		FT.
I	SANDPACK 21 FT. TO 35		FT.
	TYPE/SIZE	AQUA 8	
J	BOTTOM SEAL ___ FT. TO ___		FT.
	MATERIAL:	None	
K	PROTECTIVE CASING W/ LOCKING CAP	4	FT.
L	STICKUP	1.6	FT.

GEOLOGIC LOG

GROUND SURFACE ELEVATION _____

0 — COARSE GRAVEL FILL

DK GRAY to GRAY-BROWN, FINE to MEDIUM SAND; MINOR ROCK FRAGMENTS; WELL SORTED; DAMP

SLIGHT PETROLEUM ODOR

10 — SAME

15 — SAME

20

25 — THIN BEDS of ORGANIC SILT

30 — GRAY FINE to MEDIUM SAND

35 — GRAY SILT to VERY FINE SAND

TOTAL DEPTH: 35 FT

40

45

50

TIME Oil - PORTLAND

JOB NUMBER 821401 WELL/BORING NUMBER G1

DRAWN DML | APPROVED | DATE | ENGINEER/GEOLOGIST/HYDROLOGIST

ECOVA

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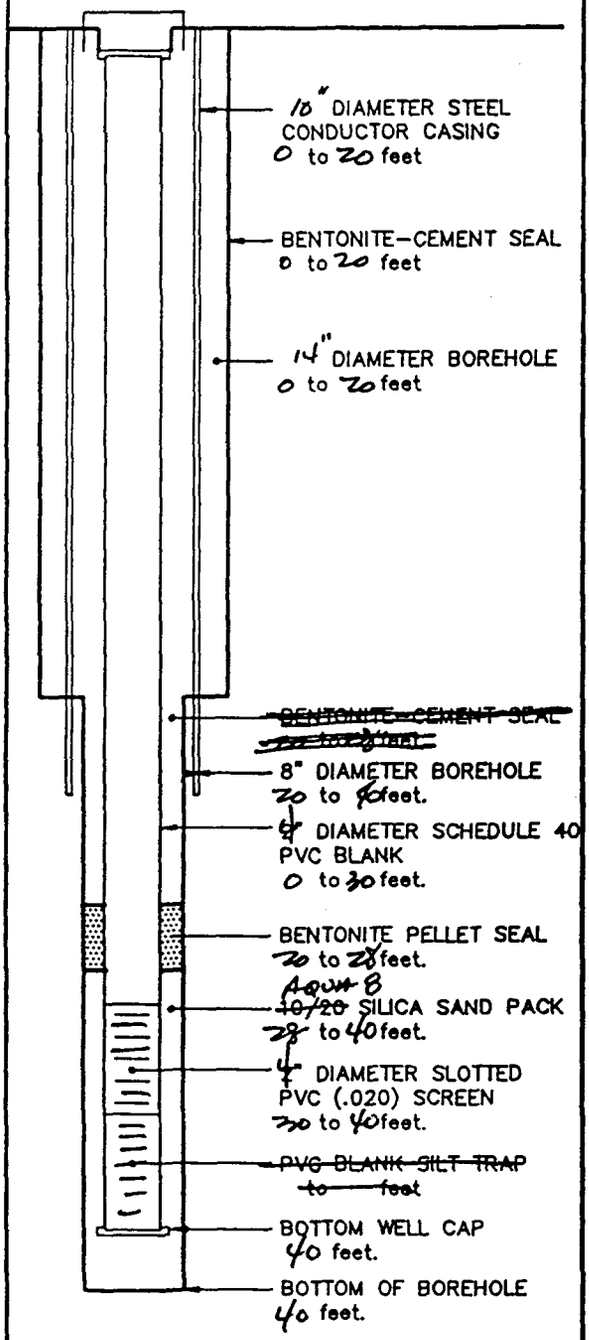
TOLS011889

BZTO104(e)048722

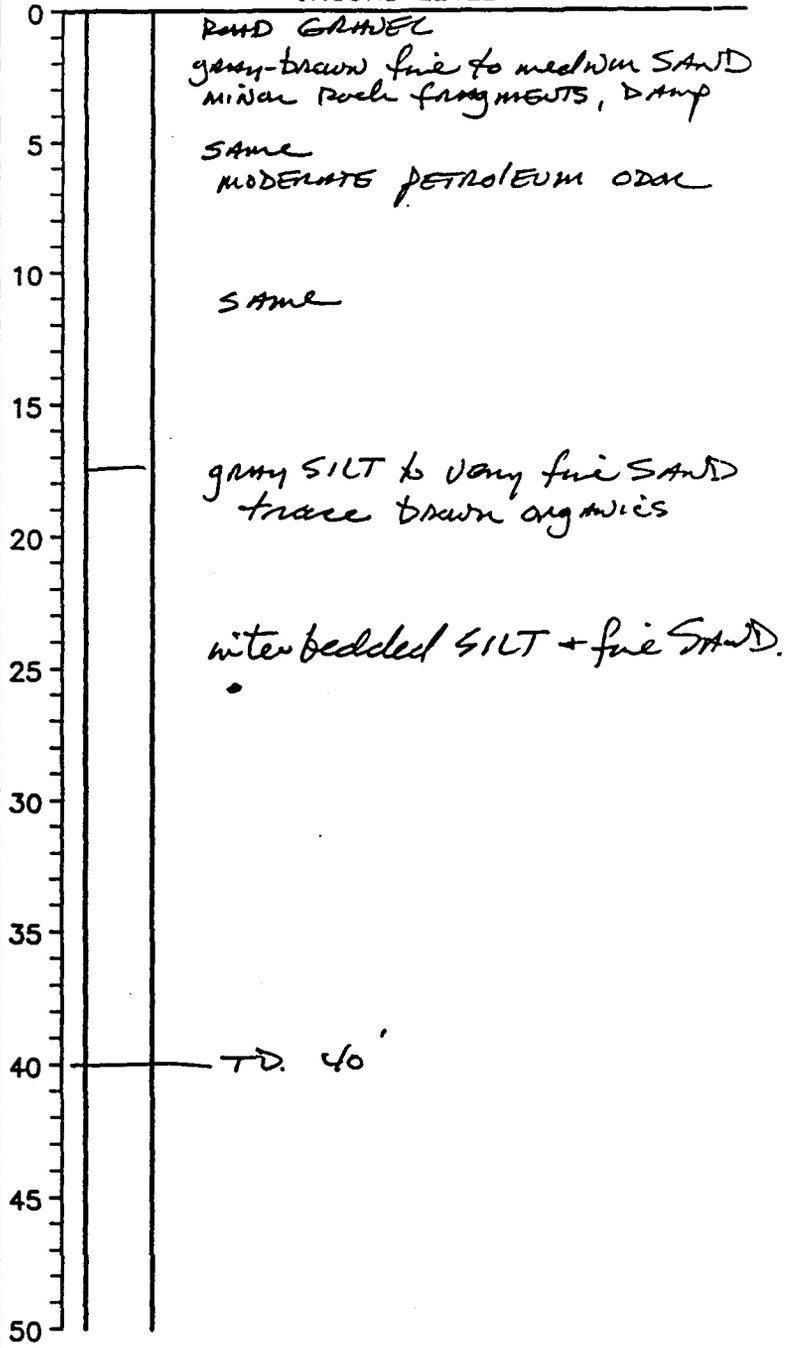
DRILLING METHODS Hollow STEM Auger / CABLE tool DATE 12/1/88

TOP OF CASING ELEVATION 97.44 GROUND SURFACE ELEVATION

WELL COMPLETION DETAILS



LOG OF BORING



ECOVA

Time Oil / Portland BORING NUMBER [redacted] J2

DRAWN	JOB NUMBER	APPROVED	DATE	ENGINEER/GEOLOGIST/HYDROLOGIST
	821401			DM Lance

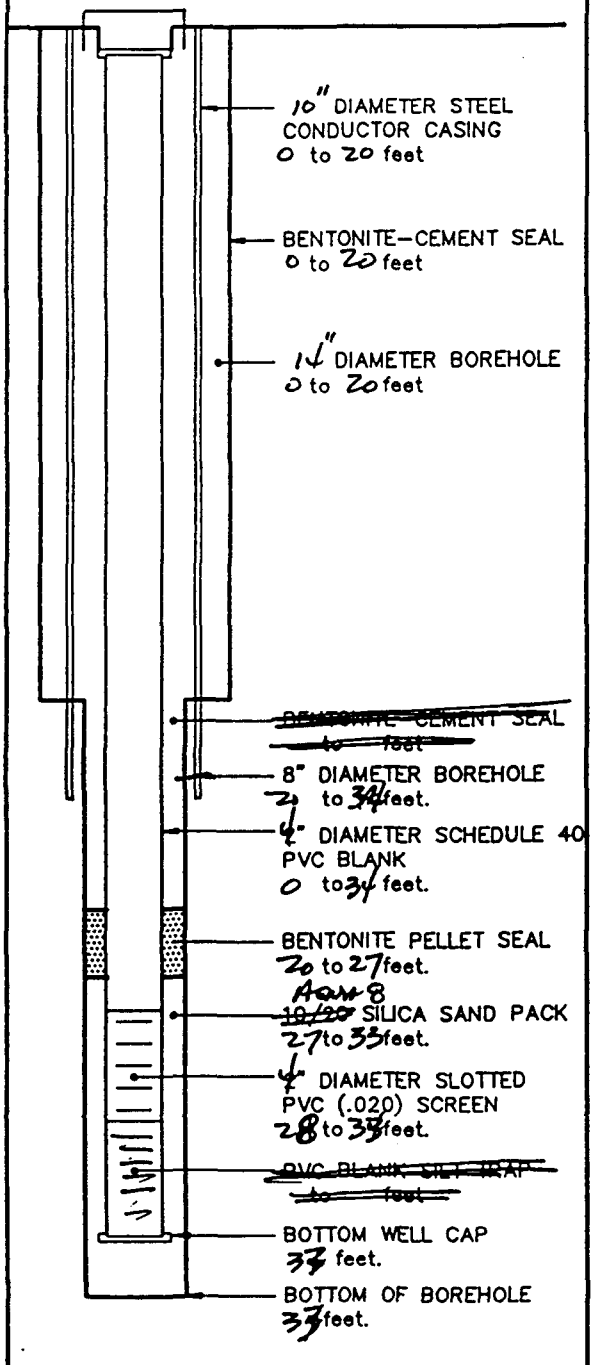
TOLS011890

BZTO104(e)048723

DRILLING METHODS Hollow stem auger/ CABLE TOOL / [redacted] DATE 1/5/89

TOP OF CASING ELEVATION 97.39 GROUND SURFACE ELEVATION _____

WELL COMPLETION DETAILS



LOG OF BORING

GROUND LEVEL

0 ROAD GRAVEL

gray-brown fine to medium SAND minor rock fragments; DAMP

5

Same moderate petroleum odor

10

Same

15

gray silt to very fine SAND brown organic matter

20

gray f. sandy silt slight PETROLEUM odor

25

gray fine to medium SAND

30

TD 34 ft.

35

40

45

50

ECOVA

TIME oil / PORTLAND

BORING NUMBER [redacted] JB

DRAWN	JOB NUMBER	APPROVED	DATE	ENGINEER/GEOLOGIST/HYDROLOGIST
				DM Lance

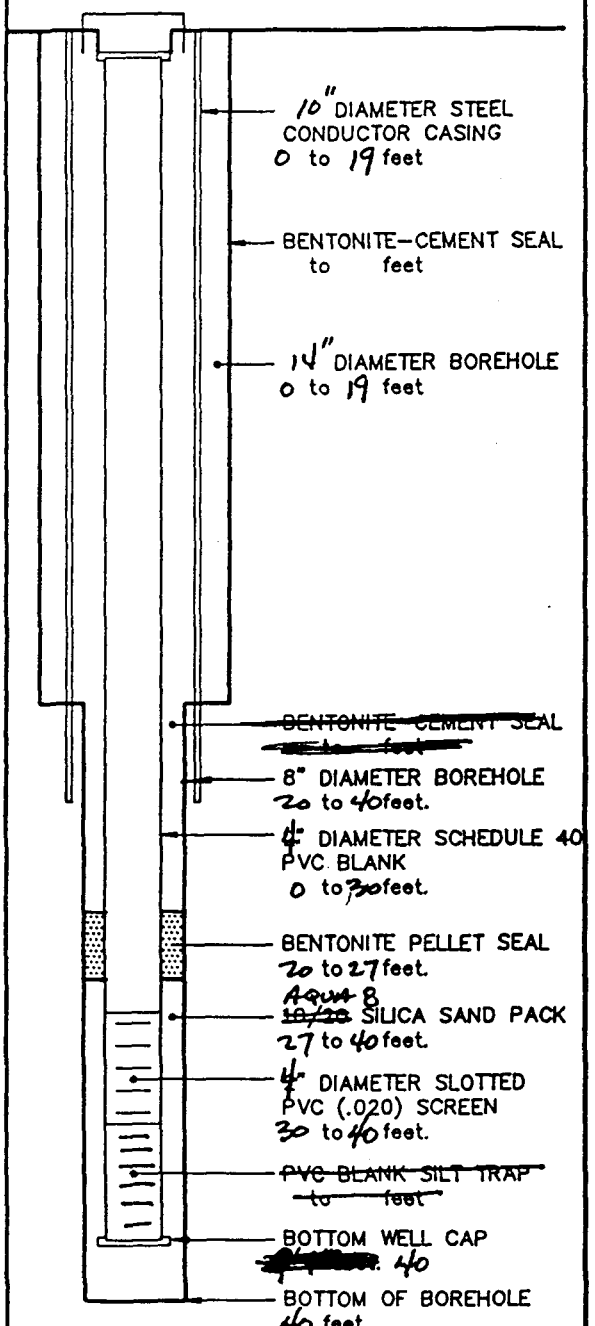
TOLS011891

BZTO104(e)048724

DRILLING METHODS Hollow STEM AUGER / CABLE TOOL DATE 11/30/88

TOP OF CASING ELEVATION _____ GROUND SURFACE ELEVATION _____

WELL COMPLETION DETAILS



LOG OF BORING

GROUND LEVEL

0	ROAD GRAVEL W/ DARK BROWN fine to medium SAND
5	DARK gray to brown, fine to MEDIUM SAND; minor Rock FRAGMENTS, DAMP
	strong PETROLEUM ODOR
10	SAME
15	SAME
20	gray brown silt to very fine SAND; minor organics
25	gray SILT and SAND layers
30	same
35	gray interbedded Sands + SILTS Beds <1/4" to 6" thick.
40	T.D. 40 feet
45	
50	

ECOVA

Tank oil / PORTLAND BORING NUMBER B2

DRAWN	JOB NUMBER	APPROVED	DATE	ENGINEER/GEOLOGIST/HYDROLOGIST
	821401			DM LANCE

TOLS011892

BZTO104(e)048725

*** External Standard ***

Operator: ENNIS 4 Aug 89 1:42 pm
Method File Name : PCP.M
Sample Info : TIME OIL WELL SAMPLE ~~B2~~ 2'
Misc Info:
Integration File Name : DATA:0804A05A.I
consisting of channels : 1. A 305,4 550,100 of 0804A05A.D
Sequence Index: 1 Bottle Number : 5 Repetition Number: 1

PCP CALIBRATION CURVE 7/12/89

Calibration file: DATA:PCP712.Q Last Update: 12 Jul 89 5:43 pm
Reference Peak Window: 5.00 % of Retention Time
Non-Reference Peak Window: 5.00 % of Retention Time
Sample Amount: 0.000 Uncalibrated Peak RF: 0.000 Multiplier: 1.000

Peak Num	Type	Int Type	Ret Time	Signal Description	Compound Name	Area	Amount
1		1	-------	A 305,4 550,100		*** Not Found ***	

*** Not all calibrated peaks found ***

TOLS011893

*** External Standard ***

Operator: ENNIS 4 Aug 89 1:18 pm
Method File Name : PCP.M
Sample Info : TIME OIL WELL SAMPLE, B1
Misc Info:
Integration File Name : DATA:0804A04A.I
consisting of channels : 1. A 305,4 550,100 of 0804A04A.D
Sequence Index: 1 Bottle Number : 4 Repetition Number: 1

PCP CALIBRATION CURVE 7/12/89

Calibration file: DATA:PCP712.Q Last Update: 12 Jul 89 5:43 pm
Reference Peak Window: 5.00 % of Retention Time
Non-Reference Peak Window: 5.00 % of Retention Time
Sample Amount: 0.000 Uncalibrated Peak RF: 0.000 Multiplier: 1.000

Peak Num	Type	Int Type	Ret Time	Signal Description	Compound Name	Area	Amount
1		1	-------	A 305,4 550,100		*** Not Found ***	

*** Not all calibrated peaks found ***

TOLS011894

*** External Standard ***

Operator: ENNIS 4 Aug 89 1:42 pm
Method File Name : PCP.M
Sample Info : TIME OIL WELL SAMPLE B2
Misc Info:
Integration File Name : DATA:0804A05A.I
consisting of channels : 1. A 305,4 550,100 of 0804A05A.D
Sequence Index: 1 Bottle Number : 5 Repetition Number: 1

PCP CALIBRATION CURVE 7/12/89

Calibration file: DATA:PCP712.Q Last Update: 12 Jul 89 5:43 pm
Reference Peak Window: 5.00 % of Retention Time
Non-Reference Peak Window: 8.00 % of Retention Time
Sample Amount: 0.000 Uncalibrated Peak RF: 0.000 Multiplier: 1.000

Peak Num	Int Type	Ret Type	Ret Time	Signal Description	Compound Name	Area	Amount
1		BB	S 12.448	A 305,4 550,100		3.8571	1.5657 ng/ul

TOLS011895

BZTO104(e)048728

*** External Standard ***

Operator: ENNIS 4 Aug 89 2:07 pm
Method File Name : PCP.M
Sample Info : TIME OIL WELL SAMPLE G1
Misc Info:
Integration File Name : DATA:0804A06A.I
consisting of channels : 1. A 305,4 550,100 of 0804A06A.D
Sequence Index: 1 Bottle Number : 6 Repetition Number: 1

PCP CALIBRATION CURVE 7/12/89

Calibration file: DATA:PCP712.Q Last Update: 12 Jul 89 5:43 pm
Reference Peak Window: 5.00 % of Retention Time
Non-Reference Peak Window: 5.00 % of Retention Time
Sample Amount: 0.000 Uncalibrated Peak RF: 0.000 Multiplier: 1.000

Peak Num	Int Type	Ret Type	Ret Time	Signal Description	Compound Name	Area	Amount
1		i	-------	A 305,4 550,100		*** Not Found ***	

*** Not all calibrated peaks found ***

TOLS011896

*** External Standard ***

Operator: ENNIS 4 Aug 89 2:31 pm
Method File Name : PCP.M
Sample Info : TIME OIL WELL SAMPLE J1
Misc Info:
Integration File Name : DATA:0804A07A.I
consisting of channels : 1. A 305,4 550,100 of 0804A07A.D
Sequence Index: 1 Bottle Number : 7 Repetition Number: 1

PCP CALIBRATION CURVE 7/12/89

Calibration file: DATA:PCP712.Q Last Update: 12 Jul 89 5:43 pm
Reference Peak Window: 5.00 % of Retention Time
Non-Reference Peak Window: 8.00 % of Retention Time
Sample Amount: 0.000 Uncalibrated Peak RF: 0.000 Multiplier: 1.000

Peak Num	Int Type	Ret Type	Ret Time	Signal Description	Compound Name	Area	Amount
1		BB	S 12.456	A 305,4 550,100		2.2689	1.1533 ng/ul

TOLS011897

*** External Standard ***

Operator: ENNIS 4 Aug 89 2:31 pm
Method File Name : PCP.M
Sample Info : TIME OIL WELL SAMPLE J1
Misc Info:
Integration File Name : DATA:0804A07A.I
consisting of channels : 1. A 305,4 550,100 of 0804A07A.D
Sequence Index: 1 Bottle Number : 7 Repetition Number: 1

PCP CALIBRATION CURVE 7/12/89

Calibration file: DATA:PCP712.Q Last Update: 12 Jul 89 5:43 pm
Reference Peak Window: 5.00 % of Retention Time
Non-Reference Peak Window: 5.00 % of Retention Time
Sample Amount: 0.000 Uncalibrated Peak RF: 0.000 Multiplier: 1.000

Peak Num	Int Type	Ret Type	Ret Time	Signal Description	Compound Name	Area	Amount
1		1	-------	A 305,4 550,100		*** Not Found ***	

*** Not all calibrated peaks found ***

TOLS011898

*** External Standard ***

Operator: ENNIS 4 Aug 89 2:55 pm
Method File Name : PCP.M
Sample Info : TIME OIL WELL SAMPLE J2
Misc Info:
Integration File Name : DATA:0804A08A.I
consisting of channels : 1. A 305,4 550,100 of 0804A08A.D
Sequence Index: 1 Bottle Number : 8 Repetition Number: 1

PCP CALIBRATION CURVE 7/12/89

Calibration file: DATA:PCP712.Q Last Update: 12 Jul 89 5:43 pm
Reference Peak Window: 5.00 % of Retention Time
Non-Reference Peak Window: 5.00 % of Retention Time
Sample Amount: 0.000 Uncalibrated Peak RF: 0.000 Multiplier: 1.000

Peak Num	Type	Int Type	Ret Time	Signal Description	Compound Name	Area	Amount
1		1	-------	A 305,4 550,100		*** Not Found ***	

*** Not all calibrated peaks found ***

TOLS011899

*** External Standard ***

Operator: ENNIS 4 Aug 89 3:20 pm
Method File Name : PCP.M
Sample Info : TIME OIL WELL SAMPLE J3
Misc Info:
Integration File Name : DATA:0804A09A.I
consisting of channels : 1. A 305,4 550,100 of 0804A09A.D
Sequence Index: 1 Bottle Number : 9 Repetition Number: 1

PCP CALIBRATION CURVE 7/12/89

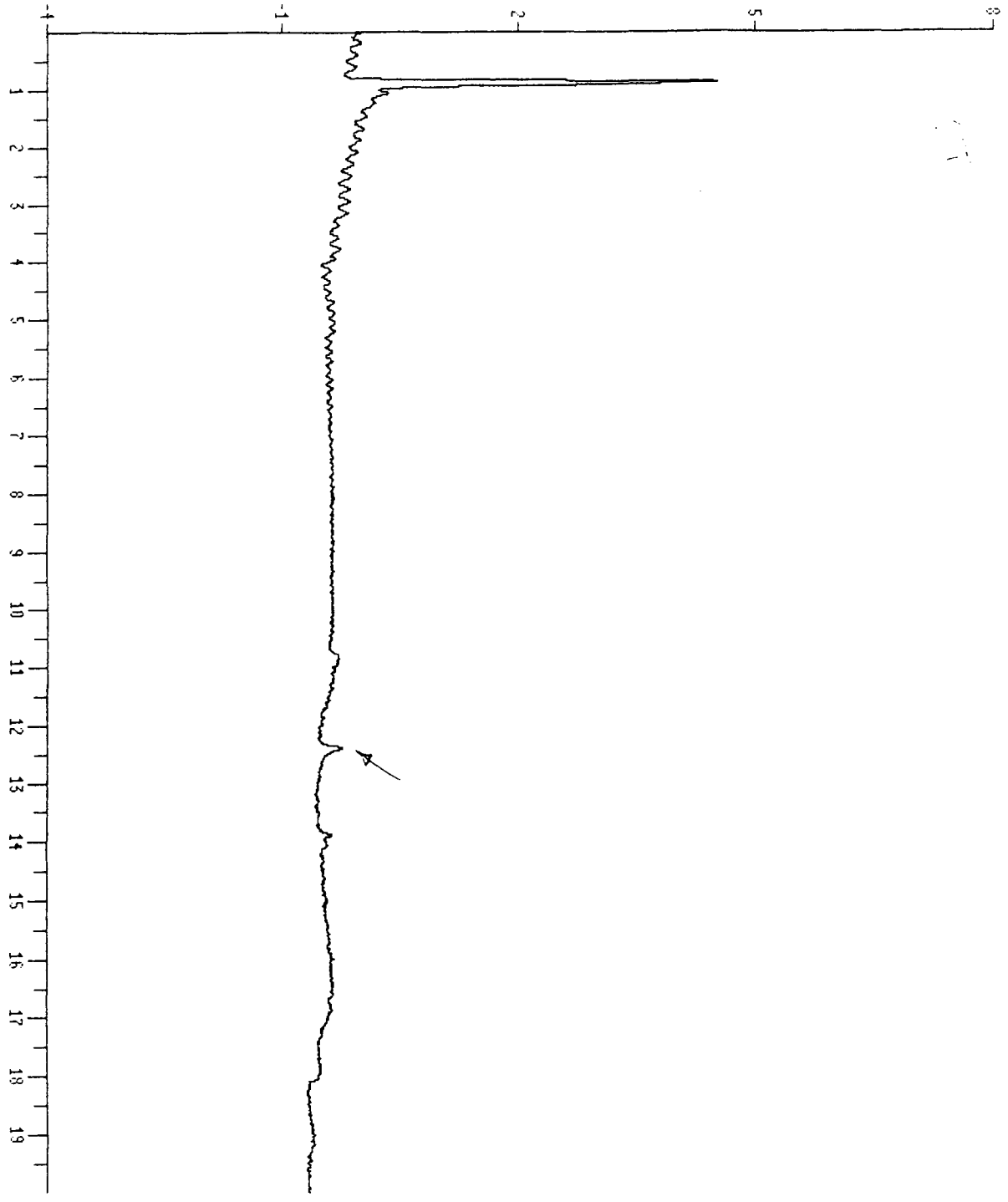
Calibration file: DATA:PCP712.Q Last Update: 12 Jul 89 5:43 pm
Reference Peak Window: 5.00 % of Retention Time
Non-Reference Peak Window: 5.00 % of Retention Time
Sample Amount: 0.000 Uncalibrated Peak RF: 0.000 Multiplier: 1.000

Peak Num	Peak Type	Int Type	Ret Time	Signal Description	Compound Name	Area	Amount
1		1	-------	A 305,4 550,100		*** Not Found ***	

*** Not all calibrated peaks found ***

TOLS011900

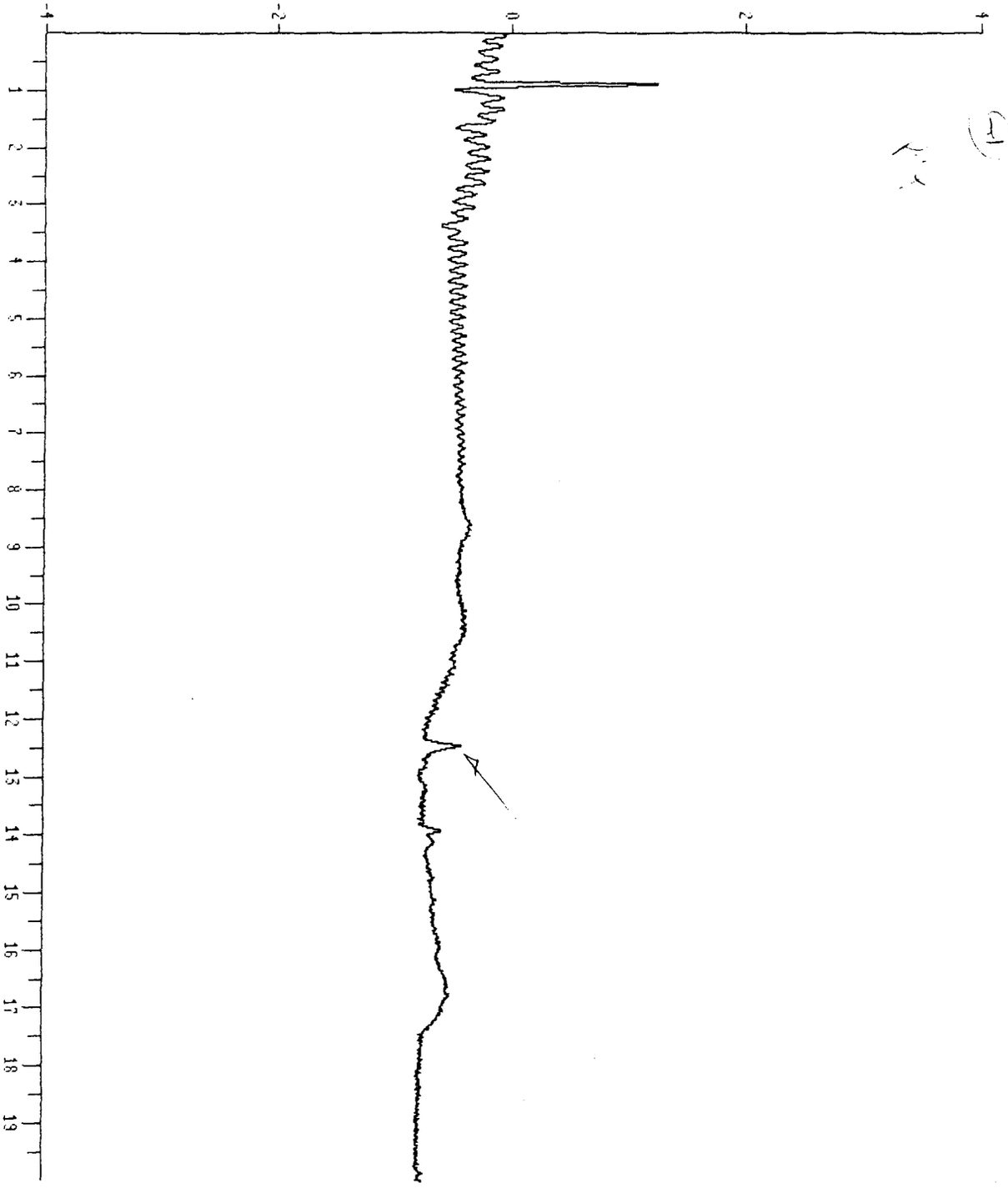
1: LC A 305,4 550,100 of 0804A04A.D



End of plot. Time = 0.00 to 19.98 minutes Chart speed = 1.00 cm/min

TOLS011901

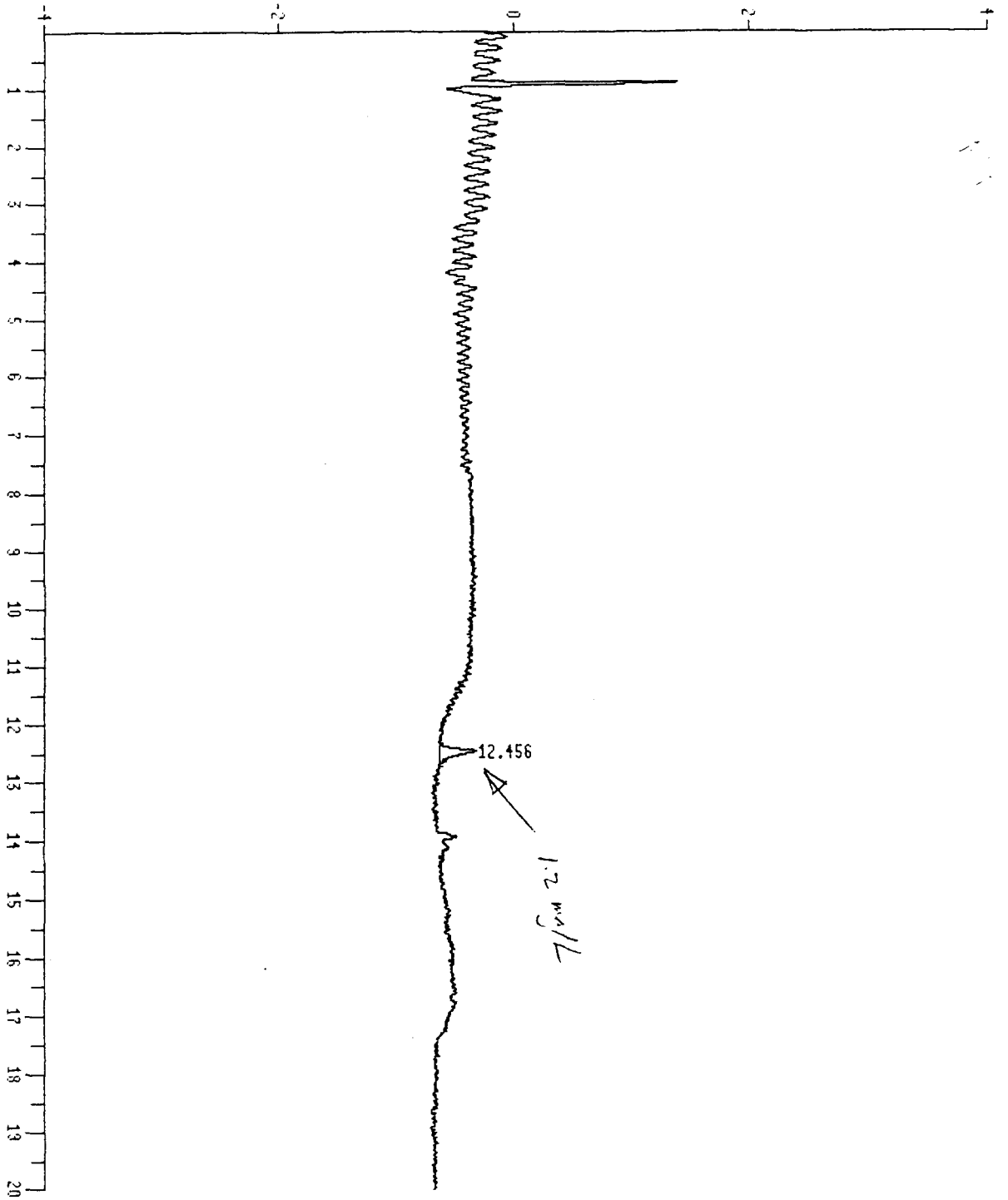
1: LC A 305,4 550,100 of 0804A06A.D



End of plot. Time = 0.01 to 19.98 minutes Chart speed = 1.00 cm/min

TOLS011902

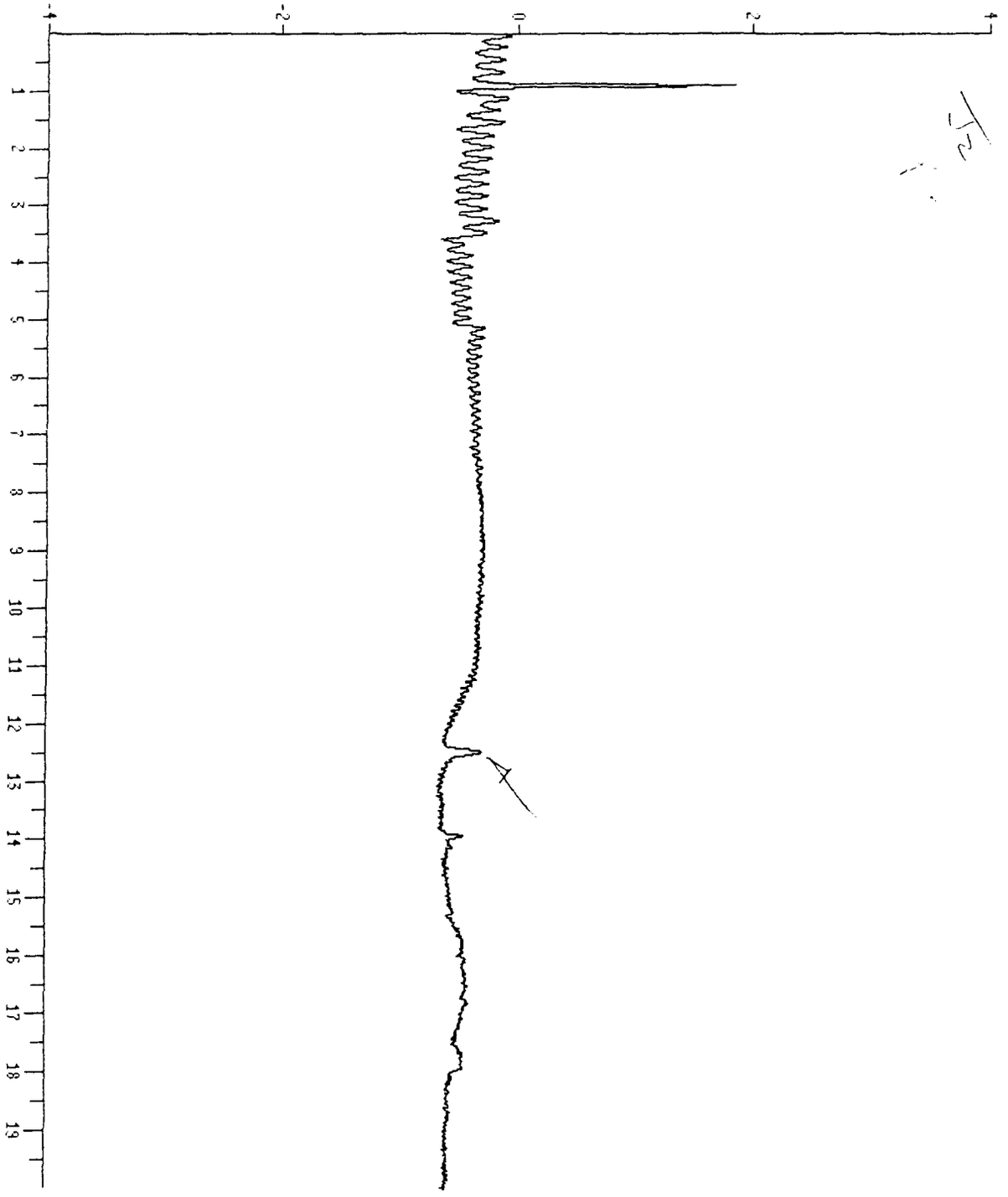
1: LC A 305,4 550,100 of 0804A07A.D



End of plot. Time = 0.01 to 19.99 minutes Chart speed = 1.00 cm/min

TOLS011903

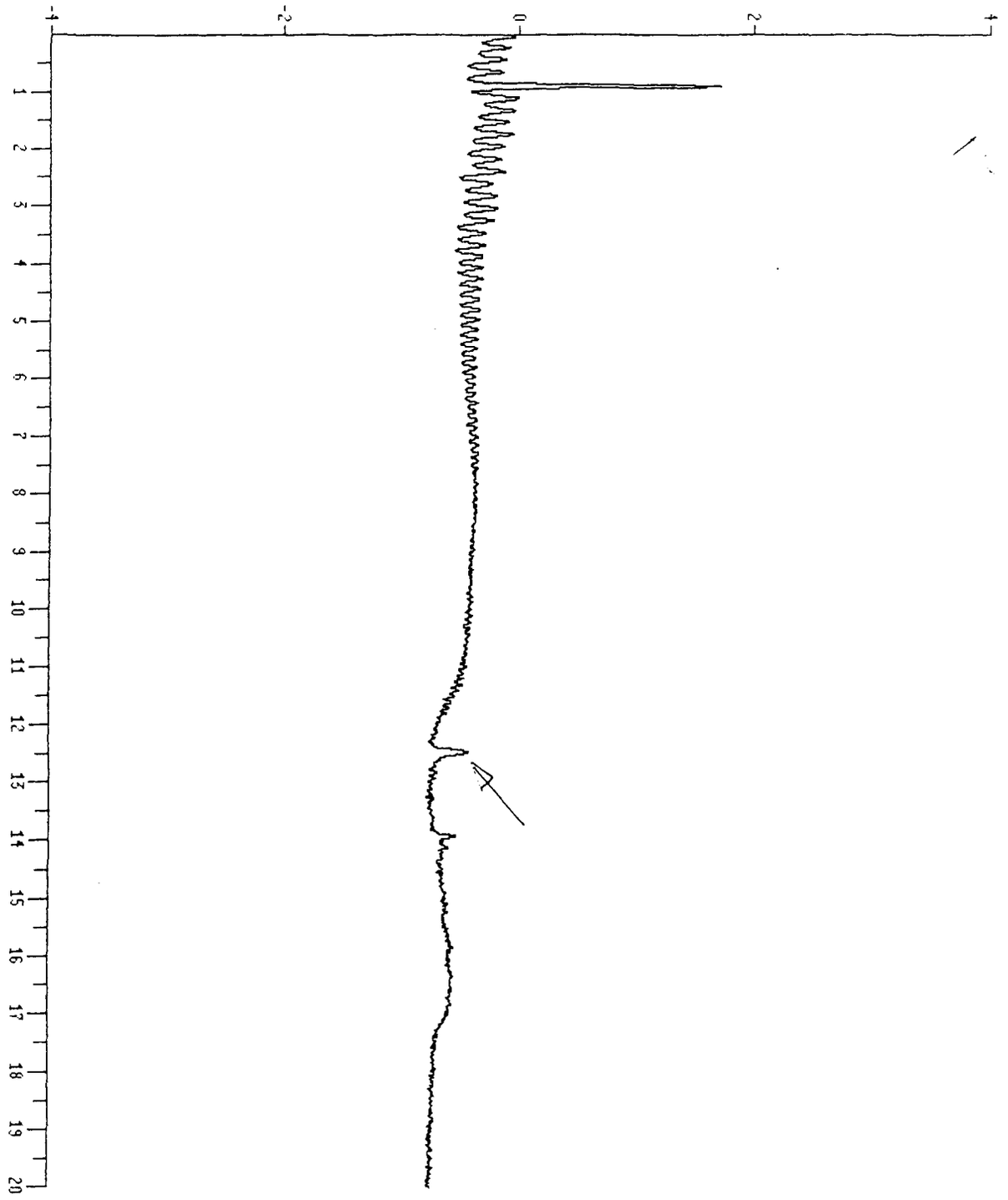
1: LC A 305,4 550,100 of 0804A08A.D



End of plot. Time = 0.00 to 19.98 minutes Chart speed = 1.00 cm/min

TOLS011904

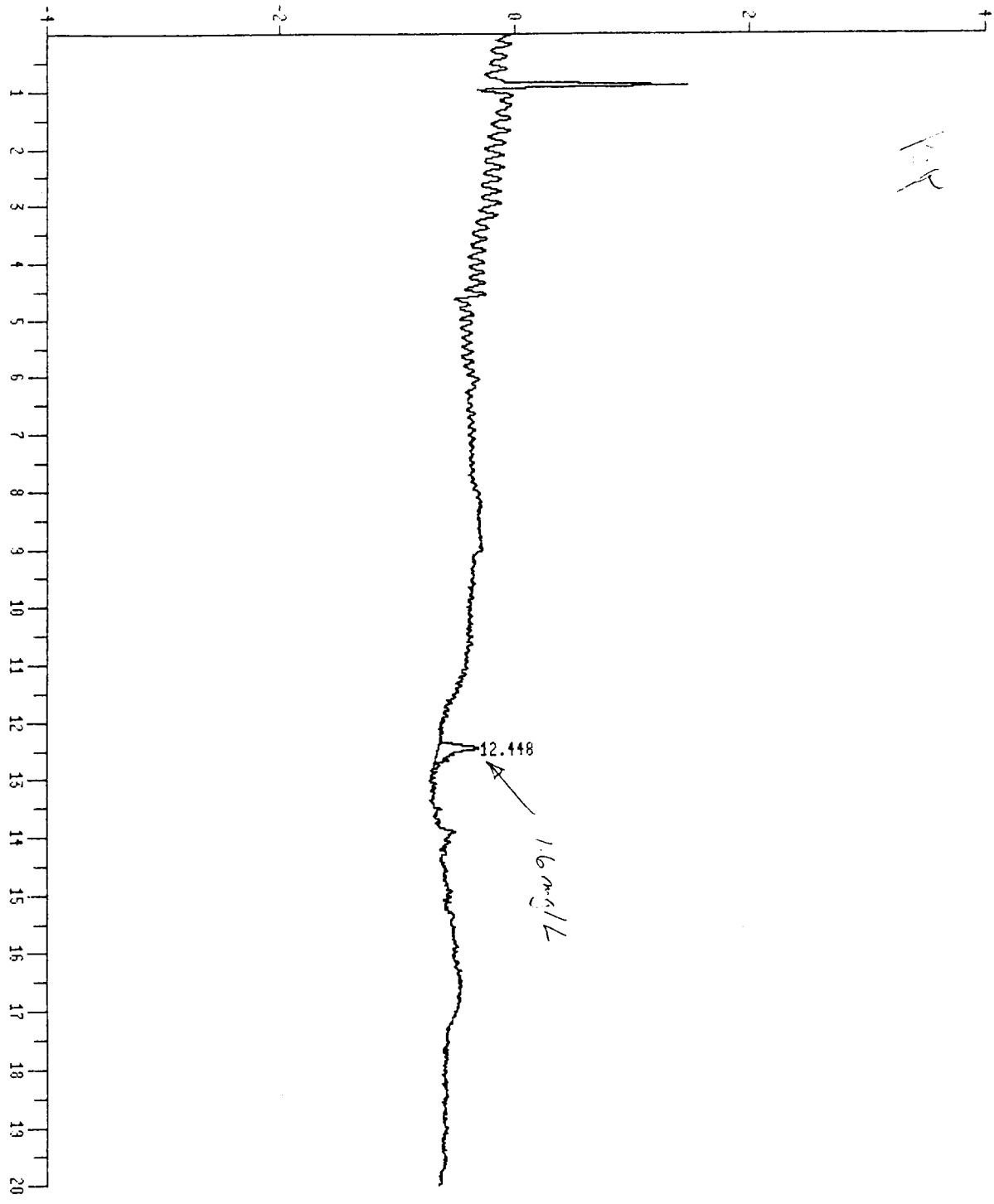
1: LC A 305,4 550,100 of 0804A09A.D



End of plot. Time = 0.01 to 19.98 minutes Chart speed = 1.00 cm/min

TOLS011905

1: LC A 305,4 550,100 of 0804A05A.D



End of plot. Time = 0.01 to 19.98 minutes Chart speed = 1.00 cm/min

TOLS011906

BZTO104(e)048739

*** External Standard ***

Operator: ENNIS 4 Aug 89 12:30 pm
Method File Name : PCP.M
Sample Info : PCP STANDARD 23 PPM
Misc Info:
Integration File Name : DATA:0804A02A.I
consisting of channels : 1. A 305,4 550,100 of 0804A02A.D
Sequence Index: 1 Bottle Number : 2 Repetition Number: 1

PCP CALIBRATION CURVE 7/12/89

Calibration file: DATA:PCP712.Q Last Update: 12 Jul 89 5:43 pm
Reference Peak Window: 5.00 % of Retention Time
Non-Reference Peak Window: 5.00 % of Retention Time
Sample Amount: 0.000 Uncalibrated Peak RF: 0.000 Multiplier: 1.000

Peak Num	Type	Int Type	Ret Time	Signal Description	Compound Name	Area	Amount
1		IBV	12.323	A 305,4 550,100		96.2382	25.551 ng/ul

TOLS011907

BZTO104(e)048740

*** External Standard ***

Operator: ENNIS 4 Aug 89 12:54 pm
Method File Name : PCP.M
Sample Info : PCP STANDARD 4.6 PPM
Misc Info:
Integration File Name : DATA:0804A03A.I
consisting of channels : 1. A 305,4 550,100 of 0804A03A.D
Sequence Index: 1 Bottle Number : 3 Repetition Number: 1

PCP CALIBRATION CURVE 7/12/89

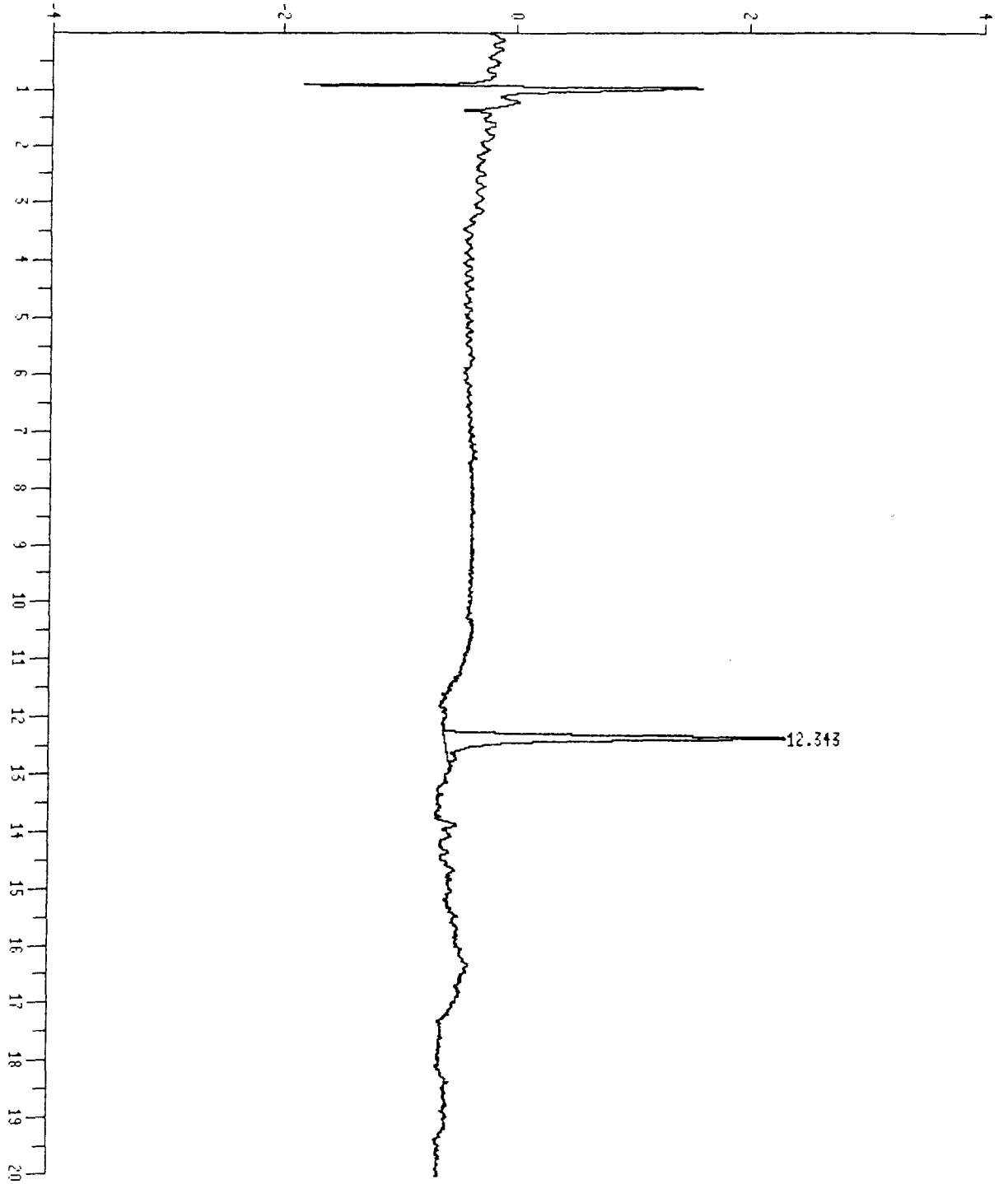
Calibration file: DATA:PCP712.Q Last Update: 12 Jul 89 5:43 pm
Reference Peak Window: 5.00 % of Retention Time
Non-Reference Peak Window: 5.00 % of Retention Time
Sample Amount: 0.000 Uncalibrated Peak RF: 0.000 Multiplier: 1.000

Peak Num	Type	Int Type	Ret Time	Signal Description	Compound Name	Area	Amount
1		BB	S 12.343	A 305,4 550,100		20.6775	5.9328 ng/ul

TOLS011908

BZTO104(e)048741

1: LC A 305,4 550,100 of 0804A03A.D



End of plot. Time = 0.01 to 19.99 minutes Chart speed = 1.00 cm/min

TOLS011909

PHONE 285-2400
CABLE ADDRESS: TIMOIL
(FAX)206-283-8036

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TIME
PRODUCTS TIME TESTED
TEN TO ONE IT'S TIME

TIME OIL COMPANY

2737 WEST COMMODORE WAY
P.O. BOX 24447, TERMINAL STATION

SEATTLE, WASHINGTON 98199-1233
SEATTLE, WASHINGTON 98124-0447

August 31, 1990

ECOVA Corporation
Attn: Mr. John Kinsella
3820 159th Avenue NE
Redmond, WA 98052

RE: Utility bill for Northwest Terminal Penta project

Dear John:

The enclosed invoice in the amount of $34 addressed to ECOVA from Elmer's Sanitary Service was received this week at our Northwest Terminal. Kindly arrange for its payment.

Sincerely,

Fred Proby
Environmental Specialist

Enclosure a/s

FLP\aug

ELMER'S SANITARY SERVICE
ELMER L. ANDRÉ 6616 N.E. Alameda St. • Portland, Oregon 97213
Phone: 287-3068 or 282-8410

FORWARDING & ADDRESS CORRECTION REQUESTED

All bills due and payable within 30 days. A Finance Charge of 1½% per month, 18% per year, *minimum* 50¢ may be assessed on accounts not received within 30 days of closing date.

CLOSING DATE	ACCOUNT NO.	PREVIOUS BALANCE
8/15/90		

To:
ECOVA CORP.
12005 N. BURGARD
PORTLAND, OR.

JAN. FEB. APR. service $33.00

FINAL BILL:

PAST DUE

AMOUNT ON WHICH FINANCE CHARGE COMPUTED	FINANCE CHARGE	AMOUNT DUE	ACCOUNT NO.	AMOUNT DUE
	$ 1.00	$ 34.00	final bill	$ 34.00

RETAIN THIS STUB FOR YOUR RECEIPT — PLEASE RETURN THIS STUB WITH PAYMENT

TOLS011910

TIME OIL - N.W. TERMINAL

Meeting Agenda

September 7, 1990

The following issues were brought up in the August 31, 1990 letter from Time Oil to ECOVA, and need to be addressed:

1) Clean Up Criteria

It is correct that a proposed clean up level must be determined before approaching ODEQ. We suggest the following:

PCP Soil	200 ppm ← AL
PCP Water	500 ~~200~~ ppb detection limit
Solvent (Soil)	300 ~~200~~ ppm (?)*
Solvent (Water)	Unknown (?)*

Downgradient water quality monitoring for PCP at three points quarterly during cleanup operations.

Dollar limit placed on level of oversight that DEQ is allowed to charge to Time Oil.

2) Lead Roles

The roles which Time Oil and ECOVA will assume in negotiation with ODEQ will be at Time Oil's option. Certainly, ECOVA would be glad to handle the entire issue, and operate with Time Oil participating minimally.

At the other end of the scale, there is a minimum amount of involvement below which ECOVA will not accept. This is simply because the agreement reached with ODEQ has to be technically achievable, and achievable at a reasonable price.

As Time Oil suggested, the tasks to be performed should be outlined and a determination made as to who will handle which activites.

Some activities which will most certainly be required are:

a) Site visit by DEQ (T/E)

b) Report detailing the following:

- History of site (T)
- Description of site from environmental (T/E) perspective
- Results of activities to date (E)
- Best Available Technology (E)

* Function of actual solvents present.

3) Rate Schedule

There was a schedule issued on 7/1/90.

4) Level of Documentation for ODEQ

ECOVA expects that ODEQ will request a report summarizing analytical results which describe:

1) The characteristics of the site.

2) The results of efforts to remediate the contamination.

It is possible that they may request some sampling performed that will confirm the above results, and/or fill in gaps in the data.

5) Dioxin Analysis

Cleanup levels will be strongly effected by the results of Dioxin analysis. ODEQ will most certainly be interested in this information.

6) Design Changes

As the clean up criteria increases, different technologies become available to us. These will be incorporated into the remediation system.

Potential design changes:

a) Keep original design (mixer, screen)
b) Attrition srubbing
c) Requirment for surfactants, or other wash aids.
d) Processing rate ([PCP] dependant)
e) Health and Safety (level of personnel protection, dioxin dependant)
f) Solid phase soil treatment

7) Phase III

If the project to date could be considered Phase I, then our current rearrangement of the understood conditions of the project could be considered an interim phase (Phase II). The understood conditions being, what contaminants are in the soil, and the clean up criteria.

Phase III is simply the continuation of Phase I, under the new conditions - an understanding of what contaminants are in the soil, and the new clean up criteria.

MEETING NOTES

DATE: September 7, 1990

TIME: 11:45 A.M.

ATTENDEES: Jim Borthen, Fred Proby, Don Butler, John Kinsella, Bill Mahaffey

RE: Portland Pentachlorophenol Project No. 821401

1.0 CLEANUP CRITERIA

We need to establish cleanup levels with DEQ. ECOVA and Time Oil tentatively agreed that the following levels would be reasonable objectives to petition DEQ for.

1.1 GROUNDWATER MONITORING LEVELS

Groundwater will be monitored quarterly during operations and for 1 year afterwards and then subsequent numbers appropriately. .

1.2 PCP SOIL CLEANUP LEVELS

Jim believes that we should go with a PCP level of 200 ppm based on information obtained from EPA and ODEQ, for projects performed at other Oregon sites. Fred was concerned that it may take us time to get an agreement. Don agreed for a higher level than we can reach so that we have room to negotiate. EPA #8040

1.3 PCP WATER CLEANUP LEVELS

Agree to clean to detection 500 ppb. EPA # 604.

1.4 SOLVENTS IN SOIL

We don't know exactly what we have as solvents, we should agree on a TPH total for cleanup i.e., 300 ppm TPH. Fred says we have a question regarding the solvent treatment process and levels that can be reached. Bill said we don't know exactly what we can treat the solvents down to both in the soil and wash water. Need to do some additional work to determine the method we will use.

The idea regarding dioxin samples is to demonstrate that no dioxin is present and that future sampling will not be needed. The key here will be to make a very thorough evaluation of the dioxin analyses.

2.0 NEGOTIATION WITH THE DEQ

There are some aspects of the DEQ negotiations which we can anticipate and hence estimate our expected costs, and there are some aspects for which it is impossible to estimate.

What we can estimate:

- Field Pilot Demonstration Report - Prepared by Ecova. We will go forward with a very strong report (5 - 10 pages, will take more than 2 man weeks).

We can not estimate:

- DEQ negotiations

Fred will take the lead role for scheduling meeting/calls/letters etc. Ecova will be the technical lead on this effort.

3.0 **DESIGN CHANGES**

- Level of design effort will reflect the final system used.
- We should look at and discuss other treatment processes.
- Time Oil will pay for design changes necessary to deal with the solvents.

4.0 **TO DO LIST**

- Submit request for C.O. #5 to Fred week of September 10, 1990. This C.O. will contain estimate for Item 2 above (DEQ Negotiations).

Fred estimates that we will begin ODEQ negotiations by end of month.

John V. Kinsella
09/10/90

7/MtgPPP/gbm

TOLS011914

9/7/90 FLP

Ecova Progress Meeting NW Penta
John K, Jim Barthen, Bill Mahaffy, Jack Gask

DEQ negotiation objectives:

1. Ecova suggests 200 ppm PCP in soil based on past DEQ/DOE projects. DOE I-97 level is 10 ppm in soil "Comfort level" is 20-50 ppm
   - 200 is a good opening number
   - 200 ppb in water is drinking water standard
     - 500 ppb is detection limit

2. "Solvent" composition is still under question -- not really sure what it is.
   Try to characterize them as TPH - high boiling hydrocarbons.
   ∴ Shoot for a 300 ppm cleanup level ~~can~~ can be reached.
   Do not have hard data on what solvent level can be reached in water.
   Need to solubilize it to get it out of the soil, then

3. Need to present post-excavation data very clearly.
   Need to emphasize that there's been no migration.

4. Fugitive Dust: We really should put a good cover on the pile. ∴ Ecova will estimate cost of Griffolyn cover.

5. Dioxin: Very important that we identify all isomers, so we're sure about 2,3,7,8-TCDD. Bill knows some experts that can evaluate risk of dioxin.

TOLS011915

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Negotiation roles

- Ecova assumed that Time would take the lead role.
- A detailed strong report on the "pilot project" is very important - will take more than 2 man-weeks
- Need to clean up the site & cover pile before DEQ visits.
- Time will take lead role w/ meetings, calls & correspondence. Ecova will put together a good presentation on what we want to do & why. Support Time @ meetings.

Rates - [New rate sheet provided.]

- John is charging lower rates on Visalia since he's become proj. mgr.
- Large rate increase was made to keep people from being taken by other firms. "To be competitive."
- Haven't increased rates on an annual basis for a project - new rates go into new projects.

Redesign

- Clean up level is determining factor
- I re-emphasized that Time won't pay for redesign beyond dealing with the Edwards,
- Hold off on Change order #6 until negotiations have progressed.

ECOVA CORPORATION
Rates for Professional Services, Time and Materials Projects, and General Conditions for Service Agreements
July 1, 1990

The following rate schedule applies to work performed by ECOVA Corporation on a time and materials (T&M) basis. The company also provides services based on lump-sum and unit price agreements which are established on a project specific basis. Compensation for services provided on a T&M basis includes:

1. An hourly charge for hours worked by ECOVA supplied staff. These rates include all fringe benefits, payroll burdens, overhead, and fees.
2. Reimbursement of costs for materials, equipment, and outside analytical services.
3. Reimbursement of cost of subcontractors utilized on the project.
4. Reimbursement for usage of ECOVA owned equipment will be quoted on a project specific basis.

PERSONNEL:	Hourly Rate	Billing Classification
Principal	$ 150.00 – Kinsella	P4A
Senior Manager/Engineer/Geologist/Scientist	125.00 – Mahaffey	P4B
Project Manager/Project Controls Manager	115.00 – Borrow	P3A
Project Engineer/Geologist/Scientist	80.00	P3B
Staff Engineer/Geologist/Scientist	65.00	P2
Research Associate/Technical Editor	60.00	P2
CAD Drafter (includes computer equipment)	60.00	T3
Senior Site Superintendent	75.00	P3B
Field Supervisor/Senior Field Technician/Senior Operator	60.00	T3
Assistant Engineer/Geologist/Scientist	55.00	P1
Word Processor/Clerical	40.00	T2
Field/Lab Technician	40.00	T2
Administrative Support	35.00	T1

When a project requires non-exempt personnel to work more than 40 hours per work week, then time in excess of 40 hours will be billed at 1.5 times the above rates.

TRAVEL TIME: Travel time will be charged at regular hourly rates, portal-to-portal, not-to-exceed 8 hours per day.

REIMBURSABLE EXPENSES: ..... Cost Plus 20%
Reimbursable expenses include travel costs, living expenses for personnel required to be away from their home office in connection with project work, rental cars, long-distance telephone calls, telegrams and cables, copies, prints or reprints, shipping costs for samples and other materials, expendable supplies purchased specifically for a project, and premiums for insurance required by the Client in addition to normal coverage.

Incidental Mileage	$ .35 per mile	Photocopies	$ .20 per page

OTHER DIRECT EXPENSES: ..... Cost Plus 20%
This includes subcontract charges, equipment rental and other costs not associated with normal overhead.

TERMS OF PAYMENT: Payment terms for professional services are NET 30 DAYS. A service charge equal to 1.5 percent per month or maximum lawful rate, whichever is lesser, will be charged on all account balances past due. Client agrees to pay any and all expenses associated with collection of delinquent amounts, including but not limited to attorney's fees, collection fees and lien costs. Invoices will be submitted monthly unless other arrangements are made.

SALES TAX: Sales tax, if applicable, will be charged at the appropriate rate.

FORMATION OF CONTRACT: Any Agreement between Client and ECOVA incorporating these terms and conditions will come into existence and effect in Seattle, Washington, and shall be interpreted according to the laws of the State of Washington.

HAZARDOUS WASTE SAMPLES: All hazardous waste samples will remain the property of the generator. Unused portions of samples received by ECOVA will be returned or retained at the Client's request. Samples retained over 30 days will be subject to a minimum storage charge of $5.00 per month per sample. ECOVA can arrange for disposal at an additional charge.

OWNERSHIP OF DOCUMENTS: Any documentary report or tangible item developed and furnished under this agreement is intended solely for the purpose of communicating and transferring tangible information relating to professional and engineering services. All designs, drawings, specifications, notes, data, samples, materials, report reproducibles and other work developed by ECOVA Corporation are instruments of service and as such remain the property of ECOVA Corporation. The Client agrees to hold harmless and indemnify ECOVA Corporation against all claims demands, losses, penalties, or damages, including attorney's fees arising out of the unauthorized use of these documents.

CONFIDENTIAL INFORMATION: Client agrees that proprietary information received from ECOVA (including but not limited to drawings, samples, designs, concepts, or customer information) shall remain ECOVA's property. Client agrees to maintain as secret all such proprietary information and shall not disclose such information to a third party without ECOVA's written consent. Client agrees to use such proprietary information for the sole purpose of fulfilling the requirements set out by this Agreement. ECOVA will maintain Client's proprietary information in a like manner.

121/609999JULY/gbm/1

TOLS011917

Rcd 9/13/89 EDP

ECOVA

Mr. Fred Proby
The Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199

September 12, 1989

Dear Mr. Proby:

This letter with attachments should bring us up to date as far as submittals you have requested from ECOVA, and outstanding Change Orders that cover the work to date at the Portland Northwest Terminal Remediation Site.

The contents of the attachments have been pulled from a variety of sources within ECOVA and are provided in regular type. Explanatory comments are given in boldfaced type to set them aside from the original documentation which has been provided to me.

Please review the document and call me at 883-1900 if I can provide any clarifications. Having not been directly involved in the hands on work at the site, I have had to rely on project manager files and the correspondence which has passed between our respective firms. I believe that we will need to sit down together to devise some mutually agreeable responses and conclusions based on this document. I look forward to doing that in the very near future.

It is my understanding that you were in favor of weekly progress meetings and that you and Mark Anderson held them at breakfast. I would be pleased to continue such communication if you will name the time and place. My work day commences at 7 AM, so I am happy to make the most of my early rising.

Please provide written direction to Ecova for the placement of treated soil from the bioreactors as indicated in your recent telephone conversation with Dr. Dave Edwards.

Sincerely yours,

Roderick A Carr

Roderick A. Carr
Contract Administrator

Encl. Three (3) Attachments

Corporate Office
3820 159th Avenue NE
Redmond, WA 98052
(206) 883-1900
(206) 867-2210 FAX

Gulf Coast Region
12790 Merit Drive #220
Lock Box 145
Dallas, TX 75251
(214) 404-7540
(214) 404-7545 FAX

Eastern Region
500 Fifth Avenue
Suite 935
New York, NY 10110
(212) 840-1042
(212) 840-1663 FAX

TOLS011918

BZTO104(e)048751

TABLE OF CONTENTS

Attachment 1 - Memorandum of August 10, 1989 Meeting

Attachment 2 - Discussion of Analytical Laboratory QA/QC

Attachment 3 - Consolidated Change Order Request: Project Inception to Date

TOLS011919

BZTO104(e)048752

ATTACHMENT 1 - Memorandum of August 10, 1989 Meeting

NOTE: Bold type indicates comments in addition to the original memorandum which was typed shortly after the meeting.

Attendees: Fred Proby, Time Oil
Dave Edwards, Ecova
Jim Borthen, Ecova
John Kinsella, Ecova
Mark Anderson, Ecova
Eric Paukstaitis, Ecova
April Rivkin, Ecova

SUBJECT: Summary of Time Oil- Portland Terminal Meeting held at Ecova Corporation on August 10, 1989

Ecova Team Members

Fred Proby was presented with an Ecova organization chart and resumes for the people working on the Time Oil - Portland Terminal project (J.N. 821401) He will review this material at another time. Fred stated that while he was concerned about the people assigned to this particular project, he was considering starting another clean-up project and wanted to know if Ecova, as a company would handle another project.

Change Orders

Outstanding Change Orders were discussed at length.

This discussion has been summarized in Attachment 4, Change Order Request, a part of this document.

It is obvious from the project record that both Ecova and Time Oil deal more effectively with changes in the scope of services and resulting potential changes in compensation. A Field Change Order Form is available for use so that additional requirements for response to site requirements can be properly documented, signed off by Time Oil, and productively accomplished.

Proposed Change Orders

We discussed the fact that there is a great deal (approximately 200,000 gallons) of contaminated water from various sources and with various types and amounts of contaminants. Time Oil's position was that we should use this water in our processing at this time and that there would be no charge for processing the water.

Our contract with Time Oil is for the bioremediation of soil not water. The potential for complications and negative impact on the bioreactors which could be caused by using the aforementioned

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contaminated water cannot be determined. Ecova's best technical direction can only be to use clean water for supporting the bioreactors in order that they work as quickly and as efficiently as possible. Whether the contaminated water could be used is as yet undetermined, and would have to be explored in at least a bench scale experiment before a prudent project manager would allow the contaminated water to be placed in the bioreactors. This exploration would necessitate an equitable adjustment in Ecova's compensation.

Soil Borings in South End of Pit

No consensus was established on what will be done with this issue.

Groundwater Modeling

Recommendations for additional work have been made to Time Oil. Sampling and analysis completed. Analysis was accomplished in the Ecova Project Lab with a method that had "relatively high" detection limits. The data indicated no gross contamination, but could not be used to quantify low levels of contamination. Recommendations for additional sampling and analysis have been made to Time Oil but not agreed to, nor equitable adjustment determined.

Dioxin Analysis

Dioxin analysis at a cost of $1,800 has been agreed to and is contained in Attachment 3 - Change Order Request.

Treatment of Contaminated Soil in Excavation Pit

Treatment of soil in addition to the 3,440 yards originally contemplated by the parties has not been agreed to.

Change Order Procedures

Ecova's Field Change Order Form provides a format for quick documentation of a change in the scope of services, a place for mutually agreeing for the equitable adjustment required for compensation, and finally signature lines to indicate acceptance of both parties.

Schedule

An adjustment to the completion date of the effort is warranted based on the following situations encountered on site:

* Five weeks delay caused by failure to have electrical power on the site, outside of Ecova's control.

* Three weeks delay caused by the discovery of solvents and unexpected unknown contaminants within the excavation area

TOLS011921

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* Four week delay in obtaining clean soil for backfilling of the PCP pit due to the discovery of additional contamination on the site

A total of 12 weeks delay outside of Ecova control has impacted the project schedule and therefore project completion should be rescheduled at no additional cost for September 9, 1990. This change is included on Attachment 3 - Change Order Request

Unresolved Items

Monthly Progress Reports -

Monthly Progress Reports will be prepared during the first week of the Month covering the preceding months operations.

Electric Service Installation and Monthly Bills -

Ecova and Time Oil have agreed that the installation charge for power to the site will be paid by Time Oil. Ecova will pay PGE directly for electrical usage and the utility now sends directly to Ecova c/o Rod Carr for payment.

NO
Rod agrees

Chromatograms -

The question of missing chromatograms needs further identification of the samples in question to allow for retreival.

Certification of Insurance -

Certification of Insurance (July 27, 1899) mailed by Corroon and Black to Time Oil. Confirmed in Carr/Proby Memo of August 15, 1989.

Workman's Compensation Insurance - same as above.

City of Portland Business License Copy and registration as Foreign Corporation provided to Time Oil, August 15, 1989. These are the only current permits/licenses that we have been required to obtain from any level of government in Oregon.

As of this date there are no liens outstanding as a result of Ecova Operations at the Northwest Terminal of which I am aware.

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ATTACHMENT 2 - Discussion of Analytical Laboratory QA/QC

It is my understanding that you have requested documentation on Laboratory QA/QC procedures that are used in the analysis of samples from the Time Oil Northwest Terminal Remediation Site. The following discussion provides some background as well as a description of the kinds of decisions that are made in specifying QA/QC for remediation analytical support.

The level and intensity of QA/QC is directly dependent on the data objectives of the project at hand. The need for specific demonstration of analytical precision and accuracy is contingent upon the use to which the date will be put. It is no secret that precision and accuracy are directly related to the cost of the analysis.

The first question that needs to be answered is what will the analytical result be used for. In the case of samples obtained at the Northwest Terminal up to now, the results have been used to:

a) Control the limits of the excavation activity – contam left in the ground

b) Determine the trends in bioremediation operations in the bioreactors now operating at the site

On both cases above, the data have been used in "go/no go" decision support. In a) we either continued to excavate if the analysis showed measurable (>0.5ppm) contamination. In b) a time series of measurements were utilized to show the trend with time inside of the bioreactor as the process was established and tuned to meet the needs of the biological population.

The second question is how rapidly the analytical results are required. Increased levels of QA/QC require additional time and do not allow the rapid turnaround of data necessary for decision making on-site. In both a) and b) above, time has been of the essence, and quick availability of data has been very important.

The third question is what budgetary constraints impact on the choice of analytical protocol. If the data is not to be used as legal evidence, then rigorous and expensive EPA CLP protocols are not the best use of project resources. Simply put, the budget often determines how many samples can be taken, and how they can be most advantageously analyzed.

The answer to each question leads us to the conclusion that the project demands cost effective, rapid turnaround, and appropriate QA/QC giving the precision and accuracy necessary for the decision making which will be required. For the project to date this has meant utilization of the Ecova Project Support Laboratory (PSL). QA/QC in the PSL focuses on routine monitoring of reagent blanks,

TOLS011923

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and on calibration of instrumentation using standardized solutions of known concentration. Precision and accuracy are typically controlled to within ±10% of the amount of analyte present.

Chain of custody procedures are established by the Project Manager and his staff. For the Northwest Terminal site, most samples are either hand carried directly from the field to the laboratory, or sent by overnight means.

Non-routine analyses were accomplished when unexpected pollutants were discovered at the Northwest Terminal site. The powerful technique of combined gas chromatography/mass spectroscopy (GC/MS) was employed to make tentative identifications of compounds which were found on the site which were not the compounds which the remediation system was developed to handle. The analysis for these compounds was accomplished by adding samples to the stream being handled by Pacific Northwest Environmental Lab (PNEL). The existing sample stream was already under control of rigorous tuning and response criteria required by EPA. Time Oil samples were analyzed with the benefit of this control protocol and instrumental parameters and performance was well documented within the standard procedures employed by PNEL.

Chemical analysis for determining final concentrations of analytes in soil and solutions that have undergone bioremediation may be subject to substantially increased scrutiny due to the importance of the analytical result, and to the need for defensability of the data. These requirements can be met by utilization of Pacific Northwest Environmental Laboratory formerly Ecova Analytical Services. This fully equipped, instrumented and established facility can provide the complete range of services required for production of legally admissable data from chemical analysis of environmental samples. Utilization of this facility needs to be based upon the needs of the client, and the ultimate use to which the data may be put. It is more costly, but allows a complete support of QA/QC methodology employing method blanks, matrix spikes, matrix spike duplicates, trip and reagent blanks, and comparison with external standards which are part of the EPA Contract Laboratory Program. A copy of the PNEL QA/QC Manual is available upon your request.

TOLS011924

BZTO104(e)048757

ATTACHMENT 3 - Consolidated Change Order Request: Project Inception to Date

TOLS011925

BZTO104(e)048758

ECOVA CHANGE ORDER

CLIENT: TIME OIL COMPANY

PROJECT: NORTHWEST TERMINAL REMEDIATION - J.N. 821401

LOCATION: PORTLAND, OREGON

CHANGE ORDER NO.	001
DATE	09/12/89
ORIGINATOR	ROD CARR
PROJECT NO.	821401
COST CODE	

DESCRIPTION OF CHANGE

INCREASE IN SCOPE. ADDITIONAL WORK TO BE PERFORMED. EXTRA SERVICES AS REQUIRED BY VERBAL REQUEST OF TIME OIL'S FRED PROBY. ADJUSTMENT OF SCHEDULE DUE TO DELAYS BEYOND CONTROL OF ECOVA.

CAUSE OF CHANGE

DIFFERING SITE CONDITIONS FROM THOSE ANTICIPATED BY BOTH PARTIES UPON ENTERING INTO THE CONTRACT. PERFORMANCE OF OUT OF SCOPE SERVICES ON VERBAL ORDER OF TIME OIL COMPANY.

SCHEDULE IMPACT

Delay beyond control of ECOVA for original power drop to site, five weeks; delay for discovery of solvents and unexpected contaminants, 3 weeks; delay in obtaining clean soil for backfilling, 5 weeks. Request for no cost extension of period of Period of performance to be extended to September 9, 1990 at no cost.

QUALITY IMPACT

NONE

COST IMPACT

Reference Elevation Measurements on Wells	$ 330.00 ✓
Extra Cost of Gasoline Compatible Liner on Tank 38002	670.00 ✓
Eight (8) additional soil samples for PCB Analysis outside Crosby & Overton dike wall	700.00 ✓
Contamination Characterization of Location Where Clean Fill Soil Was To Be Obtained for filling contamination excavation Sampling for Contaminated Soils (Attachment A)	3,960.00 ✓
Additional Solvents Encountered in PCP Contaminated Soils (Attachment B)	
Add'l Time to Excavate Soil	~~4,240.00~~ ✓
Sampling	930.00 ✓
Sample Analysis	3,620.00 ✓
Changes to Health and Safety Plan	360.00 ✓

only if QA/QC is provided

TOLS011926

Pumping and Repumping of Contaminated Water between tanks (Attachment C) ~~2,000.00~~ ?

One (1) GC Analysis of Sump "Slop" Tank Water (Attachment C)..... 110.00 ✓

Ground Water Study ..... 1,500.00 ✓

Sample Analysis Charges for Groundwater Study (Attachment D)..... ~~1,800.00~~ 300.00 ✓

Procurement, review and support of Time Oil with respect to Oregon Department of Environmental Quality ..... 360.00 ✓

Dioxin Analysis (1 analysis @ $1,800 per analysis)..... 1,800.00

$22,380.00

Less Power Doop Paid by Time 4763

PROPOSED:

$22,380.00 R.L. Carr for Dave Edwards

Amount ECOVA Project Manager Date

Roderick A. Carr 9/12/89

ECOVA Contract Administrator Date

ACCEPTED:

TOLS011927

$ _____

Amount Client Project Manager Date

ATTACHMENT A

COST ESTIMATES FOR CHANGE ORDERS

Disposal Pit Clean Up

Summary:

The area where we were supposed to obtain clean soil to fill in the excavated PCP area, turned out to be contaminated with solvents and other "mineral" spirits.

Upon discovery of contaminants, work on the pit was halted, and several holes were dug with a back hoe so that samples could be obtained for analysis.

Cost Break Down:

Taking Samples

Back Hoe Rental	3 days x 8 hrs x $50.00/hr	$1200.00
M. Anderson	3 days x 8 hrs x $75.00/hr	1800.00
Operator	3 days x 8 hrs x $40.00/hr	960.00
Additional time necessary to collect clean soil		$3,960.00
Two Trucks	4 days x $100/day	800.00
Loader	4 days x $180/day	720.00
Two Operators	4 days x 11 hours x 30.00	2640.00
		$8120.00

Rod

Rod

analyses ?? Change Order Rod

mark/Kevin

in scope ?? Contract

NO RAC

TOLS011928

ATTACHMENT B

Penta - $90/yd.

KBs / min / carrier for penta

3440 cu. yd.

Solvents Discovered in PCP Contaminated Soils

Summary: Need log books. Excessive yardage.

During excavation of the area south of the PCP warehouse, where it was believed that only PCP's would be found, solvents were discovered.

Cost Break Down:

Added time to excavate soil

Two Operators	4 days x 11 hours x $40.00/hr	$3520.00
Loader	4 days x $180.00	720.00
		$ 4240.00

?

Taking Soil Samples

2 Operators	1 day x 11 hours x $40.00/hr	880.00
2 boats / ? 1 boat*	1 day x $50.00/day	50.00
		$ 930.00

2 Soil Sampling

Sample Analysis

4 samples GC/MS/Library Search $700.00 per sample	$2800.00
Kodak KB-3 and B-11 samples	$820.00
	$ 3,620.00

n

OK Administrative

MSDS

Changes to Health and Safety Plan $360.00

~~Elimination of Contaminated Water in Pit~~

~~2 Operators 25 hours x $40.00/hour..... $2000.00~~

~~Testing of Sample (at Tank) ? ..... $110.00~~ ?

H_2O (Results -

~~Re-Pumping to new tank because first tank leaked~~

~~2 Operators 5 hours x $40.00/hours..... $400.00~~

NO RAC

$11,660.00

* The boat was required because the excavated pit had filled with water, and obtaining samples from the side walls was not possible otherwise.

TOLS011929

BZTO104(e)048762

ATTACHMENT C

Sump "Slop" Tank Water OK

Summary:

Time Oil had a tank near the water front which contained 100,000 gallons of water contaminated with diesel, gasoline and other hydrocarbons. We were asked to pump this water over to a storage tank next to our site, and later to clean this mixture.

Cost Break Down:

Pumping solution to new tank

2 Operators 25 hours x $40.00/hour $2000.00

Sample Analysis

GC analysis $110.00

$2110.00

Dan/Gary

What happened — long time?

Log

TOLS011930

ATTACHMENT D

Ground Water Study

Summary: Oct. 18th, 1988 Letter -

The original contract required that Ecova perform a pump test on the groundwater system and that the water be tested for PCP. Later, a second pump test was requested, and upon discovery of solvents in the soil, the water samples were tested for solvents.

Cost Break Down: 1st Shallow

Additional Pump Test 2nd Test - Deep zone ... $1500.00 ? need Breakdown

Solvent Analysis HPLC 6 samples x $50.00/sample $300.00

2m

Total $1800.00

need lab report.

Change Order:

Power Drop

TOLS011931

BZTO104(e)048764

DISTRIBUTION: **Important 1997 Plan Information Attached**

Pat Hassey
Mary Ellen Bowers
John Piowaty
Larry Mueller
Fred Siegel
Ron Machetta
Bob Wetherbee
Greg Koch
Zelpha Clatfelter
Jeff Thompson
Tim Wilkinson
Leon Hensley
Kurt Landsberg
Doug O'Leary
Larry Nissen
Frank Bellisario
John Weaver
David Bennett
Don Nelson
John Harrington
Bob Marino
Mike Maloney

CC:
L.A. Orr
M.S. Hoots
N.J. Drayton
C.A. Pribyl
P.A. Tomlinson
L.M. Glynn
L.F. Castro
R.G. Herman

Contents:

1) REVISED (second time) AGENDA for Sept 12th meeting
2) REVISED meeting attendee list. I forgot to list Distribution attendees for Aerospace Plate, Aerospace Sheet and Marine market segments

EPA Reg. No.	PRODUCT
453-182	RESTRICTED Tritox Preservative Paste
453-182	RESTRICTED Pole-Hugger
453-190	Pole-Aid No. 3 - CANCELLED W/EPA 6/13/86
453-196	Woodtox Pre-Prime Concentrate - CANCELLED W/EPA 3/14/86
453-202	Woodtox Pre-Prime Ready To Use - CANCELLED W/EPA 3/14/86
453-214	Composition A Wood Preservative Water Repellent - CANCELLED W/EPA 3/14/86
453-215	Woodtox 140 Concentrate - CANCELLED W/EPA 3/14/86
453-216	Woodtox 140 Ready To Use - CANCELLED W/EPA 3/14/86
453-219	Penta Wood Preservative 1-10 Concentrate - CANCELLED W/EPA 3/14/86
453-222	Wood Preservative Surface Sealing Compound - CANCELLED W/EPA 3/14/86
453-229	Liquid Noxtane 120 - CANCELLED W/EPA 3/14/86
453-240	Liquid Noxtane SS - CANCELLED W/EPA 3/14/86
453-245	SUPER DIPRITE WOOD PRESERVATIVE - CANCELLED W/EPA 3/14/86
453-251	WOOD PRESERVATIVE SURFACE SEALING COMPOUND - CANCELLED W/EPA
	WPR00027453-254Liquid Noxtane 1 - CANCELLED W/EPA 3/14/86
453-255	Lumbrella 23 WaterRepellent Protective Coating - CANCELLED W/EPA 3/14/86
453-256	Penta Stain 509 Amber - CANCELLED W/EPA 3/14/86
453-258	Lubrella 9 Red Brown Water Repellent Wood Preservative - CANCELLED W/EPA 3/14/86
453-259	Pole-Life Preservative Paste TF
453-260	Timbertreat 95
453-261	Liquid Noxtane SS1 - CANCELLED W/EPA 3/14/86
453-262	Woodtox S Concentrate - CANCELLED W/EPA 3/14/86
453-264	Timbertox 7½% Wood Preservative - CANCELLED W/EPA 3/14/86
453-265	Presstreat-T Wood Preservative - CANCELLED W/EPA 3/14/86
453-266	Penta Stain Base Concentrate - CANCELLED W/EPA

TOLS011932

To _____ Date _____

Update Storage & Disposal

"Subtitle C"

"Puncture"

"grain" left Column.

duff TRUCK LINE, INC. SERVICE & PEOPLE

TOLS011933

BZTO104(e)048767

WOODTOX PRE-PRIME READY TO USE

CONCENTRATE

TOLS011934

BZTO104(e)048768

WOODTOX PRE-PRIME READY TO USE

CONCENTRATE

TOLS011935

BZTO104(e)048769

**5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

11672-2

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%

BZTO104(e)048770

TOLS011936

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.20%
INERT INGREDIENTS	10.81%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

This product is toxic to fish, wildlife and domestic animals. Keep out of lakes, streams and ponds. Keep containers closed when not in use. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

BZTO104(e)048771

TOLS011937

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.20%
INERT INGREDIENTS	10.81%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

This product is toxic to fish, wildlife and domestic animals. Keep out of lakes, streams and ponds. Keep containers closed when not in use. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

BZTO104(e)048772

TOLS011938

**5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

11672-2

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%

BZTO104(e)048773

TOLS011939

Woodtox Pre Brush RTU

Woodtox RTU

**5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

11672-2

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%

BZTO104(e)048774

TOLS011940

READY - TO - USE

WOODTOX PRE-PRIME

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF
WOOD TREATING CHEMICALS
DEPARTMENT OF **KOPPERS** COMPANY, INC.
5137 SOUTHWEST AVENUE • ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN.
See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

EPA
USDA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	85.10%
INERT INGREDIENTS	9.91%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

DO NOT STORE NEAR OPEN FLAME

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant. causes hyperthemia. Treat symptomatically.

This product is toxic to fish and wildlife. Keep out of lakes, streams, and ponds.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

~~Apply this product only as specified on this label.~~

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to accept the terms of this notice which may not be varied by any verbal or written agreement.

11672-1

BZTO104(e)048775

TOLS011941

KOPPERS

WOODTOX PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF
WOOD TREATING CHEMICALS DEPT.
KOPPERS COMPANY, INC.
5137 SOUTHWEST AVENUE, ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

EPA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47 %
Other Chlorophenols & Related Compounds*	.52 %
Mineral Spirits	84.55 %
INERT INGREDIENTS	10.46 %
Total	100.00 %

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a brown oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

Do not use, pour, spill or store near heat or open flame.

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthemia. Treat symptomatically.

This product is toxic to fish, wildlife and domestic animals. Keep out of lakes, streams and ponds. Keep containers closed when not in use. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

Apply this product only as specified on this label.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

11672-2

BZTO104(e)048776

TOLS011942

KOPPERS

WOODTOX PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

™ TRADEMARK OF
WOOD TREATING CHEMICALS DEPT.
KOPPERS COMPANY, INC.
5137 SOUTHWEST AVENUE, ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

EPA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a brown oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

Do not use, pour, spill or store near heat or open flame.

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthemia. Treat symptomatically.

This product is toxic to fish, wildlife and domestic animals. Keep out of lakes, streams and ponds. Keep containers closed when not in use. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

Apply this product only as specified on this label.

LIMIT OF WARRANTY AND LIABILITY

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11672-2

BZT0104(e)048777

TOLS011943

READY - TO - USE

WOODTOX PRE-PRIME

WATER REPELLENT WOOD PRESERVATIVE --

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF

WOOD TREATING CHEMICALS

DEPARTMENT OF **KOPPERS** COMPANY, INC.

5137 SOUTHWEST AVENUE • ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN.

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

USDA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	85.10%
INERT INGREDIENTS	9.91%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

DO NOT STORE NEAR OPEN FLAME

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthemia. Treat symptomatically.

This product is toxic to fish and wildlife. Keep out of lakes, streams, and ponds.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

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LIMIT OF WARRANTY AND LIABILITY

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11672-1

BZTO104(e)048778

TOLS011944

READY - TO - USE

WOODTOX® PRE-PRIME

WATER REPELLENT WOOD PRESERVATIVE --

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF
WOOD TREATING CHEMICALS
DEPARTMENT OF **KOPPERS** COMPANY, INC.
5137 SOUTHWEST AVENUE • ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN.
See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

USDA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	85.10%
INERT INGREDIENTS	9.91%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect *maximum penetration into the wood and heavy absorption* especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash *thoroughly after handling.*

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

DO NOT STORE NEAR OPEN FLAME

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, *causes hyperthemia. Treat symptomatically.*

This product is toxic to fish and wildlife. Keep out of lakes, streams, and ponds.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

Apply this product only as specified on this label.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the *manner of its use or application.* NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

11672-1

BZTO104(e)048779

TOLS011946

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder-post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

DIRECTIONS FOR USE

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the Woodtox solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Do not paint or varnish wood that has been treated with this product until the excess petroleum solvents have volatilized from the wood.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

NOTICE

Neither the manufacturer nor the seller makes any representation or warranty, express or implied, concerning this material, except that it is of the manufacturer's standard quality. Neither shall be held responsible in any manner for any personal injury or property damage or other type of loss resulting from the handling, storage or use of this material. The buyer accepts and uses this material on these conditions.

USDA Reg. No.

NET CONTENTS **GALLONS**

READY - TO - USE

WOODTOX

PRE-PRIME

Penta, water repellent preservative specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards and Federal Specification TT-W-572.

DILUTION: DO NOT dilute. This is a ready-to-use solution.

APPLICATION: See Manufacturer's wood treating specifications and recommendations based on use requirements of the treated wood, and Manufacturer's Product Information Data Sheet No. 200.

CAUTION: KEEP OUT OF REACH OF CHILDREN

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.50%
Other Chlorophenols & Related Compounds*	0.50%
Mineral Spirits	87.25%
INERT INGREDIENTS:	7.75%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

Warning: Harmful if swallowed or absorbed through skin! Causes skin irritation! Do not breathe vapor or spray mist. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Do not store or use near open flames.

Avoid contamination of feed and food stuffs.

Toxic to fish and wildlife. Do not contaminate water by cleaning equipment or disposal of waste containers.

MANUFACTURED BY

WOOD TREATING CHEMICALS CO.

5137 SOUTHWEST AVE. • ST. LOUIS, MO. 63110

This product is effective for application to wood for the control of termites, powder-post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore thoroughness of treatment is essential to good control.

DIRECTIONS FOR USE

TERMITE CONTROL. For protection of new wood prior to installation, see instructions on other panel this label. For application to wood in place to protect against subterranean or drywood termite damage, apply the solution to run-off, allow to soak in, and make at least one more application. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BETTLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Because special precautions must be taken for application to infested floors, furniture and the like, contact the manufacturer for information on these types of uses.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the treated wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

POULTRY RED MITES AND TICKS. Before applying this product, clean the poultry house thoroughly, including the floor, roosts, and nests. After the interior has been allowed to dry out, apply this product by brush, mop, swab, or spray, giving a heavy soak treatment to all surfaces, and particularly cracks and joints. For light infestation, treatment can be eliminated for the ceilings and walls a foot or so above the roosts.

After treatment, ventilate and allow to dry for a minimum of 48 hours.

9-1-66

BZTO104(e)048780

TOLS011947

March 20, 1967

Mr. Harold G. Alford
U. S. Department of Agriculture
Agricultural Research Service
Pesticides Regulation Division
Washington, D. C. 20250

Re: Woodtox Pre-Prime RTU #453-X your letter March 14, 1967

Dear Mr. Alford:

We are resubmitting five label copy on the above for acceptance.

We have made the suggested corrections as in your above dated letter and ask that you refer to our letter of January 13, 1967 in which we enclosed five copies of bulletin #1049. Please let us know if you require additional copies.

Sincerely yours,

Ray Northrop
Products Manager

RN:mt

TOLS011949

BZTO104(e)048781

November 4, 1966

Dr. G. M. Downard, Head
Registration Section
U. S. Department of Agriculture
Agricultural Research Service
Pesticides Regulation Division
Washington, D. C. 20250

Re: Woodtox Pre-Prime Concentrate #453-X
Woodtox Pre-Prime Ready-To-Use #453-X

Dear Dr. Downard:

We are submitting five labels each on the above new products for acceptance and registration.

We also enclose application form showing breakdown of inert ingredients.

We attach product information data on these two new products.

Sincerely yours,

Ray Northrop,
Products Manager

RN:mt

TOLS011950

BZTO104(e)048782

WOODTOX PRE-PRIME RTU

Grant Ingredients

	%
* Inerts from Tech. Pentachlorophenol	0.20
* Santolene C (corrosion inhibitor)	0.10
** Ucon 144 Solvent	4.00
*** Shellwax 100	0.45
**** Filtrez PE75 Resin	3.00
	7.75

* Monsanto Company
** Union Carbide Chemical Co.
*** Shell Oil Co.
**** Filtered Rosin Products Co.

TOLS011951

BZTO104(e)048783

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder-post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

DIRECTIONS FOR USE

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the Woodtox solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Do not paint or varnish wood that has been treated with this product until the excess petroleum solvents have volatilized from the wood.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

NOTICE

Neither the manufacturer nor the seller makes any representation or warranty, express or implied, concerning this material, except that it is of the manufacturer's standard quality. Neither shall be held responsible in any manner for any personal injury or property damage or other type of loss resulting from the handling, storage or use of this material. The buyer accepts and uses this material on these conditions.

USDA Reg. No.

BZTO104(e)048784

READY - TO - USE

NET CONTENTS **GALLONS**

WOODTOX PRE-PRIME

Penta, water repellent preservative specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards and Federal Specification TT-W-572.

DILUTION: DO NOT dilute. This is a ready-to-use solution.

APPLICATION: See Manufacturer's wood treating specifications and recommendations based on use requirements of the treated wood, and Manufacturer's Product Information Data Sheet No. **200.**

CAUTION: KEEP OUT OF REACH OF CHILDREN

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.50%
Other Chlorophenols & Related Compounds*	0.50%
Mineral Spirits	87.25%
INERT INGREDIENTS:	7.75%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

Warning: Harmful if swallowed or absorbed through skin! Causes skin irritation! Do not breathe vapor or spray mist. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Do not store or use near open flames.

Avoid contamination of feed and food stuffs.

MANUFACTURED BY

WOOD TREATING CHEMICALS CO.

5137 SOUTHWEST AVE. • ST. LOUIS, MO. 63110

This product is effective for application to wood for the control of termites, powder-post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore thoroughness of treatment is essential to good control.

DIRECTIONS FOR USE

TERMITE CONTROL. For protection of new wood prior to installation, see instructions on other panel this label. For application to wood in place to protect against subterranean or drywood termite damage, apply the solution to run-off, allow to soak in, and make at least one more application. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BETTLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Because special precautions must be taken for application to infested floors, furniture and the like, contact the manufacturer for information on these types of uses.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the treated wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

POULTRY RED MITES AND TICKS. Before applying this product, clean the poultry house thoroughly, including the floor, roosts, and nests. After the interior has been allowed to dry out, apply this product by brush, mop, swab, or spray, giving a heavy soak treatment to all surfaces, and particularly cracks and joints. For light infestation, treatment can be eliminated for the ceilings and walls a foot or so above the roosts.

After treatment, ventilate and allow to dry for a minimum of 48 hours.

9-1-66

TOLS011952

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION

NOTICE OF REGISTRATION UNDER THE FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT

REGISTRATION NO.
453-202

DATE OF ISSUANCE
May 22, 1967

NAME OF ECONOMIC POISON
WOODTOX PRE-PRIME

NAME AND ADDRESS OF REGISTRANT

Wood Treating Chemicals Company
5137 Southwest Avenue
St. Louis, Missouri 63110

Attention: Mr. R. Northrop

RECEIVED
MAY 29 1967
WOOD TREATING
ST. LOUIS

NOTE: Changes in labeling or formula differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Pesticides Regulation Division prior to use of the label in interstate commerce. In any correspondence on this product always refer to the above registration number.

On the basis of the information furnished by the registrant, the above named economic poison is hereby registered under Section 4 of the Federal Insecticide, Fungicide, and Rodenticide Act.

A copy of the labeling accepted in connection with this registration is returned herewith.

Registration is in no way to be construed as an endorsement or approval of this product by this Department. In order to protect the public, the Secretary, on his own motion, may at any time cancel the registration of an economic poison in accordance with Section 4 (c) of the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by a trademark held by others.

The following paragraphs are applicable only when checked:

[x] To expedite registration, this notice is being issued on the basis of the draft submitted with the application. Certain defects, given below, have been noted. These corrections must be incorporated when the printed labeling is prepared. Five copies of the printed labeling must be submitted to complete the file on this product.

[ ] The registration for this product is being issued with the understanding that certain defects in the labeling which are noted below will be corrected as soon as possible. Objection is not raised to the use of the present labeling for a reasonable period of time while fully corrected labeling is being prepared. Five copies of the corrected labeling must be submitted.

[x] 1. Note that the assigned USDA Reg. No. must appear on the finished label.

[ ] Attachment is applicable.

SIGNATURE

Harold D. Alford

Assistant Director
for Registration

PR FORM 9-225
OCT. 1964

EXISTING STOCK OF PR FORM 9-225, MAR. 1962, WILL BE USED UNTIL EXHAUSTED

TOLS011953

BZTO104(e)048785

C.C. MR. DOUGLAS D CAMPT

WOOD TREATING
CHEMICALS CO.

5137 Southwest Avenue / St. Louis, Missouri 63110 / 314 PR 2-2200

JANUARY 18, 1971

EDWIN COOPER, INC.
1700 SOUTH SECOND STREET
ST. LOUIS, MISSOURI

GENTLEMEN:

WE PURCHASE "SANTOLENE C" FROM YOU AND USE IN FORMULATING ONE OF OUR LIQUID WOOD PRESERVATIVES.

A COMPLETE BREAKDOWN OF INERT INGREDIENTS MUST NOW BE FURNISHED TO THE ENVIRONMENTAL PROTECTION AGENCY IN ORDER TO REGISTER ECONOMIC POISON LABELS. THE SANTOLENE C WE USE IS AN INERT INGREDIENT AND THE E P A HAS REQUESTED THAT WE HAVE YOU FILL OUT AND RETURN THE ATTACHED FORM PR-9-196 FOR THEIR CONFIDENTIAL RECORDS.

WE APPRECIATE YOUR COOPERATION IN THIS MATTER.

YOURS VERY TRULY,

HAROLD P. STRUESSEL, MANAGER

HPS/MS
ENC.

Per phone
mailed to
EPA
1/21/71

TOLS011954

BZTO104(e)048786

ENVIRONMENTAL PROTECTION AGENCY

Washington, D. C. 20250

Pesticides Regulation Division

JAN 14 1971

Mr. G. B. Mills
Wood Treating Chemicals Company
5137 Southwest Avenue
St. Louis, Missouri 63110

Dear Mr. Mills:

Subject: WOODTOX PRE-PRIME

This will acknowledge your letter of June 4, 1970, regarding the subject product.

As stated in our letters of January 13 and June 2, 1970, the information submitted relative to the composition of "SANTOLENE C" is not sufficient. It is the responsibility of the registrant to provide complete information on the composition of products. As provided in the statute this information is considered confidential and is revealed only in accordance with the Act.

Unless the requested information is made available either by you or your supplier, it will be necessary to take action to cancel this registration.

Sincerely,

Douglas D. Campt
Assistant Chief
Registration Branch

TOLS011955

BZTO104(e)048787

CHEMTECH

7882 FOLK AVENUE / ST. LOUIS, MO. 63143 / 314-645-4100

May I please have the
Mail Address of

Wm. Cooper

the firm that supplies us
with Santolene C. ?

Thanks Edwin Cooper
1700 So 2nd St.
St Louis MO.

TOLS011956

BZTO104(e)048788

cc: R. M. Morriss, Jr.
Ray Northrop
R. F. Simmons

June 4, 1970

Attn: 9-C 1

Mr. H. G. Alford
Assistant Director for Registration
USDA Agricultural Research Service
Pesticides Regulation Division
Washington, D. C. 20250

Subject: Woodtox Pre-Prime
USDA Reg. No. 453-202

Dear Mr. Alford:

We refer to your letter of June 2, with respect to the composition of Santolene C. The manufacturer has submitted the following information:

> "Santolene C is a 50% solution in a petroleum hydrocarbon, kerosene essentially, of a polymerized fatty acid, with a controlled minor amount of a phosphoric acid ester."

We realize that this description may not be detailed enough for your requirement of complete chemical composition; however, Santolene C additive is a proprietary composition under which Monsanto Company is merely a licensee. The license to Monsanto Company does not afford the right to disclose detailed information on the chemical composition. Monsanto has received many requests in recent years from governmental agencies and customers for a chemical description of Santolene C additive. In each case, the licensor has refused permission for Monsanto to disclose in any greater detail than that already provided to USDA.

Monsanto has reviewed your present request on Santolene C with the licensor. It is the licensor's contention that a disclosure of the exact composition of Santolene C additive would contravene the best interests of the licensor in regard to a highly proprietary product.

TOLS011957

BZTO104(e)048789

We certainly hope that this information will be sufficient for your requirements.

Yours very truly,

G. B. Mills, Manager
Technical Department

GBM/lr

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

Reply to
Attn of: 9-C 1

Wood Treating Chemicals Co.
5137 Southwest Avenue
St. Louis, Missouri 63110

JUN 2 1970

Gentlemen:

Subject : WOODTOX PRE-PRIME
USDA Reg. No. 453-202

A review of our records for your subject product reveals that we do not have the complete composition of the following inert ingredient.

"Santolene C"

We must have a statement of its complete chemical composition. List the precise chemical name and percentage by weight of each separate compound used in its formulation. If you are unable to furnish this information, ask your basic supplier to submit it to us. Refer to our enclosed PR Notice 67-3.

This information must be submitted to support continued registration of your product.

Sincerely,

Harold G. Alford

Harold G. Alford
Assistant Director
for Registration

Enclosure
PR Notice 67-3

ARS:PR:CLFleck:sb 5-27-70

TOLS011959

BZTO104(e)048791

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Pesticides Regulation Division
Washington, D.C. 20250

PR NOTICE 67-3

July 27, 1967

NOTICE TO MANUFACTURERS, FORMULATORS, DISTRIBUTORS, AND REGISTRANTS OF ECONOMIC POISONS

Attention: Person responsible for Federal Registration of Economic Poisons

Applications for registration of economic poisons under the Federal Insecticide, Fungicide, and Rodenticide Act must be supported by complete information on the formula of the proposed product as provided in Section 4.b. of the Act. This information is necessary to properly evaluate the product and its proposed use.

Processing and review of applications are facilitated if five (5) copies of a statement listing the correct name and percentage by weight of each active and each inert ingredinet is submitted with each application. The statement of formula submitted in support of registration for a given product is not revealed to anyone. It cannot be applied to support a customer's (formulator) application for subsequent registration without a written authorization from the registrant.

If necessary information on the formula is not available to the applicant (formulator or packer), he should:

A. Obtain the necessary information from the basic supplier and submit five (5) copies of the statement with the application for registration, or

B. Request the basic supplier to furnish the necessary information to the Division along with a statement specifically authorizing the extent of use of such information to support separate registration for the applicant. The statement from the basic supplier must clearly identify the applicant's product to which it applies.

Harry M. Hays, Ph.D.
Director

TOLS011960

BZTO104(e)048792

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

Wood Treating Chemicals Co.
5137 Southwest Avenue
St. Louis, Missouri 63110

13 JAN 1970

Gentlemen:

Subject: WOODTOX PRE-PRIME
USDA Reg. No. 453-202
Your letters of July 29, October 27, and November 6, 1969

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act is acceptable and a stamped copy is enclosed for your records.

The information in Santolene C is not sufficient for us to identify the chemical composition. We need to know which fatty acid is present, which phosphoric acid ester is present, and the percentage of each.

Sincerely,

Harold D. Alford

Harold G. Alford
Assistant Director
for Registration

Enclosure

TOLS011961

BZTO104(e)048793

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder-post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

DIRECTIONS FOR USE

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the Woodtox solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Do not paint or varnish wood that has been treated with this product until the excess petroleum solvents have volatilized from the wood.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

WARNING

Toxic to fish and wildlife.

Do not contaminate water by cleaning equipment or disposal of waste containers.

USDA Reg. No. 453-202 7-20-68

BZTO104(e)048794

NET CONTENTS GALLONS

WOODTOX

PRE-PRIME

Penta, water repellent preservative specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards and Federal Specification TT-W-572.

DILUTION: DO NOT dilute. This is a ready-to-use solution.

APPLICATION: See Manufacturer's wood treating specifications and recommendations based on use requirements of the treated wood, and Manufacturer's Product Information Data Sheet No. 200.

CAUTION: KEEP OUT OF REACH OF CHILDREN
See side panel for other warnings.

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.50%
Other Chlorophenols & Related Compounds*	0.50%
Mineral Spirits	87.25%
INERT INGREDIENTS:	7.75%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

Warning: Harmful if swallowed or absorbed through skin! Causes skin irritation! Do not breathe vapor or spray mist. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Do not store or use near open flames.

Avoid contamination of feed and food stuffs.

TOLS011962

MANUFACTURED BY

WOOD TREATING CHEMICALS CO.

5137 SOUTHWEST AVE. • ST. LOUIS, MO. 63110

This product is effective for application to wood for the control of termites, powder-post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore thoroughness of treatment is essential to good control.

DIRECTIONS FOR USE

TERMITE CONTROL. For protection of new wood prior to installation, see instructions on other panel this label. For application to wood in place to protect against subterranean or drywood termite damage, apply the solution to run-off, allow to soak in, and make at least one more application. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Because special precautions must be taken for application to infested floors, furniture and the like, contact the manufacturer for information on these types of uses.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the treated wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

Wood Treating Chemicals Co. warrants that this material conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products, the manner of its use or application, or the presence of other products or materials in or on the soil or crop. Wood Treating makes no other express or implied warranty of fitness or merchantability. The exclusive remedy of the user or buyer, and the limit of the liability of Wood Treating Chemicals Co. or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

ACCEPTED

JAN9 1970

UNDER THE FEDERAL INSECTICIDE FUNGICIDE AND RODENTICIDE ACT FOR ECONOMIC POISON REGISTERED UNDER NO. 453-243 SUBJECT TO AT...

BZTO104(e)048795

TOLS011962A

cc: R. M. Morriss, Jr.
G. B. Mills
W. H. Duffey

November 6, 1969

Mr. Harold G. Alford
Assistant Director for Registration
USDA Agricultural Research Service
Pesticides Regulation Division
Washington, D. C. 20250

Subject: Woodtox Pre-Prime
USDA Reg. No. 453-202

Dear Mr. Alford:

This will supplement my letter of October 27th, in connection with the above subject. We are passing along to you the information received from Monsanto Company:

"Santolene C is a 50% solution in a petroleum hydrocarbon, kerosene essentially, of a polymerized fatty acid, with a controlled minor amount of a phosphoric acid ester."

We trust that this information will enable you to process our application for registration.

Yours very truly,

Ray Northrop
Products Manager

RN/lr

TOLS011963

BZTO104(e)048796

Monsanto

FROM (NAME & LOCATION) Patent Department - 1700 South Second Street (5171)

DATE November 3, 1969

CC E. P. Grattan - EGRAT
George Mills - Wood Treating

SUBJECT Disclosure of SANTOLENE C to USDA

REFERENCE

TO Ray Northrup
Wood Treating Chemicals Co.

This is in connection with the request by the U. S. Department of Agriculture for a description of the chemical composition of SANTOLENE C. Although the USDA request was directed to Wood Treating, the Petroleum Additives group of the Organic Division has experienced many requests of this type in the past. SANTOLENE C is a rust inhibitor widely employed as an additive in hydrocarbon fuels.

As I mentioned to you on the phone Friday, the active component of SANTOLENE C was developed and patented by a company other than Monsanto. That company, which we should not identify by name to USDA, still considers the formulation of SANTOLENE C as proprietary information. Accordingly, Monsanto or Wood Treating is permitted to disclose no more than the following information on SANTOLENE C.

> "SANTOLENE C is a 50% solution in a petroleum hydrocarbon, kerosene essentially, of a polymerized fatty acid, with a controlled minor amount of a phosphoric acid ester".

You have indicated that a description such as quoted above would probably be sufficient for USDA purposes. Please advise if we can be of further help in this matter.

William H. Duffey

cho

TOLS011964

IN-10 REV. 11-65

BZTO104(e)048797

cc: R. M. Morriss, Jr.
G. B. Mills
Ray Vogelgesang

October 27, 1969

Mr. Harold G. Alford
Assistant Director for Registration
USDA Agricultural Research Service
Pesticides Regulation Division
Washington, D. C. 20250

Subject: Woodtox Pre-Prime
USDA Reg. No. 453-202

Dear Mr. Alford:

In reply to your letter of October 17, 1969, asking that we submit information as to the chemical identity of the organic acid in the Santolene C (one of the inert ingredients used in the above product), we have requested Monsanto Company to furnish this information directly to you.

We trust that the information to be furnished by them will be satisfactory.

Sincerely yours,

Ray Northrop
Products Manager

RN/lr

TOLS011965

BZTO104(e)048798

L. B. Mills

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

27 OCT 1969

Wood Treating Chemicals Co.
5137 Southwest Avenue
St. Louis, Missouri 63110

Gentlemen:

Subject: WOODTOX PRE-PRIME
USDA Reg. No. 453-202

This is in reply to your letter dated September 9, 1969.

Submit information as to the chemical identity of the organic acid.

Sincerely,

Harold G. Alford

Harold G. Alford
Assistant Director
for Registration

"Corrosion inhibitor consisting of an organic acid with a trace of phosphorus".

TOLS011966

Loretta:
Please write Alford to the effect that the only information that we have or can get from Monsanto is that furnished in our letter of Sept 9, 1969.

BZTO104(e)048799

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

17 OCT 1969

Wood Treating Chemicals Co.
5137 Southwest Avenue
St. Louis, Missouri 63110

Gentlemen:

Subject: WOODTOX PRE-PRIME
USDA Reg. No. 453-202

This is in reply to your letter dated September 9, 1969.

Submit information as to the chemical identity of the organic acid.

Sincerely,

Harold D. Alford

Harold G. Alford
Assistant Director
for Registration

TOLS011967

BZTO104(e)048800

cc: R. M. Morriss, Jr.
G. B. Mills

September 9, 1969

Mr. H. G. Alford
Assistant Director for Registration
USDA Agricultural Research Service
Pesticides Regulation Division
Washington, D. C. 20250

Subject: Woodtox Pre-Prime
USDA Reg. 453-202
Your letter Sept. 4, 1969

Dear Mr. Alford:

The product information asked for under paragraph 1 of your letter is as follows:

Santolene C - Santolene C is produced by the Monsanto Company, Saint Louis, Missouri. It is a corrosion inhibitor consisting of an organic acid with a trace of phosphorous.

Ucon 144 Solvent - Ucon 144 is produced by Union Carbide Chemical Co., and is a polypropylene glycol.

Shellwax - Shellwax is produced by the Shell Chemicals Corporation and is a fully refined paraffin wax of 125 to 130° F. melting point.

Filtrex PE-75 Resin - Filtrex PE-75 Resin is a pentaerythritol ester of refined tall oil.

This is the entire information we have on these products at this time, and if it is not sufficient we will ask the suppliers of these various products to furnish you with additional information.

Sincerely yours,

Ray Northrop
Products Manager

RN/lr

TOLS011971

BZTO104(e)048801

(2)

SEP 1969

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

RECEIVED SEP 8 1969 WOOD TREATING ST. LOUIS

Wood Treating Chemicals Company
5137 Southwest Avenue
St. Louis, Missouri 63110

Gentlemen:

Subject: WOODTOX PRE-PRIME
USDA Reg. No. 453-202
Received July 29, 1969

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, is not acceptable for the reason given below.

* 1. Submit information as to the chemical identities of the santolene, ** ucon 144 soluent, *** shell wax and filtrez ~~DE~~ 75 Resin.
**** PE 75 Resin

Sincerely,

Harold G. Alford

Harold G. Alford
Assistant Director
for Registration

TOLS011972

* Santolene C - Monsanto Company, St Louis - ~~Composition unknown by us & will have to be furnished by Monsanto~~ a ~~corr~~ corrosion inhibitor consisting of an organic acid with a trace of phosphorous

** Ucon 144 solvent - a polypropylene glycol mfd. by Union Carbide Chem Co.

*** Shell wax - a fully refined paraffin wax of 125 to 130°F melt point.

**** Filtrez PE 75 Resin - a pentaerythritol ester of refined tall oil.

BZTO104(e)048802

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder-post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

DIRECTIONS FOR USE

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the Woodtox solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Do not paint or varnish wood that has been treated with this product until the excess petroleum solvents have volatilized from the wood.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

WARNING

Toxic to fish and wildlife.

Do not contaminate water by cleaning equipment or disposal of waste containers.

USDA Reg. No. 453-202 7-20-68

NET CONTENTS

READY - TO - USE

GALLONS

4/9/69 Changed but not submitted

WOODTOX

PRE-PRIME

Penta, water repellent preservative specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards and Federal Specification TT-W-572.

DILUTION: DO NOT dilute. This is a ready-to-use solution.

APPLICATION: See Manufacturer's wood treating specifications and recommendations based on use requirements of the treated wood, and Manufacturer's Product Information Data Sheet No. 200.

CAUTION: KEEP OUT OF REACH OF CHILDREN
See side panel for other warnings.

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.50%
Other Chlorophenols & Related Compounds*	0.50%
Mineral Spirits	87.25%
INERT INGREDIENTS:	7.75%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

Warning: Harmful if swallowed or absorbed through skin! Causes skin irritation! Do not breathe vapor or spray mist. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Do not store or use near open flames.

Avoid contamination of feed and food stuffs.

MANUFACTURED BY

WOOD TREATING CHEMICALS CO.

5137 SOUTHWEST AVE. • ST. LOUIS, MO. 63110

This product is effective for application to wood for the control of termites, powder-post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore thoroughness of treatment is essential to good control.

DIRECTIONS FOR USE

TERMITE CONTROL. For protection of new wood prior to installation, see instructions on other panel this label. For application to wood in place to protect against subterranean or drywood termite damage, apply the solution to run-off, allow to soak in, and make at least one more application. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Because special precautions must be taken for application to infested floors, furniture and the like, contact the manufacturer for information on these types of uses.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the treated wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

Wood Treating Chemicals Co. warrants that this material conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products, the manner of its use or application, or the presence of other products or materials in or on the soil or crop. Wood Treating makes no other express or implied warranty of fitness or merchantability. The exclusive remedy of the user or buyer, and the limit of the liability of Wood Treating Chemicals Co. or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

BZTO104(e)048803

TOLS011970

cc: R. M. Morriss, Jr.
G. B. Mills

September 9, 1969

Mr. H. G. Alford
Assistant Director for Registration
USDA Agricultural Research Service
Pesticides Regulation Division
Washington, D. C. 20250

Subject: Woodtox Pre-Prime
USDA Reg. 453-202
Your letter Sept. 4, 1969

Dear Mr. Alford:

The product information asked for under paragraph 1 of your letter is as follows:

Santolene C - Santolene C is produced by the Monsanto Company, Saint Louis, Missouri. It is a corrosion inhibitor consisting of an organic acid with a trace of phosphorous.

Ucon 144 Solvent - Ucon 144 is produced by Union Carbide Chemical Co., and is a polypropylene glycol.

Shellwax - Shellwax is produced by the Shell Chemicals Corporation and is a fully refined paraffin wax of 125 to 130° F. melting point.

Filtrex PE-75 Resin - Filtrex PE-75 Resin is a penta erythritol ester of refined tall oil.

This is the entire information we have on these products at this time, and if it is not sufficient we will ask the suppliers of these various products to furnish you with additional information.

Sincerely yours,

Ray Northrop ✓
Products Manager

RN/lr

TOLS011971

BZTO104(e)048804

(2)

SEP 1969

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

RECEIVED SEP 8 1969 WOOD TREATING ST. LOUIS

Wood Treating Chemicals Company
5137 Southwest Avenue
St. Louis, Missouri 63110

Gentlemen:

Subject: WOODTOX PRE-PRIME
USDA Reg. No. 453-202
Received July 29, 1969

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, is not acceptable for the reason given below.

* 1. Submit information as to the chemical identities of the santolene, ** ucon 144 soluent, *** shell wax and filtrez ~~DE~~ 75 Resin.
**** PE 75 Resin

Sincerely,

Harold G. Alford

Harold G. Alford
Assistant Director
for Registration

TOLS011972

* Santolene C - Monsanto Company, St Louis - ~~Composition unknown by us & will have to be furnished by Monsanto~~ a ~~corr~~ corrosion inhibitor consisting of an organic acid with a trace of phosphorous

** Ucon 144 solvent - a polypropylene glycol mfd. by Union Carbide Chem Co.

*** Shell wax - a fully refined paraffin wax of 125 to 130°F melt point.

**** Filtrez PE 75 Resin - a pentaerythritol ester of refined tall oil.

BZTO104(e)048805

RFS

3-1-73

So that I can get Woodtox Pre-Prime RTU + Conc "In the Mill". Could you supply me with a new formula sheet on each? Is this a certain, firm change we are talking about?

[signature]

TOLS011973

BZTO104(e)048806

~~Monsanto~~

RAPID-GRAM

TO (Please Print)	LOCATION	SUBJECT
G. B. Mills		Woodtox Pre-Prime RTU

MESSAGE	REPLY
Could you please supply me with a new label assay for Subject product based on attached new formula.	
Sandflash Pt. 2	

SENDER'S FULL NAME (Please Print)	DATE	SIGNATURE	DATE
Harold Trussell	3/6/73		
LOCATION		LOCATION	

G-1140 REV. 9-70

SENDER'S COPY

TOLS011974

BZTO104(e)048807

CONFIDENTIAL FORMULA RECORD

WOODTREATING CHEMICALS CO., 5137 Southwest Avenue — Saint Louis 10, Missouri, U. S. A.

Product WOODTOX PREPRIME RTU Lab. Book No. _____ Date MAR 3 19 73

Made for ST. LOUIS, MO. Chemist _____

Recommended and approved by _____

POUNDS	GALLONS	MATERIAL	POUNDS PER GAL.	COST PER UNIT	EXTENSION	%
5.20	0.335	PENTA	15.54	.1476	.007675	
0.60	0.080	PARAFFIN WAX 130° MP	7.5	.0746	.000448	
10.00	1.304	KB-21	7.67	.04	.004000	
84.20	12.933	MINERAL SPIRITS 360° EP	6.51	.0258	.021724	
100.00	14.652		6.825		.033847	

DILUTION: ONE TO _____ DILUENT _____ LBS. PER GAL. _____

REMARKS:

COSTS: (PER GAL, EXCEPT QT.)

	BULK	55G	5 GAL	6 X 1 G	12 X 1 QT
RMC	.231	.231	.231	.231	.058
CONT	—	.143	.200	.480	.161
LABOR	.005	.025	.082	.122	.478
OH	.015	.075	.246	.366	1.434
TOTAL MFG. COST	.251	.474	.759	1.199	2.131

1100 GAL BATCH

PENTA	391
WAX	45
KB-21	751
MN SPTS	6321
	7508 LB

MFG. INSTRUCTIONS

DISSOLVE PENTA & WAX IN KB-21 AND APPROX. HALF OF THE MINERAL SPIRITS @ 175°F WITH AGITATION. COOL HEAT AND ADD REMAINING MINERAL SPIRITS & AGITATE UNTIL HOMOGENOUS.

DISTRIBUTION: RMM Jr. ..... Regis File ..... Safe File ..... Production ..... Research

TOLS011975

BZTO104(e)048808

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

REPORT OF ANALYSIS

I.D. NUMBER: 113462

NAME AND ADDRESS OF ESTABLISHMENT *(Include ZIP code)*
Time Oil Company
12005 North Burgard Street
Portland, Oregon 97203

NAME OF OWNER, OPERATOR OR AGENT IN CHARGE
Mr. N. P. Lesh

TITLE
Vice-President

NAME OF PRODUCT
KUPPERS WOODTOX PRE-PRIME

EPA REGISTRATION NO.
453-202

BATCH OR CODE'S
WD 012 T (on file but not on tank #8005)

DATE COLLECTED
4-25-74

DATE ANALYZED
5-16-74

PRODUCER/DISTRIBUTOR'S NAME
Same as above

ESTABLISHMENT NO.

Sec. 9(a) of the Federal Insecticide, Fungicide, and Rodenticide Act *(7 U. S. C. 135-135k)* as amended by the Federal Environmental Pesticide Control Act of 1972 requires that a copy of the analysis of any sample collected in connection with the enforcement of the Act be furnished promptly to the owner, operator or agent in charge of the establishment where the sample was collected. This section of the act is quoted on the reverse of this form.

RESULTS OF ANALYSIS

Method of Analysis	Ingredient Analyzed	% Found
GLC	Pentachlorophenol	5.06%

OK

The information contained in this report should not be used in the labeling, advertising, or other promotion of the product analyzed.

▶ Additional information regarding results of analysis may be obtained from the individual listed below.

NAME AND TITLE
Donald A. Donaldson, Operations Officer

PHONE NO.
(206) 442-1090

DATE
5-17-74

ADDRESS *(Regional Office)*
Environmental Protection Agency
Region X
Pesticide Branch
1200 6th Avenue M/S 532
Seattle, Washington 98101

EPA Form 3540-5 (3-73)

ESTABLISHMENT COPY

TOLS011976

BZTO104(e)048809

ENVIRONMENTAL PROTECTION AGENCY
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

AUG 8 1972

Wood Treating Chemicals Company
Attention: Harold P. Struessel
5137 Southwest Ave.
Stl. Louis, Missouri 63110

Gentlemen:

Subject : AMENDMENTS
WOODTOX-PRE PRIME
EPA Reg. No. 453-202
Your application of July 5, 1972

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, is acceptable and a stamped copy is enclosed for your records.

Very truly yours,

TE Adamczyk RFM

T. E. Adamczyk
Chief
Fungicide-Herbicide Branch

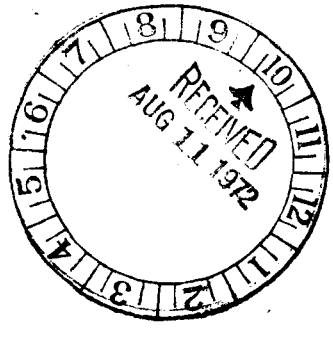
Enclosure

PR FORM 9-258
SEP 1967

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

TOLS011977

BZTO104(e)048810



TOLS011978

BZTO104(e)048811

READY - TO - USE

WOODTOX PRE-PRIME

WATER REPELLENT WOOD PRESERVATIVE --

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF

WOOD TREATING CHEMICALS

DEPARTMENT OF **KOPPERS** COMPANY, INC.

5137 SOUTHWEST AVENUE • ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN.

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

USDA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47 %
Other Chlorophenols & Related Compounds*	.52 %
Mineral Spirits	85.10 %
INERT INGREDIENTS	9.91 %
Total	100.00 %

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

DO NOT STORE NEAR OPEN FLAME

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthemia. Treat symptomatically.

This product is toxic to fish and wildlife. Keep out of lakes, streams, and ponds.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

Apply this product only as specified on this label.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

11672 1

TOLS011979

BZTO104(e)048812

ACCEPTED

August 7, 1972

UNDER THE FEDERAL INSECTICIDE FUNGICIDE AND RODENTICIDE ACT FOR ECONOMIC POISON REGISTERED UNDER NO. 453-302

RECEIVED AUG 11 1972

TOLS011980

BZTO104(e)048813

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

FORM APPROVED
BUDGET BUREAU NO. 40-R1746

APPLICATION FOR AMENDED REGISTRATION OF ECONOMIC POISONS

(Under the Federal Insecticide, Fungicide, and Rodenticide Act)

IMPORTANT: READ INSTRUCTIONS ON REVERSE

1. DATE OF APPLICATION: 7/5/72

2. NAME OF ECONOMIC POISON *(Must be same product name as on label—do not list active ingredients)*

Woodtox Pre-Prime Ready-To-Use

3. NAME & MAILING ADDRESS OF REGISTRANT *(Include Zip Code)*

Wood Treating Chemicals Dept.
Koppers Co., Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110

4. REGISTRATION NO.: 453-202

5. PROPOSED EFFECTIVE DATE OF CHANGE: 7/5/72

6. NATURE OF REVISION *(Check applicable item and give details in item 7, when required)*

- GENERAL REVISION OF LABELING ☐
- CHANGE IN FORMULATION ☐ *(Give description of exact change in item 7)*
- OTHER X *(Specify in item 7)*
- ADDITIONAL USES ADDED TO LABELING ☐ *(List new recommendations in item 7)*
- CHANGE IN PRODUCT NAME ☐ *(Give old name and new name in item 7)*

7. DETAILS REQUIRED BY REVISION CHECKED IN ITEM 6 *(Attach additional sheets if more space is needed)*

Deletion of instructions for treatment of wood in place

Up dating of our company name

Changed statement from "this product will kill fish" to "this product is toxic to fish"

☐ CONTINUED ON ATTACHMENT

8. THE FOLLOWING MUST BE SUBMITTED WITH THIS APPLICATION

- Five (5) copies of revised labeling, including any printed or graphic matter which may accompany the product. Copies must be clearly legible and identical.
- If a change in formulation is involved, five (5) copies of a statement of revised formula showing the precise name and percentage of each active and each inert ingredient. *(This information is treated confidentially)*
- When appropriate, three (3) copies of Supporting Data.

IN ANY CORRESPONDENCE ON THIS PRODUCT REFER TO REGISTRATION NO. IN ITEM 4, ABOVE.

9. SIGNATURE OF AUTHORIZED REPRESENTATIVE

Harold P. Struessel

10. TITLE: Label Coordinator

11. DATE SIGNED: 7/5/72

PR FORM 9-198
MAY 1969

EXISTING STOCK OF PR FORM 9-198 (AUG. 1968) WILL BE USED UNTIL EXHAUSTED

APPLICANT'S COPY

TOLS011981

BZTO104(e)048814

INSTRUCTIONS FOR PR FORM 9-198

ITEM

1. Applications should be submitted as far in advance as possible prior to desired registration date. The time required to process applications may vary depending on the extent of review required. Applications which require consultation with other governmental agencies will take a longer time to process.

2. The name of the economic poison shown in the application must be the same product name as that shown on the labeling submitted. Do not list the active ingredients.

3. The name of the firm or person and address shown in your application is the person or firm to whom registration will be issued. If you are acting in behalf of another party, you must submit authorization from that party to act for them in registration matters. The address given in item three will be the mailing address permanently on record unless changed by the registrant.

4. The registration number assigned must appear on the label. The number must be the same as that appearing on the notice of registration and shall be preceded by the phrase "USDA Registration Number" or the phrase "USDA Reg. No." (Refer to Sec. 362.6(F) of the Regulations)

5. Changes in the labeling or changes in the formula must be submitted in advance of the proposed effective date.

6. Nature of revision – The registrant must describe the exact changes desired and upon request must submit a description of test results to justify such changes. Minor changes in formulation may be handled as revisions of existing registrations. This might include a change in the percentage of active ingredients or a change in inert ingredients. However, any basic change in formulation such as a change in the principal active ingredients would require a separate registration as a new product with a different product name.

7. Self Explanatory.

8. Labeling – All copies of labeling must be clearly legible and identical. Photo copy of lithograph labels should be submitted. Do not send containers. Your supplier should be able to furnish photo copies of the screen print. Submit reduced photo copies of labeling for dry agricultural fertilizer, insecticide, or herbicide bags. Any label smaller than half the size of a sheet of paper 8 inches by 10 inches should be stapled to a sheet of paper 8 inches by 10 inches before attaching to application.

   Formulation – If a change in formulation is involved, five copies of a separate statement listing the correct name and percentage by weight of each active and each inert ingredient must be submitted with each application. This statement is treated confidentially. It cannot be used to support a customer's (formulator) application for subsequent registration without written authorization from the registrant. If necessary information on the formula is not available to the applicant (formulator or packer), he should: (a) Obtain the necessary information from the basic supplier and submit five copies of the statement with the application or (b) Request the basic supplier to furnish the necessary information to the Division along with a statement specifically authorizing the use of such information to support separate registration for the applicant. The statement from the basic supplier must clearly identify the applicant's product to which it applies.

ATTENTION: The submission of an application does not constitute registration. Comment or notice of registration will be sent after examination by the Pesticides Regulation Division of the information submitted.

TOLS011982

BZTO104(e)048815

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

FORM APPROVED
BUDGET BUREAU NO. 40-R1746

APPLICATION FOR [AMENDED] REGISTRATION OF ECONOMIC POISONS

(Under the Federal Insecticide, Fungicide, and Rodenticide Act)

IMPORTANT: READ INSTRUCTIONS ON REVERSE

1. DATE OF APPLICATION: 7/5/72

2. NAME OF ECONOMIC POISON *(Must be same product name as on label—do not list active ingredients)*

Woodtox Pre-Prime Ready-To-Use

3. NAME & MAILING ADDRESS OF REGISTRANT *(Include Zip Code)*

Wood Treating Chemicals Dept.
Koppers Co., Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110

4. REGISTRATION NO.: 453-202

5. PROPOSED EFFECTIVE DATE OF CHANGE: 7/5/72

6. NATURE OF REVISION *(Check applicable item and give details in item 7, when required)*

- GENERAL REVISION OF LABELING ☐
- CHANGE IN FORMULATION ☐ *(Give description of exact change in item 7)*
- OTHER ☒ *(Specify in item 7)*
- ADDITIONAL USES ADDED TO LABELING ☐ *(List new recommendations in item 7)*
- CHANGE IN PRODUCT NAME ☐ *(Give old name and new name in item 7)*

7. DETAILS REQUIRED BY REVISION CHECKED IN ITEM 6 *(Attach additional sheets if more space is needed)*

Deletion of instructions for treatment of wood in place

Up dating of our company name

Changed statement from "this product will kill fish" to "this product is toxic to fish"

☐ CONTINUED ON ATTACHMENT

8. THE FOLLOWING MUST BE SUBMITTED WITH THIS APPLICATION

- Five (5) copies of revised labeling, including any printed or graphic matter which may accompany the sale of this product. Copies must be clearly legible and identical.
- If a change in formulation is involved, five (5) copies of a statement of revised formula showing the precise name and precentage of each active and each inert ingredient. *(This information is treated confidentially)*
- When appropriate, three (3) copies of Supporting Data.

9. SIGNATURE OF AUTHORIZED REPRESENTATIVE

Harold P. Struessel

10. TITLE: Label Coordinator

11. DATE SIGNED: 7/5/72

12. RECEIVED BY USDA—PESTICIDES REGULATION DIVISION, WASHINGTON, D. C.

IN ANY CORRESPONDENCE ON THIS PRODUCT REFER TO REGISTRATION NO. IN ITEM 4. ABOVE.

PR FORM 9-198
MAY 1969

EXISTING STOCK OF PR FORM 9-198 (AUG. 1968) WILL BE USED UNTIL EXHAUSTED

TOLS011983

BZTO104(e)048816

APPLICATION FOR AMENDED REGISTRATION OF ECONOMIC POISONS

IMPORTANT: [illegible]

7/5/72

Woodtox Pre-Prime Ready-To-Use

Wood Treating Chemicals Dept.
Koppers Co., Inc.
5157 Southwest Avenue
St. Louis, Missouri 63110

453-[illegible]

7/5/72

[illegible] (Check applicable item and give details in item [illegible] required)

GENERAL REVISION OF LABELING ☐
CHANGE IN FORMULATION ☐
(Give description of exact change in item 7)
[illegible] ☐
[illegible] in item 7)

ADDITIONAL [illegible] LABELING ☐
(List new recommendations in item 7)
CHANGE IN PRODUCT NAME ☐
(Give old name and new name in item 7)

[illegible] REQUIRED BY REVISION CHECKED IN ITEM 6 (Attach additional sheets if more space is needed)

[illegible] of wood in place

[illegible] kill fish"

RECEIVED JUL 24 1972

CONTINUED ON ATTACHMENT

3. THE FOLLOWING MUST BE SUBMITTED WITH THIS APPLICATION:
- Five (5) copies of revised labeling, including any printed or graphic matter which may accompany the sale of this product. Copies must be clearly legible and identical.
- If a change in formulation is involved, five (5) copies of a statement of revised formula showing the precise name and percentage of each active and each inert ingredient.
- (This information is treated confidentially)
- When appropriate, three (3) copies of Supporting Data.

12. RECEIVED BY USDA-PESTICIDES REGULATION DIVISION, WASHINGTON, D. C.

IN ANY CORRESPONDENCE ON THIS [illegible] REGISTRATION NO. [illegible]

SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE

Harold P. Struessel

TITLE: Label Coordinator

DATE SIGNED: 7/5/72

PR FORM 9-191 EXISTING STOCK OF PR FORM 9-190 (AUG. 1966) WILL BE USED UNTIL EXHAUSTED

TOLS011984

BZTO104(e)048817

READY - TO - USE

WOODTOX PRE-PRIME

WATER REPELLENT WOOD PRESERVATIVE --

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF

WOOD TREATING CHEMICALS

DEPARTMENT OF **KOPPERS** COMPANY, INC.

5137 SOUTHWEST AVENUE • ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN.

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

USDA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	85.10%
INERT INGREDIENTS	9.91%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

DO NOT STORE NEAR OPEN FLAME

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthemia. Treat symptomatically.

This product is toxic to fish and wildlife. Keep out of lakes, streams, and ponds.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

Apply this product only as specified on this label.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

11672-1

BZTO104(e)048818

TOLS011985

ENVIRONMENTAL PROTECTION AGENCY
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

11 NOV 1971

Wood Treating Chemicals Company
Attention: Harold P. Struessel
5137 Southwest Ave.
St. Louis, Missouri 63110

Gentlemen:

Subject : WOODTOX PRE-PRIME
EPA Reg. No. 453-202
Your letter of October 21, 1971

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, is acceptable and a stamped copy is enclosed for your records.

Very truly yours,

T E Adamczyk RFm
T. E. Adamczyk
Chief
Fungicide-Herbicide Branch

Enclosure

PR FORM 9-265
SEP 1967

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

TOLS011986

BZTO104(e)048819

TOLS011987

NOV 15 1971

READY-TO-USE

WOODTOX® PRE-PRIME

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM–TRADEMARK OF

WOOD TREATING CHEMICALS CO.

5137 SOUTHWEST AVE., ST. LOUIS, MO. 63110 A SUBSIDIARY OF **Monsanto**

WARNING: KEEP OUT OF REACH OF CHILDREN.

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

USDA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	85.10%
INERT INGREDIENTS	9.91%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Do not paint or varnish wood that has been treated with this product until the excess petroleum solvents have volatized from the wood.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. For application to wood in place to protect against subterranean termite damage, apply the solution to run-off, allow to soak in, and make at least one more application. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

DO NOT STORE NEAR OPEN FLAME

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthemia. Treat symptomatically.

This product will kill fish and wildlife. Keep out of lakes, streams, and ponds.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

Apply this product only as specified on this label.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

11672-1

TOLS011988

BZTO104(e)048821

EPA-PR

ACCEPTED
NOV 10 1971
UNDER THE FEDERAL INSECTICIDE FUNGICIDE AND RODENTICIDE ACT FOR ECONOMIC POISON REGISTERED UNDER NO. 453-202

NOV 15 1971

TOLS011989

BZTO104(e)048822

WOOD TREATING
CHEMICALS CO.

5137 Southwest Avenue / St. Louis, Missouri 63110 / 314 PR 2-2200

OCTOBER 21, 1971

MR. CHARLES T. MITCHELL, ACTING HEAD
REGISTRATION REVEIW FUNGICIDES
ENVIRONMENTAL PROTECTION AGENCY
PESTICIDES OFFICE
WASHINGTON, D. C. 20250

SUBJECT: WOODTOX PRE-PRIME
READY-TO-USE
USDA REG. NO. 453-202

DEAR MR. MITCHELL:

ATTACHED ARE FIVE COPIES OF FINISHED LABELS FOR ABOVE PRODUCT.

WE DO HAVE A ROUGH DRAFT OF THIS LABEL STAMPED "ACCEPTED" AUGUST 25, 1971 BUT TO KEEP OUR RECORDS UP TO DATE WE WOULD APPRECIATE RECEIVING ONE OF THE ATTACHED STAMPED "ACCEPTED" AND RETURNED FOR OUR FILES.

THANKS.

YOURS VERY TRULY,

HAROLD P. STRUESSEL
LABEL COORDINATOR

HPS/PB

ENCLOSURES (5)

TOLS011990

READY - TO - USE

WOODTOX PRE-PRIME

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM-TRADEMARK OF

WOOD TREATING CHEMICALS CO.

5137 SOUTHWEST AVE., ST. LOUIS, MO. 63110 A SUBSIDIARY OF **Monsanto**

WARNING: KEEP OUT OF REACH OF CHILDREN.

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

USDA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	85.10%
INERT INGREDIENTS	9.91%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Do not paint or varnish wood that has been treated with this product until the excess petroleum solvents have volatized from the wood.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. For application to wood in place to protect against subterranean termite damage, apply the solution to run-off, allow to soak in, and make at least one more application. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

DO NOT STORE NEAR OPEN FLAME

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthemia. Treat symptomatically.

This product will kill fish and wildlife. Keep out of lakes, streams, and ponds.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

Apply this product only as specified on this label.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

11672-1

BZTO104(e)048824

TOLS011991

ENVIRONMENTAL PROTECTION AGENCY
PESTICIDES OFFICE
WASHINGTON, D.C. 20250

17 AUG 1971

Wood Treating Chemicals Company
5137 Southwest Avenue
St. Louis, Missouri 63110

Gentlemen:

Subject: WOODTOX PRE-PRIME
EPA Reg. No. 453-202

This is in reply to your letter of August 31, 1971 regarding the above product.

Regarding Amyl Phenyl Acid Phosphate our staff has been able to identify the chemical structure. No further action is required on your part.

Sincerely,

Charles T. Mitchell RFM

Charles T. Mitchell
Acting Head
Registration Review-Fungicides

to Comm Serv
9-21-71
JPH

TOLS011992

BZTO104(e)048825

TOLS011993

SEP 20 1971

WOOD TREATING
CHEMICALS CO.

5137 Southwest Avenue / St. Louis, Missouri 63110 / 314 PR 2-2200

AUGUST 31, 1971

MR. CHARLES T. MITCHELL, ACTING HEAD
ENVIRONMENTAL PROTECTION AGENCY
REGISTRATION REVIEW - FUNGICIDES
WASHINGTON, D. C. 20250

SUBJECT: WOODTOX PRE-PRIME
EPA REG. NO. 453-202
YOUR LETTER OF AUGUST 26, 1971

DEAR MR. MITCHELL:

THIS IS IN REPLY TO YOUR AUGUST 26, 1971 LETTER.

ITEM 1 - WE HAVE NO INFORMATION ON "AMYL PHENYL ACID PHOSPHATE" NOR DO WE KNOW WHAT IT IS. IS THIS PERHAPS WHAT ONE OF OUR SUPPLIERS CALLED ONE OF THE INGREDIENTS IN THIS FORMULATION FOR WHICH THEY SUBMITTED A FORM PR-9-196' CONFIDENTIAL STATEMENT OF FORMULA?

ITEM 2 - SINCE MUCH OF THE COPY FOR THIS LABEL WAS TAKEN DIRECTLY FROM THE PREVIOUS LABEL WE REFERRED TO "OTHER PANEL" IN ERROR. WE INTEND TO REVISE THIS SENTENCE TO READ:"------ SEE INSTRUCTIONS ABOVE". THIS REFERS, OF COURSE, TO THE SECTION TITLED "WOOD PRESERVATION AND DIMENSIONAL CONTROL". PLEASE ADVISE IF THIS CHANGE WILL SATISFY ITEM 2.

ALSO PLEASE ADVISE FURTHER REGARDING THE AMYL PHENYL ACID PHOSPHATE.

THANK YOU.

YOURS VERY TRULY,

HAROLD P. STRUESSEL
LABEL CORDINATOR

HPS/PB
P.S. EXTRA COPY OF THIS LETTER MAY BE USED AS AN ACKNOWLEDGMENT OF RECEIPT.

TOLS011994

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, and checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Do not paint or varnish wood that has been treat
with this product until the excess petroleum solvent
have volatilized from the wood.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions on other panel this label. For application to wood in place to protect against subterranean or drywood termite damage, apply the solution to run-off, allow to soak in, and make at least one more application. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

F SWALLOWED. HARMFUL IF
BSORBED THROUGH SKIN.
RRITATION. MAY PRODUCE
ICAL BURNS. COMBUSTIBLE.

pray mist. Use only with ade-
. Do not get in eyes, on skin
Wash thoroughly after handl-

clothing and rubber gloves
ne freshly treated lumber.

RE NEAR OPEN FLAME

allowed induce vomiting by
wn throat or by giving soapy
water to drink. Repeat until
Call a physician. Never give
h to an unconscious person.

e of contact, wash skin with
or eyes, flush with water for
es and get medical attention.

IAN: This product is a meta-
causes hyperthemia. Treat

kill fish and wildlife. Keep
eams, and ponds.

e injury if adequate ventila-
d. Do not use this product
ther confined areas, where
oncentrate and cause injury
life.

t only as specified on this

RRANTY AND LIABILITY

its that this material conforms to the
on the label and is reasonably fit for
to in the directions for use. This pro-
o the understanding that the buyer as-
e or handling which may result in loss
beyond the control of the seller, such
patibility with other products and the
application. NO OTHER EXPRESSED OR
OF FITNESS OR MERCHANTABILITY IS
remedy of the buyer, and the limit of
ny or any other seller for any and all
nages resulting from the use or handl-
all be the purchase price paid by the
quantity of this product involved. The
e deemed to have accepted the terms
may not be varied by any verbal or

1279-1

TOLS011995

BZTO104(e)048828

ENVIRONMENTAL PROTECTION AGENCY
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

26 AUG 1971

Wood Treating Chemicals Company
5137 Southwest Avenue
St. Louis, Missouri 63110

Gentlemen:

Subject: WOODTOX PRE-PRIME
EPA Reg. No. 453-202
Your application of June 25, 1971

The subject labeling, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, is being accepted at this time. To expedite registration, this acceptance is being made on the basis of the draft submitted with the application. Certain defects, given below, have been noted. These corrections must be incorporated when the finished labeling is prepared. Five copies of the finished labeling must be submitted.

1. Submit a more complete name or submit the structure of "amyl phenyl acid phosphate."

2. The termite control directions to "See instructions on other panel this label" for treatment of new wood prior to installation should be clarified. There are no directions on the other panels of this label.

Sincerely,

Charles T. Mitchell

Charles T. Mitchell
Acting Head
Registration Review-Fungicides

Enclosure

FR FORM 9-26
Feb. 1965

TOLS011996

BZTO104(e)048829

AUG 30 1971

TOLS011997

BZTO104(e)048830

WOOD TREATING
CHEMICALS CO.

5137 Southwest Avenue / St. Louis, Missouri 63110 / 314 PR 2-2200

PRODUCT INFORMATION DATA

May 20, 1971

WOODTOX PRE-PRIME

Trade Name	Penta Water Repellent Preservative
Wood Treating Name	Woodtox Pre-Prime
Chemical Name	5% pentachlorophenol in light petroleum solvent
Description	Clear, light amber colored solution
Penta Content	5.2% by weight technical pentachlorophenol meeting Federal Specification TT-W-570
Non-Volatile Content	12.7% by weight
Specific Gravity	0.8213 at 15.5° C. (typical)
Weight per Gallon	6.85 pounds at 15.5° C. (typical)
Pour Point	- 15° F.
Flash Point	Minimum 105° F. (Tag. Closed Cup) Typical 115° F. (Tag. Closed Cup)
Dilution Data	DO NOT DILUTE. This is a 5% ready-to-use solution.
Swellograph Efficiency	60% minimum
Paintability	Woodtox Pre-Prime has been specially formulated for minimum interference with paint primer and finish coatings applied at the factory or in the field. It dries to a hard film and contains a minimum of paraffin or other water repellent ingredients that tend to interfere with paintability. The length of time that should elapse between the time the wood is treated and the time that paint, varnish, or other finishes are applied, depends upon how soon the excess mineral spirits carrier used in the Woodtox Pre-Prime can get out of the wood. The mineral spirits carrier may be "trapped" when sash parts are bulk stacked or bundled too tightly and dip treated; doors or plywood flat stacked is another problem. However,

THE INFORMATION GIVEN HEREIN IS BASED ON OUR EXPERIENCE, REPRESENTS OUR BEST JUDGMENT IN THE MATTER, AND IS INTENDED TO BE HELPFUL: BUT WE CANNOT ASSUME RESPONSIBILITY FOR ANY LOSS OR ACCIDENT THAT MAY RESULT FROM ITS USE.

AUG 30 1974

WOODTOX PRE-PRIME

Paintability (cont'd.)	where there is free air circulation to volatilize the light solvent from the wood surfaces, Woodtox Pre-Prime open tank treated millwork, lumber or plywood can usually be finished within 48-72 hours after treatment. Woodtox Pre-Prime meets paintability tests or standards of Federal Specification TT-W-572B, NWMA, and CS 262-63.
Corrosion	Contains corrosion inhibitor to aid in the prevention of color formation in shipping containers or storage tanks, and to minimize corrosion and/or discoloration of metal fasteners.
Storage Precautions	None, other than to keep out water. Stable over the normal range of storage conditions.
Uses for Woodtox Pre-Prime	Woodtox Pre-Prime is used for the treatment of sash and other millwork to meet the Seal of Approval program of the National Woodwork Manufacturers Association for a preservative water repellent (Commercial Standard CS 262-63 effective 12/31/63). It is also useful for the treatment of other wood products where the benefits of a preservative and water repellent solution are desired that will help control stain, decay (rot), termites, and other wood boring insects; that will not cause grain raising; and that will leave the wood paintable.
Treating Data	Woodtox Pre-Prime may be applied by the vacuum, immersion, brush, or spray methods. The effectiveness of the treatment is in proportion to the distribution and retention of solution by the treated item.
Safe Handling of Pentachlorophenol Solutions	See Wood Treating Chemicals Co. Bulletin No. 1049 entitled, "Safety Measures & Precautions for Handling Solutions Containing Pentachlorophenol."
Packaging	Bulk - in 4,000 to 10,000 gal. tank cars; or in tank truck transports. 5 gal. and 55 gal. drums.
Shipping Classification	Chlorinated Phenol Petroleum Solution Wood Preservative Liquid, Not Exceeding 5% of Chlorinated Phenol By Weight.
Production Points and Shipping Points	St. Louis, Missouri; Portland, Oregon.

Printed in U.S.A.

TOLS011999

BZTO104(e)048832

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

FORM APPROVED
BUDGET BUREAU NO. 40-R1746

APPLICATION FOR [AMENDED] REGISTRATION OF ECONOMIC POISONS

(Under the Federal Insecticide, Fungicide, and Rodenticide Act)

IMPORTANT: READ INSTRUCTIONS ON REVERSE

1. DATE OF APPLICATION: JUNE 25, 1971

2. NAME OF ECONOMIC POISON *(Must be same product name as on label—do not list active ingredients)*

WOODTOX PRE-PRIME READY-TO-USE

3. NAME & MAILING ADDRESS OF REGISTRANT *(Include Zip Code)*

WOOD TREATING CHEMICALS CO.
5137 SOUTHWEST AVENUE
ST. LOUIS, MISSOURI 63110

4. REGISTRATION NO.

453-202

5. PROPOSED EFFECTIVE DATE OF CHANGE

IMMEDIATE

6. NATURE OF REVISION *(Check applicable item and give details in item 7, when required)*

- GENERAL REVISION OF LABELING [X]
- CHANGE IN FORMULATION [X] *(Give description of exact change in item 7)*
- OTHER [ ] *(Specify in item 7)*
- ADDITIONAL USES ADDED TO LABELING [ ] *(List new recommendations in item 7)*
- CHANGE IN PRODUCT NAME [ ] *(Give old name and new name in item 7)*

7. DETAILS REQUIRED BY REVISION CHECKED IN ITEM 6 *(Attach additional sheets if more space is needed)*

UP-DATING OF WARNING AND ENVIRONMENTAL STATEMENTS.

CHANGE IN LABEL FOREMAT.

CANNOT GIVE EXACT DESCRIPTION OF CHANGE IN FORMULATION WITHOUT GIVING NAMES AND PERCENTAGES OF CONFIDENTIAL INGREDIENTS. FORMULATION AND INGREDIENTS ARE THE SAME WITH A VERY SLIGHT CHANGE IN PERCENTAGES.

TOLS012000

[ ] CONTINUED ON ATTACHMENT

8. THE FOLLOWING MUST BE SUBMITTED WITH THIS APPLICATION
- Five (5) copies of revised labeling, including any printed or graphic matter which may accompany the sale of this product. Copies must be clearly legible and identical.
- If a change in formulation is involved, five (5) copies of a statement of revised formula showing the precise name and precentage of each active and each inert ingredient. *(This information is treated confidentially)*
- When appropriate, three (3) copies of Supporting Data.

9. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE

Harold P. Struessel

10. TITLE: HAROLD P. STRUESSEL — LABEL COORDINATOR

11. DATE SIGNED: 6/25/71

12. RECEIVED BY USDA—PESTICIDES REGULATION DIVISION, WASHINGTON, D. C.

IN ANY CORRESPONDENCE ON THIS PRODUCT REFER TO REGISTRATION NO. IN ITEM 4, ABOVE.

PR FORM 9-198
MAY 1969

EXISTING STOCK OF PR FORM 9-198 (AUG. 1968) WILL BE USED UNTIL EXHAUSTED

BZTO104(e)048833

TOLS012001

BZTO104(e)048834

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

FORM APPROVED
BUDGET BUREAU NO. 40-R1134

APPLICATION FOR AMENDED REGISTRATION OF ECONOMIC POISONS

(Under the Federal Insecticide, Fungicide, and Rodenticide Act)

IMPORTANT: READ INSTRUCTIONS ON REVERSE BEFORE COMPLETING THIS FORM

1. DATE OF APPLICATION

2. NAME OF ECONOMIC POISON *(Must be same product name as on label — do not list active ingredients)*
WOODTOX PRE-PRIME READY-TO-USE

3. NAME & MAILING ADDRESS OF REGISTRANT *(Include Zip Code)*
WOOD TREATING CHEMICALS CO.
5137 SOUTHWEST AVENUE
ST. LOUIS, MISSOURI 63110

4. REGISTRATION NO.

5. PROPOSED EFFECTIVE DATE OF CHANGE
IMMEDIATE

6. NATURE OF REVISION *(Check applicable item and give details in item 7, when required)*

GENERAL REVISION OF LABELING ☒
CHANGE IN FORMULATION ☒ *(Give description of exact change in item 7)*
OTHER ☐ *(Specify in item 7)*
ADDITIONAL USES ADDED TO LABELING ☐ *(Use new recommendations in item 7)*
CHANGE IN PRODUCT NAME ☐ *(Give old name and new name in item 7)*

7. DETAILS REQUIRED BY REVISION CHECKED IN ITEM 6 *(Attach additional sheets if more space is needed)*

UP-DATING OF WARNING AND ENVIRONMENTAL STATEMENTS.

CHANGE IN LABEL FORMAT.

CANNOT GIVE EXACT DESCRIPTION OF CHANGE IN FORMULATION WITHOUT GIVING NAMES AND PERCENTAGES OF CONFIDENTIAL INGREDIENTS. FORMULATION AND INGREDIENTS ARE THE SAME WITH A VERY SLIGHT CHANGE IN PERCENTAGES.

☐ CONTINUED ON ATTACHMENT

8. THE FOLLOWING MUST BE SUBMITTED WITH THIS APPLICATION
- Five (5) copies of labeling including any booklets, leaflets, or other literature to be supplied with the product. Labeling must be clearly legible and identical.
- If a change in formulation is involved, five (5) copies of a statement of revised formula showing the precise name and percentage of each active and each inert ingredient. *(This information is treated confidentially)*
- When appropriate, three (3) copies of Supporting Data.

IN ANY CORRESPONDENCE ON THIS PRODUCT REFER TO EPA REGISTRATION NO. (if assigned) or notice of registration will be sion of the information submitted

9. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE
Harold P. Struessel

10. TITLE
LABEL COORDINATOR

11. DATE SIGNED
6/25/71

PR FORM 9-198
MAY 1969

EXISTING STOCK OF PR FORM 9-198 (AUG. 1968) WILL BE USED UNTIL EXHAUSTED

APPLICANT'S COPY

TOLS012002

BZTO104(e)048835

ITEM

INSTRUCTIONS FOR PR FORM 9-198

1. Applications should be submitted as far in advance as possible prior to desired registration date. The time required to process applications may vary depending on the extent of review required. Applications which require consultation with other governmental agencies will take a longer time to process.

2. The name of the economic poison shown in the application must be the same product name as that shown on the labeling submitted. Do not list the active ingredients.

3. The name of the firm or person and address shown in your application is the person or firm to whom registration will be issued. If you are acting in behalf of another party, you must submit authorization from that party to act for them in registration matters. The address given in item three will be the mailing address permanently on record unless changed by the registrant.

4. The registration number assigned must appear on the label. The number must be the same as that appearing on the notice of registration and shall be preceded by the phrase "USDA Registration Number" or the phrase "USDA Reg. No." (Refer to Sec. 362.6(f) of the Regulations)

5. Changes in the labeling or changes in the formula must be submitted in advance of the proposed effective date.

6. Nature of revision – The registrant must describe the exact changes desired and upon request must submit a description of test results to justify such changes. Minor changes in formulation may be handled as revisions of existing registrations. This might include a change in the percentage of active ingredients or a change in inert ingredients. However, any basic change in formulation such as a change in the principal active ingredients would require a separate registration as a new product with a different product name.

7. Self Explanatory.

8. Labeling – All copies of labeling must be clearly legible and identical. Photo copy of lithograph labels should be submitted. Do not send containers. Your supplier should be able to furnish photo copies of the screen print. Submit reduced photo copies of labeling for dry agricultural fertilizer, insecticide, or herbicide bags. Any label smaller than half the size of a sheet of paper 8 inches by 10 inches should be stapled to a sheet of paper 8 inches by 10 inches before attaching to application.

   Formulation – If a change in formulation is involved, five copies of a separate statement listing the correct name and percentage by weight of each active and each inert ingredient must be submitted with each application. This statement is treated confidentially. It cannot be used to support a customer's (formulator) application for subsequent registration without written authorization from the registrant. If necessary information on the formula is not available to the applicant (formulator or packer), he should: (a) Obtain the necessary information from the basic supplier and submit five copies of the statement with the application or (b) Request the basic supplier to furnish the necessary information to the Division along with a statement specifically authorizing the use of such information to support separate registration for the applicant. The statement from the basic supplier must clearly identify the applicant's product to which it applies.

ATTENTION: The submission of an application does not constitute registration. Comment or notice of registration will be sent after examination by the Pesticides Regulation Division of the information submitted.

TOLS012003

BZTO104(e)048836

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

FORM APPROVED
BUDGET BUREAU NO. 40-R1746

CONFIDENTIAL STATEMENT OF FORMULA

(Under the Federal Insecticide, Fungicide, and Rodenticide Act)

1. PAGE NO. *This Formula)* 1 OF 1

IMPORTANT: *Read instructions on reverse before completing form. All information will be treated confidentially.*

2. DATE OF APPLICATION: JUNE 25, 1971

3. REASON FOR SUBMISSION *(Check one)*

APPLICATION FOR NEW REGISTRATION ☐ APPLICATION FOR AMENDED OR RENEWAL REGISTRATION ☒ SUBMITTED BY BASIC SUPPLIER *(See instruction C on reverse)* ☐

4. NAME & MAILING ADDRESS OF APPLICANT OR REGISTRANT *(Include Zip Code)*

WOOD TREATING CHEMICALS CO
5137 SOUTHWEST AVE
ST. LOUIS, MISSOURI

5. NAME OF ECONOMIC POISON *(Must be same product name as on label-do not list active ingredients)*

WOODTOX PRE-PRIME RTU

6. REGISTRATION NO. OR FILE SYMBOL *(If known)*

453-202

7. NAME & MAILING ADDRESS OF BASIC SUPPLIER *(If applicable) (Include zip code)*

8. NAME OF INGREDIENT (PRODUCT) PROVIDED BY BASIC SUPPLIER FOR WHICH FORMULATION IS UNKNOWN *(If any)*

9. IS THE INGREDIENT (PRODUCT) NAMED IN ITEM 8 REGISTERED WITH THE USDA? YES ☐ NO ☐

10. IF "YES" IN ITEM 9, GIVE REGISTRATION NO.

11. NAME OF EACH ACTIVE AND EACH INERT INGREDIENT USED IN THE FORMULATION *(List both the common name and the precise chemical name of each)*	12. PERCENT OF EACH BY WEIGHT
ACTIVE INGREDIENTS:	
PENTACHLOROPHENOL*.....	04.47%
OTHER CHLOROPHENOL & RELATED COMPOUNDS*.....	00.52%
MINERAL SPIRITS.....	85.10%
	90.09%
*5.2% TECHNICAL PENTACHLOROPHENOL AS DEFINED IN FED. SPEC TT-W-570	
INERT INGREDIENTS:	
FROM TECHNICAL PENTACHLOROPHENOL (MONSANTO CO).....	00.21%
UCON 144 (UNION CARBIDE).....	04.00%
FILTREZ PE 75-60 (FILTERED ROSIN PROD).....	05.00%
SHELL WAX 100 (SHELL OIL CO.).....	00.45%
SANTOLENE C (MONSANTO CO).....	00.25%
	9.91%
☐ CONTINUED ON ATTACHMENT(S) — All ingredients listed in item 11 above and on additional pages must total →	100%

13. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE

Harold P. Struessel

HAROLD P. STRUESSEL
14. TITLE

LABEL COORDINATOR
15. DATE SIGNED

JUNE 25, 1971

PR FORM 9-196
(MAY 1970)

APPLICANT'S COPY

TOLS012004

BZTO104(e)048837

INSTRUCTIONS FOR PR FORM 9-196

A. The complete chemical composition of each economic poison must be known so it can be evaluated for registration under the Federal Insecticide, Fungicide, and Rodenticide Act. This information is also necessary to determine the status of ingredients, both active and inert, under the Pesticide Chemicals Amendment to the Federal Food, Drug, and Cosmetic Act.

B. This form is designed for reporting the ingredients used in the formulation of an economic poison. Its use will speed the review. It must be completed and submitted with each "Application for New Registration of Economic Poisons" (PR Form 9-199), or with each "Application for Amended Registration of Economic Poisons" (PR Form 9-198) if revision involves a formula change, or with each "Application for Renewal Registration of Economic Poisons" (PR Form 9-197).

C. If the complete chemical composition of formulated ingredients, either active or inert, used in this product's formulation is not known to you, send a separate set of these forms for each such ingredient to your Basic Supplier. When you do this, it is important that you first fill in items 2 thru 8 so that we may positively identify the supplier's product with your economic poison. The Basic Supplier is then requested to complete item 1, and items 9 thru 15, and submit the form to this Division. This Statement is treated confidentially. It cannot be used to support a customer's (formulator's) application for subsequent registration without written authorization from the Basic Supplier.

ITEM NO.

1. PAGES OF THIS FORMULA. Show "1 of 1", "1 of 2", etc. If space on this form is insufficient to list all ingredients, continue on additional sheets and number in sequence.
2. DATE OF APPLICATION. Enter the same date as the related application form.
3. REASON FOR SUBMISSION. Read instruction B above.
4. NAME AND MAILING ADDRESS OF APPLICANT OR REGISTRANT. Enter the name and mailing address of your firm.
5. NAME OF ECONOMIC POISON. Enter the product name of this economic poison as it will appear on the finished label.
6. REGISTRATION NO. OR FILE SYMBOL. These reference items are assigned by the PR Division. If unknown, leave blank.
7. NAME AND MAILING ADDRESS OF BASIC SUPPLIER.
8. NAME OF INGREDIENT (PRODUCT) PROVIDED BY BASIC SUPPLIER FOR WHICH FORMULATION IS UNKNOWN.

Complete only if required by Instruction C above.

9. IS THE INGREDIENT (PRODUCT) NAMED IN ITEM 8 REGISTERED WITH USDA? "YES" or "NO".
10. IF "YES" IN ITEM 9, GIVE REGISTRATION NO. Self-Explanatory.

Completed only by the Basic Supplier.

11. NAME OF EACH ACTIVE AND EACH INERT INGREDIENT USED IN THE FORMULATION. List both the common name and the precise chemical name of each active and each inert ingredient used in formulating this product.
    a. First list the active ingredients. List them in the very same order as they appear or will appear in the ingredient statement on the finished label.
    b. Next, list the name of each inert ingredient.
    c. When a formulated product is listed in the formula, name its basic manufacturer and give its USDA Registration Number, if known, in parenthesis following the name of the product. (Also see Instruction C above).
    d. The trade name and manufacturer of surfactants and other adjuvants (dyes, emulsifiers, solvents, perfumes) must be listed. The complete chemical composition of emulsifiers and surfactants must be listed. Enclose the manufacturer's name in parenthesis following the product listed by trade name. (Also see Instructions C above).
    e. If a dye or other coloring material is used, state the color.
12. PERCENT OF EACH BY WEIGHT. Enter in this column the percentage by weight of each active and each inert ingredient listed in item 11. Each entry must be opposite that ingredient to which it applies. The percentages by weight for the active ingredients must agree with those appearing in the ingredient statement on the label. The sum of all the percentages listed must equal 100 percent.
13. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE. When completed, the authorized representative of the firm must sign this form.
14. TITLE. Self-explanatory.
15. DATE SIGNED. Self-explanatory.

TOLS012005

BZTO104(e)048838

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, and checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption, especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Do not paint or varnish wood that has been with this product until the excess petroleum have volatilized from the wood.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions on other panel this label. For application to wood in place to protect against subterranean or drywood termite damage, apply the solution to run-off, allow to soak in, and make at least one more application. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

TAL IF SWALLOWED. HARMFUL IF
OR ABSORBED THROUGH SKIN.
KIN IRRITATION. MAY PRODUCE
HEMICAL BURNS. COMBUSTIBLE.

the spray mist. Use only with adelation. Do not get in eyes, on skin ing. Wash thoroughly after handl-

ctive clothing and rubber gloves ling the freshly treated lumber.

STORE NEAR OPEN FLAME

If swallowed induce vomiting by ger down throat or by giving soapy alty water to drink. Repeat until ear. Call a physician. Never give mouth to an unconscious person.

In case of contact, wash skin with ater, for eyes, flush with water for minutes and get medical attention.

HYSICIAN: This product is a metalant, causes hyperthemia. Treat cally.

t will kill fish and wildlife. Keep s, streams, and ponds.

cause injury if adequate ventilainsured. Do not use this product any other confined areas, where may concentrate and cause injury nimal life.

product only as specified on this

OF WARRANTY AND LIABILITY

ny warrants that this material conforms to the escription on the label and is reasonably fit for es referred to in the directions for use. This pro- subject to the understanding that the buyer asisks of use or handling which may result in loss which are beyond the control of the seller, such mple incompatibility with other products and the its use of application. NO OTHER EXPRESSED OR ARRANTY OF FITNESS OR MERCHANTABILITY IS exclusive remedy of the buyer, and the limit of this company or any other seller for any and all ries or damages resulting from the use or handlproduct shall be the purchase price paid by the er for the quantity of this product involved. The ll users are deemed to have accepted the terms ce which may not be varied by any verbal or ement.

11672-1

TOLS012006

BZTO104(e)048839

WOOD TREATING
CHEMICALS CO.

5137 Southwest Avenue / St. Louis, Missouri 63110 / 314 PR 2-2250

PRODUCT INFORMATION DATA

May 20, 1971

WOODTOX PRE-PRIME

Trade Name	Penta Water Repellent Preservative
Wood Treating Name	Woodtox Pre-Prime
Chemical Name	5% pentachlorophenol in light petroleum solvent
Description	Clear, light amber colored solution
Penta Content	5.2% by weight technical pentachlorophenol meeting Federal Specification TT-W-570
Non-Volatile Content	12.7% by weight
Specific Gravity	0.8213 at 15.5° C. (typical)
Weight per Gallon	6.85 pounds at 15.5° C. (typical)
Pour Point	- 15° F.
Flash Point	Minimum 105° F. (Tag. Closed Cup) Typical 115° F. (Tag. Closed Cup)
Dilution Data	DO NOT DILUTE. This is a 5% ready-to-use solution.
Swellograph Efficiency	60% minimum
Paintability	Woodtox Pre-Prime has been specially formulated for minimum interference with paint primer and finish coatings applied at the factory or in the field. It dries to a hard film and contains a minimum of paraffin or other water repellent ingredients that tend to interfere with paintability. The length of time that should elapse between the time the wood is treated and the time that paint, varnish, or other finishes are applied, depends upon how soon the excess mineral spirits carrier used in the Woodtox Pre-Prime can get out of the wood. The mineral spirits carrier may be "trapped" when sash parts are bulk stacked or bundled too tightly and dip treated; doors or plywood flat stacked is another problem. However,

TOLS012007

THE INFORMATION GIVEN HEREIN IS BASED ON OUR EXPERIENCE, REPRESENTS OUR BEST JUDGMENT IN THE MATTER, AND IS INTENDED TO BE HELPFUL; BUT WE CANNOT ASSUME RESPONSIBILITY FOR ANY LOSS OR ACCIDENT THAT MAY RESULT FROM ITS USE.

BZTO104(e)048840

WOODTOX PRE-PRIME

Paintability (cont'd.)	where there is free air circulation to volatilize the light solvent from the wood surfaces, Woodtox Pre-Prime open tank treated millwork, lumber or plywood can usually be finished within 48-72 hours after treatment. Woodtox Pre-Prime meets paintability tests or standards of Federal Specification TT-W-572B, NWMA, and CS 262-63.
Corrosion	Contains corrosion inhibitor to aid in the prevention of color formation in shipping containers or storage tanks, and to minimize corrosion and/or discoloration of metal fasteners.
Storage Precautions	None, other than to keep out water. Stable over the normal range of storage conditions.
Uses for Woodtox Pre-Prime	Woodtox Pre-Prime is used for the treatment of sash and other millwork to meet the Seal of Approval program of the National Woodwork Manufacturers Association for a preservative water repellent (Commercial Standard CS 262-63 effective 12/31/63). It is also useful for the treatment of other wood products where the benefits of a preservative and water repellent solution are desired that will help control stain, decay (rot), termites, and other wood boring insects; that will not cause grain raising; and that will leave the wood paintable.
Treating Data	Woodtox Pre-Prime may be applied by the vacuum, immersion, brush, or spray methods. The effectiveness of the treatment is in proportion to the distribution and retention of solution by the treated item.
Safe Handling of Pentachlorophenol Solutions	See Wood Treating Chemicals Co. Bulletin No. 1049 entitled, "Safety Measures & Precautions for Handling Solutions Containing Pentachlorophenol."
Packaging	Bulk - in 4,000 to 10,000 gal. tank cars; or in tank truck transports. 5 gal. and 55 gal. drums.
Shipping Classification	Chlorinated Phenol Petroleum Solution Wood Preservative Liquid, Not Exceeding 5% of Chlorinated Phenol By Weight.
Production Points and Shipping Points	St. Louis, Missouri; Portland, Oregon.

Printed in U.S.A.

TOLS012008

BZTO104(e)048841

1. FOLD AT MARK FOR WINDOW ENVELOPE. 2. FORWARD WHITE AND YELLOW. 3. YELLOW WILL BE RETURNED WITH REPLY.

SPEEDISET ● MOORE BUSINESS FORMS, INC., 26

Monsanto RAPID-GRAM

TO (Please Print) G. B. Mills LOCATION

SUBJECT Label Assay - Woodtox Pre-Prime RTU

MESSAGE

May I please have an assay for Woodtox Pre-Prime RTU for label registration purposes.

Thanks

REPLY

See attached

SENDER'S FULL NAME (Please Print) Harold Strussel DATE 6-24-71

LOCATION

SIGNATURE [signature] DATE 6-25-71

LOCATION

G-1140 REV. 9-70

TOLS012009

BZTO104(e)048842

6-25-71

Woodtox Pre-Prime RTU

Active:

Pentachlorophenol	4.47 %
Other chloro + related	.52
Mineral Spirits	85.10
Inert	9.91
	100.00

Inert Breakdown:

(Monsanto)	From Tech Penta	0.21 %
(Union Carbide)	Ucon-144	4.00
(Filtrol Corp. Prod.)	Filtrol PE75-60	5.00
(Shell Oil Co)	Shellwax 100	.45
(Monsanto)	Santolene C	.25
		9.91

TOLS012010

BZTO104(e)048843

Monsanto **RAPID-GRAM**

TO (Please Print) / LOCATION	SUBJECT
G. B. Mills	Label Assay - Wondra Pre-Prime RTU
MESSAGE	**REPLY**
May I please have an Assay for Wondra Pre-Prime RTU for label registration purposes. Thanks	
SENDER'S FULL NAME (Please Print) / DATE	SIGNATURE / DATE
Harold Stevens 6-24-71	
LOCATION	LOCATION

6-1140 REV. 9-70

SENDER'S COPY

BZTO104(e)048844

TOLS012011

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder-post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

DIRECTIONS FOR USE

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the Woodtox solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Do not paint or varnish wood that has been treated with this product until the excess petroleum solvents have volatilized from the wood.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

WARNING

Toxic to fish and wildlife.

Do not contaminate water by cleaning equipment or disposal of waste containers.

USDA Reg. No. 453-202 7-20-68

READY - TO - USE

NET CONTENTS **GALLONS**

WOODTOX

PRE-PRIME

Penta, water repellent preservative specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards and Federal Specification TT-W-572.

DILUTION: DO NOT dilute. This is a ready-to-use solution.

APPLICATION: See Manufacturer's wood treating specifications and recommendations based on use requirements of the treated wood, and Manufacturer's Product Information Data Sheet No. 200.

CAUTION: KEEP OUT OF REACH OF CHILDREN
See side panel for other warnings.

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.50%
Other Chlorophenols & Related Compounds*	0.50%
Mineral Spirits	87.25%
INERT INGREDIENTS:	7.75%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

Warning: Harmful if swallowed or absorbed through skin! Causes skin irritation! Do not breathe vapor or spray mist. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Do not store or use near open flames.

Avoid contamination of feed and food stuffs.

MANUFACTURED BY

WOOD TREATING CHEMICALS CO.

5137 SOUTHWEST AVE. • ST. LOUIS, MO. 63110

This product is effective for application to wood for the control of termites, powder-post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore thoroughness of treatment is essential to good control.

DIRECTIONS FOR USE

TERMITE CONTROL. For protection of new wood prior to installation, see instructions on other panel this label. For application to wood in place to protect against subterranean or drywood termite damage, apply the solution to run-off, allow to soak in, and make at least one more application. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Because special precautions must be taken for application to infested floors, furniture and the like, contact the manufacturer for information on these types of uses.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the treated wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

Wood Treating Chemicals Co. warrants that this material conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products, the manner of its use or application, or the presence of other products or materials in or on the soil or crop. Wood Treating makes no other express or implied warranty of fitness or merchantability. The exclusive remedy of the user or buyer, and the limit of the liability of Wood Treating Chemicals Co. or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

BZTO104(e)048845

TOLS012012

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Registration Division (WH-567)

Wood Treating Chemicals Company
Attention: H. P. Struessel
5137 Southwest Avenue
St. Louis, Missouri 63110

Gentlemen:

Subject: WOODTOX PRE PRIME
EPA Reg. No. 453-202
Your letter of April 8, 1974

You have satisfied all of our requests in our November 19, 1973 letter finalizing action on this registration.

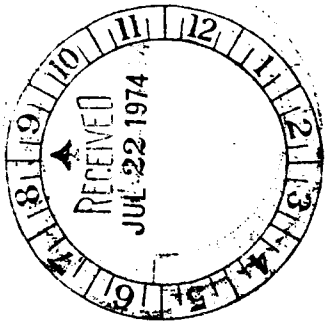
Sincerely,

Arthur D. Baker
for

Richard F. Mountfort
Section Head
Fungicide-Herbicide Branch

TOLS012013

BZTO104(e)048846



TOLS012014

BZTO104(e)048847

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 25 1974

Wood Treating Chem. Co.
5137 Southwest Avenue.
St. Louis, Mo. 63110

Gentlemen:

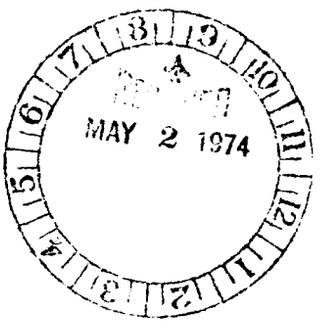
Subject : WOODTOX PRE PRIME
EPA Reg. No. 453-202
Your letter of March 11, 1974 &
Monsanto's letter of November 29, 1973

We have received the information from your supplier and have included it in our records. Pentachlorophenol.

Sincerely,

Arthur D. Baker for

Richard F. Mountfort
Section Head
Fungicide-Herbicide Branch



TOLS012015

BZTO104(e)048848

April 8, 1974

Director, Registration Division (HM-567)
Environmental Protection Agency
Waterside Mall, East Tower
Washington, D.C 20460

Subject: Woodtox Pre-Prime Ready To Use
EPA Reg. No. 453-202

Gentlemen:

Thanks for your letter of April 3, 1974, copy attached.

Also attached is a copy of your letter of November 19, 1973. We would greatly appreciate your confirming that all of the exceptions listed in your letter have now been satisfied.

Thank you.

Yours very truly,

H. P. Struessel
Manager-Order & Billing Dept.

HPS/sjk

Attachment

TOLS012016

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Wood Treating Chem Co.
Attention: Mr. Harold Strussel
5137 Southwest Avenue
St. Louis, Mo. 63110

Gentlemen:

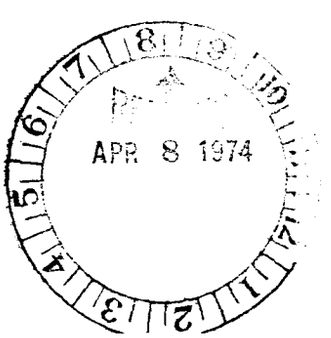
Subject : WOODTOX PRE PRIME
EPA Reg. No. 453-202
Your supplier's letter of February 25, 1974

We have received the information from your supplier and have included it in our records. Sunwax 738

Sincerely,

Arthur D. Baker for

Richard F. Mountfort
Section Head
Fungicide-Herbicide Branch



TOLS012017

BZTO104(e)048850

March 11, 1974

Environmental Protection Agency
Registration Division (HM-567)
Waterside Mall, East Tower
Washington, DC 20460

Subject: Woodtox Pre-Prime Ready To Use
EPA Reg. No. 453-202
Your letter of November 19, 1973

Gentlemen:

Attached is a Xerox copy of your letter of November 19, 1973 for your reference.

Also attached is a copy of a letter from Mr. Mark Litteken of Monsanto authorizing the use of their Confidential Statement of Formula for Monsanto Pentachlorophenol EPA Reg. No. 524-5.

We have been informed by Mr. Porter P. Robb of the Sun Oil Company that a EPA form 8570-4 was submitted to you for Sunwax 738 dated February 25, 1974.

The flash point of our Woodtox Pre-Prime Ready To Use is 100 degrees F. minimum.

The above should fulfil all the requirements of your November 19, 1973 letter.

Yours very truly,

H. P. Struessel
Manager-Order & Billing Dept.

HPS/sjk

Attachment

TOLS012018

November 29, 1973

Registration Division
Office of Pesticides Programs
Environmental Protection Agency
Washington, D.C. 20460

Gentlemen:

This letter authorizes you to refer to the Monsanto Confidential Statement of Formula for Monsanto Penta, EPA Reg. No. 524-5 in support of registrations submitted by

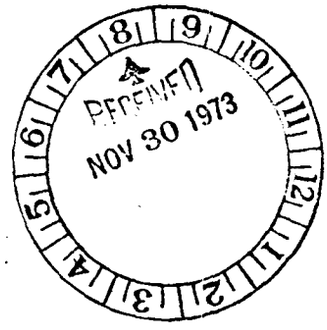
Wood Treating Chemicals Dept.,
Koppers Company, Inc.
St. Louis, Mo. 63110

for any of their products containing Monsanto Penta.

Sincerely

Mark F. Litteken
Labeling and Registration
Supervisor

/mw
CC:
Mr. H. P. Struessel
Wood Treating Chemicals Dept.
Koppers Company, Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110



TOLS012019

PRODUCTS GROUP
Tulsa Marketing District

SUN OIL COMPANY POST OFFICE BOX 2039, 1800 SOUTH UNION, TULSA, OKLAHOMA 74102 (918) 583-4300

March 7, 1974

Koppers Company, Inc.
Wood Treating Chemicals Dept.
5137 Southwest Avenue
St. Louis, Missouri 63110

Attn: Mr. Harold P. Struessel
Manager - Order and Billing Dept.

Dear Mr. Struessel:

As per your request of February 7, 1974, EPA form 8570-4, on Sunoco Wax 738, has been completed and forwarded to Washington. Attached is a copy for your files.

Should you need further assistance, please feel free to contact this office.

Yours very truly,

Porter P. Robb/cjs

Porter P. Robb
District Manager of
Industrial Products

PPR:cjs

Attachment

cc: Shirley Ann Miller

TOLS012020

BZTO104(e)048853

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES PROGRAMS, REGISTRATION DIVISION
WASHINGTON, D.C. 20950

CONFIDENTIAL STATEMENT OF FORMULA

(Under the Federal Insecticide, Fungicide and Rodenticide Act)

Form Approved
OMB No. 158-R0066

1. PAGE OF PAGES

▶ **IMPORTANT:** Read instructions on the reverse before completing form.

2. DATE OF APPLICATION: **February 1, 1974**

3. REASON FOR SUBMISSION *(Check one)*

	APPLICATION FOR A NEW REGISTRATION		APPLICATION FOR AMENDED OR RENEWAL REGISTRATION	X	SUBMITTED BY BASIC SUPPLIER *(See instruction C on reverse)*

4. NAME AND ADDRESS OF APPLICANT OR REGISTRANT *(Include ZIP Code)*

Wood Treating Chemicals Dept.
Koppers Company, Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110

5. NAME OF PESTICIDE *(Must be same product name as on label. Do not list active ingredients)*

WOODTOX PRE-PRIME READY TO USE

6. EPA REGISTRATION NO./FILE SYMBOL *(If known)*

453-202

7. NAME AND MAILING ADDRESS OF BASIC SUPPLIER *(If applicable) (Include ZIP Code)*

Sun Oil Company
P.O. Box 2039
Tulsa, Oklahoma 74102

8. NAME OF INGREDIENT *(Product)* PROVIDED BY BASIC SUPPLIER FOR WHICH FORMULATION IS UNKNOWN *(If any)*

SUNWAX 738

9. IS THE INGREDIENT *(Product)* IN ITEM 8 REGISTERED WITH EPA?

[ ] YES [XX] NO

10. IF YES TO ITEM 9, GIVE REGISTRATION NO.

11. NAME OF EACH ACTIVE AND INERT INGREDIENT USED IN THE FORMULATION *(List both the common name and the precise chemical name of each.)*	12. PERCENT OF EACH BY WEIGHT
Sunoco Wax P116, typical melt point 116°F	32%
Sunoco Wax P127, typical melt point 132°F	68%
Notes: 1) Both components are fully refined, petroleum derived, paraffin waxes.	
2) Both components meet FDA regulation 121.1156 for petroleum wax.	
[ ] CHECK IF CONTINUED ON ATTACHMENT(S) — ALL INGREDIENTS LISTED IN ITEM 11 ABOVE AND ON ADDITIONAL PAGES MUST TOTAL	100%

13. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE

Edward A. Kalley Sr

14. TITLE AND FIRM NAME

Agriculturalist, Sun Oil Company

15. DATE SIGNED

February 25, 1974

16. RECEIVED BY EPA-OPP, REGISTRATION DIVISION, WASHINGTON, D.C. 20259

EPA FORM 8570-4 (1-73) REPLACES PR FORM 9-196 WHICH MAY NOT BE USED.

APPLICANT'S COPY

TOLS012021

BZTO104(e)048854

INSTRUCTIONS

NOTE: Use a separate form for each Formulation.

Applicant - keep the second copy for your files and forward the original to EPA or follow the instructions in "C" below.

A. The complete chemical composition of each pesticide must be known so it can be evaluated for registration under the Federal Insecticide, Fungicide and Rodenticide Act. This information is also necessary to determine the status of ingredients, both active and inert, under the Pesticide Chemicals Amendment to the Federal Food, Drug and Cosmetic Act.

B. This form is designed for reporting the ingredients used in the formulation of a pesticide. Its use will speed the review. It must be completed and submitted with each EPA Form 8570-1, Application For New Registration Of A Pesticide, or with each EPA Form 8570-2, Application For Amended Registration Of A Pesticide, if revision involves a formula change, or with each EPA Form 8570-3, Application For Renewal Registration Of A Pesticide.

C. If the complete chemical composition of formulated ingredients, either active or inert, used in this product's formulation is not known to you, send a separate set of these forms for each ingredient to your Basic Supplier. When you do this, it is important that you first fill in items 2 thru 8 so that we may positively identify the supplier's product with your pesticide. The Basic Supplier is then requested to complete items 1, and 9 thru 15, and submit the form to this Division. This statement is treated confidentially. It cannot be used to support a customer's (formulator's) application for subsequent registration without written authorization from the Basic Supplier.

ITEM No.

1. If more than 1 page is required, number them "1 of 2", "1 of 3", etc.
2. Enter the same date as the Application.
3. Read instruction "B" above.
4. Enter the name and address of your firm.
5. Enter the product name of this pesticide as it will appear on the finished label.
6. Enter the EPA Registration Number or File Symbol if known.
7. Complete if required by instructon "C" above.
8. Complete if required by instruction "C" above.
9. Completed only by Basic Supplier.
10. Completed only by Basic Supplier.
11. List first all active ingredients then the inert ingredients each in the exact order as they will appear on the finished label. When a formulated product is listed in the formula, name its basic manufacturer and give its EPA Registration No., if known, in parenthesis following the name of the product. (Also see instruction "C" above.) The trade name and manufacturer of surfactants and other adjuvants (dyes, emulsifiers, solvents, perfumes) must be listed. The complete chemical composition of emulsifiers and surfactants must be listed. Enclose the manufacturer's name in parenthesis following the product listed by trade name. (Also see instruction "C" above.) If a dye or other coloring is used, state the color.
12. Enter the percentage by weight of each active and inert ingredient beside the ingredient to which it applies. The percentages by weight for the active ingredients must agree with those appearing in the ingredient statement on the label. The sum of all percentages listed must equal 100 percent.
13. Self explanatory.
14. Self explanatory.
15. Self explanatory.

TOLS012022

BZTO104(e)048855

PRODUCTS GROUP
Tulsa Marketing District

SUN OIL COMPANY POST OFFICE BOX 2039, 1600 SOUTH UNION, TULSA, OKLAHOMA 74102 (918) 583-4300

February 5, 1974

Koppers Company, Inc.
Wood Treating Chemical Dept.
5137 Southwest Avenue
St. Louis, Missouri 63110

Attn: Mr. Harold P. Struessel

Gentlemen:

Attached please find Material Safety Data Sheets for Sunoco Wax 738, which comply with U. S. Department of Labor Occupational Safety and Health Administrations Regulations 1910.93.

If we may be of further assistance, please advise.

Yours very truly,

Wynn Brinson

Wynn Brinson
District Technical
Representative

WB:cjs

Attachments

cc: Shirley Ann Miller

TOLS012023

BZTO104(e)048856

MATERIAL SAFETY DATA SHEET

(Approved by U. S. Department of Labor "Essentially Similar" to Form OSHA-20)

I. Manufacturer's Name: Sun Oil Company
Address (number, street): P.O. Box 1135
(City, state, zip code): Marcus Hook, PA 19061
Emergency Telephone Number: (215) 485-1121
Information Supplied by: P. W. Lilley
Date: 12/73 Title: Medical Research Specialist

Product Trade Name: Sunoco Wax 738
Chemical Name & Synonyms:
Chemical Family: Formula: See ingredients
National Fire Protection Association 704M Signal (or estimate)
Health 0 Fire 1 Reactivity 0 Specific Hazard
Meets FDA Reg. 121.1156

II. HAZARDOUS INGREDIENTS

MATERIAL	%	TLV (Units)	MATERIAL	%	TLV (Units)
Fully refined paraffin wax blend containing trace amounts of anti-oxidant.	100	2 mg/m^3			

III. PHYSICAL DATA

a. Boiling point (°F): Wide range
b. Vapor pressure (mm Hg): Nil @70°F.
c. Vapor density (Air = 1): 7+
d. Solubility in water (%): Nil
e. Specific gravity (H_2O = 1): 0.86
f. Per cent volatile by volume: Nil
g. Evaporation rate (Ethyl ether = 1): 5000+
h. Appearance & odor: White solid; paraffin odor.

IV. FIRE AND EXPLOSION HAZARD DATA

a. Flash point (state method, °F): 390° Minimum COC
b. Ignition temperature (°F): 475° Estimated
c. Flammable limits in air, LEL: Not UEL: determined
d. Extinguishing media: Water fog, foam, CO_2, dry chemicals.
e. Special fire fighting procedures: None
f. Unusual fire and explosion hazards: None

V. HEALTH HAZARD DATA

a. Physiological Properties:

1. Acute oral toxicity (LD_{50} if available): LD_{50} in excess of 35 g/kg (rats).
2. Local effects to eyes: Non-irritating.
3. Local effects to skin: Non-irritating.
4. Sensitizing effects: None known.
5. Dermal absorption (LD_{50} if available): LD_{50} in excess of 8 g/kg (rabbits).
6. Inhalation effects (LC_{50} if available): None expected.
7. Threshold Limit Value (or estimate): 2 mg/m^3 as wax fume (ACGIH proposed for 1973).

SUN OIL COMPANY

TOLS012024

BZTO104(e)048857

Product Name Sunoco Wax 738

V.

b. Emergency and First Aid Procedures:

1. Ingestion: Give liquids; induce vomiting if indicated.
2. Eye Contact: Flush with water for 15 minutes.
3. Skin Contact: Wash with soap and water.
4. Inhalation: None.

Other Health Data: _____

VI. *REACTIVITY DATA*

a. Stability: Stable X Unstable _____ Conditions to avoid: _____

b. Incompatible Materials: Strong oxidizers may ignite this material.

c. Hazardous Decomposition Products: Carbon monoxide and asphyxiants.

d. Hazardous Polymerization: May occur _____ Will not occur X Conditions to avoid: _____

VII. *SPILL OR LEAK PROCEDURES*

a. Steps to be taken for spill or leak: If molten, allow to solidify and scoop up.

b. Waste disposal methods: Incinerate or bury in a sanitary landfill.

VIII. *SPECIAL PROTECTION INFORMATION*

a. Respiratory protection (Specify type) requirements: Usually none needed.

b. Ventilation requirements (local exhaust, general dilution, special): General dilution for heat load, if necessary.

c. Protective gloves required: To protect from molten material.

d. Eye protection required: Goggles or full faceshield recommended when handling molten product.

e. Other required equipment: None.

IX. *SPECIAL PRECAUTIONS*

a. Precautionary label required? If yes, please attach. No.

b. Precautions to be taken in handling and storing: Normal handling and storage.

c. Other precautions: None.

TOLS012025

BZTO104(e)048858

February 1, 1974

Mr. Wynn Brinson,
District Technical Representative
Sun Oil Company
P.O. Box 2039
Tulsa, Oklahoma 74102

Dear Mr. Brinson:

We purchase Sunwax 738 and use it in formulating several of our liquid wood preservatives.

A complete breakdown of inert ingredients must now be furnished to the Environmental Protection Agency in order to register economic poison labels such as are used on our products. The Sunwax 738 we use is an inert ingredient in our formulations and the EPA has requested that we have you complete the attached EPA form 8570-4 (1-73), items 1, and 9 through 15.

For your convenience, we would be pleased to forward the form to the EPA if you would return it to us after completion.

Thank you.

Yours very truly,

Harold P. Struessel
Manager-Order and Billing Dept.

HPS:mab

Enclosure

100°F MIN. FLASH

TOLS012026

BZTO104(e)048859

☆ U.S. GOVERNMENT PRINTING OFFICE: 1973—725-631

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES PROGRAMS, REGISTRATION DIVISION
WASHINGTON, D.C. 20950

CONFIDENTIAL STATEMENT OF FORMULA

(Under the Federal Insecticide, Fungicide and Rodenticide Act)

Form Approved
OMB No. 158-R0066

1. PAGE OF PAGES

▶ **IMPORTANT:** Read instructions on the reverse before completing form.

2. DATE OF APPLICATION: February 1, 1974

3. REASON FOR SUBMISSION *(Check one)*

	APPLICATION FOR A NEW REGISTRATION		APPLICATION FOR AMENDED OR RENEWAL REGISTRATION	X	SUBMITTED BY BASIC SUPPLIER *(See Instruction C on reverse)*

4. NAME AND ADDRESS OF APPLICANT OR REGISTRANT *(Include ZIP Code)*

Wood Treating Chemicals Dept.
Koppers Company, Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110

5. NAME OF PESTICIDE *(Must be same product name as on label. Do not list active ingredients)*

WOODTOX PRE-PRIME
READY TO USE

6. EPA REGISTRATION NO./FILE SYMBOL *(If known)*: 453-202

7. NAME AND MAILING ADDRESS OF BASIC SUPPLIER *(If applicable) (Include ZIP Code)*

Sun Oil Company
P.O. Box 2039
Tulsa, Oklahoma 74102

8. NAME OF INGREDIENT *(Product)* PROVIDED BY BASIC SUPPLIER FOR WHICH FORMULATION IS UNKNOWN *(If any)*

SUNWAX 738

9. IS THE INGREDIENT *(Product)* IN ITEM 8 REGISTERED WITH EPA? ☐ YES ☐ NO

10. IF YES TO ITEM 9, GIVE REGISTRATION NO.

11. NAME OF EACH ACTIVE AND INERT INGREDIENT USED IN THE FORMULATION *(List both the common name and the precise chemical name of each.)*	12. PERCENT OF EACH BY WEIGHT
☐ CHECK IF CONTINUED ON ATTACHMENT(S) — ALL INGREDIENTS LISTED IN ITEM 11 ABOVE AND ON ADDITIONAL PAGES MUST TOTAL	100%

13. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE

14. TITLE AND FIRM NAME

15. DATE SIGNED

16. RECEIVED BY EPA-OPP, REGISTRATION DIVISION, WASHINGTON, D.C. 20259

EPA FORM 8570-4 (1-73) REPLACES PR FORM 9-196 WHICH MAY NOT BE USED.

TOLS012027

cc: R. D. Arsenault

November 28, 1973

Mr. Mark F. Litteken G-5-E
Monsanto Company
800 North Lindbergh Blvd.
St. Louis, MO. 63166

Dear Mark:

The EPA in Washington, D.C. is now requesting a confidential Statement of Formula for Pentachlorophenol every time we register, re-register, or amend an existing registration.

In order to avoid this bother to you, an alternative would be to send a blanket letter of authorization for them to use your Confidential Statement of Formula to support our registrations.

Please advise whether or not you could write such a letter. If so, could you please send us a copy for our files?

Thanks for your usual cooperation in this matter.

Yours very truly,

H. P. Stueessel
Manager-Order and Billing Dept.

HPS:mab

TOLS012028

BZTO104(e)048861

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 19 1973

Registration Division

Wood Treating Chemicals Company
Attention: Mr. Harold Strussel
5137 Southwest Avenue
St. Louis, Missouri 63110

Subject: WOODTOX PRE_PRIME
EPA Reg. No. 453-202
Your application of September 27, 1973

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, is acceptable, and a stamped copy is enclosed for your records.

Request your supplier(s) to submit a statement specifically authorizing this Division to use their confidential formula(s) in support of your product's registration. Alternatively, request your supplier to submit to this Division their complete formula(s) giving the names and percentages of both the active and inert ingredients for:

1. Technical pentachlorophenol from Monsanto Company.

2. Sunwax 738 Sun Oil Company.

Refer to the enclosed "FIFRA Labeling Information," Comment #20. Submit the flash point of this product.

It is understood that this product under the new formula replaces the old product accepted for registration August 7, 1972.

Sincerely,

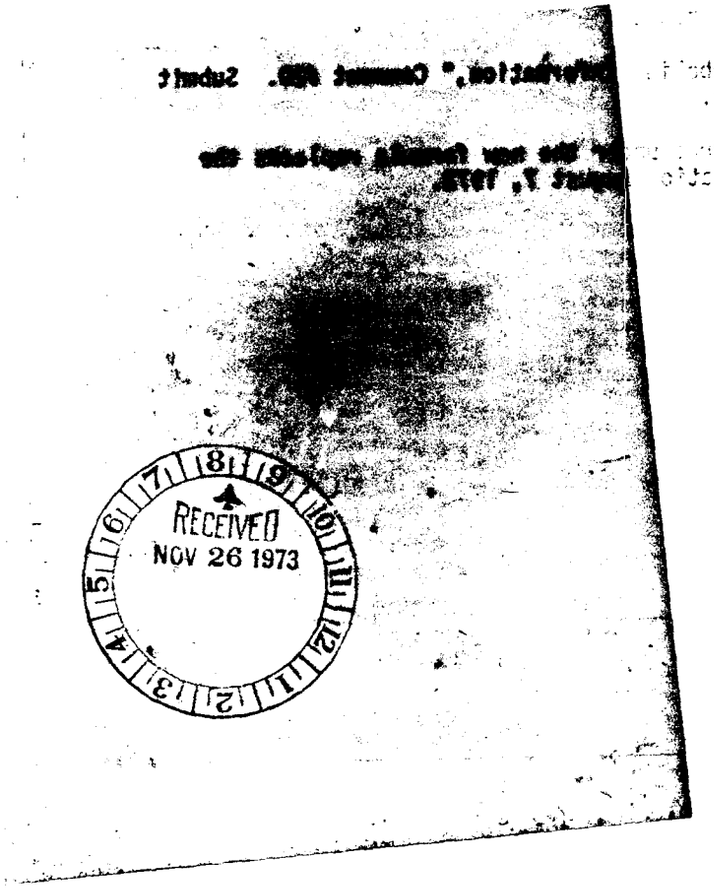
for

Richard F. Mountfort
Section Head
Fungicide-Herbicide Branch

Enclosures (2)

TOLS012029

BZTO104(e)048862



TOLS012030

KOPPERS

WOODTOX PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

ACCEPTED

NOV 15 1973

UNDER THE FEDERAL INSECTICIDE FUNGICIDE AND RODENTICIDE ACT FOR ECONOMIC POISON REGISTERED UNDER NO. 453-202 SUBJECT TO ATTACHED COMMENTS.

TM TRADEMARK OF

WOOD TREATING CHEMICALS DEPT.

KOPPERS COMPANY, INC.

5137 SOUTHWEST AVENUE, ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

EPA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a brown oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

Do not use, pour, spill or store near heat or open flame.

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthemia. Treat symptomatically.

This product is toxic to fish, wildlife and domestic animals. Keep out of lakes, streams and ponds. Keep containers closed when not in use. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

Apply this product only as specified on this label.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

TOLS012031

11672-2

BZTO104(e)048864

TOLS012032

BZTO104(e)048865

PR Notice 70-21

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

September 18, 1970

NOTICE TO MANUFACTURERS, FORMULATORS, DISTRIBUTORS, AND REGISTRANTS OF ECONOMIC POISONS

Attention: Person Responsible For Federal Registration of Economic Poisons

Applications for registration of economic poisons under the Federal Insecticide, Fungicide, and Rodenticide Act must be supported by complete information on the formula of the proposed product as provided in Section 4.b of the Act.

The complete chemical composition of each economic poison must be known to properly evaluate the product prior to registration under the Act. This information is also necessary to determine the status of ingredients, both active and inert, under the Pesticide Chemicals Amendment to the Federal Food, Drug, and Cosmetic Act.

This notice revises PR Notice 67-3 and includes instructions for completing PR Form 9-196, "Confidential Statement of the Formula" which is designed for reporting the ingredients used in the formulation of an economic poison. All information will be treated confidentially.

PR Form 9-196 must be completed and submitted with each "Application for New Registration of Economic Poisons" (PR Form 9-199), or with each "Application for Renewal of Registration of Economic Poisons" (PR Form 9-197). If the revision involves a change in formula which does not require a new registration, the form should accompany the "Application for Amended Registration of Economic Poisons" (PR Form 9-198).

If the complete chemical composition of the components of the product, either active or inert, is not known, send a separate set of the form for each such ingredient to your basic supplier. It is important that you first fill in items 2 thru 8 so that we may associate the supplier's information with the records for your product. The supplier should complete item 1, and items 9 thru 15, and submit the form to this Division.

TOLS012033

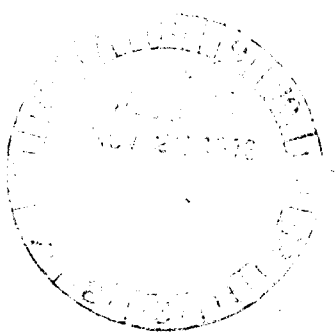
BZTO104(e)048866

the confidential statement of the formula forms, PR 9-196 are available upon request. Please address your request to:

United States Department of Agriculture
Agricultural Research Service
Pesticides Regulation Division
9-PR Forms
Washington, D.C. 20250

Attachment
(1) PR Form 9-196, Confidential Statement of Formula.

T. E. Adamczyk
Acting Chief
Registration Branch



TOLS012034

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

FORM APPROVED
BUDGET BUREAU NO. 40-R1746

CONFIDENTIAL STATEMENT OF FORMULA

(Under the Federal Insecticide, Fungicide, and Rodenticide Act)

1. PAGE NO. *This Formula* OF

IMPORTANT: *Read instructions on reverse before completing form. All information will be treated confidentially.*

2. DATE OF APPLICATION

3. REASON FOR SUBMISSION *(Check one)*

APPLICATION FOR NEW REGISTRATION ☐ APPLICATION FOR AMENDED OR RENEWAL REGISTRATION ☐ SUBMITTED BY BASIC SUPPLIER *(See instruction C on reverse)* ☐

4. NAME & MAILING ADDRESS OF APPLICANT OR REGISTRANT *(Include Zip Code)*

5. NAME OF ECONOMIC POISON *(Must be same product name as on label-do not list active ingredients)*

6. REGISTRATION NO. OR FILE SYMBOL *(If known)*

7. NAME & MAILING ADDRESS OF BASIC SUPPLIER *(If applicable) (Include zip code)*

8. NAME OF INGREDIENT (PRODUCT) PROVIDED BY BASIC SUPPLIER FOR WHICH FORMULATION IS UNKNOWN *(If any)*

9. IS THE INGREDIENT (PRODUCT) NAMED IN ITEM 8 REGISTERED WITH THE USDA? YES ☐ NO ☐

10. IF "YES" IN ITEM 9, GIVE REGISTRATION NO.

11. NAME OF EACH ACTIVE AND EACH INERT INGREDIENT USED IN THE FORMULATION *(List both the common name and the precise chemical name of each)*	12. PERCENT OF EACH BY WEIGHT
☐ CONTINUED ON ATTACHMENT(S) — All ingredients listed in item 11 above and on additional pages must total →	100%

13. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE

16. **RECEIVED BY USDA—PESTICIDES REGULATION DIVISION, WASHINGTON, D. C.**

14. TITLE

15. DATE SIGNED

PR FORM 8-186
(MAY 1970)

TOLS012035

BZTO104(e)048868

INSTRUCTIONS FOR PR FORM 9-196

A. The complete chemical composition of each economic poison must be known so it can be evaluated for registration under the Federal Insecticide, Fungicide, and Rodenticide Act. This information is also necessary to determine the status of ingredients, both active and inert, under the Pesticide Chemicals Amendment to the Federal Food, Drug, and Cosmetic Act.

B. This form is designed for reporting the ingredients used in the formulation of an economic poison. Its use will speed the review. It must be completed and submitted with each "Application for New Registration of Economic Poisons" (PR Form 9-199), or with each "Application for Amended Registration of Economic Poisons" (PR Form 9-198) if revision involves a formula change, or with each "Application for Renewal Registration of Economic Poisons" (PR Form 9-197).

C. If the complete chemical composition of formulated ingredients, either active or inert, used in this product's formulation is not known to you, send a separate set of these forms for each such ingredient to your Basic Supplier. When you do this, it is important that you first fill in items 2 thru 8 so that we may positively identify the supplier's product with your economic poison. The Basic Supplier is then requested to complete item 1, and items 9 thru 15, and submit the form to this Division. This Statement is treated confidentially. It cannot be used to support a customer's (formulator's) application for subsequent registration without written authorization from the Basic Supplier.

ITEM NO.

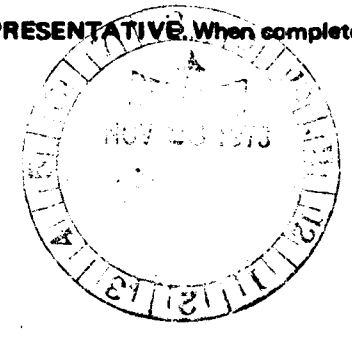
1. PAGES OF THIS FORMULA. Show "1 of 1", "1 of 2", etc. If space on this form is insufficient to list all ingredients, continue on additional sheets and number in sequence.
2. DATE OF APPLICATION. Enter the same date as the related application form.
3. REASON FOR SUBMISSION. Read instruction B above.
4. NAME AND MAILING ADDRESS OF APPLICANT OR REGISTRANT. Enter the name and mailing address of your firm.
5. NAME OF ECONOMIC POISON. Enter the product name of this economic poison as it will appear on the finished label.
6. REGISTRATION NO. OR FILE SYMBOL. These reference items are assigned by the PR Division. If unknown, leave blank
7. NAME AND MAILING ADDRESS OF BASIC SUPPLIER.
8. NAME OF INGREDIENT (PRODUCT) PROVIDED BY BASIC SUPPLIER FOR WHICH FORMULATION IS UNKNOWN

   } Complete only if required by Instruction C above.

9. IS THE INGREDIENT (PRODUCT) NAMED IN ITEM 8 REGISTERED WITH USDA? "YES" or "NO".
10. IF "YES" IN ITEM 9, GIVE REGISTRATION NO. Self-Explanatory.

   } Completed only by the Basic Supplier.

11. NAME OF EACH ACTIVE AND EACH INERT INGREDIENT USED IN THE FORMULATION. List both the common name and the precise chemical name of each active and each inert ingredient used in formulating this product.
    a. First list the active ingredients. List them in the very same order as they appear or will appear in the ingredient statement on the finished label.
    b. Next, list the name of each inert ingredient.
    c. When a formulated product is listed in the formula, name its basic manufacturer and give its USDA Registration Number, if known, in parenthesis following the name of the product. (Also see Instruction C above).
    d. The trade name and manufacturer of surfactants and other adjuvants (dyes, emulsifiers, solvents, perfumes) must be listed. The complete chemical composition of emulsifiers and surfactants must be listed. Enclose the manufacturer's name in parenthesis following the product listed by trade name. (Also see Instructions C above).
    e. If a dye or other coloring material is used, state the color.
12. PERCENT OF EACH BY WEIGHT. Enter in this column the percentage by weight of each active and each inert ingredient listed in item 11. Each entry must be opposite that ingredient to which it applies. The percentages by weight for the active ingredients must agree with those appearing in the ingredient statement on the label. The sum of all the percentages listed must equal 100 percent.
13. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE. When completed, the authorized representative of the firm must sign this form.
14. TITLE. Self-explanatory.
15. DATE SIGNED. Self-explanatory.



TOLS012036

( ) 20. Non-Pressurized Products

If it is known or suspected that a product will burn, its flash point should be determined by the applicant by the appropriate method and the result made a part of the records of its registration.

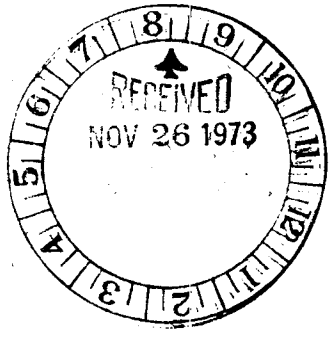
If the flash point is found to be 20° Fahrenheit or lower, the label should bear the prominent caution: "DANGER-EXTREMELY FLAMMABLE" "KEEP AWAY FROM FIRE, SPARKS, AND HEATED SURFACES."

If the flash point is found to be between 20° and 80° Fahrenheit, the label should bear the prominent warning: "WARNING-FLAMMABLE! KEEP AWAY FROM HEAT OR OPEN FLAME."

If the flash point is found to be between 80° and 150° F., the label should bear the prominent caution: "DO NOT USE, POUR, SPILL, OR STORE NEAR HEAT OR OPEN FLAME."

The Pesticides Regulation Division does not require fire hazard cautions on the labels of products that flash above 150° Fahrenheit. Products labeled to comply with the requirements of these more restrictive laws will be acceptable under the Federal Insecticide, Fungicide, and Rodenticide Act insofar as "fire warnings" are concerned.

TOLS012037



TOLS012038

BZTO104(e)048871

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D.C. 20250

FORM APPROVED
BUDGET BUREAU NO. 40-R1746

APPLICATION FOR AMENDED REGISTRATION OF ECONOMIC POISONS

(Under the Federal Insecticide, Fungicide, and Rodenticide Act)

1. DATE OF APPLICATION: SEPTEMBER 27, 1973

IMPORTANT: READ INSTRUCTIONS ON REVERSE

2. NAME OF ECONOMIC POISON *(Must be same product name as on label—do not list active ingredients)*
WOODTOX PRE-PRIME READY TO USE

3. NAME & MAILING ADDRESS OF REGISTRANT *(Include Zip Code)*
WOODTREATING CHEMICALS DEPT.
KOPPERS COMPANY INC.
5137 SOUTHWEST AVENUE
ST. LOUIS, MO. 63110

4. REGISTRATION NO.
453-202

5. PROPOSED EFFECTIVE DATE OF CHANGE
9-27-73

6. NATURE OF REVISION *(Check applicable item and give details in item 7, when required)*

- GENERAL REVISION OF LABELING ☐
- CHANGE IN FORMULATION ☒ *(Give description of exact change in item 7)*
- OTHER ☐ *(Specify in item 7)*
- ADDITIONAL USES ADDED TO LABELING ☐ *(List new recommendations in item 7)*
- CHANGE IN PRODUCT NAME ☐ *(Give old name and new name in item 7)*

7. DETAILS REQUIRED BY REVISION CHECKED IN ITEM 6 *(Attach additional sheets if more space is needed)*

SEE CONFIDENTIAL FORMULA SHEET

REPLACED [redacted] UCON 144 AND FILTREZ PE-75-60
WITH ONE OTHER INGREDIENT IN INACTIVE INGREDIENTS

ACKNOWLEDGEMENT

TOLS012039

☒ CONTINUED ON ATTACHMENT

8. THE FOLLOWING MUST BE SUBMITTED WITH THIS APPLICATION

- Five (5) copies of revised labeling, including any printed or graphic matter which may accompany the sale of this product. Copies must be clearly legible and identical.
- If a change in formulation is involved, five (5) copies of a statement of revised formula showing the precise name and precentage of each active and each inert ingredient. *(This information is treated confidentially)*
- When appropriate, three (3) copies of Supporting Data.

12. RECEIVED BY USDA-PESTICIDES REGULATION DIVISION, WASHINGTON, D. C.

IN ANY CORRESPONDENCE ON THIS PRODUCT REFER TO REGISTRATION NO. IN ITEM 4, ABOVE.

9. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE
Harold P. Strunk

10. TITLE
LABEL COORDINATOR

11. DATE SIGNED
SEPTEMBER 27, 1973

PR FORM 9-198
MAY 1969

EXISTING STOCK OF PR FORM 9-198 (AUG. 1968) WILL BE USED UNTIL EXHAUSTED

BZTO104(e)048872

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D.C. 20250

FORM APPROVED
BUDGET BUREAU NO. 40-R1746

APPLICATION FOR AMENDED REGISTRATION OF ECONOMIC POISONS

(Under the Federal Insecticide, Fungicide, and Rodenticide Act)

1. DATE OF APPLICATION: SEPTEMBER 27,1973

IMPORTANT: READ INSTRUCTIONS ON REVERSE

2. NAME OF ECONOMIC POISON *(Must be same product name as on label—do not list active ingredients)*
WOODTOX PRE-PRIME READY TO USE

3. NAME & MAILING ADDRESS OF REGISTRANT *(Include Zip Code)*
WOODTREATING CHEMICALS DEPT.
KOPPERS COMPANY INC.
5137 SOUTHWEST AVENUE
ST. LOUIS,MO. 63110

4. REGISTRATION NO.
453-202

5. PROPOSED EFFECTIVE DATE OF CHANGE
9-27-73

6. NATURE OF REVISION *(Check applicable item and give details in item 7, when required)*

- GENERAL REVISION OF LABELING ☐
- CHANGE IN FORMULATION ☒ *(Give description of exact change in item 7)*
- OTHER ☐ *(Specify in item 7)*
- ADDITIONAL USES ADDED TO LABELING ☐ *(List new recommendations in item 7)*
- CHANGE IN PRODUCT NAME ☐ *(Give old name and new name in item 7)*

7. DETAILS REQUIRED BY REVISION CHECKED IN ITEM 6 *(Attach additional sheets if more space is needed)*

SEE CONFIDENTIAL FORMULA SHEET

REPLACED UCON 144 AND FILTREZ PE-75-60
WITH ONE OTHER INGREDIENT IN INACTIVE INGREDIENTS

☐ CONTINUED ON ATTACHMENT

8. THE FOLLOWING MUST BE SUBMITTED WITH THIS APPLICATION

- Five (5) copies of revised labeling, including any printed or graphic matter which may accompany the sale of this product. Copies must be clearly legible and identical.
- If a change in formulation is involved, five (5) copies of a statement of revised formula showing the precise name and precentage of each active and each inert ingredient. *(This information is treated confidentially)*
- When appropriate, three (3) copies of Supporting Data.

IN ANY CORRESPONDENCE ON THIS PRODUCT REFER TO REGISTRATION NO. IN ITEM 4, ABOVE.

9. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE
Harold P. Brunsel

10. TITLE: LABEL COORDINATOR

11. DATE SIGNED: SEPTEMBER 27,1973

PR FORM 9-198
MAY 1969

EXISTING STOCK OF PR FORM 9-198 (AUG. 1968) WILL BE USED UNTIL EXHAUSTED

APPLICANT'S COPY

TOLS012040

BZTO104(e)048873

ITEM

INSTRUCTIONS FOR PR FORM 9—198

1. Applications should be submitted as far in advance as possible prior to desired registration date. The time required to process applications may vary depending on the extent of review required. Applications which require consultation with other governmental agencies will take a longer time to process.

2. The name of the economic poison shown in the application must be the same product name as that shown on the labeling submitted. Do not list the active ingredients.

3. The name of the firm or person and address shown in your application is the person or firm to whom registration will be issued. If you are acting in behalf of another party, you must submit authorization from that party to act for them in registration matters. The address given in item three will be the mailing address permanently on record unless changed by the registrant.

4. The registration number assigned must appear on the label. The number must be the same as that appearing on the notice of registration and shall be preceded by the phrase "USDA Registration Number" or the phrase "USDA Reg. No." (Refer to Sec. 362.6(F) of the Regulations)

5. Changes in the labeling or changes in the formula must be submitted in advance of the proposed effective date.

6. Nature of revision — The registrant must describe the exact changes desired and upon request must submit a description of test results to justify such changes. Minor changes in formulation may be handled as revisions of existing registrations. This might include a change in the percentage of active ingredients or a change in inert ingredients. However, any basic change in formulation such as a change in the principal active ingredients would require a separate registration as a new product with a different product name.

7. Self Explanatory.

8. Labeling — All copies of labeling must be clearly legible and identical. Photo copy of lithograph labels should be submitted. Do not send containers. Your supplier should be able to furnish photo copies of the screen print. Submit reduced photo copies of labeling for dry agricultural fertilizer - insecticide, or herbicide bags. Any label smaller than half the size of a sheet of paper 8 inches by 10 inches should be stapled to a sheet of paper 8 inches by 10 inches before attaching to application.

   Formulation — If a change in formulation is involved, five copies of a separate statement listing the correct name and percentage by weight of each active and each inert ingredient must be submitted with each application. This statement is treated confidentially. It cannot be used to support a customer's (formulator) application for subsequent registration without written authorization from the registrant. If necessary information on the formula is not available to the applicant (formulator or packer), he should: (a) Obtain the necessary information from the basic supplier and submit five copies of the statement with the application or (b) Request the basic supplier to furnish the necessary information to the Division along with a statement specifically authorizing the use of such information to support separate registration for the applicant. The statement from the basic supplier must clearly identify the applicant's product to which it applies.

ATTENTION: The submission of an application does not constitute registration. Comment or notice of registration will be sent after examination by the Pesticides Regulation Division of the information submitted.

TOLS012041

BZTO104(e)048874

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES PROGRAMS, REGISTRATION DIVISION
WASHINGTON, D.C. 20950

CONFIDENTIAL STATEMENT OF FORMULA

(Under the Federal Insecticide, Fungicide and Rodenticide Act)

Form Approved
OMB No. 158-R0066

1. PAGE 1 OF 1 PAGES

IMPORTANT: Read instructions on the reverse before completing form.

2. DATE OF APPLICATION: SEPTEMBER 27,1973

3. REASON FOR SUBMISSION *(Check one)*

	APPLICATION FOR A NEW REGISTRATION	X	APPLICATION FOR AMENDED OR RENEWAL REGISTRATION		SUBMITTED BY BASIC SUPPLIER *(See instruction C on reverse)*

4. NAME AND ADDRESS OF APPLICANT OR REGISTRANT *(Include ZIP Code)*

WOOD TREATING CHEMICALS DEPT.
KOPPERS COMPANY INC.
5137 SOUTHWEST AVENUE
ST.LOUIS,MO. 63110

5. NAME OF PESTICIDE *(Must be same product name as on label. Do not list active ingredients)*

WOODTOX PRE-PRIME READY TO USE

6. EPA REGISTRATION NO./FILE SYMBOL *(If known)*

453-202

7. NAME AND MAILING ADDRESS OF BASIC SUPPLIER *(If applicable) (Include ZIP Code)*

8. NAME OF INGREDIENT *(Product)* PROVIDED BY BASIC SUPPLIER FOR WHICH FORMULATION IS UNKNOWN *(If any)*

9. IS THE INGREDIENT *(Product)* IN ITEM 8 REGISTERED WITH EPA? ☐ YES ☐ NO

10. IF YES TO ITEM 9, GIVE REGISTRATION NO.

11. NAME OF EACH ACTIVE AND INERT INGREDIENT USED IN THE FORMULATION *(List both the common name and the precise chemical name of each.)*	12. PERCENT OF EACH BY WEIGHT
ACTIVE INGREDIENTS:	
PENTACHLOROPHENOL*.....04.47%	
OTHER CHLOROPHENALS*.....00.52%	
MINERAL SPIRITS.....84.55%	
	89.54%
INERT INGREDIENTS:	
FROM TECHNICAL PENTACHLOROPHENOL* (MONSANTO CO.).....00.21%	
SUNWAX 738 (SUN OIL CO.).....00.75%	
OXOBOTTOMS SOLVENT (MONSANTO CO.).....09.00%	
SANTOLENE C.....00.50%	10.46%
*5.2% TECHNICAL PENTACHLOROPHENOL AS DEFINED IN FEDERAL SPEC TT-W-570	
TOLS012042	
☐ CHECK IF CONTINUED ON ATTACHMENT(S) — ALL INGREDIENTS LISTED IN ITEM 11 ABOVE AND ON ADDITIONAL PAGES MUST TOTAL	100%

13. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE: Harold O. Thomas

14. TITLE AND FIRM NAME: LABEL COORDINATOR — WOOD TREATING CHEMICAL KOPPERS COMPANY INC.

15. DATE SIGNED: 9-27-73

16. RECEIVED BY EPA-OPP, REGISTRATION DIVISION, WASHINGTON, D.C. 20259

EPA FORM 8570-4 (1-73) REPLACES PR FORM 9-196 WHICH MAY NOT BE USED.

APPLICANT'S COPY

BZTO104(e)048875

INSTRUCTIONS

[illegible] for each Formulation.

Applicant - keep the second copy for your files and forward the original to EPA or follow the instructions in "C" below.

A. The complete chemical composition of each pesticide must be known so it can be evaluated for registration under the Federal Insecticide, Fungicide and Rodenticide Act. This information is also necessary to determine the status of ingredients, both active and inert, under the Pesticide Chemicals Amendment to the Federal Food, Drug and Cosmetic Act.

B. This form is designed for reporting the ingredients used in the formulation of a pesticide. Its use will speed the review. It must be completed and submitted with each EPA Form 8570-1, Application For New Registration Of A Pesticide, or with each EPA Form 8570-2, Application For Amended Registration Of A Pesticide, if revision involves a formula change, or with each EPA Form 8570-3, Application For Renewal Registration Of A Pesticide.

C. If the complete chemical composition of formulated ingredients, either active or inert, used in this product's formulation is not known to you, send a separate set of these forms for each ingredient to your Basic Supplier. When you do this, it is important that you first fill in items 2 thru 8 so that he may positively identify the supplier's product with your pesticide. The Basic Supplier is then requested to complete items 1, and 9 thru 15, and submit the form to this Division. This statement is treated confidentially. It cannot be used to support a customer's (formulator's) application for subsequent registration without written authorization from the Basic Supplier.

ITEM No.

1. If more than 1 page is required, number them "1 of 2", "1 of 3", etc.
2. Enter the same date as the Application.
3. Read instruction "B" above.
4. Enter the name and address of your firm.
5. Enter the product name of this pesticide as it will appear on the finished label.
6. Enter the EPA Registration Number or File Symbol if known.
7. Complete if required by instructon "C" above.
8. Complete if required by instruction "C" above.
9. Completed only by Basic Supplier.
10. Completed only by Basic Supplier.
11. List first all active ingredients then the inert ingredients each in the exact order as they will appear on the finished label. When a formulated product is listed in the formula, name its basic manufacturer and give its EPA Registration No., if known, in parenthesis following the name of the product. (Also see instruction "C" above.) The trade name and manufacturer of surfactants and other adjuvants (dyes, emulsifiers, solvents, perfumes) must be listed. The complete chemical composition of emulsifiers and surfactants must be listed. Enclose the manufacturer's name in parenthesis following the product listed by trade name. (Also see instruction "C" above.) If a dye or other coloring is used, state the color.
12. Enter the percentage by weight of each active and inert ingredient beside the ingredient to which it applies. The percentages by weight for the active ingredients must agree with those appearing in the ingredient statement on the label. The sum of all percentages listed must equal 100 percent.
13. Self explanatory.
14. Self explanatory.
15. Self explanatory.

TOLS012043

BZTO104(e)048876

KOPPERS

WOODTOX PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF
WOOD TREATING CHEMICALS DEPT.
KOPPERS COMPANY, INC.
5137 SOUTHWEST AVENUE, ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

EPA Reg. No. 453-202

NET U.S. GALLONS

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

DIRECTIONS FOR USE

This product is a brown oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is a potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

Do not use, pour, spill or store near heat or open flame.

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthemia. Treat symptomatically.

This product is toxic to fish, wildlife and domestic animals. Keep out of lakes, streams and ponds. Keep containers closed when not in use. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

Apply this product only as specified on this label.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

11672-2

BZTO104(e)048877

TOLS012044

KOPPERS

WOODTOX® PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF

WOOD TREATING CHEMICALS DEPT.

KOPPERS COMPANY, INC.

5137 SOUTHWEST AVENUE, ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

EPA Reg. No. 453-202
EPA Est. 453-MO-1
EPA Est. 33760-OR-01

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

NET CONTENTS 55 U.S. GALLONS

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the treated lumber.

Do not use, pour, spill or store near heat or open flame.

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

This product is toxic to fish and wildlife. Keep out of lakes, streams, and ponds. Keep containers closed when not in use. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

FPL 1167 R 03

BZTO104(e)048878

TOLS012045

New

9-13-74

deleted "and Domestic Animals"

added EPA Est. No

updated product Code

BZTO104(e)048879

TOLS012046

ENVIRONMENTAL PROTECTION AGENCY
PESTICIDES REGULATION DIVISION
WASHINGTON, D. C. 20250

Wood Treating Chem Co
5137 Southwest Avenue
St. Louis, MO 63110

OCT 25 1974

Attention: H. P. Struessel

Gentlemen:

Subject : WOODTOX PRE PRIME
EPA Reg. No. 453-202
Your Application of October 3, 1974

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, is acceptable and a stamped copy is enclosed for your records.

Very truly yours,

Richard F Mountfort

Richard F. Mountfort
Section Head
Fungicide-Herbicides Branch

Enclosure

RECEIVED
NOV 4 1974

PR FORM 5-258
SEP 1967

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

TOLS012047

BZTO104(e)048880

ACCEPTED

October 24, 1974

UNDER THE FEDERAL INSECTICIDE FUNGICIDE AND RODENTICIDE ACT FOR ECONOMIC POISON REGISTERED UNDER NO. 453-202

TOLS012048

BZTO104(e)048881

KOPPERS

WOODTOX® PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF

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KOPPERS COMPANY, INC.

5137 SOUTHWEST AVENUE, ST. LOUIS, MISSOURI 63110

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See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

EPA Reg. No. 453-202
EPA Est. 453-MO-1
EPA Est. 33760-OR-01

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

NET CONTENTS 55 U.S. GALLONS

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder-post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

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LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example, incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

FPL 1167 R C3

BZTO104(e)048882

TOLS012049

This page inserted due to clerical error

BZTO104(e)048883

TOLS012051

BZTO104(e)048884

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D.C. 20250

FORM APPROVED
BUDGET BUREAU NO. 40-R1746

APPLICATION FOR AMENDED REGISTRATION OF ECONOMIC POISONS

(Under the Federal Insecticide, Fungicide, and Rodenticide Act)

1. DATE OF APPLICATION: October 3, 1974

IMPORTANT: READ INSTRUCTIONS ON REVERSE

2. NAME OF ECONOMIC POISON *(Must be same product name as on label—do not list active ingredients)*

Woodtox Pre-Prime Ready To Use

3. NAME & MAILING ADDRESS OF REGISTRANT *(Include Zip Code)*

Wood Treating Chemicals Dept.
Koppers Company, Inc
5137 Southwest Avenue
St. Louis, Missouri 63110

4. REGISTRATION NO.: 453 - 202

5. PROPOSED EFFECTIVE DATE OF CHANGE: October 3, 1974

6. NATURE OF REVISION *(Check applicable item and give details in item 7, when required)*

GENERAL REVISION OF LABELING ☐

CHANGE IN FORMULATION ☐
(Give description of exact change in item 7)

OTHER ☒
(Specify in item 7)

ADDITIONAL USES ADDED TO LABELING ☐
(List new recommendations in item 7)

CHANGE IN PRODUCT NAME ☐
(Give old name and new name in item 7)

7. DETAILS REQUIRED BY REVISION CHECKED IN ITEM 6 *(Attach additional sheets if more space is needed)*

Changed "Net U. S. Gallons"
to "Net Contents U. S. Gallons"

Deleted "and domestic animals" from general fish and wildlife paragraph

Corrected "Hyperthemia" to "Hyperthermia"

Added EPA Establishment numbers.

☐ CONTINUED ON ATTACHMENT

8. THE FOLLOWING MUST BE SUBMITTED WITH THIS APPLICATION

- Five (5) copies of revised labeling, including any printed or graphic matter which may accompany the sale of this product. Copies must be clearly legible and identical.
- If a change in formulation is involved, five (5) copies of a statement of revised formula showing the precise name and precentage of each active and each inert ingredient.
  (This information is treated confidentially)
- When appropriate, three (3) copies of Supporting Data.

12. RECEIVED BY USDA-PESTICIDES REGULATION DIVISION, WASHINGTON, D. C.

IN ANY CORRESPONDENCE ON THIS PRODUCT REFER TO REGISTRATION NO. IN ITEM 4 ABOVE.

RECEIVED OCT 14 1974

RECEIVED 7 OCT 1974

9. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE

H. P. Struessel

10. TITLE: Label Coordinator

11. DATE SIGNED: 10-3-74

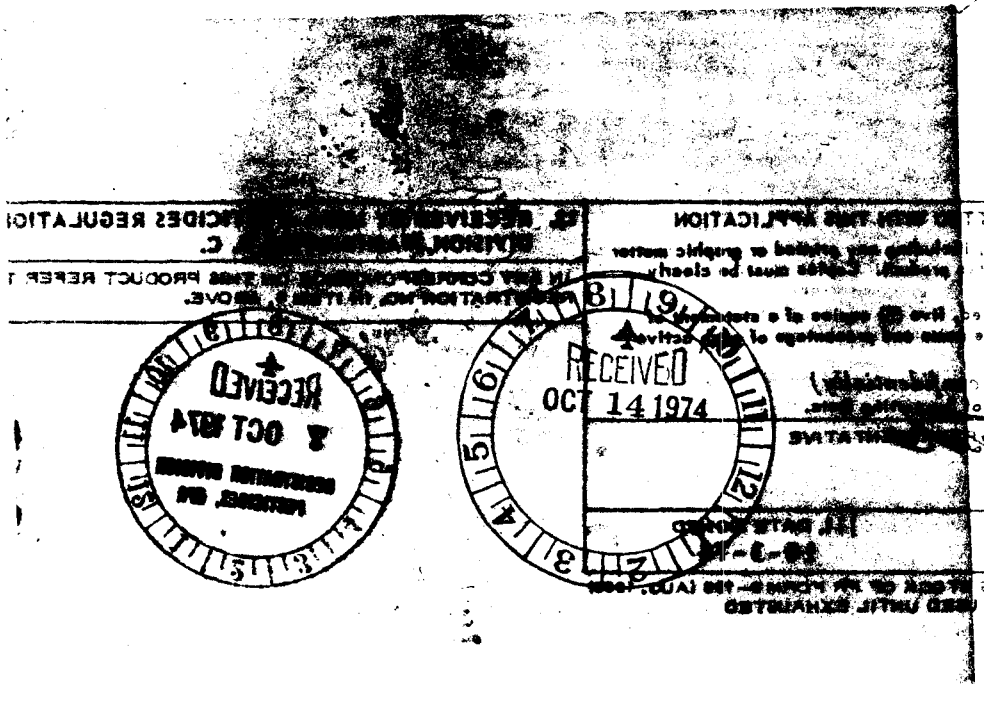
PR FORM 9-198
MAY 1969

EXISTING STOCK OF PR FORM 9-198 (AUG. 1968) WILL BE USED UNTIL EXHAUSTED

ACKNOWLEGEMENT

TOLS012052

BZTO104(e)048885



TOLS012053

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PESTICIDES REGULATION DIVISION
WASHINGTON, D.C. 20250

FORM APPROVED
BUDGET BUREAU NO. 40-R1746

APPLICATION FOR AMENDED REGISTRATION OF ECONOMIC POISONS

(Under the Federal Insecticide, Fungicide, and Rodenticide Act)

IMPORTANT: READ INSTRUCTIONS ON REVERSE

1. DATE OF APPLICATION: **October 3, 1974**

2. NAME OF ECONOMIC POISON *(Must be same product name as on label—do not list active ingredients)*

Woodtox Pre-Prime Ready To Use

3. NAME & MAILING ADDRESS OF REGISTRANT *(Include Zip Code)*

Wood Treating Chemicals Dept.
Koppers Company, Inc
5137 Southwest Avenue
St. Louis, Missouri 63110

4. REGISTRATION NO.: **453 - 202**

5. PROPOSED EFFECTIVE DATE OF CHANGE: **October 3, 1974**

6. NATURE OF REVISION *(Check applicable item and give details in item 7, when required)*

GENERAL REVISION OF LABELING ☐ — *(Submit complete new label)*
ADDITIONAL USES ADDED TO LABELING ☐ — *(List new recommendations in item 7)*
CHANGE IN FORMULATION ☐ — *(Give description of exact changes in item 7)*
CHANGE IN PRODUCT NAME ☐ — *(Give old name and new name in item 7)*
OTHER ☒ — *(Specify in item 7)*

7. DETAILS REQUIRED BY REVISION CHECKED IN ITEM 6 *(Attach additional sheets if more space is needed)*

Changed "Net U. S. Gallons" to "Net Contents U. S. Gallons"

Deleted "and domestic animals" from general fish and wildlife paragraph

Corrected "Hyperthemia" to "Hyperthermia"

Added EPA Establishment numbers.

☐ CONTINUED ON ATTACHMENT

8. THE FOLLOWING MUST BE SUBMITTED WITH THIS APPLICATION:

- Five (5) copies of revised labeling, including any printed or graphic matter which may accompany the sale of this product. Copies must be clearly legible and identical.
- If a change in formulation is involved, five (5) copies of a statement or revised formula showing the precise name and percentage of each active and each inert ingredient. *(This information is treated confidentially)*
- When appropriate, three (3) copies of Supporting Data.

IN ANY CORRESPONDENCE ON THIS PRODUCT REFER TO REGISTRATION NO. (SEE ITEM 4, ABOVE)

9. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE

H. P. Struessel

H. P. Struessel

10. TITLE: **Label Coordinator**

11. DATE SIGNED: **10-3-74**

PR FORM 9-198
MAY 1969

EXISTING STOCK OF PR FORM 9-198 (AUG. 1968) WILL BE USED UNTIL EXHAUSTED

APPLICANT'S COPY

TOLS012054

BZTO104(e)048887

ITEM

INSTRUCTIONS FOR PR FORM 9—198

1. Applications should be submitted as far in advance as possible prior to desired registration date. The time required to process applications may vary depending on the extent of review required. Applications which require consultation with other governmental agencies will take a longer time to process.

2. The name of the economic poison shown in the application must be the same product name as that shown on the labeling submitted. Do not list the active ingredients.

3. The name of the firm or person and address shown in your application is the person or firm to whom registration will be issued. If you are acting in behalf of another party, you must submit authorization from that party to act for them in registration matters. The address given in item three will be the mailing address permanently on record unless changed by the registrant.

4. The registration number assigned must appear on the label. The number must be the same as that appearing on the notice of registration and shall be preceded by the phrase "USDA Registration Number" or the phrase "USDA Reg. No." (Refer to Sec. 362.6(F) of the Regulations)

5. Changes in the labeling or changes in the formula must be submitted in advance of the proposed effective date.

6. Nature of revision — The registrant must describe the exact changes desired and upon request must submit a description of test results to justify such changes. Minor changes in formulation may be handled as revisions of existing registrations. This might include a change in the percentage of active ingredients or a change in inert ingredients. However, any basic change in formulation such as a change in the principal active ingredients would require a separate registration as a new product with a different product name.

7. Self Explanatory.

8. Labeling — All copies of labeling must be clearly legible and identical. Photo copy of lithograph labels should be submitted. Do not send containers. Your supplier should be able to furnish photo copies of the screen print. Submit reduced photo copies of labeling for dry agricultural fertilizer - insecticide, or herbicide bags. Any label smaller than half the size of a sheet of paper 8 inches by 10 inches should be stapled to a sheet of paper 8 inches by 10 inches before attaching to application.

   Formulation — If a change in formulation is involved, five copies of a separate statement listing the correct name and percentage by weight of each active and each inert ingredient must be submitted with each application. This statement is treated confidentially. It cannot be used to support a customer's (formulator) application for subsequent registration without written authorization from the registrant. If necessary information on the formula is not available to the applicant (formulator or packer), he should: (a) Obtain the necessary information from the basic supplier and submit five copies of the statement with the application or (b) Request the basic supplier to furnish the necessary information to the Division along with a statement specifically authorizing the use of such information to support separate registration for the applicant. The statement from the basic supplier must clearly identify the applicant's product to which it applies.

ATTENTION: The submission of an application does not constitute registration. Comment or notice of registration will be sent after examination by the Pesticides Regulation Division of the information submitted.

TOLS012055

BZTO104(e)048888

KOPPERS

WOODTOX® PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF

WOOD TREATING CHEMICALS DEPT.

KOPPERS COMPANY, INC.

5137 SOUTHWEST AVENUE, ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

EPA Reg. No. 453-202
EPA Est. 453-MO-1
EPA Est. 33760-OR-01

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

NET CONTENTS 55 U.S. GALLONS

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE.

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

Do not use, pour, spill or store near heat or open flame.

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

This product is toxic to fish and wildlife. Keep out of lakes, streams, and ponds. Keep containers closed when not in use. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

FPL 1167 R 03

BZTO104(e)048889

TOLS012056

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES PROGRAMS, REGISTRATION DIVISION
WASHINGTON, D.C. 20250

CONFIDENTIAL STATEMENT OF FORMULA

(Under the Federal Insecticide, Fungicide and Rodenticide Act)

Form Approved
OMB No. 158-R0066

1. PAGE 1 OF 1 PAGES

IMPORTANT: Read instructions on the reverse before completing form.

2. DATE OF APPLICATION
March 24, 1975

3. REASON FOR SUBMISSION *(Check one)*

	APPLICATION FOR A NEW REGISTRATION		APPLICATION FOR AMENDED OR RENEWAL REGISTRATION	X	SUBMITTED BY BASIC SUPPLIER *(See instruction C on reverse)*

4. NAME AND ADDRESS OF APPLICANT OR REGISTRANT *(Include ZIP Code)*
National Solvent Corporation
955 W. Smith Road
Medina, Ohio 44256

5. NAME OF PESTICIDE *(Must be same product name as on label. Do not list active ingredients)*
Nasco Water Repellent &
Penta Wood Preservative

6. EPA REGISTRATION NO./FILE SYMBOL *(If known)*
7161 -

7. NAME AND MAILING ADDRESS OF BASIC SUPPLIER *(If applicable) (Include ZIP Code)*
Wood Treating Chemicals Dept.
Koppers Company, Inc.
5137 Southwest Avenue
St. Louis, Missouri 63110

8. NAME OF INGREDIENT *(Product)* PROVIDED BY BASIC SUPPLIER FOR WHICH FORMULATION IS UNKNOWN *(If any)*
Woodtox Pre-Prime
Ready To Use

9. IS THE INGREDIENT *(Product)* IN ITEM 8 REGISTERED WITH EPA?
X YES ☐ NO

10. IF YES TO ITEM 9, GIVE REGISTRATION NO.
453 - 202

11. NAME OF EACH ACTIVE AND INERT INGREDIENT USED IN THE FORMULATION *(List both the common name and the precise chemical name of each.)*		12. PERCENT OF EACH BY WEIGHT
ACTIVE INGREDIENTS:		
Pentachlorophenol*	04.47%	
Other Chlorophenols*	00.52%	
Mineral Spirits	84.55%	
		89.54%
INERT INGREDIENTS:		
From Technical Pentachlorophenol* (Monsanto Co.)	00.21%	
Sunwax 738 (Sun Oil Co.)	00.75%	
Oxobottoms Solvent (Monsanto Co.)	09.00%	
Santolene C	00.50%	
		10.46%
*5.2% Technical Pentachlorophenol as defined in Federal Spec. TT-W-570		

CHECK IF CONTINUED ON ATTACHMENT(S)	ALL INGREDIENTS LISTED IN ITEM 11 ABOVE AND ON ADDITIONAL PAGES MUST TOTAL	100%

13. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE
Harold P. Stroussel

14. TITLE AND FIRM NAME
Label Coordinator Wood Treating Chemical Koppers Company, Inc.

15. DATE SIGNED
March 24, 1975

16. RECEIVED BY EPA-OPP, REGISTRATION DIVISION, WASHINGTON, D.C. 20259

TOLS012057

EPA FORM 8570-4 (1-73) REPLACES PR FORM 9-196 WHICH MAY NOT BE USED.

APPLICANT'S COPY

BZTO104(e)048890

BZTO104(e)04889

INSTRUCTIONS

NOTE: Use a separate form for each Formulation.

Applicant - keep the second copy for your files and forward the original to EPA or follow the instructions in "C" below.

A. The complete chemical composition of each pesticide must be known so it can be evaluated for registration under the Federal Insecticide, Fungicide and Rodenticide Act. This information is also necessary to determine the status of ingredients, both active and inert, under the Pesticide Chemicals Amendment to the Federal Food, Drug and Cosmetic Act.

B. This form is designed for reporting the ingredients used in the formulation of a pesticide. Its use will speed the review. It must be completed and submitted with each EPA Form 8570-1, Application For New Registration Of A Pesticide, or with each EPA Form 8570-2, Application For Amended Registration Of A Pesticide, if revision involves a formula change, or with each EPA Form 8570-3, Application For Renewal Registration Of A Pesticide.

C. If the complete chemical composition of formulated ingredients, either active or inert, used in this product's formulation is not known to you, send a separate set of these forms for each ingredient to your Basic Supplier. When you do this, it is important that you first fill in items 2 thru 8 so that we may positively identify the supplier's product with your pesticide. The Basic Supplier is then requested to complete items 1, and 9 thru 15, and submit the form to this Division. This statement is treated confidentially. It cannot be used to support a customer's (formulator's) application for subsequent registration without written authorization from the Basic Supplier.

ITEM No.

1. If more than 1 page is required, number them "1 of 2", "1 of 3", etc.
2. Enter the same date as the Application.
3. Read instruction "B" above.
4. Enter the name and address of your firm.
5. Enter the product name of this pesticide as it will appear on the finished label.
6. Enter the EPA Registration Number or File Symbol if known.
7. Complete if required by instruction "C" above.
8. Complete if required by instruction "C" above.
9. Completed only by Basic Supplier.
10. Completed only by Basic Supplier.
11. List first all active ingredients then the inert ingredients each in the exact order as they will appear on the finished label. When a formulated product is listed in the formula, name its basic manufacturer and give its EPA Registration No., if known, in parenthesis following the name of the product. (Also see instruction "C" above.) The trade name and manufacturer of surfactants and other adjuvants (dyes, emulsifiers, solvents, perfumes) must be listed. The complete chemical composition of emulsifiers and surfactants must be listed. Enclose the manufacturer's name in parenthesis following the product listed by trade name. (Also see instruction "C" above.) If a dye or other coloring is used, state the color.
12. Enter the percentage by weight of each active and inert ingredient beside the ingredient to which it applies. The percentages by weight for the active ingredients must agree with those appearing in the ingredient statement on the label. The sum of all percentages listed must equal 100 percent.
13. Self explanatory.
14. Self explanatory.
15. Self explanatory.

TOLS012058

DIRECTIONS FO

This product is a ready-to use clean o
protection of wood against fungus gro
stain, termites, Lyctus (powder post) be
and contains water repellents to aid in
swelling, end checking, grain raising ar

WOOD PRESERVATION AND DIMENSION

For best results, this product should b
maximum penetration into the wood
especially at joints and wherever end

foundation timbers and heavy wooden
bark, dry and well-seasoned and in
period of 12 to 48 hours to be an ef

open tank treatments, complete ir
the solution is generally recommer
inch of thickness. For the contro
shrinkage and swelling, the treatn
most important since the moisture
dred to a thousand times greater
grain surface for many species of woo

Where open tank treating is impra
existing structure, two heavy brush
should be applied, cutting out and
two feet beyond any visible evidence
be normally dry, and the framing c
application of this product.

COVERAGE: Approximately 5 to 10
feet for open tank treating — 400
brush application on smooth woods
more solution.

This product is effective for applicat
of termites, powder post (Lyctus) be
all of these cases, it will be effectiv
wood contacted by the solution.
treatment is essential to good contro

TERMITE CONTROL. For protection of
tion, see instructions above. For ap
to protect against subterranean terr
tion to run-off, allow to soak in, ar
application.

foundation should be 30" deep but not be
footing if this is shallower. The rate
be 5 gallons of product per 10 linear fe
deep and 10 gallons per linear feet for
trees, and shrubs within 3 ft. of the
or protected with tar paper. Care must be exe
contact asphaltic products (ta
other such items) or that it is
will stain plaster or other surfac
plamental to soil treating.

POWDER-POST BEETLE CONTRO
infested with powder post beet
the wood in this product for a
thickness. Since there is a pote
a... treatment of floors, furn
these items after treatment w
the solvent has evaporated, is
hazard.

CARPENTER ANTS. This produc
by spraying or by injection o
has proved useful for cleaning
poisoning of the colony at th
treatments of infested wood a

DANGER

HARMFUL OR FATAL IF SWALLOWED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

DO NOT USE, POUR, SPILL OR STORE NEAR HEAT OR OPEN FLAME.

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

ENVIRONMENTAL CAUTIONS: This product is toxic to fish and wildlife. Keep out of any body of water. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life. Keep containers closed when not in use.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use of application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

EPA Reg. No.

EPA EST. 7151-OH-1

Sold By

NATIONAL SOLVENT CORPORATION

MEDINA, OHIO U.S.A. 44256

TOLS012059

BZTO104(e)048892

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

National Solvent Corporation
Attn: Mr. Jack Cofall
955 W. Smith Road
Medina, OH 44256

Gentlemen:

Subject: NASCO WATER REPELLENT & PENTA
File Symbol 7161-I
Application of March 24, 1975

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, is not acceptable, for the reasons given below.

1. The label must be limited to having one ingredient statement. This one must appear on the front panel of the label. The front panel is the panel displayed under customary conditions of purchase. This portion of the label must display the assigned signal word "Danger", immediately followed by the statement "Keep Out of Reach of Children". (This statement does not contain the word "the".)

2. Under directions for Wood Preservation, add Fence posts, poles, foundation timbers and heavy wooden members should be free of bark, dry and well-seasoned and immersed in the product for a period of 12 to 48 hours to be an effective wood preserver.

3. Expand termite control directions to include: Trenches around foundation should be 30" deep but not below the top of the footing if this is shallower. The rate of application should be 5 gallons of product per 10 linear feet of trench up to 15" deep and 10 gallons per linear feet for deeper trenches. Grass, trees, and shrubs within 3 ft. of the trench should be removed or protected with tar paper.

TOLS012060

BZTO104(e)048893

It should be understood that the 60 day period for filing claims on this product will not expire until 29 JUN [illegible]. Registration cannot be issued until this period has expired.

This product may not be lawfully distributed in interstate commerce until it is registered.

Sincerely,

John H. Lee

John H. Lee
Product Manager (22)
Fungicide Herbicide Branch
Registration Division (WH-567)

TOLS012061

U.S. GOVERNMENT PRINTING OFFICE: 1970—725-639

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES PROGRAMS, REGISTRATION DIVISION
WASHINGTON, D.C. 20460

CONFIDENTIAL STATEMENT OF FORMULA

(Under the Federal Insecticide, Fungicide and Rodenticide Act)

Form Approved
OMB No. 158-R0066

1. PAGE 1 OF 1 PAGES

IMPORTANT: Read instructions on the reverse before completing form.

2. DATE OF APPLICATION
March 24, 1975

3. REASON FOR SUBMISSION *(Check one)*

X	APPLICATION FOR A NEW REGISTRATION		APPLICATION FOR AMENDED OR RENEWAL REGISTRATION		SUBMITTED BY BASIC SUPPLIER *(See instruction C on reverse)*

4. NAME AND ADDRESS OF APPLICANT OR REGISTRANT *(Include ZIP Code)*
NATIONAL SOLVENT CORPORATION
955 W. Smith Rd.
MEDINA, Ohio 44256

5. NAME OF PESTICIDE *(Must be same product name as on label. Do not list active ingredients)*
NASCO WATER REPELLENT & PENTA Wood PRESERVATIVE

6. EPA REGISTRATION NO./FILE SYMBOL *(If known)*
EPA Reg. 7161-

7. NAME AND MAILING ADDRESS OF BASIC SUPPLIER *(If applicable) (Include ZIP Code)*
KOPPERS COMPANY, INC.
5137 SOUTHWEST Avenue
ST. LOUIS, MO. 63110

8. NAME OF INGREDIENT *(Product)* PROVIDED BY BASIC SUPPLIER FOR WHICH FORMULATION IS UNKNOWN *(If any)*
Ready To use WATER Repellent and PENTA Wood PRESERVATIVE

9. IS THE INGREDIENT *(Product)* IN ITEM 8 REGISTERED WITH EPA?
X YES ☐ NO

10. IF YES TO ITEM 9, GIVE REGISTRATION NO.
EPA Reg. 453-202

11. NAME OF EACH ACTIVE AND INERT INGREDIENT USED IN THE FORMULATION *(List both the common name and the precise chemical name of each.)*	12. PERCENT OF EACH BY WEIGHT
KOPPERS Wood TOX PREPRIME	
Ready To use WATER Repellent and PENTA Wood PRESERVATIVE	100%
CHECK IF CONTINUED ON ATTACHMENT(S) ☐ — ALL INGREDIENTS LISTED IN ITEM 11 ABOVE AND ON ADDITIONAL PAGES MUST TOTAL	100%

13. SIGNATURE OF AUTHORIZED FIRM REPRESENTATIVE
Jack M Cargill

14. TITLE AND FIRM NAME
President NATIONAL SOLVENT CORPORATION

15. DATE SIGNED
March 24, 1975

16. RECEIVED BY EPA-OPP, REGISTRATION DIVISION, WASHINGTON, D.C. 20259

EPA FORM 8570-4 (1-73) REPLACES PR FORM 9-196 WHICH MAY NOT BE USED.

TOLS012062

BZTO104(e)048895

3/26/75

Koppers Company, Inc.
5137 Southwest Ave.
St. Louis, Mo. 63110

KOPPERS

Mr. John H. Lee
Product Manager #22
Fungicide Herbicide Branch
U. S. Environmental Protection Agency
Waterside Mall, East Tower
Washington, D.C. 20460

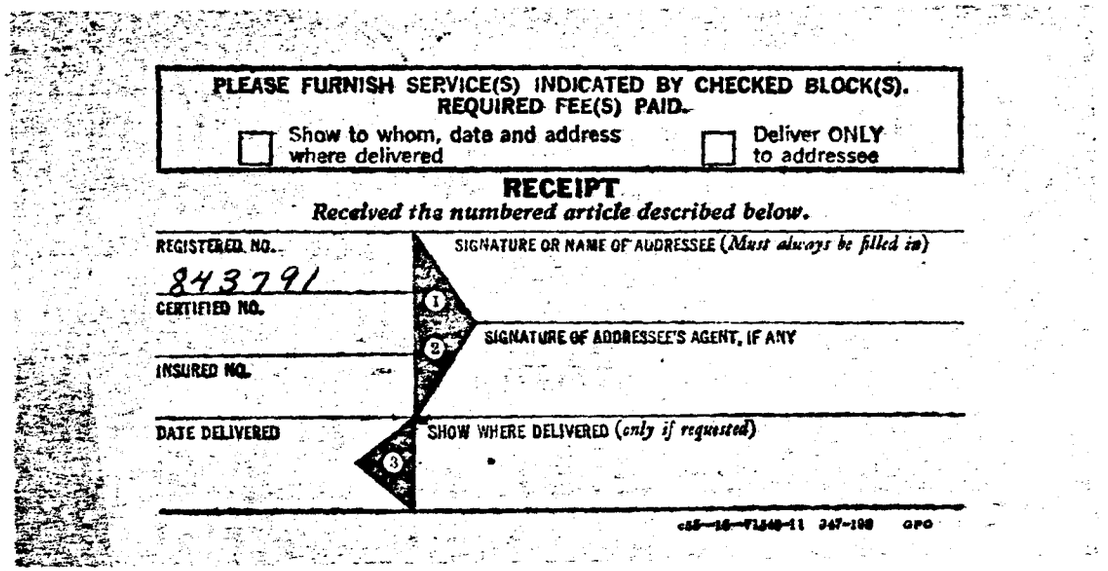
RETURN RECEIPT REQUESTED

843171

EEE PAID

BZTO104(e)048896

TOLS012063



PLEASE FURNISH SERVICE(S) INDICATED BY CHECKED BLOCK(S). REQUIRED FEE(S) PAID.

☐ Show to whom, date and address where delivered

☐ Deliver ONLY to addressee

RECEIPT

Received the numbered article described below.

REGISTERED NO.

843791

CERTIFIED NO.

INSURED NO.

DATE DELIVERED

1 SIGNATURE OR NAME OF ADDRESSEE (*Must always be filled in*)

2 SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

3 SHOW WHERE DELIVERED (*only if requested*)

c55—16—71540-11 347-198 GPO

TOLS012064

BZTO104(e)048897

cc.... J. Palmer

KOPPERS

Interoffice Correspondence

To J. M. Montgomery — From R. F. Simmons

Location St. Louis, Missouri — Location St. Louis, Missouri

Subject Rockdale Sash & Trim Co. request for statement of Compliance to Rule 205, Illinois Environmental Protection Agency. — Date May 20, 1975

To answer Jim Beirnes' request it will be necessary for you to state that to our knowledge the Illinois rule specifies control over only photochemically reactive hydrocarbons which is defined as a solvent that contains more than:

5%	Olefins
8%	C_8 and above Aromatics (except Ethylbenzene)
20%	Branched chain ketones
20%	Ethylbenzene, Toluene

and that the total sum of the above components is limited to 20% by volume in a solvent blend. Additional, Illinois also makes an all-inclusive statement about odor nuisance, which I don't know the status of.

We are using two ecologically clean, fast-dry mineral spirits in our Preprime and will be soon buying a third. One of those now purchased contains no C_8 and above, the other only 1.6%, and neither contain any of the other compounds. The third material we will purchase contains 9% C_8 and above and as we anticipate buying only every third lead from this supplier, at no time should our product tank or raw material spirits tank exceed 6%.

R. F. Simmons

RFS/sjk

HAROLD

FOR YOUR PRODUCT INFORMATION

BL

K 43- REV. 5 100M 7-74

TOLS012065

BZTO104(e)048898

U.S. Environmental Protection Agency
Region V
230 South Dearborn
Chicago, Illinois 60604

ANALYTICAL REPORTS OF ANALYSIS

Gentlemen:

Enclosed is a report of analysis of a pesticide sample collected at your establishment recently. The pesticide sample was analyzed at an Environmental Protection Agency pesticide analytical laboratory by the method indicated.

You should compare the results of our analysis with your own analysis to insure that we agree on the amount of the product's active ingredient(s). If you note a significant discrepancy, please notify us immediately so that we can resolve any differences. We encourage you to maintain your quality control because it is a violation of the Federal Insecticide, Fungicide and Rodenticide Act, as amended, to distribute or sell any registered pesticide the composition of which substantially differs from claims made when the pesticide was registered.

Thank you for your cooperation.

Sincerely,

A. Charles Lincoln

A. Charles Lincoln, Ph.D.
Chief, Pesticide Branch

Enclosure

SEP 15 1975

TOLS012066

BZTO104(e)048899

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

REPORT OF ANALYSIS

I.D. NUMBER: 125361

NAME AND ADDRESS OF ESTABLISHMENT *(Include ZIP code)*
Koppers Company, Inc./Wood Treating
5137 Southwest Ave. Chemicals Dept.
St. Louis, MO 63110

NAME OF OWNER, OPERATOR OR AGENT IN CHARGE
Robert F. Simmons

TITLE
Operations Manager

BRAND NAME OF PRODUCT
WOODTOX PRE-PRIME RTU

EPA REGISTRATION NO.
none

BATCH OR CODE NO'S
none

DATE COLLECTED
6/20/75

DATE ANALYZED
9/3/75

PRODUCER/DISTRIBUTOR'S NAME

ESTABLISHMENT NO.
none

Sec. 9(a) of the Federal Insecticide, Fungicide, and Rodenticide Act *(7 U. S. C. 135-135k)* as amended by the Federal Environmental Pesticide Control Act of 1972 requires that a copy of the analysis of any sample collected in connection with the enforcement of the Act be furnished promptly to the owner, operator or agent in charge of the establishment where the sample was collected. This section of the act is quoted on the reverse of this form.

RESULTS OF ANALYSIS

METHOD OF ANALYSIS	INGREDIENT ANALYZED	CLAIMED	FOUND
Technical lime fusion, 565.1	Pentachlorophenol	5.2%	7.4%
TLC PRD-50 TLC AOAC 6.026	Contaminants		OK

➤ The information contained in this report should not be used in the labeling, advertising, or other promotion of the product analyzed.

➤ Additional information regarding results of analysis may be obtained from the individual listed below.

NAME AND TITLE
George J. Marsh, Head
Inspection & Surveillance Section

PHONE NO.
312-353-7270

DATE
Sept. 10, 1975

ADDRESS *(Regional Office)*
U. S. EPA - Pesticides Branch
Federal Office Building
230 South Dearborn Street
Chicago, Illinois 60604

EPA Form 3540-5 (Rev. 11-74)

PREVIOUS EDITION TO BE USED UNTIL SUPPLY IS EXHAUSTED.

ESTABLISHMENT COPY

TOLS012067

BZTO104(e)048900

Sec. 9. INSPECTION OF ESTABLISHMENTS, ETC.

(a) In General. – For purposes of enforcing the provisions of this Act, officers or employees duly designated by the Administrator are authorized to enter at reasonable times, any establishment or other place where pesticides or devices are held for distribution or sale for the purpose of inspecting and obtaining samples of any pesticides or devices, packaged, labeled, and released for shipment, and samples of any containers or labeling for such pesticides or devices.

Before undertaking such inspection, the officers or employees must present to the owner, operator; or agent in charge of the establishment or other place where pesticides or devices are held for distribution or sale, appropriate credentials and a written statement as to the reason for the inspection, including a statement as to whether a violation of the law is suspected. If no violation is suspected, an alternate and sufficient reason shall be given in writing. Each such inspection shall be commenced and completed with reasonable promptness. If the officer or employee obtains any samples, prior to leaving the premises, he shall give to the owner, operator, or agent in charge a receipt describing the samples obtained and, if requested, a portion of each such sample equal in volume or weight to the portion retained. If an analysis is made of such samples, a copy of the results of such analysis shall be furnished promptly to the owner, operator, or agent in charge.

TOLS012068

BZTO104(e)048901

R. D. Arsenault

Pittsburgh

Woodtox Pre Prime Label

See HPS's Memo - Copy Attached

J. M. Montgomery

St. Louis, Missouri

October 30, 1975

As a corollary to Harolds' memo the complications referred to regarding repackagers is a real one. We know of at least one who does make the TT-W 572 B claim. There are likely others. Whether we change the formulation to conform or delete the reference to TT W 572 B it means a costly label change for them.

I don't understand why the FPL people used 159 gm for TT W 572 B and NWMA (who always worked with the FPL on specs.) used 154 gm. If the two of them would agree to the same level it would simplify things. Is there any possibility of this?

For the present I don't think there is any need to do anything different but we should decide what direction to go in the future and start taking the necessary steps to get our labels and those of our customers changed in the proper manner - whatever that is.

J. M. Montgomery

JMM/pa

Attachment - Letter

cc: H. P. Struessel
J. D. Hite
Al Guzman
G. B. Mills
R. F. Simmons

TOLS012069

BZTO104(e)048902

J. M. Montgomery

St. Louis

Woodtox Preprime Label

R. D. Arsenault

Pittsburgh

November 5, 1975

The answer to the question as to why TT-W-572B and NWMA specifications do not agree on the amount of penta per gallon is possibly related to what type of mineral spirits are used. For example, Woodtox Preprime low end point solvent is lighter weight than the mineral spirits used in the Woodtox 140. TT-W-572B, amendment 1, April 13, 1972, specifies grade 1 thinner of TT-T-291, which has an end point of 410°F. Therefore, with an end point this high the permitted solvents could be on the heavy side and, therefore, require 159 grams of penta per gallon.

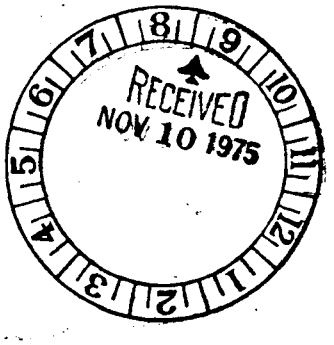
From our standpoint, I think it would be best to leave the two specs as they are because (1) if NWMA increased to match the federal spec, we would have to put more than 5.2% technical penta in Preprime thus raising the cost, and (2) we would have to use a higher cost mineral spirits in Woodtox 140 in order to obtain a 5% solution by assay if only 154 grams of penta were used.

In other words, the percent solution concentrate would have to change in one of the products necessitating a label change, or the cost would have to increase. It is much easier to get statements such as deletions through EPA than change the formulation. I don't think our customers would have any problems deleting a claim from the label.

Robert D. Arsenault

RDA/ms

cc: G. B. Mills
J. D. Hite
Al Guzman
H. P. Strussel
R. F. Simmons



TOLS012070

BZTO104(e)048903

cc: J. D. Hite
J. M. Montgomery
Al Guzman
R. F. Simmons

KOPPERS

Interoffice Correspondence

To R. D. Arsenault

Location Pittsburgh, PA K/750

Subject Woodtox Pre-Prime Labels

From H. P. Struessel

Location St. Louis, Missouri

Date October 29, 1975

I have been instructed to reply to your October 22, 1975 memo as follows:

We will leave the Woodtox Pre-Prime Ready To Use label as is until we have to re-register under the new FIFRA regulations.

There is very little, if any, of this product sold to meet TT-W-572B. Generally Woodtox 140 is sold to meet this spec., as in the Ammo box business, because of costs.

The statement on our present label, "Meets NWMA standards and Federal Specification TT-W-572 B" is not regulated or checked by the EPA. Their main concerns being whether or not the product contains what the ingredients statement shows, directions, warnings, etc.

A recommendation was also made that an effort be put forth to have the Federal Spec. TT-W-572 B changed so that it matches the requirements of the NWMA. At least have paragraph 3.6.1 (Composition A) requirements changed to decrease the 159 grams per gallon requirement.

Another point to be considered is whether or not those customers purchasing this product to repackage are showing this statement on their labels (by using our label as a guide.)

Our Woodtox Pre-Prime Concentrate label states: "Diluted product meets NWMA standards and Federal Specification TT-W-572B, Comp A." The dilution instructions say to use a "solvent weighing not more than 6.28 lbs/gal. _____ ." Can we supply a name for this solvent? Can we name a supplier for this solvent?

All of the above is fine - except - it does not answer the question: When re-registering this label will we drop the reference to TT-W-572B, Comp. A or will we change our formula to meet the specification?

H. P. Struessel

HPS/sib

K 43- REV. 5 100M 7-74

TOLS012071

BZTO104(e)048904

KOPPERS

Interoffice Correspondence

To Harold Struessel

Location St. Louis

Subject Woodtox Preprime Labels

From R. D. Arsenault

Location Pittsburgh K-750

Date October 22, 1975

You have a copy of Al Guzman's memo on subject. I think Al has a good point.

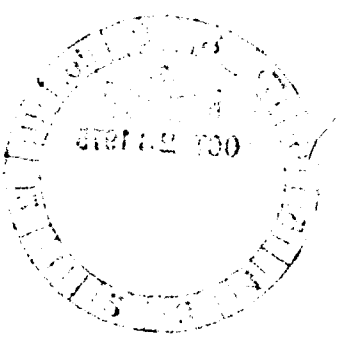
The naptha used to make Woodtox Preprime is much lighter in weight than the mineral spirits used to make Woodtox 140. In general, Woodtox 140 is the product used to meet Federal Spec TT-W-572B, while Woodtox Preprime is sold generally to meet NWMA standards. Therefore, would you please check with Joe Montgomery to ascertain whether it is necessary to have the statement on the Woodtox Preprime label that the product meets TT-W-572B.

Please let me know the answer.

Robert D. Arsenault

RDA/mz

cc: J. D. Hite
J. M. Montgomery
Al Guzman



-5 REV. 2

TOLS012072

Harold Truessel

[illegible] Louis

[illegible] Woodtox Preprime Labels

[illegible] Arsenault

Pittsburgh [illegible]-7[illegible]

October 22, 197[illegible]

You have a copy of Al Guzman's memo on subject. I think it has a good point.

The naptha used to make Woodtox Preprime is much lighter in weight than the mineral spirits used to make Woodtox 140. In general, Woodtox 140 is the product used to meet Federal Spec [illegible] - [illegible]-[illegible], while Woodtox Preprime is sold generally to meet [illegible] standards. Therefore, would you please check with Joe Montgomery to ascertain whether it is necessary to have the statement on the Woodtox Preprime label that the product meets [illegible] - [illegible]-[illegible].

Please let me know the answer.

Robert [illegible]. Arsenault

FDA/mz

cc: [illegible]. D. Hite
[illegible]. M. Montgomery
Al Guzman

RECEIVED
OCT 23 1975

TOLS012073

BZTO104(e)048906

cc: J. D. Palmer
G. B. Mills
R. F. Simmons
J. M. Montgomery
H. P. Struessel

KOPPERS

Interoffice Correspondence

To Bob Arsenault

Location Pittsburgh, PA

Subject Pre Prime RTU Labels

From Al Guzman

Location St. Louis, MO

Date October 15, 1975

John Palmer questioned a competitor's product meeting specifications. Consequently, I started looking into our own products to see if they were meeting our label claims.

I found that Woodtox Pre Prime RTU, due to a change of the specific gravity of the solvents, does not meet the label specifications.

Federal Spec. TT-W-572B requires a 5% by weight of pentachlorophenol but no less than 159 grams per gallon @60°F.

I am enclosing a chart which demonstrates, since the average weight of the solution has been 6.75 lbs/gal. @60°F., we are not meeting these specs., unless a different figure is used to calculate the grams of penta per gallon.

I suggest deleting from the label that we meet Federal Specs, and simply say that we meet NWMA Standards. These are easier to meet than Federal Specs. However, I feel we need to take a close look at our product to see if it is actually meeting label requirements.

A. G.

Al Guzman

AG/pa

Attachment

K 43- REV 5 100M 75

TOLS012074

BZTO104(e)048907

PENTA CONCENTRATION = (By Analysis)	5.00%	5.10%	5.15%	5.20%
LBS/GAL @ 60 F	GRAMS OF PENTA PER GALLON OF SOLUTION @ 60 F			
6.70	152	155	157	158
6.75	153	156	158	159
6.80	154	157	159	160

BZTO104(e)048908

TOLS012075

KOPPERS

Interoffice Correspondence

To Mr. J. D. Palmer

Location

Subject Woodtox Ready-to-Use
~~(Woodtox Pre-Prime Ready-to-Use)~~
Acute Toxicity Tests

From Mr. C. W. Flickinger

Location MRC

Date May 9, 1977

As per your written request, the subject acute (single-dose) toxicity tests were carried out by the Chemical Hygiene Fellowship, Carnegie-Mellon University. The results are submitted by Dr. E. F. Cox in the report titled "Koppers Company, Inc., Woodtox Pre-Prime Ready-to-Use, Range Finding Toxicity Tests" dated April 18, 1977.

In summary the results are as follows:

Ingestion, Oral LD_{50} (rats) = 1.41 ml/Kg
Skin Penetration LD_{50} (rabbits) - 1.41 ml/Kg
Inhalation LT_{50}* = 5 hours
Primary Skin Irritation - Slight Irritation
Eye Injury - Slight Corneal Injury

*Statistically derived Lethal Time for 50% of animals exposed to near saturated exposure to die.

Based on the single dose-animal applications, Woodtox Pre-Prime Ready-to-Use, appears to be moderately toxic by both ingestion and skin penetration. It is slightly irritating to the skin and caused slight corneal injury to some of the test animals. The inhalation of substantially saturated vapor evolved at room temperature and without adequate ventilation must be avoided as such exposures resulted in tremors, coordination loss, convulsions and death for the test animals.

According to the ANSI Z129.1-1976 Standard it would labeled as eye and skin irritant, as well as "TOXIC" by inhalation. The appropriate signal word, precautionary measure and first aid instructions in case of exposure are also required. The fire hazard potential of this material must also be established for labeling purposes too (flash point). From the inhalation data I assume the solvent base is not entirely water.

Please advise if you have any questions on the above.

TOLS012076

A copy of this report will be sent to Dr. Baetjer and by copy of this correspondence, I am requesting her comments on this report.

C. W. Flickinger

CWF:ddm
Attachment

K-5 REV 2

BZTO104(e)048909

DISTRIBUTION:

Mr. R. D. Arsenault
Dr. A. M. Baetjer
Mr. C. P. Brush
Mr. G. Daugherty
Mr. D. L. Davies
Mr. R. S. Detrick
Mr. J. D. Hite
Dr. G. Kitazawa
Mr. G. B. Mills
Mr. J. M. Montgomery
Mrs. J. Redd
Mr. R. F. Simmons

TOLS012077

Carnegie-Mellon University
Carnegie-Mellon Institute of Research

CHEMICAL HYGIENE FELLOWSHIP

RE
APR 20 1977
ENVIRONMENTAL HEALTH
& SAFETY -MRC

SPONSOR: KOPPERS COMPANY, INC.

COMPOUND: Woodtox Pre-Prime Ready-To-Use

SUBJECT: *Range Finding Toxicity Tests*

Peroral, Single Dose
Skin Penetration, Single Dose
Inhalation, Saturated Vapor, Single Exposures
Skin Irritation
Eye Irritation

Eugene F. Cox

Eugene F. Cox, Ph.D.
Director, Chemical Hygiene Fellowship
Carnegie-Mellon Institute of Research
Carnegie-Mellon University
4400 Fifth Avenue
Pittsburgh, Pennsylvania 15213

April 18, 1977

(Date)

Telephone: [412] 327-1020

TOLS012078

BZTO104(e)048911

Woodtox Pre-Prime Ready-To-Use

Range Finding Toxicity Tests

SAMPLE

One quart of Woodtox Pre-Prime Ready-to-Use was received from Koppers Company, Inc., St. Louis, MO on 1-3-77. It was assigned the Chemical Hygiene Fellowship (CHF) sample number 40-1. The toxicity study was requested by C. W. Flickinger of Koppers in Monroeville, PA.

PROCEDURES

Standard CHF procedures which are appended to this report were followed.

SUMMARY OF RESULTS

Stomach Intubation, rat

LD50 = 1.41 ml/kg; dosed as received.
Moderately toxic.

Skin Penetration, rabbit

LD50 = 1.41 ml/kg; dosed as received.
Moderately toxic.

Inhalation, rat

Substantially saturated vapor, static conditions at 22°C.
LT50 = 5.0 hours.
Inhalation of substantially saturated vapor should be avoided.

Uncovered Skin Irritation, rabbit

Minor, Grade 4.

Eye Injury, rabbit

Trace, Grade 2.

BZTO104(e)048912

Peroral, Single Dose to Rats

LD50 - 1.41 (1.03 to 1.95) ml/kg; dosed as received.

Conditions - Standard.

Dosage; ml/kg	Dead / Dosed	Days to Death	Weight Change	Signs and/or Symptoms
4.0	5/5	0,0,1,1,1	-	Sluggish, unsteady gait 20 to 30 min; death of 2 in 4 hr.
2.0	5/5	0,0,0,1,1	-	Unsteady gait 1 hr; convulsions 3 hrs; death of 3 in 4 hr.
1.0	0/5	-	101 to 133 gm	-

Gross Pathology - In victims, petechial hemorrhages of the lungs; livers and spleens mottled; acini of livers prominent; kidneys pale, white; adrenals slightly congested; stomachs opaque, gas or liquid-filled; pylori pink; intestines opaque, yellow, liquid-filled. In survivors, nothing remarkable.

Conclusions - Moderately toxic following acute peroral intubation.

Skin Penetration, Single Dose to Rabbits

LD50 - 1.41 (0.648 to 3.08) ml/kg; dosed as received.

Conditions - Standard. Dosed under polyethylene sheeting.

Dosage; ml/kg	Dead / Dosed	Days to Death	Weight Change	Skin Irritation	Signs and/or Symptoms
2.0	3/4	0,1,14	184 gm	ecchymosis (one), desquamation	Death of 1 within 2.5 hr.
1.0	1/4	13	58,296, 418 gm	erythema, ecchymosis (one); slight desquamation at 14 days	-

Gross Pathology - In victims, lungs congested; livers congested and mottled; kidneys pale and mottled. In survivors, kidneys pale and mottled.

Conclusions - Moderately toxic following acute covered dermal application.

Inhalation, Single, by Rats

Conditions - Static exposure at 22°C. Procedure B of standard test procedures.

Procedure	Time	Concentration	Dead/Dosed	Death	Weight Change	Signs and/or Symptoms
B	8 hr	Substantially saturated vapor	5/6	in exposure	86 gm (16 days)	Tremors, hyperactivity, slight coordination loss within 1.5 hr; convulsions within 3 hrs; death within 1.5 to 8 hr.
B	4 hr	Substantially saturated vapor	2/6	in exposure	72 to 86 gm	Signs time-related as above; death within 3 to 4 hr.

Gross Pathology - In victims, lungs hemorrhaged; stomachs and intestines gas-filled. In survivors, nothing remarkable.

Conclusions - Inhalation of substantially saturated vapor evolved at room temperature under normal handling conditions should be avoided as it may result in tremors, coordination loss, convulsions and death.

LT50 = 5.0 (2.9 to 8.6) hours.

Skin Irritation, Rabbit, Uncovered

Conditions - Standard. Applied undiluted.

Conclusions - Marked capillary injection on 3 rabbits, moderate erythema on 2. Grade 4.

Eye Irritation, Rabbit

Conditions - Standard. Instilled undiluted.

Conclusions - Trace corneal injury on 3 of 5 eyes from an excess, 0.5 ml per eye. Grade 2.

Standard Test Procedures

In all tests, the nonfasted animals are maintained on appropriate Wayne diets and water *ad lib* except during period of manipulation or confinement. Dosage levels differ by a factor of 2 in a geometric series. LD50s or LC50s are calculated by the moving average method based on a 14-day observation period.

Toxicity Terminology for Peroral and 24-Hr Dermal LD50s (A)/Inhalation 4-Hr LC50 (B)

	A, gm/kg	B, ppm		A, gm/kg	B, ppm
Extremely low order	> 15	> 100M	Highly	0.05-0.5	100-1M
Slightly	5-15	10M-100M	Seriously	0.01-0.05	10-100
Moderately	0.5-5	1M-10M	Dangerously	< 0.001	< 10

Peroral. Compounds administered by stomach intubation to Wistar derived male rats, 90-120 grams in weight and 3 to 4 weeks of age, reared in our own colony.

Skin Penetration. Male albino rabbits, 3 to 5 months of age, are immobilized during the 24-hour contact period with the compound retained under impervious sheeting on the clipped intact skin of the trunk. Thereafter, excess fluid is removed to prevent ingestion. Maximum dosage that can be retained is 16 to 20 ml/kg.

Inhalation. Procedure A. Concentrated vapor is generated in a gas washing bottle by passing dried air at 2.5 liters/min through a fritted glass disc immersed to a depth of at least 1-1/2 inches in the chemical which is delivered to rats in a 9-liter glass exposure chamber. Mean vapor concentration is calculated from the loss in weight of the liquid or estimated from the vapor pressure at the actual temperature of the chemical during aeration.

Procedure B. Substantially saturated vapor is prepared by spreading 50 grams of chemical over 200 cm^2 area on shallow tray placed near the top of a 120-liter glass chamber which is then sealed for at least 16 hours while an intermittently operated fan agitates the internal chamber atmosphere. Rats are then introduced in a gasketed drawer-type cage designed and operated to minimize vapor loss.

Procedure C. Mist, vapor and any oxidation or decomposition products of the chemical held at 170°C are generated and delivered as in A.

Procedure D. Vapor at metered concentration, not checked analytically, is generated by feeding the liquid at a constant rate down the inside of a spirally corrugated surface of a minimally heated one-inch Pyrex tube, through which metered air is passed. Resultant vapor is delivered as in A.

Procedure E. Spray - Solutions or suspensions are atomized in a glass VAPONEFRIN nebulizer using dried compressed air at 9 liters/min (corrected) and 22 psi. The resultant aerosol of droplets averaging 2 microns in diameter is conducted directly into a 60-liter cubic glass chamber containing rats. Mean aerosol concentration is calculated from the amount of material atomized.

Procedure F. Dust - Dust clouds are generated by a baffled Wright Dust Feed through which air is passed at 14 liters/min (uncorrected) at 5 psi. The dust is delivered directly to a 120-liter plexiglas chamber containing rats. Airborne dust concentrations are measured gravimetrically every half hour.

Skin Irritation. Chemical is applied in 0.01 ml amounts to clipped, uncovered intact skin of 5 rabbit bellies either undiluted or in progressive dilutions of 10, 1, 0.1, and 0.01% in solvent. Ten grades are recognized based on appearance of moderate or marked capillary injection, erythema, edema or necrosis within 24 hours. No injury from undiluted = Grade 1.

Eye Irritation. Eyes not staining with 5% fluorescein in 20 seconds contact are accepted. Single instillation of 0.005, 0.02, 0.10 or 0.5 ml undiluted or of 0.5 ml of 40, 15, 5 and 1% dilutions are made into conjunctival sac of 5 rabbits. Read immediately unstained and after fluorescein at 24 hours, with ten grades recognized. Trace or no injury from 0.5 ml undiluted = Grade 1.

DESCRIPTION OF SAMPLE

2 - 8 oz [illegible]

NAME AND ADDRESS OF ESTABLISHMENT WHERE SAMPLE WAS COLLECTED (Include ZIP code)

Wood Treating Chemical Dept. [illegible]
5137 Southwest Av
St Louis, Mo 63110

PRODUCT NAME

[illegible]

LOT OR CODE NUMBER(S)

[illegible]

NAME AND ADDRESS OF PRODUCER (If different from 7 above)

RESULTS OF ANALYSIS

	Claim	Found
Pentachlorophenol (HPLC - GDS Permaphase 254NM)	4.47%	4.36%

ec. 9(a) of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 U.S.C. 136g) requires that if an analysis is ade of any sample collected in connection with the enforcement of the Act, a copy of the results of such analysis must be furished promptly to the owner, operator or agent in charge of the establishment where the sample was collected. This section of he Act is quoted on the reverse of this form.

'he information contained in this report should not be used in the labeling, advertising, or other promotion of the product anayzed.

dditional information regarding results of analysis may be obtained from the individual listed below.

ME AND TITLE OF EPA OFFICIAL		ADDRESS OF REGIONAL OFFICE (Include ZIP code)
Robert L. Morby, Chief Enforcement Section, Pesticides Branch		EPA - Pesticides 1735 Baltimore, Room 249 Kansas City, Missouri 64108
ONE NUMBER (816) 374-3036	DATE 6/1/77	

Form 3540-5 (Rev. 5-76) PREVIOUS EDITIONS ARE OBSOLETE. ESTABLISHMENT COPY

TOLS012083

BZTO104(e)048916

KOPPERS

Interoffice Correspondence

To Mr. J. D. Palmer

Location

Subject Woodtox Ready-to-Use
(Woodtox Pre-Prime Ready-to-Use)
Acute Toxicity Tests

From Mr. C. W. Flickinger

Location Monroeville Research Center

Date July 7, 1977

In reference to my May 9, 1977 correspondence, same subject, Dr. Baetjer has commented to the undersigned in her June 29, 1977 correspondence on this CHF toxicity report as follows:

"I read the report on Woodtox Ready-to-Use toxicity tests and consider that study satisfactory".

This is provided for your information and files.

C. W. Flickinger

CWF:ddm
cc: R. D. Arsenault
Dr. A. M. Baetjer
C. P. Brush
G. Daugherty
D. L. Davies
R. S. Detrick
J. D. Hite
Dr. G. Kitazawa
G. B. Mills
J. M. Montgomery
Mrs. J. B. Redd
R. F. Simmons

TOLS012084

KOPPERS

Interoffice Correspondence

To Mr. J. D. Palmer

Location

Subject Woodtox Ready-to-Use
(Woodtox Pre-Prime Ready-to-Use)
Acute Toxicity Tests

From Mr. C. W. Flickinger

Location Monroeville Research Center

Date July 7, 1977

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C. W. Flickinger

C. W. Flickinger

CWF:ddm
cc: R. D. Arsenault
Dr. A. M. Baetjer
C. P. Brush
G. Daugherty
D. L. Davies
R. S. Detrick
J. D. Hite
Dr. G. Kitazawa
G. B. Mills
J. M. Montgomery
Mrs. J. B. Redd
R. F. Simmons

TOLS012085

BZTO104(e)048918

Wood Treating Chemicals Dept., Koppers Company, Inc.
5137 Southwest Ave., St. Louis, Mo. 63110
Telephone 314-772-2200

KOPPERS

August 25, 1978

Mr. John H. Lee
Product Manager #22
Fungicide Herbicide Branch
U.S. Environmental Protection Agency
Registration Division (WH-567)
Waterside Mall, East Tower
401 M Street SW
Washington, D.C. 20460

Subject: WOODTOX PRE-PRIME
Ready To Use
EPA Reg. No. 453-202

Dear Mr. Lee:

Attached is a copy of our current label for Subject product (accepted October 24, 1974).

Before submitting a formal Application For Amended Label, we wanted to ask whether or not we could add a statement to make the user better informed in the safe use and handling of this product.

We propose to add the statement:

> "Precautions should be taken to prevent drip, spray or mist from contacting ornamental shrubs, trees, grass and other desirable vegetation. Pentachlorophenol is phytotoxic and can damage or kill living plants on contact."

We also propose to increase the type size of all statements in the right panel to make them more easily read.

May we please have your comments regarding this proposal?

Yours very truly,

Harold P. Struessel
Label Co-ordinator

HPS/me
cc: R.D. Arsenault (K-750)
J.D. Palmer

TOLS012086

BZTO104(e)048919

KOPPERS

Interoffice Correspondence

To H. P. Struessel — From R. D. Arsenault

Location St. Louis — Location Pittsburgh

Subject Penta Products - Label Precautions — Date August 21, 1978

In reply to your memo of August 16, I don't think Mr. Lee's revised statement tells enough. Despite Mr. Lee's incompetence in understanding the problems he creates, I think we should try again.

A statement saying that care should be taken is not adequate. It doesn't say what will happen if care is not taken. It tells nothing to the user except "watch out" (for something). Perhaps it would be OK (for Mr. Lee) if we say:

"Precautions should be taken to prevent drip or spray or mist from contacting ornamental shrubs, trees, grass and other desirable vegetation. Pentachlorophenol is phytotoxic and can damage or kill living plants on contact."

Robert D. Arsenault

RDA/dk

cc: J. D. Hite
J. B. Redd
P. A. Goydan
R. F. Simmons
J. D. Palmer
J. Montgomery
G. L. Daugherty

K-5 REV 2

TOLS012087

BZTO104(e)048920

Wood Treating Chemicals Dept., Koppers Company, Inc.
5137 Southwest Ave., St. Louis, Mo. 63110
Telephone 314-772-2200

KOPPERS

August 25, 1978

Mr. John H. Lee
Product Manager #22
Fungicide Herbicide Branch
U.S. Environmental Protection Agency
Registration Division (WH-567)
Waterside Mall, East Tower
401 M Street SW
Washington, D.C. 20460

Subject: WOODTOX PRE-PRIME
Ready To Use
EPA Reg. No. 453-202

Dear Mr. Lee:

Attached is a copy of our current label for Subject product (accepted October 24, 1974).

Before submitting a formal Application For Amended Label, we wanted to ask whether or not we could add a statement to make the user better informed in the safe use and handling of this product.

We propose to add the statement:

> "Precautions should be taken to prevent drip, spray or mist from contacting ornamental shrubs, trees, grass and other desirable vegetation. Pentachlorophenol is phytotoxic and can damage or kill living plants on contact."

We also propose to increase the type size of all statements in the right panel to make them more easily read.

May we please have your comments regarding this proposal?

Yours very truly,

Harold P. Struessel
Label Co-ordinator

HPS/me
cc: R.O. Arsenault
J.O. Palmer

TOLS012088

KOPPERS

Interoffice Correspondence

To H. P. Struessel

Location St. Louis

Subject Penta Products - Label Precautions

From R. D. Arsenault

Location Pittsburgh

Date August 21, 1978

In reply to your memo of August 16, I don't think Mr. Lee's revised statement tells enough. Despite Mr. Lee's incompetence in understanding the problems he creates, I think we should try again.

A statement saying that care should be taken is not adequate. It doesn't say what will happen if care is not taken. It tells nothing to the user except "watch out" (for something). Perhaps it would be OK (for Mr. Lee) if we say:

"Precautions should be taken to prevent drip or spray or mist from contacting ornamental shrubs, trees, grass and other desirable vegetation. Pentachlorophenol is phytotoxic and can damage or kill living plants on contact."

Robert D. Arsenault

RDA/dk

cc: J. D. Hite
J. B. Redd
P. A. Goydan
R. F. Simmons
J. D. Palmer
J. Montgomery
G. L. Daugherty

TOLS012089

K-5 REV 2

Koppers Company, Inc.
Environmental Resources and Occupational Health
Pittsburgh, PA 15219, Telephone 412-227-2000

KOPPERS

April 28, 1980

Mr. John Richter, Management Analyst
System Support Branch
Program Support Division (TS-757)
Environmental Protection Agency
401 M. Street, S.W.
Washington, D.C. 20460

Dear Mr. Richter:

Koppers Company, Inc. has reviewed the 3rd Edition of the Data Submitters List and has found several omissions. On January 22, 1980, the following data was submitted to Mr. Henry Jacoby, Fungicide-Herbicide Branch, Registration Division, EPA, in support of the named registrations:

Registrations 453-17, 453-38, 453-41, 453-66, 453-73, 453-202, 453-216, 453-270, 453-271:

Woodtox Pre-Prime Ready-To-Use Range Finding Tests (4/18/77), Accession No. 241720.

Registrations 453-74, 453-103, 453-171, 453-219, 453-259:

Liquid Noxtane SS-1 Acute Toxicity Testing (2/15/74), Accession No. 241719.

Registrations 453-229, 453-254:

Liquid Noxtane 120 Acute Toxicity Testing (2/15/74), Accession No. 241721.

Thus, Wood Treating Chemicals (EPA Registration No. 453-) of Koppers Company, Inc. should have the following listings:

AT Pentachlorophenol
AT Tetrachlorophenol — Both are in Woodtox Pre-Prime and Liquid Noxtane SS-1.

AT Sodium pentachlorophenate
AT Sodium metaborate — All are in Liquid Noxtane 120.
AT Phenyl mercuric lactate

All of our other listings are correct as noted on the 3rd edition. The only other correction is the address for Koppers Company, Inc. This should now be: 3017 Koppers Building, Pittsburgh, PA 15219.

Writer's Direct Dial Number (412) 227-2876

TOLS012090

BZTO104(e)048923

I would like these changes made on the 4th Edition of the Data Submitters List together with any other new data submissions made before the publication of the 4th Edition.

If you have any questions, please do not hesitate to contact me at (412)-227-2876.

Sincerely,

Maryann S. Marino, Ph.D
Director,
Product Registration and Labeling Program

MSM/cad

bcc: W.J. Baldwin
H.R. Struessel
R.D. Arsenault
J.R. Brown

TOLS012091

4-23-80
9:45-A.M.

Per phone from Maryann Marino:

Did we get a listing from EPA about data on file? Told her yes but did not agree — sending her a copy of the listing + she is writing EPA about Toxicity I/o in her 1/22/80 letter.

[illegible]

Sent 4/24/80

TOLS012092

BZTO104(e)048925

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

March 25, 1980

OFFICE OF TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Clarification of EPA Records for Data Submitters Under FIFRA

TO: All Submitters of Data Received by the Agency Since December 31, 1969

In an effort to be as helpful as possible to applicants for registration, the Agency has published a "Data Submitters List" that has been mailed recently under separate cover. As you may see from the instructor sheet included with the fiche, it it now in its third edition.

Each succeeding edition has been more specific regarding which data submitters want compensation for their data and what general types of data the various firms have submitted.

Most data submitters have assisted the Agency in developing a useful list by filling out an Agency questionnaire in 1979 about their data and whether or not they wish to be retained on the data submitters list. Of those replying, most submitters wished to have their names removed from the list and that has been done.

For those submitters who wished to be retained on the list, we have indicated what types of data the submitters claimed to have sent to the Agency for which compensation is desired.

Although most data submitters responded to the questionnaire, a large number did not. If the submitter did not respond, EPA personnel reviewed Agency files to determine if potentially compensable data could be located and if located to further determine the kinds of data that have been submitted. If a search failed to locate any potentially compensable data, the company's name and address was deleted from the list. If potentially compensable data were found, the types of data located were included on the list.

The Agency did not attempt to validate data or make any determination as to pertinence to the registrability of any product. The exercise was designed to determine if (1) scientific studies were in our files, (2) such studies had been submitted after December 31, 1969, and (3) these studies had been developed at the expense of the submitter.

The enclosed sheet is the culmination of your efforts and the Agency's refinement of those data listed (or omitted) in your company's name in the original listing. The explanation of the enclosed sheet is set forth in the sample and explanation attached to this memorandum.

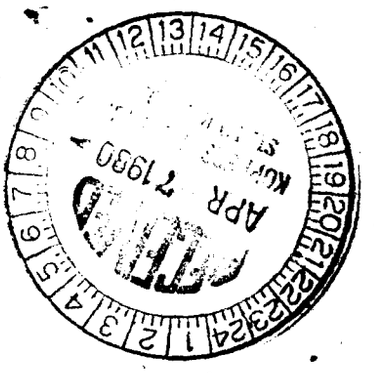
TOLS012093

BZTO104(e)048926

Before our fourth edition is published in the early summer of 1980, we are giving you and each data submitter the opportunity to review the progress the Agency has made in developing an accurate "Data Submitters List."

Please review the status sheets enclosed, along with the microfiche in this package, to determine if the Agency has the correct information regarding the status of your data. If you believe there is an error, omission or misunderstanding please write to Mr. John Richter, Systems Support Branch, Program Support Division (TS-757), Environmental Protection Agency, Washington, D.C. 20460, explaining what change you believe is required. This should be done within 30 days from receipt of this package. Thank you for your cooperation.

Douglas D. Campt
Director
Registration Division (TS-767)



TOLS012094

LISTING OF PESTICIDE DATA-SUBMITTERS IN EPA FILES BY COMPANY

EDITION DATE: 2/29/80 ←①

COMPANY: 50000 ←②

JOHN DOE CHEMICAL COMPANY
333 PESTICIDE AVENUE
NEW YORK, NEW YORK ←③

012121 ←④

888-555-1111 ←⑤

TYPE OF DATA ⑥	CHEMICAL CODE ⑦	CHEMICAL NAME ⑧	ACTN CODE ⑨	TAB DATE ⑩
AT EC FW EF OT	008901	BENZENE HEXACHLORIDE	01	022879
AT EC FW OT EXCLUSIVE USE	09999	PESTICIDE X	03	020480
UNDETERMINED	066308	TERRAMYCIN	02	022879
NO	007101	ARSENOSOBENZENE	04	081379

(1)

EXPLANATION OF LISTING COMPONENTS

1. Date List printed by EPA
2. Company number assigned by EPA
3. Company name and address
4. Zip Code of company
5. Telephone number (if on record)
6. Explanation of Data Status on List as follows:

   AT indicates that the data submitter has submitted acute toxicity data where the substance tested was a formulated end-use product rather than a technical grade or manufacturing-use product (including acute oral, dermal, inhalation, primary eye and dermal irritation and dermal sensitalization).

EC indicates that the data submitter has submitted environmental chemistry field studies, where the substance tested was required to be the formulated end-use product rather than a technical grade or manufacturing-use product.

FW indicates that the data submitter has submitted fish and wildlife field studies, where the substance tested was required to be the formulated end-use product rather than a technical grade or manufacturing-use products.

EF indicates that the data submitter has submitted efficacy data.

OT indicates that the data submitter has submitted other data, which may be product and residue chemistry, subacute and chronic toxicity data, acute toxicity data using a technical or manufacturing-use product, and/or other fish and wildlife and environmental chemistry studies than set forth above.

UNDETERMINED indicates that the Agency had not received the data submitters reply to the questionnaire or the data in question were out of the Agency files being reviewed by some other unit within EPA and unavailable for the purpose of refining the data submitters list at this time.

NO compensation not requested by submitter when filling out EPA questionnaire or name dropped by EPA from list when Agency reviewers searched EPA files and found no compensible data.

7. EPA Chemical Code assigned to each chemical

8. EPA accepted name for chemical.

9. Key to action taken in listing as follows:

   01 indicates that Data Submitter answered EPA's questionnaire and stated data have been submitted after December 31, 1969 and compensation is desired.

   02 indicates that submitter answered EPA questionnaire and does not want to be retained on list.

   03 indicates Data is exclusive use under Section 3(c)(1)(D) of FIFRA as amended (September 30, 1978).

   04 indicates Data Submitter did not return EPA questionnaire but that EPA personnel reviewed data fields and made determination as to data types and compensation rights.

   05 Data submitter could not be located during process.

   06 addition of chemical that did not appear on original edition of data submitters list.

   07 not used.

   08 addition of company that did not appear for specified chemical or original data submitters list.

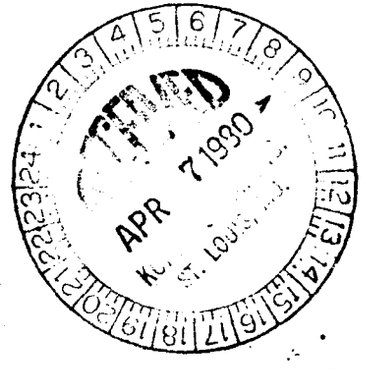
10. Date action taken by EPA in recording data information on current list.

BZTO104(e)048929

COMPANY - 000453

WOOD TREATING CHEMICALS DEPT
KOPPERS CO INC
DEPT. KOPPERS CO. 5137 SOUTHWEST AVE.
ST LOUIS MO 63110

TYPE OF DATA	CHEMICAL CODE	CHEMICAL NAME	ACTN CODE	TAB DATE
NO	042501	Propylene oxide	02	022879
EF	063001	Pentachlorophenol	01	022879
NO	063003	Sodium pentachlorophenate	02	022879
EF	063004	Tetrachlorophenols	01	022879
NO	063502	Mineral oil, mineral seal oil or white mineral oil	02	022879
NO	063503	Petroleum distillate, oils, solvent, or hydrocarbons; also paraffini aliphatic hydrocarbons, paraffinic oil	02	022879
NO	063506	Mineral spirits	02	022879
EF	083001	Bis(tributyltin) oxide	01	022879



TOLS012097

BZTO104(e)048930

Koppers Company, Inc.
Environmental Resources and Occupational Health
Pittsburgh, PA 15219, Telephone 412-227-2000

KOPPERS

January 22, 1980

Mr. Henry Jacoby
Product Manager
Fungicide-Herbicide Branch
Registration Division
U.S. EPA
4th & M Streets, S.W.
Washington, D.C. 20460

Dear Mr. Jacoby:

Koppers Company, Inc. is submitting the attached studies in support of the indicated registrations for our files at EPA:

Registrations 61-110, 61-111:

Eight-day Dietary LC_{50} - Mallard Ducks, FCAP (3/6/74)

Eight-day Dietary LC_{50} - Bobwhite Quail, FCAP (3/6/74)

Range Finding Toxicity Tests on Wolman Dope Solution (Sample No. ER-9156) (11/68 to 8/69)

Registration 61-128:

Eight-day Dietary LC_{50} - Mallard Ducks, Taco CCA (5/23/73)

The Amount and Valence of Arsenic Excreted in the Urine of Dogs Fed CCA-C in their Diet (4/30/79)

Range-Finding Toxicity Tests on Wolmanac (10/64 to 6/65)

D.O.T. Evaluations: Skin Penetration, Single Dose, Skin Irritation (2/17/78)

Registrations 453-17, 453-38, 453-41, 453-66, 453-73, 453-202, 453-216, 453-270, 453-271:

Woodtox Pre-Prime Ready-To-Use Range Finding Tests (4/18/77)

Writer's Direct Dial Number (412) 227-2876

TOLS012098

BZTO104(e)048931

Registrations 453-74, 453-103, 453-171, 453-219, 453-259:

Liquid Noxtane SS-1 Acute Toxicity Testing (2/15/74)

Registrations 453-229, 453-254:

Liquid Noxtane 120 Acute Toxicity Testing (2/15/74)

We are also resubmitting the study, In Vivo Cytogenetic Studies of Chromated Copper Arsenate Treated Sawdust in Mouse Bone Marrow (accession number 240889) which was originally submitted on February 19, 1979, but was reported to us (September 11, 1979) to be deficient after evaluation by your review committee. A rewritten study is being submitted. This study is in support of all the registrations listed in Jan Redd's February 19, 1979 correspondence.

We would appreciate confirmation that the data is in our files at EPA. Thank you.

Sincerely,

Maryann S. Marino

Maryann S. Marino, Ph.D
Director,
Product Registration and Labeling Program

MSM/cad

bcc: R.D. Arsenault
W. Baldwin

TOLS012099

KOPPERS

Interoffice Correspondence

To W.J. Baldwin — From M.S. Marino

Location K-750 — Location K-3017

Subject Woodtox Pre-Prime RTU MSDS — Date April 28, 1980

Section IV - In relation to C.W. Flickinger's suggested change for this section, I have attached some OSHA information on types of fires and fire extinguishers which I thought might be useful. I myself did not know what a Class B fire extinguisher was. This OSHA information will be helpful for future use in writing MSDSs. Although there is no IN CASE OF FIRE statement on the label, FIFRA does not require this; the appropriate statement for a material with 104°F flash point is on the label.

Section V - The label includes "Note to Physician: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically." Perhaps this should be included in Effects of Overexposure or in Section IX.

First aid procedures - I would modify your skin and eye contact statements to follow the ANSI Guide as follows:
"In case of eye or skin contact, immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician (or Get Medical Attention). Wash contaminated clothing before re-use. Discard contaminated shoes as a waste product (see Section VII)."

The ANSI Guide does not recommed the use of soap and water on skin except for contact with strong skin sensitizers which I do not think Woodtox Pre-Prime is.

Although you have correctly included an inhalation first aid statement on the MSDS, there is not one on the label. However, an inhalation first aid statement should be on the label since the toxicity data indicates that this product can be harmful if inhaled in high concentrations without adequate ventilation.

The following statements which are on the label should be incorporated onto either Section VII or IX:
"Avoid contamination of feed or foodstuffs."
"Do not re-use container."

According to the toxicity data we have on this product and the FIFRA labeling requirements, some of the hazard statements on the label are incorrect. It should read:
"MAY BE FATAL IF ABSORBED THROUGH THE SKIN. HARMFUL IF SWALLOWED OR INHALED," etc.

TOLS012100

KOPPERS

Interoffice Correspondence

To W.J. Baldwin From

Location Location

Subject -2- Date April 28, 1980

Also, soapy or salt water emesis is used in the ingestion first aid statement on the label; these are no longer acceptable methods. As noted previously, no inhalation first aid statement is given.

Thus, unless the label is revised through an amended registration process, there will be some discrepancies between the label and the MSDS. Since the Wood Treating Chemicals Department of St. Louis devised this label, they should amend it. However, if desired, I would be glad to try to amend the label; as you and I both know, this is easier said than done with the present change (May, 1979) to FIFRA regarding Conditional Registrations.

If you have any questions, please advise.

Maryann S. Marino, Ph.D
Director,
Product Registration and Labeling Program

MSM/cad

cc: W.H. Lederer
C.W. Flickinger
W.H. Simkins
R.D. Arsenault
H. Struessel

TOLS012101

corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

§ 1910.152 [Reserved]

§ 1910.153 Sources of standards.

The standard in § 1910.151 is derived from 41 CFR 50-204.6.

Subpart L—Fire Protection

§ 1910.156 Definitions applicable to this subpart.

(a) "Class A fires" are fires in ordinary combustible materials, such as wood, cloth, paper, and rubber.

(b) "Class B fires" are fires in flammable liquids, gases, and greases.

(c) "Class C fires" are fires which involve energized electrical equipment where the electrical nonconductivity of the extinguishing media is of importance. (When electrical equipment is deenergized, extinguishers for Class A or B fires may be used safely.)

(d) "Class D fires" are fires in combustible metals, such as magnesium, titanium, zirconium, sodium, and potassium.

(e) Classification of portable fire extinguishers: "Portable fire extinguishers" are classified for use on certain classes of fires and rated for relative extinguishing effectiveness at a temperature of plus 70° F. by nationally recognized testing laboratories. This is based upon the preceding classification of fires and the fire extinguishment potentials as determined by fire tests.

NOTE: The classification and rating system described in this section is that used by Underwriters' Laboratories, Inc. and Underwriters Laboratories of Canada and is based on extinguishing preplanned fires of determined size and description as follows:

(i) Class A rating—Wood and excelsior fires excluding deep-seated conditions.

(ii) Class B rating—Two-inch depth gasoline fires in square pans.

(iii) Class C rating—No fire test. Agent must be a nonconductor of electricity.

(iv) Class D rating—Special tests on specific combustible metal fires.

(f) A "light hazard" is a situation where the amount of combustibles or flammable liquids present is such that fires of small size may be expected. These may include offices, schoolrooms, churches, assembly halls, telephone exchanges, etc.

(g) An "ordinary hazard" is a situation where the amount of combustibles or flammable liquids present is such that fires of moderate size may be expected. These may include mercantile storage and display, auto showrooms, parking garages, light manufacturing, warehouses not classified as extra hazard, school shop areas, etc.

(h) An "extra hazard" is a situation where the amount of combustibles or flammable liquids present is such that fires of severe magnitude may be expected. These may include woodworking, auto repair, aircraft servicing, warehouses with high-piled (14 feet or higher) combustibles, and processes such as flammable liquid handling, painting, dipping, etc.

(i) Sprinkler system: A "sprinkler system," for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply, such as a gravity tank, fire pump, reservoir, or pressure tank and/or connection by underground piping to a city main. The portion of the sprinkler system above ground is a network of specially sized or hydraulically designed piping installed in a building, structure or area, generally overhead, and to which sprinklers are connected in a systematic pattern. The system includes a controlling valve and a device for actuating an alarm when the system is in operation. The system is usually activated by heat from a fire and discharges water over the fire area.

NOTE: The design and installation of water supply facilities such as gravity tanks, fire pumps, reservoirs, or pressure tanks, and underground piping are covered by NFPA Standards No. 22-1970, Water Tanks For Private Fire Protection; No. 20-1970, Installation of Centrifugal Fire Pumps and No. 24-1970, Outside Protection.

(j) Sprinkler alarms: A "sprinkler alarm" unit is an assembly of apparatus approved for the service and so constructed and installed that any flow of water from a sprinkler system equal to or greater than that from a single automatic sprinkler will result in an audible alarm signal on the premises.

(k) Class of service—standpipe systems: "Standpipe systems" are grouped into three general classes of service for the intended used in the extinguishment of fire.

(1) Class I: For use by fire departments and those trained in handling heavy fire streams (2½-inch hose).

(2) Class II: For use primarily by the building occupants until the arrival of the fire department (small hose).

(3) Class III: For use by either fire departments and those trained in handling heavy hose streams or by the building occupants.

(l) Class I service: "Class I service" is a standpipe system capable of furnishing the effective fire streams required during the more advanced stages of fire on the inside of buildings or for exposure fire.

(m) Class II service: "Class II service" is a standpipe system which affords a ready means for the control of incipient fires by the occupants of buildings during working hours and by watchmen and those present during the night time and holidays.

(n) Class III service: "Class III service" is a standpipe system capable of furnishing the effective fire streams required during the more advanced stages of fire on the inside of buildings as well as providing a ready means for the control of fires by the occupants of the building.

(o) Standpipe systems: "Standpipe systems" are usually of the following types:

(1) A wet standpipe system having a supply valve open and water pressure maintained at all times.

(2) A standpipe system so arranged through the use of approved devices as to admit water to the system automatically by opening a hose valve.

(3) A standpipe system arranged to admit water to the system through manual operation of approved remote control devices located at each hose station.

(4) Dry standpipe having no permanent water supply.

See also paragraph (x) of this section.

(p) Type I storage: "Type I storage" is that in which combustible commodities or noncombustible commodities involving combustible packaging or storage aids are stored over 15 feet but not more than 21 feet high in solid piles or over 12 feet but not more than 21 feet high in piles that contain horizontal channels. Minor quantities of commodities of hazard greater than ordinary combustibles may be included without affecting this general classification.

(q) Type II storage: "Type II storage" is that in which combustible commodities or noncombustible commodities involving combustible packaging or storage aids are stored not over 15 feet high in solid piles or not over 12 feet high in piles that contain horizontal channels. Minor quantities of commodities of hazard greater than ordinary combustibles may be included without affecting this general classification.

(r) Type III storage: "Type III storage" is that in which the stored commodities, packaging, and storage aids are noncombustible or contain only a small concentration of combustibles which are incapable of producing a fire that would cause appreciable damage to the commodities stored or to noncombustible wall, floor or roof construction. Ordinary combustible commodities in completely sealed noncombustible containers may qualify for this classification. General commodity storage that is subject to frequent changing and storage of combustible packaging and storage aids is excluded from this category.

(s) "Approved": "Approved" means listed or approved by: (1) At least one of the following nationally recognized testing laboratories: Factory Mutual Engineering Corp.; Underwriters Laboratories, Inc., or (2) Federal agencies such as Bureau of Mines, Department of the Interior; Department of Transportation, or U.S. Coast Guard which issue approvals for such equipment.

BZTO104(e)048935

TOLS012102

PORTABLE FIRE SUPPRESSION EQUIPMENT

§ 1910.157 Portable fire extinguishers.

(a) *General requirements*—(1) *Operable condition.* Portable extinguishers shall be maintained in a fully charged and operable condition, and kept in their designated places at all times when they are not being used.

(2) *Location.* Extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of fire. They shall be located along normal paths of travel.

(3) *Marking of location.* Extinguishers shall not be obstructed or obscured from view. In large rooms, and in certain locations where visual obstruction cannot be completely avoided, means shall be provided to indicate the location and intended use of extinguishers conspicuously.

(4) *Marking of extinguishers.* If extinguishers intended for different classes of fire are grouped, their intended use shall be marked conspicuously to insure choice of the proper extinguisher at the time of a fire.

(5) Revoked

(6) Revoked

TOLS012103

(7) Revoked

(8) Revoked

(9) *Temperature range.* Extinguishers shall be suitable for use within a temperature range of at least plus 40° to 120° Fahrenheit.

(10) *Extreme temperature exposure.* When extinguishers are installed in locations subjected to temperatures outside the range prescribed in this subparagraph, they shall be of a type approved or listed for the temperature to which they will be exposed, or placed in an enclosure capable of maintaining the temperature within the range prescribed in this subparagraph.

(b) *Selection of extinguishers*—(1) *General.* The selection of extinguishers for a given situation will depend upon the character of the fires anticipated, the construction and occupancy of the individual property, the vehicle or hazard to be protected, ambient-temperature conditions, and other factors. The number of extinguishers required shall be determined by reference to paragraph (c) of this section. Approved fire extinguishers shall be used to meet the requirements of this section.

(2) *Selection by hazard.* (i) Extinguishers shall be selected for the specific class or classes of hazards to be protected in accordance with the following paragraphs.

(ii) Extinguishers for protecting Class A hazards shall be selected from among the following: foam, loaded stream, multipurpose dry chemical, and water types. Certain smaller extinguishers which are charged with multipurpose dry chemical are rated on Class B and Class C fires, but have insufficient effectiveness to earn the minimum 1-A rating even though they have value in extinguishing smaller Class A fires.

Such smaller extinguishers shall not be used to meet the requirements of paragraph (c)(2)(i) of this section.

(iii) Extinguishers for protection of Class B hazards shall be selected from the following: bromotrifluoromethane, carbon dioxide, dry chemical, foam, loaded stream, and multipurpose dry chemical. Extinguishers with ratings less than 1-B shall not be considered in determining suitability.

(iv) Extinguishers for protection of Class C hazards shall be selected from the following: bromotrifluoromethane, carbon dioxide, dry chemical, and multipurpose dry chemical.

NOTE: Carbon dioxide extinguishers equipped with metal horns are not considered safe for use on fires in energized electrical equipment and, therefore, are not classified for use on Class C hazards.

(v) Extinguishers and extinguishing agents for the protection of Class D hazards shall be of types approved for use on the specific combustible-metal hazard.

(c) *Distribution of portable fire extinguishers*—(1) *General.* (i) The number of fire extinguishers needed to protect a property shall be determined as prescribed herein, considering the area and arrangement of the building or occupancy, the severity of the hazard, the anticipated classes of fires, and the distances to be traveled to reach extinguishers.

(ii) Fire extinguishers shall be provided for the protection of

the occupancy hazards contained therein.

(iii) Revoked

(iv) Occupancy hazard protection shall be provided by fire extinguishers suitable for such Class A, B, C, or D fire potentials as may be present.

(v) Revoked

(vi) Combustible buildings having an occupancy hazard subject to Class B, and/or Class C fires, shall have a standard complement of Class A fire extinguishers as required by Table L-1 for building protection, plus additional Class B and/or Class C extinguishers. Where fire extinguishers have more than one letter classification (such as 2-A: 20-B:C), they may be considered to satisfy the requirements of each letter class.

(vii) Rooms or areas shall be graded generally as light hazard, ordinary hazard, or extra hazard. Limited areas of greater or lesser hazard shall be protected as required.

(2) *Fire extinguisher size and placement for Class A hazards.* (i) Minimum sizes of fire extinguishers for the listed grades of hazard shall be provided on the basis of Table L-1. Extinguishers shall be located so that the maximum travel distances shall not exceed those specified in Table L-1.

TABLE L-1

Basic minimum extinguishers rating for area specified	Maximum travel distances to extinguishers (feet)	Areas to be protected per extinguisher: Light hazard occupancy (square feet)	Ordinary hazard occupancy (square feet)	Extra hazard occupancy (square feet)
1A	75	3,000	Note 1	Note 1
2A	75	6,000	3,000	Note 1
3A	75	9,000	4,500	3,000
4A	75	11,250	6,000	4,000
6A	75	11,250	9,000	6,000

NOTE 1: Not permitted except as specified in subdivision (ii) of this subparagraph.

(ii) The protection requirements specified in Table L-1 may be fulfilled by several extinguishers of lower ratings for ordinary or extrahazard occupancies.

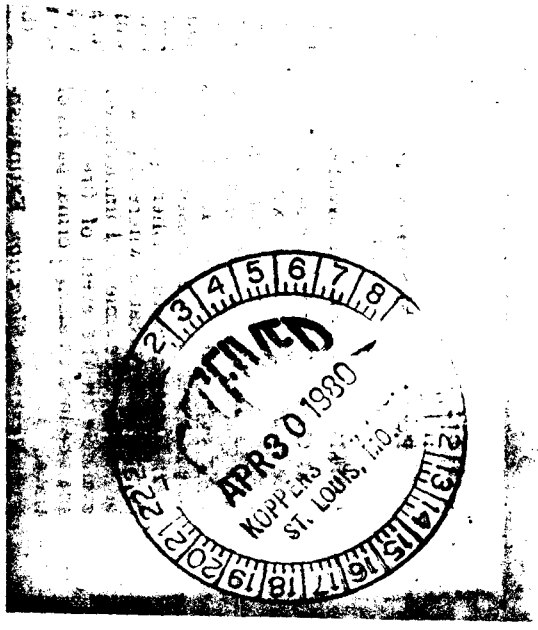
(iii) Where the floor area of a building is less than that specified in Table L-1, at least one extinguisher of the minimum size recommended shall be provided.

(iv) The protection requirements may be fulfilled with extinguishers of higher rating provided the travel distance to such larger extinguishers shall not exceed 75 feet.

(3) *Fire extinguisher size and placement for Class B fires other than for fires in flammable liquids of appreciable depth.* (i) Minimal sizes of fire extinguishers for the listed grades of hazard shall be provided on the basis of Table L-2. Extinguishers shall be located so that the maximum travel distances shall not exceed those specified in Table L-2.

(ii) Two or more extinguishers of lower rating, except for foam extinguishers, shall not be used to fulfill the protection requirements of Table L-2. Up to three foam extinguishers

BZTO104(e)048936



TOLS012104

may be used to fulfill these requirements.

(iii) The protection requirements may be fulfilled with extinguishers of higher ratings provided the travel distance to such larger extinguishers shall not exceed 50 feet.

TABLE L-2

Type of hazard	Basic minimum extinguisher rating	Maximum travel distance to extinguishers (feet)
Light	4B	50
Ordinary	8B	50
Extra	12B	50

NOTE: Where this section calls for minimum extinguisher ratings of 4-B, 8-B, or 12-B the requirements may be met by existing extinguishers of multiple foam extinguishers as allowed by paragraph (c)(3)(ii) of this section. However, if a single extinguisher must be purchased to fulfill such requirements the next higher rating shall be used.

(4) *Fire extinguisher size and placement for Class B fires in flammable liquids of appreciable depth.* (i) For flammable liquid hazards of appreciable depth (Class B), such as in dip or quench tanks, Class B fire extinguishers shall be provided on the basis of one numerical unit of Class B extinguishing potential per square foot of flammable liquid surface of the largest tank hazard within the area.

NOTE: Appreciable depth is defined as a depth of a liquid greater than one-quarter inch.

(ii) Two or more extinguishers of lower ratings except for foam extinguishers, shall not be used in lieu of the extinguisher required for the largest tank. Up to three foam extinguishers may be used to fulfill these requirements.

(iii) Scattered or widely separated hazards shall be individually protected if the specified travel distances in subdivisions (i) and (iii) of subparagraph (3) of this paragraph (c) are exceeded. Likewise, extinguishers in the proximity of a hazard shall be carefully located so as to be accessible in the presence of a fire without undue danger to the operator.

(5) *Fire extinguisher size and placement for Class C hazards.* (i) Extinguishers with Class C ratings shall be required where energized electrical equipment may be encountered which would require a nonconducting extinguishing media. This will include fire either directly involving or surrounding electrical equipment. Since the fire itself is a Class A or Class B hazard the extinguishers are sized and located on the basis of the anticipated Class A or B hazard.

(d) *Inspection, maintenance, and hydrostatic tests*—(1) *General.* (i) The employer shall be responsible for such inspection, maintenance, and testing.

(ii) For details of conducting needed inspections, proper maintenance operations, and required tests, see NFPA No. 10A-1970, Maintenance and Use of Portable Fire Extinguishers.

(2) *Inspection.* (i) Extinguishers shall be inspected monthly, or at more frequent intervals when circumstances require, to insure they are in their designated places, to insure they have not been actuated or tampered with, and to detect any obvious physical damage, corrosion, or other impairments.

(ii) Any extinguishers showing defects shall be given a complete maintenance check.

(3) *Maintenance.* (i) At regular intervals, not more than 1 year apart, or when specifically indicated by an inspection, extinguishers shall be thoroughly examined and/or recharged or repaired to insure operability and safety; or replaced as needed.

(ii) Extinguishers removed from the premises to be recharged shall be replaced by spare extinguishers during the period they are gone.

(iii) Pails or drums of powder-extinguishing agents for scoop or shovel application to metal fires shall be kept full at all times.

(iv) Each extinguisher shall have a durable tag securely attached to show the maintenance or recharge date and the initials or signature of the person who performs this service.

(4) *Hydrostatic tests.* (i) If, at any time, an extinguisher shows evidence of corrosion or mechanical injury, it shall be subjected to a hydrostatic pressure test, or replaced.

(ii) For evaluating the condition of extinguisher cylinders made to Department of Transportation specifications (cf. 49 CFR Chapter I), see the Standard for Visual Inspection of Compressed Gas Cylinders (CGA C-6), published by the Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.

(iii) At intervals not exceeding those specified in Table L-3 and subdivision (iv) of this subparagraph, extinguishers shall be hydrostatically tested. The first hydrostatic retest may be conducted between the fifth and sixth years for those with a designated test interval of 5 years.

TABLE L-3

HYDROSTATIC TEXT INTERVAL FOR EXTINGUISHERS

Extinguisher type	*Test interval year*
Soda-acid	5
Cartridge-operated water and/or antifreeze	5
Stored-pressure water and/or antifreeze	5
Wetting agent	5
Foam	5
Loaded stream	5
Dry chemical extinguishers with stainless steel shells, or soldered-brass shells	5
Carbon dioxide extinguishers	5
Dry chemical extinguishers with brazed-brass shells, mild-steel shell, or aluminum shells	12
Bromotrifluoromethane	12
Dry powder extinguishers for metal fires	12

NOTE: Cylinders under jurisdiction of the U.S. Department of Transportation (formerly Interstate Commerce Commission) may require hydrostatic testing at more frequent periods.

(iv) Nitrogen cylinders (or other cylinders used for inert-gas storage), such as found on wheeled extinguishers, shall be tested at a 5-year interval.

(v) On those extinguishers which are equipped with a shutoff nozzle at the outlet end of the hose, a hydrostatic test shall be performed on the hose with its couplings (but without the discharge nozzle) at the test interval specified for the unit on which the hose is installed.

(vi) The test pressure for dry chemical and dry powder hose assemblies requiring a hydrostatic test shall be at a test pressure of 300 pounds per square inch for a 1-minute period. Carbon dioxide hose assemblies requiring a hydrostatic test shall be at test pressure of 1,250 p.s.i. for a 1-minute period.

(vii) Hydrostatic tests are not required on fire pails, pump-type water and/or antifreeze extinguishers, and factory-sealed disposable (nonrefillable) containers. If such an extinguisher or water pail shows evidence of corrosion or mechanical injury, it may be unsafe or unsuitable for further use and shall be replaced with a new unit.

(viii) The hydrostatic test date shall be recorded on a record tag of metal or equally durable material, or a suitable metallized decal which shall be affixed (by a heatless process) to the shell of an extinguisher which favorably passes the hydrostatic test. The record tag shall contain the following information: Date of test, test pressure, and name or initials of person or agency making the test.

(ix) For extinguishers subjected to an original factory test pressure of 350 p.s.i. or greater, the test pressure shall be 75 percent of the factory test pressure (as noted on the extinguisher nameplate), but in no case less than 300 p.s.i., see Table L-4. For extinguishers subjected to an original factory test pressure of less than 350 p.s.i., the test pressure shall be 75 percent of the factory test pressure; see Table L-4. Pressure shall be applied at a rate of rise to reach the test pressure in approximately 1 minute, and the pressure shall be held for 1 minute after which it shall be released.

TABLE L-4

HYDROSTATIC TEST PRESSURE REQUIREMENTS—NON-ICC SHELLS, SHELLS NOT SPECIFIED IN U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS, FORMERLY INTERSTATE COMMERCE COMMISSION)

Extinguisher type	Original factory test pressure	Requires hydrostatic test pressure
All dry chemical and dry powder.	400 p.s.i. or greater.	75% of factory test pressure
	350–399 p.s.i.	300 p.s.i.
	below 350 p.s.i.	75% of factory test pressure
Foam—500 p.s.i. factory test.	500	375
Foam—350 p.s.i. factory test.	350	300.

BZTO104(e)048938

TOLS012105

TOLS012106

KOPPERS

Interoffice Correspondence

To: John D. Palmer - St. Louis
Harold Struessel - St. Louis

From: D. L. Davies

Location:

Location: K/700

Subject: LABEL CHANGES

Date: Sept. 22, 1980

I have the following comments/suggestions regarding your September 8, 1980 correspondence, same subject:

Penta Wood Preservative 1-10 Concentrate (EPA Reg. No. 453-219) Container Disposal Statement needs changed, i.e. "bury in a safe place" is no longer acceptable.

- Revision 5 should be changed to R06.

Timbertox 40 (EPA Reg. No. 453-8) Storage and Disposal statements need added on left column.

- The emesis statement will also need revised.

→ Woodtox Pre-Prime RTU (EPA Reg. No. 453-202)

-Storage and Disposal statements need added on left column.

-As noted in your memo, a do not induce vomiting statement is needed.

I have also sent a copy of the labels to M. S. Marino for review.

Bill

W. J. BALDWIN

WJB:m
Copies to:
P. A. Goydan
R. D. Arsenault
M. J. Marino - with encl.
File

K43-REV. 5 100M 8-79

TOLS012107

BZTO104(e)048940

KOPPERS

Interoffice Correspondence

To	Paul Goydan K/100 R. D. Arsenault	From	John D. Palmer ~~Harold Struessel~~
Location	K/1001	Location	St. Louis, Missouri
Subject	Label Changes	Date	September 8, 1980

Attached you will find a mock-up of a revised Penta Wood Preservative 1-10 Concentrate label and a copy of how it looks today. We have deleted termite and weed control directions.

On your approval we will initiate these changes with the EPA in two weeks.

In addition you will notice copies of Timbertox 40 and Woodtox Preprime. These labels reference termite and other changes that need to be made. Also, the First Aid statement on Woodtox Preprime needs to be changed to "do not induce vomiting....." This is what is now stated on our Material Safety Data Sheets.

John Palmer
Harold Struessel

JDP/pa

cc: Bill Baldwin K/700
Pam Armbruster

TOLS012108

1/30/81

Per phone between Diane Eierley of EPA and J.D. Palmer, they have found and are using the OKO Confidential formula needed for Woodtox Pre-Prime RTU + Conc - Amended registration - For Industrial Use Only.

JDP

TOLS012109

BZTO104(e)048942

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

FOR EXTERIOR USE ONLY.

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

STORAGE AND DISPOSAL

PROHIBITIONS: Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

PESTICIDE DISPOSAL: Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of according to procedures approved by Federal, State or local disposal authorities.

CONTAINER DISPOSAL: Empty containers shall be triple rinsed (or equivalent), compressed so they are not reusable, and disposed of according to applicable local, state, and federal regulations.

GENERAL: Consult Federal, State, or local disposal authorities for approved alternative procedures.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling of this material not in strict accordance with the directions given herewith which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

KOPPERS®

FOR INDUSTRIAL USE ONLY

WOODTOX®
PRE-PRIME
READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards

WARNING! KEEP OUT OF REACH OF CHILDREN.
See side panel for first aid and additional precautionary statements.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING. IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

EPA Reg. No. 453-202
EPA Est. 453-MO-1

Koppers Company, Inc.
Wood Treating Chemicals Dept.
5137 Southwest Avenue, St. Louis, Missouri 63110

NET CONTENTS U.S. GALLONS

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)

WARNING

MAY BE FATAL IF SWALLOWED OR ABSORBED THROUGH THE SKIN. HARMFUL IF INHALED.

May be irritating to the eyes, skin or respiratory tract.

Do not get in eyes, on skin or on clothing. Use of goggles and protective clothing (rubber gloves) is recommended when brushing or dipping, and use of an approved respirator when spraying. Avoid prolonged and or repeated breathing of vapors, mist or substantially saturated atmosphere. Use only in well ventilated areas. Not for use or storage in or around the home. Avoid contamination of food. Do not take internally.

FIRST AID: If swallowed, CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

In case of eye contact, flush immediately with plenty of water for 15 minutes and get medical attention. **For skin contact,** wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes before reuse. **If inhaled,** remove to fresh air.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

PHYSICAL OR CHEMICAL HAZARDS COMBUSTIBLE: Do not use, pour, spill or store near heat or open flame.

IN CASE OF FIRE: Use dry chemicals, foam, water fog or CO_2. Cool closed containers with water.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Do not apply directly to lakes, streams or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

Treated sawdust and other wood wastes should not be used as mulch where it will come in contact with useful living plants. Care should be taken to prevent drip or spray from contacting ornamental shrubs, trees, grass and other desirable vegetation.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life. Keep containers closed when not in use.

TOLS012110

FPL 1167 R 03

BZTO104(e)048943

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 29 1981

Koppers Company, Inc.
Wood Treating Chemicals Department
5137 Southwest Avenue
St. Louis, MO 63110

Attention: John D. Palmer

Gentlemen:

Subject: Woodtox Pre-Prime Ready-to-Use
EPA Registration No. 453-202
Letter dated April 2, 1981

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, is acceptable subject to the comments listed below. Five copies of the finished labeling must be submitted.

1. Effective immediately, the disposal statements developed in 1976 must be replaced. The old statements place users in violation of RCRA. You may use the statements recommended below or propose alternatives of a more definitive nature:

"Storage and Disposal" 12 point type

PROHIBITIONS: Do not contaminate water, food or feed by storage or disposal.

PESTICIDE DISPOSAL: Pesticide, spray mixture or rinsate that cannot be used accoding to label instruction must be disposed of according to Federal, state or local procedures under the Resource Conservation and Recovery Act.

CONTAINER DISPOSAL: Triple rinse (or equivalent) and offer for recycling or reconditioning, or dispose of in a sanitary landfill, or by other approved State and local procedures.

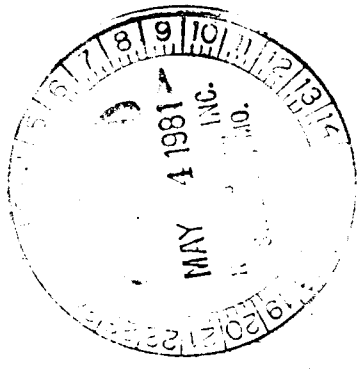
Sincerely,

Henry M. Jacoby

Henry M. Jacoby
Product Manager (21)
Fungicide-Herbicide Branch
Registration Division (TS-767)

TOLS012111

BZTO104(e)048944



TOLS012112

Koppers Company, Inc., Wood Treating Chemicals Department
5137 Southwest Ave., St. Louis, MO 63110
Telephone 314-772-2200

KOPPERS

April 2, 1981

Mr. Henry Jacoby
Product Manager 21
Fungicide - Herbicide Branch
Registration Division (TS-767)
U.S. Environmental Protection Agency
401 M Street, N.W.
Washington, D.C. 20460

Attention Ms. Diane Ierley

Subject: WOODTOX PRE-PRIME Ready To Use
EPA Reg. No. 453-202
Your letter to us of March 17, 1981

Dear Mr. Jacoby:

Attached are two copies of draft labels for our product WOODTOX PRE-PRIME Ready-To-Use reflecting the change shown in item 1. of your letter (copy attached).

As soon as we receive your approval of the draft, finished labels will be printed and 5 copies forwarded for final approval.

Thanks for your cooperation in this matter.

Yours very truly,

Harold P. Struessel
Label Co-ordinator

HPS/me

TOLS012113

BZTO104(e)048946

Koppers Company, Inc., Wood Treating Chemicals Department
5137 Southwest Ave., St. Louis, MO 63110
Telephone 314-772-2200

KOPPERS

April 2, 1981

Mr. Henry Jacoby
Product Manager 21
Fungicide - Herbicide Branch
Registration Division (TS-767)
U.S. Environmental Protection Agency
401 M Street, N.W.
Washington, D.C. 20460

Attention Ms. Diane Ierley

Subject: WOODTOX PRE-PRIME Ready To Use
EPA Reg. No. 453-202
Your letter to us of March 17, 1981

Dear Mr. Jacoby:

Attached are two copies of draft labels for our product WOODTOX PRE-PRIME Ready-To-Use reflecting the change shown in item 1. of your letter (copy attached).

As soon as we receive your approval of the draft, finished labels will be printed and 5 copies forwarded for final approval.

Thanks for your cooperation in this matter.

Yours very truly,

Harold P. Struessel
Label Co-ordinator

HPS/me

TOLS012114

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

APR 17 1981

Koppers Company, Inc.
Wood Treating Chemicals Department
5137 Southwest Avenue
St. Louis, MO 63110

Attention: John D. Palmer

Gentlemen:

Subject: Woodtox Pre-Prime Ready-to-Use
EPA Registration No. 453-202
Your Application of February 10, 1981

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, is not acceptable, for the reasons given below.

1. Since directions for use have been deleted for termites, powder post beetles and carpenter ants, all claims against these pests must be deleted. Delete these pest names in the first sentence under "For Exterior Use Only."

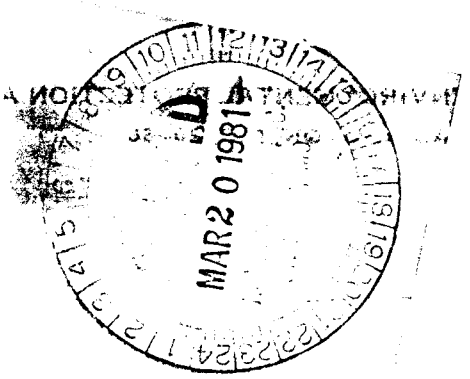
Sincerely,

Henry M. Jacoby

Henry M. Jacoby
Product Manager (21)
Fungicide-Herbicide Branch
Registration Division (TS-767)

TOLS012115

BZTO104(e)048948



TOLS012116

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

FOR EXTERIOR USE ONLY.

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3 minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

STORAGE AND DISPOSAL

PROHIBITIONS: Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

PESTICIDE DISPOSAL: Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of according to procedures approved by Federal, State or local disposal authorities.

CONTAINER DISPOSAL: Empty containers shall be triple rinsed (or equivalent), compressed so they are not reusable, and disposed of according to applicable local, state, and federal regulations.

GENERAL: Consult Federal, State, or local disposal authorities for approved alternative procedures.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling of this material not in strict accordance with the directions given herewith which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

BZTO104(e)048950

KOPPERS®

FOR INDUSTRIAL USE ONLY

WOODTOX® PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards

WARNING! KEEP OUT OF REACH OF CHILDREN.
See side panel for first aid and additional precautionary statements.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING. IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

EPA Reg. No. 453-202
EPA Est. 453-MO-1

Koppers Company, Inc.
Wood Treating Chemicals Dept.
5137 Southwest Avenue, St. Louis, Missouri 63110

NET CONTENTS U.S. GALLONS

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)

WARNING

MAY BE FATAL IF SWALLOWED OR ABSORBED THROUGH THE SKIN. HARMFUL IF INHALED.

May be irritating to the eyes, skin or respiratory tract.

Do not get in eyes, on skin or on clothing. Use of goggles and protective clothing (rubber gloves) is recommended when brushing or dipping, and use of an approved respirator when spraying. Avoid prolonged and or repeated breathing of vapors, mist or substantially saturated atmosphere. Use only in well ventilated areas. Not for use or storage in or around the home. Avoid contamination of food. Do not take internally.

FIRST AID: If swallowed, CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

In case of eye contact, flush immediately with plenty of water for 15 minutes and get medical attention. **For skin contact,** wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes before reuse. **If inhaled,** remove to fresh air.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

PHYSICAL OR CHEMICAL HAZARDS COMBUSTIBLE: Do not use, pour, spill or store near heat or open flame.

IN CASE OF FIRE: Use dry chemicals, foam, water fog or CO_2. Cool closed containers with water.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Do not apply directly to lakes, streams or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

Treated sawdust and other wood wastes should not be used as mulch where it will come in contact with useful living plants. Care should be taken to prevent drip or spray from contacting ornamental shrubs, trees, grass and other desirable vegetation.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life. Keep containers closed when not in use.

TOLS012117

FPL 1167-R-93

Koppers Company, Inc., Wood Treating Chemicals Department
5137 Southwest Ave., St. Louis, MO 63110
Telephone 314-772-2200

KOPPERS

February 10, 1981

Mr. Henry Jacoby
Product Manager 21
Fungicide - Herbicide Branch
Registration Division (TS-767
U.S. Environmental Protection Agency
401 M Street, N.W.
Washington, D.C. 20460

Attention: Ms. Diane Ierley

Subject: WOODTOX PRE-PRIME Ready To Use
EPA Reg. No. 453-202

Dear Mr. Jacoby:

Attached is our application for amended application as well as two (2) draft labels for our product WOODTOX PRE-PRIME Ready To Use.

We have deleted specific instructions for termite, powder post beetle, carpenter ant use and generally revised and up-dated the label with such paragraphs as the storage and disposal statements.

Your usual prompt attention to this application will be appreciated.

Yours very truly,

Harold P. Struessel
Label Co-ordinator

HPS/me

TOLS012118

Form Approved
OMB No. 158-R0066

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDE PROGRAMS (WH-567)
WASHINGTON, D.C. 20460

APPLICATION FOR AMENDED PESTICIDE PRODUCT REGISTRATION

(Read instructions on last page before completing) B

1. REFERENCE CODE	2. EPA USE ONLY
	- -
3. REGISTRATION NO. 453-202	4. PRODUCT MANAGER P. M. #21

5. NAME AND ADDRESS OF REGISTRANT (Include Zip Code)

Koppers Company, Inc.
Wood Treating Chemicals Dept.
5137 Southwest Avenue
St. Louis, MO 63110

☐ CHECK HERE IF THIS IS A NEW ADDRESS

6. TYPE OF AMENDMENT

	CHANGE IN PRODUCT NAME
	MINOR CHANGE IN FORMULATION
	REQUEST FOR ADDITIONAL BRAND NAMES
	REQUEST FOR MULTIPLE INERT FORMULATION PER PR NOTICE 74-2
X	DELETION OF LABEL TEXT
	ADDED USES
X	GENERAL REVISION OF LABEL

7. PRODUCT NAME
WOODTOX PRE-PRIME Ready To Use

8. EXPERIMENTAL PERMIT NO.

9. SUBJECT OF AMENDMENT (See instructions)
Deletion of specific instructions for termite, powder post beetle, carpenter ant use. Addition of updated Storage and Disposal Statement and General Revision of label.

12. TYPES OF DATA SUBMITTED

		FOR REAL
X	01 NONE	1201
	02 PRODUCT CHEMISTRY	1202
	03 RESIDUE CHEMISTRY	1203
	04 ENVIRONMENTAL CHEMISTRY	1204
	05 EFFICACY	1205
	06 PHYTOTOXICITY	1206
	07 HUMAN SAFETY	1207
	08 DOMESTIC ANIMAL SAFETY	1208
	09 FISH AND WILDLIFE SAFETY	4209
	10 BENEFICIAL INSECT SAFETY	1210
	11 ACCIDENT EXPOSURE EXPERIENCE	1211
	12 OTHER (Specify)	1212
	13 OTHER (Specify)	1213

13. METHOD OF SUPPORT (See instructions)
☐ Required Supporting Data Attached. (2A)
☒ Required Supporting Data is Submitted by Reference. (2B)

14. CONTACT POINT
Complete items directly below for identification of individual to be contacted, if necessary, to process this application.

15. DATE APPLICATION RECEIVED (Stamped)

OFFER TO PAY STATEMENT
I hereby offer to pay reasonable compensation to the extent authorized under Section 3(c)(1)(D) of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, and in accordance with the Regulations and Guidelines published thereunder for use of any test data which has been submitted to the U.S. Environmental Protection Agency in support of an application for the registration of a pesticide for the first time on or after January 1, 1970 and which may be used in support of the registration application for the subject pesticide.

NAME
Harold P. Struessel

TITLE
Label Co-ordinator

TELEPHONE NO. (Include Area Code)
(314) 772-2200

16. SIGNATURE
Harold P. Struessel

17. TITLE
Label Co-ordinator

18. TYPED NAME
Harold P. Struessel

19. DATE SIGNED
February 10, 1981

EPA Form 8570-11 (Rev. 4-76) PREVIOUS EDITION IS OBSOLETE.

TOLS012119

BZTO104(e)048952

INSTRUCTION

GENERAL

This form is to be used to initiate a new change to an existing pesticide registration. It is not to be used to transmit resubmissions to previous EPA correspondence regarding a pending submission.

In order to process an application for amended registration submitted on this form, the following material must accompany the application when appropriate:

1. Label Technical Data Sheet (EPA Form 8570-10). Needed whenever the subject of the current amendment changes any item of information from the previous submission of the sheet.
2. Confidential Statement of Formula (EPA Form 8570-4). Needed whenever the amendment relates to the chemistry of the product.
3. Two copies of draft labeling or five copies of final printed labeling.
4. Two copies of any data being submitted.

Submission of Labeling: Normally draft labeling (2 copies) should be submitted with applications for amended registration. Such draft labels may be in the form of typed label text on 8½ x 11 inch paper or as a mock-up of the proposed label. If prepared as a mock-up it should be constructed in such a way as to facilitate storage in an 8½ x 11 inch file. Mock-up labels significantly smaller than 8½ x 11 inches should be mounted on 8½ x 11 inch paper for submission.

Where the risk of rejection is acceptably low, the applicant may choose to submit 5 copies of final printed labeling. While this procedure may avoid one application cycle, it must be understood that to submit final printed labels is to risk having to discard all such labeling if any small part of the proposed labeling is unacceptable.

Submission of Data: Data submitted in support of this application must be submitted in two copies. In order to facilitate review, each type of data identified in Item 12 must be submitted, bound separately, and identified on the front cover to include the information in boxes 3, 5, 8 and 12, and the data submitted. Additional information on the preparation of data for submission in support of registration applications is available by writing the Director, Registration Division, at the address specified at the top of the form.

SPECIFIC

ITEM

1. Reference Code. For use only when specifically directed by the Agency. Not for use on routine applications for amended registration.
2. For EPA use only.
3. Registration Number. Insert the number assigned to this product.
4. Product Manager. Insert the name of the EPA Product Manager to whom this product is assigned.
5. Self-explanatory.
6. Type of amendment. Check the box that most adequately describes the intent of your amendment.
7. Product Name. The name given must match the label submitted.
8. Experimental Permit Number. If this application was preceded by an experimental permit issued to permit development of data to support this application, specify the experimental permit number in this box.
9. Subject of Amendment. Insert a very short statement of the purpose of this amendment, as "to add beans," "to change product name," "general revision of label," etc.

10-11. Not used.

12. Types of data submitted. Specify each type of data submitted or specify none. See "Submission of Data" above.
13. Method of support. The federal Insecticide, Fungicide, and Rodenticide Act, as amended requires that applicant prove the efficacy and safety of a proposed product. This box identifies the method by which you are attempting to provide such proof.

2A is used when all the data required to support the proposed product is actually attached to the application.

2B is used when all of the data required to support the proposed product is either attached or submitted by specific references.

14. Self-explanatory.
15. EPA use only.

16-19. Self-explanatory. Note that the signature in box 16 certifies the offer to pay statement printed above as well as certifying the accuracy of the entire application package.

TOLS012120

BZTO104(e)048953

KOPPERS

Interoffice Correspondence

To M. S. Marino

Location Env. Res. & Occ. Health K-1201

Subject Product Labels

From Harold P. Struessel

Location WTC - St. Louis, Mo.

Date May 5, 1981

Please see attached copy of a 4/29/81 letter to us from the EPA.

It seems they have changed the "Storage and Disposal" statement again and no PR notice received (at least not here).

This is for your information and according to the letter, it seems that all of our labels bearing such a statement must be changed again, agree?

Harold P. Struessel

HPS/me

cc: J. D. PALMER
R. D. Arsenault K-1001
W. J. Baldwin (K-700)

Phoned W.J. Baldwin 6/11/81.
He advises to proceed with revised Storage Disposal statement on Woodtox Pre-Prime RTU label - and others as they are up-dated.

K-5 REV 2

TOLS012121

BZTO104(e)048954

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

FOR EXTERIOR USE ONLY.

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

STORAGE AND DISPOSAL

PROHIBITIONS: Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

PESTICIDE DISPOSAL: Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of according to procedures approved by Federal, State or local disposal authorities.

CONTAINER DISPOSAL: Empty containers shall be triple rinsed (or equivalent), compressed so they are not reusable, and disposed of according to applicable local, state, and federal regulations.

GENERAL: Consult Federal, State, or local disposal authorities for approved alternative procedures.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling of this material not in strict accordance with the directions given herewith which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

BZTO104(e)048955

KOPPERS®

FOR INDUSTRIAL USE ONLY

WOODTOX® PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards

WARNING! KEEP OUT OF REACH OF CHILDREN.
See side panel for first aid and additional precautionary statements.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING. IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

EPA Reg. No. 453-202
EPA Est. 453-MO-1

TOLS012122

Koppers Company, Inc.
Wood Treating Chemicals Dept.
5137 Southwest Avenue, St. Louis, Missouri 63110

NET CONTENTS U.S. GALLONS

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)

WARNING

MAY BE FATAL IF SWALLOWED OR ABSORBED THROUGH THE SKIN. HARMFUL IF INHALED.

May be irritating to the eyes, skin or respiratory tract.

Do not get in eyes, on skin or on clothing. Use of goggles and protective clothing (rubber gloves) is recommended when brushing or dipping, and use of an approved respirator when spraying. Avoid prolonged and or repeated breathing of vapors, mist or substantially saturated atmosphere. Use only in well ventilated areas. Not for use or storage in or around the home. Avoid contamination of food. Do not take internally.

FIRST AID: If swallowed, CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

In case of eye contact, flush immediately with plenty of water for 15 minutes and get medical attention. **For skin contact,** wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes before reuse. **If inhaled,** remove to fresh air.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

PHYSICAL OR CHEMICAL HAZARDS COMBUSTIBLE: Do not use, pour, spill or store near heat or open flame.

IN CASE OF FIRE: Use dry chemicals, foam, water fog or CO_2. Cool closed containers with water.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Do not apply directly to lakes, streams or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

Treated sawdust and other wood wastes should not be used as mulch where it will come in contact with useful living plants. Care should be taken to prevent drip or spray from contacting ornamental shrubs, trees, grass and other desirable vegetation.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life. Keep containers closed when not in use.

FPL 1167 R 03

FOR INDUSTRIAL USE ONLY

KOPPERS®

WOODTOX® PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

TM TRADEMARK OF

WOOD TREATING CHEMICALS DEPT.

KOPPERS COMPANY, INC.

5137 SOUTHWEST AVENUE, ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

EPA Reg. No. 453-202
EPA Est. 453-MO-1

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

NET CONTENTS 55 U.S. GALLONS

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

Do not use, pour, spill or store near heat or open flame.

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

This product is toxic to fish and wildlife. Keep out of lakes, streams, and ponds. Keep containers closed when not in use. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

TOLS012123

FPL 1167 R 03

BZTO104(e)048956

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

FOR EXTERIOR USE ONLY.

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

STORAGE AND DISPOSAL

PROHIBITIONS: Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

PESTICIDE DISPOSAL: Pesticide, spray mixture, or rinsate that cannot be used or chemically reprocessed should be disposed of according to procedures approved by Federal, State or local disposal authorities.

CONTAINER DISPOSAL: Empty containers shall be triple rinsed (or equivalent), compressed so they are not reusable, and disposed of according to applicable local, state, and federal regulations.

GENERAL: Consult Federal, State, or local disposal authorities for approved alternative procedures.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling of this material not in strict accordance with the directions given herewith which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement

KOPPERS®

FOR INDUSTRIAL USE ONLY

WOODTOX® PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards

WARNING! KEEP OUT OF REACH OF CHILDREN.
See side panel for first aid and additional precautionary statements.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING. IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

EPA Reg. No. 453-202
EPA Est. 453-MO-1

Koppers Company, Inc.
Wood Treating Chemicals Dept.
5137 Southwest Avenue, St. Louis, Missouri 63110

NET CONTENTS U.S. GALLONS

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)

WARNING

MAY BE FATAL IF SWALLOWED OR ABSORBED THROUGH THE SKIN. HARMFUL IF INHALED.

May be irritating to the eyes, skin or respiratory tract.

Do not get in eyes, on skin or on clothing. Use of goggles and protective clothing (rubber gloves) is recommended when brushing or dipping, and use of an approved respirator when spraying. Avoid prolonged and/or repeated breathing of vapors, mist or substantially saturated atmosphere. Use only in well ventilated areas. Not for use or storage in or around the home. Avoid contamination of food. Do not take internally.

FIRST AID: If swallowed, CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

In case of eye contact, flush immediately with plenty of water for 15 minutes and get medical attention. **For skin contact,** wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes before reuse. **If inhaled,** remove to fresh air.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

PHYSICAL OR CHEMICAL HAZARDS COMBUSTIBLE: Do not use, pour, spill or store near heat or open flame.

IN CASE OF FIRE: Use dry chemicals, foam, water fog or CO_2. Cool closed containers with water.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Do not apply directly to lakes, streams or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

Treated sawdust and other wood wastes should not be used as mulch where it will come in contact with useful living plants. Care should be taken to prevent drip or spray from contacting ornamental shrubs, trees, grass and other desirable vegetation.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life. Keep containers closed when not in use.

FPL 1167 R 03

TOLS012124

BZTO104(e)048957

Koppers Company, Inc., Wood Treating Chemicals Department
5137 Southwest Ave., St. Louis, MO 63110
Telephone 314-772-2200

KOPPERS

October 27, 1981

Mr. Henry Jacoby
Product Manager 21
Fungicide - Herbicide Branch
Registration Division (TS-767)
U.S. Environmental Protection Agency
401 M Street, N.W.
Washington, D.C. 20460

Attention: Ms. Diane Ierley

Subject: WOODTOX PRE-PRIME Ready To Use
EPA Reg. No. 453-202
Your letter to us of April 29, 1981

Dear Mr. Jacoby:

In accordance with your letter to us of April 29, 1981, copy attached for your convenience, we are attaching five copies of finished labeling for Subject product.

The storage and disposal statement has been revised to reflect the statements shown in your letter.

We urgencly request your usual prompt approval of this label as we are most anxious to put it in use as soon as possible. THANKS.

Yours very truly,

Harold P. Struessel
Label Co-Ordinator

HPS/me

NM 2

11/3

703-557-1900

TOLS012125

BZTO104(e)048958

KOPPERS®

FOR INDUSTRIAL USE ONLY

WOODTOX® PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards

WARNING! KEEP OUT OF REACH OF CHILDREN.
See side panel for first aid and additional precautionary statements.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING. IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

EPA Reg. No. 453-202
EPA Est. 453-MO-1

Koppers Company, Inc.
Wood Treating Chemicals Dept.
5137 Southwest Avenue, St. Louis, Missouri 63110

NET CONTENTS U.S. GALLONS

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

FOR EXTERIOR USE ONLY.

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain. It contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end gragn is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

STORAGE AND DISPOSAL

PROHIBITIONS: Do not contaminate water, food or feed by storage or disposal.

PESTICIDE DISPOSAL: Pesticide, spray mixture or rinsate that cannot be used according to label instruction must be disposed of according to Federal, state or local procedures under the Resource Conservation and Recovery Act.

CONTAINER DISPOSAL: Triple rinse (or equivalent) and offer for recycling or reconditioning, or dispose of in a sanitary landfill, or by other approved State and local procedures.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling of this material not in strict accordance with the directions given herewith which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use of application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)

WARNING

MAY BE FATAL IF SWALLOWED OR ABSORBED THROUGH THE SKIN. HARMFUL IF INHALED.

May be irritating to the eyes, skin or respiratory tract.

Do not get in eyes, on skin or on clothing. Use of goggles and protective clothing (rubber gloves) is recommended when brushing or dipping, and use of an approved respirator when appropriate. Avoid prolonged and/or repeated breathing of vapors, mist or substantially saturated atmosphere. Use only in well ventilated areas. Not for use or storage in or around the home. Avoid contamination of food. Do not take internally.

FIRST AID: If swallowed, CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

In case of eye contact, flush immediately with plenty of water for 15 minutes and get medical attention. **For skin contact,** wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes before reuse. **If inhaled,** remove to fresh air.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

PHYSICAL OR CHEMICAL HAZARDS COMBUSTIBLE: Do not use, pour, spill or store near heat or open flame.

IN CASE OF FIRE: Use dry chemicals, foam, water fog or CO_2. Cool closed containers with water.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Do not apply directly to lakes, streams or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

Treated sawdust and other wood wastes should not be used as mulch where it will come in contact with useful living plants. Care should be taken to prevent drip or spray from contacting ornamental shrubs, trees, grass and other desirable vegetation.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life. Keep containers closed when not in use.

FPL 1167 R 04 8:08

BZTO104(e)048959

TOLS012126

KOPPERS

Interoffice Correspondence

To M. S. Marino — From Harold P. Struessel

Location Env. Res. & Occ. Health K-1201 — Location WTC - St. Louis, Mo.

Subject Product Labels With Salt Water Emesis — Date November 5, 1981

Attached are 20 copies of our WOODTOX 140 Concentrate label omitting the salt water emesis statement.

Below are listed reasons for not submitting labels for the balance of the products shown on your list to us:

B WOOD PRESERVATIVE 453-38
C WOOD PRESERVATIVE 453-158

Both of these labels were prepared specifically for sales to Western Electric Co. We no longer have the contract for these sales so the labels will not be updated or re-rpited until and if we are awarded the contract again. They are dormant labels.

WOODTOX Ready To Use 453-41

This label was designed for use on containers sold to retail customers (homeowners). Since we are no longer in this field, the label will not be updated or re-printed. It is dormant.

LIQUID NOXTANE 120 453-229

Present registration is for a product containing phenyl mercuric lactate. It is not being formulated or sold at this time. It is dormant.

TIMBERTREAT 95 453-260

Both TIMBERTREAT 625 and 95 were for a BHC product. Two labels for the SAME product to different types of customers. The 625 label was amended to Lindane but 95 was not - - it is still for banned BHC. The registration may have been administratively cancelled by now but we have not been notified.

PENTA STAIN BASE CONCENTRATE 453-266

This product was made specifically for one customer. This customer is no longer formulating Penta stains so we have no sales of this product. Label is not being updated or re-printed. It is dormant.

TIMBERTOX 20 NW 453-268

This product was formulated for us by an outside blender at St. Louis Park, MN. using Northwestern Refinery Oil, hence the "NW". The outside blender burned down and the business dried up so we are no longer selling this product. Label not being updated or re-printed. It is dormant.

K 5 REV. 2

TOLS012127

BZTO104(e)048960

KOPPERS

Interoffice Correspondence

To M. S. Marino

From

Location

Location

Subject

Date November 5, 1981

PENTA STAIN 453-174 thru 181 and 256

The current PENTA STAIN label is printed by an outside printer and we still have a pretty good stock. We propose to obtain pressure sensitive stickers to apply over the present emesis statement deleting the salt water recommendation. I believe this label will undergo a major revision soon conforming to our standard format.

→ WOODTOX PRE-PRIME Ready To Use 453-202

Attached is 1 copy of this label which was submitted recently to the U.S. EPA for final approval. As soon as it is approved, we will advise and send additional copies for your use. We hope to have approval prior to November 30, 1981.

If additional labels or information is needed, please advise.

Harold P. Struessel

HPS/me

TOLS012128

K 5 REV. 2

To _____ Date 11-9-81

Per phone W/ Shane Jerley
8:50 - A.M. 11/9/81 -

WOODTUX PRE-PRIME RTU
APPROVED - LETTER TO POOL 11/2

COPPER TREAT 00 RTU
APPROVED - LETTER TO POOL 11/3

LIQUIN NOXTANE SS2
EPA Reg. No. 453-EOG
293
still Valid application - No administrative
cancellation yet.
[illegible]

duff
TRUCK LINE INC.
SERVICE & PEOPLE

TOLS012129

BZTO104(e)048962

KOPPERS®

WOODTOX® PRE-PRIME READY TO USE

SPECIMEN LAB

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards & Federal Specification TT-W-572B.

WOOD TREATING CHEMICALS DEPT.

KOPPERS COMPANY, INC.

5137 SOUTHWEST AVENUE, ST. LOUIS, MISSOURI 63110

WARNING: KEEP OUT OF REACH OF CHILDREN

See side panel for other warnings.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING.

IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

EPA Reg. No. 453-202
EPA Est. 453-MO-1
EPA Est. 33760-OR-01

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

NET CONTENTS 55 U.S. GALLONS

DIRECTIONS FOR USE

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain, termites, Lyctus (powder post) beetles and carpenter ants, and contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

WOOD PRESERVATION AND DIMENSIONAL CONTROL

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical as in the case of an existing structure, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

This product is effective for application to wood for the control of termites, powder post (Lyctus) beetles and carpenter ants. In all of these cases, it will be effective only in the areas of the wood contacted by the solution. Therefore, thoroughness of treatment is essential to good control.

TERMITE CONTROL. For protection of new wood prior to installation, see instructions above. Care must be exercised that the solution does not contact asphaltic products (tar paper, composition shingles, or other such items) or that it is not applied in such a way that it will stain plaster or other surfaces. Treatment of the wood is supplemental to soil treating.

POWDER-POST BEETLE CONTROL. Lumber, flooring or other items infested with powder-post beetles can be controlled by immersing the wood in this product for a minimum of 5 minutes per inch of thickness. Since there is potential hazard from dermal contact after treatment of floors, furniture and the like, re-waxing of these items after treatment with a heavy duty paste wax, after the solvent has evaporated, is necessary to insure against this hazard.

CARPENTER ANTS. This product applied to infested wood either by spraying or by injection into the cavities made by the ants, has proved useful for cleaning out ants living in the wood. Since poisoning of the colony at their source is the surest remedy, treatments of infested wood are usually supplemental.

NOTICE

Avoid contamination of feed or foodstuffs.

Do not reuse container. Return to drum reconditioner or destroy and bury in a safe place. Do not contaminate water by cleaning equipment or disposal of waste and containers.

Treated sawdust and other wood wastes should not come in contact with domestic animals, or be used as mulch where it will come in contact with useful living plants.

WARNING

MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES SKIN IRRITATION. MAY PRODUCE DELAYED CHEMICAL BURNS. COMBUSTIBLE.

Do not breathe spray mist. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.

Wear protective clothing and rubber gloves when handling the freshly treated lumber.

Do not use, pour, spill or store near heat or open flame.

FIRST AID: If swallowed induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

FIRST AID: In case of contact, wash skin with soap and water, for eyes, flush with water for at least 15 minutes and get medical attention.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

This product is toxic to fish and wildlife. Keep out of lakes, streams, and ponds. Keep containers closed when not in use. Do not contaminate water by cleaning of equipment, or disposal of wastes. Apply this product only as specified on this label.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling which may result in loss or damage which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

TO: M. S. Marino Env. Res. & Occ. Health K-1201 PGH	FROM: Harold P. Struessel WTC - St. Louis, Mo.

SUBJECT: Product Label WOODTOX PRE-PRIME RTU

DATE: 11/20/81

FOLD— MESSAGE

Attached is a copy of a letter received today from the U.S. EPA formally accepting our revised label for Subject product. A copy of the "Approved" stamped label is also attached for your information. We are enclosing about 20 of the finished labels for ;your registration purposes.

cc: K.E. Cogan
W.J. Baldwin

ORIGINATOR-DO NOT WRITE BELOW THIS LINE — REPLY TO → SIGNED Harold Struessel

REPLY

DATE

SIGNED

DETACH AND RETAIN THIS COPY

BZTO104(e)048964

TOLS012131

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

NOV 17 1981

Koppers Company, Inc.
Wood Treating Chemicals Dept.
5137 Southwest Avenue
St. Louis, MO 63110

Attention: Harold P. Struessel

Gentlemen:

Subject: Woodtox Pre-Prune Ready-To-Use
EPA Registration No. 453-202
Submission of October 27, 1981

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, is acceptable. A stamped copy is enclosed for your records.

Sincerely,

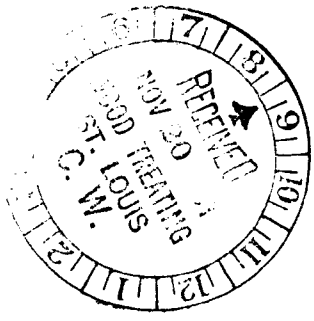
Henry M. Jacoby

Henry M. Jacoby
Product Manager (21)
Fungicide-Herbicide Branch
Registration Division (TS-767)

Enclosure

TOLS012132

BZTO104(e)048965



TOLS012133

BZTO104(e)048966

KOPPERS®

FOR INDUSTRIAL USE ONLY

WOODTOX® PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards

ACCEPTED

NOV 17 1981

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 453-202

WARNING! KEEP OUT OF REACH OF CHILDREN.
See side panel for first aid and additional precautionary statements.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING. IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

ACTIVE INGREDIENTS:	
Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

EPA Reg. No. 453-202
EPA Est. 453-MO-1

Koppers Company, Inc.
Wood Treating Chemicals Dept.
5137 Southwest Avenue, St. Louis, Missouri 63110

NET CONTENTS U.S. GALLONS

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

FOR EXTERIOR USE ONLY.

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain. It contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end gragn is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage. 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

STORAGE AND DISPOSAL

PROHIBITIONS: Do not contaminate water, food or feed by storage or disposal.

PESTICIDE DISPOSAL: Pesticide, spray mixture or rinsate that cannot be used according to label instruction must be disposed of according to Federal, state or local procedures under the Resource Conservation and Recovery Act.

CONTAINER DISPOSAL: Triple rinse (or equivalent) and offer for recycling or reconditioning, or dispose of in a sanitary landfill, or by other approved State and local procedures.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling of this material not in strict accordance with the directions given herewith which are beyond the control of the seller, such as for example incompatibility with other products and the manner of its use of application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)

WARNING

MAY BE FATAL IF SWALLOWED OR ABSORBED THROUGH THE SKIN. HARMFUL IF INHALED.

May be irritating to the eyes, skin or respiratory tract.

Do not get in eyes, on skin or on clothing. Use of goggles and protective clothing (rubber gloves) is recommended when brushing or dipping, and use of an approved respirator when appropriate. Avoid prolonged and/or repeated breathing of vapors, mist or substantially saturated atmosphere. Use only in well ventilated areas. Not for use or storage in or around the home. Avoid contamination of food. Do not take internally.

FIRST AID: If swallowed, CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

In case of eye contact, flush immediately with plenty of water for 15 minutes and get medical attention. **For skin contact,** wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes before reuse. **If inhaled,** remove to fresh air.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

PHYSICAL OR CHEMICAL HAZARDS COMBUSTIBLE: Do not use, pour, spill or store near heat or open flame.

IN CASE OF FIRE: Use dry chemicals, foam, water fog or CO_2. Cool closed containers with water.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Do not apply directly to lakes, streams or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

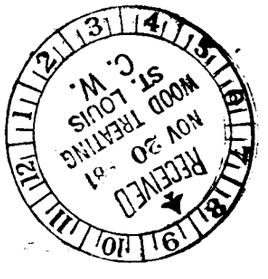
Treated sawdust and other wood wastes should not be used as mulch where it will come in contact with useful living plants. Care should be taken to prevent drip or spray from contacting ornamental shrubs, trees, grass and other desirable vegetation.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life. Keep containers closed when not in use.

FPL 1167 R 04 8108

BZTO104(e)048967

TOLS012134



TOLS012135

BZTO104(e)048968

KOPPERS

Interoffice Correspondence

To Conrad Kempinska

Location F. P. Gr. K-750

Subject WOODTOX PRE-PRIME
Ready To Use
Revised Product Label

From Harold P. Struessel

Location WTC - St. Louis, MO.

Date December 11, 1984

Conrad, attached are ten (10) copies of the new WOODTOX PRE-PRIME Ready-To-Use label showing the revised Storage and Disposal statements.

Will this label have to be cleared through the EPA before we can use it? Please advise when and if we can start using this new label. THANKS!

Harold P. Struessel

HPS/me
cc: J. F. Garrity

TOLS012136

K-5 REV. 2

BZTO104(e)048969

KOPPERS®

FOR INDUSTRIAL USE ONLY

WOODTOX® PRE-PRIME READY TO USE

WATER REPELLENT WOOD PRESERVATIVE

Specially formulated for treatment of millwork prior to factory or field priming. Meets NWMA standards

WARNING! KEEP OUT OF REACH OF CHILDREN.
See side panel for first aid and additional precautionary statements.

READ "LIMIT OF WARRANTY AND LIABILITY" BEFORE BUYING OR USING. IF SUCH TERMS ARE NOT ACCEPTABLE, RETURN AT ONCE UNOPENED.

ACTIVE INGREDIENTS:

Pentachlorophenol*	4.47%
Other Chlorophenols & Related Compounds*	.52%
Mineral Spirits	84.55%
INERT INGREDIENTS	10.46%
Total	100.00%

*5.2% Technical Pentachlorophenol as defined in Fed. Spec. TT-W-570.

EPA Reg. No. 453-202
EPA Est. 453-MO-1

Koppers Company, Inc.
Wood Treating Chemicals Dept.
5137 Southwest Avenue, St. Louis, Missouri 63110

NET CONTENTS **U.S. GALLONS**

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

FOR EXTERIOR USE ONLY.

This product is a clean oil solution useful for the protection of wood against fungus growths which cause rot and stain. It contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping.

For best results, this product should be applied so as to effect maximum penetration into the wood and heavy absorption especially at joints and wherever end grain exists. A 3-minute immersion period is recommended for millwork. For other open tank treatments, complete immersion of the wood in the solution is generally recommended for five minutes per inch of thickness. For the control of dimensional changes, shrinkage and swelling, the treatment of the end grain is most important since the moisture pick-up there is a hundred to a thousand times greater than at the flat or edge grain surface for many species of wood.

Where open tank treating is impractical, two heavy brush applications of this product should be applied, cutting out and removing all unsound wood two feet beyond any visible evidence of decay. All wood should be normally dry, and the framing or cutting completed before application of this product.

Estimated Coverage: 5 to 10 gallons per thousand board feet for open tank treating; 200 square feet per gallon for brush application.

STORAGE AND DISPOSAL

STORAGE: Store in a closed, properly labelled container in a cool place. If static generating conditions exist, provide necessary grounding and bonding. Keep containers closed when not in use.

PESTICIDE DISPOSAL: Do not contaminate water, food, or feed by storage or disposal. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the nearest Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this material conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the directions for use. This product is sold subject to the understanding that the buyer assumes all risks of use or handling of this material not in strict accordance with the directions given herewith which are beyond the control of the seller, such as, for example, incompatibility with other products and the manner of its use or application. NO OTHER EXPRESSED OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY IS MADE. The exclusive remedy of the buyer, and the limit of liability of this company or any other seller for any and all losses, injuries or damages resulting from the use or handling of this product shall be the purchase price paid by the user or buyer for the quantity of this product involved. The buyer and all users are deemed to have accepted the terms of this notice which may not be varied by any verbal or written agreement.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)

WARNING

MAY BE FATAL IF SWALLOWED OR ABSORBED THROUGH THE SKIN. HARMFUL IF INHALED.

May be irritating to the eyes, skin or respiratory tract.

Do not get in eyes, on skin or on clothing. Use of goggles and protective clothing (rubber gloves) is recommended when brushing or dipping, and use of an approved respirator when appropriate. Avoid prolonged and/or repeated breathing of vapors, mist or substantially saturated atmosphere. Use only in well ventilated areas. Not for use or storage in or around the home. Avoid contamination of food. Do not take internally.

FIRST AID: If swallowed, CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

In case of eye contact, flush immediately with plenty of water for 15 minutes and get medical attention. **For skin contact,** wash thoroughly with soap and water. Remove contaminated clothing and shoes. Wash clothes before reuse. **If inhaled,** remove to fresh air.

NOTE TO PHYSICIAN: This product is a metabolic stimulant, causes hyperthermia. Treat symptomatically.

PHYSICAL OR CHEMICAL HAZARDS COMBUSTIBLE: Do not use, pour, spill or store near heat or open flame.

IN CASE OF FIRE: Use dry chemicals, foam, water fog or CO_2. Cool closed containers with water.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Do not apply directly to lakes, streams or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

Treated sawdust and other wood wastes should not be used as mulch where it will come in contact with useful living plants. Care should be taken to prevent drip or spray from contacting ornamental shrubs, trees, grass and other desirable vegetation.

Vapors may cause injury if adequate ventilation is not insured. Do not use this product indoors, or any other confined areas, where the vapors may concentrate and cause injury to plant or animal life. Keep containers closed when not in use.

FPL 1167 R 05 1284

BZTO104(e)048970

TOLS012137

TOLS012139

TOLS012140

TOLS012141

BZTO104(e)048974

TOLS012142

TOLS012143

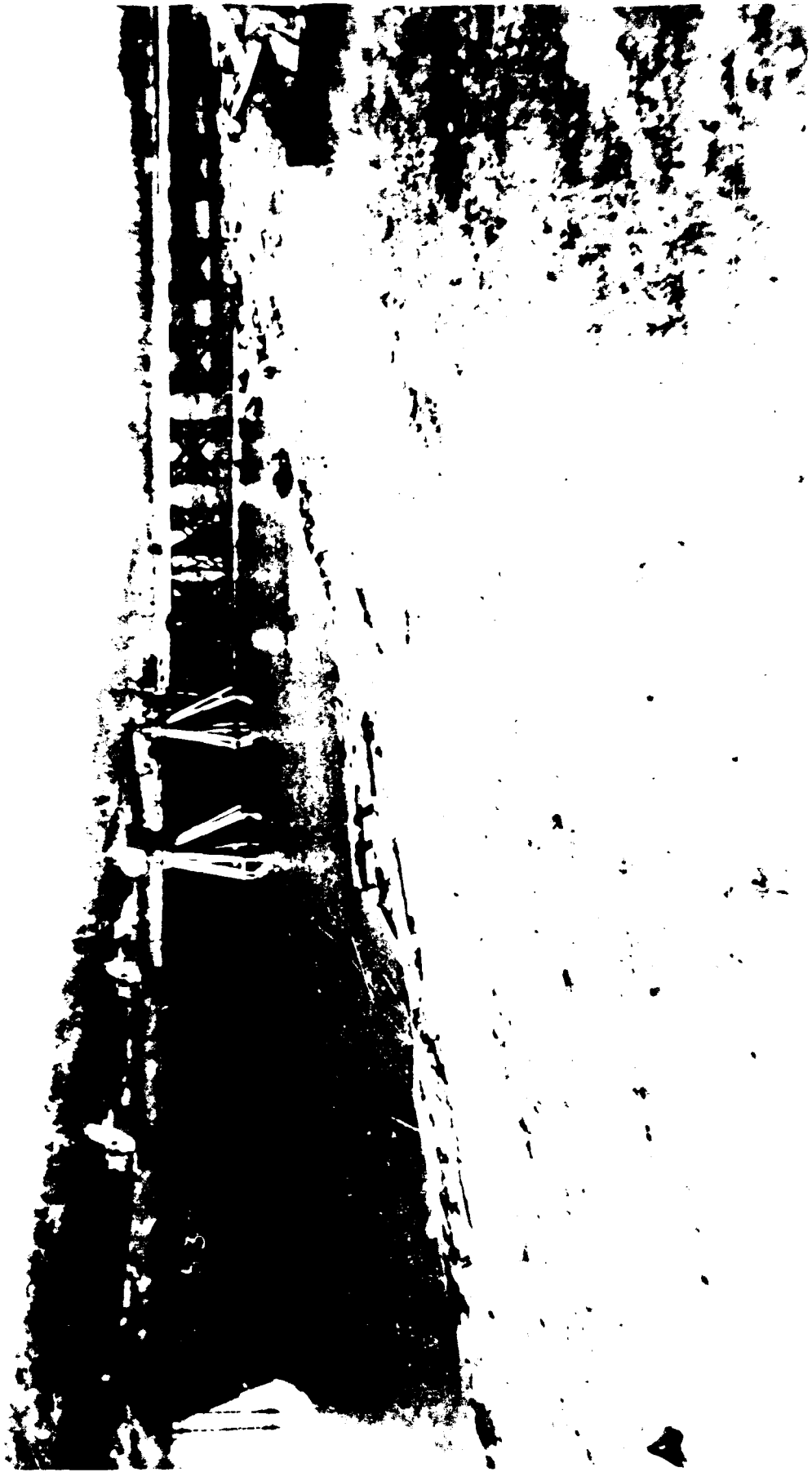
TOLS012144

BZTO104(e)048977

TOLS012145

BZTO104(e)04897

TOLS012146



TOLS012147

TOLS012148

BZTO104(e)048981

EXHIBIT A

MONSANTO WAREHOUSING & TERMINALING

UNIFIED PROCEDURE

I. ORDER PROCESSING

A. Order Receipt Mode

Warehouses and Terminals will receive shipping instructions through our Shipping Order form which will indicate type and quantity of material to be shipped. Shipping instructions may first be received by telephone or wire, but they will always be confirmed by a shipping order form.

B. Form CP-229 Copy Distribution

After shipment has been made, all parts of the form should be completed by the warehouse or terminal, adding the variable data such as gross, tare and net weights, shipping date, carrier and routing. The CP-229 form should then be forwarded to OSRCPB, Rate Section, Corporate Distribution Department.*

II. SHIPPING PAPERS

A. Bill of Lading

Warehouse will prepare a Bill of Lading set for each outbound shipment handled, using Monsanto Form BL-1-R. It is of special importance that the Monsanto shipper's number (as shown on the shipping order form or as given in verbal orders) be entered correctly in the space on the Bill of Lading provided for this purpose. It is also very important that the proper freight classification for the product shipped is used.

*MONSANTO COMPANY
800 North Lindbergh Blvd.
St. Louis, Mo. 63166
WYdown 3-1000
H&P 11-66

TOLS012149

BZTO104(e)048982

B. Bill of Lading Distribution

Original: The original Bill of Lading must be forwarded to the Bill of Lading Desk, Corporate Distribution Department.*

Copy 2: Retained by Carrier
Copy 3: Forwarded to District Sales Office
Copy 4: Retained by Warehouse or Terminal
Copy 5: Spare copy, may be destroyed.

III. PAYMENT OF FREIGHT BILLS

A. Outbound Prepaid Shipments

1. Freight bills for all outbound prepaid shipments are not to be paid by warehouses or terminals unless specifically requested to do so by Monsanto. Carriers should be notified of this request and that transportation bills, including weighing charges, should be sent directly by the carriers to the Cass Bank address shown below. When preparing statements, we request that the following steps be carried out by carriers.

   a. Prepare an itemized statement in duplicate, using your own statement forms, list PRO number and Monsanto's shipper's number opposite each amount and show a total.

   b. Attach individual freight bills to the duplicate statement and then mail both original and duplicate statements directly to:

MONSANTO COMPANY
c/o Cass Bank and Trust Company
Drawer 7585 Progress Station
St. Louis, Missouri 63159

*MONSANTO COMPANY
800 North Lindbergh Blvd.
St. Louis, Missouri 63166
WYdown 3-1000
H & P 11-66

TOLS012150

2. Drayage

Freight bills for drayage service performed by warehouses and terminals are not to be included on invoices for warehouse and terminal services. Drayage bills should be submitted to the Cass Bank in the same manner as outlined above for carriers.

B. Inbound Collect (Return Shipments)

1. Occasionally the Hydrocarbons & Polymers and Plastics Products & Resins Divisions will authorize a customer to return material to your warehouse. Our District Sales Office will advise you in advance when a return is acceptable. If a shipment arrives without prior notice, you should contact them before accepting the material.

2. The notification from our office will advise whether the material should be:

   a) Segregated as "Returned Goods"
   b) Returned to regular stock

3. When material is segregated:

   a) The enclosed green "Returned Goods" label must be attached to the containers.

   b) Your warehouse receipt and records should specifically note that the labels have been affixed.

   c) No shipment of any material carrying the "Returned Goods" label may be made without specific approval from our District Sales Office. This approval will be shown in the special instructions section of our warehouse release form.

   d) When such a release is received you must make certain that all markings or labels identifying the material as "Returned Goods" are removed prior to shipment.

4. When material is scheduled to be returned to regular stock:

   a) Set aside in a separate warehouse lot all partially filled, recoopered, damaged, or badly soiled containers. Apply green "Returned Goods" labels to these and handle as segregated stock.

   b) On balance, make certain any labels and markings identifying as returned material are removed. The lot may then be handled normally.

5. If the District Office requests that a returned shipment be split between Returned Goods and regular stock, be sure separate warehouse lot numbers are assigned to each section.

6. Returned goods may come in prepaid or freight collect. If collect, please make certain the carrier knows his bill should be sent to:

   Mr. H. D. Woodmansee
   Monsanto Company
   P. O. Box 1531
   Springfield, Mass. 01101

7. Strict compliance with this procedure will prevent costly and embarrassing situations which result if the wrong material is shipped. Please contact our District Sales Office or the writer if there are any questions.

IV. INVOICES

Invoices in duplicate for all warehousing and terminaling services, except drayage should be submitted to H. D. Woodmansee, Hydrocarbons & Polymers Division.* Warehouse receipts should be furnished the concerned Monsanto District Sales Office.

A. Inbound Shipments

Invoices for individual receipts should contain the following information:

*MONSANTO COMPANY
P. O. Box 1531
Springfield, Mass. 01101

TOLS012152

BZTO104(e)048985

1. Shippers address. (Plant Location or Customer's Name)
2. Delivering carrier (include car number for rail shipments).
3. Monsanto shipper's number.
4. Itemized listing of material received including number, size and type of package and the storage and handling rates.
5. Gross weight of total shipment received as shown on the bill of lading.
6. Notation of the type and amount of damage, if present.

B. Carry-Over Storage and Special Charges.

Monthly invoices for storage and special charges should contain the following information:

1. Itemized listing of material with the individual storage rates.

2. Gross weight of total material billed. (B/L weight)

3. Special charges that are normally accessed monthly such as withdrawal, stenciling and bill of lading preparation charges should be included on the monthly invoice for storage in order to reduce paper work requirements.

V. INVENTORY REPORTING

Consigned Stock Report

1. Preparation:

Monthly at the close of business (no later than the 3rd working day), warehouses and terminals are required to complete, in duplicate, Monsanto Consigned Stock Report (Form A615). This form indicates the beginning and ending inventories, by commodity, and summarizes receipts and shipments during the month.

2. Distribution:

Forward one copy to: Monsanto District Sales Office
Forward one copy to: H. D. Woodmansee*

*MONSANTO COMPANY
P. O. Box 1531
Springfield, Mass. 01101
H&P 11-66

VI. DAMAGE AND LOSS

A. Inspection

The warehouse must inspect all inbound shipments for loss and/or damage at time of receipt.

1. Notify Carrier and Request Inspection

Upon discovery of any loss or damage, the warehouse shall immediately notify the delivering carrier and request carrier to inspect the loss or damage. If carrier waives inspection, record name of carrier representatives and date he waives inspection. If damage or loss is extensive, warehouse shall insist on carrier inspection.

2. Carrier Acknowledgment on Delivery Receipt

Carrier must acknowledge shortage or damage revealed by inspection at time of receipt on any copy of a delivery receipt or Monsanto inspection report before warehouse will sign. Acknowledgment must mention shortage or damage and include carrier representative's signature. One copy of this receipt should be forwarded to Monsanto with the inspection report.

3. Concealed Damage

If package is dented or abused or other evidence of damage is apparent when received, warehouse should note it on Monsanto Form TF-65 at time of receipt and have carrier sign same.

If damage becomes known after receipt of inbound shipment, the procedures outlined in 1 and 2 of this Section A shall be followed promptly upon discovery of such damage.

TOLS012154

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B. Monsanto Loss and Damage Report (TF-65)

1. Preparation of Report TF-65

Warehouse will complete Monsanto Loss and Damage report whenever loss or damage becomes known. If in checking various squares of the report the damage is not fully and accurately described, include additional facts in the "additional information" space, examples--"seals broken upon arrival," "bags stained with black powder," "holes in roof of truck."

Warehouse shall not, without obtaining the specific approval of Monsanto in each instance, make or sign any statement or acknowledgment to any carrier with respect to the cause or circumstance involved in any loss, damage or shortage claim, nor shall Monsanto be bound in any way by any such statement or acknowledgment made by the warehouse without such approval of Monsanto.

2. TF-65 Copy Distribution

Copy 1 - Attach to any other substantiating documents such as delivery receipt or carrier inspection report. Warehouse should also attach a copy of any invoice for services such as recoopering, temporary storage, et cetera, that were incurred as a result of the damage. Forward to:

Claim Agent
Corporate Distribution Department
Monsanto Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63166

Copy 2 - To carrier.
Copy 3 - To originating Monsanto plant.
Copy 4 - Retained by receiving location.

3. To obtain an additional supply of forms, contact:

Claim Agent, at above address

TOLS012155

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C. Disposition of Damaged Material

The warehouse should reject all damaged material to the carrier except on Plan III shipments. Warehouse should instruct carrier that rejected material may be returned to origin plant at carrier's expense for possible salvage value only if carrier contacts origin plant and receives word that origin plant can accept damaged material.

D. In-Warehouse Loss and Damage

Value of material damaged or lost in handling by the warehouse will be charged to the warehouse by Monsanto. In the event of any conflict or variance between the provisions of this Section D and any private warehousing agreement between the warehouse and Monsanto, the provisions of the latter shall control.

VII. RECONSIGNMENT AND DIVERSION PROCEDURE - Change in Bill of Lading

A. Once a bill of lading has been given to a carrier, any changes in the original instructions, i.e., destination, route, commodity designation, weight, terms of the bill, etc., a Form TF-47 must be issued to the carrier. Do not issue a new bill of lading. Diversion instructions may be given by telephone or wire but must be confirmed by a TF-47 Form. Copies of this form should be sent to the following:

J. F. Brady (2) - Rate Section, Corporate Distribution*
Reconsignment Desk, Corporate Distribution Department*
Bill of Lading Desk, Corporate Distribution Department*

B. Extreme care should be used by party preparing TF-47's to make sure that all information concerning shipment be shown clearly and precisely. In particular:

1. Shippers Number
2. Shipping Weight
3. Freight Classification
4. Terms of the bill (Collect or Prepaid)
5. Route
6. Party to receive freight bill
7. Product Code

*MONSANTO COMPANY
800 North Lindbergh Blvd.
St. Louis, Missouri 63166
WYdown 3-1000
H&P 11-66

TOLS012156

C. When placing diversion instructions, the carrier must be instructed to submit his bill in duplicate, being careful to show shipper's number on both copies of the bill along with a statement in duplicate showing the freight bill number, Monsanto shipper's number and charges due.

D. Follow-Ups: When placing diversion instructions, the carrier should be requested to advise accomplishment of reconsignment notices. This gives a check and follow-up that instructions have been followed and shipment is moving to proper destination.

E. The freight bills on diversion/reconsignment orders or any change in the original bill of lading which results in a difference in original transportation charges, should be sent to R. B. Axum, Accounts Payable.* If the freight charges are to be billed to anyone else, be sure and show this clearly and distinctly on the TF-47. If the charges for demurrage, diversion, weighing, etc., are to be billed separately from the freight charges and to some other party then show same on the TF-47 Form.

*MONSANTO COMPANY
800 North Lindbergh Blvd.
St. Louis, Missouri 63166
WYdown 3-1000
H&P 11-66

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"SAMPLE"

LOSS AND DAMAGE INSPECTION REPORT

DST | 11 | LEAVE BLANK

WAREHOUSE NAME | DATE MONTH/DAY/YEAR | REPORT NUMBER WAREHOUSE OWN SERIES OF NOS.

GIN PLANT	ORIGIN CITY	STATE	DATE LOADED (LEAVE BLANK) / MONTH/DAY/YEAR
WAREHOUSE NAME	DESTINATION CITY (46-55)	STATE (56-59)	DATE UNLOADED MONTH/DAY/YEAR
OBTAIN FROM BILL OF LADING	MONSANTO ACCOUNT NUMBER WAREHOUSE LEAVE BLANK		DATE CARRIER INSPECTED MONTH/DAY/YEAR
			SEAL NUMBERS NUMBERS
DELIVERING CARRIER NAME OF CARRIER	CAR OR TRAILER NUMBER (DESIGNATE WHICH) INITIAL & NUMBER		WAYBILL OR PRO (DESIGNATE WHICH) NUMBER & DATE

DESCRIPTION OF EXCEPTION (NUMBER, SIZE AND TYPE OF CONTAINERS OF DAMAGED OR LOST MATERIAL AND PRODUCT NAME DAMAGED OR NOT DELIVERED) (FOR DAMAGED EQUIPMENT INDICATE DAMAGE OF EQUIPMENT AND PACKAGING IN DETAIL INCLUDING DRAWING USING SUPPLEMENTARY PAGES IF NECESSARY TO DESCRIBE DAMAGE AND ALSO HAVING PAGES SIGNED BY CARRIER.)

EXAMPLES " 9 - 50 lb. bags Polyethylene damaged"
" 2 - 400 lb. drums Sodium Bisulfate damaged"
"12 - 5 - gal. cans 2,4-D Amine damaged"

TYPE OF CLAIM (60)
☐ LOSS
☐ DAMAGE

CHECK ALL APPROPRIATE BOXES IN EACH SECTION OF "GENERAL DESCRIPTION OF DAMAGE"

GENERAL DESCRIPTION OF DAMAGE

TYPE OF TRANSPORTATION (61)
- ☐ RAIL
- ☐ TRUCK
- ☐ VAN TRAILER
- ☐ OTHER PIGGYBACK
- ☐ BARGE
- ☐ AIR
- ☐ OTHER (SPECIFY)

TYPE OF RAIL EQUIPMENT (62)
- ☐ CUSHION UNDERFRAME
- DAMAGE FREE
- DAMAGE FREE W/CUSHION UNDERFRAME

TYPE OF CONTAINER (63-64)
- 10 ☐ BAG
- 92 ☐ CAN
- 30 ☐ METAL DRUM
- 20 ☐ FIBRE DRUM
- 91 ☐ WOOD BOX
- 91 ☐ FIBREBOARD BOX
- 51 ☐ TANK CAR
- 53 ☐ BULK HOPPER
- 90 ☐ OTHER (SPECIFY)

CONDITION OF PACKAGE (65-66)
- 01 ☐ WET
- 02 ☐ STAINED
- 03 ☐ LEAKY
- 04 ☐ CRUSHED
- 05 ☐ TORN OPEN
- 10 ☐ ONLY OUTSIDE PLY TORN
- 06 ☐ PUNCTURED (thru to product)
- 11 ☐ PUNCTURED (not thru to product)
- ☐ SEAMS BROKEN
- 08 ☐ TAPE LOOSE
- 09 ☐ OTHER (SPECIFY)

LOCATION OF DAMAGE (WITHIN VEHICLE) (67-68)
- 01 ☐ AT FRONT END (TRUCK)
- 02 ☐ AT REAR END (TRUCK)
- 03 ☐ AT "A" END (RR)
- 04 ☐ AT "B" END (RR)
- 05 ☐ ALONG SIDEWALLS
- 06 ☐ ON FLOORS
- 07 ☐ IN DOORWAY AREA
- 08 ☐ ON TOP OF LOAD
- 09 ☐ WITHIN LOAD
- 10 ☐ THRU OUT LOAD
- 11 ☐ OTHER (SPECIFY)

CONDITION OF CARRIER EQUIPMENT (69)
- 1 ☐ NEW
- 2 ☐ DIRTY
- 3 ☐ NAILS PROTRUDING
- 4 ☐ OTHER (SPECIFY)
- 5 ☐ OLD
- 6 ☐ CLEAN

PROTECTION PROVIDED (70)
- 01 ☐ ON SIDES
- 02 ☐ ON ENDS
- 03 ☐ ON FLOORS
- 04 ☐ AT DOORWAYS
- 05 ☐ WITHIN LOAD
- 06 ☐ OTHER (SPECIFY)

CONDITION OF LOAD (71-74)
- 1 ☐ LOAD SHIFTED (indicate number of inches)
- 2 ☐ NO INDICATION OF LOAD SHIFT
- 4 ☐ LOAD PALLETIZED
- 5 ☐ PALLETIZED WITH GLUING OR TYING
- 6 ☐ EVIDENCE OF LEAKING
- 7 ☐ NO EVIDENCE OF LEAKING
- 8 ☐ LOAD DISARRAYED

ADDITIONAL INFORMATION (ONLY IF ABOVE DOES NOT DESCRIBE DAMAGE SUFFICIENTLY)

CARD #2 (FOR COMPLETION BY ST. LOUIS CLAIM DEPARTMENT)

CLAIM AMOUNT (16-22)	% (23-25)	DIV. (26-27)	PRODUCT CODE MAJOR GRADE (28-34)	I/R 35	DELIVERING CARRIER (36-45)	CARRIER CODE (46-49)	CLAIM WEIGHT (50-55)
WAREHOUSE LEAVE BLANK							

TOLS012158

DAMAGE INSPECTED BY CARRIER	IS MATERIAL SALVAGABLE	DISPOSITION OF MATERIAL
☐ BEFORE UNLOADING ☐ DURING UNLOADING ☐ AFTER UNLOADING ☐ WAIVED BY CARRIER	CHECK APPROPRIATE BOXES ☐ YES ☐ NO ☐ UNABLE TO DETERMINE	☐ REJECTED TO CARRIER ☐ ACCEPTED ☐ HELD FOR LOCAL MONSANTO INSTRUCTIONS

CARRIER INSPECTOR (Signature) CARRIER REPRESENTATIVE SIGN IF CARRIER WAIVES INSPECTION PLACE NAME OF REPRESENTATIVE & DATE HERE

MONSANTO REPRESENTATIVE (Signature) WAREHOUSE REPRESENTATIVE SIGN

DISTRIBUTION COPIES
Copy 1 TO MONSANTO HOME OFFICE FOR CLAIM AGAINST CARRIER (WHITE)
Copy 2 TO CARRIER (YELLOW)

MONSANTO COMPANY

BZTO104(e)048991

Monsanto
COMPANY

_____ 19

[ ] THIS HAS REFERENCE TO YOUR PREPAID FREIGHT BILL _____ OF _____

[ ] THIS WILL CONFIRM OUR TELEPHONE CONVERSATION OF _____ CONCERNING:

SHIPMENT FROM _____

CONSISTING OF _____

CONSIGNED TO _____

SHIPMENT WAS ROUTED

VIA _____

	AS COVERED BY	BILL OF LADING NO.
	☐ PPD ☐ COLL.	

PLEASE USE THIS AS YOUR AUTHORITY TO:

☐ CHANGE THE WEIGHT	FROM (Pounds)	TO (Pounds)
☐ CHANGE THE BILLING	TO	
☐ RECONSIGN THIS SHIPMENT TO:		
VIA	BASIS ☐ PPD ☐ COLL.	

SEND FREIGHT BILL TO: MONSANTO COMPANY
C/O CASS BANK & TRUST COMPANY
DRAWER 7585, PROGRESS STATION
ST. LOUIS, MISSOURI 63159

REMARKS:

TOLS012159

_____
TRAFFIC DEPARTMENT

BZTO104(e)048992

From the desk of

KENNETH E. COGAN

TIME OIL

Bob ABENDROTH

206-285-2400

NEIL WALLIS

503-286-1611

$1180/mo. = Depreciation

25-30,000 Investment Improvements

$1148 - Rental/mo. Warehouse

61

TOLS012160

BZTO104(e)048993

Prestania

RODDA PAINT Co. Portland | 6932 SW MacAdam
503-244-7512 oregon | Avenue
Tom Braden 97219

Bob Sterns Commerce City, Oregon

Warehouse [redacted]

NWT Destribution Services
215-S.E. Morrison Street
Portland, Oregon 97214
Lynne Bradenburg
503-232-2121

Western Express Truck ( )
.65 gallon ½ drums

6.76
.64 O.H.
.10 Labor
5.50 R.W.
.524 Container
6.76
.6[redacted]
7.4[redacted]

30 drums Min. 1.50 1.50 Co-op
1.50 P.O. # 2063

61

TOLS012161

BZTO104(e)048994

Warehouse Time oil

Time Oil Tanks

Warehouse Space

1 - 38,000 gal tank	✓	Solvent	- 3' "sludge"
3 - 20,000 "	✓	Solvents	1 - 20 - KB3
			1 - 20 Prepunic
1 - 13,000 "	✓		Timbertox 40
1 - 7000 "	✓	7000 - MTJ	
1 - 1400 gal heating tank			

WTC

3 - 8000 gal tank	}	2-8 - oxyl bottom
		1-8 woodtox 140 core
1 - 6000 gal tank		1-6 } MTJ prepunicone
1 - 3000 gal tank		1-3 } MTJ

- Bulk -

KB-3	Eastman
Oxyl bottoms	Monsanto
Mineral Spirits	Union

- Box -

Penta	-	Reichold
Wax	-	Union Chemical

- Drum -

Nalco Inhibitor

61

TOLS012162

1. CLEAN UP CHARGES

CROSBY & OVERTON WERE ONLY FIRM OUT OF THREE IN AREA THAT WERE WILLING TO TAKE ON CLEAN OUT.

-penta mud.

per Geo Mills we can reclaim appx 75% of Sample & Sludge sent out of 20,000 gal tank. $6000

PLUS DISPOSAL

PLUS 20,000 GAL TANK

2. TRANSPORTATION & SETUP CHARGES AT UNION OIL $50,000 est

SAY $60,000

3.

61

TOLS012163

BZTO104(e)048996

(LIME INC
GRAVID)

JOHN DENHAM - SAFETY
800-426-0235

325 SOLVENT 30,000 gal

Timbertox 90 Conc

1 CAR/2 MO RAIL — KB3 — 10,000/CAR

Preprime RTU (4:1 Conc)

Preprime Conc

1 CAR/2 MO RAIL — Oxy bottoms — 8000 GAL

Woodtox 140 Conc

TOLS012164

BZTO104(e)048997

	FR	TO		FLIGHT	TIME		HOTEL	COMPANY
SUNDAY	ATL	SEA		EA 94	6 49 P	8 34 P	SHERATON 206-226-7700	—
MONDAY	SEA.	PORT.		EA 86	6 19 P	7 09 P	SHERATON 503-288-7171	TIME OIL 206-285-2400 R. ABENBROTH
TUES	PORT.	S.F.		UA 1275	6 08 P	7 34 P	BEST WESTERN 415-792-4300	TIME OIL 503-286-1611 NEIL WALLS
WED.	S.F	-					BEST WEST 415-792-4300	JONES HAMILTON 415-797-2471 KERN HAMILTON
THURS	SF.	PITT		UA 486	1 09 P	8 39 P	WM. PENN	K.C.D
FRI	PITT	ATL		EA 493	9 19 P	10 43 P	—	—

D.R
Please Post & Panafax to R. Kroter

BZTO104(e)048998

TOLS012165

Time Oil — Replacement Prospects

Union Chemical — Vancouver
Norris Paint — Salem

~~Coburg~~ Chemical — Rhodia Paint
Morrison Oil

Lilly-Miller ?

Lily blad

GATX Terminal — Pat Cuerdus

M = Clay ?

TOLS012166

BZTO104(e)048999