TNRCC

Protecting Texas
by Reducing and
Preventing Pollution

Preliminary Assessment/ Screening Site Inspection Work Plan

for

Star Lake Canal, a.k.a. Jefferson Canal
TX0001414341
Port Neches, Jefferson County, Texas

Prepared in cooperation with the
U.S. Environmental Protection Agency

September 1996

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PRELIMINARY ASSESSMENT/SCREENING SITE INSPECTION WORK PLAN

Star Lake Canal, a.k.a. Jefferson Canal

Port Neches, Texas

TX0001414341

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Texas Natural Resource Conservation Commission
and
U.S. Environmental Protection Agency

Prepared by

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September 1996

The preparation of this report was financed through grants from the U.S. Environmental Protection Agency administered through the Texas Natural Resource Conservation Commission.

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NOTE

The State predecessor agencies: Texas Water Quality Board (TWQB), Texas Department of Water Resources (TDWR), Texas Water Commission (TWC), and Texas Air Control Board (TACB), referred to throughout this report are now known as the Texas Natural Resource Conservation Commission (TNRCC). The new agency, TNRCC, became effective September 1, 1993, as mandated under State Senate Bill 2 of the 73rd Regular Legislative Session.

SECTION 1

INTRODUCTION

The Texas Natural Resource Conservation Commission (TNRCC) has been requested by the U.S. Environmental Protection Agency (EPA) Region VI to conduct a Screening Site Inspection (SSI) at the Star Lake Canal (SLC), a.k.a Jefferson Canal, site (EPA Identification Number TX0001414341).

The purpose of this work plan is to describe the site reconnaissance and sampling activities which are planned at the site to determine if further action is required as described below.

WORK PLAN OVERVIEW

The purpose of the SSI is to document the release(s) or potential release(s) of hazardous substances from the canal which may have migrated off-site. This work plan was developed using available information obtained through a review of TNRCC central files located in Austin, Texas. The information collected during the PA and file review was evaluated for data gaps and additional information needs were incorporated into the work plan. This plan will be modified as necessary based on actual site conditions encountered.

Section 1 is the introduction. Section 2 is the site background and description, and Section 3 describes the site field work to be conducted. The TNRCC file information used in preparing this workplan, water quality inventory data, TNRCC Region 10 Environmental Assessment Program sampling results for Star Lake Canal, site specific Health and Safety Plan, TNRCC FY96 Quality Assurance/Quality Control (QA/QC) Requirements document, and the Site Reconnaissance Checklist are presented as appendices A through F, respectively.

SITE OBJECTIVE WITH RESPECT TO THE PREREMEDIAL PROCESS

The preremedial stage of the Superfund process involves a PA and a site inspection (SI) stage consisting of an SSI and, if necessary, a listing site inspection (LSI). This SSI is being conducted to determine if the above-referenced site is eligible for proposal to the National Priorities List (NPL) under the Federal Superfund Program. The SSI will focus on assessing the threat along the surface water pathway associated with the site.

A PA has already been completed for the site. This SSI will build upon existing data by obtaining additional background information relevant to the site through a file review and collecting environmental samples to further characterize conditions at the site. Sampling conducted during the field work will attempt to document hazardous substance migration to and from the site from potential sources, and look for evidence of actual human and environmental exposure to contaminants.

PROJECT CONTACTS PHONE

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SITE CONTACT
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SECTION 2

SITE BACKGROUND AND DESCRIPTION

SITE INFORMATION

A PA was performed on July 23, 1996 for the Star Lake Canal (SLC) in which the surface water pathway was identified as the primary pathway of concern.

The SLC confluences with Molasses Bayou as it empties into the Neches River. The canal is approximately 2 miles long. Land surrounding the canal is undeveloped, residential and industrial. The canal begins at 29° 58' 28" N Latitude and 93° 56' 32" W Longitude and empties into the Neches River at 29° 58' 57" N Latitude and 93° 53' 38" W Longitude. The Jefferson Canal confluences with the SLC between State Highway 366 and Sara Jane Road. SLC then drains directly to Stream Segment Number 0601 of the Neches River in the Neches River Basin. See Figure 1 for the geographical location of the site. Water in the canals is owned by the State of Texas.

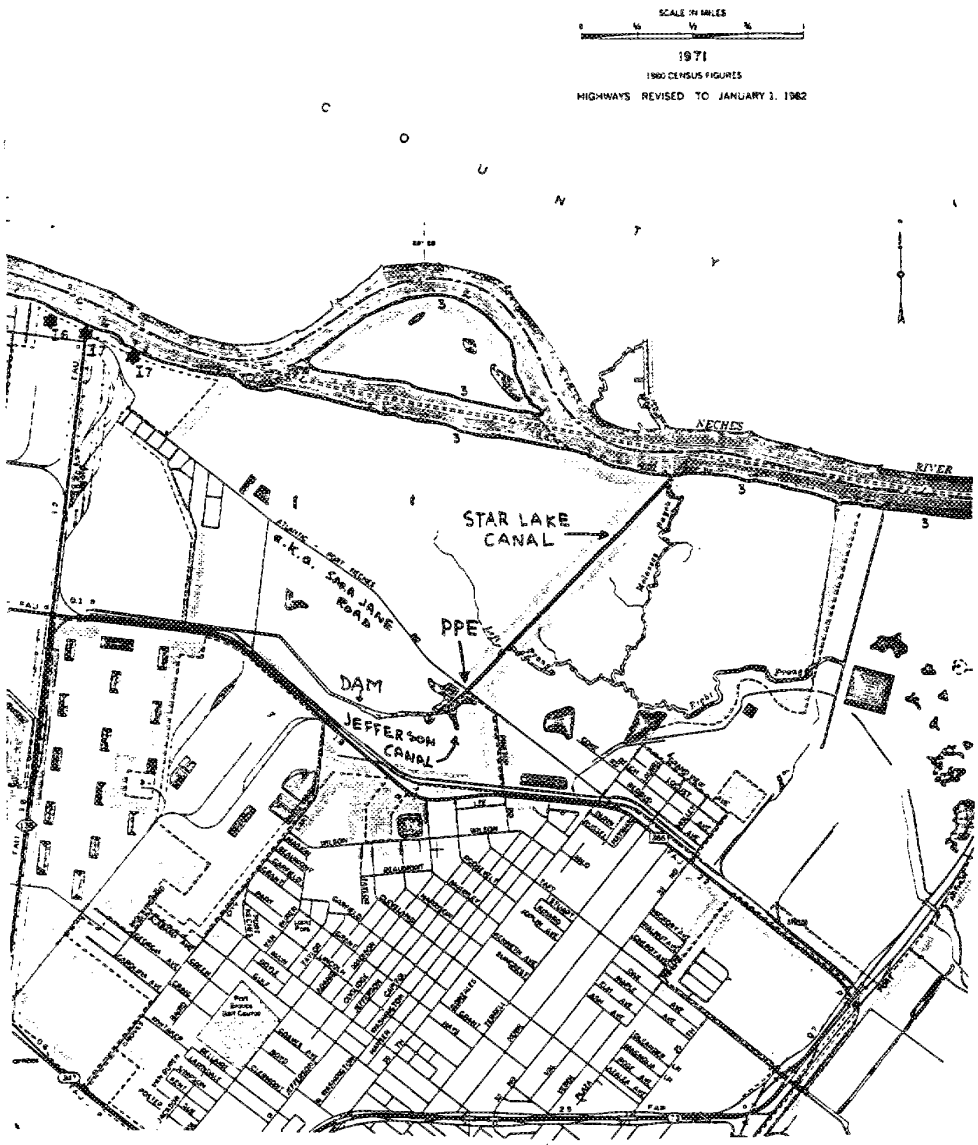
A sampling inspection by the Texas Department of Water Resources (TDWR) in March, 1983, documented the presence of hazardous substances in material dredged from the banks of the Jefferson Canal (Reference 3). This canal was used by Chemall, Inc (now Calabrian Chemicals) and Texaco Chemical Company (now Huntsman Corporation) as an outfall for stormwater and wastewater for an unknown period of time. The Jefferson Canal confluences with SLC in an area between State Highway 366 and Sara Jane Road, a.k.a. East Port Neches Avenue (see Figure 1).

The pathway of concern for this site is the surface water pathway.

WASTE CONTAINMENT/HAZARDOUS SUBSTANCE IDENTIFICATION

Characteristics

The information used to identify the waste characteristics which may be present in the SLC was obtained from a review of state records. The Jefferson Canal was documented to have sediments in which hazardous substances had been deposited, stored, disposed, or placed. Results from the March, 1983 sampling event shows the following hazardous substances in material dredged from the Jefferson Canal: Naphthalene (9280 mg/kg), acenaphthene (330 mg/kg), acenaphthylene (2140 mg/kg), fluorene (1140 mg/kg), phenanthrene (2050 mg/kg), anthracene (300 mg/kg), pyrene (535 mg/kg), benzo-a-anthracene (160 mg/kg), benzo-b-fluoranthene (15 mg/kg), benzo-a-pyrene (60 mg/kg), benzo-a-fluoranthene (15 mg/kg), chrysene (150 mg/kg), and other aromatic hydrocarbons that could not be identified by GC/MS. Property owned by Chemall, Inc. was also documented to be contaminated by toxaphene and



TNRCC	**Figure 1** **Site Location Map**	**Star Lake Canal and Jefferson Canal** **Port Neches, Jefferson County, Texas** **CERCLIS No. TX0001414341**

pentachlorophenol in the vicinity of the Jefferson Canal (Reference 3). Water flowing in the Jefferson Canal may carry sediment contaminated with these hazardous substances into SLC and downstream into the Neches River.

Required Information (Data Gaps)

- Field verify the site features and locations along the canals. Establish ownership of canal sediments.

- Field verify the location and lateral extent of the areas of interest. Note any areas void of vegetation and obtain samples to confirm the release of contaminants in these areas.

- Field verify, to the extent possible, previous discharges to the canal and any hazardous substances related to these activities through observation and interviews with PRP representatives.

- Obtain background sediment and surface water samples to determine the naturally occurring levels of contaminants from unaffected areas adjacent to the site.

CENOZOIC ERA = QUATERNARY
AND TERTIARY PERIOD
0 TO 66 M.Y.

GROUNDWATER PATHWAY AND TARGETS

Characteristics

The SLC is located on the seaward margin of the Gulf Coast Plain of Texas. Layers of sediments in this area are of Cenozoic age and can be tens of thousands of feet thick at the coastline. These clastic sediments of sand, silt and clay represent depositional environments ranging from nonmarine at the outcrops of most units to marine environments with distinctive suites of fossils. The oscillations of ancient seas and changes in the amount and source of sediments deposited, caused facies changes downdip and along strike. Thus, a time-stratigraphic unit of equivalent age may consist of sand in one area, sandy clay in a second area and clay in a third area. Subsidence within the depositional basin, along with a rising land surface, caused the stratigraphic units to thicken gulfward. Growth faults have greatly increased the thickness of some stratigraphic units within short distances. These factors contribute to the heterogeneity of units from place to place, making correlation between them difficult (Reference 4).

The sediments which make up the surface of the Coastal Plain are the : a) Quaternary alluvium of sand, silt and clay; b) the Beaumont Clay; c) the Montgomery Formation; d) the Bentley Formation; and e) the Willis Sand. Collectively, these layers make up the Chicot Aquifer. Underlying these deposits are Tertiary stratigraphic units: the Goilad Sand, Flemming Formation, Oakville Sandstone and the Catahoula Sandstone. These Tertiary deposits make up the Evangeline Aquifer. Together, the Chicot and Evangeline aquifers make up the Gulf Coast Aquifer (Reference 4).

Targets

Drinking water in the area of the canal is supplied by the Lower Neches Valley Authority whose surface water intake points are north of the study area, in the City of Beaumont.

There is no documentation indicating that wells in the vicinity of the canal have been contaminated by hazardous substances attributable from the canal. No wellhead protection areas exist near the canal. No public supply wells exist within 4 miles of the canal.

A 1-mile radius from the beginning and endpoint of the canal was evaluated for the presence of drinking water wells by a review of State of Texas water well reports. The following information was developed:

- Within 0 - 0.25 miles of the site, no wells were identified.
- Between 0.25 - 0.50 miles of the site, no wells were identified.

- Between 0.50 - 1 mile of the site, one irrigation well and one domestic well was identified. Both wells are hydrologically upgradient from the beginning of the canal.

The groundwater pathway will not be evaluated during this SSI.

Required Information (Data Gaps)

- Field verification of existing well locations within 1 mile of the site. Verify by inspection and personal interviews whether the wells are in use, for what purpose and the number of people served.

- Verify by a review of TNRCC Public Water Supply records that no public supply well is located within 4 miles of the site.

SURFACE WATER PATHWAY AND TARGETS

Characteristics

The SLC and Jefferson Canal are located within the Neches River Basin, draining directly to Water Quality Segment No. 0601. This segment is designated for contact recreation and intermediate quality aquatic habitat. Currently, this segment has 5 on-segment monitoring stations and 1 off-segment monitoring station (Reference 5). The average total discharge and total basin drainage area are unknown at this time. Natural drainage is from the Jefferson Canal into SLC and thence to the Neches River.

Annual average precipitation for this region is 51 inches per year (Reference 6).

Both canals are within the 100-year floodplain.

The Probable Point of Entry (PPE) for the source sediments is within the SLC at the public boat ramp off Sara Jane Road (Figure 1).

There is no documentation of any releases of contaminants to the Neches River, however TNRCC files note that wastewater has been discharged to the Jefferson Canal in violation of the Texas Water Code. TNRCC Region 10 Environmental Assessment sampling results document the presence of metals in the SLC at a point 0.25 miles upstream of its confluence with the Neches River (Reference 7).

Targets

Water flow in the canal system is eastward from the PPE approximately 1 mile to the Neches River. No public drinking water intakes exist within the 15 mile TDL downstream of the PPE. The SLC passes through wetland areas on its way to the Neches River. It is unknown at this time if any endangered species reside within the TDL downstream of the PPE.

Required Information (Data Gaps)

- Verify the direction and rate of surface water flow in the canals.
- Field verification to determine the location of drainage channels and drainage patterns in relation to the possible contaminant sources.
- Field verification of surrounding perennial water bodies and their uses.
- Establish the presence of wetlands, sensitive environments and endangered species within a 4 mile radius of the site by correspondence with Texas Department of Parks and Wildlife.

SOIL EXPOSURE PATHWAY AND TARGETS

Characteristics

The SLC site consists of sediments at the bottom of the approximately 2 mile long canal and sediments in the Jefferson Canal where it confluences with the SLC. Adjacent land is undeveloped, residential and industrial. Entry into either canal by boat from the Neches River, or the boat ramp adjacent to Sara Jane Road, is unrestricted.

The SLC canal is used for recreational purposes by boaters and fishermen. Telephone conversations with TNRCC Region 10 personnel revealed that people occasionally swim in the canal at the Sara Jane Road boat ramp.

Soils within the study area are of the salt water marsh-Tidal marsh association, Morey-Crowley-Hockley association and the Beaumont-Morey association.

Occupying approximately 3% of the county, the salt water marsh-Tidal marsh association soils are made up of boggy beds of organic material over permanently waterlogged clay, sand and shells. These areas are at or below sea level and may be covered daily by tides. The Morey-Crowley-Hockley association is nearly level and better drained than the marsh soils. Primarily, they are silty soils that occupy approximately 18% of the county. The Beaumont-Morey association is made up of clayey and silty soils that are poorly drained, occupying approximately 46% of the county (Reference 8).

Targets

It is unknown if there are any workers along either canal who may come in contact with contaminated sediments. There are no schools, day care centers, parks, or other established recreational areas within 200 feet of the site. It is unknown how close the nearest occupied residence is to the site.

The following are estimates of the number of persons living in the vicinity of SLC:
Zero -0.25 miles = 0
0.25 to 0.5 miles = 0
0.5 miles to 1 mile = 190
1 mile to 2 miles = 5,728
2 miles to 3 miles = 17,052
3 miles to 4 miles = 20,376
Total estimated population within 4 miles of SLC is 43,346 persons.

Correspondence has been initiated with the Texas Department of Parks and Wildlife regarding the presence of any endangered species or sensitive environments within a 4 mile radius of the site; no response has been received as of the date of preparation of this workplan.

The soil exposure pathway will not be evaluated during this SSI.

Required Information (Data Gaps)

- Field verification of drainage patterns in the vicinity of the canals.
- Verification of the distance to the nearest residence and number of occupants.
- Establish the location of any endangered species or sensitive environments within a 4 mile radius of the site through correspondence with the Texas Department of Parks and Wildlife.

AIR PATHWAY AND TARGETS

Characteristics

No analytical data was available to document off-site migration of airborne transported hazardous substances from existing on-site sources.

Wind rose analysis indicates that the prevailing wind is from southeast (Reference 6).

No air samples are planned to assess the releases to the air pathway. Since the site consists of canal sediments, the air pathway will not be evaluated during this SSI.

SECTION 3

SITE NONSAMPLING DATA COLLECTION AND FIELD WORK

The Texas Natural Resource Conservation Commission (TNRCC) will perform the activities described in this section to provide site background information and analytical data that can be used by the EPA to evaluate the site using the Hazard Ranking System (HRS). This information will be presented in a documentation report that includes groundwater, soil, and sediment sampling as discussed below.

All field work will be conducted in accordance with the health and safety plan (HSP) and the TNRCC-approved quality assurance project plan (QAPP). The HSP and QAPP are in Appendixes D and E, respectively. These plans will be reviewed by all personnel upon arrival at the site.

PERSONNEL REQUIREMENTS AND RESPONSIBILITIES

The TNRCC Central Office Technical Director for this screening site inspection (SSI) is Mr. Wesley Newberry and the TNRCC Program Manager is Mr. Allan Seils. The TNRCC Site Investigation Manager is Mr. Marshall A. Cedilote. Other team members will be identified prior to the sampling event. The TNRCC's Central Office mailing address is Pollution Cleanup Division, Emergency Response and Assessment Section, P.O Box 13087, Austin, Texas 78711-3087, (telephone no. (512) 239-2514, FAX no. (512) 239-2527). The Technical Director and Program Manager are responsible for identifying, assigning, and organizing the staff to execute the activities required to complete the SSI. The Site Investigation Manager is responsible for completing the activities described in this plan and adhering to the sampling activities and report schedule. The planned field schedule for activities at the SLC is presented in Table 2.

The TNRCC Technical Director and Program Manager will review all major reports and provide technical and administrative support to the Site Investigation Manager. The TNRCC Technical Director will review the work plan and final report and will approve the final versions. In addition, the TNRCC Technical Director and Program Manager will provide oversight for the field activities during the investigation. The EPA Region VI site assessment manager (SAM) is responsible for approving the sampling activities work plan and reviewing the final report.

COMMUNITY RELATIONS

Prior to the start of any work at the site, TNRCC will inform the appropriate City of Port Arthur authorities of the intended site visit. Individual residents and businesses in the immediate area will be contacted by letter from the TNRCC or during the off-site reconnaissance visit. Requests for site-specific information will be made during the interview process or identified in the letter from the TNRCC. TNRCC will make no other formal notifications of the SSI sampling events. Sample results will be sent to

each property owner, for their property only, upon completion of the data quality assurance process. Any requests for information before or after the planned site inspection which the TNRCC receives from the above will be referred through the PA/SI Program Manager for an appropriate response. Any requests for information by the news media or parties not associated with the site will be directed through the TNRCC Technical Director or his designee to the TNRCC Central Office Media Relations Office, P.O. Box 13087, Austin, TX 78711, telephone (512) 239-5000.

The TNRCC Program Manager will provide each member of the TNRCC inspection team and the Site Investigation Manager with letters of introduction stating the purpose of the investigation and authorization to conduct appropriate field activities. The TNRCC will send notification letters to the appropriate site representatives informing them of the impending sampling activities and requesting access authorization for TNRCC inspectors to the site. TNRCC will set up the site visit only after receiving written or verbal access authorization from the property owner or their representatives.

Table 1. Star Lake Canal
Field Schedule

Time	Activity
	Day 1
1030	Members of field team drive from Austin to Port Neches.
1530	Arrive in Port Neches. Drive to SLC site.
1300	Arrive at site. Review health and safety plan. Conduct initial safety meeting. Establish off site staging area.
1330	Begin on site and off site reconnaissance. Review and modify on site sampling plan. Prepare shipping and sampling labels. Prepare field logbook.
1600	End of day.
	Day 2
0700	Arrive at the site. Review health and safety plan. Conduct daily safety meeting. Review sampling strategy and prepare equipment.
0800	Begin collecting rinsate samples, background and target sediment samples. Record applicable data in logbook, document sampling locations with photographs.
1200	Lunch break.
1300	Resume collection of target sediment samples. Record applicable data in logbook, document sampling locations with photographs.
1630	Complete sediment sampling through SE-11, packaging and CLP lab documentation. Pack samples for overnight shipment.
1745	Deliver samples for shipping.
1800	End of day.
	Day 3
0700	Arrive at the site. Review health and safety plan. Conduct daily safety meeting. Review sampling strategy and prepare equipment.
0800	Begin collection of rinsate samples and remaining sediment samples. Record applicable sampling data in logbook, document sampling locations with photographs.
1200	Lunch break.
1300	Resume collection of source sediment samples in SLC. Record applicable sampling data in logbook, document sampling locations with photographs.
1630	Complete rinsate and sediment sampling, packaging and CLP lab documentation. Pack samples for overnight shipment.
1745	Deliver samples for shipping.
1800	End of day.
	Day 4
0900	Check out of lodging and return to Austin.

WORK PLAN ACTIVITIES

Task 1: Nonsampling and Sampling Activities and Rationale

The field team will first meet with property owner representatives (if specifically requested). The purpose of the meeting will be to conduct an initial safety briefing and review the intended sampling work schedule. Information concerning past and current site conditions outlined in the PA and SSI work plan will be discussed and verified. The Site Investigation Manager will record significant comments in the field logbook pertaining to site history and current/past operations.

After the initial meeting, an off-site reconnaissance inspection will be completed by designated team members. Information will be logged in the field logbook to include names of individuals interviewed, physical/mailing addresses, date and time of interviews, and observations noted. Information outlined in the Site Reconnaissance Checklist (Appendix F) applicable to off-site requirements will be obtained during the inspection. The off-site reconnaissance will be conducted at level D protection.

The initial on-site reconnaissance inspection will be accompanied by the owner or his designated representative, if available, to assist in identifying potential site hazards. Appropriate safety equipment will be required by each team member, which will include field respiratory protection with a combination organic/pesticide vapor cartridge and a dust/mist filter suitable for organic wastes. Personal protective equipment will initially be level C for sediment sampling. If it can be established that volatile and semivolatile vapors are safely below background and action levels, the on-site reconnaissance will continue at modified level D.

A determiniation will be made in the field whether any air monitoring equipment will be used. Any visual evidence of a release of hazardous substances will be noted to ascertain whether additional protective equipment will be required for the sampling events. In general, site safety requirements will be assessed in the initial site reconnaissance inspection, and safe entry and exit points will be identified for each proposed sampling event.

Upon completion of the site reconnaissance activities, the field team will again review the sampling plan. Sample locations will be adjusted as necessary to ensure that the samples provide sufficient data to properly evaluate the site. Photographs will be taken as required to document site conditions and support observations recorded in the field logbook. Photographs will require at a minimum, the following information for each photograph:

- Site name
- Location
- Name of photographer

- Date and time of photograph
- Description of situation/scene photographed.
- Type of camera, film, and lens setting (Must be 50mm).

The following section describes the proposed sampling plan for the SLC. This plan may be modified as a result of the on-site reconnaissance and/or noted site access constraints. The proposed samples to be collected and sample rationale are listed in Table 2. Proposed sample analyses, containers, and preservation requirements for the groundwater and soil samples are shown in Tables 3 and 4, respectively. Sample locations will be confirmed during the site reconnaissance inspection and noted in the field logbook. A field copy of this workplan will be annotated by the Site Investigation Manager to reflect actual sample locations.

Table 2. Proposed Samples to be Collected

Sample Matrix	Sample ID	Sample Location	Rationale
Sediment	SE-1	Sediment sample on northern side of the Neches River in shallow marshland (Figure 2).	Background sample.
	SE-2	Sediment sample on northern side of the Neches River in shallow marshland (Figure 2).	Background sample.
	SE-3	Sediment sample on northern side of the Neches River in shallow marshalnd (Figure 2).	Background sample.
	SE-4	Sediment sample west of confluence of SLC with the Neches River (Figure 3).	Target sample downstream in TDL to assess and characterize any contaminanation of the Neches River fishery.
	SE-5	Sediment sample at confluence of SLC and the Neches River (Figure 3).	Target sample downstream in TDL to assess and characterize any contaminanation of the Neches River fishery.
	SE-6	Sediment sample east of confluence of SLC with the Neches River (Figure 3).	Target sample downstream in TDL to assess and characterize any contaminanation of the Neches River fishery.
	SE-7	Sediment sample in SLC adjacent to wetlands (Figure 3).	Target sample to assess and charactrerize any contamination in wetland area.
	SE-8	Sediment sample in SLC adjacent to wetlands (Figure 3).	Target sample to assess and charactrerize any contamination in wetland area.
	SE-9	Sediment sample in wetlands area (Figure 3). This sample location may be moved if this area is inaccessable by boat during the SSI.	Target sample to assess and charactrerize any contamination in wetland area.
	SE-10	Sediment sample in left prong of Molasses Bayou (Figure 3).	Target sample to assess and charactrerize any contamination in wetland area.
	SE-11	Sediment sample in left prong of Molasses Bayou (Figure 3).	Target sample to assess and charactrerize any contamination in wetland area.
	SE-12	Sediment sample southeast of boat ramp in marshland (Figure 3).	Target sample to assess and charactrerize any contamination in wetland area.

Sample Matrix	Sample ID	Sample Location	Rationale
Sediment	SE-13	Sediment sample taken at boat ramp (Figure 3).	Target sample at PPE.
	SE-14	Sediment sample taken at boat ramp (Figure 3). This is not a duplicate of SE-13.	Target sample at PPE.
	SE-15	Sediment source sample in SLC (Figure 3).	Delineate and characterize source.
	SE-16	Sediment source sample in Jefferson Canal (Figure 3).	Delineate and characterize source.
	SE-17	Sediment source sample from headwaters of Jefferson Canal (Figure 3).	Delineate and characterize source.
	SE-18	QA/QC	Duplicate sample taken at same location as SE-17.
	SE-19	Sediment source sample in SLC (Figure 3).	Delineate and characterize source.
	SE-20	Sediment source sample at dam across SLC (Figure 3).	Delineate and characterize source.
	SE-21	QA/QC	Duplicate sample taken at same location as SE-20
Rinsate	R-1	Rinsate sample from Eckman dredge and core sampler prior to Day 1 of sediment sampling.	QA/QC
	R-2	Rinsate sample from Eckman dredge and core sampler after to Day 1 of sediment sampling.	QA/QC
	R-3	Rinsate sample from Eckman dredge and core sampler after Day 2 of sediment sampling.	QA/QC
	FB-1	Field blank collected at same time as R-1.	QA/QC
	FB 2	Field blank collected at same time as R-3.	QA/QC

Table 3. Sample Containers, Methods, Preservatives, and Holding Times for Soil/Sediment

Parameters	Sample Container	Preservative	Holding Time
Volatile organics	Two 4-ounce widemouth glass jars with Teflon-lined septa	Cool to 4°C	14 days
Semivolatile organics	Two 4-ounce widemouth glass jars with Teflon-lined lids	Cool to 4°C	Extract within 14 days of collection and analyze within 40 days of extraction.
Pesticides/ PCBs	Two 4-ounce widemouth glass jars with Teflon-lined lids	Cool to 4°C	Extract within 14 days of collection and analyze within 40 days of extraction.
Metals/Cyanide	Two 4-ounce widemouth glass jars with Teflon-lined lids	Cool to 4°C	180 days after collection for metals and 14 days for cyanide

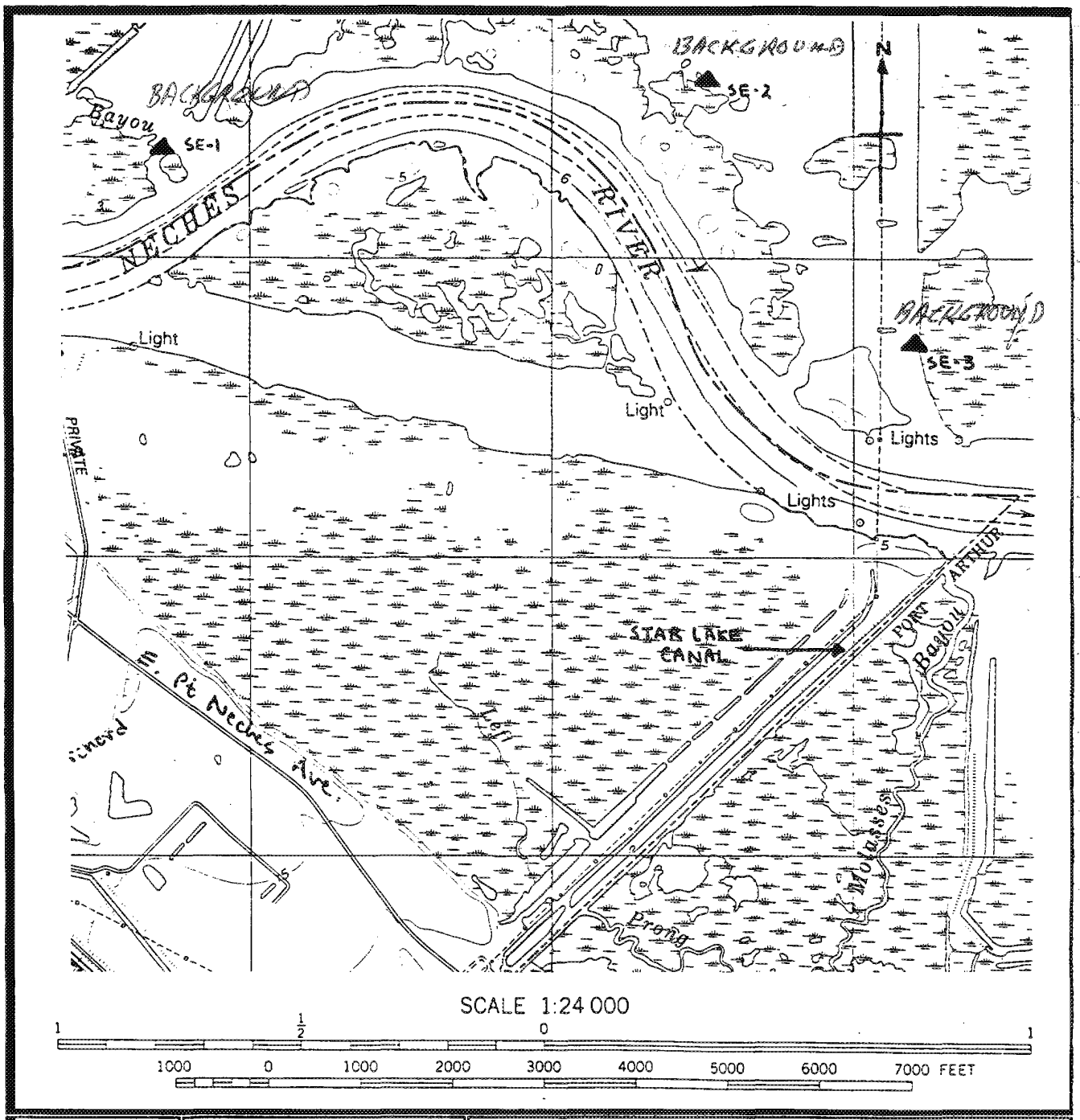
Table 4. Sample Containers, Methods, Preservatives, and Holding Times for Aqueous Samples

Parameters	Sample Container	Preservative	Holding Time
Volatile organics	Two 40-ml widemouth glass vials with Teflon-lined septa	Cool to 4°C	7 days
Semivolatile organics	Two 1-liter amber glass bottles with Teflon-lined lids	Cool to 4°C	Extract within 7 days of collection and analyze within 40 days of extraction.
Pesticides/PCBs	Two 1-liter amber glass bottles with Teflon-lined lids	Cool to 4°C	Extract within 7 days of collection and analyze within 40 days of extraction.
Metals/Cyanide	One 1-liter polyethylene bottle with a Teflon-lined cap	HNO_3 to Ph<2	6 months (except mercury*) and 14 days for cyanide

* Reference: EPA Contract Laboratory Program Statement of Work for Organics Analysis (March 1990) and Statement of Work for Inorganic Analysis (March 1990).

Waste Containment/Hazardous Substance Identification

The primary contaminants of concern for this site are toxaphene, pentachlorophenol and numerous aromatic hydrocarbons. To obtain legally defensible characterization data, a laboratory will be designated to perform EPA-stipulated Contract Laboratory Program (CLP) analytical methods on all samples collected from the site. The specific analytical methods for this sampling event are those listed under the CLP routine analytical services (RAS) contract.



TNRCC

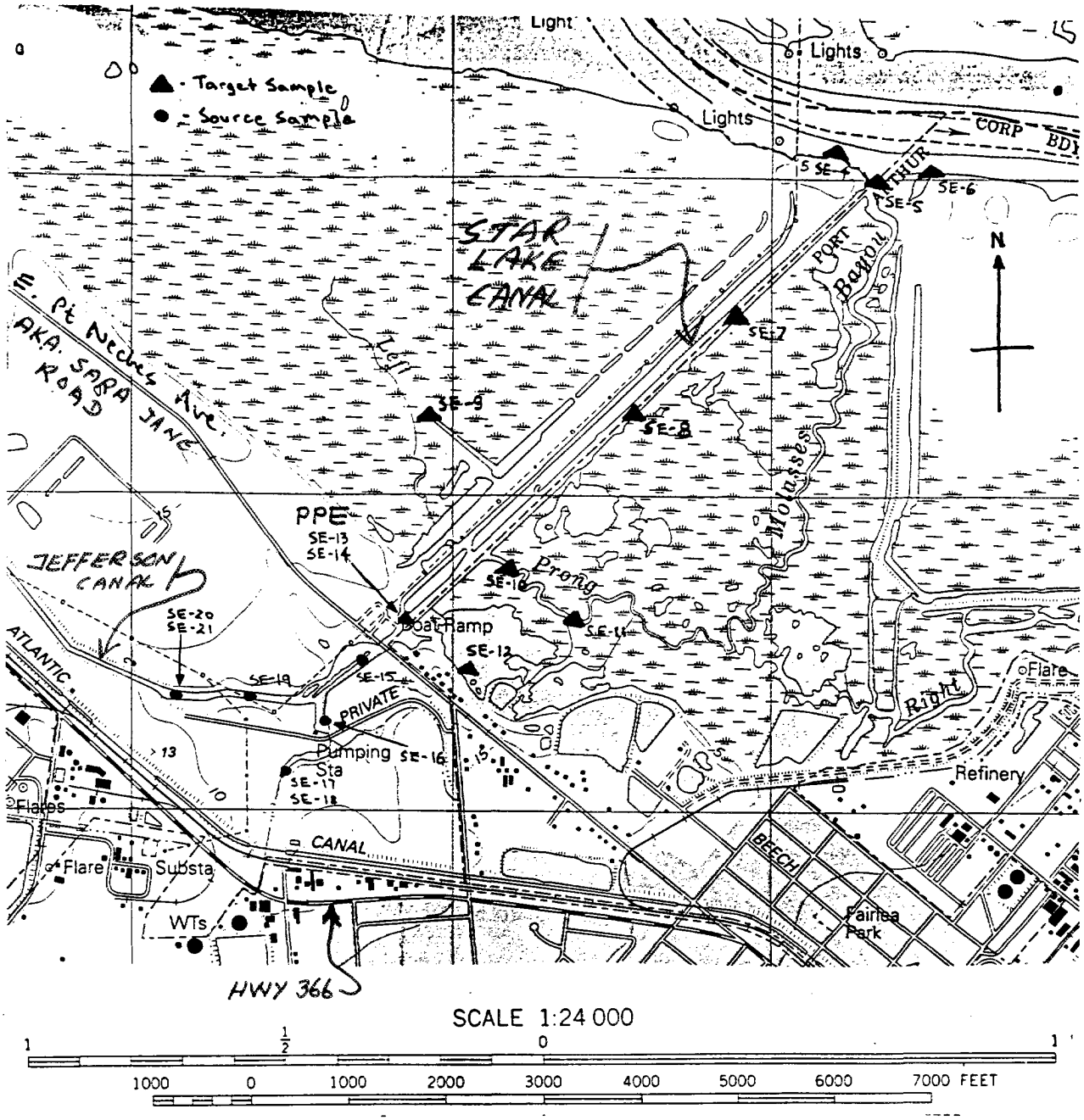
Figure 2

Proposed Background Sample Locations

Star Lake Canal and Jefferson Canal

Port Neches, Jefferson County, Texas

CERCLIS No. TX0001414341



TNRCC

Figure 3

Proposed Sediment Sample Locations

Star Lake Canal and Jefferson Canal

Port Neches, Jefferson County, Texas

CERCLIS No. TX0001414341

Nonsampling data to be collected include:

- Field verify the site features and locations as depicted in Figure 1.
- Field verify the location and lateral extent of the areas of interest. Note any areas void of vegetation and obtain samples to confirm the release of contaminants.
- Field verify previous operations at the site and any hazardous substances related to these activities through observation and interviews with PRP personnel.

For this SSI, sediments in the Jefferson Canal and SLC are considered to be the source. A total of 21 sediment samples are planned for this project (see Figure 3 for locations); seven of these are source samples. Samples collected with a core sampler will be visually inspected, their appearance documented, and the most visibly contaminated portion selected for analysis. Source samples SE-15 through SE-21 will be taken within the SLC and Jefferson Canal (these include two duplicates, SE-18 and SE-21).

Prior to using the Eckman dredge and core sampler, rinsate samples will be collected. Rinsate samples will also be collected at the end of sediment sampling for that day. This procedure will be repeated at the end of the second day of sediment sampling. Rinsate samples are designated as R-1 through R-3.

Groundwater Pathway

Nonsampling data to be collected includes:

- Verify the existence of any drinking water wells located within a 0.5-mile radius of the site and the population served by these wells. Water level measurements, well construction details, well development procedures, water quality test results, and aquifer pumping data will be obtained from interviews with the well owners, if available.
- Verify that no drinking water wells exist within a 1 mile radius of the site.
- Verify by a review of TNRCC Public Water Supply records that no public supply well is located within 4 miles of the site.

No groundwater samples are planned during this SSI. However, if during the off-site reconnaissance other wells are discovered within the 1-mile site radius which more appropriately represent potential groundwater contamination targets, then the plan will be modified to sample these wells from the drinking water producing zone. The well

purging and sampling procedures are dependent on the type of well and are discussed in more detail in the Quality Assurance Project Plan (QAPP).

As a general rule, all monitoring wells will be pumped or bailed a minimum of three volumes of water in the well casing until three consistent readings of the pH, conductivity, and temperature are achieved before representative samples will be withdrawn. For a well served by a tap, three to five volumes will be removed by letting the tap run. If the system volume is unknown, the tap will be opened and allowed to run for 15 minutes prior to sampling. Field log notes will reflect the well evacuation procedure used. Purge water from the domestic wells will not be collected. All samples will be collected from the discharge point as close to the well as possible and before the water is processed through any treatment devices. If samples are taken from direct water main connections, the spigot will be flushed for 2 to 3 minutes to clear the line. For private wells with a hand pump, the water will be pumped for 5 minutes before the sample is collected. Purging will be considered complete after three (3) consistent readings of pH, temperature, and conductivity are achieved.

To avoid cross contamination of samples, dedicated sampling equipment will be used. Appropriate equipment and personnel decontamination procedures are described in the attached QAPP (Appendix E). Proper sample containers, preservation, and holding times are presented in Table 4 for CLP aqueous samples.

Surface Water Pathway

Nonsampling data to be collected include:

- Verify the direction of surface water in the canals.
- Field verification to determine the location of drainage channels and drainage patterns in relation to the contaminant sources.
- Establish the presence of wetlands, sensitive environments or endangered species within a 4 mile radius of the site by correspondence with Texas Department of Parks and Wildlife.

An Eckman dredge may be used to collect target samples at the confluence of SLC with the Neches River. Samples SE-1 through SE-3 are background samples. Samples SE-4 through SE-14 will be used to determine if there are releases to the surface water pathway. Target samples SE-4 through SE-6 will be collected near the confluence of SLC with the Neches River. Target samples SE-7 through SE-12 will be taken along and in wetland areas adjacent to SLC. Target samples SE-13 and SE-14 will be taken in SLC at the public boat ramp off Sara Jane Road.

Soil Exposure Pathway

Nonsampling data to be collected include:

- Verify the distance to the nearest residence, school, day care center, park or recreational area through observation.

- Verify of the total number of on-site workers during daily shifts through observation or interviews with knowledgeable personnel.

- Field verification of drainage patterns and soil exposure pathways in the vicinity of the canal.

- Establish the location of any endangered species or sensitive environments within a 4 mile radius of the site through correspondence with the Texas Department of Parks and Wildlife.

No soil samples are planned during this SSI. In the event that soil sampling becomes necessary, each soil sample will be collected within 6 inches of the upper soil surface. Surface soil samples will be collected using a dedicated stainless steel spoon or trowel. The samples will be collected from a depth as close to the surface as possible, yet deep enough to avoid grass and roots. Soil samples for VOA analysis will be collected first, metals second, and non-volatiles last. Rocks and twigs will be removed as much as possible before placing the soil sample in the jar.

As specified by the QAPP, samples will be placed in glass jars and sealed with Teflon-lined lids. Volatile and non-volatile organic and inorganic samples each will be placed in two 4-ounce, widemouth glass jars. No headspace will be left in the VOA sample jars. Sample jars will be marked for identification and placed on ice for preservation. Identification markings will include: site location, sample number, date and time of collection, and names of samplers.

To avoid cross contamination of samples, dedicated sampling equipment will be used. Equipment and personnel decontamination procedures are described in the QAPP. Proper sample containers, preservation, and holding times for CLP soil samples are presented in Table 3.

Air Pathway

Nonsampling data to be collected include:

- Verify the existence of sensitive environments or endangered species within a 4-mile radius of the site through consultation with TDPW local staff or by observation during the project reconnaissance.

- Field verification of drainage patterns and soil exposure pathways at the site.

- Field verification of potential targets in the target distance radii, in particular those located downwind.

- Verification that there have been no reports of adverse health effects potentially resulting from releases of hazardous substances from the site into the air.

No air samples are planned to assess releases to the air pathway; however, results of any surface soil samples collected for the soil exposure pathway will be used to assess potential for releases to occur to the air pathway.

Quality Assurance/Quality Control Samples

Three types of QA/QC samples will be used in this sampling inspection. Duplicate samples will be taken at the rate of one (1) duplicate per matrix (groundwater and soil) and one (1) duplicate for every ten (10) samples collected. Field blanks will be collected and accompany each ice chest containing groundwater samples shipped for volatile organic analysis. In addition, temperature blanks will accompany each ice chest to the respective laboratories.

A fourth QA/QC sample may be used, as required, in this sampling inspection. Equipment rinsate samples may be collected to establish that proper field decontamination procedures have been employed for sampling equipment which is used more than once in the field.

Volatile organics samples are susceptible to contamination by diffusion of organic contaminants through the Teflon-lined septum of the sample vial; therefore, a VOA field blank will be analyzed to monitor for possible sample contamination. The field blank also serves to detect contaminants in the sample bottles. Each field blank will be prepared by filling two VOA vials with CLP-specified grade water and shipping the blanks with the sample bottles. Field blanks accompany the sample bottles through collection and shipment to the laboratory and are stored with the samples. The field blanks will be analyzed for VOAs. Results of field blank analyses will be maintained with the corresponding sample analytical data in the project file.

An equipment rinsate sample(s) will be analyzed to detect possible sample contamination of non-dedicated sample equipment through field decontamination procedures. Each equipment blank will be prepared by filling two VOA vials; one 1-gallon amber glass bottle; and two 1-liter polyethylene bottles with CLP-specified grade water collected from the final rinse of the decontaminated equipment and shipped with the other samples. The equipment rinsate sample(s) will be analyzed for volatiles, semi-volatiles, pesticides/PCB's, metals, and cyanides. Results of equipment rinsate

sample(s) analyses will be maintained with the corresponding sample analytical data in the project file.

Organic contaminates and some inorganic contaminants may volatilize during collection and subsequent shipment to the laboratory due to warming temperatures in the shipping container; therefore, a temperature blank will be monitored to insure that samples are properly cooled during shipment. One temperature blank per ice cooler will accompany the sample bottles to the laboratory. Each temperature blank will be prepared by filling one VOA vial with deionized water; enclosing it in a bubble bag; taping the package to the interior of the ice cooler and clearly marking it as the "temperature blank". Temperature blanks accompany the sample bottles through collection and shipment to the laboratory and are stored with the samples. Results of shipment temperatures will be maintained with the corresponding sample analytical data in the project file.

Task 2: Decontamination Procedures

Equipment Decontamination

Proper decontamination procedures will aid in preserving the representativeness of the samples collected. Dedicated sampling spoons or trowels will be used to collect each soil sample at the site. These spoons or trowels will have been decontaminated prior to arrival at the site and sealed in plastic sealable bags in accordance with the QAPP. After sampling, gross contamination (visible) will be removed from the surface of the scoops or trowels and they will be placed back in their original plastic bag. Further decontamination will be accomplished by a detergent scrub and distilled water rinse at a location away from the investigation site in accordance with the QAPP. To minimize cross contamination, the outside of each sample container will be wiped clean with clean paper towels prior to placing the container into a plastic bag and bubble-wrapping it for shipment. An effort will be made to initially keep the outside of the containers free of gross contamination.

If sample equipment (non-dedicated) must be used more than once in the field, then the decontamination procedures for sample equipment will be followed by an equipment rinsate sample collected in the field at the end of each day and/or between each sample matrix type sampled, whichever is greater.

Decontamination fluids used to clean equipment will be disposed of on-site in the approximate area of the sampling location in accordance with investigation derived waste (IDW) guidelines. Equipment decontamination will not be necessary for domestic wells since the water sample is collected directly from the tap.

Personal Decontamination

All disposable clothing (i.e., Tyvek, gloves, etc.) will be rendered unusable prior to disposal to prevent inadvertent reuse. Boots will be scrubbed with detergent and rinsed with distilled water that will be disposed of on-site. Decontamination fluids from the rinse (if used) will also be disposed of on-site. Locations for IDW disposal will be noted in the field log book.

Task 3: Sample Shipping

During sampling activities, samples will be packed and preserved according to procedures described in the QAPP. Excess soil or liquid will be removed from the outside of each sample prior to placing it in a sealable plastic bag and placing it into an ice cooler packed with sealed ice bags. The Site Investigation Manager will assure that all appropriate paperwork necessary to ship samples to CLP laboratories for analysis is completed. Normally, a 35-day turnaround time for RAS will be requested. Details of the sample handling and chain-of-custody (COC) requirements are discussed in greater detail in the attached QAPP (Appendix E).

Samples collected each day will be shipped and delivered daily to the designated CLP laboratory for analysis using an overnight courier. The overnight freight courier pickup point and office schedule in the area of the site is:

Airborne Express (1-800-247-2676)
Beaumont, Texas 77703
Office hours - 8:00 am to 6:30 pm Monday through Friday; no service Saturday.
Samples must be dropped off by 5:45 PM.

The chain-of-custody forms will be checked, signed, and placed in a sealable plastic bag and taped to the inside lid of the cooler. The outside of the cooler will be sealed with tamper-resistant tape which cannot be removed without tearing it. The sample custodian will sign across the seal prior to shipping the samples. In the event the shipper has to remove the cooler seal, the receiving laboratory will verify and record that the individual container, bottle, or vial sample seals are still intact.

During sampling and sample shipment, the site Investigation Manager (or his designee) will contact the CLP sample management office (SMO) representative, as designated on the CLP RAS Lab Assignment, each day that a shipment is sent. If there are any significant changes to the CLP analytical requirements, contact the TNRCC Central Office, Allan Seils, PA/SI Program Manager at (512) 239-2514, FAX (512) 239-2527 or his designee to coordinate and obtain approval for additional analytical requirements.

REFERENCES

1. US Environmental Protection Agency. Guidance for Performing Site inspections Under CERCLA, Office of Emergency and Remedial Response, Hazardous Site Evaluation Division, Publication 9345.1-05, September, 1992. 125 pages.

2. US Environmental Protection Agency. 1993 Superfund Chemical Data Matrix (SCDM). March, 1993.

3. TNRCC file information. Included as Appendix A.

4. Texas Department of Water Resources. Report 236. Stratigraphic and Hydrogeologic Framework of Part of the Coastal Plain of Texas. July, 1979.

5. Texas Natural Resource Conservation Commission. The State of Texas Water Quality Inventory, Volume 2. 1994. Included as Appendix B.

6. Texas Department of Water Resources. Climatic Atlas of Texas. December, 1983.

7. Texas Natural Resource Conservation Commission. Region 10 Environmental Assessment Program Sampling Results for Star Lake Canal from 9/20/73 to 3/19/96. Included as Appendix C.

8. United States Department of Agriculture Soil Conservation Service. Soil Survey Jefferson County, Texas. February, 1965.

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APPENDIX A

TNRCC File Information

ATTACHMENT I

TEXAS WATER QUALITY BOARD
P.O. Box 13246, Capitol Station
Austin, Texas 78711

May 27, 1976

ENFORCEMENT ORDER NO. 76-26

AN ENFORCEMENT ORDER of the Texas Water Quality Board setting out findings of fact and conclusions of law with regard to violations of Permit No. 01857 by Riverside Chemical Company and specifying corrective measures to be taken by the company.

WHEREAS, a public Enforcement Hearing was held before a Hearing Commission of the Texas Water Quality Board on February 11, 1976 at Beaumont, Texas for the purpose of exploring the status of compliance by Riverside Chemical Company with the terms and provisions of Permit No. 01857; and

WHEREAS, Riverside Chemical Company was duly represented at the Enforcement Hearing of which notice had been given through letter and publication;

THE TEXAS WATER QUALITY BOARD MAKES THE FOLLOWING FINDINGS OF FACT BASED ON INFORMATION AND TESTIMONY PRESENTED AT THE ENFORCEMENT HEARING:

1. Riverside Chemical Company owns and operates a toxaphene and chlorinated paraffin manufacturing plant located at the intersection of FM Road 366 and Hogaboom Road in Port Neches, Jefferson County, Texas. The company is authorized by Permit No. 01857 to discharge industrial wastes into the Jefferson County Canal and thence into the Neches River.

2. The company has not provided a flow measuring device at Outfall 001. The self reporting instructions adopted pursuant to Board Order No. 69-1219-1 require that measurements of flow be taken at certain intervals. Accurate reporting of flow is not possible without a flow measuring device.

3. The company has failed to collect samples of the final effluent at the monitoring point specified in the permit. Permit No. 01857, Part A. states that samples taken in compliance with specified monitoring requirements shall be taken at Outfall 001, the point of discharge of plant effluent into the Jefferson County Canal.

4. The company has failed to collect the required number of

ATTACHMENT I

weekly composite samples for toxaphene and chlorinated hydrocarbon concentrations in its final effluent. Permit No. 01857, Part A. requires that two (2) 24-hour composite samples of toxaphene and chlorinated hydrocarbons be taken each week.

5. On many occasions since May 22, 1974, the company has discharged effluent in excess of 0.5 milligrams per liter (mg/l) toxaphene, 70 mg/l suspended solids, 3500 mg/l total dissolved solids, 20 mg/l oil and grease, 70 mg/l biochemical oxygen demand (BOD), and 6.0-9.0 standard units pH. The Other Requirements section of Permit No. 01857 specifies grab sample limits for the following quality parameters: 0.5 mg/l toxaphene, 70 mg/l suspended solids, 3500 mg/l total dissolved solids, 20 mg/l oil and grease, and 70 mg/l BOD. Part A of Permit No. 01857 specifies a pH of 6.0-9.0 standard units.

6. The company has not provided the treatment facilities necessary to meet the effluent requirements of Permit No. 01857.

7. Partially treated domestic sewage is periodically discharged from a septic tank system on the company's property into a public drainage ditch. This discharge is not authorized by a permit or other order of the Texas Water Quality Board.

8. The company has not taken adequate measures to prevent the occurrence of spills of hazardous materials on the plant property. The spill areas, if not segregated from the uncontaminated areas and controlled, pose a threat of pollution to the waters of the state.

9. Notice of the Enforcement Hearing at which alleged violations of Permit No. 01857 by Riverside Chemical Company were considered was mailed on January 13, 1976 and published in a newspaper of local circulation on January 22, 1976. The Enforcement Hearing was held on February 11, 1976.

THE TEXAS WATER QUALITY BOARD MAKES THE FOLLOWING CONCLUSIONS OF LAW BASED ON THE FOREGOING FINDINGS OF FACT AND IN ACCORDANCE WITH THE REQUIREMENTS AND POLICIES OF CHAPTER 21 OF THE TEXAS WATER CODE:

ENFORCEMENT ORDER

NO. 76-26

1. Failure by the company to provide a flow measuring device at Outfall 001 is a violation of Board Order No. 69-1219-1 and the instructions adopted thereto. Violation of a Board order contravenes Section 21.251(c) of the Texas Water Code which prohibits the discharge of any waste or the performance of any activity in violation of any permit or order of the Texas Water Quality Board.

2. Failure by the company to collect samples of the final effluent at the monitoring point specified in Part A. of Permit No. 01857 violates that permit provision and also violates Section 21.251(c) of the Texas Water Code.

3. Failure by the compnay to collect the required number of composite samples for toxaphene and chlorinated hydrocarbons as specified in Part A. of Permit No. 01857 contravenes that permit provision and also contravenes Section 21.251(c) of the Texas Water Code.

4. The discharge by the company of effluent containing concentrations of toxaphene, suspended solids, total dissolved solids, oil and grease and BOD in excess of grab sample limits specified by Permit No. 01857 violates those permit specifications and also violates Section 21.251(c) of the Texas Water Code.

5. The unauthorized discharge of partially treated sewage from a septic tank system on the company's premises contravenes Section 21.251(a) of the Texas Water Code which states that except as authorized by a permit or other order of the Texas Water Quality Board, no person may discharge sewage into or adjacent to any water in the state.

6. Violations of Permit No. 01857 by Riverside Chemical Company and related matters were considered at an Enforcement Hearing held in accordance with the Texas Water Quality Board's Rules of Practice and Procedure and the Texas Water Code. Now, therefore,

BE IT ORDERED BY THE TEXAS WATER QUALITY BOARD THAT:

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ENFORCEMENT ORDER

NO. 76-26

1. Effective immediately, Riverside Chemical Company shall comply with the reporting, monitoring and sampling requirements of Permit No. 01857 and Board Order No. 69-1219-1.

2. By not later than July 1, 1976, Riverside Chemical Company shall install on Outfall 001 a permanent flow measureing device.

3. By not later than July 1, 1976, Riverside Chemical Company shall submit to the Executive Director of the Texas Water Quality Board a spill prevention control and countermeasure plan prepared by a registered professional engineer experienced in industrial wastewater control technology.

4. By not later than July 1, 1976, Riverside Chemical Company shall submit to the Executive Director of the Texas Water Quality Board for approval a plan prepared by a registered professional engineer to eliminate any storm water discharges from its property contaminated with detectable amounts of toxaphene, pentachlorophenol or any chlorinated hydrocarbon. All such storm water discharges shall be eliminated within 90 days of approval of the plan. In addition, the company shall by not later than July 1, 1977, reduce concentrations of oil and grease and total organic carbon in contaminated storm water to not more than 15 mg/l and 35 mg/l, respectively.

5. By not later than July 1, 1976, Riverside Chemical Company shall eliminate the discharge of inadequately treated domestic sewage from a septic tank system located on the company's property.

6. By not later than December 1, 1976, Riverside Chemical Company shall submit to the Executive Director of the Texas Water Quality Board for approval plans and specifications prepared by a registered professional engineer to limit discharges of toxaphene to 0.01 mg/l for any single grab sample; upon submission of the plans and specifications, Riverside Chemical Company shall also submit an application to amend Permit No. 01857 to reflect the modifications that are necessary to limit the discharge of toxaphene.

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ENFORCEMENT ORDER

NO. 76-26

7. By not later than July 1, 1977, Riverside Chemical Company shall complete all construction necessary to meet the conditions of the permit and/or an appropriately amended permit.

APPROVED AND ISSUED THIS, THE 27TH DAY OF MAY, 1976.

TEXAS WATER QUALITY BOARD

J. Douglass Poole, Chairman

(Seal)

ATTEST:

Hugh C. Yantis, Jr., Executive Director

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RIVERSIDE CHEMICAL COMPANY
TOXAPHENE SAMPLES

DATE	SAMPLE CONCENTRATION	GRAB SAMPLE REQUIREMENT
10/29/75	.76 mg/l	.5 mg/l
5/07/75	.54 mg/l	.5 mg/l
4/17/75	1.4 mg/l	.5 mg/l
4/11/75	1.7 mg/l	.5 mg/l
4/03/75	2.8 mg/l	.5 mg/l
3/27/75*	1.4 mg/l	.5 mg/l
3/20/75	1.9 mg/l	.5 mg/l
3/14/75	1.1 mg/l	.5 mg/l
2/19/75	.86 mg/l	.5 mg/l
2/12/75	.95 mg/l	.5 mg/l
2/07/75	2.05 mg/l	.5 mg/l
1/30/75	2.14 mg/l	.5 mg/l
1/22/75	5.9 mg/l	.5 mg/l
1/10/75	1.25 mg/l	.5 mg/l
1/17/75	1.27 mg/l	.5 mg/l
12/31/74	1.6 mg/l	.5 mg/l
12/26/74	16.2 mg/l	.5 mg/l
12/11/74	9.2 mg/l	.5 mg/l

TABLE II
RIVERSIDE CHEMICAL COMPANY
SUSPENDED SOLIDS SAMPLES

DATE	SAMPLE CONCENTRATION	GRAB SAMPLE REQUIREMENT
4/23/75	186 mg/l	70 mg/l
3/27/75	75 mg/l	70 mg/l
3/17/75	156 mg/l	70 mg/l
2/28/75	259 mg/l	70 mg/l
2/12/75	234 mg/l	70 mg/l
1/22/75	314 mg/l	70 mg/l
1/14/75	262 mg/l	70 mg/l
12/26/74	900 mg/l	70 mg/l
11/27/74	108 mg/l	70 mg/l
10/23/74	268 mg/l	70 mg/l
9/25/74	206 mg/l	70 mg/l
9/11/74	529 mg/l	70 mg/l
3/27/75	75 mg/l	70 mg/l
2/12/75	234 mg/l	70 mg/l
1/22/75	260 mg/l	70 mg/l
9/25/74	206 mg/l	70 mg/l
8/08/74	81 mg/l	70 mg/l
7/26/74	82 mg/l	70 mg/l
5/01/74	152 mg/l	70 mg/l
4/26/74	119 mg/l	70 mg/l

TOTAL DISSOLVED SOLIDS SAMPLES

DATE	SAMPLE CONCENTRATION	GRAB SAMPLE REQUIREMENT
7/25/75	15,927 mg/l	3500 mg/l
7/23/75	4,163 mg/l	3500 mg/l
7/21/75	26,310 mg/l	3500 mg/l
9/12/74	6,720 mg/l	3500 mg/l
9/11/74	16,800 mg/l	3500 mg/l
9/06/74	18,400 mg/l	3500 mg/l
9/05/74	25,800 mg/l	3500 mg/l

TABLE IV
RIVERSIDE CHEMICAL COMPANY
OIL AND GREASE SAMPLES

DATE	SAMPLE CONCENTRATION	GRAB SAMPLE REQUIREMENTS
12/03/75	21 mg/l	20 mg/l
11/07/75	108 mg/l	20 mg/l
11/06/75	25 mg/l	20 mg/l
10/01/75	86 mg/l	20 mg/l
9/24/75	260 mg/l	20 mg/l
9/12/75	114 mg/l	20 mg/l
8/20/75	27 mg/l	20 mg/l
2/12/75	106 mg/l	20 mg/l
1/22/75	230 mg/l	20 mg/l
1/14/75	40 mg/l	20 mg/l
12/26/74	75 mg/l	20 mg/l

TABLE V
RIVERSIDE CHEMICAL COMPANY
BIOCHEMICAL OXYGEN DEMAND SAMPLES

DATE	SAMPLE CONCENTRATION	GRAB SAMPLE REQUIREMENT
10/29/75	2,052 mg/l	70 mg/l
10/22/75	2,000 mg/l	70 mg/l
10/03/75	1,150 mg/l	70 mg/l
10/01/75	83 mg/l	70 mg/l
7/15/75	185 mg/l	70 mg/l
1/22/75	260 mg/l	70 mg/l
7/26/74	240 mg/l	70 mg/l

TABLE VI
RIVERSIDE CHEMICAL COMPANY
pH SAMPLES

DATE	SAMPLE CONCENTRATION	EFFLUENT LIMITATION
12/05/75	10.0	6.0-9.0
12/03/75	10.96	6.0-9.0
11/14/75	10.8	6.0-9.0
11/12/75	11.6	6.0-9.0
11/11/75	10.9	6.0-9.0
10/31/75	11.5	6.0-9.0
10/29/75	12.73	6.0-9.0
9/24/75	9.99	6.0-9.0
9/12/75	10.43	6.0-9.0
8/27/75	4.94	6.0-9.0
8/20/75	9.55	6.0-9.0
5/7/75	10.64	6.0-9.0
4/23/75	13.2	6.0-9.0
3/27/75	10.0	6.0-9.0
11/27/74	10.5	6.0-9.0
11/13/74	13.3	6.0-9.0
10/23/74	10.5	6.0-9.0
9/25/74	9.8	6.0-9.0
9/11/74	13.6	6.0-9.0
4/26/74	1.4	6.0-9.0

8/9/79

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Steve Cook, Investigation Unit, Enforcement Support Section

DATE: August 13, 1979

THRU :

FROM : Clarence W. Moritz, District 6 Supervisor

SUBJECT: Enforcement Action: Sonford Chemical Company, Permit Application Control No. 342; H & R Chemical, No Permit; Bison Chemical Company, Permit Application Control No. 2564; Riverside Chemical Company, Permit No. 01857 and Solid Waste Registration No. 30446; and/or Chemall, Inc., Permit No. 01857

Attached is an Enforcement Report concerning Sonford Chemical Company, H & R Chemical, Bison Chemical Company, Riverside Chemical Company, and/or Chemall, Inc. with the subject permit status. In preparing and/or reviewing this report, I find that it is accurate and that the proposed recommendations will bring about the correction of those problems which are causing or have caused the violations. Please review this matter for appropriate enforcement action.

Clarence W. Moritz

Clarence W. Moritz

See Attachment

INVESTIGATION REPORT

Sonford Chemical Company; H & R Chemical;
Bison Chemical Company; Riverside
Chemical Company and Chemall, Inc.

Sonford Chemical Company, Permit Application Control No. 342; H & R Chemical, no permit, operating for Sonford Chemical Co.; Bison Chemical Company, Permit Application Control No. 2564; Riverside Chemical Company, Permit No. 01857 and Solid Waste Registration No. 30446 and Chemall, Inc., Permit No. 01857.

Chemical Plant of the subject companies is located at the intersection of FM 366 (Pure Atlantic Highway) and Hogaboom Road in Port Neches, Jefferson County, Texas. Area of concern in this investigation is the Jefferson Chemical Outfall Canal and land owned by Jefferson Chemical - leased to Union Carbide, both of which have been found to be contaminated with high concentrations of toxaphene discharged or improperly disposed of in the area. The adjacent Union Carbide land is in Groves, Jefferson County, Texas with the outfall ditch apparently forming the boundary line between Groves and Port Neches.

I. Introduction (by sequential ownership)

A. Identification

1. Sonford Chemical (in operation prior to October 31, 1967 to October 3, 1972):

No treatment system - drains, ditch, sump, and tile pipe to Jefferson Chemical Outfall Ditch

Permit applications pending, Control No. 342 submitted on October 23, 1968, June 30, 1969 and November 20, 1970. Permit application was extended to amend and meet "excellent treatment" requirements by September 30, 1973. Owner filed bankruptcy petition on June 2, 1972. Permit was never issued.

2. H & R Chemical (packaged inventory, only with no discharge, for Sonford Chemical Company from July 5, 1972 to last week in August 1972):

   No treatment system

   No permit (apparently operated under provisions of Chapter 11 of Bankruptcy Act or under orders of the court)

3. Bison Chemical Company (owned plant from October 3, 1972 to February 5, 1974):

   No treatment system

   Permit Application Control No. 2564, submitted application on November 18, 1973

4. Riverside Chemical Company (owned plant from February 5, 1974 to February 17, 1978):

   No treatment system initially. Neutralization of discharge by caustic scrubbers apparently took place after April 26, 1974. On November 8, 1975 all wastewater except boiler blowdown and cooling water were routed to a 600,000 gallon holding pond. On March 2, 1976 the boiler blowdown was routed to the pond. Discharges from the pond were routed to a pit where they joined the cooling water prior to discharge through a clay tile pipe to the outfall ditch. On March 19, 1976 a pit system used for monitoring was sealed, the cooling water recycled and the pond used for holding and evaporation.

The pond was formerly used as a waste slop pit for toxaphene, pentachlorophenol, chlorinated hydrocarbons and calcium chloride wastes.

Permit pending February 5, 1974 to May 22, 1974. Permit No. 01857, May 22, 1974. Permit No. 01857 amended August 31, 1977 and transferred to Chemall, Inc., pending transfer of title, which was finally closed on February 17, 1978. Solid Waste Registration No. 30466, April 12, 1976.

5. Chemall, Inc. (owned plant from February 17, 1978 to date):

No treatment - same as Riverside (recent inspection report to follow).

Permit No. 1857, amended August 31, 1977 and transferred from Riverside Chemical Company to Chemall, Inc., pending transfer of title, which was finally closed February 17, 1978. Note: Letter DW/HCY, Jr./Robert C. Harnden, Riverside Chemical Company on August 2, 1977 relative to holding and evaporation pond (still contaminated) holding both Riverside Chemical and Chemall, Inc. jointly liable for any discharge from pond (pit). Chemall has had no apparent discharge.

B. Current Discharge Parameters (average):

1. Sonford Chemical Company proposed monthly average. Excellent treatment requirements of October 8, 1970 (equivalent to Permit Application Control No. 342):

pH	5.5 - 8.5
Total Residue, mg/l	10,000
Chloride, mg/l	5,000
Sulphate, mg/l	1,000
Total Suspended Solids, mg/l	30
Volatile Suspended Solids, mg/l	10
Settleable Matter, mg/l	5
Immediate Oxygen Demand, mg/l	0.5
Biochemical Oxygen Demand	25
Chemical Oxygen Demand	250
Oil and Grease, mg/l	2
Free and Floating Oil	None
Color APHA Units	20
Temperature °F	90
Debris	None
Phenol, mg/l	5
Flow, mgd	0.580

Toxic Compounds - None in such amounts that will cause the receiving waters to be toxic to human, animal, or aquatic life.

Foaming or Frothing Material - None in such amounts that will cause foaming or frothing of a persistent nature in the receiving waters.

2. H & R Chemical - packaging of inventory only

3. Bison Chemical Company - submitted application November 18, 1973. Processed under Riverside Chemical Company ownership on May 22, 1974.

4. Riverside Chemical Company, Permit No. 01857 dated May 22, 1974

Flow, mgd, not to exceed	.045
Biochemical Oxygen Demand (5 day), lbs/day	10.0
Chemical Oxygen Demand, lbs/day	60.0
Total Suspended Solids, lbs/day	10.0
Oil & Grease, lbs/day	5.0
Toxaphene, lbs/day	0.04
Chlorinated Hydrocarbons as CCl_4, mg/l	3.0 max/day
pH	6 - 9

Solid Waste Registration No. 30406 dated April 12, 1976 - General plant trash & rubble (Class II) off-site - Camphene and waxes (Class I) off-site - Toxaphene (Class I) off-site

Riverside Chemical Company, Permit No. 01857 dated August 31, 1977, as amended (to transfer of title, effective February 17, 1978):

Flow (see Special Provisions below)	
Biochemical Oxygen Demand (5 day), lbs/day	10.0
Chemical Oxygen Demand, lbs/day	60.0
Total Suspended Solids, lbs/day	10.0
Oil & Grease, lbs/day	5.0
Toxaphene, lbs/day	0.0007
Chlorinated Hydrocarbons (as C Cl4) max/day	3.0 mg/l
pH	6.0 - 9.(

5. Chemall, Inc., Permit No. 01857 dated August 31, 1977, as amended (transferred title effective February 17, 1978). Parameters same as Riverside as of August 31, 1977.

C. Special Provisions of Permit:

1. Sonford Chemical Company - No permit

2. H & R Chemical - No permit (operating under Bankruptcy Act)

3. Riverside Chemical Company, Permit No. 01857 dated May 22, 1974 (permit pending February 5, 1974 to May 22, 1974):

   Standard provisions for effluent limitations and monitoring requirements including point of discharge; monitoring and reporting pursuant to Board Order No. 69-1219-1; management requirements including change in discharge, non-compliance notification, facilities operation, adverse impact, bypassing, power failures and removed substances.

Removed substances specified that solids, sludges, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering the waters of the State of Texas.

Standard provisions also included responsibilities including right of entry, transfer of ownership or control, availability of reports, permit modifications, toxic pollutants, civil and criminal liability, oil and hazardous substance liability, state and federal laws, property rights, and severability of conditions.

No special provisions were included in Part III, Other Requirements of the May 22, 1974 permit.

Solid Waste Registration No. 30446 dated April 12, 1976 included standard provisions for shipping-control tickets and monthly reporting for off-site disposal of Class I wastes.

Riverside Chemical Co., Permit No. 01857, amended August 31, 1977. Part III, Other Requirements.

All storm water which falls within the boundaries of the plant site shall be considered to be contaminated and will be given full treatment in the treatment plant prior to discharge should samples indicate that the quality of water exceeds these limits:

Parameter (mg/l)	Grab Sample (not to exce
Total Organic Carbon	70
Oil & Grease	15
Toxaphene	0.01
Total Chlorinated Hydrocarbons	0.5

The treatment technology considered to be the minimum necessary to properly treat the wastewaters which are authorized to be discharged by this permit during any period of plant production is considered to be neutralization, API separation, equalization, filtration, carbon adsorption, or ion exchange, or reductive degradation, and only additional treatment or pre-treatment necessary to stabilize biodegradable organic material to within the limits specified by this permit.

An alternative treatment system may be used with prior approval from the Executive Director. No discharge of pollutants to the waters in the State is authorized by this permit unless the pollutant has received treatment in a facility which includes the processes specified above or an approved alternate. This provision applies only to process water and contaminated storm water.

The permittee shall,within 180 days following the approval of this permit, install a permanent flow measuring device equipped to totalize and record measured volume for all discharges from the outfall.

All samples which are taken to characterize the chemical quality of the effluent to be discharged shall be analyzed according to the Environmental Protection Agency method specified in 40 CFR, Part 136. An alternate method of analyses may be used with prior approval of the Executive Director.

II. Waste Load

A. Source:

1. Sonford Chemical Company: Chemical plant producing pentachlorophenol, toxaphene, chlorinated waxes, and calcium chloride, with once through (well) cooling water, steam condensate, caustic scrubbing (sodium hydroxide), boiler blowdown, brine, glycol solvent and with muratic (hydrochloric) acid as a by-product. Discharge was subject to spills, wash down, pipe and valve leaks, and rainfall runoff. Pilot plant operations at plant was unknown; however, as outlined in a later SPCCP (Riverside Chemical Company) warehouse storage included 2, 4, 5-T; 2, 4D, malathion, dinitrophenol, captan, carbaryl, chlorodane, dalapon, diazinon, dimethylamine, diquat, diuron, ethion, guthion, methylparathion, and parathion in addition to toxaphene.

2. H & R Chemical - Packaging inventory for Sonford Chemical Company

3. Bison Chemical Company - Same as Sonford Chemical Company except pentachlorophenol was not being produced, but was in inventory.

4. Riverside Chemical Company: Produced toxaphene, chlorinated waxes, and hydrochloric acid until February 25, 1976 when toxaphene production was discontinued. Inventory of pentachlorophenol was removed following purchase of plant on February 5, 1974. Removal date of toxaphene inventory is unknown; although, in an engineering report (TCB, August 1977) a small inventory was still on hand along with drums containing acetone, epon resin, and diesel oil. Warehouse storage of insecticides status was the same as listed in the SPCCP of June 1976 and in

August 1977 methylparathion, 2, 4D, and 2, 4, 5T were on hand. Status of others was unknown. Have had no process discharges since March 1973; however, storm water runoff contaminated with high concentrations of toxaphene was observed on July 21, 1977 and August 5, 1977.

Samples taken in the facultative holding pond on September 30, 1976 and November 2, 1976, recorded on Chain of Custody Tags IN3753 and IN3789, indicated brown sludge concentrations of 7,400 and 20,000 mg/kg of toxaphene, respectively and in the water of 17.5 and 2.0 mg/l of toxaphene, respectively. Samples of sediment from wet well on January 29, 1976 (IN2620) revealed a toxaphene concentration of 3,916 mg/kg and a pentachlorophenol concentration of 87.7 mg/kg. On July 21, 1977 the pond waters contained 78 mg/l toxaphene and 69.0 mg/l pentachlorophenol.

5. Chemall, Inc.: Produced parafins and chlorinated waxes and oils for the linoleum industry with muratic (hydrochloric) acid as a by-product. Holding and evaporation pond still contained toxaphene sludges on August 5, 1977; however, the company has made no discharges of wastewaters and have no toxaphene in inventory. A recent inspection report is in progress.

B. Quantity and Quality of Waste from each Source:

1. Sonford Chemical Co.: Boiler blowdown (1%), domestic sewage (septic tank to inadequate drain field), cooling water (94%), process water (0.0%), intermittant wash up water (5.0%) - unit clean-up, small product spills, ruptured pipeline and flanges, and rainfall runoff.

Flow	0.06 - 0.55 mgd
pH	0.9 - 11.0 (neutralizing with brine)
Phenols	0.4 - 68 mg/l
Cond.	1808 - 81,144 umhos/cm
TSS	<10 - 652 mg/l
VSS	6 - 90 mg/l
BOD	24 - 230 mg/l
DO	0.8 - 7.5 mg/l
COD	113 - 4330 mg/l (interference)
Chlorides	13,300
Oil & Grease	7.8 mg/l

Production rates: Pentachlorophenol - 10,000 pounds/yr (2/18/70)
Planned expansion to 18,000,000 pounds/yr (5/70)
Leading producer of toxaphene

2. H & R Chemical: Packaging inventory for Sonford Chemical while under bankruptcy investigation.

3. Bison Chemical Co.: Same as Sonford Chemical Co. except pentachlorophenol was discontinued.

Flow	0.37 mgd
pH	2.0
Cond.	34,944 umhos/cm
TSS	2,800 mg/l
BOD	25 mg/l
COD	<0.2 mg/l
Phenols	<0.05 mg/l
Oil & Grease	1.6 mg/l

On January 23, 1973 a contractor from Denver, Colorado was in process of removing approximately 100,000 pounds of off-grade toxaphene and pentachlorophenol left by Sonford and shipping it to Colorado. Planned to tear down pentachlorophenol unit, old toxaphene unit, and build a new toxaphene unit.

On October 2, 1973 attempting tear down and to rebuild old corroding plants with considerable progress. Still had 158 drums and some partially filled tanks on hand, utilizing Class I sites.

On October 24, 1973 indicated they had gotten rid of 40 drums of PCP but still had 400 more belonging to Dr. Hatcher of Sonford.

4. Riverside Chemical Company: Producing 5-6,000,000 pounds per year of toxaphene, 2,000,000 pounds per year of chlorinated paraffins, and 12,000,000 pounds per year of muratic (hydrochloric) acid. Estimated 1 ppm or less of toxaphene, 1 ppm or less chlorinated paraffins and 5-10 ppm or less hydrochloric acid in waste. Survey of August 6, 1974 (BM, 11/6/74) gives breakdown of boiler blowdown, storm water runoff, cooling water, acid tank wash, caustic scrubber and final plant effluent. Chlorides 5100 mg/l, TSS 256 mg/l, and pH 10.0 were in violation of Permit No. 01857. Toxaphene was 5.25 mg/l in storm water runoff.

   From April 26, 1974 to December 5, 1975 pollutants in excess of Column II effluent limitations specified on page 11 of Permit No. 01857 were allowed on 85 separate occassions to discharge. Eighteen (18) violations of toxaphene (0.52 - 16.2 mg/l) occurred between the period of October 29, 1975 to December 11, 1974. Seven TDS violations ranged from 4,163 to 26,310 mg/l. Eleven oil and grease violations ranged from 21 to 260 mg/l. Seven BOD violations ranged from 83 mg/l to 2,052 mg/l. Twenty pH violations ranged from a pH of 1.4 to 13.3. Two COD violations of 414 and 1,120 mg/l also occurred. District 6 inspection of September 29, 1975 revealed non-compliance discharge violations of pH (9.4), oil and grease (188 mg/l), TSS (92 mg/l) and Toxaphene (2.08 mg/l).

III. Treatment System

A. Description of System:

1. Sonford Chemical Company: No treatment system - gravity flow to drains to sump to ditch to pit to 10" clay tile pipe to Jefferson Chemical Outfall Canal. No control of storm water runoff. Slop pit (600,000 gal.) utilized for waste disposal of toxaphene, pentachlorophenol, chlorinated hydrocarbons and calcium chloride.

2. H & R Chemical: No treatment system - same as Sonford Chemical Company - said to be packaging inventory only.

3. Bison Chemical Company: No treatment - same as Sonford Chemical Company.

4. Riverside Chemical Company: No treatment system - initially same as Sonford Chemical Company. Neutralization of discharge by caustic occurred after April 26, 1974. On November 8, 1975 all wastewaters except boiler blowdown and cooling water were routed to 600,000 gallon waste pond, thence to a monitoring pit where the discharge was joined by cooling water and boiler blowdown prior to discharge through 10" clay tile pipe through a levee to the Jefferson Chemical Outfall Ditch. On March 2, 1976 the boiler blowdown was routed to the holding and evaporation pond. On March 19, 1976 the pit system used for monitoring was sealed and the cooling water recycled. Outfall 001 was filled and no apparent discharges other than in storm water runoff occurred after March 1977. Only the contaminated holding and evaporation pond was utilized for wastewaters were routed to a caustic scrubber thence to a common pump utilized also for wash down wastewaters and runoff from the railroad tank car loading area prior to discharging to holding and evaporation pond and/or a back-up surge tank.

5. Chemall, Inc.: Inspection report in progress - apparently no change from Riverside Chemical Co.

V. Construction Grants - Not Applicable

VI. Previous Citations and Other Enforcement Orders

1. Sonford Chemical Co.: Shut down for two months in the summer of 1971 in the face of a Texas Air Control Board order for immediate compliance with the Clean Air Act. Suit filed in February 1972 by Jefferson County for alledged air pollution problems.

2. H & R Chemical - No action

3. Bison Chemical Co.: Referred to Attorney General on October 15, 1973 by the Texas Water Quality Board for illegal discharges without a Waste Control Order - under litigation October 19, 1973. Cause D99641, 136th Judicial Court, Jefferson County - judgment 12/13/73 resulted in a civil penalty of $2,500 and that the defendant be permanently enjoined from violating the Texas Water Quality Act.

4. Riverside Chemical Co.: District 6, CWM/GS, October 24, 1975 requested enforcement action for continued non-compliance of Permit No. 01857 and violation of the Texas Water Quality Act. Enforcement Order 75-26 effective May 26, 1976 required in general:

   a. Immediate compliance with the reporting, monitoring and sampling requirements of Permit No. 01857 and Board Order No. 69-1219-1;

b. By July 1, 1976 a flow measuring device installed on Outfall 001;

c. By July 1, 1976 an SPCCP prepared by a professional engineer experienced in industrial wastewater control technology;

d. By July 1, 1976 a plan to eliminate any contaminated storm water discharge, prepared by a registered professional engineer, and submitted to the Executive Director of the Texas Water Quality Board for approval; and

(1) Within 90 days of approval of the plan - eliminate such storm water discharges;

(2) By no later than July 1, 1977 reduce oil and grease to not more than 15 mg/l and TOC to not more than 35 mg/l in contaminated storm water.

e. By July 1, 1976 eliminate septic tank discharge of domestic sewage;

f. By December 1, 1976 submit plans and specifications to limit discharges of toxaphene to 0.01 mg/l for any single grab sample, prepared by a registered professional engineer, to the Executive Director of the Texas Water Quality Board for approval; and

(1) Submit an application to amend Permit No. 01857 to reflect the modifications that are necessary to limit the discharge of toxaphene;

g. By July 1, 1977 complete all construction necessary to meet the conditions of the permit and/or an appropriately amended permit.

On June 6, 1977 all items of Enforcement Order 76-26 were said to be completed (R.C. Harnden/HCY, Jr.); however, follow-up inspections on July 21, 1977 and August 5, 1977 revealed toxaphene in storm water runoff in violation of Items 4, 6 and 7 of the order.

5. Chemall, Inc.: No action taken - inspection report in progress. Note: Letter DW/HCY, Jr./ Robert C. Harnden, Riverside Chemical Co. held Riverside Chemical Co. and the purchaser (Chemall, Inc.) jointly liable for any discharge from the pit (holding and evaporation pond).

VII. Violations (sequential table)

Violation	Data Source	Permit or Other Requirement
Sonford Chemical Co.: Discharging wastewaters to the waters of the State without a Waste Control Order	District 6 inspection of 1967(1), 1968(2), 1969(4) and 1971(2)	Section 21.251 of the Texas Water Code
Bison Chemical Co.: Discharging highly acidic wastewaters to the waters of the State without a Waste Control Order on 01/23/73	Dist. 6 inspection (LH) report of 03/29/73	Section 21.251 of the Texas Water Code

Violation	Data Source	Permit or Other Requirement
Eastman Kodak B-11 solvent spill (1400 gal.) and diesel fuel (100 gal.) spills on 06/12/73	Dist. 6 report AG/JBL (KJ) 07/11/73	Section 21.251 of the Texas Water Code
Hydrochloric acid spill (4500 gal.) on 10/02/73	Dist. report AT/JBL (KJ) 10/09/73	Section 21.251 of the Texas Water Code
Hydrochloric acid spill (8,000 gal.) on 10/08/73	Dist. report AT/JBL (KJ) 10/09/73	Section 21.251 of the Texas Water Code
Riverside Chemical Co.: 08/06/74 - non-compliant with chlorides, TSS, and pH with 5.25 mg/l of toxaphene in storm water runoff	District 6 survey BM, 11/06/74	Permit No. 01857; Sec. 21.251 of Texas Water Code or Part II, Sec. 5 of Permit No. 01857
04/26/74 to 12/05/75 85 separate violations of non-compliance - toxaphene (18), TDS (7), oil & grease (11), BOD (7), pH (20), COD (2), TSS (20)	Dist. 6 enforcement presentation, 02/12/76	Permit No. 01857, Col. II, p. 11
09/29/75 - non-compliance with pH, oil and grease, TSS, toxaphene and possible contaminated storm water outfalls	Dist. 6 inspection of 09/29/75	Permit No. 01857, Col. II, p. 11

Violation	Data Source	Permit or Other Requirement
No flow device	Dist. 6 enforcement presentation 02/12/76	Permit No. 01857, Board Order 69-1218-1
Failure to collect samples of final effluent monitoring point	Dist. 6 inspection of 09/29/75	Permit No. 01857
Failure to collect composite samples representative of volume and nature of monitored discharge	Dist. 6 inspection of 09/29/75	Permit No. 01857 Monitoring Requirements
Failure to collect any composite samples for the purpose of self-reporting for August 1975	Dist. 6 inspection of 09/29/75	Permit No. 01857 and Board Order No. 69-1219-1
Failed to collect required number of weekly composite samples for toxaphene and chlorinated hydrocarbons	Dist. 6 inspection of 09/29/75	Permit No. 01857 Monitoring Requirements
Unpermitted discharge from inadequate domestic tank system	Dist. 6 inspection of 09/29/75	Permit No. 01857, Part II, Sec. 5 or Sec. 21.251 of Texas Water Code
01/22/76, pH non-compliant	Dist. 6 inspection of 01/22/76	Permit No. 01857

Violation	Data Source	Permit or Other Requirement
Jan. 1976 - non-compliant in pH max. and toxaphene	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1
Feb. 1976 - non-compliant in pH max., 13 pH violations, COD (mg/l), not reporting toxaphene and chlorides	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1
Discharging storm water containing high concentrations of toxaphene on 08/05/77 and 07/21/77	Dist. inspection report of 11/28/77	Enforcement Order 76-26, Items 4, 6, and 7 and Permit No. 01857
Mar. 1976 - non-compliant in pH max., 4 pH violations, TSS avg. (#s), BOD avg. (#s), oil & grease (mg/l) and avg. (#s), chlorides mg/l (3), TDS mg/l (3)	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1
April 1976 - non-compliant with toxaphene mg/l (3), TDS mg/l (4), and chlorides mg/l (4)	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1

Violation	Data Source	Permit or Other Requirement
May 1976 - non-compliant in TSS, avg. (kg/day), toxaphene (kg/day) and (mg/l) TDS mg/l (4), chlorides mg/l (4)	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1
June 1976 - non-compliant in TSS, avg. (kg/day), toxaphene, avg. (kg/day) and max. (kg/day)	Self-Reporting	Permit No. 01857 and Board Order 09-1219-1
Oct. 1975 - July 1976 not reporting chlorinated hydrocarbons analyses	Self-Reporting	Permit No. 01857 and Board Order 69-1219-1
Sept. 30, 1976 - bypassing treatment system with domestic wastewater	Dist. 6 inspection of 09/30/76	Permit No. 01857, Part II, Sec. 5 and/or Sec. 21.251 of the Texas Water Code and Enforcement Order 76-25, Item 5

VIII. Causes of Violations

1. Sonford Chemical Co.: Discharging wastewaters on District 6 inspections of 10/31/67, 02/14/68, 04/09/68, 03/04/69, 04/01/69, 04/17/69, 09/23/69, 04/26/71, and 11/03/71 without a permit. Operations were production oriented with poorly designed and corroded units resulting in pipe and valve leaks and spills with apparent conscious disregard to the Texas Water Code and the Clean Air Act

in addition to poor housekeeping and disregard for the environment. In general, operations were "damn" sloppy.

2. Bison Chemical Co.: Discharging wastewaters on District 6 inspection of January 23, 1973 without a permit. Tank truck ran over and broke solvent line to solvent tank, then backed-up and ruptured fuel tank on June 12, 1973. Hydrochloric acid spill resulted on October 2, 1973 when valve or tank broke. Hydrochloric acid spill resulted on October 8, 1973 when Durakne resin tank ruptured and gave way. Bison Chemical Co. inherited the problems of housekeeping and corroded units from Sonford Chemical Company in addition to a large inventory which was still owned by Sonford Chemical Co. Bison tore down the old toxaphene and pentachlorophenol units and built a new toxaphene unit. In the process they contracted for disposal of 100,000 pounds of off-grade to a Denver, Colorado contractor about March 29, 1973. On September 13, 1973 Bison Chemical Co. needed 630 yards hauled off with that much to go. Operating personnel were essentially the same except for management. Bison Chemical felt that no treatment was needed.

3. Riverside Chemical Co.: Inherited Sonford Chemical Co.'s mess in addition to essentially some operating personnel, except for management. Neither the corporate structure nor the management had regard for the Texas Water Code and/or their permit which did result in the numerous violations of their permit until the enforcement hearing on February 22, 1976. The company did make an attempt to stop the discharges of wastewaters and contaminated

storm water under the enforcement order; however, like its predecessors did not believe treatment was necessary. Toxaphene production was stopped on February 25, 1976; however, inventories were on hand and the contaminated holding and evaporation pond remained without clean-out when sold to Chemall, Inc.

4. Chemall, Inc.: Retained essentially the same operating personnel. Delayed purchase of the plant from August 31, 1977 (date of amended permit and transfer to Chemall, Inc.) to February 17, 1978 due to apparent financial status. Provisions of amended permit require treatment and apparently no treatment has been implemented as there has been no discharge reported from the plant since March 1977. A District inspection was planned prior to learning of a toxaphene disposal problem from past operations on May 15, 1979 through an indirect complaint. The toxaphene determination due to this problem and as a result of a recent inspection, should determine Chemall's present status.

Recommendations

This investigation was made in an attempt to assess the party and/or parties responsible for past disposal of toxaphene in high concentrations in Jefferson Chemical Company Outfall Ditch (Permit No. 00585-02 used formerly for process wastewaters and now used for uncontaminated storm water runoff) and onto adjacent property leased by Jefferson Chemical Co. to Union Carbide Corporation, Linde Division, Groves. Soil from construction of the latter plant was delivered to Block Sand Pit, Port Arthur and to Keown Supply Co., Port Neches for use as topsoil, which has in part ended up on several yards and in gardens ultimately leading to a complaint

resulting in back tracking to the source. It has not at this point been determined as to whether or not the toxaphene was dredged from the ditch and/or dumped indiscriminately onto the adjacent property. It has, however, been determined that discharges containing high concentrations of toxaphene did occur through the period prior to October 31, 1967 through February 25, 1976 when toxaphene production was stopped or when pumping from the pond stopped on March 5, 1976, and/or when the pit system used for monitoring was sealed on March 19, 1976. This places the former owners - Sonford Chemical Company, H & R Chemical, Bison Chemical Co., and Riverside Chemical Co. and the operators, some serving in supervisor capacity for several of the companies as the potential responsible parties. Riverside Chemical Company continued to violate Enforcement Order 76-26 and Permit No. 01857 for the period of May 27, 1976 to September 30, 1976. It is therefore recommended that:

1. Sonford Chemical Company, H & R Chemical, Bison Chemical Co. and Riverside Chemical Co. be held responsible for the toxaphene disposal and violations of the Texas Water Code and/or the Solid Waste Act for which Union Carbide has and Jefferson Chemical may (unknown at this writing) assume the responsibility for clean-up.

2. The responsible companies listed in No. 1 above should also assume responsibility for any future violations of the Texas Water Code and/or the Solid Waste Act.

3. That Riverside Chemical Co. be held responsible for further violations of Permit No. 01857 and Enforcement Order 76-26 and be subject to appropriate enforcement action.

4. That Chemall, Inc. implement the conditions and special provisions of Permit No. 01857, as amended on August 31, 1977 and effectively transferred to them on February 17, 1978, not withstanding any further violations found in the recent inspection for which the report is incomplete at this writing.

5. That should further violations of storm water runoff in and/or adjacent to the plant be found, Chemall, Inc. shall assume the responsibility of clean-up and appropriate correction.

6. That should the holding pond and/or evaporation pond contain high concentrations of toxaphene in the water or sediment samples of the sludge, Chemall, Inc. shall take immediate steps to clean and dispose of the ponds contents in an approved Class I site suitable for that disposal.

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Gary Schroeder (SC), Chief, Enforcement Support, Enforcement and Field Operations

DATE: August 17, 1979

THRU :

FROM : Susan S. Ferguson, District 6

SUBJECT: Toxaphene Analyses, Chemall, Inc., Permit No. 01857 Perimeter Ditches - Follow-up to Enforcement Action Request of 8/13/79

On July 9, 1979 a sampling investigation was conducted at Chemall, Inc., Permit 01857 to determine if the soils in the perimeter ditches surrounding the plant site were contaminated with toxaphene and/or chlorinated hydrocarbons and to determine if the storm water discharged into those ditches exceeded the 0.01 mg/l toxaphene limitation established in the permit.

Samples were collected at 15 locations (see map I) and recorded on COC tags SS05301 thru SS05315. Analyses were performed and the results are listed in Table I below.

TABLE I

Samples Collected 7/9/79
Chemall, Inc. Perimeter Ditches

Site	COC Tag Number	Sample Type	Toxaphene mg/l	Cl_2 Hydrocarbon mg/l
A	SS05302	Water	0.0058	None Detected
A_1	SS05301	Soil	1.1 mg/kg	"
B	SS05303	Water	0.018*	"
C	SS05304	Water	0.018*	"
D	SS05305	Soil	878.0 mg/kg	"
E	SS05306	Water	<0.005	"
F	SS05307	Soil	276.0 mg/kg	"
G	SS05308	Water	<0.005 oil interference	"
H	SS05309	Soil	Results Incomplete	"
I	SS05310	Soil	Results Incomplete 820.0 mg/kg	"
J	SS05311	Water	0.016*	"
K	SS05312	Water	0.016*	"
L	SS05313	Water	0.014*	"
M	SS05314	Water	0.02 *	"
N	SS05315	Water	0.018*	"

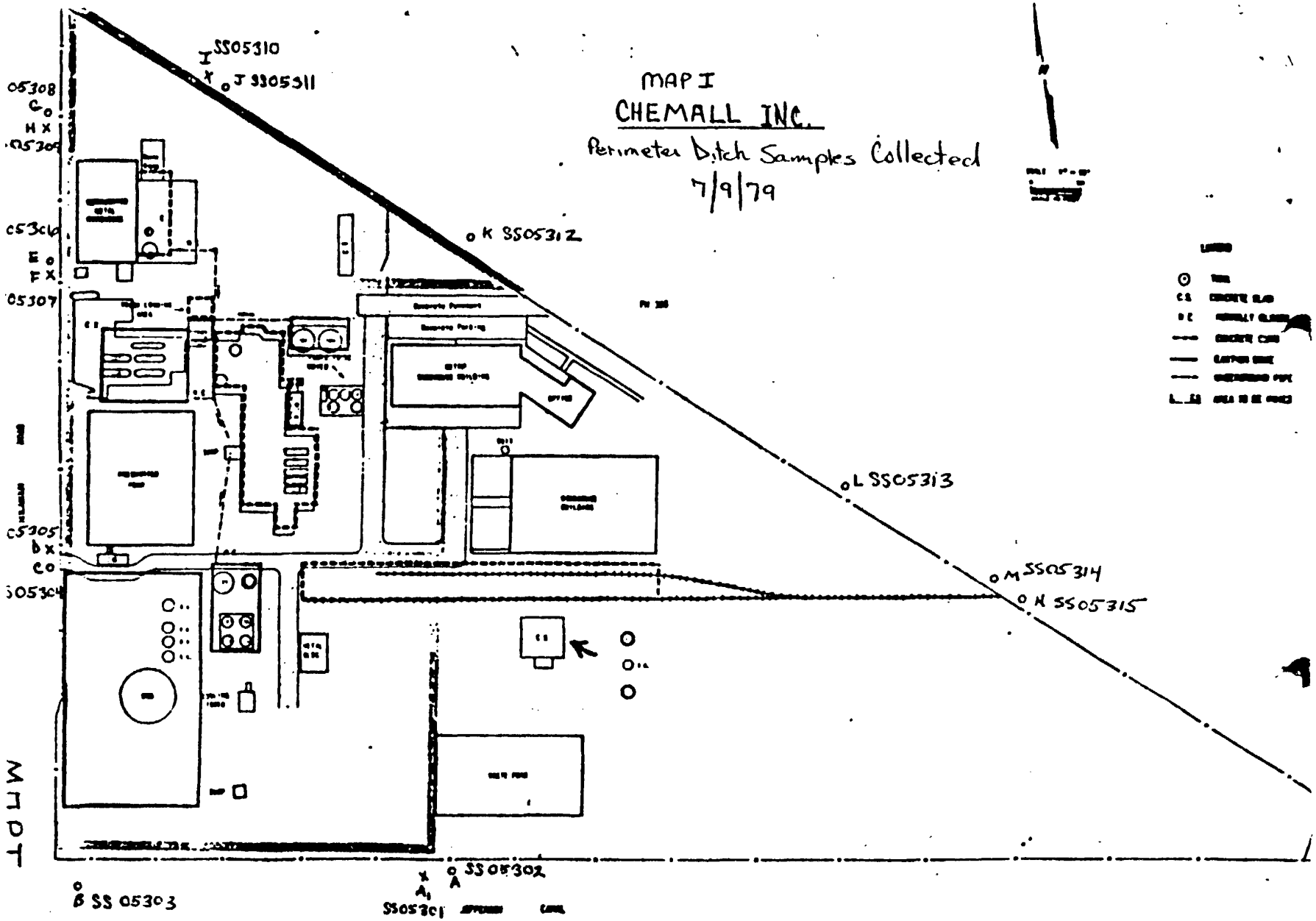
*Storm water samples in violation of 0.01 mg/l Toxaphene limitation.

Additional information including other sample locations and results, list of materials (products, by-product and raw materials) as well as the NPDES form 3560-3 and TDWR annual inspection form 0263 will be forthcoming pending receipt of data.

Approved: Clarence W. Moritz Signed: Susan S. Ferguson

Clarence W. Moritz Susan S. Ferguson

See Attachment


MAP I
CHEMALL INC.
Perimeter Ditch Samples Collected
7/9/79
I SS05310
J SS05311
K SS05312
L SS05313
M SS05314
N SS05315
SS05302
SS05301
SS 05303
05308
05307
05305
05304
MAPT

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Bruce Bigelow, General Counsel DATE: November 27, 1979

THRU : Gary D. Schroeder, Chief, Enforcement Support Section, Enforcement and Field Operations Division

FROM : Steve Cook, Enforcement and Field Operations Division

SUBJECT: Enforcement Action: Chemall, Inc. (Permit No. 01857 and Riverside Chemical Company (Permit No. 01857)

Attached are investigation reports concerning Chemall, Inc. and Riverside Chemical Company which bring to your attention alleged violations of Permit No. 01857. Enforcement Summaries based on these investigation reports have been circulated to the enforcement coordinators. Comments received from the coordinators are maintained in the Investigations Unit file. Pertinent comments are listed below:

> On August 3, 1979, the Executive Director, TDWR, requested Jefferson Chemical Company (Texaco, Inc.) to remove all toxaphene contaminated soils from the Jefferson Outfall Canal. By their letter (D. Bruce Pope/ Harvey Davis dated September 14, 1979--attached), they refused. (See Item IX,A.)

Please review these matters to determine whether enforcement action is appropriate.

Steve Cook

SSF:vw
Attachments
cc: TDWR District 6 Office

RECEIVED
NOV 30 1979
DEPT. OF
WATER RESOURCES
DISTRICT 6

INVESTIGATION REPORT

Chemall, Inc.
Permit No. 01857
Port Neches, Texas

I. Introduction

A. Identification

1. A manufacturer of chlorinated hydrocarbons operating under Permit No. 01857, issued May 22, 1974 and transferred on February 17, 1978 to Chemall, Inc., from Riverside Chemical Company. The treatment system consists of a primary settling pond with spray evaporation--, no discharge.

B. Current Discharge Limits

Parameter	Daily Average (kg/D)	(ppd)
BOD_5	4.5	10.0
COD	27.0	60.0
TSS	4.5	10.0
Oil & Grease	2.0	5.0
Toxaphene	0.0003	0.0007
Total chlorinated hydrocarbons (CCl_4)	n/a	n/a

C. Current Special Provisions, Permit No. 01857

1. All storm water which falls within the boundaries of the plant site shall be considered to be contaminated and will be given full treatment in the treatment plant prior to discharge should samples indicate that the quality of water exceeds these limits:

TOC	70 mg/l
Oil & Grease	15 mg/l
Toxaphene	0.01 mg/l
Total Chlorinated Hydrocarbons (CCl_4)	0.5 mg/l

2. The treatment technology considered to be the minimum necessary to properly treat the wastewaters which are authorized to be discharged by this permit during any period of plant production is considered to be neutralization, API separation, equalization, filtration, carbon absorption, or ion exchange, or reductive degradation, and any additional treatment or pretreatment necessary to stabilize biodegradable organic material to within the limits specified by this permit. An alternative treatment system may be used with prior approv from the Executive Director. No discharge of pollutants to the waters in this state is authorized by this permit unless the pollutant has received treatment in a facility which includes the processed specifie above or an approved alternative. This provision applies only to process water and contaminated storm water.

II. Waste Load

A. Source

The permittee chlorinates waxes and oils to produce chlorinated paraffi and chlorinated oils.

There are four (4) sources of process wastewaters at the plant. The largest volume source is effluent from the caustic scrubber. Waste tai gases from the hydrochloric absorption system are passed through a scrubber containing caustic to remove chlorine. Another wastewater source is boiler blowdown. The third source of process wastewater was drainage from the process area. The fourth source consists of cooling tower blowdown.

B. Quantity and Quality

7,500 gallons of scrubber effluent are discharged to the waste pond two times a month and contain high concentrations of chlorides. Boile blowdown contains high pH, and dissolves solids concentrations. Drain from the process area is variable in quantity and quality and would co any spillage or leakage within the process area.

III. Treatment System

A. The waste streams identified in II.A. are pumped to the waste pond whe a spray evaporation system is used.

B. Unit dimensions/capacities

Waste pond--100ft x 150ft x 6ft, with ≃1:2 internal slopes
area--<53,424ft^3*
maximum capacity--<399,612 gals*
capacity with 2ft freeboard--<266,408 gals

*Does not include sedimentation (solids buildup)

Spray evaporation system

5hp electric pump--70 gmp
3 Sprayco "mister" nozzels

IV. Receiving Stream

A. The permit specifies the permittee discharges to Star Lake Ditch, the into Star Lake thence into Neches Butane Products Outfall Canal thenc to Segment 0601 of the Neches River Basin. However, any discharge wo be to the Jefferson Outfall Canal, thence into Star Lake thence to Segment 0601 of the Neches River Basin.

B. Noncontact recreation, propagation of fish and wildlife, industrial navigation.

C. Past and present discharges of contaminated storm runoff containing toxaphene in excess of the permitted limitations have been documented. Subsequently, toxaphene has been found in large concentrations in sediments in the Jefferson Outfall Canal (IOM LH, 9/25/79). Toxaphene toxicity to aquatic organisms has been well documented.

V. Grant Status

None

VI. Previous Citations and Other Enforcement Action

A. No citations or other enforcement actions have been issued or initiated against Chemall, Inc., Permit No. 01857. Predecessors, Riverside Chemica Company and Bison Chemical Company, have been issued Enforcement Order No. 76-26 (May 26, 1976) and Judgement, Cause No. 1,799,641 (December 13, 1973), respectively.

VII. Violations

A. The permittee has failed to notify the Texas Department of Water Resource that they have changed operations, i.e. operating with a no-discharge system, in violation of Part II.A.1. of Permit No. 01857.

B. The permittee violated the 0.01 toxaphene limitation established in Part III of Permit No. 01857.

Violation	Data Source	Permit or Other Requirement
7/9/79--Grab Sample Toxaphene--0.018 mg/l	Chain of Custody Tag No. SS05303	0.01 mg/l
7/9/79--Grab Sample Toxaphene--0.018 mg/l	Chain of Custody Tag No. SS05304	0.01 mg/l
7/9/79--Grab Sample Toxaphene--0.016 mg/l	Chain of Custody Tag No. SS05311	0.01 mg/l
7/9/79--Grab Sample Toxaphene--0.016 mg/l	Chain of Custody Tag No. SS05312	0.01 mg/l
7/9/79--Grab Sample Toxaphene--0.014 mg/l	Chain of Custody Tag No. SS05313	0.01 mg/l
7/9/79--Grab Sample Toxaphene--0.02 mg/l	Chain of Custody Tag No. SS05314	0.01 mg/l
7/9/79--Grab Sample Toxaphene--0.018 mg/l	Chain of Custody Tag No. SS05315	0.01 mg/l

C. Failure to treat discharges of contaminated storm water listed above as required by Permit No. 01857.

D. Past or present storm water discharges have contaminated the soils in the perimeter ditches as evidenced by toxaphene concentrations of 878.0 mg/kg and 276.0 mg/kg within these sediments. In addition, such discharges of contaminated storm water would increase amount(s) of toxaphene retained in the receiving stream (see part IV). Interoffice memorandum dated Sept. 25, 1979 documents large concentrations of toxaph within sediments in the receiving stream.

VIII. Causes of Violation

Storm water runoff is contaminated with toxaphene residuals from the plant site. (The plant site was contaminated with toxaphene prior to the purchase of the plant by Chemall, Inc. from Riverside Chemical Company.)

IX. Technical Recommendations

A. Within 45 days, Chemall, Inc. shall remove all soils from the perimeter storm water ditches, adjacent to the plant site, which (a) contain more than 50.0 mg/kg toxaphene and/or (b) will leach ≥0.01 mg/l toxaphene in equal volumes distilled water and soil in 24 hours and dispose of such soils in site authorized in writing by the Executive Director, Texas Department of Water Resources (TDWR).

B. Within 60 days, Chemall, Inc. shall remove all soils from the Jefferson Outfall Canal, which (a) contains more than 50.0 mg/kg toxaphene and/or (b) will leach ≥0.01 mg/l toxaphene in distilled water in 24 hours and dispose of such soils in a site authorized in writing by the Executive Director, TDWR.

C. Within 90 days, Chemall, Inc. shall submit for acceptance by the Executi Director, TDWR, a plan prepared and signed by a certified professional engineer designed to eliminate any discharges of storm water containing excess of 0.01 mg/l toxaphene including a timetable for the construction of any and all appurtenances necessary to implement said plan.

D. Within 30 days of notice of acceptance of the plan referred to in Item by the Executive Director, TDWR, the permittee shall implement said plan.

E. If Item 3 contains no plans for a discharge, the permittee shall submit a permit amendment to reflect the current no discharge status.

F. Sediments in the waste pond were found to contain toxaphene concentratic in excess of 600 mg/kg. Within 45 days the permittee shall remove all s ments from the waste pond which (a) contain more than 50.0 mg/kg toxaphe and/or (b) will leach ≥0.01 mg/l toxaphene in equal volumes distilled wa and soil in 24 hours and dispose of such soils in site authorized in wri by the Executive Director, TDWR.

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G. Within 30 days, Chemall, Inc. shall submit a permit amendment correcting the route of the discharge so that it reads "to the Jefferson Chemical Outfall Canal thence into Star Lake thence to Segment 0601 of the Neches River Basin."

INVESTIGATION REPORT

Riverside Chemical Company
Permit No. 01857
Port Neches, Texas

I. Introduction

A. Identification

A. A manufacturer of chlorinated hydrocarbons operating under Permit No. 01857 issued May 22, 1976. The treatment system consists of a primary settling pond (installed by March 19, 1976). This facility was sold to Chemall, Inc. and the permit was transferred on February 17 1978.

B. Current Discharge Limits

Parameter	Daily Average (kg/D)	Daily Average (ppd)
BOD_5	4.5	10.0
COD	27.0	60.0
TSS	4.5	10.0
Oil & Grease	2.0	5.0
Toxaphene	0.0003	0.0007
Total Chlorinated Hydrocarbons (CCl_4)	n/a	n/a

C. Current Special Provisions, Permit No. 01857.

1. All storm water which falls within the boundaries of the plant sit shall be considered to be contaminated and will be given full treat ment in the treatment plant prior to discharge should samples indicate that the quality of water exceeds these limits:

TOC	70 mg/l
Oil & Grease	15 mg/l
Toxaphene	0.01 mg/l
Total Chlorinated Hydrocarbons (CCl_4)	0.5 mg/l

2. The treatment technology considered to be the minimum necessary to properly treat the wastewaters which are authorized to be dischar by this permit during any period of plant production is considere be neutralization, API separation, equalization, filtration, carbo absorption, or ion exchange, or reductive degradation, and any additional treatment or pretreatment necessary to stabilize biodegradable organic material to within the limits specified by this permit. An alternative treatment system may be used with prior approval from the Executive Director. No discharge of pollutants to the waters in this state is authorized by this permit unless the pollutant has received treatment in a facility which includes the processes specified above or an approved alternative. This provision applies only to process water and contaminated storm water.

APPENDIX B

The State of Texas Water Quality Inventory

The State of Texas Water Quality Inventory 94

SURFACE WATER QUALITY MONITORING PROGRAM

12th Edition, 1994 • Prepared Pursuant to Section 305(b) Federal Clean Water Act

Basin Summaries, Basin Maps, Segment Fact Sheets, and Water Quality Status Tables (Basins 1 - 12)

2

VOLUME TWO

SFR-11 ◆ 11/94

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

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THE STATE OF TEXAS WATER QUALITY INVENTORY

12th Edition
1994

Prepared Pursuant to
SECTION 305(b)
FEDERAL CLEAN WATER ACT

VOLUME 2

Basin Summaries, Basins Maps, Segment Fact Sheets,
and Water Quality Status Tables (Basins 1-12)

by the

Texas Natural Resource Conservation Commission

November 1994

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SEGMENT 0601 OF THE NECHES RIVER BASIN

NAME: Neches River Tidal

DESCRIPTION: from the confluence with Sabine Lake in Orange County to a point 11.3 kilometers (7.0 miles) upstream of IH 10 in Orange County

LENGTH/SURFACE AREA: 27 miles (43 kilometers)

SEGMENT CLASSIFICATION: Effluent Limited SEGMENT RANK: 243

DESIGNATED WATER USES: Contact Recreation
Intermediate Quality Aquatic Habitat

USE ATTAINABILITY ANALYSIS: None

STATIONS MONITORED IN THE LAST FOUR YEARS ON SEGMENT: 5 OFF SEGMENT: 1

PUBLISHED STUDIES:

22 Jul 1975	Q,L,F,C,S,P,I,B	IMS-55	(De La Cruz)
22 Sep 1980	F,C,W,S,T	IS-60	(Davis: May 1984)
16 Sep 1985	Q,X,L,F,C	IS-86-05	(Twidwell: Jun 1986)
28 May 1987	F,C,W,S,T,I,N	LP-89-07	(Davis: Dec 1989)

AMBIENT TOXICITY MONITORING STATIONS:
ON SEGMENT: 2
OFF SEGMENT: 0

SUMMARY OF FISH KILLS: None

FISH CONSUMPTION ADVISORIES AND/OR CLOSURES: Due to dioxin in fish tissue the Texas Department of Health issued in September 1990, an all fish restricted consumption advisory for the general population and an all fish no consumption advisory for children and women of child-bearing age. The area affected is from the IH-10 near Beaumont to the upper segment boundary, a distance of 7.0 miles.

PERMITTED FACILITIES (FINAL):

Domestic	11 outfalls	2.43 MGD
Industrial	64 outfalls	120.05 MGD
Total	75 outfalls	122.48 MGD

SEGMENT SUMMARY:

The tidal portion of the Neches River is highly developed, industrialized, and a busy international port. The segment receives numerous domestic and industrial wastewater discharges. Accidental spills of oil and other contaminants from industries along the river or from ships using the channel have the potential to episodically influence water quality of the segment. Historically, water quality in the segment has been generally poor. In the early 1970's, the tidal portion of the Neches River was one of Texas' most polluted waterways. Implementation of improved wastewater treatment at the major domestic and industrial wastewater treatment facilities in the early 1980's has resulted in a dramatic improvement in water quality in the segment. Water quality in the segment is now sufficient to support all of the designated uses, excepting the fish consumption use in the upper portion due to elevated levels of dioxin in fish tissues. Arsenic levels in sediment samples collected downstream of the Mobil Canal are frequently elevated and constitute a cause for concern.

000094

SEGMENT 601 Neches River Tidal

FIELD MEASUREMENTS AND WATER CHEMISTRY

Parameter	Standards Criteria	Screening Levels	Number of Samples	Number of Detects	Minimum	Maximum	Mean	Number of Values Outside Criteria or Screening Levels	Mean of Values Outside Criteria or Screening Levels	Percent of Values Outside Criteria or Screening Levels
WATER TEMP (C)	35.00		62	62	9.10	32.50	21.60	0	0.0	0.0%
DISSOLVED OXYGEN (MG/L)	3.00		62	62	3.70	9.57	6.65	0	0.0	0.0%
PH (SU)	6.00- 8.50		62	62	6.10	8.20	7.20	0	0.0	0.0%
CHLORIDE (MG/L)			60	60	8.00	7040.00	1118.95	0	0.0	0.0%
SULFATE (MG/L)			60	60	1.00	1170.00	183.05	0	0.0	0.0%
CONDUCTIVITY FIELD UMHOS			591	591	90.00	39100.00	8869.43	0	0.0	0.0%
TOTAL DISS SOLIDS (MG/L)			62	62	58.50	15808.00	3091.40	0	0.0	0.0%
AMMONIA (MG/L)		0.40	60	55	0.01	0.44	0.07	1	0.4	1.67%
NITRATES&NITRITES (MG/L)		0.40	60	58	0.01	1.00	0.09	1	1.0	2%
ORTHOPHOS (MG/L)		0.20	60	60	0.01	0.10	0.05	0	0.0	0.0%
TOTAL PHOSPHORUS (MG/L)		0.40	59	59	0.03	0.16	0.08	0	0.0	0.0%
CHLOROPHYL A (UG/L)		30.00	58	44	1.00	32.00	4.91	1	32.0	2%
FECAL COL (#/100 ML)	400.0		56	56	7.00	920.00	135.68	6	654.5	11%

SEGMENT 601 Neches River Tidal

TOXIC SUBSTANCES IN WATER

Storet Code	Parameter ug/L	Marine Acute Criteria	Marine Chronic Criteria	Number of Samples	Number of Detects	Minimum	Maximum	Mean	Number of Values Outside Acute Criteria	Mean Exceeds Chronic Criteria
01106	ALUMINUM	None	None	0	NA	NA	NA	NA	NA	NA
01000	ARSENIC	149.000	78.000	1	0	2.500	2.500	2.500	0	NO
01025	CADMIUM	45.620	10.020	1	0	0.500	0.500	0.500	0	NO
01220	CHROMIUM, HEXAVALENT	1100.000	50.000	0	NA	NA	NA	NA	NA	NO
01040	COPPER	16.270	4.370	1	0	2.000	2.000	2.000	0	NO
01049	LEAD	140.000	5.600	1	0	1.500	1.500	1.500	0	NO
71890	MERCURY	2.100	1.100	1	0	0.100	0.100	0.100	0	NO
01065	NICKEL	119.000	13.200	1	1	15.000	15.000	15.000	0	YES
01145	SELENIUM	564.000	136.000	1	0	2.500	2.500	2.500	0	NO
01090	ZINC	98.000	89.000	1	1	160.000	160.000	160.000	1	YES
39330	ALDRIN	1.300	None	6	0	0.004	0.100	0.022	0	NA
39350	CHLORDANE	0.090	0.004	6	0	0.002	0.002	0.002	0	NO
39370	DDT	0.130	0.001	6	0	0.001	0.001	0.001	0	NO
39380	DIELDRIN	0.710	0.002	6	0	0.001	0.001	0.001	0	NO
39388	ENDOSULFAN	0.034	0.009	6	0	0.004	0.004	0.004	0	NO
39390	ENDRIN	0.037	0.002	6	0	0.001	0.001	0.001	0	NO
39782	GAMMA-HEXACHLOROCYCLOHEXANE	0.160	None	6	0	0.004	0.015	0.007	0	NA
39410	HEPTACHLOR	0.053	0.004	6	0	0.002	0.002	0.002	0	NO
39530	MALATHION	None	0.010	6	0	0.005	0.005	0.005	NA	NO
39480	METHOXYCHLOR	None	0.030	6	0	0.015	0.015	0.015	NA	NO
39755	MIREX	None	0.001	0	NA	NA	NA	NA	NA	NO
39540	PARATHION	None	None	6	0	0.020	0.125	0.068	NA	NA
39516	PCBS	10.000	0.030	6	0	0.015	0.015	0.015	0	NO
39032	PENTACHLOROPHENOL	15.140	9.560	6	0	0.009	1.000	0.178	0	NO
39400	TOXAPHENE	0.210	0.000	6	0	0.000	0.000	0.000	0	NO
39740	2,4,5-T	259.000	12.000	6	0	0.019	2.500	0.437	0	NO

SEGMENT 601 Neches River Tidal

TOXIC SUBSTANCES IN SEDIMENT

Storet Code	Parameter	Units	Screening Levels	Number of Samples	Number of Detects	Minimum	Maximum	Mean	Number of Values Outside Criterion or Screening Levels
01003	ARSENIC	MG/KG	6.900	19	19	1.300	14.000	5.021	5
01008	BARIUM	MG/KG	297.000	17	17	31.000	175.000	84.000	0
01028	CADMIUM	MG/KG	1.500	19	1	0.100	0.740	0.352	0
01029	CHROMIUM	MG/KG	44.000	19	19	2.000	49.000	19.395	1
01043	COPPER	MG/KG	40.000	19	17	0.050	34.000	11.366	0
01052	LEAD	MG/KG	95.000	19	14	0.500	62.000	30.389	0
01053	MANGANESE	MG/KG	489.500	19	19	51.000	1120.000	336.895	4
71921	MERCURY	MG/KG	0.220	19	16	0.010	0.240	0.075	1
01068	NICKEL	MG/KG	19.000	19	18	1.100	25.000	9.347	1
01148	SELENIUM	MG/KG	1.250	19	2	0.100	1.300	0.405	1
01078	SILVER	MG/KG	1.600	19	5	0.100	1.600	0.737	0
01093	ZINC	MG/KG	170.000	19	19	20.000	96.000	59.105	0
39333	ALDRIN	UG/KG	0.500	10	0	0.015	1.250	0.419	0
39076	ALPHA-HEXACHLOROCYCLOHEXANE	UG/KG	0.500	8	0	0.015	1.250	0.481	0
39783	GAMA-HEXACHLOROCYCLOHEXANE	UG/KG	0.500	10	0	0.010	1.250	0.439	0
39102	BIS(2-ETHYLHEXYL) PHTHALATE	UG/KG	894.000	3	0	150.000	850.000	383.333	0
39571	DIAZINON	UG/KG	2.890	10	1	1.040	299.600	32.355	1
39112	DI-N-BUTYL PHTHALATE	UG/KG	350.000	3	0	25.000	850.000	300.000	0
39351	CHLORDANE	UG/KG	17.300	10	0	0.030	7.500	2.031	0
39363	DDD	UG/KG	3.000	10	0	0.030	7.500	1.980	0
39368	DDE	UG/KG	1.500	10	0	0.025	3.750	1.000	0
39373	DDT	UG/KG	3.000	10	0	0.025	7.500	1.975	0
39383	DIELDRIN	UG/KG	1.000	10	0	0.020	2.500	0.868	0
39393	ENDRIN	UG/KG	1.500	10	0	0.025	3.750	1.251	0
39413	HEPTACHLOR	UG/KG	0.250	10	0	0.015	6.500	0.816	0
39423	HEPTACHLOR EPOXIDE	UG/KG	0.500	10	0	0.020	1.250	0.441	0
39701	HEXACHLOROBENZENE	UG/KG	0.600	10	0	0.015	1.250	0.440	0
39531	MALATHION	UG/KG	2.500	8	0	0.095	6.500	2.432	0

39481 METHOXYCHLOR	UG/KG	5.000	10	0	0.130	5.000	3.172	0
39541 PARATHION	UG/KG	1.500	10	0	0.065	3.750	1.340	0
39519 PCBS	UG/KG	18.700	9	0	0.605	10.000	7.294	0
39507 AROCLOR 1254	UG/KG	25.000	1	0	25.000	25.000	25.000	0
39061 PENTACHLOROPHENOL	UG/KG	2.500	9	0	0.085	3250.000	362.820	0
39761 SILVEX	UG/KG	5.000	8	0	0.160	5.000	3.793	0
39403 TOXAPHENE	UG/KG	25.000	10	0	0.285	62.500	21.445	0
39731 2,4-D	UG/KG	25.000	10	0	0.695	25.000	18.515	0
39741 2,4,5-T	UG/KG	5.000	10	0	0.170	5.000	3.946	0

SEGMENT 601 Neches River Tidal

TOXIC SUBSTANCES IN TISSUE

Storet Code	Parameter	Units	Screening Levels	Number of Samples	Number of Detects	Minimum	Maximum	Mean	Number of Values Outside Criterion or Screening Levels
34680	ALDRIN	MG/KG	0.0904	10	0	0.0020	0.0020	0.0010	0
39074	ALPHA-HEXACHLOROCYCLOHEXANE	MG/KG	0.2440	7	0	0.0020	0.0020	0.0010	0
34258	BETA-HEXACHLOROCYCLOHEXANE	MG/KG	0.8540	0	0	NA	NA	NA	0
39075	GAMMA-HEXACHLOROCYCLOHEXANE	MG/KG	3.9010	10	0	0.0020	0.0020	0.0010	0
34241	BENZIDINE	MG/KG	0.0002	0	0	NA	NA	NA	0
34682	CHLORDANE	MG/KG	0.3000	10	0	0.0050	0.0200	0.0065	0
81897	DDD	MG/KG	6.4040	10	1	0.0100	0.0200	0.0077	0
81896	DDE	MG/KG	3.6340	10	5	0.0050	0.0400	0.0120	0
39376	DDT	MG/KG	3.5180	10	4	0.0100	0.0500	0.0171	0
39406	DIELDRIN	MG/KG	0.0379	10	0	0.0060	0.0060	0.0030	0
34687	HEPTACHLOR	MG/KG	0.1350	10	0	0.0020	0.0020	0.0010	0
34686	HEPTACHLOR EPOXIDE	MG/KG	0.1690	10	0	0.0040	0.0040	0.0020	0
34688	HEXACHLOROBENZENE	MG/KG	0.4060	10	0	0.0020	0.0020	0.0010	0
34400	HEXACHLOROETHANE	MG/KG	109.7780	0	0	NA	NA	NA	0
71936	LEAD	MG/KG	5.3330	10	1	1.0000	35.0000	4.1450	1
71930	MERCURY	MG/KG	1.0000	10	8	0.0400	0.1590	0.0720	0
34451	NITROBENZENE	MG/KG	5.9110	0	0	NA	NA	NA	0
39515	PCBS	MG/KG	0.0891	10	7	0.0400	0.1600	0.0755	3
39060	PENTACHLOROPHENOL	MG/KG	354.6670	0	0	NA	NA	NA	0
34691	TOXAPHENE	MG/KG	0.5520	10	0	0.1000	0.1000	0.0500	0

APPENDIX C

TNRCC Region 10 Environmental Assessment Program Sampling Results in Star Lake Canal

Texas Natural Resource Conservation Commission

Computer Center -- Xpress Print

REPORT DESCRIPTION

USERID - STANDARD

ACCOUNT NUMBER -

RUNID - STANDARD

FILENAME - BLANDRY9.00C

PARTNAME -

PARTNUMBER -

DATE - 07/01/96

TIME - 09:25:09

DEVICE - X4050

FORMAT - FPR5

QUEUE -

BIN -

DELIVER TO

Texas Natural Resource Conservation Commission

USERID - blandry

FILENAME - /tracs/spool/swqm/marshall.rpt

DATE - Jul 01, 1996

TIME - 09:03:26

ORIGIN - UNIX Network

BARBARA G LANDRY (512)-239-4595 F 02 C 231

Texas Natural Resource Conservation Commission

LPS Form UNXBNR (09-15-92)

```
 --Database              :prod::prod_db/SMNRPT
 --Report Program        :raw_data_report
 --Storet Code           :ALL
 --Order By              :seg_id,stream_seq_num,long_desc_txt

attWheepaCtypeE_txt      : swqm_station.epa_type1_txt LIKE 'AMBNT' swqm_station.epa_type2_txt LIKE 'AMBNT' swqm_station.epa_type3_txt LIKE 'AMBNT' swqm_
```

Station ID: 10485 Station#: 0600.0500 Lat: 29:58:45.00 Long: 093:51:41.99 County: 181 ORANGE
STAR LAKE CANAL 0.4 KM UPSTREAM OF THE NECHES RIVER

Segment : 0601
On Segment : No
Stream Seq : 00000
District# : 10
Basin : 6

HUC : 12010005
Reach : 0
On Reach : No
Mile Pt. : 0.00

EPA Type(s)
CANAL
AMBNT

USGS Gauge#:
Eco-Region : 34

Station Id: 10485 Date/Time: SEP-20-1973/10:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028645

00010	38.3	00011	101	00070	60	00081	220	00094	1920
00095	2240	00300	2.1	00400	9	00403	7.2	00530	33
00535	14	00610 <	0.1	00620 <	0.03	00650	0.57	00660	0.13
00665	0.186	00671	0.042	00940	580	00945	95	31501	310
31616	90	32211 <	4						

Station Id: 10485 Date/Time: OCT-17-1973/09:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028646

00010	32.8	00011	91	00070	70	00077	13	00081	260
00094	2600	00300	3.3	00400	9.7	00941	875		

Station Id: 10485 Date/Time: NOV-14-1973/10:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028647

00010	30.6	00011	87	00070	85	00077	10	00081	300
00094	1390	00300	3.8	00400	10.2	00941	390		

Station Id: 10485 Date/Time: DEC-17-1973/11:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028648

00010	27.2	00011	81	00070	75	00077	9	00081	275
00094	1600	00095	1770	00300	5.7	00400	11	00403	9.9
00410	74	00530	87	00535	18	00610 <	0.1	00620 <	0.03
00650	0.84	00660	0.19	00665	0.275	00671	0.062	00940	436
00945	107	31616 <	10	32211 <	4				

Station Id: 10485 Date/Time: JAN-28-1974/09:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028649

00010	29.4	00011	85	00070	79	00094	1400	00300	5.1
00400	11	00410	111	00415	70	00941	449		

Station Id: 10485 Date/Time: FEB-11-1974/10:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028650

00010	28.3	00011	83	00070	71	00094	1070	00095	1488
00300	5.8	00400	11	00403	10.3	00410	79	00415	43
00530	92	00535	42	00610 <	0.1	00620 <	0.03	00650	0.78
00660	0.08	00665	0.255	00671	0.026	00940	357	00945	42

Station Id: 10485 Date/Time: MAR-13-1974/10:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028651

00010	32.8	00011	91	00070	80	00094	1000	00095	1190
00300	4.2	00400	10.1	00403	9.8	00410	88	00415	50
00530	65	00535	18	00610 <	0.1	00620	0.06	00650	1.2
00660	0.03	00665	0.392	00671	0.01	00940	285	00945	44
31616 <	10	32211 <	4						

Station Id: 10485 Date/Time: MAR-13-1974/10:15 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028652

00010	32.8	00011	91	00094	1000	00300	4.2	00400	10.1

Station Id: 10485 Date/Time: APR-24-1974/09:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028653

00010	33.9	00011	93	00070	173	00095	1602	00300	2.1
00400	11	00403	10	00410	78	00415	28	00530	550
00535	70	00610	1.5	00620	0.05	00650	1.82	00660	0.03
00665	0.595	00671	0.01	00940	386	00945	86		

Station Id: 10485 Date/Time: MAY-06-1974/10:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028654

00010	36.7	00011	98	00070	104	00094	1130	00095	1472
00300	3.2	00400	9.6	00403	9.5	00410	79	00415	32
00530	104	00535	77	00610 <	0.1	00620 <	0.03	00650	0.81
00660	0.07	00665	0.265	00671	0.023	00680	45	00940	345
00945	101								

Station Id: 10485 Date/Time: JUN-10-1974/10:20 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028655

00010	37.8	00011	100	00070	75	00094	2500	00095	2240
00300	3.7	00400	10.2	00403	9.8	00410	98	00415	51
00530	118	00535	25	00610	1	00620	0.5	00650	0.55
00660	0.05	00665	0.18	00671	0.016	00680	28	00940	560
00945	91	31616	10	32211 <	4				

Station Id: 10485 Date/Time: JUL-02-1974/10:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028656

00010	39.4	00011	103	00070	55	00094	5600	00095	17024
00300	1.6	00400	8.8	00403	7.6	00410	81	00415	13
00530	18	00535	5	00610 <	0.1	00620	0.04	00650	0.57
00660	0.16	00665	0.186	00671	0.052	00680	16	00940	4410
00945	630	01002 <	5	01007 <	500	01022	700	01027 <	10
01034 <	100	01042 <	100	01045	300	01051 <	50	01055	100
01067 <	100	01077 <	50	01092 <	100	01147 <	1	71900 <	0.5

Station Id: 10485 Date/Time: AUG-14-1974/10:10 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028657

00010	42.2	00011	108	00070	33	00077	15	00094	15500
00095	17024	00300	1.7	00400	8.8	00403	8.9	00410	84
00415	19	00530	35	00535	11	00610 <	0.1	00620 <	0.03
00650	0.56	00660	0.28	00665	0.183	00671	0.092	00680	18
00940	4460	00945	630						

Station Id: 10485 Date/Time: SEP-27-1974/12:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028658

00010	35.6	00011	96	00070	45	00077	4	00094	8900
00095	9072	00300	2.1	00400	8.7	00403	7.3	00410	66
00415	13	00530	17	00535	14	00610 <	0.1	00620 <	0.03
00650	0.95	00660 <	0.03	00665	0.31	00671	0.01	00680	31
00940	2580	00945	361	31616	40	32211 <	4		

Station Id: 10485 Date/Time: OCT-30-1974/12:35 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028659

00010	33.3	00011	92	00070	32	00094	8500	00095	20720
00300	1.9	00400	8.8	00403	8.8	00410	121	00415	25
00530	53	00535	20	00610 <	0.1	00620	0.03	00650	0.32
00660 <	0.03	00665	0.105	00671	0.01	00680	14	00940	5600
00945	820								

Station Id: 10485 Date/Time: NOV-21-1974/12:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028660

00010	28.9	00011	84	00070	62	00077	8	00094	4600
00095	4940	00300	5	00400	9.2	00403	9.6	00410	66
00415	21	00530	74	00535	26	00610 <	0.1	00620	0.1
00650	0.53	00660 <	0.03	00665	0.173	00671	0.01	00680	24
00940	1320	00945	172						

Station Id: 10485 Date/Time: DEC-17-1974/10:10 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028661

00010	22.2	00011	72	00070	118	00077	3	00094	2150
00095	2320	00300	5.9	00400	9.3	00403	10.3	00410	160
00415	84	00530	129	00535	36	00610 <	0.1	00620	0.06
00650	0.75	00660 <	0.03	00665	0.245	00671	0.01	00680	26
00940	580	00945	85	31616	10	32211 <	4		

Station Id: 10485 Date/Time: JAN-09-1975/10:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028662

00010	26	00011	78.8	00070	60	00077	11	00094	1620
00095	1710	00300	6.2	00400	9.7	00403	10	00410	80
00415	40	00530	50	00535	12	00610 <	0.1	00620	0.07
00650	0.61	00660	0.14	00665	0.199	00671	0.046	00680	24
00940	405	00945	62						

Station Id: 10485 Date/Time: FEB-06-1975/11:20 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028663

00010	24	00011	75.2	00070	30	00077	11	00094	1750
00095	1881	00300	6.1	00400	9.8	00403	9.9	00410	86
00415	11	00530	50	00535	13	00610 <	0.1	00620	0.06
00650	0.57	00660	0.1	00665	0.186	00671	0.033	00680	11
00940	413	00945	65						

Station Id: 10485 Date/Time: MAR-25-1975/11:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028664

00010	26.5	00011	79.7	00070	70	00077	6	00094	1350
00095	1548	00300	5.5	00400	10	00403	10	00410	100
00415	46	00530	83	00535	18	00610 <	0.1	00620 <	0.02
00650	0.55	00660 <	0.03	00665	0.18	00671	0.01	00680	22
00940	369	00945	27	31616	10	32211 <	4		

Station Id: 10485 Date/Time: APR-09-1975/12:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028665

00010	28.1	00011	82.6	00070	61	00077	13	00094	4250
00095	3184	00300	4.6	00400	9.4	00403	9.4	00410	70
00415	37	00530	50	00535	17	00610 <	0.1	00620 <	0.02
00650	0.41	00660 <	0.03	00665	0.134	00671	0.01	00680	24
00940	810	00945	110						

Station Id: 10485 Date/Time: MAY-08-1975/10:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028666

00010	31.5	00011	88.7	00070	30	00077	16	00094	1275
00300	3.3	00400	10.1	00410	95	00415	51		

Station Id: 10485 Date/Time: JUN-26-1975/11:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028667

00010	34.9	00011	94.8	00070	51	00077	10	00094	590
00095	638	00300	3.8	00400	8.8	00403	7.7	00410	53
00415	9	00530	44	00535	11	00610	0.37	00650	0.64
00660	0.41	00665	0.209	00671	0.134	00680	22.5	00940	135
00945	39	31616	36	32211	12				

Station Id: 10485 Date/Time: JUL-14-1975/12:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028668

00010	36	00011	96.8	00070	27	00077	12	00094	2450
00300	2.5	00400	9.6	00410	81	00415	35		

Station Id: 10485 Date/Time: AUG-08-1975/12:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028669

00010	33	00011	91.4	00070	60	00077	10	00094	2220
00300	2.3	00400	9	00410	98	00415	21		

Station Id: 10485 Date/Time: SEP-23-1975/13:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028670

00010	34.5	00011	94.1	00070	72	00077	13	00094	11100
00095	9500	00300	3.6	00400	9.4	00403	9.8	00410	100
00415	33	00530	56	00535	22	00610	0.07	00650	0.31
00660	0.15	00665	0.101	00671	0.049	00680	13	00940	3200
00945	420	31616 <	1	32211	8				

Station Id: 10485 Date/Time: OCT-29-1975/13:35 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028671

00010	32	00011	89.6	00070	52	00077	13	00094	6800
00300	2.5	00400	8.2	00410	86	00415	25		

Station Id: 10485 Date/Time: NOV-18-1975/10:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028672

00010	28.2	00011	82.8	00094	7800	00300	3.2	00400	9.1

Station Id: 10485 Date/Time: NOV-18-1975/10:30 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028673

00010	28.2	00011	82.8	00094	7800	00300	3.2	00400	9.1

Station Id: 10485 Date/Time: DEC-29-1975/12:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028674

00010	22	00011	71.6	00070	79	00077	10	00094	11200
00095	11800	00300	5.2	00400	9	00410	92	00415	30
00530	41	00535	15	00610	0.25	00620	0.12	00650	0.53
00660	0.18	00665	0.173	00671	0.059	00940	3000	00945	600
31616	18	32211	4						

Station Id: 10485 Date/Time: JAN-15-1976/14:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028675

00010	20.2	00011	68.4	00070	90	00094	4900	00300	7.3
00400	9	00410	317	00415	157				

Station Id: 10485 Date/Time: FEB-20-1976/13:10 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028676

00010	29.5	00011	85.1	00070	62	00094	10500	00300	2.9
00400	9	00410	97	00415	35				

Station Id: 10485 Date/Time: MAR-17-1976/13:20 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028677

00010	25.9	00011	78.6	00070	90	00077	10	00094	6000
00095	5680	00300	6.1	00400	9.1	00403	9.7	00410	78
00415	30	00530	42	00535	12	00610	0.33	00620	0.18
00650	0.33	00660	0.1	00665	0.108	00671	0.033	00940	1650
00945	220	31616	10	32211	3				

Station Id: 10485 Date/Time: APR-08-1976/12:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028678

00010	31.2	00011	88.2	00070	45	00077	14	00094	4820
00300	4.6	00400	9.4	00410	90	00415	30		

Station Id: 10485 Date/Time: APR-08-1976/12:40 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028679

00010	31.2	00011	88.2	00094	4800	00300	4.5	00400	9.4

Station Id: 10485 Date/Time: MAY-20-1976/14:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028680

00010	31.8	00011	89.2	00070	50	00077	6	00094	1900
00300	4	00400	9.4	00410	66	00415	27		

Station Id: 10485 Date/Time: MAY-20-1976/14:00 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028681

00010	31.8	00011	89.2	00094	1900	00300	4	00400	9.5

Station Id: 10485 Date/Time: JUN-10-1976/12:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028682

00010	36	00011	96.8	00070	50	00077	12	00094	2200
00095	2550	00300	4.3	00400	9.1	00403	9.5	00410	79
00415	0	00530	29	00535 <	3	00610	0.09	00620	0.1
00650	0	00660	0.21	00665	0.09	00671	0.07	00680	24
00940	780	00945	89	32211	7				

Station Id:	10485	Date/Time: JUN-10-1976/12:15		Depth(m):	1.52	Data Source: WC FO RT		Tag# Z028683			
00010	36	00011	96.8	00094	2200	00300	4.2	00400	9.1		
Station Id:	10485	Date/Time: JUL-07-1976/13:30		Depth(m):	0.30	Data Source: WC FO RT		Tag# Z028684			
00010	34.8	00011	94.6	00070	69	00077	8	00094	2800		
00300	5.1	00400	9.6	00410	69	00415	32				
Station Id:	10485	Date/Time: JUL-07-1976/13:30		Depth(m):	1.52	Data Source: WC FO RT		Tag# Z028685			
00010	34.8	00011	94.6	00094	2920	00300	4.7	00400	9.6		
Station Id:	10485	Date/Time: AUG-05-1976/13:30		Depth(m):	0.30	Data Source: WC FO RT		Tag# Z028686			
00010	38.2	00011	100.8	00070	42	00077	13	00094	11000		
00300	3.4	00400	9.7	00403	9.7	00410	82	00415	23		
Station Id:	10485	Date/Time: AUG-05-1976/13:30		Depth(m):	1.52	Data Source: WC FO RT		Tag# Z028687			
00010	38.2	00011	100.8	00094	11000	00300	3.4	00400	9.7		
Station Id:	10485	Date/Time: SEP-09-1976/11:45		Depth(m):	0.30	Data Source: WC FO RT		Tag# Z028688			
00010	37.5	00011	99.5	00070	45	00077	12	00094	6900		
00095	8860	00300	2	00400	9.2	00403	9.2	00410	88		
00415	0	00530	39	00535	14	00610	0.11	00620	0.38		
00650	0.31	00660	0.03	00665	0.1	00671 <	0.01	00680	52		
00940	3050	00945	425	31616 <	1	32211	1	32218	0		
Station Id:	10485	Date/Time: SEP-09-1976/11:45		Depth(m):	1.52	Data Source: WC FO RT		Tag# Z028689			
00010	38	00011	100.4	00094	6800	00300	1.8	00400	9.2		
Station Id:	10485	Date/Time: OCT-22-1976/12:10		Depth(m):	0.30	Data Source: WC FO RT		Tag# Z028690			
00010	28	00011	82.4	00070	40	00077	17	00094	20000		
00300	4.6	00400	9.6	00415	59						
Station Id:	10485	Date/Time: OCT-22-1976/12:10		Depth(m):	1.52	Data Source: WC FO RT		Tag# Z028691			
00010	28	00011	82.4	00094	20000	00300	4.5	00400	9.6		

Station Id: 10485 Date/Time: NOV-09-1976/14:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028692

00010	26.5	00011	79.7	00070	30	00077	18	00094	18000
00300	4.7	00400	9.3	00415	43				

HIGH FLOW CONDITIONS

Station Id: 10485 Date/Time: DEC-01-1976/13:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028693

00010	22	00011	71.6	00070	40	00077	18	00094	12300
00095	11300	00300	6.4	00400	9.5	00403	9.7	00410	56
00415	40	00530	40	00535	16	00610	0.85	00620	0.35
00650	0.34	00660	0.06	00665	0.11	00671	0.02	00680	18
00940	4200	00945	580	31616 <	1	32211 <	1	32218	40

Station Id: 10485 Date/Time: JAN-07-1977/14:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028694

00010	19.2	00011	66.6	00070	50	00077	13	00094	8700
00300	7.5	00400	6.6	00415	0				

Station Id: 10485 Date/Time: JAN-07-1977/14:00 Depth(m): 1.22 Data Source: WC FO RT Tag# Z028695

00010	19.2	00011	66.6	00094	8600	00300	7.4	00400	6.6

Station Id: 10485 Date/Time: FEB-24-1977/13:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028696

00010	26.5	00011	79.7	00070	40	00077	13	00094	5050
00300	6.3	00400	6.2	00415	0				

Station Id: 10485 Date/Time: MAR-09-1977/13:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028697

00010	25.4	00011	77.7	00070	40	00094	3950	00095	410
00300	5.9	00400	6.4	00403	6.5	00410	20	00530	9
00535	2	00610	4.9	00620	0.15	00650	0.4	00660	0.18
00665	0.13	00671	0.06	00680	25	00940	175	00945	170
31616	36								

Station Id: 10485 Date/Time: APR-22-1977/12:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028698

00010	32	00011	89.6	00070	20	00077	15	00094	2850
00300	4.4	00400	7.1	00415	0				

Station Id: 10485 Date/Time: MAY-05-1977/13:55 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028699

00010	33	00011	91.4	00070	40	00077	12	00094	1100
00300	3.2	00400	6.6	00415	0				

HYDROLAB IS BEING REPAIRED UD

Station Id: 10485 Date/Time: JUN-02-1977/12:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028700

00010	37.5	00011	99.5	00070	8	00077	25	00094	7380
00095	8500	00300	1.4	00400	6.3	00403	6.8	00410	48
00415	0	00530	16	00535	6	00610	0.9	00620	0.23
00650	0.28	00660	0.03	00665	0.09	00671 <	0.01	00680	18
00940	2200	00945	330	01002 <	20	01007 <	50	01022 <	1000
01027 <	20	01034	20	01042 <	20	01045	630	01051 <	20
01055	150	01067	50	01077 <	20	01092 <	20	01147 <	20
31616 <	1	32211	7	32218	0	71900 <	0.5		

Station Id: 10485 Date/Time: JUL-06-1977/14:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028701

00010	36.8	00011	98.2	00070	30	00077	18	00094	9200
00300	3.1	00400	6.7	00415	0				

Station Id: 10485 Date/Time: AUG-02-1977/13:25 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028702

00010	39	00011	102.2	00070	20	00077	26	00094	14000
00300	5.5	00400	6.9	00415	0				

OIL SHEEN ON WATER SURFACE UD

Station Id: 10485 Date/Time: SEP-14-1977/14:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028703

00010	36.5	00011	97.7	00077	32	00094	10100	00095	18000
00300	4.5	00400	6.9	00403	7	00410	56	00530	16
00535	6	00610	0.73	00620	0.24	00650	0.28	00660	0.06
00665	0.09	00671	0.02	00680	14	00940	4650	00945	630
31616 <	1	32211	6	32218	3	70300	8200		

SKY PARTLY CLOUDY, THIN LATEX FILM ON SURFACE, ODOR PRESENT, HEAVY RAIN PREVIOUS NIGHT

Station Id: 10485 Date/Time: OCT-04-1977/12:55 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028704

00010	35	00011	95	00077	22	00094	13800	00300	4.4
00400	7	00415	0						

CLEAR AND MILD Y,

Station Id: 10485 Date/Time: NOV-17-1977/12:10 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028705

00010	29	00011	84	00077	36	00094	21800	00300	6.1
00400	7.3	00415	0						

SKY PARTLY CLOUDY, WARM, STILL

Station Id: 10485 Date/Time: DEC-05-1977/11:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028706

00010	26.5	00011	79.7	00070	40	00077	17	00094	3100
00095	3900	00300	4.7	00400	6.3	00403	6.5	00410	29
00415	0	00530	22	00535	7	00610	0.23	00620	0.18
00650	0.18	00660 <	0.03	00665	0.06	00671 <	0.01	00680	25
00940	900	00945	126	31616	36	32211	3	32218 <	1
70300	1730								

WEATHER CLEAR AND MILD, USUAL BAD ODOR PRESENT

Station Id: 10485 Date/Time: JAN-13-1978/12:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028708

00010	19.5	00011	67.1	00070	40	00077	23	00094	14800
00300	6.9	00400	6.9	00415	0				

OVERCAST AND COLD, TIDE OUTGOING

Station Id: 10485 Date/Time: FEB-23-1978/13:25 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028710

00010	20	00070	90	00077	11	00094	3250	00300	8.5
00400	6.5	00415	0						

WEATHER CLEAR AND MILD, FLOW NORMAL, TYPICAL LATEX ODOR PRESENT VY

Station Id: 10485 Date/Time: MAR-09-1978/13:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028712

00010	20.5	00070	55	00077	16	00094	10100	00095	10988
00300	7.3	00400	6.8	00403	6.7	00410	41	00415	0
00530	26	00535	6	00610	0.79	00620	0.2	00665	0.02
00671	0.16	00680	16	00940	3325	00945	468	31616	70
32211	6	32218 <	1	70300	6399				

COLD, OVERCAST, CANAL LEVEL LOW DUE TO TIDE OUT

Station Id: 10485 Date/Time: APR-11-1978/14:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028714

00010	26.9	00077	16	00094	10000	00300	6.2	00400	6.9

SLIGHT OIL SHEENCA

Station Id: 10485 Date/Time: MAY-18-1978/14:10 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028715

00010	36	00011	97	00077	27	00094	19000	00300	4.6
00400	6.8								

Station Id: 10485 Date/Time: JUN-23-1978/13:05 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028718

00010	39.2	00011	102.6	00077	25	00094	9900	00095	9316
00300	4.4	00400	6.7	00403	6.8	00410	45	00530	11
00535	4	00610	0.08	00620	0.27	00650	0.21	00660 <	0.03
00665	0.07	00671 <	0.01	00680	15	00940	3200	00945	450
01002 <	20	01027 <	20	01034 <	20	01042 <	20	01045	680
01051 <	20	01055	240	01067	20	01092 <	20	01147 <	20
31616	100	32211	6	32218	4	70300	5741	71900 <	0.5

ALGAL SCUM FLOATING WITH

Station Id: 10485 Date/Time: JUL-11-1978/01:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028720

00010	38.6	00011	101.5	00070	15	00077	22	00094	8000
00300	4	00400	6.9	00415	0				

Station Id: 10485 Date/Time: AUG-03-1978/12:35 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028722

00010	38.6	00011	101.5	00077	27	00094	11700	00300	4.5
00400	6.9	00415	0						

HAZY, STILL, HOTIN

Station Id: 10485 Date/Time: SEP-21-1978/12:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028724

00010	36.1	00011	97	00077	27	00094	15800	00095	10837
00300	3.4	00400	7.1	00403	6.8	00410	60	00530	8
00535	4	00610	0.34	00620	0.33	00650	0.18	00660	0.03
00665	0.06	00671	0.01	00680	16	00940	4850	00945	664
31616	30	32211	3	32218	3	70300	8915		

PARTLY CLOUDY, HOT

Station Id: 10485 Date/Time: OCT-12-1978/12:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028726

00010	32.5	00011	90.5	00070	15	00077	26	00094	16000
00300	5.2	00400	7.6						

PARTLY CLOUDY, WARM

Station Id: 10485 Date/Time: NOV-01-1978/13:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028728

00010	31.8	00011	89.2	00077	37	00094	25000	00300	5.3
00400	7.2								

CLEAR AND WARM AR

Station Id: 10485 Date/Time: DEC-06-1978/13:20 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028729

00010	25.6	00011	78.1	00077	20	00094	7900	00095	7560
00300	4.8	00400	6.9	00403	6.9	00410	22	00530	10
00535	3	00610	2.2	00620	0.23	00650	0.24	00660	0.06
00665	0.08	00671	0.02	00680	21	00940	2425	00945	382
31616	360	32211	4	32218 <	1				

OVERCAST, COOL AR

Station Id: 10485 Date/Time: JAN-12-1979/13:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028732

00010	15.5	00011	59.9	00077	9	00094	1300	00300	9.4
00400	6.5								

CLEAR, COOL

Station Id: 10485 Date/Time: FEB-08-1979/16:05 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028733

00010	19.2	00011	66.6	00077	12	00094	1300	00300	8.4
00400	6.7								

PARTLY CLOUDY, MILD

Station Id: 10485 Date/Time: MAR-06-1979/14:35 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028734

00010	25.4	00011	77.7	00077	13	00094	460	00095	485
00300	7.4	00400	6.6	00403	7	00410	22	00530	17
00535 <	3	00610	1.4	00620	0.13	00650	0.37	00660	0.06
00665	0.12	00671	0.02	00680	16	00940	110	00945	58
31616	90	32211	6	32218 <	1				

CLEAR, MILD

Station Id: 10485 Date/Time: APR-18-1979/14:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028737

00010	29.6	00011	85.3	00077	10	00094	520	00300	5.9
00400	6.6								

OVERCAST, MILD, WINDY

Station Id: 10485 Date/Time: MAY-31-1979/09:35 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028739

00010	28.7	00011	83.7	00077	13	00094	530	00300	6
00400	6.6								

OVERCAST, MILD, RECENT HEAVY RAINS

Station Id: 10485 Date/Time: JUN-14-1979/13:50 Depth(m): UNSP Data Source: WC FO RT Tag#: Z028741
Start Date/Time: JUN-14-1979/13:50 Start Depth: UNSP (m) Compsite Category: S Compsite Calculation: Composite Type:

39333 <	0.5	39351 <	10	39363 <	8	39368 <	6.5	39373 <	8
39383 <	2	39393 <	3	39403 <	50	39413 <	0.5	39423 <	1
39481 <	10	39519 <	20	39541 <	3	39571 <	5	39601 <	3
39761 <	10	39783 <	1						

SEDIMENT - 4 SUBSAMPLES, BLACK MUCK WITH SHELL OR HARD DEPOSITS VY

Station Id: 10485 Date/Time: JUN-14-1979/13:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028742

00010	33.7	00011	92.7	00070	60	00077	12	00094	370
00095	350	00300	4.6	00400	6.3	00403	6.7	00410	21
00530	23	00535	6	00610	0.67	00620	0.2	00650	0.61
00660	0.15	00665	0.2	00671	0.05	00680	20	00940	63
00945	41	01147 <	20	31616	20	32211	10	32218	2

CLEAR, HOT, STILL

Station Id: 10485 Date/Time: JUN-14-1979/13:50 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028743

00010	33.6	00011	92.5	00094	372	00300	4.5	00400	6.3

Station Id: 10485 Date/Time: JUL-17-1979/12:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028745

00010	37	00011	98.6	00077	9	00094	2500	00300	4.4
00400	7								

PARTLY CLOUDY, HOT

Station Id: 10485 Date/Time: AUG-10-1979/13:20 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028746

00010	33.8	00011	92.8	00077	11	00094	1100	00300	3.2
00400	6.6								

THUNDERSTORMS, WARM, WATER YELLOW-BROWN S

Station Id: 10485 Date/Time: SEP-05-1979/13:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028748

00010	34.4	00011	93.9	00077	9	00094	2650	00095	2830
00300	2.9	00400	6.4	00403	6.6	00410	33	00530	56
00535	7	00610	0.15	00620	0.94	00650	0.43	00660	0.09
00665	0.14	00671	0.03	00680	14	00940	720	00945	130
31616	70	32211	6	32218	2				

OVERCAST, HOT, WATER TURBID, SMELLY

Station Id: 10485 Date/Time: DEC-10-1979/13:10 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028753

00010	21	00011	69.8	00077	12	00094	5800	00095	5200
00300	6.9	00400	7.2	00403	7.2	00410	33	00530	33
00535	6	00610	0.22	00620	0.63	00650	0.24	00660	< 0.03
00665	0.08	00671	< 0.01	00680	12	00940	1700	00945	250
31616	30	32211	6	32218	2				

CLEAR, COOL, LATEX FILM ON WATER

Station Id: 10485 Date/Time: MAR-28-1980/13:05 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028757

00010	21.9	00011	71.4	00077	15	00094	2190	00095	2030
00300	7.6	00403	7	00410	44	00530	20	00535	5
00610	0.14	00620	0.87	00650	0.31	00660	0.03	00665	0.1
00671	0.01	00680	11	00940	510	00945	119	31616	500
32211	< 1	32218	21						

CLEARING, MILD, RECENT HEAVY RAINS, ALLIGATOR OBSERVED

Station Id: 10485 Date/Time: JUN-09-1980/12:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028760

00010	33.1	00011	91.6	00077	11	00094	549	00095	450
00300	5.5	00400	6.6	00403	6.9	00410	25	00530	55
00535	9	00610	0.1	00620	1	00650	0.46	00660	0.12
00665	0.15	00671	0.04	00680	15	00940	84	00945	29
31616	120	32211	18	32218	5				

OVERCAST, RAIN, MILD

Station Id: 10485 Date/Time: JUN-09-1980/12:50 Depth(m): 1.83 Data Source: WC FO RT Tag# Z028761

39102	< 50	39112	< 10	39333	< 1	39351	< 2	39363	< 1
39368	< 1	39373	< 1	39383	< 1	39393	< 1	39403	< 5
39413	< 1	39423	< 1	39481	< 1	39519	< 5	39531	< 1
39541	< 1	39571	< 1	39601	< 1	39783	< 1		

Station Id: 10485 Date/Time: SEP-15-1980/13:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028765

00010	34.1	00011	93.4	00077	26	00094	5530	00095	5050
00300	4.7	00400	6.4	00403	6.8	00410	38	00530	20
00535	7	00610	0.27	00620	0.83	00650	0.21	00660	0.06
00665	0.07	00671	0.02	00680	6	00940	1600	00945	300
31616	< 1	32211	10	32218	4				

HAZY, HOT

Station Id: 10485 Date/Time: SEP-09-1981/13:55 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028785

00010	33.2	00011	91.8	00077	19	00094	11830	00095	9800
00300	4.2	00400	7	00403	7.2	00410	56	00530	14
00535	4	00610	0.18	00620	0.26	00650	0.58	00660	0.31
00665	0.19	00671	0.1	00680	9	00940	3600	00945	480
31616	50	32211	6	32218	4				

CLEAR, WARM, WATER YELLOW BROWN, SLIGHTLY TURBID

Station Id: 10485 Date/Time: SEP-09-1981/13:55 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028786

00010	33.1	00011	91.6	00094	11800	00300	4.2	00400	7

Station Id: 10485 Date/Time: DEC-18-1981/14:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028790

00010	19.5	00011	67.1	00077	19	00094	17030	00095	13900
00300	7.3	00400	7	00403	7.5	00410	61	00530	30
00535	9	00610	0.25	00620	11	00650	0.89	00660	0.77
00665	0.29	00671	0.25	00680	11	00940	4800	00945	740
31616	70	32211	3	32218	2				

CLEAR, COLD, WINDY, TIDE OUT, WATER CLEAR AND DARK AR

Station Id: 10485 Date/Time: MAR-04-1982/13:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028794

00010	21.7	00011	71.1	00077	15	00094	8430	00095	6500
00300	6.6	00400	6.7	00403	7.1	00410	48	00530	16
00535	4	00610	0.14	00620	1.1	00650	0.37	00660	0.18
00665	0.12	00671	0.06	00680	17	00940	2500	00945	420
31616	170	32211	5	32218 <	1				

CLOUDY, MILD, WINDY, WATER BROWN

Station Id: 10485 Date/Time: MAR-04-1982/13:45 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028795

00010	21.1	00011	70	00094	8370	00300	6.4	00400	6.8

Station Id: 10485 Date/Time: JUN-23-1982/13:25 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028799

00010	34.3	00011	93.7	00077	20	00095	8400	00300	5.8
00400	7	00403	7.2	00410	49	00530	17	00535	5
00610	0.18	00620	0.8	00650	0.37	00660	0.15	00665	0.12
00671	0.05	00680 <	3	00940	3200	00945	490	31616 <	100
32211	8	32218	3						

PARTLY CLOUDY, HOT, WATER OLIVE-BROWN WITH SMALL BITS OF PLANTS RL

Station Id: 10485 Date/Time: JUN-23-1982/13:25 Depth(m): 1.83 Data Source: WC FO RT Tag# Z028800

39102	<	50	39112	<	10	39333	<	1	39351	<	2
39363	<	1	39368	<	1	39373	<	1	39383	<	1
39393	<	1	39403	<	5	39413	<	1	39423	<	1
39481	<	1	39519	<	5	39531	<	1	39541	<	1
39571	<	1	39601	<	1	39783	<	1			

SEDIMENT - 5 SUBSAMPLES, BLACK MUCK WITH CRUSTY SURFACE, GRITTY RL

Station Id: 10485 Date/Time: SEP-09-1982/13:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028803

00010	33	00011	91	00077	36	00094	21000	00095	18800	00300	3.7
00400	7.1	00403	7.2	00410	68	00530	10	00535	5	00610	0.11
00620	0.87	00650	0.4	00660	0.21	00665	0.13	00671	0.07	00680	4
00940	7000	00945	900	31616	36	32211	6	32218	2		

WARM, WINDY, HAZY, WATER GREENISH-BROWN C

Station Id: 10485 Date/Time: SEP-09-1982/13:45 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028804

00010	33	00011	91.4	00094	21000	00300	3.6	00400	7.1

Station Id: 10485 Date/Time: DEC-16-1982/14:05 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028809

00010	18.5	00011	65.3	00094	4570	00095	3800	00300	7
00400	6.5	00403	6.7	00410	34	00530	26	00535	5
00610	0.11	00620	0.17	00650	0.55	00660	0.24	00665	0.18
00671	0.08	00680	10	00940	1300	00945	190	31616	900
32211	3	32218	< 1						

Station Id: 10485 Date/Time: DEC-16-1982/14:05 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028810

00010	18.5	00011	65.3	00094	4570	00300	7	00400	6.5

Station Id: 10485 Date/Time: MAR-24-1983/13:10 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028813

00010	17.9	00011	64.2	00077	24	00094	1755	00095	1654
00300	9.1	00400	6.5	00403	6.72	00410	28	00530	15
00535	5	00610	0.169	00620	0.182	00650	0.373	00660	0.245
00665	0.122	00671	0.08	00680	13	00940	599	00945	91
31616	836								

CLEAR, COOL, LIGHT BREEZE, OUTGOING TIDE, WATER LIGHT BROWN

Station Id: 10485 Date/Time: MAR-24-1983/13:10 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028814

00010	17.1	00011	62.8	00094	1751	00300	8.8	00400	6.5

Station Id: 10485 Date/Time: JUN-09-1983/14:22 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028818

00010	32	00011	89.6	00077	10	00094	1100	00095	1270
00300	5.6	00400	6.5	00403	6.78	00410	28	00530	18
00535	1	00610	0.1	00620	0.177	00650	0.312	00660	0.303
00665	0.102	00671	0.099	00680	27	00940	280	00945	77

RECENT RAINS

Station Id: 10485 Date/Time: JUN-09-1983/14:22 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028819

00010	32	00011	89.6	00094	1200	00300	5.5

Station Id: 10485 Date/Time: JUN-09-1983/14:22 Depth(m): 2.13 Data Source: WC FO RT Tag# Z028820

00010	32	00011	89.6	00094	1200	00300	5.4	39102	582
39112 <	50	39333 <	0.5	39351 <	3	39363 <	3	39368 <	1.5
39373 <	3	39383 <	2	39393 <	3	39403 <	50	39413 <	0.5
39423 <	1	39481 <	10	39519 <	20	39531 <	5	39541 <	3
39571 <	5	39601 <	3	39783 <	1				

RECENT RAIN

Station Id: 10485 Date/Time: SEP-22-1983/13:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028825

00010	29	00011	84.2	00077	12	00094	3300	00095	3100
00300	5	00400	7	00410	32	00530	19	00535	7
00610	0.11	00620	0.2	00650	0.49	00660	0.21	00665	0.16
00671	0.07	00680	14	00940	890	00945	150	31616	70
32211 <	1	32218	5						

Station Id: 10485 Date/Time: SEP-22-1983/13:30 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028826

00010	29	00011	84.2	00300	4.9

Station Id: 10485 Date/Time: DEC-08-1983/14:34 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028830

00010	21.9	00011	71.4	00077	8	00094	5170	00095	3840
00300	7	00400	6.8	00403	6.6	00410	26	00530	39
00535	8	00610	0.06	00620	0.73	00650	0.58	00660	0.28
00665	0.19	00671	0.09	00680	17	00940	1200	00945	180
31616	91	32211	6	32218	2				

Station Id: 10485 Date/Time: DEC-08-1983/14:34 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028831

00010	21.9	00011	71.4	00094	5160	00300	6.8	00400	6.8

Station Id: 10485 Date/Time: MAR-07-1984/13:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028834

00010	22	00011	72	00077	13	00095	1140	00300	6.4
00400	6.8	00403	7	00410	24	00530	14	00535	3
00610	0.87	00620	0.5	00650	0.28	00660 <	0.03	00665	0.09
00671 <	0.01	00680	12	00940	270	00945	61	32211	4
32218 <	1								

CRUMB RUBBER, POPCORN POLYMER, AND SCUM FLOATING ON WATER, AROMATIC ODOR

Station Id: 10485 Date/Time: AUG-20-1984/14:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028839

00010	37	00011	98.6	00077	30	00095	10500	00300	4.8
00400	6.6	00403	7.3	00410	51	00530	14	00535	5
00610	0.04	00620	0.19	00650	0.52	00660	0.28	00665	0.17
00671	0.09	00680	11	00940	2800	00945	430	31616 <	5

Station Id: 10485 Date/Time: AUG-20-1984/14:45 Depth(m): 2.74 Data Source: WC FO RT Tag# Z028840

39102 <	300	39112 <	50	39333 <	1	39351 <	3	39363 <	3
39368 <	1.5	39373 <	3	39383 <	2	39393 <	3	39403 <	50
39413 <	0.5	39423 <	1	39481 <	10	39519 <	20	39531 <	5
39541 <	3	39571 <	5	39601 <	3	39783 <	1		

Station Id: 10485 Date/Time: SEP-28-1984/13:46 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028843

00010	27.2	00011	81	00077	24	00094	13700	00095	13100
00300	4.7	00400	6.5	00403	7.2	00410	60	00530	18
00535	5	00610	0.11	00620	0.48	00650	0.77	00660	0.43
00665	0.25	00671	0.14	00680	8	00940	4400	00945	650
31616 <	2	32211	7	32218 <	1				

A LOT OF SUSPENDED MATERIAL, WATER ALMOST APPEARS MILKY

Station Id: 10485 Date/Time: DEC-19-1984/14:20 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028847

00010	22.5	00011	72.5	00077	19	00094	4200	00095	3530
00300	5.9	00400	7.1	00403	7.2	00410	45	00530	14
00535	9	00610	0.4	00620	0.22	00650	0.24	00660 <	0.03
00665	0.08	00671 <	0.01	00680	23	00940	1000	00945	180
31616	190	32211	6	32218	4				

Station Id: 10485 Date/Time: DEC-19-1984/14:20 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028848

00010	22.5	00011	72.5	00094	4300	00300	5.6	00400	7.1

Station Id: 10485 Date/Time: MAR-06-1985/14:35 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028852

00010	18.4	00011	65.1	00077	10.2	00094	565	00095	525
00300	7.9	00400	7	00403	6.79	00410	29	00530	28
00535	6	00610	1.55	00620	0.056	00650	0.395	00660	0.288
00665	0.129	00671	0.094	00680	22	00900	49	00940	120
00945	37	01002 <	20	01007 <	50	01027 <	20	01034 <	20
01042	40	01045	1500	01051 <	20	01055	90	01067 <	20
01077 <	20	01092	90	01147 <	20	31616	66	32211 <	0.1
32218	103	71900 <	0.5						

Station Id: 10485 Date/Time: MAR-06-1985/14:35 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028853

00010	18.5	00011	65.3	00094	563	00300	7.8	00400	6.8

Station Id: 10485 Date/Time: JUN-24-1985/14:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028857

00010	34.9	00011	94.8	00077	20	00094	9920	00095	9550
00300	5.2	00400	7	00403	7.2	00410	55	00530	12
00535	4	00610	0.07	00620	0.29	00650	0.4	00660	0.24
00665	0.13	00671	0.08	00680	22	00940	2900	00945	410
31616	16								

SLIGHT SHEEN ON WATER.

Station Id: 10485 Date/Time: SEP-17-1985/11:30 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028860

00010	30.4	00011	86.7	00077	22	00094	7014	00095	16422
00300	5.1	00400	7.4	00403	7.34	00410	64	00530	14
00535	5	00610	0.063	00620	0.42	00650	0.551	00660	0.435
00665	0.18	00671	0.142	00680	43	00940	7000	00945	672
32211	4.9	32218 <	0.2						

Station Id: 10485 Date/Time: SEP-17-1985/15:42 Depth(m): 0.30 Data Source: WC CO SS Tag# Z028861

00010	30.3	00011	86.54	00094	16050	00300	6.2	00400	6.7

Station Id: 10485 Date/Time: SEP-17-1985/15:42 Depth(m): 3.05 Data Source: WC CO SS Tag# Z028862

00010	30.4	00011	86.72	00094	16330	00300	6.3	00400	6.9

Station Id: 10485 Date/Time: SEP-17-1985/19:13 Depth(m): 0.30 Data Source: WC CO SS Tag# Z028863

00010	31.5	00011	88.7	00094	18000	00300	6.2	00400	6.8

Station Id: 10485 Date/Time: SEP-17-1985/19:13 Depth(m): 3.05 Data Source: WC CO SS Tag# Z028864

00010	29	00011	84.2	00094	18500	00300	5.7	00400	7.1

Station Id: 10485 Date/Time: SEP-17-1985/22:56 Depth(m): 0.30 Data Source: WC CO SS Tag# Z028865

00010	28.4	00011	83.12	00094	20000	00300	5.7	00400	7

Station Id: 10485 Date/Time: SEP-17-1985/22:56 Depth(m): 3.05 Data Source: WC CO SS Tag# Z028866

00010	28.5	00011	83.3	00094	22000	00300	5.7	00400	7.1

Station Id: 10485 Date/Time: SEP-18-1985/01:00 Depth(m): UNSP Data Source: WC CO SS Tag#: Z028867
Start Date/Time: SEP-18-1985/01:00 Start Depth: UNSP (m) Compsite Category: B Compsite Calculation: Composite Type:

00095	23856	00307	1	00308	3.5	00309	2.5	00314	1.5
00403	7.5	00410	65	00530	19	00535	6	00610	0.02
00615	0.05	00620	0.29	00625	0.7	00650	0.4896	00660	0.2754
00665	0.16	00671	0.09	00684	6	00940	5930	00945	868
32211	9	32218	3	70300	11130				

Station Id: 10485 Date/Time: SEP-18-1985/02:54 Depth(m): 0.30 Data Source: WC CO SS Tag# Z028868

00010	30	00011	86	00094	17000	00300	4.7	00400	6.6

Station Id: 10485 Date/Time: SEP-18-1985/02:54 Depth(m): 3.05 Data Source: WC CO SS Tag# Z028869

00010	29	00011	84.2	00094	22000	00300	5.3	00400	7

Station Id: 10485 Date/Time: SEP-18-1985/07:31 Depth(m): 0.30 Data Source: WC CO SS Tag# Z028870

00010	30	00011	86	00094	19000	00300	4.7	00400	6.7

Station Id: 10485 Date/Time: SEP-18-1985/07:31 Depth(m): 3.05 Data Source: WC CO SS Tag# Z028871

00010	29	00011	84.2	00094	23000	00300	5.4	00400	6.9

Station Id: 10485 Date/Time: SEP-18-1985/10:40 Depth(m): 0.30 Data Source: WC CO SS Tag# Z028872

00010	31	00011	87.8	00094	20000	00300	4.4	00400	6.7

Station Id: 10485 Date/Time: SEP-18-1985/10:40 Depth(m): 3.05 Data Source: WC CO SS Tag# Z028873

00010	31	00011	87.8	00094	20000	00300	4.3	00400	6.7

Station Id: 10485 Date/Time: DEC-04-1985/12:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028876

00010	17.5	00077	8	00094	3100	00095	3162	00300	7.8
00400	6.4	00403	6.95	00410	42	00530	12	00535	4
00610	0.104	00620	0.756	00665	0.303	00671	0.237	00900	296
00940	875	00945	116	01002	2	01007	56	01027	< 2
01034	< 8	01042	196	01045	2190	01051	< 10	01055	100
01067	69	01077	< 2	01092	248	01147	< 2	31616	230
32211	8.4	32218	1.4	71900	< 0.2				

Station Id: 10485 Date/Time: DEC-04-1985/12:45 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028877

00010	17.5	00094	3100	00300	7.9	00400	6.7

Station Id: 10485 Date/Time: MAR-11-1986/14:49 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028881

00010	24	00077	10.5	00094	4640	00095	5757	00300	7
00400	6.7	00403	7.48	00410	36	00530	26	00535	4
00610	0.323	00620	1.04	00665	0.346	00671	0.194	00940	1571
00945	185	31616	220	32211	8.3	32218	5		

Station Id: 10485 Date/Time: MAR-11-1986/14:49 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028882

00010	23.7	00094	4980	00300	6.9	00400	6.8

Station Id: 10485 Date/Time: JUN-12-1986/12:34 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028886

00010	31.3	00077	10	00094	1011	00095	1047	00300	4.9
00400	6.4	00403	6.93	00410	37	00530	13	00535	4
00610	0.207	00620	1.11	00665	0.25	00671	0.164	00680	27
00940	242	00945	54	31616	140	32211	5.9	32218	1.1

Station Id: 10485 Date/Time: JUN-12-1986/12:34 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028887

00010	29.6	00094	1025	00300	4.3	00400	6.6

Station Id: 10485 Date/Time: JUN-12-1986/12:34 Depth(m): 2.44 Data Source: WC FO RT Tag# Z028888

00010	27	00094	1400	00300	2.5	00400	6.6

Station Id: 10485 Date/Time: DEC-17-1986/10:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028895

00010	17	00077	18	00094	1350	00095	2656	00300	8.8
00400	6.7	00403	6.86	00410	32	00530	17	00535	3
00610	0.011	00620	0.621	00665	0.175	00671	0.163	00680	12
00900	250	00940	693	00945	168	01002 <	2	01007	51
01027 <	2	01034 <	8	01042	28	01045	1440	01051	22
01055	99	01067	82	01077	11	01092	34	01147 <	2
32211	1.2	32218	2.9	71900 <	0.2				

Station Id: 10485 Date/Time: JUN-02-1987/13:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028901

00010	33.9	00077	19.5	00094	6380	00095	5338	00300	4.3
00400	6.9	00403	6.9	00410	41	00530	21	00535	4
00610	0.133	00620	0.08	00665	0.2	00671	0.168	00680	14
00940	1731	00945	322	01351	3	31616	43	32211	4
32218	2								

Station Id: 10485 Date/Time: DEC-13-1987/11:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028907

00010	22.1	00077	10	00094	1760	00300	7.8	00400	6.9
00410	30	00530	18	00535	2	00610	0.424	00620	5.4
00665	0.558	00671	0.418	00680	10	00900	362	00940	1028
00945	152	01002	12.5	01007	45	01027 <	10	01034 <	40
01042 <	5	01045	1300	01051 <	50	01055	90	01067 <	10
01077 <	20	01092	110	01147	7.3	31616	65	32211 <	1
32218	2.1	71900 <	0.2						

Station Id: 10485 Date/Time: DEC-13-1987/11:45 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028908

00010	22.1	00094	3980	00300	7.4	00400	6.9

Station Id: 10485 Date/Time: JUN-27-1988/15:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028909

00010	34.69	00077	22	00094	14800	00300	5.45	00400	6.9
00410	63	00530	12	00535	3	00610	0.95	00615	0.05
00620	0.56	00665	0.35	00671	0.33	00680	6	00940	3750
00945	880	31616	57	32211	9.4	32218	2.1		

ONE BOAT PASSED

Station Id: 10485 Date/Time: JUN-27-1988/15:00 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028910

00010	34.56	00094	14900	00300	5.31	00400	6.95

Station Id: 10485 Date/Time: DEC-19-1988/11:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028911

00010	19.72	00077	15	00094	21200	00300	8	00400	7.5
00410	58	00530	28	00535	8	00610	0.06	00620	0.89
00665	0.33	00671	0.3	00680 <	1	00900	2300	00940	13500
00945	970	01002 <	10	01007	65	01027	10	01034 <	9
01042	15	01045	865	01051 <	48	01055	55	01067 <	11
01077 <	16	01092	475	01147 <	10	31616	29	32211 <	1
32218 <	1	71900	0.6						

WORKBOAT

Station Id: 10485 Date/Time: DEC-19-1988/11:45 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028912

00010	19.66	00094	21100	00300	7.9	00400	7.5

Station Id: 10485 Date/Time: AUG-15-1989/10:45 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028913

00010	31.7	00078	0.66	00094	2220	00300	4.8	00400	7.5
00410	34	00530	22	00535	4	00610	0.02	00615	0.02
00620	0.22	00665	0.206	00671	0.145	00680	11	00940	387
00945	128	31616	51	32211	17.1	32218	42.7		

WATER LEVEL WAS A LITTLE HIGH

Station Id: 10485 Date/Time: AUG-15-1989/10:45 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028914

00010	31.8	00094	2320	00300	4.3	00400	7.4

Station Id: 10485 Date/Time: OCT-17-1989/11:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028915

00010	29.2	00078	0.71	00094	17900	00300	3.9	00400	7.1
00410	78	00480	10.5	00530	34	00535	7	00610	0.05
00615	0.04	00620	0.59	00665	0.135	00671	0.125	00680	6
00900	2200	00940	5100	00945	930	01002 <	5	01027 <	1
01034	35	01042	34	01051 <	3	01067	30	01077 <	16
01092	135	01147 <	5	31616	125	32211	21.5	32218	14.9
39032 <	0.019	39330 <	0.01	39350 <	0.095	39360 <	0.019	39365 <	0.017
39370 <	0.015	39380 <	0.011	39388 <	0.02	39390 <	0.015	39400 <	0.29
39410 <	0.01	39420 <	0.011	39480 <	0.04	39516 <	0.3	39530 <	0.244
39540 <	0.119	39570 <	0.218	39700 <	0.01	39730 <	0.143	39740 <	0.037
39782 <	0.011	71900 <	0.2						

WEATHER-CLOUDY,WINDY,COOL.ABNORMALLY HIGH TIDE.

Station Id: 10485 Date/Time: OCT-17-1989/11:00 Depth(m): 1.01 Data Source: WC FO RT Tag# Z028916

00010	29.2	00094	18000	00300	3.9	00400	7.1	00480	10.5

Station Id: 10485 Date/Time: OCT-17-1989/11:00 Depth(m): 2.01 Data Source: WC FO RT Tag# Z028917

00010	28.7	00094	18300	00300	3.9	00400	7	00480	10.6

Station Id: 10485 Date/Time: OCT-15-1990/12:15 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028918

00010	29.8	00078	0.29	00094	14070	00300	6.5	00400	7.5
00410	65	00480	7.9	00530	6	00535	3	00556 <	5
00610	0.07	00615	0.02	00620	0.23	00665	0.172	00671	0.17
00680	1	00940	5860	00945	500	31616	110	32211	3.8
32218	0								

FLOATING SOLIDS, SOME FOAM AND OIL, WATER BROWNISH, LIGH NOTED ON SURFACE

Station Id: 10485 Date/Time: OCT-15-1990/12:15 Depth(m): 1.01 Data Source: WC FO RT Tag# Z028919

00010	29.8	00094	14040	00300	6.5	00400	7.5	00480	7.8

Station Id: 10485 Date/Time: APR-15-1991/12:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028920

00010	23.3	00078	0.3	00094	302	00300	6.5	00400	7.1
00410	19	00530	12	00535	2	00610	0.08	00615	0.01
00620	0.1	00665	0.105	00671	0.086	00680	15	00940	57
00945	34	31616	800	32211	3.2	32218 <	1	72053 <	1

Station Id: 10485 Date/Time: APR-15-1991/12:50 Depth(m): 1.01 Data Source: WC FO RT Tag# Z028921

00010	22.3	00094	596	00300	5.7	00400	6.9		

Station Id: 10485 Date/Time: APR-15-1991/12:50 Depth(m): 2.01 Data Source: WC FO RT Tag# Z028922

00010	21.7	00094	687	00300	5.4	00400	6.9		

Station Id: 10485 Date/Time: FEB-09-1992/13:40 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028923

00010	12.6	00078	0.35	00094	556	00300	9.2	00400	7.2
00410	24	00480 <	2	00530	22	00535	4	00610	0.56
00615	0.03	00620	0.4	00665	0.12	00671	0.09	00680	15
00940	129	00945	42	31616	100	32211	2.7	32218	7.3
72053	4								

GREENISH BROWN WATER, NO BIRDS, NO TRAFFIC, FISHERS AT MOUTH OF OUTFALL CANAL,
HEAVY RAINS IN JAN. AND FEB.

Station Id: 10485 Date/Time: FEB-09-1992/13:40 Depth(m): 1.01 Data Source: WC FO RT Tag# Z028924

00010	12.7	00094	1028	00300	8.2	00400	7.1	00480	2.4

Station Id: 10485 Date/Time: AUG-24-1992/16:30 Depth(m): 0.30 Data Source: WC FO RT Tag# 0000605

00010	32.1	00078	0.5	00094	12460	00300	7.6	00400	7.5
00410	50	00480	6.9	00530	20	00535	6	00610	0.15
00615	0.1	00620	0.57	00665	0.62	00671	0.53	00680 <	1
00940	3960	00945	676	31616	860	32211	19.9	32218	0
72053	0								

MOSTLY SUNNY, HOT, WINDY, WATER GREENISH COLOR, RECENT THUNDERSTORMS, FLOATING B
LACK DUST OBSERVED, FISHERMAN NOTED

Station Id: 10485 Date/Time: AUG-24-1992/16:30 Depth(m): 1.00 Data Source: WC FO RT Tag# PF11287

00010	31.5	00094	15400	00300	6.1	00400	7.3	00480	8.8

MOSTLY SUNNY, HOT, WINDY, WATER GREENISH COLOR, RECENT THUNDERSTORMS, FLOATING B
LACK DUST OBSERVED, FISHERMAN NOTED

Station Id: 10485 Date/Time: FEB-09-1993/11:40 Depth(m): 0.30 Data Source: WC FO RT Tag# 0001546

00410	37	00530	22	00535	4	00610	0.1	00615	0.04
00620	1.69	00625	0.96	00665	0.59	00671	0.48	00680	11
00940	796	00945	156	32211	1	32218	2.4		

Station Id: 10485 Date/Time: FEB-09-1993/11:40 Depth(m): 0.30 Data Source: WC FO RT Tag# R100029

00010	17.2	00078	0.3	00094	3340	00300	8.2	00400	7.9
00480 <	2	31616	40	72053	3				

WEATHER WARM, PARTLY CLOUDY, BREEZY; ONE CREW BOAT PASSED

Station Id: 10485 Date/Time: FEB-09-1993/11:40 Depth(m): 1.00 Data Source: WC FO RT Tag# PF07489

00010	17.1	00094	3340	00300	8.2	00400	7.8	00480 <	2

WEATHER WARM, PARTLY CLOUDY, BREEZY; ONE CREW BOAT PASSED

Station Id: 10485 Date/Time: AUG-12-1993/12:58 Depth(m): 0.30 Data Source: WC FO RT Tag# 0003040

00410	61	00530	9	00535	4	00610	0.02	00615	0.02
00620	2.49	00625	1.4	00665	1.28	00671	1.1	00680	16
00940	2130	00945	38	32211	36.4	32218	0		

Station Id: 10485 Date/Time: AUG-12-1993/12:58 Depth(m): 0.30 Data Source: WC FO RT Tag# R100031

00010	34.7	00078 <	0.1	00094	7710	00300	9	00400	8.1
00480	3.9	31616	260	72053	3				

WEATHER PARTLY CLOUDY, HOT

Station Id: 10485 Date/Time: AUG-12-1993/12:58 Depth(m): 1.00 Data Source: WC FO RT Tag# PF07490

00010	32.8	00094	15900	00300	6.8	00400	7.8	00480	9.1

WEATHER PARTLY CLOUDY, HOT

Station Id: 10485 Date/Time: AUG-12-1993/12:58 Depth(m): 1.80 Data Source: WC FO RT Tag# PF07491

00010	32.7	00094	17900	00300	3.9	00400	7.3	00480	10.4

WEATHER PARTLY CLOUDY, HOT

Station Id: 10485 Date/Time: DEC-15-1993/15:50 Depth(m): 0.30 Data Source: WC FO RT Tag# 0005143

00410	92	00530	46	00535	7	00610	0.22	00615	0.08
00620	2.96	00625	2.3	00665	2.04	00671	1.83	00680	16
00940	1300	00945	342	32211	5.02	32218	14.3		

Station Id: 10485 Date/Time: DEC-15-1993/15:50 Depth(m): 0.30 Data Source: WC FO RT Tag# R100133

00010	14.9	00078	0.3	00094	5000	00300	6.9	00400	7.5
00480	2.3	31616 >	1200	72053	2				

Weather-Clear, cool, light wind. Extremely low tide.

Station Id: 10485 Date/Time: DEC-15-1993/15:50 Depth(m): 1.00 Data Source: WC FO RT Tag# PF04625

00010	12.8	00094	6180	00300	5.6	00400	7.3	00480	3

Station Id: 10485 Date/Time: JUN-22-1994/15:05 Depth(m): 0.30 Data Source: WC FO RT Tag# 0008297

00410	34	00530	21	00535	6	00610	0.01	00615	0.04
00625	0.91	00665	0.15	00671	0.04	00680	10	00940	731
00945	110	32211	27.8	32218	0	70300	1560		

Water routine analysis.

Station Id: 10485 Date/Time: JUN-22-1994/15:05 Depth(m): 0.30 Data Source: WC FO RT Tag# R100199

00010	32.5	00078	0.4	00094	2860	00300	10	00400	8.3
00480 <	2	31616	23	72053	0				

Weather-Overcast, Still, Hot, Light rain. The tide was moving in.

Station Id: 10485 Date/Time: JUN-22-1994/15:05 Depth(m): 1.00 Data Source: WC FO RT Tag# PF06086

00010 32 00094 2890 00300 6.8 00400 7.6 00480 < 2

Station Id: 10485 Date/Time: JUN-22-1994/15:05 Depth(m): 1.50 Data Source: WC FO RT Tag# PF06087

00010 30.5 00094 2910 00300 5.6 00400 7.2 00480 < 2

Station Id: 10485 Date/Time: OCT-11-1994/15:10 Depth(m): 0.30 Data Source: WC FO RT Tag# R162726

00010 22.6 00078 0.5 00094 6150 00300 5.2 00400 7.2
00480 2.9 31616 227 72053 3
CLOUDY, COOL, WINDY, BOAT TRAFFIC HAS WATER MUDDIED, OUTGOING TIDE.

Station Id: 10485 Date/Time: OCT-11-1994/15:10 Depth(m): 1.00 Data Source: WC FO RT Tag# PR02727

00010 22.6 00094 7220 00300 5.3 00400 7.1 00480 3.8

Station Id: 10485 Date/Time: OCT-11-1994/15:10 Depth(m): 1.50 Data Source: WC FO RT Tag# PR02728

00010 22.4 00094 8400 00300 5.5 00400 7.2 00480 4.4

Station Id: 10485 Date/Time: JAN-30-1995/14:40 Depth(m): 0.30 Data Source: WC FO RT Tag# R164558

00010 13.2 00078 0.3 00094 2450 00300 6.5 00400 7.3
31616 290
CLOUDY, BREEZY, COLD, LOW TIDE.

Station Id: 10485 Date/Time: JAN-30-1995/14:40 Depth(m): 1.00 Data Source: WC FO RT Tag# PR04559

00010 12.7 00094 2460 00300 6.3 00400 7.3

Station Id: 10485 Date/Time: JAN-30-1995/14:40 Depth(m): 1.50 Data Source: WC FO RT Tag# PR04560

00010 12.6 00094 2450 00300 6.2 00400 7.3

Station Id: 10485 Date/Time: MAY-09-1995/11:30 Depth(m): 0.30 Data Source: WC FO RT Tag# R165610

00010 26 00078 0.4 00094 1240 00300 4.1 00400 6.7
00480 < 1 31616 660
PARTLY CLOUDY, WATER BROWN GREEN.

Station Id: 10485 Date/Time: DEC-02-1980/12:20 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028770

00010	22.1	00011	71.8	00077	16	00094	16330	00095	16100
00300	7.3	00400	7.2	00403	7.2	00410	58	00530	72
00535	11	00610	0.13	00620	0.65	00650	0.98	00660	0.61
00665	0.32	00671	0.2	00680	4	00940	2800	00945	740
31616	160	32211	7	32218	2				

PARTLY CLOUDY, COOL, WATER DISTURBED BY PASSING SHIPAR

Station Id: 10485 Date/Time: DEC-02-1980/12:20 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028771

00010	21.7	00011	71.1	00094	16370	00300	7.3	00400	7.2

Station Id: 10485 Date/Time: MAR-11-1981/10:00 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028775

00010	21.3	00011	70.3	00077	20	00094	10840	00095	10100
00300	7.1	00400	6.9	00403	7	00410	59	00530	18
00535	4	00610	0.26	00620	0.44	00650	0.28	00660	0.03
00665	0.09	00671	0.01	00680	7	00940	3300	00945	800
31616	100	32211	5	32218 <	1				

OVERCAST AND COOL, WATER BROWN

Station Id: 10485 Date/Time: MAR-11-1981/10:00 Depth(m): 1.52 Data Source: WC FO RT Tag# Z028776

00010	22.6	00011	72.7	00094	10280	00300	6.3	00400	6.9

Station Id: 10485 Date/Time: JUN-02-1981/13:50 Depth(m): 0.30 Data Source: WC FO RT Tag# Z028779

00010	33	00011	91.4	00077	24	00094	20000	00095	18500
00300	3.7	00403	6.8	00410	73	00530	21	00535	7
00610 <	0.01	00620	0.5	00650	0.31	00660	0.06	00665	0.1
00671	0.02	00680	8	00940	6600	00945	860	31616 <	1
32211	6	32218	1						

PARTLY CLOUDY, HOT, WATER BROWN

Station Id: 10485 Date/Time: JUN-02-1981/13:50 Depth(m): 1.83 Data Source: WC FO RT Tag# Z028780

39102 <	50	39112 <	10	39333 <	1	39351 <	2	39363 <	1
39368 <	1	39373 <	1	39383 <	1	39393 <	1	39403 <	5
39413 <	1	39423 <	1	39481 <	1	39519 <	5	39531 <	1
39541 <	1	39571 <	1	39601 <	1	39783 <	1		

SEDIMENT - 1 SUBSAMPLE

Station Id: 10485 Date/Time: MAY-09-1995/11:30 Depth(m): 1.00 Data Source: WC FO RT Tag# PR05611

00010 23.6 00094 1275 00300 3.1 00400 6.7 00480 < 1

Station Id: 10485 Date/Time: MAY-09-1995/11:30 Depth(m): 2.00 Data Source: WC FO RT Tag# PR05612

00010 23.4 00094 1327 00300 2.7 00400 6.8 00480 < 1

Station Id: 10485 Date/Time: JUL-13-1995/15:05 Depth(m): 0.30 Data Source: WC FO RT Tag# R165987

00010 35.8 00078 0.33 00094 4232 00300 10.9 00400 8.6
00480 2.3
HOT, PATLY CLOUDY, BREEZY, WATER GREEN, FISH OBSERVED.

Station Id: 10485 Date/Time: JUL-13-1995/15:05 Depth(m): 1.00 Data Source: WC FO RT Tag# PR05988

00010 33.6 00094 4296 00300 8.5 00400 7.8 00480 2.3

Station Id: 10485 Date/Time: JUL-13-1995/15:05 Depth(m): 1.50 Data Source: WC FO RT Tag# PR05989

00010 32 00094 4373 00300 5.6 00400 7.1 00480 2.4

Station Id: 10485 Date/Time: NOV-28-1995/11:08 Depth(m): 0.30 Data Source: WC FO RT Tag# R167861

00010 16.9 00078 0.57 00094 6288 00300 5.8 00400 7.1
00480 3.5 31616 533 72053 0
WATER BLACKISH BROWN, SHEEN ON WATER, COLD, CLOUDY, 15-20 MPH N WIND.

Station Id: 10485 Date/Time: NOV-28-1995/11:08 Depth(m): 1.00 Data Source: WC FO RT Tag# PR07862

00010 16.9 00094 6355 00300 5.5 00400 7.1 00480 3.5

Station Id: 10485 Date/Time: MAR-19-1996/12:55 Depth(m): 0.30 Data Source: WC FO RT Tag# R169844

00010 20 00078 0.18 00094 5226 00300 6 00400 7.7
00480 2.9 31616 293 72053 > 7
COOL, SUNNY, CLEAR SKIES, 20 MPH NW WIND, WATER COLOR BROWN, EXTREMELY LOW TIDE.

Station Id: 10485 Date/Time: MAR-19-1996/12:55 Depth(m): 1.00 Data Source: WC FO RT Tag# PR09845

00010 16.8 00094 7963 00300 5 00400 7.5 00480 4.5

Storet	Description
00010	TEMPERATURE, WATER (DEGREES CENTIGRADE)
00011	TEMPERATURE, WATER (DEGREES FAHRENHEIT)
00070	TURBIDITY, (JACKSON CANDLE UNITS)
00077	TRANSPARENCY, SECCHI DISC (INCHES)
00078	TRANSPARENCY, SECCHI DISC (METERS)
00081	COLOR,APPARENT(UNFILTERED SAMPLE) PLAT-COB UNITS
00094	SPECIFIC CONDUCTANCE,FIELD (UMHOS/CM @ 25C)
00095	SPECIFIC CONDUCTANCE (UMHOS/CM @ 25C)
00300	OXYGEN, DISSOLVED (MG/L)
00307	BIOCHEM OXY DEM,NIT INHIB DISS(MG/L, 5 DAY-20C)
00308	BIOCHEM OXY DEM,NIT INHIB,TOT (MG/L,20 DAY-20C)
00309	BIOCHEM OXY DEM,NIT INHIB DISS(MG/L,20 DAY-20C)
00314	BIOCHEM OXY DEM NIT INHIB, TOT (MG/L, 5 DAY-20C)
00400	PH (STANDARD UNITS)
00403	PH (STANDARD UNITS) LAB
00410	ALKALINITY, TOTAL (MG/L AS CACO3)
00415	ALKALINITY, PHENOLPHTHALEIN (MG/L)
00480	SALINITY - PARTS PER THOUSAND
00530	RESIDUE, TOTAL NONFILTRABLE (MG/L)
00535	RESIDUE, VOLATILE NONFILTRABLE (MG/L)
00556	OIL & GREASE (FREON EXTR.-GRAV METH) TOT,REC,MG/
00610	NITROGEN, AMMONIA, TOTAL (MG/L AS N)
00615	NITRITE NITROGEN, TOTAL (MG/L AS N)
00620	NITRATE NITROGEN, TOTAL (MG/L AS N)
00625	NITROGEN, KJELDAHL, TOTAL, (MG/L AS N)
00650	PHOSPHATE, TOTAL (MG/L AS PO4)
00660	PHOSPHATE, ORTHO (MG/L AS PO4)
00665	PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)
00671	PHOSPHORUS, DISSOLVED ORTHOPHOSPHORUS(MG/L AS P)
00680	CARBON, TOTAL ORGANIC (MG/L AS C)
00684	CARBON, TOTAL ORGANIC, FILTERED (MG/L AS C)
00900	HARDNESS, TOTAL (MG/L AS CACO3)
00940	CHLORIDE (MG/L AS CL)
00941	CHLORIDE, DISSOLVED IN WATER MG/L
00945	SULFATE (MG/L AS SO4)
01002	ARSENIC, TOTAL (UG/L AS AS)
01007	BARIUM, TOTAL (UG/L AS BA)
01022	BORON, TOTAL (UG/L AS B)
01027	CADMIUM, TOTAL (UG/L AS CD)
01034	CHROMIUM, TOTAL (UG/L AS CR)
01042	COPPER, TOTAL (UG/L AS CU)
01045	IRON, TOTAL (UG/L AS FE)
01051	LEAD, TOTAL (UG/L AS PB)
01055	MANGANESE, TOTAL (UG/L AS MN)
01067	NICKEL, TOTAL (UG/L AS NI)

Storet	Description
01077	SILVER, TOTAL (UG/L AS AG)
01092	ZINC, TOTAL (UG/L AS ZN)
01147	SELENIUM, TOTAL (UG/L AS SE)
01351	FLOW:1=DRY,2=LOW,3=NORMAL,4=FLOOD,5=ABOVE NORMAL
31501	COLIFORM,TOT,MEMBRANE FILTER,IMMED.M-ENDO,
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH, #/100ML
32211	CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH
32218	PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.
39032	PCP (PENTACHLOROPHENOL) WHOLE WATER SAMPLE UG/L
39102	BIS(2-ETHYLHEXYL) PHTHALATE SED, DRY WGT,UG/KG
39112	DI-N-BUTYL PHTHALATE,SEDIMENTS,DRY WGT,UG/KG
39330	ALDRIN IN WHOLE WATER SAMPLE (UG/L)
39333	ALDRIN IN BOTTOM DEPOS. (UG/KILOGRAM DRY SOLIDS)
39350	CHLORDANE (TECH MIX & METABS),WHOLE WATER,UG/L
39351	CHLORDANE(TECH MIX&METABS) SED,DRY WGT,UG/KG
39360	DDD IN WHOLE WATER SAMPLE (UG/L)
39363	DDD IN BOTTOM DEPOS. (UG/KILOGRAM DRY SOLIDS)
39365	DDE IN WHOLE WATER SAMPLE (UG/L)
39368	DDE IN BOTTOM DEPOS. (UG/KILOGRAM DRY SOLIDS)
39370	DDT IN WHOLE WATER SAMPLE (UG/L)
39373	DDT IN BOTTOM DEPOS. (UG/KILOGRAM DRY SOLIDS)
39380	DIELDRIN IN WHOLE WATER SAMPLE (UG/L)
39383	DIELDRIN IN BOTTOM DEPOS. (UG/KILOGRAM DRY SOL.)
39388	ENDOSULFAN IN WHOLE WATER SAMPLE (UG/L)
39390	ENDRIN IN WHOLE WATER SAMPLE (UG/L)
39393	ENDRIN IN BOTTOM DEPOS. (UG/KILOGRAM DRY SOLIDS)
39400	TOXAPHENE IN WHOLE WATER SAMPLE (UG/L)
39403	TOXAPHENE IN BOTTOM DEPOS.(UG/KILOGRAM DRY SOL.)
39410	HEPTACHLOR IN WHOLE WATER SAMPLE (UG/L)
39413	HEPTACHLOR IN BOT. DEP. (UG/KILOGRAM DRY SOLIDS)
39420	HEPTACHLOR EPOXIDE IN WHOLE WATER SAMPLE (UG/L)
39423	HEPTACHLOR EPOXIDE IN BOT. DEP. (UG/KG DRY SOL.)
39480	METHOXYCHLOR IN WHOLE WATER SAMPLE (UG/L)
39481	METHOXYCHLOR IN BOTTOM DEPOSITS (UG/KG DRY SOL.)
39516	PCBS IN WHOLE WATER SAMPLE (UG/L)
39519	PCBS IN BOTTOM DEPOSITS (UG/KG DRY SOLIDS)
39530	MALATHION IN WHOLE WATER SAMPLE (UG/L)
39531	MALATHION IN BOT. DEPOS. (UG/KILOGRAM DRY SOLIDS
39540	PARATHION IN WHOLE WATER SAMPLE (UG/L)
39541	PARATHION IN BOT. DEPOS. (UG/KILOGRAM DRY SOLIDS
39570	DIAZINON IN WHOLE WATER SAMPLE (UG/L)
39571	DIAZINON IN BOT. DEPOS. (UG/KILOGRAM DRY SOLIDS)
39601	METHYL PARATHION IN BOT. DEPOS.(UG/KG DRY SOLIDS
39700	HEXACHLOROBENZENE IN WHOLE WATER SAMPLE (UG/L)
39730	2,4-D IN WHOLE WATER SAMPLE (UG/L)

Storet	Description
39740	2,4,5-T IN WHOLE WATER SAMPLE (UG/L)
39761	SILVEX IN BOTTOM DEPOSITS (UG/KG DRY SOLIDS)
39782	LINDANE IN WHOLE WATER SAMPLE (UG/L)
39783	LINDANE IN BOTTOM DEPOSITS (UG/KG DRY SOLIDS)
70300	RESIDUE,TOTAL FILTRABLE (DRIED AT 180C),MG/L
71900	MERCURY, TOTAL (UG/L AS HG)
72053	DAYS SINCE PRECIPITATION EVENT (DAYS)

APPENDIX D

Health & Safety Plan

HEALTH AND SAFETY PLAN
FOR
SCREENING SITE INSPECTION FIELD WORK
STAR LAKE CANAL, a.k.a. JEFFERSON CANAL

Prepared by

Texas Natural Resource Conservation Commission
Superfund Site Discovery and Assessment Team
Austin, Texas

Reviewed and approved by

Site Safety Officer:	_____ Name	_____ Date
Site Investigation: Manager	Marshall Cochran Name	9/17/96 Date
PA/SI Program Manager Representative:	Allan M. Seeli Name	10/1/96 Date
TNRCC Central Office Health & Safety Representative:	Todd Counter Name	9/17/96 Date

September 1996

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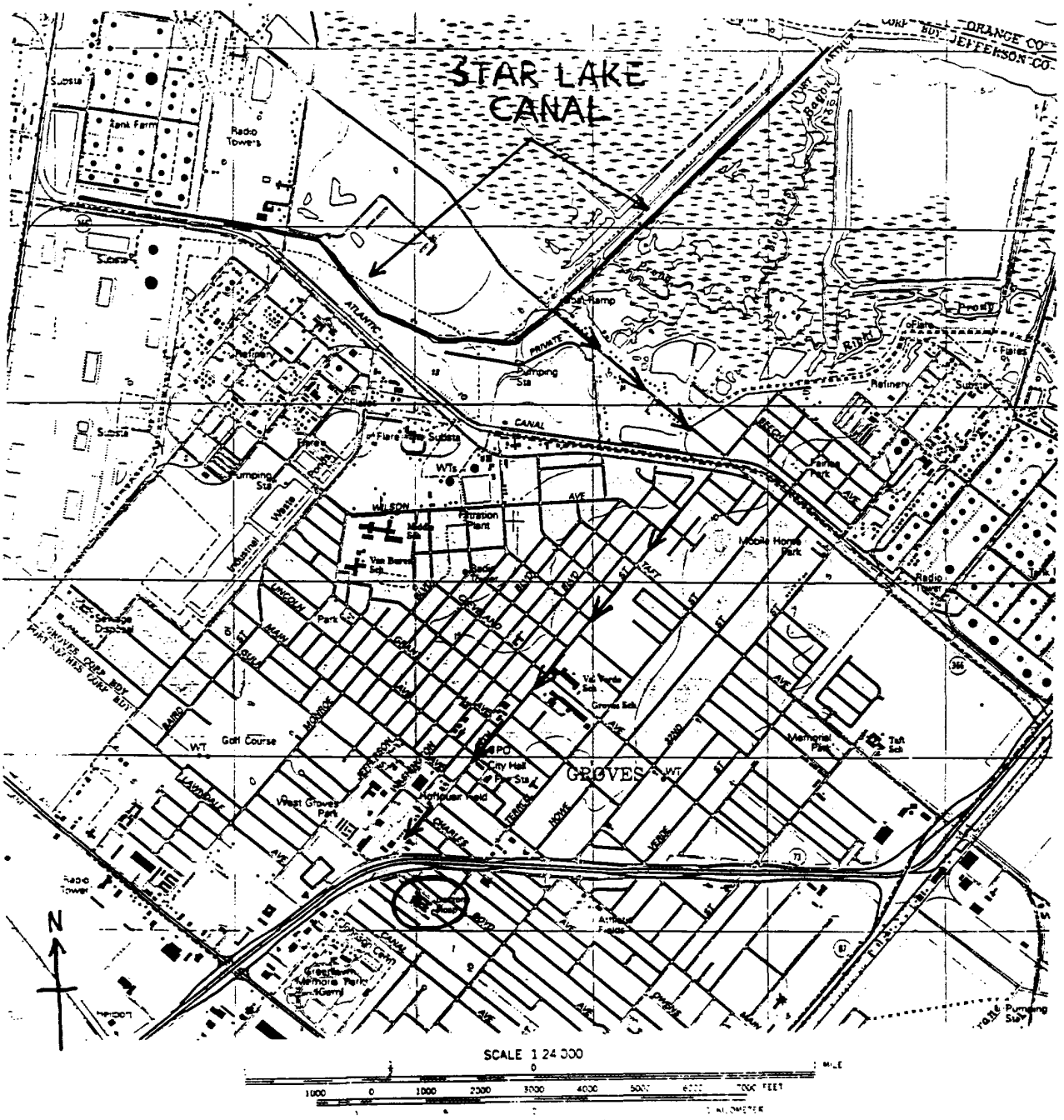
EMERGENCY CONTACTS

In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations contact the appropriate response teams:

Contingency Contacts	Phone Number
Fire Department	911
Police	911
Sheriff's Department	911

Medical Emergency	
Hospital Name	Doctor's Hospital Phone No. (409) 962-5733
Hospital Address	5500 39th Street Groves, Texas
Map to Hospital (see next page)	

TNRCC Contacts	
TNRCC PA/SI Program Manager:	Allan M. Seils- Austin, Texas Phone: Work (512) 239-2514
TNRCC Central Office Health & Safety Representative:	C. Todd Counter - Austin, Texas Phone: Work (512) 239-2591
TNRCC Field Health & Safety Representative:	To be Determined Phone: Work



TNRCC

Figure 1

Map to Hospital

Star Lake Canal

Port Arthur, Jefferson County, Texas

CERCLIS No. PENDING

SECTION 1

INTRODUCTION

PURPOSE AND POLICY

The purpose of this health and safety plan is to establish personnel protection standards and mandatory safety practices and procedures for work conducted for screening site inspections (SSI) under the Texas Natural Resource Conservation Commission (TNRCC) Preliminary Assessment/Site Investigation (PA/SI) program. The plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while field work is being conducted at the Star Lake Canal (SLC) site in Jefferson County, Texas.

All personnel who engage in field project activities at the site must be familiar with this plan and comply with its requirements. The provisions of the plan are mandatory for all TNRCC field personnel on this project.

PROGRAM DESCRIPTION

This screening site inspection will be conducted in conformance with the requirements of the revised Hazard Ranking System (HRS) 40 CFR Part 300; Final Rule, dated December 14, 1990. TNRCC Central Office staff recently completed collecting information needed to prepare a work plan and this health and safety plan. TNRCC Central Office staff personnel may visit the site to assist in executing the work plan and/or conduct inspection activities. Activities that will be conducted during the site visit include: site reconnaissance, interviews with any site personnel, and collection of surface water and sediment samples. The anticipated time frame for the execution of all the field work is October, 1996. This health and safety plan pertains to activities performed while executing the work plan.

SECTION 2

SITE INFORMATION

GENERAL INFORMATION

Site: Star Lake Canal Site TX0001414341

Location: Empties into the Neches River between Port Neches and Groves, Texas. The Jefferson Canal confluences with Star Lake Canal (SLC) between State Highway 366 and Sara Jane Road.

Mailing Address: None

Proposed date of field work: October, 1996

Hazard Assessment: ___ High ✓ Medium ___ Low

___ None ___ Unknown

Site description:
The SLC confluences with Molasses Bayou as it empties into the Neches River. The canal is approximately 2 miles long. Land surrounding the canal is undeveloped, residential and industrial. The canal begins at 29° 58' 28" N Latitude and 93° 56' 32" W Longitude and empties into the Neches River at 29° 58' 57" N Latitude and 93° 53' 38" W Longitude.

A sampling inspection by the Texas Department of Water Resources (TDWR) in March, 1983, documented the presence of hazardous substances in material dredged from the banks of the Jefferson Canal. This canal was used by Chemall, Inc (now Calabrian Chemicals) and Texaco Chemical Company (now Huntsman Corporation) as an outfall for stormwater and wastewater for an unknown period of time. The Jefferson Canal confluences with SLC in an area between State Highway 366 and Sara Jane Road, a.k.a. East Port Neches Avenue.

SCOPE OF WORK SUMMARY

The field team will collect surface water and sediment samples. Sampling data to be collected includes a total of twenty (21) sediment samples. These include three (3) background samples from the north side of the Neches River; nine (9) target samples downstream of the PPE; two (2) at the PPE; and seven (7) sediment samples from the suspected source sediments.

All samples will be collected according to the procedures outlined in the QAPP (Appendix E).

No air samples are planned to assess releases to the air pathway and no soil samples are anticipated since canal sediments are considered the source for this project.

SITE/CHEMICAL CHARACTERISTICS

Chemical type(s):	✓ Liquid	✓ Solid	___ Sludge	___ Gas
Characteristic(s):	___ Corrosive	___ Ignitable	___ Radioactive	
	✓ Volatile	✓ Toxic	___ Reactive	
	___ Unknown	___ Other		

Summary of known wastes: See below.

List of chemicals used on site:
The Jefferson Canal was documented to have sediments in which hazardous substances had been deposited, stored, disposed, or placed. The hazardous substances include toxaphene, pentachlorophenol, naphthalene, acenaphthene, acenaphthylene, fluorene, phenanthrene, anthracene, pyrene, benzo-a-anthracene, benzo-b-fluoranthene, benzo-a-pyrene, benzo-a-fluoranthene, chrysene, and other aromatic hydrocarbons that could not be identified by GC/MS. Water flowing in the canals may carry contaminated sediment downstream into the Neches River.

Description of all known waste disposal areas on site:
A Preliminary Assessment was performed in June, 1996 which identified the sediments of both the Jefferson and Star Lake Canals as possible sources of hazardous substances.

Site waste management history:
Specific wastes disposed of in the Jefferson and Star Lake Canals are unknown. The Jefferson Canal received industrial wastewater discharges for an unknown period of time. It is unknown what discharges were made to the Star Lake Canal.

Unusual features (surface impoundment/tank integrity, power lines, terrain, etc.):
The canals may have steep and unvegetated banks that could present a falling hazard. A concrete dam was constructed by Texaco Chemical in the 1940's upstream in the SLC. A low coefficient of friction would be expected on this concrete structure.

Current status of site:
The canals may be freely accessed by way of the Neches River or a public boat ramp where SLC passes under Sara Jane Road. Currently, SLC is used by fishermen and recreational boaters alike. TNRCC Region 10 personnel have stated that people occasionally swim in SLC.

Summary of the regulatory history of the site:
The Texas Water Quality Board issued an enforcement order to the Riverside Chemical Company, (site is now occupied by Calabrian Chemical Company), on May 27, 1976 for wastewater discharges to the Jefferson Canal in exceedance of their wastewater discharge permits. The unpermitted discharges exceeded, among other water quality parameters, toxaphene and pentachlorophenol.

A sampling inspection by the Texas Department of Water Resources in March, 1983, documented the presence of hazardous substances in material dredged from the banks of the Jefferson Canal. The hazardous substances include toxaphene, pentachlorophenol, naphthalene, acenaphthene, acenaphthylene, fluorene, phenanthrene, anthracene, pyrene, benzo-a-anthracene, benzo-b-fluoranthene, benzo-a-pyrene, benzo-a-fluoranthene, chrysene, and other aromatic hydrocarbons that could not be identified by GC/MS.

SECTION 3

PROJECT TEAM ORGANIZATION

Table 3.1 describes the responsibilities of all staff and on-site personnel associated with this project. The names of individuals associated with this project are listed below:

TNRCC PA/SI Program Manager:	Allan M. Seils, Austin, Texas
Staff Safety Officer:	C. Todd Counter, Austin, Texas
Site Investigation Manager:	Marshall A. Cedilote, Austin, Texas
Assistant:	To Be Determined.
Site Safety Officer:	To Be Determined.

Personnel - The Site Investigation Manager designates the Site Health and Safety Officer who will be responsible to see that the site work is performed in a manner consistent with the Health and Safety Plan (HASP). The Site Health and Safety Officer will be responsible for Health and Safety briefings before each daily on-site inspection. **The Site Investigation Manager or the Site Health and Safety Officer may temporarily suspend field activities if health and safety of personnel are endangered. The Site Investigation Manager or the Site Health and Safety Offer may temporarily suspend an individual from the field activities for infractions of the HASP.**

Table 3.1
Staff and On-site Personnel

Title	General Description	Responsibilities
PA/SI Program Manager/ Deputy	Reports to upper-level management. Has authority to direct site investigation activities. Assumes responsibility of meeting all PA/SI program goals/objectives.	Prepares, organizes, and provides program support material. Reviews/approves the project Work Plan, Health and Safety Plan, and the Quality Assurance Project Plan. Appoints field team members for the field work.
		Briefs the Site Investigation Manager on his specific duties.
		Ensures, through the Staff Safety Officer, that safety and health requirements are met.
		Serves as the liaison with the Region VI EPA Representative.
Staff Safety Officer	Advises the PA/SI Program Manager on all aspects of health and safety. Reviews Health and Safety Plans submitted to Central Office.	Advises the PA/SI Program Manager on all health and safety issues. Reviews all project Health and Safety Plans to assure proper clothing and protective equipment are identified.
		Ensures that the proper protective clothing and safety equipment are available for the field investigation efforts.
Site Safety Officer	Advises the Site Investigation Manager on all aspects of health and safety. Assures proper field safety is implemented according to the project Health and Safety Plan.	Ensures that entry and exit controls at the site access control points are in place and maintained.
		Periodically inspects protective clothing and equipment.
		Confirms each team member's suitability for work based on a physician's recommendation.
		Monitors the work parties for signs of stress, such as cold exposure, heat stress, and fatigue.
		Implements the health and safety plan.
		Conducts periodic inspections to determine if the project Health and Safety Plan is being followed.
		Enforces the buddy system.

Table 3.1
Staff and On-site Personnel
(Continued)

Title	General Description	Responsibilities
Site Safety Officer (Continued)		Notifies, when necessary, local public emergency officials in coordination with on-site representatives.
		Coordinates emergency medical care.
		Ensures setup of decontamination lines and solutions appropriate for the type of chemical contamination on the site.
		Controls decontamination of all equipment, personnel, and samples from the contaminated areas.
		Ensures proper disposal of contaminated clothing and materials.
		Advises medical personnel of potential exposures and consequences.
		Notifies emergency response personnel by telephone or radio in the event of an emergency.
		Ensures that all personnel can appropriately use the equipment.
Site Investigation Manager	Prepares Work Plan, and Health and Safety Plan for review/approval. Responsible for field investigation phase of the project.	Obtains permission for site access from the property owners or their representatives. Coordinates all field activities with the appropriate local community officials.
		Prepares the Work Plan and Health and Safety Plan for Central Office review/approval. Ensures that the work plan is complete and submitted to meet schedule requirements.
		Executes the Work Plan, Health and Safety Plan, and assures QAPP requirements are met according to the project schedule.
		Enforces safety procedures through the Site Safety Officer. Documents field activities and sample collection efforts.
		Serves as a liaison with the on-site client representative.

Table 3.1
Staff and On-site Personnel
(Continued)

Title	General Description	Responsibilities
Site Investigation Manager (Continued)		Prepares and submits the final report and required support documentation for Central Office approval.
Field Team Members	Perform field activities as instructed by Site Investigation Manager.	Safely complete the on-site tasks required to fulfill the work plan.
		Notify Site Safety Officer or supervisor immediately of suspected or noted unsafe conditions observed in the field.
		Take precautions necessary to prevent injury to themselves and other employees.
		Read, sign-off, and comply with the project Health and Safety Plan before entering the site for field activities.
		Maintain visual contact between partners (buddy system).
		Perform only those tasks they believe they can do safely.
		Immediately report to the field team leader any accidents and/or unsafe conditions, or any deviations from the Health and Safety Plan.

SECTION 4

SAFETY AND HEALTH RISK ANALYSIS

RESPIRATORY HAZARDS

Respiratory hazards may exist on site from volatile compounds in contaminated sediments which could be inhaled during sediment sampling activities.

CHEMICAL HAZARDS

Chemical hazards can exist when liquid, vapors, or soil samples contact human tissue. Every effort will be made to avoid inadvertent contact with the chemical media at the site. Since groundwater and soil samples will be collected, protective equipment will be used to avoid physical contact. The chemical hazards at the site include Surface water and sediments which may contain hazardous substances detected during previous investigations.

Information on the contaminants that may be encountered at the site is presented in Section 2 and Appendix B. The site may contain other hazardous chemicals that may release hazardous or toxic vapors. The site will be approached with caution, and any moving or handling of drums, containers, or equipment will be avoided.

ROUTES OF EXPOSURE

The field team may be exposed to contaminated materials through inhalation, ingestion, and/or skin and eye contact.

- Respiratory system contact with hazardous airborne materials can occur. If these conditions exist, field work will be conducted upwind, proper protective equipment will be used, or the site will be evacuated.

- Eye contact with solid samples that are contaminated can occur when a worker does not wear safety glasses while samples are being taken or handled.

- Skin contact with contaminated solid or liquid samples can occur when a worker does not wear gloves and protective clothing during sampling activities.

- Gastrointestinal system contact with samples can occur when workers do not observe personal hygiene rules designed to reduce the chance of ingesting site contaminants (i.e., wash hands before smoking, eating, or drinking).

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PHYSICAL HAZARDS

Active Sites

The site is a canal with unrestricted public access. There may be unknown physical hazards encountered during site sampling events that could cause physical injury. Physical hazards include, but are not limited to snakes, alligators, mosquitoes, fire ants, and poison ivy. Field work should be performed using all normal safety precautions. The Health and Safety Plan guidelines concerning avoiding physical hazards will be followed, as a minimum. In addition,

- Unnecessary moving or opening any heavy or bulky containers, drums, bags, etc., will be avoided;
- The "buddy" system will be used at all times;
- Field team members will follow safe boating procedures as outlined in the materials included in this Health & Safety Plan as Appendix C.

Heat Stress

If elevated temperatures are encountered, heat stress may occur. Field work may be performed when daytime temperatures are often high. Water will be available on site, and the Site Safety Officer will encourage workers to drink frequently to prevent dehydration and stay in shaded areas whenever possible. In addition, workers should adhere to the recommended work/rest schedule determined by the Site Safety Officer. Depending on work levels and outside temperatures, each individual should monitor his body temperature and note indications of heat stress as they onset. The "buddy" system will be used at all times to check each other for the first symptoms of heat stress.

Heat stress/stroke control. The TNRCC Site Safety Officer will set work and break schedules depending on the outside temperature. General guidelines for heat stress control while sampling include rest breaks in the shade for at least 10 minutes out of every hour during elevated temperatures. Rest time shall also include fluid replacement with water or electrolytes fluids.

Heat stress/stroke monitoring. The TNRCC Site Safety Officer will monitor workers who are performing strenuous activities in elevated temperatures for heat stress/ stroke. Monitoring will be conducted at the Site Safety Officers discretion, worker's request, or at the beginning of a rest period. The monitoring shall also be conducted when workers performance or mental status significantly changes. The heat stress monitoring plan may include:

- Measurement of worker heart rate, OR
- Measurement of body temperature, and
- Observation of the field team members for signs and symptoms of heat injury.

Heart rate (HR) will be measured by the radial pulse for 30 seconds as early as possible during the resting period. The HR at the beginning of the rest period should **not exceed 100 beats per minute**. If the HR exceeds 100 beats per minute, the next work period will be shortened by one third while the length of the rest period remains the same.

Body temperature will be measured using an oral thermometer. Worker **body temperature should not exceed 99.6°F.** If the worker's body temperature exceeds this, the work period will be shortened by one third while the length of the rest period remains the same. No person will be permitted to wear a semipermeable or impermeable garment **when body temperature exceeds 100.6°F.**

Table 4.1 presents suggested frequencies for heat monitoring. Heat stress monitoring will be performed by a person with a current first-aid certification. Workers that exhibit signs of heat injury will be allowed to rest until the signs are no longer observable. The signs of heat stress/stroke are depicted in Figures 4.1 and 4.2. Suggested emergency medical procedures for treating heat exhaustion and heat stroke are also provided.

Cold Injury

Although the field sampling activities will occur during the autumn months, all field personnel should be especially alert to the possibility of cold injuries, which are most likely to occur when an unprotected individual is exposed to cold temperatures. Temperature, humidity, precipitation, and wind all play roles in the development of cold injuries. The most serious cold injuries are hypothermia and frostbite. Dehydration can also occur if insufficient fluids are not taken as in hot weather. In cold weather, the individual may not be as aware of the problem since perspiration evaporates rapidly or is absorbed by layers of heavy clothing.

Individuals with a history of cold injuries (i.e., frostbite) have a higher-than-normal risk of recurrence, not necessarily involving the part previously injured. Individuals with prior cold injuries should notify the Health and Safety Officer and use the "buddy" system to monitor early detection of cold injury symptoms.

Heat Exhaustion/ Heat Cramps

Signs & Symptoms: cool, pale, clammy skin / fatigue and faintness/headache/ heavy sweating/weak pulse/near-normal body temperature/nausea. Onset is gradual.

If person is unconscious, see *Heatstroke*, p. 54.

Calm the person by talking while attending to the problem. Explain what you are doing. Try not to show anxiety; act with confidence. Your calm behavior can help to reassure the sick person.

If possible, bring person indoors to a cool room. (Use air conditioner or electric fan or open windows and fan vigorously.) Outdoors, move person to a shaded area.

Have the person lie down. Elevate legs and feet with pillows or rolled blankets.

Loosen or remove clothing. Cool the skin with cool, wet sponges or cloths applied to forehead, arms, and legs.

If the person has no heart problems or high blood pressure and is fully conscious, give sips of a salt solution (1 teaspoon salt to 10 oz. — 2 cups — water) every 15 minutes for about one hour. Check body temperature every 5 minutes and continue to cool with wet cloths.

If the person complains of muscle cramps, do not massage cramped muscles. This may increase pain.

Does temperature suddenly rise? Are there convulsions, stupor, or unconsciousness?

Yes → If any of these occur, see *Heatstroke*, p. 54.

No

Does the person begin to feel better after one hour?

Yes → Keep person out of the sun and as cool and comfortable as possible.

Person should be checked by a doctor as a precaution. Discourage unnecessary exercise; this person may now be more susceptible to heat. If symptoms reappear, repeat process and call a physician.

No → Seek medical care immediately. While awaiting assistance, continue cooling with wet cloths and checking body temperature frequently.

Smelling salts, held briefly under the nose, may help to stimulate the person.

If the temperature suddenly rises or convulsions, stupor, or unconsciousness develop, see *Heatstroke*, p. 54.

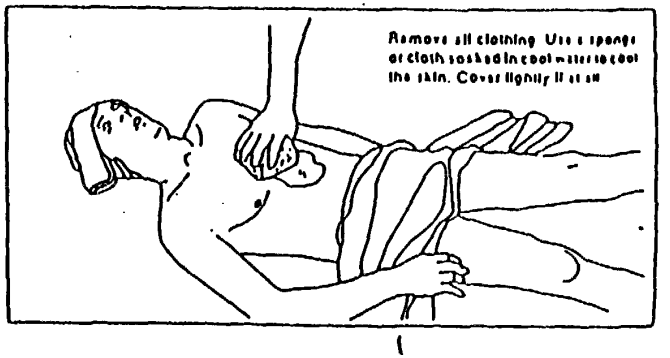


Figure 4.1

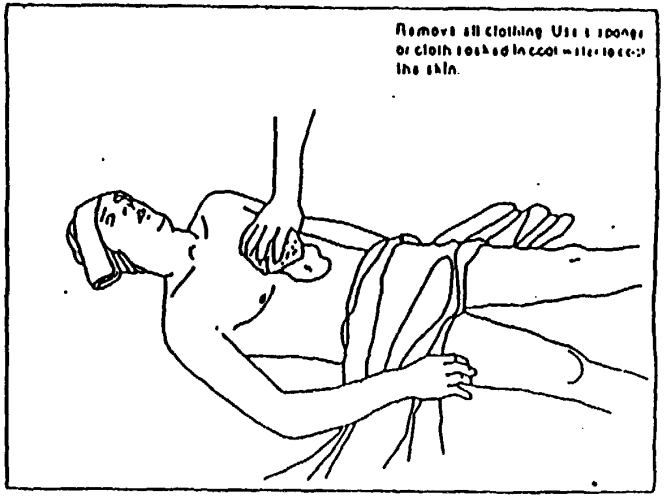
Reproduced from *Emergency Medical Procedures for the Home, Auto & Workplace*, revised edition, by The Deltakron Institute. New York: Prentice-Hall Press, 1987.

Heatstroke

Signs & Symptoms: red, hot, dry skin/no perspiration/body temperature around 106°F (or very warm to the touch)/strong rapid pulse/stupor or unconsciousness

If there are two or more rescuers, one should obtain emergency assistance while the other is following the procedures outlined below.

Calm the person by talking while attending to the problem. Explain what you are doing. Try not to show anxiety; act with confidence. Your calm behavior can help reassure the sick person.



If possible, bring person indoors to a cool room. (Use air conditioner or electric fan or open windows and fan vigorously.) Outdoors, move person to a shaded area.

Remove all clothing. Use a sponge, cloth, or sheet soaked in cool water to cool the skin, wetting the material often, or immerse the person in a bathtub filled with cool water.

See immersion on opposite page

Do convulsions occur?

No → Watch for breathing problems. If breathing stops, see *Artificial Respiration* p. 4

Yes → Remove objects that may cause injury and place pillows or rolled blankets around head to prevent injury. Do not try to hold person down. Do not place anything between teeth.

Watch for breathing problems. If breathing stops, see *Artificial Respiration* p. 4

Check temperature every 5-10 minutes until it drops to 100-102°F, then discontinue sponging or immersion. If you have no thermometer, continue cooling process until person feels cool.

Is there a history of heart problems?

No → Have the person lie flat. Do not cover unless chilled. Then cover lightly.

Yes → Have the person sit or lie in a comfortable position with a pillow behind head and shoulders.

If emergency assistance has not been summoned, obtain help now.

While awaiting assistance keep person as cool and comfortable as possible and continue to watch for breathing problems. Check temperature frequently.

If temperature begins to rise again, repeat the cooling process.

Figure 4.2

Reproduced from *Emergency Medical Procedures for the Home, Auto & Workplace*, revised edition, by The Deltakron Institute. New York: Prentice-Hall Press, 1987.

Table 4.1 - Suggested Frequency of Physiological Monitoring for Fit and Acclimatized Workers[1]

Temperature	Normal Work Ensemble[2]	Impermeable Ensemble
90°F (32.2°C) or above	After each 45 minute work period	After each 15 minutes work period
87.5-90°F (30.8-32.2°C)	After each 60 minutes work period	After each 30 minutes work period
82.5-87.5°F (28.1-30.8°C)	After each 90 minutes work period	After each 60 minutes work period
77.5-82.5°F (25.3-28.1°C)	After each 90 minutes work period	After each 90 minutes work period
72.5-77.5°F (22.5-25.3°C)	After each 150 minutes work period	After each 120 minutes work period

[1] For moderate work, e.g. walking about with moderate lifting and pushing.
[2] A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

Noise

The field team may be exposed to excessive noise levels when vehicles or other boats are operating near the site. Therefore, hearing protection will be available for use as appropriate.

Snake Hazards

It is likely that snakes may be encountered at the site. Long pants and high boots or snake guards will be worn during site activities to avoid a snake hazard. Never reach into a bushy area before checking for snakes by probing the area with a stick and listening for movement in the brush. Workers will use caution when working in areas where snakes may be present.

If a worker is bitten by a poisonous snake, the following steps should be taken:

- Attempt to identify the type of snake and its location,
- Keep the victim calm and minimize movement,
- Apply ice to the area bitten, and
- Transport victim to the nearest medical facility.

SAFE WORK PRACTICES

To ensure a strong safety awareness program during the sampling inspection, personnel must have adequate training. The Health and Safety Plan must be read by each member of the field team before conducting field activities and briefed to the field team at the beginning of each sampling day. A safety awareness must be developed and communicated to all members of the field team. All members of the field team will adhere to the following safety requirements while conducting field work for this sampling effort:

- No smoking, eating, or drinking carbonated beverages while at the site.
- Do not carry matches, lighters, or other ignition sources on the site.
- Facial hair will not be allowed where respirators contact the face.
- Contact lenses will not be worn during field work.
- Alcoholic beverages will not be permitted in state vehicles.
- Always use the "buddy" system while performing field work.
- Avoid walking through puddles or stained soil.
- Discovery of unusual or unexpected conditions will result in immediate evaluation and reassessment of site conditions and health and safety practices.
- A safety briefing will be performed each day prior to on-site work beginning.
- Other safety meetings may be conducted, as necessary.
- Take precautions to reduce injuries from field equipment and other tools.

All personnel will check their equipment at least two weeks before going into the field in case replacements are necessary. For respirator users, the correct corresponding

cartridge or canister for the user's respirator will be verified before entering the site.

Tyvek coveralls, neoprene or nitrile gloves, hard hats, and rubber steel-toed boots or steel-toed shoes or boots will be worn by all personnel performing sampling activities. Safety glasses will be worn during sediment sampling to prevent eye injury from contaminated sediment.

SECTION 5

PERSONNEL PROTECTION EQUIPMENT AND MONITORING

RESPIRATORY PROTECTION

The chemicals that may be present at the site are listed in Section 2, List of Chemicals Used On Site. As a precaution to avoid respiratory exposure to on-site airborne chemical vapors, daily air monitoring will be performed during the inspection events as specified in Section 7, if determined to be necessary by the Site Investigation Manager. In addition, visual inspection will be used to detect the presence of any remaining chemicals by noting stained or vegetation stressed areas during the initial walk through. As a final precaution, during the sample collection efforts, warning symptoms such as headaches and nausea and observations of unusual vapors, mists, or clouds, will require using readily available respiratory protective equipment or immediate evacuation of the area.

PERSONAL PROTECTION

The required personal protection clothing will be worn during on-site inspections, especially during all sampling events, except where down-grades are acceptable:

Level C (Modified)

- Coveralls (i.e., Tyvek), neoprene, PVC, or rubber boots (steel toe), inner vinyl or latex surgical gloves, outer neoprene work gloves, full-face respirator with organic and particulate filters.

- Coveralls will be taped at wrists and ankles. Respirator cartridges to be used will bear NIOSH/MSHA approvals. Respirator cartridges will be changed once daily or when recommended exposure is reached to minimize the potential for break-through. If break-through occurs, cartridges must be changed.

If a down-grade is deemed acceptable:

Level D

- Tyvek (non-chemical resistant) coveralls, neoprene, PVC, rubber, or leather work boots (steel toe), optional inner vinyl or latex surgical gloves, outer neoprene work glove, optional goggles or face masks, and a hard hat.

MEDICAL SURVEILLANCE

Each field member must be a current participant in the TNRCC Health Monitoring Program, and must have already had their initial physical examination prior to entering this or any site where a potential exists for exposure to hazardous chemicals.

Each team member will acknowledge that they have had a current annual physical by signature on the Plan Acceptance Form and that they are medically fit to perform team tasks as assigned. If there are any medical restrictions on a team member's utilization, these restrictions must be provided in writing to the Site Safety Officer as noted by a physician as soon as possible before the field work begins. These restrictions will be complied with at all times while performing team tasks. If the team member cannot perform the task as required, another team member will be selected to perform the task.

SITE SPECIFIC TRAINING

The Site Safety Officer will be responsible for developing a hazard awareness briefing for all TNRCC personnel that are to perform team member tasks on the site, and other visiting personnel, as necessary. If other personnel visit the site during the sampling inspection and wish to participate, they will be required to review the Health and Safety Plan and/or receive a hazard awareness briefing from the Site Safety Officer before entering the site. This training will be acknowledged by signature of the visiting personnel on the Plan Acceptance Form (Appendix A). A daily safety meeting will be held prior to entering the site each day and a Site Safety Briefing Form completed (See Appendix B). The safety meeting will consist of the following topics:

SITE SAFETY BRIEFING (Held Each Day)

- Roll call - identify the team member responsible for site safety and health. Assure the Plan Acceptance Form has been signed by each team member.
- Discuss safety, health, and other issues that may effect the tasks assigned.
- Discuss/review proper use of personal protective equipment.
- Review work practices by which the employee can minimize risk from hazards.
- Discuss safe operation of engineering controls and equipment used on the site.
- Review potential chemicals and acute effects of the chemicals at the site.
- Review evacuation routes, signals, and emergency evacuation procedures.

- Review decontamination procedures, assign decontamination tasks.
- Assign designated area to meet in case work area must be evacuated.
- Review "buddy" system procedures.

The Site Safety Officer shall be familiar with the operation, calibration, and limitations of all field monitoring equipment. In addition, the field team should have the following health and safety items readily available:

- Copy of the Health and Safety Plan,
- First aid and snake bite kits, including ice,
- Emergency eyewash bottle,
- Air sampling/monitoring equipment (photoionization detector, etc,),
- Oxygen/combustible gas indicator (as required),
- Fire extinguisher, and
- Distilled water (for eyewash bottle refill and decontamination procedures).

SECTION 6

FREQUENCY AND TYPES OF AIR MONITORING

If the Site Investigation Manager determines that air monitoring is necessary two types will be performed at this site: monitoring for combustible hydrocarbon emissions and for volatile organic vapors. The first instrument to be used on site is the O_2/combustible gas indicator (CGI), or explosimeter. The lower explosive limit (LEL) for combustible gases will be monitored initially before any other instruments are employed, since volatile ignitable gases may be present. Dangers from these gases include asphyxiation to entering a potentially explosive atmosphere. The **action level** for LEL is established as **>20% LEL**. Therefore, LELs of 20% or greater are cause to stop work and evacuate the area upwind until levels are determined below this action level.

If the LEL is established as < 20%, monitoring for organic vapors/gases will be conducted as the second type of air monitoring using a photoionization detector (PID) instrument. Field instruments must be calibrated prior to use at the site according to the manufacturer's specifications and as outlined in the QAPP. Monitoring of the potential breathing zone around the sampling areas will be performed during the sampling activities as well as periodically during other on-site activities. An **action level** of **10 ppm above background** will be used for **volatile organics** at all sampling areas because of the potential for encountering unknown chemicals. If 10 ppm above background is encountered on the air monitoring equipment at a sampling location, the Site Safety Officer will be immediately contacted to reevaluate safety equipment requirements or whether the site will be evacuated until the vapors are identified or dissipate.

The need for air monitoring equipment and frequency will be determined on a site-specific basis by anticipated respiratory concerns at the area (i.e., background samples taken off-site may not need air monitoring equipment).Table 6.1 lists the chemicals that **may be present** in the Jefferson and Star Lake canals and the TLV, PEL, and other pertinent information for each chemical. Table 6.2 lists the same information for the decontamination and preservation chemicals which may be used at this site.

AIR MONITORING EQUIPMENT CALIBRATION AND MAINTENANCE

All monitoring instruments will be calibrated daily in accordance with the QAPP. Calibration data/time/equipment comments will be noted in the project field notebook.

HNU Photoionization Analyzer Model PI-101

The HNU Systems, Inc. Model PI-101 Photoionization Detector (PID) must be kept hooked up to the battery charger overnight before use. A spare battery is kept in the carrying case and should be kept charged so a backup battery is available.

The HNU may be calibrated with a calibration gas of known contents by connecting the probe to a sampling source using flexible tubing. The HNU requires a "zero" adjustment to background levels. Start-up procedures are provided with the instrument and may be referred to for correct equipment operation. A review of the operatiing considerations are provided below:

Check the function switch on the control panel to make sure it is in the OFF position. Attach the probe to the readout unit. Match the alignment key, and twist the connector clockwise until it locks. Turn the function switch to the BATTERY CHECK position and check that the indicator is in the "green." Turn the function switch to STANDBY to zero the instrument. Rotate the ZERO POTENTIOMETER until the meter reads "zero." Wait 15 to 20 seconds to confirm that the zero adjustment is stable. If not, then readjust. Check to see that the SPAN POTENTIOMETER is set to the appropriate setting for the probe being used (5.0 or 10.2). Set the function switch to the desired ppm range. Listen for the fan operation to verify the fan function. Check operation of the sensor using an organic source, such as a "magic marker" to verify instrument function.

MONITORING REQUIREMENTS AND INSTRUMENT LIMITATIONS

The TNRCC Site Safety Officer will periodically perform and maintain calibration and on-site maintenance records for the direct-reading instruments.

Table 6.1 Chemicals that may be present at the Star Lake Canal Site (From NIOSH & ACGIH Pocket Guides)

Possible Chemical Contaminants	**NIOSH REL** (Recommended exposure level for 10 hr wk day/40 hr week) ST (short term exposure level/15 minutes)	**PEL** (Permissible exposure limit for 8 hr days in a 40 hr week) ST (short term exposure level/15 minutes)	**TLV** (Threshold Limit Values for 8 hours) **only listed if more stringent than PEL	**IDLH** (Immediate Dangerous to life or health concentrations	**Symptoms of Exposure** (inhalation; skin absorption)
Naphthalene	10 ppm ST=15 ppm	10 ppm	**	250 ppm	Eye irritation, headache, nausea
Pentachlorophenol	0.5 mg/m³	0.5 mg/m³	**	2.5 mg/m³	Eye, nose and throat irritation. Sneezing, coughing, weakness.
Toxaphene	0.5 mg/m³	0.5 mg/m³	**	Not Listed	Skin irritation, convulsions
Arsenic	0.002 mg/m³	0.002 mg/m³	**	5 mg/m³	Ulceration of nasal septum, dermatitis, GI disturbances.
Chromium	0.5 mg/m³	0.5 mg/m³	**	25 mg/m³	Eye and skin irritation.
Iron	1 mg/m³	1 mg/m³	**	Not Listed	Eye, skin, throat and mucous membrane irritation.
Lead	*100 mg/m³* ST=0.05 mg/m³	*100 mg/m³*	**	100 mg/m³	Weakness,
Manganese	1 mg/m³ ST=3 mg/m³	1 mg/m³	**	500 mg/m³	Asthenia
Selenium	0.2 mg/m³	0.2 mg/m³	**	1 mg/m³	Eye, skin and nose irritation.

ppm = Parts per million
ca = Carcinogen
a/TLV-TWA = Threshold limit value, time weighted average. OSHA-enforced average air concentration to which a worker may be exposed for an 8-hour workday without harm.
b/PEL = Permissible exposure limit. Average air concentration (same definition as TLV, above) as recommended by the American Conference of Governmental and Industrial Hygienists (ACGIH).
c/IDLH = Immediately dangerous to life or health. Air concentration at which an unprotected worker can escape without debilitating injury or health effects. Expressed as ppm unless noted otherwise.
© = denotes Ceiling limit

Table 6.2 Chemicals of Record Used for Field Investigations

Chemical	TLV a/	(OSHA) PEL b/	Odor Threshold (ppm)	IDLH c/ (ppm)	Comments
Hexane	50	500		500	Calibration for HNU PI-101 photoionization detector. No anticipated problems since hexane in cylinder is only 0.14 percent by volume with air.
Nitric Acid	2	2		100	Very corrosive sample preservative agent. Avoid contact with skin, eyes, and clothing. Store bottle in an upright secure position. Do not preserve water samples suspected of containing cyanide compounds.
Hydrochloric Acid	(C),5	(C),5	1-5	100	Very corrosive sample preservative agent. Avoid contact with skin, eyes, and clothing. Store bottle in an upright secure position. Do not preserve water samples suspected of containing cyanide compounds.
Isopropanol	400			12,000	Decontamination fluid. Wear gloves when cleaning equipment.

ppm = Parts per million
ca = Carcinogen
a/TLV-TWA = Threshold limit value, time weighted average. OSHA-enforced average air concentration to which a worker may be exposed for an 8-hour workday without harm.
b/PEL = Permissible exposure limit. Average air concentration (same definition as TLV, above) as recommended by the American Conference of Governmental and Industrial Hygienists (ACGIH).
c/IDLH = Immediately dangerous to life or health. Air concentration at which an unprotected worker can escape without debilitating injury or health effects. Expressed as ppm unless noted otherwise.
© = denotes Ceiling limit

SECTION 7

ACCIDENT PREVENION AND CONTINGENCY PLAN

ACCIDENT PREVENTION

All field personnel will receive health and safety training prior to the initiation of any site activities. On a day-to-day basis, individual personnel should be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency. Before beginning the site investigation, a meeting will be held to discuss accident prevention (see Section 5, Site Safety Briefing). The discussion should cover but not be limited to:

- Tasks to be performed; time constraints (e.g., rest breaks);
- Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals; and emergency medical procedures.
- Emergency evacuation procedures.

Buddy System

The "buddy" system will be used at all times by all TNRCC field personnel while performing work related tasks on site. All activities must be conducted with a partner (buddy) who can:

- Provide his or her partner with assistance;
- Observe his or her partner for signs of chemical or weather exposure; and
- Notify the Site Safety Officer or others if emergency help is needed.

CONTINGENCY PLAN

Emergency Procedures

In the event that an emergency develops on site, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while on site, or

- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

Chemical Exposure

If a member of the field crew demonstrates symptoms of chemical exposure, the procedures outlined below should be followed:

- Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should then notify the Site Safety Officer of the chemical exposure. The Site Investigation Manager should contact the appropriate emergency response agency.

- If the chemical is on the individual's clothing, the chemical should be neutralized or removed (if it is safe to do so).

- If the chemical has contacted the skin, the skin should be washed immediately with copious amounts of water.

- In case of eye contact, the emergency eye-wash solution should be used. Eyes should be washed for at least 15 minutes using available distilled water.

- All chemical exposure incidents must be reported to the Region/Central Office Staff Safety Offices. The Site Investigation Manager is responsible for reporting the chemical exposure incident and assist the individual's supervisor in submitting a written report (see Appendix A).

Personal Injury

In case of personal injury at the site, the following procedures should be followed:

- A team member should signal the other team member that an injury has occurred.

- A field team member trained in first aid can administer immediate treatment to the injury.

- The victim should then be transported (if applicable) to the nearest hospital or medical center, or stabilized so that further injury does not occur.

- The Site Investigation Manager is responsible for making certain that an accident report form is completed and submitted to the Region and Central Office Staff Safety Offices. Follow-up action should be taken to correct the situation that caused the accident.

Evacuation Procedures

- The Site Safety Officer will determine whether an evacuation is necessary.
- All personnel in the work area should evacuate the area and meet in the predesignated area.
- Account for all personnel. Wait for further instructions from the Site Safety Officer.

SECTION 8

SITE-SPECIFIC DECONTAMINATION PROCEDURES

Prior to leaving the site, personnel protective and sampling equipment will be decontaminated. Decontamination procedures will be conducted as follows:

- Remove and wash goggles or safety glasses (if used),
- Remove and wash chemical protective boots, gloves,
- Wash sampling equipment to remove gross contamination, and
- Wash hands and face.

Protective gloves will be placed in garbage bags and disposed of appropriately at the conclusion of site activities. Sampling equipment will be placed in plastic bags for final decontamination at the conclusion of site activities.

PERSONNEL DECONTAMINATION PROCEDURES

The TNRCC field team will establish an on-site decontamination station. An area will be set up during initial field activities prior to any sampling event. The decontamination station will have provisions for collecting disposable protective equipment; for washing boots, gloves, field instruments, sampling tools (if required); and for washing hands, face, and other exposed body parts. Investigation derived waste (IDW) from decontamination will be properly disposed in accordance with EPA guidelines outlined in the EPA/540/G-91/009, May 1991 handbook.

Decontamination equipment will include, as necessary:

- Plastic buckets, pails, and scrub brushes
- Non-phosphate detergent
- Isopropyl alcohol
- Paper towels
- Plastic garbage bags, sheets of plastic
- Deionized and potable water.

SECTION 9

DOCUMENTATION AND NOTIFICATION

LOGBOOK DOCUMENTATION REQUIREMENTS

Implementation of the provisions of the Health and Safety Plan will be recorded in the field log book. Information to be recorded shall include:

- Weather conditions at the time of the inspection (daily entry),
- Names of the personnel on-site (daily entry),
- Levels of personal protective equipment worn by the field personnel (specifically note conditions or rational for down- or up-grading PPE),
- Monitoring instrument readings,
- Subjects discussed during site health and safety briefings, and
- All safety violations.

A Health and Safety Checklist has been included in Appendix C to assist the Site Safety Officer in assuring that appropriate safety consideration have been covered in the daily safety briefing.

EPA NOTIFICATION OF IMMINENT DANGER TO THE GENERAL PUBLIC

If there is an imminent danger that the general public may come into direct contact with hazardous substances or wastes, which are readily accessible on-site, the Site Investigation Manager will notify the Project Manager who will notify the EPA no later than one (1) day after the inspection team returns from the site. Written notification will follow any verbal communication in regard.

SECTION 10

CONFINED SPACE ENTRY

A "Confined Space" means that a space:

1) is large enough and so configured that an employee can bodily enter and perform assigned work;
2) has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
3) is not designed for continuous employee occupancy.

Should confined spaces be required to be inspected for a SSI, the Site Project Manager will be responsible for evaluating the site to determine if any confined spaces meet the definition of a permit-required confined space. "Permit-required confined space" means a confined space that has one or more of the following characteristics:

1) contains or has a potential to contain a hazardous atmosphere;
2) contains material that has the potential for engulfing an entrant;
3) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
4) contains any other recognized serious safety or health hazard.

If permit-required confined spaces are observed on site and are required to be investigated, the Site Project Manager, or any other team member, will not enter these spaces and will notify the Staff Health and Safety Officer, who will arrange for certified personnel who can work in permit-required confined spaces.

APPENDIX A

PLAN ACCEPTANCE FORM

SUMMARY OF ACTIVITIES

ACCEPTANCE

I have read the Health and Safety plan (or been briefed on the hazards) for Screening Site Inspection (SSI) field work to be conducted at the Star Lake Canal Site located in Jefferson County, Texas, and agree to abide by the rules and guidelines contained therein. I acknowledge that I have had a current annual physical within the last 12-month period from the date signed below, and am medically cleared to perform my tasks as outlined.

Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

AUSTIN TEXAS

MEMORANDUM

RECEIVED

OCT 27 1993

TO: All TNRCC SUPERVISORS

FROM: Walter E. Keith WEK
Workers' Compensation Claims Coordinator

DATE: August 6, 1993

SUBJECT: Reporting Procedures For Workers' Compensation Claims

---

All TNRCC employees are encouraged to report any accident to their supervisor immediately. Accidents involving an "on-the-job" injury resulting in a medical expense and/or lost time must be reported. In the absence of an immediate supervisor, employees should report to the person left in charge or someone else in a supervisory capacity.

The supervisor upon being informed of an employee injury should immediately contact Walter E. Keith, Workers' Compensation Claims Coordinator for the agency, by calling 512/908-1819. Follow-up correspondence such as witness statements should be sent to the Workers' Compensation Claims Coordinator at 12124 Park 35 Circle, Austin, TX 78753 either by fax 512/908-1212 or by mail.

All Employee injuries involving lost time or medical payment must be reported to the State Employees Division of the Attorney General's Office followed by the necessary paperwork within two calendar days.

Supervisors should pay particular attention to the TWCC 1S form attached. You will be required to supply much of the information for the completion of this form. Please be prepared to communicate telephonically the information to satisfy items 1 through 33. I will supply data to satisfy items 34 through 51.

It is important that supervisors are aware of the following:

(a) Item 9 - Mailing Address: Home address of the injured employee. You must include the COUNTY.
(b) Item 30 - Date of Hire: Agency hire-in date of employee.
(c) Item 33 - Length of Service in Occupation: Time indicated may differ with the date of hire.

Please note that recent staff reorganizations have shifted the Workers' Compensation function from the Human Resources Division to the Risk Management Section. As we all adjust to this change, I want you to know that I appreciate your interest and concern to help make our Workers' Compensation Claim Procedures operate smoothly. Our ultimate goal is to have NO workers' compensation claims to process, if and/or when the occasion does arise, I look forward to working with you. Thank you and please do not hesitate to call me if you have any questions.

ATTACHMENT

APPENDIX E

Quality Assurance Project Plan

TNRCC

Protecting Texas
by Reducing and
Preventing Pollution

Quality Assurance Project Plan

for

Texas Natural Resource Conservation Commission Preliminary Assessment/Site Inspection Program (FY 1996)

Prepared in cooperation with the U.S. Environmental Protection Agency

September 1995

SECTION 1

PROJECT MANAGEMENT

(A4) PROJECT ORGANIZATION and (A6) PROJECT DESCRIPTION

This document is a Quality Assurance Project Plan (QAPP) for the planning and implementation by the Texas Natural Resource Conservation Commission (TNRCC) of Preliminary Assessments and Screening Site Inspections in Texas for the U.S. Environmental Protection Agency (EPA). This QAPP serves as a controlling mechanism to ensure that all data collected are of satisfactory quality. This QAPP has been prepared in accordance with the "Interim Draft EPA Requirements for Quality Assurance Project Plans ", EPA QA/R-5, May 1994, and EPA Data Quality Objectives Process for Superfund, EPA QA/G-4, September 1994.

The TNRCC Site Investigation Manager will be responsible for collecting the samples defined in the Screening Site Inspections (SSI) or Expanded Site Investigation (ESI) Work Plan (WP), initiating the proper chain-of-custody, health and safety, and quality assurance procedures. The TNRCC Site Investigation Manager will also be responsible for making any field sampling determinations as dictated by site conditions. Samples from the sites will be analyzed for semi-volatiles, volatiles, metals, pesticides and Polychlorinated Biphenyls (PCBs).

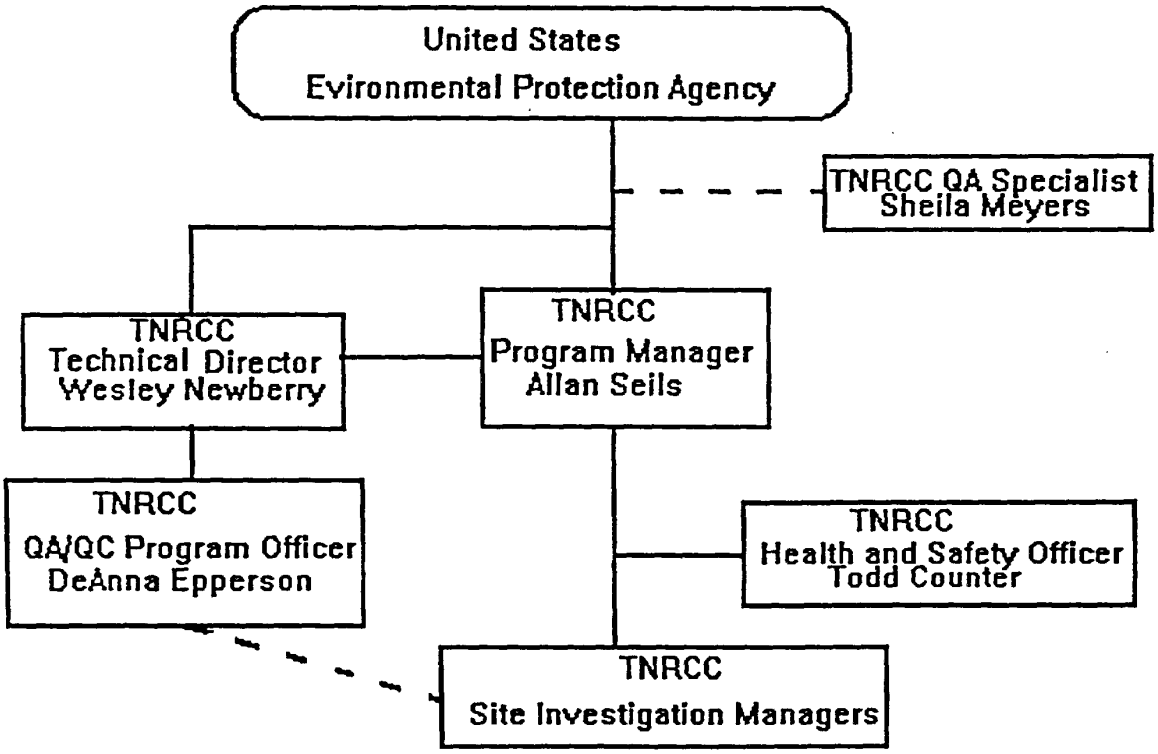
If, considering site conditions, there is an imminent danger that the general public may come into direct contact with hazardous substances or wastes which are readily accessible on-site, the EPA will be notified no later than one (1) day after the inspection team returns from the site visit. Written notification will follow any verbal communication in this regard.

The Preliminary Assessments and Site Investigation (PA/SI) program organization chart, Figure 1.1, identifies the key individuals who will be primarily responsible for performance of the project. This organizational structure forms a management team of professionals to oversee the technical aspects of the project, supported by an administrative team who will ensure that personnel and equipment are available to the project when required.

Allan M. Seils, will function as TNRCC Program Manager. Mr. Seils will be responsible for overall coordination of project activities. He also will serve as primary TNRCC contact for the EPA. The Technical Director, Wesley G. Newberry, will review the SSI work plans, Preliminary Assessment (PA) and SSI reports, and progress reports. DeAnna Epperson, the Program QA/QC Officer, will be responsible for reviewing data in accordance with the procedures outlined in this QAPP, and will complete associated data assessment reports. The Program QA/QC Officer will function independently of the Program Manager and will assure

Figure 1.1 Program Organization

Preliminary Assessment/Site Inspection Program
Superfund Site Discovery and Assessment Unit



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REFERENCES

Interim Draft EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, May 1994

EPA Data Quality Objectives Process for Superfund, EPA QA/G-4, September 1994.

USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Document No. ILM04.0

USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Revision No. OLM03.1, August, 1994

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QAPP DISTRIBUTION LIST

Name	Organization
Bartolomé J. Cañellas Site Assessment Manager	U.S. Environmental Protection Agency, Region 6 Site Response Section
Wesley G. Newberry, Technical Director	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program
Allan M. Seils, Program Manager	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program
DeAnna Epperson, QA/QC Program Officer	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program
Kelly Cook, Site Investigation Manager	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program
Debra Hendricks, Site Investigation Manager	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program
Abigail Power, Site Investigation Manager	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program
Moira McCarthy, Site Investigation Manager	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program
C. Todd Counter Site Investigation Manager	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program
Johnny Kennedy Site Investigation Manager	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program Region 10/12 (Beaumont/Houston) Offices
J.D. Thompson, Site Investigation Manager	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program Region 4 (Arlington) Office
Gary Hazelwood, Site Investigation Manager	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program Region 5/10 (Tyler/Beaumont) Offices
Four Staff Positions Site Investigation Managers	TNRCC, Pollution Cleanup Division Superfund Site Discovery and Assessment Program
Sheila Meyers QA Specialist	TNRCC, Administrative Services Organizational Development and Training

that project quality control is maintained. The TNRCC Program Quality Assurance/Quality Control (QA/QC) Officer shall audit the field work at 20% of the SSI/ESI sites. Sheila Meyers is the Quality Assurance Specialist and will serve as TNRCC final approval authority for this PA/SI QAPP. C. Todd Counter will serve as the Health and Safety Officer, independent of the Program Manager. As such, he, or his designee will be responsible for ensuring that all on-site activities comply with the approved site specific Health and Safety Plan.

A generic Health and Safety Plan (H&SP) will be followed during performance of each PA site visit. Individual site H&SPs will be prepared for all SSI sites as part of the work plan development. All H&SPs will be based on TNRCC's health and safety program and TNRCC's understanding of current health and safety regulations.

There will be no more than twelve (12) PAs and eighteen (18) SSIs conducted during this project with the possibility that both a PA and SSI may be conducted at any one location. A maximum of two (2) persons per PA and four (4) persons per SSI/ESI will be used to conduct field activities. At these sites, one TNRCC staff person will be designated as the lead Site Investigation Manager and will have the on-site responsibility for ensuring that the HSP and QAPP are followed, and that appropriate data are collected to allow for preparation of site-specific SSI/ESI WP. The Site Investigation Manager also will be responsible for planning and conducting the site visit and preparing the final PA, SSI report and/or Documentation Record (for ESI sites, only) for the site.

It is anticipated the TNRCC Program Manager will issue site assignments such that the majority of PAs are completed within the first six (6) months of the project. This will allow those sites which progress directly to an SSI Work Plan to be completed within the final six months of the project. The total anticipated time to complete each PA is 120 hours and each SSI is 400 hours. A detailed schedule is presented in Table 1.2. This schedule may be adjusted to meet specific requirements of the EPA guidance.

The TNRCC Site Investigation Manager designated to lead investigations at the SSI/ESI site will develop a WP and sampling strategy for the site. The information gained from the PA, tentative disposition, and other timely information will be used in determining tentative numbers, nature, and location of samples collected. The WP consists (1) a list of project contacts; (2) a site background review including site history, descriptions of the site including geology, hydrology, soil conditions, site map(s), and waste handling practices including types and quantities of wastes generated (if known); (3) a WP summary including field personnel, site reconnaissance plan, sampling strategy, sampling locations and map(s), and QA/QC sample protocols and

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QUALITY ASSURANCE PROJECT PLAN
FOR
TNRCC PRELIMINARY ASSESSMENTS AND SCREENING SITE INSPECTIONS

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Quality Assurance Project Plan

Texas Natural Resource Conservation Commission
Preliminary Assessment/Site Inspection
Program (FY 1996)

Prepared in cooperation with the

U.S. Environmental Protection Agency

September 1995

The preparation of this report was financed through a grant from the U.S. Environmental Protection Agency.

QTRACK # _____

APPENDIX F

Site Reconnaissance Checklists

SITE RECONNAISSANCE CHECKLIST

I. General
   1. Name and title of site contact.
   2. Telephone number.
   3. Site address.
   4. Mailing address (if different).
   5. Name of owner and/or operator.
   6. Mailing address.

II. Site History
   1. How long has current owner/operator been at site?
   2. What were previous uses of site? Who were previous owners?
   3. Size of site (acres).
   4. Is any other property used that is not contiguous with site?
   5. Permits (RCRA, TDH, etc.)
   6. Any past spills or other environmental or accident problems.
   7. What were previous waste management practices?

III. Current Operations
   1. What is currently being done at facility?
   2. What are waste management practices?
   3. What are hazardous chemical management practices?
   4. List major hazardous chemicals/constituents present and past.
   5. Discuss sources (e.g., tanks, impoundments, containers, etc.).
   6. Number of employees - current, peak.

IV. Source Characteristics
   1. Identify type of wastes and quantities disposed of at site.
      a. Identify source of information.
      b. Photograph.
      c. Dimension (quantity, volume, area) of waste locations.
      d. Containment controls (clay cap, clay liner, vegetative cover, etc.)
      e. Existing data.
      f. Condition/integrity of storage/disposal units.

V. Groundwater Pathway
   1. Distance from source to nearest well. Identify name and address of well owner, if possible - and estimate well usage (number of people served, irrigation, supplemental, etc.).

2. Verify wells within range of site. Indicate depth to water for each well and number of people served. Identify as many owners and addresses as practically feasible.
   a. 0 - 0.25 mile
   b. 0.25 - 0.50 mile
   c. 0.50 - 1.00 mile
   d. 1.00 - 2.00 mile
   e. 2.00 - 3.00 mile
   f. 3.00 - 4.00 mile
3. Aquifer nearest wells are screened in, and water quality.

VI. Surface Water Pathway
1. Identify the TNRCC Basin and Stream Segment where the site is located.
2. Describe surface water quality including:
   a. average discharge,
   b. total basin drainage area,
   c. TNRCC surface water quality monitoring stations.
3. Are there surface water bodies within 2 miles of site?
4. Provide sketch of surface water runoff and flow patterns for 15 stream-miles downstream.
5. identify intakes along surface water route within 15 stream-miles downstream.
6. What is water use at each intake.
7. Identify fisheries along the 15 stream-mile downstream pathway.
8. Identify sensitive environments along the 15 stream-mile downstream pathway (see attached list).
9. Identify downstream recreational uses.
10. Estimate approximate flow rates for each water body within the 15 stream-mile target distance (i.e., <10 cfs, 10-100 cfs, 100-1,000 cfs, 1,000- 10,000 cfs, etc.). Estimate length of each stream segment.
11. Identify the annual rainfall and net rainfall at the site.
12. Is site in flood plain (10 year, 100 year, 500 year)?
13. Estimate upgradient drainage area limits (watershed).
14. Draw a sketch of drainage from site to nearest surface water including any other contributing tributaries.
15. Identify recreational uses downstream (15 miles).

VII. Soil Exposure Pathway
1. Describe status of site access, fencing, gates, locks, condition of security controls.
2. Describe adjacent land use.
3. Describe off-site runoff patterns.
4. Describe number of people with residence, school, or day care on-site or within 200 yds.
5. Locate nearest school or day care.

6. Number of workers on-site (include maximum number to cover work on-site).
7. Identify sensitive environments, (see list end of checklist).
8. Describe any off-site runoff pattern existing at the site.

VIII. Air Pathway

1. Estimate number of people within 4 miles (city or county records).
   a. 0 - 0.25 mile
   b. 0.25 - 0.50 mile
   c. 0.50 - 1.00 mile
   d. 1.00 - 2.00 mile
   e. 2.00 - 3.00 mile
   f. 3.00 - 4.00 mile
2. Shortest distance from source to occupied building.
3. Identify known releases to air.
4. Identify reports of adverse health effects.
5. Identify existence of sensitive environments within 4 miles (see end of checklist for list).

Miscellaneous Inquiries

1. Are any additional aerial photographs depicting site history available?
2. Meteorological data.
3. Nearest recreational area? Hospital?
4. Local water supply sources?

Site Sketches to Include

1. Date(s) of visit.
2. Well locations (including nearest to site).
3. Storage areas (past and present).
4. UST and above ground storage tanks.
5. Waste Areas.
6. Buildings
7. Access roads.
8. Areas of ponded water, or depressions in surface.
9. Drainage direction.
10. Photograph locations and directions.
11. Vegetation and significant landscaped features.
12. Any irregular appearance for soil, vegetation, tanks, etc. such as may result from spill, backfill operation, recent dirt moving work, etc.

II. Waste Load

A. Source

The permittee chlorinates waxes and oils to produce chlorinated paraffins and chlorinated oils.

There are four (4) sources of process wastewaters at the plant. The large volume source is effluent from the caustic scrubber. Waste tail gases fro the hydrochloric absorption system are passed through a scrubber containir caustic to remove chlorine. Another wastewater source is boiler blowdown. The third source of process wastewater was drainage from the process area. The fourth source consists of cooling tower blowdown.

B. Quantity and Quality

7,500 gallons of scrubber effluent are discharged two times a month and contain high concentrations of chlorides. Boiler blowdown contains high pH, and dissolves solids concentrations. Drainage from the process area is variable in quantity and quality and would contain any spillage or leakage within the process area.

III. Treatment System

A. Primary settling pond

100ft x 150ft x 6ft with $\cong$ 1:2 internal slopes

area-- $<$ 53,424ft*

capacity-- $<$ 399,612 gals (maximum)*

$<$ 266,408 gals (with 2ft freeboard)

*Does not include sedimentation.

B. The permittee routed all waste streams to the pond by March 19, 1976. After June 1976, the permittee reported no discharge.

IV. Receiving Stream

A. The permit specified the permitted discharges to Star Lake Ditch, thence into Star Lake thence into Neches Butane Products Outfall Canal thence to Segment 0601 of the Neches River Basin. However, any discharge would be to the Jefferson Chemical Outfall Canal thence into Star Lake thence to Segment 0601 of the Neches River Basin.

B. Noncontact recreation, propagation of fish and wildlife, industrial navigation.

000190

C. Past and present discharges of contaminated storm runoff containing toxaphene in excess of the permitted limitations have been documented. Subsequently, toxaphene has been found in large concentrations in sediments in the Jefferson Outfall Canal (IOM LH, 9/25/79). Toxaphene toxicity to aquatic organisms has been well documented.

V. Grant Status

None

VI. Previous Citations and Other Enforcement Action

Riverside Chemical Company was issued Enforcement Order No. 76-26 on May 26, 1976. Copy of said order is included as Attachment I.

VII. Violations

A. The permittee has never complied with Provision 4 of Enforcement Order No. 76-26 requiring the company to eliminate any storm water discharges containing detectable amounts of toxaphene.

1. Violation*	Data Source	Permit or Other Requirement
7/21/79--Grab Sample Toxaphene--260.0 Pentachlorophenol--4.55	Chain of Custody Tag No. IN06108	Enforcement Order No. 76.26, Part III of Permit 018
7/21/79--Grab Sample Toxaphene--210.0 Pentachlorophenol--35.2	Chain of Custody Tag No. IN06109	Enforcement Order No. 76-26, Part I of Permit 01857
8/5/77-Grab Sample Toxaphene--168 Pentachlorophenol--35.2	Chain of Custody Tag No. IN06128	Enforcement Order No. 76-26, Part I of Permit 01857
8/5/77--Grab Sample Toxaphene--interference Pentachlorophenol--12.4	Chain of Custody Tag No. IN06126	Enforcement Order No. 76-26, Part I of Permit 01857
8/5/77--Grab Sample Toxaphene--48 Pentachlorophenol--108	Chain of Custody Tag No. IN06139	Enforcement Order No. 76-26, Part II of Permit 01857
8/5/77--Grab Sample Toxaphene--330 Pentachlorophenol--7.8	Chain of Custody Tag No. IN06127	Enforcement Order No. 76-26, Part II of Permit 01857

*expressed in ug/l.

Violation*	Data Source	Permit or Other Requirement
8/5/77--Grab Sample Toxaphene--100 Pentachlorophenol--2,330	Chain of Custody Tag No. IN06125	Enforcement Order No. 76-26, Part III of Permit 01857

*expressed in ug/l

2. The permittee failed to treat the discharges listed above as required by Permit No. 01857.

B. The permittee consistently and frequently violated the wastewater limitat established in Permit No. 10857.

1. Violation	Data Source	Permit or Other Requirement
Toxaphene--0.04 kg/day daily average	Self-reporting June 1976 IOM--AT/File--7/14/76	0.02 kg/day
TSS--5.2 kg/day daily average	Self-reporting June 1976 IOM--AT/File--7/14/76	4.5 kg/day
6/17/76 Toxaphene 0.04 kg/day daily maximum	IOM--AT/File---7/14/76	0.03 kg/day 24-hour composite
6/16/76 Toxaphene--0.07 kg/day daily maximum	IOM--AT/File---7/14/76	0.03 kg/day 24-hour composite
6/15/76 Toxaphene--0.07 kg/day daily maximum	IOM--AT/File--7/14/76	0.03 kg/day 24-hour composite
TSS--5.3 kg/day	Self-reporting May 1976 IOM--AT/File--7/14/76	4.5 kg/day
5/11/76 Toxaphene--0.04 kg/day daily maximum	IOM--AT/File--7/14/76	0.03 kg/day 24-hour composite

2. Tables I through VI (Attachment II) document 18 toxaphene violations, 20 TSS violations, 7 TDS violations, 11 oil and grease violations, 7 BOD_5 violations, and 20 ph violations as compiled from a review of company records dated April 26, 1974 to December 5, 1975.

VIII. Causes of Violations

Storm water runoff is contaminated with toxaphene residuals from the plant site. The plant site was contaminated through sloppy operations and lack groundskeeping. Wastewater discharges have been in violation of the limitations established in Permit No. 01857 due to the permittee's failure to provide adequate treatment.

IX. Technical Recommendations

A. Within 45 days, Riverside Chemical Company shall remove all soils from the perimeter storm water ditches, adjacent to the plant site, which (a) contain more than 50.0 mg/kg toxaphene and/or (b) will leach greater than or equal to 0.01 mg/l toxaphene in equal volumes distilled water and soil in 24 hours and dispose of such soils in a site authorized in writing by the Executive Director of the Texas Department of Water Resources(TDWR).

B. Within 60 days, Riverside Chemical Company shall remove all soils from the Jefferson Outfall Canal which (a) contain more than 50.0 mg/kg toxaphene and/or (b) will leach greater than or equal to 0.01 mg/l toxaphene in toxaphene in distilled water in 24 hours and dispose of such soils in a site authorized in writing by the Executive Director of the TDWR.

C. Within 90 days, Riverside Chemical Company shall submit for acceptance by the Executive Director of the TDWR a plan prepared and signed by a certifie professional engineer designed to eliminate any discharges of storm water containing in excess of 0.01 mg/l toxaphene including a timetable for the construction of any and all appurtenances necessary to implement said plan

D. Within 30 days of notice of acceptance of the plan referred to in Item 3 by the Executive Director of the TDWR, the company shall implement said pl

NO. D116345

STATE OF TEXAS	§	IN THE DISTRICT COURT
PLAINTIFF	§	
VS.	§	OF JEFFERSON COUNTY, TEXAS
CHEMALL, INC.,	§	
DEFENDANT	§	136 JUDICIAL DISTRICT

AGREED FINAL JUDGMENT

BE IT REMEMBERED THAT ON THIS 13th day of December, 1982, came on to be heard the above entitled and numbered cause, said cause being an action prosecuted by Plaintiff, State of Texas, against Defendant, Chemall, Inc., for alleged violations by Defendant in Jefferson County, Texas of Chapter 26 of the Texas Water Code and The Rules and Regulations of the Texas Department of Water Resources, and came Defendant by and through its attorney of record, and came Plaintiff by and through its attorney of record, and the parties announced to the Court that all matters alleged by Plaintiff in this case had been settled, agreed and compromised, subject to the approval of this Court, based on entry of this Judgment agreed upon by the parties and recommended to the Court; and the parties jointly moved the Court for entry of such agreed upon and recommended Judgment; and

The Defendant having waived all formalities of Rules 680-693, Texas Rules of Civil Procedure, and acknowledging an understanding of the terms contained in the Judgment, following participation in settlement negotiations and waiving writ of execution, and acknowledging receipt of a copy of this Judgment, and waiving all right of appeal; and it appearing to the Court that the agreed upon and recommended Judgment is in all respects proper and necessary at this time, it is, therefore, ORDERED, ADJUDGED AND DECREED as follows:

I.

Defendant Chemall, Inc., shall complete closure of their existing inactive waste pond in accordance with the rules, regulations and technical guidelines of the Texas Department of Water Resources no later than 22 weeks from the date of this

May 16, 83
Extended - Sept. 30, 83

DEPT. OF WATER RESOURCES

Judgment. Such closure shall be subject to Department review and approval and may be accomplished by disposal of existing contaminated wastewater at an approved disposal facility; removing remaining sludges to an approved disposal facility or solidifying sludges in place; filling of the emptied pit area with earthen fill material; capping the pit area with a three foot deep layer of compacted clay material; vegetating the capped fill material; and recording this Judgement, a plat of this property including the location of the prior pit and the proposed treatment facility and a statement that there may be residual toxaphene contamination on the plant property, in the deed records of Jefferson County, Texas.

II.

Defendant, Chemall, Inc. shall design, construct and implement a wastewater treatment system within 70 weeks from the date of this Judgment in accordance with the general design schedule contemplated by the documents titled "Chemall Wastewater Compliance Schedule," copies of which are attached hereto and made a part of this Judgment. The wastewater treatment system will be subject to standard Texas Department of Water Resources review and approval for such facilities, and will be designed and operated to assure compliance with toxaphene discharge limitations imposed by Permit No. 08157, as amended.

III.

Defendant Chemall, Inc. shall remove all toxaphene contaminated sediments from all ditches adjacent to and contiguous with Defendant's plant-site property, with the exception of the Jefferson Canal, to a point where concentration of toxaphene leachate does not exceed .04 mg/l. This toxaphene removal shall be completed no later than 4 weeks from the date of completion of the wastewater treatment system required by this judgment. Such toxaphene removal shall be subject to review and approval by the Texas Department of Water Resources in accordance with the standard TDWR Leachate Test as described in TDWR Technical Guide Number 1.

IV.

Defendant Chemall, Inc., its agents, representatives and employees are hereby permanently restrained, prohibited and enjoined from violating any of the terms of Texas Department of Water Resources Permit No. 01857, as amended, a copy of which is attached hereto and made a part of this Judgment.

IT IS FURTHER ORDERED, ADJUDGED and DECREED that Plaintiff, State of Texas, have and recover from Defendant Chemall, Inc. the sum of FOURTEEN THOUSAND DOLLARS ($14,000.00) civil penalites in satisfaction of all violations of the Texas Water Code alleged in Plaintiff's Original Petition and Application for Permanent Injunction.

IT IS FURTHER ORDERED, ADJUDGED and DECREED that Defendant pay all costs of court.

SIGNED and ENTERED this 13th day of December, 1982.

/s/ Robert King
JUDGE PRESIDING

APPROVED AS TO FORM AND SUBSTANCE
AND ENTRY REQUESTED:

MARK WHITE
ATTORNEY GENERAL OF TEXAS

/s/
MICHAEL LEBURKIEN
SBN 12100650
Assistant Attorney General
Environmental Protection Division

1220 Dallas, Suite 202
Houston, Texas 77002

ATTORNEYS FOR PLAINTIFF
STATE OF TEXAS

Paul G. Gosselink
PAUL G. GOSSELINK
SBN 08222800

BOOTH, LLOYD AND SIMMONS, P.C.
302 San Jacinto Building
Austin, Texas 78701

ATTORNEYS FOR DEFENDANT
CHEMALL, INC.

CHEMALL, INC. BY ITS AUTHORIZED
AGENT, JERRY P. MOHN, PRESIDENT
CHEMALL, INC.

TEXAS DEPARTMENT OF WATER RESOURCES
P. O. Box 13087 Capitol Station
Austin, Texas 78711

TELEPHONE MEMO TO THE FILE

Call To: L. D. Bryant, DD #7 Call From: M. Moore, Dist. 6

Date of Call: March 22, 1983 File No:

Subject of Call: Contaminated soil dredged from drainage ditch below FM Road 366 in Port Neches, Jefferson County.

Information for File: I told Mr. Bryant that TDWR had sampled soil dredged from the drainage ditch below FM Road 366, and that we suspected that the soil contained hazardous wastes (eg: toxaphene and pentachlorophenol) I requested that DD #7 remove the soil from the banks of the ditch and have it disposed of in an approved facility.

Mr. Bryant furnished me with the following information:

1) The ditch was dredged by drag-line beginning about six weeks ago, with the project being completed approximately two weeks ago;

2) The ditch has never been dredged before, since it was a natural drainage area, and DD #7 did not previously have an easement on the property, which is owned by Texaco Chemicals;

3) Approximately one year ago, DD #7 acquired an easement on the ditch in order to improve area drainage, but the property is still owned by Texaco Chemicals;

4) Mr Bryant also pointed out that the area is very marshy, and pallets had to be used to support the equipment during the dredging operation;

5) Mr. Bryant recalled that for many years Texaco (then Jefferson

Signed: Mike O C Moore

Chemical Co.), Riverside, and Sonford Chemical companies discharged chemical wastes into the ditch, and he speculated that a variety of chemical residues still exist in the sediments.

6) Mr. Bryant also said that DD #7 is planning to concrete the ditch from FM 366 upstream to the point at which it is already lined and downstream to the railroad crossing.

I recommended that the drainage district contact TDWR prior to beginning any further work on the ditch. I also agreed to let him know what the laboratory analysis results show on the samples we collected on March 21, 1983.

TEXAS DEPARTMENT OF WATER RESOURCES
P. O. Box 13087 Capitol Station
Austin, Texas 78711

TELEPHONE MEMO TO THE FILE

Call To: A.W. Catanach, Texaco Chemical Co. Call From: M. Moore, Dist. 6

Date of Call: March 23, 1983 File No: 30029

Subject of Call: Jefferson Canal - Texaco Chemical Co. Reg. No. 30029

Information for File: I informed Mr. Catanach that we are investigating possible chemical contamination in the Jefferson Canal downstream from Hogaboom Road in Port Neches. I told him that we had been informed that the canal is located on property owned by Texaco Chemical Co. I also told him that we had noted strong phenolic odors in sediments which had recently been dredged from the canal below FM 366 and disposed along the canal bank, as well as in the sediments in the canal between Hogaboom Road and FM 366.

I recommended that Texaco Chemical Co. immediately remove and properly dispose of the dredge spoils which were removed in order to prevent contaminated run-off from re-entering the canal. I also recommended that the company determine the extent of contamination remaining in the canal between Hogaboom Rd. and Star Lake and begin remedial action to remove such contaminated material that is determined to exist in the canal.

I informed Mr. Catanach that the results of our investigation would soon be forwarded to the Central Office for appropriate enforcement action. I also mentioned that if hazardous wastes or hazardous waste constituents exist in the canal, this would constitute violations of

the Texas Solid Waste Disposal Act and the Texas Water Code.

Mr. Catanach thanked me for informing him of the investigation and said that he would relay the information to appropriate corporate officials for review. He said that the company had no objections to TDWR representatives entering Texaco Chemical property in the vicinity of the canal to continue our investigation.

Milton A. Moore

Signed

C-4/5

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Gary Schroeder, Chief, Solid Waste and Spill Response, Enforcement and Field Operations

DATE: April 5, 1983

THRU :

FROM : Harry D. Boudreaux, District 6 Supervisor

SUBJECT: Enforcement Action--Texaco Chemical Company, Registration No. 30029

Attached is an Enforcement Report concerning Texaco Chemical Co., Registration No. 30029. In reviewing this report, prepared by Michael Moore, I find that it is accurate and that the proposed recommendations will bring about the correction of those problems which are causing the violations. Please review this matter for appropriate enforcement action.

Harry D. Boudreaux

Attachment

Circle the appropriate contract: ARCS START TAT RAC OTHER _____ CASE # _____

REGION 6
CLP SAMPLE REQUEST FORM

Site Name: Star Lake Canal Location: Port Neches, TX Cerclis #: TX0001414341

Type of Investigation: (✓) SSI ( ) ESI ( ) HRS ( ) RI/FS ( ) OTHER: _____

Sampling Company: TNRCC Contact: Allan Seils Marshall Cedilote Phone: (512) 239-~~4184~~ 2514

A 10/14/96

Shipping Contact: Marshall Cedilote On Site Phone: TBD Fax: (512) 239-2527

Signed By: B Canellas Date: 10/15/96 Mail Code: 6SF-RA Phone: 214-665-6662
(EPA SITE MANAGER,RPM,OSC)

Sampling Date: 10/21-25/96 Shipping Date: 10/21-25/96 Spill I.D.#: _____ Turnaround Time: 35

Is this activity a Superfund Lead? (Y) (N) / A PRP Lead (Y) (N) / A State Lead (Y) (N) / Other: _____
Are these samples splits, provided by the PRP (Y) (N). If these are split samples, please provide the names of the labs that the PRP's will use: Organic lab(s) _____ Inorganic lab(s) _____

RAS ANALYSES (Submit to RSCC on Wednesdays by 11:00 am, one week prior to your sampling date).

	Low Concentration Water	Med Concentration Water	Low Concentration Soil/Sediment	Med Concentration Soil/Sedimet
TCL Organic (all three fractions)	3		21	
VOA fraction	2			
BNA fraction				
PEST/PCB fraction				
TAL Metals + CN	3		21	
TAL Metals ONLY				
Dissolved Metals				

TCL = Target Compound List / TAL = Target Analyte List / RAS = Routine Analytical Services

A RAS SAMPLES IS A WATER OR SOIL/SEDIMENT SAMPLES THAT IS SINGLE PHASE AND HOMOGENEOUS, LOW/MEDIUM CONCENTRATION. DO NOT SEND OILY SAMPLES TO A RAS LABORATORY.

COMMENTS: _____

NOTE: If you are collecting samples from drinking water sources, you must contact Lisa Doucet to obtain a scheduling form. Lisa's phone number is (713) 983-2129.

INVESTIGATION REPORT

Texaco Chemical Company
Registration No. 30029
P.O. Box 847
Port Neches, Texas 77651

I. Introduction

A. Identification

1. Name of facility: Texaco Chemical Company

2. Location: Farm Road 366, Port Neches, Texas

B. Permits and Registrations

1. Permits: WCO No. 00585; TX0005606

2. Registration: 30029

C. Permit provisions: Texaco Chemical Company is a petrochemical plant which manufactures the following organic chemicals: ethylene/propylene, ethylene oxide, ethylene glycols, propylene glycols, glycol ethers, morpholine, diglycoamine, oil additive TC-9781, nonylphenols, ethanolamines, and ethylene oxide/propylene oxide adducts. Wastewater permits control discharge of uncontaminated storm water only. Outfall is into Jefferson Canal at Hogaboom Road (NPDES Outfall 002 is the same as Texas Department of Water Resources (TDWR) Outfall 001). Process wastewater is treated at the Neches Butane Products Company regional treatment facility (Permit No. 00511).

D. Background information: The Jefferson Canal, from Hogaboom Road to Star Lake, is located on property owned by Texaco Chemical Company (formerly Jefferson Chemical Company). Other background information, including previous owners of the facility which is a suspected contributor to the contamination of the Jefferson Canal, is contained in the attached report dated August 13, 1979, August 17, 1979, and November 27, 1979 (enforcemen action against one of these companies, Chemall, Inc., was resolved in the Agreed Final Judgement, Cause No. D116345, 136th Judicial District Court, Jefferson County, Texas, signed on December 13, 1982).

II. Waste Handling Facility

A. Type of facility: Drainage ditch

B. Description of facility: The drainage ditch runs from Hogaboom Road to Farm Road 366, between Chemall, Inc. and Union Carbide; thence below Farm Road 366 to Star Lake (see attached map). The ditch is approximately 15 feet deep and 50 feet wide at the top. The distance between Hogaboom Road and Star Lake is approximately one mile. In past years, various wastes were discharged to the ditch, including untreated toxaphene and pentachlorophenol process wastes. During the past two months, the ditch between Farm Road 366 and Star Lake was dredged, and the contaminated

dredgings were placed along the north bank of the ditch.

III. Water Quality Impact

A. Surface water: Samples were collected at the railroad crossing below Farm Road 366 on March 23, 1983 after a 2.5-inch rain (Chain of Custody (COC) Tag Numbers SW 02094 and SW 02096). Laboratory analysis results for these samples will be forwarded in an addendum report when received by this office.

B. Ground water: Unknown; no shallow wells have thus far been identified in the area.

IV. Previous enforcement: See attached reports dated August 13, 1979, November 27, 1979, and Agreed Final Judgement dated December 13, 1982.

V. Violation

Violation	Data Source	Permit or Other Requirement
Disposal of hazardous wastes in such a manner so as to cause the discharge or imminent threat of discharge of wastes into or adjacent to the waters in the State.	Reports dated 08/13/79, 08/17/79, and 11/27/79; COC Tag Nos. SW 02090, SW 02091, SW 02094, and SW 02096 (pending).	Texas Solid Waste Disposal Act; Texas Water Code

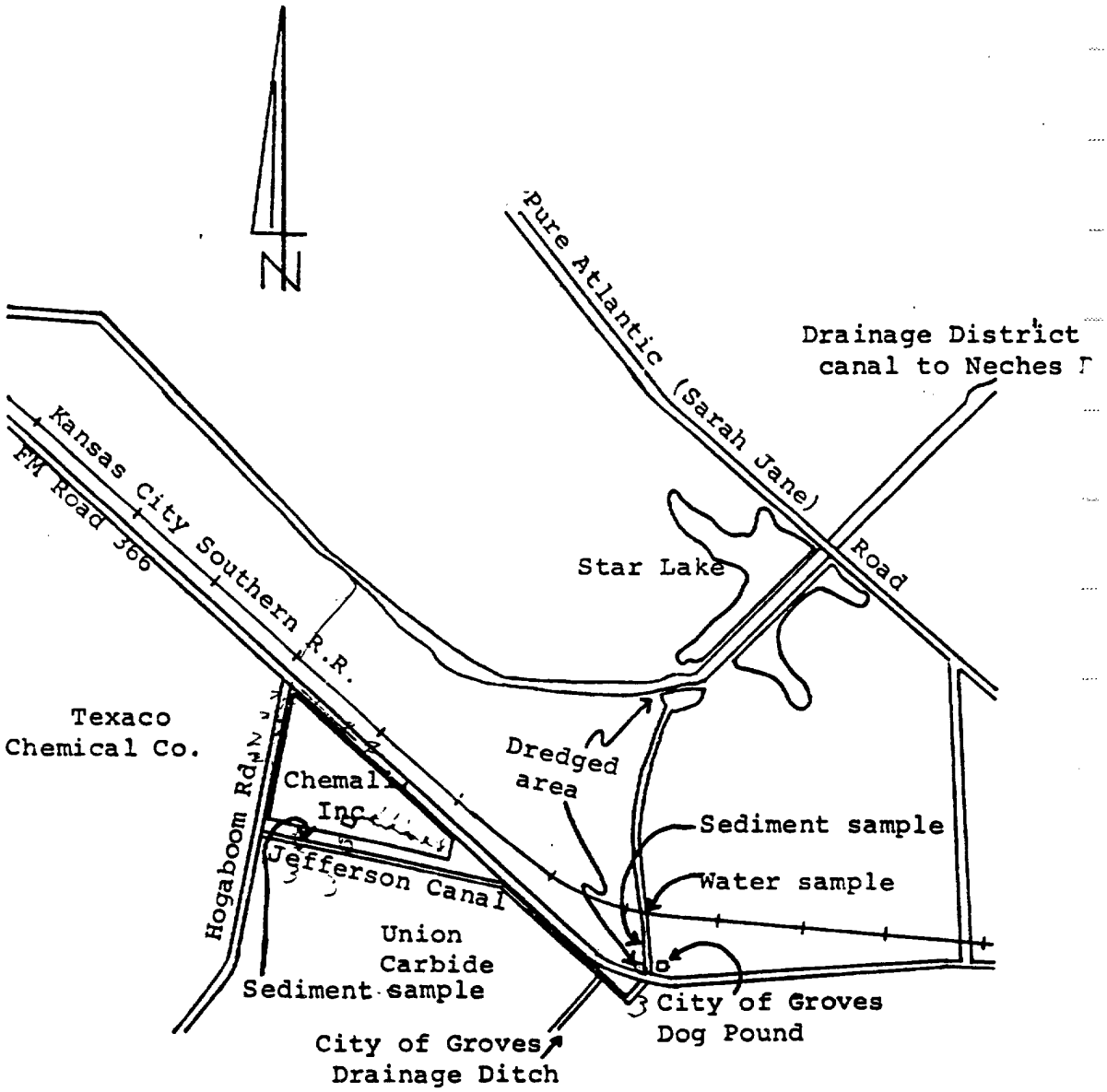
VI. Causes of violation: For an undetermined period of time, Jefferson Chemical Co. (presently owned by Texaco Chemical Co.) and/or the various owners and operators of the facility now owned by Chemall, Inc. disposed of wastes and contaminated wastewater into the Jefferson Canal, which is located on propert owned by Texaco Chemical Company. On August 3, 1979 Texaco Chemical Company was requested by TDWR to remove the contaminated materials from the ditch, but the request was refused by the company (see interoffice memorandum dated 11/27/79, S. Cook to B. Bigelow). On March 21, 1983 TDWR District 6 representatives Michael Moore and Wesley Newberry inspected the ditch and collecte sediment samples. The samples were observed to have a strong aromatic odor characteristic of phenolic compounds (COC Tag No. SW 02090). A sample was also collected from soil which had recently been dredged from the ditch belov Farm Road 366 and it was observed that this material had a similar odor (COC Tag No. SW 02091). During a follow-up inspection conducted on March 23, 198: it was observed that rainfall runoff from the dredge disposal area was enteri the canal. A sample of the runoff was collected and it also had a strong phenolic odor (COC Tag No. SW 02094). It appears probable that hazardous was including toxaphene and pentachlorophenol, are being discharged to the waters of the State from the sediments in the canal and from the dredgings which wer recently disposed along the bank of the canal.

VII. Technical Recommendations

A. It is recommended that, within 20 days, Texaco Chemical Company remove all contaminated dredgings from the bank of the Jefferson Canal and dispose of such wastes in an approved facility.

B. It is recommended that, within 30 days, Texaco Chemical Company determine the extent of contamination present in the sediments of the Jefferso Canal and Star Lake; and within 60 days, remove all contaminated sediment and dispose of such wastes in an approved facility.

C. It is recommended that, during the course of the cleanup activities, adequate measures be taken to prevent further discharges of hazardous wastes, via rainfall runoff and mixing of sediments with canal water, to the waters of the State.



Scale in feet:

1,000 0 1,000 2,000

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Harry D. Boudreaux, District 6 Supervisor, District 6 Office

DATE: April 14, 1983

THRU :

FROM : Gary D. Schroeder, Chief, Solid Waste and Spill Response Section, Enforcement and Field Operations Division

SUBJECT: Enforcement Action - Texaco Chemical Company Registration No. 30029

A memorandum regarding the above subject has been received by this office. The matter has been assigned to Mr. Mike Dick of the Solid Waste Compliance Unit for necessary action. I understand that Mr. Michael Moore is the field representative dealing with this matter, and Mike will contact Michael in due course. Meanwhile, if you or Michael have any questions or additional information, please feel free to contact Mike directly.

Gary D. Schroeder

BWD:tm

RECEIVED
APR 18 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
Louis A. Beecherl, Jr., Chairman
George W. McCleskey, Vice Chairman
Glen E. Roney
W. O. Bankston
Lonnie A. "Bo" Pilgrim
Louie Welch

Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Lee B. M. Biggart, Chairman
Felix McDonald
John D. Stover

May 26, 1983

Mr. M. J. Adair
Commissioner
Drainage District No. 7
4401 9th Street
Port Arthur, Texas 77640

Dear Commissioner Adair:

Re: Disposal of Contaminated Dredge Spoil from Jefferson Canal;
Solid Waste Registration No. 30029

The purpose of this letter is to summarize the meeting held May 19, 1983. This meeting was held to discuss the disposal of dredge spoil from Jefferson Canal. It is the Department's understanding that the parties present would review the analytical data submitted at the meeting and contact the Department by June 9, 1983 with their respective entities' intentions regarding this matter. Therefore, the Department fully expects a response by this date. If you have any questions in the interim, please contact Mr. Michael Dick at 512/475-5516.

Sincerely,

Robert G. Fleming, P.E.
Director
Enforcement and Field Operations Division

MGD:rn

ccs: Ms. Mary Reagan, Office of the General Counsel
Texas Department of Water Resources District 6 Office

RECEIVED
MAY 31 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

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Executive Director

TEXAS WATER COMMISSION
Lee B. M. Biggart, Chairman
Felix McDonald
John D. Stover

June 30, 1983

Mr. J. Samuel Listiak
Texaco Butadiene Company
Texaco, Inc.
P. O. Box 52332
Houston, Texas 77052

Dear Mr. Listiak:

Re: Disposal of Contaminated Dredge Spoil From Jefferson Canal

This letter is written in response to your letter of June 7, 1983, indicating that your company needed additional time to evaluate the issues discussed in our May 19, 1983 meeting. The Department expects the response requested in that meeting to be submitted no later then July 5, 1983.

The Department appreciates your attention to this matter and if you have any questions, please contact Mr. Michael Dick at 512/475-5516.

Sincerely,

Robert G. Fleming, P.E.
Director
Enforcement and Field Operations Division

MGD:rn

ccs: Office of the General Counsel
Texas Department of Water Resources District 6 Office

RECEIVED
JUL 05 1983
WATER RESOURCES
DISTRICT 6

P. O. Box 13087 Capitol Station • Austin, Texas 78711 • Area Code 512/475-3187

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Enforcement Coordinators DATE: August 3, 1983

THRU: Gary D. Schroeder, Chief
Solid Waste and Spill Response Section
Enforcement and Field Operations Division

FROM : Mike Dick, Solid Waste Compliance Unit,
Solid Waste and Spill Response Section

SUBJECT: Enforcement Notice - Texaco Chemical Company, Registration No. 30029 and Drainage District No. 7

The Solid Waste Compliance Unit is reviewing Texaco Chemical Company and Drainage District No. 7 for enforcement action. Please review the attached investigation report and provide your comments in writing within 10 days to me.

Mike Dick

Mike Dick

MGD:rn

Attachment

ccs: Office of the General Counsel
Texas Department of Water Resources District 6 Office

RECEIVED
AUG 05 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
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George W. McCleskey, Vice Chairman
Glen E. Roney
W. O. Bankston
Lonnie A. "Bo" Pilgrim
Louie Welch

Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Felix McDonald, Chairman
Lee B. M. Biggart
John D. Stover

August 8, 1983

Mr. J. Samuel Listiak
Texaco Butadiene Company
Texaco, Inc.
P.O. Box 52332
Houston, Texas 77052

Dear Mr. Listiak:

Re: Disposal of Contaminated Dredge Spoil from Jefferson Canal

The Department is in receipt of your letter dated July 22, 1983 which states Texaco's analytical data of the dredge spoil shows concentrations of contaminants approximately one thousand times lower than those documented by the Department. In light of this matter, the Department would like to offer the following comments:

1. The types of compounds which have been found in the dredge spoil are relatively resistant to degradation, therefore, this would not support a theory of degradation between sampling events.

2. Texaco's samples may have come from different areas of the dredge spoil than those collected by the Department.

3. The samples collected by the Department were analyzed by the Texas Department of Health and were reported in mg/kg (ppm) and not in parts per billion as suggested by Texaco.

In any case, the Department stands by its results. However, it may well be that the degree of contamination varies throughout the dredge spoil. Therefore, we request that Texaco and Drainage District Number 7 initiate a comprehensive sampling effort to determine what type of disposal will be required.

In regard to your question concerning the responsibility of Drainage District No. 7, the Department reiterates that this matter is the responsibility of both parties. The Department hopes this situation will be resolved voluntarily between Texaco and the Drainage District.

RECEIVED
AUG 10 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

P. O. Box 13087 Capitol Station • Austin, Texas 78711 • Area Code 512/475-3187

Please submit a response detailing Texaco's intentions within 10 days upon receipt of this letter, otherwise we will pursue alternative measures to ensure this problem is resolved. If you have any questions in the interim, please contact Mr. Michael Dick at 512/475-5516 or Ms. Mary Reagan at 512/475-7845.

Sincerely,

Robert G. Fleming, P.E.
Director
Enforcement and Field Operations Division

MGD/jp

cc: Office of the General Counsel
Texas Department of Water Resources District 6 Office

INVESTIGATION REPORT

Texaco Chemical Company
Registration No. 30029
P.O. Box 847
Port Neches, Texas 77651

I. Introduction

A. Identification

1. Name of facility: Texaco Chemical Company

2. Location: Farm Road 366, Port Neches, Texas

B. Permits and Registrations

1. Permits: WCO No. 00585; TX0005606

2. Registration: 30029

C. Permit provisions: Texaco Chemical Company is a petrochemical plant which manufactures the following organic chemicals: ethylene/propylene, ethylene oxide, ethylene glycols, propylene glycols, glycol ethers, morpholine, diglycoamine, oil additive TC-9781, nonylphenols, ethanolamines, and ethylene oxide/propylene oxide adducts. Wastewater permits control discharge of uncontaminated storm water only. Outfall is into Jefferson Canal at Hogaboom Road (NPDES Outfall 002 is the same as Texas Department of Water Resources (TDWR) Outfall 001). Process wastewater is treated at the Neches Butane Products Company regional treatment facility (Permit No. 00511).

D. Background information: The Jefferson Canal, from Hogaboom Road to Star Lake, is located on property owned by Texaco Chemical Company (formerly Jefferson Chemical Company). Other background information, including previous owners of the facility which is a suspected contributor to the contamination of the Jefferson Canal, is contained in the attached reports dated August 13, 1979, August 17, 1979, and November 27, 1979 (enforcement action against one of these companies, Chemall, Inc., was resolved in the Agreed Final Judgement, Cause No. D116345, 136th Judicial District Court, Jefferson County, Texas, signed on December 13, 1982).

II. Waste Handling Facility

A. Type of facility: Drainage ditch

B. Description of facility: The drainage ditch runs from Hogaboom Road to Farm Road 366, between Chemall, Inc. and Union Carbide; thence below Farm Road 366 to Star Lake (see attached map). The ditch is approximately 15 feet deep and 50 feet wide at the top. The distance between Hogaboom Road and Star Lake is approximately one mile. In past years, various wastes were discharged to the ditch, including untreated toxaphene and pentachlorophenol process wastes. During the past two months, the ditch between Farm Road 366 and Star Lake was dredged, and the contaminated

dredgings were placed along the north bank of the ditch.

III. Water Quality Impact

A. Surface water: Samples were collected at the railroad crossing below Farm Road 366 on March 23, 1983 after a 2.5-inch rain (Chain of Custody (COC) Tag Numbers SW 02094 and SW 02096). Laboratory analysis results for these samples will be forwarded in an addendum report when received by this office.

B. Ground water: Unknown; no shallow wells have thus far been identified in the area.

IV. Previous enforcement: See attached reports dated August 13, 1979, November 27, 1979, and Agreed Final Judgement dated December 13, 1982.

V. Violation

Violation	Data Source	Permit or Other Requirement
Disposal of hazardous wastes in such a manner so as to cause the discharge or imminent threat of discharge of wastes into or adjacent to the waters in the State.	Reports dated 08/13/79, 08/17/79, and 11/27/79; COC Tag Nos. SW 02090, SW 02091, SW 02094, and SW 02096 (pending).	Texas Solid Waste Disposal Act; Texas Water Code

VI. Causes of violation: For an undetermined period of time, Jefferson Chemical Co. (presently owned by Texaco Chemical Co.) and/or the various owners and operators of the facility now owned by Chemall, Inc. disposed of wastes and contaminated wastewater into the Jefferson Canal, which is located on property owned by Texaco Chemical Company. On August 3, 1979 Texaco Chemical Company was requested by TDWR to remove the contaminated materials from the ditch, but the request was refused by the company (see interoffice memorandum dated 11/27/79, S. Cook to B. Bigelow). On March 21, 1983 TDWR District 6 representatives Michael Moore and Wesley Newberry inspected the ditch and collected sediment samples. The samples were observed to have a strong aromatic odor characteristic of phenolic compounds (COC Tag No. SW 02090). A sample was also collected from soil which had recently been dredged from the ditch below Farm Road 366 and it was observed that this material had a similar odor (COC Tag No. SW 02091). During a follow-up inspection conducted on March 23, 1983 it was observed that rainfall runoff from the dredge disposal area was entering the canal. A sample of the runoff was collected and it also had a strong phenolic odor (COC Tag No. SW 02094). It appears probable that hazardous wastes including toxaphene and pentachlorophenol, are being discharged to the waters of the State from the sediments in the canal and from the dredgings which were recently disposed along the bank of the canal.

VII. Technical Recommendations

A. It is recommended that, within 20 days, Texaco Chemical Company remove all contaminated dredgings from the bank of the Jefferson Canal and dispose of such wastes in an approved facility.

B. It is recommended that, within 30 days, Texaco Chemical Company determine the extent of contamination present in the sediments of the Jefferson Canal and Star Lake; and within 60 days, remove all contaminated sediments and dispose of such wastes in an approved facility.

C. It is recommended that, during the course of the cleanup activities, adequate measures be taken to prevent further discharges of hazardous wastes, via rainfall runoff and mixing of sediments with canal water, to the waters of the State.

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Susan Plettman, General Counsel

DATE: August 4, 1983

THRU :

FROM : Robert G. Fleming, Director,
Enforcement and Field Operations ~~Division~~

SUBJECT: Request for Enforcement Action - Texaco Chemical Company,
Registration No. 30029 and Drainage ~~District No. 7~~,
No Registration or Permit

Enforcement and Field Operations Division hereby requests that the Office of the General Counsel schedule immediate enforcement action concerning Texaco Chemical Company and Drainage District No. 7. Attached is the original Investigation Report regarding this matter.

Robert G. Fleming

MGD:rn

Attachments

cc: Texas Department of Water Resources District 6 Office

RECEIVED
AUG 08 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
[illegible] A. Beecherl, Jr., Chairman
[illegible] W. McCleskey, Vice Chairman
Glen E. Roney
[illegible] O. Bankston
Lonnie A. "Bo" Pilgrim
[illegible] Welch

Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Felix McDonald, Chairman
Lee B. M. Biggart
John D. Stover

August 9, 1983

Mr. M. J. Adair
Commissioner
Drainage District No. 7
4401 9th Street
Port Arthur, Texas 77640

Dear Commissioner Adair:

Re: Disposal of Contaminated Dredge Spoil from Jefferson Canal

The Department is in receipt of the letter dated June 8, 1983 from your attorney, Mr. David A. Provost, which states that the District neither created nor added to any environmental pollution that already existed in Jefferson Canal by disposing of dredge spoil adjacent to the canal. The Department does not agree with this contention. While the contaminants remained in the sediment of the canal covered by a silt layer, they were less likely to commingle with the overlying water. Once the sediments were removed and stockpiled adjacent to the canal, increased contamination is occurring from runoff from the spoil directly to the waters of the canal. This phenomenon has been documented by Department samples.

Additionally, we have received a letter from Texaco, Inc. indicating that sample results collected from the dredge spoil by Texaco showed contaminant concentrations one thousand times lower than ones analyzed by the Department. The Department stands by its results; however, these results may evidence that the degree of contamination varies throughout the dredge spoil. Therefore, we request that Texaco and the Drainage District conduct a comprehensive sampling effort to determine what type of disposal from each area will be required.

Please submit a response detailing the District's intentions in regard to this matter within 10 days upon receipt of this letter. Otherwise, we will pursue alternative measures to ensure that this problem is resolved. If you have any questions in the interim, please contact Mr. Michael Dick at 512/475-5516 or Ms. Mary Reagan at 512/475-7845.

Sincerely,

Robert G. Fleming, P.E.
Director
Enforcement and Field Operations Division

RECEIVED
AUG 11 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

MGD/jp

ccs: Office of the General Counsel
Texas Department of Water Resources District 6 Office

P. O. Box 13087 Capitol Station • Austin, Texas 78711 • Area Code 512/475-3187

Site # 50024

AUG 19 '83

ENFORCEMENT AND FIELD OPERATIONS

TEXACO INC.

P. O. BOX 52332
HOUSTON, TEXAS 77052
(713) 650-4221

J. SAMUEL LISTIAK
ATTORNEY

August 17, 1983

RE: DREDGED MATERIAL -
STAR LAKE OUTFALL CANAL

David A. Provost, Esq.
Provost, Umphrey, McPherson
& Swearingen
P. O. Box 3837
Port Arthur, Texas 77640

Dear Mr. Provost:

Enclosed is a copy of a letter from the Texas Department of Water Resources concerning the material dredged from the Star Lake Outfall Canal by Jefferson County Drainage District No. 7 and piled on its easement along the Canal by the District.

As can be determined from the August 8, 1983 letter of TDWR, the Department continues to believe that Drainage District No. 7 bears at least some responsibility in connection with this matter. Whether or not the District shares this belief, Texaco would be interested in knowing the intentions of the District concerning any further activities with regard to this matter. In particular, does the District have any present intention or willingness to share in sampling, testing, or other investigation or to share the costs of such sampling, testing, or investigation?

Inasmuch as certain sampling and testing has already been performed, an early response would be appreciated.

Sincerely,

J. SAMUEL LISTIAK

JSL
sly:l/d

cc: Robert G. Fleming, P.E.
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

Mr. Michael Dick
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

Mary Reagan, Esq.
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

SWLB - 029

AUG 19 '83

ENFORCEMENT AND FIELD OPERATIONS

TEXACO INC.

P. O. BOX 52332
HOUSTON, TEXAS 77052
(713) 650-4221

J. SAMUEL LISTIAK
ATTORNEY

RECEIVED

AUG 25 1983

DEPT. OF WATER RESOURCES DISTRICT 6

August 17, 1983

(BLIND) RE: ENVIRONMENTAL - POLLUTION INCIDENTS - STATE WATER - TEXACO CHEMICAL COMPANY - PORT NECHES

RE: DREDGED MATERIAL - STAR LAKE OUTFALL CANAL

Mr. Robert G. Fleming, P.E.
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

Dear Mr. Fleming:

Texaco has received your letter of August 8, 1983 which, in all likelihood, crossed in the mail with my letter of August 4, 1983.

The contract laboratory which analyzed the dredged soil samples is confident of its results, just as the Texas Department of Health is confident of its results. Nevertheless, if the discrepancy is due to variations in the dredged soil, it would be helpful to compare the Texaco sampling locations with the Department sampling locations. I will make an attempt to uncover information concerning where the samples were taken which led to the results detailed in my letter of August 4, 1983, if the Department feels it can provide similar information concerning its sampling location for purposes of comparison. Secondly, it may also be useful to split samples with the Department in an attempt to resolve the discrepancies in the results. Beyond anyother information which such additional sampling might provide, the results may well have an influence on the cost of any disposal.

With regard to Drainage District No. 7, Texaco knows of no investigation or any other efforts which may have been made by the District in connection with this matter, nor has Texaco been in communication with the District. Since recent communications from the TDWR to Texaco have not been copied to Jefferson County Drainage District No. 7, Texaco has assumed that any communications between the Department and the District were independent of the correspondence between Texaco

and the Department, or, that the TDWR was no longer corresponding with the District. Texaco does wish to reiterate that it does not purport to speak for Drainage District No. 7, nor has Texaco's investigation involved the participation of Drainage District No. 7. By letter Texaco has sought a clarification of the District's present position on any future involvement.

Sincerely,

J. SAMUEL LISTIAK

JSL
sly:1/c

cc: Mr. Michael Dick
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

Mary Reagan, Esq.
Texas Department of Water Resources
P. O. Box 13087 - Capitol Station
Austin, Texas 78711

DISTRICT NO. 6
WORK NO. 9085

TEXAS DEPARTMENT OF WATER RESOURCES

INSPECTION SYSTEM
INSPECTION SUMMARY REPORT
DW2600

Texaco Chemical Company, Port Neches ENTITY NAME (For Reference Only)

S W — 0 0 3 0 0 2 9 — ___ ___ ___ PERMIT NUMBER
1 12

A (13) I (14) — ACTION CARD NO.
A—Add
C—Change

08-25-83 (15–20) — DATE OF REPORT (MMDDYY)

C (21) — TYPE EFFLUENT SAMPLE
C—Composite
G—Grab

___ ___ (22–23) — NO. OF HOURS (Comp. Only)

N (24) — CITATION ISSUED?
Y—Yes
N—No

2 (25) — TYPE
1—Major
2—Minor

5 (26) — TYPE WASTE
1—Publicly Owned Domestic
2—Privately Owned Domestic
3—Industrial
4—Agricultural
* 5—Solid Waste Hazardous
6—Solid Waste Non-Hazardous
7—Other

Non-Commercial		Commercial		Transporters
Gen	TSD	Gen	TSD	••
☒	☒	☐	☐	☐

NOTE: * Check all appropriate boxes, e.g. if a facility is both a generator and TSD facility, check both boxes.
•• In addition to checking the appropriate boxes concerning their status as generator and/or TSD facility, check this box for all hazardous waste transporters.

5 (27) — INSPECTION
1—Annual Compliance
2—Compliance Survey
3—Pre-Hearing
4—Pre-Grant
5—Other
6—Waste Disposal Wells
7—In-Situ Mining Wells

0 1 (28–29) — NUMBER OF SAMPLES FOR LAB

0 0 2 (30–32) — NUMBER OF ANALYSES

1 (33) — LABORATORY USED
1—State Department of Health Resources
2—Trinity River Authority
3—Sabine River Authority
4—TDWR—EPA
5—Corpus Christi City County Health Department
6—Other
7—San Antonio River Authority

SIGNATURE [signature] 8/19/83

___ Permit Not Required
___ Permit Required
___ Permit Applied For

TDWR-0228 (Rev. 8-18-82)

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Gary Schroeder, Chief, Solid Waste and Spill Response, Enforcement and Field Operations

DATE: August 25, 1983

THRU :

FROM : Michael A. Moore, Engineering Technician, District 6

SUBJECT: Texaco Chemical Company, Registration No. 30029 and Drainage District No. 7, No Registration or Permit--Enforcement Action Request Addendum Report

Attached is a copy of the laboratory analysis results for a sample of soil which was collected during a solid waste investigation which was conducted on March 21, 1983. The sample was collected from a pile of dredge spoils which had recently been deposited on the north bank of a drainage ditch between Farm Road 366 and the Kansas City Southern Railroad, behind the city of Groves dog pound. The laboratory results indicate that significant amounts of toxaphene and other organic pollutants were present in the dredged material.

It is requested that these data be added to the enforcement action request submitted by this office, dated April 5, 1983.

Approved: Harry D. Boudreaux

Signed: Michael A. Moore

MAM/bk

Attachment

TEXAS DEPARTMENT OF WATER RESOURCES TDWR 0849

NO. SW 02091

District 6 Org. No. 536 Work No. 9082 Lab TDH

Site Name Jefferson Outfall canal

Site Location Drainage ditch below FM 366 behind Port Neches dog pound

County Jefferson Basin Neches (Seg no 0601)

Method of Collection Used shovel and plastic scoop to collect several gub-samples, which were composited in clean plastic pail, then placed in acetone-rinsed jar with Teflon liner.

Point of Collection Dredge spoils on north bank of ditch below FM 366

Type facility: ☐ Drum; ☐ Tank; ☐ Impoundment; ☐ Landfill; ☐ Waste pile; ☐ Landfarm; ☒ Other drainage ditch

Time Collected 4:30 (am, pm) Date Shipped 3/22/83

Add. COC #s None

ODOR; ☒ Yes; ☐ No; Describe sweet, phenolic odor, very strong

[signature]
(Collector's Signature)

S.W. Registration (1–9)	Permit Number (10–18)	Page No. (19–21)	Date Mo. (23–24)	Day (25–26)	Yr. (27–28)	
None	NONE		A 0	3 2	1 8	3 E

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71

TEXAS DEPARTMENT OF WATER RESOURCES TDWR 0849

NO. SW 02091 MAY 24 1983

(106)

District 6 Org. No. 536 Work No. 9082 Lab TDH

Material Sampled: ☐ Solid waste (W); ☐ Liquid waste (L); ☒ Soil (E); ☐ Well (M); ☐ Stream (S); ☐ Other (O)

Comments Dredging from ditch which was once used for disposal of wastes from various chemical plants in line

(continued on back)

Lab Only — Date: rec'd MAR 23 1983; cm MAY 23 1983 [redacted]

Analyst sign.: [signature]

Preservation: ☒ None; ☐ Ice; ☐ H_2SO_4; ☐ HNO_3; Other

Auxiliary Tags None

☐ LEACHATE: EP Toxicity Series; TDWR

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71
pH 00403		Priority Pollutants			
COD 00340					
TOC 00680		Toxaphene	µg/Kg 21000		
GC/MS					

Texas Department of Health

Bureau of Laboratories
Austin, Texas

Product: **Laboratory No.:** EH3426 **Sample No.:** SW02009

Date Received: 23MAR83 **Delivered By:** TDWR **Condition of Seals:** INTAC

Description of Sample: SOIL SAMPLE

From:

LABORATORY FINDINGS

GC/MS ANALYSIS.

① EPA PRIORITY POLLUTANTS.

Naphthalene - 9280 mg/Kg.
Acenaphthylene - 2140 mg/Kg.
Fluorene - 1140 mg/Kg.
Acenaphthene - 330 mg/Kg.
Phenanthrene - 2050 mg/Kg.
Anthracene - 300 mg/Kg.
Fluoranthene - 275 mg/Kg.
Pyrene - 535 mg/Kg.
Benz (a) anthracene - 160 mg/Kg
Chrysene - 150 mg/Kg
Benz (b) fluoranthene - 15 mg/Kg.
Benz (k) fluoranthene - 15 mg/Kg
Benz (a) pyrene - 60 mg/Kg.

② Other organic compounds present at up to 2000 mg/Kg.
Substituted naphthalenes (C_1 & C_2)
Biphenyls
Other aromatic hydrocarbons, unable to positively identify.

MAY 23 1983
Date Reported

③ TCDD - 2,3,7,8 isomer by capillary GC/MS technique <2 ug/Kg

MID
FORM NO. G-59

Texas Department of Water Resources

INTEROFFICE MEMORANDUM

TO : Gary Schroeder, Chief, Solid Waste and Spill Response, Enforcement and Field Operations

DATE: August 25, 1983

THRU :

FROM : Michael A. Moore, Engineering Technician, District 6

SUBJECT: Texaco Chemical Company, Registration No. 30029 and Drainage District No. 7, No Registration or Permit--Enforcement Action Request Addendum Report

Attached is a copy of the laboratory analysis results for a sample of soil which was collected during a solid waste investigation which was conducted on March 21, 1983. The sample was collected from a pile of dredge spoils which had recently been deposited on the north bank of a drainage ditch between Farm Road 366 and the Kansas City Southern Railroad, behind the city of Groves dog pound. The laboratory results indicate that significant amounts of toxaphene and other organic pollutants were present in the dredged material.

It is requested that these data be added to the enforcement action request submitted by this office, dated April 5, 1983.

Approved: Harry D. Boudreaux

Signed: Michael A. Moore

MAM/bk

Attachment

TEXAS DEPARTMENT OF WATER RESOURCES

NO. SW 02091

District 6 Org. No. [illegible] Work No. [illegible] Lab TDH

Site Name Jefferson Outfall canal

Site Location Drainage ditch below FM 366 behind Port Neches dog pound

County Jefferson Basin Neches (Jeg no 0601)

Method of Collection Used shovel and plastic scoop to collect several subsamples, which were composited in clean plastic pail, then placed in acetone-rinsed jar with Teflon liner.

Point of Collection Dredge spoils on north bank of ditch below FM 366

Type facility: ☐ Drum; ☐ Tank; ☐ Impoundment; ☐ Landfill; ☐ Waste pile; ☐ Landfarm; ☒ Other drainage ditch

Time Collected 4:30 (am, pm) Date Shipped 3/22/83

Add COC #s None

ODOR; ☒ Yes; ☐ No; Describe sweet, phenolic odor, very strong

[signature]

(Collector's Signature)

S.W. Registration	Permit Number	Page No.	Date Mo.	Day	Yr.	
1 9	10 18	19 21	22 23 24	25 26	27 28	29
None	NONE		A	03	21 83	E

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71

TEXAS DEPARTMENT OF WATER RESOURCES TDWR 0949

NO. SW 02091 MAY 24 1983

(106)

District 6 Org. No. 536 Work No. 9082 Lab TDH

Material Sampled: ☐ Solid waste (W); ☐ Liquid waste (L); ☒ Soil (E); ☐ Well (M); ☐ Stream (S); ☐ Other (O)

Comments Dredging from ditch which was once used for disposal of wastes from various chemical plants which

(continued on back)

Lab Only Date rec'd MAR 23 1983 [redacted]

cm MAY 23 1983

Analyst sign.: [illegible]

Preservation: ☒ None; ☐ Ice; ☐ H_2SO_4; ☐ HNO_3

Other

Auxiliary Tags None

☐ LEACHATE: EP Toxicity Series: TDWR

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71
pH		Priority Pollutants			
00403					
COD					
00340					
TOC		Toxaphene	ug/Kg		
00680			21000		
GC/MS					

Texas Department of Health

Bureau of Laboratories
Austin, Texas

Product: Laboratory No.: EH3426 Sample No.: SW02

Date Received: 23 MAR 83 Delivered By: TDWR Condition of Seals: IN

Description of Sample: SOIL SAMPLE

From:

LABORATORY FINDINGS

GC/MS ANALYSIS.

① EPA PRIORITY POLLUTANTS.

Naphthalene - 9280 mg/Kg.
Acenaphthylene - 2140 mg/Kg.
Fluorene - 1140 mg/Kg.
Acenaphthene - 330 mg/Kg.
Phenanthrene - 2050 mg/Kg.
Anthracene - 300 mg/Kg.
Fluoranthene - 275 mg/Kg.
Pyrene - 535 mg/Kg.
Benz (a) anthracene - 160 mg/Kg
Chrysene - 150 mg/Kg
Benz (b) fluoranthene - 15 mg/Kg.
Benz (k) fluoranthene - 15 mg/Kg
Benz (a) pyrene - 60 mg/Kg.

② Other organic compounds present at up to 2000 mg/Kg.
Substituted naphthalenes (C_1 & C_2)
Biphenyls
Other aromatic hydrocarbons, unable to positively identify.

MAY 23 1983
Date Reported

③ TCDD - 2,3,7,8 isomer by capillary GC/MS technique <2 ug/Kg

MID
FORM NO. G-59

000228

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
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Lonnie A. "Bo" Pilgrim
Louis Welch

Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Felix McDonald, Chairman
Lee B. M. Biggart
G. Ralph Roming

September 20, 1983

Mr. J. Samuel Listiak
Texaco Butadiene Company
Texaco, Inc.
P. O. Box 52332
Houston, Texas 77052

Dear Mr. Listiak:

Re: Disposal of Contaminated Dredge Spoil from Jefferson Canal

Pursuant to your telephone request on August 23, 1983 the analyses of dredge spoil were reviewed by our Permits Division for the purposes of classification.

These results indicated the material could be classified as a Class II waste and may be disposed of accordingly. The discrepancy in the quantity of materials found by Texaco and the Department may be attributed to sample locations. The Department sampled areas where visual contamination was obvious, while Texaco sampled a more representative area.

We are forwarding a copy of this letter to Drainage District #7 and request that both entities respond with their respective intentions within 10 days upon receipt.

In the interim, if you have any questions, please contact Mr. Michael Dick at 512/475-5516 or Ms. Mary Reagan at 512/475-7845.

Sincerely,

Gary D. Schroeder, P.E., Chief
Solid Waste and Spill Response Section
Enforcement and Field Operations Division

RECEIVED
SEP 22 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

MGD:py

ccs: General Counsel's Office
Texas Department of Water Resources District 6 Office
Mr. M. J. Adair, Commissioner
Drainage District #7

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
Louis A. Beecherl, Jr., Chairman
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Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Paul Hopkins, Chairman
Lee B. M. Biggart
Ralph Roming

December 8, 1983

Mr. J. Samuel Listiak
Texaco Butadiene Company
Texaco, Inc.
P. O. Box 52332
Houston, Texas 77052

Dear Mr. Listiak:

Re: Disposal of Contaminated Dredge Spoil from Jefferson Canal

The Department has received your letter dated October 5, 1983 in which Texaco requested our opinion in regard to creating a landfill in the vicinity of the above-referenced dredge spoil. Because this proposal does not conform with the definition of on site storage or disposal as defined in 31 Texas Administrative Code Section 335.1, the Department cannot agree to this type of environmental solution without permit authorization under the Solid Waste Disposal Act. Therefore, the Department must reiterate our original requests in this matter:

1) Texaco and Drainage District Number 7 should dispose of the dredge spoil at a proper site which will be determined by a representative sampling program to be initiated by the company and the district; and

2) Texaco and Drainage District Number 7 should initiate a sampling program to determine the degree of contamination in the sediments of the Jefferson Canal so that decisions can be made in regard to future disposal of the dredge spoil.

The Department requests that we be notified of Texaco's intentions within 15 days upon receipt of this letter.

Sincerely,

Robert G. Fleming, P.E.
Director
Enforcement and Field Operations Division

RECEIVED
DEC 14 1983
DEPT. OF
WATER RESOURCES
DISTRICT 6

MGD:py

ccs: Drainage District Number 7
Office of the General Counsel, Texas Department of Water Resources
Texas Department of Water Resources District 6 Office

1836-1986

TEXAS DEPARTMENT OF WATER RESOURCES
P. O. Box 13087 Capitol Station
Austin, Texas 78711

TELEPHONE MEMO TO THE FILE

Call To: Mike Dick

Call From: Wesley Newberry

Date of Call: 12-14-83

File No:

Subject of Call: Texaco Chemical Co. Reg. 30029

Information for File: I asked Mike if he had any reason for the district not to send an enforcement letter to Texaco Chemical Co. (Port Neches) concerning the recent Compliance Inspection. Mike stated that the enforcement action request only was concern with Jefferson Canal and that this was separate from their Solid Waste registration. He had no objection to the District sending an enforcement letter.

Signed: Wesley Newberry

TDWR-0225 b

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
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Louie Welch

Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Paul Hopkins, Chairman
Lee B. M. Biggart
Ralph Roming

January 16, 1984

RECEIVED
JAN 19
DEPT. OF WATER RESOURCES DISTRICT 6

RECEIVED
JAN 16 '84
ENFORCEMENT AND FIELD OPERATIONS

The Honorable Jim Mattox
The Attorney General of Texas
Supreme Court Building
Austin, Texas 78711

Attention: Mr. Jim Mathews, Chief
Environmental Protection Division

Dear General Mattox:

Re: Texaco Chemical Company, Permit No. 00588
Solid Waste Registration No. 30029
Jefferson County, Texas Drainage District No. 7

The enclosures to this letter summarize evidence which indicate that Texaco Chemical Company and Jefferson County, Texas Drainage District No. 7, are in violation of the Texas Solid Waste Disposal Act, Article 4477-7, V.A.C.S., Chapter 26 of the Texas Water Code, and the rules and regulations promulgated pursuant to these statutes. Texaco Chemical Company is a petrochemical plant manufacturing a number of organic chemicals and is located at Farm Road 366, Port Neches, Jefferson County, Texas. For an undetermined period of time, Jefferson Chemical Company, now owned by Texaco Chemical Company, disposed of wastes and contaminated wastewaters into the Jefferson Canal, which from Hogaboom Road to Star Lake is located on property owned by Texaco Chemical Company. Wastewater permits issued to the Company and its predecessor authorize discharge of uncontaminated stormwater only. As a result of this activity, and other disposal activities in the area, the sediments in the canal have become contaminated. In February, 1983, Drainage District No. 7 excavated portions of the canal and stockpiled these sediments along its banks. These disposal activities on the part of Texaco Chemical Company and Drainage District No. 7 have been conducted without authorization and in a manner so as to cause the discharge or imminent threat of discharge of wastes into or adjacent to the waters of the State.

Please accept this letter as a request for the Attorney General to represent the Texas Department of Water Resources and the Executive Director in instituting appropriate legal action for these violations. In requesting that you represent the Department in this matter, we would appreciate having the opportunity for the Department's representative Mary Reagan, Special Counsel for Hazardous Waste, to discuss this matter with your representative and assist in determining more specifically the nature of the action

necessary for representing the Department in this lawsuit. Should there be any other material, information or assistance needed, please let us know.

Sincerely yours,

Charles E. Nemir
Executive Director

Enclosure
cc: U. S. Environmental Protection Agency, Region VI

Mr. J. Samuel Listiak
Texaco Butadiene Company
Texaco Inc.
P. O. Box 52332
Houston, Texas 77052

Mr. M. J. Adair, Commissioner
Drainage District No. 7
4401 9th Street
Port Arthur, Texas 77640

TEXAS DEPARTMENT OF WATER RESOURCES

CONFERENCE ATTENDANCE

Project: Jefferson Canal

Conference: 3-6-84 Place: 1028 SFA

Name	Representing	Title Function, or Position	Phone No.
Mike Dick	TDWR	Staff	512/475-5514
Mary Reagan	TDWR	a Harney	475-7845
Ken Cross	AG	Attorney	475-1101
Pete Steele	~~Atty for~~ DD7	Attorney	409/963-0101
W.C. Vetters	Drainage Dist #7	Engineer	409/985-43
[illegible]	" "	Com.	[illegible]
J. Samuel Listiak	Texaco	Atty	713-650
H.W. Miller	Texaco	Manager Services	713-432-

TEXAS DEPARTMENT OF WATER RESOURCES

C O N F E R E N C E R E C O R D

Project: Jefferson Canal - Solid Waste Registration 30029

Conference date: March 8, 1984 Place: SFA Building - Rm. 1028

Type of conference: Informal
(telephone, staff, formal or informal hearing, other)

Attendance:

Name	Agency
See Attachment	

Summary:

The outcome of this meeting was that Texaco would immediately start sampling the dredge spoil for classification and disposal alternatives. Texaco would respond by March 12, 1984 as to whether they would be willing to make an assessment of the upper reaches of Jefferson Canal. We informed Texaco that a decision would be made on March 12, 1984 as to whether the Attorney General's Office would file suit.

MGD:py

ccs: TDWR District 6 Office
Office of the General Counsel

MAR 14 1984
DEPT. OF
WATER RESOURCES
DISTRICT 5

Prepared by: _____

TDWR-0103

TEXACO
INC.

P. O. BOX 52332
HOUSTON, TEXAS 77052
(713) 960-4221

RECEIVED
MAR 21 '84

J. SAMUEL LISTIAK
ATTORNEY

March 16, 1984

DREDGED MATERIAL-STAR LAKE
OUTFALL CANAL

Kenneth Cross, Esquire
Office of the Attorney General
Supreme Court Building
Austin, Texas 78711

Dear Mr. Cross:

Due to difficulties encountered in making telephone contact, the following is being utilized as a means of apprising you of Texaco's current position on several matters relating to the material dredged from Star Lake Outfall Canal by Drainage District No. 7 and piled on its easement along the Canal by the District.

As has been communicated to Mr. Michael Dick of the Texas Department of Water Resources, Texaco is willing to undertake a program for sampling sediment in the drainage ditch between the Port Neches Chemical Plant and Highway 366, which is upstream of the area where Drainage District No. 7 has performed its dredging. Preliminary plans for a sampling program have been developed, and should be initiated shortly.

Texaco has also developed a preliminary plan for representative sampling of the dredged spoil, in order to confirm its waste classification. When this is complete, the results will be communicated to the Texas Department of Water Resources for its review in connection with the classification.

With further regard to the dredged spoil, Texaco is willing to participate in its disposal in a manner acceptable to the State. It is Texaco's intent to seek Drainage District No. 7's participation in the disposal.

MAR 26 1984
DEPT. OF
WATER RESOURCES
DISTRICT 5

000236

Lastly, it has already been determined that there is no locally available municipal landfill in the Port Neches area which would dispose of this material so this does not appear to be a viable disposal option.

Sincerely,

Signed: J. SAMUEL LISTIAK

J. SAMUEL LISTIAK

JSL
cz:2/ee

cc: Mary Reagan, Esq.
Texas Department of
Water Resources
P.O. Box 13087
Capitol Station
Austin, Texas 78711

Mr. Michael Dick
Texas Department of
Water Resources
P.O. Box 13087
Capitol Station
Austin, Texas 78711

Peter Steele, Esq.
Provost, Umphrey, McPherson
& Swearingen
4800 Twin City Highway
P.O. Box 3837
Port Arthur, Texas 77640

bc: HWMiller

File

TEXACO

H.W. MILLER
MANAGER - SERVICES

TEXACO
CHEMICAL COMPANY
A DIVISION OF TEXACO INC.
P. O. BOX 430
BELLAIRE, TEXAS 77401
(713) 432-2029

RECEIVED
APR 17 '84
ENGINEERING, ENVIRONMENT AND FIELD OPERATIONS

April 16, 1984

Mr. Michael Dick
Texas Department of
Water Resources
P. O. Box 13087
Capitol Station
Austin, Texas 78711

Dear Mr. Dick:

DREDGED MATERIAL-STAR
LAKE OUTFALL CANAL

In reference to my subject memorandum of March 26, the sampling of the dredge spoil and the sediment in the Jefferson Canal was completed last week.

The sampling of the dredge spoil was accomplished as previously outlined. The Jefferson Canal samples were obtained as planned; however, the sample taken between the railroad and Highway 366 will not be composited with the four upstream samples since the appearance of this material differs substantially from the others. A separate top, middle and bottom analysis will be run on this sample with the other four samples being composited as originally outlined.

The sampling was delayed beyond the projection time due to the arrangements with the contractor taking longer than anticipated coupled with having to modify the specialty sampling equipment to perform this specific work.

Work will commence this week on making up the samples for analysis. The outside laboratories are being contacted in order to arrange for early attention to these samples. Pending firm commitments

APR 23 1984
TEXAS DEPT. OF
WATER RESOURCES
DISTRICT 6

from the laboratories, it is estimated it will be 4-6 weeks before the results are available. If this schedule changes substantially you will be so advised.

Very truly yours,

H. W. Miller

H. W. Miller

HWM:bjb/50

attachment

cc: Mary Reagan, Esq.
Texas Department of
Water Resources
P. O. Box 13087
Capitol Station
Austin, TX 78711

Mr. Kenneth Cross, Esquire
Office of the Attorney General
P. O. Box 12548, Capitol Station
Austin, Texas 78711

TEXACO

mm

H.W. MILLER
MANAGER - SERVICES

TEXACO
CHEMICAL COMPANY
A DIVISION OF TEXACO INC.
P. O. BOX 430
BELLAIRE, TEXAS 77401
(713) 432-3029

June 28, 1984

#30029

Mr. Michael Dick
Texas Department of Water Resources
P. O. Box 13087
Capitol Station
Austin, Texas 78711

Dear Mr. Dick:

We want to apologize for the length of time it took the contract laboratories to analyze samples from the Star Lake dredge material and core samples taken from the Texaco Chemical Company stormwater canal. The stormwater canal is upstream of Star Lake and in the past has also been used with effluent and stormwater from Chemall and its predecessors.

The dredge material was sampled at eight locations with samples taken at four depths for a total of 32 samples. The 32 samples were composited and mixed in a mechanical blender. Samples of the blended composite were sent to Spectrix Corporation, Houston and Southwestern Laboratories, Houston for analysis for priority pollutants by EPA approved methods. Southwestern Laboratories subcontracted the GC-MS analysis to Chromospec Corporation, Houston. Results of the analysis of the dredged material is given in attached Table 1. Also included in Table 1 are: (1) results on a grab sample of dredge material taken by Texaco Chemical Company and analyzed by Spectrix Corporation and (2) results on a grab sample by the local TDWR representative which was sent to the Austin office of the TDWR for analysis. We are concerned with the lack of agreement of the results obtained for priority pollutants between the two contract laboratories on the same composite sample of dredged material. However, a comparison of all of the data indicates the earlier TDWR sample was not representative of the total dredged material.

The differences in results obtained on the composite samples by the two laboratories will be analyzed by a Texaco expert in this analytical technique to determine if this kind of variation is typical. If not, a visit to the laboratories will be made to try and establish reasons for these variations. It is expected this

RECEIVED
JUL 2 1984
DEPT. OF WATER RESOURCES
DISTRICT 6

will be completed and that we will be in a position to meet and discuss these results with you in about two to three weeks.

Also, we have included GC-MS results on core samples from the Texaco Chemical Company stormwater canal upstream of the Star Lake dredged material. As with the results obtained on the dredged material, we plan to have the data reviewed by a Texaco GC-MS expert and will discuss the results of the investigation at the meeting on the dredged material.

Very truly yours,

H. W. Miller

H. W. Miller

GDE-AWC
mc:D/dd

cc: Mr. Harry Boudreaux
TDWR District 6 Office
P. O. Box 337
Orange, Texas 77630

TABLE 1

DREDGED MATERIAL RESULTS

Priority Pollutants

wt. ppm

	Grab Sample by TDWR - Results from TDWR	Grab Sample by Texaco - Analyzed by Spectrix	Composite of 32 Samples by Southwestern La	
			Analyzed by Chromospec	Analyze by Spectr
Methyl Napthalene				35
Diethylphthalate		1.2	112	
Phenanthrene			3500	
Di-n-Octylphthalate			156	
Di-N-Butylphthalate		2.1		
Ethyl Benzene				11
Pyrene		0.7	1100	26
Napthalene	2080			
Acenapthylenes	2140	110	76	30
Fluorene	1140			29
Anthracene	300			62
Chrysene	150		325	
Perylene			76	
Toluene				7
Total Xylenes				4
Acetone				19
Styrene				24
Fluoranthene	275	0.3		13
Phenantherene	2050			
Benzopyrenes	60	0.6		
Total Benzo fluoranthenes	30	0.3		
Toxaphene	210			
Acenapthane	330			
Benzoanthracene	160			
Other PNA's	2000			

D/ddl
6/28/84

TABLE 2

wt. ppm

Composite from Cores #2&3 Approx. 1500' & 2000' from Hogaboom Rd.				Core #4 Approx. 2200' from Hogaboom Rd.				Core #5 Aprox. 150' North of Hwy. 366		
0-4"	4"-24"		24-31"	0-4"		4"-155"	15.5"-28"	0-23"		23"-31"
S.W. Labs	S.W. Labs	Spectrix	S.W. Labs	S.W. Labs	Spectrix	S.W. Labs	S.W. Labs	S.W. Labs	Spectrix	S.W. Labs
									1,900	
	23		4	34			34	114	310	
	6	6	1	51		19	24	10,600		35
800	205		21	94		63	150			91
117	39		6			67	65			70
43	10		2						330	
					5			2,600		
								3,300		
								700	320	
					4			441	600	
					10			1,300	1,300	
								2,400		
									7	
									170	
									140	
									3	
									5	
					2				180	
									190	
									1,200	

Analytical tests to Chromospec Labs - Houston, TX

TEXAS DEPARTMENT OF WATER RESOURCES
P. O. Box 13087 Capitol Station
Austin, Texas 78711

→ MM
→ HB
Mike let's discuss

TELEPHONE MEMO TO THE FILE

(Please complete with typewriter or black pen)

Call To: LARRY HAGEN

Call From: MIKE DICK

Date of Call: 7/25/84

File No.:

Phone No.: ( )

Subject: TEXACO CHEMICAL (STARLAKE OUTFALL DITCH) Pi Neches

Information for File:

MIKE SAID A MEETING ~~WITH~~ WITH TEXACO ~~&~~ CHEMICAL HAS BEEN SET FOR 1:30 PM AUG 9, 1984 IN ROOM 1028 SFA BLDG. MIKE MOORE MAY WISH TO ATTEND. CALL BACK FOR DETAILS

Signed: Larry Hagen RS

TDWR-0225b (Rev. 9-8-83)

TEXAS DEPARTMENT OF WATER RESOURCES

CONFERENCE RECORD

Project: Texaco # 30029

Conference date: August 9, 1984 Place: SFA Bldg. Rm. 1028A

Type of conference: Formal
(telephone, staff, formal or informal hearing, other)

Attendance:

Name	Agency
See attachment	

Summary:
Texaco agreed to the following.

1. Remove and dispose properly of all dredge spoil from Hwy 366 to the Railroad Trussel (DD7 to dredge and concrete this area).

2. Sample remaining sediments for PNA's and Toxaphene.

3. Sample all dredge spoil to be left on site for Toxaphene for purposes of deed recordation.

4. Perform Toxaphene analyses on previously collected samples from Hogaboom Rd. to Intersection at Hwy. 366 (from 0-12").

5. All Toxaphene analyses will be for total and E. P. Tox.

We informed Texaco that we would forward this information to the Ken Cross at the A. G.'s office. Additionally, Texaco agreed that all laboratory results reported by S. W. Labs (Chromospec) were invalid. Texaco was able to reproduce the spectric laboratory results from split samples run in house.

RECEIVED
AUG 13 1984

Prepared by: Michael Dick

DMM

(233)

TEXAS DEPARTMENT OF WATER RESOURCES TDWR-0849

NO. SW 04178 AUG 20 1984

District 06 Org. No. 536 Work No. 9093 Lab TDH

Site Name Jefferson Outfall Canal

Site Location From Hogaboom Rd. between Clemall, Inc and Union Carbide - Linde Division plants

County Jefferson Basin Neches (Seg. no. 0601)

Method of Collection Pushed plastic tube into ditch bottom to 2' depth then extracted sample into bucket; composited and mixed enough samples to fill glass quart jars

Point of Collection East side of ditch just below clay pipe, at end of concrete skirting

Type facility: ☐ Drum; ☐ Tank; ☐ Impoundment; ☐ Landfill ☐ Waste pile; ☐ Landfarm; ☒ Other Drainage ditch

Time Collected 0830 (am, pm) Date Shipped 8/14/84

Add. COC #s N/A

ODOR: ☒ Yes; ☐ No; Describe Chlorinated hydrocarbons (toxaphene)

[signature] (Collector's Signature)

S.W. Registration (1–9)	Permit Number (10–18)	Page No. (19–21)	Code Type (22)	Date Mo. (23–24)	Date Day (25–26)	Date Yr. (27–28)	Mtr Serial (29)
30029			B	08	14	84	0

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71

TEXAS DEPARTMENT OF WATER RESOURCES TDWR-0849

(233)

NO. SW 04178 AUG 30 1984

District 06 Org. No. 536 Work No. 9093 Lab TDH

Material Sampled: ☐ Solid waste (W); ☐ Liquid waste (L); ☐ Soil (E); ☐ Well (M); ☐ Stream (S); ☒ Other (O) Ditch sediment and water

Comments Sample collected from ditch previously used to discharge raw process wastes from various petrochemical manufacturing plants (continued on back)

Lab Only — Date: rec'd: AUG 15 1984; cmplt: AUG 28 1984 [redacted]

Analyst sign.: KAA

Preservation: ☒ None; ☐ Ice; ☐ H_2SO_4; ☐ HNO_3

Other

Auxiliary Tags NONE

☐ LEACHATE: ___ EP Toxicity Series; ___ TDWR

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value 71
pH 00493		Priority pollutants scan			
COD 00340		Toxaphene	mg/kg 177		
TOC 00680					
GC/MS					

000246

TEXAS DEPARTMENT OF WATER RESOURCES TDWR-0849

(233)

NO. SW 04173

District 16 Org. No. 536 Work No. 9093 Lab TDH

Site Name Jefferson Fall Canal

Point of Collection Center of ditch adjacent to closed spray evaporation pond at Clemsall plant.

Site Location From Nyabaco Rd. between Clemsall Inc. and Union Carbide Linde Division plants

County Jefferson Basin Neches (Seg. no. 0601)

Type facility: ☐ Drum; ☐ Tank; ☐ Impoundment; ☐ Landfill ☐ Waste pile; ☐ Landfarm; ☒ Other Drainage ditch

Method of Collection Pushed plastic tube into ditch bottom to 2' depth then extracted sample into bucket; composited and mixed enough samples to fill glass quart jars

Time Collected 0930 (am, pm) Date Shipped 8/14/84

Add. COC #s N/A

ODOR; ☒ Yes; ☐ No; Describe chlorinated hydrocarbon (naphtha)

Michael C. Moore (Collector's Signature)

S.W. Registration (1–9)	Permit Number (10–18)	Page No. (19–21)	Type (22)	Date Mo. (23–24)	Date Day (25–26)	Date Yr. (27–28)	Type (29)
3 0 0 2 9			B	08	14	84	0

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value (71)

TEXAS DEPARTMENT OF WATER RESOURCES TDWR-0849

(233)

NO. SW 04173

District 16 Org. No. 536 Work No. 9093 Lab TDH

Material Sampled: ☐ Solid waste (W); ☐ Liquid waste (L); ☐ Soil (E); ☐ Well (M); ☐ Stream (S); ☒ Other (O) Soil sediment and water

Comments Sample collected from ditch previously used to discharge raw process wastes from various petrochemical manufacturing plants. (continued on back)

Lab Only — Date rec'd: AUG 8 1984; cmplt: [redacted]; Analyst sign.: RBM

Preservation: ☒ None; ☐ Ice; ☐ H_2SO_4; ☐ HNO_3

Other N/A

Auxiliary Tags None

☐ LEACHATE: ___ EP Toxicity Series; ___ TDWR

30 Code	35 Parameter Value	44 Code	49 Parameter Value	58 Code	63 Parameter Value (71)
pH		Priority pollutants scan			
0 0 4 0 3					
COD		Tox applicic	mg/Kg		
0 0 3 4 0			3 4 0		
TOC					
0 0 6 8 0					
GC/MS					

000247

J Samuel Listiak
Attorney

Texaco Inc

PO Box 52332
Houston TX 77052
713 650 4221

November 15, 1984

RE: STAR LAKE OUTFALL CANAL

NOV 6 1984
DEPT. OF WATER RESOURCES
DISTRICT 6

Mary Reagan, Esquire
Texas Department of Water Resources
P. O. Box 13087
Capitol Station
Austin, Texas 78711

Dear Ms. Reagan:

Texaco Chemical contracted with Spectrix Corporation Laboratories to analyze various Star Lake Outfall Canal samples for toxaphene. The results it reported are tabulated below:

Sample*	Toxaphene mg/kg	EP Toxicity Toxaphene mg/l
TDWR composite close to Hogaboom	Not tested	0.010
TDWR composite close to B-1	" "	0.014
B-1 0-5"	15	Not tested
B-1 12-30"	46	" "
B 2-3 composite 0-4"	23	" "
B 2-3 composite 4"-24"	2.7	" "
B-4 0-4"	26	" "
B-4 4-15-1/2"	46	" "
Special between concrete ditch & Hwy. 366 0-12"	1.2	" "
Special between concrete ditch & Hwy. 366 12-18"	N.D. (0.3)[1]	" "
B-5 0-24" composite	N.D. (10)[1]	N.D. (0.0065)[1]
B-5 26-31"	N.D. (0.3)[1]	Not tested
Dredge material composite	N.D. (8)[1]	" "

[1] ( ) = Detection Limit.
* Sample locations are identified on the attached map.

The earliest we will be able to meet to discuss this matter will be the week of November 26.

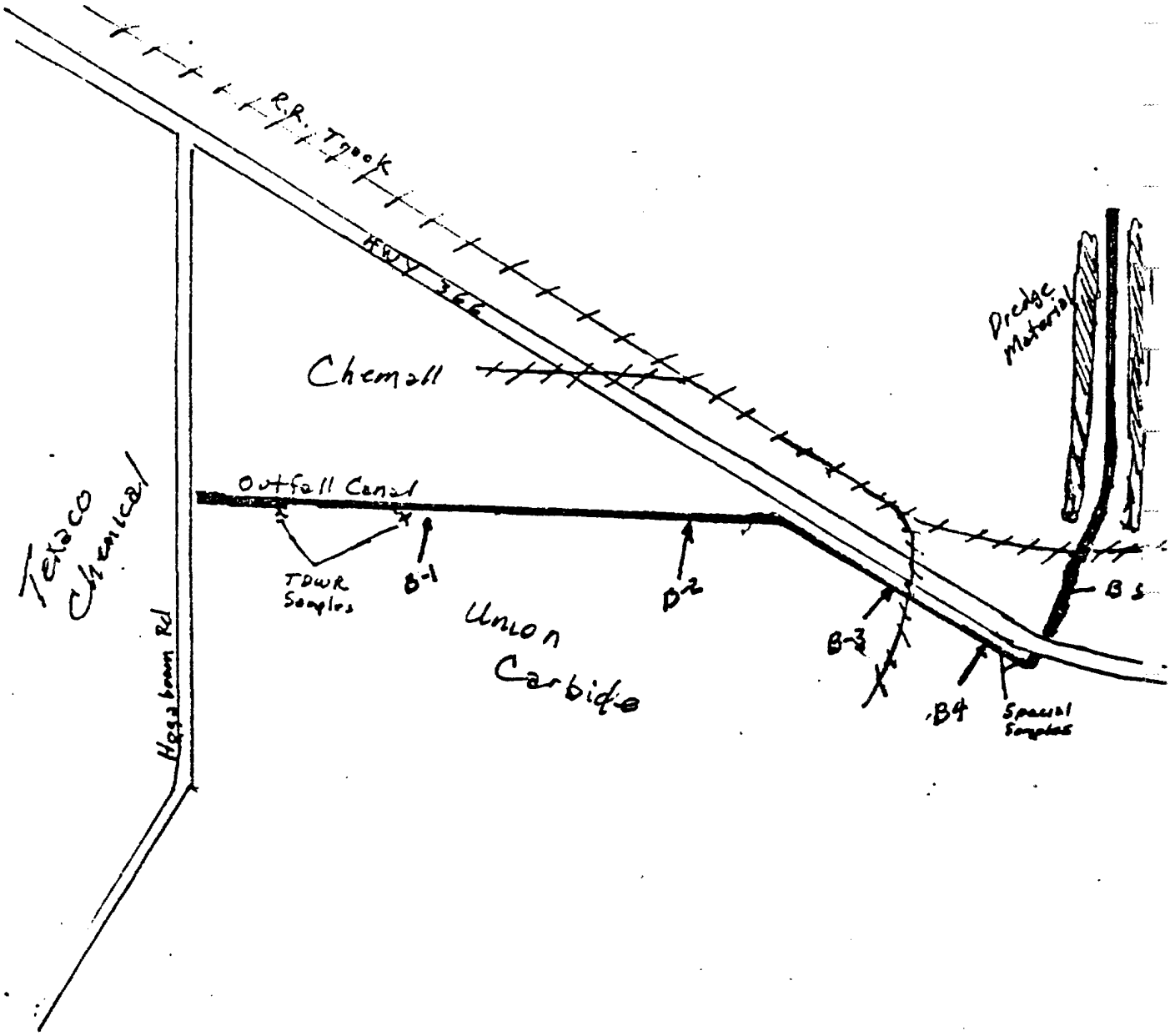
Sincerely,

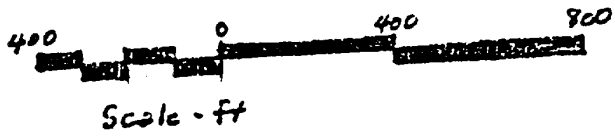
J. SAMUEL LISTIAK

JSL
cz:1/dl
Attachment

cc: Mr. Michael Dick
TDWR District Office
Orange, Texas

STAR LAKE OUTFALL
CANAL SAMPLE LOCATION





AWC
11-13-84

APPENDIX D

Workers' Compensation Division
P. O. Box 13777
Austin, Texas 78711
Please read instruction sheet CAREFULLY, giving special attention to items marked with an asterisk (*)

TWCC CLAIM # _____

DIRECTOR'S # _____

EMPLOYER'S FIRST REPORT OF INJURY OR ILLNESS

1. Name (Last, First, M.I.)
2. Sex F ☐ M ☐
3. Social Security Number - -
4. Home Phone ( )
5. Date of birth (m-d-y) - -
6. Does the Employee Speak English? If No, Specify Language YES ☐ NO ☐ WORK PHONE ( ) -
7. Race White ☐ Black ☐ Asian ☐
8. Ethnicity Hispanic ☐ Other ☐ Native American ☐
9. Mailing Address
Street or P.O. Box
City State ZIP Code County
10. Marital Status Married ☐ Widowed ☐ Separated ☐ Single ☐ Divorced ☐
11. Number of Dependent Children
12. Spouse's Name
13. Doctor's Name
14. Doctor's Mailing Address (Street or P.O. Box)
City State ZIP Code
DR'S PHONE # ( ) -

15. Date of Injury (m-d-y) - -
16. Time of Injury : am ☐ pm ☐
17. Date Last Time Bo (m-d-y) - -
18. Nature of Injury*
19. Part of Body Injured or Exposed*
20. How and Why Accident/Injury Occurred*
21. Was employee doing his regular job? YES ☐ NO ☐
22. Worksite Location of Injury (room, dock, etc
23. Address Where Injury or Exposure Occurred
Name of business if incident occurred on a business site
Street or P.O. Box County
City State ZIP Code
24. Cause of Injury (fall, tool, machine, etc.)*
25. List Witnesses
26. Return to work date(s) expected (m-d-y) - -
27. Did employee die? YES ☐ NO ☐
28. Supervisor's Name
29. Date reporte (m-d-y) - -

30. Date of Hire (m-d-y) - -
31. Was employee hired or recruited in Texas? YES ☐ NO ☐
32. Length of Service in Current Position Months _____ Years _____
33. Length of Service in Occupation Months _____ Years _____
34. State Payroll Classification Code
35. Occupation of Injured Worker
36. Rate of Pay at this Job $ _____ Hourly $ _____ Weekly $ _____ Monthly
37. Full Work Week is: ____ Hours ____ Days
38. Last Paycheck was: $ _____
39. Is employee an Owner, Partner, or Corporate Officer? YES ☐ NO ☒

40. Name and Title of Person Completing Form
Claim Coordinator
41. Name of Agency
42. Agency Mailing Address and Telephone Number
Street or P.O. Box Telephone ( )
City State ZIP Code
43. Agency Location (If different from mailing address)
Number and Street
City State ZIP Code
44. Federal Tax Identification Number 9998
45. Primary Standard Industrial Classification Code (SIC)* (4 digit)
46. Specific SIC Code* (4 digit)
47. Comptroller Agency Code
48. Workers' Compensation Insurance Company State Employee's Division, Attorney General's Office
49. Policy Number TXSTATEPOL0001
50. Did you request accident prevention services in past 12 months? YES ☐ NO ☐ If yes, did you receive them? YES ☐ NO ☐
52. Number of Hours of Sick Leave Credited to Employee on Date of Injury

Signature and Title (READ INSTRUCTIONS ON INSTRUCTION SHEET BEFORE SIGNING)
X _____ Claim Coordinator Date _____

TWCC-15 (3-91)

Rule 120.

RISK MANAGEMENT

TACB SUPPLEMENTAL INSTRUCTIONS FOR COMPLETION FORM TWCC-121 TWC

Supervisor's Investigation of Employee's Accident/Incident

1. All thirteen (13) blocks in the heading must be completed. To assist in this area, note the following:

Block	Instructions
7. Date of Employment in Unit	Use date employee arrived in your work section. (This date may differ from date of employment with the Agency.)
8. Agency Number	a) For TACB, this number is 519 b) For TWC, this number is 582
9. Budget Number of Assigned Unit	This is a four-digit budget number (program activity) that, if not known, can be found by contacting your budget office or by looking at the employee's monthly earnings statement. On that statement, the budget number is the first four (4) digits to the right of the employee's name.
10. Job Classification Code	This may be alpha-numeric (a letter and 3 numbers), but it is usually a four-digit number established by the State Auditor's Office. For example, an Occupational Safety Manager I has a Job Classification Code of 2752. As a last resort, this number may be obtained from the Personnel Office.

2. Be meticulous when completing Blocks A - N. Data is intended at all levels for Accident Prevention Analysis (not disciplinary action).

3. Supervisors are expected to conduct the investigation and to complete Blocks A-N on the form. ADSOs can assist, but should not be tasked to do the investigation.

4. Once the TWCC-121 is filled out through Block P. 2, the completed form is sent through distribution to the Agency Risk Manager and not inadvertently forwarded to the Texas Workers' Compensation Commission.

5. Form should be locally reproduced as needed.

6. Questions concerning this form and its use should be addressed to the Agency Risk Manager and Safety Director at (512) 308-1913 (TXAN: 247-1913).

[illegible] OF EMPLOYEE'S ACCIDENT/INCIDENT

1. LAST NAME OF INJURED	2. FIRST NAME	3. M.I.	4. SOCIAL SECURITY NUMBER - -	5. DATE OF BIRTH / /
6. SEX M ☐ F ☐	7. DATE OF EMPLOYMENT IN UNIT / /	8. AGENCY NUMBER (COMPTROLLER'S CODE)	9. BUDGET NUMBER OF ASSIGNED UNIT	
10. JOB CLASSIFICATION CODE	11. POSITION STATUS ☐ Full-time ☐ Part-time ☐ Floater (fills where needed)	12. DATE OF INCIDENT / /	13. TIME OF INCIDENT : a.m. ☐ p.m. ☐	

A. EXTENT OF INJURY (Check one only)

- ☐ 01 No injury (accident only)
- ☐ 02 Injury not requiring a TWCC-1
- ☐ 03 Medical
- ☐ 04 Lost time only (more than one day)
- ☐ 05 Medical and lost time
- ☐ 06 Fatality

B. CATEGORY (Check one only)

- ☐ 01 Occupational injury (accident)
- ☐ 02 Occupational injury (aggressive behavior)
- ☐ 03 Occupational illness/disease

C. SPECIFIC LOCATION OF OCCURRENCE (Check one only)

INDOORS:
BUILDING INVENTORY NO. _____

- ☐ 01 Auditorium
- ☐ 02 Bath/Toilet area
- ☐ 03 Boiler room
- ☐ 04 Canteen/Snack bar
- ☐ 05 Cell block
- ☐ 06 Classroom
- ☐ 07 Closet
- ☐ 08 Day room
- ☐ 09 Dormitory/Living room
- ☐ 10 Elevator
- ☐ 11 Food service area/Dining/Kitchen
- ☐ 12 Garage
- ☐ 13 Gymnasium/Recreation
- ☐ 14 Hallway/Corridor
- ☐ 15 Hospital/Clinic/Dispensary
- ☐ 16 Laboratory
- ☐ 17 Laundry
- ☐ 18 Library
- ☐ 19 Nursing station
- ☐ 20 Office areas
- ☐ 21 Program areas
- ☐ 22 Ramp
- ☐ 23 Sales store/Outlet
- ☐ 24 Seclusion room
- ☐ 25 Sleeping room
- ☐ 26 Steps/Stairs/Stairway
- ☐ 27 Storage area
- ☐ 28 Waiting room
- ☐ 29 Workshop/Technical trades
- ☐ 30 Other (specify) _____

OUTDOORS:

- ☐ 31 Athletic field
- ☐ 32 Campus
- ☐ 33 Grounds
- ☐ 34 Highway/Road/Street
- ☐ 35 Loading dock
- ☐ 36 Park or recreation area
- ☐ 37 Parking lot
- ☐ 38 Roof
- ☐ 39 Sidewalk
- ☐ 40 Steps/Stairs/Stairway
- ☐ 41 Storage area
- ☐ 42 Swimming pool area
- ☐ 43 Tower
- ☐ 44 Other (specify) _____

D. ACTIVITY ENGAGED IN BY INJURED AT TIME OF INJURY (Check one only)

- ☐ 01 Bathing
- ☐ 02 Buffing
- ☐ 03 Carrying
- ☐ 04 Cleaning
- ☐ 05 Climbing
- ☐ 06 Cooking
- ☐ 07 Descending
- ☐ 08 Digging
- ☐ 09 Dressing
- ☐ 10 Driving
- ☐ 11 Eating
- ☐ 12 Escorting
- ☐ 13 Exercising
- ☐ 14 Feeding
- ☐ 15 Grinding
- ☐ 16 Grooming
- ☐ 17 Jumping
- ☐ 18 Lifting
- ☐ 19 Loading
- ☐ 20 Mopping
- ☐ 21 Moving
- ☐ 22 Opening
- ☐ 23 Pulling
- ☐ 24 Pushing
- ☐ 25 Reaching
- ☐ 26 Redirecting
- ☐ 27 Restraining
- ☐ 28 Running
- ☐ 29 Sanding
- ☐ 30 Serving
- ☐ 31 Searching
- ☐ 32 Securing
- ☐ 33 Sitting
- ☐ 34 Standing
- ☐ 35 Stripping
- ☐ 36 Turning
- ☐ 37 Walking
- ☐ 38 Welding
- ☐ 39 Other (specify) _____

E. BODY PART INJURED (Most serious)

- ☐ 01 Ankle
- ☐ 02 Arm
- ☐ 03 Back
- ☐ 04 Buttocks
- ☐ 05 Cheek
- ☐ 06 Chest
- ☐ 07 Chin
- ☐ 08 Ear(s)
- ☐ 09 Eye(s)
- ☐ 10 Foot-Feet
- ☐ 11 Finger/Thumb(s)
- ☐ 12 Forehead
- ☐ 13 Groin
- ☐ 14 Head
- ☐ 15 Hips
- ☐ 16 Internal organ
- ☐ 17 Jaw
- ☐ 18 Knee(s)
- ☐ 19 Leg(s)
- ☐ 20 Mouth
- ☐ 21 Neck
- ☐ 22 Nose
- ☐ 23 Pelvis
- ☐ 24 Rib(s)
- ☐ 25 Scalp
- ☐ 26 Shoulder
- ☐ 27 Toe(s)
- ☐ 28 Wrist(s)
- ☐ 29 Other (specify) _____

F. TYPE OF INJURY (Check primary one)

- ☐ 01 Abrasion
- ☐ 02 Amputation
- ☐ 03 Bite
- ☐ 04 Bruise
- ☐ 05 Burn
- ☐ 06 Concussion
- ☐ 07 Cut
- ☐ 08 Dermatitis
- ☐ 09 Dislocation
- ☐ 10 Foreign object
- ☐ 11 Fracture
- ☐ 12 Frostbite
- ☐ 13 Hearing loss
- ☐ 14 Heart attack
- ☐ 15 Heat exhaustion
- ☐ 16 Hernia
- ☐ 17 Infection
- ☐ 18 Inflammation
- ☐ 19 Internal injuries
- ☐ 20 Puncture
- ☐ 21 Rupture
- ☐ 22 Scratch
- ☐ 23 Shock
- ☐ 24 Sprain
- ☐ 25 Sting
- ☐ 26 Strain
- ☐ 27 Other (specify) _____

G. TYPE OF OCCURRENCE (Check one only)

- ☐ 01 Aggression (client, student, inmate, patient)
- ☐ 02 Bodily reaction (drug, medication)
- ☐ 03 Caught in, on, under, or between
- ☐ 04 Contact with chemicals
- ☐ 05 Contact with electric current
- ☐ 06 Contact with temperature extremes

G. CONTINUED

- ☐ 07 Fall on same level
- ☐ 08 Fall on different level
- ☐ 09 Over-exertion (exceeding physical ability resulting in strain, rupture)
- ☐ 10 Overexposure to environmental hazards (noise, toxic)
- ☐ 11 Slip (not a fall)
- ☐ 12 Struck against (rough, sharp object)
- ☐ 13 Struck by falling, moving object
- ☐ 14 Other (specify) _____

H. PHYSICAL THING MOST CLOSELY ASSOCIATED WITH OCCURRENCE (Check one)

- ☐ 01 Aircraft
- ☐ 02 Air pressure
- ☐ 03 Animal (snake, dog, horse, etc.)
- ☐ 04 Athletic equipment (baseball, bat, dart, etc.)
- ☐ 05 Attachments (belt, pulley, gear, shaft)
- ☐ 06 Building component
- ☐ 07 Cabinet
- ☐ 08 Chemical (solid, liquid, or gas)
- ☐ 09 Clothing
- ☐ 10 Container (bottle, box, barrel, cylinder, etc.)
- ☐ 11 Curb
- ☐ 12 Doors (automatic, manual, revolving)
- ☐ 13 Drugs or medicine
- ☐ 14 Dust
- ☐ 15 Electrical apparatus
- ☐ 16 Elevator, escalator
- ☐ 17 Explosives
- ☐ 18 Eyewear
- ☐ 19 Fan
- ☐ 20 Fire, flame, smoke
- ☐ 21 Floor
- ☐ 22 Food products
- ☐ 23 Frames
- ☐ 24 Furniture, fixtures
- ☐ 25 Gas
- ☐ 26 Glass items
- ☐ 27 Gun
- ☐ 28 Ground (earth)
- ☐ 29 Hand tool
- ☐ 30 Heating equipment
- ☐ 31 Hoisting equipment
- ☐ 32 Icy condition
- ☐ 33 Infectious or parasitic agent
- ☐ 34 Inmate, client, employee
- ☐ 35 Insect
- ☐ 36 Kitchen equipment
- ☐ 37 Knife
- ☐ 38 Lighting fixture and equipment
- ☐ 39 Ladder, scaffold
- ☐ 40 Locker
- ☐ 41 Machine
- ☐ 42 Material handling equipment
- ☐ 43 Metal
- ☐ 44 Mineral items (asphalt, clay, gravel, etc.)
- ☐ 45 Motor vehicle
- ☐ 46 Needle
- ☐ 47 Office equipment (chair, desk, cabinet, etc.)
- ☐ 48 Paint
- ☐ 49 Pesticide
- ☐ 50 Pavement
- ☐ 51 Person (other than client, inmate, employee)
- ☐ 52 Pipe
- ☐ 53 Platform, deck, ramp

H. CONTINUED

- ☐ 54 Pole
- ☐ 55 Power tool or machinery (lathe, saw, etc.)
- ☐ 56 Radiating equipment (microwave, x ray, etc.)
- ☐ 57 Receptacle
- ☐ 58 Smoke
- ☐ 59 Stair, step
- ☐ 60 Sun
- ☐ 61 Trench/Ditch
- ☐ 62 Vegetation
- ☐ 63 Weather
- ☐ 64 Wood
- ☐ 65 Other (specify) _____

I. CONTINUED

- ☐ 21 Riding moving equipment not designed for passengers
- ☐ 22 Unauthorized (daydreaming, inattentive, etc.)
- ☐ 23 Using unsafe/defective tool, material, equipment
- ☐ 24 Using wrong tool, material, equipment
- ☐ 25 Working/Walking under suspended load (crane, hoist, derrick)
- ☐ 26 Working in a confined space without proper safeguard
- ☐ 27 Working without adequate lighting
- ☐ 28 Other (specify) _____

J. CONTINUED

- ☐ 21 Unsafe/Defective hand or electric tools
- ☐ 22 Unsafe equipment
- ☐ 23 Unsafe material
- ☐ 24 Unsafe vehicle
- ☐ 25 Unshored trench, excavation, etc.
- ☐ 26 Walkway, sidewalk, pavement
- ☐ 27 Other (specify) _____

I. ACT/PRACTICE ASSOCIATED WITH OCCURRENCE (Check one only)

- ☐ 01 Contact with electrical source (tool, device, wire, etc.)
- ☐ 02 Entering an unauthorized area
- ☐ 03 Failure to practice safe driving technique
- ☐ 04 Failure to use established route or taking short cut
- ☐ 05 Failure to use handrail, grab bar
- ☐ 06 Failure to use lockout device
- ☐ 07 Failure to wear personal protective equipment (PPE)
- ☐ 08 Failure to warn of known hazards (i.e. no safety sign, light, barricade, instruction, etc.)
- ☐ 09 Failure to wear appropriate dress (shoes, shirt, blouse)
- ☐ 10 Handling (of object, material, item, thing)
- ☐ 11 Horseplay
- ☐ 12 Improper mixing or storing (non-compatible material, chemicals, etc.)
- ☐ 13 Improper placing or storing (materials, tools, equipment)
- ☐ 14 Lifting (including position, stance)
- ☐ 15 Making safety devices inoperative
- ☐ 16 No unsafe act/practice on the part of employee
- ☐ 17 Operating/Working at unsafe speed
- ☐ 18 Operating without proper authority/clearance
- ☐ 19 Over or unnecessary exposure to hazards (gas, fumes, dust, chemicals, mist, radiation, etc.)
- ☐ 20 Repairing or servicing moving object/thing (machine, equipment, etc.)

J. CONDITION (PHYSICAL HAZARD) ASSOCIATED WITH OCCURRENCE (Check one)

- ☐ 01 Congested area
- ☐ 02 Electrical hazard (uninsulated wire, overloaded circuit, inadequate ground, etc.)
- ☐ 03 Excessive noise
- ☐ 04 Harmful animals/insects/reptiles
- ☐ 05 Health hazards (radiation, gas, fumes, dust, vapors, etc.)
- ☐ 06 Improper housekeeping
- ☐ 07 Improperly stored chemicals, hazardous substances
- ☐ 08 Inadequate ventilation
- ☐ 09 Inadequate or no warning signs
- ☐ 10 Layout or design (office, shop, equipment)
- ☐ 11 Lighting
- ☐ 12 Mislabeled/Unlabeled chemicals, hazardous materials, etc.
- ☐ 13 No unsafe condition
- ☐ 14 Open trench, hole, ditch, sharp drop-off
- ☐ 15 Poisonous vegetation (oak, ivy, etc.)
- ☐ 16 Protruding object (nail, wire, splinter, etc.)
- ☐ 17 Rough/Sharp objects
- ☐ 18 Slipping or tripping hazard
- ☐ 19 Step, stairs, ladder, or other working surfaces
- ☐ 20 Unguarded machine, belt, pulley, roller, etc.

K. DID THE STATE OR THE UNIT HAVE SAFETY RULE, REGULATION, OR STANDARD THAT WOULD HAVE PREVENTED THE OCCURRENCE?

☐ 01 Yes ☐ 02 No

L. WAS THE RULE, REGULATION, OR STANDARD VIOLATED?

☐ 01 Yes ☐ 02 No

M. ACTION(S) TAKEN OR PLANNED TO PREVENT RECURRENCE (Check all that apply)

- ☐ 01 Action taken with employee for violating rules, regulations or procedures
- ☐ 02 All employees were made aware of the occurrence cause, consequence, and action to prevent recurrence
- ☐ 03 Employee given basic training
- ☐ 04 Employee given refresher or remedial training
- ☐ 05 Existing rule, regulation or standard (SOP) enforced
- ☐ 06 Existing rule, regulation or standard (SOP) revised
- ☐ 07 New rule, regulation or standard prepared
- ☐ 08 Physical hazard(s) corrected
- ☐ 09 Other positive action taken _____

H. DESCRIBE BRIEFLY IN NARRATIVE FORM THE CIRCUMSTANCES THAT LED TO AND CAUSED THIS OCCURRENCE.

ANSWER: WHO? WHAT? WHERE? WHEN? WHY? AND HOW? (Use additional sheet if necessary)

INJURED'S IMMEDIATE SUPERVISOR (print)	SIGNATURE	DATE / /	PHONE ( )

P. REVIEWED BY

P.1 SECTION/DEPARTMENT/DIVISION ADDITIONAL DUTY SAFETY OFFICER COMMENT:

	SIGNATURE	DATE /

P.2 SECTION/DEPARTMENT/DIVISION HEAD COMMENT:

	SIGNATURE	DATE /

P.3 AGENCY OR FACILITY SAFETY MANAGER

A) Repeat occurrence: ☐ 01 No ☐ 02 Yes total incidents: ☐ 03 Two ☐ 04 Three ☐ 05 Four ☐ 06 Five ☐ 07 C

B) Were three (3) or more workers injured in the accident? (if so, complete a separate form for each employer) ☐ 01 Yes ☐ 02 No

C) Comment

	/ /

APPENDIX B

SITE SAFETY BRIEFING

Job Number (Site) _____ Number TXD _____
Date _____ Start Time _____ Completed _____
Site Location _____
Type of Work (General) _____
****

SAFETY ISSUES

Tasks (this shift) _____
_____
_____
Protective Clothing/Equipment _____
_____
_____
Physical Hazards _____
_____
_____
Control Methods _____
_____
_____
Chemical Hazards _____
_____
_____
Decontamination Procedures/Tasks _____
_____
_____
Evacuation Procedures/Route/Signals _____
_____
_____
Evacuation Meeting Area _____
_____
Nearest Phone _____
_____
Hospital Name/Address _____
_____
Special Topics (incidents, actions taken, etc.) _____
_____
_____
_____
_____

****

ATTENDESS

Print Name	Sign Name
_____	_____
_____	_____

HEALTH AND SAFETY CHECKLIST

_ 1. Conduct safety briefing (each day).

_ 2. Conduct initial site survey (first day).

_ 3. Personal Protective Equipment: Tyvek (or chemical resistant suit) coveralls, boots, inner and outer gloves, respirator and matching organic and particulate filter canisters, hard hat, and goggles.

_ 4. Copy of HASP.

_ 5. First aid and snakebite kits, including ice.

_ 6. Calibrated air monitoring devices.

_ 7. Water.

_ 8. Emergency contact list and map to hospital (or mark in HASP).

_ 9. Appropriate weather gear (i.e., rain gear, cold weather clothing, etc.)

_ 10. Copy of SSI Workplan.

APPENDIX C

Federal Law Says You MUST Have This Aboard

Equipment	Less than 16 feet	Less than 26 feet
Life Jackets (PFDs)	One Type I, II, III, IV, or Hybrid Type V for each person. Hybrid Type V must be worn at all times to meet Coast Guard regulations	One Type I, II, III, or Hybrid Type V for each person on board or being towed on water skis, etc., plus 1 Type IV available to be thrown. Hybrid Type V must be worn at all times to meet Coast Guard regulations
Fire Extinguishers	At least one B-1 Coast Guard approved type hand portable fire extinguisher. Not required on outboard motorboats less than 26 feet in length if the construction of such motorboats will not permit the entrapment of flammable gases or vapors. NOTE: When Coast Guard approved fixed fire extinguishing system is installed in machinery space(s), no hand portable extinguisher is required.	
Ventilation	At least 2 ventilator ducts fitted with cowls for the purpose of properly and efficiently ventilating the bilges of every inboard engine and fuel tank compartment of boats constructed or decked over after 25 April 1940, using gasoline or other fuel having a flashpoint less than 110°F. Boats built after 31 July 1980 must have operable power blowers.	
Whistle, Bell, or Horn	Any device capable of making an "efficient sound signal" audible for 1/2 mile.	
Backfire Flame Arrester	One Coast Guard approved device on each carburetor of all gasoline engines installed after 25 April 1940, except outboard motors.	
Visual Distress Signals - for coastal waters, Great Lakes or high seas.	Required only when operating at night (N). Same night equipment choices as for larger boats as shown at night.	Orange flag with black square-and-disc (D); and an S-O-S electric light (N); or 3 orange smoke signals, hand held or floating (D); or 3 red flares of handheld, meteor, or parachute type (D/N).

Operating Rules

You are legally responsible for the safety of those on your boat, any damage your boat causes to other boats and property, and all others injured by any damage you cause. Just like driving a car, if you don't know and obey the rules, the fact that you didn't know them is NOT a valid defense. Important: The law also says you're GUILTY if you cause an accident because you're "right" and therefore elect not to prevent the accident. These drawings show some (but not all) "right of way" rules. (Horn signals and navigation lights are not covered here.)

CROSSING: Every boat has a DANGER ZONE from straight in front (the bow) to past the middle of its right side. Like when meeting another car at a street intersection, the one on the RIGHT has the RIGHT OF WAY. You must YIELD to boats in your DANGER ZONE.

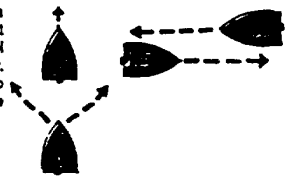
Danger Zone: Must give way! Stop, let other boat pass, or turn away in plenty of time.

Caution: Hold course but watch approaching boat carefully. Prepare to "give way" if other boat does not.

POWERBOATS MUST YIELD TO SAILBOATS and boats being rowed or paddled, except in a narrow channel. Stay well clear of all big vessels.

OVERTAKING: Be ready for trouble when a power boat passes you in a narrow waterway. As the lead boat (which always has the right of way) stay on your side of the channel and maintain a steady speed so that the overtaking vessel can pass you safely. Use your radio to discuss this with the passing boat.

MEETING: As in a car, both stay to your right & as far apart as practical, so its easier & safer to cross each other's wake. (Okay to pass left, if both know the plan.) Give notice by steering to right or left while still far apart. Then stay with that plan unless the other boat indicates otherwise. If you have a CB or VHF, use it. Be careful.



Take A Boating Course

This pamphlet funded through a grant from the United States Coast Guard with additional support from the USPS Educational Fund.

UNITED SAFE BOATING INSTITUTE

1504 Blue Ridge Road, Raleigh, NC 27622, (919) 821-0281

For info on boating classes call: 1-800-336-BOAT.

UNITED STATES POWER SQUADRONS

Take the public Boating Course to learn the basics of safer and more enjoyable boating, whether you own a boat, are thinking of buying one, or enjoy boating with friends. All instruction is free; there is a nominal charge to cover costs including a 150 page student workbook & chart. The course is offered as a public service to adults and teenagers in over 500 local areas throughout the U.S.A. Instructors are volunteer USPS members with advanced training, who have taught 2-1/2 million students.

UNITED STATES COAST GUARD AUXILIARY

Coast Guard Auxiliary, created by Act of Congress in 1939, is the Volunteer Civilian Arm of the United States Coast Guard. In promoting safe boating in the U.S.A., it performs these non-profit services: ■ Teaches several public boating courses. ■ Examines recreational boats for proper safety equipment. ■ Assists regular Coast Guard in search & rescue, and patrols navigable and state waterways.

For more free info on boating safety (including safety recalls) call: 1-800-368-5647.

AMERICAN RED CROSS

By congressional charter, the ARC is responsible for relieving and preventing accidents and suffering. The aim of the organization is to improve the quality of human life and to enhance individual self reliance and concern for others. It provides standards, courses, and materials in first aid, CPR, swimming, lifesaving, lifeguarding, and boating safety (canoeing, kayaking, sailing.)

UNITED STATES YACHT RACING UNION

National governing body for sailing. USYRU is also a membership organization of 25,000 active sailor and sailing groups. Programs include instructor training, sailing safety, and services to sailing groups. Membership benefits include discounts on sailing publications, videos, and travel; monthly "American Sailor" magazine. For information call (401) 849-5200 or write USYRU, Box 209, Newport, RI 02840

For information on Boating Classes in Canada call 1-800-268-3579

The information herein is furnished as a public service by United Safe Boating Institute (USBI), which disclaims any liability from the use thereof.

Tips for Safe Boating

No matter how many years you've been around boats, please take just five minutes to scan this quick reading booklet. People who hunt or fish from boats have one of the highest boat fatality rates. More die from falling off boats 16 feet and smaller than larger boats, and most boats are anchored at the time.

☐ Be weather wise. Sudden wind shifts, lightning flashes and choppy water all can mean a storm is brewing. Bring a portable radio to regularly check weather reports.

☐ Bring extra gear you may need. A flashlight, extra batteries, matches, a map of where you are, flares, sun tan lotion, first aid kit, extra sunglasses. Put those that need to be protected in a waterlight pouch or a container that floats.

☐ Tell someone where you're going, who is with you, and how long you'll be away. Then check your boat, equipment, boat balance, engine and fuel supply before leaving.

☐ Ventilate after fueling. Open hatches, run blower, and most important, carefully sniff for gasoline fumes in the fuel and engine areas before starting your engine.

☐ Stay dry and warm. Wear several layers of light clothing; bring rainproof covering. Never wear hip waders in a small boat.

☐ Keep fishing & hunting gear clean and well packed. A loose fish hook can cause a lot of pain and ruin a great outing. Bring an extra length of line to secure boat or equipment.

☐ When changing seats, stay low and near center line of a small boat.

☐ Be ready for trouble when a powerboat passes you in a narrow channel. As the lead boat (which always has the right of way) stay on your side of the channel and maintain a steady speed so that the overtaking vessel can pass you safely. Use your radio to discuss this with the passing boat.

☐ Anchor from bow, not stern. Use anchor line length at least five times longer than water depth.

☐ Take a safe boating course. As an extra benefit, you may earn lower boat insurance costs. (See back cover.)

Distress Signals.

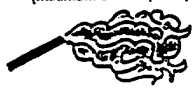
This illustrates the variety and combinations of distress signals which can be carried in order to meet Coast Guard requirements (the arm signals are shown for information only – they are an internationally recognized sign of distress, but are not "required distress signals"). All signals, except for the distress flag and light must show the words "Coast Guard Approved" and be marked with the service life of the signal. The distress flag and light must carry the manufacturer's certification that they meet Coast Guard requirements.

Visual Distress Signals

Orange Flag
use day only

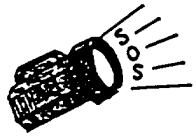
Arm Signals (Use Bright Cloth)

Red Distress Flare (Hand)
use day and night
(minimum of 3 required)



Orange Smoke Signal (Hand)
use day only
(minimum of 3 required)

Red Meteor
use day, night
(minimum of 3 required)



use night only

Orange Smoke Signal (Floating)
use day only
(minimum of 3 required)

How you Board and Load Your Boat is Important.

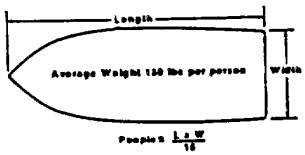
Be sure you know your boat's capacity. Look at the Capacity Plate. Don't overload it or put an oversize motor on it. On boats with no capacity plate, use the formula in the sketch at right to determine the maximum number of persons you can carry.

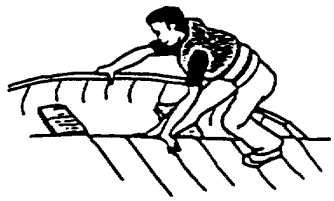
Be sure the dock lines are tied securely before you put gear aboard or go aboard yourself. Don't wind up straddling from dock to boat. If the boat is small, step as near the centerline as possible, and stay low in the boat. As you load, look at how much distance there is between the water and the top edge of your boat (freeboard). Waves, or wakes from passing boats, can easily swamp a small boat with low freeboard. Don't overload. Don't load heavy gear to one side.

Remember: When you overload, you are asking for trouble. Even with flotation a swamped boat is dangerous. Capsizing and falls overboard account for 70% of boating fatalities.

LOADING YOUR BOAT

Passenger Capacity Calculation





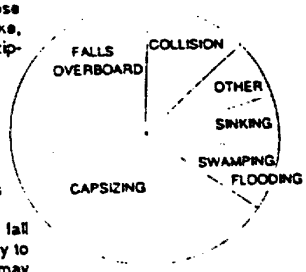
Some Sobering Facts about Alcohol

Over 1,000 people die in boating accidents every year. Nine out of ten of them drown. About half those deaths involve alcohol. It's a tragic fact and not a joke, but 50% of drunk men who drown have their fly unzipped. Enough said?

Four hours of exposure to powerboat noise, vibration, sun, glare, wind and motion produces a kind of "boater's hypnosis". This slows reactions almost as much as being legally drunk. Adding alcohol to this sun exposure intensifies the effects. As the chart shows, sometimes just a couple of beers are too many.

When you're "tipsy", you're much more likely to fall overboard. Alcohol also reduces your body's ability to protect against cold water. So within minutes you may not be able to call for help, or swim to safety. Actually, a drunk person whose head is immersed can be confused and swim down to death instead of up to safety.

BOATING FATALITIES



TYPE OF ACCIDENT
50% ALCOHOL RELATED

Blood Alcohol Content Chart

Body Weight in Pounds	Number of Drinks in a Two Hour Period. 12 oz. beer = 5 oz. wine = 1 oz. 80 proof liquor.								
100	1	2	3						
120	1	2	3						
140	1	2	3	4					
160	1	2	3	4	5				
180	1	2	3	4	5				
200	1	2	3	4	5	6			
220	1	2	3	4	5	6			
240	1	2	3	4	5	6			

BAC to .05%	BE CAREFUL - Loss of judgment and coordination
BAC .05% to .10%	ABILITIES IMPAIRED - Chance of accident increased
BAC .10% and over	DO NOT OPERATE A BOAT - High risk of accident

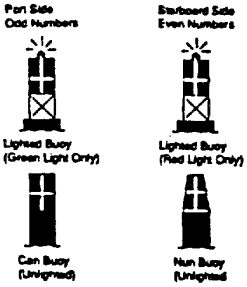
Federal Aids to Navigation.

(State waterway aids not shown)

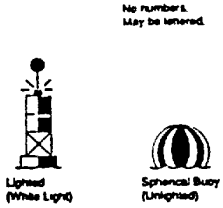
Federal Waterway Marking System

- Keep RED aids on your RIGHT coming upstream (& in from seaward).
- Keep marked channels clear. Don't anchor in a channel or to a navigational aid.

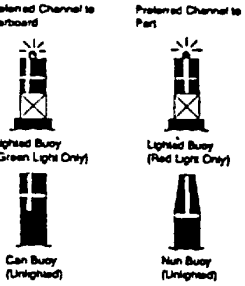
Lateral Aids Marking the sides of channels as seen when entering from seaward



Safe Water Aids marking mid-channels and fairways



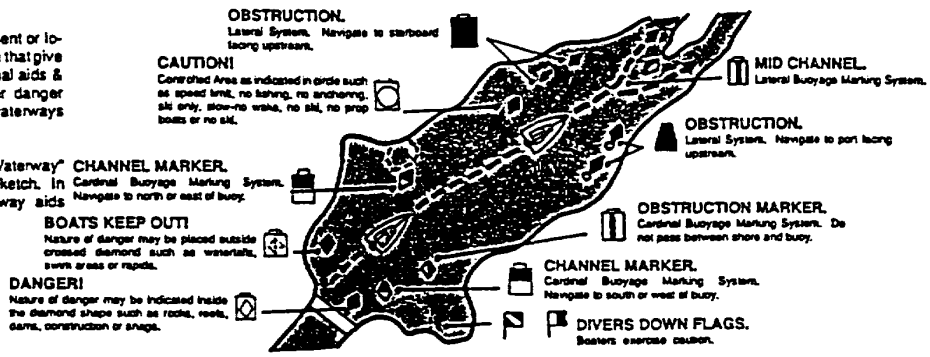
Preferred Channel Aids (Mark bifurcations. No numbers. May be lettered.)



Charts — Your "Road Maps"

Most areas have government or locally prepared charts available that give water depth, show navigational aids & major landmarks, underwater danger areas, as well as shorelines, waterways and harbor areas.

Some "Uniform State Waterway" aids are shown in the chart sketch. In most areas, Federal waterway aids also would be shown.



Life Jackets (PFDs) - The Choice Is Yours

- Get and wear a Coast Guard approved Personal Flotation Device (PFD) that fits well; make sure it is the proper type and approved for your specific usage. Actually put it on, adjust it and test it in the water, so you'll know how it will feel when needed. Do the same for all family members - especially children. Knowing what to expect in the water can prevent panic. Non-swimmers should wear a PFD on any small boat.
- Never leave PFDs sealed in plastic wrapping. They must be ready to put on fast.
- Whenever water conditions or weather cause concern, have everybody aboard immediately put on a PFD.
- And if you fall in the water, stay with the boat.

Offshore Life Jackets (Type I): Bulky; but floats you the best; best for open, rough, or remote water. Turns most unconscious persons face-up in the water. Not pictured here.

Near shore buoyant vests (Type II): Yoke-type, less bulky than Type I and more comfortable to wear. Will hold head of many unconscious persons out of water.

Flotation Aids (Type III): Vest style; popular among recreational boaters. Only designed for calm water with good chance of fast rescue. Wearer may have to hold head back to keep face out of water, which can contribute to exhaustion and hypothermia. May not hold face of unconscious wearer out of water.

Throwable Devices (Type IV): Life rings and floating cushions.

Special Use Devices (Type V): Approved only for the activities listed on the label. Some are approved specifically for white water rafting, board sailing, etc. Also includes new Hybrid PFDs with foam flotation and an inflatable chamber. Type V Hybrid PFDs are as comfortable to wear as a Type III, but when fully inflated have the flotation performance of a Type II or better.

First Aid Emergency Measures

Be boatwise. Take a first aid and CPR course.

FIRST AID EMERGENCY MEASURES		
INJURY	SIGNS	TREATMENT
Broken Bones	Pain, swelling, deformity, discoloration and possible bleeding.	Keep broken bone ends and adjacent joints from moving, control bleeding, treat for shock.
Burns	DEGREE: 1st - Skin is pink or reddish (sunburn). 2nd - Skin is blistered. 3rd - Skin may be red and raw, possibly black charred areas.	Pain of 1st degree and small 2nd degree burns can be relieved by excluding air. Three ways to exclude air from 1st or 2nd degree burns are: 1.) Submerge in cold water; 2.) Apply a cold pack, 3.) Cover with a thick dressing or unused plastic. For a 3rd degree burn, cover with dry clean cloth and call for medical help. If the victim's face is burned, he may stop breathing. Be ready to give artificial respiration.
Sunburn	Red, painful skin and chills. Fever and shock occasionally accompany severe sunburns.	Apply cold water. Do not re-expose burned area to sun until completely healed. Get medical attention.
Heart Failure - Epilepsy	Victim is ill with no apparent external injury. Clutching chest, extreme shortness of breath, convulsions.	Place the victim in a comfortable position, usually sitting up. Call for medical help and give prescribed heart medicine if available. If not breathing, give artificial respiration. Victims with convulsions should be laid down in a cleared, open area. Never place anything in the person's mouth.
Shock	Pale, clammy skin, irregular breathing, fast, weak pulse.	Keep person lying down and prevent loss of body heat. Do not give fluids if victim is unconscious. Get medical help as soon as possible.

Hypothermia - Here's How To Fight This Killer

Exposure causes loss of body heat. This is called hypothermia. Hypothermia can kill. Defense against hypothermia is to avoid exposure to cold. Do this by staying dry and avoiding the wind. Put on rain gear before you get wet. If you fall into cold water, do NOT discard clothing; it will help trap heat. Avoid moving as much as possible. A life jacket helps in two ways: it reduces the need to move, and it helps insulate against heat loss. When you wear a life jacket, draw knees up into a H.E.L.P. (Heat Escape Lessening Position).

If several persons are in the water, huddle together so you can conserve heat and stay alive.

Treatment involves getting the victim out of cold producing environment. Strip off all wet clothing and get person into a warm sleeping bag. Try to keep person awake. Do NOT give alcohol or massage vigorously. Giving the person warm drinks or food is not a good idea. They don't help re-warm the person and they can pose a choking hazard. Transport the victim to a hospital as soon as possible.

If the Water Temp. (F) is...	Exhaustion or Unconsciousness	Expected Time of Survival is...
32.5	Under 15 Min.	Under 15-45 Min.
32.5-40.0	15-30 Min.	30-90 Min.
40-50	30-60 Min.	1-3 Hr.
50-60	1-2 Hr.	1-6 Hr.
60-70	2-7 Hr.	2-40 Hr.
70-80	3-12 Hr.	3-Indefinitely
over 80	Indefinitely	

Canoeing

You can quickly and easily master getting into and out of a canoe without getting wet if you remember the following important points:

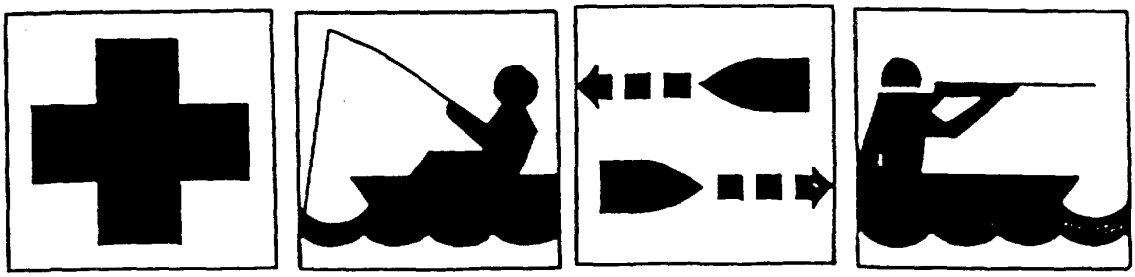
- Keep your center of gravity low, and move slowly and deliberately.
- Transfer your weight slowly from shore to the bottom center of the canoe.
- Board your canoe directly into your paddling position whenever possible.
- For maximum control and stability always kneel in canoes, even though some canoes have seats.

To get out of a canoe, simply reverse the steps described above.

Canoe capsizing: Once you have capsized, relax and make contact with the canoe with your hands, if you have not already done so. Stay upside down long enough to extract feet and legs from the canoe. Then surface, maintaining contact with the canoe. Keep your eyes open.

FISHERMEN, HUNTERS & CAMPERS

Tips for safe boating



Before Casting Off

Get in the habit of performing these brief steps:

1. "Sniff" your bilges. Usually your nose is the best fuel/vapor detector. It'll mean getting down on your hands and knees, but it's the best way to do it.

2. Operate the bilge blower for at least FOUR MINUTES before starting an inboard engine. If you still smell fumes, try to find what is causing them and make repairs before starting the engine.

3. Make sure the location of your fire extinguishers is known to all passengers.

4. When refueling, close all hatches, ports and other openings; shut off all engines and motors; and refrain from smoking. Fill all portable tanks on the dock.

5. After refueling, wipe up or wash off any excess or spilled fuel; open all hatches and ports; and let the boat air out. "Sniff" your bilges. Operate the bilge blower for at least four minutes before starting an inboard engine.

U.S. Department of Transportation
United States Coast Guard

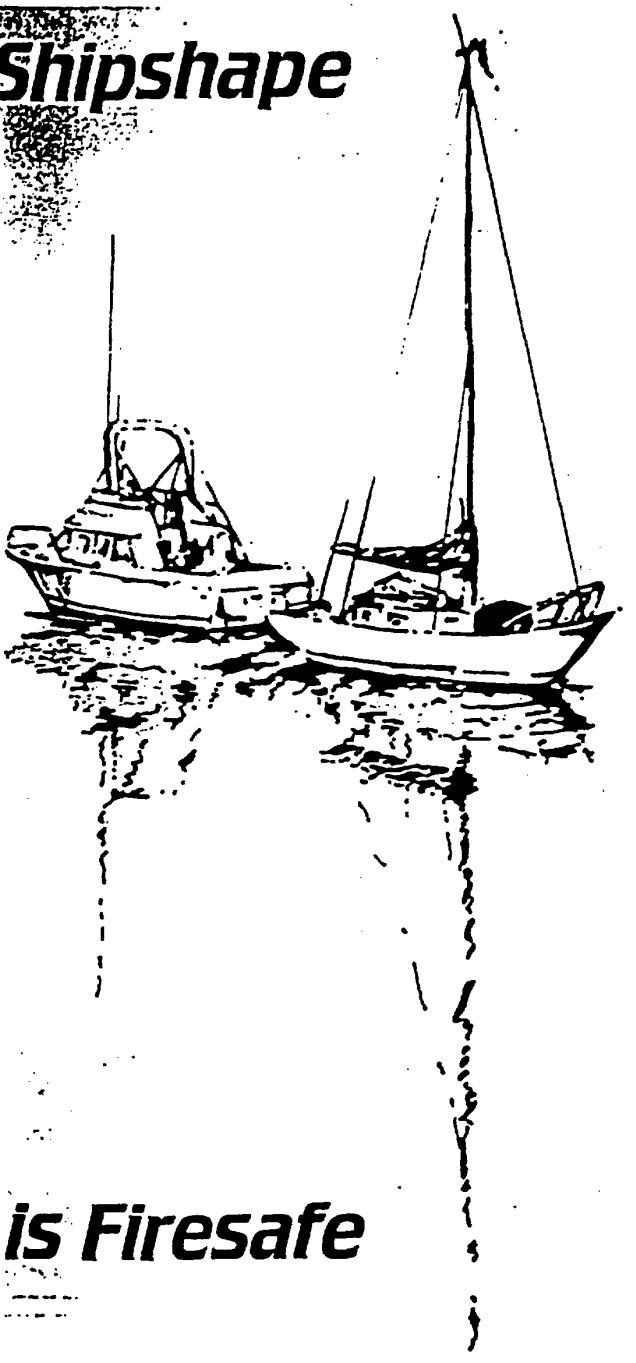
Call the Boating Safety Hotline:

800-368-5647

(Toll Free!)

- For Boating-Safety-Recall Information.
- To Report Possible Safety Defects in Boats.
- For Answers to Boating Safety Questions.

Shipshape



is Firesafe

Shipshape is Firesafe

A shipshape boat is a safe boat. Firesafety is something that everyone who owns or operates a boat should practice.

Each year, boating fires and explosions injure hundreds of Americans and cause millions of dollars in property damage. While there is a greater chance for a fire or explosion on a boat than on land, many of these accidents can be prevented.

Fuel and fuel vapors are two of the leading ingredients in all boating accidents involving fires and explosions. Keep fuel and vapors in their proper places and make all of your boating trips **firesafe.**

The United States Coast Guard and the National Fire Protection Association offer the following helpful reminders:

In General or Seasonal

1. Be alert for damage to your boat's fuel system. Over a period of time, **fuel fittings and fuel hoses** wear out. Inspect these fittings and hoses regularly, especially near the engine where engine heat can accelerate deterioration.

2. Inspect **fuel tanks** annually. Pay particular attention to bottom surfaces which may have been in contact with bilge water and any part of the tank which touches the boat structure. The tank could have rusted or been damaged due to rubbing and abrasion. Permanently installed fuel tanks should be vented to the outside of the hull as well as closed compartments.

3. Be sure the **fuel pipe** is tightly fitted to fill the plate and located outside closed compartments. The fill pipe should also be located where any spilled fuel will be directed overboard. Look for fuel fill hoses that are dry and cracked or soft and mushy. Such hoses should be replaced with marine fuel hoses immediately.

4. **If a hose or fuel tank is leaking, replace it before using your boat.**

5. On a boat with **portable fuel tanks,** make sure the vents can be closed and that the tanks have a vapor-tight, leak-proof cap. The vent on a protable tank should be open when the motor is running, but when the tank is not in use, the vent and the cap should be tightly closed.

6. If the boat has powered ventilation **(a bilge blower),** make sure the blower operates.

7. Be sure **heating and cooking appliances** on board are secured and operate properly. Refer to the owner's manual for the appliance for guidance on inspecting for leaks in valves and connections; **never use a match.**

8. Make sure that **flammable items** are stowed safely and cannot come into contact with cooking or heating appliances or hot engine parts.

9. Make sure Coast Guard Approved **fire extinguishers** on board are in working order - that gauges register and that nozzels are clear. Take a boating safety course that teaches the correct use of a fire extinguisher aboard a boat. The time to learn is **before** a fire occurs.

10. Look for bare wires or loose **electrical connections.** They might cause a short in your boat's electrical system, which could start a fire.

11. Do not store small disposable propane cylinders or charcoal lighting fluid on board.

12. Conduct a bow to stern inspection checking for loose fuel, gas fumes and any malfunctioning instruments.

Table 1.2. Schedule of Preliminary Assessments

Activity	Hours After Site Assignment
Site Assignment	0
Draft Preliminary Assessment Scoresheets and Background Research	60
Conduct PA Site Visit	12
Compute PREscore for Site	8
Draft PA Report Complete	30
Final PA Report Submitted to EPA	10

Table 1.3. Schedule of Site Inspections

Activity	Hours After Site Assignment
Site Assignment to TNRCC	0
SSI Background Research Completed	68
Work Plan Completed and Approved	60
Health and Safety Plan Completed and Approved	18
Work Plan Executed (includes travel)	123
Laboratory Analyses Complete	40
Draft SSI Report Complete	75
Final SSI Report Submitted to EPA	16

decontamination procedures. The WP will also identify potential targets for the groundwater, surface water, soil exposure, and air pathways; (4) a health and safety plan to describe potential hazards and necessary site specific precautions and preparations for completing the field work described in the sampling plan; and (5) general project requirements such as a schedule, equipment needed, and mobilization/demobilization procedures.

The TNRCC will prepare the WP according to the format agreed to by the EPA for use on the FY'92 SSI Scope of Work. Revisions to this format will be determined by the EPA and TNRCC project managers prior to preparing the first documents. The EPA will be responsible for approving each work plan, however, the decision to proceed with WP implementation may be delegated by the EPA Site Assessment Manager (SAM) to the TNRCC Program Manager, as appropriate.

Subcontractors will be used to assist in report photographic production services. Other needs for subcontractor services will be determined throughout the course of this project. EPA shall choose a laboratory to be used for this project under its Contract Laboratories Program (CLP) and shall incur all costs for sample analyses. The EPA Houston's Laboratory shall provide analytical support for drinking water samples. The sample analyses shall include analysis for all constituents listed on the CLP Routine Analytical Services (RAS) Organic Target Compound List (TCL) and Inorganic Target Analyte List (TAL).

Control of subcontractor work quality, schedules, and budgets will be assured by the following means:

- To assure accountability on a personal level and to avoid the problems associated with diffused responsibilities, the subcontractor will designate a single individual who will function as the subcontractor's project manager.

- The subcontractor's project manager will report directly to the TNRCC Site Investigation Managers.

- The subcontractor will establish and maintain a system of controls to ensure that the objectives indicated in the project QA/QC plan will be accomplished. TNRCC personnel will periodically inspect this system of controls to ensure compliance by the subcontractor.

- The subcontractor will specify that the TNRCC Site Investigation Manager has the authority to remove any subcontractor personnel from the project if he or she is not performing satisfactorily.

(A5) PROJECT DEFINITION/BACKGROUND

The major objective of this project is to perform and complete Preliminary Assessments and Screening Site Inspections at sites judged to be potentially hazardous because of current and past operational and waste disposal activities. The PA and SSI reports will provide technical information and data that can be used to determine the score of each respective site according to the Hazard Ranking System.

Preliminary Assessments (PA) and Screening Site Inspections (SSI) will be conducted in conformance with the requirements of the revised Hazard Ranking System (HRS), Final Rule, dated December 14, 1990. The EPA furnished guidance for performance of these tasks and it will be used as reference material in collecting data, planning, and conducting on-site activities, and in preparation of the reports for each site. This guidance currently includes the following references: (1) *Federal Register,* 40 CFR Part 300, December 14, 1990; (2) "Guidance for Performing Preliminary Assessments Under CERCLA" September, 1991; 3) "Guidance for Performing Site Inspections Under CERCLA", September, 1992; 4) "Regional Quality Control Guidance for NPL Candidate Sites", December, 1991; 5) "Region 6 CLP Training Manual", October, 1993; and 6) Management of Investigation-Derived Wastes During Site Inspections", May, 1991.

In most cases, it will be necessary to obtain advance permission to inspect the sites. The TNRCC will obtain access agreements for each site. The designated TNRCC Site Investigation Manager for each site will prepare a written notification to the site owner/operator of the impending site visit, followed by telephone confirmation by the TNRCC Site Investigation Manager. The TNRCC Site Investigation Manager will also be responsible for notifying the local the TNRCC Regional Office of the impending site visit. The TNRCC Program Manager will provide each member of the TNRCC project staff with written credentials describing the nature of the project and the authority under which it is conducted.

Upon arrival at a site, the inspection team will conduct an initial survey of the site to ensure adequate safety precautions are in place during site activities. The Site Investigation Manager will, when possible, conduct a detailed interview with site representatives. Interviews with other individuals familiar with the site will be conducted as appropriate before, during, or after on-site reconnaissance activities.

A thorough site reconnaissance, if possible, will be conducted at each site. The inspection team will visually survey and document the location of the site relative to any roads or other access, drainage systems, surface waters, nearby structures, drums, tanks, monitoring wells, facility boundaries, unique geological features, and other factors which may affect pollutant migration pathways. These factors will be recorded, to the extent practical, on a field site sketch which will be prepared during the site visit. The facility sketch also will document the location of sensitive environmental receptors such as on-site and off-site homes and public building, natural areas, and drinking water supplies. Residences within 400 yards of the site will be included in the site sketch. Indicators of existing problems, such as areas of diseased, dying, or distressed vegetation or discolored soil, also will be noted on the site sketch. Photographs will be taken as necessary to document observations and on-site activities. Generalized population information, including collection of environmental equality data, will be based on the number and types of surrounding homes and businesses.

Where operator records are present, these will be reviewed for an indication of the type and quantity of materials disposed of at a given site. Where possible, the party responsible for waste disposal will be determined.

For SSI/ESI visits, environmental samples will be collected in accordance with the approved WP to provide site-specific data on the hazardous substances present as well as pollutant dispersal pathways. The samples collected during the SSIs and ESIs typically will be from the following sources:

- On-site and off-site soils;
- Groundwater from existing potable or agricultural water or monitoring wells;
- Water or waste from open drums, surface impoundments, or evaporation pits;
- Point of entry into receiving waters in the runoff pathway(s) from the site;
- Environmentally sensitive areas near the site.

For each PA, initial activities will involve the collection of site background information and completion of a site visit. A Regional EPA site assessment representative will accompany TNRCC personal on the PA site visit and based solely on the field findings an immediate decision will be made on whether to proceed with preparation of an SSI Work Plan. On those occasions when no EPA site assessment representative is present, the TNRCC PA/SI Program Manager, Technical Director and designated Site Investigation Manager (with EPA follow up concurrence) will decide if the site should proceed to the SSI stage.

If a site is designated to proceed to the SSI phase, than an SSI Work Plan and final SSI Report will be prepared for submission to the EPA. A complete PA will not be prepared for these sites. An abbreviated PA Report will be prepared for those PA candidate sites which are determined ineligible for CERCLA response by the EPA site assessment representative.

For each SSI, field activities will be conducted in two steps. TNRCC will collect information needed to prepare a work plan before the site visit. Following approval of the work plan, TNRCC will visit the site to execute the work plan, including sampling activities. The collected information, including sample results, will be compiled into a final SSI Report for the site.

Initial preparations for each PA, SSI and ESI site visit will involve obtaining information for preparation of the Health and Safety Plan and SSI/ESI WP. This task also includes obtaining access to the sites and the site inspection visit. Prior to any on-site inspections, the project staff and the TNRCC Program Manager will review the results of the preliminary assessment and/or available EPA and/or TNRCC files to address any health and safety risk concerns, and to assess the level of effort necessary to perform the site visit.

The TNRCC project staff will conduct a detailed background study for each PA/SSI/ESI site prior to any field activities. The purpose of this study is to collect available file information concerning activities at the site, hydrogeologic, photographic and topographic in formation pertinent to the site (to be used in pathway evaluation), and population and ecological information available for the area surrounding the site (to be used in a target evaluation).

Site activities information to be collected during this background study will be primarily the EPA, TNRCC, and other State and Federal agency records on the site. Hydrogeologic and topographic information will be collected at this time primarily from USGS topographic maps, city and county maps, county and regional water reports, county and regional geologic cross sections, state well construction records, soil maps, etc. Population and ecological information will be collected primarily from census figures, USGS topographic maps, public school records, the Texas Manufacturers Index, U.S. Fish and Wildlife and Texas Parks and Wildlife endangered species publications, and additional information if available. Aerial photography, as available from the Texas Natural Resources Information System, Texas Department of Transportation, and other sources, will also be examined for additional information about the site.

The data collected will, whenever possible, be selected to meet the requirements of the HRS model. It is understood that, at the level of effort appropriate for a PA, it may not be possible at some sites to collect "HRS quality" data to fulfill every requirement of the model. The TNRCC will make every reasonable effort to collect "HRS quality" data for every site, within the limits of the project schedule, budget, and the available information. Every effort will be made to collect the best available information during the performance of each PA. In addition, all SSI/ESI information will be collected in accordance with applicable SI guidance.

The level of effort required for the SSI background research may be greater than that normally required. This increased effort is necessary because the PAs for some of the sites may not have been prepared prior to publication of the current HRS guidance and do not contain complete HRS information. Therefore, this additional PA information may need to be collected during the background study task of the SSI/ESI.

(A7) DQO for MEASUREMENT DATA

A quality assurance (QA) program is essential to assure the quality, controllability, accountability, and traceability of the work being performed for the TNRCC PA/SI Program. Quality assurance encompasses all actions taken by TNRCC and its subcontractors to achieve results which are accurate, reliable, and legally defensible for all aspects of the project. TNRCC and its subcontractors will adhere to the quality assurance procedures outlined herein and will rigorously implement the QA program throughout the duration of the project.

The primary goal of this QA program is to ensure the accuracy and completeness of the data which ultimately will be used to score and to determine the status of the sites that are investigated. In order to achieve this accuracy and completeness, it is necessary that all sampling, analysis, and data management activities be conducted in accordance with preset standards, and that these activities be reviewed regularly to maintain full compliance with the standards. This program has been designed so that corrective action can be implemented quickly if necessary without causing undue expense or delay to the project. The standards and review procedures which TNRCC will use to attain optimum accuracy and completeness of data are outlined in this plan. All subcontractors to TNRCC will be required to follow these standards and procedures, at a minimum.

The quality assurance objectives for all measurement data include considerations of precision, accuracy, completeness, representativeness, and comparability. Compliance with the QA objectives will be judged individually for each site. QC objectives stated in the EPA CLP Statement Of Work (SOW) are presented in Tables 1.4 and 1.5.

Table 1.4. Matrix Spike/Matrix Spike Duplicate Control Limits for CLP GC/MS Organic Analyses

	Water		Soil	
Matrix Spike Compound	% Recovery	RPD %	% Recovery	RPD %
Volatile organics:	61-145	14	59-172	22
1,1-Dichloroethene	71-120	14	62-137	24
Trichloroethene	76-127	11	66-142	21
Benzene	76-125	13	59-139	21
Toluene	75-130	13	60-133	21
Chlorobenzene				
Semivolatile organics				
Phenol	12-110	42	26-90	35
2-Chlorophenol	27-123	40	25-102	50
1,4-Dichlorobenzene	36-97	28	28-104	27
N-Nitroso-di-n-propylamine	41-116	38	41-126	38
1,2,4-Trichlorobenzene	39-98	28	38-107	23
4-Chloro-3-methylphenol	23-97	42	26-103	33
Acenaphthene	46-118	31	31-137	19
4-Nitrophenol	10-80	50	11-114	50
2,4-Dinitrotoluene	24-96	38	28-89	47
Pentachlorophenol	9-103	50	17-109	47
Pyrene	26-127	31	35-142	36
Pesticides:				
gamma-BHC	56-123	15	46-127	50
Heptachlor	40-131	20	35-130	31
Aldrin	40-120	22	34-132	43
Dieldrin	52-126	18	31-134	38
Endrin	56-121	21	42-139	45
4,4'-DDT	38-127	27	23-134	50

Table 1.5 Surrogate Spike Control Limits
for CLP GC/MS Organic Analyses

Surrogate Compound	Soil/Sediment % Recovery	Water % Recovery
Volatile organics:		
1,2-Dichloroethane-d4	70-121	76-114
4-Bromofluorobenzene	59-113	86-115
Toluene-d8	84-138	88-110
Semivolatile organics:		
Nitrobenzene-d5	23-120	35-114
Terphenyl-d14	18-137	33-141
2-Fluorobiphenyl	30-115	43-116
2-Fluorophenol	25-121	21-110
2,4,6-Tribromophenol	19-122	10-123
Phenol-d5	24-113	10-110
2-Chlorophenol-d4	20-130*	33-110*
1,2-Dichlorobenzene-d4	20-130*	16-110*

* These limits are for advisory purposes only.

PRECISION

The precision of a measurement is an expression of mutual agreement of multiple measurement values of the same property conducted under prescribed similar conditions. Precision is evaluated most directly by recording and comparing multiple measurements of the same parameter on the same exact sample under the same conditions or a matrix spike and matrix spike duplicate. It is usually expressed in terms of the relative percent difference (RPD). The RPD can be evaluated both internal (laboratory duplicates) and external (field duplicates) to the laboratory. Laboratory duplicate control limits for organics are method and laboratory specific, and will be evaluated as part of the EPA-CLP data validation. For metals analysis, a control limit of 20 percent RPD will be used for matrix spike and matrix spike duplicate sample values greater than or equal to 5 times the contract required detection limit. For field duplicates, a RPD of 50 percent will be used as the objective of precision.

Field measurements will be taken of pH, conductivity, temperature, water level, and organic vapor concentration based on HNU[2] or OVA[3] readings. The objective for precision of field data collection methods is to achieve and maintain the factory specifications for the field equipment. For the pH meter, precision will be tested by multiple readings in the medium concerned. Consecutive field measurement readings should agree within 10% RPD, and within 0.1 pH standard units after the instrument has been field calibrated with standard (NIST-traceable) buffers.

The water level indicator readings will be precise within 0.01 foot for duplicate measurements. The HNU or OVA will be calibrated each day prior to field use. If calibration readings deviate 15 percent or more from the concentration of the calibration gas, the instrument will be recalibrated.

ACCURACY

The degree of accuracy of a measurement is based on a comparison of the measured value with the actual true value. Accuracy of an analytical procedure is best determined based on the recoveries of matrix spike, matrix spike duplicate, and surrogate compounds.

The degree of accuracy and the recovery of analyte to be expected for the analyses of QC samples and spiked samples is dependent on the matrix, method of analysis, and the compound or element being determined. The concentration of the analyte relative to the method detection limit is also a major factor in determining the accuracy of the measurement. For metals analysis, spike recovery limits of 75-125 percent will be used. The QC acceptance ranges

and limits for GC/MS organic analyses used to assess the accuracy of the data according to CLP protocol are presented in Tables 2.1 and 2.2. These QC acceptance ranges and limits may vary between laboratories and will be evaluated as part of the EPA-CLP data validation.

The objective for accuracy of field measurements is to achieve and maintain factory specifications for the field equipment. The pH meter is calibrated with buffer solutions traceable to National Institute of Standards and Technology (NIST) standards. The HNU or OVA will be calibrated daily with calibration gas.

REPRESENTATIVENESS

Samples taken must be representative of the population. All samples will be collected with dedicated equipment. All sampling equipment will be decontaminated prior to initiating sampling activities. Two types of blanks will be taken. The first type, a field blank, is a 40 milliliter VOA[4] vial filled with CLP-specified grade water. The vial will remain capped and accompany all samples for volatile organic analysis. One field blank (2 VOA vials) will be shipped with each container of appropriate samples. The second type is a rinsate blank and will consist of CLP-specified grade water that has been poured over the equipment after completion of decontamination. The types of blanks collected will be specified by the work plans for each site. The purpose of these blanks is to establish that proper sample bottle preparation, decontamination, and handling techniques have been employed. The blanks will not be counted for the laboratory's quality control protocol for matrix spikes or duplicate samples.

COMPARABILITY

Consistency in the acquisition, handling, and analysis of samples is necessary so the results may be compared with previous and future studies. Concentrations will be reported in a manner consistent with general practices. Standard EPA analytical methods and quality control will be used to support the comparability of analytical results with those obtained in other testing. Calibrations will be performed in accordance with EPA or manufacturer's specifications and will be checked with the frequency specified in the methods.

COMPLETENESS

The completeness of the data is measured as the amount of valid data obtained from the measurement system (field and laboratory) versus the amount of data expected from the system. The EPA-CLP data validation will determine the amount of valid data obtained from each site inspection. At the end of each SSI, completeness of data will be assessed and, if any data omissions are apparent, an attempt will be made to re-sample the parameters in question. The specific objective for the completeness of this project will be greater than or equal to 90 percent for field and laboratory data for each site.

ANALYTICAL PARAMETERS AND QUANTITATION LIMITS

The analytical parameters and their quantitation limits for use on this project will be determined on a per-site basis. All samples will be analyzed by CLP methods. The quantitation limits may vary since they are matrix and analyte dependent.

HOLDING TIMES

Holding times specified by EPA protocols will be set for samples collected under this program. Tables 1.6 and 1.7 list the types of analyses and their holding times.

[2]HNU = systems photoionization detector
[3]0VA = organic vapor analyzer
[4]VOA = volatile organics analysis

Table 1.6 Holding Times* and Preservation for Aqueous Samples

Analysis	Extraction Times	Analysis Time	Preservation Method***
Volatile organics (VOA)	NA	7 days 14 days	cool, 4°C HCl to pH < 2 cool to 4°C
Semivolatile organics (BNA)	7 days	40 days after extraction	cool, 4°C
Pesticides/PCBs	7 days	40 days after extraction	cool, 4°C
Metals**	NA	6 months	HNO_3 to pH<2 cool, 4°C
Cyanide	NA	14 days	NaOH to pH>12 cool, 4°C

* Holding times begin at the time of collection.
** Except mercury, analysis time is 28 days.
***Preservation temperature may fluxuate by 2°C.

Table 1.7 Holding Times* and Preservation for Soil and Sediment Samples

Analysis	Extraction Times	Analysis Time	Preservation Method***
Volatile organics (VOA)	NA	14 days	cool, 4°C
Semivolatile organics (BNA)	14 days	40 days after extraction	cool, 4°C
Pesticides/PCBs	14 days	40 days after extraction	cool, 4°C
Metals**	NA	6 months	cool, 4°C
Cyanide	NA	14 days	cool, 4°C

* Holding times begin at the time of collection.
** Except mercury, analysis time is 28 days.
***Preservation temperature may fluxuate by 2°C.

(A9) TRAINING

A large percentage of TNRCC Site Investigation Managers have prior experience in conducting site investigations; however, all inspectors will undergo a formal training program. Major areas covered during the formal training project will be the objectives of the PA and SSI, preparation for inspection, legal ramifications, health and safety considerations, use of monitoring and sampling equipment in the field, sample shipment and chain-of-custody procedures, the appropriate procedures to be followed relative to any denial-of-entry problems encountered, and other aspects of the work to be performed under this project.

Each TNRCC employee involved in sample collection will be trained on how to collect representative samples from every medium which might be encountered. Project personnel will receive additional training in proper field documentation and in health and safety procedures. All training will be documented, and records will be maintained by the Program Manager.

(A10) DOCUMENTATION and RECORDS

Documentation Records will include documentation for all HRS factors evaluated. All assertions of fact will be referenced in the record.

All reports will be submitted to the EPA as they are completed. Any corrections or additions to the submitted material that the EPA deems necessary and appropriate will be made by the TNRCC within budget constraints. A PA, SSI/ESI WP, SSI Report, and Documentation Record will be deemed complete and final when the EPA approval is received, or within six (6) months of submittal, whichever comes first.

Following the site visits and completion of analytical work, the TNRCC will prepare a PA (Abbreviated) and/or SSI report or Documentation Record (for ESI sites only) highlighting significant findings for each site. The abbreviated PA Reports will be prepared in accordance with the requirements stated in the "Guidance for Performing Preliminary Assessments Under CERCLA", September 1991, Section 4.4 Abbreviated Reporting. The final SSI reports will be prepared in accordance with the report outlines approved by the EPA in Attachment P. Documentation Records will be prepared in accordance with current guidance and by using the companion WordPerfect® version of the Documentation Record. Should additional guidance become available prior to completion of this project, the TNRCC will evaluate the effect that conformance to this guidance will have on the schedule and budget, and will submit a revised schedule and budget to the EPA for approval.

The SSI reports will contain a description of the site, the operating history and nature of waste handling at the site, and a discussion of waste sources, pathway characteristics, and identification and description of potential human and environmental targets. In addition, the SSI report will contain a description of

the data collected, analytical results, and QA/QC data. Supporting documents will be included in the SSI report as appendices and will consist of stratigraphic, hydrogeologic, and topographic information; a site sketch other pertinent maps; laboratory and chain-of-custody report originals; photographs; field notes; and reports from previous investigations at the site.

All data collected during each SSI/ESI visit will be validated using the most current EPA data validation guidelines and any EPA Regional instructions.

QUALITY ASSURANCE REPORT

A summary of all QA activities and findings during the course of this project will be reported to the EPA on a site specific basis with the final site inspection reports. Other project-related quality assurance items and corrective actions will be discussed in the monthly progress reports. These may include the following items:

1. Summary of QA management, including any changes
2. Measures of data quality from the project.
3. Significant problems related to work quality, and the status of any corrective actions implemented
4. Results of QA performance audits
5. Results of QA systems audits
6. Assessment of data quality in terms of precision, accuracy, completeness, representativeness, and comparability
7. Quality-assurance-related training
8. An assessment of indicators used in the project.

RECORD KEEPING

All information pertinent to PA site visits and SSI sampling activities will be recorded in a logbook. This book will be bound and have consecutively numbered pages. Entries in the logbook will be made in ink and will include, at a minimum, a description of all activities, the names of all individuals involved (sampling and oversight), date and time of sampling, weather conditions, any problems, and all field measurements.

SECTION 2

MEASUREMENT/DATA ACQUISITION

(B1) SAMPLING PROCESS DESIGN

After approval of the SSI work plan, the field activities will be executed. At each site, these activities may include shallow soil sampling, sediment sampling, surface water sampling, and groundwater sampling.

Detailed reports on all PA and SSI non-sampling data collection and SSI sampling activities will be kept in field logbooks. In this book will be noted the date, time, location, and identification of each sample, along with the collector's name, a description of all equipment used and any problems encountered, and general comments of the inspection team. Logbooks also are used to record pertinent information regarding the site itself, including date, time, location, and identification of all photographs taken during the site visit.

Proper identification and labeling of samples is crucial to an effective sampling program. Immediately upon collection, each sample must be sealed and tagged. The tag should be marked with a sample identification number, station location, type (composite or grab), concentration (low, medium, or high), the parameters requested, collector's name, and the date and time of sample collection.

For many of the SSIs, the determining factor of hazard evaluation will be the data provided by sampling and analytical activities. Thus, it is important that QA/QC be maintained for each sample. The purpose of this Section is to outline specific procedures for inspectors to use while acquiring and handling samples during an inspection to ensure that quality data are obtained.

EPA-certified clean sample bottles will be used for sample collection. Custody of these bottles will be maintained by documenting the batch number of the sealed box, documenting opening of the box, and keeping the bottles locked up at all times. If returned to the office, the bottles will be placed in a sealable container and secured with custody seals.

(B2) SAMPLE METHODS REQUIREMENTS

This Section discusses the standard sampling procedures. Other sampling procedures may be used as determined necessary by the lead Site Investigation Manager and with approval of the Technical Director or Program Manager.

Regardless of sample type, the following principles and procedures should be adhered to during the sample collection phase of a site inspection:

1. Obtain ice before visiting a site where sample collection is involved.

2. Add appropriate preservatives to the sample bottles at the time of sample collection. The bottles preservatives are required for each analysis are shown in Tables 2.1 and 2.2.

3. If there is reason to suspect the presence of toxic vapors, precede sampling activities by an initial survey of suspect areas, using appropriate safety gear and a photoionization detector (or equivalent). The potential use of air monitoring equipment should have been specified in the SSI Work Plan. If it was not, and if organic vapor presence is possible, contact the Program Manager and Project Safety Officer for possible changes in safety procedures.

4. If possible, collect background samples first, then proceed from the probable least contaminated to most contaminated sampling points.

5. Change disposable gloves between sampling points, placing used gloves in a plastic bag for disposal.

6. If it is necessary to reuse sampling devices, use the specified decontamination procedures between sampling points.

7. At each sampling location,
   a. Photograph the collection of samples.
   b. Record in the logbook:
   - Sample number;
   - Photo number;
   - Location (show on site sketch);
   - Type of sample;
   - Time; and
   - Relevant observations.

Table 2.1 Bottles Required for Aqueous Samples

Analysis	Required Volume	Container Type
Volatile Organics	80 mL	2 40-mL glass vials
Extractable Organics (BNA and pesticide/PCB)	1 gallon	2 80-ounce or 4 1-liter amber glass bottles
Metals	1 liter	1 1-liter polyethylene bottle
Cyanide	1 liter	1 1-liter polyethylene bottle

Table 2.2 Bottles Required for Soil and Sediment Samples

Analysis	Required Volume	Container Type
Volatile Organics	240 mL	2 120-mL widemouthed glass vials
Extractable Organics (BNA and pesticide/PCB)	6 ounces	1 8-ounce or 2 4-ounce widemouthed glass jars
Metals and Cyanide	6 ounces	1 8-ounce or 2 4-ounce widemouthed glass jars

8. If a facility representative requests, they will be allowed the opportunity to collect split samples. If these are desired, place samples directly in different containers at the sampling point rather than splitting them at a later time. In the event there may not be enough soil, sediment, and/or groundwater volume to provide split samples, collect the SSI required sample first and than provide the remaining volume to the facility representative.

9. If samples can be collected in a short period of time (less than 20 minutes), leave the cooler with ice at the car for convenience. Before placing samples in the iced cooler:

   a. Complete the sample tags and labels, and place clear tape over the sample labels on the sample containers to protect the writing from moisture.

   b. Double check the pH of all preserved water samples (exclusive of VOA samples).

   c. Place a custody seal around the bottle cap.

   d. Wrap the sample containers with plastic foam, bubble pack, or equivalent to protect against breakage.

   e. The TNRCC will include in each ice chest with samples to be shipped for analysis, a temperature blank taped to the side of the chest prior to shipping.

   f. Place the sample containers in plastic Ziploc® bags or equivalent to prevent melted ice from contacting the container.

   g. Place wrapped sample containers into ice chests filled with 2 to 3 inches of vermiculite.

10. Remove water from melted ice frequently, and replace with fresh ice. Place ice in plastic Ziploc® or sealable bags to minimize water leakage during shipment.

The following standard operating guidelines are presented for specific sample types.

GROUNDWATER WELL SAMPLING PROCEDURES

General

The primary consideration is to obtain a representative sample of the groundwater zone of interest without mixing the sample with stagnant (standing) water in the well casing.

To safeguard against collecting nonrepresentative stagnant water in a sample, the following guidelines and techniques will be adhered to during sample withdrawal:

1. As a general rule, all monitoring wells shall be pumped or bailed a minimum of three volumes of water in the well casing with three (3) consecutive consistent readings within 10% RPD for conductivity and temperature, and within 0.1 pH units before representative samples are withdrawn.

2. For wells that can be pumped or bailed to dryness with the sampling equipment, the well should be evacuated and allowed to recover to 85 percent of original water level before sample withdrawal.

3. The purge waters will be managed according to guidance provided in the "Management of Investigation-Derived Wastes During Site Inspections", May 1991. The preference is to leave both RCRA hazardous and non-hazardous investigation-devired wastes on-site whenever it complies with regulations and does not pose any immediate threat to human health and the environment.

Sampling, Monitoring, and Evacuation Equipment

Sample containers will conform to EPA regulations for the appropriate constituents.

The following equipment should be on hand when sampling wells:

1. Coolers for sample shipping and cooling, chemical preservatives, and appropriate packing cartons and filler.

2. Thermometer, pH paper and meter, camera and film, labels, appropriate keys (for locked wells), tape measure, water level indicators, and specific-conductivity meter.

3. Pumps. Pumps will normally be used to obtain samples, although samples may be obtained directly from the pump discharge line for high yielding monitoring wells and wells with dedicated pumps.

4. Bailers and monofilament line with tripod-pulley assembly (if necessary).

5. Decontamination solutions--tap water, distilled water, Alconox, isopropanol, CLP specified grade water.

Ideally, sample withdrawal equipment should be completely inert, economical to manufacture, easily cleaned, and reused, able to operate at remote sites in the absence of power resources, and capable of delivery variable rates for well flushing and sample collection.

Calculation of Well Volume

Calculations are to be made according to the following steps:

1. Obtain all available information on well construction (casing, screens, etc.).

2. Determine well or casing diameter.

3. Determine static water level (feet below ground level).

4. Determine depth of well.

5. Calculate number of linear feet of static water (total depth minus the static water level).

6. Calculate static volume in gallons: $V = Tr^2 (0.163)$, where T is linear feet of static water, and r is the inside radius of the well of casing in inches.

7. Determine the minimum amount to be evacuated before sampling.

If possible, a number of observations will be made when groundwater sampling is to take place. Some of the information can be gained from file review prior to a site inspection.

1. Note if monitoring wells are locked. Arrangements must be made to secure keys or to remove locks by other means and re-secure the wells.

2. Note the condition of the monitoring wells (i.e. casing, concrete pad, etc.).

3. Note well diameters to ensure that a pump and/or bailer of the proper size will be available. The diameter is also necessary for calculating the wells' static water volume.

4. Note the type of casing materials--PVC, steel, etc.

5. Note any observable physical characteristics of the groundwater as it is being sampled--color, odor, turbidity, etc.

6. Measure the static water level of each well before sampling, if possible. This is best accomplished with an electronic water level indicator. Similarly, determine the total depth of the well before sampling. Obtain these measurements whether or not well logs are available, since the measurements are required in calculating the static water volume of the well.

7. Measure the pH, temperature, and specific conductivity of the groundwater being sampled. To avoid possible contamination problems, measure temperature, pH, and specific conductivity on a portion of groundwater which is not in a sample container to be sent out for analysis.

SURFACE WATER SAMPLING PROCEDURES

Surface water sampling locations will be selected according to the probability that they will show contaminants migrating from a site. In general, samples will be taken from streams running through or adjacent to a site, including those bodies of water which may receive surface runoff or leachate from a site. Samples will only be collected where it can be shown that the site provides the only source of contaminants to the surface water body. Care will be taken in sampling leachate breakouts, which may have high concentrations of contaminants. Surface water will also be sampled from any adjacent standing bodies of water such as ponds, lakes, or swamps which might be receiving contaminants.

Grab samples will be collected using a pond sampler. The pond sampler, described in "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA 1980 (EPA-600/2-80-018), consists of a beaker attached with a clamp to a telescoping aluminum pole. This sampler allows a sample to be collected several feet from the bank or berm.

TAP WATER SAMPLING PROCEDURES

Well depth, casing size, and holding-tank volume will be obtained if possible to calculate the volume of the system, and the system will be evacuated by removing three to five volumes by letting a tap run. If the well depth, casing size, or holding-tank volume is not readily available or is unknown, a tap will be opened and allowed to run for 15 minutes. The well evacuation strategy will be documented in the field book.

Samples will be collected in containers in accordance with the sampling guidelines from a point as close to the well as possible and before the water is processed through any water treatment devices (e.g., softeners or filters). In many cases this may not be possible. When samples must be collected after the filtration or softener system, the situation will be documented in the logbook. The exact type of filtration system or softener in use will be recorded. To determine whether desorption of the filters is occurring, samples may be collected after water has passed through treatment devices. When possible, do not collect samples through a water hose. Samples should be collected directly from the spout.

If samples are taken from direct water main connections, the spigot will be flushed for 2 to 3 minutes (15 to 30 minutes is not necessary) to clear the service line. Water parameters (temperature, conductivity, pH) will be measured. Well purging will be considered complete after three (3) consistent readings of pH, temperature, and conductivity. Samples will *not* be collected from spigots after treatment (except as noted above) or from spigots that leak around their stems **or that** contain aeration devices or screens within the faucet.

For private wells equipped with hand or mechanical pumps, the water will be pumped for 5 minutes before the sample is collected directly from the spout.

SURFACE SOIL SAMPLING PROCEDURES

Areas selected for sampling will be located in order to collect a representative fraction of the soils with the minimum of samples. A surface inspection of the subject area will be made to locate pertinent features (e.g., rock outcrops, drainage patterns, surface runoff, erosion areas, etc.) and to evaluate the relationship among these features and potential sources of pollution. The locations of sediment deposition areas are good indicators of surface runoff direction.

A method of obtaining a shallow soil sample is to use stainless steel spoon or shovel. The soil sample will then be placed in the appropriate glass bottle. After the sample has been collected, the top of the bottle and lid will be wiped with a clean paper towel to ensure a tight seal. Samples for VOA analysis will be collected first, followed by samples for BNA's, metals and pesticides/PCBs. If metals are the primary concern at a site, the metals sample will be collected second. Care will be taken to fill the 120 mL VOA sample as full as possible to minimize headspace. A decontaminated shovel or spade can be used to uncover the top 6 inches of soil so the sample can be collected from beneath the surface.

Sampling equipment such as stainless steel scoops and spoons, and shovels or spades must be decontaminated according to the specified procedures between sampling locations to avoid cross contamination. Dedicated sampling equipment will normally be used. If dedicated equipment are not used, then an equipment rinsate sample shall be collected at the end of each sampling day to demonstrate decontamination efficiency by TNRCC field personnel.

SEDIMENT SAMPLING PROCEDURES

Areas selected for sampling will be located in order to collect a representative fraction of the sediments with the minimum of samples. The primary consideration in sample site selection will be to choose an area of quiescent settling with low hydrologic activity or energy, and to evaluate these areas and potential sources of pollution. For example, areas that are: 1) inside the bend of channels; 2) backwater areas or side channels; and 3) of heavy shoaling and deposition. Quiescent areas are conducive to the settling of finer materials.

Sediment samples will be collected by use of a stainless steel spoon or an Ekman dredge for samples greater than six (6) inches beneath the water surface. When using a dredge, it will be lowered to the bottom of the water body with a minimum of substrate disturbance. Once the dredge jaws have been triggered, the closed dredge will be retrieved at a moderate speed of less than two (2) feet/second. Water overlying the sediment in the dredge will be gently decanted by slightly tipping the dredge until the water runs out the top. The decanting process will be completed in a manner to avoid the removal of surficial sediments. In order to avoid contamination from material on the dredge walls, a stainless steel spoon

will be used to remove sediments to a depth of one inch and no closer than 0.75 inches to the wall of the dredge. The sediment sample will then be placed in the appropriate glass bottle. Rocks and branches will not be transferee to the sample bottle. Additional dredge samples will be collected as needed to fill the sample bottle. After the sample has been collected, the top of the bottle and lid will be wiped with a clean paper towel to ensure a tight seal. Samples for VOA analysis will be collected first, followed by samples for BNA's, metals and pesticides/PCBs.

If metals are the primary concern at a site, the metals sample will be collected second. Care will be taken to fill the 120 mL VOA sample as full as possible to minimize headspace. The Ekman dredge and stainless steel spoons must be decontaminated according to the specified procedures between sampling locations to avoid cross contamination. Dedicated sampling equipment will normally be used.

DECONTAMINATION PROCEDURES

To prevent contamination of samples by materials originating from the variety of on-site sampling tools and equipment, all sampling equipment (sample scoops, bailers, surface water dippers) will be decontaminated. Dedicated sampling equipment will be available for each sample planned. All equipment to be used at one site will be decontaminated in one batch prior to initiating any sampling. Each sampling tool will be placed in an individual sealable plastic bag or wrapped in a large plastic trash bag and closed with a custody seal. In the event that additional sampling is required or a sampling tool's integrity is questionable, then that tool will go through a decontamination process. The decontamination procedures are as follows:

1. Rinse equipment with tap (potable) water.

2. Clean the equipment with a brush in a solution of laboratory-grade detergent (Liquinox, Alconox, or equivalent) and potable water.

3. Rinse with tap water.

4. Rinse with 10 percent nitric acid solution, (trace metals grade) if analyzing for metals.

5. Rinse with distilled or deionized water.

6. If analyzing for organics, rinse with reagent-grade isopropanol.

7. Rinse with deionized water.

8. Air dry.

9. Place in plastic sealable bag if immediate use is not expected.

The sampling equipment will be cleaned as described above before its use for collecting each sample. After sampling is complete, each sample tool will be cleaned with a detergent wash and rinsed with distilled water to remove any potential contamination.

(B3) SAMPLE HANDLING/CUSTODY REQUIREMENTS

Sample custody is an integral part of any sample collection and analysis plan. Several steps for maintaining sample custody apply to field sample custody versus laboratory sample custody. First, in the field, the appropriate collection, identification, preservation, and shipment of the samples will ensure sample integrity. The second step is correct sample bottle identification and preparation. Lastly, when samples reach the laboratory, they are assigned a laboratory number and maintained at 4°C until sample preparation and analyses can be performed.

FIELD SAMPLE CUSTODY

Sample custody and documentation procedures described in this Section will be followed throughout all sample collection for all TNRCC SSIs. Components of sample custody are field logbooks, sample labels, sample tags, and chain-of-custody forms. CLP Organic and Inorganic Traffic Report (TR) forms will serve as chain-of-custody forms for this project. When Dioxin samples are to be collected the PCDD/PCDF Traffic Report (For Dioxin CLP Analysis) form will be used for this project.

FIELD LOGBOOKS

Bound field logbooks will be maintained by the Site Investigation Manager and other team members to provide a daily record of significant events, observations, and measurements during the field investigation. Each page in the logbook will be initialed by the author and signed after the last entry of each day. All entries by persons other than the author will be initialed or signed. All entries will be signed and dated.

All information pertinent to the field survey and sampling will be recorded in the logbooks. The logbooks will be bound books with consecutively numbered pages that are at least 4 1/2 inches by 7 inches in size. Waterproof ink will be used in making all entries. Entries in the logbook will include, at the minimum, the following:

- General information:

- Names and titles of author and assistant, date and time of entry, and physical/environmental conditions during field activity
- Location of sampling activity
- Name and title of field crew.

- Sampling documentation:

- Sample medium (e.g., soil)
- Description of sampling point(s)
- Date and time of collection
- Sample identification number(s).
- Photographs

- Other information:

- Names and titles of any site visitors or interviewees
- Field observations and unusual field conditions
- Any field measurements made (such as pH, conductivity, temperature) including specific calibration data and documentation of field equipment (serial number, decontamination, etc.)
- Modifications to the work plan
- Sample handling (e.g., preservation with ice).

None of the field logbooks or chain-of-custody documents will be destroyed or discarded, even if they are illegible or contain inaccuracies that require a replacement document. If a previously recorded value is discovered to be incorrect, the wrong information will be crossed out in such manner that it is still legible, the correct value written in, and the change initialed and dated. If the change is made by someone other than the original author or if the change is made on a subsequent day, a reason for the change will be recorded at the then-current active location in the logbook, with cross-references.

SAMPLE TAGS

All samples collected at the site will be placed in an appropriate sample container for preservation and shipment to the designated laboratory. Each sample will be identified with a separate identification label and tag. The bottles and ice chests will be sealed with custody seals. Sample identification tags and custody seals will be provided by the CLP Sample Management Office. The tag will indicate if the sample is a split sample. The label will contain the sample number. The following information will be recorded on the tag:

- Analyses to be performed
- Sample identification number
- Source/location of sample
- Type of sample (composite or grab)
- Preservatives used (ice)
- Date
- Time (a four-digit number indicating the 24-hr clock time collection; for example, 1430 for 2:30PM)
- Sampler's signature
- CLP case number.

Once the tag is complete, a custody seal will be placed over the lid of the bottle. The custody seal will show the date and sampler's signature.

TRAFFIC REPORT FORMS

Introduction - Samples and Sample Numbers

The CLP organic and inorganic multi-sample Traffic Reports/Chain-of-Custody forms (TRs) document samples shipped to CLP laboratories. They also enable the Sample Management Office (SMO) and the Region to track samples and ensure that the samples are shipped to the appropriate contract laboratory. TRs will be used each time Routine Analytical Services (RAS) samples are shipped to a CLP laboratory. The TRs may document up to ten samples shipped to one CLP laboratory under one case number and RAS analytical program.

The TR includes a chain-of-custody record which is located at the bottom of the form. The form is used as physical evidence of sample custody. According to EPA enforcement requirements, official custody of samples must be maintained and documented from the time of collection until the time the samples are introduced as evidence in the event of litigation. The lead Site Investigation Manager is responsible for the care and custody of the sample until sample shipment.

A sample is considered to be in custody if any of the following criteria are met:

1. The sample is in possession of the sampling team or is in view after being in possession.

2. The sample was in possession and then locked up or sealed to prevent tampering.

3. The sample is in a secured area, and security is documented.

CLP sample types are defined by the RAS analytical program. Under the RAS Protocol (SOW), a RAS sample consists of a low or medium concentration water matrix or a soil/sediment matrix that is single phase and homogeneous. No oily sample, nor a multi-phasic sample can be shipped to a CLP laboratory operating under the RAS contract. Such high concentration samples are handled only by Special Analytical Services (SAS) CLP laboratories. The collection and management of high concentration samples will be conducted in accordance with the requirements outlined in the "Region 6 CLP Training Manual", October, 1991. PCDD/PCDF Traffic Report forms (For Dioxin CLP Analysis), SAS, and Multi-Client SAS Analyses will only be used in this project with approval of the Program Manager and EPA Site Assessment Manger.

Low concentration samples are samples collected from off-site areas, where hazards are thought to be significantly reduced by normal environmental processes. Medium concentration samples are those where a compound or element may comprise as much as 15% of the total sample.

Low/medium concentration inorganic, low to medium concentration organic, and high concentration organic. Low/medium inorganic samples may be analyzed for total metals, cyanide, or both. Low/medium organic samples may be analyzed for VOAs, base/neutral/acid (BNAs), pesticide/PCBs, or any combination of these. High concentration organic samples may be analyzed for VOAs, BNA/pesticide/PCBs, and aroclors/toxaphenes. Inorganic samples are documented on Inorganic TRs. Organic and high concentration samples are documented on Organic TRs.

A CLP sample is one matrix - water or soil - never both. The CLP sample is further defined as consisting of all the sample aliquots from one station location, for each matrix and RAS analytical program.

The CLP generates unique sample numbers that must be assigned to each organic and inorganic sample. The unique CLP sample numbers are printed at SMO on adhesive labels and distributed to the region as requested. The field team leader will be responsible for assigning this critical sample number correctly and transcribing it accurately on the TR.

Organic sample numbers are in the format XX123, and have ten labels per strip four for extractables, two for VOAs, and four blank (extra). **UNUSED LABELS will be destroyed to prevent duplication of sample numbers.**

Inorganic sample numbers are in the format MXX123 and have seven labels per strip-- two for total metals, two for cyanide, and three extra (see Attachment 1). Remember that the unique sample number must only be used once. **EXTRA LABELS must be destroyed.**

Use only the labels provided by EPA Region 6. CLP sample numbers are alphabetically coded to correspond with each region as follows:

Letter Code			Letter Code		
Organic	Inorganic	Region	Organic	Inorganic	Region
A	MA	I	F	MF	VI
B	MB	II	G	MG	VII
C	MC	III	H	MH	VIII
D	MD	IV	Y	MY	IX
E	ME	V	J	MJ	X

Remember:

- TRs must be used for each case number with every shipment of samples to each CLP laboratory.
- Organic samples, high concentration samples, and inorganic samples are assigned separate, unique sample numbers. Each sample consists of all the sample aliquots from a sample station location for analysis in one of the three analytical programs.
- A CLP RAS sample will be analyzed as either a water or a soil sample.
- Prevent accidental duplication of sample numbers by destroying unused labels.
- Use the sample numbers specific to EPA Region 6.

- Contact the Program Manager or Technical Director at telephone number 512/908-2514 or 512/908-2512 if you need to collect more than the previously approved number of samples or a high concentration sample.

- Call Regional Sample Control Center (RSCC) at telephone number 713/983-2130 or 713/983-2137 if you have any questions about using TRs.

Forms Completion - Case Documentation

Instructions for filling out the Organic and Inorganic Traffic Report/Chain of Custody forms are as follows:

Top of Form
- SAS Number

    - Enter this number only if explicitly told to do so by the RSCC.

    - Case Number

    - Enter this number.

Box No. 1

- Project code/site information:

    - Leave the Project Code, Account Code, Regional Information and Non-Superfund Program fields blank.

    - Enter the Site name, City/State and Site Spill ID in the designated spaces.

Box No. 2

- Regional information:

    - Enter the EPA Region number (6), the name of your Sampling Company (TNRCC), and your name and signature in the designated spaces.

Box No. 3

- Type of activity:

  - Check funding level for sampling. Next, check the code which describes the task of the sampling mission:

Funding Level

SF - **Superfund**
PRP - Potential responsible party
ST - State
FED - Federal

Pre-Remedial

PA - Preliminary Assessment
SSI - **Screening Site Investigation**
LSI - Listing Site Investigation

Remedial

RIFS - Remedial investigation feasibility study
RD - Remedial design
O&M - Operations and maintenance
NPLD - National priorities list delete

Removal

CLEM - Classic emergency
REMA - Removal assessment
REM - Removal
Oil - Oil response
UST - Underground storage tank response

Box No. 4

- Shipping Information:

  - Enter the Date Shipped, the Carrier (i.e. Federal Express, Purolator, Airborne) and the Airbill Number in the appropriate spaces.

Box No. 5

- Ship to:

  - Enter the name of the CLP laboratory contact (sample custodian) and its full address in the box.

Box No. 6

- Preservative:

  - This box provides a list of commonly-used preservatives. Please enter the appropriate preservative used in Column D.

Box No. 7

- Sample description:

  - This box provides a list of the description/matrices of samples that are collected. Please enter the appropriate description in Column A.

Completing the Form - Sample Documentation

- Carefully transcribe the CLP Sample Number(s) from the printed sample labels on the TR in the space provided.

Note: If you have made a mistake, do NOT attempt to erase or write over your mistake. Draw a single line through the mistake and initial and date it. Then, enter the correct information on the next line.

Complete columns A through G to describe the sample.

Column A, Sample Description

Enter the appropriate sample description code from Box No. 7.

When out in the field:

If sampling groundwater or surface water, describe both VOA TRIP BLANKS and EQUIPMENT RINSATE SAMPLES as No. 1 "Surface Water."

If sampling only soil/sediment, describe both the EQUIPMENT RINSATE SAMPLE and the ULTRA DI SAMPLE as No. 4 "Field QC".

When conducting a laboratory decontamination event:

Describe both the EQUIPMENT RINSATE SAMPLE and the ULTRA DI SAMPLE as No. 4 "Field QC".

Note: Item No. 6 "Oil" and item No. 7 "Waste" are for SAS projects only. DO NOT SHIP OILY SAMPLES OR WASTE SAMPLES WITHOUT MAKING PRIOR ARRANGEMENTS WITH THE PROJECT MANAGER AND RSCC.

Column B, Concentration

Organic--If sample is estimated to be low or medium concentration, enter "L." When shipping SAS high concentration samples (previously arranged with Program Manager and RSCC), enter"H."

Inorganic--Enter "L" for low concentration, "M" for medium concentration, and "H" for high concentration (under previous SAS arrangement).

Note: Ship medium and high concentration organic and inorganic samples in metal cans.

Column C, Sample Type

Please enter which type of sample (composite or grab) was collected.

Column D, Preservation

Please enter preservation used (i.e., HCL, NaOH, HNO_3, H_2SO_4) refer to Box No. 6 or the reference number of the preservation (1-7, N). Always include ice as a preservative in addition to any chemical preservative used.

Column E, RAS Analysis

Check the analytical fractions requested for each sample, for example, VOAs, SVs, and pesticides are for low/medium concentration organics. Request only total metals and cyanide for RAS low/medium concentration inorganics.

Note: Aroclors/Toxaphenes may be requested, when using the High Concentration SOW, in a SAS Request.

Note: Either total or dissolved metals can be requested for each individual inorganic sample assigned a unique sample number, but not both analyses. A unique number must be assigned for each, even though they are from the same station location.

Column F, Regional Specific Tracking Number or Tag Number

Enter the Region specific tracking number or tag number(s) in the space provided. Since space is limited try to use tag numbers in a sequential order.

Column G, Station Location Number

Enter the Station Location Number in the space provided.

Column H, Month/Day/Year/Time of Sample Collection

Record the month, day, year, and time in military time (e.g., 1600 hours = 4:00 P.M.) of sample collection.

Column I, Sampler Initials

Enter the samplers initials.

Column J, Corresponding CLP Organic/Inorganic- Sample No.

Enter the corresponding CLP sample number for organic or inorganic analysis.

Column K, Designated Field QC

Enter the appropriate qualifier for "Blind" Field QC samples in this column.

Note: All samples must have a qualifier.

Blind Field QC	Qualifier
Blank	B
Duplicate	D
Rinsate	R
Performance Evaluation Samples	PE
Not a QC sample	--------

Note: **This information will be entered into EPA Headquarters database to track QC sample data. Please complete this Section carefully and accurately.**

Box Titled, "Shipment for Case Complete (Y/N)"

This should reflect the status of the samples scheduled at a lab for a specific case. When ALL samples scheduled/collected for shipment to a lab for a specific case have been shipped, the case is complete.

Box Titled, "Page 1 of "

Please enter the number of TRs per shipment.

Box Titled, "Sample Used for Spike and/or Duplicate"

Please enter sample number to be used for matrix spike and/or duplicate sample (internal lab QC). One per twenty/matrix/concentration/lab. See back of TR form.

Box Titled, "Additional Sampler Signatures"

Please record any additional sampler signatures you are unable to record in box 2.

Box Titled, "Chain-of-Custody Seal Number"

Leave the Chain-of-Custody Seal Number blank (Not used in Region 6).

Box Titled, "Split Samples Accepted/Declined"

Sampler should ask sight owner, PRP, etc. whether they want split samples taken. The split samples are either accepted or declined. Sampler should record their signature if split samples are collected and check the appropriate box.

How and When to Separate and Send Traffic Report/Chain-of-Custody Form Copies

When all paperwork has been completed by the sampler and samples are ready to be shipped:

Bottom 2 copies (white and yellow) of the traffic report/chain-of-custody forms should be placed in a plastic bag and taped to the inside of the cooler.

Top Blue/Green copy - Send to Region within five (5) working days from date of sample shipment. On this copy indiciate in Column K the duplicate sample number.

Myra Perez
USEPA Region 6
10625 Fallstone Road
Houston, Texas 77099

Pink copy - Send to Sample Management Office (SMO) on the same day as the samples are shipped.

Sample Management Office
300 North Lee Street
Suite 200
Alexandria, Virginia 22314

Instructions on the Reverse

Instructions summarizing CLP sample volumes, packaging, and shipment reporting requirements are printed on the back of the TRs.

SHIPPING OF SAMPLES

Samples will be shipped and delivered to the designated laboratory for analysis daily. During sampling and sample shipment, the lead Site Investigation Manager (or designee) will contact the SMO (designated on the CLP RAS Lab Assignment information facsimile) to inform them of shipments. **TNRCC WILL NOT CONTACT THE RECEIVING LABORATORY!!**

The samples will be shipped in ice chests by an overnight carrier such as Airborne Express. The TR forms (white and yellow) will be placed within the ice chest, which will be sealed with custody seals and/or tamper-resistant tape. Custody seals will be signed by the sample custodian shipping the samples. The air bill number will be noted on the chain-of-custody form. In addition the Airbill and TR form(s), each ice chest will contain an additional Airbill to provide for return of the ice chest to Judie Mattocks, Pollution Cleanup Division, TNRCC, Technical Park Center, Building D, 12118 North IH-35, Austin, Texas 78753.

(B4) ANALYTICAL PROCEDURES and (B10) DATA MANAGEMENT

All analytical procedures will conform to analytical methods specified in the Routine Analytical Services (RAS) contract with the EPA. All data is managed by EPA in accordance with the USEPA Contract Laboratory Program Statement of Works for Organic and Inorganic Analyses. Data received by TNRCC in accordance with the 1996 and 1997 Cooperative Agreement is returned to EPA after validation for use in the SSI reports. EPA maintains full control of record-keeping procedures, receipt of data from the laboratory, and for detecting/correcting laboratory errors.

As per the EPA-CLP Statement of Work for Organic Analysis (including February 1994 revision), laboratories are required to perform any method specified in Exhibit D for volatile organic compounds (CLP-VOA), semivolatile organic compounds (CLP-SV), and pesticide/PCB compounds (CLP-PEST).

As per the EPA-CLP Statement of Work for inorganic analysis (including February 1994 revision), laboratories are required to perform methods specified in Exhibit D. Metals will be analyzed using the 200 series, CLP-modified, methods as specified in Exhibit D. Cyanide will be analyzed by method 335.2 CLP-modified. Table 2.3 list the methods to be performed during this project under the RAS contract. If methods other than those included in RAS are required, then this QAPP will be amended accordingly.

Table 2.3 Analytical Procedures for USEPA-CLP

Parameters	Method
Organics	
Volatile organics (VOA)	CLP-VOA
Semivolatile organics (BNA)	CLP-SV
Pesticides/PCBs	CLP-PEST
Inorganics	
Cyanides	335.2 CLP-M*
Metals	
Aluminum	202.2 CLP-M or 202.1 CLP-M
Antimony	204.2 CLP-M
Arsenic	206.2 CLP-M
Barium	208.2 CLP-M or 202.1 CLP-M
Beryllium	210.2 CLP-M
Cadmium	213.2 CLP-M
Calcium	218.2 CLP-M
Chromium	215.1 CLP-M
Cobalt	219.2 CLP-M or 219.1 CLP-M
Copper	220.2 CLP-M or 220.1 CLP-M
Iron	236.2 CLP-M or 236.1 CLP-M
Lead	239.2 CLP-M
Magnesium	242.1 CLP-M
Manganese	243.2 CLP-M or 243.1 CLP-M
Mercury	245.1 CLP-M, 245.2 CLP-M, or 245.5 CLP-M
Nickel	249.2 CLP-M or 249.1 CLP-M
Potassium	258.1 CLP-M
Selenium	270.2 CLP-M
Silver	272.2 CLP-M
Sodium	273.1 CLP-M
Thallium	279.2 CLP-M
Vanadium	286.2 CLP-M or 286.1 CLP-M
Zinc	289.2 CLP-M or 289.1 CLP-M

* CLP-M modified for the Contract Laboratory Program

(B5) QUALITY CONTROL REQUIREMENTS

Quality assurance for analytical work on this project will involve analysis of blank samples, spiked samples, and duplicate samples. For each group of 20 samples (or less if fewer than 20 samples are collected) of similar matrix (i.e., groundwater, soil or sediment) collected at each site, CLP internal laboratory QA/QC analysis will be conducted on one blank, one spiked, and one duplicate spiked sample. Field duplicates will be collected at a rate of 10% for each matrix and/or one per day, whichever is greater. Also, the TNRCC will include in each ice chest with samples to be shipped for analysis a temperature blank taped to the side of the chest prior to shipping.

LABORATORY QUALITY CONTROL BLANKS, SPIKED BLANKS, AND MATRIX SPIKES

Analysis of blank samples verifies that the analytical method does not introduce contaminants. The spiked blank is generated by addition of standard solutions to the blank water. The matrix spike will be generated by the CLP laboratory through the addition of standard solutions to a randomly selected field sample. Extra volume (triple volume) for a matrix spike and matrix spike duplicate will be collected for one water sample (groundwater or surface water, but not both) by the field team and sent to the assigned CLP Laboratory for internal quality control. In addition, one soil sample (no extra volume) will be designated on the TR by the field team and sent to the designated CLP laboratory for internal quality control per day of sampling.

FIELD BLANKS

Volatile organics samples are susceptible to contamination by diffusion of organic contaminants through the Teflon-lined septum of the sample vial; therefore, a VOA field blank will be analyzed to monitor for possible sample contamination. The field blank also serves to detect contaminants in the sample bottles. Each field blank will be prepared by filling two VOA vials with CLP-specified grade water and shipping the blanks with the sample bottles. Field blanks accompany the sample bottles through collection and shipment to the laboratory and are stored with the samples. The field blanks will be analyzed for VOAs. Results of field blank analyses will be maintained with the corresponding sample analytical data in the project file.

One field blank will accompany each ice chest containing samples collected for VOA analyses. Samples for VOA analysis will be shipped together as practicable.

FIELD DUPLICATES

For samples collected for laboratory analysis, field duplicates will be collected at a rate of 10 percent of the total number of samples collected during each day of sampling for each sample matrix type at every site. The number of samples collected will be rounded up to the next increment of ten, such that twenty-one samples would require collection of three duplicates, if collected within three days. At least one field duplicate will be collected per day of sampling and will be packaged and sent to the laboratory for analysis with the other samples of the same sample matrix type.

EQUIPMENT RINSATE SAMPLES

Equipment rinsate samples will be collected to establish that proper sample bottle preparation, decontamination and handling techniques have been employed. The equipment rinsate sample will be collected at the TNRCC Region 11 Austin Office laboratory prior to the sampling activities. Dedicated sample equipment will be used at each site for each sample station. All sample equipment will be decontaminated in the field and carefully packaged for return to the TNRCC Central Office. The decontaminated equipment will be taken to the TNRCC Region 11 Austin Office laboratory where one equipment blank will be collected and shipped to the assigned CLP laboratory for analysis. The equipment rinsate sample will be prepared by collecting CLP-specified grade water from the final rinse of the sampling equipment. Finally, the sample equipment will be placed in individual dated plastic bags, including chain-of-custody seals.

If sample equipment must be used more than once in the field, then the decontamination procedures for sample equipment will be followed and a rinsate sample collected in the field at the end of each sampling day and/or between each sample matrix type sampled, whichever is greater, and shipped to the assigned CLP laboratory with the associated sample matrix type. The number and type of QA samples at each site will be estimated in the SSI work plan. Modifications to the plan may be deemed necessary by the site investigation manager depending on field conditions, the on-site determination of additions or removals of sample locations, and the number of days required to complete the site sampling investigation.

(B7) CALIBRATION PROCEDURES AND FREQUENCY

Calibration of field instruments and equipment will be performed at approved intervals as specified by the manufacturer or more frequently as conditions dictate. Calibrations also may be performed at the start and completion of each test run. However, such calibrations will be re-initiated after any delay caused by meals, work shift change, or damage incurred. Calibration standards used as reference standards will be traceable to the NIST, when existent. Standards will be used and duplicate samples analyzed in the field to verify pH and specific conductance data.

Instruments and equipment used to gather, generate, or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the EPA-CLP specifications. Calibration of laboratory equipment will be based on approved written procedures. It is the responsibility of the EPA data validators to ensure that the proper calibration protocols specified in the CLP statement of work were used. These calibration procedures and frequencies are included in the EPA Contract Laboratory Program, "Statement of Work for Organic Analysis" (Exhibit E) including revisions through August 1991, and in the EPA Contract Laboratory Program, "Statement of Work for Inorganic Analysis" (Exhibit E) including revisions through September 1991.

Records of calibration, repair, or replacement will be filed and maintained by the designated laboratory personnel performing quality control activities in accordance with EPA-CLP requirements. Calibration records of assigned laboratories will be filed and maintained at the laboratory location where the work is performed and will be subject to QA audit.

(B6 and B8) INSTRUMENT/EQUIPMENT TESTING, INSPECTION, PREVENTIVE MAINTENANCE PROCEDURES

Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedures developed by the operators.

SCHEDULES

Manufacturer's procedures identify the schedule for servicing critical items in order to minimize the downtime of the measurement system. It will be the responsibility of the operator to adhere to this maintenance schedule and to arrange any necessary and prompt service as required. Service to the equipment, instruments, tools and gauges shall be performed by qualified personnel.

In the absence of any manufacturer's recommended maintenance criteria, a maintenance procedure will be developed by the operator based on experience and previous use of the equipment.

RECORDS

Logs will be established to record maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Records produced will be reviewed, maintained, and filed by the operator when equipment, instruments, tools, and gauges are used at the sites. The Program QA/QC Officer will audit these records to verify complete adherence to these procedures.

SECTION 3

ASSESSMENT/OVERSIGHT

(C1) ASSESSMENT AND RESPONSE

QA audits are performed by the Program QA/QC Officer. Functioning as an independent agent, the Program QA/QC Officer will plan, schedule, and approve system and process audits according to company procedure, customized to specific project requirements. These audits will be implemented to evaluate the capability and performance of project and subcontractor personnel, activities, and documentation of the measurement system(s), including subcontractor activities.

The Program QA/QC Officer will report directly to the Technical Director. The Program QA/QC Officer will coordinate and monitor the overall QA program, including all on-site activities and the quality control programs of the laboratories. Implementing prompt, effective, and accurate corrective action in response to noncompliance that may occur on projects is absolutely essential in assuring the quality of the end product.

QUALITY SYSTEM AUDIT

A quality system audit refers to a detailed evaluation of the Project's Quality Assurance Program to determine its conformance to the Multi-Site Cooperative Agreement commitments and standard TNRCC procedures. Such an audit includes preparation of formal plans and a checklist based on established requirements. A copy of a field audit checklist is at the end of this section. Audits may be performed on TNRCC and subcontractor work.

(C2) REPORTS TO MANAGEMENT

Audit reports will be written by the Program QA/QC Officer after gathering and evaluating all available data. Items, activities, and documents determined by the Program QA/QC Officer to be non-compliant will be identified at interviews conducted with the involved management. Non-compliant elements will be logged, documented, and controlled through audit findings, which are attached to the audit report. These audit findings are directed to the Program Manager to resolve the noncompliance satisfactorily in a specified and timely manner.

All audit checklists, audit reports, audit findings, and acceptable resolutions are approved by the Program QA/QC Officer prior to issue. QA verification of acceptable resolutions may be determined by re-audit for documented surveillance of the item or activity. Upon verification acceptance, the Program QA/QC Officer will close out the audit report and findings.

It is the Program Manager's overall responsibility to ensure that all corrective actions to resolve audit findings are acted upon promptly and satisfactorily by project personnel.

FIELD AUDIT CHECKLIST

Project No. _____

Project Name _____

Site Investigation Manager _____

Auditor _____

Dates of Field Audit _/__/__ - _/__/__

1. The Site-Specific Health and Safety Plan has been prepared by the TNRCC Site Investigation Manager and subsequently approved by the TNRCC Program Manager and TNRCC Health and Safety Officer prior to arrival to the site.

Yes ___ No ___

Comments_____

_____

2. The Site-Specific Health and Safety Plan has been signed by all who intend to enter within the site boundaries prior to entry onto the site.

Passed ___ Failed ___

Comments_____

_____

○ Project organization:

1. Did the Site Investigation Manager hold a briefing with each participant to go over any concerns or questions for project organization; and

2. Did the Site Investigation Manager provide appropriate number and types of material supplies necessary to collect samples (jars, bottles, gloves, pens, coolers, coolant, preservatives, protective gear, Work Plan, Health and Safety Plan, CLP, QAPP or other reference material)?

Adequate ___ Marginal ___ Failed ___

Comments_____

_____

3. Were additional instructions given to each participant not otherwise found in the preliminary written material, such as the Site-Specific Work Plan, Health and Safety Plan, CLP or QAPP?

Not Applicable ___

Additional Instructions_____

_____

○ Samples collection procedures:

1a. The Site Investigation Manager ensured that the sampler collected adequate volumes of sample to allow for the planned sample analyses and field duplicates, plus any laboratory QC blanks and laboratory QC duplicates/spikes, as applicable; and

1b. The Site Investigation Manager provided a supply of the appropriate type of sample containers for the samples collected.

No Modifications ___ Modifications ___ Failed ___

Comments_____

_____

2. Were samples collected as stated in the Site-Specific Work Plan (number, frequency, and type)?

No Modifications ___ Modifications ___

Sample Modifications_____

_____

○ Chain of Custody:

1a. The Site Investigation Manager ensured that the sample tags were properly completed and attached to each sample container;

1b. The Site Investigation Manager ensured that the custody seals were properly completed and attached to each sample container in unbroken condition; and

1c. The Site Investigation Manager ensured that each sample container was labeled with the sample number and protected with clear tape.

Passed ___ Failed ___

Comments_____

_____

2. Each traffic report has been completed, faxed to EPA, original copy mailed to EPA, and copies corrected as necessary.

Passed ___ Failed ___

Comments_____

_____

3. The traffic report accompanied each shipment to the correct EPA contract lab.

Passed ___ Failed ___

Comments_____

_____

4. Field observations are written in ink and are presented accurately in the field logbook, and each page is signed and dated.

Passed ___ Failed ___

Comments_____

_____

5. Photographs are logged in the logbook with the date, time, location, name of person taking the picture, type of sample, sample number, and the photo number.

Yes ___ No ___

Comments_____

_____

6. Prior to use, the Site Investigation Manager ensured that the measuring equipment was calibrated to standard procedures as presented in accompanied documents written specifically for the instrument.

Passed ___ Failed ___

Comments_____

_____

7. Have any accountable documents been lost?

Not Applicable ___

Documents Lost_____

_____

General Comments or Concerns Regarding the Sampling Procedures, Organization, and Site Investigation Management:

_____

_____

_____

Signature of Auditor _____

SECTION 4

DATA VALIDATION AND USABILITY

(D1 and D2) DATA REVIEW, VALIDATION, VERIFICATION METHODS

FIELD MEASUREMENT DATA

Field measurements will be made by field geologists and engineers, environmental analysts, and technicians. The following standard reporting units will be used during all phases of the project:

- pH will be reported to 0.1 standard units.
- Specific conductance will be reported to two significant figures below 100 umhos per centimeter (umhos/cm) and three significant figures above 100 umhos/cm.
- Temperature will be reported to the nearest 0.5° Celsius (°C).
- Water levels measured in wells will be reported to the nearest 0.01 foot.
- Soil sampling depths will be reported to the nearest 0.5 foot.

Field data will be validated using different procedures.

- Routine checks will be made during the processing of data - for example, looking for errors in identification codes.
- Checks may be made for consistency with parallel data sets (data sets obtained presumably from the same population) - for example, from the same region of the aquifer or volume of soil.

The purpose of these validation checks and tests is to identify outliers, i.e., observations that do not conform to the pattern established by other observations. Outliers may be the result of transcription error or instrumental breakdowns. Outliers may also be manifestations of a greater degree of spatial or temporal variability than expected.

If an outlier is identified, a decision concerning its fate will be rendered. Obvious mistakes in data will be corrected when possible, and the correct value will be inserted. If the correct value cannot be obtained, the data may be excluded. An attempt will be made to explain the existence of the outlier. If no plausible explanation can be found for the outlier, it may be excluded, but a note to that effect will be included in the report. Also, an attempt will be made to determine the effect of the outlier when both included and excluded in the data set.

LABORATORY DATA

The procedures used for calculations and data reduction are specified in each method referenced previously. It will be the responsibility of the laboratory to follow these procedures.

VALIDATION

The laboratory data will be validated by EPA according to the following EPA documents:

- National Functional Guidelines for Organic Data Review (February 1994)
- National Functional Guidelines for Evaluating Inorganics Analyses (February 1994).

REPORTING

The project analytical report from the CLP laboratory will contain data sheets and the results of analysis of QC samples. Analytical reports may also contain the following items:

- Project identification
- Field sample number
- Laboratory sample number
- Sample matrix description
- Date of sample collection
- Analytical method description and reference citation
- Individual parameter results
- Date of analysis (extraction, first run, and subsequent runs)
- Quantitation limits achieved
- Dilution or concentration factors
- Corresponding QC report (including duplicates and spikes).

Matrix interferences on some of the samples, particularly the waste samples, may result in increased detection limits. Matrix interference will be reported as the cause of increased detection limits. These data will be valid.

(D3) RECONCILIATION WITH DQO

The following procedures have been established to assure that conditions adverse to quality--malfunctions, deficiencies, deviations, and errors--are promptly investigated, evaluated, and corrected.

INITIATION OF CORRECTIVE ACTION

When a significant condition adverse to quality is noted at the project site, laboratory, or subcontractor locations, the cause of the condition will be determined and corrective action taken to preclude repetition. All project personnel have the responsibility, as part of normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality.

Corrective actions may be initiated at a minimum:

- When predetermined acceptance standards--objectives for precision, accuracy, and completeness--are not attained.
- When procedures or data compiled are determined to be faulty.
- When equipment or instrumentation is found faulty.
- When samples and test results cannot be traced with certainty.
- When quality assurance requirements have been violated.
- When designated approvals have been circumvented
- As a result of an audit.

PROCEDURE DESCRIPTION

Project management and staff, including field investigation teams, sample control personnel, and laboratory groups, monitor ongoing work performance in the normal course of daily responsibilities.

Following identification of an adverse condition or quality assurance problem, notification of the deficiency will be made to the project manager and senior individual in charge of the activity found to be deficient, along with recommendations for correction.

Following implementation of corrective action, the senior individual in charge will report actions taken and results to the Program Manager and Program QA/QC Officer.

SECTION 5

EQUATIONS FOR PRECISION, ACCURACY, AND COMPLETENESS

Planned procedures used to assess data precision and accuracy are in accordance with 44 FR 69533, "Guidelines Establishing Test Procedures for the Analyses of Pollutants", and appendix III, "Example Quality Assurance and Quality Control Procedures for Organic Priority Pollutants", December 3, 1979. Completeness is recorded by comparing the number of parameters initially analyzed with the number of parameters successfully completed and validated.

PRECISION

Relative percent difference (RPD) is calculated as:

$$RPD = \frac{|x_1 - x_2|}{x} \times 100\%$$

where:
x_1 = analyte concentration of first duplicate
x_2 = analyte concentration of second duplicate
x = average analyte concentration of duplicates 1 and 2.

ACCURACY

Accuracy is expressed as a percent recovery (PR), calculated by:

$$PR = \frac{(A-B)}{C} \times 100\%$$

where:
A = spiked sample result (SSR)
B = sample result (SR)
C = spike added (SA).

COMPLETENESS

The completeness of the data will be determined by:

$$PC = \frac{N_a}{N_t} \times 100\%$$

where:
PC = percent complete
N_a = number of actual valid results
N_t = number of theoretical results obtainable.

GROUNDWATER PATHWAY AND TARGETS

Characteristics

The SLC is located on the seaward margin of the Gulf Coast Plain of Texas. Layers of sediments in this area are of Cenozoic age and can be tens of thousands of feet thick at the coastline. These clastic sediments of sand, silt and clay represent depositional environments ranging from nonmarine at the outcrops of most units to marine environments with distinctive suites of fossils. The oscillations of ancient seas and changes in the amount and source of sediments deposited, caused facies changes downdip and along strike. Thus, a time-stratigraphic unit of equivalent age may consist of sand in one area, sandy clay in a second area and clay in a third area. Subsidence within the depositional basin, along with a rising land surface, caused the stratigraphic units to thicken gulfward. Growth faults have greatly increased the thickness of some stratigraphic units within short distances. These factors contribute to the heterogeneity of units from place to place, making correlation between them difficult (Reference 4).

The sediments which make up the surface of the Coastal Plain are the : a) Quaternary alluvium of sand, silt and clay; b) the Beaumont Clay; c) the Montgomery Formation; d) the Bentley Formation; and e) the Willis Sand. Collectively, these layers make up the Chicot Aquifer. Underlying these deposits are Tertiary stratigraphic units: the Goilad Sand, Flemming Formation, Oakville Sandstone and the Catahoula Sandstone. These Tertiary deposits make up the Evangeline Aquifer. Together, the Chicot and Evangeline aquifers make up the Gulf Coast Aquifer (Reference 4).

Targets

Drinking water in the area of the canal is supplied by the Lower Neches Valley Authority whose surface water intake points are north of the study area, in the City of Beaumont.

There is no documentation indicating that wells in the vicinity of the canal have been contaminated by hazardous substances attributable from the canal. No wellhead protection areas exist near the canal. No public supply wells exist within a 4 mile radius of the canal.

A 1-mile radius from the beginning and endpoint of the canal was evaluated for the presence of drinking water wells by a review of State of Texas water well reports. The following information was developed:

- Within 0 - 0.25 miles of the site, no wells were identified.
- Between 0.25 - 0.50 miles of the site, no wells were identified.

- Between 0.50 - 1 mile of the site, one irrigation well and one domestic well was identified. Both wells are hydrologically upgradient from the beginning of the canal.

The groundwater pathway was not evaluated during this SSI.

SURFACE WATER PATHWAY AND TARGETS

Characteristics

The SLC and Jefferson Canal are located within the Neches River Basin, draining directly to TNRCC Water Quality Segment Number 0601. Two distinct 15 mile target distance limits (TDLs) exist for this site and will be defined in the Targets section.

The Neches River Basin drains approximately 1,145 miles^2 with an average total discharge of 1,200 cubic feet per second. It is designated for contact recreation and intermediate quality aquatic habitat. Currently, this segment has 5 on-segment monitoring stations and 1 off-segment monitoring station (Reference 5).

Natural drainage in the study area is shown in Figure 1. SLC begins near the intersection of State Highways 366 and 136 and flows in a southeasterly direction for approximately 1 mile before turning in a northeasterly direction as it flows approximately 1 mile to the Neches River. The Jefferson Canal flows in a northerly direction and confluences with SLC where it turns to the northeast.

The Probable Points of Entry (PPE) for source sediments lie within the SLC at the lowermost point of observed contamination, identified in Figure 1. Sensitive environments and wetlands exist within the source area and downstream of the PPEs as SLC flows toward the Neches River. The Neches River downstream of SLC is a documented fishery. No drinking water intakes are located along the 15 mile target distance limit (TDL).

Annual average precipitation for this region is 51 inches per year (Reference 6).

Both canals are within the 100-year floodplain.

TNRCC files note that wastewater has been discharged to the Jefferson Canal in violation of the Texas Water Code.

Targets

Target Distance Limit (TDLs) for the SLC are as follows. Since there are two distinct areas of observed contamination (source area 1: SE-20 and SE-21; source area 2:SE-16 and SE-19), there are two distinct PPEs: PPE_1 and PPE_2. See Figure 2 for the locations of the PPEs.

000320

HRS In-Water Segment Definitions

Source Area 1

HRS In-Water Segment 1(approximately 1.32 miles) is defined as the in-water distance from PPE_1 (MFGP62/63, SE-19/20) along Star Lake Canal to sample location SE-07 (MFGP49). This is the farthest downstream observed release sample for this source area (see Figure 3). No surface water use permits exist within this in-water segment. No drinking water intakes exist near PPE_1. This segment is not used as a fishery. No flow rate data is available for the Star Lake Canal as it is a tidally influenced man-made ditch that flows into other surface water (HRS Guidance, page 207).. Wetland areas exist along both sides of both branches of this in-water segment (Reference 10). A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the study area (Reference 8).

HRS In-Water Segment 2 (approximately 0.29 miles) is defined as the in-water distance from sample location SE-07 (MFGP49) along Star Lake Canal to its confluence with the Neches River (see Figure 3).

HRS In-Water Segment 3 (approximately 3.04 miles) is defined as the in-water distance along the Neches River (from its point of confluence with Star Lake Canal) to Sabine Lake (see Figure 4). One surface water use permit exists along this in-water segment for industrial purposes. No drinking water intakes exist along this in-water segment. Average discharge in this in-water segment is 1,200 cubic feet per second (Reference 5). This in-water segment is documented as a fishery (Appendix B). Wetland areas (estuarine emergent) exist along this in-water segment (Reference 10). A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the study area (Reference 8). This in-water segment is used as a resource by sport fishermen (Reference 11) and is designated for contact recreation (Reference 5).

HRS In-Water Segment 4 (11.67 miles) is defined as the in-water segment in Sabine Lake to the 15 mile TDL (see Figure 4). No surface water use permits exist along this in-water segment. No public drinking water intakes exist along this in-water segment. No flow rate data is available for this in-water segment as it is a coastal tidal water. This in-water segment is designated as a fishery (Reference 11). A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the study area (Reference 8). This in-water segment has resource uses for contact recreation, high quality aquatic habitat and shellfish waters (Reference 5).

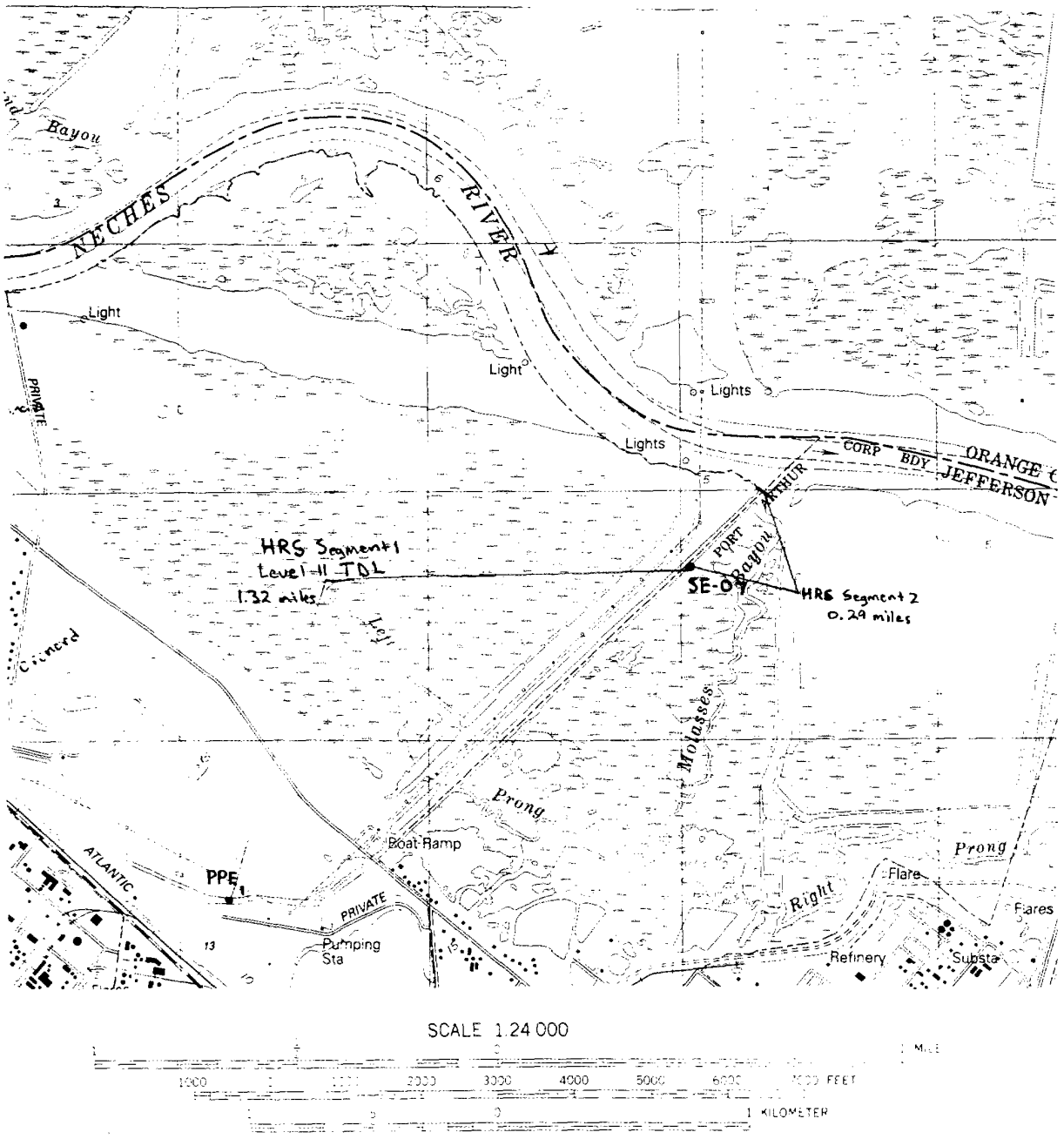


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FIGURE 3: HRS IN-WATER SEGMENTS
SOURCE 1
STAR LAKE CANAL
CERCLIS # TXO001414341
PORT NECHES, JEFFERSON COUNTY
TEXAS

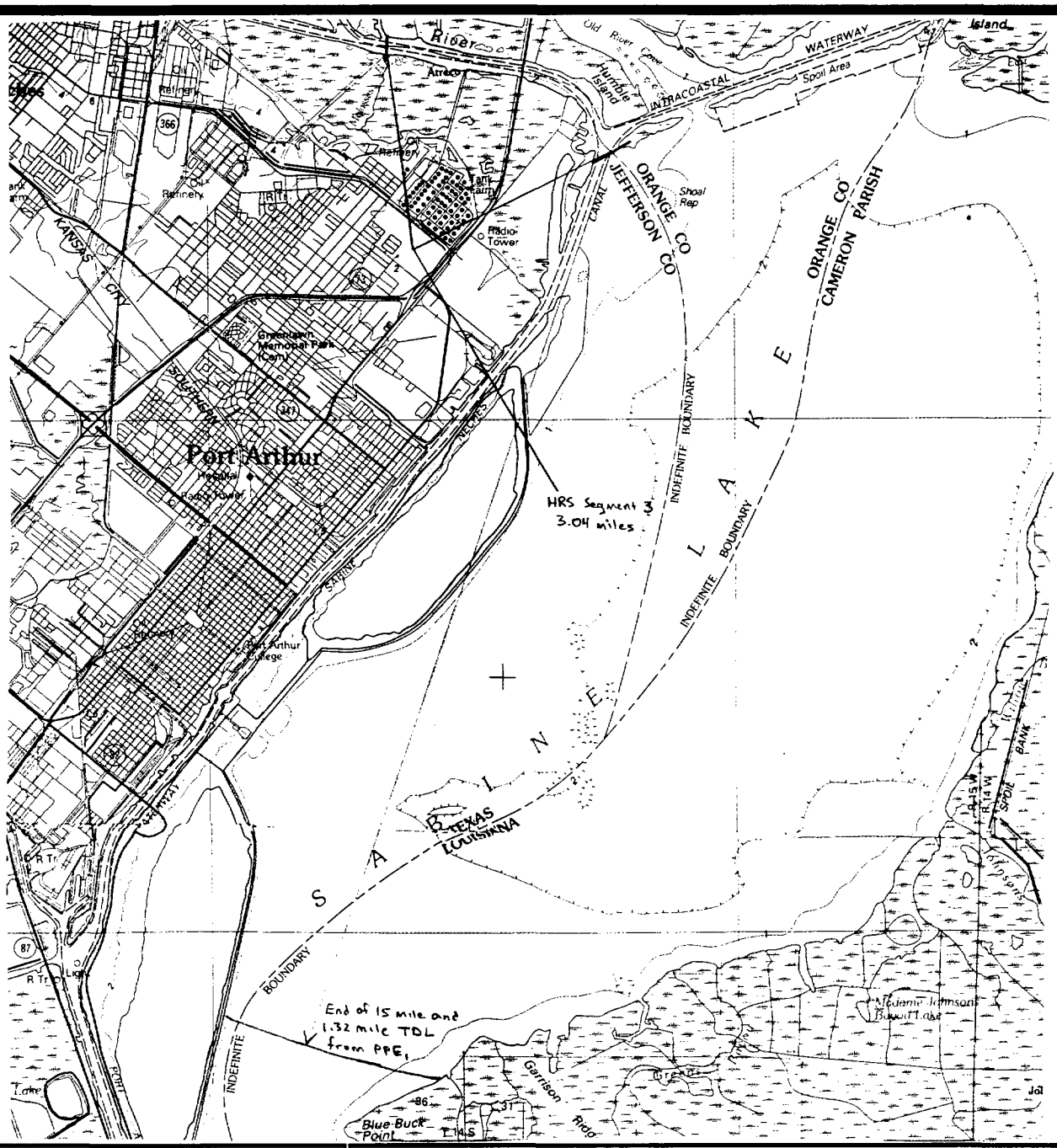

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FIGURE 4: HRS IN-WATER SEGMENTS
SOURCE 1
STAR LAKE CANAL
CERCLIS # TXO001414341
PORT NECHES, JEFFERSON COUNTY
TEXAS

Scale: 1 inch = 2 miles

Source Area 2

HRS In-Water Segment 1 (approximately 1.10 miles) is defined as the in-water distance from PPE_2 (MFGP40/SE-16) along Star Lake Canal to sample location SE-07 (MFGP49). This is the farthest downstream observed release for this source (see Figure 5). No surface water use permits exist within this in-water segment. No drinking water intakes exist near PPE_2. This segment is not used as a fishery. No flow rate data is available for the Star Lake Canal as it is a tidally influenced man-made ditch that flows into other surface water (HRS Guidance, page 207). Wetland areas exist along both sides of both branches of this in-water segment (Reference 10). A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the study area (Reference 8).

HRS In-Water Segment 2 (approximately 0.29 miles) is defined as the in-water distance from sample location SE-07 (MFGP49) along Star Lake Canal to its confluence with the Neches River (see Figure 5).

HRS In-Water Segment 3 (approximately 3.04 miles) is defined as the in-water distance along the Neches River (from its point of confluence with Star Lake Canal) to Sabine Lake (see Figure 6). One surface water use permit exists along this in-water segment for industrial purposes. No drinking water intakes exist along this in-water segment. Average discharge in this in-water segment is 1,200 cubic feet per second (Reference 5). This in-water segment is documented as a fishery (Appendix B). Wetland areas (estuarine emergent) exist along this in-water segment (Reference 10). A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the study area (Reference 8). This in-water segment is used as a resource by sport fishermen (Reference 11) and is designated for contact recreation (Reference 5).

HRS In-Water Segment 4 (11.67 miles) is defined as the in-water segment in Sabine Lake to the 15 mile TDL (see Figure 6). No surface water use permits exist along this in-water segment. No public drinking water intakes exist along this in-water segment. No flow rate data is available for this in-water segment as it is a coastal tidal water. This in-water segment is designated as a fishery (Reference 11). A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities in the vicinity of the study area (Reference 8). This in-water segment has resource uses for contact recreation, high quality aquatic habitat and shellfish waters (Reference 5).

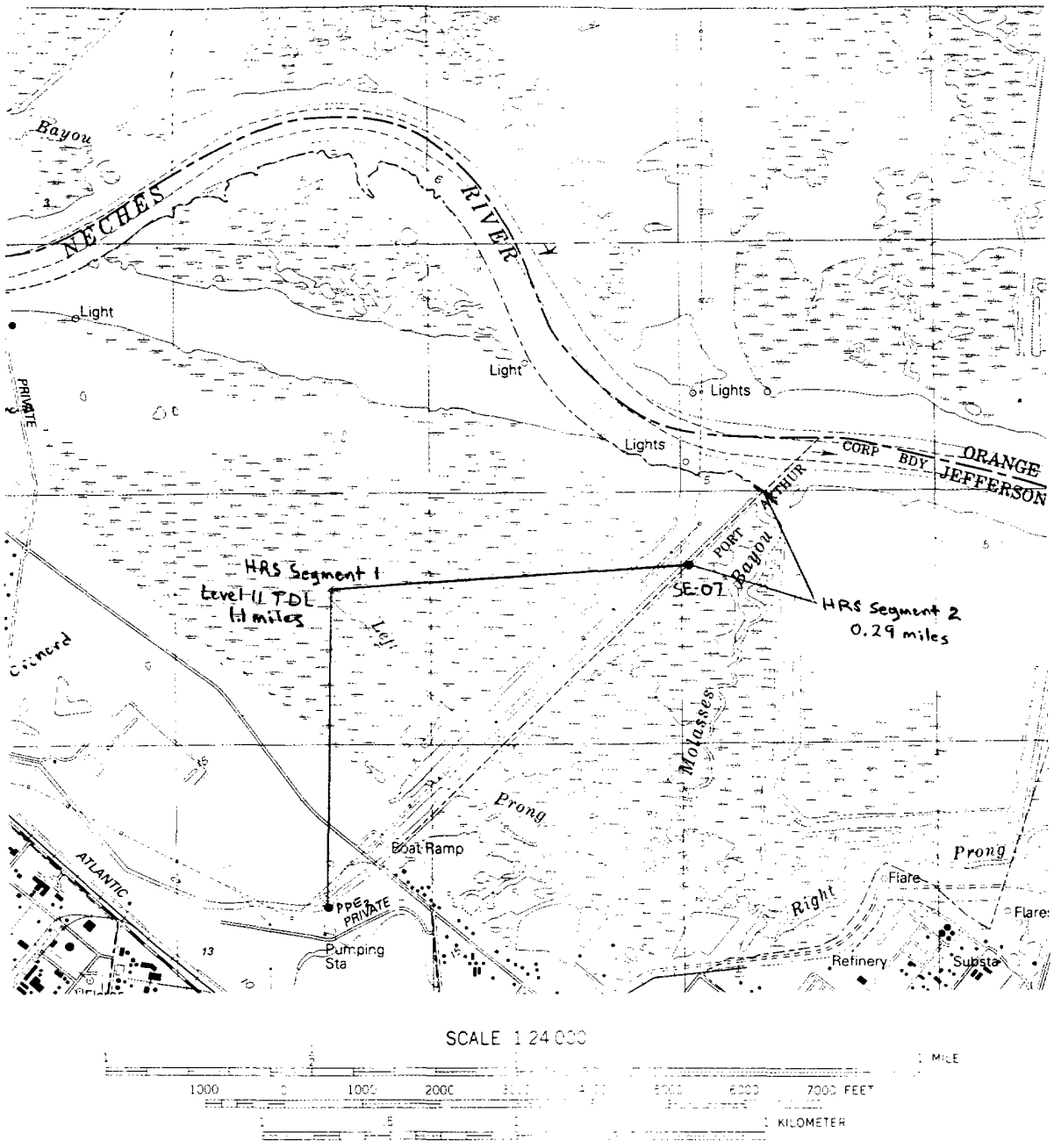

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FIGURE 5: HRS IN-WATER SEGMENTS
SOURCE 2
STAR LAKE CANAL
CERCLIS # TXO001414341
PORT NECHES, JEFFERSON COUNTY
TEXAS

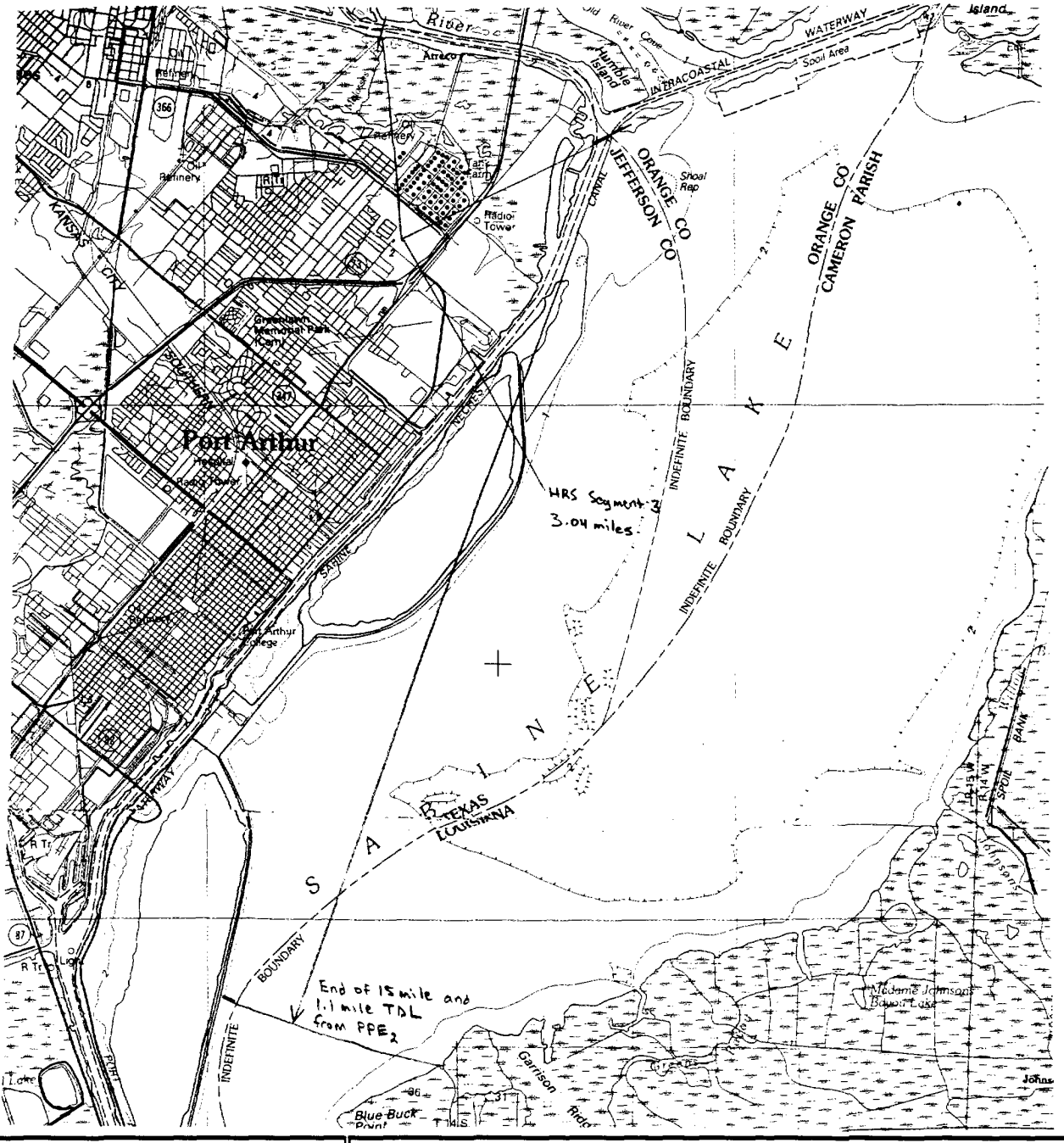

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FIGURE 6: HRS IN-WATER SEGMENTS
SOURCE 2
STAR LAKE CANAL
CERCLIS # TXO001414341
PORT NECHES, JEFFERSON COUNTY
TEXAS

Scale: 1 inch = 2 miles

Nineteen sediment samples, including two field duplicates and three background samples, were collected to assess sediment contamination via transport along the surface water pathway (see Table 3 and Figure 2). Samples SE-01, SE-02 and SE-03 are background samples. Samples SE-04, SE-05 and SE-06 were target samples taken at the confluence of SLC with the Neches River. Samples SE-07, SE-08, SE-09, SE-10, SE-11, SE-12, SE-13, SE-14 and SE-15 were target samples taken along and within wetlands bordering SLC. The remaining five samples were taken in the source areas (see Waste Containment/Hazardous Substance Identification).

Table 3: Sediment Sample Locations

Sample Matrix	Sample ID#	Sample Location
Sediment	SE-01	Background sample upstream in Neches River
Sediment	SE-02	Background sample upstream in Neches River
Sediment	SE-03	Background sample upstream in Neches River
Sediment	SE-04	Target sample immediately upstream of confluence of SLC with Neches River
Sediment	SE-05	Target sample at confluence of SLC with Neches River
Sediment	SE-06	Target sample immediately downstream of confluence of SLC with Neches River
Sediment	SE-07	Target sample taken along bank of SLC
Sediment	SE-08	Target sample taken along bank of SLC
Sediment	SE-09	Target sample taken in marsh approximately 1/3 of a mile downstream of the Sara Jane Road bridge
Sediment	SE-10	Target sample taken at confluence of Molasses Bayou with SLC
Sediment	SE-11	Target sample taken in Molasses Bayou
Sediment	SE-12	Target sample taken in marsh approximately 1/8 of a mile downstream of the Sara Jane Road bridge
Sediment	SE-13	Target sample taken in SLC at the public boat ramp adjacent to Sara Jane Road
Sediment	SE-14	Duplicate sample of SE-13
Sediment	SE-15	Target sample taken in SLC immediately upstream of Sara Jane Road bridge
Sediment	SE-16	Source sample taken in Jefferson Canal
Sediment	SE-19	Source sample taken at the confluence of the Jefferson Canal with SLC
Sediment	SE-20	Source sample taken in SLC at the dam
Sediment	SE-21	Duplicate of sample of SE-20

All sediment samples were taken with a 2 foot long, stainless steel, soil coring device. In the case of samples SE-01, SE-02, SE-03, SE-04, SE-13 and SE-14, the soil coring device , and removable tip, was decontaminated (per procedures outlined in the QAPP) after each sampling location. In the case of samples SE-05, SE-06, SE-07, SE-08, SE-09, SE-10, SE-11, SE-12 and SE-15, a dedicated polyethylene zero-contamination tube was inserted into the soil coring device at each sample location. All sediment samples were placed in dedicated, decontaminated stainless steel bowls. Samples were taken from this with dedicated, decontaminated stainless steel spoons and loaded into certified clean 4 ounce glass jars with a Teflon lined lid.

The highest background and inorganic releases for sediment samples are presented in Table 4.

Table 4

Highest Background and Inorganic Releases for Sediment Samples					
CLP Traffic Report No./ Sample Location No.	% Solid	Hazardous Sustance			
		Barium	Mercury	Thallium	Cyanide
Background MFGP55/SE-01	42.2	61.8	0.17	0.81J	0.59U
Background MFGP56/SE-02	73.5	0.75	18.0	0.07U	0.27U
Background MFGP57/SE-03	65.3	60.0	0.07U	0.65J	0.38U
Background Eastern US Soil Values	N/A	7.4	640	0.12	8.6
MFGP46/SE-10	39.8	94.2	0.1U	3.3 L	0.62U
MFGP47/SE-11	34.4	109	1.6	2.6U	4.3
MFGP48/SE-12	45.6	100	0.1U	2.1 L	0.54U
MFGP43/SE-13	50.1	142	0.09U	0.81 LJV	0.49U
MFGP44/SE-14 (dup.SE-13)	51.4	155	0.09U	0.64 LJV	0.49U
MFGP45/SE-15	49.2	297	0.1	2.6 L	0.5U
MFGP49/SE-07	48.2	114	0.1U	2.5 L	0.52U
MFGP50/SE-08	46.9	116	0.09U	0.93 LJV	0.53U
MFGP51/SE-09	36.4	128	0.13U	1.2 LJV	0.57U
MFGP52/SE-04	72.6	30.6	0.07U	0.27 L	0.34U
MFGP53/SE-05	70.9	57.1	0.06U	2.1 L	0.35U
CRDL mg/Kg		40	0.1	2	5

Notes:

J = The value is an estimated concentration because one or more quality control criteria have not been met.
U = Analyte concentration is undetected at the sample quantitation limit.
J↓ = The value is estimated and biased low.
Shaded values for samples represent releases of attributable hazardous substances.

Four target samples indicate releases of hazardous substances attributable to the site: SE-07 for thallium; SE-10 for thallium; and SE-11 for mercury and cyanide; and SE-15 for barium and thallium.

The highest background and organic releases for sediment samples is presented in Table 5.

Table 5

Highest Background and Releases for Sediment Samples				
Organics µg/Kg	FEY92 Background [SQL] SE-01	FEY83 [SQL] SE-10	FEY84 [SQL] SE-11	CRQL µg/Kg
Naphthalene	780 U	590 J [890]	210000 [61000]	330
2-Methylnaphthalene	780 U	2300 [890]	84000 [30000]	330
Acenaphthene	780 U	2700 [890]	70000J↑ [30000]	330
Fluorene	780 U	1500 [890]	61000 [30000]	330
Phenanthrene	780 U	2700 [890]	U	330
Pyrene	60 J [780]	1400 [890]	48000 J↑ [30000]	330
% Moisture	58	63	67	

Notes:

1) CRQL listed in the table are for low concentration soils.
U = Analyte concentration undetected at the reported sample quantitation limit.
[SQL] = Sample quantitation limit provided within the brackets.
J = The value is an estimated concentration because one or more quality control criteria

		have not been met.
J↑	=	The value is estimated and biased high.

Analytical results of two target samples (SE-10 and SE-11) indicate releases of naphthalene, 2-methylnaphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene and pyrene.

All other attribution and target samples (SE-04, SE-05, SE-06, SE-07, SE-08, SE-09, SE-12, SE-13, SE-14 and SE-15) were nondetect for the organic hazardous substances listed above.

SOIL EXPOSURE PATHWAY AND TARGETS

Characteristics

The SLC site consists of contaminated sediments at the bottom of the Star Lake and Jefferson Canals. Adjacent land is undeveloped, residential and industrial. Entry into either canal by boat from the Neches River, or the boat ramp adjacent to Sara Jane Road, is unrestricted. The SLC canal is used for recreational purposes by boaters and fishermen. Telephone conversations with TNRCC Region 10 personnel revealed that individuals occasionally swim in the canal at the Sara Jane Road boat ramp.

Soils within the study area are of the salt water marsh-Tidal marsh association, Morey-Crowley-Hockley association and the Beaumont-Morey association. Occupying approximately 3% of the county, the salt water marsh-Tidal marsh association soils are made up of boggy beds of organic material over permanently waterlogged clay, sand and shells. These areas are at or below sea level and may be covered daily by tides. The Morey-Crowley-Hockley association is nearly level and better drained than the marsh soils. Primarily, they are silty soils that occupy approximately 18% of the county. The Beaumont-Morey association is made up of clayey and silty soils that are poorly drained, occupying approximately 46% of the county (Reference 10).

Targets

No workers were documented along either canal who may come in contact with contaminated sediments. There are no schools, day care centers, parks, or other established recreational areas within 200 feet of the site. The nearest occupied residence is approximately 300 feet from the site.

The following are estimates of the number of persons living in the vicinity of SLC (Reference 11):

Zero -0.25 miles	=	0
0.25 to 0.5 miles	=	0
0.5 miles to 1 mile	=	190
1 mile to 2 miles	=	5,728

2 miles to 3 miles	=	17,052
3 miles to 4 miles	=	20,376

Total estimated population within 4 miles of SLC is 43,346 persons.

NOTE: The estimated population was computed by averaging the Latitude and Longitude values for either end of SLC and assuming that the center of the site is at that geographic midpoint (see Appendix E, page 2).

The soil exposure pathway was not evaluated during this SSI.

AIR PATHWAY AND TARGETS

Characteristics

No analytical data was available to document off-site migration of airborne transported hazardous substances from existing on-site sources.

Wind rose analysis indicates that the prevailing wind is from southeast (Reference 6).

No air samples were taken to assess releases to the air pathway. The site consists of canal sediments and the air pathway cannot be evaluated during this SSI.

SECTION 3
ANALYTICAL DATA ASSESSMENT

Nineteen sediment samples were collected during the Superfund Site Investigation (SSI) of the Star Lake Canal site. The samples were analyzed for Contract Laboratory Program (CLP) metals and cyanide by Analytical Resources, Inc. in Seattle, WA. Volatiles, semivolatiles and pesticides were analyzed by Compuchem in Research Triangle, NC. The resulting CLP data packages were reviewed and validated by EPA Region 6 according to the USEPA CLP Statement of Work for Inorganic Analysis (Document Number ILMO4.0), Organic Analysis (Document Number OLMO3.1), and National Functional Guidelines for Organic Data Review (EPA 1994) and Inorganic Analyses (EPA 1994). The EPA data validation reports are included in **Appendix C.**

A. Quality Assurance/Quality Control Review

In accordance with the Quality Assurance Project Plan (QAPP) for the TNRCC Preliminary Assessment/Site Inspection Program (FY 96), the TNRCC has reviewed the inorganic and organic analyses to ensure accuracy, precision, representativeness, comparability, field custody and completeness. The following is the result of that review presented as an account for the acceptance or rejection of data for its use in Superfund decision-making, including the scoring of this site.

Accuracy

For inorganics, the ICP Interference Check Samples (ICS) were analyzed at the beginning and end of each sample analysis run and no analytes were detected at levels near the interferant levels. Lab Control Samples (LCS) were conducted at adequate frequencies and the analytes had acceptable percent recoveries.

For organics, the Bromoflourobenzene (BFB) and Decafluorotriphenylphosphine (DFTPP) instrument performance checks met the ion abundance criteria.

Volatile internal standards for the samples did not vary by more than a factor of two. Most semivolatile internal standards were within criteria. One sample in SDG FEY95, sample FEY97, and one sample in SDG FEY80, sample FEY93, both had low area counts in IS6 (Perylene-d_{12}). The samples were reanalyzed resulting with slightly improved quality control. The TNRCC chooses to use reanalysis of these sample. No releases were affected.

Volatile and semivolatile surrogates recoveries were acceptable for all samples in SDG FEY95. Pesticide surrogate recoveries for a single column (Decachlorobiphenyl) in samples FEY96 and FEY97 were under 30% recovery. No qualifications were necessary and no releases were affected.

Volatile surrogate recoveries were acceptable for all samples in SDG FEY80; however,

most semivolatile surrogates for sample FEY93 were high. The TNRCC chooses to use the reanalysis of this sample. Analyte responses associated with IS6 (2,4,6-Tribromophenol) are qualified as estimated. The EPA data summary table accurately delineates the qualifications. No releases were affected.

Several pesticide samples had high recoveries in a single column for at least one surrogate response. EPA data reviewers did not qualify any data as a result of a single poor surrogate response. DDT in sample FEY84 is qualified as estimated and meets release criteria, but is estimated because of two column quantitation difference of greater than 25%.

Two of the inorganic matrix spike recoveries were outside the 75-125% control limit for SDG MFGP43; selenium and antimony. Four matrix spike recoveries were low for SDG MFGP63; selenium, antimony, thallium, and arsenic. Antimony results are not usable for either package because the concentrations are below IDL and the recovery was 19.2% reported in SDG MFGP43, and 0% reported in SDG MFGP63. Affected selenium, arsenic, and thallium results are estimated and biased low. The quality control problem is attributable to digestion effects. Several releases were affected. The EPA data summary tables associated with these SDG packages reflect the qualifications appropriately.

Spike recoveries were not analyzed for the rinsate and field blank samples in SDG FEY95. For SDG FEY80, all low level analysis spike recoveries were within limits. For medium level analysis of semivolatiles for sample FEY84, three spike recoveries were high and most duplicate spike recoveries were high. Several analytes met release criteria in this sample. The TNRCC qualified analytes acenaphthene and pyrene as estimated and biased high due to the high matrix spike recoveries and high relative percent difference.

Soil inorganic preparation blanks and calibration blanks detected concentrations of several metals. No results were affected in SDG MFGP63. In SDG MFGP43, lead and zinc rinsate sample results were affected by blank contamination. The EPA data summary tables reflect the qualifications and presents several of the results as undetected with raised sample quantitation limits (SQLs). The raised SQLs did not affect release calculations results.

The common laboratory contaminants, acetone and methylene chloride were detected in the organic method blank analyses. Additionally, in SDG FEY80 medium level analysis, the blank contained naphthalene, phenanthrene and anthracene. None of these concentrations were great enough to significantly affect the results and no qualifications were necessary. Pesticide blanks in SDG FEY80 contained delta-BHC, Heptachlor, DDE and Endrin at low levels such that no qualifications were necessary.

Precision

Two sediment samples were collected and designated appropriately as duplicates. All of the analytes detected in the duplicate pairs were within 50% relative percent difference (RPD) of each other.

Inorganic laboratory duplicates were within criteria for SDG MFGP43. In SDGP63, aluminum, arsenic, calcium, and chromium laboratory duplicate results were higher than the technical limits. The TNRCC chooses not to qualify the results based on this one quality control problem. Arsenic was already not unusable due to a low matrix spike recovery for both data packages.

A matrix spike duplicate was analyzed for each organic sample. Low level volatile, semivolatile and pesticide matrix spike duplicates were within the %RPD criteria. Medium level relative percent differences were high for acenaphthene and pyrene. Both these analytes are qualified as estimated and biased high by the TNRCC.

Nickel result for sample MFPG50 is estimated because of an inconsistent ICP replicate reading. The coefficient of variation exceeded 20 percent. No releases were affected.

Representativeness

Three equipment rinsate samples were collected of the sampling equipment used to collect the sediment samples. Equipment rinsate data results are located in SDG FEY95 and SDG MFGP43. Several analytes were detected, but at levels which did not critically affect the sample results. No qualification of the results were necessary.

Two field blanks were also collected and accompanied the equipment rinsate volatile organic samples to the laboratory. No analytes were detected in these samples.

All sediment samples were mixed in dedicated bowls and spoons. For the equipment decontamination of the dedicated bowls and spoons used at the Star Lake SSI, one equipment rinsate sample and one field blank sample were collected and analyzed for CLP metals and cyanide by Analytical Resources Inc. in Seattle, WA, and for CLP organics by ATAS in Maryland Heights, MO. The resulting data packages were reviewed and validated by EPA Region 6. The EPA data verification reports are included in **Appendix C**.

The following is a brief summary of the TNRCC review of the inorganic and organic analyses of these samples.

The analysis of the equipment rinsate sample, MFGL31, revealed detectable amounts of the following analytes:

Analyte	Concentration (µg/L)	IDL (µg/L)	CRDL (µg/L)
Calcium	115	20	5000
Chromium	5.8	5.0	10
Copper	17.9	2.0	25
Iron	41.8	20	100
Lead	3.8	1.0	3.0
Manganese	4.7	1.0	15
Sodium	404	50	5000
Zinc	10	4.0	20

The sample results for these analytes detected in the equipment rinsate sample are considered contamination introduced by the decontamination procedure. Please note that the field blank, sample MFGL32, composed of only ultra distilled water, contained calcium at 28 µg/L and lead at 3.0 µg/L.

The contamination incurred through TNRCC decontamination procedures did not cause any concentrations of the inorganic target analytes from this site screening inspection to be disqualified as releases. The TNRCC concludes that the decontamination procedures of the bowls and spoons did not critically contribute contamination to the organic fraction of the samples.

The equipment rinsate samples FEY95, FEY96, and FEY97, had low concentrations of analytes acetone and/or phthalates and were detected at levels well below the CRQL of 10 µg/L. Since these analytes are common laboratory contaminants, they are not considered a concern by the TNRCC. DDE was detected in rinsate sample FEY95 at a low concentration, below the sample quantitation limit. This did not have any affect on the sediment samples.

Samples were collected on October 22 and 23, 1996. The laboratories received all samples by October 25, 1996. The samples were analyzed within holding time criteria. Cooler temperatures were reported at or below 4° C.

Comparability

Standard EPA methodology was conducted. ICP inorganic analyte recoveries from calibration solutions met criteria and were conducted at adequate frequencies. ICP standard calibrations for the analytes were generally acceptable. ICP serial dilutions were within 10% difference for all results.

Most organic target analytes met the percent relative standard deviation initial calibration criteria and the percent difference continuing calibration criteria. A few target analytes were outside percent difference criteria, but did not affect the data.

The instrument detection limits, the ICP interelement correction factor, and the ICP linear range requirements were met.

EPA contractual assessment of the data packages documented several contractual non-compliances. These non-compliances are listed by SDG number in the EPA data validation reports included in Appendix D. These non-compliances did not disqualify any release constituents.

Field Custody

Custody seals were all present and intact. Sample condition was reported as intact for each sample received.

Completeness

Nineteen (19) of the results were rejected; therefore, data from these packages is 99.4% complete which meets the 90% completeness objective. All acceptable CLP inorganic and organic data reported herein represent good quality data of reasonable confidence, and are suitable for use in Superfund decision-making, including the scoring of this site.

SECTION 4
FIELD AUDIT REPORT

In accordance with the QAPP for the TNRCC Preliminary Assessment/Site Inspection Program (FY 95), the TNRCC has implemented a systems audit of the TNRCC performance of the project activities and documentation during the Superfund investigation of the Star Lake Canal site. This audit includes all TNRCC site sampling activities and the quality control program of the laboratories. A completed field audit checklist is included as Appendix H.

TNRCC Site Sampling Activities

Sample collection involved obtaining nineteen sediment samples with a sediment corer during the Superfund Site Investigation (SSI) of the Star Lake Canal site. Field blanks were collected and included in each ice chest containing rinsate volatile organic analysis. The sampling team members were Daniel Benson, Wesley Newberry, Debra Hendricks and Marshall Cedilote.

Brief safety meetings were held at the start of each day of sampling for the sampling team. Each member signed and dated the briefing sheets.

Each sample was appropriately logged in the field logbook with the date, time, location, weather conditions, and identification of each sample, along with the sampler's name. All samples were preserved within thirty minutes of the time of collection.

The samples were collected using proper procedures. VOA samples were collected prior to all other chemical fractions and shielded from light immediately following collection. Disposable gloves were discarded before the next sampling event.

Samples were split with Huntsman representatives. The volatile samples for TNRCC were collected first, then the Huntsman volatiles were collected second. The other organic fractions and the metals and cyanide for TNRCC were collected. Lastly, the other organic fractions and metals and cyanide were collected for Huntsman.

TNRCC Sample Custody

Samples were properly preserved, tagged, sealed and labeled, protected from breakage, and shipped by Airborne Express within twelve hours (12) of the last sample collected. No breach of custody was noted. Traffic reports were completed with the duplicate samples designated appropriately.

The field logbook was maintained by the site investigation manager or his designee during the field investigation. Each page was initialed and/or signed by the author after each entry of each day. All entries were made in pen and field observations were

presented accurately in the field logbook, including photographs logged with the date, time, location, sample number and the photograph number, the name of person taking the picture, and the type of sample taken.

Analytical Procedures

Four data packages were reviewed and validated by EPA Region 6 according to the USEPA CLP Statement of Work for Inorganic Analysis (Document Number ILMO4.0), Organic Analysis (Document Number OLMO3.1), and National Functional Guidelines for Organic Data Review (EPA 1994) and Inorganic Analyses (EPA 1994). The EPA data validation reports are included in **Appendix C**. All data packages were considered by EPA to be technically provisional.

Appropriate analytical procedures were conducted. Some of the data was qualified as estimated, "J", or as unusable, "R" for Superfund purposes due to quality control criteria failures by the laboratory. The accuracy and completeness of the data associated with this project may be used with reasonable confidence to determine the score and/or current status of the Star Lake Canal site investigated by the TNRCC.

Audit Close-Out

In accordance with the Quality Assurance Project Plan (QAPP) for the TNRCC Preliminary Assessment/Site Inspection Program (FY 95), the TNRCC has completed the systems audit of the TNRCC performance of the project activities and documentation during the Superfund investigation of the Star Lake Canal site. No further action by the Technical Director, Program Manager, or Site Investigation Manager is necessary to assure the quality, controllability, accountability, and traceability of the work performed during this Superfund investigation within the TNRCC PA/SI Program.

SECTION 5
CONCLUSIONS

The surface water pathway has been evaluated for contaminant migration from the Star Lake Canal (SLC) site. Complete analytical results are given in Appendix C.

The hazardous substances attributable to this site are acenaphthene, acenaphthylene, anthracene, arsenic, barium, benzo(b)fluoranthene, benzo(k)fluoranthene, cyanide, fluoranthene, fluorene, mercury, 2-methylnaphthalene, naphthalene, PCB (aroclor-1254), phenanthrene, pyrene, and thallium (see Table 1).

A total of nineteen (19) sediment samples collected at this site. Based upon analyses of the samples collected, twelve (12) organic and five (5) inorganic hazardous substances were detected in source sediment samples (SE-16, SE-19, SE-20 and SE-21). Releases of six (6) organic and four (4) inorganic hazardous substances were detected in target samples (SE-05, SE-07, SE-10 and SE-11). Wetlands border both source and contaminated target areas.

The SLC is approximately 2 miles long and empties directly into the Neches River in Port Neches, Jefferson County, Texas. The groundwater, soil exposure and air pathways for this site are inactive.

A sampling inspection by the TDWR in March, 1983, documented the presence of hazardous substances in material dredged from the banks of the Jefferson Canal. This canal was used by local chemical companies as an outfall for stormwater and wastewater for more than 50 years. The Jefferson Canal confluences with SLC in an area between State Highway 366 and Sara Jane Road, a.k.a. East Port Neches Avenue. TNRCC files note that wastewater has been discharged to the Jefferson Canal in violation of the Texas Water Code. TNRCC Region 10 Environmental Assessment Program sampling results document the presence of metals in the SLC at a point 0.25 miles upstream of its confluence with the Neches River.

A search of the Texas Biological and Conservation Data System revealed the presence of sensitive species and natural communities within a 4 mile radius of the site.

000339

REFERENCE LISTING

1. US Environmental Protection Agency. Guidance for Performing Site inspections Under CERCLA, Office of Emergency and Remedial Response, Hazardous Site Evaluation Division, Publication 9345.1-05, September, 1992. 125 pages.

2. US Environmental Protection Agency. 1993 Superfund Chemical Data Matrix (SCDM). March, 1993.

3. TNRCC file information, 98 pages. Included as Appendix D.

4. Texas Department of Water Resources. Report 236. Stratigraphic and Hydrogeologic Framework of Part of the Coastal Plain of Texas. July, 1979.

5. Texas Natural Resource Conservation Commission. The State of Texas Water Quality Inventory, Volume 2. 1994.

6. Texas Department of Water Resources. Climatic Atlas of Texas. December, 1983.

7. Texas Parks and Wildlife Department correspondence. October 10, 1996. Included as Appendix E.

8. United States Department of Agriculture Soil Conservation Service. Soil Survey Jefferson County, Texas. February, 1965.

9. National Wetland Inventory Map, Port Arthur North Quadrangle. 1995. Included as Appendix I.

10. Texas Parks and Wildlife Department, Fisheries and Wildlife Division. Trends in Finfish Landings and Social and Economic Characteristics of Sport-Boat Fishermen in Texas Marine Waters, May 1974-May 1989. Management Data Series, No. 56, 1991.

11. TNRCC Interoffice Memorandum: Population Around Star Lake Canal, Jefferson County, Texas. September 16, 1996. Included as Appendix F.

000340

APPENDIX A

APPENDIX E

TEXAS
PARKS AND WILDLIFE DEPARTMENT
4200 Smith School Road • Austin, Texas 78744 • 512-389-4800

RECEIVED
OCT 14 1996
Pollution Cleanup Division

ANDREW SANSOM
Executive Director

COMMISSIONERS

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Ft. Worth

October 10, 1996

Wesley G. Newberry, Unit Manager
Superfund Site Discovery and Assessment Team
Emergency Response and Assessment Section
Pollution Cleanup Division
Texas Natural Resource Conservation Commission
P.O. Box 13087
Austin, Texas 78711-3087

Dear Mr. Newberry:

Thank you for contacting us regarding your September 9, 1996 request for information on sensitive species and natural communities within or near the Star Lake Canal project area in Jefferson County. A search of the Texas Biological and Conservation Data System (BCD) revealed special species and natural communities from the general surrounding area. Printouts for nearby occurrence and managed area records and a code key are attached. I've also attached a county list for your reference. Following is information about species known from the general area. Please also note that many species of birds use the coastal region and bay systems during migration, as well as breeding and wintering areas. Many species, such as the Peregrine Falcon, would be of concern for adverse impacts from biomagnification of contaminants in the food chain or reduction in food supply.

State Threatened--
- Plegadis chihi (White-faced Ibis) G5 S4

Other Species of Concern--
- Laterallus jamaicensis (Black Rail) G4? S2
- Malaclemys terrapin littoralis (Texas Diamondback Terrapin) G5T3 S3 - coastal marshes, tidal flats, sloughs, coves, estuaries, and lagoons behind barrier beaches; brackish and salt water; burrows into mud when inactive; may venture into lowlands at high tide
- Nerodia clarkii (Gulf Saltmarsh Snake) G4Q S4 - saline flats, coastal bays, and brackish river mouths

Natural Communities--
- Significant bottomland hardwood communities and other wetlands communities exist throughout the area.

Rookeries--(1992 information is most recent available)
- Colony #601-121, Dooms Island
- Colony #601-120, Sydney Island
- Colony #601-100, Texaco
- Colony #587-120, McFadden
- Colony #587-121, Beaumont Ship Channel

Managed Areas--
Lower Neches Wildlife Management Area - Old River Unit
Lower Neches Wildlife Management Area - Nelda Stark Unit
Sydnes Island - Audubon Preserve

The BCD information included here is based on the best data currently available to the state regarding threatened, endangered, or otherwise sensitive species. However, these data do not provide a definite statement as to the presence or absence of special species or natural communities within your project area, nor can these data substitute for an on-site evaluation by qualified biologists. This information is intended to assist you in avoiding harm to species that occur on your site.

This letter does not constitute a review of fish and wildlife impacts that might result from the activity for which this information is provided. Should you need an impact review of this type from the Texas Parks and Wildlife Department, contact the Habitat Assessment Branch, attention Mr. Roy Frye, or contact him at 512/389-4725. All requests for reviews must be in writing.

Please contact one of the Texas Parks and Wildlife Department's BCD Information Managers before publishing printout data or otherwise disseminating any specific locality information. Thank you again for contacting us. If you have additional questions, please feel free to call me or Shannon Breslin at 512/912-7011.

Sincerely,

Dorinda Scott

Dorinda Scott, Information System Manager
Texas Biological and Conservation Data System
Endangered Resources Branch

Enclosures

DLS:ds

TEXAS BIOLOGICAL AND CONSERVATION DATA SYSTEM
TEXAS PARKS AND WILDLIFE DEPARTMENT
27 SEP 1996

NAME: MALACLEMYS TERRAPIN LITTORALIS
COMMON NAME: TEXAS DIAMONDBACK TERRAPIN
OTHER NAME:
FEDERAL STATUS: STATE STATUS:
GLOBAL RANK: G5T3 STATE RANK: S3
IDENTIFIED: Y TRACK: Y SENSITIVITY:
COUNTY: Orange

USGS TOPO MAPS: TOPO QUAD: MARGIN #:
WEST OF GREENS BAYOU 2909387 2

ELEMENT OCCURRENCE NUMBER: 021 DATE LAST OBSERVED:
PRECISION: M DATE FIRST OBSERVED:
OCCURRENCE RANK: DATE SURVEYED:
SURVEY COMMENTS:

MANAGED AREAS: CONTAINED:

DIRECTIONS:
NORTH END OF SABINE LAKE.

DESCRIPTION:

QUALITATIVE/QUANTITATIVE DATA:

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:

SOURCE OF INFORMATION:
TEXAS COOPERATIVE WILDLIFE COLLECTION (TEXAS A&M UNIV) 35596ONE SPECIMEN.

TEXAS BIOLOGICAL AND CONSERVATION DATA SYSTEM
TEXAS PARKS AND WILDLIFE DEPARTMENT
27 SEP 1996

NAME: ROOKERY
COMMON NAME:
OTHER NAME: COLONY # 601-121, DOOMS ISLAND
FEDERAL STATUS: STATE STATUS:
GLOBAL RANK: STATE RANK:
IDENTIFIED: Y TRACK: Y SENSITIVITY:
COUNTY: Orange

USGS TOPO MAPS: TOPO QUAD: MARGIN #:
WEST OF GREENS BAYOU 2909387 4

ELEMENT OCCURRENCE NUMBER: 401 DATE LAST OBSERVED: 1984
PRECISION: S DATE FIRST OBSERVED: 1984
OCCURRENCE RANK: DATE SURVEYED:
SURVEY COMMENTS:

MANAGED AREAS: CONTAINED:

DIRECTIONS:
DOOMS ISLAND, INCLUDING THE SOUTHERN TIP OF STEWTS ISLAND AT THE MOUTH OF NECHES RIVER, NORTHWEST SABINE LAKE

DESCRIPTION:
GRAVEL/SHELL BEACH WITH BACCHARIS, SALT CEDAR, AND SEA OX-EYE ON SAND, SOIL, AND SHELL SURFACE; NESTS SUBJECT TO FLOODING

QUALITATIVE/QUANTITATIVE DATA:
NESTING COLONY OF THE BLACK SKIMMER

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:
COLONY NUMBER 601-121

SOURCE OF INFORMATION:
TEXAS COLONIAL WATERBIRD SOCIETY AND TPWD. 1981-1985. SPECIAL ADMINISTRATIVE REPORTS, TCW ANNUAL CENSUS SUMMARIES.

TEXAS BIOLOGICAL AND CONSERVATION DATA SYSTEM
TEXAS PARKS AND WILDLIFE DEPARTMENT
08 OCT 1996

NAME: ROOKERY
COMMON NAME:
OTHER NAME: COLONY # 601-120, SYDNEY ISLAND
FEDERAL STATUS: STATE STATUS:
GLOBAL RANK: STATE RANK:
IDENTIFIED: Y TRACK: Y SENSITIVITY:
COUNTY: Orange

USGS TOPO MAPS: TOPO QUAD: MARGIN #:
WEST OF GREENS BAYOU 2909387 3

ELEMENT OCCURRENCE NUMBER: 174 DATE LAST OBSERVED: 1992
PRECISION: S DATE FIRST OBSERVED: 1973
OCCURRENCE RANK: DATE SURVEYED:
SURVEY COMMENTS:

MANAGED AREAS: CONTAINED:
SYDNES ISLAND Y

DIRECTIONS:
SPOIL ISLAND ALONG GIWW--SYDNEY ISLAND; EAST-SOUTHEAST OF OLD RIVER COVE

DESCRIPTION:
DREDGED MATERIAL ISLAND WITH GRASS AND PRICKLY PEAR TO 1 METER, SHRUBS TO 1.3 METERS, SCATTERED TREES TO 4 METERS; MAXIMUM ELEVATION 2 METERS OR LESS; HUMAN DISTURBANCE MODERATE

QUALITATIVE/QUANTITATIVE DATA:
NESTING COLONY OF THE BLACK SKIMMER

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:
COLONY NUMBER 601-120

SOURCE OF INFORMATION:
TEXAS COLONIAL WATERBIRD SOCIETY AND TPWD. 1991-1992. SPECIAL ADMINISTRATIVE REPORTS, TCW ANNUAL CENSUS SUMMARIES.

TEXAS BIOLOGICAL AND CONSERVATION DATA SYSTEM
TEXAS PARKS AND WILDLIFE DEPARTMENT
08 OCT 1996

NAME: ROOKERY
COMMON NAME:
OTHER NAME: COLONY # 601-100, TEXACO
FEDERAL STATUS: STATE STATUS:
GLOBAL RANK: STATE RANK:
IDENTIFIED: Y TRACK: Y SENSITIVITY:
COUNTY: Jefferson

USGS TOPO MAPS: TOPO QUAD: MARGIN #:
PORT ARTHUR NORTH 2909388 1

ELEMENT OCCURRENCE NUMBER: 175 DATE LAST OBSERVED: 1976
PRECISION: S DATE FIRST OBSERVED: 1976
OCCURRENCE RANK: DATE SURVEYED:
SURVEY COMMENTS:

MANAGED AREAS: CONTAINED:

DIRECTIONS:
PETROLEUM TANK CONSTRUCTION PAD; WEST OF HOUSTEN SCHOOL IN PORT ARTHUR; NORTH OF OIL REFINERY IN PORT ARTHUR; SOUTHWEST CORNER OF INTERSECTION OF HIGHWAY 73 AND 287

DESCRIPTION:
UNVEGETATED SHELL; MAXIMUM ELEVATION 1 METER; HUMAN DISTURBANCE HEAVY

QUALITATIVE/QUANTITATIVE DATA:
NESTING COLONY OF THE BLACK SKIMMER

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:
COLONY NUMBER 601-100

SOURCE OF INFORMATION:
MULLINS, L.M. ET.AL. 1982. ET.SEQ. ATLAS & CENSUS OF TEXAS WATERBIRD COLONIES, 1973-1980. TX COLONIAL WATERBIRD SOCIETY. (AND SPECIAL ADMINISTRATIVE REPORT FOR 1989, 1988, 1987, AND 1986.)

TEXAS BIOLOGICAL AND CONSERVATION DATA SYSTEM
TEXAS PARKS AND WILDLIFE DEPARTMENT
08 OCT 1996

NAME: ROOKERY
COMMON NAME:
OTHER NAME: COLONY # 587-120, MCFADDEN
FEDERAL STATUS: STATE STATUS:
GLOBAL RANK: STATE RANK:
IDENTIFIED: Y TRACK: Y SENSITIVITY:
COUNTY: Jefferson

USGS TOPO MAPS: TOPO QUAD: MARGIN #:
BEAUMONT EAST 3009411 3

ELEMENT OCCURRENCE NUMBER: 178 DATE LAST OBSERVED: 1990
PRECISION: S DATE FIRST OBSERVED: 1980
OCCURRENCE RANK: DATE SURVEYED:
SURVEY COMMENTS:

MANAGED AREAS: CONTAINED:

DIRECTIONS:
RIVER BOTTOM SITE ALONG NECHES RIVER; AT JEFFERSON AND ORANGE COUNTY LINE; SOUTHEAST OF CITY OF BEAUMONT

DESCRIPTION:
RIVER BOTTOM SITE WITH HARDWOOD TREES TO 5 METERS; MAXIMUM ELEVATION 10 METERS

QUALITATIVE/QUANTITATIVE DATA:
NESTING COLONY OF THE OLIVACEOUS CORMORANT, SNOWY EGRET, CATTLE EGRET, ROSEATE SPOONBILL, GREAT EGRET

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:
COLONY NUMBER 587-120

SOURCE OF INFORMATION:
TEXAS COLONIAL WATERBIRD SOCIETY AND TPWD. 1990. SPECIAL ADMINISTRATIVE REPORT, TCW ANNUAL CENSUS SUMMARY.

TEXAS BIOLOGICAL AND CONSERVATION DATA SYSTEM
TEXAS PARKS AND WILDLIFE DEPARTMENT
08 OCT 1996

NAME: ROOKERY
COMMON NAME:
OTHER NAME: COLONY # 587-121, BEAUMONT SHIP CHANNEL
FEDERAL STATUS: STATE STATUS:
GLOBAL RANK: STATE RANK:
IDENTIFIED: Y TRACK: Y SENSITIVITY:
COUNTY: Jefferson

USGS TOPO MAPS: TOPO QUAD: MARGIN #:
BEAUMONT EAST 3009411 2

ELEMENT OCCURRENCE NUMBER: 177 DATE LAST OBSERVED: 1990
PRECISION: S DATE FIRST OBSERVED: 1976
OCCURRENCE RANK: DATE SURVEYED:
SURVEY COMMENTS:

MANAGED AREAS: CONTAINED:

DIRECTIONS:
SPOIL ISLAND ALONG MCFADDEN BEND CUTOFF; AT JEFFERSON AND ORANGE COUNTY LINE

DESCRIPTION:
SHRUBS ON DREDGED MATERIAL ISLAND; MAXIMUM ELEVATION 1 METER

QUALITATIVE/QUANTITATIVE DATA:
NESTING COLONY OF THE GREAT EGRET, ROSEATE SPOONBILL, ANHINGA

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:
COLONY NUMBER 587-121

SOURCE OF INFORMATION:
TEXAS COLONIAL WATERBIRD SOCIETY AND TPWD. 1990. SPECIAL ADMINISTRATIVE REPORT, TCW ANNUAL CENSUS SUMMARY.

TEXAS BIOLOGICAL AND CONSERVATION DATA SYSTEM
TEXAS PARKS AND WILDLIFE DEPARTMENT
MANAGED AREA INFORMATION
08 OCT 1996

NAME: LOWER NECHES WILDLIFE MANAGEMENT AREA
MANAGED AREA TYPE CODE: SPWWM
COUNTY NAME(S): Orange

USGS TOPO QUADS: TERRY
ORANGE
ORANGEFIELD
WEST OF GREENS BAYOU
ECHO

ESTABLISHED: 1986- - ESTABLISHED SIZE: 11113.00
DESCRIPTION: FLOODPLAIN WETLANDS BETWEEN THE NECHES AND SABINE RIVERS; CONSISTS OF FOUR NON-CONTIGUOUS UNITS--NELDA STARK UNIT, OLD RIVER UNIT, ADAMS BAYOU UNIT, AND BLUE ELBOW--SEE INDIVIDUAL UNIT RECORDS FOR ADDITIONAL INFORMATION

COMMENTS: ACCESS RESTRICTED TO PERMITTED HUNTERS; BOUNDARIES ARE APPROXIMATE

MANAGEMENT:

MANAGER: JIM SUTHERLIN
MGR.INST.:

ADDRESS: 10 PARKS AND WILDLIFE DRIVE
PORT ARTHUR , TX 77640
PHONE: 409 736-2551

TEXAS BIOLOGICAL AND CONSERVATION DATA SYSTEM
TEXAS PARKS AND WILDLIFE DEPARTMENT
MANAGED AREA INFORMATION
08 OCT 1996

NAME: LOWER NECHES WMA - NELDA STARK UNIT
MANAGED AREA TYPE CODE: SPWWM
COUNTY NAME(S): Orange

USGS TOPO QUADS: TERRY

ESTABLISHED: SIZE: 3451.00
DESCRIPTION:

COMMENTS: BOUNDARIES ARE APPROXIMATE; ACCESS RESTRICTED TO PERMITTED HUNTERS

MANAGEMENT:

MANAGER: JIM SUTHERLIN
MGR.INST.:

ADDRESS: 10 PARKS AND WILDLIFE DRIVE
PORT ARTHUR , TX 77640
PHONE: 409 736-2551

TEXAS BIOLOGICAL AND CONSERVATION DATA SYSTEM
TEXAS PARKS AND WILDLIFE DEPARTMENT
MANAGED AREA INFORMATION
08 OCT 1996

NAME: SYDNES ISLAND
MANAGED AREA TYPE CODE: PNAPR
COUNTY NAME(S): Orange

USGS TOPO QUADS: WEST OF GREENS BAYOU

ESTABLISHED: 1974-11-05 ESTABLISHED SIZE: 128.00
DESCRIPTION: SPOIL ISLAND CREATED BY DREDGING ACTIVITIES (1955). ISLAND HAS BECOME NESTING SITE FOR NUMEROUS BIRD SPECIES

COMMENTS: LEASED FROM GLO UNDER LEASE NO. CL-1001 TO YR 2005

MANAGEMENT:

MANAGER: SUE BAILEY
MGR.INST.:

ADDRESS: P.O. BOX 11
BRIDGE CITY , TX 77611
PHONE: 409 735-4298

DRAFT

TEXAS PARKS AND WILDLIFE DEPARTMENT
ENDANGERED RESOURCES BRANCH
SPECIAL SPECIES LIST
JEFFERSON COUNTY

DRAFT
Revised:
96-10-10

Scientific Name	Common Name	Federal Status	State Status
*** AMPHIBIANS			
RANA GRYLIO	PIG FROG		
*** BIRDS			
CHARADRIUS MELODUS	PIPING PLOVER	LT	T
EGRETTA RUFESCENS	REDDISH EGRET	SOC	T
FALCO PEREGRINUS ANATUM	AMERICAN PEREGRINE FALCON	LE	E
FALCO PEREGRINUS TUNDRIUS	ARCTIC PEREGRINE FALCON	E/SA	T
MYCTERIA AMERICANA	WOOD STORK		T
PELECANUS OCCIDENTALIS	BROWN PELICAN	LE	E
PLEGADIS CHIHI	WHITE-FACED IBIS	SOC	T
STERNA ANTILLARUM ATHALASSOS	INTERIOR LEAST TERN	LE	E
*** MAMMALS			
CANIS RUFUS	RED WOLF	LE	E
CORYNORHINUS RAFINESQUII	RAFINESQUE'S BIG-EARED BAT	SOC	T
*** REPTILES			
CARETTA CARETTA	LOGGERHEAD SEA TURTLE	LT	E
CEMOPHORA COCCINEA COPEI	NORTHERN SCARLET SNAKE		T
CHELONIA MYDAS	GREEN SEA TURTLE	LT	T
CROTALUS HORRIDUS	TIMBER RATTLESNAKE		T
DERMOCHELYS CORIACEA	LEATHERBACK SEA TURTLE	LE	E
ERETMOCHELYS IMBRICATA	HAWKSBILL SEA TURTLE	LE	E
LEPIDOCHELYS KEMPII	KEMP'S RIDLEY SEA TURTLE	LE	E
MACROCLEMYS TEMMINCKII	ALLIGATOR SNAPPING TURTLE	SOC	T
MALACLEMYS TERRAPIN LITTORALIS	TEXAS DIAMONDBACK TERRAPIN	SOC	
NERODIA CLARKII	GULF SALTMARSH SNAKE	SOC	
PHRYNOSOMA CORNUTUM	TEXAS HORNED LIZARD	SOC	T
*** VASCULAR PLANTS			
ELEOCHARIS WOLFII	WOLF'S SPIKESEDGE	SOC	
LEITNERIA FLORIDANA	CORKWOOD	SOC	
SILENE SUBCILIATA	SCARLET CATCHFLY	SOC	

Codes:
- LE,LT - Federally Listed Endangered/Threatened
- PE,PT - Federally Proposed Endangered/Threatened
- E/SA,T/SA - Federally Endangered/Threatened by Similarity of Appearance
- C1 - Federal Candidate, Category 1; information supports proposing to list as endangered/threatened
- SOC - Federal Species of Concern
- DL,PDL - Federally Delisted/Proposed Delisted
- E,T - State Endangered/Threatened

G#T# - "G"= species rank; "T"= rank of variety or subspecies taxa.
GU - Possibly in peril range-wide, but status uncertain.
G#G# - Ranked within a range as status uncertain.
GX - Believed to be extinct throughout range.
Q - Qualifier denoting questionable taxonomic assignment.
? - Not ranked to date; or, Qualifier denoting uncertain rank.
C - Captive population exists.

STATE RANK (SRANK)
S1 - Critically imperiled in state, extremely rare, very vulnerable to extirpation, 5 or fewer occurrences.
S2 - Imperiled in state, very rare, vulnerable to extirpation, 6 to 20 occurrences.
S3 - Rare or uncommon in state, 21 to 100 occurrences.
S4 - Apparently secure in state.
S5 - Demonstrably secure in state.
SA - Accidental in state.
SE - An exotic species established in state.
SH - Of historical occurrence in state. May be rediscovered.
SP - Potential occurrence in state.
SR - Reported, but without persuasive documentation.
SRF - Reported in error, but error persists in literature.
SU - Possibly in peril in state, but status uncertain.
SX - Apparently extirpated from State.
SZ - Migratory/transient in state to irregular/dispersed locations.
B - Basic rank refers to the breeding population in the state.
N - Basic rank refers to the non-breeding population in the state.
? - Not ranked to date; or, Qualifier denoting uncertain rank.
C - Captive population exists.

PRECISION
S - Second: Accuracy within 3-second radius of latitude/longitude.
M - Minute: Accuracy within 1-minute radius of lat/long, approx. 2 km or 1.5 mi radius.
G - Occurrence mapped general to quad or place name precision only, precision within about 8 km or 5 mi radius.
U - Unmappable record.

OCCURRENCE RANK

A - Excellent	**AI** - Excellent, Introduced
B - Good	**BI** - Good, Introduced
C - Marginal	**CI** - Marginal, Introduced
D - Poor	**DI** - Poor, Introduced
E - Extant/Present	**EI** - Extant, Introduced
H - Historical/No Field Information	**HI** - Historical, Introduced
O - Obscure	**OI** - Obscure, Introduced
X - Destroyed/Extirpated	**XI** - Destroyed, Introduced

MANAGED AREA - CONTAINED (code following managed area name)
Y - Element occurrence contained within managed area boundaries.
N - Element occurrence is not entirely contained within managed area boundaries.
? - Whether the element occurrence is wholly contained or not within managed area boundaries is disputed.
blank - No information available.

CODE KEY

FEDERAL STATUS (USESA)

LE - Listed Endangered
LT - Listed Threatened
LELT - Listed Endangered in part of range, Threatened in a different part
PE - Proposed to be listed Endangered
PT - Proposed to be listed Threatened
E(S/A) or T(S/A) - Listed Endangered or Threatened on basis of Similarity of Appearance.
DL - Delisted Endangered/Threatened
C1 - Candidate, Category 1. USFWS has substantial information on biological vulnerability and threats to support proposing to list as endangered or threatened. Data are being gathered on habitat needs and/or critical habitat designations.
C1* - C1, but lacking known occurrences
C1** - C1, but lacking known occurrences, except in captivity/cultivation
C2 - Candidate, Category 2. Information indicates that proposing to list as endangered or threatened is possibly appropriate, but substantial data on biological vulnerability and threats are not currently known to support the immediate preparation of rules. Further biological research and field study will be necessary to ascertain the status and/or taxonomic validity of the taxa in Category 2.
C2* - C2, but lacking known occurrences
C2** - C2, but lacking known occurrences, except in captivity/cultivation
3 - Taxa no longer being considered for listing as threatened or endangered. Three subcategories indicate the reasons for removal from consideration.
3A - Former Candidate, rejected because presumed extinct and/or habitats destroyed
3B - Former Candidate, rejected because not a recognized taxon; i.e. synonym or hybrid
3C - Former Candidate, rejected because more common, widespread, or adequately protected
XE - Essential Experimental Population.
XN - Non-essential Experimental Population.

STATE STATUS

E - Listed as Endangered in the State of Texas
T - Listed as Threatened in the State of Texas

GLOBAL RANK (GRANK)

G1 - Critically imperiled globally, extremely rare, 5 or fewer occurrences. [Critically endangered throughout range.]
G2 - Imperiled globally, very rare, 6 to 20 occurrences. [Endangered throughout range.]
G3 - Very rare and local throughout range or found locally in restricted range, 21 to 100 occurrences. [Threatened throughout range.]
G4 - Apparently secure globally.
G5 - Demonstrably secure globally.
GH - Of historical occurrence through its range.

APPENDIX F

Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

Population Around Star Lake Canal

Jefferson County, Texas

Location of site: Latitude 29 degrees, 58 minutes, 42 seconds N
Longitude 93 degrees, 55 minutes, 04 seconds W

The following estimated population totals are based on block-level 1990 U.S. Census Bureau data, which is the most current and detailed population data available. Since census blocks vary in size and since some blocks lie only partially within a circle described by a given radius, these numbers were computed by averaging the highest and lowest possible population totals for each radius.

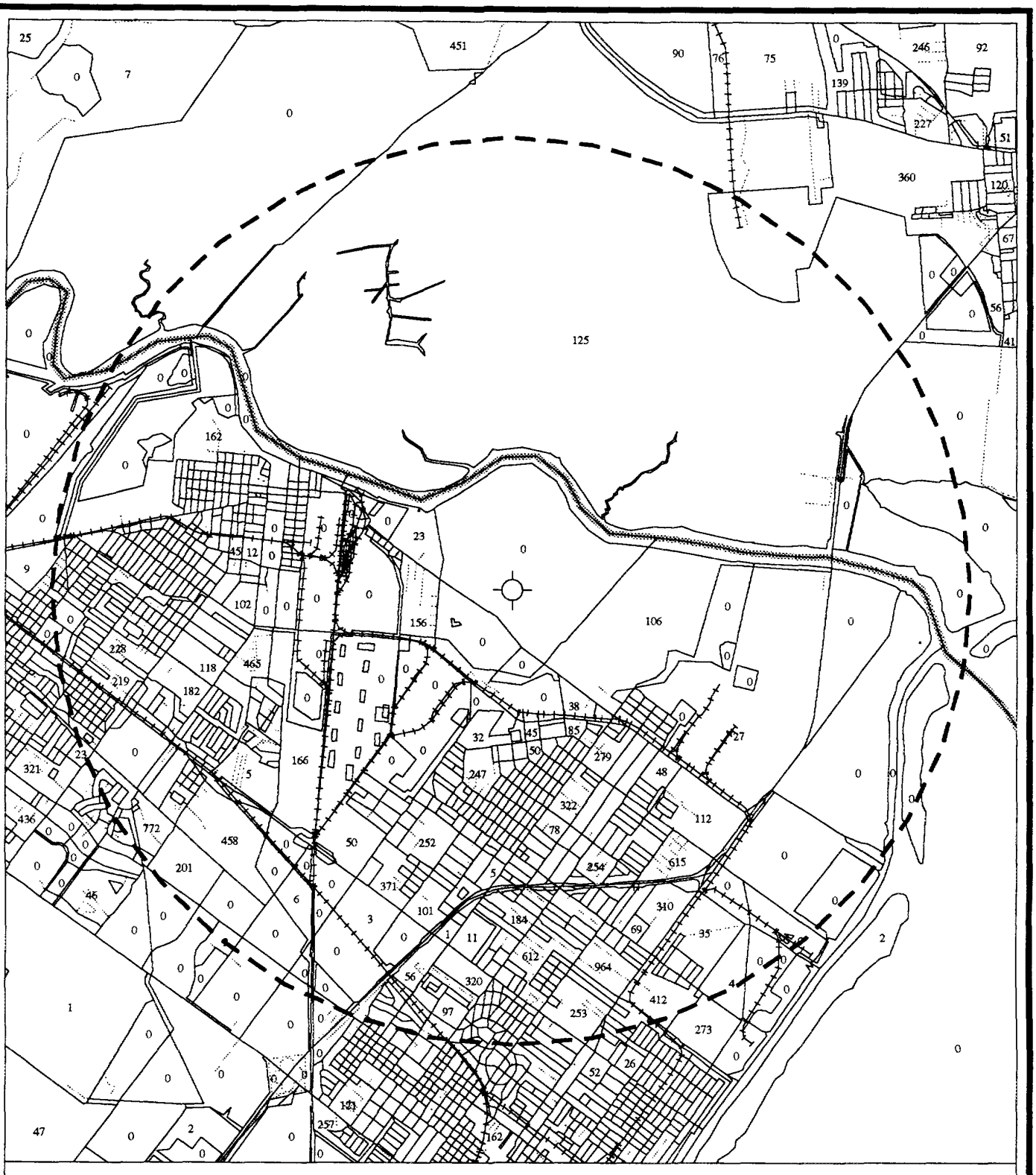
Radius (mi)	Highest	Lowest	Average
.25	0	0	0
.5	0	0	0
1	380	0	190
2	7,121	4,713	5,918
3	25,414	20,527	22,970
4	46,768	39,924	43,346

Given the above average population numbers, the estimated total population that lives within each distance range from the site can be computed:

Distance Range	Estimated Population
0 to .25	0
.25 to .5	0
.5 to 1	190
1 to 2	5,728
2 to 3	17,052
3 to 4	20,376

M McDonough
GIS Section

09/16/96
CRF 970916004



star-lake-canal

1990 Census Block Boundaries and Populations
4 Mile Radius Circle Centered on Latitude 29.9784 N, Longitude 93.9180 W

970916004 mmcdonou

FIELD AUDIT CHECKLIST

Case No.: 25093

Project Name: Star Lake Canal

Site Investigation Manager: Marshall Cedilote

Auditor: DeAnna Epperson

Dates of Field Audit: 10/22/96 - 10/24/96

o The Site-Specific Health and Safety Plan has been prepared by the TNRCC Site Investigation Manager and subsequently approved by the TNRCC Project Manager and TNRCC Health and Safety Officer prior to arrival to the site.

Yes _X_ No ___

Comments _____

o The Site-Specific Health and Safety Plan has been signed by all who intend to enter within the site boundaries prior to entry onto the site.

Passed _X__ Failed __

Comments Each member of the team signed and dated the Health and Safety daily briefing sheet each day of the site investigation.

o Project organization:

Did the Site Investigation Manager hold a briefing with each participant to go over any concerns or questions for project organization; and

Did the Site Investigation Manager provide appropriate number and types of material supplies necessary to collect samples (jars, bottles, gloves, pens, coolers, coolant, preservatives, protective gear, Work Plan, Health and Safety Plan, CLP, QAPP or other reference material)?

Adequate _X_ Marginal ___ Failed ___

Comments_____

- Were additional instructions given to each participant not otherwise found in the preliminary written material, such as the Site-Specific Work Plan, Health and Safety Plan, CLP or QAPP?

  Not Applicable _X_

  Additional Instructions:_____

- Samples collection procedures:

  The Site Investigation Manager ensured that the sampler collected adequate volumes of sample to allow for the planned sample analyses and field duplicates, plus any laboratory QC blanks and laboratory QC duplicates/spikes, as applicable; and

  The Site Investigation Manager provided a supply of the appropriate type of sample containers for the samples collected.

No Modifications _X_ Modifications ___ Failed ___

Comments: _____

- Were samples collected as stated in the Site-Specific Work Plan (number, frequency, and type)?

No Modifications ___ Modifications _X_

Sample Modifications

Comments: One sample and its duplicate were omitted from the original sampling plan.

- Sample container labeling:

  The Site Investigation Manager ensured that the sample tags were properly completed and attached to each sample container;

  The Site Investigation Manager ensured that the custody seals were properly completed and attached to each sample container in unbroken condition; and

  The Site Investigation Manager ensured that each sample container was labeled with the sample number and protected with clear tape.

Passed _X_ Failed ___

Comments _____

- Each traffic report has been completed, original copy mailed to EPA, and copies corrected as necessary.

Passed _X_ Failed ___

Comments_____

- The traffic report accompanied each shipment to the correct EPA contract lab.

Passed _X_ Failed ___

Comments_____

- Field observations are written in ink and are presented accurately in the field logbook, and each page is signed and dated.

Passed _X_ Failed ___

Comments_____

_____

- Photographs are logged in the logbook with the date, time, location, name of person taking the picture, type of sample, sample number, and the photo number.

Yes _X_ No ___

Comments_____

_____

- Prior to use, the Site Investigation Manager ensured that the measuring equipment was calibrated to standard procedures as presented in accompanied documents written specifically for the instrument.

Passed _X_ Failed ___

Comments_____

_____

- Have any accountable documents been lost?

Not Applicable _X_

Documents Lost_____

General Comments or Concerns Regarding the Sampling Procedures, Organization, and Site Investigation Management:

This was a well organized and well planned site screening inspection. The members worked smoothly without any major problems. The project manager provided each member a briefing of their tasks and ensured the their completion to his satisfaction.

Signature of Auditor DeAnna Epperson

APPENDIX G

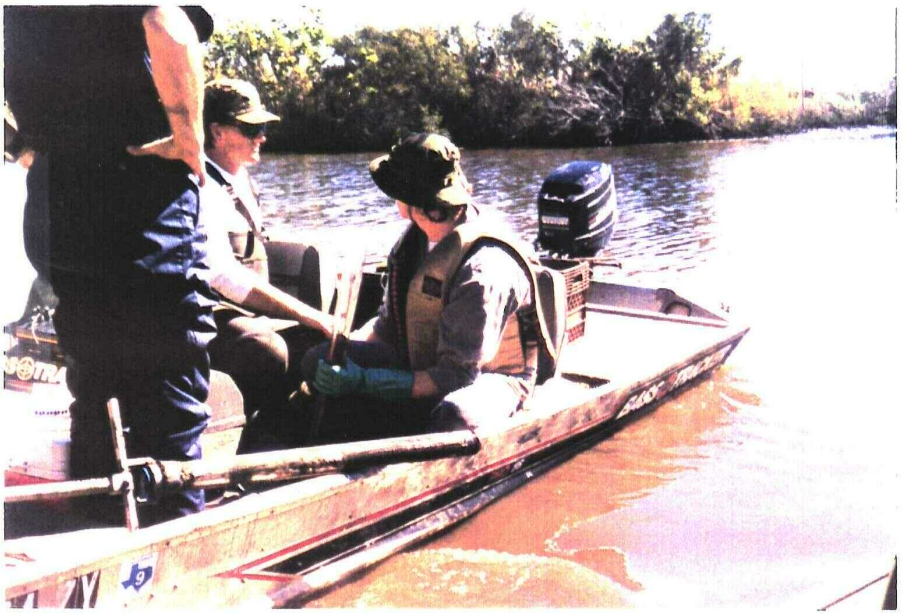


Photo 12 (Facing Southeast) Date: 10/23/96 Photographer: Daniel Benson
SE-8 sample location in Star Lake Canal.

Photo 13 (Facing Southeast) Date: 10/23/96 Photographer: Daniel Benson
SE-9 sample location in marsh adjacent to Star Lake Canal.

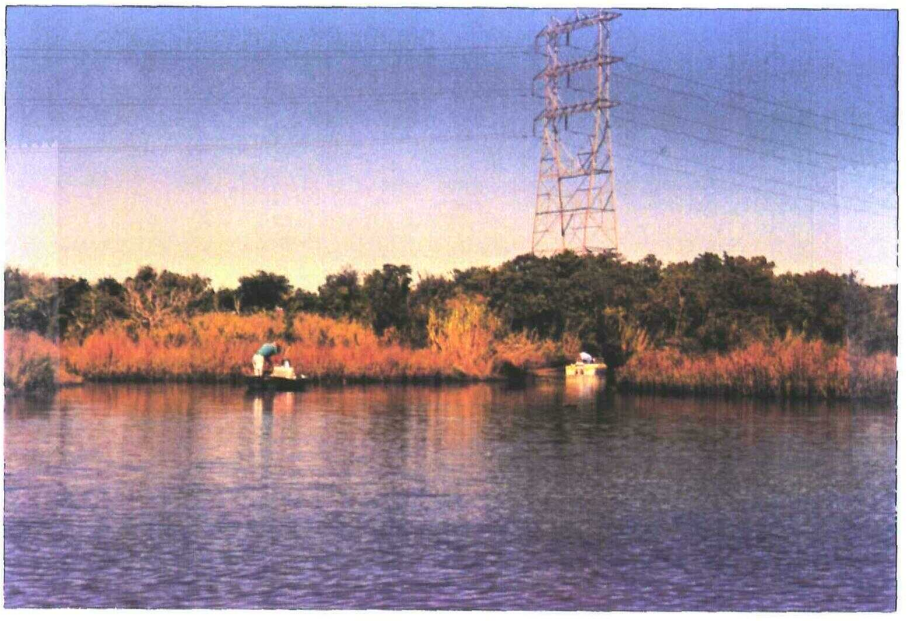


Photo 14 (Facing Northwest) Date: 10/23/96 Photographer: Daniel Benson
Documentation that sport fishermen use areas adjacent to Star Lake Canal.

Photo 15 (Facing South) Date:10/23/96 Photographer: Daniel Benson
SE-20 and SE-21 sample locations upstream in Star Lake Canal.

Photo 16 (Facing South) Date: 10/23/96 Photographer: Daniel Benson
SE-19 sample location at confluence of Jefferson Canal with Star Lake Canal.
NOTE: This photo was overexposed and is therefore unavailable.

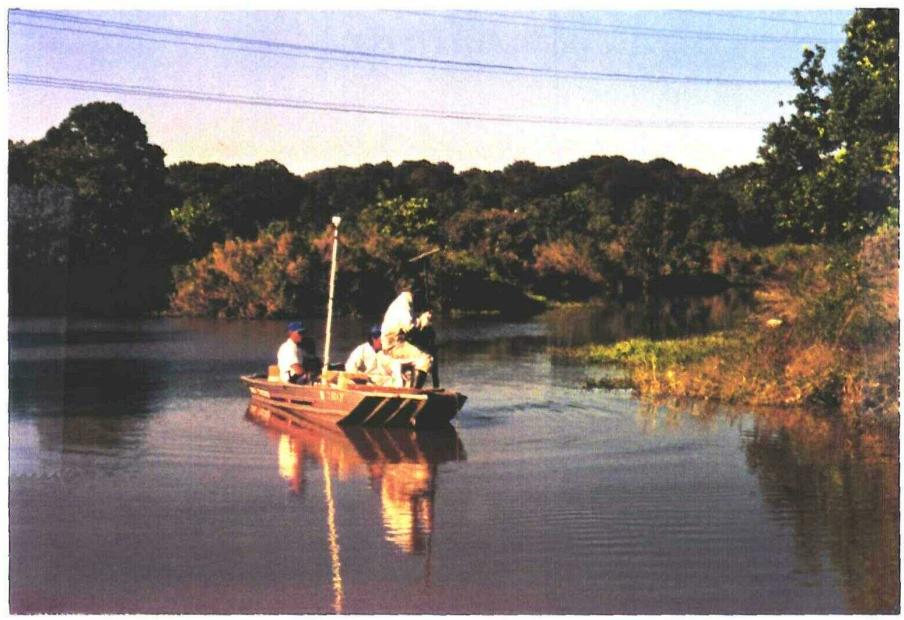


Photo 17 (Facing North) Date: 10/23/96 Photographer: Daniel Benson
SE-16 sample location upstream in Jefferson Canal.

Photo18 (Facing West) Date: 10/23/96 Photographer: Daniel Benson
SE-15 sample location in Star Lake Canal upstream of Sara Jane Road bridge.

Photo 20 (Facing East) Date: 10/23/96 Photographer: Daniel Benson
SE-11 sample location in Molasses Bayou adjacent to Star Lake Canal.

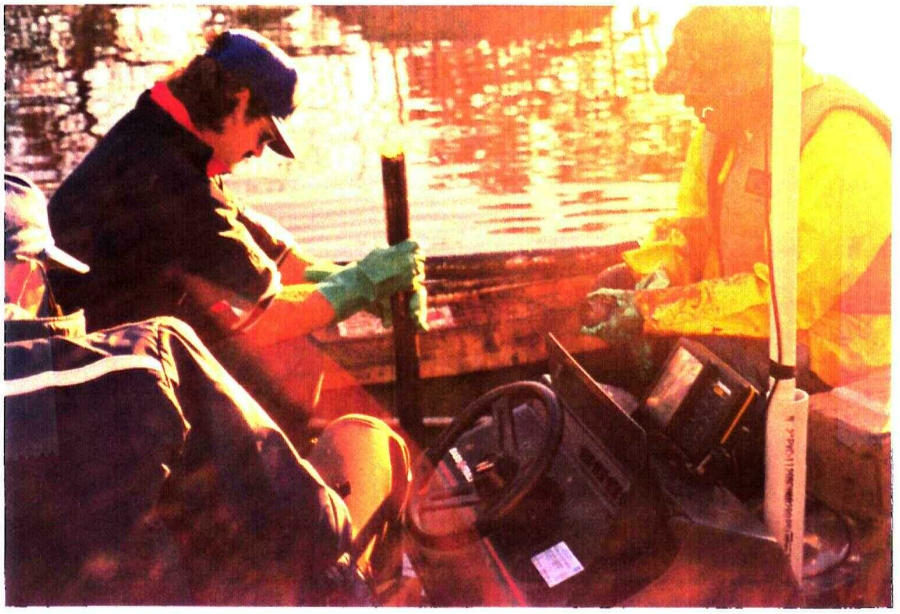


Photo 21 (Facing Southwest) Date: 10/23/96 Photographer: Daniel Benson
SE-10 sample location in Molasses Bayou adjacent to Star Lake Canal.

Photo 22 (Facing Southwest) Date: 10/23/96 Photographer: Daniel Benson
SE-12 sample location in marsh adjacent to Star Lake Canal.

Photo 23 (Facing West) Date: 10/23/96 Photographer: Marshall Cedilote
Decontamination of equipment.

Photo 24 (Facing West) Date: 10/23/96 Photographer: Marshall Cedilote
Taking sample ER-3 (equipment rinsate).

Photo 25 (Facing West) Date: 10/23/96 Photographer: Marshall Cedilote
Taking sample FB-2 (field blank).

APPENDIX I

APPENDIX B

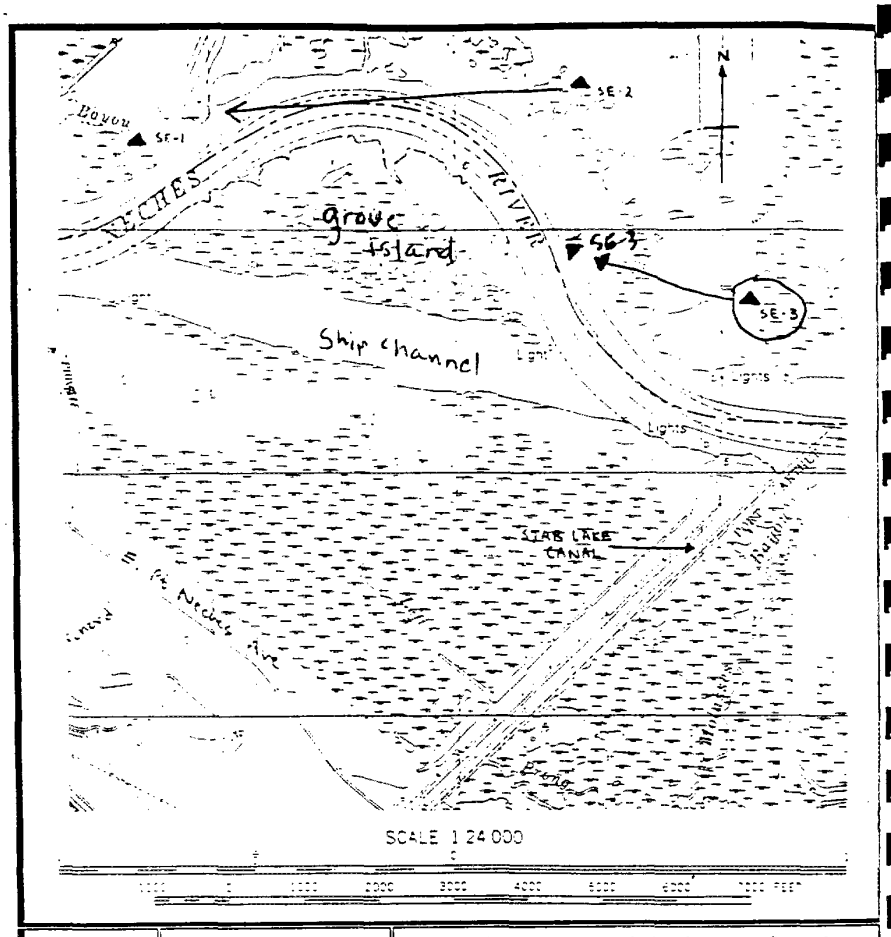
2

Table 2. Proposed Samples to be Collected

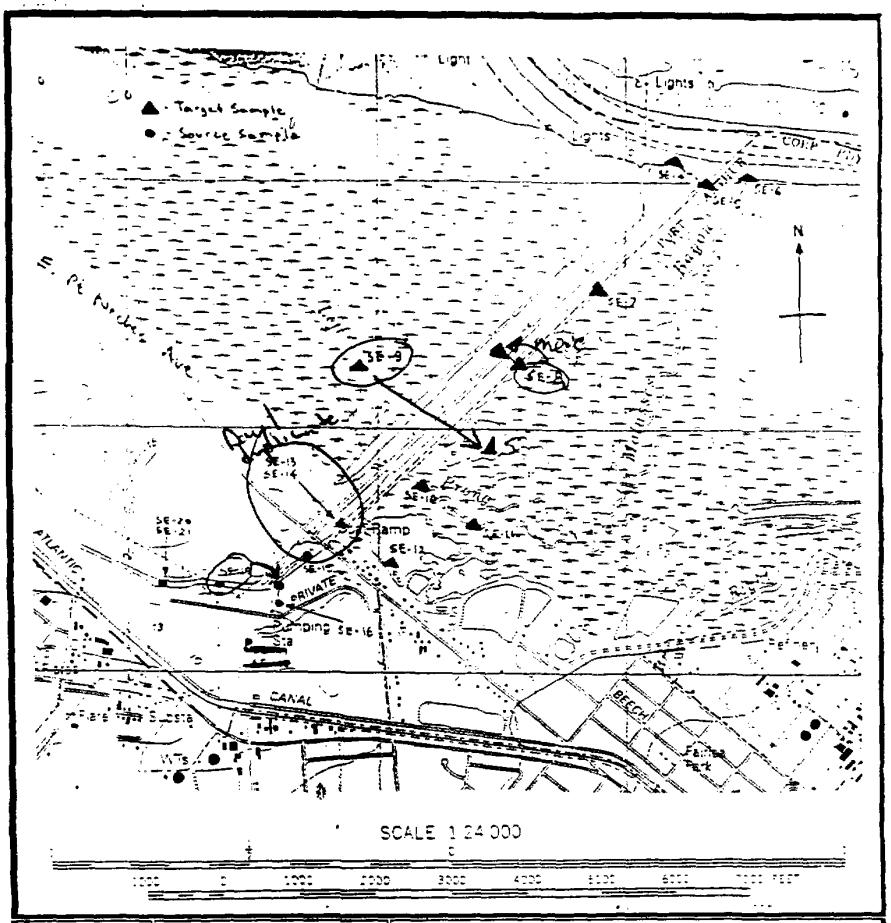
Sample Matrix	Sample ID	Sample Location	Rationale
Sediment	SE-1	Sediment sample on northern side of the Neches River in shallow marshland (Figure 2).	Background sample
	SE-2	Sediment sample on northern side of the Neches River in shallow marshland (Figure 2).	Background sample
	SE-3	Sediment sample on northern side of the Neches River in shallow marshalnd (Figure 2).	Background sample
	SE-4	Sediment sample west of confluence of SLC with the Neches River (Figure 3	Target sample downstream in TDL to assess and characterize any contaminanation of the Neches River fishery.
	SE-5	Sediment sample at confluence of SLC and the Neches River (Figure 3).	Target sample downstream in TDL to assess and characterize any contaminanation of the Neches River fishery
	SE-6	Sediment sample east of confluence of SLC with the Neches River (Figure 3).	Target sample downstream in TDL to assess and characterize any contaminanation of the Neches River fishery
	SE-7	Sediment sample in SLC adjacent to wetlands (Figure 3)	Target sample to assess and characterize any contamination in wetland area.
	SE-8	Sediment sample in SLC adjacent to wetlands (Figure 3).	Target sample to assess and characterize any contamination in wetland area
	SE-9	Sediment sample in wetlands area (Figure 3). This sample location may be moved if this area is inaccessable by boat during the SSI.	Target sample to assess and characterize any contamination in wet and area.
	SE-10	Sediment sample in left prong of Molasses Bayou (Figure 3	Target sample to assess and characterize any contamination in wetland area
	SE-11	Sediment sample in left prong of Molasses Bayou (Figure 3	Target sample to assess and characterize any contamination in wetland area
	SE-12	Sediment sample southeast of boat ramp in marshland (Figure 3).	Target sample to assess and characterize any contamination in wetland area

Sample Matrix	Sample ID	Sample Location	Rationale
Sediment	SE-13	Sediment sample taken at boat ramp (Figure 3)	Target sample at PPE
	SE-14	Sediment sample taken at boat ramp (Figure 3). This is not a duplicate of SE-13	Target sample at PPE
	SE-15	Sediment source sample in SLC (Figure 3).	Delineate and characterize source
	SE-16	Sediment source sample in Jefferson Canal (Figure 3)	Delineate and characterize source.
	SE-17	Sediment source sample from headwaters of Jefferson Canal (Figure 3).	Delineate and characterize source
	SE-18	QA/QC	Duplicate sample taken at same location as SE-17.
	SE-19	Sediment source sample in SLC (Figure 3).	Delineate and characterize source.
	SE-20	Sediment source sample at dam across SLC (Figure 3)	Delineate and characterize source
	SE-21	QA/QC	Duplicate sample taken at same location as SE-20
Rinsate	R-1	Rinsate sample from Eckman dredge and core sampler prior to Day 1 of sediment sampling.	QA/QC
	R-2	Rinsate sample from Eckman dredge and core sampler after to Day 1 of sediment sampling.	QA/QC
	R-3	Rinsate sample from Eckman dredge and core sampler after Day 2 of sediment sampling.	QA/QC
	FB-1	Field blank collected at same time as R-1.	QA/QC
	FB-2	Field blank collected at same time as R-3.	QA/QC

4



TNRCC	Figure 2 Proposed Background Sample Locations	Star Lake Canal and Jefferson Canal Port Neches, Jefferson County, Texas CERCLIS No. TX0001414341



TNRCC	Figure 3 Proposed Sediment Sample Locations	Star Lake Canal and Jefferson Canal Port Neches, Jefferson County, Texas CERCLIS No. TX0001414341

6

Contacts:

Tim Praznik 409 723-3431

Greg Conley 409 898-3838 Mobil 409 782-2842

Marshall Cedilote 10/22/96

FIEL
NOTE

10/22/96

Arrived at site at 7:35 Am

Met Tim Praznik - Huntsman

Daniel Benson conducted Safety Briefing

Marty Briggs - Huntsman arrived 7:50 AM

Began setting up decon for core sampler

Wes and Deanna left site @ 8:25 for wal mart for bottle brush

Will get zero-contamination tubes sent from Austin by bus

Greg Conley arrived 8:25

Debra and Daniel verified that OVA worked and was calibrated

9:13 Am - Began taking rinsate and field blank samples

Left Huntsman boat ramp at 10:15 AM

10:37 arrived at SE-01 sample location - directly accross from O & O plant (Texaco) dock. This is a background sample on Neches River (Ship Channel)

Grey clay organic matter, slight odor, extremely wet clay

Photo #2 by D. Benson looking South at SE-1 sample location.

(Sample taken by Debra Hendricks) across Neches River (at 10:40 a.m.) M. Cedilote used core sampler and Debra mixed composite

Sample depth approx 1' below water surface

Weather is cool ± 68°F, cloudy with no sun. Wind out of the NW at about 15-20 mph

Star is splitting Samples w/ TNRCC using their own containers. (for SE-1)

11:10 Arrive at SE-2 location approx. 200 yards north from confluence of Ship channel and Neches River. Depth of sample approx 1.5' below water surface

Photo #3 by. D. Benson looking south across Neches River toward ship channel. View of sediment sample location SE-2 - GPS File# R102322A N 29°59'38.67" W 93°55'30.81" visual

Sample is dark black/grey clay, silty sand mixed in also - organic matter (roots), wet, slightsheen

Sample by D. Hendricks at 11:15 am - Star did not split SE-2.

All samples taken today will utilize dedicated spoons/bowls from Decon Event #10

Daniel Benson 10/22/96

Marshall Cecilton 10/22/96

8

10/22/96

11:42 Arrived at SE-Location SE-3. Depth of sample approx 2' below water surface. We are downstream from SE at Neches River & Ship Channel West bank of Old Neches River. Bottom is very sandy and sample retreival is difficult (low recovery). Moving out from bank approx 15' no luck - trying North Bank.
Photo #4 SE-3 looking South toward Ship Channel. Photo by D. Benson
D. Hendricks mixed composite sample and filled jars once we got to North bank and recovered SE-3. Star did not split sample
Weather is still cool, no rain yet although it was raining earlier, no Sun
Wind out of NW.

12:34 SE-4 location is on upstream side of outfall at Canal and Neches River intersection (approx 30 yds from canal) See page 31 for additional information
Photo #6 by D Benson looking North at SE-4 location
Star is splitting this sample with us.

2:35 SE-13, SE-14 sediment samples taken approx 40' downstream from E Pt Neches Avenue bridge and near the public boat ramp
SE-14 is field duplicate of SE-13
Photograph 7 by D Benson facing East looking at SE-13 sample location
Recovery of this sample was difficult. Black stiff clay - all the way

Work plan modified as follows: 13 and 14 were taken on afternoon of 10/22/96, SE-14 is a duplicate of SE-13

Finished work at site at 5:00 PM
Loaded sample coolers into truck
Dropped off at Airborne Express at 5:30 PM

Marshall Cecilton 10/22/96

Daniel Benson 10/22/96

Marshall Ceditor 10/23/96

10/23/96

Arrived at site 7:35 AM

Greg Conley, Tim Praznik, Marty Briggs already here

Daniel Benson conducted safety briefing

Wes Newberry and Greg Conley took boat to get GIS coordinants for SE-1, SE-2, SE-3, SE-4

Deanna Epperson called Sample Management office to notify of samples shipped on 10/22/96

Setup decon area under pavillion

Setup decon area on pier

Bart Cañellas (EPA) arrived ~ 8:10 AM

left Huntsman boat ramp about 9:30 am

10 06 10/23/96 GPS INFORMATION AS PROVIDED By TNRCC Greg Conley

SE-5 Sample location FILE# R102315A

Position: N 29° 58' 58.11" W 93° 53' 54.44" - This is a corrected position.

This sample location is on the South bank (downstream side) of star canal at junction with (Old) Neches River (ship cannel). SE-5 is first sed. sample collected today

Star will split samples with TNRCC.

Weather today is clear, sunny, breezy - winds out of north at 10-15 mph

Temperature is about 63°F.

Once core sample was obtained, the zero contamination tube was removed. A sterile nitrile glove was used along with a push rod to extract the sample from tube. Sample recovery was then mixed in dedicated spoon & bowl from decon event #10.

10:35 Sample location SE-06 - arrived at location - GPS information

File# R102315B N 29° 58' 58.04" 93° 53' 47.18" (corrected)

Sample location is approx. 300' downstream of outfall of Star Canal and Neches River - collected on the Neches.

Star split Sample w/ TNRCC

See sample notes p. 33

Daniel Benson 10/23/96

Marshall Cedilo 10/23/96

11:00 AM 10/23/96

File # R102316A DRB N 29° 58' 46.51" 93° 54' 06.06" corrected

SE-07 arrived. correct coordinates

400yds upstreams from Star outfall and Neches River intersection

Star is splitting this sample w/ TNRCC

See sample notes p.34

Weather: still sunny and breezy, warming up to about 70°F

clear skies.

corrected position

10/23/96 11:35 SE-08 File# 102316B N 29°58'43.70" W93°54' ~~13.21"~~ 12.46" DRB

Approx 200yds upstream from SE-7 on star lake canal (north bank)

Canal water level was (lowered) fluched to a small degree following the passage of a large sea going vessel (tanker ship), Water level returned a few minutes later. Star is splitting samples with TNRCC.

See page 35 for additional information

10/23/96 12:20pm SE-9 location is on pond area approximately 200' ~~South~~ east of Star canal File# R102317A N 29°58'24.99 W 93°54'29.59"

(corrected position)

Sample location is east of star canal in tidal flat marsh area

All samples collected today were mixed in dedicated spoons and bowls from decon event #10

corrected position

10/23/96 2:20 File ~~R102319A~~ DRB R102319B N 29°58'02.89" W93°55'13.74"

Arrived at SE 20/21 sample location approx 200' feet downstream of damm on Star Lake Canal and upstream of Grossie road bridge (burned out)

1st attempt at coring was not good enough to recover enough sample material. Moved downstream another 100'

OVA reading 2:30 is 1.2 ppm

Daniel Benson 10/23/96 Will have to collect at least 5 core tubes to have enough sample to recover.

Marshall Cedilote 10/23/96

10/23/96

SE-21 is duplicate of SE-20 taken at same location
- approx 50' West of Old Grossie Road Bridge
These are source samples.

Weather - has warmed to about 78°F, clear and sunny, wind has died down to <5 mph. Slight breeze only. Warm now.

corrected position

10/23/96 3:30pm GPS: File# R102320A N 29°58' 4.07" W93°54 58.28"
SE-19 sample location is East bank of Star Canal approx. 200' N of County Pump station on Star Canal (at) near Jefferson Canal intersection
OVA reading 0.4 ppm

corrected position

10/23/96 3:50pm SE-16 Sample Location GPS File# R1023B 29°58' 03.21' N
Approx. 50' South of SE-19 - on Jefferson Canal 93°54 59.45" W
right before confluence of Star Lake Canal - down from pump station

10/23/96 4:05 M. Cedilote indicated SE-17, SE-18 will not be collected due to inaccessability

File# dsb

10/23/96 4:20 SE-15 ~~approx~~ location: GPS R102321A N 29°58' ~~10~~ 9.12"
W 93 54 52.61"
Approx 50' South of Pt Neches Road Bridge on Star Canal
Star is splitting sample.

10/23/96 5:40 Arrived at SE-11 GPS File# R102322B N 29°58' 16.63" W93°54 36.74"
We are approx 75 yds upstream on left prong of Molasses Bayou - upstream of intersection of Molasses and Star Canal.

Weather: cooler, sun going down, winds back up around 10-15 mph

Daniel Berson 10/23/96

Marshall Cochran 10/23/96

corrected position DRB 20.33" 37.63"

10/23/96 SE-10 - GPS File# R102323A N 29°58' ~~18.73"~~ DRB W 93°54' ~~38.81"~~ DRB

Arrived at 6:00 pm to SE-10 location at confluence of left prong of Molasses Bayou and Star Lake Canal. We are downstream of SE-11 by about 60 yards.

Sample SE-10 has heavy odor w/ sheen like appearance.

We are in vicinity of a sunken boat which is approx. 20 feet south of sample location.

10/23/96 SE-12 GPS File# R102323B N 29°58' 11.47" W 93° 54' 40.39"

Arrived at 6:25 pm Sun is going down, it's getting cold.

We are approx. 100 yds East of Star Canal in tributary draining to the canal. - On private property

File #

SE-13 102323C

Corrected N 29° 58' 10.17"

W 93° 54' 52.51"

Deconned equipment

Took rinsate sample and Field Blanks

Cleaned up site

Left Huntsman property at 7:45 PM

Arrived back at hotel 8:00 PM

Marshall Cochran 10/23/96

Marshall [illegible]
10/23/96

[illegible] 1/25/96

[illegible] 10/23/96

[illegible] 10/23/96

105

[illegible] 10/23/96

Marshall Cable
10/23/96

Marshall Erdman
11/23/96

Marshall Cadden
10/23/96

21

PHOT

[illegible] 10/23/96

22

Roll #1	Subject	Direction	Time/Date	Photographer
1	Equipment decon	W	10/22 8:15	Cedilote
2	SE-1	S	10/22 10:37	D. Benson
3	SE-2	S	10/22 11:10	D Benson
4	SE-3 (1st try - South West bank)	S	10/22 11:42	D Benson
5	SE-3 North bank old Neches River	SE	10/22 12:00	D. Benson
6	SE-4 Upstream on Neches River of Canal outfall	N	10/22 12:33	D. Benson
7	SE-13	E	10/22 2:35	D Benson
8	SE-14	E	10/22 2:45	D. Benson
9	SE-5	NE	10/23 10:10	D Benson
10	SE-6	N	10/23 10:45	D Benson
11	SE-7	NW	10/23 11:05	D Benson
12	SE-8	SE	10/23 11:40	D Benson
13	SE-9 Fina in background Refinery Bridge	SE	10/23 12:20	D Benson
14	From SE-9 location - Accumenting fisherman	NW	10/23 12:30	D. Benson
15	SE-20-21	S	10/23 2:30	D Benson
16	SE-19	S	10/23 2:38	D Benson
17	SE-16	N	10/23 4:00	D Benson
18	SE-15	W	10/23 4:20	D Benson
19	Project Manager	S	10/23 5:00	D Benson
20	SE-11	E	10/23 5:40	D Benson
21	SE-10	SW	10/23 6:05	D Benson
22	SE-11 12	SW	10/23 6:25	D Benson
23	Decon of equipment	W	10/23 7:15	M. Cedilote
24	Taking sample EB-3	W	10/23 7:25	M. Cedilote
25	Taking EB-2	W	10/23 7:26	M. Cedilote

Daniel Benson 10/22/96
Daniel Benson 10/23/96

Roll #2	Subject	Direction	Time/ Date	Photographer

Marshall Pickle
10/23/96

24

Roll #3	Subject	Direction	Time/ Date	Photographer	R

Marshall Cadillac
10/23/96

Roll #4	Subject	Direction	Time/Date	Photographer

[illegible]
10/23/96

Marshall Clarke
10/23/96

Marshall Fickle
10/23/96

SAMPLES

Background

Star Lake Outfall Canal
Case #25093
Station No. SE-01

	SAMPLE ID #	C.O.C. #
VOA	FEY92	6-016659
VOA	FEY92	6-016660
EXT	FEY92	6-016661
EXT	FEY92	6-016662
TM	MFGP55	6-016663
CYN	MFGP55	6-016664

10/22/96 Sampled at 10:40 - background sample SE-01 directly across from C & O plant dock (Texaco) - on the Neches River

See page 7 for additional Sampling information.

Sampled by D Hendricks.

Daniel Benson 10/22/96

Background

Star Lake Outfall Canal
Case #25093
Station No. SE-02

	SAMPLE ID #	C.O.C. #
VOA	FEY93	6-016665
VOA	FEY93	6-016666
EXT	FEY93	6-016667
EXT	FEY93	6-016668
TM	MFGP56	6-016669
CYN	MFGP56	6-016670

10/22/96 Sed. Sample SE-02 taken at 11:15 am by D. Henaricks
SE-2 is background obtained approx. 200 yds north of SE-1
on Old Neches River.

Seepage 7 for additional sampling information

Daniel Benson 10/22/96

Background

Star Lake Outfall Canal
Case #25093
Station No. SE-03

	SAMPLE ID #	C.O.C. #
VOA	FEY94	6-016671
VOA	FEY94	6-016672
EXT	FEY94	6-016673
EXT	FEY94	6-016674
TM	MFGP57	6-016675
CYN	MFGP57	6-016676

10/22/96 11:00pm SE-3 taken from North Bank of Old Neches - because we got no recovery at location described on Pg 8, we moved across Old Neches to north bank. D. Hendrix mixed composite and filled jars

Sample is dark black clay, wet, and sticky.
Taken at 12:05pm This is another background sample

Sample depth approx 2' below water surface

Daniel Benson 10/22/96

Star Lake Outfall Canal
Case #25093
Station No. SE-04

	SAMPLE ID #	C.O.C. #
VOA	FEY89	6-016677
VOA	FEY89	6-016678
EXT	FEY89	6-016679
EXT	FEY89	6-016680
TM	MFGP52	6-016681
CYN	MFGP52	6-016682

10/22/96 12:34 SE-04 taken at upstream side of outfall of Canal on Neches River
Sample taken by Debra Hendricks at 12:34 Approximate depth
is 2' below water surface. Sample is black gray clay with sand mixed
in, little odor, and moist to wet

Daniel Benson. 10/22/96

Star Lake Outfall Canal
Case #25093
Station No. SE-05

	SAMPLE ID #	C.O.C. #
VOA	FEY90	6-016683
VOA	FEY90	6-016684
EXT	FEY90	6-016685
EXT	FEY90	6-016686
TM	MFGP53	6-016687
CYN	MFGP53	6-016688

10/2

10/23/96 10:10 Sample obtained by Wes Newberry
Black clay, no sand or silt, no odor. Sticky wet black clay.

See page 9 for additional information on this sample location.

Daniel Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-06

	SAMPLE ID #	C.O.C. #
VOA	FEY91	6-016689
VOA	FEY91	6-016690
EXT	FEY91	6-016691
EXT	FEY91	6-016692
TM	MFGP54	6-016693
CYN	MFGP54	6-016694

10/23/96 10:40 SE-06 collected by M. Cedilote and mixed/sampled by W. Newberry

Sample is black to grey clay with some sand, no odor. Upper 2 inches was silty.
Used core sampler with dedicated tubes. Recovery from tube was difficult because of sticky clay not coming out of tube.
We used nitrile glove with push rod to extract sample from tube and into bowl.

Recovery of sample material was not enough to fill metals and cyanides jars; consequently tot mtls. and cyanide will not be sent to laboratory for CPL analysis

Daniel Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-07

	SAMPLE ID #	C.O.C. #
VOA	FEY86	6-016695
VOA	FEY86	6-016696
EXT	FEY86	6-016697
EXT	FEY75	6-016698
TM	MFGP49	6-016699
CYN	MFGP49	6-016700

11:05 SE-07 collected by M. Cedilote sampled by W. Newberry

10/23/96

Silty clay with some detritus at upper end of column dark gray in color w/ slight decaying odor.

Sample recovery was sufficient to fill all jars, after filling tube of core sampler twice. Sample was then mixed after VOA's were filled first.

Daniel Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-08

	SAMPLE ID #	C.O.C. #
VOA	FEY87	6-016915
VOA	FEY87	6-016916
EXT	FEY87	6-016917
EXT	FEY87	6-016918
TM	MFGP50	6-016919
CYN	MFGP50	6-016920

10/23/96

11:40 Sample SE-8 collected by W. Newberry – Sampled by M. Cedillo
Wea are on north bank 2500' upstream from Star outfall and Neches River confluence.

Sample is silty black clay, w/ some detritus, sample depth approx 2' below water surface. Slight hydrogen sulfide smell.

See page 10 for additional information.

Daniel Benson - 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-09

	SAMPLE ID #	C.O.C. #
VOA	FEY88	6-016921
VOA	FEY88	6-016922
EXT	FEY88	6-016923
EXT	FEY88	6-016924
TM	MFGP51	6-016925
CYN	MFGP51	6-016926

10/23/96

12:20 Collected by W. Newberry - Sampled by M. Cedilote
1st foot of sample was organic debris, 2nd foot is silty clay mixed with decaying matter. Slight H_2S odor.

2 cores were taken for composite. Stan is splitting samples with TNRCC

See page 10 for additional information on this location.

Daniel Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-10

	SAMPLE ID #	C.O.C. #
VOA	FEY83	6-016927
VOA	FEY83	6-016928
EXT	FEY83	6-016929
EXT	FEY83	6-016930
TM	MFGP46	6-016931
CYN	MFGP46	6-016932

10/23/96 6:05 Sampled obtained by W. Newberry

Black silty sand w/some clay. Wet to very wet with heavy chemical odor.

See page 12 for sample location information.

Star is splitting sample

Daniel Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-11

	SAMPLE ID #	C.O.C. #
VOA	FEY84	6-016933
VOA	FEY84	6-016934
EXT	FEY84	6-016935
EXT	FEY84	6-016936
TM	MFGP47	6-016937
CYN	MFGP47	6-016938

10/23

5:40 Sampled by W. Newberry
Black/grey silty sand w/some clay - 2 distinct layers
Strong chemical odor - sheen/rainbow color to matrix

Star is splitting sample with TWRCC.

See page 11 for description of sample location

Sample obtained at approx depth of 2.5' below water surface

Daniel Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-12

	SAMPLE ID #	C.O.C. #
VOA	FEY85	6-016939
VOA	FEY85	6-016940
EXT	FEY85	6-016941
EXT	FEY85	6-016942
TM	MFGP48	6-016943
CYN	MFGP48	6-016944

10/23/96 Sampled by W. Newberry at 6:25 pm

Black, Sandy silt, little or no clay, heavy odor and sheen.

Star is not splitting this sample

See page 12 for location information

urface

David Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-13

	SAMPLE ID #	C.O.C. #
VOA	FEY80	6-017273
VOA	FEY80	6-017274
EXT	FEY80	6-017275
EXT	FEY80	6-017276
TM	MFGP43	6-017277
CYN	MFGP43	6-017278

10/22/96

2:40 → Sample taken by D Hendricks: Approx 40' from E. Pt Neches Ave Bridge
See page 8 for additional information.

Black to dark gray clay, slight decaying odor and organic matter. Sticky. Slow recovery from core sampler.

Star is splitting sample at this location (no duplicate for Star)
Only 4 Jars were filled for Star because of low sample recovery

Daniel Benson 10/22/96

Field Duplicate

Star Lake Outfall Canal
Case #25093
Station No. SE-14

	SAMPLE ID #	C.O.C. #
VOA	FEY81	6-016951
VOA	FEY81	6-016952
EXT	FEY81	6-016953
EXT	FEY81	6-016954
TM	MFGP44	6-016955
CYN	MFGP44	6-016956

10/22/16
SE-14 is field duplicate of SE-13, Obtained by D. Hendricks
Sample taken at 2:50 pm

Daniel Benson 10/22/16

Star Lake Outfall Canal
Case #25093
Station No. SE-15

	SAMPLE ID #	C.O.C. #
VOA	FEY82	6-017279
VOA	FEY82	6-017280
EXT	FEY82	6-017281
EXT	FEY82	6-017282
TM	MFGP45	6-017283
CYN	MFGP45	6-017284

10/23/96
4:20 Approx 50' South of Ft Neches Bridge on Star Lake.
Collected ~~and~~ by M. Cedilote Sampled by W. Newberry

Black silty clay, no obvious odors. Wet to very wet
Star split sample with TNRCC. Stiff to very stiff clay
Sample recovery was slow; enough material was composited
to fill all sample containers. (3 cores were composited)

Daniel Benson
10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-16

	SAMPLE ID #	C.O.C. #
VOA	FEY77	6-017285
VOA	FEY77	6-017286
EXT	FEY77	6-017287
EXT	FEY77	6-017288
TM	MFGP40	6-017289
CYN	MFGP40	6-017290

10/23/96

3:50 pm Sampled by W. Newberry
SE-16 obtained in Jefferson Canal before it empties into Star Canal
-approx 100' North of county pump station and 50' South of SE-19

Black gooey silt w/some clay, non-(un)consolidated, chemical odor
with silver sheen on water when core sample was removed.
Sample was wet to very wet.

Star split sample with TNRCC

Daniel Benson. 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-17

	SAMPLE ID #	C.O.C. #
VOA	FEY78	6-017291
VOA	FEY78	6-017292
EXT	FEY78	6-017293
EXT	FEY78	6-017294
TM	MFGP41	6-017295
CYN	MFGP41	6-017296

10/23/96
4:05pm
M. Cailiote (Project Manager) indicated this sample would not be collected due to inaccessability of sample location.

Daniel Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-18

	SAMPLE ID #	C.O.C. #
VOA	FEY79	6-017343
VOA	FEY79	6-017344
EXT	FEY79	6-017345
EXT	FEY79	6-017346
TM	MFGP42	6-017347
CYN	MFGP42	6-017348

10/23/96
4:05 M. Cedilote indicated this sample would not be collected due to inaccessability of sample location.

Daniel Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-19

	SAMPLE ID #	C.O.C. #
VOA	FEZ01	6-017349
VOA	FEZ01	6-017350
EXT	FEZ01	6-017351
EXT	FEZ01	6-017352
TM	MFGP61	6-017353
CYN	MFGP61	6-017354

10/23/96 3:30 SE-19 200' North of Pump station owned by county on East (South) bank of Star Canal and Jefferson Canal
Sampled by W. Newberry @ 3:30pm
Black, gooey non consolidated, silty, wet, slight amount of organic material - chemical odor, some clay
OVA reading was 0.4 ppm @ 3:30 pm

Sample depth approximately 2' below water surface
Star is splitting samples

Daniel Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. SE-20

	SAMPLE ID #	C.O.C. #
VOA	FEZ02	6-017355
VOA	FEZ02	6-017356
EXT	FEZ02	6-017357
EXT	FEZ02	6-017358
TM	MFGP62	6-017359
CYN	MFGP62	6-017360

10/23/96 2:30 SE-20 taken approx 200' downstream of dam on Star Canal. Sample location from near north bank
This is a source sample. Sampled by W. Newberry

OVA reading was 1.2 ppm

Black silt, wet to very wet, slight organic odor (chemical)
See page 10 and 11 for additional location information

Star is splitting samples (without a duplicate)

Daniel Benson 10/23/96

Field Duplicate

Star Lake Outfall Canal
Case #25093
Station No. SE-21

	SAMPLE ID #	C.O.C. #
VOA	FEZ03	6-017361
VOA	FEZ03	6-017362
EXT	FEZ03	6-017363
EXT	FEZ03	6-017364
TM	MFGP63	6-017365
CYN	MFGP63	6-017366

10/23/96

2:40 sample obtained by W. Newberry
- duplicate of SE-20. See pg. 47 for description

Daniel Benson 10/23/96

Star Lake Outfall Canal
Case #25093
Station No. ER-01

	SAMPLE ID#	C.O.C. #
VOA	FEY95	6-016640
VOA	FEY95	6-016641
EXT	FEY95	6-016642
TM	MFGP58	6-016643
CYN	MFGP58	6-016644

Sample taken @ 9:20 Am
by Marshall Cedilote
weather - overcast 65°F light breeze
Samples taken under metal pavilion on Huntsman property
Samples tagged and wrapped by ues Newbery

10/23/86

Star Lake Outfall Canal
Case #25093
Station No. FB-01

	SAMPLE ID#	C.O.C. #
VOA	FEY98	6-016655
VOA	FEY98	6-016656

Sample taken at 9:13 AM
by Marshall Cedilowe
Weather - Overcast 65°F Light breeze
Samples taken under metal pavilion on Huntsmen property
Samples tagged and wrapped by Wes Newberry

10-22-96

Photo 1 (Facing West) Date: 10/22/96 Photographer: Marshall Cedilote
Equipment decontamination prior to sampling.

Photo 2 (Facing South) Date: 10/22/96 Photographer: Daniel Benson
SE-1(background) sample location on the Neches River.

Photo 3 (Facing South) Date: 10/22/96 Photographer: Daniel Benson
SE-2 (background) sample location on Neches River.

Photo 5 (Facing Southeast) Date: 10/22/96 Photographer: Daniel Benson
SE-3 (background) sample location on Neches River.

Photo 6 (Facing North) Date: 10/22/96 Photographer: Daniel Benson
SE-4 sample location on Neches River upstream of confluence with Star Lake Canal.

Photo 7 (Facing East) Date: 10/22/96 Photographer: Daniel Benson
SE-13 sample location at boat ramp in Star Lake Canal at Sara Jane Road.

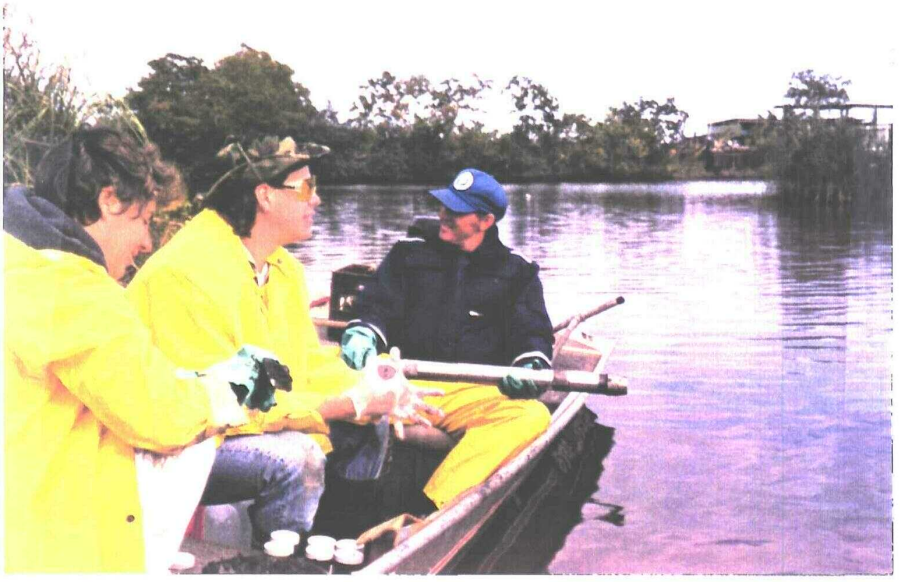


Photo 8 (Facing East) Date: 10/22/96 Photographer: Daniel Benson
SE-14 sample location (duplicate of SE-13).

Photo 9 (Facing Northeast) Date: 10/23/96 Photographer: Daniel Benson
SE-5 sample location at confluence of Star Lake Canal with Neches River.

Photo 10 (Facing North) Date: 10/23/96 Photographer: Daniel Benson
SE-6 sample location downstrean of Star Lake Canal's confluence with Neches River.

Photo 11 (Facing Northwest) Date: 10/23/96 Photographer: Daniel Benson
SE-7 sample location in Star Lake Canal.

Star Lake Outfall Canal
Case #25093
Station No. ER-02

	SAMPLE ID#	C.O.C. #
VOA	FEY96	6-016645
VOA	FEY96	6-016646
EXT	FEY96	6-016647
TM	MFGP59	6-016648
CYN	MFGP59	6-016649

Sample taken at 4:20 pm
by Debra Hendricks
weather - Sunny 80° F Light Breeze
Samples taken under metal pavillion on Huntsman property
Samples tagged and wrapped by Wes Newberry

[illegible]
10-23-96

Star Lake Outfall Canal
Case #25093
Station No. ER-03

	SAMPLE ID#	C.O.C. #
VOA	FEY97	6-016650
VOA	FEY97	6-016651
EXT	FEY97	6-016652
TM	MFGP60	6-016653
CYN	MFGP60	6-016654

Time 7:25 PM
Taken by U.S. New berry

10/23/96

Star Lake Outfall Canal
Case #25093
Station No. FB-02

	SAMPLE ID#	C.O.C. #
VOA	FEY92	6-016657
VOA	FEY92	6-016658

Time 7:20 PM
Taken by Wes Newberry

10-23-96

APPENDIX C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
HOUSTON BRANCH
10625 FALLSTONE RD.
HOUSTON, TEXAS 77099

MEMORANDUM

Date: 12-16-1996

Subject: **Contract Laboratory Program Data Review**

From: Melvin L. Ritter, ESAT RPO, 6MD-HC MLRitter 12/16/96

To: B. Canellas , 6SF-RA

Site: STAR LAKE CANAL

Case#: 25093

SDG#: MFG-P63

The EPA Region 6 Houston Branch ESAT data validation team has completed a review of the submitted Contract Laboratory Program (CLP) data package for the referenced site. The samples analyzed and reviewed are detailed in the attached Regional data review and assessment report for this case.

The data package was found to be:

( ) Acceptable: No major problems with data package.

(X) Provisional: Use of data requires caution.
Data is acceptable for Regional use. Problems are noted in the review report.

( ) Unacceptable: Some or all of data should not be used.
Problems are noted in the review report.

Questions regarding the data review report can be addressed to me.

Attachments

cc: R. Flores, Region 6 CLP/TPO
M. El-feky, Region 6 Data Coordinator

Files (2)

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LOCKHEED MARTIN SERVICES GROUP
10101 SOUTHWEST FREEWAY, SUITE 500
HOUSTON, TEXAS 77074

MEMORANDUM

DATE: December 13, 1996

TO: Dr. Melvin Ritter, ESAT RPO, Region VI

FROM: Dr. Tom Chiang, ESAT ETM, Region VI

SUBJECT: CLP Data Review

REF: TDF # 6-7071A, ESAT File No. I2060

Attached is the data review summary for Case #25093
SDG #MFGP63
Site STAR LAKE CANAL

COMMENTS:

I. CONTRACTUAL ASSESSMENT OF DATA PACKAGE:

The hard copy review detected the following contractual noncompliance. The CCS report was not available at the time of this report preparation.

The data package was submitted without the contractually required custody seals (ILM04.0, Exhibit F, F-8, 2.7.14).

II. TECHNICAL/USABILITY ASSESSMENT OF DATA PACKAGE:

A total of 24 results were reviewed for this data package. The package is technically provisional for the problems summarized below.

A. The reviewer qualified approximately 17 percent of the results because of technical problems.

B. Matrix spike recoveries for antimony, arsenic, selenium, and thallium failed to meet QC criteria. The antimony result is unusable because the laboratory reported an antimony matrix spike recovery below 30 percent.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
HOUSTON BRANCH
10625 FALLSTONE ROAD
HOUSTON, TEXAS 77099

INORGANIC REGIONAL DATA ASSESSMENT

CASE NO. 25093
LABORATORY ARI
CONTRACT # 68-D5-0134
SDG # MFGP63
SOW# ILM04.0
ACCT # 7FAXJN10 SF # FAXUZZ

SITE STAR LAKE CANAL
NO. OF SAMPLES 1
MATRIX SOIL
REVIEWER (IF NOT ESD) ESAT
REVIEWER'S NAME Linda Hoffman
COMPLETION DATE December 13, 1996

SAMPLE NO.: MFG-P63

DATA ASSESSMENT SUMMARY

	ICP	FAA	HG	CYANIDE
1. HOLDING TIMES	O	O	O	O
2. CALIBRATIONS	O	O	O	O
3. BLANKS	O	O	O	O
4. MATRIX SPIKES	M	M	O	O
5. DUPLICATE ANALYSIS	O	O	O	O
6. ICP QC	O			
7. FAA QC		O		
8. LCS	O	O	O	O
9. SAMPLE VERIFICATION	O	O	O	O
10. OTHER QC	O	O	O	O
11. OVERALL ASSESSMENT	M	M	O	O

O = Data had no problems.
M = Data qualified because of major or minor problems.
Z = Data unacceptable.
N/A= Not applicable

ACTION ITEMS: The laboratory submitted the package without custody seals.

AREAS OF CONCERN: The matrix spike recoveries for antimony, arsenic, selenium, and thallium were less than 75 percent.

NOTABLE PERFORMANCE:

INORGANIC QA REVIEW
CONTINUATION PAGE

Case 25093 SDG MFGP63 Site STAR LAKE CANAL Lab ARI

COMMENTS: The package consisted of one soil sample for total metals and cyanide analyses by ILM04.0. The sampler designated samples MFG-P62(from SDG MFGP43) and MFG-P63 as field duplicates. Since a QC sample was not indicated, the laboratory used sample MFG-P63 as the QC sample. The laboratory met the 35-day turnaround time requirement but submitted the package without the required custody seals. Sixty-two percent of the reported results were above the CRDL's.

The antimony result is unusable because the laboratory reported a 0.0 percent antimony matrix spike recovery. The data package is technically provisional because of problems with matrix spike recoveries. The technical usability of all reported results is indicated in the attached Data Summary Table.

An Evidence Audit was conducted for the Complete Sample Delivery Group File (CSF), and the Evidence Inventory Checklist is attached to this report.

NOTE: THE FOLLOWING REVIEW NARRATIVE ADDRESSES BOTH CONTRACTUAL AND TECHNICAL ISSUES. THE ASSESSMENT MADE FOR EACH QC PARAMETER IS SOLELY BASED ON THE TECHNICAL DATA USABILITY, WHICH MAY NOT NECESSARILY BE AFFECTED BY CONTRACTUAL PROBLEMS.

1. **Holding Times:** Acceptable. Contractual holding time and sample preservation criteria were met. Technical holding time criteria have not been established for soil samples.

2. **Calibrations:** Acceptable. All calibrations met contractual requirements. The CRDL standard results indicated that instrument performance near the CRDL's was acceptable.

3. **Blanks:** Acceptable. Preparation and calibration blanks met contractual requirements although the laboratory reported five analytes in the blanks. Calibration and preparation blank concentrations did not affect any sample results.

   Rinsates: The rinsate samples reported with SDG MFGP43 may be associated with the sample in this case, so the user needs to evaluate the associated sample results for possible contamination. The laboratory reported analyte concentrations in the rinsates below the CRDL's for eight analytes.

INORGANIC QA REVIEW
CONTINUATION PAGE

Case 25073 SDG MFGP63 Site STAR LAKE CANAL Lab ARI

4. **Pre-digestion/Pre-distillation Matrix Spike Recovery:** Provisional. The laboratory reported matrix spike recoveries below the QC limits for antimony, arsenic, selenium, and thallium. Since the antimony recovery was less than 30 percent and antimony was undetected in the sample, the reviewer qualified this result as unusable. The reviewer qualified the arsenic, selenium, and thallium results as estimated with a low bias because of the outlying matrix spike recoveries.

5. **Duplicate Analysis:** Acceptable. The laboratory reported duplicate differences outside the SOW QC limits for aluminum, arsenic, calcium, and chromium. Since these differences met technical QC limits, the reviewer did not qualify any results.

6. **ICP Quality Control:**

   Serial Dilution: Acceptable. The laboratory reported acceptable serial dilution differences for all analytes.

   Interference Check Sample: Acceptable. Acceptable ICS results indicated satisfactory interelement and background correction.

   Coefficient of Variation: Acceptable. Replicate ICP readings were consistent for all analytes.

7. **Furnace Atomic Absorption Quality Control:**

   FAA Analytical Spike Recovery: Acceptable. The laboratory reported a thallium analytical spike recovery that was only marginally low, so the reviewer did not qualify this result.

   Duplicate Injection Coefficient of Variation: Acceptable. Replicate instrument readings were consistent.

   Method of Standard Addition: MSA analysis was not required.

8. **Laboratory Control Sample:** Acceptable. Acceptable LCS results indicated satisfactory sample preparation and analysis.

9. **Sample Verification:** The reviewer detected numerous reporting errors and contacted the laboratory for resubmission (see attached FAX Record Log).

INORGANIC QA REVIEW
CONTINUATION PAGE

Case 25073 SDG MFGP63 Site STAR LAKE CANAL Lab ARI

10. **Other QC:**

    Field Duplicate: Acceptable. Field duplicate results demonstrated satisfactory field precision.

11. **Overall Assessment:** The data package is technically provisional because the reviewer qualified the antimony, arsenic, selenium, and thallium results for matrix related problems.

INORGANIC DATA QUALIFIER DEFINITIONS

The following definitions provide brief explanations of the ESAT-Region 6 qualifiers assigned to results in the inorganic data review process.

U Undetected at the laboratory reported detection limit (IDL).

L Reported concentration is between the IDL and the CRDL.

J Result is estimated because of outlying quality control parameters such as matrix spike, serial dilution, FAA spike recovery, etc.

R Result is unusable.

F A possibility of a false negative exists.

UC Reported concentration should be used as a raised detection limit because of apparent blank contamination.

^ High bias. Actual concentration may be lower than the concentration reported.

v Low bias. Actual concentration may be higher than the concentration reported.

DATA SUMMARY

Case No.: 25093 SDG. No.: MFGP63 Reviewer: REVIEWER

Laboratory: ARI Matrix: SOIL Units: mg/Kg

EPA TR #=>	MFG-P63	FLAG		FLAG		FLAG		FLAG		FLAG		COMMENTS
ALUMINUM	25300											
ANTIMONY	16.8	UR										
ARSENIC	14.2	Jv										
BARIUM	411											
BERYLLIUM	1.7											
CADMIUM	0.67	U										
CALCIUM	11500											
CHROMIUM	32.5											
COBALT	15.3	L										
COPPER	20.2											
IRON	36700											
LEAD	27.6											
MAGNESIUM	3990											
MANGANESE	468											
MERCURY	0.08	U										
NICKEL	19.5											
POTASSIUM	3900											
SELENIUM	1.7	UJv										
SILVER	1.0	U										
SODIUM	1670	L										
THALLIUM	2.2	LJv										
VANADIUM	76.9											
ZINC	44.5											
CYANIDE	0.42	U										
% SOLIDS	58.9											

INORGANIC/ORGANIC COMPLETE SDG FILE (CSF) INVENTORY CHECKLIST

Case No. 25093 SDG No. MFGP63 SDG Nos. To Follow SAS No. Date Rec 11/29/96

EPA Lab ID: ARI

Lab Location: Seattle, WA

Region: 6 Audit No.: 25093/MFGP43

Re_Submitted CSF? Yes ____ No X

Box No(s): 1

COMMENTS:

1. The laboratory failed to secure the data package with the required custody seals. The laboratory was notified of this omission.

3. On Form DC-2-2, the laboratory failed to record the traffic report page numbers. The page number was omitted from the page between pages 284 and 285. The reviewer made the necessary corrections and contacted the laboratory.

4. The laboratory did not include the Form DC-1 page number on Form DC-2-2. The reviewer made the necessary correction and notified the laboratory of the omission.

20A. The laboratory submitted copies of the TR/COC and the airbill but did not indicate where the originals were located. The reviewer notified the laboratory of this omission.

Over for additional comments

ORIGINALS	YES	NO	N/A
CUSTODY SEALS			
1. Present on package?		X	
2. Intact upon receipt?			X
FORM DC-2			
3. Numbering scheme accurate?		X	
4. Are enclosed documents listed?		X	
5. Are listed documents enclosed?	X		
FORM DC-1			
6. Present?	X		
7. Complete?	X		
8. Accurate?	X		
CHAIN-OF-CUSTODY RECORD(s)			
9. Signed?	X		
10. Dated?	X		
TRAFFIC REPORT(s) PACKING LIST(s)			
11. Signed?	X		
12. Dated?	X		
AIRBILLS/AIRBILL STICKER			
13. Present?	X		
14. Signed?	X		
15. Dated?	X		
SAMPLE TAGS			
16. Does DC-1 list tags as being included?	X		
17. Present?	X		
OTHER DOCUMENTS			
18. Complete?	X		
19. Legible?	X		
20. Original?		X	
20a. If "NO", does the copy indicate where original documents are located?		X	

Audited by: Linda Hoffman /ESAT Data Reviewer Date 12/09/96

Audited by: Date

Audited by: Date

Signature Printed Name/Title

TO BE COMPLETED BY CEAT

Date Recvd by CEAT: Date Entered: Date Reviewed:

Entered by:

Reviewed by:

Signature Printed Name/Title

DC-2___

In Reference to
Case 25093/SDG MFGP63
Page 1 of 2 pages
ESAT File No.: I2060

Contract Laboratory Program
REGIONAL/LABORATORY COMMUNICATION SYSTEM

FAX Record Log

Date of FAX: December 13, 1996

Laboratory Name: ARI

Lab Contact: Jeff Reitan

Region: 6

Regional Contact: Linda Hoffman (ESAT)

FAX Initiated by: Region

In reference to data for the following sample number(s):

All samples in this SDG.

Summary of Questions/Issues:

1. The data package was submitted without the contractually required custody seals (ILM04.0, Exhibit F, F-8, 2.7.14). Please explain this contractual noncompliance.

2. The traffic report page number was not recorded on Form DC-2-2, Item #26. The SOW (ILM04.0, Exhibit B, B-42, U, 2nd paragraph) states, "Inventory the CSF by reviewing the document numbers and recording page number ranges in the column provided on Form DC-2." Since the TR/COC are on the same document, the SOW requires the traffic report page numbers to be recorded on Form DC-2-2. Please acknowledge and note for the future that the traffic report page number must be recorded under Item #26.

3. The traffic report and airbill were copies but the location of the original documents was not indicated (ILM04.0, Exhibit F, F-7, 2.7.9). Please resubmit pages 248 and 249 with the appropriate notations initialed and dated.

4. For your information, soil samples do not require aluminum and iron matrix spike analyses (ILM04.0, Exhibit E, E-23, Table 3).

5. On Form 4 (pp. 26 and 27), all analytes analyzed by ICP were not recorded for "Initial/Final Sol. A". The SOW (ILM04.0, Exhibit B, B-26 and B-27, Paragraphs beginning "Under 'Initial Found Sol. A' and "Under 'Final Found Sol. A'" and Exhibit E, E-20, 5, 2nd paragraph) states analytes for all wavelengths used for each analyte reported by ICP must be recorded on Form 4 (starting with Solution A). Please make the necessary corrections to pages 26 and 27 and resubmit.

6. In the lead instrument raw data, time of analysis was not recorded for the initial and continuing calibration verifications and blanks (ILM04.0, Exhibit B, d, B-11, #9). Please add the time of each ICV, ICB, CCV, and CCB analysis to the lead raw data and resubmit.

7. Please explain why the ICV/CCV concentrations in the cyanide raw data do not agree with the concentrations reported on the Form 2's and make any necessary corrections and resubmissions.

The EPA expects the laboratory to look into items and submit data within seven days to Mahmoud El-Feky, U.S. EPA, 10625 Fallstone Road, Houston TX 77099.

Signature

12/13/96
Date

Distribution: (1) Lab Copy, (2) Region Copy

Lockheed Martin Services Group
ESAT Region 6

10101 S. W. Freeway, Suite 500, Houston, TX 77074 TEL:(713) 988-2983

FACSIMILE COVER SHEET

Please deliver the following pages to:

Name Jeff Reitan

Firm ARI

City Seattle **State** WA

Telephone 206-621-6490 **Ext.** _____

FAX Telephone No. 206-621-7523 **Ext.** _____

Sender:

Name Linda Hoffman ESAT

Date 12/13/96 **Time** _____

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If you do not receive all the pages or if any pages are unclear, please call: (713) 988-2983.

MESSAGES: _____

FAX No. (713) 988-2994

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP63

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI__ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP63

Matrix (soil/water): SOIL_ Lab Sample ID: 5369A

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _58.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	25300		*	P
7440-36-0	Antimony_	16.8	U	N	P
7440-38-2	Arsenic__	14.2		N*	F
7440-39-3	Barium___	411			P
7440-41-7	Beryllium	1.7			P
7440-43-9	Cadmium__	0.67	U		P
7440-70-2	Calcium__	11500		*	P
7440-47-3	Chromium_	32.5		*	P
7440-48-4	Cobalt___	15.3	B		P
7440-50-8	Copper___	20.2			P
7439-89-6	Iron____	36700			P
7439-92-1	Lead____	27.6			F
7439-95-4	Magnesium	3990			P
7439-96-5	Manganese	468			P
7439-97-6	Mercury__	0.08	U		CV
7440-02-0	Nickel___	19.5			P
7440-09-7	Potassium	3900			P
7782-49-2	Selenium_	1.7	U	WN	F
7440-22-4	Silver___	1.0	U		P
7440-23-5	Sodium___	1670	B		P
7440-28-0	Thallium_	2.2	B	N	F
7440-62-2	Vanadium_	76.9			P
7440-66-6	Zinc____	44.5			P
	Cyanide__	0.42	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

FORM I - IN

EPA United States Environmental Protection Agency
Contract Laboratory Program

Inorganic Traffic Report & Chain of Custody Record
(For Inorganic CLP Analysis)

Case No. 25093

1. Project Code	Account Code	2. Region No.	Sampling Co.	4. Date Shipped	Carrier
25093		VI	TNRLC	10/22/96	

Regional Information

Sampler (Name): DEBRA D. HENDRICKS

Airbill Number: 862 445 0376

Non-Superfund Program

Sampler Signature: Debra D. Hendricks

5. Ship To: Analytical Resources, Inc. 400 9th Ave North Seattle, WA 98109 ATTN: [illegible] (206) 621-6490

Site Name: Star Lake Canal

City, State: Port Neches, TX

Site Spill ID

3. Purpose*: Lead: SF, PRP, X ST, FED; Early Action: CLEM, PA, REM, RI, X SI, ESI; Long-Term Action: FS, RD, RA, O&M, NPLD

6. Matrix (Enter in Column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil (High only) 7. Waste (High only) 8. Other (specify in Column A)

7. Preservative (Enter in Column D): 1. HCl 2. HNO3 3. NaOH 4. H_2SO_4 5. $K_2CR_2O_7$ 6. Ice only 7. Other (specify in Column D) N. Not preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 6) Other:	B Conc. Low-Med High	C Sample Type: Comp./Grab	D Preservative (from Box 7) Other:	E – RAS Analysis: Diss. Metals	Total Metals	Cyanide	Low only: NO_2/NO_3	Fluoride	High only: pH	Conduct.	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank, S = Spike, D = Duplicate, R = Rinsate, PE = Perform. Eval., — = Not a QC Sample)
MFGP58	4	low	Grab	2/3/6		X	X					6-016643-44	ER-01	10/22/96 920	FEY95	MC	R
MFGP55	5	low	Grab	6		X	X					6-016663-64	SE-01	10/22/96 10:40	FEY92	DH	
MFGP56	5	low	Grab	6		X	X					6-016669-70	SE-02	10/22/96 11:15	FEY93	DH	
MFGP57	5	low	Grab	6		X	X					6-016675-76	SE-03	10/22/96 1200	FEY94	DH	
MFGP52	5	low	Grab	6		X	X					6-016681-82	SE-04	10/22/96 1234	FEY89	DH	
MFGP43	5	low	Grab	6								6-017277-78	SE-13	10/22/96 1440	FEY80	DH	
MFGP44	5	low	Grab	6		X	X					6-016955-56	SE-14	10/22/96 1450	FEY81	DH	D (MFGP43)
~~MFGP59~~	~~4~~																
MFGP59	4	low	Grab	2/3/6		X	X					6-016648-49	ER-02	10/22/96 1620	FEY96	DH	R

Shipment for Case Complete? (Y/N): N

Page 1 of 1

Sample(s) to be Used for Laboratory QC: MFGP52

Additional Sampler Signatures: [signature]

Chain of Custody Seal Number(s)

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/22/96 5:45				
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 Is custody seal intact? Y/N/none	

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*SEE REVERSE FOR PURPOSE CODE DEFINITIONS

369014

EPA United States Environmental Protection Agency
Contract Laboratory Program

Inorganic Traffic Report & Chain of Custody Record
(For Inorganic CLP Analysis)

Case No. 25093

1. Project Code: [redacted] | Account Code: [redacted]
2. Region No.: VI | Sampling Co.: TNRCC
4. Date Shipped: 10/23/96 | Carrier: AIRBORNE EXPRESS
Regional Information: [redacted]
Sampler (Name): Wesley Walberg
Airbill Number: [redacted]
Non-Superfund Program: [redacted]
Sampler Signature: [signature]
5. Ship To: ANALYTICAL RESOURCES, INC. 400 9TH AVE NORTH SEATTLE, WA 98109 ATTN: JAY ROHN (206) 621-6490
Site Name: STAR LAKE CANAL
3. Purpose*: Lead: [X] SF, [ ] PRP, [ ] ST, [ ] FED; Early Action: [ ] CLEM, [ ] PA, [ ] REM, [ ] RI, [X] SI, [ ] ESI; Long Term Action: [ ] FS, [ ] RD, [ ] RA, [ ] O&M, [ ] NPLD
City/State: PRINCETON, TX | Site Spill ID: [redacted]

6. Matrix (Enter in Column A): 1. Surface Water, 2. Ground Water, 3. Leachate, 4. Field QC, 5. Soil/Sediment, 6. Oil (High only), 7. Waste (High only), 8. Other (specify in Column A)

7. Preservative (Enter in Column D): 1. HCl, 2. HNO_3, 3. NaOH, 4. H_2SO_4, 5. $K_2CR_2O_7$, 6. Ice only, 7. Other (specify in Column D), N. Not preserved

A CLP Sample Numbers (from labels)	A Matrix (from Box 6)	B Conc. Low Med High	C Sample Type: Comp./Grab	D Preservative (from Box 7)	E-RAS Analysis: Diss. Metals	Total Metals	Cyanide	NO_2/NO_3 (Low only)	Fluoride (Low only)	pH (High only)	Conduct. (High only)	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank, S = Spike, D = Duplicate, R = Rinsate, PE = Perform. Eval., — = Not a QC Sample)
MEGP53	5	LOW	GRAB	6		X	X					6-016688-788	SE-05	10/23/96 10:10	FEY90	WN	
MEGP49	5	LOW	GRAB	6		X	X					6-018699-700	SE-07	10/23/96 11:05	FEY86	WN	
MEGP50	5	LOW	GRAB	6		X	X					6-016919-20	SE-08	10/23/96 11:40	FEY87	MC	
MEGP51	5	LOW	GRAB	6		X	X					6-016925-26	SE-09	10/23/96 12:20	FEY88	MC	
MEGP61	5	LOW	GRAB	6		X	X					6-017353-54	SE-19	10/23/96 15:30	FEZ01	WN	
MEGP45	5	LOW	GRAB	6		X	X					6-017283-84	SE-15	10/23/96 16:20	FEY82	WN	
MEGP40	5	LOW	GRAB	6		X	X					6-017289-90	SE-16	10/23/96 15:50	FEY77	WN	
MEGP02	5	LOW	GRAB	6		X	X			DA		6-017359-60	SE-20	10/23/96 14:30	FEZ02	WN	
MEGP63	5	LOW	GRAB	6		X	X			DA		6-017365-66	SE-21	10/23/96 14:40	FEZ03	WN	
MEGP62	5	LOW	Comp	6		X	X					6-017359-60	SE-20	10/23/96 14:30	FEZ02	WN	

Shipment for Case Complete? (Y/N): Y | Page: 1 of 2 | Sample(s) to be Used for Laboratory QC: [redacted] | Additional Sampler Signatures: [signature] | Chain of Custody Seal Number(s): [redacted]

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/24/96 8:00 AM				
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: Is custody seal intact? Y/N/none	

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*SEE REVERSE FOR PURPOSE CODE DEFINITIONS

3...01..

EPA United States Environmental Protection Agency
Contract Laboratory Program

Inorganic Traffic Report & Chain of Custody Record
(For Inorganic CLP Analysis)

Case No. 25093

1. Project Code: Account Code:
2. Region No.: VI Sampling Co.: TNRCC
4. Date Shipped: 10/24/96 Carrier: AIRBORNE EXPRESS
Regional Information:
Sampler (Name): West Newberry
Airbill Number: 8624450697
Non-Superfund Program:
Sampler Signature:
5. Ship To: ANALYTICAL RESOURCES INC 4009 7TH AVE NORTH SEATTLE WA 98109 ATTN: JAY KUHN (206) 624-6490
Site Name: STARLAKE CANAL
3. Purpose*: Early Action: CLEM, PA, REM, RI, SI (X), ESI; Long-Term Action: FS, RD, RA, O&M, NPLD; Lead: SF (X), PRP, ST, FED
City, State: PI NECHES TX Site Spill ID:

6. Matrix (Enter in Column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil (High only) 7. Waste (High only) 8. Other (specify in Column A)

7. Preservative (Enter in Column D): 1. HCl 2. HNO3 3. NaOH 4. H_2SO_4 5. $K_2CR_2O_7$ 6. Ice only 7. Other (specify in Column D) N. Not preserved

Sample Numbers (from Labels)	A Matrix (from Box 6)	B Conc. Low-Med High	C Sample Type: Comp./Grab	D Preservative (from Box 7)	E RAS Analysis: Dis. Metals	Total Metals	Cyanide	NO_2/NO_3 (Low only)	Fluoride (Low only)	pH (High only)	Conductivity (High only)	F Regional Specific Tracking Number or Tag Number	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank, S = Spike, D = Duplicate, R = Rinsate, PE = Perform./Eval., – = Not a QC Sample)
MFGP33	5	LOW	COMP	6		X	X					6-017365-66	SE-21	10/23/96 14:40	FEZ03	WN	D(MFGP62)
MFGP46	5	LOW	GRAB	6		X	X					6-016931-92	SE-10	10/23/96 18:05	FEY83	WN	
MFGP47	5	LOW	GRAB	6		X	X					6-016932-38	SE-11	10/23/96 17:40	FEY84	WN	
MFGP48	5	LOW	GRAB	6		X	X					6-016943-47	SE-12	10/23/96 18:25	FEY85	WN	
MFGP60	4	LOW	GRAB	2,3,6		X	X					6-016653-59	ER-03	10/23/96 19:25	FEY97	WN	R

Shipment for Case Complete? Y/N: Y Page 2 of 2
Sample(s) to be Used for Laboratory QC:
Additional Sampler Signatures:
Chain of Custody Seal Number(s):

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/24/96 8:00 AM				
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: Is custody seal intact? Y/N/none	

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*SEE REVERSE FOR PURPOSE CODE DEFINITIONS

A21-012-13 REV.

365232

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
HOUSTON BRANCH
10625 FALLSTONE RD.
HOUSTON, TEXAS 77099

MEMORANDUM

Date: 12-16-1996

Subject: **Contract Laboratory Program Data Review**

From: Melvin L. Ritter, ESAT RPO, 6MD-HC

To: B. Canellas , 6SF-RA

MLRitter 12/16/96

Site: STAR LAKE CANAL

Case#: 25093

SDG#: MFG-P43

The EPA Region 6 Houston Branch ESAT data validation team has completed a review of the submitted Contract Laboratory Program (CLP) data package for the referenced site. The samples analyzed and reviewed are detailed in the attached Regional data review and assessment report for this case.

The data package was found to be:

( ) Acceptable: No major problems with data package.

(X) Provisional: Use of data requires caution.
Data is acceptable for Regional use. Problems are noted in the review report.

( ) Unacceptable: Some or all of data should not be used.
Problems are noted in the review report.

Questions regarding the data review report can be addressed to me.

Attachments

cc: R. Flores, Region 6 CLP/TPO
M. El-feky, Region 6 Data Coordinator

Files (2)

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LOCKHEED MARTIN SERVICES GROUP
10101 SOUTHWEST FREEWAY, SUITE 500
HOUSTON, TEXAS 77074

MEMORANDUM Page 1 of 2 pages

DATE: December 13, 1996

TO: Dr. Melvin Ritter, ESAT RPO, Region VI

FROM: Dr. Tom Chiang, ESAT ETM, Region VI

SUBJECT: CLP Data Review

REF: TDF # 6-7073A, ESAT File No. I2059

Attached is the data review summary for Case #25093
SDG #MFGP43
Site STAR LAKE CANAL

COMMENTS:

I. CONTRACTUAL ASSESSMENT OF DATA PACKAGE:

The hard copy review detected the following contractual noncompliances. The CCS report was not available at the time of this report preparation.

A. The data package was submitted without the contractually required custody seals.

B. The laboratory made incorrect dilutions to selenium samples MFG-P44 and MFG-P45 when the analytical spike recoveries were below 40 percent (Exhibit E, E-30, 13.b.1). As a result, the reviewer qualified these two selenium results.

C. The laboratory submitted the data package 2 days late for the 35-day turnaround time requirement.

II. TECHNICAL/USABILITY ASSESSMENT OF DATA PACKAGE:

A total of 480 results were reviewed for this data package. The package is technically provisional for the problems summarized below.

A. The reviewer qualified approximately nine percent of the results because of technical problems.

LOCKHEED MARTIN SERVICES GROUP
10101 SOUTHWEST FREEWAY, SUITE 500
HOUSTON, TEXAS 77074

MEMORANDUM

Attached is the data review summary for Case #25093
SDG #MFGP43
Site STAR LAKE CANAL

COMMENTS, continued:

B. Matrix spike recoveries for antimony and selenium failed to meet QC criteria. The antimony results are unusable because the laboratory reported an antimony matrix spike recovery below 30 percent.

C. FAA analytical spike recoveries for one arsenic, ten selenium and six thallium analyses failed to meet QC criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
HOUSTON BRANCH
10625 FALLSTONE ROAD
HOUSTON, TEXAS 77099

INORGANIC REGIONAL DATA ASSESSMENT

CASE NO. 25093
LABORATORY ARI
CONTRACT # 68-D5-0134
SDG # MFGP43
SOW# ILM04.0
ACCT # 7FAXJN10 SF # FAXUZZ

SITE STAR LAKE CANAL
NO. OF SAMPLES 20
MATRIX 3 WATER/17 SOIL
REVIEWER (IF NOT ESD) ESAT
REVIEWER'S NAME Linda Hoffman
COMPLETION DATE December 13, 1996

SAMPLE NO.:					
	MFG-P40	MFG-P46	MFG-P50	MFG-P55	MFG-P59
	MFG-P43	MFG-P47	MFG-P51	MFG-P56	MFG-P60
	MFG-P44	MFG-P48	MFG-P52	MFG-P57	MFG-P61
	MFG-P45	MFG-P49	MFG-P53	MFG-P58	MFG-P62

DATA ASSESSMENT SUMMARY

	ICP	FAA	HG	CYANIDE
1. HOLDING TIMES	O	O	O	O
2. CALIBRATIONS	O	O	O	O
3. BLANKS	O	O	O	O
4. MATRIX SPIKES	M	M	O	O
5. DUPLICATE ANALYSIS	O	O	O	O
6. ICP QC	M			
7. FAA QC		M		
8. LCS	O	O	O	O
9. SAMPLE VERIFICATION	O	O	O	O
10. OTHER QC	O	O	O	O
11. OVERALL ASSESSMENT	M	M	O	O

O = Data had no problems.
M = Data qualified because of major or minor problems.
Z = Data unacceptable.
N/A= Not applicable

ACTION ITEMS: The laboratory submitted the package two days late without custody seals and made incorrect sample dilutions.

AREAS OF CONCERN: The matrix spike recoveries for antimony and selenium were less than 75 percent. One arsenic, ten selenium, and six thallium analyses failed to meet FAA QC criteria. One nickel analysis had a coefficient of variation greater than 20 percent.

NOTABLE PERFORMANCE:

INORGANIC QA REVIEW
CONTINUATION PAGE

Case 25093 SDG MFGP43 Site STAR LAKE CANAL Lab ARI

COMMENTS: The package consisted of 17 soil and 3 water samples for total metals and cyanide analyses by ILM04.0. The sampler designated samples MFG-P43/MFG-P44 and MFG-P62/MFG-P63 (from SDG MFGP63) as field duplicate pairs and sample MFG-P52 as the QC sample. The three water samples were listed as rinsate samples. The laboratory did not meet the 35-day turnaround time requirement, submitted the package without custody seals, and made incorrect dilutions to two selenium samples. Forty-seven percent of the reported results were above the CRDL's.

All antimony results are unusable because the antimony matrix spike was 19.2 percent. The data package is technically provisional because of problems with matrix and FAA analytical spike recoveries and replicate instrument readings. The technical usability of all reported results is indicated in the attached Data Summary Table.

An Evidence Audit was conducted for the Complete Sample Delivery Group File (CSF), and the Evidence Inventory Checklist is attached to this report.

NOTE: THE FOLLOWING REVIEW NARRATIVE ADDRESSES BOTH CONTRACTUAL AND TECHNICAL ISSUES. THE ASSESSMENT MADE FOR EACH QC PARAMETER IS SOLELY BASED ON THE TECHNICAL DATA USABILITY, WHICH MAY NOT NECESSARILY BE AFFECTED BY CONTRACTUAL PROBLEMS.

1. **Holding Times:** Acceptable. Contractual holding time and sample preservation criteria were met. Technical holding time criteria have not been established for soil samples.

2. **Calibrations:** Acceptable. All calibrations met contractual requirements. The CRDL standard results indicated that instrument performance near the CRDL's was acceptable.

3. **Blanks:** Acceptable. Preparation and calibration blanks met contractual requirements although the laboratory reported six analytes in the blanks. Calibration and preparation blank concentrations only affected results below the CRDL's.

   Rinsates: The laboratory reported analyte concentrations below the CDRL's for eight analytes. The user needs to evaluate the associated sample results for possible contamination.

4. **Pre-digestion/Pre-distillation Matrix Spike Recovery:** Provisional. The laboratory reported matrix spike recoveries below the QC limits for antimony and selenium. Since the antimony recovery was less than 30 percent and antimony was undetected in the samples, the reviewer qualified these results as unusable. The reviewer qualified the selenium results as estimated with a low bias because of the outlying selenium recovery.

5. **Duplicate Analysis:** Acceptable. The laboratory demonstrated satisfactory laboratory precision as seen by acceptable duplicate differences.

6. **ICP Quality Control:**

   Serial Dilution: Acceptable. The laboratory reported acceptable serial dilution differences for all analytes.

   Interference Check Sample: Acceptable. Acceptable ICS results indicated satisfactory interelement and background correction.

   Coefficient of Variation: Provisional. Replicate ICP readings were inconsistent for nickel in sample MFG-P50, so the reviewer qualified this result as estimated.

7. **Furnace Atomic Absorption Quality Control:**

   FAA Analytical Spike Recovery: Provisional. The laboratory reported analytical spike recoveries below the QC limits for the following samples that the reviewer qualified as estimated with a low bias:

   arsenic in sample MFG-P45;

   selenium in samples MFG-P40, MFG-P44, MFG-P45, MFG-P46, MFG-P47, MFG-P52, MFG-P53, MFG-P55, MFG-P57, and MFG-P62; and

   thallium in samples MFG-P43, MFG-P44, MFG-P50, MFG-P51, MFG-P55, and MFG-P57.

   The analytical spike recoveries for lead in sample MFG-P58 and thallium in samples MFG-P59 and MFG-P60 were only marginally low, so the reviewer did not qualify these results.

INORGANIC QA REVIEW
CONTINUATION PAGE

Case 25073 SDG MFDG43 Site STAR LAKE CANAL Lab ARI

7. **Furnace Atomic Absorption Quality Control, continued:**

   Duplicate Injection Coefficient of Variation: Acceptable. Replicate instrument readings were consistent.

   Method of Standard Addition: MSA analysis was not required.

8. **Laboratory Control Sample:** Acceptable. Acceptable LCS results indicated satisfactory sample preparation and analysis.

9. **Sample Verification:** The reviewer detected numerous reporting errors and contacted the laboratory for resubmission (see attached FAX Record Log).

10. **Other QC:**

    Field Duplicate: Acceptable. Field duplicate results demonstrated satisfactory field precision.

11. **Overall Assessment:** The data package is technically provisional for the following reasons.

    The reviewer qualified one arsenic, all antimony and selenium, and six thallium results because of matrix related problems.

    The reviewer qualified one nickel result because of inconsistent ICP readings.

INORGANIC DATA QUALIFIER DEFINITIONS

The following definitions provide brief explanations of the ESAT-Region 6 qualifiers assigned to results in the inorganic data review process.

U Undetected at the laboratory reported detection limit (IDL).

L Reported concentration is between the IDL and the CRDL.

J Result is estimated because of outlying quality control parameters such as matrix spike, serial dilution, FAA spike recovery, etc.

R Result is unusable.

F A possibility of a false negative exists.

UC Reported concentration should be used as a raised detection limit because of apparent blank contamination.

^ High bias. Actual concentration may be lower than the concentration reported.

v Low bias. Actual concentration may be higher than the concentration reported.

DATA SUMMARY

Case No.: 25093
Laboratory: ARI

SDG. No.: MFGP43
Matrix: SOIL

Reviewer: L. Hoffman
Units: mg/Kg

EPA TR #=>	MFG-P40	FLAG	MFG-P43	FLAG	MFG-P44	FLAG	MFG-P45	FLAG	MFG-P46	FLAG	COMMENTS
ALUMINUM	34700		30400		26500		43400		32900		
ANTIMONY	21.7	UR	18.8	UR	18.9	UR	19.2	UR	23.3	UR	
ARSENIC	3.1	L	1.5	L	1.5	L	0.41	UJv	6.6		
BARIUM	163		142		155		297		94.2		
BERYLLIUM	1.4	L	1.6	L	1.4	L	1.9	L	1.6	L	
CADMIUM	0.87	U	0.75	U	0.77	L	0.77	U	0.93	U	
CALCIUM	38400		5210		4490		6900		4410		
CHROMIUM	51.0		31.4		28.7		40.8		35.7		
COBALT	9.7	L	10.1	L	4.8	L	5.1	L	13.6	L	
COPPER	106		19.1		16.3		29.5		19.5		
IRON	24200		16800		15200		19400		37300		
LEAD	46.8		23.6		20.2		19.9		26.5		
MAGNESIUM	6860		5940		5730		6910		9200		
MANGANESE	308		116		102		186		2780		
MERCURY	0.23		0.09	U	0.09	U	0.10	L	0.10	U	
NICKEL	19.0		17.2		12.1	L	21.6		29.9		
POTASSIUM	2480		3690		3600		4750		5540		
SELENIUM	0.42	UJv	1.9	UJv	0.76	UJv	0.81	UJv	0.50	UJv	
SILVER	1.3	U	1.1	U	1.1	U	1.2	U	1.4	U	
SODIUM	1920	L	2830		2610		4140		4880		
THALLIUM	3.3	L	0.81	LJv	0.64	LJv	2.6	L	3.3	L	
VANADIUM	56.9		53.5		50.6		59.3		62.0		
ZINC	96.7		74.4		53.5		56.4		94.3		
CYANIDE	1.5		0.49	U	0.49	U	0.50	U	0.62	U	
% SOLIDS	43.9		50.1		51.4		49.2		39.8		

DATA SUMMARY

Case No.: 25093
Laboratory: ARI

SDG. No.: MFGP43
Matrix: SOIL

Reviewer: L. Hoffman
Units: mg/Kg

EPA TR #=>	MFG-P47	FLAG	MFG-P48	FLAG	MFG-P49	FLAG	MFG-P50	FLAG	MFG-P51	FLAG	COMMENTS
ALUMINUM	21700		28500		25100		27800		22500		
ANTIMONY	26.4	UR	20.5	UR	19.2	UR	19.6	UR	25.2	UR	
ARSENIC	7.0		11.5		1.2	L	1.7	L	3.2	L	
BARIUM	109		100		114		116		128		
BERYLLIUM	1.2	L	1.5	L	1.6	L	1.7	L	1.6	L	
CADMIUM	1.1	U	0.82	U	0.77	U	0.78	U	1.0	U	
CALCIUM	47200		3390		3250		3150		6030		
CHROMIUM	70.1		32.4		26.7		29.0		24.7		
COBALT	9.1	L	17.4	L	6.1	L	5.0	L	4.7	L	
COPPER	143		22.9		14.8		14.6		16.0		
IRON	21700		25000		17000		17100		14300		
LEAD	89.1		24.6		21.3		21.1		17.8		
MAGNESIUM	14300		6860		7050		7540		8000		
MANGANESE	598		223		110		143		133		
MERCURY	1.6		0.10	U	0.10	U	0.09	U	0.13	U	
NICKEL	27.5		27.5		16.1		16.6	J	17.4	L	
POTASSIUM	2490	L	4680		4760		4790		4290		
SELENIUM	0.53	UJv	2.1	UJv	1.9	UJv	2.0	UJv	2.7	UJv	
SILVER	1.6	U	1.2	U	1.2	U	1.2	U	1.5	U	
SODIUM	3700		3640		5360		5980		5890		
THALLIUM	2.6	U	2.1	L	2.5	L	0.93	LJv	1.2	LJv	
VANADIUM	42.2		53.4		47.1		48.6		44.2		
ZINC	120		73.5		66.4		58.1		50.4		
CYANIDE	4.3		0.54	U	0.52	U	0.53	U	0.67	U	
% SOLIDS	34.4		45.6		48.2		46.9		36.4		

DATA SUMMARY

Case No.: 25093
Laboratory: ARI

SDG. No.: MFGP43
Matrix: SOIL

Reviewer: L. Hoffman
Units: mg/Kg

EPA TR #=>	MFG-P52	FLAG	MFG-P53	FLAG	MFG-P55	FLAG	MFG-P56	FLAG	MFG-P57	FLAG	COMMENTS
ALUMINUM	5930		15300		20000		1650		13900		
ANTIMONY	13.5	UR	13.8	UR	22.8	UR	13.3	UR	14.2	UR	
ARSENIC	2.0	L	4.7		3.9	L	0.75	L	3.8		
BARIUM	30.6	L	57.1		61.8	L	9.8	L	60.0		
BERYLLIUM	0.36	L	1.0	L	0.95	L	0.27	U	0.89	L	
CADMIUM	0.54	U	0.55	U	0.91	U	0.53	U	0.57	U	
CALCIUM	837	L	1740		1500	B	204	L	1070	L	
CHROMIUM	6.5		18.7		20.3		3.2		15.1		
COBALT	2.1	L	12.9	L	5.4	L	1.4	L	7.4	L	
COPPER	5.3	L	12.1		13.9		2.7	LUC	8.2		
IRON	5360		21400		14700		1740		15200		
LEAD	8.7		15.9		47.4		12.0		14.4		
MAGNESIUM	1510		5080		4560		490	L	3560		
MANGANESE	41.0		1170		98.6		18.0		136		
MERCURY	0.07	U	0.06	U	0.17	L	0.07	U	0.07	U	
NICKEL	4.4	L	21.6		12.7	L	3.0	L	13.5		
POTASSIUM	906	L	3720		2800		228	L	2490		
SELENIUM	0.27	UJv	0.27	UJv	0.47	UJv	0.27	UJv	0.29	UJv	
SILVER	0.81	U	0.83	U	1.4	U	0.80	U	0.85	U	
SODIUM	1460		3040		5370		1100	L	2930		
THALLIUM	0.27	L	2.1	L	0.81	LJv	0.27	U	0.65	LJv	
VANADIUM	12.4	L	29.8		39.0		3.9	L	29.0		
ZINC	17.4		58.3		46.8		8.9		41.3		
CYANIDE	0.34	U	0.35	U	0.59	U	0.34	U	0.38	U	
% SOLIDS	72.6		70.9		42.2		73.5		65.3		

DATA SUMMARY

Case No.: 25093
Laboratory: ARI

SDG. No.: MFGP43
Matrix: SOIL

Reviewer: L. Hoffman
Units: mg/Kg

EPA TR #=>	MFG-P61	FLAG	MFG-P62	FLAG		FLAG		FLAG		FLAG		COMMENTS
ALUMINUM	28800		23200									
ANTIMONY	21.6	UR	15.8	UR								
ARSENIC	1.9	L	21.0									
BARIUM	179		436									
BERYLLIUM	1.5	L	1.8									
CADMIUM	0.86	U	0.63	U								
CALCIUM	24700		13700									
CHROMIUM	46.0		29.7									
COBALT	6.3	L	15.1	L								
COPPER	67.1		16.1									
IRON	17300		35200									
LEAD	63.5		31.6									
MAGNESIUM	6400		3500									
MANGANESE	181		491									
MERCURY	0.76		0.08	U								
NICKEL	15.2	L	18.3									
POTASSIUM	3390		3240									
SELENIUM	2.1	UJv	0.33	UJv								
SILVER	1.3	U	0.95	U								
SODIUM	3100		1700									
THALLIUM	2.1	U	3.3	L								
VANADIUM	47.8		71.1									
ZINC	93.4		40.8									
CYANIDE	0.55	U	0.42	U								
% SOLIDS	45.0		59.1									

DATA SUMMARY

Case No.: 25093
Laboratory: ARI

SDG. No.: MFGP43
Matrix: WATER

Reviewer: L. Hoffman
Units: ug/L

EPA TR #=>	MFG-P58	FLAG	MFG-P59	FLAG	MFG-P60	FLAG		FLAG		FLAG		COMMENTS
ALUMINUM	27.3	LUC	27.7	LUC	26.8	L						
ANTIMONY	50.0	U	50.0	U	50.0	U						
ARSENIC	1.0	U	1.0	U	1.0	U						
BARIUM	1.0	U	1.0	U	1.0	U						
BERYLLIUM	1.0	U	1.0	U	1.0	U						
CADMIUM	2.0	U	2.0	U	2.0	U						
CALCIUM	39.5	L	32.3	L	29.4	L						
CHROMIUM	5.0	U	5.0	U	5.0	U						
COBALT	3.0	U	3.0	U	3.0	U						
COPPER	3.5	LUC	2.8	LUC	2.8	LUC						
IRON	58.1	L	20.0	U	20.0	U						
LEAD	1.0	U	1.4	LUC	1.3	LUC						
MAGNESIUM	25.0	U	25.0	U	25.0	U						
MANGANESE	5.0	L	1.0	U	1.0	U						
MERCURY	0.10	U	0.10	U	0.10	U						
NICKEL	10.0	U	10.0	U	10.0	U						
POTASSIUM	500	U	500	U	500	U						
SELENIUM	1.0	U	1.0	U	1.0	U						
SILVER	3.0	U	3.0	U	3.0	U						
SODIUM	86.7	L	78.0	L	59.1	L						
THALLIUM	1.0	U	1.0	U	1.0	U						
VANADIUM	2.0	U	2.0	U	2.0	U						
ZINC	15.1	LUC	4.1	LUC	4.0	U						
CYANIDE	5.0	U	5.0	U	5.0	U						

INORGANIC/ORGANIC COMPLETE SDG FILE (CSF) INVENTORY CHECKLIST

Case No. 25093 SDG No. MFGP43 SDG Nos. To Follow SAS No. Date Rec 11/29/96

EPA Lab ID: ARI

Lab Location: Seattle, WA

Region: 6 Audit No.: 25093/MFGP43

Re_Submitted CSF? Yes _____ No X

Box No(s): 1

COMMENTS:

1. The laboratory failed to secure the data package with the required custody seals. The laboratory was notified of this omission.

3. On Form DC-2-2, the laboratory failed to record the traffic report page numbers. The page number was omitted from the page between pages 284 and 285. The reviewer made the necessary corrections and contacted the laboratory.

ORIGINALS	YES	NO	N/A
CUSTODY SEALS			
1. Present on package?		X	
2. Intact upon receipt?			X
FORM DC-2			
3. Numbering scheme accurate?		X	
4. Are enclosed documents listed?	X		
5. Are listed documents enclosed?	X		
FORM DC-1			
6. Present?	X		
7. Complete?	X		
8. Accurate?	X		
CHAIN-OF-CUSTODY RECORD(s)			
9. Signed?	X		
10. Dated?	X		
TRAFFIC REPORT(s) PACKING LIST(s)			
11. Signed?	X		
12. Dated?	X		
AIRBILLS/AIRBILL STICKER			
13. Present?	X		
14. Signed?	X		
15. Dated?	X		
SAMPLE TAGS			
16. Does DC-1 list tags as being included?	X		
17. Present?	X		
OTHER DOCUMENTS			
18. Complete?	X		
19. Legible?	X		
20. Original?		X	
20a. If "NO", does the copy indicate where original documents are located?	X		

Over for additional comments.

Audited by: Linda Hoffman /ESAT Data Reviewer Date 12/03/96

Audited by: Date

Audited by: Date

Signature Printed Name/Title

TO BE COMPLETED BY CEAT

Date Recvd by CEAT: Date Entered: Date Reviewed:

Entered by:

Reviewed by:

Signature Printed Name/Title

DC-2___

In Reference to
Case 25093/SDG MFGP43
Page 1 of 3 pages
ESAT File No.: I2059

Contract Laboratory Program
REGIONAL/LABORATORY COMMUNICATION SYSTEM

FAX Record Log

Date of FAX: December 13, 1996

Laboratory Name: ARI

Lab Contact: Jeff Reitan

Region: 6

Regional Contact: Linda Hoffman (ESAT)

FAX Initiated by: Region

In reference to data for the following sample number(s):

All samples in this SDG.

Summary of Questions/Issues:

1. The data package was submitted without the contractually required custody seals (ILM04.0, Exhibit F, F-8, 2.7.14). Please explain this contractual noncompliance.

2. Contractually noncompliant dilutions (2X) were made to samples MFG-P44 and MFG-P45 for the selenium analyses. The SOW (ILM04.0, Exhibit E, E-30, 13.b.1) states, "If the spike recovery is less than 40%, the sample shall be diluted and rerun with another spike. Dilute the sample by a factor of 5 to 10 and rerun." Please explain this contractual noncompliance.

3. On Form DC-2-1 improper corrections were made. The SOW (ILM04.0, Exhibit F, 2.5.8, F-5) states, "Corrections to laboratory documents and raw data shall be made by drawing single lines through the errors and entering the correct information....Corrections and additions to information shall be signed (or initialed) and dated." Please acknowledge this requirement and note for the future.

4. The traffic report page number was not recorded on Form DC-2-2, Item #26. The SOW (ILM04.0, Exhibie B, B-42, U, 2nd paragraph) states, "Inventory the CSF by reviewing the document numbers and recording page number ranges in the column provided on Form DC-2." Since the TR/COC are on the

same document, the SOW requires the traffic report page numbers to be recorded on Form DC-2-2. Please acknowledge and note for the future that the traffic report page number must be recorded under Item #26.

5. On Form 4 (pp. 46 and 47), all analytes analyzed by ICP were not recorded for "Initial/Final Sol. A". The SOW (ILM04.0, Exhibit B, B-26 and B-27, Paragraphs beginning "Under "Initial Found Sol, A" and "Under "Final Found Sol. A" and Exhibit E, E-20, 5, 2nd paragraph) states analytes for all wavelengths used for each analyte reported by ICP must be recorded on Form 4 (starting with Solution A). Please make the necessary corrections to pages 46 and 47 and resubmit.

6. For your information, soil samples do not require aluminum and iron matrix spike analyses (ILM04.0, Exhibit E, E-23, Table 3).

7. In the lead instrument raw data, time of analysis was not recorded for the initial and continuing calibration verifications and blanks (ILM04.0, Exhibit B, d, B-11, #9). Please add the time of each ICV, ICB, CCV, and CCB analysis to the lead raw data and resubmit.

8. On Form 14 (p.75), a 0.0 %R was entered for lead sample MFG-P44A. From the raw data (pp. 293 and 294), however, the correct %R should be 98.0. Please correct and resubmit Form 14.

9. In the thallium raw data (pp. 368 - 370 and 380 - 385), the CCV's and CCB's were not identified with the required EPA sample numbers. Please make this correction to all appropriate pages and resubmit.

10. On the Form 14's for the first cyanide run, the "start date" is later than the "end date" and also does not agree with the start date in the raw data pages 404, 405, and 406. Please make the necessary corrections and resubmit the appropriate pages.

11. Please explain why the ICV/CCV concentrations in the cyanide raw data do not agree with the concentrations reported on the Form 2's and make any necessary corrections and resubmissions.

12. On the SDG/TR Cover Sheet (p. 467), the last sample in SDG is also listed as the SDG number, which in this case it is not. Please correct this discrepancy and resubmit page 467.

In Reference to
Case 25093/SDG MFGP43
Page 3 of 3 pages
ESAT File No.: I2059

The EPA expects the laboratory to look into items and submit data within seven days to Mahmoud El-Feky, U.S. EPA, 10625 Fallstone Road, Houston TX 77099.

Signature

12/13/96
Date

Distribution: (1) Lab Copy, (2) Region Copy

Lockheed Martin Services Group
ESAT Region 6

10101 S. W. Freeway, Suite 500, Houston, TX 77074 TEL:(713) 988-2983

FACSIMILE COVER SHEET

Please deliver the following pages to:

Name Jeff Reitan

Firm ARI

City Seattle **State** WA

Telephone 206-621-6490 **Ext.** _____

FAX Telephone No. 206-621-7523 **Ext.** _____

Sender:

Name Linda Hoffman ESAT

Date 12/13/96 **Time** _____

Total Number of pages including this Cover Sheet 4

If you do not receive all the pages or if any pages are unclear, please call: (713) 988-2983.

MESSAGES: _____

FAX No. (713) 988-2994

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP40

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368I

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _43.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	34700			P
7440-36-0	Antimony_	21.7	U	N	P
7440-38-2	Arsenic__	3.1	B		F
7440-39-3	Barium___	163			P
7440-41-7	Beryllium	1.4	B		P
7440-43-9	Cadmium__	0.87	U		P
7440-70-2	Calcium__	38400			P
7440-47-3	Chromium_	51.0			P
7440-48-4	Cobalt___	9.7	B		P
7440-50-8	Copper___	106			P
7439-89-6	Iron____	24200			P
7439-92-1	Lead____	46.8			F
7439-95-4	Magnesium	6860			P
7439-96-5	Manganese	308			P
7439-97-6	Mercury__	0.23			CV
7440-02-0	Nickel___	19.0			P
7440-09-7	Potassium	2480			P
7782-49-2	Selenium_	0.42	U	WN	F
7440-22-4	Silver___	1.3	U		P
7440-23-5	Sodium___	1920	B		P
7440-28-0	Thallium_	3.3	B		F
7440-62-2	Vanadium_	56.9			P
7440-66-6	Zinc____	96.7			P
	Cyanide__	1.5			CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP43

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368A

Level (low/med): LOW__ Date Received: 10/23/96

% Solids: _50.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	30400			P
7440-36-0	Antimony_	18.8	U	N	P
7440-38-2	Arsenic__	1.5	B		F
7440-39-3	Barium___	142			P
7440-41-7	Beryllium	1.6	B		P
7440-43-9	Cadmium__	0.75	U		P
7440-70-2	Calcium__	5210			P
7440-47-3	Chromium_	31.4			P
7440-48-4	Cobalt___	10.1	B		P
7440-50-8	Copper___	19.1			P
7439-89-6	Iron____	16800			P
7439-92-1	Lead____	23.6			F
7439-95-4	Magnesium	5940			P
7439-96-5	Manganese	116			P
7439-97-6	Mercury__	0.09	U		CV
7440-02-0	Nickel___	17.2			P
7440-09-7	Potassium	3690			P
7782-49-2	Selenium_	1.9	U	N	F
7440-22-4	Silver___	1.1	U		P
7440-23-5	Sodium___	2830			P
7440-28-0	Thallium_	0.81	B	W	F
7440-62-2	Vanadium_	53.5			P
7440-66-6	Zinc____	74.4			P
	Cyanide__	0.49	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

FORM I - IN ILM04.0

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP44

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368B

Level (low/med): LOW__ Date Received: 10/23/96

% Solids: _51.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	26500			P_
7440-36-0	Antimony_	18.9	U	N	P_
7440-38-2	Arsenic__	1.5	B		F_
7440-39-3	Barium___	155			P_
7440-41-7	Beryllium	1.4	B		P_
7440-43-9	Cadmium__	0.77	B		P_
7440-70-2	Calcium__	4490			P_
7440-47-3	Chromium_	28.7			P_
7440-48-4	Cobalt___	4.8	B		P_
7440-50-8	Copper___	16.3			P_
7439-89-6	Iron_____	15200			P_
7439-92-1	Lead_____	20.2			F_
7439-95-4	Magnesium	5730			P_
7439-96-5	Manganese	102			P_
7439-97-6	Mercury__	0.09	U		CV
7440-02-0	Nickel___	12.1	B		P_
7440-09-7	Potassium	3600			P_
7782-49-2	Selenium_	0.76	U	WN	F_
7440-22-4	Silver___	1.1	U		P_
7440-23-5	Sodium___	2610			P_
7440-28-0	Thallium_	0.64	B	W	F_
7440-62-2	Vanadium_	50.6			P_
7440-66-6	Zinc_____	53.3			P_
	Cyanide__	0.49	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP45

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368J

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _49.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	43400			P
7440-36-0	Antimony_	19.2	U	N	P
7440-38-2	Arsenic__	0.41	U	W	F
7440-39-3	Barium___	297			P
7440-41-7	Beryllium	1.9	B		P
7440-43-9	Cadmium__	0.77	U		P
7440-70-2	Calcium__	6900			P
7440-47-3	Chromium_	40.8			P
7440-48-4	Cobalt___	5.1	B		P
7440-50-8	Copper___	29.5			P
7439-89-6	Iron____	19400			P
7439-92-1	Lead____	19.9			F
7439-95-4	Magnesium	6910			P
7439-96-5	Manganese	186			P
7439-97-6	Mercury__	0.10	B		CV
7440-02-0	Nickel___	21.6			P
7440-09-7	Potassium	4750			P
7782-49-2	Selenium_	0.81	U	WN	F
7440-22-4	Silver___	1.2	U		P
7440-23-5	Sodium___	4140			P
7440-28-0	Thallium_	2.6	B		F
7440-62-2	Vanadium_	59.3			P
7440-66-6	Zinc____	56.4			P
	Cyanide__	0.50	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

FORM I - IN ILM04.0

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP46

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368K

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _39.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	32900			P
7440-36-0	Antimony_	23.3	U	N	P
7440-38-2	Arsenic__	6.6			F
7440-39-3	Barium___	94.2			P
7440-41-7	Beryllium	1.6	B		P
7440-43-9	Cadmium__	0.93	U		P
7440-70-2	Calcium__	4410			P
7440-47-3	Chromium_	35.7			P
7440-48-4	Cobalt___	13.6	B		P
7440-50-8	Copper___	19.5			P
7439-89-6	Iron_____	37300			P
7439-92-1	Lead_____	26.5			F
7439-95-4	Magnesium	9200			P
7439-96-5	Manganese	2780			P
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	29.9			P
7440-09-7	Potassium	5540			P
7782-49-2	Selenium_	0.50	U	WN	F
7440-22-4	Silver___	1.4	U		P
7440-23-5	Sodium___	4880			P
7440-28-0	Thallium_	3.3	B		F
7440-62-2	Vanadium_	62.0			P
7440-66-6	Zinc_____	94.3			P
	Cyanide__	0.62	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

FORM I - IN ILM04.0

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1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP47

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368L

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _34.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	21700			P
7440-36-0	Antimony_	26.4	U	N	P
7440-38-2	Arsenic__	7.0			F
7440-39-3	Barium___	109			P
7440-41-7	Beryllium	1.2	B		P
7440-43-9	Cadmium__	1.1	U		P
7440-70-2	Calcium__	47200			P
7440-47-3	Chromium_	70.1			P
7440-48-4	Cobalt___	9.1	B		P
7440-50-8	Copper___	143			P
7439-89-6	Iron_____	21700			P
7439-92-1	Lead_____	89.1			F
7439-95-4	Magnesium	14300			P
7439-96-5	Manganese	598			P
7439-97-6	Mercury__	1.6			CV
7440-02-0	Nickel___	27.5			P
7440-09-7	Potassium	2490	B		P
7782-49-2	Selenium_	0.53	U	WN	F
7440-22-4	Silver___	1.6	U		P
7440-23-5	Sodium___	3700			P
7440-28-0	Thallium_	2.6	U		F
7440-62-2	Vanadium_	42.2			P
7440-66-6	Zinc_____	120			P
	Cyanide__	4.3			CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

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EPA SAMPLE NO.

MFGP48

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368M

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _45.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	28500			P
7440-36-0	Antimony_	20.5	U	N	P
7440-38-2	Arsenic__	11.5			F
7440-39-3	Barium___	100			P
7440-41-7	Beryllium	1.5	B		P
7440-43-9	Cadmium__	0.82	U		P
7440-70-2	Calcium__	3390			P
7440-47-3	Chromium_	32.4			P
7440-48-4	Cobalt___	17.4	B		P
7440-50-8	Copper___	22.9			P
7439-89-6	Iron____	25000			P
7439-92-1	Lead____	24.6			F
7439-95-4	Magnesium	6860			P
7439-96-5	Manganese	223			P
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	27.5			P
7440-09-7	Potassium	4680			P
7782-49-2	Selenium_	2.1	U	N	F
7440-22-4	Silver___	1.2	U		P
7440-23-5	Sodium___	3640			P
7440-28-0	Thallium_	2.1	B		F
7440-62-2	Vanadium_	53.4			P
7440-66-6	Zinc____	73.5			P
	Cyanide__	0.54	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP49

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368N

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _48.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	25100			P
7440-36-0	Antimony_	19.2	U	N	P
7440-38-2	Arsenic__	1.2	B		F
7440-39-3	Barium___	114			P
7440-41-7	Beryllium	1.6	B		P
7440-43-9	Cadmium__	0.77	U		P
7440-70-2	Calcium__	3250			P
7440-47-3	Chromium_	26.7			P
7440-48-4	Cobalt___	6.1	B		P
7440-50-8	Copper___	14.8			P
7439-89-6	Iron____	17000			P
7439-92-1	Lead____	21.3			F
7439-95-4	Magnesium	7050			P
7439-96-5	Manganese	110			P
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	16.1			P
7440-09-7	Potassium	4760			P
7782-49-2	Selenium_	1.9	U	N	F
7440-22-4	Silver___	1.2	U		P
7440-23-5	Sodium___	5360			P
7440-28-0	Thallium_	2.5	B		F
7440-62-2	Vanadium_	47.1			P
7440-66-6	Zinc____	66.4			P
	Cyanide__	0.52	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

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EPA SAMPLE NO.

MFGP50

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 53680

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _46.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	27800			P
7440-36-0	Antimony_	19.6	U	N	P
7440-38-2	Arsenic__	1.7	B		F
7440-39-3	Barium___	116			P
7440-41-7	Beryllium	1.7	B		P
7440-43-9	Cadmium__	0.78	U		P
7440-70-2	Calcium__	3150			P
7440-47-3	Chromium_	29.0			P
7440-48-4	Cobalt___	5.0	B		P
7440-50-8	Copper___	14.6			P
7439-89-6	Iron_____	17100			P
7439-92-1	Lead_____	21.1			F
7439-95-4	Magnesium	7540			P
7439-96-5	Manganese	143			P
7439-97-6	Mercury__	0.09	U		CV
7440-02-0	Nickel___	16.6			P
7440-09-7	Potassium	4790			P
7782-49-2	Selenium_	2.0	U	N	F
7440-22-4	Silver___	1.2	U		P
7440-23-5	Sodium___	5980			P
7440-28-0	Thallium_	0.93	B	W	F
7440-62-2	Vanadium_	48.6			P
7440-66-6	Zinc_____	58.1			P
	Cyanide__	0.53	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

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EPA SAMPLE NO.

MFGP51

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368P

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _36.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	22500			P
7440-36-0	Antimony_	25.2	U	N	P
7440-38-2	Arsenic__	3.2	B		F
7440-39-3	Barium___	128			P
7440-41-7	Beryllium	1.6	B		P
7440-43-9	Cadmium__	1.0	U		P
7440-70-2	Calcium__	6030			P
7440-47-3	Chromium_	24.7			P
7440-48-4	Cobalt___	4.7	B		P
7440-50-8	Copper___	16.0			P
7439-89-6	Iron____	14300			P
7439-92-1	Lead____	17.8			F
7439-95-4	Magnesium	8000			P
7439-96-5	Manganese	133			P
7439-97-6	Mercury__	0.13	U		CV
7440-02-0	Nickel___	17.4	B		P
7440-09-7	Potassium	4290			P
7782-49-2	Selenium_	2.7	U	N	F
7440-22-4	Silver___	1.5	U		P
7440-23-5	Sodium___	5890			P
7440-28-0	Thallium_	1.2	B	W	F
7440-62-2	Vanadium_	44.2			P
7440-66-6	Zinc____	50.4			P
	Cyanide__	0.67	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

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EPA SAMPLE NO.

MFGP52

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368C

Level (low/med): LOW__ Date Received: 10/23/96

% Solids: _72.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	5930			P
7440-36-0	Antimony_	13.5	U	N	P
7440-38-2	Arsenic__	2.0	B		F
7440-39-3	Barium___	30.6	B		P
7440-41-7	Beryllium	0.36	B		P
7440-43-9	Cadmium__	0.54	U		P
7440-70-2	Calcium__	837	B		P
7440-47-3	Chromium_	6.5			P
7440-48-4	Cobalt___	2.1	B		P
7440-50-8	Copper___	5.3	B		P
7439-89-6	Iron_____	5360			P
7439-92-1	Lead_____	8.7			F
7439-95-4	Magnesium	1510			P
7439-96-5	Manganese	41.0			P
7439-97-6	Mercury__	0.07	U		CV
7440-02-0	Nickel___	4.4	B		P
7440-09-7	Potassium	906	B		P
7782-49-2	Selenium_	0.27	U	WN	F
7440-22-4	Silver___	0.81	U		P
7440-23-5	Sodium___	1460			P
7440-28-0	Thallium_	0.27	B		F
7440-62-2	Vanadium_	12.4	B		P
7440-66-6	Zinc_____	17.4			P
	Cyanide__	0.34	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

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EPA SAMPLE NO.

MFGP53

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368Q

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _70.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	15300			P
7440-36-0	Antimony_	13.8	U	N	P
7440-38-2	Arsenic__	4.7			F
7440-39-3	Barium___	57.1			P
7440-41-7	Beryllium	1.0	B		P
7440-43-9	Cadmium__	0.55	U		P
7440-70-2	Calcium__	1740			P
7440-47-3	Chromium_	18.7			P
7440-48-4	Cobalt___	12.9	B		P
7440-50-8	Copper___	12.1			P
7439-89-6	Iron____	21400			P
7439-92-1	Lead____	15.9			F
7439-95-4	Magnesium	5080			P
7439-96-5	Manganese	1170			P
7439-97-6	Mercury__	0.06	U		CV
7440-02-0	Nickel___	21.6			P
7440-09-7	Potassium	3720			P
7782-49-2	Selenium_	0.27	U	WN	F
7440-22-4	Silver___	0.83	U		P
7440-23-5	Sodium___	3040			P
7440-28-0	Thallium_	2.1	B		F
7440-62-2	Vanadium_	29.8			P
7440-66-6	Zinc____	58.3			P
	Cyanide__	0.35	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

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EPA SAMPLE NO.

MFGP55

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368D

Level (low/med): LOW__ Date Received: 10/23/96

% Solids: _42.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	20000			P
7440-36-0	Antimony_	22.8	U	N	P
7440-38-2	Arsenic__	3.9	B		F
7440-39-3	Barium___	61.8	B		P
7440-41-7	Beryllium	0.95	B		P
7440-43-9	Cadmium__	0.91	U		P
7440-70-2	Calcium__	1500	B		P
7440-47-3	Chromium_	20.3			P
7440-48-4	Cobalt___	5.4	B		P
7440-50-8	Copper___	13.9			P
7439-89-6	Iron_____	14700			P
7439-92-1	Lead_____	47.4			F
7439-95-4	Magnesium	4560			P
7439-96-5	Manganese	98.6			P
7439-97-6	Mercury__	0.17	B		CV
7440-02-0	Nickel___	12.7	B		P
7440-09-7	Potassium	2800			P
7782-49-2	Selenium_	0.47	U	WN	F
7440-22-4	Silver___	1.4	U		P
7440-23-5	Sodium___	5370			P
7440-28-0	Thallium_	0.81	B	W	F
7440-62-2	Vanadium_	39.0			P
7440-66-6	Zinc_____	46.8			P
	Cyanide__	0.59	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

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EPA SAMPLE NO.

MFGP56

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368E

Level (low/med): LOW__ Date Received: 10/23/96

% Solids: _73.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	1650			P_
7440-36-0	Antimony_	13.3	U	N	P_
7440-38-2	Arsenic__	0.75	B		F_
7440-39-3	Barium___	9.8	B		P_
7440-41-7	Beryllium	0.27	U		P_
7440-43-9	Cadmium__	0.53	U		P_
7440-70-2	Calcium__	204	B		P_
7440-47-3	Chromium_	3.2			P_
7440-48-4	Cobalt___	1.4	B		P_
7440-50-8	Copper___	2.7	B		P_
7439-89-6	Iron____	1740			P_
7439-92-1	Lead____	12.0			F_
7439-95-4	Magnesium	490	B		P_
7439-96-5	Manganese	18.0			P_
7439-97-6	Mercury__	0.07	U		CV
7440-02-0	Nickel___	3.0	B		P_
7440-09-7	Potassium	228	B		P_
7782-49-2	Selenium_	0.27	U	N	F_
7440-22-4	Silver___	0.80	U		P_
7440-23-5	Sodium___	1100	B		P_
7440-28-0	Thallium_	0.27	U		F_
7440-62-2	Vanadium_	3.9	B		P_
7440-66-6	Zinc____	8.9			P_
	Cyanide__	0.34	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

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EPA SAMPLE NO.

MFGP57

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368F

Level (low/med): LOW__ Date Received: 10/23/96

% Solids: _65.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	13900			P
7440-36-0	Antimony_	14.2	U	N	P
7440-38-2	Arsenic__	3.8			F
7440-39-3	Barium___	60.0			P
7440-41-7	Beryllium	0.89	B		P
7440-43-9	Cadmium__	0.57	U		P
7440-70-2	Calcium__	1070	B		P
7440-47-3	Chromium_	15.1			P
7440-48-4	Cobalt___	7.4	B		P
7440-50-8	Copper___	8.2			P
7439-89-6	Iron____	15200			P
7439-92-1	Lead____	14.4			F
7439-95-4	Magnesium	3560			P
7439-96-5	Manganese	136			P
7439-97-6	Mercury__	0.07	U		CV
7440-02-0	Nickel___	13.5			P
7440-09-7	Potassium	2490			P
7782-49-2	Selenium_	0.29	U	WN	F
7440-22-4	Silver___	0.85	U		P
7440-23-5	Sodium___	2930			P
7440-28-0	Thallium_	0.65	B	W	F
7440-62-2	Vanadium_	29.0			P
7440-66-6	Zinc____	41.3			P
	Cyanide__	0.38	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

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EPA SAMPLE NO.

MFGP58

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): WATER Lab Sample ID: 5368G

Level (low/med): LOW__ Date Received: 10/23/96

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	27.3	B		P_
7440-36-0	Antimony_	50.0	U		P_
7440-38-2	Arsenic__	1.0	U		F_
7440-39-3	Barium___	1.0	U		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	2.0	U		P_
7440-70-2	Calcium__	39.5	B		P_
7440-47-3	Chromium_	5.0	U		P_
7440-48-4	Cobalt___	3.0	U		P_
7440-50-8	Copper___	3.5	B		P_
7439-89-6	Iron____	58.1	B		P_
7439-92-1	Lead____	1.0	U	W	F_
7439-95-4	Magnesium	25.0	U		P_
7439-96-5	Manganese	5.0	B		P_
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	10.0	U		P_
7440-09-7	Potassium	500	U		P_
7782-49-2	Selenium_	1.0	U		F_
7440-22-4	Silver___	3.0	U		P_
7440-23-5	Sodium___	86.7	B		P_
7440-28-0	Thallium_	1.0	U		F_
7440-62-2	Vanadium_	2.0	U		P_
7440-66-6	Zinc____	15.1	B		P_
	Cyanide__	5.0	U		CA

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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EPA SAMPLE NO.

MFGP59

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): WATER Lab Sample ID: 5368H

Level (low/med): LOW__ Date Received: 10/23/96

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	27.7	B		P_
7440-36-0	Antimony_	50.0	U		P_
7440-38-2	Arsenic__	1.0	U		F_
7440-39-3	Barium___	1.0	U		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	2.0	U		P_
7440-70-2	Calcium__	32.3	B		P_
7440-47-3	Chromium_	5.0	U		P_
7440-48-4	Cobalt___	3.0	U		P_
7440-50-8	Copper___	2.8	B		P_
7439-89-6	Iron_____	20.0	U		P_
7439-92-1	Lead_____	1.4	B		F_
7439-95-4	Magnesium	25.0	U		P_
7439-96-5	Manganese	1.0	U		P_
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	10.0	U		P_
7440-09-7	Potassium	500	U		P_
7782-49-2	Selenium_	1.0	U		F_
7440-22-4	Silver___	3.0	U		P_
7440-23-5	Sodium___	78.0	B		P_
7440-28-0	Thallium_	1.0	U	W	F_
7440-62-2	Vanadium_	2.0	U		P_
7440-66-6	Zinc_____	4.1	B		P_
	Cyanide__	5.0	U		CA

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP60

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): WATER Lab Sample ID: 5368R

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	26.8	B		P_
7440-36-0	Antimony_	50.0	U		P_
7440-38-2	Arsenic__	1.0	U		F_
7440-39-3	Barium___	1.0	U		P_
7440-41-7	Beryllium	1.0	U		P_
7440-43-9	Cadmium__	2.0	U		P_
7440-70-2	Calcium__	29.4	B		P_
7440-47-3	Chromium_	5.0	U		P_
7440-48-4	Cobalt___	3.0	U		P_
7440-50-8	Copper___	2.8	B		P_
7439-89-6	Iron____	20.0	U		P_
7439-92-1	Lead____	1.3	B		F_
7439-95-4	Magnesium	25.0	U		P_
7439-96-5	Manganese	1.0	U		P_
7439-97-6	Mercury__	0.10	U		CV
7440-02-0	Nickel___	10.0	U		P_
7440-09-7	Potassium	500	U		P_
7782-49-2	Selenium_	1.0	U		F_
7440-22-4	Silver___	3.0	U		P_
7440-23-5	Sodium___	59.1	B		P_
7440-28-0	Thallium_	1.0	U	W	F_
7440-62-2	Vanadium_	2.0	U		P_
7440-66-6	Zinc____	4.0	U		P_
	Cyanide__	5.0	U		CA

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP61

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368S

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _45.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	28800			P
7440-36-0	Antimony_	21.6	U	N	P
7440-38-2	Arsenic__	1.9	B		F
7440-39-3	Barium___	179			P
7440-41-7	Beryllium	1.5	B		P
7440-43-9	Cadmium__	0.86	U		P
7440-70-2	Calcium__	24700			P
7440-47-3	Chromium_	46.0			P
7440-48-4	Cobalt___	6.3	B		P
7440-50-8	Copper___	67.1			P
7439-89-6	Iron____	17300			P
7439-92-1	Lead____	63.5			F
7439-95-4	Magnesium	6400			P
7439-96-5	Manganese	181			P
7439-97-6	Mercury__	0.76			CV
7440-02-0	Nickel___	15.2	B		P
7440-09-7	Potassium	3390			P
7782-49-2	Selenium_	2.1	U	N	F
7440-22-4	Silver___	1.3	U		P
7440-23-5	Sodium___	3100			P
7440-28-0	Thallium_	2.1	U		F
7440-62-2	Vanadium_	47.8			P
7440-66-6	Zinc____	93.4			P
	Cyanide__	0.55	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

FORM I - IN ILM04.0

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MFGP62

Lab Name: ANALYTICAL_RESOURCES_INC. Contract: 68-D5-0134

Lab Code: ARI___ Case No.: 25093_ SAS No.: _____ SDG No.: MFGP43

Matrix (soil/water): SOIL_ Lab Sample ID: 5368T

Level (low/med): LOW__ Date Received: 10/25/96

% Solids: _59.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	23200			P
7440-36-0	Antimony_	15.8	U	N	P
7440-38-2	Arsenic__	21.0			F
7440-39-3	Barium___	436			P
7440-41-7	Beryllium	1.8			P
7440-43-9	Cadmium__	0.63	U		P
7440-70-2	Calcium__	13700			P
7440-47-3	Chromium_	29.7			P
7440-48-4	Cobalt___	15.1	B		P
7440-50-8	Copper___	16.1			P
7439-89-6	Iron_____	35200			P
7439-92-1	Lead_____	31.6			F
7439-95-4	Magnesium	3500			P
7439-96-5	Manganese	491			P
7439-97-6	Mercury__	0.08	U		CV
7440-02-0	Nickel___	18.3			P
7440-09-7	Potassium	3240			P
7782-49-2	Selenium_	0.33	U	WN	F
7440-22-4	Silver___	0.95	U		P
7440-23-5	Sodium___	1700			P
7440-28-0	Thallium_	3.3	B		F
7440-62-2	Vanadium_	71.1			P
7440-66-6	Zinc_____	40.8			P
	Cyanide__	0.42	U		CA

Color Before: BROWN____ Clarity Before: _____ Texture: FINE__

Color After: GREEN____ Clarity After: CLOUDY Artifacts: _____

Comments:

EPA United States Environmental Protection Agency
Contract Laboratory Program

Organic Traffic Report & Chain of Custody Record
(For Organic CLP Analysis)

Case No. 25093

1. Project Code	Account Code	2. Region No.	Sampling Co.	4. Date Shipped	Carrier
		6	TNRCC	10/24/96	AIRBORNE EXPRESS

Regional Information

Sampler (Name): Wesley Newberry

Airbill Number: 8862445 0870

Non-Superfund Program

Sampler Signature: [signature]

5. Ship To: COMPUCHEM LAB, 4600 SILICON DRIVE, RESEARCH TRIANGLE, NC 27709, ATTN: BOB MEIERER

Site Name: STAR LAKE CANAL

3. Purpose: Lead [X] SF [ ] PRP [ ] ST [ ] FED; Early Action: [ ] CLEM [ ] PA [ ] REM [ ] RI [X] SI [ ] ESI; Long-Term Action: [ ] FS [ ] RD [ ] RA [ ] O&M [ ] NPLD

City, State: Pt. Neches, TX

Site Spill ID

6. Matrix (Enter in Column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil (High only) 7. Waste (High only) 8. Other (Specify in Column A)

7. Preservative (Enter in Column D): 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. Ice only 6. Other (Specify in Column D) N. Not preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 6) Other:	B Conc. Low Med High	C Sample Type: Comp. Grab	D Preservative (from Box 7) Other:	E RAS Analysis VOA	BNA	Pest/PCB	High only ARO/TOX	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank S = Spike D = Duplicate R = Rinsate PE = Perform. Eval. — = Not a QC Sample)
FE201	5	LOW	GRAB	5	X	X	X		6-017349-52	SE-19	10/23/96 15:30	MFGP61	WN	
FE202	5	LOW	GRAB	5	X	X	X		6-017279-52	SE-15	10/23/96 16:20	MFGP45	WN	
FE203	5	LOW	GRAB	5	X	X	X		6-017283-56	SE-16	10/23/96 15:50	MFGP40	WN	
~~FE202~~	~~5~~	~~LOW~~	~~GRAB~~	~~5~~	~~X~~	~~X~~	~~X~~		~~6-017353-58~~	~~SE-20~~	~~10/23/96 14:30~~	~~MFGP62~~	~~WN~~	
FE203	5	LOW	COMP	5	X	X	X		6-017361-64	SE-21	10/23/96 14:40	MFGP63	WN	
FE197	4	LOW	GRAB	5	X				6-016650-51	ER-03	10/23/96 19:25	MFGP60	WN	R
FE192	4	LOW	GRAB	5	X				6-016657-58	FB02	10/23/96 19:26		WN	B
FE202	5	LOW	COMP	5	X	X	X		6-017355-58	SE-20	10/23/96 14:30	MFGP62	WN	

Shipment for Case Complete? (Y/N): Y

Page 1 of 1

Sample(s) to be Used for Laboratory QC:

Additional Sampler Signatures

Chain of Custody Seal Number(s)

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/24/96 8:00 AM				
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: Is custody seal intact? Y/N/none	

A21-012-15 REV.

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EPA Form 9110-2

SEE REVERSE FOR ADDITIONAL STANDARD INSTRUCTIONS
*SEE REVERSE FOR PURPOSE CODE DEFINITIONS

365580

Organic Traffic Report / Chain of Custody Record Form Instructions

EPA United States Environmental Protection Agency Contract Laboratory Program

Organic Traffic Report & Chain of Custody Record
(For Organic CLP Analysis)

Case No. 25093

1. Project Code	Account Code	2. Region No.	Sampling Co.	4. Date Shipped	Carrier
		6	TNRCC	10/24/96	AIRBORNE EXPRESS

Regional Information

Sampler (Name): WES NEWBERRY

Airbill Number: 862 445 0973

Non-Superfund Program

Sampler Signature: [signature]

Site Name: STAR LAKE CANAL

City, State: Ft. Neches, TX

Site Spill ID: DH

3. Purpose*: Lead [X] SF [ ] PRP [ ] ST [ ] FED; Early Action [ ] CLEM [ ] PA [ ] REM [ ] RI [X] SI [ ] ESI; Long-Term Action [ ] FS [ ] RD [ ] RA [ ] O&M [ ] NPLD

5. Ship To: CompuChem, 4600 Silicon Drive, Reasearch Triangle, NC 27709, ATTN: BOB Meierer

6. Matrix (Enter in Column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil (High only) 7. Waste (High only) 8. Other (Specify in Column A)

7. Preservative (Enter in Column D): 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. Ice only 6. Other (Specify in Column D) N. Not preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 6) Other:	B Conc. Low Med High	C Sample Type: Comp./Grab	D Preservative (from Box 7) Other:	E RAS Analysis VOA	BNA	Pest/PCB	High only ARO/TOX	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank S = Spike D = Duplicate R = Rinsate PE = Perform. Eval. — = Not a QC Sample)
FEY87	5	LOW	GRAB	5	X	X	X		6-016915-18	SE-08	10/23/96 11:40	MFGP50	MC	
FEY90	5	LOW	GRAB	5	X	X	X		6-016683-86	SE-05	10/23/96 10:10	MFGP53	WN	
~~FEY91~~	~~5~~	~~LOW~~	~~GRAB~~	~~5~~	~~X~~	~~X~~	~~X~~		~~6-016689-92~~	~~SE-06~~	~~10/23/96 10:40~~	~~MFG DH~~	~~WN~~	
FEY91	5	LOW	GRAB	5	X	X	X		6-016689-92	SE-06	10/23/96 10:40		WN	
FEY96	5	LOW	GRAB	5	X	X	X		6-016695-98	SE-07	10/23/96 11:05	MFGP49	WN	
FEY88	5	LOW	GRAB	5	X	X	X		6-016921-24	SE-09	10/23/96 12:20	MFGP51	MC	

Shipment for Case Complete? (Y/N) | Page ___ of ___ | Sample(s) to be Used for Laboratory QC: | Additional Sampler Signatures: [signature] | Chain of Custody Seal Number(s)

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/24/96 8:00 AM				
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 Is custody seal intact? Y/N/none	

A21-012-15 REV.

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300570

EPA United States Environmental Protection Agency
Contract Laboratory Program

Organic Traffic Report & Chain of Custody Record
(For Organic CLP Analysis)

Case No. 25093

1. Project Code	Account Code	2. Region No. VI	Sampling Co: TNRCC
4. Date Shipped 10/24/96	Carrier AIRBORNE EXPRESS		
Regional Information	Sampler (Name) Wesley Newberry	Airbill Number 8624405 1076	
Non-Superfund Program	Sampler Signature	5. Ship To COMPUCHEM 4600 SILICON DRIVE RESEARCH TRIANGLE PARK NC 27709 ATTN: BOB MEIERER (919) 474-7000	
Site Name STAR LAKE CANAL	3. Purpose: Lead ☒ SF, PRP, ST, FED; Early Action: CLEM, PA, REM, RI, ☒ SI, ESI; Long-Term Action: FS, RD, RA, O&M, NPED		
City, State PT. NECHES TX	Site Spill ID		

6. Matrix (Enter in Column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil (High only) 7. Waste (High only) 8. Other (Specify in Column A)

7. Preservative (Enter in Column D): 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. Ice only 6. Other (Specify in Column D) N. Not preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 6) Other:	B Conc. Low Med High	C Sample Type: Comp Grab	D Preservative (from Box 7) Other:	E RAS Analysis VOA	BNA	Pest/PCB	High only ARO/TOX	Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank, S = Spike, D = Duplicate, R = Rinsate, PE = Perform. Eval., — = Not a QC Sample)
~~FEY97~~	~~4~~	~~LOW~~	~~GRAB~~	~~5~~		~~X~~	~~X~~		~~6-016653-54 DH~~	~~ER-03~~	~~10/23/96 19:25~~	~~FEY97~~	~~WN~~	~~R~~
FEY83	5	LOW	GRAB	5	X	X	X		6-016927-30	SE-10	10/23/96 18:05	MFGP46	WN	
FEY84	5	LOW	GRAB	5	X	X	X		6-016933-36	SE-11	10/23/96 17:40	MFGP47	WN	
FEY85	5	LOW	GRAB	5	X	X	X		6-016939-42	SE-12	10/23/96 18:25	MFGP48	WN	
~~FEY97~~	~~4~~	~~LOW~~	~~GRAB~~	~~5~~		~~X~~	~~X~~		~~6-016653-54 DH~~	~~ER-03~~	~~10/23/96 19:25~~	~~MFGP60~~	~~WN~~	~~R~~
FEY97	4	LOW	GRAB	5		X	X		6-016652	ER-03	10/23/96 19:25	MFGP60	WN	R

Shipment for Case Complete? (Y/N) Y	Page 1 of 1	Sample(s) to be Used for Laboratory QC:	Additional Sampler Signatures	Chain of Custody Seal Number(s)

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Marshall Cielo	10/24/96 8:00 AM				
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 - Is custody seal intact? Y/N/none	

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365581

EPA United States Environmental Protection Agency
Contract Laboratory Program

Organic Traffic Report & Chain of Custody Record
(For Organic CLP Analysis)

Case No. 25093

1. Project Code	Account Code	2. Region No.	Sampling Co.	4. Date Shipped	Carrier
~~25093~~		VI	TNRCC	10/22/96	Airborne Express

Regional Information	Sampler (Name)	Airbill Number
	DEBRA D. HENDRICKS	862 445 0575

Non-Superfund Program	Sampler Signature	5. Ship To
	Debra D. Hendrick	Compuchem, 4600 Silicon Drive, Research Triangle Park, NC 27709

Site Name	3. Purpose*	Early Action	Long-Term Action
Star Lake Canal	Lead: SF, PRP, [X] ST, FED	CLEM, PA, REM, RI, [X] SI, ESI	FS, RD, RA, O&M, NPLD

City, State	Site Spill ID	ATTN
Port Neches, TX		Bob Meierer

6. Matrix (Enter in Column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil (High only) 7. Waste (High only) 8. Other (Specify in Column A)

7. Preservative (Enter in Column D): 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. Ice only 6. Other (Specify in Column D) N. Not preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 6) Other:	B Conc. Low Med High	C Sample Type: Comp./Grab	D Preservative (from Box 7) Other:	E RAS Analysis VOA	BNA	Pest/PCB	High only ARO/TOX	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank S = Spike D = Duplicate R = Rinsate PE = Perform. Eval. — = Not a QC Sample)
FEY95	4	Low	Grab	5	X	X	X		6-016640-42	ER-01	10/22/96 9:20	MFGP58	MC	R
FEY98	4	Low	Grab	5	X				6-016655-56	FB-01	10/22/96 9:13	—	MC	B
FEY92	5	Low	Grab	5	X	X	X		6-016659-62	SE-01	10/22/96 1040	MFGP55	DH	
FEY93	5	Low	Grab	5	X	X	X		6-016665-68	SE-02	10/22/96 1115	MFGP56	DH	
FEY94	5	Low	Grab	5	X	X	X		6-016671-74	SE-03	10/22/96 1200	MFGP57	DH	
FEY96	4	Low	Grab	5	X				6-016645-46	ER-01	10/22/96 1620	MFGP59	DH	R

Shipment for Case Complete? (Y/N)	Page	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s)
	1 of 1		Marshall Cedstone	

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Marshall Cedstone	10/22/96 5:45				
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 Is custody seal intact? Y/N/none	

A21-012-15 REV.

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37-200

EPA United States Environmental Protection Agency
Contract Laboratory Program

Organic Traffic Report & Chain of Custody Record
(For Organic CLP Analysis)

Case No. 25093

1. Project Code	Account Code	2. Region No.	Sampling Co.	4. Date Shipped	Carrier
		6	TNRCC	10/22/96	Airborne Express

Regional Information

Sampler (Name): DEBRA D. HENDRICKS

Airbill Number: 862 445 0472

Non-Superfund Program

Sampler Signature: Debra D. Hendricks

5. Ship To: Compuchem, 4600 Silicon Drive, Research Triangle, NC 27709

ATTN: Bob Meierer

Site Name: Star Lake Canal

City, State: Portlandes, TX

Site Spill ID

3. Purpose*: Lead: SF, PRP, X ST, FED; Early Action: CLEM, PA, REM, RI, X SI, ESI; Long-Term Action: FS, RD, RA, O&M, NPLD

6. Matrix (Enter in Column A): 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. Oil (High only) 7. Waste (High only) 8. Other (Specify in Column A)

7. Preservative (Enter in Column D): 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. Ice only 6. Other (Specify in Column D) N. Not preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 6) Other:	B Conc.: Low Med High	C Sample Type: Comp./Grab	D Preservative (from Box 7) Other:	E RAS Analysis VOA	BNA	Pest/PCB	High only ARO/TOX	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank S = Spike D = Duplicate R = Rinsate PE = Perform. Eval. — = Not a QC Sample)
FEY89	5	Low	Grab	5	X	X	X		6-016677-80	SE-04	10/22/96 1234	MFGP52	DH	
FEY80	5	Low	Grab	5	X	X	X		6-017273-76	SE-13	10/22/96 1440	MFGP 43	DH	
FEY81	5	Low	Grab	5	X	X	X		6-016951-54	SE-11	10/22/96 1450	MFGP 44	DH	D(FEY80)
~~FEY96~~	~~4~~	~~Low~~	~~Grab~~	~~5~~		~~X~~	~~X~~		~~6-016646-4~~					
FEY96	4	Low	Grab	5		X	X		6-016647	12KD2	10/22/96 1620	MFGP59	DH	R

Shipment for Case Complete? (Y/N): Y

Page 1 of 1

Sample(s) to be Used for Laboratory QC: FEY89

Additional Sampler Signatures: [signature]

Chain of Custody Seal Number(s)

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Marshall Cochran	10/22/96 5:45				
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: Is custody seal intact? Y/N/none	

A21-012-15 REV.

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*SEE REVERSE FOR PURPOSE CODE DEFINITIONS

370210

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
HOUSTON BRANCH
10625 FALLSTONE RD.
HOUSTON, TEXAS 77099

MEMORANDUM

Date: 12-11-1996

Subject: **Contract Laboratory Program Data Review**

From: for Melvin L. Ritter, ESAT RPO, 6MD-HC

To: B. Canellas , 6SF-RA

Site: STAR LAKE CANAL

Case#: 25093

SDG#: FE-Y80

The EPA Region 6 Houston Branch ESAT data validation team has completed a review of the submitted Contract Laboratory Program (CLP) data package for the referenced site. The samples analyzed and reviewed are detailed in the attached Regional data review and assessment report for this case.

The data package was found to be:

( ) Acceptable: No major problems with data package.

(X) Provisional: Use of data requires caution.
Data is acceptable for Regional use. Problems are noted in the review report.

( ) Unacceptable: Some or all of data should not be used.
Problems are noted in the review report.

Questions regarding the data review report can be addressed to me.

Attachments

cc: R. Flores, Region 6 CLP/TPO
M. El-feky, Region 6 Data Coordinator

Files (2)

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LOCKHEED MARTIN SERVICES GROUP
10101 SOUTHWEST FREEWAY, SUITE 500
HOUSTON, TX 77074

MEMORANDUM

DATE: December 4, 1996

TO: Dr. Melvin Ritter, ESAT RPO, Region VI

FROM: Dr. Tom C.H. Chiang, ESAT ETM, Region VI

SUBJECT: CLP Data Review

REF: TDF # 6-7063A ESAT # O-1768

Attached is the data review summary for Case # 25093
SDG # FEY80
Site Star Lake Canal

COMMENTS:

I. CONTRACTUAL ASSESSMENT OF THE DATA PACKAGE

The data package contained the following contractual non-compliance as determined by hard copy data review and CCS audit.

The laboratory extracted the following 13 Pest/PCB samples 1 day past the contractual holding time limit (OLM03.0, page D-20/PEST, Section 8.4.1):

FE-Y77, FE-Y82, FE-Y83, FE-Y84, FE-Y85, FE-Y86, FE-Y87, FE-Y88, FE-Y90, FE-Y91, FE-Z01, FE-Z02, and FE-Z03.

This deficiency did not affect sample results.

II. TECHNICAL USABILITY ASSESSMENT OF THE DATA PACKAGE

The total number of results reviewed was 2,375 for this data package. The data package is technically provisional because of the following significant technical problems.

1. One BNA sample had a low internal standard response.

2. The laboratory was unable to completely resolve benzo(b)fluoranthene and benzo(k)fluoranthene in one BNA sample.

3. Acetone results for 17 VOA samples were qualified because of a calibration problem.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
HOUSTON BRANCH
10625 FALLSTONE ROAD
HOUSTON, TEXAS 77099
ORGANIC REGIONAL DATA ASSESSMENT

CASE NO.	25093	SITE	Star Lake Canal
LABORATORY	COMPU	NO. OF SAMPLES	19
CONTRACT#	68-D5-0004	MATRIX	Soil
SDG#	FEY80	REVIEWER (IF NOT ESD)	ESAT
SOW#	RAS SOW OLM03.2	REVIEWER'S NAME	Wallace Doong
ACCT#	7FAXJN10 SF# FAXUZZ	COMPLETION DATE	December 4, 1996

SAMPLE NO.					
	FE-Y77	FE-Y83	FE-Y87	FE-Y91	FE-Z01
	FE-Y80	FE-Y84	FE-Y88	FE-Y92	FE-Z02
	FE-Y81	FE-Y85	FE-Y89	FE-Y93	FE-Z03
	FE-Y82	FE-Y86	FE-Y90	FE-Y94	

DATA ASSESSMENT SUMMARY

	VOA	BNA	PEST
1. HOLDING TIMES	O	O	O
2. GC/MS TUNE/INSTR. PERFORM.	O	O	O
3. CALIBRATIONS	M	M	O
4. BLANKS	O	O	O
5. SMC/SURROGATES	O	O	O
6. MATRIX SPIKE/DUPLICATE	O	O	O
7. OTHER QC	O	O	O
8. INTERNAL STANDARDS	O	M	N/A
9. COMPOUND ID/QUANTITATION	O	O	M
10. PERFORMANCE/COMPLETENESS	O	O	O
11. OVERALL ASSESSMENT	M	M	M

O = Data had no problems.
M = Data qualified due to major or minor problems.
Z = Data unacceptable.
NA = Not applicable.

ACTION ITEMS: None.

AREA OF CONCERN: **VOA** Acetone and methylene chloride failed technical %RSD and/or %D calibration criteria. **BNA** One analyte failed technical minimum RRF criteria. One sample had a low internal standard response. The laboratory was unable to completely resolve benzo(b)fluoranthene and benzo(k)fluoranthene in one sample. **Pest/PCB** The laboratory extracted 13 samples 1 day past the contractual holding time limit. Two Pest/PCB samples had inconsistent two column quantitation results for several analytes.

NOTABLE PERFORMANCE: The data package was 10 days early.

COMMENTS/CLARIFICATIONS
REGION VI CLP QA REVIEW

CASE 25093 **SDG** FEY80 **SITE** Star Lake Canal **LAB** COMPU

The following is a summary of sample qualifiers used by Region 6 in reporting this CLP data:

No.	Acceptable	Provisional	Unacceptable
VOA	2	17	
BNA	14	5	
PEST	17	2	

COMMENTS: The case consisted of 19 soil samples for complete RAS organics analysis. The OTR/COC Record designated sample FE-Y89 for MS/MSD analyses and samples FE-Y80/FE-Y81 as a field duplicate pair. The data package arrived 10 days early for the contractual 35-day turnaround time. However, the laboratory extracted 13 Pest/PCB samples one day past the contractual holding time limit.

TCL analytes reported above CRQL's included 2-butanone, xylene, ethylbenzene, PAH's (polynuclear aromatic hydrocarbons), DDT, endrin ketone, aroclor 1254, and blank contaminants acetone and methylene chloride. The laboratory performed a medium level analysis for BNA sample FE-Y84. All VOA and other BNA samples were analyzed at the low level.

BNA Because of high concentrations (up to 210,000 ug/Kg) of PAH's, sample FE-Y84 was analyzed at medium level and low level samples FE-Y77 and FE-Z01 required dilutions. The laboratory reanalyzed sample FE-Y93 because of low internal standard (IS) responses. The reviewer recommends using the reanalysis results because of better overall QC performance. The laboratory was unable to completely resolve benzo(b)fluoranthene and benzo(k)fluoranthene in sample FE-Z01.

Some data are provisional for 17 VOA, 5 BNA, and 2 Pest/PCB samples because of problems with calibration, IS performance, and compound identification and quantitation. The technical usability of all reported sample results is indicated by ESAT's final data qualifiers in the attached Data Summary Table. An Evidence Audit was conducted for the Complete Sample Delivery Group File (CSF), and the Evidence Inventory Checklist is attached to this report.

NOTE: THE FOLLOWING REVIEW NARRATIVE ADDRESSES BOTH CONTRACTUAL AND TECHNICAL ISSUES. THE ASSESSMENT MADE FOR EACH QC PARAMETER IS SOLELY BASED ON THE TECHNICAL DATA USABILITY, WHICH MAY NOT NECESSARILY BE AFFECTED BY CONTRACTUAL PROBLEMS.

ORGANIC QA REVIEW
CONTINUATION PAGE

CASE 25093 **SDG** FEY80 **SITE** Star Lake Canal **LAB** COMPU

1. Holding Times: Acceptable. The laboratory extracted Pest/PCB samples FE-Y77, FE-Y82, FE-Y83, FE-Y84, FE-Y85, FE-Y86, FE-Y87, FE-Y88, FE-Y90, FE-Y91, FE-Z01, FE-Z02, and FE-Z03 one day past the contractual holding time limit. Since the holding time was not excessive, the reviewer did not qualify the results. All other samples met contractual holding time criteria.

2. Tuning/Performance: Acceptable. The BFB and DFTPP analyses met ion abundance criteria. All sample analyses met instrument performance guidelines.

3. Calibrations: Provisional. TCL compounds met contractual calibration criteria. The reviewer qualified the methylene chloride result in sample FE-Y81 and all acetone concentrations above CRQL's as estimated because these analytes failed technical %RSD and/or %D calibration criteria. The reviewer also qualified the 2,4-dinitrophenol quantitation limits as estimated for BNA samples FE-Y80, FE-Y81, and FE-Y89 because the analyte failed technical minimum RRF criteria.

4. Blanks: Acceptable. The method, storage, and instrument blanks met contractual QC guidelines. The method blanks contained methylene chloride, acetone, naphthalene, phenanthrene, anthracene, delta-BHC, heptachlor, DDE, and endrin below the upper contractual limit. The reviewer recommends that the laboratory "B"-flagged results, except naphthalene in BNA sample FE-Y84, should be considered as undetected (U) because the sample concentrations were less than 10X the associated method blank values. All other laboratory blanks were free of TCL contamination.

Rinsates/Field blank: The following field QC samples are associated with this SDG:

rinsate samples FE-Y95, FE-Y96, and FE-Y97 from SDG FEY95 and rinsate sample FE-W52 from Case/SDG 25013/FEW52; and

field blank samples FE-Y98 and FE-Y99 from SDG FEY95 and field blank sample FE-W53 from Case/SDG 25013/FEW52.

Rinsate sample FE-W53, collected about one month before the samples for this SDG were collected, contained chloroform, 2-butanone, and bis(2-ethylhexyl)phthalate above CRQL's. One or more of the following compounds were detected below CRQL's in the other field QC samples:

ORGANIC QA REVIEW
CONTINUATION PAGE

CASE 25093 **SDG** FEY80 **SITE** Star Lake Canal **LAB** COMPU

4. Blanks:

Rinsates/Field blank: (continued)

methylene chloride, acetone, bromodichloromethane, phenol, 2-hexanone, diethylphthalate, di-n-butylphthalate, heptachlor, and DDE.

The user is advised to use results for these analytes in the soil samples with caution because of possible field/equipment contamination.

5. System Monitoring Compounds (SMC's)/Surrogates: Acceptable. The SMC and surrogate recoveries generally met QC criteria except as noted below.

BNA Many surrogate recoveries exceeded QC limits for sample FE-Y93. The reviewer recommends using data from the reanalysis, FE-Y93RE, because only one surrogate recovery is outlying. Data qualification is not required. Samples FE-Y84MS/MSD had a high S6 recovery, but the unspiked sample had acceptable surrogate recoveries.

Pest/PCB Sample FE-Y82 had high DCB recoveries on both columns. Result qualification was unnecessary because no TCL analytes were reported above CRQL's in the sample. DCB had high recoveries on one column for samples FF-Y84, FE-Y91, and FE-Z01. Result qualification was not necessary because the second column had acceptable recoveries. The laboratory misreported several other surrogate recoveries, but the reviewer verified that the recoveries were within the advisory QC limits.

6. Matrix Spike/Matrix Spike Duplicate: Acceptable. The MS/MSD results generally met QC criteria for accuracy and recovery, and exceptions are noted below.

Medium Level BNA MS/MSD: Many spike compounds had high MS and/or MSD recoveries, and two analytes also had outlying %RPD's. The high recoveries would only affect results for the spike analytes detected above CRQL's in the native sample FE-Y84, which are acenaphthene and pyrene. These two compounds had high MSD recoveries but acceptable MS recoveries. The reviewer did not qualify results for these two compounds because the outlying MSD recoveries may not be accurate as explained below.

ORGANIC QA REVIEW
CONTINUATION PAGE

CASE 25093 **SDG** FEY80 **SITE** Star Lake Canal **LAB** COMPU

6. Matrix Spike/Matrix Spike Duplicate:

Medium Level BNA Ms/MSD: (continued) The MSD sample contained much higher concentrations of non-spike compounds (up to 8.9X higher) than the native or MS sample, probably attributed to inhomogeneous matrices. This may very well be the case for spike analytes acenaphthene and pyrene. Since the native concentrations used for the MSD recovery calculation were taken from the unspiked sample analysis, which may be substantially lower than the actual concentrations, high biased recoveries were very likely for these two compounds.

7. Other QC:

Field Duplicate: Acceptable. Duplicate results were generally consistent.

8. Internal Standards (IS): Provisional. The IS responses met QC criteria except those noted below.

BNA Samples FE-Y93 and FE-Y93RE had low IS6 responses. The reviewer recommends using the reanalysis results because of better overall QC performance. However, the reviewer qualified analyte results associated with IS6 as estimated for sample FE-Y93RE with quantitation limits biased low.

9. Compound Identity/Quantitation: Provisional. Sample spectra met identification criteria for all reported VOA and BNA analytes.

VOA The samples contained 2-butanone, xylene, and ethylbenzene, and several blank contaminants above CRQL's.

BNA Sample FE-Y84 was analyzed at medium level and required a dilution (2X) because of high PAH concentrations (up to 210,000 ug/Kg). Samples FE-Y77 and FE-Z01 were also diluted because of high PAH concentrations. The laboratory could not resolve benzo(b)fluoranthene and benzo(k)fluoranthene in sample FE-Z01 and reported the same peak for both isomers. The reviewer qualified benzo(b)fluoranthene and benzo(k)fluoranthene results in sample FF-Z01 as estimated and biased high because of the coelution. The laboratory reported inconsistent concentrations (up to 8.9X difference) for the unspiked analytes in the MSD sample and the unspiked sample of FE-Y84. The reviewer did not qualify any results because the MS analysis confirmed unspiked sample results.

ORGANIC QA REVIEW
CONTINUATION PAGE

CASE 25093 **SDG** FEY80 **SITE** Star Lake Canal **LAB** COMPU

9. Compound Identity/Quantitation:

Pest/PCB The analytes reported above CRQL's were DDT and endrin ketone in sample FE-Y84 and aroclor-1254 in sample FE-Y77. The laboratory also reported aroclor-1254 and pesticides in several samples below the CRQL's. All reported positive results met compound identification criteria, and GC/MS confirmation was not required. The reviewer qualified results as estimated for aroclor 1254 in sample FE-Y77 and DDD and endrin ketone in sample FE-Y84 because the two column quantitation results differed by more than 25%.

The endrin ketone identification is questionable for sample FE-Y84 because of the absence of its commonly co-existing pesticide endrin. The laboratory reported extremely low concentrations (less then one tenth of CRQL's) for many sample analytes. The reviewer raised these unrealistic concentrations to the CRQL's and flagged them as undetected per Region 6 guideline.

10. Performance/Completeness: Acceptable. The data package was complete but had some deficiencies. The laboratory was contacted for the necessary resubmissions (see attached Fax Record Log).

11. Overall Assessment: Data are acceptable for 2 VOA, 14 BNA, and 17 Pest/PCB samples.

VOA: Some results are provisional for the following samples because of calibration deficiencies:

FE-Y77, FE-Y80, FE-Y81, FE-Y82, FE-Y83, FE-Y84, FE-Y85, FE-Y86, FE-Y87, FE-Y89, FE-Y90, FE-Y92, FE-Y93, FE-Y94, FE-Z01, FE-Z01, and FE-Z03.

BNA: Some results are provisional for samples FE-Y80, FE-Y81, FE-Y89, FE-Y93RE, and FE-Z01 because of problems with IS performance, calibration, compound quantitation.

Pest/PCB: Some results are provisional for samples FE-Y77 and FE-Y84 because of problems with compound identification and quantitation.

INORGANIC/ORGANIC COMPLETE SDG FILE (CSF) INVENTORY CHECKLIST

Case No.	25093	SDG No.	FEY80	SDG Nos. To Follow		SAS No.		Date Rec	11/19/96

EPA Lab ID: COMPU

Lab Location: RTP, NC

Region: 6 Audit No.: 25093/FEY80

Re_Submitted CSF? Yes _____ No X

Box No(s): ONE

COMMENTS:

Over for additional comments.

ORIGINALS	YES	NO	N/A
CUSTODY SEALS			
1. Present on package?	X		
2. Intact upon receipt?	X		
FORM DC-2			
3. Numbering scheme accurate?	X		
4. Are enclosed documents listed?	X		
5. Are listed documents enclosed?	X		
FORM DC-1			
6. Present?	X		
7. Complete?	X		
8. Accurate?	X		
CHAIN-OF-CUSTODY RECORD(s)			
9. Signed?	X		
10. Dated?	X		
TRAFFIC REPORT(s) PACKING LIST(s)			
11. Signed?	X		
12. Dated?	X		
AIRBILLS/AIRBILL STICKER			
13. Present?	X		
14. Signed?	X		
15. Dated?	X		
SAMPLE TAGS			
16. Does DC-1 list tags as being included?	X		
17. Present?	X		
OTHER DOCUMENTS			
18. Complete?	X		
19. Legible?	X		
20. Original?		X	
20a.If "NO", does the copy indicate where original documents are located?	X		

Audited by:	Wallace Doong	Wallace Doong / ESAT Data Reviewer	Date 12/03/96
Audited by:			Date
Audited by:			Date
	Signature	Printed Name/Title	

TO BE COMPLETED BY CEAT

Date Recvd by CEAT: _____ Date Entered: _____ Date Reviewed: _____

Entered by: _____ _____

Reviewed by: _____ _____

Signature Printed Name/Title

DC-2___

ORGANIC DATA QUALIFIER DEFINITIONS

The following definitions provide brief explanations of the ESAT-Region 6 qualifiers assigned to results in the Data Summary Table.

U Not detected at reported quantitation limit.

N Identification is tentative.

J Estimated value.

R Unusable.

^ High biased. Actual concentration may be lower than the concentration reported.

v Low biased. Actual concentration may be higher than the concentration reported.

F+ A false positive exists.

F- A false negative exists.

B This result may be high biased because of laboratory/field contamination. The reported concentration is above 5X or 10X the concentration reported in the method/field blank.

UJ Estimated quantitation limit.

T Identification is questionable because of absence of other commonly coexisting pesticides.

***** Result not recommended for use because of associated QA/QC performance inferior to that from other analysis.

ORGANIC DATA SUMMARY

Case No.: 25093 SDG: FEY80 Reviewer: W. DOONG

Laboratory: COMPU Matrix: SOIL Units: ug/Kg

VOLATILES	FLAG	FLAG	FLAG	FLAG	FLAG	FLAG	FLAG
EPA SAMPLE NUMBER:	SE-16 FE-Y77	FE-Y80	FE-Y81	FE-Y82	FE-Y83	FE-Y84	FE-Y85
Chloromethane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Bromomethane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Vinyl chloride	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Chloroethane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Methylene chloride	28 U	20 U	23 UJ	20 U	27 U	30 U	24 U
Acetone	89 UJ	79 UJ	130 UJ	96 UJ	60 UJ	74 UJ	48 UJ
Carbon disulfide	28 U	20 U	19 U	20 U	27 U	30 U	24 U
1,1-Dichloroethene	28 U	20 U	19 U	20 U	27 U	30 U	24 U
1,1-Dichloroethane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
1,2-Dichloroethene (total)	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Chloroform	28 U	20 U	19 U	20 U	27 U	30 U	24 U
1,2-Dichloroethane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
2-Butanone	28 U	20 U	19 U	21	14 J	13 J	24 U
1,1,1-Trichloroethane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Carbon tetrachloride	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Bromodichloromethane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
1,2-Dichloropropane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
cis-1,3-Dichloropropene	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Trichloroethene	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Dibromochloromethane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
1,1,2-Trichloroethane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Benzene	28 U	20 U	19 U	20 U	27 U	30 U	24 U
trans-1,3-Dichloropropene	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Bromoform	28 U	20 U	19 U	20 U	27 U	30 U	24 U
4-Methyl-2-pentanone	28 U	20 U	19 U	20 U	27 U	30 U	24 U
2-Hexanone	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Tetrachloroethene	28 U	20 U	19 U	20 U	27 U	30 U	24 U
1,1,2,2-Tetrachloroethane	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Toluene	28 U	20 U	19 U	20 U	27 U	7 J	24 U
Chlorobenzene	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Ethylbenzene	8 J	20 U	19 U	20 U	27 U	310	38
Styrene	28 U	20 U	19 U	20 U	27 U	30 U	24 U
Xylenes (total)	10 J	20 U	19 U	20 U	27 U	120	17 J
Sample wt (g):	5.0	5.0	5.0	5.0	5.0	5.0	5.0
%Moisture:	64	50	48	50	63	67	58
Dilution Factor:	1	1	1	1	1	1	1
Level:	LOW	LOW	LOW	LOW	LOW	LOW	LOW
Number of TIC's:	14	0	0	3	5	30	11

Note: For the results listed in the Data Summary Table, ESAT has replaced the laboratory assigned flags with ESAT Organic Data Qualifiers. The ESAT flags indicate the technical usability of the reported results.

ORGANIC DATA SUMMARY

Case No.: 25093 SDG: FEY80 Reviewer: W. DOONG

Laboratory: COMPU Matrix: SOIL Units: ug/Kg

VOLATILES	FLAG	FLAG	FLAG	FLAG	FLAG	FLAG	FLAG
EPA SAMPLE NUMBER:	FE-Y86	FE-Y87	FE-Y88	FE-Y89	FE-Y90	FE-Y91	FE-Y92
Chloromethane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Bromomethane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Vinyl chloride	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Chloroethane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Methylene chloride	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Acetone	43 UJ	59 UJ	34 U	66 UJ	15 UJ	16 U	83 UJ
Carbon disulfide	19 U	28 U	34 U	16 U	15 U	16 U	24 U
1,1-Dichloroethene	19 U	28 U	34 U	16 U	15 U	16 U	24 U
1,1-Dichloroethane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
1,2-Dichloroethene (total)	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Chloroform	19 U	28 U	34 U	16 U	15 U	16 U	24 U
1,2-Dichloroethane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
2-Butanone	19 U	28 U	34 U	16 U	15 U	16 U	24 U
1,1,1-Trichloroethane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Carbon tetrachloride	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Bromodichloromethane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
1,2-Dichloropropane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
cis-1,3-Dichloropropene	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Trichloroethene	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Dibromochloromethane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
1,1,2-Trichloroethane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Benzene	19 U	28 U	34 U	16 U	15 U	16 U	24 U
trans-1,3-Dichloropropene	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Bromoform	19 U	28 U	34 U	16 U	15 U	16 U	24 U
4-Methyl-2-pentanone	19 U	28 U	34 U	16 U	15 U	16 U	24 U
2-Hexanone	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Tetrachloroethene	19 U	28 U	34 U	16 U	15 U	16 U	24 U
1,1,2,2-Tetrachloroethane	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Toluene	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Chlorobenzene	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Ethylbenzene	3 J	28 U	34 U	16 U	15 U	16 U	24 U
Styrene	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Xylenes (total)	19 U	28 U	34 U	16 U	15 U	16 U	24 U
Sample wt (g):	5.0	5.0	5.0	5.0	5.0	5.0	5.0
%Moisture:	48	64	71	36	32	38	58
Dilution Factor:	1	1	1	1	1	1	1
Level:	LOW	LOW	LOW	LOW	LOW	LOW	LOW
Number of TIC's:	5	1	0	0	0	0	0

Note: For the results listed in the Data Summary Table, ESAT has replaced the laboratory assigned flags with ESAT Organic Data Qualifiers. The ESAT flags indicate the technical usability of the reported results.

ORGANIC DATA SUMMARY

Case No.: 25093 SDG: FEY80 Reviewer: W. DOONG

Laboratory: COMPU Matrix: SOIL Units: ug/Kg

VOLATILES	FLAG	FLAG	FLAG	FLAG	FLAG	FLAG	FLAG
EPA SAMPLE NUMBER:	FE-Y93	FE-Y94	FE-Z01	FE-Z02	FE-Z03		
Chloromethane	18 U	14 U	22 U	17 U	17 U		
Bromomethane	18 U	14 U	22 U	17 U	17 U		
Vinyl chloride	18 U	14 U	22 U	17 U	17 U		
Chloroethane	18 U	14 U	22 U	17 U	17 U		
Methylene chloride	18 U	14 U	22 U	17 U	17 U		
Acetone	56 UJ	83 UJ	91 UJ	49 UJ	36 J		
Carbon disulfide	18 U	14 U	22 U	17 U	17 U		
1,1-Dichloroethene	18 U	14 U	22 U	17 U	17 U		
1,1-Dichloroethane	18 U	14 U	22 U	17 U	17 U		
1,2-Dichloroethene (total)	18 U	14 U	22 U	17 U	17 U		
Chloroform	18 U	14 U	22 U	17 U	17 U		
1,2-Dichloroethane	18 U	14 U	22 U	17 U	17 U		
2-Butanone	18 U	14 U	22 U	17 U	17 U		
1,1,1-Trichloroethane	18 U	14 U	22 U	17 U	17 U		
Carbon tetrachloride	18 U	14 U	22 U	17 U	17 U		
Bromodichloromethane	18 U	14 U	22 U	17 U	17 U		
1,2-Dichloropropane	18 U	14 U	22 U	17 U	17 U		
cis-1,3-Dichloropropene	18 U	14 U	22 U	17 U	17 U		
Trichloroethene	18 U	14 U	22 U	17 U	17 U		
Dibromochloromethane	18 U	14 U	22 U	17 U	17 U		
1,1,2-Trichloroethane	18 U	14 U	22 U	17 U	17 U		
Benzene	18 U	14 U	22 U	17 U	17 U		
trans-1,3-Dichloropropene	18 U	14 U	22 U	17 U	17 U		
Bromoform	18 U	14 U	22 U	17 U	17 U		
4-Methyl-2-pentanone	18 U	14 U	22 U	17 U	17 U		
2-Hexanone	18 U	14 U	22 U	17 U	17 U		
Tetrachloroethene	18 U	14 U	22 U	17 U	17 U		
1,1,2,2-Tetrachloroethane	18 U	14 U	22 U	17 U	17 U		
Toluene	18 U	14 U	22 U	17 U	17 U		
Chlorobenzene	18 U	14 U	22 U	17 U	17 U		
Ethylbenzene	18 U	14 U	22 U	17 U	17 U		
Styrene	18 U	14 U	22 U	17 U	17 U		
Xylenes (total)	18 U	14 U	18 J	17 U	17 U		
Sample wt (g):	5.0	5.0	5.0	5.0	5.0		
%Moisture:	43	31	55	40	42		
Dilution Factor:	1	1	1	1	1		
Level:	LOW	LOW	LOW	LOW	LOW		
Number of TIC's:	0	0	17	5	0		

Note: For the results listed in the Data Summary Table, ESAT has replaced the laboratory assigned flags with ESAT Organic Data Qualifiers. The ESAT flags indicate the technical usability of the reported results.

Protecting Texas by Reducing and Preventing Pollution

TNRCC

Texas Natural Resource Conservation Commission
GIS Section (Mail Code 197)
P. O. Box 13087
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Figure 1

Star Lake Canal & Jefferson Canal Site

CERCLIS No. TX0001414341

Base Map:
Port Arthur North 7.5 Minute Quad

The base data used in this map is a Digital Raster Graphic (DRG), which is a digital version of a U.S. Geological Survey 7.5 Minute Quadrangle. The DRG was produced by TNRCC using USGS standards.

For a description of map symbols, see the USGS publication: Topographic Map Symbols, National Large Scale Series.

Texas Statewide Mapping System (TSMS) Projection

Scale 1:24,000
(One Inch Equals 2,000 Feet)

February 4, 1997

This map was generated by the Information Resources Division of the Texas Natural Resource Conservation Commission. No claims are made to the accuracy or completeness of the data or to its suitability for a particular use. For more information concerning this map, contact Barry Allison, GIS Section Manager, Information Resources Division, at (512) 239 0850.

MMcDonough CRF-97020460