EPA Region 5 Records Ctr.
349372

CONSTRUCTION COMPLETION REPORT

FINAL REMEDIAL ACTION

LASKIN/POPLAR
OIL COMPANY SITE
Ashtabula County, Ohio

Prepared For:

LASKIN FINAL REMEDIATION TRUST FUND

December 1993

Prepared By:

ENGINEERING-SCIENCE
19101 Villaview Road, Suite 301
Cleveland, Ohio 44119

ES ENGINEERING-SCIENCE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

RECEIVED
MAY 09 1994

APR 21 1994

REPLY TO THE ATTENTION OF:

VIA FIRST CLASS MAIL

Dr. James Campbell
Laskin Site Group Administrator
2020 Ardmore Blvd., Suite 327
Pittsburgh, Pennsylvania 15221

RE: Approval of the December 1993 Construction Completion Report for the Final Remedial Action Operable Unit of the Laskin/Poplar Oil Site in Jefferson, Ohio

Dear Dr. Campbell:

The United States Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (OEPA) have received the Construction Completion Report dated December 1993 for the Laskin/Poplar Oil (LPO) Site in Jefferson, Ohio. This report documents the Final Remedial Action Operable Unit conducted at the LPO Site. These actions included the construction of the groundwater diversion trench and the capping of the site.

U.S. EPA approves this document as the Final Construction Completion Report for the Final Remedial Action Operable Unit at the LPO Site. In addition, OEPA's approval letter is enclosed with this letter.

If you have any questions, please feel free to call Kathleen Warren, the Remedial Project Manager for the site, at (312) 353-6756.

Sincerely,

Jo Lynn Traub

Jo Lynn Traub, Acting Associate
Division Director
Office of Superfund

Enclosure

cc: Richard Smith, OEPA
Eileen Furey, ORC

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OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

George V. Voinovich
Governor

April 14, 1994

RE: LASKIN/POPLAR OIL
ASHTABULA COUNTY, OHIO
OHIO EPA ID#204-0458

Ms. Kathleen Warren
USEPA, Region V
Office of Superfund (HSRM-6J)
77 W. Jackson Blvd.
Chicago, IL 60604

Dear Ms. Warren:

The purpose of this correspondence is to confirm Ohio EPA's receipt and review of the Construction Completion Report for the Final Remedial Action Operable Unit at the Laskin/Poplar Oil Company Superfund Site as submitted by Engineering Science on December 9, 1993.

After review, this document appears to be approvable as submitted.

Should you have any questions or comments concerning this review please contact me.

Sincerely,

Richard A. Smith

Richard A. Smith
Environmental Engineer
Division of Emergency and Remedial Response

RAS.ke

cc: Bob Princic, DERR, NEDO
Jeff Hundley, DERR, Legal

Printed on recycled paper

CONSTRUCTION COMPLETION REPORT

FINAL REMEDIAL ACTION

LASKIN/POPLAR
OIL COMPANY SITE
Ashtabula County, Ohio

Prepared For:

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ENGINEERING-SCIENCE
19101 Villaview Road, Suite 301
Cleveland, Ohio 44119

1193DPC/KER-1#
7 December, 1993

FORWARD

The following is a summary description of the Final Remedial Action activities performed pursuant to the Consent Decree entered on 17 September 1990 for the Laskin/Poplar Oil Company Site in Jefferson Township, Ashtabula County, Ohio.

Plans and Specifications for the Final Remedial Action were prepared by Engineering-Science (ES) during 1991 and 1992, and a Contract awarded to OHM Remediation Services (OHM) on 18 December 1992 for the implementation of the required actions.

OHM was given a Notice to Proceed on 14 January 1993, the date of the Pre-Construction meeting, and immediately started preparation of the required Work Plans. This activity continued through the mobilization and site preparation phases of the work.

Section 1 of this report provides background and historical information as well as a brief description of the Final Remedial Action and waste descriptions.

Section 2 is a chronological list of major events and milestones leading to the completion of the Final Remedial Action.

Section 3 describes the established performance standards and quality control objectives.

Section 4 is a narrative description of the major construction activities and also identifies problems encountered and corrective actions taken.

Section 5 describes the inspection of the work conducted on 20 September 1993.

Section 6 is the Certification of Completion.

TABLE OF CONTENTS

			Page
	FORWARD		i
SECTION 1.0	INTRODUCTION		
	1.1	Site Description and Location	1-1
	1.2	Site History	1-1
	1.3	Objectives of Final Remedial Action	1-2
	1.4	Summary of the Final Remedial Action	1-3
SECTION 2.0	CHRONOLOGY OF EVENTS		2-1
SECTION 3.0	PERFORMANCE STANDARDS AND QUALITY CONTROL		3-1
	3.1	Decontamination Water	3-1
	3.2	Construction of Multi-layer Cap	3-1
	3.3	Residual Wastes from the Source Removal	3-1
SECTION 4.0	CONSTRUCTION/REMEDIATION ACTIVITIES		4-1
	4.1	Site Preparation	4-1
	4.2	Earthwork in the Fresh Water Pond	4-1
	4.3	Removal and Installation of Site Drainage	4-2
	4.4	Engineering-Science Air Monitoring Program	4-2
	4.5	Gundwall Work	4-3
	4.6	Installation of the CB Slurry Wall	4-4
	4.7	Installation of Diversion Trenches	4-5
	4.8	Exclusion Zone Soil Grading	4-6
	4.9	Source Removal Residual Wastes	4-7
	4.10	Installation of the Piezometers	4-7
	4.11	Bedding Soils	4-8
	4.12	Installation of the Cap	4-9
	4.13	Final site Grading and Seeding	4-10
	4.14	Disposal of Decontamination Water	4-10
	4.15	Conclusions	4-11
SECTION 5.0	CONSTRUCTION INSPECTION		5-1
SECTION 6.0	CERTIFICATION OF COMPLETION		6-1

Appendix A - Record Drawings and Profiles
Appendix B - Analytical Results
Appendix C - Resource Compilation List

SECTION 1

INTRODUCTION

1.1 SITE DESCRIPTION AND LOCATION

The former Laskin/Poplar Oil (LPO) Company Site is located in northern Ohio within Jefferson Township in Ashtabula County. The site comprises approximately 9 acres west of the village of Jefferson. It is bounded on the north by Cemetery Creek, on the south and east by Ashtabula County Fairgrounds, and on the west by open, wooded areas, belonging to the County of Ashtabula. Figures 1 and 2 show the general site location and the site plan prior to the Source Removal. Figure 3 shows the site topography following the Source Removal and prior to the Final Remedy.

The LPO site consisted of the following features:

- A boiler house, four boilers and a stack;
- A group of greenhouses;
- Thirty-five tanks (eight of which were empty, two that were alleged to contain heating oil) and four below ground storage pits;
- A spill and runoff retention pond;
- A freshwater pond;
- Miscellaneous sheds and buildings; and
- A house (former residence of Mr. Alvin Laskin).

1.2 SITE HISTORY

The greenhouses at the LPO Site were in use for nearly 80 years. About 30 years ago boilers were installed to heat the greenhouses. In the 1960s, tanks were installed to store fuel oils to fire the boilers. When the greenhouse business deteriorated, the owner began collecting, reselling, and disposing of waste oils. Through a series of legal actions, the company was forced into receivership.

Site investigation activities were conducted by Federal and State agencies and PRPs in the early 1980s. In 1983, the LPO Site was listed on the National Priority List of Superfund Sites. Several removal actions took place at the site prior to the Source Removal action.

Based on a 30 September 1987 Record of Decision (ROD), U.S. EPA issued Administrative Order V-W-88-C-002 to 39 PRPs on 26 February 1988, requiring that a Source Removal remedial action be performed. The Source Removal required on-site incineration of oils, sludges, and visibly contaminated source soils at the LPO Site. Twenty of the companies responded to the order and initiated a remedial design effort. Before the remedial design was completed, however, a feasibility study for the total site remediation was completed. The feasibility study was finalized on 7 April 1989 and a ROD for the site was issued on June 29, 1989.

After the ROD was issued, Consent Decree negotiations for the design and implementation of both the Source Removal and the Final Remedial Action took place between the USEPA and a group of the PRPs. The requirements of the Source Removal Administrative Order were included in this Consent Decree. In addition, several elements of the final remedy were incorporated into the Source Removal Actions by agreement between the U.S. EPA and the Settling Defendants. The Source Removal project was essentially completed in December 1992. The Final Remedial Action, which involves construction of a groundwater diversion trench, slurry walls, a low permeability cap and general site grading, was initiated 15 January 1993, with the Notice to Proceed and completed on September 15, 1993.

1.3 OBJECTIVES OF FINAL REMEDIAL ACTION

The objectives of the Final Remedial Action were:

- To control a public health risk through direct contact with and incidental ingestion or inhalation of contaminated soils.
- To control potential long term risk to groundwater from residual constituents in site soils.
- To control potential long-term risk associated with surface water runoff.

1.4 SUMMARY OF THE FINAL REMEDIAL ACTION

The major components of the Final Remedial Action included:

- Construction of groundwater diversion trenches around the area to be capped;
- Construction of slurry trench cut-off walls around the area to be capped;
- Grading of the pit, tank, pond, and North slope areas to facilitate the installation of the cap;
- Excavation of the buried ravine area and backfilling with low permeability fill;
- Filling of the Fresh Water Pond area with clean off site fill;
- Construction of a multilayer cap to cover the delisted ash and any soils which have a reported Total Hazard Index greater than one or a reported potential excess life-time cancer risk greater than one-in-one-million ($1x10^{-6}$); and
- Stabilization and disposal of SROU residuals on site.

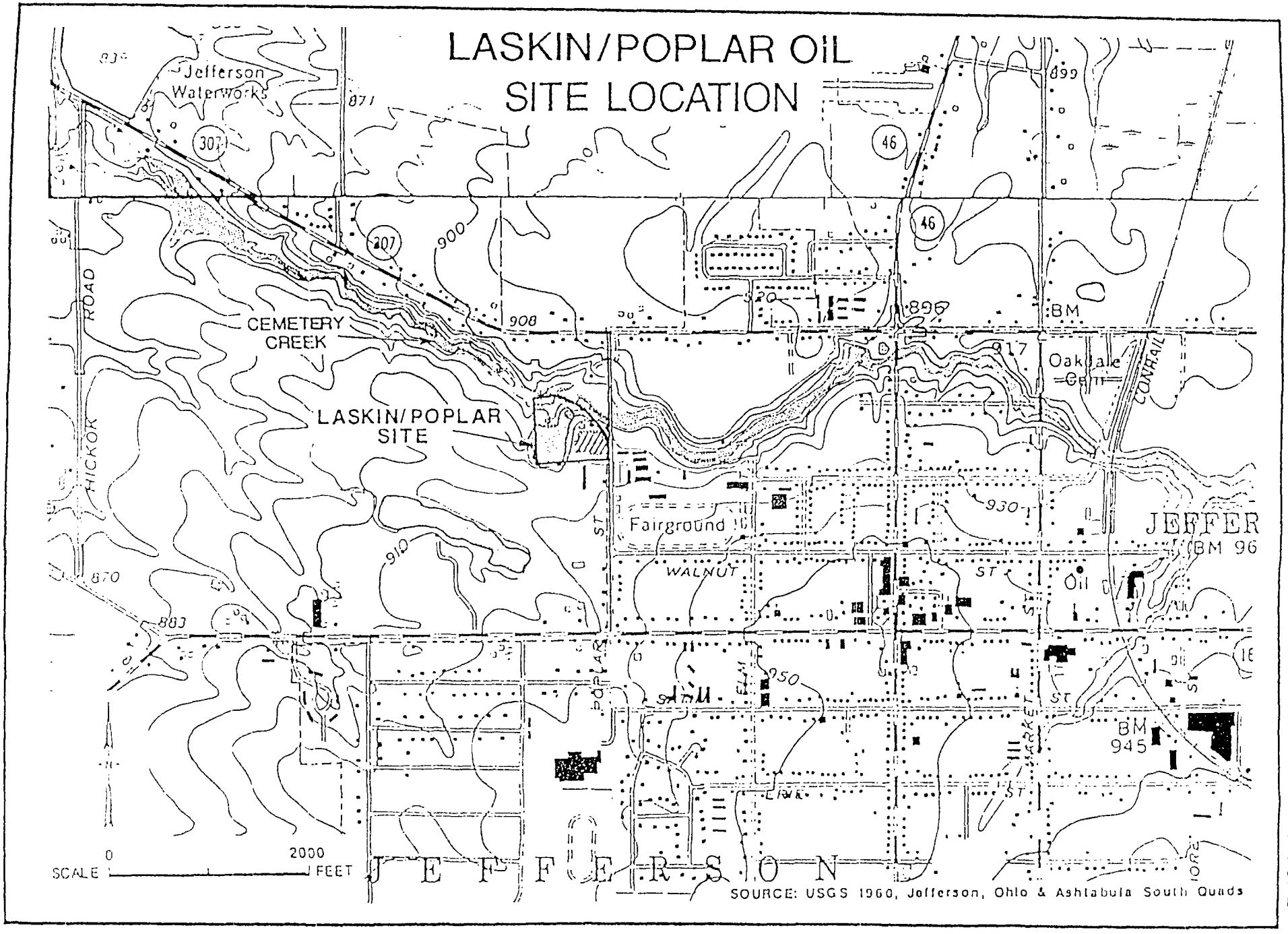
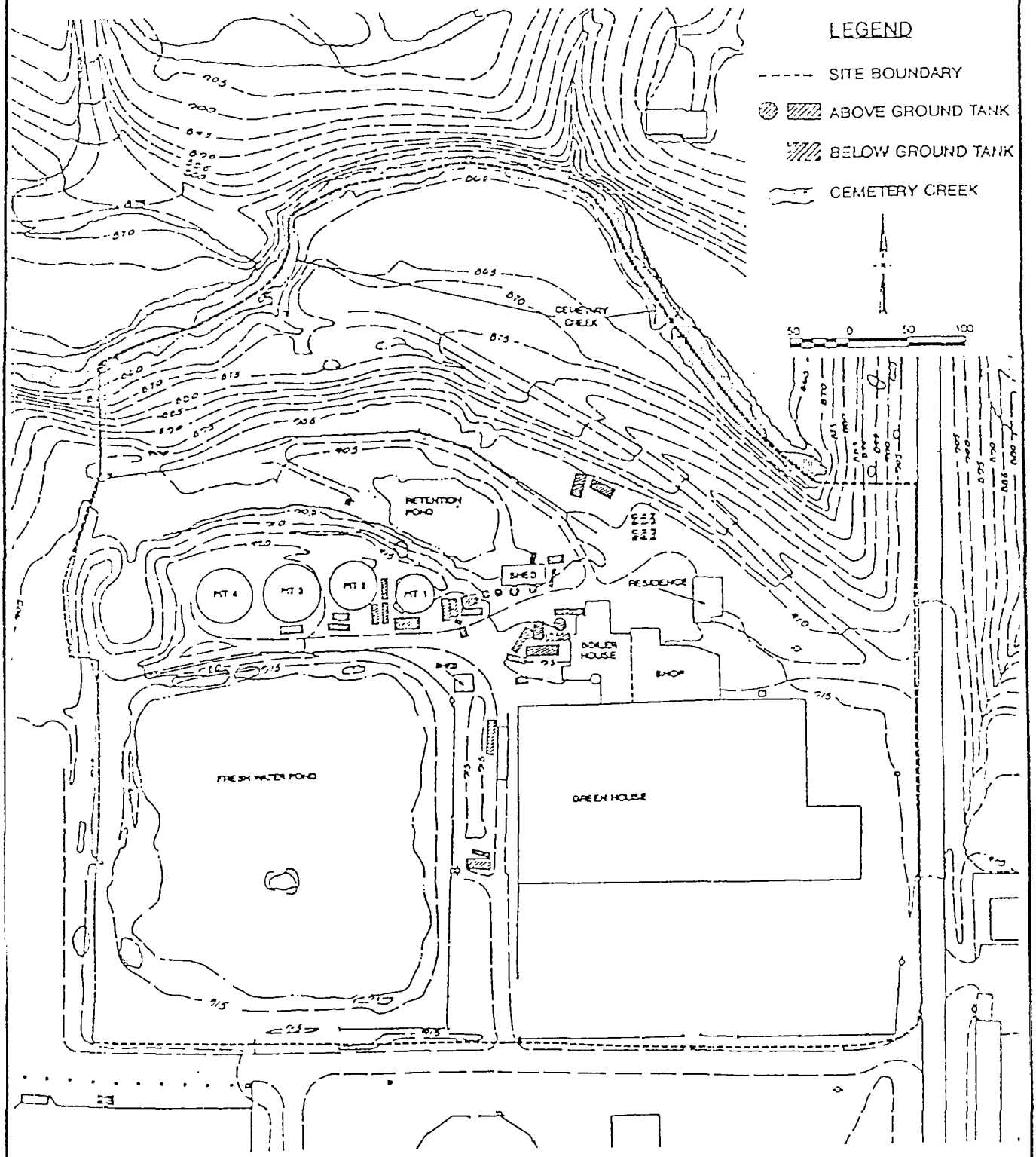

LASKIN/POPLAR OIL
SITE LOCATION
Jefferson
Waterworks
CEMETERY
CREEK
LASKIN/POPLAR
SITE
HICKOK
ROAD
Fairground
WALNUT
ST
POPLAR
ELM
MARKET
Oakdale
Cem
CONRAIL
JEFFER
BM 96
Oil
BM
945
JEFFERSON
SCALE
0
2000
FEET
SOURCE: USGS 1960, Jefferson, Ohio & Ashtabula South Quads

FIGURE 1

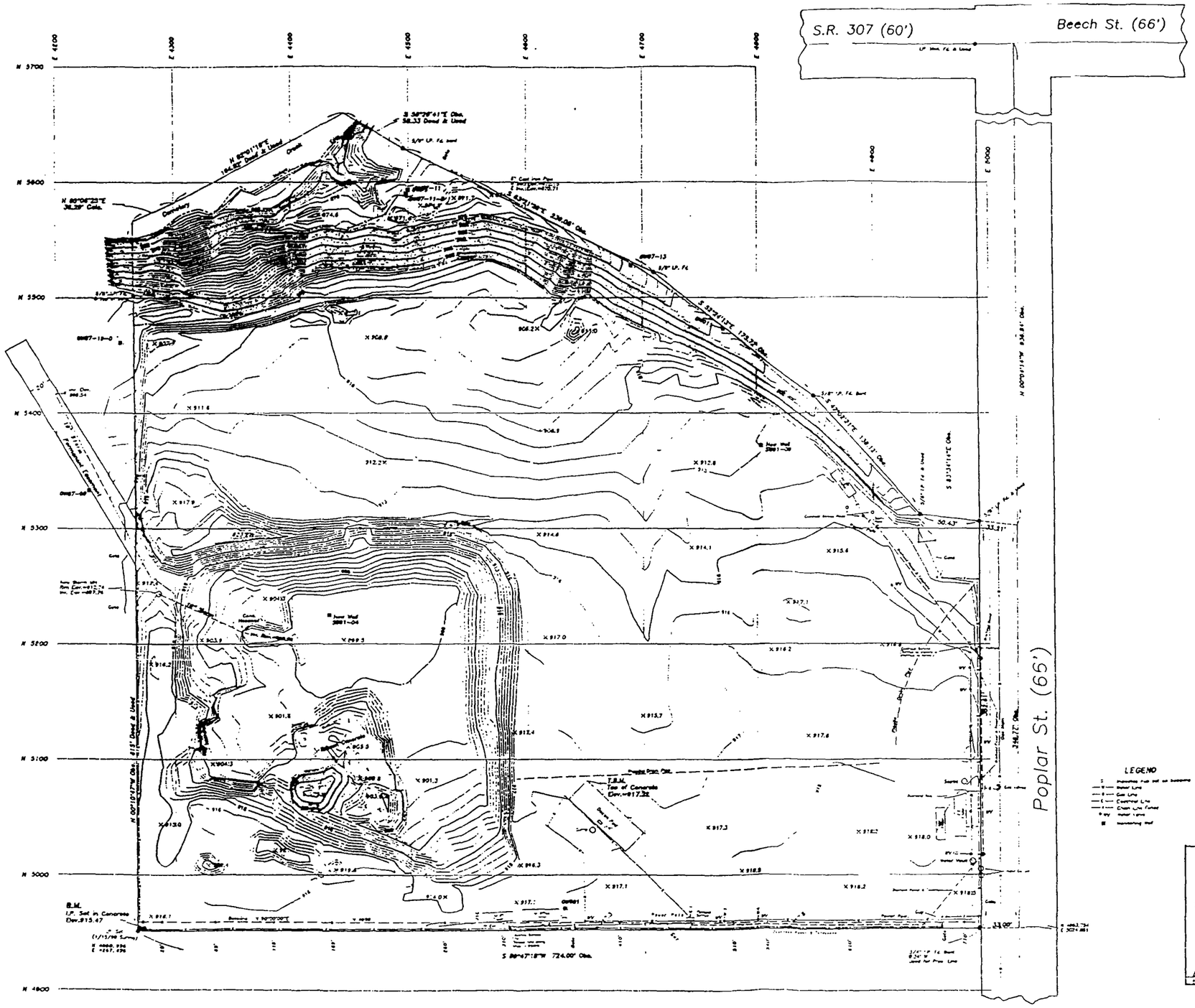
FIGURE 2

LASKIN/POPLAR OIL SITE

(PRE-SOURCE REMOVAL ACTION)



ES ENGINEERING-SCIENCE



Basis for Bearings:
Line of three monuments set by Kuwara International on the West side of Poplar Street, just East of the West R/W. North and South assumed on this line.

40 0 40 80 120
GRAPHIC SCALE - FEET

Note:
All gas, electrical and water lines shown on map are underground, unless otherwise noted.

B.M.
Top of iron pin (set in concrete) @:
N 4953.84
E 4273.31
Elevation=915.46

LEGEND

SURVEYED WELL ELEVATIONS

WELL #	TOP OF RISER ELEVATION	TOP OF CASING	GROUND SURFACE
09001	919.91	919.97	917.6
09011	891.57	892.23	890.0
09B7-08	909.11	909.32	907.2
09B7-11	876.24	876.41	872.5
09B7-11-D	875.67	875.86	872.8
09B7-13	883.44	883.64	880.7
09B7-13-D	904.08	904.40	902.8
5991-08	915.14	915.29	912.7
5991-04	903.72	903.88	900.2

FIGURE 3

LASKIN/POPLAR OIL CO. SITE
Part of Lot 14 O.S. Jefferson Twp.
Ashtabula Co. State of Ohio

Scale 1" = 40'
Date 2/17/93
APPROVED BY:

PRE FINAL REMEDIATION
TOPOGRAPHIC AND LOCATION
SURVEY

WESTFALL & ASSOCIATES
16 S. CHESTNUT ST., JEFFERSON, OHIO
216-576-5551 1-800-322-4851

SECTION 3.0

PERFORMANCE STANDARDS AND CONSTRUCTION QUALITY CONTROL

The following standards and requirements were applicable to the major components of the Final Remedial Action for the LPO Site. They were incorporated into the design and were required by U.S. EPA to be met during implementation.

3.1 DECONTAMINATION WATER

Decontamination water was pumped to tanker trucks for transport to an off site treatment facility. Applicable requirements for storage, sampling, transport, treatment and disposal of waste materials were met (40 CFR 261, 262, 263 and 264) (OAC 3745-52, OAC 3745-53) (49 CFR Parts 107,171-177). All transport was by licensed transporters. The decontamination water was sent to Research Oil Company Cleveland, Ohio.

3.2 CONSTRUCTION OF MULTI-LAYER CAP

The Multi-Layer Cap was designed and constructed to comply with the substantive requirements of the RCRA Landfill Closure Specifications (40 CFR 264.310;) (OAC 3745-57-10). The cap met the permeability requirement of 1x10 -6 cm/sec established in the specifications.

The Cement Bentonite Slurry Walls which were constructed along the West and East sides of the cap were tested for in place permeability. The permeability of the Slurry Wall could not exceed the maximum value of 1x10-6 cm/sec. The unconfined compressive strength of the Slurry Wall was also tested and had to exceed the 15 psi value given in the specification.

3.3 RESIDUAL WASTES FROM THE SOURCE REMOVAL OPERABLE UNIT

The residual wastes from the Source Removal Operable Unit were addressed under a Corrective Action Management Unit (CAMU) as documented by the U.S. EPA letter dated May 6, 1993. The letter regarding the CAMU is included in Appendix B. The wastes

were solidified, sampled, tested to verify compliance with the Toxicity Characteristic Leachate Procedure (TCLP), and were placed under the cap, on site. This process satisfied the substantive requirements of 264.552 (C) criteria for CAMU designation. A report on the results was sent to the U.S. and Ohio EPA.

SECTION 4.0

CONSTRUCTION/REMEDIATION ACTIVITIES

Following is a summary of the Final Remedial Action (FRA) construction and remediation activities performed at the LPO Site. These activities were performed in response to objectives identified in U.S. EPA's ROD, the Consent Decree and the Statement of Work, and were necessary to achieve completion of the Final Remedial Action.

4.1 SITE PREPARATION

The only separate contract awarded in advance of the primary Final Remedial Action contract was for Site Security which was handled by Burns International Security Services.

The Notice to Proceed was given to the successful Contractor, OHM Remediation Services Corp. (OHM) on January 5, 1993. OHM started work immediately on the Slurry Wall Mix Design and Site Plans. Work started at the site on March 29, 1993. OHM mobilized their equipment Trailers and Decon Facilities and started the work that could be done prior to full Work Plan approval by U.S. and Ohio EPAs. This preparatory work consisted of the Preconstruction Topographic Survey and clearing and grubbing of the Fresh Water Pond Area. They also located sources for the Low Permeability and Suitable Fill needed to fill the Fresh Water Pond (FWP). These sources were located and samples of the material taken for laboratory analysis as per the specification.

4.2 EARTHWORK IN THE FRESH WATER POND

As soon as the site was prepared OHM started work outside the exclusion zone, in the clean FWP area. OHM excavated the Buried Ravine and filled it with Low Permeability Fill. Excavation was performed to Plan dimensions and grades and the entire Buried Ravine area was excavated to a depth of at least one foot into the unweathered shale bedrock, (see Figure 4, Detail 1 for elevations). The ravine excavation was then filled with Low Permeability Fill and compacted as per the specification. Two Shelby Tubes were taken to verify the in-place permeability of the backfill. All test results met the specifications including the maximum in place permeability of 1x10-7 cm/sec.

OHM simultaneously started grading the FWP area and proceeded with placement of the off site fill material needed to fill the rest of the FWP. The suitable fill was placed and compacted according to plans and specifications. Concrete from the temporary foundations, removed during the Source Removal was incorporated into the FWP backfill, along with the clean soil outside the Exclusion Zone. The Decontamination Pad and structures were demolished as per the specifications and this material was placed in the area of the proposed Cap. Results of all compaction and permeability testing are included in Appendix B.

4.3 REMOVAL AND INSTALLATION OF SITE DRAINAGE

The existing 18-inch West Drain was removed and a new HDPE Drain was installed. The old 18-inch reinforced concrete pipe and existing drainage structures were demolished per specifications. This material was also incorporated into the backfill of the FWP area. The new pipe and structures were installed at a lower grade according to approved plans and specifications. The rest of the drainage system including the North Drain was installed as the project progressed. These features were also installed according to the plans and specifications. See Figure 4 for as-built elevations of the drainage system.

4.4 ENGINEERING-SCIENCE AIR MONITORING PROGRAM

The support trailers for the Air Monitoring Program were in place prior to the start of the Final Remediation Contract. The Air Monitoring Program started with the mobilization of the Air Monitoring equipment placed in storage at the end of the Source Removal Operable Unit Contract.

Commencement of FRA air monitoring coincided with initiation of work in the exclusion zone, beginning on 4 May 1993, and concluded after six inches of bedding material was installed over the compacted Exclusion Zone soil (24 August 1993). Final Remedy air monitoring activities included on-site, routine portable monitoring with a photoionization detector (PID) and a portable aerosol detector (MINIRAM), as well as twenty-four hour sampling for polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), trace metals, total suspended particulates (TSP, including all airborne particates, regardless of size), and PM_{10} parameters (particles having an aerodynamic diameter of 10 microns or less). Portable air monitoring was performed on a daily basis,

while the twenty-four hour sampling was performed every six working days, throughout the duration of FRA air monitoring.

Data collected through portable air monitoring was used to indicate the presence of airborne contaminants and to implement contingency monitoring and work practice changes. Sampling for PAH, PCB, TSP, PM_{10}, and metals were collected and submitted to the laboratory for analyses to document the airborne contaminant levels at the site during the FRA.

All air monitoring data were collected by Engineering-Science personnel, and laboratory analyses were performed by Chester LabNet. Reports regarding FRA air monitoring were submitted to the EPA on a monthly basis, with the final report dated 1993. During each reporting period, one report was presented regarding quality assurance issues, one dealt with the on-site air monitoring and off-site laboratory analyses of collocated duplicates, and the third report contained a data summary of all data collected, including data compiled from the site meteorological station, portable air monitoring results and laboratory data.

4.5 GUNDWALL WORK

The Gundwall was proposed as a substitution for the CB Slurry Walls by OHM at the Preconstruction meeting. OHM submitted a work plan, complete with details of the installation, for approval by the contracting party and by the Ohio and U.S. EPAs. The work plan and details were approved by all parties, and work started on 4 May 1993. The work coincided with the start of the Air Monitoring program.

OHM began work on the Gundwall by grading a platform along the east and west sides of the landfill inside the Exclusion Zone. They then excavated the Gundwall trenches, removed the oversized material that could interfere with the panel driving, and backfilled the trenches with the loose uncompacted soil. The trenches were excavated a minimum of one foot into the unweathered shale. The excavation depth to the top of the unweathered shale was determined visually. Once the depth of the unweathered shale was identified, elevations were recorded, and additional excavation was performed to achieve the one-foot penetration specified. The trench bottom elevations were then recorded, and trench profiles were developed (Appendix A, Figure 6 and Figure 7). The panel driving equipment arrived on 7 May 1993. Gundle started driving Gundwall panels late on May 7,

and immediately experienced difficulties. The problems ranged from not being able to inject the grout in conjunction with panel driving, to not being able to verify and maintain the integrity of the panel joints while driving.

The grout injection problem was addressed first. OHM asked for and received permission to excavate the Gundwall trenches and place the grout in the bottom of the excavation prior to backfilling with sand. The panels would then be driven through the sand. Representatives of the U.S. and Ohio EPAs were on site and after a meeting to review the procedures, permission was granted to go ahead with the change. This procedure solved the grout injection problem.

The problem of demonstrating the integrity of the panel joints while driving was insurmountable, however. The integrity of the panel lock was to be demonstrated by a runner which would run along the lock ahead of the new panel. If the string attached to the runner stopped then the integrity of the lock was suspect. This runner would jump off the lock and the locks would also fail, on occasion. Since the integrity of the panel locks could not be demonstrated the installation was not accepted. After several days of abortive attempts to drive the first three panels, OHM shut down the Gundwall operation on the 12 May 1993.

4.6 INSTALLATION OF THE CB SLURRY WALL

Immediately after the shut down of the Gundwall installation, OHM resumed planning for the installation of the CB Slurry Wall. The EPA was contacted on 12 May 1993 and asked to provide a copy of the final comments on the Slurry Wall Construction Plan. Verbal approval of the final Work Plan was received on May 20 and OHM started work on the CB Slurry Wall on 21 May 1993. Due to the stability of the CB Slurry Wall trenches, OHM elected to open cut the trenches, than fill them with the CB Slurry mixture, eliminating the need to stabilize the trench walls. The trenches were excavated down to the original grades established by the Gundwall excavation. The bottom elevations for each trench are recorded in the profiles (Figure 6 and Figure 7, Appendix A). OHM started filling the East Trench at 8 AM the morning of May 21 and finished filling the West Trench at 8 PM on the evening of 24 May 1993. The placement of the CB Slurry was continuous except for an eight hour delay due to rain early on the morning of 24 May 1993. Due to a bank failure adjacent to manhole #2, OHM had to excavate a two foot wide key in the CB Slurry Wall and place additional slurry material, in order to insure the integrity

of the wall. This procedure was approved and observed by representatives of the U.S. and Ohio EPAs.

Field testing of the CB Slurry Mix was done as per the Specification and approved Work Plan. The results are included in Appendix B. Samples of the final CB Slurry mixture were taken in the field, cured and sent to an independent lab for testing. The CB Slurry wall permeability failed to meet the specified permeability of $1x10^{-6}$ cm/sec. OHM explained that the samples were improperly cured and this could have effected the lab results. OHM asked permission to drill down through the CB Slurry Walls and take shelby tube samples of the in place Slurry. Permission was given, after consultation with the U.S. and Ohio EPAs. These samples were then tested by an independent laboratory for permeability. The results did not meet the specified permeability of 1x10-6 cm/sec. The permeability results for all the CB Slurry wall samples tested are included in Appendix B.

4.7 INSTALLATION OF DIVERSION TRENCHES

OHM installed the South Diversion Trench according to plan. The East and West trenches were built as per the EPA approved modifications made to the plans and dated 22 July 1993. These modifications to the original contract drawings show the installation of two additional diversion trenches along the East and West CB Slurry walls. These trenches were necessary to insure that groundwater did not permeate the CB Slurry wall and infiltrate the area under the cap. These modifications were proposed by OHM as an alternative to the CB Slurry walls, due to the failure to demonstrate compliance with the permeability requirement. OHM installed an East Trench 10 feet to the east of center line of the East Slurry Wall and a West trench 6 feet to the west of the center line of the West Slurry Wall. The west trench turns to the North West and parallels the West Drain inside the permanent Easement which was secured for the West Drain. The south ends of the east and west trenches were installed adjacent to the existing south trench. OHM maintained a one foot minimum penetration into the unweathered shale throughout the installation of the trenches.

The East Diversion Trench intercepts the ground water flowing northwest to the cap area, and diverts it into the North toe ditch. The West Diversion Trench intercepts any ground water that may flow in from the southwest and diverts it into the West Drain. The South Diversion Trench intercepts all the ground water flowing from the south and diverts

it into the West Drain. The profiles of these Trenches are included in Appendix A of this report.

4.8 EXCLUSION ZONE SOIL GRADING

OHM started grading exclusion zone soil on 12 June 1993. Prior to beginning of the work OHM set up silt fences along the toe of the North Slope and started clearing and grubbing the area. All of the debris from the clearing of the North Slope were stockpiled for disposal. A substantial quantity of used tires was discovered during excavation of the North Slope. Approval was received from the U.S. and Ohio EPAs to shred all debris and tires. The shredded materials were placed under the cap as per U.S. and Ohio EPA Approval.

Excavation and grading of the North Slope materials started shortly after clearing. Problems started to arise with compaction shortly after getting started with grading of the materials being excavated from the North Slope. The North Slope had a high percentage of concrete, wood and general construction debris in it. Also, many different soil types were observed. This made it impossible, in certain situations, to get the specified compaction (95 percent of the Modified Proctor). The contractor had Modified Proctors run on the different types of soils. The appropriate results were then used for Compaction Testing. When 95 percent of the Modified Proctor could not be obtained the soil lift was inspected by the engineer. If a large percentage of debris was observed in the soil lift but the lift looked stable, the moisture was checked. As long as moisture in the soil lift was acceptable (plus or minus 2 percent of optimum) the contractor was allowed to proceed with the next soil lift using 90 percent of the Modified Proctor as the compaction limit. These problems were observed at the site by a representative of the OEPA. After the representative of the OEPA discussed the solutions with the USEPA, the fill operations were allowed to continue using 90 percent of the Modified Proctor.

All the excavated site soil from the perimeter ditches was placed in the area of the proposed cap. During excavation of the ditch along the toe of the North Slope additional stained soil was observed along the ditch area. After consultation with the U.S. and Ohio EPAs, this soil was excavated and deposited under the cap. Clean offsite fill was brought in and compacted to replace the stained material excavated from the ditch area.

The site perimeter fencing was removed at this time, relocated and reinstalled in its permanent location. The posts were driven for the new fencing along the North Slope before the fabric and fencing were taken down, to minimize the down time for the fence. If any section of permanent fence was not in place for the night temporary fencing was erected to close the gaps.

During excavation of the North Slope the north end of the 18 inch concrete pipe from the old Pond 20 discharge was discovered. The south end of this pipe had been discovered and plugged with clay while filling Pond 20 at the end of the Source Removal. The manhole at the north end of the pipe was removed, demolished, mixed with the wet soil that was in it, and solidified with Portland Cement. The end of the pipe was plugged with low permeability clay and the solidified material used to backfill the excavation. This operation was approved and observed by OEPA and U.S. EPA personnel.

4.9 SOURCE REMOVAL RESIDUAL WASTES

During the North Slope work the Residual Wastes left over from the Source Removal were stabilized, tested and deposited in Cell J-3 under the Cap (see Landfill Plan - Appendix A). The plan for the handling of the residual wastes was submitted to the U.S. and Ohio EPA on 6 May 1993. Written approval was received to go ahead with the plan under the Corrective Action Management Unit (CAMU) final rule, on the same date. A sample of the Residual Wastes was shredded and mixed with cement grout as a bench scale test to determine a mix design for the stabilization of the Residual Wastes. After the development of a successful mix design, the Residual Wastes were shredded, mixed with the pre-determined ratio of cement grout, and a sample taken. The sample was cured and analyzed (TCLP) to verify compliance with the approved plan. The analytical results passed. The results are included in Appendix B.

4.10 INSTALLATION OF THE PIEZOMETERS

Three piezometers were installed within the capped area during the Final Remedial Action at the site. These piezometers will be used to determine the potentiometric surface of the groundwater in the capped area, and to establish whether the water level is being lowered to the top of the unweathered shale, as required by the site Consent Decree. Well construction diagrams for each of the piezometers installed at the site are included in Appendix A.

The cap piezometers were installed by OHM on 26 and 27 July 1993. The piezometer boreholes were advanced with 4-1/4 inch inner-diameter (I.D.), single-flight, hollow-stem augers to the depth of competent bedrock. Samples were taken at five-foot intervals, in accordance with the procedures outlined in the Standard Penetration Test (ASTM Method D-1586). Characteristics of the subsurface samples are described in the "field identification of material" column of the well construction diagram, and sample blow counts were recorded in the "penetration resistance" column of the well construction diagram (Appendix A).

The piezometers were constructed of 2-inch I.D. schedule 40 PVC screen and riser. Each screened interval is ten feet, and has a 0.010 inch slot. The screen is flush-threaded to the well bottom plug, and the riser is flush threaded to the screen. The top of the riser is equipped with an expandable well cap, and each piezometer is further protected within a 12-inch I.D. HDPE pipe equipped with HDPE cap.

The annular area between the wall of the borehole and the riser/screen was filled with fine silica sand from the boring terminus to a depth of two feet above the top of the screened interval. A two foot bentonite seal was installed on top of the filter pack, to prevent surface water from filtering into the piezometer, leading to erroneous water level measurements. A shrinkage-compensated, cement-bentonite grout was installed above the bentonite seal, and extends from the seal to surface grade.

Each piezometer was installed to the depth of competent bedrock, which ranged from 16 feet below surface grade to 35 feet below surface grade. It should be noted, however, that the piezometers were installed prior to the emplacement of the Low Permeability clay material, the liner and geocomposite materials and cover topsoil. Consequently, depth below surface grade has changed. Appendix A contains the well construction diagrams for the three piezometers installed at the site and a map showing the location of these piezometers.

4.11 BEDDING SOILS

As part of the capping procedure the exclusion zone soils were to be covered by six inches of Low Permeability clay material, as a bedding material for the liner. An additional six inches of clean off site fill was used as a cushion on the top of the North Slope material. This was done to protect the bedding soil and liner from the rubble mixed

in with North Slope soils. Approval was obtained from the U.S. and Ohio EPAs to add this additional material. The same Low Permeability clay that was used to fill the FWP was chosen for the additional fill. The clay was compacted to 95 percent of the Standard Proctor, as specified. The actual bedding soil was screened to insure the maximum particle size of 3/8 inch specified. The bedding material was a minimum of six inches thick across the cap area. It was compacted and tested as per specification. The compaction results were according to specification on the top of the cap, however, OHM was not able to obtain 95 percent of the Standard Proctor on the 3 to 1 slope. They were not able to compact the soil on the north slope to the specified level due to moisture levels in the soil and the steep grade.

A meeting was held with representatives of the U.S. and Ohio EPAs. Approval was given to reduce the compaction requirement for the 3 to 1 slope area to 90 percent of the Standard Proctor. As specified five Shelby tubes were taken on the top of the cap to check the in-place permeability of the bedding soil. All five results were well below the permeability specified. The results are included in Appendix B, along with the compaction results.

4.12 INSTALLATION OF THE CAP

Installation of the cap commenced immediately after placement of the Bedding Soil. OHM's subcontractor New England Liner Systems installed the liner and Geocomposite materials in nine days. No problems were encountered, and the process was accomplished with no delays. The QA/QC was done by New England Liner Systems under the Supervision of OHM. Copies of all the results of the QA/QC testing and the work logs are included in Appendix B. The installation of the liner materials was also observed by representatives of the U.S. and Ohio EPAs.

In conjunction with the installation of the liner, OHM installed the Infiltration Drain around the perimeter of the cap. There were three changes to the Specification which were approved by the U.S. and Ohio EPAs. These modifications are as follows:

1. OHM filed a request to use # 8 Limestone in place of the #4 stone in the specification.
2. OHM filed a request for a change in piping material from the 4-inch PVC specified to 4 inch HDPE tubing to go along with the change in stone.
3. OHM filed a request to change the method of bonding the Trevira 1145 fabric envelope at the Drain from stitching to heat bonding.

Immediately following installation of the liner and Infiltration Drain, OHM added the 18 inches of cover and 6 inches of topsoil. All the Cover and Topsoil on the cap was screened to remove all soil particles greater then 3/8 of an inch, as specified. OHM asked for permission to add the cover soil in two, 10-inch lifts instead of three, 6-inch lifts, as per the specification. The reason for this was to give the liner material more protection from the equipment needed to compact the soil. After consultation with the USEPA and OEPA, OHM was allowed to increase the lift size, pending the passing results of the compaction tests. All compaction tests for both lifts passed the 90 percent of the Standard Proctor in the specification. The Topsoil was added as a third lift. All the results of the soil testing for the Cover soil as well as the Topsoil are included in Appendix B.

4.13 FINAL SITE GRADING AND SEEDING

Immediately following construction of the cap, OHM graded the areas outside the cap. All material excavated from this area was used in the FWP as fill. The existing stone, covering the area along the East fence line was left unseeded, for additional parking area. All other stone roadways were left in place and covered with topsoil prior to seeding and mulching.

The site was then seeded and mulched. All areas that were disturbed during construction, including the North Slope down to Cemetery Creek, were seeded. In addition to the seeding and mulching, OHM elected to install a temporary erosion control mat in areas of the cap that exhibited a tendency to wash and erode. This mat helped to hold the seed in place while germinating.

All utilities were removed including the power poles, gas lines, water lines and overhead wiring.

4.14 DISPOSAL OF DECONTAMINATION WATER

All of the decontamination water accumulated during the construction of the Final Remedial Action was sent off site for treatment and disposal. The water was sent to the Research Oil Company of Cleveland Ohio. The water was sampled and tested for RCRA characteristics. The results are included in Appendix B. The water was found to be non-hazardous.

4.15 CONCLUSIONS

The Final Remedial Action at the LPO Site has been successfully completed. The project proceeded in an orderly fashion, in large part due to the team effort of the USEPA, Ohio EPA, the Laskin Final Remediation Trust and its contractors, and the Jefferson area community.

SECTION 5.0

CONSTRUCTION INSPECTION

A Final Inspection was conducted on 20 September 1993. At the time of this inspection, the work was complete. The final topographic elevations had been taken on the 15th of September and the site had been seeded and mulched. The only work remaining was some final clean up, minor repair of eroded areas, and demobilization.

The Inspection Team consisted of:

- Kathleen Warren - Project Manager, Region V, U.S. EPA
- Robert Weinschrott, Project Manager - CH2M Hill
- Richard Smith, Project Manager - OEPA
- James R. Campbell - Trustee of the Final Remedial Action Trust.
- Peter Gelman - Project Manager, Engineering Science
- Keith Rankin - Resident Engineer, Engineering-Science

The following punch list was compiled:

- Several small ruts had to be filled in.
- Soil needed to be added along the fence line in a few places to eliminate the gap between the fence and ground.
- Finish the drive access road and parking lot.
- General site clean up and demobilization.
- Removal of all utility hookups.

These items were addressed in the next two days by OHM.

The Inspection Team concluded that the Final Remedial Action was completed.

INDEPENDENT ENGINEER CERTIFICATION

"I certify under penalty of law that the Final Remedial Action Operable Unit,at the Laskin/Poplar Oil Company Site, was performed in accordance with the U.S. EPA - approved work plan, associated contract and design documents, and U.S. EPA - approved modifications thereof. I also certify that the Final Remedial Action Operable Unit design and construction were completed in accordance with the National Oil and Hazardous Substance Pollution Contingency Plan, 40 CFR, Part 300. Based on my inquiry of the person(s) who performed the construction activities, and on my observations of the aforementioned activities, the Laskin/Poplar Oil Company Site has been closed in accordance with the specifications set fourth in the U.S. EPA - approved work plans, associated contract and design documents, and U.S. EPA - approved modifications, thereof. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations."

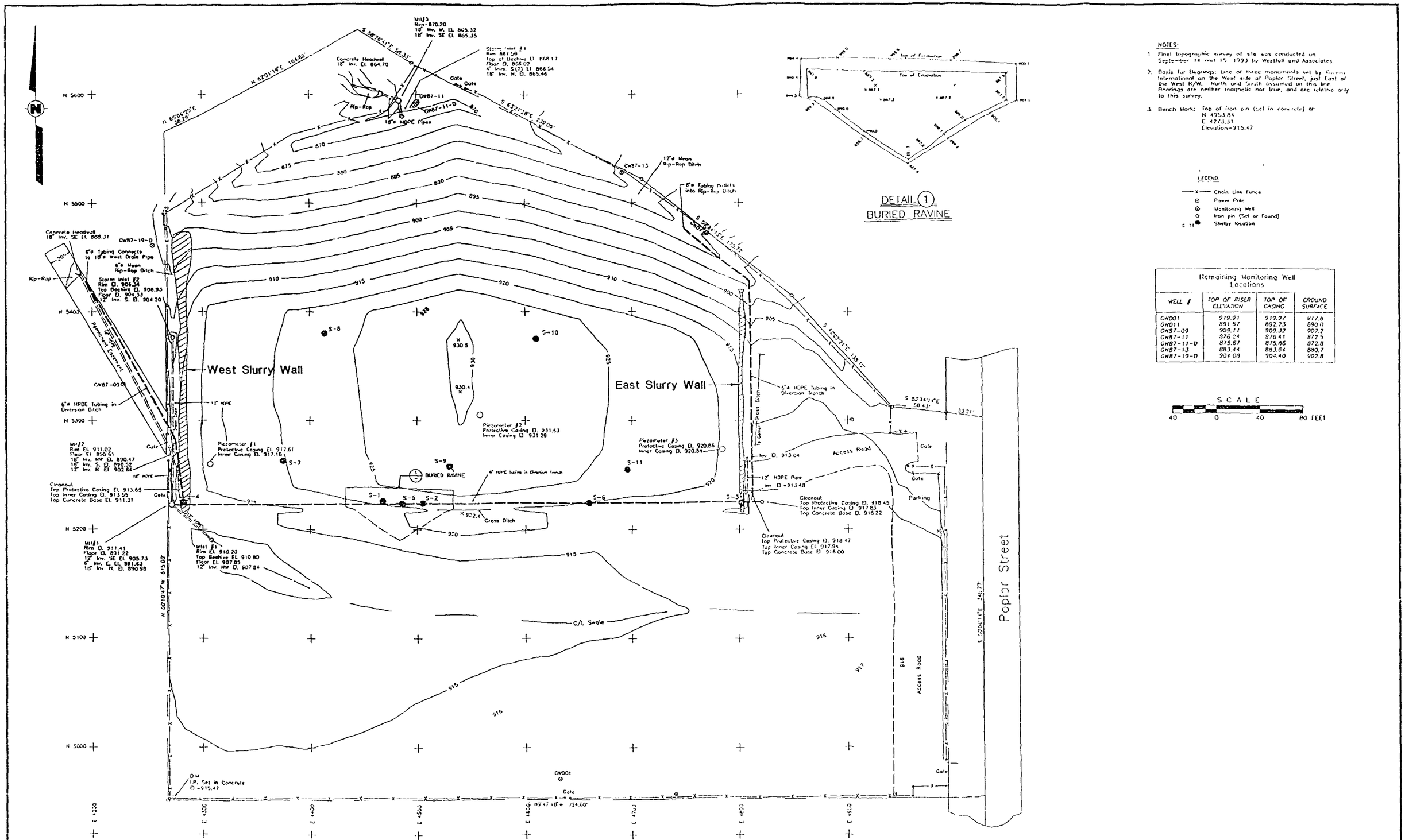
ENGINEERING SCIENCE

Keith Rankin

11/18/93

Keith E. Rankin
Registered Professional Engineer
Ohio E-49596

STATE OF OHIO
KEITH
EMERSON
RANKIN
E-49596
REGISTERED
PROFESSIONAL ENGINEER



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CHECKED BY
ENGINEER
REGISTRATION NO DATE

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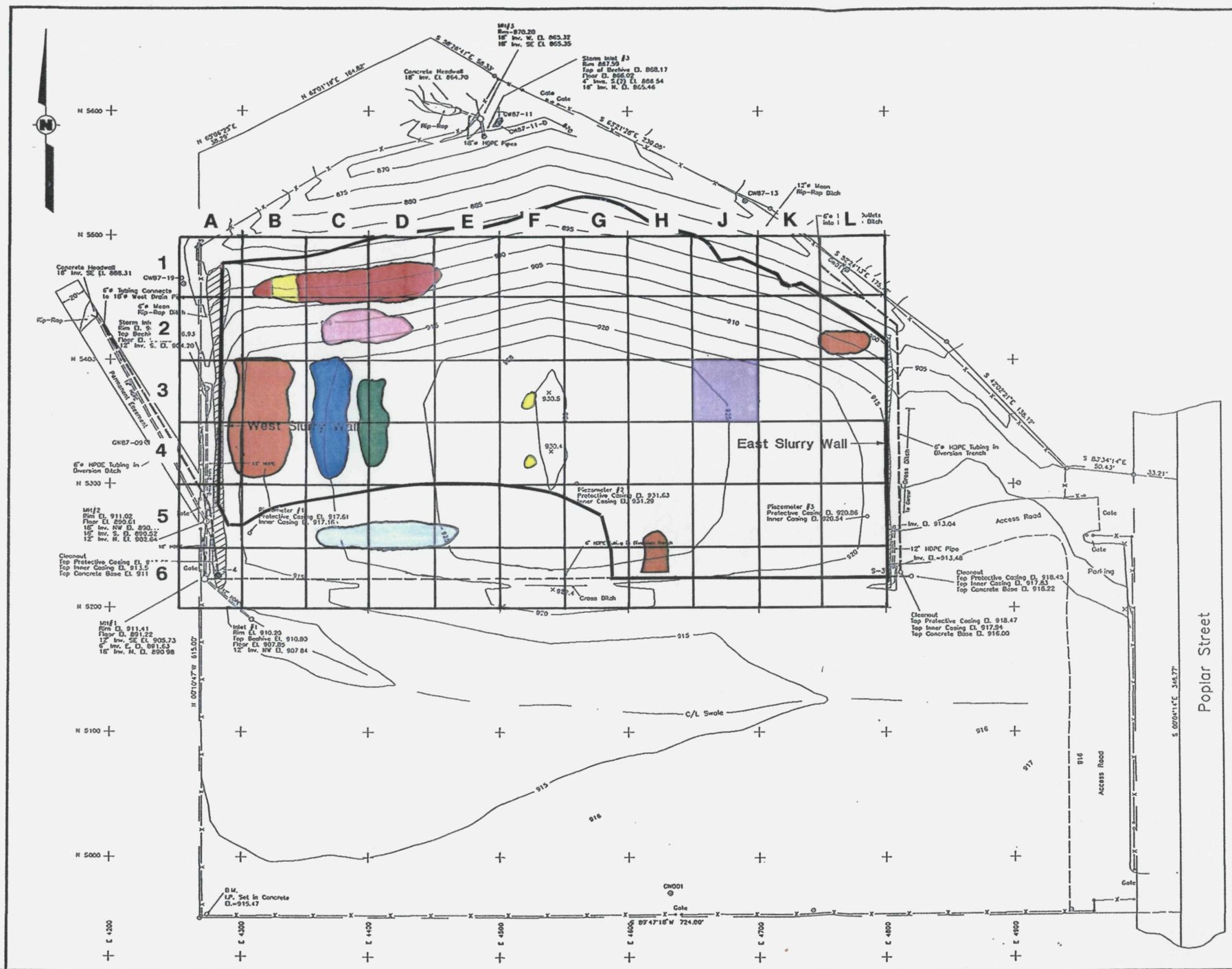
LASKIN/POPLAR OIL COMPANY SITE
JEFFERSON, ASHTABULA COUNTY, OHIO

AS-BUILT

FINAL SITE PLAN

SCALE AS SHOWN
SHEET NO. FIGURE 4
FILE NO.



Legend:

Place During Source Removal

- Greenhouse soil and debris
- Concrete placement from shop
- 18" Ash - elev. 906.53
- Shredded shop, sheds, and greenhouse structures
- Miscellaneous piping
- Encapsulated ACM

Placed During Final Remediation

- Stabilized source removal residual wastes
- Decon concrete pad

- B-1 Transite® siding material
- F-3 Dioxin exposed insulating material
- F-4 Category I asphaltic asbestos roll roofing

NOTE : PPE material placed on site per waiver is located throughout, but primarily in C/D-3/4

40 0 40
SCALE IN FEET

FIGURE 5

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DRAWN BY T.A.McCREARY
CHECKED BY
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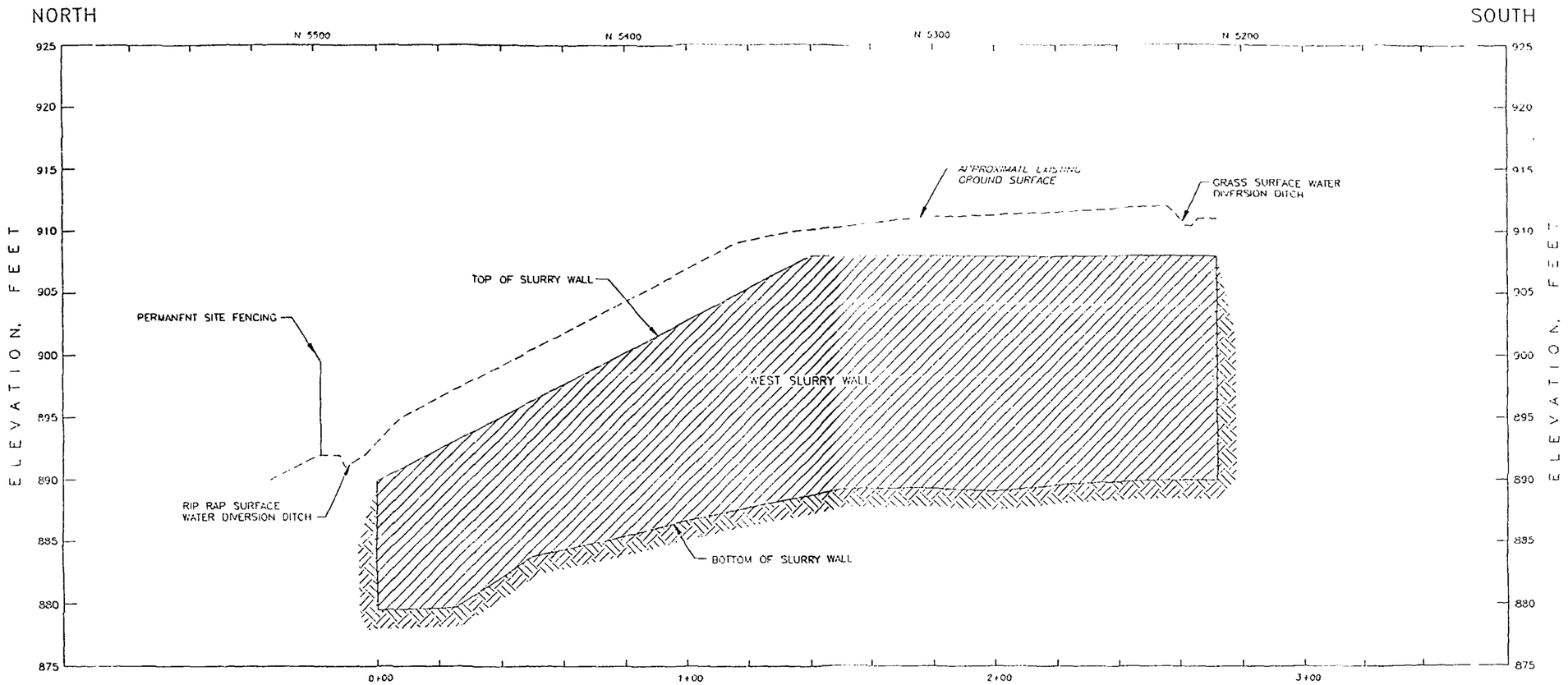
LASKIN/POPLAR OIL
JEFFERSON, OHIO

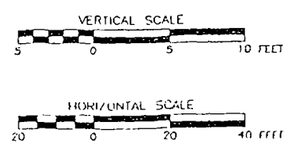
FINAL REMEDIAL ACTION
LANDFILL PLAN

FINAL SITE PLAN

SCALE AS SHOWN
SHEET NO.
FILE NO.

0505C03





NOTE:
STA. 0+00 OF THE WEST SLURRY WALL BEGINS AT N5481 AND CONTINUES SOUTH.

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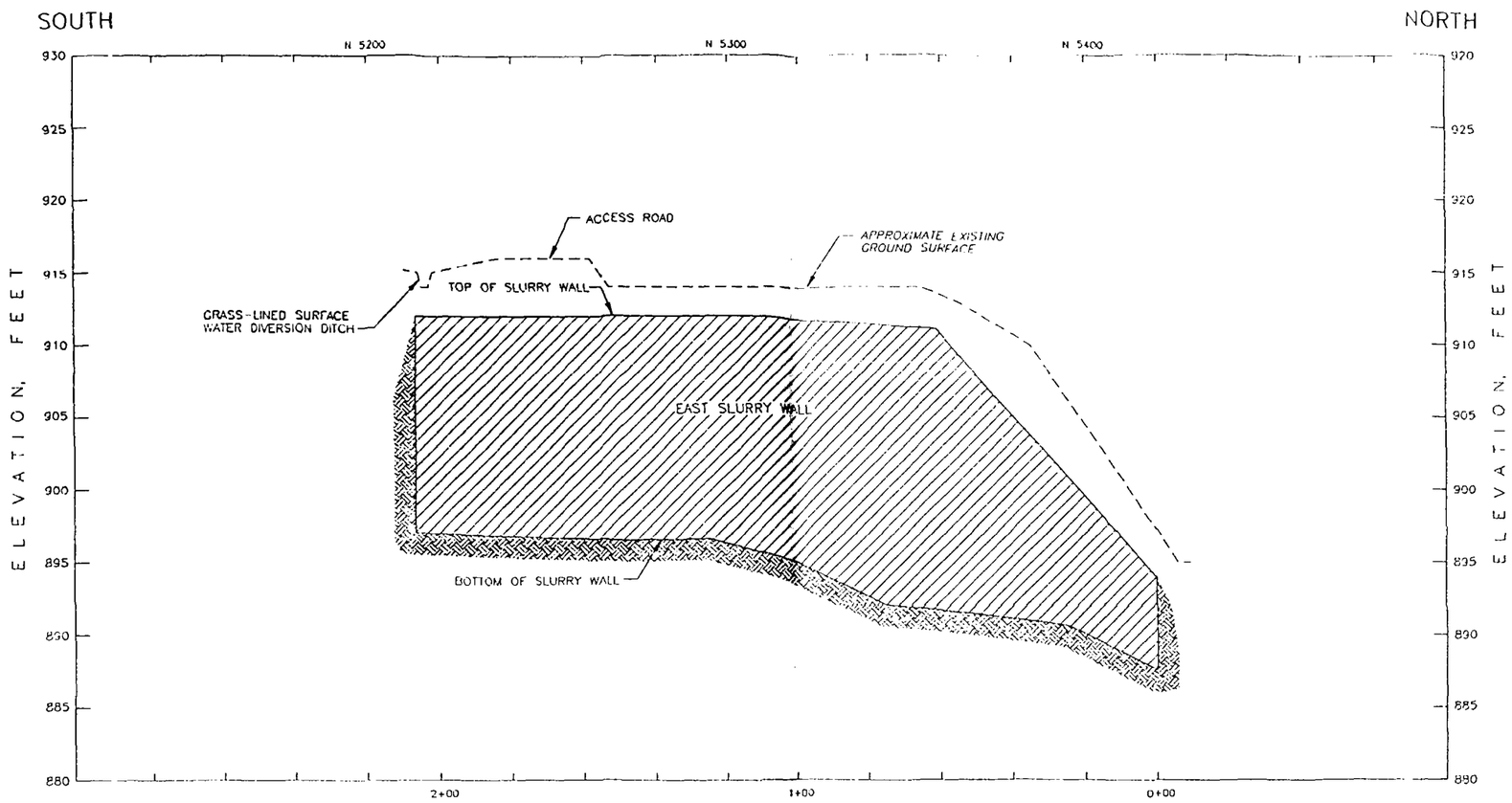
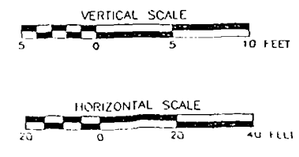
LASKIN/POPLAR OIL COMPANY SITE
JEFFERSON, ASHTABULA COUNTY, OHIO

AS-BUILT

SLURRY WALL TRENCH PROFILE-WEST

SCALE: AS SHOWN
SHEET NO.
FIGURE 8
FILE NO.





NOTE
STA. 0+00 OF THE EAST SLURRY WALL BEGINS AT N5420 AND CONTINUES SOUTH.

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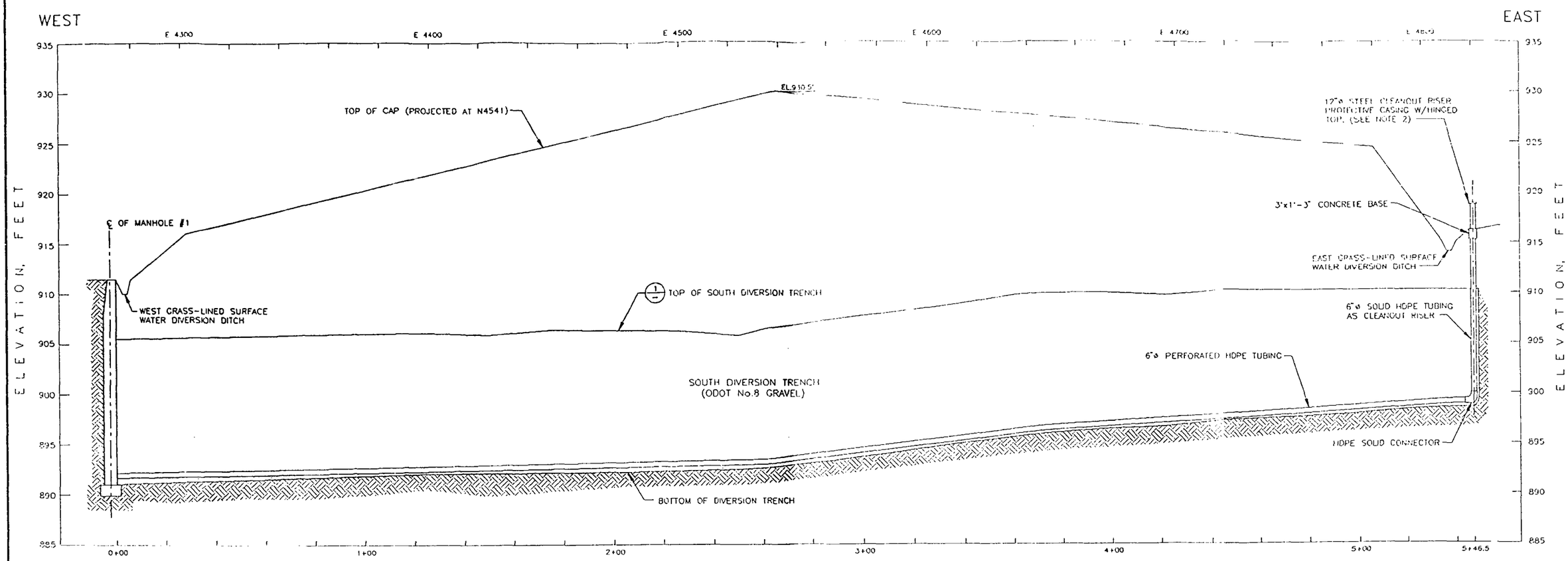
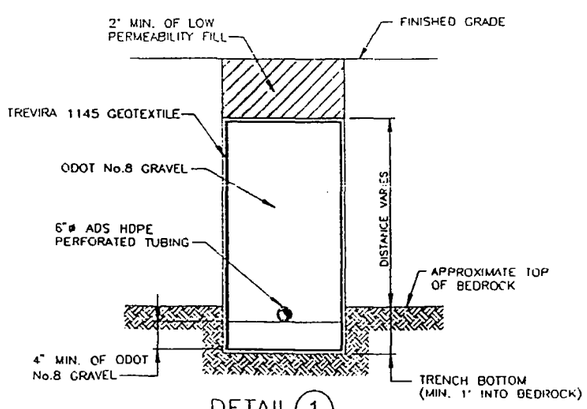
LASKIN/POPLAR OIL COMPANY SITE
JEFFERSON, ASHTABULA COUNTY, OHIO

AS-BUILT

SLURRY WALL TRENCH PROFILE-EAST

SCALE AS SHOWN
SHEET NO.
FIGURE 7
FILE NO.

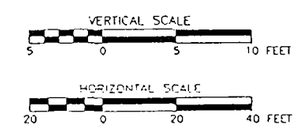




DETAIL 1

TYPICAL DIVERSION TRENCH CROSS SECTION

N. T. S.



NOTES:

1. DIVERSION TRENCH STA. 0+00 STARTS AT THE EAST SIDE OF MANHOLE #1 WITH STATIONS PROGRESSING EASTWARD.
2. ELEVATION OF 12"ø CLEANOUT PROTECTIVE CASING TOP IS A EL. 917.45' WITH 6"ø HDPE CLEANOUT TOP AT EL. 917.83'. SAND WAS PLACED BETWEEN THE PROTECTIVE CASING AND RISER PIPE.

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LASKIN/POPLAR OIL COMPANY SITE

JEFFERSON, ASHTABULA COUNTY, OHIO

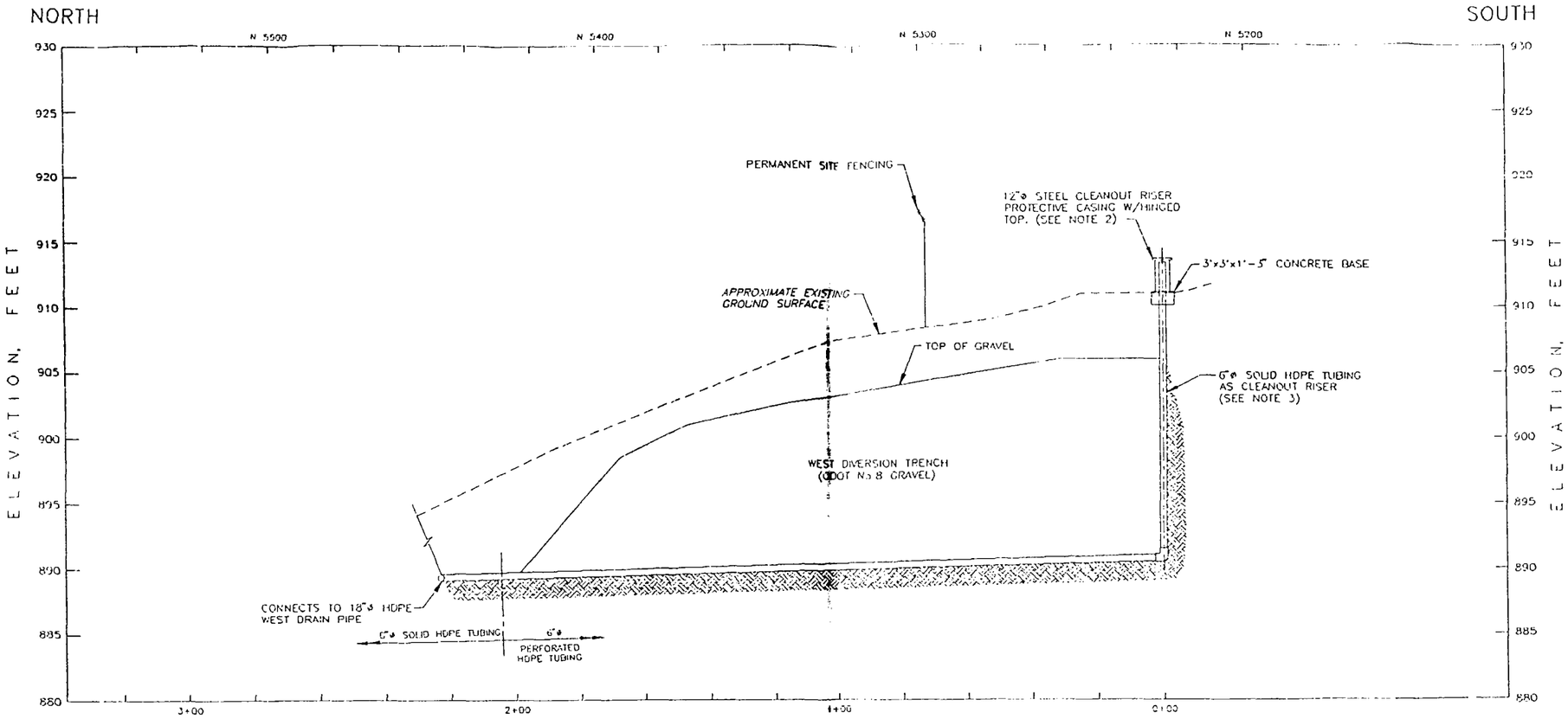
AS-BUILT

DIVERSION TRENCH PROFILE-SOUTH

SCALE AS SHOWN

SHEET NO FIGURE 8

FILE NO.



NOTES:

1. STA. 0+00 OF THE DIVERSION TRENCH BEGINS AT N5225 AT THE CLEAN OUT AND CONTINUES NORTH.
2. ELEVATION OF 12"ø CLEANOUT PROTECTIVE STEEL CASING TOP IS AT EL.913.65' WITH 6"ø HDPE CLEANOUT TOP AT EL.913.55'. SAND WAS PLACED BETWEEN THE PROTECTIVE CASING AND RISER PIPE. STEEL PROTECTIVE CASING AND CONCRETE BASE SHOWN AT EXAGGERATED SCALE FOR CLARITY.
3. 6"ø SOLID HDPE TUBING CLEANOUT RISER SHOWN AT EXAGGERATED SCALE FOR CLARITY.

VERTICAL SCALE
5 0 5 10 FEET

HORIZONTAL SCALE
20 0 20 40 FEET

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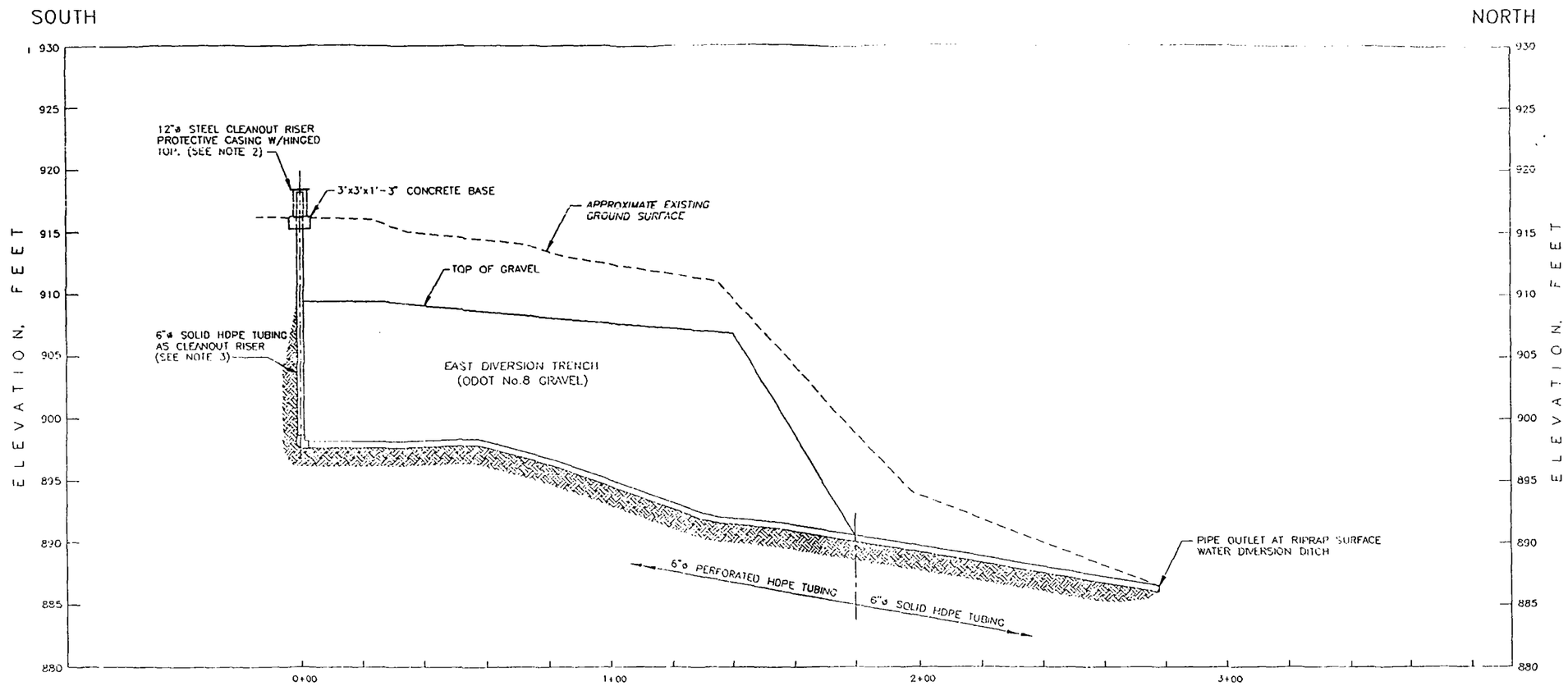
LASKIN/POPLAR OIL COMPANY SITE
JEFFERSON, ASHTABULA COUNTY, OHIO

AS-BUILT

DIVERSION TRENCH PROFILE-WEST

SCALE AS SHOWN
SHEET NO.
FIGURE 9
FILE NO.



NOTES:

1. STA. 0+00 OF THE DIVERSION TRENCH BEGINS AT N5228 AT THE CLEANOUT AND CONTINUES NORTH.
2. ELEVATION OF 12"ø CLEANOUT PROTECTIVE CASING TOP IS AT EL. 918.45' WITH 6"ø HDPE CLEANOUT TOP AT EL. 917.94'. SAND WAS PLACED BETWEEN THE PROTECTIVE CASING AND RISER PIPE. STEEL PROTECTIVE CASING AND CONCRETE BASE SHOWN AT EXAGGERATED SCALE FOR CLARITY.
3. 6"ø SOLID HDPE TUBING CLEANOUT RISER SHOWN AT EXAGGERATED SCALE FOR CLARITY.

VERTICAL SCALE
5 0 5 10 FEET

HORIZONTAL SCALE
20 0 20 40 FEET

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CHECKED BY
ENGINEER
REGISTRATION NO DATE

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LASKIN/POPLAR OIL COMPANY SITE
JEFFERSON, ASHTABULA COUNTY, OHIO

AS-BUILT

DIVERSION TRENCH PROFILE-EAST

SCALE AS SHOWN
SHEET NO.
FIGURE 10
FILE NO

APPENDIX B

LOW PERMEABILITY AND SUITABLE FILL

The suitable fill and low permeability fill was sampled and tested as per the Specification before being brought to the site and periodically as specified. Included here in the appendix are the results of this analytical testing. This part of the appendix includes the following test results:

1. Classification - ASTM D2487
2. Atterberg Limits - Plastic Index, Liquid limit, Plasticity Index.
3. Grain-Size Analysis.
4. Applicable physical properties.
5. Standard and Modified Proctor compaction results.
6. Permeability results.
7. Chemical screening.
8. A list of in-place compaction results.
9. In-place permeability for Shelby Tube samples S-1 through S-6.

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
1	Pond Fill	B+50,2+25	1	1	5/10/93	5	97.9	10.6	P
2	Pond Fill	B+25,0+50	1	1	5/10/93	5	96.0	12.6	P
3	Pond Fill	C+65,0+50	1	1	5/10/93	5	96.8	8.5	P
4	Pond Fill	C+50,1+00	1	1	5/10/93	5	90.0	12.9	P
5	Pond Fill	C+50,1+00	1	1	5/10/93	5	93.7	11.1	P
6	Pond Fill	C+50,1+00	1	1	5/10/93	5	99.0	11.2	P
7	Pond Fill	B+00,2+40	2	1	5/10/93	5	97.7	13.0	P
8	Pond Fill	B+00,0+70	2	1	5/10/93	5	97.2	13.9	F
9	Pond Fill	B+40,0+60	3	1	5/10/93	5	96.9	12.6	P
10	Pond Fill	B+50,2+50	3	1	5/10/93	5	103.9	12.7	P
11	Pond Fill	B+00,0+50	4	1	5/10/93	5	95.1	15.2	P
1	Pond Fill	A+90,0+50	4	1	5/11/93	5	92.1	16.2	F
2	Pond Fill	A+90,0+50	4	1	5/11/93	5	94.2	15.8	F
3	Pond Fill	C+20,0+50	4	1	5/11/93	5	97.1	14.0	P
4	Pond Fill	B+50,2+25	3	1	5/11/93	5	89.7	15.9	F
5	Pond Fill	B+50,2+25	3	1	5/11/93	5	93.7	13.3	F
6	Pond Fill	B+50,2+25	3	1	5/11/93	5	91.6	18.3	F
7	Pond Fill	B+50,2+25	3	1	5/11/93	5	96.5	14.9	P
8	Pond Fill	B+50,2+25	3	1	5/11/93	5	94.2	17.0	F
9	Pond Fill	B+25,2+30	3	1	5/11/93	5	95.5	14.6	P
10	Pond Fill	A+70,0+60	5	1	5/11/93	5	94.2	15.9	F
11	Pond Fill	B+25,0+60	5	1	5/11/93	5	96.8	13.3	P
12	Pond Fill	C+00,2+75	4	1	5/11/93	5	97.7	11.7	P
13	Pond Fill	A+70,0+50	6	1	5/11/93	5	93.7	16.2	F
14	Pond Fill	B+25,0+80	6	1	5/11/93	5	96.6	13.3	P
1	Pond Fill	B+00,2+25	5	1	5/12/93	5	95.3	13.7	P
2	Pond Fill	A+85,0+50	7	1	5/12/93	5	96.0	12.8	P
3	Pond Fill	B+25,2+25	6	1	5/12/93	5	94.7	13.8	F
4	Pond Fill	B+25,2+25	6	1	5/12/93	5	95.1	13.5	P
5	Pond Fill	B+25,2+25	7	1	5/12/93	5	95.2	15.3	P
1	Pond Fill	B+00,2+25	8	1	5/13/93	5	97.2	12.8	P
2	Pond Fill	B+40,2+70	9	1	5/13/93	5	97.1	12.1	P
3	Pond Fill	B+60,2+25	10	1	5/13/93	5	100.2	12.0	P
4	Pond Fill	B+15,2+70	6	1	5/13/93	5	97.6	12.3	P
1	Pond Fill	B+40,1+85	1	1	5/18/93	5	99.5	9.4	P
2	Pond Fill	C+45,0+60	1	1	5/18/93	5	95.1	13.0	P
3	Pond Fill	C+25,0+50	2	1	5/18/93	5	95.2	13.1	P
4	Pond Fill	C+25,0+50	2	1	5/18/93	5	98.1	12.4	P

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
5	Pond Fill	See Note 1	4	NA	5/18/93	NA	See Note(1)	See Note(1)	NA
1	Pond Fill	C+40,0+50	5	1	5/19/93	5	96.7	11.7	P
2	Pond Fill	B+00,0+47	5	1	5/19/93	5	95.2	13.3	P
3	Pond Fill	A+75,0+40	6	1	5/19/93	5	98.2	12.4	P
4	Pond Fill	C+25,0+35	6	1	5/19/93	5	97.2	12.4	P
1	Pond Fill	C+25,0+90	1	1	5/20/93	5	94.0	12.7	F
2	Pond Fill	C+45,0+85	1	1	5/20/93	5	96.2	12.3	P
3	Pond Fill	C+45,0+85	2	1	5/20/93	5	96.9	12.8	P
4	Pond Fill	C+50,1+00	3	1	5/20/93	5	96.1	11.0	P
5	Pond Fill	C+75,1+00	4	1	5/20/93	5	93.0	13.5	F
6	Pond Fill	C+50,1+00	4	1	5/20/93	5	96.2	12.3	P
7	Pond Fill	C+00,0+75	4	1	5/20/93	5	98.1	12.6	P
8	Pond Fill	B+70,1+00	1	1	5/20/93	5	96.5	13.0	P
9	Pond Fill	B+15,1+00	1	1	5/20/93	5	99.4	11.9	P
13	Pond Fill	C+50,2+25	12	1	6/17/93	8	90.0	17.0	F
14	Pond Fill	C+50,2+25	12	1	6/17/93	8	92.9	14.7	F
21	Pond Fill	B+00,2+15	12	1	6/18/93	8	90.2	16.3	F
22	Pond Fill	+50,2+00	12	1	6/18/93	8	87.8	15.3	F
23	Pond Fill	+50,2+00	12	1	6/18/93	8	95.8	12.3	P
24	Pond Fill	B+50,2+00	13	1	6/18/93	8	95.2	12.1	P
25	Pond Fill	B+50,1+80	13	1	6/18/93	8	92.9	13.4	F
26	Pond Fill	C+00,1+50	13	1	6/18/93	8	92.8	14.4	F
27	Pond Fill	C+00,1+50	13	1	6/18/93	8	92.6	14.8	F
28	Pond Fill	C+00,1+50	13	1	6/18/93	8	96.0	13.4	P
29	Pond Fill	C+50,1+80	13	1	6/18/93	8	94.2	13.6	F
30	Pond Fill	C+50,1+80	13	1	6/18/93	8	94.7	12.9	F
31	Pond Fill	C+50,1+80	13	1	6/18/93	8	94.8	13.4	F
1	Pond Fill	A+70,2+30	14	1	6/30/93	8	89..5	17.2	F
10	Pond Fill	A+70,2+30	14	1	6/30/93	8	97.1	13.9	P
2	Pond Fill	A+70,2+20	15	1	7/1/93	8	94.2	13.3	P (1)
3	Pond Fill	B+50,0+50	1	1	8/13/93	24	93.7	13.8	F
4	Pond Fill	B+50,0+50	1	1	8/13/93	24	94.8	12.8	F
5	Pond Fill	B+50,0+50	1	1	8/13/93	24	99.5	11.7	P
6	Pond Fill	B+25,0+50	2	1	8/13/93	24	95.3	12.0	P
7	Pond Fill	B+50,0+50	3	1	8/13/93	24	95.2	13.1	P
8	Pond Fill	A+00,0+25	3	1	8/13/93	24	96.7	8.5	P
9	Pond Fill	A+50,0+25	3	1	8/13/93	24	95.0	11.5	P
6	4:1Slope-Dike	A+75,3+00	16	1	7/13/93	22	101.7	12.1	P
7	4:1Slope-Dike	A+75,3+00	16	1	7/13/93	22	97.7	16.2	P
8	4:1Slope-Dike	E+50,0+25	12	1	7/13/93	17	87.7	15.0	F

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
1	Buried Ravine	A+75,2+75	1	1	4/13/93	1	94.1	19.8	F
2	Buried Ravine	B+00,2+25	1	1	4/13/93	1	88.9	24.5	F
3	Buried Ravine	B+00,2+25	1	1	4/13/93	1	88.3	26.0	F
4	Buried Ravine	NA	1	1	4/13/93	1	87.1	25.8	F
5	Buried Ravine	B+00,2+25	1	1	4/13/93	1	88.9	26.7	F
6	Buried Ravine	B+00,2+25	1	1	4/13/93	1	88.5	28.4	F
9	Buried Ravine	B+25,2+50	1	1	4/13/93	1	101.3	11.5	F (1)
10	Buried Ravine	B+25,2+50	1	1	4/13/93	1	101.6	11.8	P
11	Buried Ravine	B+25,2+50	2	1	4/13/93	1	95.1	12.8	F (1)
12	Buried Ravine	B+00,2+50	2	1	4/13/93	1	97.9	13.0	F (1)
13	Buried Ravine	B+25,2+50	2	1	4/13/93	1	97.2	14.2	F (1)
1	Buried Ravine	A+75,2+50	2	1	4/14/93	1	95.6	16.8	P
2	Buried Ravine	A+00,2+50	2	1	4/14/93	1	97.7	16.2	P
3	Buried Ravine	A+00,2+50	3	1	4/14/93	1	93.8	13.0	F
4	Buried Ravine	A+80,2+50	3	1	4/14/93	1	95.3	17.1	P
5	Buried Ravine	B+25,2+50	4	1	4/14/93	1	93.7	19.4	F
6	Buried Ravine	A+00,2+50	4	1	4/14/93	1	91.9	20.9	F
8	Buried Ravine	B+00,2+50	4	1	4/14/93	1	96.5	16.5	P
9	Buried Ravine	A+75,2+50	5	1	4/14/93	1	93.1	19.6	F
10	Buried Ravine	A+00,2+50	5	1	4/14/93	1	94.4	17.6	F
11	Buried Ravine	A+00,2+50	5	1	4/14/93	1	95.2	15.8	P
12	Buried Ravine	A+00,2+50	6	1	4/14/93	1	93.6	17.9	F
13	Buried Ravine	A+75,2+50	6	1	4/14/93	1	97.3	15.0	P
14	Buried Ravine	A+00,2+30	7	1	4/14/93	1	95.0	18.4	P
15	Buried Ravine	A+75,2+30	7	1	4/14/93	1	93.1	18.5	F
1	Buried Ravine	A+20,2+40	7	1	4/15/93	1	96.5	16.3	P
1	Buried Ravine	B+00,2+50	8	1	4/24/93	1	90.5	22.3	F
2	Buried Ravine	B+50,2+50	8	1	4/24/93	1	90.5	20.1	F
1	Buried Ravine	B+25,2+25	6(2)	1	5/1/93	1	98.8	15.4	P
2	Buried Ravine	B+25,2+20	7(2)	1	5/1/93	1	96.7	14.4	P
3	Buried Ravine	B+40,2+30	8	1	5/1/93	1	98.5	14.4	P
4	Buried Ravine	B+30,2+40	9	1	5/1/93	1	95.3	14.9	P
5	Buried Ravine	B+25,2+20	10	1	5/1/93	1	97.2	15.0	P
6	Buried Ravine	B+30,2+35	11	1	5/1/93	1	98.0	14.9	P
7	Buried Ravine	B+25,2+45	12	1	5/1/93	1	98.1	14.5	P
8	Buried Ravine	B+25,2+30	13	1	5/1/93	1	100.7	13.4	F
1	Buried Ravine	B+30,2+40	13	1	5/2/93	1	96.4	17.2	P
2	Buried Ravine	B+25,2+40	14	1	5/2/93	1	95.0	14.9	P
3	Buried Ravine	B+35,2+45	15	1	5/2/93	1	99.1	14.2	P
4	Buried Ravine	B+25,2+50	16	1	5/2/93	1	97.7	14.3	P
5	Buried Ravine	B+20,2+60	17	1	5/2/93	1	95.2	16.7	P

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
6	Buried Ravine	B+25,2+40	18	1	5/2/93	1	99.8	15.0	P
7	Buried Ravine	B+15,2+70	19	1	5/2/93	1	98.2	15.8	P
8	Buried Ravine	B+25,2+50	20	1	5/2/93	1	95.1	17.2	P
1	E.Div. Trench	0+25(1)	1	NA	7/25/93	22	81.5	19.0	F
2	E.Div. Trench	1+12	1	NA	7/25/93	22	84.7	17.0	F
3	E.Div. Trench	1+12	1	NA	7/25/93	22	87.9	15.4	F
4	E.Div. Trench	1+12	1	NA	7/25/93	22	90.0	16.1	P(2)
5	E.Div. Trench	1+12	2	NA	7/25/93	22	88.8	17.4	F
6	E.Div. Trench	0+75	3	NA	7/25/93	22	98.4	12.7	P
7	E.Div. Trench	0+25	4	NA	7/25/93	22	97.2	15.3	P
8	E.Div. Trench	1+00	5	NA	7/25/93	22	97.9	15.0	P
9	E.Div. Trench	1+12	2	NA	7/25/93	22	91.5	16.3	F
10	E.Div. Trench	1+12	2	NA	7/25/93	22	97.2	15.5	P
11	E.Div. Trench	0+75	3	NA	7/25/93	22	95.5	13.9	P
12	E.Div. Trench	0+25	6	NA	7/25/93	22	97.2	13.2	P(3)
5	S. Div. Trench	1+15(4)	1	NA	6/14/93	7	99.4	14.6	P
6	S. Div. Trench	2+60	1	NA	6/14/93	7	102.9	12.2	P
7	S. Div. Trench	3+90	1	NA	6/14/93	7	92.4	15.7	F
8	S. Div. Trench	4+50	1	NA	6/14/93	7	90.7	14.8	F
7	S. Div. Trench	1+50	2	NA	6/16/93	7	87.3	25.7	F
8	S. Div. Trench	0+60	2	NA	6/16/93	7	85.2	28.9	F
13	S. Div. Trench	2+25	2	NA	6/16/93	7	99.5	16.0	P
14	S. Div. Trench	2+20	3	NA	6/16/93	7	94.9	17.4	P
15	S. Div. Trench	1+50	3	NA	6/16/93	7	95.5	18.7	P
16	S. Div. Trench	0+65	3	NA	6/16/93	7	95.6	17.9	P
9	S. Div. Trench	2+75	4	1	6/17/93	7	96.8	14.7	P
10	S. Div. Trench	1+50	4	1	6/17/93	7	92.7	17.2	F
11	S. Div. Trench	1+50	4	1	6/17/93	7	96.5	16.7	P
12	S. Div. Trench	0+75	4	1	6/17/93	7	101.5	13.9	P
16	S. Div. Trench	2+30	5	NA	6/18/93	7	98.6	15.3	P
17	S. Div. Trench	1+40	5	NA	6/18/93	7	98.2	14.7	P
18	S. Div. Trench	0+75	5	NA	6/18/93	7	93.2	19.9	F
19	S. Div. Trench	0+75	5	NA	6/18/93	7	94.7	19.2	P
20	S. Div. Trench	0+75	5	NA	6/18/93	7	95.3	18.0	P
32	S. Div. Trench	1+50	6	NA	6/18/93	7	96.4	15.5	P
33	S. Div. Trench	2+30	6	NA	6/18/93	7	99.2	15.7	P
3	S. Div. Trench	3+50	1	NA	6/23/93	7	98.0	16.1	P
4	S. Div. Trench	4+50	1	NA	6/23/93	7	97.7	14.9	P
5	S. Div. Trench	3+65	2	NA	6/23/93	7	97.8	13.3	P
6	S. Div. Trench	4+30	2	NA	6/23/93	7	97.9	16.3	P
7	S. Div. Trench	3+70	3	NA	6/23/93	7	98.0	14.5	P

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
8	S. Div. Trench	4+25	3	NA	6/23/93	7	95.3	14.4	P
21	S. Div. Trench	3+50	4	NA	6/23/93	7	97.3	16.2	P
22	S. Div. Trench	4+60	4	NA	6/23/93	7	100.0	15.0	P
23	S. Div. Trench	4+00	5	NA	6/23/93	7	95.0	19.8	P
24	S. Div. Trench	4+90	5	NA	6/23/93	7	96.9	16.7	P
25	S. Div. Trench	3+50	6	NA	6/23/93	7	100.2	15.3	P
26	S. Div. Trench	4+65	6	NA	6/23/93	7	99.6	15.9	P
8	S. Div. Trench	3+30	7	NA	6/24/93	7	98.2	14.8	P
9	S. Div. Trench	4+40	7	NA	6/24/93	17	97.7	16.3	P
2	S. Div. Trench	2+55	7	NA	6/30/93	7	92.5	15.8	F
3	S. Div. Trench	2+25	7	NA	6/30/93	7	101.9	14.6	P
4	S. Div. Trench	2+25	7	NA	6/30/93	7	103.3	11.7	P
5	S. Div. Trench	2+25	7	NA	6/30/93	7	102.3	14.0	P
6	S. Div. Trench	2+25	7	NA	6/30/93	7	103.3	13.8	P
9	S. Div. Trench	1+25	7	NA	6/30/93	7	97.8	14.4	P
11	S. Div. Trench	2+55	7	NA	6/30/93	7	96.4	16.8	P
1	S. Div. Trench	2+75	8	NA	7/1/93	7	102.0	13.8	P
3	S. Div. Trench	1+90	8	NA	7/1/93	7	100.2	14.7	P
4	S. Div. Trench	2+40	8	NA	7/1/93	7	94.6	19.4	P
5	S. Div. Trench	2+40	8	NA	7/1/93	7	94.8	19.8	P
6	S. Div. Trench	2+40	8	NA	7/1/93	7	95.0	19.3	P
7	S. Div. Trench	2+40	8	NA	7/1/93	7	95.7	18.8	P
2	S. Div. Trench	2+25	9	NA	7/2/93	7	105.8	11.9	P
3	S. Div. Trench	2+25	9	NA	7/2/93	7	105.7	13.6	P
4	S. Div. Trench	2+45	9	NA	7/2/93	22	101.0	13.7	P
5	S. Div. Trench	2+45	9	NA	7/2/93	22	97.0	17.0	P
6	S. Div. Trench	1+75	10	NA	7/2/93	22	101.0	13.9	P
7	S. Div. Trench	1+75	10	NA	7/2/93	22	95.5	15.5	P
8	S. Div. Trench	2+25	9	NA	7/2/93	7	99.6	15.7	P
3	S. Div. Trench	3+00	10	NA	7/3/93	22	98.5	15.3	P
1	S. Div. Trench	2+75	11	NA	7/9/93	22	97.8	15.2	P
4	S. Div. Trench	2+25	12	2	7/9/93	22	102.2	13.5	P
5	S. Div. Trench	2+25	12	2	7/9/93	22	96.1	17.2	P
5	S. Div. Trench	4+25	8	NA	7/10/93	22	100.4	13.1	P
6	S. Div. Trench	4+20	8	NA	7/10/93	22	102.0	15.6	P
1	S. Div. Trench	2+25	9	NA	7/12/93	22	102.4	13.2	P
2	S. Div. Trench	2+25	9	NA	7/12/93	22	96.5	14.8	P
3	S. Div. Trench	2+75	10	NA	7/12/93	22	104.1	13.7	P
4	S. Div. Trench	2+75	10	NA	7/12/93	22	95.5	16.3	P
5	S. Div. Trench	2+75	11	NA	7/12/93	22	104.3	12.3	P
1	S. Div. Trench	2+55	11	NA	7/13/93	22	106.7	12.1	P

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
2	S. Div. Trench	2+55	11	NA	7/13/93	22	93.5	16.9	F
3	S. Div. Trench	2+55	11	NA	7/13/93	22	93.9	16.2	F
4	S. Div. Trench	2+55	11	NA	7/13/93	22	95.7	17.0	P
2	W. Div. Trench	NA	1	NA	8/5/93	22	95.6	16.5	P
4	W. Div. Trench	NA	2	NA	8/5/93	22	94.6	17.0	P
5	W. Div. Trench	NA	3	NA	8/5/93	22	99.7	13.4	P
6	W. Div. Trench	NA	4	NA	8/5/93	22	99.7	12.6	P
7	W. Div. Trench	NA	5	NA	8/5/93	22	96.9	14.6	P

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
9	E. Slurry Wall	1+25(5)	1	NA	6/14/93	7	98.4	16.9	P
10	E. Slurry Wall	2+25	1	NA	6/14/93	7	98.5	17.1	P
11	E. Slurry Wall	0+20	1	NA	6/14/93	7	97.0	16.2	P
12	E. Slurry Wall	2+50	2	NA	6/14/93	7	92.8	21.8	F
13	E. Slurry Wall	1+50	2	NA	6/14/93	7	91.7	23.2	F
9	E. Slurry Wall	1+25(5)	1	NA	6/14/93	7	98.4	16.9	P
10	E. Slurry Wall	2+25	1	NA	6/14/93	7	98.5	17.1	P
11	E. Slurry Wall	0+20	1	NA	6/14/93	7	97.0	16.2	P
12	E. Slurry Wall	2+50	2	NA	6/14/93	7	92.8	21.8	F
13	E. Slurry Wall	1+50	2	NA	6/14/93	7	91.7	23.2	F
4	See Note (1)	2+80,0+12	1	NA	6/14/93	7	100.3	12.6	P
11	See Note (2)	2+80,0+15	2	NA	6/16/93	7	97.6	16.9	P
12	See Note (2)	2+80,0+15	2	NA	6/16/93	7	98.0	17.0	P
1	W. Slurry Wall	0+50(2)	1	NA	6/14/93	7	82.8	22.7	F
2	W. Slurry Wall	1+00	1	NA	6/14/93	7	102.6	17.7	P
3	W. Slurry Wall	2+00	1	NA	6/14/93	7	98.8	15.5	P
9	W. Slurry Wall	0+40	2	NA	6/16/93	7	99.6	14.9	P
10	W. Slurry Wall	1+05	2	NA	6/16/93	7	95.9	17.0	P

Notes:

1) This station at the intersection of the w. slurry wall station 2+80 and s. diversion trench station 0+12.
2) This station at the intersection of w. slurry wall station 2+80 and s. trench station 0+15.

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

April 5, 1993

Mr. Bill Fenwick
OHM REMEDIATION SERVICES CORP.
Facsimile No. (216) 576-8915

Dear Mr. Fenwick:

SUBJECT: LANSKIN/POPLAR SITE
JEFFERSON, OHIO
STL FILE NO. A93196X12

The following are results of tests performed on materials received from the above subject project. These results are being sent by facsimile as you requested. The formal report will follow and will include the results of the tests still being run.

TEST	RESULT
% MOISTURE AS RECEIVED	15.6
LIQUID LIMIT	34.0
PLASTIC LIMIT	20.0
PLASTICITY INDEX	14.0
STANDARD PROCTOR TEST (ASTM D-698)	
MAXIMUM DENSITY (PCF)	116.7
% MOISTURE	14.2

We hope this information is of help to you at this time. If you have any further questions, please do not hesitate to call.

Sincerely,

SOLAR TESTING LABORATORIES, INC.

Frank J. Kichurchak, Director
Sales and Operations

FJK/mp
Sent by Facsimile

DATA SUMMARY REPORT

DATE: 04/05/93

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID: 13988-001
ASC Sample Number: JR0928
Sample Date: 930331
Facility Code: 013988

Parameters	Units	
Aromatic Volatile Analysis, GC, (GV31)		
Benzene	mg/kg	<.001
Chlorobenzene	mg/kg	<.001
1,2-Dichlorobenzene	mg/kg	<.001
1,3-Dichlorobenzene	mg/kg	<.001
1,4-Dichlorobenzene	mg/kg	<.001
Ethylbenzene	mg/kg	<.001
Toluene	mg/kg	<.001
Xylenes	mg/kg	<.001
RCRA Total Metals Analysis, (MS50)		
Arsenic	mg/kg	8.98
Barium	mg/kg	95.8
Cadmium	mg/kg	<1.00
Chromium	mg/kg	11.1
Lead	mg/kg	10.1
Mercury	mg/kg	<.050
Selenium	mg/kg	<5.00
Silver	mg/kg	<1.00

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To	From
Bill Fenwick	Melanie
Co.	Co.
Dept.	Phone #
Fax #	Fax #

SPECIAL REQUESTED TOTAL METALS ANALYSIS, (ME40)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	013988	13988-001	JX1069

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Selenium	ND	.500	ND	Q2R2340

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To Bill Fenwick	From Moran
Co.	Co.
Dept.	Phone #
Fax #	Fax #

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-1
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-6-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 2

Following are the test results for the soil sample submitted by OHM to this laboratory:

SIEVE SIZE	PARTICLE SIZE (mm)	PERCENT PASSING
1/2"	12.700	100.0
3/8"	9.500	99.6
#4	4.750	97.6
#10	2.000	93.6
#20	0.850	90.8
#40	0.425	88.2
#100	0.150	80.9
#200	0.075	74.3
	0.029	63.2
	0.019	57.6
	0.011	48.3
	0.008	42.8
	0.006	38.1
	0.003	31.6
	0.001	22.3

PERCENT COURSE - 6.4
PERCENT SAND - 19.3
PERCENT SILT - 46.7
PERCENT CLAY - 27.6

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-1
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-6-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	2 OF 2

Percent Moisture as Received 15.60

Liquid Limit 34.00

Plastic Limit 20.00

Plasticity Index 14.00

Unified Soil Classification CL

Specific Gravity 2.68

STANDARD PROCTOR RESULTS (ASTM D-698)

Maximum Dry Density (pcf) 116.7
Optimum Moisture (percent) 14.2

MODIFIED PROCTOR RESULTS (ASTM D-1557)

Maximum Dry Density (pcf) 126.1
Optimum Moisture (percent) 10.1

TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

Ahmad M. Arayssi

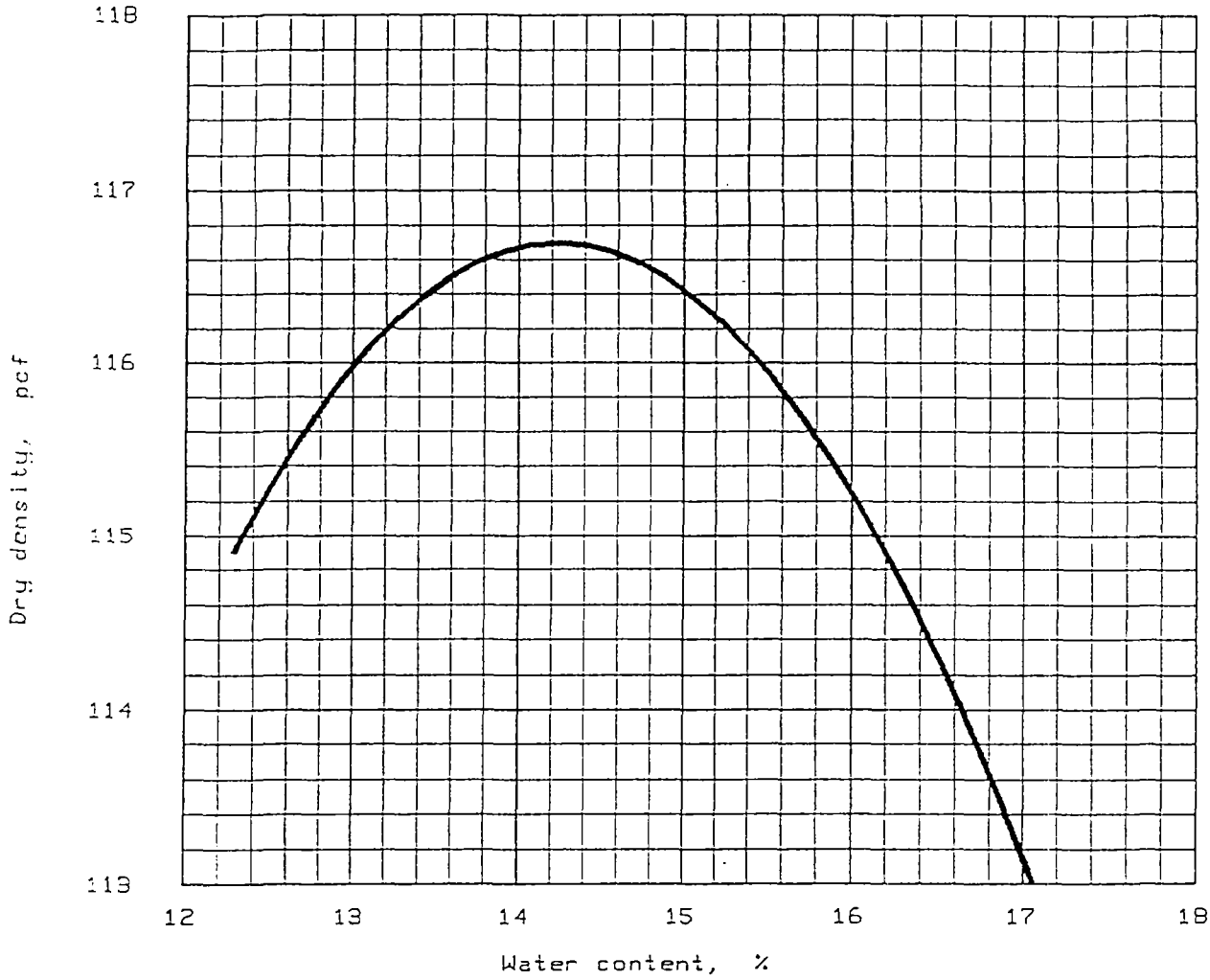
Ahmad M. Arayssi, P.E.
Civil Engineer

Attachments (3)

FILE NO.: A93196X1
REPORT NO.: A-1

PROCTOR TEST REPORT

CURVE NO. 1



"Standard" Proctor, ASTM D 698, Method A

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No. 4	% < No. 200
	USCS	AASHTO						
			15.6 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 14.2 % Maximum dry density = 116.7 pcf	Brown SILT AND CLAY, little sand, trace gravel, shale fragments

Project No.: A93196x1
Project: Laskin\Poplar Jefferson, Ohio
Location: sample delivered by OHM

Date: 4-03-1993

Ahmad M. Arayin

PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

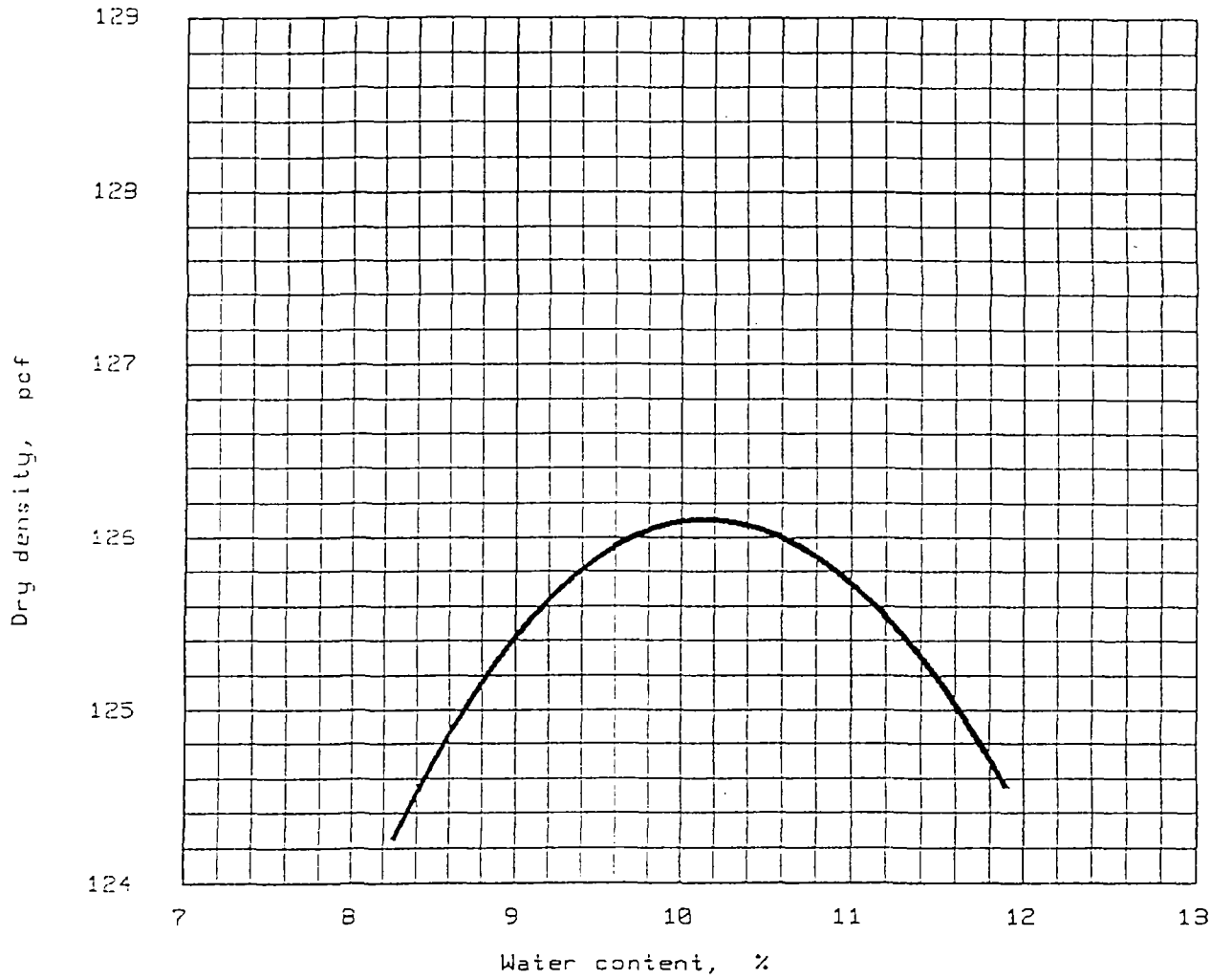
Remarks:
G-1

Figure No. _____

FILE NO.: A93196X12
REPORT NO.: A-1

PROCTOR TEST REPORT

CURVE NO. 2



"Modified" Proctor, ASTM D 1557, Method B

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in	% < No. 200
	USCS	AASHTO						
	CL		15.6 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 10.1 % Maximum dry density = 126.1 pcf	Brown SILT AND CLAY, little sand, trace gravel, shale fragments

Project No.: A93196x1
Project: Laskin\Poplar Jefferson, Ohio
Location: delivered by OHM

Date: 4-06-1993

Ahmad M. Arayji

PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

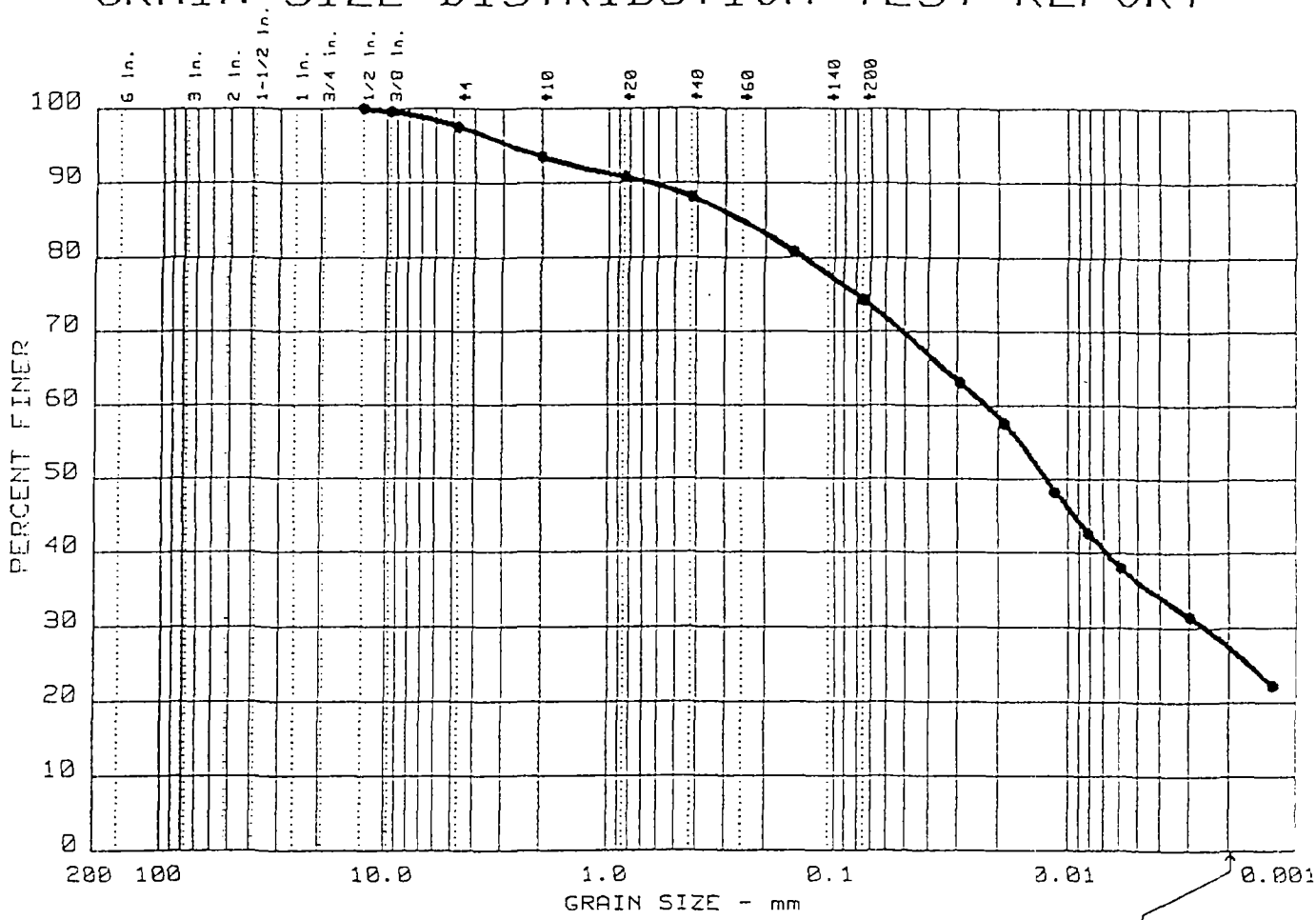
Remarks:

G-1

Figure No. _____

FILE NO.: A93196X12
REPORT NO.: A-1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	10	0.0	6.4	19.3	46.7	27.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.25		0.01	0.002				

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown Silt and Clay, little sand, tr gravel	CL	

Project No.: A93196x12
Project: Laskin\Poplar Jefferson, Ohio
● Location: delivered to lab by OHM

Date: 4-6-93

Remarks:
G-1

GRAIN SIZE DISTRIBUTION TEST REPORT
SOLAR TESTING LABORATORIES

Figure No. _____

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-2
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-8-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 1

A sample of the soil G-1, submitted by OHM, was tested for permeability as per ASTM specification D-5084. The remolded soil sample used for the test had a moisture content of 3 percent above the optimum moisture and was compacted to 95 percent of the maximum standard proctor density. Following is the permeability result:

Coefficient of Permeability (k) = 2.8×10^{-8} cm/sec (Average of 4)

Following is the data for the sample tested:

Diameter (in)	2.83
Length (in)	5.58
Initial Dry Density (pcf)	110.80
Percent Moisture	17.20
Confining Pressure (psi)	85
Influent Pressure (psi)	75
Effluent Pressure (psi)	60
Percent Saturation	98.00

TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

Ahmad M. Arayssi

Ahmad M. Arayssi, P.E.
Civil Engineer

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-3
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-20-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 2

On April 14, 1993, a sample of low permeability fill for the buried ravine, identified as LP-1, was submitted for a material analysis. Following are the test results:

SIEVE SIZE	PARTICLE SIZE (mm)	PERCENT PASSING
3/4"	19.000	100.0
1/2"	12.700	99.2
3/8"	9.510	97.2
#4	4.750	94.9
#10	2.000	92.0
#20	0.850	89.1
#40	0.425	86.7
#100	0.150	80.4
#200	0.075	75.1
	0.029	64.0
	0.019	57.6
	0.011	47.5
	0.008	42.0
	0.006	36.6
	0.003	27.4
	0.001	20.1

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PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-8
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-27-93
DESCRIPTION:	PERMEABILTIY TEST	PAGE NO.:	1 OF 2

On April 14, 1993, a Shelby Tube sample identified as S2 was submitted to this laboratory for a permeability test. This test was performed in accordance with ASTM Specification D-5084.

Following are the test results:

Coefficient of Permeability (k) = 9.12×10^{-9} cm/sec

Following is the data for the sample tested:

Diameter	-	2.84"
Length	-	5.57"
Initial Dry Density (pcf)	-	110.60
Percent Moisture (as received)	-	18.30
Confining Pressure	-	90
Influent Pressure	-	85
Effluent Pressure	-	70
Percent Saturation	-	100

INFLUENT READING	EFFLUENT READING	TIME
8.1	7.7	2:30 P.M.
8.3	7.5	4:30 P.M.
9.7	6.1	6:30 A.M.
9.8	6.0	7:30 A.M.
10.0	5.8	9:30 A.M.

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-8
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-27-93
DESCRIPTION:	PERMEABILITY TEST	PAGE NO.:	2 OF 2

1. $$\frac{0.2 \times 14.15}{40.87 \times 15 \times 70.3 \times 7200} = 9.12 \times 10^{-9} \text{ cm/sec}$$

2. $$\frac{1.4 \times 14.15}{40.87 \times 15 \times 70.3 \times 50400} = 9.12 \times 10^{-9} \text{ cm/sec}$$

3. $$\frac{0.1 \times 14.15}{40.87 \times 15 \times 70.3 \times 3600} = 9.12 \times 10^{-9} \text{ cm/sec}$$

4. $$\frac{0.2 \times 14.15}{40.87 \times 15 \times 70.3 \times 7200} = 9.12 \times 10^{-9} \text{ cm/sec}$$

TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

Attachment

SOLAR TESTING LABORATORIES, INC.

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PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-7
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-23-93
DESCRIPTION:	PERMEABILTIY TEST	PAGE NO.:	1 OF 2

On April 14, 1993, a Shelby tube sample identified as S1 was submitted to this laboratory for a permeability test. This test was performed in accordance with ASTM Specification D-5084.

Following are the test results:

Coefficient of Permeability (k) = 1.2×10^{-8} cm/sec (Average of 4)

Following is the data for the sample tested:

Diameter	-	2.86"
Length	-	5.57"
Initial Dry Density (pcf)	-	113.90
Percent Moisture (as received)	-	17.20
Confining Pressure	-	80
Influent Pressure	-	70
Effluent Pressure	-	55
Percent Saturation	-	100

INFLUENT READING	EFFLUENT READING	TIME
22.0	3.6	10:50 A.M.
19.0	3.9	12:50 P.M.
18.5	4.4	4:50 P.M.
16.5	6.4	7:50 A.M.
16.1	6.0	10:50 A.M.

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-7
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-23-93
DESCRIPTION:	PERMEABILITY TEST	PAGE NO.:	2 OF 2

1. $$\frac{0.3 \times 14.15}{41.45 \times 15 \times 70.3 \times 7200} = 1.35 \times 10^{-8} \text{ cm/sec}$$

2. $$\frac{0.5 \times 14.15}{41.45 \times 15 \times 70.3 \times 14400} = 1.12 \times 10^{-8} \text{ cm/sec}$$

3. $$\frac{2.0 \times 14.15}{41.45 \times 15 \times 70.3 \times 54000} = 1.20 \times 10^{-8} \text{ cm/sec}$$

4. $$\frac{0.4 \times 14.15}{41.45 \times 15 \times 70.3 \times 10800} = 1.20 \times 10^{-8} \text{ cm/sec}$$

TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash

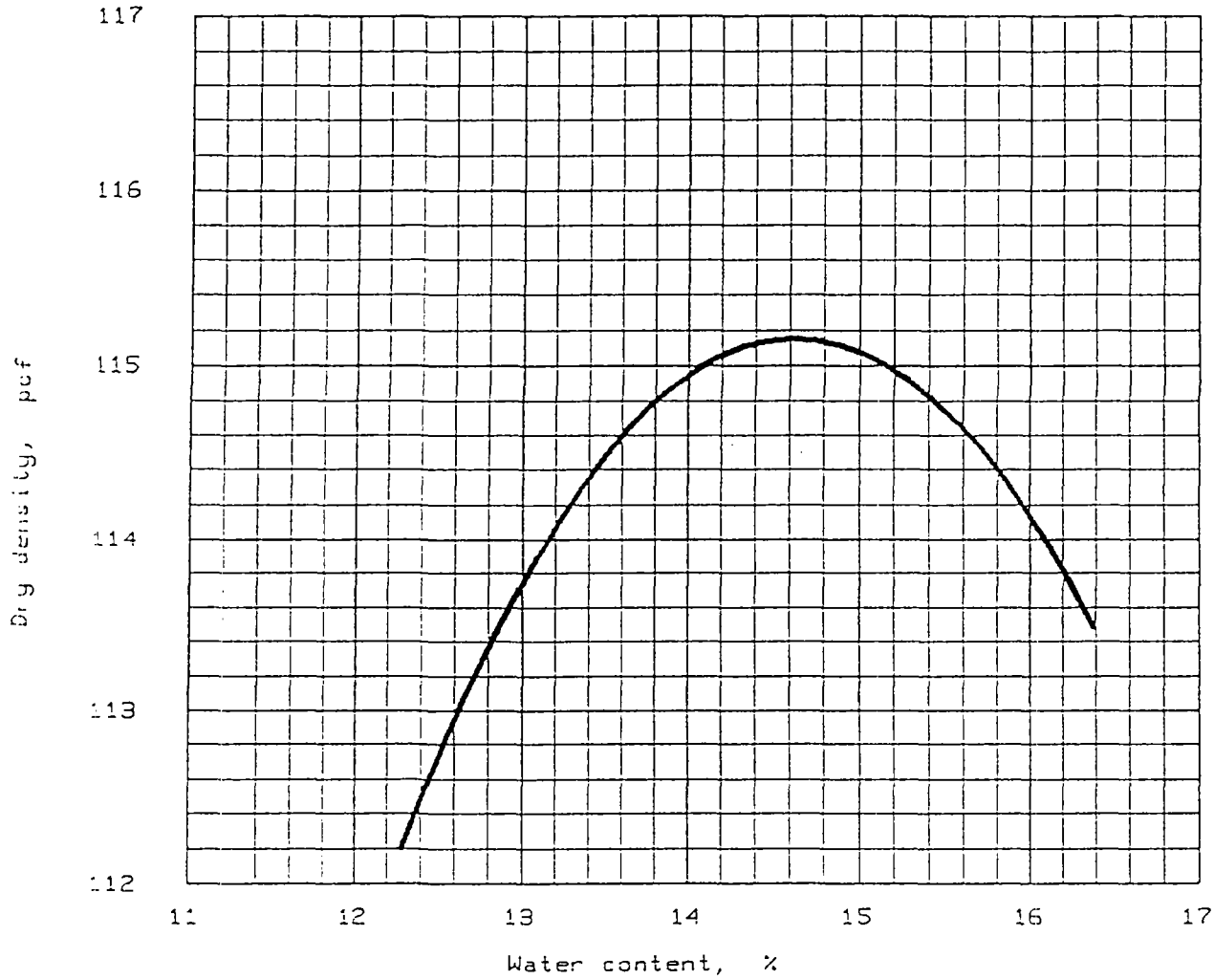
William R. Dash, P.E.
Civil Engineer

Attachment

FILE NO.: A93196X12
REPORT NO.: A-25

PROCTOR TEST REPORT

CURVE NO. 22



"Standard" Proctor, ASTM D 698, Method B

Elev/ Depth	Classification USCS	Classification AASHTO	Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in	% < No. 200
			19.5 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 14.5 % Maximum dry density = 115.2 pcf	Brown with some gray SILT AND CLAY, little sand, few shale fragments

Project No.: A93196x1
Project: Laskin\Poplar Site
Location: off-site fill

Date: 7-01-1993

Remarks:
sample LP - 2

PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

SOLAR TESTING LABORATORIES, INC.

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PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-25
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	7-7-93
DESCRIPTION:	MATERIAL ANALYSIS		

On June 30, 1993, a sample identified as LP-2, was submitted to this laboratory for a material analysis. Following are the test results:

Liquid Limit - 36
Plastic Limit - 21
Plasticity Index - 15

Permeability (k)--1.72×10^{-8} cm/sec (average of 4 readings)
(compacted to 95 percent of standard proctor density at 3 percent above optimum moisture)

Standard Proctor

Maximum Dry Density	115.2 pcf
Optimum Moisture	14.6 %

TECHNICIAN: DONALD HOLLENBAUGH

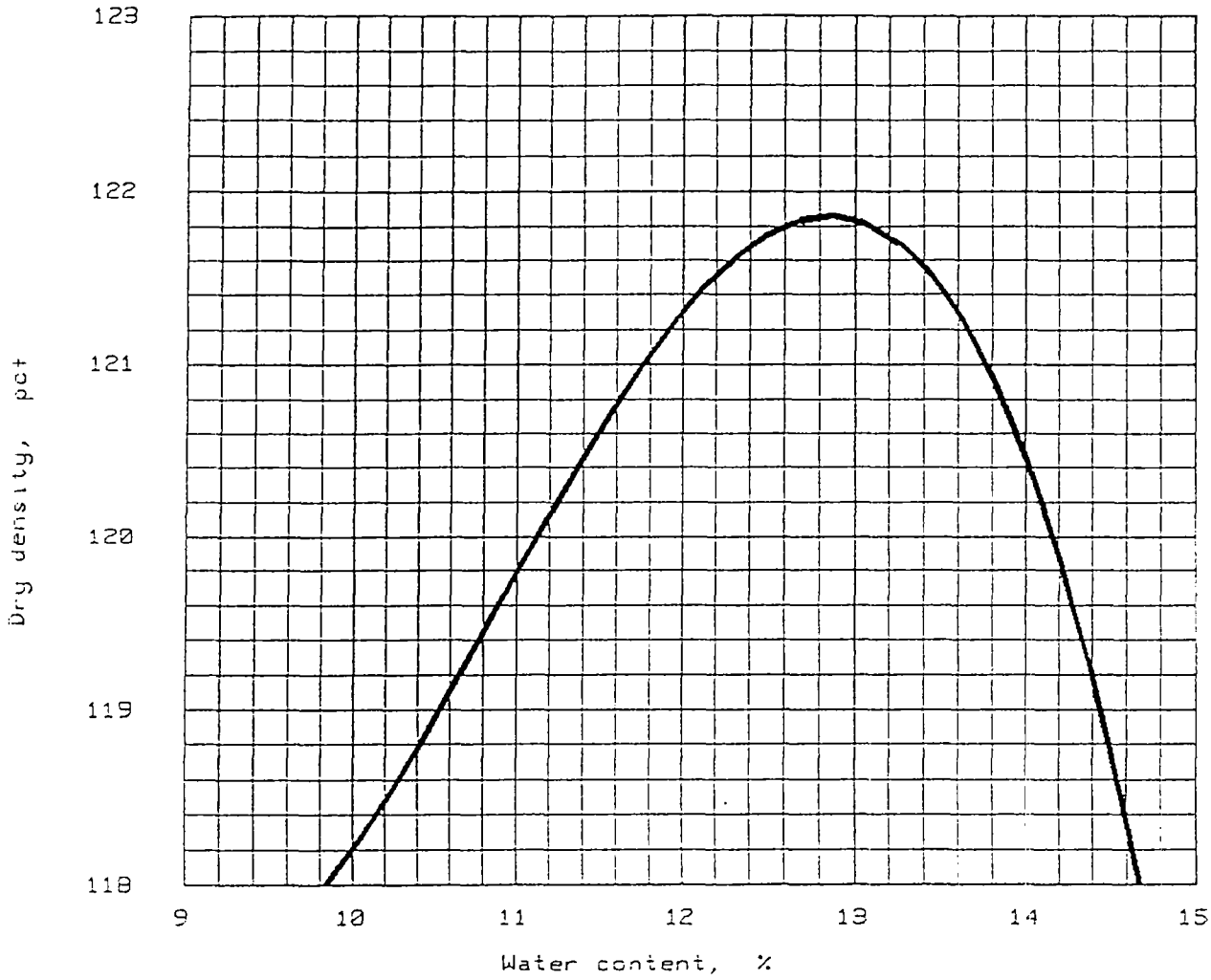
SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

Attachment

PROCTOR TEST REPORT

CURVE NO. 5



"Modified" Proctor, ASTM D 1557, Method A

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No. 4	% < No. 20
	USCS	AASHTO						
			20.9 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 12.8 % Maximum dry density = 121.9 pcf	Brown SILT, little clay, sand

Project No.: A93196x1

Project: Laskin\Poplar Site Jefferson, Ohio

Location: Area 1 and 2 of Simak Trucking

Date 4-19-1993

Ahmad M. Arayssi

Remarks:

SM-1

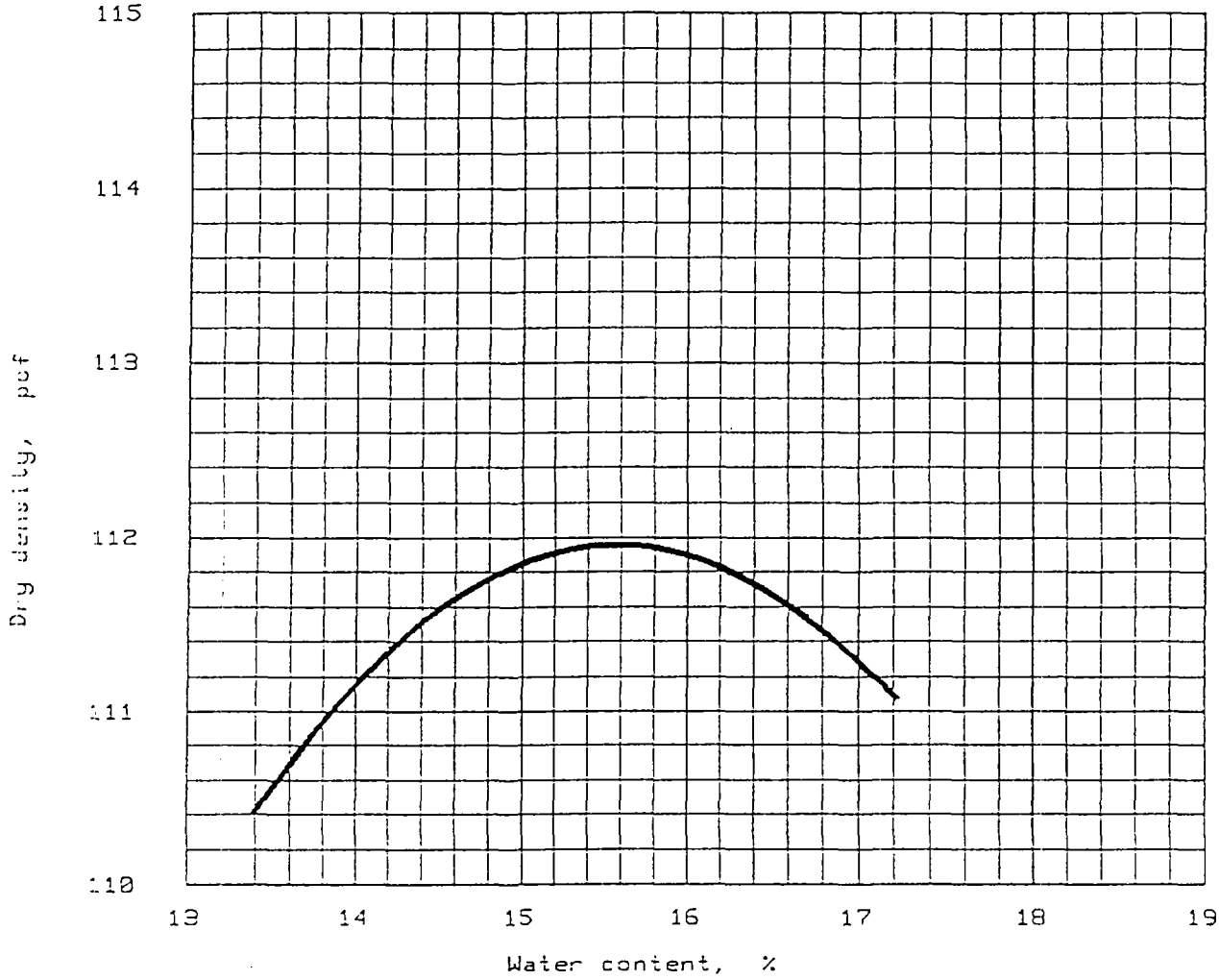
PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

PROCTOR TEST REPORT

CURVE NO. 3



"Standard" Proctor, ASTM D 698, Method A

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No. 4	% < No. 200
	USCS	AASHTO						
			20.9 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 15.6 % Maximum dry density = 112.0 pcf	Brown SILT, little clay, sand

Project No.: A93196x1

Project: Laskin\Poplar Site Jefferson, Ohio

Location: Area 1 and 2 of Simak Trucking

Date: 4-19-1993 Ahmad M. Arayssi

Remarks:

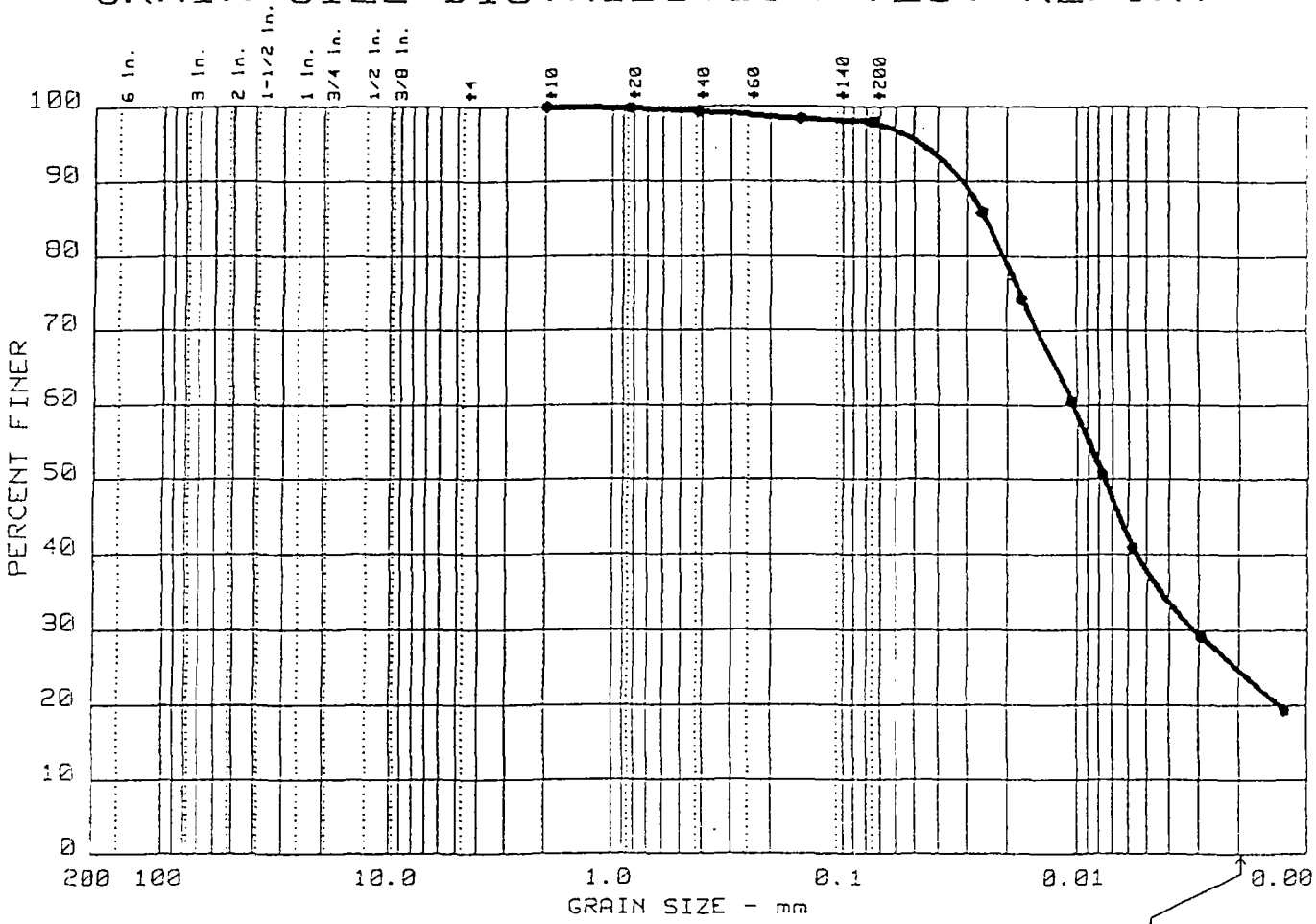
SM-1

PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	11	0.0	0.0	2.0	73.2	24.8

	LL	PI	D_{95}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.01	0.003				

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown Silt, little clay, trace sand	ML	

Project No.: A93196x12
Project: Laskin\Poplar Jefferson, Ohio
● Location: Area 1 and 2 of Simak Trucking

Date: 4-20-93

Remarks:

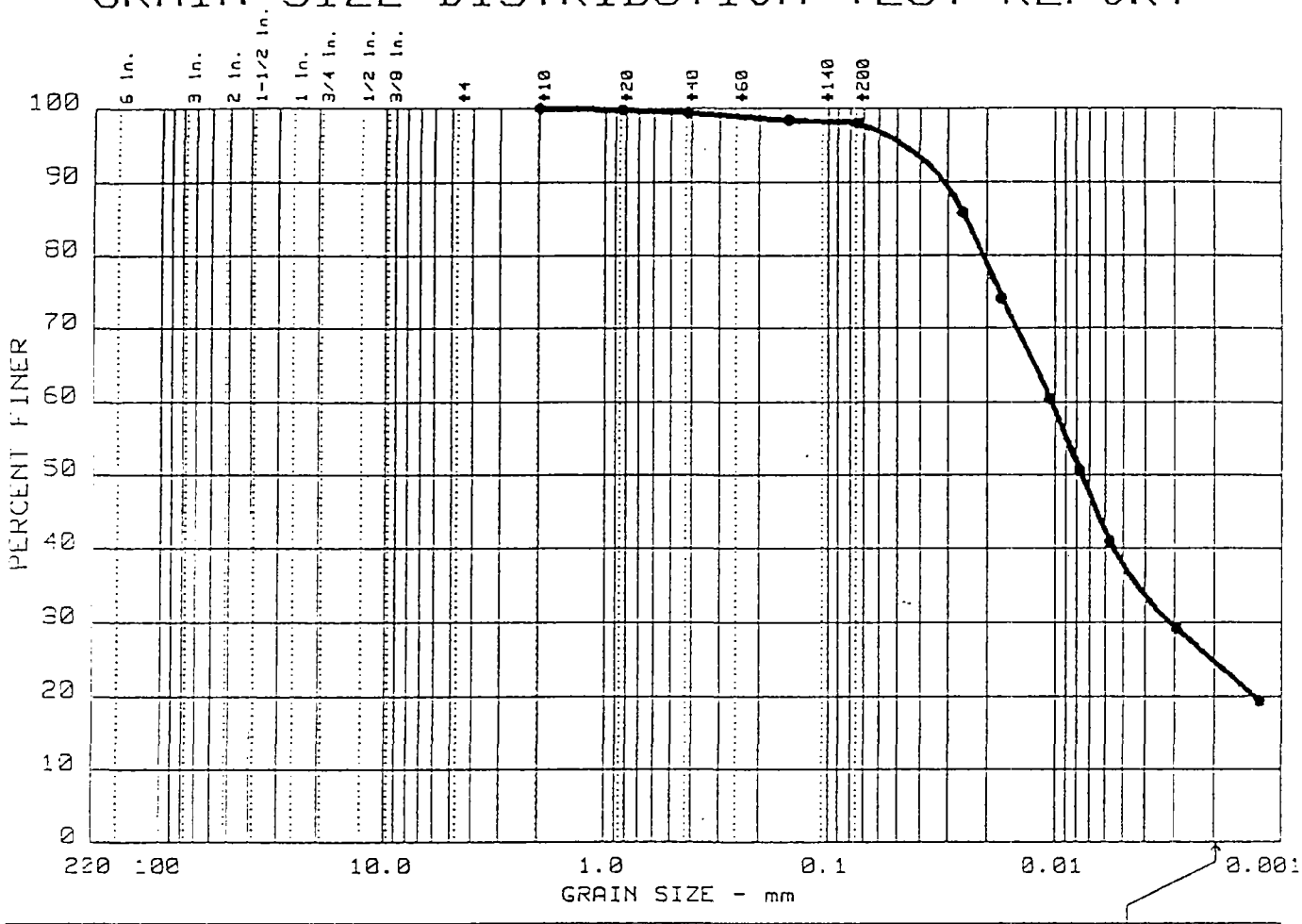
SM-1

GRAIN SIZE DISTRIBUTION TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	11	0.0	0.0	2.0	73.2	24.8

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.01	0.003				

MATERIAL DESCRIPTION	USCS	AASHTO
● Brown Silt, little clay, trace sand	ML	

Project No.: A93196x12

Project: Laskin\Poplar Jefferson, Ohio

● Location: Area 1 and 2 of Simak Trucking

Date: 4-20-93

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-4
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-20-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 3

On April 16, 1993, three samples, identified as SM-1 from Simak Trucking, were submitted to this laboratory for material analyses. The samples, marked Area 1 and Area 2, visually were the same, so they were combined as one sample. The Area 3 sample appeared to be a different material, so it was treated as such. Following are the test results:

AREA 1 AND 2

SIEVE SIZE	PARTICLE SIZE (mm)	PERCENT PASSING
#10	2.000	100.0
#20	0.850	99.8
#40	0.425	99.4
#100	0.150	98.4
#200	0.075	98.0
	0.026	85.9
	0.017	74.2
	0.011	60.5
	0.008	50.8
	0.006	41.0
	0.003	29.3
	0.001	19.5

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
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PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-9
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	5-06-93
DESCRIPTION:	PERMEABILTIY TEST	PAGE NO.:	1 OF 2

A sample of soil, SM-1,from Areas 1 and 2 of Simak Trucking, was tested for permeability as per ASTM Specification D-5084. The remolded soil sample used for the test had a moisture content of optimum moisture and was compacted to 95 percent of the maximum modified proctor density. Following is the permeability results:

Coefficient of Permeability (k) = 8.75×10^{-8} cm/sec (Average of 4)

Following is the data for the sample tested:

Diameter (in.)	-	2.83
Length (in.)	-	5.58
Initial Dry Density (pcf)	-	115.80
Percent Moisture	-	12.80
Confining Pressure	-	90
Influent Pressure	-	80
Effluent Pressure	-	70
Percent Saturation	-	100

INFLUENT READING	EFFLUENT READING	TIME
14.7	8.9	6:45 A.M.
15.4	8.2	7:50 A.M.
16.2	7.4	9:10 A.M.
17.0	6.6	10:25 A.M.
18.3	5.3	12:25 P.M.

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-9
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	5-06-93
DESCRIPTION:	PERMEABILITY TEST	PAGE NO.:	2 OF 2

1. $$\frac{0.7 \times 14.17}{40.58 \times 10 \times 70.3 \times 3900} = 8.92 \times 10^{-8} \text{ cm/sec}$$

2. $$\frac{0.8 \times 14.17}{40.58 \times 10 \times 70.3 \times 4800} = 8.28 \times 10^{-8} \text{ cm/sec}$$

3. $$\frac{0.8 \times 14.17}{40.58 \times 10 \times 70.3 \times 4500} = 8.83 \times 10^{-8} \text{ cm/sec}$$

4. $$\frac{1.3 \times 14.17}{40.58 \times 10 \times 70.3 \times 7200} = 8.97 \times 10^{-8} \text{ cm/sec}$$

TECHNICIAN: DONALD HOLLENBAUGH

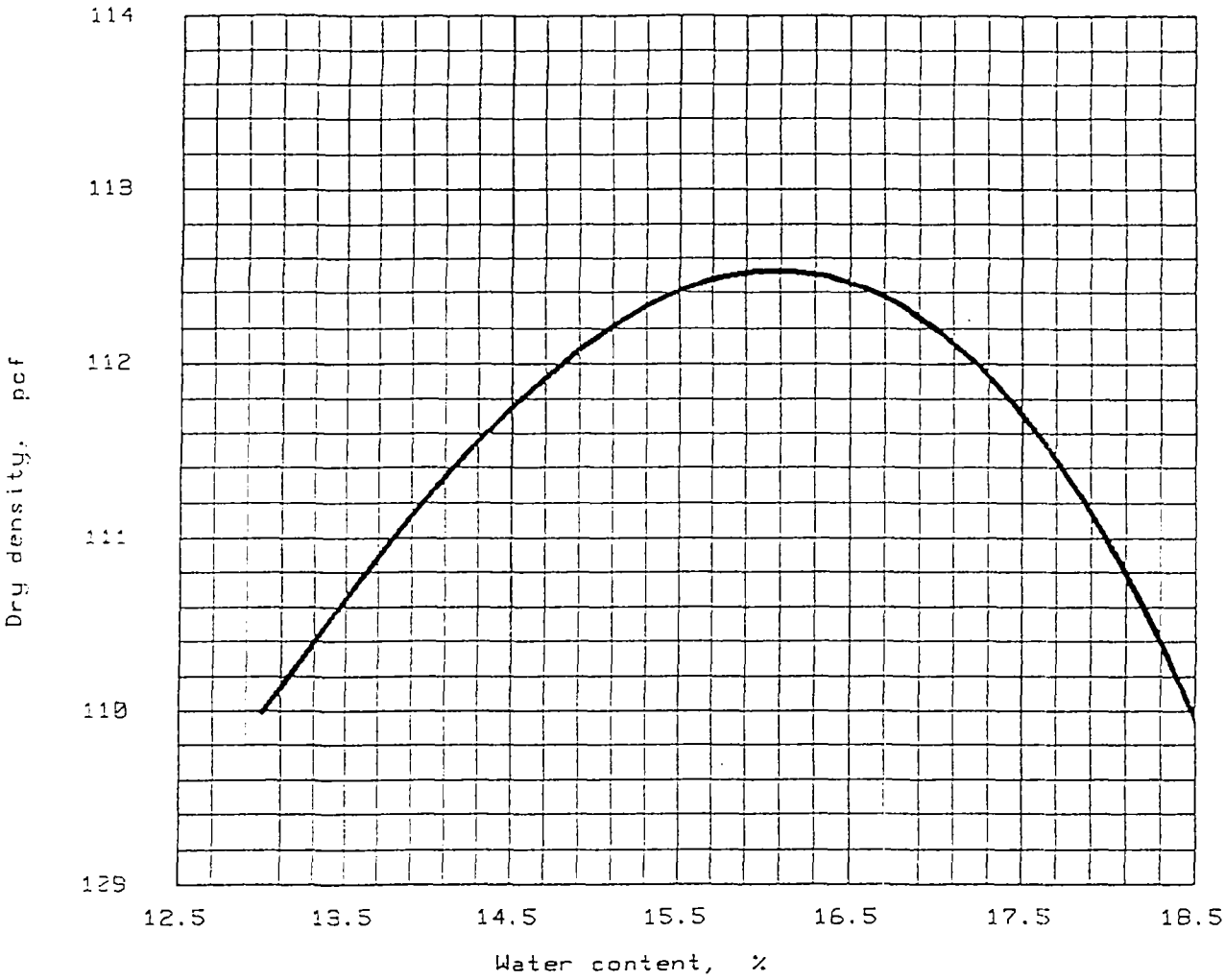
SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

Attachment

PROCTOR TEST REPORT

CURVE NO. 7



"Standard" Proctor, ASTM D 698, Method B

Elev/ Depth	Classification USCS	Classification AASHTO	Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in	% < No. 200
			19.6 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 16.1 % Maximum dry density = 112.5 pcf	Brown w\trace gray SILT AND CLAY, little sand, tr. gravel, shale frags.

Project No.: A93196x1
Project: Laskin\Poplar Site Jefferson, Ohio
Location: from borrow pit material delivered to site
Date: 4-17-1993

Remarks:
PFS-1

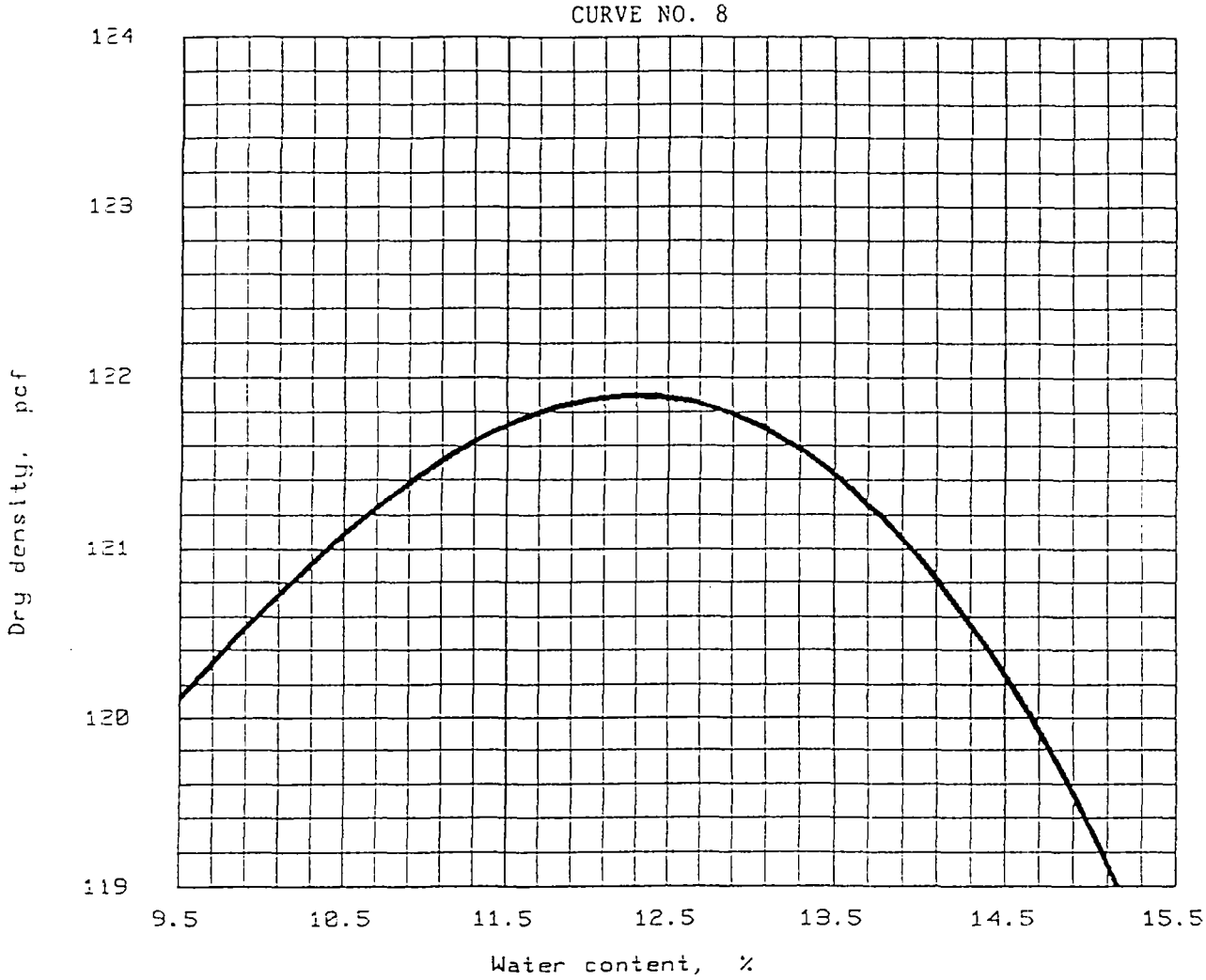
PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

PROCTOR TEST REPORT

CURVE NO. 8



"Modified" Proctor, ASTM D 1557, Method B

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in	% < No. 200
	USCS	AASHTO						
			19.6 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 12.3 % Maximum dry density = 121.9 pcf	Brown w\trace gray SILT AND CLAY, little sand, tr. gravel, shale frags.

Project No.: A93196x1
Project: Laskin\Poplar Site Jefferson, Ohio
Location: from borrow pit material delivered to site
Date: 4-17-1993

Remarks:
PFMD-1

PROCTOR TEST REPORT

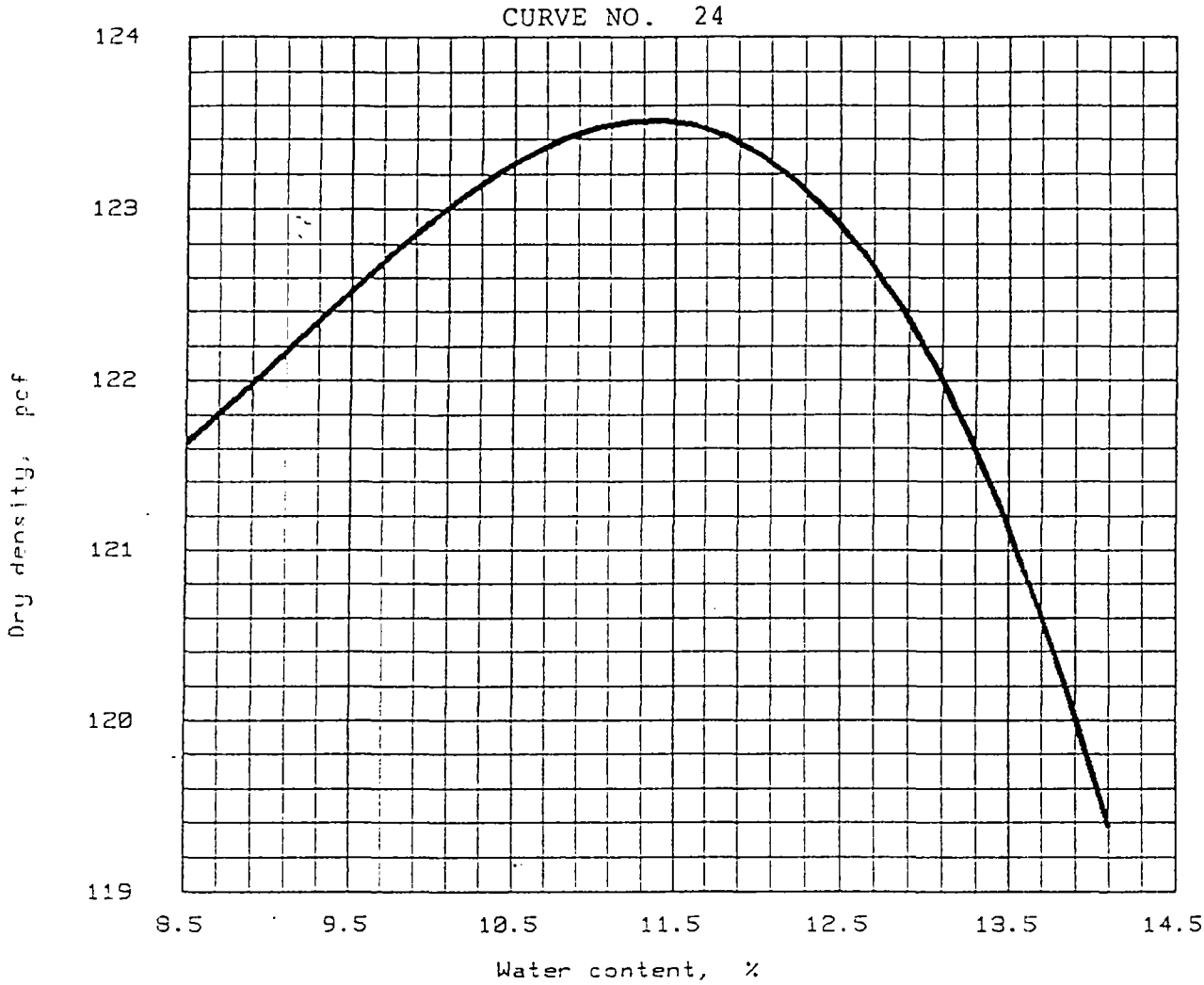
SOLAR TESTING LABORATORIES

Figure No. _____

FILE NO: A3196X1

REPORT NO: A-28

PROCTOR TEST REPORT



"Modified" Proctor, ASTM D 1557, Method B

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in	% < No. 200
	USCS	AASHTO						
			15.7 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 11.3 % Maximum dry density = 123.5 pcf	Brown and gray SILTY CLAY, trace SAND, little LIMESTONE

Project No.: A-93196x1

Project: Laskin Poplar

Location: FGM-2

Date: 7-16-1993

Remarks:

PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-24
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	6-30-93
DESCRIPTION:	PERMEABILITY TESTS (ASTM D 5084)		

On June 25, 1993, two Shelby tube samples were submitted to this lab for permeability tests. Following are the test results:

Sample S3 (East Slurry Wall--Low Permeability Fill)

Permeability (k)--1.44×10^{-8} cm/sec (average of 5 readings)

Dry Density	110.3 pcf
Percent Moisture	19.9

Sample S4 (West Slurry Wall--Low Permeability Fill)

Permeability (k)--2.05×10^{-8} cm/sec (average of 5 readings)

Dry Density	117.6 pcf
Percent Moisture	16.1

TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-31
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	7-28-93
DESCRIPTION:	PERMEABILITY TESTS (ASTM D5084)		

Two Shelby tube samples were submitted to this laboratory for permeability tests. Following are the test results:

Sample S-5

Permeability (k) - 2.74×10^{-8} cm/sec (average of 4 readings)
Percent Moisture (as received) - 15.4

Sample S-6

Permeability (k) - 3.58×10^{-8} cm/sec (average of 4 readings)
Percent Moisture (as received) - 13.9

TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

TEST RESULTS FOR THE CEMENT BENTONITE SLURRY WALLS

Included in this section of the appendix are the test results for the Cement Bentonite Slurry Walls. This part of the appendix includes the following results:

1. Results for the permeability testing of the CB Slurry Wall samples.
2. Results of field testing of the Slurry Wall Mixture.
3. Unconfined compression test results.

OHM Remediation Services Corp.

September 9, 1993

Mr. Peter Gelman
Remedial Project Manager
Engineering-Science, Inc.
19101 Villaview Road, Suite 301
Cleveland, OH 44119

RE: CEMENT-BENTONITE SLURRY WALL RESULTS
LASKIN FINAL REMEDIATION TRUST FUND
JEFFERSON, ASHTABULA COUNTY, OHIO
TRANSMITTAL LETTER NO. 00120-01
OHM PROJECT 13988

Dear Mr. Gelman:

OHM Remediation Services Corp. (OHM), a subsidiary of OHM Corporation, is forwarding this letter as a formal notice for the slurry wall test results.

The technical specifications (Sections 323) required the completed slurry walls meet the permeability requirement of 1X10-6 cm/sec or less, plus several other technical requirements. All other technical requirements were met or exceeded. Refer to the attached two letters and laboratory data for permeability tests results which indicate that the slurry wall did not achieve a low enough permeability . The results attached refer to the samples collected during the slurry wall installation and slurry wall corings removed after slurry wall installation.

Respectfully submitted,

Robert L. Smith
Site Engineer

pc: Dr. James Campbell
Keith Rankin
Bill Fenwick
Jim Faison

OHM Corporation

May 26, 1993

Mr. Peter Gelman
Remedial Project Manager
Engineering-Science, Inc.
19101 Villaview Road, Suite 301
Cleveland, OH 44119

RE: **SLURRY TRENCH SHALE AND MIX SAMPLES**
LASKIN/POPLAR FINAL REMEDIATION TRUST FUND
JEFFERSON, ASHTABULA COUNTY, OHIO

Dear Mr. Gelman:

OHM Remediation Services Corp. (OHM), a subsidiary of OHM Corporation submits the following data collected between May 21, 1993 and May 26, 1993, for the cement-bentonite mix during the slurry wall installations. Also provided are samples of shale fragments collected during east and west trench excavations occurring on May 4 and May 5, 1993.

The following table summarizes the data pertaining to samples of CB collected in one and one-half inch tubes to be tested for permeability and strength as outlined in technical specification 323, section 1.03, part b (Test Procedures) :

SAMPLE IDENTIFICATION	TRENCH	STATION	DATE	TIME	DEPTH	CB MARSH FUNNEL (SEC.)	CB MUD BALANCE
S-1	East	0+15	5/21/93	0930	16 ft.	98.68	76.8 pcf
S-2	East	1+25	5/21/93	0945	16 ft.	61.95	76.8 pcf
S-1	West	0+50	5/22/93	2000	18 ft.	100.00	78.0 pcf
S-2	West	1+50	5/22/93	2350	18 ft.	65.00	79.5 pcf
S-3	West	2+50	5/23/93	0200	18 ft.	98.00	79.0 pcf
S-4	West	2+50	5/26/93	1015	0 ft.	71.29	76.0 pcf

If you have any questions, please do not hesitate to call either Bill Fenwick or myself.

Respectfully submitted,

Robert L. Smith
Site Engineer

OHM Remediation Services Corp.

July 3, 1993

Mr. Peter Gelman
Remedial Project Manager
Engineering-Science, Inc.
19101 Villaview Road, Suite 301
Cleveland, OH 44119

RE: **SLURRY TRENCH SAMPLE CORING LOCATIONS**
LASKIN/POPLAR FINAL REMEDIATION TRUST FUND
JEFFERSON, ASHTABULA COUNTY, OHIO
OHM PROJECT 13988

Dear Mr. Gelman:

OHM Remediation Services Corp. (OHM), a subsidiary of OHM Corporation submits the following data collected between July 1, 1993 and July 2, 1993 for six (6) core samples drilled in the previously constructed east and west slurry walls. These corings were taken to verify permeability results obtained from tests on cured samples of cement-bentonite sampled as the walls were constructed.

The following table summarizes the data regarding core location, depth, and date for each sample coring: Permeability tests were run on these coring samples as per Technical Specification 323, Section 1.03, Part b (Test Procedures):

SAMPLE IDENTIFICATION	TRENCH	STATION	DATE	TIME	DEPTH
CW-1	WEST	2+10	7/1/93	1630	17 ft.
CW-2	WEST	1+10	7/1/93	1730	16 ft.
CW-3	WEST	0+10	7/1/93	1830	15 ft.
CE-1	EAST	1+50	7/2/93	0800	18 ft.
CE-2	EAST	0+90	7/2/93	0900	15 ft.
CE-3	EAST	0+30	7/2/93	1030	12 ft.

If you have any questions, please do not hesitate to call either Bill Fenwick or myself.

Respectfully submitted,

Robert L. Smith
Site Engineer

16406 U.S. Route 224 East ■ P.O. Box 551 ■ Findlay, Ohio 45839-0551 ■ 419-423-3526

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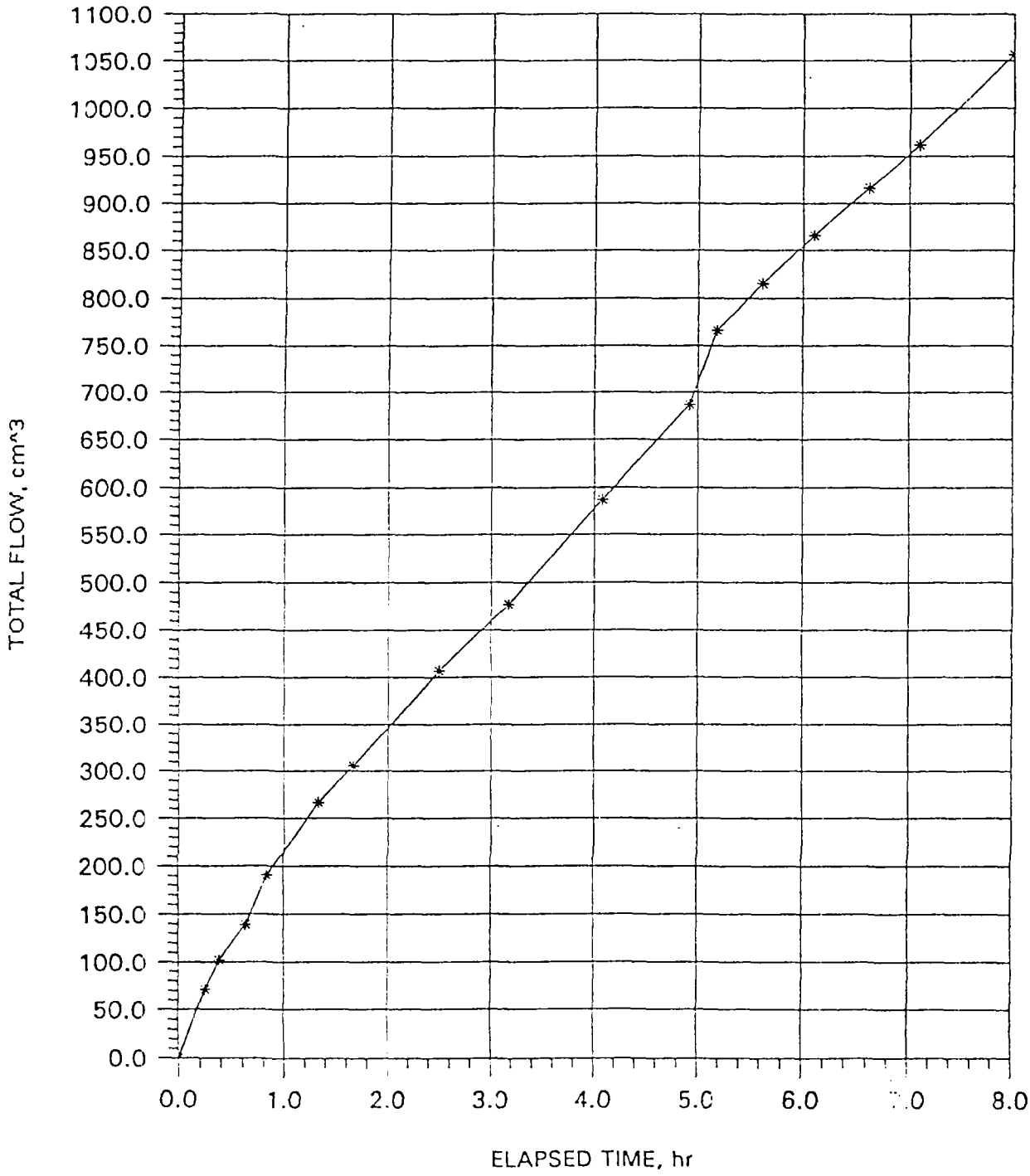
Client	OHM	Boring No.	07-01-93
Client Project	LASKIN POPLAR	Depth(ft.)	NA
Project No.	93269	Sample No.	CW-1

Visual Description GRAY CEMENT BENTONITE BACKFILL

PERMEABILITY TEST

PERMEABILITY = 1.56E-05 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	07-06-93
Client Project	LASKIN POPLAR	Checked By	CJM	Date	7-23-93
Project No.	93269				
Boring No.	07-01-93		Specific Gravity		2.70
Depth(ft.)	NA				ASSUMED
Sample No.	CW-1				

Visual Description GRAY CEMENT BENTONITE BACKFILL

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	1005	8
Wt. Tare & WS(gm.)	186.05	406.30
Wt. Tare & DS(gm.)	128.59	198.90
Wt. Water(gm.)	57.46	207.40
Wt. Tare(gm.)	90.32	74.48
Wt. DS(gm.)	38.27	124.42
Moisture Content(%)	150.14	166.69
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	762.20	NA
Wt. Of Tube(gms.)	280.71	NA
Wt. Of WS.(gms.)	481.49	513.3
Length 1 (in.)	3.640	3.633
Length 2 (in.)	3.636	3.632
Length 3 (in.)	3.661	3.642
Top Diameter (in.)	2.878	2.848
Middle Diameter (in.)	2.864	2.851
Bottom Diameter (in.)	2.870	2.846
Average Length (in)	3.65	3.64
Average Area (in^2)	6.47	6.37
Sample Volume(cc.)	386.66	379.63
Unit Wet Wt.(gms/cc)	1.25	1.35
Unit Wet Wt.(pcf.)	77.70	84.38
Unit Dry Wt.(pcf.)	31.06	31.64
Unit Dry Wt.(gms/cc)	0.50	0.51
Void Ratio,e	4.42	4.33
Porosity, n	0.82	0.81
Pore Volume(cm^3)	315.37	308.34

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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	07-06-93
Client Project	LASKIN POPLAR	Checked By	EJM	Date	7-23 93
Project No.	93269				
Boring No.	07-01-93	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	CW-1				
Visual Description	GRAY CEMENT BENTONITE BACKFILL				

Pressures		Final Sample Dimensions	
Top Cap (psi)	40.0	Sample Length (in.)	3.64
Bottom Cap (psi)	45.0	Sample Diameter (in.)	2.85
Cell (psi)	55.0	Sample Area (in.^2)	6.37
Total Head (cm)	351.5		
		B Parameter	96%

TIME 1	5.2	hrs.	Permeability	1.83E-05	CM/SEC
TOTAL FLOW 1	766.2	cm^3	Avg. Test Temp	26.9	CELSIUS
TIME 2	8.0	hrs.	Permeability	1.56E-05	CM/SEC
TOTAL FLOW 2	1056.8	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
07-06-93	9	17	0.0	1.0	1.0	0.0	0	NA
07-06-93	9	32	0.3	72.0	72.0	71.1	0	5.05E-05
07-06-93	9	40	0.4	103.2	103.2	102.2	0	4.15E-05
07-06-93	9	55	0.6	66.7	66.7	138.7	0	2.59E-05
07-06-93	10	7	0.8	118.3	118.3	190.3	1	4.58E-05
07-08-93	9	0	0.8	0.0	0.0	190.3	0	NA
07-08-93	9	30	1.3	76.4	76.4	266.8	0	2.71E-05
07-08-93	9	50	1.7	114.9	114.9	305.2	1	2.05E-05
07-08-93	9	56	1.7	0.0	0.0	305.2	0	NA
07-08-93	10	46	2.5	101.7	101.7	407.0	1	2.17E-05
07-12-93	9	25	2.5	0.5	0.5	407.0	0	NA
07-12-93	10	5	3.2	70.6	0.5	477.1	0	1.87E-05
07-12-93	11	0	4.1	110.5	0.0	587.1	0	2.13E-05
07-12-93	11	50	4.9	99.8	99.8	686.9	1	2.13E-05
07-13-93	12	5	4.9	0.5	0.5	686.9	0	NA

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07-13-93	12	21	5.2	79.8	79.8	766.2	1	[illegible]05
07-14-93	9	3	5.2	4.4	4.4	766.2	0	NA
[illegible]-14-93	9	29	5.6	53.5	53.5	815.4	0	2.01E-05
07-14-93	9	58	6.1	104.2	104.2	866.0	1	1.86E-05
07-14-93	10	3	6.1	0.0	0.0	866.0	0	NA
07-14-93	10	34	6.6	50.1	50.1	916.1	0	1.72E-05
07-14-93	11	3	7.1	95.4	95.4	961.4	1	1.66E-05
07-15-93	13	6	7.1	1.9	1.9	961.4	0	NA
07-15-93	14	0	8.0	97.4	97.4	1056.8	1	1.88E-05

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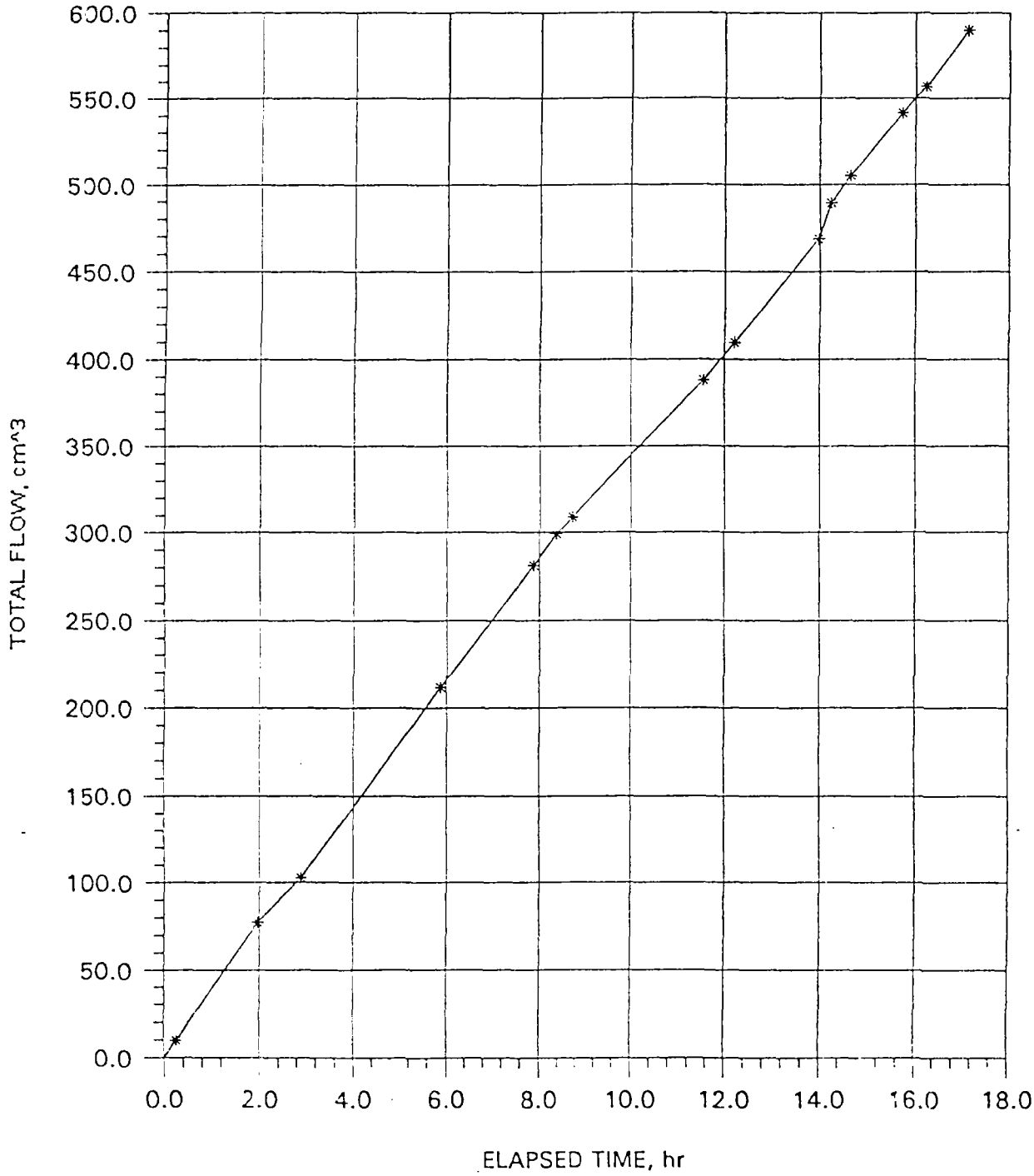
Client	OHM	Boring No.	07-01-93
Client Project	LASKIN POPLAR	Depth(ft.)	NA
Project No.	93269	Sample No.	CW-2

Visual Description GRAY CEMENT BENTONITE BACKFILL

PERMEABILITY TEST

PERMEABILITY = 5.34E-06 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	07-02-93
Client Project	LASKIN POPLAR	Checked By	EJM	Date	7-23-93
Project No.	93269				
Boring No.	07-01-93	Specific Gravity			2.70 ASSUMED
Depth(ft.)	NA				
Sample No.	CW-2				

Visual Description GRAY CEMENT BENTONITE BACKFILL

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	ZY	9
Wt. Tare & WS(gm.)	223.65	533.60
Wt. Tare & DS(gm.)	136.06	272.56
Wt. Water(gm.)	87.59	261.04
Wt. Tare(gm.)	85.75	74.65
Wt. DS(gm.)	50.31	197.91
Moisture Content(%)	174.10	131.90
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	714.20	NA
Wt. Of Tube(gms.)	254.86	NA
Wt. Of WS.(gms.)	459.34	388.6
Length 1 (in.)	3.483	3.495
Length 2 (in.)	3.477	3.487
Length 3 (in.)	3.471	3.481
Top Diameter (in.)	2.878	2.836
Middle Diameter (in.)	2.875	2.845
Bottom Diameter (in.)	2.860	2.842
Average Length (in)	3.48	3.49
Average Area (in^2)	6.47	6.34
Sample Volume(cc.)	368.87	362.30
Unit Wet Wt.(gms/cc)	1.25	1.07
Unit Wet Wt.(pcf.)	77.70	66.93
Unit Dry Wt.(pcf.)	28.35	28.86
Unit Dry Wt.(gms/cc)	0.45	0.46
Void Ratio,e	4.94	4.84
Porosity, n	0.83	0.83
Pore Volume(cm^3)	306.80	300.23

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PERMEABILITY TEST

lient	OHM	Tested By	JCM	Date	07-02-93
lient Project	LASKIN POPLAR	Checked By	EJM	Date	7-23-93
Project No.	93269				
oring No.	07-01-93	Specific Gravity			2.70
epth(ft.)	NA				ASSUMED
Sample No.	CW-2				
isual Description	GRAY CEMENT BENTONITE BACKFILL				

Pressures		Final Sample Dimensions	
op Cap (psi)	40.0	Sample Length (in.)	3.49
ottom Cap (psi)	45.0	Sample Diameter (in.)	2.84
Cell (psi)	55.0	Sample Area (in.^2)	6.34
otal Head (cm)	351.5		
		B Parameter	95.0

ME 1	12.2	hrs.	Permeability	6.28E-06	CM/SEC
TOTAL FLOW 1	409.5	cm^3	Avg. Test Temp	27.0	CELSIUS
IME 2	17.1	hrs.	Permeability	5.34E-06	CM/SEC
TOTAL FLOW 2	589.9	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS INITIAL	BURETTE READINGS FINAL	TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
non-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
07-06-93	9	17	0.0	0.0	0.0	0.0	0	NA
07-06-93	9	32	0.3	9.5	9.5	9.5	0	6.54E-06
07-06-93	11	15	2.0	77.3	77.3	77.3	0	6.76E-06
07-06-93	12	10	2.9	102.6	102.6	102.6	1	4.72E-06
07-06-93	12	15	2.9	0.0	0.0	102.6	0	NA
07-06-93	15	15	5.9	109.3	109.3	211.9	1	6.24E-06
07-06-93	15	30	5.9	0.0	0.0	211.9	0	NA
07-06-93	17	30	7.9	69.2	69.2	281.1	1	5.92E-06
07-08-93	9	0	7.9	0.0	0.0	281.1	0	NA
07-08-93	9	30	8.4	18.1	18.1	299.3	0	6.21E-06
07-08-93	9	50	8.7	27.7	27.7	308.8	0	4.90E-06
07-08-93	12	40	11.6	106.9	106.9	388.0	1	4.79E-06
07-12-93	9	25	11.6	0.0	0.0	388.0	0	NA
07-12-93	10	5	12.2	21.5	21.5	409.5	0	5.51E-06

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7-12-93	11	50	14.0	80.7	80.7	468.7	1	[illegible]06
7-13-93	10	50	14.0	1.4	35.8	468.7	1	NA
-13-93	12	5	14.0	0.5	0.5	468.7	0	NA
7-13-93	12	21	14.2	21.0	21.0	489.2	1	1.32E-05
7-14-93	9	6	14.2	1.0	1.0	489.2	0	NA
07-14-93	9	31	14.7	16.7	16.7	505.0	0	6.47E-06
7-14-93	10	35	15.7	53.0	53.0	541.2	0	5.82E-06
7-14-93	11	5	16.2	68.7	68.7	557.0	1	5.39E-06
07-15-93	13	7	16.2	0.0	0.0	557.0	0	NA
7-15-93	14	2	17.1	32.9	32.9	589.9	1	6.15E-06

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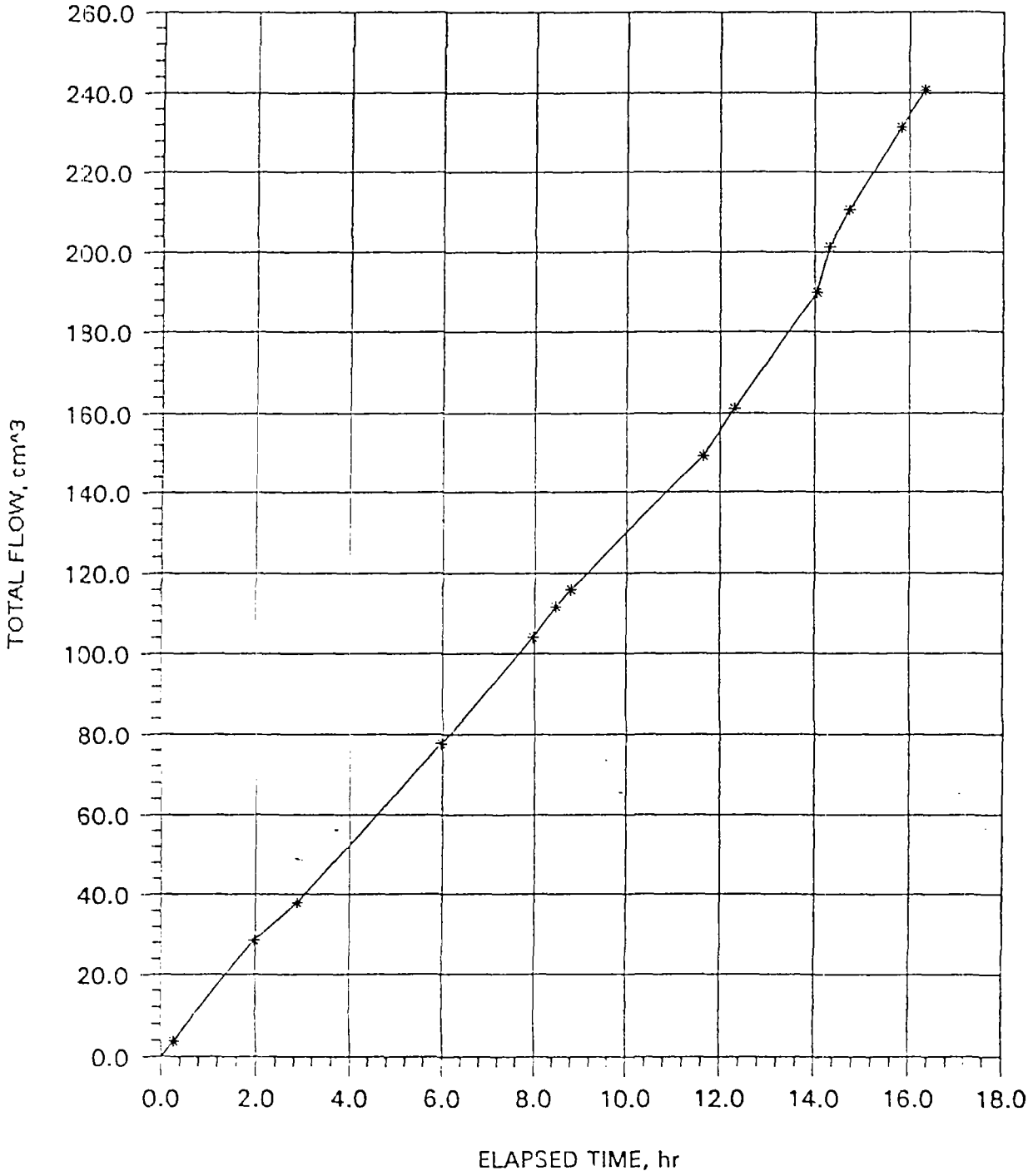
Client	OHM	Boring No.	07-01-93
Client Project	LASKIN POPLAR	Depth(ft.)	NA
Project No.	93269	Sample No.	CW-3

Visual Description GRAY CEMENT BENTONITE BACKFILL

PERMEABILITY TEST

PERMEABILITY = 4.32E-06 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	07-06-93
Client Project	LASKIN POPLAR	Checked By	[illegible]	Date	7-23-93
Project No.	93269				
Boring No.	07-01-93	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	CW-3				

Visual Description GRAY CEMENT BENTONITE BACKFILL

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	981	T420
Wt. Tare & WS(gm.)	121.02	317.00
Wt. Tare & DS(gm.)	87.55	195.14
Wt. Water(gm.)	33.47	121.86
Wt. Tare(gm.)	42.99	8.32
Wt. DS(gm.)	44.56	186.82
Moisture Content(%)	75.11	65.23
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1008.50	NA
Wt. Of Tube(gms.)	326.14	NA
Wt. Of WS.(gms.)	682.36	643.8
Length 1 (in.)	4.454	4.572
Length 2 (in.)	4.468	4.550
Length 3 (in.)	4.517	4.513
Top Diameter (in.)	2.866	2.761
Middle Diameter (in.)	2.864	2.825
Bottom Diameter (in.)	2.879	2.836
Average Length (in)	4.48	4.55
Average Area (in^2)	6.47	6.19
Sample Volume(cc.)	474.79	461.01
Unit Wet Wt.(gms/cc)	1.44	1.40
Unit Wet Wt.(pcf.)	89.68	87.15
Unit Dry Wt.(pcf.)	51.21	52.74
Unit Dry Wt.(gms/cc)	0.82	0.85
Void Ratio,e	2.29	2.19
Porosity, n	0.70	0.69
Pore Volume(cm^3)	330.47	316.69

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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	07-06-93
Client Project	LASKIN POPLAR	Checked By	[illegible]	Date	7-23-93
Project No.	93269				
Boring No.	07-01-93	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	CW-3				
Visual Description	GRAY CEMENT BENTONITE BACKFILL				

Pressures		Final Sample Dimensions	
Top Cap (psi)	40.0	Sample Length (in.)	4.55
Bottom Cap (psi)	45.0	Sample Diameter (in.)	2.81
Cell (psi)	55.0	Sample Area (in.^2)	6.19
Total Head (cm)	351.5		
		B Parameter	97%

TIME 1	14.1	hrs.	Permeability	5.08E-06	CM/SEC
TOTAL FLOW 1	189.8	cm^3	Avg. Test Temp	27.0	CELSIUS
TIME 2	16.3	hrs.	Permeability	4.32E-06	CM/SEC
TOTAL FLOW 2	240.6	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
07-06-93	9	17	0.0	0.9	0.9	0.0	0	NA
07-06-93	9	33	0.3	4.6	4.6	3.7	0	3.17E-06
07-06-93	11	15	2.0	29.6	29.6	28.6	0	3.35E-06
07-06-93	12	10	2.9	38.8	38.8	37.9	0	2.30E-06
07-06-93	15	15	6.0	78.5	78.5	77.6	1	2.94E-06
07-06-93	15	30	6.0	0.0	0.0	77.6	0	NA
07-06-93	17	30	8.0	26.3	26.3	103.9	1	3.01E-06
07-08-93	9	0	8.0	0.0	0.0	103.9	0	NA
07-08-93	9	30	8.5	7.9	7.9	111.8	0	3.59E-06
07-08-93	9	50	8.8	12.0	12.0	115.9	0	2.85E-06
07-08-93	12	40	11.6	45.3	45.3	149.2	1	2.68E-06
07-12-93	9	25	11.6	0.0	0.0	149.2	0	NA
07-12-93	10	5	12.3	12.0	12.0	161.2	0	4.11E-06
07-12-93	11	50	14.1	40.6	40.6	189.8	1	3.74E-06
07-13-93	11	21	14.1	22.6	22.6	189.8	1	NA

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)7-13-93	12	5	14.1	1.4	1.4	189.8	0	
)7-13-93	12	21	14.3	12.9	12.9	201.4	1	9.89E-06
-14-93	9	7	14.3	0.5	0.5	201.4	0	NA
)7-14-93	9	32	14.7	9.7	9.7	210.6	0	5.06E-06
)7-14-93	10	38	15.8	30.5	30.5	231.4	0	4.32E-06
07-14-93	11	8	16.3	39.7	39.7	240.6	1	4.22E-06

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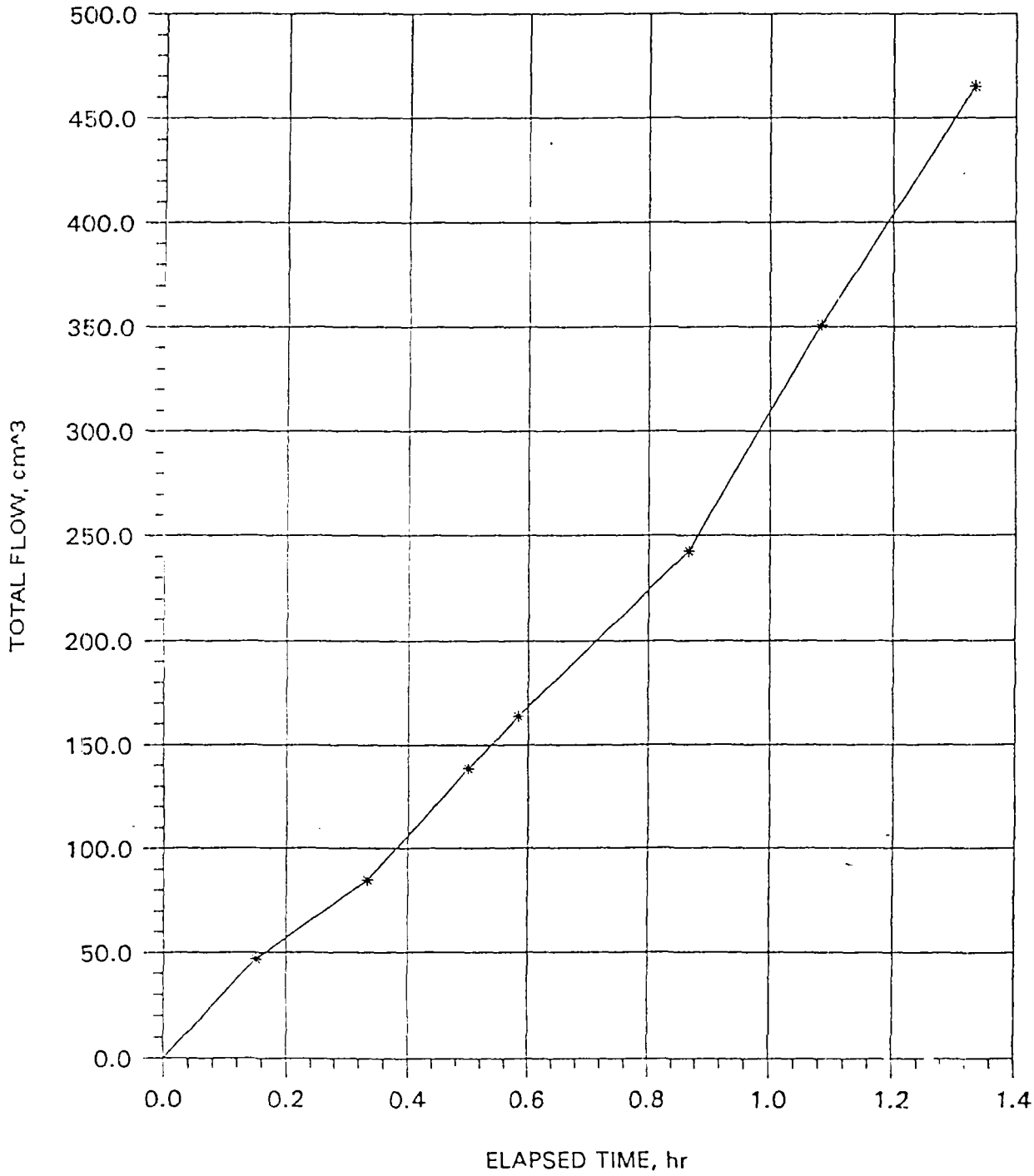
Client	OHM	Boring No.	07-02-93
Client Project	LASKIN POPLAR	Depth(ft.)	NA
Project No.	93269	Sample No.	CE-1

Visual Description GRAY CEMENT BENTONITE BACKFILL

PERMEABILITY TEST

PERMEABILITY = 1.99E-05 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	07-06-93
Client Project	LASKIN POPLAR	Checked By	CJM	Date	7-23-93
roject No.	93269				
Boring No.	07-02-93		Specific Gravity		2.70
Depth(ft.)	NA				ASSUMED
ample No.	CE-1				

Visual Description GRAY CEMENT BENTONITE BACKFILL

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	974	1210
Wt. Tare & WS(gm.)	145.78	127.70
Wt. Tare & DS(gm.)	80.89	68.31
Wt. Water(gm.)	64.89	59.39
Wt. Tare(gm.)	43.70	34.51
Wt. DS(gm.)	37.19	33.80
Moisture Content(%)	174.48	175.71
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	669.00	NA
Wt. Of Tube(gms.)	240.17	NA
Wt. Of WS.(gms.)	428.83	430.7
Length 1 (in.)	3.418	3..279
Length 2 (in.)	3.412	3.276
Length 3 (in.)	3.412	3.298
Top Diameter (in.)	2.868	2.835
Middle Diameter (in.)	2.874	2.857
Bottom Diameter (in.)	2.897	2.864
Average Length (in)	3.41	2.19
Average Area (in^2)	6.51	6.39
Sample Volume(cc.)	364.37	229.40
Unit Wet Wt.(gms/cc)	1.18	1.88
Unit Wet Wt.(pcf.)	73.44	117.17
Unit Dry Wt.(pcf.)	26.76	42.50
Unit Dry Wt.(gms/cc)	0.43	0.68
Void Ratio,e	5.30	2.96
Porosity, n	0.84	0.75
Pore Volume(cm^3)	306.50	171.54

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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	07-06-93
Client Project	LASKIN POPLAR	Checked By	EJM	Date	7-23-93
Project No.	93269				
Boring No.	07-02-93	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	CE-1				
Visual Description	GRAY CEMENT BENTONITE BACKFILL				

Pressures		Final Sample Dimensions	
Top Cap (psi)	40.0	Sample Length (in.)	2.19
Bottom Cap (psi)	45.0	Sample Diameter (in.)	2.85
Cell (psi)	55.0	Sample Area (in.^2)	6.39
Total Head (cm)	351.5		

TIME 1	3.4	hrs.	Permeability	2.34E-05	CM/SEC
TOTAL FLOW 1	898.1	cm^3	Avg. Test Temp	27.0	CELSIUS
TIME 2	6.0	hrs.	Permeability	1.99E-05	CM/SEC
TOTAL FLOW 2	1480.1	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
07-06-93	9	3	0.0	70.3	70.3	0.0	0	NA
07-06-93	9	12	0.1	117.0	0.0	46.7	0	3.32E-05
07-06-93	9	23	0.3	38.2	38.2	84.9	0	2.22E-05
07-06-93	9	33	0.5	92.0	92.0	138.7	0	3.44E-05
07-06-93	9	38	0.6	117.0	0.0	163.7	0	3.20E-05
07-06-93	9	55	0.9	78.8	78.8	242.4	1	2.97E-05
07-08-93	9	0	0.9	0.0	0.0	242.4	0	NA
07-08-93	9	13	1.1	108.5	108.5	350.9	1	5.34E-05
07-08-93	9	15	1.1	0.0	0.0	350.9	0	NA
07-08-93	9	30	1.3	114.1	114.1	465.1	1	4.87E-05
07-08-93	9	35	1.3	0.0	0.0	465.1	0	NA
07-08-93	9	50	1.6	89.6	89.6	554.7	1	3.83E-05
07-08-93	9	56	1.6	0.0	0.0	554.7	0	NA
07-08-93	10	23	2.0	117.0	117.0	671.7	1	2.77E-05
07-12-93	9	25	2.0	0.9	0.9	671.7	0	NA

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)7-12-93	10	5	2.7	112.3	0.0	783.0	0	[illegible]05
)7-12-93	10	45	3.4	115.1	0.0	898.1	0	1.84E-05
-12-93	11	15	3.9	107.5	107.5	1005.6	1	2.30E-05
)7-13-93	12	5	3.9	0.5	0.5	1005.6	0	NA
)7-13-93	12	21	4.1	61.3	61.3	1066.4	1	2.43E-05
07-14-93	9	1	4.1	5.7	5.7	1066.4	0	NA
)7-14-93	9	14	4.3	56.6	56.6	1117.4	0	2.51E-05
)7-14-93	9	26	4.5	103.3	103.3	1164.1	1	2.49E-05
07-14-93	9	27	4.5	0.5	0.5	1164.1	0	NA
07-14-93	9	57	5.0	113.7	113.7	1277.3	1	2.42E-05
)7-14-93	10	5	5.0	0.0	0.0	1277.3	0	NA
07-14-93	10	37	5.6	111.3	111.3	1388.6	1	2.23E-05
07-14-93	10	41	5.6	0.0	0.0	1388.6	0	NA
)7-14-93	11	7	6.0	91.5	91.5	1480.1	1	2.25E-05

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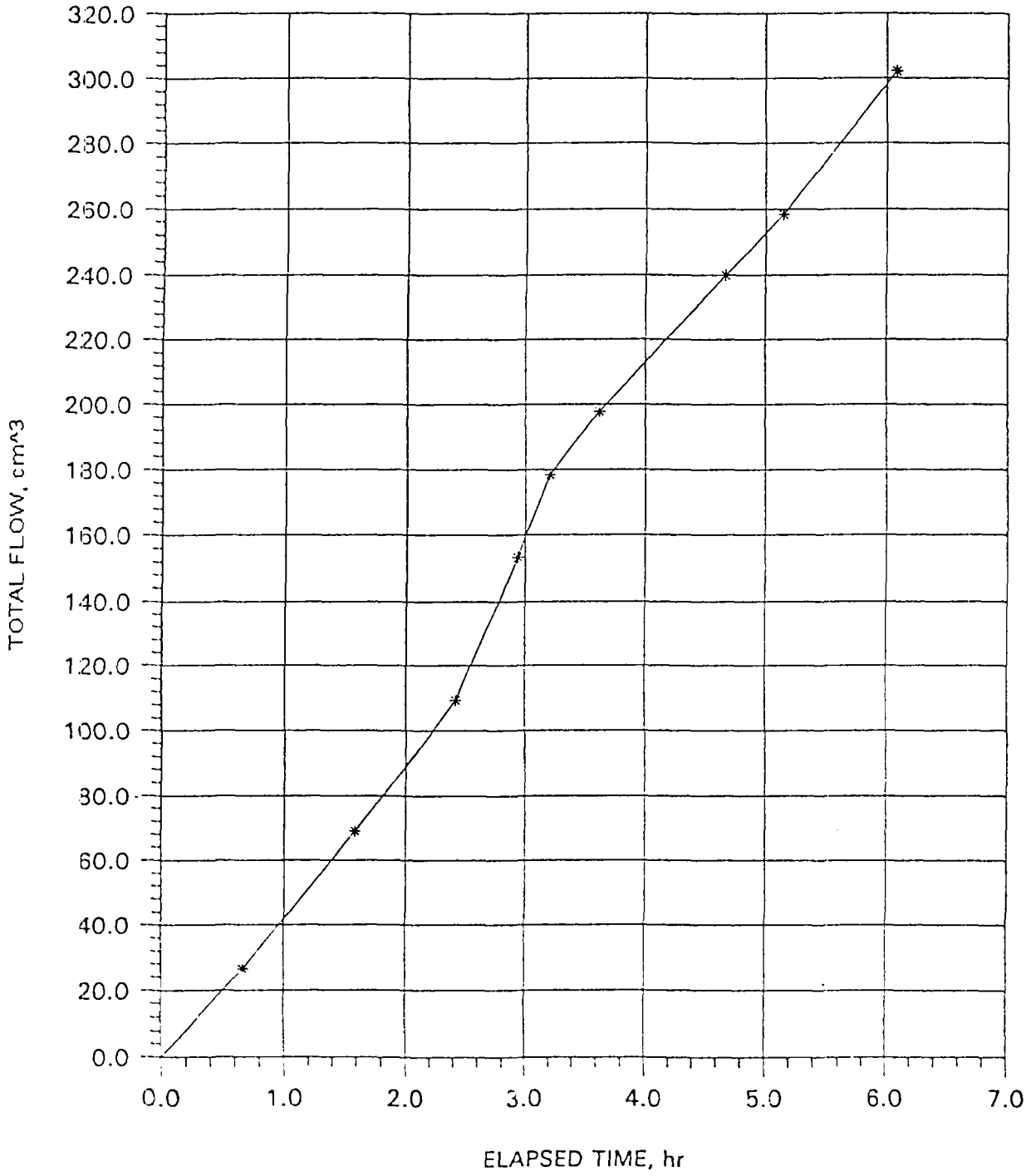
Client	OHM	Boring No.	07-02-93
Client Project	LASKIN POPLAR	Depth(ft.)	2nd TEST
Project No.	93269	Sample No.	CE-3

Visual Description GRAY CEMENT BENTONITE BACKFILL (UNDISTURBED)

PERMEABILITY TEST

PERMEABILITY = 7.35E-06 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	KBL	Date	07-08-93
Client Project	LASKIN POPLAR	Checked By	MZM	Date	7-20-93
Project No.	93269				
Boring No.	07-02-93	Specific Gravity			2.70
Depth(ft.)	2nd TEST				ASSUMED
Sample No.	CE-3				

Visual Description GRAY CEMENT BENTONITE BACKFILL (UNDISTURBED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	11006	9
Wt. Tare & WS(gm.)	212.42	315.48
Wt. Tare & DS(gm.)	128.36	153.30
Wt. Water(gm.)	84.06	162.18
Wt. Tare(gm.)	90.30	74.60
Wt. DS(gm.)	38.06	78.70
Moisture Content(%)	220.86	206.07
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	437.90	NA
Wt. Of Tube(gms.)	0.00	NA
Wt. Of WS.(gms.)	437.90	417.7
Length 1 (in.)	3.510	3.389
Length 2 (in.)	3.543	3.426
Length 3 (in.)	3.494	3.354
Top Diameter (in.)	2.875	2.750
Middle Diameter (in.)	2.853	2.792
Bottom Diameter (in.)	2.871	2.825
Average Length (in)	3.52	3.39
Average Area (in^2)	6.45	6.11
Sample Volume(cc.)	371.75	339.35
Unit Wet Wt.(gms/cc)	1.18	1.23
Unit Wet Wt.(pcf.)	73.50	76.81
Unit Dry Wt.(pcf.)	22.91	25.10
Unit Dry Wt.(gms/cc)	0.37	0.40
Void Ratio,e	6.35	5.71
Porosity, n	0.86	0.85
Pore Volume(cm^3)	321.20	288.80

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PERMEABILITY TEST

lient	OHM	Tested By	KBL	Date	07-08-93
lient Project	LASKIN POPLAR	Checked By	MRM	Date	7-21-93
Project No.	93269				
oring No.	07-02-93	Specific Gravity			2.70
epth(ft.)	2nd TEST				ASSUMED
Sample No.	CE-3				
isual Description	GRAY CEMENT BENTONITE BACKFILL (UNDISTURBED)				

Pressures		Final Sample Dimensions	
op Cap (psi)	40.0	Sample Length (in.)	3.39
ottom Cap (psi)	45.0	Sample Diameter (in.)	2.79
Cell (psi)	55.0	Sample Area (in.^2)	6.11
otal Head (cm)	351.5		
		B Parameter	NA

ME 1	0.0	hrs.	Permeability	8.57E-06	CM/SEC
TOTAL FLOW 1	0.0	cm^3	Avg. Test Temp	26.6	CELSIUS
IME 2	6.1	hrs.	Permeability	7.35E-06	CM/SEC
TOTAL FLOW 2	302.2	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS INITIAL	BURETTE READINGS FINAL	TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
non-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
07-12-93	9	25	0.0	0.9	0.9	0.0	0	NA
07-12-93	10	5	0.7	27.3	27.3	26.4	0	6.83E-06
07-12-93	11	0	1.6	69.7	2.2	68.9	0	8.00E-06
07-12-93	11	50	2.4	42.9	42.9	109.5	1	8.43E-06
07-13-93	10	50	2.4	1.3	1.3	109.5	0	NA
07-13-93	11	21	2.9	45.2	45.2	153.3	1	1.46E-05
07-13-93	12	5	2.9	0.4	0.4	153.3	0	NA
07-13-93	12	21	3.2	25.5	25.5	178.4	1	1.62E-05
07-14-93	9	5	3.2	2.2	2.2	178.4	0	NA
07-14-93	9	30	3.6	21.5	21.5	197.6	0	7.9[illegible]E-06
07-14-93	10	33	4.7	63.9	63.9	240.1	0	6.9[illegible]E-06
07-14-93	11	2	5.1	82.3	82.3	258.4	1	6.5[illegible]E-06
07-15-93	13	5	5.1	0.9	0.9	258.4	0	NA
07-15-93	14	1	6.1	44.7	44.7	302.2	1	8.09E-06

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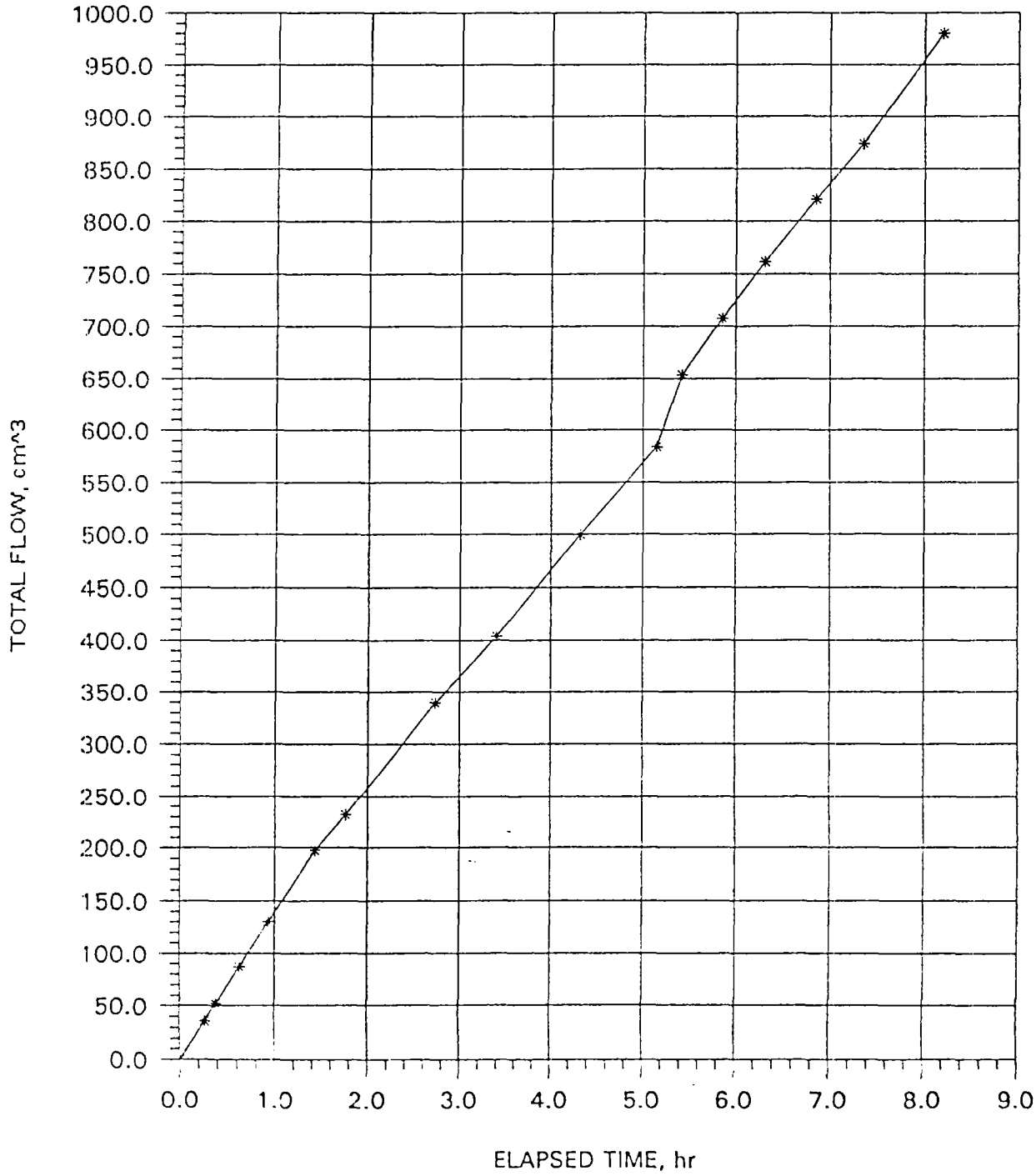
Client	OHM	Boring No.	07-02-93
Client Project	LASKIN POPLAR	Depth(ft.)	NA
Project No.	93269	Sample No.	CE-3

Visual Description GRAY CEMENT BENTONITE BACKFILL (UNDISTURBED)

PERMEABILITY TEST

PERMEABILITY = 1.88E-05 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	07-02-93
Client Project	LASKIN POPLAR	Checked By	SL	Date	7-21-93
Project No.	93269				
Boring No.	07-02-93	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	CE-3				

Visual Description GRAY CEMENT BENTONITE BACKFILL (UNDISTURBED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	1037	700
Wt. Tare & WS(gm.)	172.93	366.26
Wt. Tare & DS(gm.)	104.02	192.16
Wt. Water(gm.)	68.91	174.10
Wt. Tare(gm.)	41.19	76.05
Wt. DS(gm.)	62.83	116.11
Moisture Content(%)	109.68	149.94
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	789.20	NA
Wt. Of Tube(gms.)	283.82	NA
Wt. Of WS.(gms.)	505.38	602.4
Length 1 (in.)	3.769	3.752
Length 2 (in.)	3.773	3.726
Length 3 (in.)	3.754	3.781
Top Diameter (in.)	2.879	2.834
Middle Diameter (in.)	2.874	2.849
Bottom Diameter (in.)	2.869	2.829
Average Length (in)	3.77	3.75
Average Area (in^2)	6.49	6.32
Sample Volume(cc.)	400.28	388.86
Unit Wet Wt.(gms/cc)	1.26	1.55
Unit Wet Wt.(pcf.)	78.78	96.67
Unit Dry Wt.(pcf.)	37.57	38.68
Unit Dry Wt.(gms/cc)	0.60	0.62
Void Ratio,e	3.48	3.36
Porosity, n	0.78	0.77
Pore Volume(cm^3)	311.01	299.59

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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	07-02-93
Client Project	LASKIN POPLAR	Checked By	SUL	Date	7-21-93
Project No.	93269				
Boring No.	07-02-93	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	CE-3				
Visual Description	GRAY CEMENT BENTONITE BACKFILL (UNDISTURBED)				

Pressures		Final Sample Dimensions	
Top Cap (psi)	40.0	Sample Length (in.)	3.75
Bottom Cap (psi)	45.0	Sample Diameter (in.)	2.84
Cell (psi)	55.0	Sample Area (in.^2)	6.32
Total Head (cm)	351.5		
		B Parameter	98%

TIME 1	0.0	hrs.	Permeability	2.21E-05	CM/SEC
TOTAL FLOW 1	0.0	cm^3	Avg. Test Temp	26.9	CELSIUS
TIME 2	8.2	hrs.	Permeability	1.88E-05	CM/SEC
TOTAL FLOW 2	979.8	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
07-06-93	9	17	0.0	42.5	42.5	0.0	0	NA
07-06-93	9	33	0.3	78.3	78.3	35.8	0	2.48E-05
07-06-93	9	40	0.4	94.7	0.0	52.2	0	2.60E-05
07-06-93	9	55	0.6	34.8	34.8	87.0	0	2.57E-05
07-06-93	10	13	0.9	77.8	77.8	130.0	1	2.65E-05
07-08-93	9	0	0.9	0.0	0.0	130.0	0	NA
07-08-93	9	30	1.4	67.7	67.7	197.7	0	2.50E-05
07-08-93	9	50	1.8	102.0	102.0	232.0	1	1.90E-05
07-08-93	9	56	1.8	0.0	0.0	232.0	0	NA
07-08-93	10	54	2.7	107.8	107.8	339.8	1	2.06E-05
07-12-93	9	25	2.7	0.5	0.5	339.8	0	NA
07-12-93	10	5	3.4	64.8	0.0	404.1	0	1.78E-05
07-12-93	11	0	4.3	95.7	0.0	499.8	0	1.93E-05
07-12-93	11	50	5.2	84.1	84.1	583.9	1	1.86E-05
07-13-93	12	5	5.2	0.5	0.5	583.9	0	NA

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7-13-93	12	21	5.4	70.6	70.6	654.0	1	[illegible]05
7-14-93	9	2	5.4	2.4	2.4	654.0	0	NA
-14-93	9	28	5.9	56.1	56.1	707.7	0	2.29E-05
7-14-93	9	56	6.3	110.2	110.2	761.8	1	2.14E-05
7-14-93	10	4	6.3	0.5	0.5	761.8	0	NA
07-14-93	10	36	6.9	59.9	59.9	821.3	0	2.06E-05
7-14-93	11	6	7.4	112.6	112.6	873.9	1	1.95E-05
7-15-93	13	8	7.4	1.5	1.5	873.9	0	NA
07-15-93	13	59	8.2	107.3	107.3	979.8	1	2.30E-05

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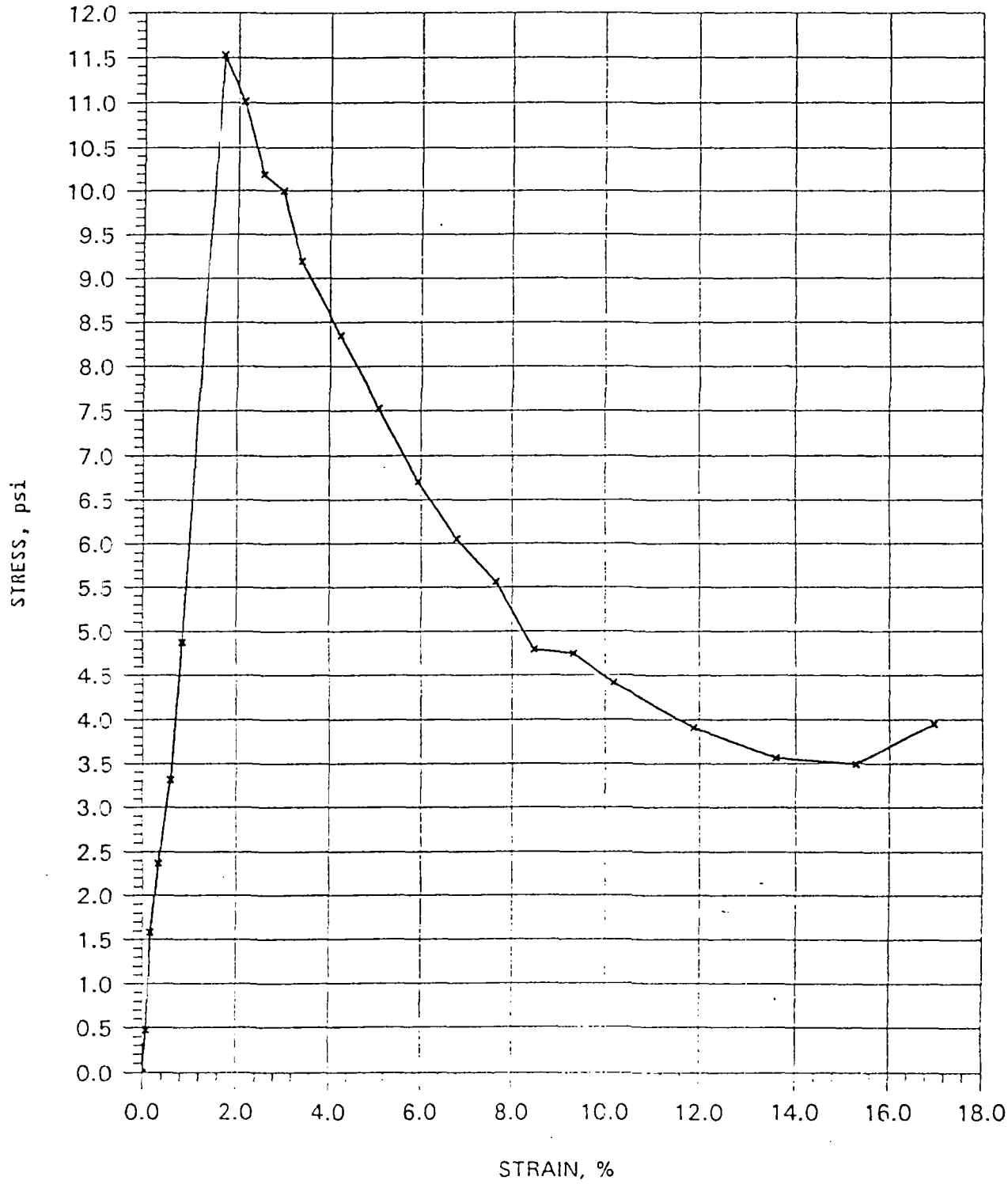
UNCONFINED COMPRESSIVE STRENGTH

Client	OHM	Boring No.	NA
Client No.	LASKIN POPLAR	Depth (ft.)	NA
Project No.	93269	Sample No.	CE-3

Visual Description GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)



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UNCONFINED COMPRESSIVE STRENGTH

Client	OHM	Tested By	KBL	Date	07-08-93
Client No.	LASKIN POPLAR	Checked By	JCM	Date	7-21-93
Project No.	93269				
Boring No.	NA				
Depth (ft.)	NA				
Sample No.	CE-3				

Visual Description: GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)

UNIT WEIGHT		WATER CONTENT	
Wt. Tube & WS.(gms.)	736.20	Tare No.	T15
Wt. Of Tube(gms.)	0.00	Wt. Tare + Ws.	267.07
Wt. Of WS.(gms.)	736.20	Wt. Tare + Ds.	99.36
Diameter (in.)	2.83	Wt. of Tare	8.50
Length (in.)	5.89	% Moisture	184.58
Length (cm.)	14.96		
Sample Volume(cc.)	609.16		
Unit Wet Wt.(gms/cc)	1.21		
Unit Wet Wt.(pcf.)	75.41		
Moisture Content, %	184.58		
Unit Dry Wt.(pcf.)	26.50		

INITIAL SAMPLE DIMENSIONS

Length 1(in)	5.866	Top Dia.(in)	2.787
Length 2(in)	5.880	Mid Dia.(in)	2.857
Length 3(in)	5.925	Bot Dia.(in)	2.860
Avg.Length(in)	5.89	Area (in.^2)	6.31

DEFORMATION IN.	LOAD LBS.	STRAIN %	STRESS PSI
0.000	0.0	0.0	0.0
0.005	3.0	0.1	0.5
0.010	10.0	0.2	1.6
0.020	15.0	0.3	2.4
0.035	21.0	0.6	3.3
0.050	31.0	0.8	4.9
0.100	74.0	1.7	11.5
0.125	71.0	2.1	11.0
0.150	66.0	2.5	10.2
0.175	65.0	3.0	10.0
0.200	60.0	3.4	9.2
0.250	55.0	4.2	8.3
0.300	50.0	5.1	7.5
0.350	45.0	5.9	6.7
0.400	41.0	6.8	6.1
0.450	38.0	7.6	5.6
0.500	33.0	8.5	4.8
0.550	33.0	9.3	4.7
0.600	31.0	10.2	4.4
0.700	28.0	11.9	3.9
0.800	26.0	13.6	3.6
0.900	26.0	15.3	3.5
1.000	30.0	17.0	3.9

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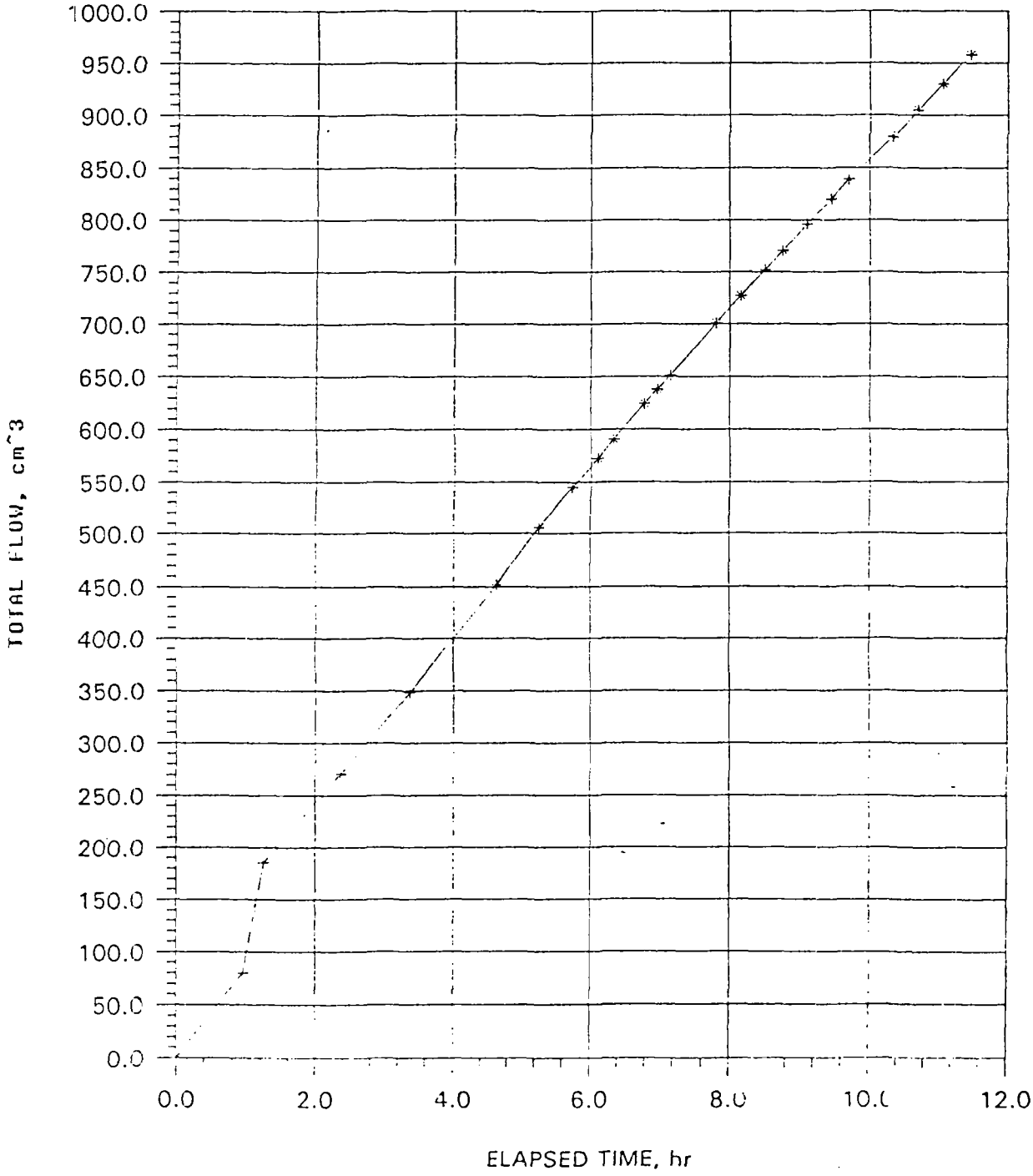
Client	OHM	Boring No.	POURED SAMPLE
Client Project	LASKIN POPLAR	Depth(ft.)	EXTRUDED FROM
Project No.	93269	Sample No.	EAST TRENCH #2

Visual Description GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)

PERMEABILITY TEST

PERMEABILITY = 5.35E-06 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	KBL	Date	07-16-93
Client Project	LASKIN POPLAR	Checked By	EJM	Date	7-23-93
Project No.	93269				
Boring No.	POURED SAMPLE		Specific Gravity		2.70
Depth(ft.)	EXTRUDED FROM PLASTIC PIPE				ASSUMED
Sample No.	EAST TRENCH #2				

Visual Description GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	951	785
Wt. Tare & WS(gm.)	100.93	332.41
Wt. Tare & DS(gm.)	59.30	158.94
Wt. Water(gm.)	41.63	173.47
Wt. Tare(gm.)	42.33	85.94
Wt. DS(gm.)	16.97	73.00
Moisture Content(%)	245.32	237.63
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	253.34	NA
Wt. Of Tube(gms.)	0.00	NA
Wt. Of WS.(gms.)	253.34	247.7
Length 1 (in.)	1.926	1.908
Length 2 (in.)	1.943	1.888
Length 3 (in.)	1.834	1.869
Top Diameter (in.)	3.043	2.991
Middle Diameter (in.)	3.056	2.998
Bottom Diameter (in.)	3.049	3.008
Average Length (in)	1.90	1.89
Average Area (in^2)	7.30	7.06
Sample Volume(cc.)	227.50	218.59
Unit Wet Wt.(gms/cc)	1.11	1.13
Unit Wet Wt.(pcf.)	69.49	70.71
Unit Dry Wt.(pcf.)	20.12	20.94
Unit Dry Wt.(gms/cc)	0.32	0.34
Void Ratio,e	7.37	7.04
Porosity, n	0.88	0.88
Pore Volume(cm^3)	200.33	191.41

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PERMEABILITY TEST

Client	OHM	Tested By	KBL	Date	07-16-93
Client Project	LASKIN POPLAR	Checked By	EJM	Date	7-23-93
Project No.	93269				
Boring No.	POURED SAMPLE	Specific Gravity			2.70
Depth(ft.)	*EXTRUDED FROM PLASTIC PIPE*				*ASSUMED*
Sample No.	EAST TRENCH #2				
Visual Description	GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)				

Pressures		Final Sample Dimensions	
Top Cap (psi)	40.0	Sample Length (in.)	1.89
Bottom Cap (psi)	45.0	Sample Diameter (in.)	3.00
Cell (psi)	55.0	Sample Area (in.^2)	7.06
Total Head (cm)	351.5		
		B Parameter	96%

TIME 1	1.3	hrs.	Permeability	6.29E-06	CM/SEC
TOTAL FLOW 1	185.5	cm^3	Avg. Test Temp	27.0	CELSIUS
TIME 2	11.5	hrs.	Permeability	5.35E-06	CM/SEC
TOTAL FLOW 2	958.1	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
07-19-93	8	46	0.0	20.6	20.6	0.0	0	NA
07-19-93	9	43	1.0	100.1	100.1	79.6	1	6.97E-06
07-19-93	9	49	1.0	0.4	0.4	79.6	0	NA
07-19-93	10	7	1.3	106.4	106.4	185.5	1	2.94E-05
07-19-93	14	38	1.3	1.3	1.3	185.5	0	NA
07-19-93	15	45	2.4	87.2	87.2	271.4	1	6.39E-06
07-19-93	15	56	2.4	0.4	0.4	271.4	0	NA
07-19-93	16	56	3.4	77.8	77.8	348.7	1	6.43E-06
07-20-93	9	26	3.4	0.4	0.4	348.7	0	NA
07-20-93	10	42	4.6	103.7	103.7	452.0	1	6.78E-06
07-20-93	10	48	4.6	0.9	0.9	452.0	0	NA
07-20-93	11	26	5.3	54.5	54.5	505.7	0	7.04E-06
07-20-93	11	54	5.7	93.9	93.9	545.0	1	7.01E-06
07-20-93	12	11	5.7	16.1	16.1	545.0	0	NA
07-20-93	12	33	6.1	43.4	43.4	572.3	0	6.19E-06

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07-20-93	12	47	6.3	61.7	61.7	590.6	0	6.93E-06
07-20-93	13	14	6.8	95.2	95.2	624.1	0	6.20E-06
07-20-93	13	25	7.0	109.1	109.1	638.0	1	6.29E-06
07-20-93	13	37	7.0	11.2	11.2	638.0	0	NA
07-20-93	13	48	7.2	25.0	25.0	651.8	0	6.29E-06
07-20-93	14	27	7.8	74.2	74.2	701.0	1	6.29E-06
07-21-93	8	21	7.8	24.6	24.6	701.0	0	NA
07-21-93	8	43	8.2	51.0	51.0	727.4	0	5.98E-06
07-21-93	9	3	8.5	75.6	75.6	752.0	0	6.13E-06
07-21-93	9	18	8.8	94.3	94.3	770.8	1	6.25E-06
07-21-93	9	25	8.8	1.3	1.3	770.8	0	NA
07-21-93	9	46	9.1	26.8	26.8	796.3	0	6.06E-06
07-21-93	10	7	9.5	50.5	50.5	820.0	0	5.63E-06
07-21-93	10	22	9.7	69.7	69.7	839.2	0	6.39E-06
07-21-93	11	0	10.3	110.0	110.0	879.4	1	5.28E-06
07-21-93	11	22	10.3	14.8	14.8	879.4	0	NA
07-21-93	11	44	10.7	40.2	40.2	904.9	0	5.78E-06
07-21-93	12	6	11.1	65.3	65.3	929.9	0	5.68E-06
07-21-93	12	30	11.5	93.4	93.4	958.1	0	5.86E-06

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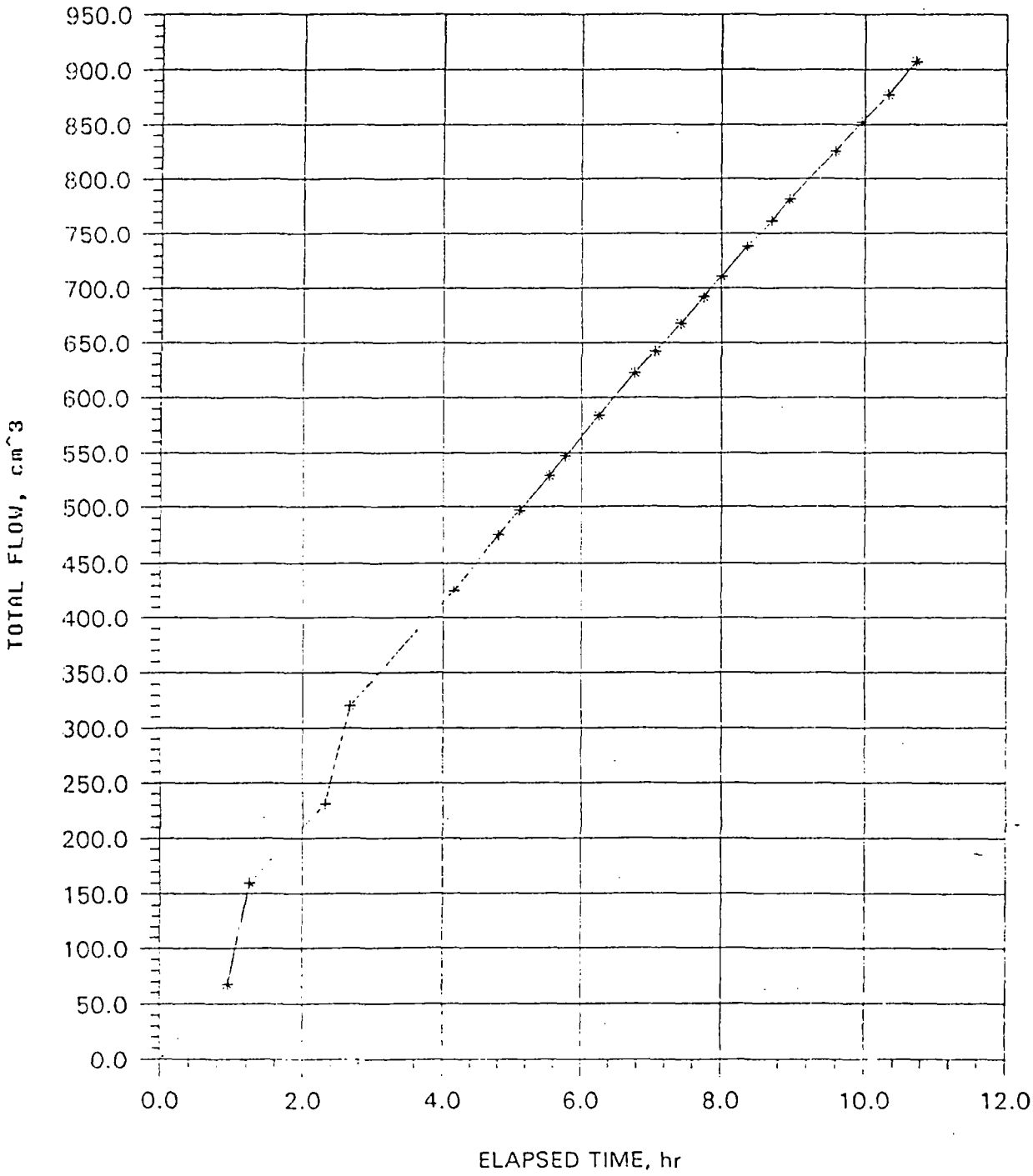
Client	OHM	Boring No.	POURED SAMPLE
Client Project	LASKIN POPLAR	Depth(ft.)	EXTRUDED FROM
Project No.	93269	Sample No.	WEST TRENCH # S2

Visual Description GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)

PERMEABILITY TEST

PERMEABILITY = 1.24E-05 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	KBL	Date	07-16-93
Client Project	LASKIN POPLAR	Checked By	EOM	Date	7-23-93
Project No.	93269				
Boring No.	POURED SAMPLE	Specific Gravity			2.70
Depth(ft.)	EXTRUDED FROM PLASTIC PIPE				ASSUMED
Sample No.	WEST TRENCH #S2				

Visual Description GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	1218	1017
Wt. Tare & WS(gm.)	120.12	475.60
Wt. Tare & DS(gm.)	59.38	218.06
Wt. Water(gm.)	60.74	257.54
Wt. Tare(gm.)	33.55	102.15
Wt. DS(gm.)	25.83	115.91
Moisture Content(%)	235.15	222.19
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	658.30	NA
Wt. Of Tube(gms.)	0.00	NA
Wt. Of WS.(gms.)	658.30	632.8
Length 1 (in.)	4.616	4.548
Length 2 (in.)	4.589	4.540
Length 3 (in.)	4.571	4.548
Top Diameter (in.)	3.047	3.019
Middle Diameter (in.)	3.046	3.025
Bottom Diameter (in.)	3.046	2.975
Average Length (in)	4.59	4.55
Average Area (in^2)	7.29	7.10
Sample Volume(cc.)	548.46	528.73
Unit Wet Wt.(gms/cc)	1.20	1.20
Unit Wet Wt.(pcf.)	74.90	74.69
Unit Dry Wt.(pcf.)	22.35	23.18
Unit Dry Wt.(gms/cc)	0.36	0.37
Void Ratio,e	6.54	6.27
Porosity, n	0.87	0.86
Pore Volume(cm^3)	475.72	455.98

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PERMEABILITY TEST

Client	OHM	Tested By	KBL	Date	07-16-93
Client Project	LASKIN POPLAR	Checked By	EJM	Date	7-23-93
Project No.	93269				
Boring No.	POURED SAMPLE	Specific Gravity			2.70
Depth(ft.)	EXTRUDED FROM PLASTIC PIPE				ASSUMED
Sample No.	WEST TRENCH #S2				
Visual Description	GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)				

Pressures		Final Sample Dimensions	
Top Cap (psi)	40.0	Sample Length (in.)	4.55
Bottom Cap (psi)	45.0	Sample Diameter (in.)	3.01
Cell (psi)	55.0	Sample Area (in.^2)	7.10
Total Head (cm)	351.5		
		B Parameter	95%

TIME 1	4.8	hrs.	Permeability	1.45E-05	CM/SEC
TOTAL FLOW 1	474.9	cm^3	Avg. Test Temp	27.0	CELSIUS
TIME 2	10.7	hrs.	Permeability	1.24E-05	CM/SEC
TOTAL FLOW 2	906.9	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
07-19-93	8	46	0.0	19.1	19.1	0.0	0	NA
07-19-93	9	43	1.0	86.4	86.4	67.3	1	1.41E-05
07-19-93	9	49	1.0	1.0	1.0	67.3	0	NA
07-19-93	10	7	1.3	93.5	93.5	159.9	1	6.15E-05
07-19-93	14	41	1.3	1.0	1.0	159.9	0	NA
07-19-93	15	45	2.3	72.1	72.1	231.0	1	1.33E-05
07-19-93	16	56	2.3	0.5	0.5	231.0	0	NA
07-19-93	17	17	2.7	89.7	89.7	320.3	1	5.08E-05
07-20-93	9	28	2.7	0.0	0.0	320.3	0	NA
07-20-93	10	57	4.2	105.0	105.0	425.3	1	1.41E-05
07-20-93	11	3	4.2	1.0	1.0	425.3	0	NA
07-20-93	11	42	4.8	50.6	50.6	474.9	0	1.52E-05
07-20-93	12	0	5.1	72.5	72.5	496.9	0	1.46E-05
07-20-93	12	26	5.5	104.5	104.5	528.8	1	1.47E-05
07-20-93	12	33	5.5	1.0	1.0	528.8	0	NA

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07-20-93	12	47	5.8	19.1	19.1	547.0	0	1.55E-05
7-20-93	13	16	6.2	55.8	55.8	583.7	0	1.51E-05
07-20-93	13	47	6.8	94.5	94.5	622.4	0	1.49E-05
07-20-93	14	4	7.1	114.1	114.1	642.0	1	1.38E-05
07-21-93	8	21	7.1	24.8	24.8	642.0	0	NA
07-21-93	8	43	7.4	50.1	50.1	667.3	0	1.37E-05
07-21-93	9	3	7.8	74.9	74.9	692.1	0	1.48E-05
07-21-93	9	18	8.0	94.0	94.0	711.2	1	1.52E-05
07-21-93	9	25	8.0	0.0	0.0	711.2	0	NA
07-21-93	9	46	8.4	26.3	26.3	737.4	0	1.49E-05
07-21-93	10	7	8.7	50.1	50.1	761.3	0	1.36E-05
07-21-93	10	22	9.0	70.2	70.2	781.3	0	1.60E-05
07-21-93	11	0	9.6	114.1	114.1	825.2	1	1.38E-05
07-21-93	11	22	9.6	16.2	16.2	825.2	0	NA
07-21-93	11	44	10.0	43.0	43.0	852.0	0	1.45E-05
07-21-93	12	6	10.3	67.8	67.8	876.8	0	1.35E-05
07-21-93	12	30	10.7	97.8	97.8	906.9	1	1.50E-05

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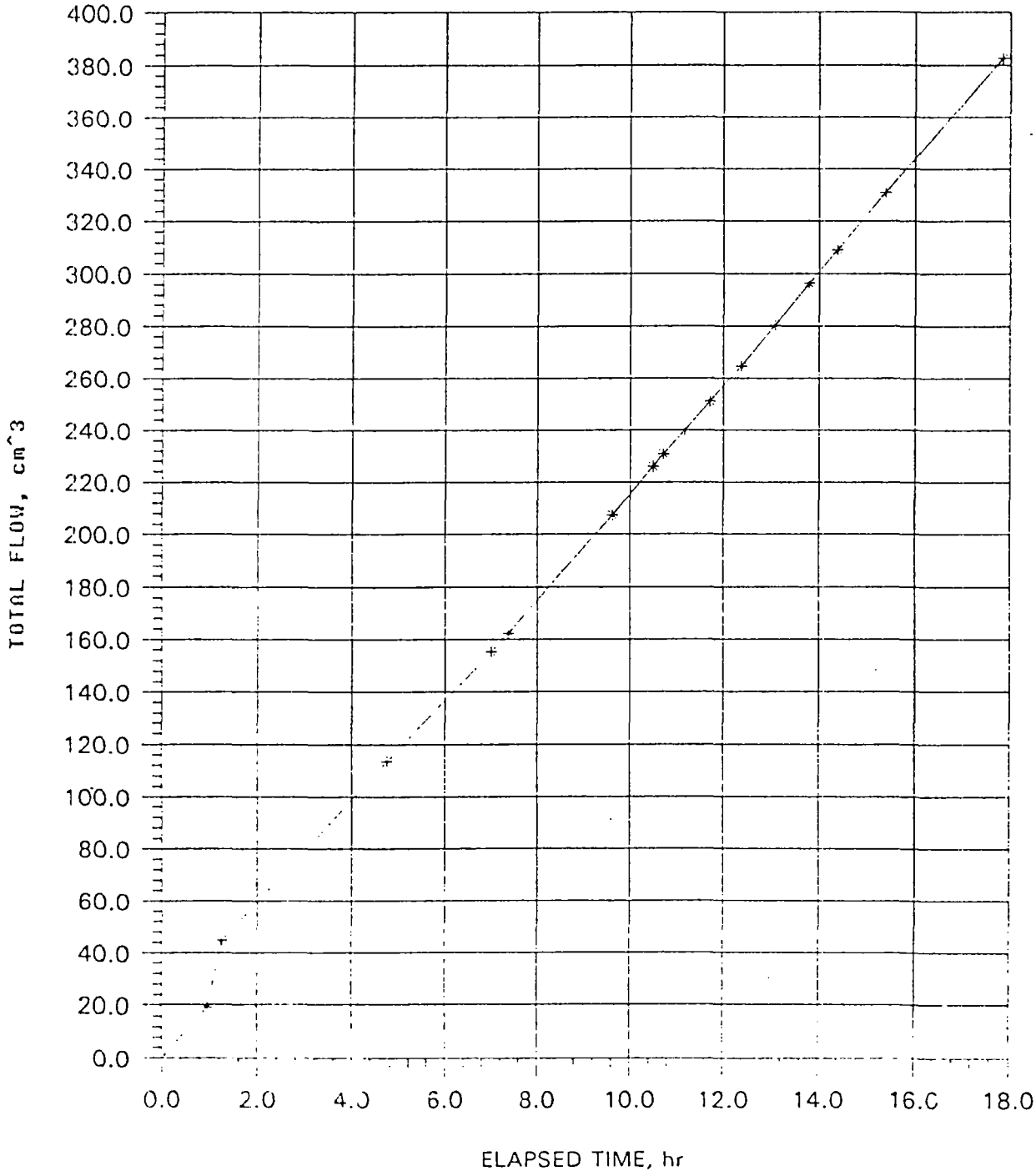
Client	OHM	Boring No.	POURED SAMPLE
Client Project	LASKIN POPLAR	Depth(ft.)	EXTRUDED FROM
Project No.	93269	Sample No.	WEST TRENCH #3

Visual Description GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)

PERMEABILITY TEST

PERMEABILITY = 3.85E-06 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	KBL	Date	07-16-93
Client Project	LASKIN POPLAR	Checked By	EJH	Date	7-23-93
Project No.	93269				
Boring No.	POURED SAMPLE	Specific Gravity			2.70
Depth(ft.)	EXTRUDED FROM PLASTIC PIPE				ASSUMED
Sample No.	WEST TRENCH #3				

Visual Description GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	1006	685
Wt. Tare & WS(gm.)	123.61	441.90
Wt. Tare & DS(gm.)	73.00	228.34
Wt. Water(gm.)	50.61	213.56
Wt. Tare(gm.)	43.19	107.16
Wt. DS(gm.)	29.81	121.18
Moisture Content(%)	169.78	176.23
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	771.40	NA
Wt. Of Tube(gms.)	0.00	NA
Wt. Of WS.(gms.)	771.40	789.9
Length 1 (in.)	5.230	5.156
Length 2 (in.)	5.505	5.205
Length 3 (in.)	5.151	5.117
Top Diameter (in.)	3.050	3.046
Middle Diameter (in.)	3.057	3.048
Bottom Diameter (in.)	3.050	3.044
Average Length (in)	5.30	5.16
Average Area (in^2)	7.32	7.29
Sample Volume(cc.)	634.96	616.09
Unit Wet Wt.(gms/cc)	1.21	1.28
Unit Wet Wt.(pcf.)	75.81	80.00
Unit Dry Wt.(pcf.)	28.10	28.96
Unit Dry Wt.(gms/cc)	0.45	0.46
Void Ratio,e	5.00	4.82
Porosity, n	0.83	0.83
Pore Volume(cm^3)	529.06	510.19

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PERMEABILITY TEST

Client	OHM	Tested By	KBL	Date	07-16-93
Client Project	LASKIN POPLAR	Checked By	EDH	Date	7-23-93
Project No.	93269				
Boring No.	POURED SAMPLE	Specific Gravity			2.70
Depth(ft.)	EXTRUDED FROM PLASTIC PIPE				ASSUMED
Sample No.	WEST TRENCH #3				
Visual Description	GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)				

Pressures		Final Sample Dimensions	
Top Cap (psi)	40.0	Sample Length (in.)	5.16
Bottom Cap (psi)	45.0	Sample Diameter (in.)	3.05
Cell (psi)	55.0	Sample Area (in.^2)	7.29
Total Head (cm)	351.5		
		B Parameter	95%

TIME 1	4.8	hrs.	Permeability	4.53E-06	CM/SEC
TOTAL FLOW 1	113.4	cm^3	Avg. Test Temp	27.0	CELSIUS
TIME 2	17.9	hrs.	Permeability	3.85E-06	CM/SEC
TOTAL FLOW 2	382.6	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
07-19-93	8	46	0.0	0.5	0.5	0.0	0	NA
07-19-93	9	43	1.0	19.5	19.5	19.0	1	4.40E-06
07-19-93	9	49	1.0	20.0	20.0	19.0	0	NA
07-19-93	10	7	1.3	45.8	45.8	44.8	0	1.89E-05
07-19-93	13	37	4.8	114.4	114.4	113.4	1	4.32E-06
07-19-93	14	40	4.8	1.5	1.0	113.4	0	NA
07-19-93	16	55	7.0	42.8	42.8	155.3	0	4.10E-06
07-19-93	17	17	7.4	49.7	49.7	162.1	1	4.09E-06
07-20-93	9	27	7.4	0.0	0.0	162.1	0	NA
07-20-93	11	12	9.6	45.3	45.3	207.4	0	4.43E-06
07-20-93	12	34	10.5	63.8	63.8	225.9	0	4.70E-06
07-20-93	12	47	10.7	68.6	68.6	230.7	0	4.95E-06
07-20-93	13	15	11.2	77.9	77.9	240.0	0	4.37E-06
07-20-93	13	47	11.7	89.1	89.1	251.2	0	4.62E-06
07-20-93	14	27	12.4	102.7	102.7	264.8	1	4.50E-06

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07-21-93	8	21	12.4	0.0	0.0	264.8	0	NA
07-21-93	9	3	13.1	15.6	15.6	280.4	0	4.90E-06
07-21-93	9	46	13.8	31.6	31.6	296.5	0	4.94E-06
07-21-93	10	22	14.4	44.3	44.3	309.1	0	4.65E-06
07-21-93	11	22	15.4	66.2	66.2	331.0	0	4.82E-06
07-21-93	13	50	17.9	117.8	117.8	382.6	1	4.61E-06

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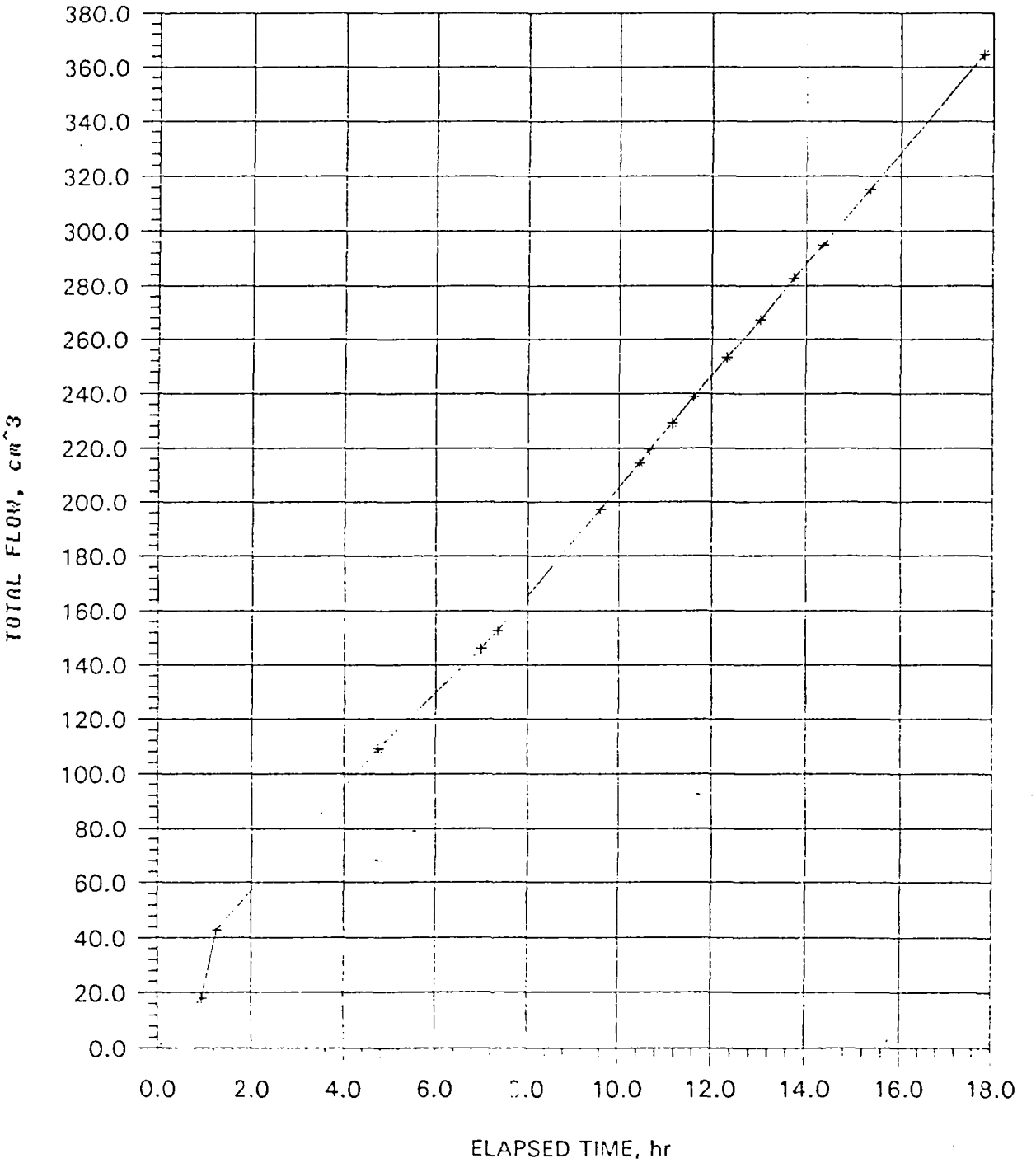
Client	OHM	Boring No.	POURED SAMPLE
Client Project	LASKIN POPLAR	Depth(ft.)	EXTRUDED FROM
Project No.	93269	Sample No.	WEST WALL #S4

Visual Description GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)

PERMEABILITY TEST

PERMEABILITY = 2.56E-06 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	KBL	Date	07-16-93
Client Project	LASKIN POPLAR	Checked By	[illegible]	Date	7-23-93
Project No.	93269				
Boring No.	POURED SAMPLE		Specific Gravity		2.70
Depth(ft.)	EXTRUDED FROM PLASTIC PIPE				ASSUMED
Sample No.	WEST WALL #S4				

Visual Description GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	442	1121
Wt. Tare & WS(gm.)	189.57	373.17
Wt. Tare & DS(gm.)	124.23	159.78
Wt. Water(gm.)	65.34	213.39
Wt. Tare(gm.)	99.85	84.40
Wt. DS(gm.)	24.38	75.38
Moisture Content(%)	268.01	283.09
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	508.40	NA
Wt. Of Tube(gms.)	0.00	NA
Wt. Of WS.(gms.)	508.40	529.2
Length 1 (in.)	3.721	3.642
Length 2 (in.)	3.637	3.629
Length 3 (in.)	3.554	3.592
Top Diameter (in.)	3.069	3.050
Middle Diameter (in.)	3.080	3.055
Bottom Diameter (in.)	3.062	3.054
Average Length (in)	3.64	3.62
Average Area (in^2)	7.40	7.32
Sample Volume(cc.)	441.31	434.38
Unit Wet Wt.(gms/cc)	1.15	1.22
Unit Wet Wt.(pcf.)	71.89	76.03
Unit Dry Wt.(pcf.)	19.53	19.85
Unit Dry Wt.(gms/cc)	0.31	0.32
Void Ratio,e	7.62	7.49
Porosity, n	0.88	0.88
Pore Volume(cm^3)	390.14	383.22

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PERMEABILITY TEST

Client	OHM	Tested By	KBL	Date	07-16-93
Client Project	LASKIN POPLAR	Checked By	[illegible]	Date	7-23-93
Project No.	93269				
Boring No.	POURED SAMPLE	Specific Gravity			2.70
Depth(ft.)	EXTRUDED FROM PLASTIC PIPE				ASSUMED
Sample No.	WEST WALL #S4				
Visual Description	GRAY CEMENT BENTONITE SLURRY (UNDISTURBED)				

Pressures		Final Sample Dimensions	
Top Cap (psi)	40.0	Sample Length (in.)	3.62
Bottom Cap (psi)	45.0	Sample Diameter (in.)	3.05
Cell (psi)	55.0	Sample Area (in.^2)	7.32
Total Head (cm)	351.5		
		B Parameter	95%

TIME 1	4.8	hrs.	Permeability	3.01E-06	CM/SEC
TOTAL FLOW 1	109.2	cm^3	Avg. Test Temp	27.0	CELSIUS
TIME 2	17.8	hrs.	Permeability	2.56E-06	CM/SEC
TOTAL FLOW 2	364.5	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
07-19-93	8	46	0.0	0.5	0.5	0.0	0	NA
07-19-93	9	43	1.0	18.4	18.4	17.9	1	2.90E-06
07-19-93	9	49	1.0	18.4	18.4	17.9	0	NA
07-19-93	10	7	1.3	43.5	43.5	43.0	0	1.29E-05
07-19-93	13	37	4.8	109.7	109.7	109.2	1	2.91E-06
07-19-93	14	41	4.8	1.0	3.4	109.2	0	NA
07-19-93	16	55	7.0	40.1	40.1	146.0	0	2.53E-06
07-19-93	17	17	7.4	46.9	46.9	152.7	1	2.84E-06
07-20-93	9	29	7.4	0.0	0.0	152.7	0	NA
07-20-93	11	43	9.6	44.5	44.5	197.2	0	3.06E-06
07-20-93	12	34	10.4	61.9	61.9	214.6	0	3.15E-06
07-20-93	12	47	10.7	66.7	66.7	219.5	0	3.43E-06
07-20-93	13	17	11.2	76.4	76.4	229.1	0	2.98E-06
07-20-93	13	45	11.6	86.0	86.0	238.8	0	3.19E-06
07-20-93	14	27	12.3	100.5	100.5	253.3	1	3.19E-06

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07-21-93	8	21	12.3	1.5	1.5	253.3	0	NA
07-21-93	9	3	13.0	15.5	15.5	267.3	0	3.08E-06
07-21-93	9	46	13.7	30.9	30.9	282.8	0	3.32E-06
07-21-93	10	23	14.4	43.0	43.0	294.9	0	3.02E-06
07-21-93	11	22	15.3	63.3	63.3	315.2	0	3.18E-06
07-21-93	13	50	17.8	112.6	112.6	364.5	1	3.08E-06

LASKIN/POPLAR SITE
CB SLURRY TESTING

DATE	TIME	POOL NO.	BENTONITE MARSH FUNNEL (SEC.)	CB MARSH FUNNEL (SEC.)	CB MUD BALANCE (pcf)	BENTONITE MUD BALANCE (pcf)	FILTRATE LOSS (cc)
5/21/93	0643	1	34.00	-	-	64.0	19.5
5/21/93	0835	1	35.68	98.68	74.0	64.0	-
5/21/93	1000	1	34.00	61.79	76.8	64.0	-
5/21/93	1127	1	33.96	62.62	76.0	64.2	-
5/21/93	1301	1	34.00	>120	76.7	64.0	-
5/21/93	1430	1	34.79	>120	79.5	64.5	-
5/21/93	1610	1	34.45	96.35	78.5	64.0	-
5/21/93	1734	2	37.78	>120	78.0	64.0	-
5/21/93	1905	2	36.50	>120	79.5	64.0	21.2
5/21/93	2030	4	37.00	>120	78.0	64.5	19.0
5/21/93	2200	4	37.00	>120	78.5	64.5	20.6
5/22/93	1030	1	34.43	63.27	76.0	64.3	20.0
5/22/93	1150	1	34.78	94.15	76.0	64.0	-
5/22/93	1246	1	33.92	>120	76.0	64.5	-
5/22/93	1400	1	35.16	>120	78.5	64.5	-
5/22/93	1504	2	37.52	>120	77.5	65.5	19.6
5/22/93	1558	2	38.24	>120	77.5	65.5	-
5/22/93	1658	2	36.54	>120	77.0	65.9	-
5/22/93	1759	2	34.50	>120	76.5	64.5	-
5/22/93	1859	2	35.10	>120	77.5	65.5	-
5/22/93	2000	1	34.50	100.00	78.0	64.5	-
5/22/93	2120	1	34.00	75.00	78.0	64.0	-
5/22/93	2205	1	34.20	65.00	79.5	64.0	-
5/22/93	2310	1	34.00	68.00	79.5	64.0	-
5/23/93	0010	1	34.00	66.00	79.0	64.5	-
5/23/93	0108	1	36.00	>120	79.0	64.5	-
5/23/93	0210	3	34.20	98.00	79.0	64.0	-
5/23/93	0320	3	34.00	>120	80.0	64.0	-
5/23/93	0420	3	34.00	98.00	78.0	64.5	-
5/23/93	0515	1	34.00	96.00	78.0	64.5	-
5/23/93	1000	1	35.75	>120	76.0	64.8	-
5/23/93	1100	1	33.81	>120	76.0	65.0	-
5/23/93	1158	1	34.12	>120	76.0	64.0	-
5/23/93	1250	1	34.59	>120	76.0	64.0	-
5/23/93	1602	2	33.69	93.12	75.5	64.0	-
5/23/93	1730	2	34.08	>120	76.0	64.0	-
5/23/93	2130	2	34.00	>120	77.0	64.5	-
5/23/93	2230	2	34.50	98.00	78.0	64.0	-
5/23/93	2340	2	34.50	95.00	77.5	64.0	-
5/24/93	1326	2	34.05	>120	79.5	64.5	-
5/24/93	1430	2	34.10	>120	79.0	65.0	-
5/24/93	1603	2	34.79	>120	78.0	64.5	-
5/24/93	1730	2	35.02	>120	77.0	64.5	-

NOTE:
Tests for 5/21/93 occured on the east slurry wall and remaining tests are for the west slurry wall.

REPORT ON THE TEST RESULTS FOR THE RESIDUAL WASTES

Included in this section of the appendix is the report submitted by OHM on the results for the testing of the residual wastes. These wastes were stabilized and tested according to the OHM plan dated 3 May 1993 also included in this appendix. The CAMU letter dated 6 May 1993 is included here also.

Analytical Services Corp.

ANALYTICAL REPORT

Client: OHM Remediation Services Corporation
Pennsylvania Division

Attn: Larry Hoffman
Bill Fenwick

Project: 13988 - Engineering Science, Jefferson, OH

Sample(s): SCA, STA and SBA

Sample Type(s): Solids

Analysis Performed: Metals and Organics

Date Sample Received: June 19, 1993

Date Order Received: June 19, 1993

Joblink(s): 613108

This report is "PROPRIETARY AND CONFIDENTIAL" and delivered to, and intended for the exclusive use of the above named client only. Analytical Services Corporation assumes no responsibility or liability for the reliance hereon or use hereof by anyone other than the above named client.

Reviewed and Approved by: T E Gran *Date:* 6/30/93
Thomas E. Gran, Ph.D., Vice President

16406 U.S. Route 224 East ▪ P.O. Box 1404 ▪ Findlay, Ohio 45839-1404 ▪ 419-423-3526

PROJECT NARRATIVE

The following items relate to the samples and analytical data contained in this report.

- All sample results are reported on an as received "wet weight" basis.
- Note any and all comments at the bottom of the tables in Appendix B and/or Appendix C.
- **ASC** will retain samples for a maximum of thirty (30) days after completion of the analysis, samples will be held for a longer period of time, if appropriate arrangements are made in advance. A nominal disposal charge of $5.00/ sample will be imposed for unreturned samples.

APPENDIX A

DATA SUMMARY REPORT

NOTE: The GC/MS screen data, if applicable, is included in Appendix B.

DATA SUMMARY REPORT

DATE: 06/28/93

Company: OHM REMEDIATION SERVICES CORPORATION

	Sample Point ID:	SCA	STA	SBA
	ASC Sample Number:	JK8016	JK8017	JK8018
	Sample Date:	930618	930618	930618
	Facility Code:	013988	013988	013988
Parameters	Units			
Halogenated Volatile Analysis, GC, (GV30)				
Bromoform	mg/kg	<.001	<.001	<.001
Bromomethane	mg/kg	<.001	<.001	<.001
Carbon tetrachloride	mg/kg	<.001	<.001	<.001
Chlorobenzene	mg/kg	<.001	<.001	<.001
Chlorodibromomethane	mg/kg	<.001	<.001	<.001
Chloroethane	mg/kg	<.001	<.001	<.001
2-Chloroethylvinyl ether	mg/kg	<.001	<.001	<.001
Chloroform	mg/kg	<.001	<.001	<.001
Chloromethane	mg/kg	<.001	<.001	<.001
1,2-Dichlorobenzene	mg/kg	<.001	<.001	<.001
1,3-Dichlorobenzene	mg/kg	<.001	<.001	<.001
1,4-Dichlorobenzene	mg/kg	<.001	<.001	<.001
Dichlorobromomethane	mg/kg	<.001	<.001	<.001
Dichlorodifluoromethane	mg/kg	<.001	<.001	<.001
1,1-Dichloroethane	mg/kg	<.001	<.001	<.001
1,2-Dichloroethane	mg/kg	<.001	<.001	<.001
1,1-Dichloroethylene	mg/kg	<.001	<.001	<.001
trans-1,2-Dichloroethene	mg/kg	<.001	<.001	<.001
1,2-Dichloropropane	mg/kg	<.001	<.001	<.001
cis-1,3-Dichloropropylene	mg/kg	<.001	<.001	<.001
trans-1,3-Dichloropropylene	mg/kg	<.001	<.001	<.001
Methylene chloride	mg/kg	<.001	<.001	<.001
1,1,2,2-Tetrachloroethane	mg/kg	<.001	<.001	<.001
Tetrachloroethylene	mg/kg	<.001	<.001	<.001
1,1,1-Trichloroethane	mg/kg	<.001	<.001	<.001
1,1,2-Trichloroethane	mg/kg	<.001	<.001	<.001
Trichloroethylene	mg/kg	<.001	<.001	<.001
Trichlorofluoromethane	mg/kg	<.001	<.001	<.001
Vinyl chloride	mg/kg	<.001	<.001	<.001
Benzene	mg/kg	<.001	<.001	<.001
Ethylbenzene	mg/kg	<.001	<.001	<.001
Toluene	mg/kg	<.001	<.001	<.001
Xylenes	mg/kg	<.001	<.001	<.001

DATA SUMMARY REPORT

DATE: 06/28/93

Company: OHM REMEDIATION SERVICES CORPORATION

	Sample Point ID:	SCA	STA	SBA
	ASC Sample Number:	JK8016	JK8017	JK8018
	Sample Date:	930618	930618	930618
	Facility Code:	013988	013988	013988
Parameters	Units			
RCRA Total Metals Analysis, (ME50)				
Arsenic	mg/kg	<5.00	<5.00	8.23
Barium	mg/kg	12.7	50.0	45.3
Cadmium	mg/kg	<1.00	<1.00	<1.00
Chromium	mg/kg	4.25	6.55	9.07
Lead	mg/kg	5.65	13.0	10.8
Mercury	mg/kg	<.050	<.050	<.050
Selenium	mg/kg	<.500	<.500	<.500
Silver	mg/kg	<1.00	<1.00	<1.00

APPENDIX B

QUANTITATIVE RESULTS

HALOGENATED VOLATILE ANALYSIS, GC, (GV30)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	013988	SCA	JK8016

Compounds	**Sample Results** mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Bromoform	ND	.001	ND	Q2W2684
Bromomethane	ND	.001	ND	Q2W2684
Carbon tetrachloride	ND	.001	ND	Q2W2684
Chlorobenzene	ND	.001	ND	Q2W2684
Chlorodibromomethane	ND	.001	ND	Q2W2684
Chloroethane	ND	.001	ND	Q2W2684
2-Chloroethylvinyl ether	ND	.001	ND	Q2W2684
Chloroform	ND	.001	ND	Q2W2684
Chloromethane	ND	.001	ND	Q2W2684
1,2-Dichlorobenzene	ND	.001	ND	Q2W2684
1,3-Dichlorobenzene	ND	.001	ND	Q2W2684
1,4-Dichlorobenzene	ND	.001	ND	Q2W2684
Dichlorobromomethane	ND	.001	ND	Q2W2684
Dichlorodifluoromethane	ND	.001	ND	Q2W2684
1,1-Dichloroethane	ND	.001	ND	Q2W2684
1,2-Dichloroethane	ND	.001	ND	Q2W2684
1,1-Dichloroethylene	ND	.001	ND	Q2W2684
trans-1,2-Dichloroethene	ND	.001	ND	Q2W2684
1,2-Dichloropropane	ND	.001	ND	Q2W2684
cis-1,3-Dichloropropylene	ND	.001	ND	Q2W2684
trans-1,3-Dichloropropylene	ND	.001	ND	Q2W2684
Methylene chloride	ND	.001	ND	Q2W2684
1,1,2,2-Tetrachloroethane	ND	.001	ND	Q2W2684
Tetrachloroethylene	ND	.001	ND	Q2W2684
1,1,1-Trichloroethane	ND	.001	ND	Q2W2684
1,1,2-Trichloroethane	ND	.001	ND	Q2W2684
Trichloroethylene	ND	.001	ND	Q2W2684
Trichlorofluoromethane	ND	.001	ND	Q2W2684
Vinyl chloride	ND	.001	ND	Q2W2684
Benzene	ND	.001	ND	Q2W2684
Ethylbenzene	ND	.001	ND	Q2W2684
Toluene	ND	.001	ND	Q2W2684
Xylenes	ND	.001	ND	Q2W2684

HALOGENATED VOLATILE ANALYSIS, GC, (GV30)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	013988	STA	JK8017

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Bromoform	ND	.001	ND	Q2W2684
Bromomethane	ND	.001	ND	Q2W2684
Carbon tetrachloride	ND	.001	ND	Q2W2684
Chlorobenzene	ND	.001	ND	Q2W2684
Chlorodibromomethane	ND	.001	ND	Q2W2684
Chloroethane	ND	.001	ND	Q2W2684
2-Chloroethylvinyl ether	ND	.001	ND	Q2W2684
Chloroform	ND	.001	ND	Q2W2684
Chloromethane	ND	.001	ND	Q2W2684
1,2-Dichlorobenzene	ND	.001	ND	Q2W2684
1,3-Dichlorobenzene	ND	.001	ND	Q2W2684
1,4-Dichlorobenzene	ND	.001	ND	Q2W2684
Dichlorobromomethane	ND	.001	ND	Q2W2684
Dichlorodifluoromethane	ND	.001	ND	Q2W2684
1,1-Dichloroethane	ND	.001	ND	Q2W2684
1,2-Dichloroethane	ND	.001	ND	Q2W2684
1,1-Dichloroethylene	ND	.001	ND	Q2W2684
trans-1,2-Dichloroethene	ND	.001	ND	Q2W2684
1,2-Dichloropropane	ND	.001	ND	Q2W2684
cis-1,3-Dichloropropylene	ND	.001	ND	Q2W2684
trans-1,3-Dichloropropylene	ND	.001	ND	Q2W2684
Methylene chloride	ND	.001	ND	Q2W2684
1,1,2,2-Tetrachloroethane	ND	.001	ND	Q2W2684
Tetrachloroethylene	ND	.001	ND	Q2W2684
1,1,1-Trichloroethane	ND	.001	ND	Q2W2684
1,1,2-Trichloroethane	ND	.001	ND	Q2W2684
Trichloroethylene	ND	.001	ND	Q2W2684
Trichlorofluoromethane	ND	.001	ND	Q2W2684
Vinyl chloride	ND	.001	ND	Q2W2684
Benzene	ND	.001	ND	Q2W2684
Ethylbenzene	ND	.001	ND	Q2W2684
Toluene	ND	.001	ND	Q2W2684
Xylenes	ND	.001	ND	Q2W2684

HALOGENATED VOLATILE ANALYSIS, GC, (GV30)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	013988	SBA	JK8018

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Bromoform	ND	.001	ND	Q2W2684
Bromomethane	ND	.001	ND	Q2W2684
Carbon tetrachloride	ND	.001	ND	Q2W2684
Chlorobenzene	ND	.001	ND	Q2W2684
Chlorodibromomethane	ND	.001	ND	Q2W2684
Chloroethane	ND	.001	ND	Q2W2684
2-Chloroethylvinyl ether	ND	.001	ND	Q2W2684
Chloroform	ND	.001	ND	Q2W2684
Chloromethane	ND	.001	ND	Q2W2684
1,2-Dichlorobenzene	ND	.001	ND	Q2W2684
1,3-Dichlorobenzene	ND	.001	ND	Q2W2684
1,4-Dichlorobenzene	ND	.001	ND	Q2W2684
Dichlorobromomethane	ND	.001	ND	Q2W2684
Dichlorodifluoromethane	ND	.001	ND	Q2W2684
1,1-Dichloroethane	ND	.001	ND	Q2W2684
1,2-Dichloroethane	ND	.001	ND	Q2W2684
1,1-Dichloroethylene	ND	.001	ND	Q2W2684
trans-1,2-Dichloroethene	ND	.001	ND	Q2W2684
1,2-Dichloropropane	ND	.001	ND	Q2W2684
cis-1,3-Dichloropropylene	ND	.001	ND	Q2W2684
trans-1,3-Dichloropropylene	ND	.001	ND	Q2W2684
Methylene chloride	ND	.001	ND	Q2W2684
1,1,2,2-Tetrachloroethane	ND	.001	ND	Q2W2684
Tetrachloroethylene	ND	.001	ND	Q2W2684
1,1,1-Trichloroethane	ND	.001	ND	Q2W2684
1,1,2-Trichloroethane	ND	.001	ND	Q2W2684
Trichloroethylene	ND	.001	ND	Q2W2684
Trichlorofluoromethane	ND	.001	ND	Q2W2684
Vinyl chloride	ND	.001	ND	Q2W2684
Benzene	ND	.001	ND	Q2W2684
Ethylbenzene	ND	.001	ND	Q2W2684
Toluene	ND	.001	ND	Q2W2684
Xylenes	ND	.001	ND	Q2W2684

RCRA Total Metals Analysis, (ME50)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	013988	SCA	JK8016

Compounds	**Sample Results** mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Arsenic	ND	5.00	ND	Q2M2737
Barium	12.7	1.00	ND	Q2M2737
Cadmium	ND	1.00	ND	Q2M2737
Chromium	4.25	1.00	ND	Q2M2737
Lead	5.65	2.00	ND	Q2M2737
Mercury	ND	.050	ND	Q2G2745R
Selenium	ND	.500	ND	Q2R2739
Silver	ND	1.00	ND	Q2M2737

RCRA Total Metals Analysis, (ME50)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	013988	STA	JK8017

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Arsenic	ND	5.00	ND	Q2M2737
Barium	50.0	1.00	ND	Q2M2737
Cadmium	ND	1.00	ND	Q2M2737
Chromium	6.55	1.00	ND	Q2M2737
Lead	13.0	2.00	ND	Q2M2737
Mercury	ND	.050	ND	Q2G2745R
Selenium	ND	.500	ND	Q2R2739
Silver	ND	1.00	ND	Q2M2737

RCRA Total Metals Analysis, (ME50)

Company Name	Facility	Sample Point	ASC Sample No.
OHM REMEDIATION SERVICES CORPORATION	013988	SBA	JK8018

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Arsenic	8.23	5.00	ND	Q2M2737
Barium	45.3	1.00	ND	Q2M2737
Cadmium	ND	1.00	ND	Q2M2737
Chromium	9.07	1.00	ND	Q2M2737
Lead	10.8	2.00	ND	Q2M2737
Mercury	ND	.050	ND	Q2G2745R
Selenium	ND	.500	ND	Q2R2739
Silver	ND	1.00	ND	Q2M2737

APPENDIX C

QUALITY ASSURANCE DATA

SUMMARY OF ANALYTICAL METHODOLOGY

Parameter	Reference	Method
Metals		
Metals (except mercury)	SW-846	6010
Mercury by Cold Vapor	SW-846	7470
Selenium by GFAA	SW-846	7740
Organics		
Halogenated Volatile Compounds by GC	SW-846	8010
Volatile Compounds by GC	SW-846	8020

METHODOLOGY REFERENCES

ASTM	*American Society for Testing and Materials*, 1985, edition.
CAWW	*Methods for Chemical Analysis of Water and Wastes*, April 1979 and Updated #1 March 1983.
CLP	*USEPA Contract Laboratory Program*, Document #OLMO1.0, updates December 1990 #OLMO1.1 and February 1991 #OLMO1.1.1.
NIOSH	*National Institute for Occupational Safety and Health*, 3rd edition, 1984.
SMEWW	*Standard Methods for the Examination of Water and Wastewater*, 17th edition, 1989.
STOA	*Spot Tests In Organic Analysis*, 7th edition, 1966.
SW-846	*Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, 3rd edition, September 1986 and Updated #1 January 1989.
(1)	This method was modified to incorporate the use of Boron Trifluoride (BF3) as the derivatizing reagent according to Method 509B in *SMEWW*, 17th edition, 1989.
Title 22	*Waste Extraction Test*, Title 22, Section 66261.126 Appendix 2 of the California Administrative Code, May 1991.

ANALYTICAL SERVICES CORP.

Certifications

(for Conventionals, Metals and Organic compounds)

State	Agency	Certification #
Alabama	ADEM	40830
California	CADOH	1178
Colorado	CODOH	OH113
Delaware	DEHSS	OH113
Kansas	KSDHE	E-202 & E-1173
Louisiana	LADOHH	92-10
Maryland	MADHMH	210
Massachusetts	MADEP	OH113
New Jersey	NJDEP	74603
New York	NYDOH	10712
North Carolina	NCDEM	392
Ohio	OHEPA	OH113
Oklahoma	OWRB	9216
Pennsylvania	PADER	68-450
South Carolina	SCDEH	92002
Tennessee	TNDOH	2978
Virginia	VADGS	00011
Wisconsin	WIDNR	999037160

Validated by:

- o US Army Corps of Engineers

Approvals:

- o Waste Characterization Analysis

  - Chemical Waste Management
  - Envirosafe

- o Permit for Importing Soils

  - USDA

REPORT KEY

mg/kg	= milligram per kilogram (ppm)
Mg/m^3	= milligram per cubic meter
ug/kg	= microgram per kilogram (ppb)
mg/L	= milligram per liter (ppm)
mg/W	= milligram per wipe
ug/L	= microgram per liter (ppb)
ug/W	= microgram per wipe
ug/S	= microgram per sample
um/cm	= microMho per centimeter
pCi/l	= picocurie per liter
ppm	= parts per million
ppb	= parts per billion
ND	= Not detected at or above stated detection limit
<	= less than
>	= greater than
%	= percent
BTU/lb	= British Thermal Units per pound
Deg. C	= Degrees Celsius
gm/cc	= grams per cubic centimeter
n/a	= not applicable
std	= result is relative to standard pH units
CV	= Conventionals
IR	= Infrared Spectrophotometric
GC	= Gas Chromatograph Instrument
GC/MS	= Gas Chromatography/Mass Spectrometer Instrument
GRO	= Gasoline Range Organics
DRO	= Diesel Range Organics
PCB	= Polychlorinated Biphenyls (PCBs)
EP TOX	= Extraction Procedure Toxicity
TCLP	= Toxicity Characteristic Leaching Procedure
RCRA	= Rescurce Conservation and Recovery Act

QUALITY ASSURANCE DATA

HALOGENATED VOLATILE ANALYSIS, GC, (GV30)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Bromoform	ND	90	ND	67	4	Q2W2684
Bromomethane	ND	104	ND	80	1	Q2W2684
Carbon tetrachloride	ND	91	ND	81	2	Q2W2684
Chlorobenzene	ND	92	ND	70	3	Q2W2684
Chlorodibromomethane	ND	97	ND	71	2	Q2W2684
Chloroethane	ND	103	ND	77	4	Q2W2684
2-Chloroethylvinyl ether	ND	89	ND	-	-	Q2W2684
Chloroform	ND	90	ND	79	2	Q2W2684
Chloromethane	ND	111	ND	82	8	Q2W2684
1,2-Dichlorobenzene	ND	95	ND	56	1	Q2W2684
1,3-Dichlorobenzene	ND	94	ND	57	1	Q2W2684
1,4-Dichlorobenzene	ND	95	ND	57	1	Q2W2684
Dichlorobromomethane	ND	101	ND	75	2	Q2W2684
Dichlorodifluoromethane	ND	97	ND	80	10	Q2W2684
1,1-Dichloroethane	ND	95	ND	82	1	Q2W2684
1,2-Dichloroethane	ND	93	ND	78	1	Q2W2684
1,1-Dichloroethylene	ND	92	ND	90	3	Q2W2684
trans-1,2-Dichloroethene	ND	94	ND	74	5	Q2W2684
1,2-Dichloropropane	ND	96	ND	77	1	Q2W2684
cis-1,3-Dichloropropylene	ND	97	ND	91	5	Q2W2684
trans-1,3-Dichloropropylene	ND	86	ND	47	1	Q2W2684
Methylene chloride	ND	93	ND	95	13	Q2W2684
1,1,2,2-Tetrachloroethane	ND	75	ND	69	1	Q2W2684
Tetrachloroethylene	ND	89	ND	70	2	Q2W2684
1,1,1-Trichloroethane	ND	91	ND	82	1	Q2W2684
1,1,2-Trichloroethane	ND	95	ND	74	2	Q2W2684
Trichloroethylene	ND	96	ND	79	1	Q2W2684
Trichlorofluoromethane	ND	104	ND	88	1	Q2W2684
Vinyl chloride	ND	107	ND	89	3	Q2W2684
Benzene	ND	85	ND	80	3	Q2W2684
Ethylbenzene	ND	92	ND	71	3	Q2W2684
Toluene	ND	93	ND	76	3	Q2W2684
Xylenes	ND	100	ND	103	2	Q2W2684

- 2-Chloroethylvinyl ether: Due to apparent interactions between the spiked compound and sample components, no matrix spike recoveries were observed for the parameters designated with a dash.

QUALITY ASSURANCE DATA

RCRA TOTAL METALS ANALYSIS, (ME50)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Arsenic	ND	82	ND	76	4	Q2M2737
Barium	ND	86	12.7	82	2	Q2M2737
Cadmium	ND	84	ND	80	3	Q2M2737
Chromium	ND	87	4.25	82	3	Q2M2737
Lead	ND	83	5.65	72	3	Q2M2737
Mercury	ND	96	ND	96	4	Q2G2745R
Selenium	ND	102	ND	69	17	Q2R2739
Silver	ND	82	ND	68	7	Q2M2737

- Low QC matrix spike recoveries were observed for this particular analysis, batch acceptance is based on QC spike recovery results.

QUALITY ASSURANCE DATA
SURROGATE SUMMARY REPORT

SURROGATE ID	A373	# OUT

QC BATCH: Q2W2684 Solid (Volatile organics by GC)

SAMPLE ID		
BLANK	102	0
BLANK SPIKE	88	0
SBA	74	0
SBA MD	75	0
SBA MS	83	0
SCA	73	0
STA	54	0
QC LIMITS	(40-144)	

SURROGATE ID

A373 = Bromochloromethane

* Values outside of method quality control limits
D Surrogate diluted out

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutral or pesticide) to exceed the stated QC limits. This policy is based upon the USEPA SOW for the Contract Laboratory Program (CLP).

OHM

CHAIN-OF-CUSTODY RECORD

Form 0019
Field Technical Services
Rev. 03/88

No. 58908

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME: LASKIN/POPLAR
PROJECT LOCATION: JEFFERSON, OH
PROJ NO: 13988
PROJECT CONTACT: ROBERT L. SMITH
PROJECT TELEPHONE NO.: (216) 576-7515
CLIENT'S REPRESENTATIVE: K. RANKIN
PROJECT MANAGER/SUPERVISOR: BILL FENWICK

ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS): VO Methods 8010 & 8020; Metals Method 6010; OR 7000 Series as Specified; IN SW-846

ITEM NO	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	VO Methods 8010 & 8020	Metals Method 6010	OR 7000 Series as Specified	IN SW-846					REMARKS
1	SCA	6/18			X	BROWN SILTY SAND	1 JAR	X	X							12 oz jar
2	STA	6/18			X	BROWN ORGANIC SILT/CLAY	1 JAR	X	X							
3	SBA	6/18			X	BROWN SILTY FINE GRAVEL	1 JAR	X	X							
4																
5																
6																
7																
8																
9																
10																

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	SCA, STA, SBA	Robt L. Smith	[signature]	6/18	
2	1-3		COOLER		
3	1-3	COOLER	Donita Jensen	6-19-93	0843
4					

REMARKS: 7 Days TAT (Melanie)

Robt L. Smith
SAMPLER'S SIGNATURE

A Subsidiary of Environmental Treatment and Technologies Corp.
The Environmental Services Company

LAB COPY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

VIA FACSIMILE AND
FIRST CLASS MAIL

REPLY TO THE ATTENTION OF:
HSRM-6J

May 6, 1993

Dr. James Campbell
Laskin Site Group Administrator
1709 S. Braddock Avenue
Pittsburgh, Pennsylvania 15218

RE: Residual Waste Management at the Laskin/Poplar Oil Site in Jefferson, Ohio

Dear Dr. Campbell:

In response to your letter dated April 13, 1993, the Agency has decided that the materials listed may be solidified by the method outlined by OHM Corporation in the attachment to the letter dated May 6, 1993 from Engineering-Science and deposited under the on-site cap. For record sampling, two composited representative samples must be collected to verify compliance with the TCLP characteristic test for organics and metals.

The following treatment residuals, incinerator scrubber media, incinerator baghouse bags, wastewater treatment plant (WWTP) oil sludge, WWTP filters, WWTP filter cake, WWTP activated carbon, and WWTP filtration sand are all considered RCRA waste considering the derived-from rule. RCRA waste F001-005, K001, and K035 were treated through the incinerator and WWTP on-site. Therefore, these treatment residuals are considered RCRA listed waste.

The decontaminated process tanks and hoses, and unused surfactant are not considered RCRA waste. These materials may be disposed of under the on-site cap. The process hoses and tanks and surfactant may be utilized in the stabilization procedure if desired by the Laskin Site Group. The Agency prefers this method since it will isolate all remaining remediation wastes to a specific location under the cap.

Under the Corrective Action Management Unit (CAMU) final rule (Federal Register, February 16, 1993, vol.58, No. 29), these RCRA wastes mentioned above are considered "remediation wastes" resulting from the corrective action taken at this Superfund site that had listed RCRA wastes on-site. Therefore, these remediation wastes can be placed under the on-site cap without attaining the LDR concentration standards.

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Solidifying the RCRA wastes under the on-site cap and obtaining record samples to verify compliance with the TCLP characteristic test will satisfy the substantive requirements of 264.552 (C) criteria for CAMU designation. The substantive requirements for design, closure, and post closure care are all addressed in the approved plans and specifications for the final remedy and the final inspection, maintenance and monitoring plan which will be finalized in the Summer of 1993.

If you have any questions, please feel free to call me at (312) 353-6756.

Sincerely,

Kathleen Warren

Kathleen Warren
Remedial Project Manager

cc: Richard Smith, OEPA
Eileen Fury, U.S. EPA, ORC

OHM Corporation

May 3, 1993

Mr. Peter Gelman
Project Manager
Engineering-Science
19101 Villaview Road
Suite 301
Cleveland, OH 44119

RE: PLACING THE WASTE MATERIALS FROM THE ROLLOFFS AND DRUMS NOW STORED AT THE LASKIN/POPLAR OIL COMPANY SITE IN JEFFERSON, OHIO INTO A CONCRETE MATRIX UNDER THE CAP

Dear Mr. Gelman:

OHM Remediation Services Corp. (OHM), a wholly owned subsidiary of OHM Corporation, appreciates the opportunity to provide Engineering-Science and the Laskin/Poplar Final Remediation Trust Fund with a lump sum bid for the above-referenced project. We have based our proposal on conversations with Kieth Rankin and our knowledge of the site and performance of similar projects.

SCOPE OF WORK

OHM, utilizing a four man crew will assign coordinates to mark a shallow area large enough to contain the 90 cubic yards of material stored on site plus an additional area to allow for 50 cubic yards of cement to be added.After this area has been delineated, it will be excavated. On completion of the excavation, OHM will empty the contents of all containers into the opening, (shredding the bag filters, personal protective clothing and other materials of a shredable nature, except metals) and mix this with a lean mix cement (using the Cat 235) to form a homogeneous mixture. This material will be visually tested for conformity, and then be allowed to cure for five days before being covered with a suitable fill. We estimate these tasks will take approximately ten days including mobilization and demobilization of additional personnel and equipment. OHM will decontaminate all of the containers and will handle the decontamination water in accordance with the specifications. The drums will then be placed back into the rolloffs containers. All tasks connected with this operation will be done in EPA level C protection with tyvek. Prior to the commencement of these tasks we will do a pilot test on the mix to insure that the TCLP leachate on lead of 5 Mg/l is met.

CONFIRMATION SAMPLES

OHM will collect a sample every ten yards and composite these at forty-five yards and again at 90 yards. These two samples will be analyzed for RCRA and D001...D043 characteristics. Should either or both of these samples not meet TCLP standards, the material will be restablized and the above procedure will be repeated until the material meets TCLP standards.

PRICING

CONCLUSION

We thank you for the opportunity to provide our field services. Should you have any questions please call me at 216-576-7515.

Sincerely,

William W. Fenwick
Project Superintendent
Midwest Region

pc: Proposal 104992-01

BEDDING SOIL

The bedding soil was sampled and tested as per the Specification before being brought to the site and periodically as specified. Included here in the appendix are the results of this analytical testing. This part of the appendix includes the following test results:

1. Classification - ASTM D2487
2. Atterberg Limits - Plastic Index, Liquid limit, Plasticity Index.
3. Grain-Size Analysis.
4. Applicable physical properties.
5. Standard and Modified Proctor compaction results.
6. Permeability results.
7. Chemical screening.
8. A list of in-place compaction results.
9. In-place permeability for Shelby Tube samples S-7 through S-11.

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
1	Bedding Soil	D+00,1+00	1	2	8/19/93	21	98.0	12.9	P
2	Bedding Soil	C+75,1+50	1	2	8/19/93	21	96.9	12.9	P
3	Bedding Soil	D+70,1+50	1	2	8/19/93	21	97.6	12.1	P
4	Bedding Soil	D+75,2+00	1	2	8/19/93	21	95.8	11.5	P
5	Bedding Soil	E+75,1+25	1	2	8/19/93	21	95.1	12.3	P
6	Bedding Soil	E+80,1+90	1	2	8/19/93	21	97.6	12.1	P
7	Bedding Soil	D+50,1+50	1	2	8/19/93	21	97.7	11.1	P
8	Bedding Soil	D+00,0+50	1	2	8/19/93	21	99.1	11.5	P
9	Bedding Soil	C+25,2+25	1	2	8/19/93	21	100.1	11.3	P
10	Bedding Soil	C+15,1+25	1	2	8/19/93	21	98.3	13.0	P
11	Bedding Soil	B+50,1+25	1	2	8/19/93	21	99.4	12.1	P
12	Bedding Soil	A+50,0+50	1	2	8/19/93	21	99.3	11.1	P
1	Bedding Soil	C+50,2+25	1	2	8/23/93	21	79.7	11.1	F
2	Bedding Soil	D+50,2+50	1	2	8/23/93	21	81.4	14.1	F
3	Bedding Soil	D+75,2+50	1	2	8/23/93	21	85.1	11.3	F
4	Bedding Soil	D+75,2+50	1	2	8/23/93	21	82.0	11.1	F
5	Bedding Soil	E+80,2+25	1	2	8/23/93	21	93.5	11.4	F
6	Bedding Soil	E+00,2+25	1	2	8/23/93	21	93.5	12.0	F
7	Bedding Soil	E+00,2+25	1	2	8/23/93	21	95.0	11.1	P
8	Bedding Soil	E+00,2+75	1	2	8/23/93	21	91.8	12.8	F
9	Bedding Soil	E+00,2+75	1	2	8/23/93	21	93.1	12.8	F
10	Bedding Soil	E+00,2+75	1	2	8/23/93	21	93.7	12.0	F
11	Bedding Soil	E+00,2+75	1	2	8/23/93	21	94.8	11.2	F
12	Bedding Soil	F+00,2+40	1	2	8/23/93	21	84.7	15.4	F
13	Bedding Soil	E+75,2+40	1	2	8/23/93	21	86.4	17.9	F
14	Bedding Soil	E+00,2+25	1	2	8/23/93	21	89.9	10.7	F
15	Bedding Soil	E+00,2+25	1	2	8/23/93	21	97.5	11.1	P
16	Bedding Soil	E+50,2+20	1	2	8/23/93	21	90.8	11.6	F
17	Bedding Soil	E+00,2+25	1	2	8/23/93	27	98.8	12.2	P
18	Bedding Soil	E+50,2+25	1	2	8/23/93	27	95.4	11.3	P
19	Bedding Soil	E+50,2+80	1	2	8/23/93	27	98.8	12.2	P
1	Bedding Soil	C+50,2+50	1	2	8/24/93	27	92.0	11.4	P
2	Bedding Soil	D+00,2+25	1	2	8/24/93	27	90.8	10.1	P
3	Bedding Soil	C+00,2+70	1	2	8/24/93	27	96.6	11.6	P
4	Bedding Soil	B+70,2+75	1	2	8/24/93	27	92.6	11.5	P
5	Bedding Soil	B+60,2+80	1	2	8/24/93	27	94.4	10.5	P

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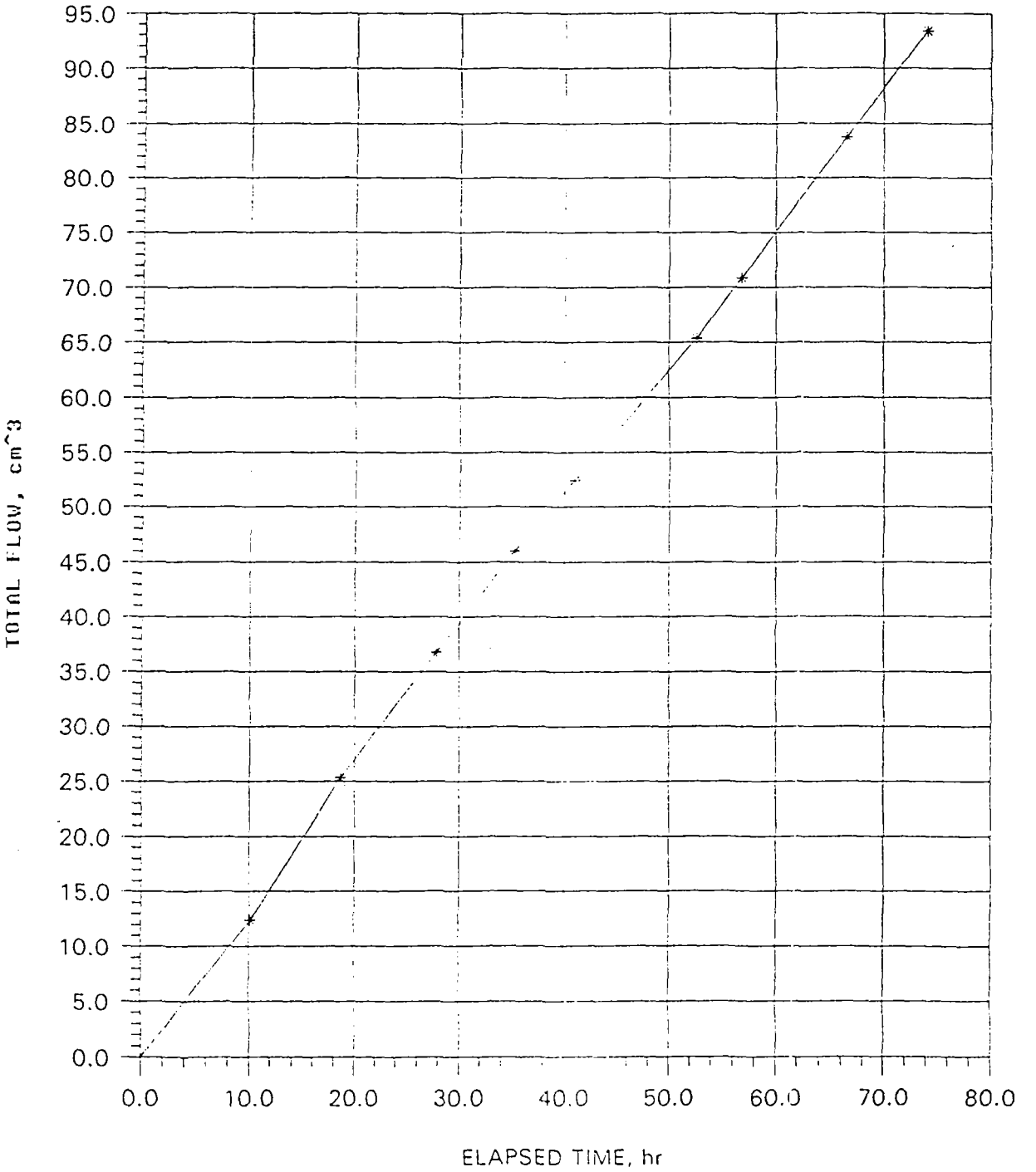
Client	OHM	Boring No.	NA
Client Project	LASKIN POPLAR	Depth(ft.)	NA
Project No.	93318	Sample No.	S-7

Visual Description BROWN SILTY CLAY WITH SAND (REMOLDED)

PERMEABILITY TEST

PERMEABILITY = 1.89E-07 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	08-20-93
Client Project	LASKIN POPLAR	Checked By		Date	8-25-93
Project No.	93318				
Boring No.	NA		Specific Gravity		2.70
Depth(ft.)	NA				ASSUMED
Sample No.	S-7				

Visual Description BROWN SILTY CLAY WITH SAND (REMOLDED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	90	1124
Wt. Tare & WS(gm.)	282.92	546.20
Wt. Tare & DS(gm.)	261.67	484.80
Wt. Water(gm.)	21.25	61.40
Wt. Tare(gm.)	100.98	84.98
Wt. DS(gm.)	160.69	399.82
Moisture Content(%)	13.22	15.36
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	806.10	NA
Wt. Of Tube(gms.)	0.00	NA
Wt. Of WS.(gms.)	806.10	821.3
Length 1 (in.)	3.649	3.623
Length 2 (in.)	3.663	3.594
Length 3 (in.)	3.616	3.590
Top Diameter (in.)	2.875	2.859
Middle Diameter (in.)	2.871	2.864
Bottom Diameter (in.)	2.866	2.863
Average Length (in)	3.64	3.60
Average Area (in^2)	6.47	6.43
Sample Volume(cc.)	386.35	379.76
Unit Wet Wt.(gms/cc)	2.09	2.16
Unit Wet Wt.(pcf.)	130.20	134.95
Unit Dry Wt.(pcf.)	114.99	116.98
Unit Dry Wt.(gms/cc)	1.84	1.87
Void Ratio,e	0.47	0.44
Porosity, n	0.32	0.31
Pore Volume(cm^3)	122.7	116.1

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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	08-20-93
Client Project	LASKIN POPLAR	Checked By	[illegible]	Date	8-25-93
Project No.	93318				
Boring No.	NA	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	S-7				
Visual Description	BROWN SILTY CLAY WITH SAND (REMOLDED)				

Pressures		Final Sample Dimensions	
Top Cap (psi)	25.0	Sample Length (in.)	3.60
Bottom Cap (psi)	30.0	Sample Diameter (in.)	2.86
Cell (psi)	35.0	Sample Area (in.^2)	6.43
Total Head (cm)	351.5		
		B Parameter	96%

TIME 1	0.0	hrs.	Permeability	2.20E-07	CM/SEC
TOTAL FLOW 1	0.0	cm^3	Avg. Test Temp	26.3	CELSIUS
TIME 2	74.1	hrs.	Permeability	1.89E-07	CM/SEC
TOTAL FLOW 2	93.4	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
08-20-93	22	20	0.0	12.9	12.9	0.0	0	NA
08-21-93	8	30	10.2	25.3	25.3	12.4	1	2.13E-07
08-21-93	14	0	10.2	0.9	0.9	12.4	0	NA
08-21-93	22	30	18.7	13.8	13.8	25.3	0	2.64E-07
08-22-93	7	40	27.8	25.3	25.3	36.8	0	2.19E-07
08-22-93	15	5	35.3	34.5	34.5	46.0	0	2.16E-07
08-22-93	20	45	40.9	40.9	40.9	52.4	0	1.98E-07
08-23-93	8	25	52.6	53.8	53.8	65.3	1	1.92E-07
08-23-93	18	15	52.6	56.1	56.1	65.3	0	NA
08-23-93	22	30	56.8	61.6	61.6	70.8	0	2.26E-07
08-24-93	8	10	66.5	74.5	74.5	83.7	0	2.32E-07
08-24-93	15	45	74.1	84.2	84.2	93.4	0	2.22E-07

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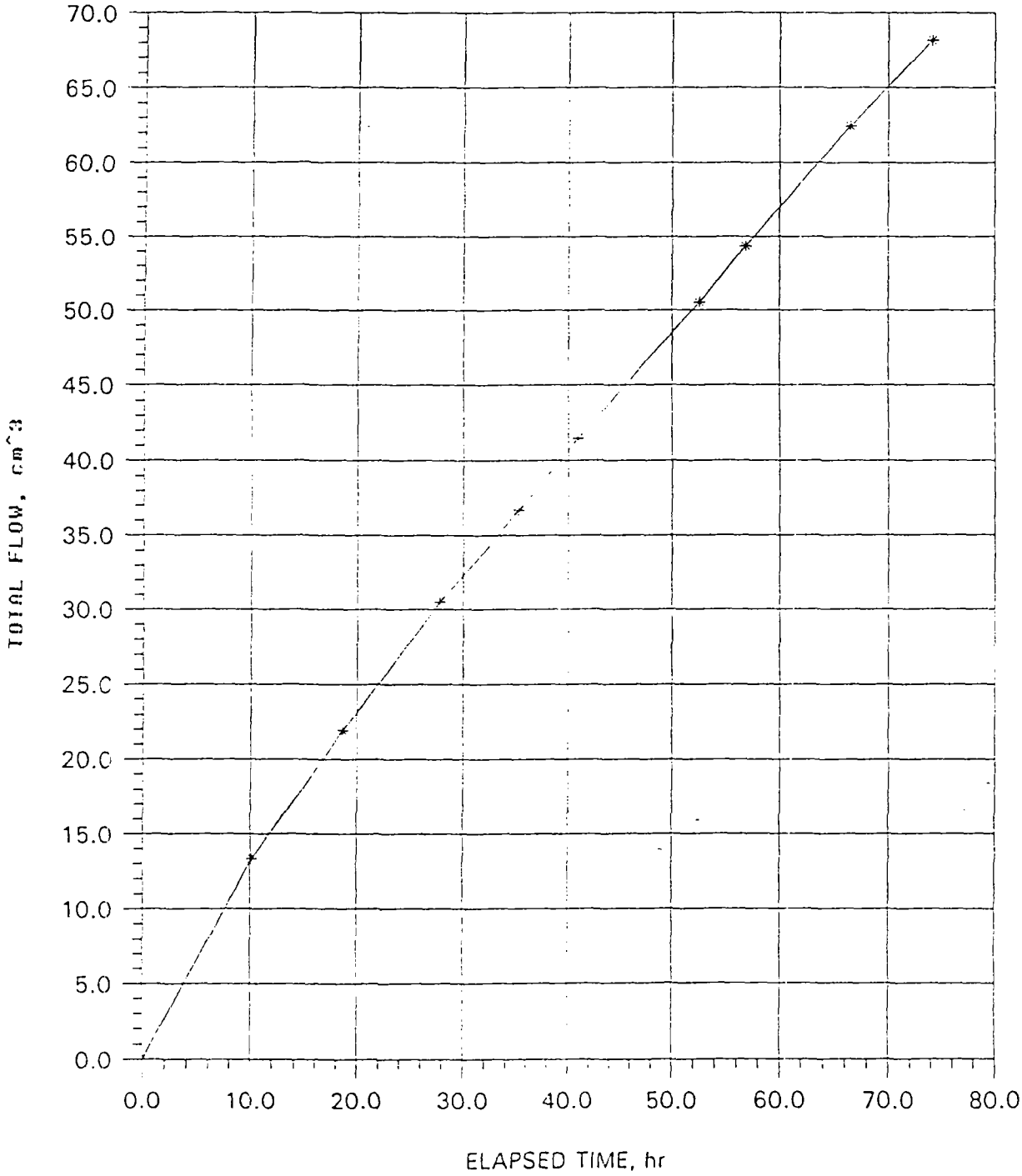
Client	OHM	Boring No.	NA
Client Project	LASKIN POPLAR	Depth(ft.)	NA
Project No.	93318	Sample No.	S8

Visual Description BROWN SILTY CLAY WITH SAND (REMOLDED)

PERMEABILITY TEST

PERMEABILITY = 1.60E-07 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	08-20-93
Client Project	LASKIN POPLAR	Checked By	TM	Date	8-25-93
Project No.	93318				
Boring No.	NA	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	S8				

Visual Description BROWN SILTY CLAY WITH SAND (REMOLDED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	1188	7
Wt. Tare & WS(gm.)	176.61	568.20
Wt. Tare & DS(gm.)	162.25	508.20
Wt. Water(gm.)	14.36	60.00
Wt. Tare(gm.)	33.75	75.23
Wt. DS(gm.)	128.50	432.97
Moisture Content(%)	11.18	13.86
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	913.80	NA
Wt. Of Tube(gms.)	0.00	NA
Wt. Of WS.(gms.)	913.80	935.9
Length 1 (in.)	4.175	4.069
Length 2 (in.)	4.076	4.122
Length 3 (in.)	4.101	4.107
Top Diameter (in.)	2.873	2.836
Middle Diameter (in.)	2.850	2.840
Bottom Diameter (in.)	2.860	2.844
Average Length (in)	4.12	4.10
Average Area (in^2)	6.43	6.33
Sample Volume(cc.)	433.75	425.54
Unit Wet Wt.(gms/cc)	2.11	2.20
Unit Wet Wt.(pcf.)	131.46	137.23
Unit Dry Wt.(pcf.)	118.25	120.53
Unit Dry Wt.(gms/cc)	1.89	1.93
Void Ratio,e	0.42	0.40
Porosity, n	0.30	0.28
Pore Volume(cm^3)	129.3	121.1

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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	08-20-93
Client Project	LASKIN POPLAR	Checked By	TM	Date	8-25-93
Project No.	93318				
Boring No.	NA	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	S8				
Visual Description	BROWN SILTY CLAY WITH SAND (REMOLDED)				

Pressures		Final Sample Dimensions	
Top Cap (psi)	25.0	Sample Length (in.)	4.10
Bottom Cap (psi)	30.0	Sample Diameter (in.)	2.84
Cell (psi)	35.0	Sample Area (in.^2)	6.33
Total Head (cm)	351.5		
		B Parameter	95%

TIME 1	0.0	hrs.	Permeability	1.85E-07	CM/SEC
TOTAL FLOW 1	0.0	cm^3	Avg. Test Temp	26.3	CELSIUS
TIME 2	74.1	hrs.	Permeability	1.60E-07	CM/SEC
TOTAL FLOW 2	68.1	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
08-20-93	22	20	0.0	3.3	3.3	0.0	0	NA
08-21-93	8	30	10.2	16.7	16.7	13.3	1	2.64E-07
08-21-93	14	0	10.2	0.5	0.5	13.3	0	NA
08-21-93	22	30	18.7	9.1	9.1	21.9	0	2.03E-07
08-22-93	7	40	27.8	17.6	17.6	30.5	0	1.88E-07
08-22-93	15	5	35.3	23.8	23.8	36.7	0	1.68E-07
08-22-93	20	45	40.9	28.6	28.6	41.5	0	1.69E-07
08-23-93	8	25	52.6	37.6	37.6	50.5	1	1.56E-07
08-23-93	18	15	52.6	35.3	35.3	50.5	0	NA
08-23-93	22	30	56.8	39.1	39.1	54.3	0	1.81E-07
08-24-93	8	10	66.5	47.2	47.2	62.4	0	1.69E-07
08-24-93	15	45	74.1	52.9	52.9	68.1	0	1.52E-07

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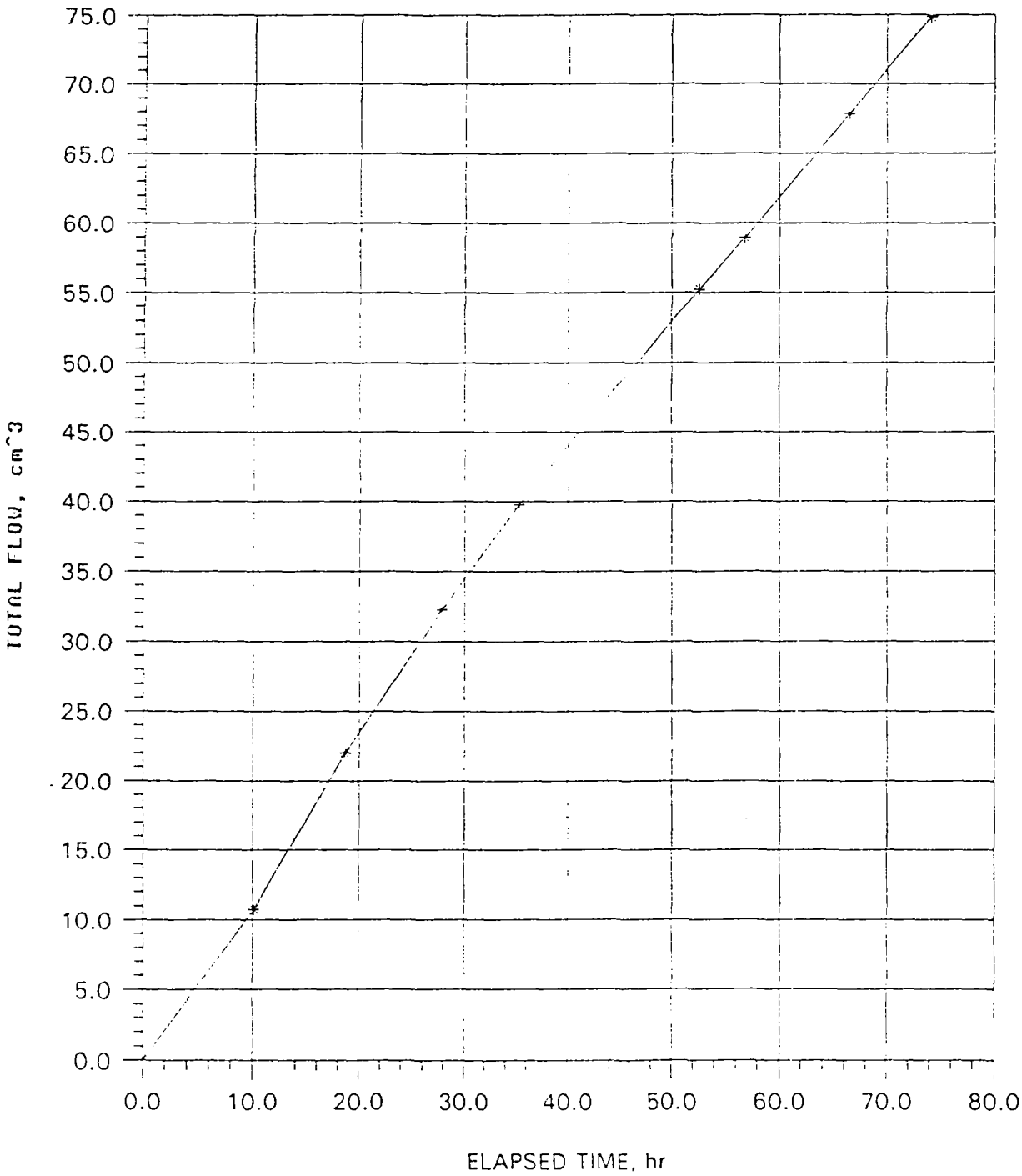
Client	OHM	Boring No.	NA
Client Project	LASKIN POPLAR	Depth(ft.)	NA
Project No.	93318	Sample No.	S9

Visual Description BROWN SILTY CLAY WITH SAND (REMOLDED)

PERMEABILITY TEST

PERMEABILITY = 1.72E-07 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	08-20-93
Client Project	LASKIN POPLAR	Checked By	EJM	Date	8-25-93
Project No.	93318				
Boring No.	NA	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	S9				

Visual Description BROWN SILTY CLAY WITH SAND (REMOLDED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	940	727
Wt. Tare & WS(gm.)	197.40	615.30
Wt. Tare & DS(gm.)	180.85	545.80
Wt. Water(gm.)	16.55	69.50
Wt. Tare(gm.)	38.93	85.63
Wt. DS(gm.)	141.92	460.17
Moisture Content(%)	11.66	15.10
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	879.50	NA
Wt. Of Tube(gms.)	0.00	NA
Wt. Of WS.(gms.)	879.50	906.6
Length 1 (in.)	4.156	4.099
Length 2 (in.)	4.145	4.011
Length 3 (in.)	4.126	3.988
Top Diameter (in.)	2.879	2.825
Middle Diameter (in.)	2.886	2.855
Bottom Diameter (in.)	2.853	2.858
Average Length (in)	4.14	4.03
Average Area (in^2)	6.48	6.36
Sample Volume(cc.)	439.95	420.39
Unit Wet Wt.(gms/cc)	2.00	2.16
Unit Wet Wt.(pcf.)	124.74	134.57
Unit Dry Wt.(pcf.)	111.71	116.91
Unit Dry Wt.(gms/cc)	1.79	1.87
Void Ratio,e	0.51	0.44
Porosity, n	0.34	0.31
Pore Volume(cm^3)	148.2	128.7

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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	08-20-93
Client Project	LASKIN POPLAR	Checked By	EJM	Date	8-25-93
Project No.	93318				
Boring No.	NA	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	S9				
Visual Description	BROWN SILTY CLAY WITH SAND (REMOLDED)				

Pressures		Final Sample Dimensions	
Top Cap (psi)	25.0	Sample Length (in.)	4.03
Bottom Cap (psi)	30.0	Sample Diameter (in.)	2.85
Cell (psi)	35.0	Sample Area (in.^2)	6.36
Total Head (cm)	351.5		
		B Parameter	95%

TIME 1	0.0	hrs.	Permeability	1.99E-07	CM/SEC
TOTAL FLOW 1	0.0	cm^3	Avg. Test Temp	26.3	CELSIUS
TIME 2	74.1	hrs.	Permeability	1.72E-07	CM/SEC
TOTAL FLOW 2	74.9	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
08-20-93	22	20	0.0	9.8	9.8	0.0	0	NA
08-21-93	8	30	10.2	20.6	20.6	10.8	1	2.09E-07
08-21-93	14	0	10.2	0.5	0.5	10.8	0	NA
08-21-93	22	30	18.7	11.7	11.7	22.0	0	2.61E-07
08-22-93	7	40	27.8	22.0	22.0	32.3	0	2.21E-07
08-22-93	15	5	35.3	29.5	29.5	39.8	0	1.99E-07
08-22-93	20	45	40.9	34.6	34.6	44.9	0	1.79E-07
08-23-93	8	25	52.6	44.9	44.9	55.2	1	1.74E-07
08-23-93	18	15	52.6	46.8	46.8	55.2	0	NA
08-23-93	22	30	56.8	50.5	50.5	59.0	0	1.74E-07
08-24-93	8	10	66.5	59.4	59.4	67.8	0	1.81E-07
08-24-93	15	45	74.1	66.4	66.4	74.9	0	1.83E-07

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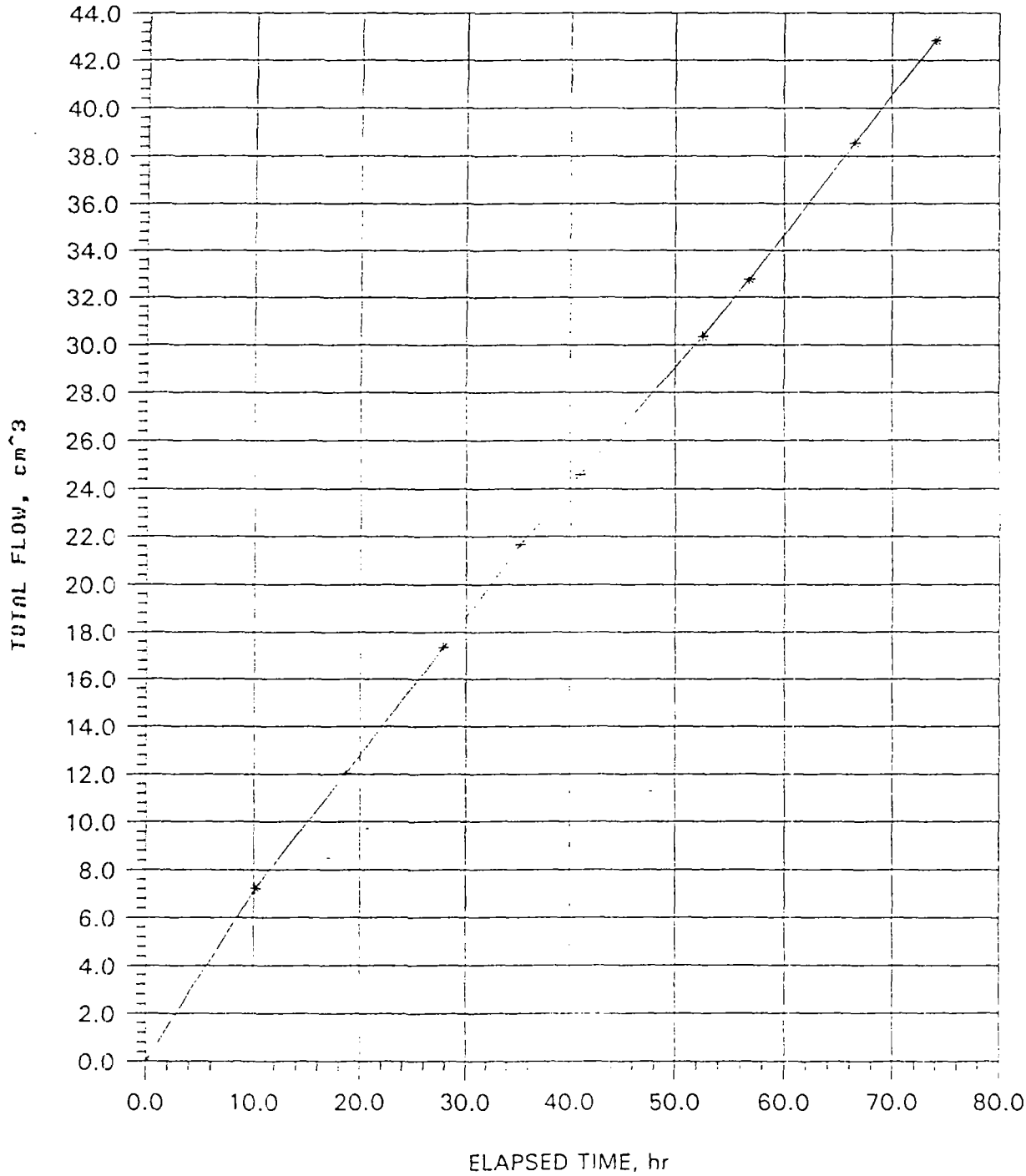
Client	OHM	Boring No.	NA
Client Project	LASKIN POPLAR	Depth(ft.)	NA
Project No.	93318	Sample No.	S10

Visual Description BROWN SILTY CLAY WITH SAND (REMOLDED)

PERMEABILITY TEST

PERMEABILITY = 1.01E-07 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	08-20-93
Client Project	LASKIN POPLAR	Checked By	[illegible]	Date	8-25-93
Project No.	93318				
Boring No.	NA		Specific Gravity		2.70
Depth(ft.)	NA				ASSUMED
Sample No.	S10				

Visual Description BROWN SILTY CLAY WITH SAND (REMOLDED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	1303	K13
Wt. Tare & WS(gm.)	251.21	528.50
Wt. Tare & DS(gm.)	236.10	471.70
Wt. Water(gm.)	15.11	56.80
Wt. Tare(gm.)	102.67	74.45
Wt. DS(gm.)	133.43	397.25
Moisture Content(%)	11.32	14.30
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	908.60	NA
Wt. Of Tube(gms.)	0.00	NA
Wt. Of WS.(gms.)	908.60	932.9
Length 1 (in.)	4.041	4.163
Length 2 (in.)	4.256	4.030
Length 3 (in.)	4.176	4.112
Top Diameter (in.)	2.883	2.837
Middle Diameter (in.)	2.875	2.839
Bottom Diameter (in.)	2.889	2.843
Average Length (in)	4.16	4.10
Average Area (in^2)	6.52	6.33
Sample Volume(cc.)	444.56	425.68
Unit Wet Wt.(gms/cc)	2.04	2.19
Unit Wet Wt.(pcf.)	127.53	136.75
Unit Dry Wt.(pcf.)	114.56	119.64
Unit Dry Wt.(gms/cc)	1.84	1.92
Void Ratio,e	0.47	0.41
Porosity, n	0.32	0.29
Pore Volume(cm^3)	142.3	123.4

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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	08-20-93
Client Project	LASKIN POPLAR	Checked By	EJM	Date	8-25-93
Project No.	93318				
Boring No.	NA	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	S10				
Visual Description	BROWN SILTY CLAY WITH SAND (REMOLDED)				

Pressures		Final Sample Dimensions	
Top Cap (psi)	25.0	Sample Length (in.)	4.10
Bottom Cap (psi)	30.0	Sample Diameter (in.)	2.84
Cell (psi)	35.0	Sample Area (in.^2)	6.33
Total Head (cm)	351.5		
		B Parameter	95%

TIME 1	0.0	hrs.	Permeability	1.17E-07	CM/SEC
TOTAL FLOW 1	0.0	cm^3	Avg. Test Temp	26.3	CELSIUS
TIME 2	74.1	hrs.	Permeability	1.01E-07	CM/SEC
TOTAL FLOW 2	42.9	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
08-20-93	22	20	0.0	8.2	8.2	0.0	0	NA
08-21-93	8	30	10.2	15.4	15.4	7.2	1	1.43E-07
08-21-93	14	0	10.2	1.9	1.9	7.2	0	NA
08-21-93	22	30	18.7	6.7	6.7	12.0	0	1.14E-07
08-22-93	7	40	27.8	12.0	12.0	17.3	0	1.16E-07
08-22-93	15	5	35.3	16.4	16.4	21.7	0	1.18E-07
08-22-93	20	45	40.9	19.3	19.3	24.6	0	1.03E-07
08-23-93	8	25	52.6	25.0	25.0	30.3	1	9.98E-08
08-23-93	18	15	52.6	26.5	26.5	30.3	0	NA
08-23-93	22	30	56.8	28.9	28.9	32.8	0	1.14E-07
08-24-93	8	10	66.5	34.7	34.7	38.5	0	1.20E-07
08-24-93	15	45	74.1	39.0	39.0	42.9	0	1.15E-07

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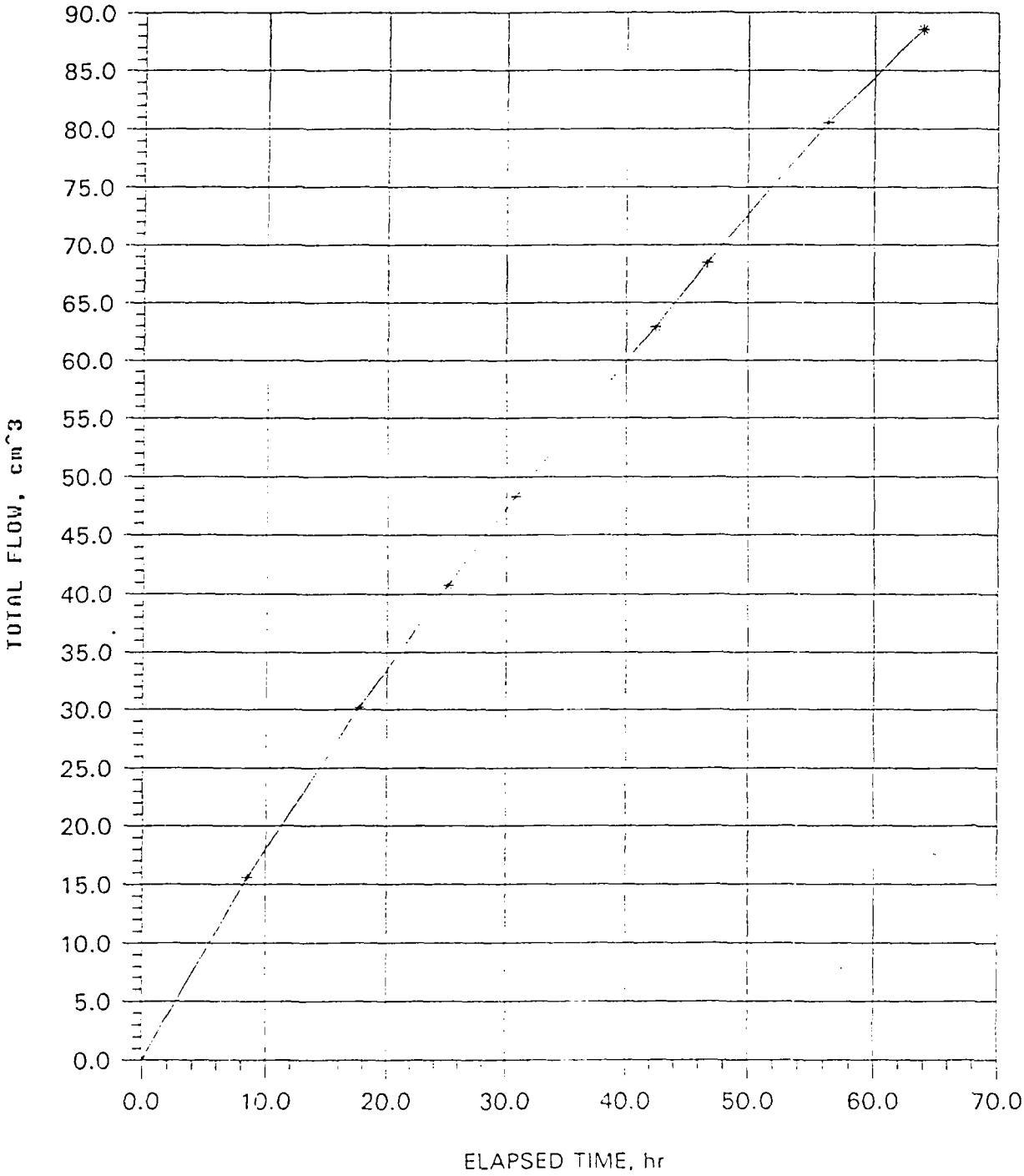
Client	OHM	Boring No.	NA
Client Project	LASKIN POPLAR	Depth(ft.)	NA
Project No.	93318	Sample No.	S11

Visual Description BROWN SILTY CLAY WITH SAND (REMOLDED)

PERMEABILITY TEST

PERMEABILITY = 2.42E-07 cm/sec



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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	08-20-93
Client Project	LASKIN POPLAR	Checked By		Date	8-25-93
Project No.	93318				
Boring No.	NA		Specific Gravity		2.70
Depth(ft.)	NA				ASSUMED
Sample No.	S11				

Visual Description BROWN SILTY CLAY WITH SAND (REMOLDED)

	BEFORE TEST	AFTER TEST
MOISTURE CONTENT		
Tare Number	1011	G
Wt. Tare & WS(gm.)	262.68	535.00
Wt. Tare & DS(gm.)	237.68	473.80
Wt. Water(gm.)	25.00	61.20
Wt. Tare(gm.)	43.23	73.58
Wt. DS(gm.)	194.45	400.22
Moisture Content(%)	12.86	15.29
UNIT WEIGHT		
Wt. Tube & WS.(gms.)	891.90	NA
Wt. Of Tube(gms.)	0.00	NA
Wt. Of WS.(gms.)	891.90	911.1
Length 1 (in.)	4.175	4.092
Length 2 (in.)	4.127	4.076
Length 3 (in.)	4.116	4.139
Top Diameter (in.)	2.881	2.828
Middle Diameter (in.)	2.882	2.828
Bottom Diameter (in.)	2.881	2.834
Average Length (in)	4.14	4.10
Average Area (in^2)	6.52	6.29
Sample Volume(cc.)	442.29	422.86
Unit Wet Wt.(gms/cc)	2.02	2.15
Unit Wet Wt.(pcf.)	125.83	134.45
Unit Dry Wt.(pcf.)	111.50	116.62
Unit Dry Wt.(gms/cc)	1.79	1.87
Void Ratio,e	0.51	0.44
Porosity, n	0.34	0.31
Pore Volume(cm^3)	149.6	130.2

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PERMEABILITY TEST

Client	OHM	Tested By	JCM	Date	08-20-93
Client Project	LASKIN POPLAR	Checked By	EJM	Date	8-25-93
Project No.	93318				
Boring No.	NA	Specific Gravity			2.70
Depth(ft.)	NA				ASSUMED
Sample No.	S11				
Visual Description	BROWN SILTY CLAY WITH SAND (REMOLDED)				

Pressures		Final Sample Dimensions	
Top Cap (psi)	25.0	Sample Length (in.)	4.10
Bottom Cap (psi)	30.0	Sample Diameter (in.)	2.83
Cell (psi)	35.0	Sample Area (in.^2)	6.29
Total Head (cm)	351.5		
		B Parameter	95%

TIME 1	0.0	hrs.	Permeability	2.81E-07	CM/SEC
TOTAL FLOW 1	0.0	cm^3	Avg. Test Temp	26.4	CELSIUS
TIME 2	63.9	hrs.	Permeability	2.42E-07	CM/SEC
TOTAL FLOW 2	88.6	cm^3	Corrected To	20.0	CELSIUS

DATE	TIME		ELAPSED TIME	BURETTE READINGS		TOTAL FLOW	FLOW 0 FLOW 1 STOP	PERMEABILITY
				INITIAL	FINAL			
mon-dy-yr	hr	min	hr	cm^3	cm^3	cm^3		cm^3/sec
08-21-93	14	0	0.0	0.0	0.0	0.0	0	NA
08-21-93	22	30	8.5	15.6	15.6	15.6	0	3.72E-07
08-22-93	7	40	17.7	30.2	30.2	30.2	0	3.23E-07
08-22-93	15	5	25.1	40.8	40.8	40.8	0	2.89E-07
08-22-93	20	45	30.8	48.3	48.3	48.3	0	2.70E-07
08-23-93	8	25	42.4	62.9	62.9	62.9	1	2.54E-07
08-23-93	18	15	42.4	65.4	65.4	62.9	0	NA
08-23-93	22	30	46.7	71.0	71.0	68.5	0	2.64E-07
08-24-93	8	10	56.3	83.1	83.1	80.5	0	2.54E-07
08-24-93	15	45	63.9	91.1	90.6	88.6	0	2.15E-07

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DATA SUMMARY REPORT

DATE: 06/28/93

PAGE: 1

Company: GHR REMEDIATION SERVICES CORPORATION

Sample Point ID:		SCA	STA	SDA
ASC Sample Number:		JK8016	JK8017	JK8018
Sample Date:		930618	930618	930618
Facility Code:		013988	013988	013988
Parameters	Units			
Halogenated Volatile Analysis, GC, (GV30)				
Bromoform	mg/kg	<.001	<.001	<.001
Bromomethane	mg/kg	<.001	<.001	<.001
Carbon tetrachloride	mg/kg	<.001	<.001	<.001
Chlorobenzene	mg/kg	<.001	<.001	<.001
Chlorodibromomethane	mg/kg	<.001	<.001	<.001
Chloroethane	mg/kg	<.001	<.001	<.001
2-Chloroethylvinyl ether	mg/kg	<.001	<.001	<.001
Chloroform	mg/kg	<.001	<.001	<.001
Chloromethane	mg/kg	<.001	<.001	<.001
1,2-Dichlorobenzene	mg/kg	<.001	<.001	<.001
1,3-Dichlorobenzene	mg/kg	<.001	<.001	<.001
1,4-Dichlorobenzene	mg/kg	<.001	<.001	<.001
Dichlorobromomethane	mg/kg	<.001	<.001	<.001
Dichlorodifluoromethane	mg/kg	<.001	<.001	<.001
1,1-Dichloroethane	mg/kg	<.001	<.001	<.001
1,2-Dichloroethane	mg/kg	<.001	<.001	<.001
1,1-Dichloroethylene	mg/kg	<.001	<.001	<.001
trans-1,2-Dichloroethene	mg/kg	<.001	<.001	<.001
1,2-Dichloropropane	mg/kg	<.001	<.001	<.001
cis-1,3-Dichloropropylene	mg/kg	<.001	<.001	<.001
trans-1,3-Dichloropropylene	mg/kg	<.001	<.001	<.001
Methylene chloride	mg/kg	<.001	<.001	<.001
1,1,2,2-Tetrachloroethane	mg/kg	<.001	<.001	<.001
Tetrachloroethylene	mg/kg	<.001	<.001	<.001
1,1,1-Trichloroethane	mg/kg	<.001	<.001	<.001
1,1,2-Trichloroethane	mg/kg	<.001	<.001	<.001
Trichloroethylene	mg/kg	<.001	<.001	<.001
Trichlorofluoromethane	mg/kg	<.001	<.001	<.001
Vinyl chloride	mg/kg	<.001	<.001	<.001
Benzene	mg/kg	<.001	<.001	<.001
Ethylbenzene	mg/kg	<.001	<.001	<.001
Toluene	mg/kg	<.001	<.001	<.001
Xylenes	mg/kg	<.001	<.001	<.001

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 2

To Bill Fenwick	From Bill Fitton
Co.	Co.
Dept.	Phone #
Fax #	Fax #

DATA SUMMARY REPORT

DATE: 06/28/93

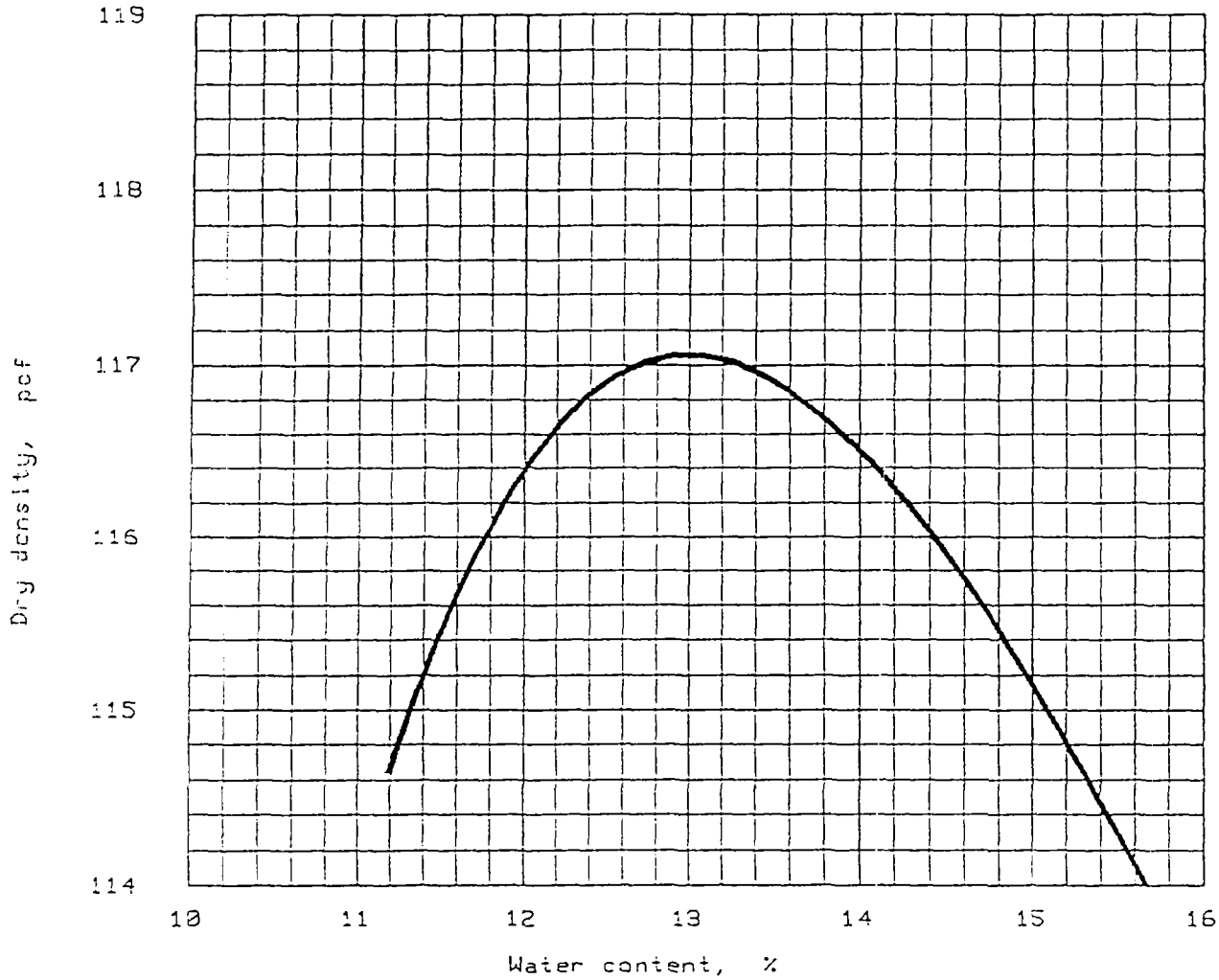
Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:		SCA	STA	SBA
ASC Sample Number:		JK8016	JK8017	JK8018
Sample Date:		930618	930618	930618
Facility Code:		013988	013988	013988
Parameters	Units			
RCRA Total Metals Analysis, (MB50)				
Arsenic	mg/kg	<5.00	<5.00	8.23
Barium	mg/kg	12.7	50.0	45.3
Cadmium	mg/kg	<1.00	<1.00	<1.00
Chromium	mg/kg	4.25	5.55	9.07
Lead	mg/kg	5.65	13.0	10.8
Mercury	mg/kg	<.050	<.050	<.050
Selenium	mg/kg	<.500	<.500	<.500
Silver	mg/kg	<1.00	<1.00	<1.00

PROCTOR TEST REPORT

FILE NO.: A93196X1
REPORT NO.: A-32

CURVE NO. 27



"Standard" Proctor, ASTM D 698, Method A

Elev/ Depth	Classification USCS	Classification AASHTO	Nat. Moist.	Sp.G.	LL	PI	% > No. 4	% < No. 200
			12.0 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 13.0 % Maximum dry density = 117.1 pcf	Brown sandy silt with clay, trace sandstone, shale and gravel.

Project No.: A93196x12
Project: Laskin Poplar Site
Location: Bedding soil from sidley

Date: 8-17-1993

Remarks:

Sample #SIDB-2

PROCTOR TEST REPORT

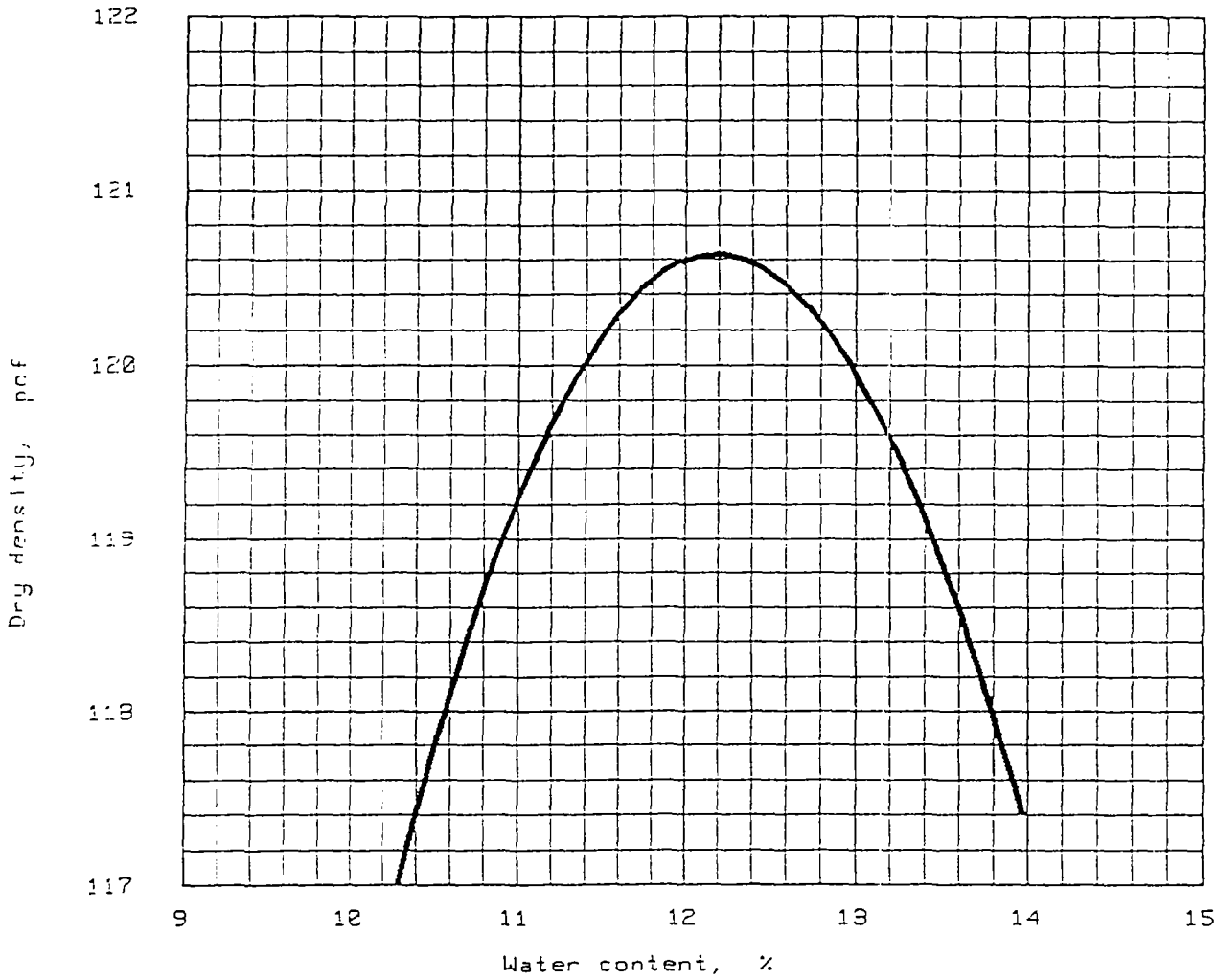
SOLAR TESTING LABORATORIES

Figure No. _____

FILE NO.: A93196X12
REPORT NO.: A-23

PROCTOR TEST REPORT

CURVE NO. 21



"Standard" Proctor, ASTM D 698, Method B

Elev/ Depth	Classification USCS	Classification AASHTO	Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in	% < No. 200
			11.6 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 12.2 % Maximum dry density = 120.6 pcf	Brown SANDY SILT AND CLAY, little gravel

Project No.: A93196x12
Project: Laskin\Poplar Site
Location: R.W. Sidley

Date 6-18-1993

Remarks:
Bedding
sample SIDB-1

PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-23
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	6-28-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 2

A sample of bedding material, identified as SIDB-1 from R.W. Sidley, was submitted to this laboratory for a material analysis. Following are the test results:

SIEVE SIZE	PARTICLE SIZE (mm)	PERCENT PASSING
3/8"	9.510	100.0
#4	4.750	92.3
#10	2.000	80.7
#20	0.850	68.3
#40	0.425	62.5
#100	0.150	54.2
#200	0.075	50.4
	0.032	40.5
	0.020	37.3
	0.012	30.8
	0.009	25.9
	0.006	22.7
	0.003	17.8
	0.001	13.0

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-23
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	6-28-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	2 OF 2

Percent Gravel	19.30
Percent Sand	30.30
Percent Silt	35.10
Percent Clay	15.30
Liquid Limit	27.00
Plastic Limit	20.00
Plasticity Index	7.00
Specific Gravity	2.63
Percent Moisture (As-received)	11.60
Classification	ML-CL

Permeabilty (k) - 8.18×10^{-8} cm/sec (Average of 4 readings) (performed at 95 percent of Standard Proctor Density and 3 percent above optimum moisture)

Standard Proctor - Maximum Dry Density - 120.6 pcf
Optimum Moisture - 12.2%

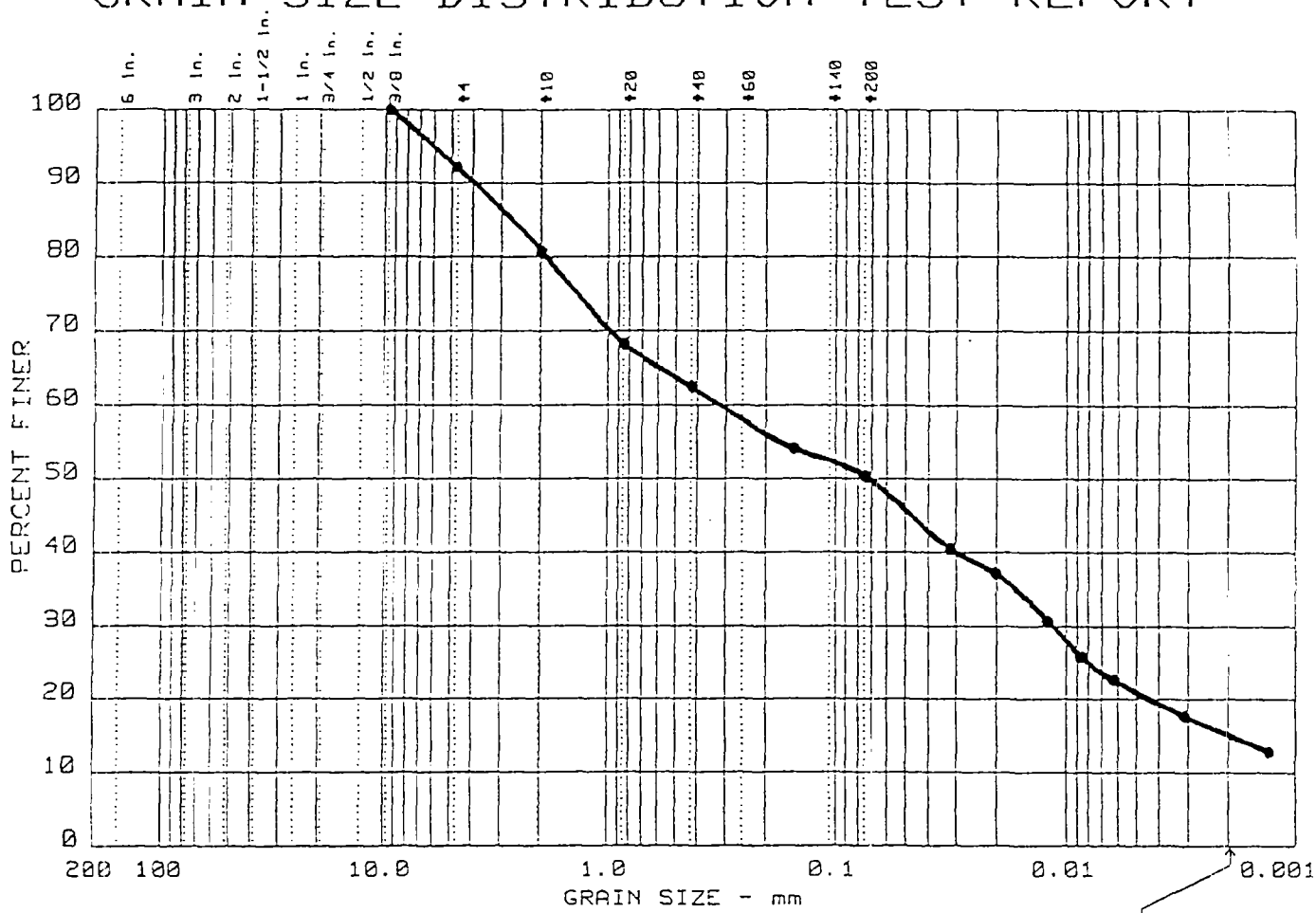
TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

Attachments (2)

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	9	0.0	19.3	30.3	35.1	15.3

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			2.66	0.31	0.07	0.011	0.0019			

MATERIAL DESCRIPTION	USCS	AASHTO
● Bedding sample SIDB-1		

Project No.: A93196x12
Project: Laskin\Poplar Site
● Location: R.W. Sidley

Date: 6-18-93

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

QA/QC FOR THE CAP

Included in this section of the QA/QC data submitted by New England Liner Systems for the cap installation. This part of the appendix includes the following data:

1. Certificate of installation.
2. Material identification lists.
3. As-built panel list.
4. Results of non-destructive testing of liner.
5. Results of destructive testing of liner.
6. List of liner seam repairs required.
7. Certificates of analysis for the Resin and Geomembrane.
8. Quality control test data for the Geo-Net material.
9. Certificate of Compliance for the 1145 filter fabric.

NEW ENGLAND LINER SYSTEMS, INC.

LASKIN / POPLAR OIL CO. SITE
JEFFERSON, OHIO

GEOSYNTHETIC COMPONENTS
AS BUILT AND QUALITY CONTROL DOCUMENTATION

FOR

OHM REMEDIATION SERVICES CORP.

NEW ENGLAND LINER SYSTEMS, INC.

36 WOOSTER COURT BRISTOL, CONNECTICUT 06010

(203) 583-6463

CERTIFICATION OF INSTALLATION

TO: OHM Remediation Services, Corp.
Midwest Region
Findlay, Ohio 45839

ATTN: Mr. Lawrence Hoffman
Project Manager

FROM: James E. Magnoli

PROJECT: Laskin / Poplar Oil Company Site
Jefferson, Ohio

GEOSYNTHETIC COMPONENTS: 40 mil HDPE Smooth Liner (NSC)
40 mil HDPE Textured Liner (NSC)
Geocomposite Drainage Net TN 3002 / 1145 (NSC)

INSTALLATION DATE: August 23, 1993 through September 1, 1993

This letter is to certify that the geosynthetic components installed at the above project, pursuant to your service purchase order ***0355672-0002***, dated April 20, 1993, were supplied and installed in accordance with the project plans and specifications, approved submittal data, and New England Liner Systems, Inc. published quality control procedures.

The surface on which the membrane liner was placed was inspected by our project representative and found to be free from extraneous material and suitable for liner deployment. The cover materials and placement methods were also found to be suitable, and should not have an adverse effect on the integrity of the geosynthetic components.

The enclosed manufacturers production, and field quality control data is provided herewith in support of this certification.

James E. Magnoli
Vice President
October 4, 1993

	MATERIAL DELIVERY		
	INVENTORY CHECKLIST		
DATE: 8/23/93			
PROJECT: LASKIN POPLAR			
LOCATION: JEFFERSON, OH			
PROJECT #:			
PRODUCT: 40 MIL TEX HDPE			
TRUCK #:			
BILL OF LADING:			
QC ID : JFS			
ROLL NUMBER	BATCH #	ROLL SIZE	DAMAGE/REMARKS
CO4F 2587-IL0520BA2	F2587	320	ROLL 1
CO4F66016-3G1606BA3	F6016	800	ROLL 2
C04F6016-3G1608BA3	F6016	830	ROLL 3
C04F6016-3G080GAA3	6016	730	ROLL 4
C04F6016-3G00807BA3	6016	815	ROLL 5
C04F6016-3G0804AA3	6016	785	ROLL 6
C04F5847-3G0803BA3	5847	640	ROLL 7
C04F215A-3C1406AA3	215 A	1093	ROLL 8 - NEW ROLL

MATERIAL DELIVERY
INVENTORY CHECKLIST

DATE: AUGUST 23, 1993
PROJECT: LASKIN POPLAR OIL
LOCATION: JEFFERSON, OHIO
PROJECT #: N/A
PRODUCT: 40 MIL HDPE SMOOTH
TRUCK #: N/A
BILL OF LADING: N/A
QC ID : JFS

ROLL NUMBER	BATCH #	ROLL SIZE	DAMAGE / REMARKS
C04L6016-3F0600141	6016	1670' x 15'	S-2
C04L5847-3F3000122	5847	1670' x 15'	S-3
C04L5847-3F3000132	5847	1670' x 15'	S-1
Co4L6016-3F0700031	6016	1670' x 15'	S-4

NEW ENGLAND LINER SYSTEMS

PANEL PLACEMENT FORM

PROJECT: LASKIN POPLAR

PRODUCT: 40 MIL TEX HDPE

LOCATION: JEFFERSON, OH

PROJECT #:

DATE/ TIME	PANEL NUMBER	ROLL NUMBER	PANEL LENGTH	PANEL WIDTH	COMMENTS PANEL\ LOCATION
23-Aug	T-1	T-1	122	15	N SLOPE
23-Aug	T-2		117	15	N.SLOPE -- WEST
23-Aug	T-3		76	15	MOVING WEST
23-Aug	T-4	T-2	28	15	BUTT SEAM MOVING WEST
23-Aug	T-5		88	15	W. ANCHOR TRENCH OF N. SLOPE
23-Aug	T-6		135	15	NEXT O T-1 EAST SIDE MOVING EAST
23-Aug	T-7		144	15	
23-Aug	T-8		155	15	
23-Aug	T-9		168	15	MOVING EAST
23-Aug	T-10		175	15	
23-Aug	T-11		181	15	
23-Aug	T-12		185	15	
23-Aug	T-13		187	15	
23-Aug	T-14		74	15	
23-Aug	T-15		121	15	
24-Aug	T-16	T-4	199	15	MOVING EAST N. SLOPE
24-Aug	T-17		201	15	
24-Aug	T-18		204	15	
24-Aug	T-19		76	15	
24-Aug	T-20	T-5	126	15	
24-Aug	T-21		197	15	MIDDLE OF N. SLOPE MOVING EAST
24-Aug	T-22		201	15	
24-Aug	T-23		195	15	
24-Aug	T-24		78	15	
24-Aug	T-25	T-6	110	15	MOVING EAST
25-Aug	T-26		188	15	
25-Aug	T-27		173	15	

DATE/ TIME	PANEL NUMBER	ROLL NUMBER	PANEL LENGTH	PANEL WIDTH	COMMENTS PANEL\ LOCATION
25-Aug	T-28		172	15	
25-Aug	T-29		48	15	
25-Aug	T-30	T-7	127	15	
25-Aug	T-31		157	15	MOVING EAST
25-Aug	T-32		152	15	
25-Aug	T-33		152	15	
25-Aug	T-34		144	15	MOVING EAST ON N. SLOPE RAN OUT OF TEX
27-Aug	T-35	T-8	133	15	
27-Aug	T-36		129	15	
27-Aug	T-37		121	15	
27-Aug	T-38		113	15	
27-Aug	T-39		106	15	
27-Aug	T-40		101	15	
27-Aug	T-41		93	15	
27-Aug	T-42		84	15	N.E. CORNER OF N. SLOPE 1/2 IN TRENCH

NEW ENGLAND LINER SYSTEMS
PANEL PLACEMENT FORM

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT #: N/A

PRODUCT: 40 MIL HDPE Smooth

DATE/ TIME	PANEL NUMBER	ROLL NUMBER	PANEL LENGTH	PANEL WIDTH	COMMENTS PANEL\ LOCATION
24-Aug	1	S-1	111'	15'	Northwest Tie In
24-Aug	2	S-1	109'	15'	Moving Eastward
24-Aug	3	S-1	35'	15'	Moving Eastward
24-Aug	4	S-1	56'	15'	moving Eastward
25-Aug	5	S-1	124'	15'	Moving Eastward
27-Aug	6	S-1	121'	15'	Measured West to East
27-Aug	7	S-1	247'	1-10'	Filler piece, middle of slope starts to NE corner to straighten line
27-Aug	1A	S-1	212	5' - 15'	
27-Aug	8	S-1	535'	15'	On flat moving south-Runs East to west
27-Aug	9	S-1	235'	15'	End of S-1
28-Aug	10	S-2	282'	15'	East End
28-Aug	11	S-2	532'	15'	
28-Aug	12	S-2	532'	15'	
28-Aug	13	S-2	306'	15'	West End
28-Aug	14	S-3	221'	15'	East End
28-Aug	15	S-3	534'	15'	
28-Aug	16	S-3	529'	15'	Moving South
30-Aug	17	S-4	527'	15'	
30-Aug	18	S-4	30'	6-8'	
30-Aug	19	S-4	114'	6-0'	

NEW ENGLAND LINER SYSTEMS
PANEL PLACEMENT FORM

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT #: N/A

PRODUCT: 40 MIL HDPE Smooth

DATE/ TIME	PANEL NUMBER	ROLL NUMBER	PANEL Length	PANEL WIDTH	COMMENTS PANEL\ LOCATION
30-Aug	20	S-1	263'	6-15'	Pie Piece
30-Aug	21	S-1	103'	6-0'	Pie Piece
30-Aug	22	S-1	350'	15'	
30-Aug	23	S-1	181'	15'	
30-Aug	24	S-1	531'	15'	Last Panel

NEW ENGLAND LINER SYSTEMS
PANEL SEAMING FORM

PROJECT: Laskin P
LOCATION: Jefferson, Ohio
PROJECT #: N/A

PRODUCT: 40 MIL HDPE Smooth

DATE/ TIME	SEAM NUMBER	SEAM LENGTH	SEAMER INITIALS	MACHINE NUMBER	DESTRUCTIVE TESTING TEMP SETTING	WEATHER	WINDS	AMBIENT TEMP	LOCATION / COMMENTS
24-Aug	1	311'	RC	1654	750	Sunny	Easterly	80	Tie In NW
24-Aug	1A	15'	RC	1654	750	Sunny	Eastrely	80	
24-Aug	1B	15'	RC	1654	750	Sunny	Easterly	80	
24-Aug	1C	15'	RC	1654	750	Sunny	Easterly	80	
25-Aug	1D	15'	RC	1654	750	Sunny	Easterly	80	
25-Aug	1	124'	RC	1654	750	Sunny	Easterly	80	
27-Aug	1	121'	RC	1654	750	Sunny	Easterly	80	South
27-Aug	1E	15'	RC	1654	750	Sunny	Easterly	80	North East End
27-Aug	2	247'	RC	1654	750	Sunny	Easterly	80	
27-Aug	2	212'	RC	1654	750	Sunny	Easterly	80	
27-Aug	3	494'	RC	1654	750	Sunny	Easterly	80	
28-Aug	4	532'	RC	1654	750	Sunny	Easterly	80	
28-Aug	4A	15'	RC	1654	750	Sunny	Easterly	80	
28-Aug	5	527'	RC	1654	750	Sunny	Easterly	80	
28-Aug	6	532'	RC	1654	750	Sunny	Easterly	80	
28-Aug	7	527'	RC	1654	750	Sunny	Easterly	80	
28-Aug	7A	15'	RC	1654	750	Sunny	Easterly	80	
28-Aug	8	527'	RC	1654	750	Sunny	Easterly	80	
28-Aug	9	529'	RC	1654	750	Sunny	Easterly	80	

NEW ENGLAND LINER SYSTEMS
PANEL SEAMING FORM

PROJECT: Laskin Poplar Oil
PRODUCT: 40 MIL HDPE S
LOCATION: Jefferson, Ohio
PROJECT #: N/A

					DESTRUCTIVE TESTING				
DATE/ TIME	SEAM NUMBER	SEAM LENGTH	SEAMER INITIALS	MACHINE NUMBER	TEMP SETTING	WEATHER	WINDS	AMBIENT TEMP	LOCATION / COMMENTS
30-Aug	12	517'	RC	1654	750	Clear	Light	80	
30-Aug	13	531'	RC	1654	750	Clear	Light	80	
30-Aug	11	353'	RC	1654	750	Clear	Light	85	
28-Aug	10	525'	RC	1654	750	Cloudy	Light	80	
28-Aug	11A	6'	RC	1654	750	Clear	Light	85	
28-Aug	11B	145'	RC	1654	750	Clear	Light	85	
28-Aug	12A	15'	RC	1654	750	Clear	Light	85	
28-Aug	11C	6'	RC	1654	750	Clear	Light	85	

NEW ENGLAND LINER SYSTEMS

PANEL SEAMING FORM

PROJECT: LASKIN POPLAR

PRODUCT: 40 MIL TEX HDPE

LOCATION: JEFFERSON, OH

PROJECT #:

DATE/ TIME	SEAM NUMBER	SEAM LENGTH	SEAMER INITIALS	MACHINE NUMBER	TEMP SETTING	WEATHER	WINDS	AMBIENT TEMP	DEST TEST	LOCATION / COMMENTS
24-Aug	T-1	117	RC	1654	750	OVERCAST	SLIGHT	70		
24-Aug	T-2	104	RC	1654	750	OVERCAST	SLIGHT	70		
24-Aug	T-2A	15	RC	1654	750	OVERCAST	SLIGHT	70		
24-Aug	T-3	88	RC	1654	750	OVERCAST	SLIGHT	70		
24-Aug	T-4	122	RC	1654	750	OVERCAST	SLIGHT	70		
24-Aug	T-5	135	RC	1654	750	OVERCAST	SLIGHT	70	P	DT-1
24-Aug	T-6	144	RC	1654	750	OVERCAST	SLIGHT	70		
24-Aug	T-7	155	RC	1654	750	OVERCAST	SLIGHT	70		
24-Aug	T-8	168	DB	1620	750	OVERCAST	SLIGHT	70		
24-Aug	T-9	175	RC	1654	750	OVERCAST	SLIGHT	70	P	DT-2
24-Aug	T-10	181	DB	1620	750	OVERCAST	SLIGHT	70		
24-Aug	T-11	185	DB	1620	750	OVERCAST	SLIGHT	70		
24-Aug	T-12	195	DB	1620	750	OVERCAST	SLIGHT	70	P	DT-3
24-Aug	T-12A	15	DB	1612	750	OVERCAST	SLIGHT	70		
24-Aug	T-14	199	RC	1654	750	OVERCAST	SLIGHT	70	P	DT-4
24-Aug	T-15	201	RC	1654	750	OVERCAST	SLIGHT	70		
24-Aug	T-16	202	RC	1654	750	OVERCAST	SLIGHT	78		
24-Aug	T-17	202	RC	1654	750	OVERCAST	SLIGHT	78		
24-Aug	T-16A	15	DB	1654	750	OVERCAST	SLIGHT	78		
24-Aug	T-18	197	RC	1654	750	OVERCAST	SLIGHT	78		
24-Aug	T-19	195	RC	1654	750	OVERCAST	SLIGHT	78		
24-Aug	T-20	188	RC	1654	750	OVERCAST	SLIGHT	78		
25-Aug	T-20A	15	RC	1654	750	OVERCAST	SLIGHT	78		
25-Aug	T-21	188	RC	1654	750	SUN/WARM	0	85		
25-Aug	T-22	173	RC	1654	750	SUN/WARM	0	85		
25-Aug	T-23	172	RC	1654	750	SUN/WARM	0	85		
25-Aug	T-24	172	RC	1654	750	SUN/WARM	0	85		

DATE/ TIME	SEAM NUMBER	SEAM LENGTH	SEAMER INITIALS	MACHINE NUMBER	TEMP SETTING	WEATHER	WINDS	AMBIENT TEMP	DEST TEST	LOCATION / COMMENTS
25-Aug	T-24A	15	RC	1654	750	SUN/WARM	0	85		
25-Aug	T-25	157	RC	1654	750	SUN/WARM	0	85		
25-Aug	T-26	152	RC	1654	750	SUN/WARM	0	85		
25-Aug	T-27	152	RC	1654	750	SUN/WARM	0	85		
25-Aug	T-28	144	RC	1654	750	SUN/WARM	0	85		
27-Aug	T-29	133	RC	1654	750	WARM/SUN	SLIGHT	75		
27-Aug	T-30	129	RC	1654	750	WARM/SUN	SLIGHT	75		
27-Aug	T-31	121	RC	1654	750	WARM/SUN	SLIGHT	75		
27-Aug	T-32	113	RC	1654	750	WARM/SUN	SLIGHT	75		
27-Aug	T-33	106	RC	1654	750	WARM/SUN	SLIGHT	75	DT-8	25'
27-Aug	T-34	101	RC	1654	750	WARM/SUN	SLIGHT	75		
27-Aug	T-35	93	RC	1654	750	WARM/SUN	SLIGHT	75		
27-Aug	T-36	84	RC	1654	750	WARM/SUN	SLIGHT	75		

NEW ENGLAND LINER SYSTEMS
NON-DESTRUCTIVE LOG

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT #: N/A

PRODUCT: 40 MIL HDPE Smooth

AIR TESTING DATA

DATE/ TIME	SEAM NUMBER	TESTER INITIALS	PRESSURE START	PRESSURE END	TIME PLUS/MIN	TIME START	TIME END	PASS/ FAIL	VBOX P / F	LOCATION / COMMENTS
30-Aug	10	GE	32	31	-1	11:05	11:10	P		
30-Aug	9	MN	N/A	N/A	N/A	N/A	N/A		P	
30-Aug	9	GE	35	34	-1	7:18	7:23	P		
30-Aug	9	MN	N/A	N/A	N/A	N/A	N/A		P	

NEW ENGLAND LINER SYSTEMS
NON-DESTRUCTIVE LOG

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT #: N/A

PRODUCT: 40 MIL HDPE Smooth

AIR TESTING DATA

DATE/ TIME	SEAM NUMBER	TESTER INITIALS	PRESSURE START	PRESSURE END	TIME PLUS/MIN	TIME START	TIME END	PASS/ FAIL	VBOX P / F	LOCATION / COMMENTS
28-Aug	8	GE	37	35	-2	11:26	11:31	P		From Cross Seam 308' to End of Seam
28-Aug	8	GE	35	33	-2	11:32	11:37	P		222'-308'
28-Aug	8	GE	35	35		11:54	11:59	P		0-222'
30-Aug	13	GE	33	32	-1	10:18	10:23	P		350'-End of Seam
30-Aug	12A	DQ	N/A	N/A	N/A	N/A	N/A		P	0-End of Seam
30-Aug	12	GE	35	33	-2	12:19	12:24	P		352'-End of Seam
30-Aug	13	GE	38	36	-2	10:03	10:08	P		6'-350'
30-Aug	13	DQ	N/A	N/A	N/A	N/A	N/A		P	0-6'
30-Aug	12	GE	37	35	-2	12:37	12:42	P		0-52'
30-Aug	12	DQ	N/A	N/A	N/A	N/A	N/A		P	252'-353'
30-Aug	11B	GE	35	34	-1	1:45	1:50	P		0-27'
30-Aug	11B	DQ	N/A	N/A	N/A	N/A	N/A		P	27'-30'
30-Aug	11B	GE	34	32	-2	1:26	1:31	P		30'-145'
30-Aug	11	GE	34	32	-2	1:00	1:05	P		128'-263'
30-Aug	11	GE	36	34	-2	1:50	1:55	P		0-32'
30-Aug	11	GE	39	37	-2	1:39	1:44	P		32'-128'
30-Aug	11	GE	35	33	-2	12:28	12:33	P		263'-End of Seam
30-Aug	10	GE	32	30	-2	11:00	11:05	P		97'-End of Seam

NEW ENGLAND LINER SYSTEMS
NON-DESTRUCTIVE LOG

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT #: N/A

PRODUCT: 40 MIL HDPE Smooth

AIR TESTING DATA

DATE/ TIME	SEAM NUMBER	TESTER INITIALS	PRESSURE START	PRESSURE END	TIME PLUS/MIN	TIME START	TIME END	PASS/ FAIL	VBOX P / F	LOCATION / COMMENTS
24-Aug	1	DQ	N/A	N/A	N/A	N/A	N/A		P	Tie in to North West slope 0-311'
24-Aug	1A	DQ	N/A	N/A	N/A	N/A	N/A		P	Cross Seam 15'
24-Aug	1B	DQ	N/A	N/A	N/A	N/A	N/A		P	Cross Seam 15'
24-Aug	1C	DQ	N/A	N/A	N/A	N/A	N/A		P	Cross Seam 15'
24-Aug	1D	DQ	N/A	N/A	N/A	N/A	N/A		P	Cross Seam 15'
24-Aug	1E	DQ	N/A	N/A	N/A	N/A	N/A		P	Cross Seam 15'
27-Aug	3	GE	30	30	N/A	2:25	2:30	P		0-End of Seam (494')
27-Aug	2	GE	N/A	N/A	N/A	N/A	N/A		P	0-End of Seam (247')
27-Aug	4	GE	35	33	-2	8:55	9:00	P		471'-End of Seam
27-Aug	4	GE	32	31	-1	8:48	8:53	P		388'-411'
28-Aug	4	GE	34	32	-2	8:46	8:51	P		257'-388'
28-Aug	4	GE	36	34	-2	9:04	9:09	P		0-257'
28-Aug	6	GE	34	32	-2	9:56	10:01	P		0-532' End of Seam
28-Aug	5	GE	36	34	-2	9:04	9:09	P		0-257'
28-Aug	4A	GE	N/A	N/A	N/A	N/A	N/A		P	Cross Seam 15'
28-Aug	5	GE	34	32	-2	8:46	8:51	P		257'-End of Seam
28-Aug	7	GE	35	34	-1	10:33	10:38	P		0-306'
28-Aug	7	GE	33	32	-1	10:45	10:50	P		306'-End of Seam
28-Aug	7A	GE	32	31	-1	10:38	10:43	P		Cross Seam 15'

NEW ENGLAND LINER SYSTEMS

NON-DESTRUCTIVE LOG

PROJECT: LASKIN POPLAR

MATERIAL: 40 MIL TEX HDPE

LOCATION: JEFFERSON, OH

PROJECT#:

AIR TESTING DATA

DATE/ TIME	SEAM NUMBER	TESTER INITIALS	PRESSURE START	PRESSURE END	TIME PLUS/MIN	TIME START	TIME END	PASS/ FAIL	VBOX P / F	LOCATION / COMMENTS
24-Aug	T-3	JFS	35	35		9:07	9:12	P		0' - 20'
24-Aug	T-3	JFS	30	30		9:07	9:12	P		20" - EOS (88')
24-Aug	T2A	JFS	V.BOX			V.BOX			P	CROSS SEAM
24-Aug	T2	JFS	27	26	-1	9:07	9:12	P		O' -28'
24-Aug	T2	JFS	34	33	-1	9:07	9:12	P		28'- EOS (104')
24-Aug	T1	JFS	32	30	-2	8:24	8:29	P		0' - EOS (117")
24-Aug	T4	JFS	35	33	-2	9:22	9:27	P		0' - EOS (122')
24-Aug	T5	JFS	32	29	-3	9:22	9.27	P		0' - EOS (135') DT-1 23'
24-Aug	T6	JFS	33	30	-3	9:51	9:56	P		0' - EOS (144')
24-Aug	T7	JFS	35	35		9:51	9:56	P		0' - EOS (155')
24-Aug	T8	JFS	35	35		10:30	10:35	P		0" - EOS (168')
24-Aug	T9	JFS	35	35		10:24	10:29	P		0' - EOS (175')
24-Aug	T10	JFS	35	33	-2	11:05	11:10	P		0'-72'
24-Aug	T10	JFS	V-BOX			V-BOX			P	72' - EOS (181')
24-Aug	T-11	JFS	35	35		10:55	11:00	P		0' - EOS (185')
24-Aug	T-12	JFS	35	35		11:33	11:38	P		0' - 121'
24-Aug	T-12	JFS	V-BOX			V-BOX		P		121' - 130'
24-Aug	T-12	JFS	30	30		11:35	11:40	P		130' - EOS (195')
24-Aug	T12-A	JFS	V-BOX			V-BOX			P	CROSS SEAM
24-Aug	T-13	JFS	35	35		11:40	11:45	P		121' - EOS
24-Aug	T-13	JFS	35	33	-2	11:40	11:45	P		0' - 118'
24-Aug	T-13	JFS	V-BOX			V-BOX			P	118' - 121'
24-Aug	T-16	JFS	35	35		12:30	12:35	P		0' - 126'
24-Aug	T-16	JFS	35	35		12:30	12:35	P		126' - EOX (202')
24-Aug	T-16A	JFS	V-BOX			V-BOX			P	
24-Aug	T-17	JFS	35	32	-3	12:38	12:43	P		0' -126'
24-Aug	T-17	JFS	35	35		12:38	12:43	P		0' - EOS (202')

DATE/ TIME	SEAM NUMBER	TESTER INITIALS	PRESSURE START	PRESSURE END	TIME PLUS/MIN	TIME START	TIME END	PASS/ FAIL	VBOX P / F	LOCATION / COMMENTS
24-Aug	T-14	JFS	V-BOX			V BOX			P	0' - 16'
24-Aug	T-14	JFS	35	35		11:59	12:04	P		16' -EOS (199')
24-Aug	T-15	JFS	35	35		11:59	12:04	P		0' - EOS (201')
24-Aug	T-18	JFS	V-BOX			V-BOX			P	0' - 27'
24-Aug	T-18	JFS	33	32	-1	2:23	2:28	P		27' - 61'
24-Aug	T-18	JFS	35	34	-1	2:42	2:47	P		61' -EOS (197')
24-Aug	T-19	JFS	35	33	-2	2:46	2:51	P		0'-EOS (195')
24-Aug	T-20	JFS	35	34	-1	2:54	2:59	P		0' -110'
24-Aug	T-20	JFS	35	33	-2	3:01	3:06	P		110' -EOS (188')
24-Aug	T-20A	JFS	V-BOX			V-BOX			P	CROSS SEAM
25-Aug	21	JFS	35	35		8:30	8:35	P		0' - 49'
25-Aug	21	JFS	35	35		8:30	8:35	P		49' -113'
25-Aug	21	JFS	V-BOX			V-BOX			P	113' -115'
25-Aug	21	JFS	V-BOX			V-BOX				116' -EOS (188')
25-Aug	22	JFS	35	35		8:54	8:59	P		0' -EOS (173')
25-Aug	23	JFS	35	35		8:56	9:01	P		0'-EOS (172')
25-Aug	24	JFS	35	35		9:18	9:23	P		0' -43'
25-Aug	24A	JFS	V-BOX			V-BOX		P		CROSS SEAM
25-Aug	T-24	JFS	35	35		9:18	9:23	P		48' - EOS (175')
25-Aug	T-25	JFS	34	31	-3	9:44	9:49	P		0' - 48'
25-Aug	T-25	JFS	35	35		9:44	9:49	P		48'-154'
25-Aug	T-25	JFS	V-BOX			V-BOX			P	154' -EOS (157')
25-Aug	T-26	JFS	35	34	-1	9:50	9:55	P		0'-EOS (152')
25-Aug	T-27	JFS	35	35		10:11	10:16	P		0' - 137'
25-Aug	T-27	JFS	V-BOX			V-BOX			P	137' -EOS' (152')
25-Aug	T-28	JFS	35	34	-1	10:22	10:27	P		0' - EOS (144')
27-Aug	T-29	JFS	30	29	-1	7:48	7.53	P		0' - 88'
27-Aug	T-29	JFS	V-BOX			V-BOX			P	88'-EOS (129')
27-Aug	T-30	JFS	V-BOX			V-BOX			P	115' - EOS (129')
27-Aug	T-30	JFS	35	32	-3	7:55	8:00	P		0' - 115'
27-Aug	T-31	JFS	35	35		8:18	8:23	P		0' - EOS (121')
27-Aug	T-32	JFS	35	31	-4	8:32	8:37	P		0' - 96'
27-Aug	T-32	JFS	V-BOX			V-BOX			P	96' - EOS (113')
27-Aug	T-33	JFS	35	33	-2	8:57	9:02	P		0' - EOS (106')

DATE/	SEAM	TESTER	PRESSURE		TIME			PASS/	VBOX	LOCATION /
TIME	NUMBER	INITIALS	START	END	PLUS/MIN	START	END	FAIL	P / F	COMMENTS
27-Aug	T-34	JPS	35	35		8:58	9:03	P		0' - 71'
27-Aug	T-34	JPS	V-BOX			V-BOX			P	71' - EOS (101')
27-Aug	T-35	JPS	35	32	-3	9:26	9:31	P		0' - EOS (93')
27-Aug	T-36	JPS	31	29	-2	9:29	9:34	P		0' - EOS (84')

NEW ENGLAND LINER SYSTEMS, INC.

35 WOOSTER COURT BRISTOL, CONNECTICUT 06010
(203) 583-5463

DESTRUCTIVE TEST DATA

LASKIN POPLAR OIL SITE
JEFFERSON OHIO

The following information was obtained from the destructive testing performed during liner installation, August 24 through August 30, 1993 .

Destructive testing was performed in accordance with ASTM Method 4437 as modified by NSF (1991) for bonded seam strength and seam peel adhesion. Destructive test samples were removed from the field seams in accordance with the project specifications. Field samples were die cut into ten 1" specimen. Five each were tested for bonded seam strength (shear) and seam peel adhesion (peel).

The following information is the resultant data obtained from the field testing. All samples exhibited a Film Tear Bond and were found to be in compliance with the project specifications.

Destructive Test Samples (DT s) # 1 thru 8 are for the textured material installed on slopes. DT # 's 9 thru 18 are for the smooth material installed.

Required properties for 40 mil HDPE seam strength are as follows:

Bonded Seam Strength	ASTM 4437, NSF mod.	80 ppi (shear)
Seam Peel Adhesion	ASTM 4437, NSF mod.	60 ppi & Film Tear Bond (peel)
Seam Peel Adhesion *(Extrusion Fillet Weld)*	ASTM 4437, NSF mod.	52 ppi & Film Tear Bond

NEW ENGLAND LINER SYSTEMS, INC.

35 WOOSTER COURT BRISTOL, CONNECTICUT 06010
(203) 583-6463

DESTRUCTIVE TEST DATA

LASKIN POPLAR OIL SITE
JEFFERSON OHIO

The following information was obtained from the destructive testing performed during liner installation, August 24 through August 30, 1993 .

Destructive testing was performed in accordance with ASTM Method 4437 as modified by NSF (1991) for bonded seam strength and seam peel adhesion. Destructive test samples were removed from the field seams in accordance with the project specifications. Field samples were die cut into ten 1" specimen. Five each were tested for bonded seam strength (shear) and seam peel adhesion (peel).

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Bonded Seam Strength	ASTM 4437, NSF mod.	80 ppi (shear)
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Seam Peel Adhesion *(Extrusion Fillet Weld)*	ASTM 4437, NSF mod.	52 ppi & Film Tear Bond

NEW ENGLAND LINER SYSTEMS
DESTRUCTIVE TEST LOG

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT# N/A

PRODUCT: 40 MIL HDPE Smooth

DATE	SAMPLE I. D.	SEAM NUMBER	MACHINE NUMBER	SEAMER INITIALS		DESTRUCTIVE TESTING Sample Number / Lbs per inch #1	#2	#3	#4	#5	PASS/ FAIL	DATE SENT	LAB PASS/ FAIL	LOCATION / COMMENTS
27-Aug	DT#9	1	1654	RC	PEEL	77/69	67/71	65/65	64/63	63/65	P			458'
					SHEAR	94	90	96	91	89	P			
28-Aug	DT#10	4	1654	RC	PEEL	73/87	74/82	67/78	69/79	74/83	P			229'
					SHEAR	107	112	109	109	110	P			
29-Aug	DT#11	6	1654	RC	PEEL	72/72	66/89	74/77	69/73	80/78	P			250'
					SHEAR	104	111	107	109	108	P			
29-Aug	DT#12	7	1654	RC	PEEL	84/83	79/81	84/80	79/83	78/76	P			244'
					SHEAR	112	111	94	115	108	P			
30-Aug	DT#13	8	1654	RC	PEEL	89/80	79/83	84/80	87/84	64/78	P			35
					SHEAR	112	108	115	117	105	P			
30-Aug	DT#14	9	1654	RC	PEEL	75/84	76/95	80/88	77/82	72/74	P			252
					SHEAR	115	112	120	110	90	P			
30 Aug	DT#15	10	1654	RC	PEEL	75/72	65/80	72/77	70/75	74/79	P			97
					SHEAR	104	102	109	110	94	P			
30-Aug	DT#16	11	1654	RC	PEEL	62/74	65/62	66/69	71/75	68/76	P			27'
					SHEAR	90	89	94	94	95	P			
30-Aug	DT#17	12	1654	RC	PEEL	70/69	63/70	63/75	67/63	73/63	P			156'
					SHEAR	91	89	89	93	92	P			

NEW ENGLAND LINER SYSTEMS
DESTRUCTIVE TEST LOG

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT# N/A

PRODUCT: 40 MIL HDPE Smooth

DESTRUCTIVE TESTING

DATE	SAMPLE I. D.	SEAM NUMBER	MACHINE NUMBER	SEAMER INITIALS		Sample Number / Lbs per inch #1	#2	#3	#4	#5	PASS/ FAIL	DATE SENT	LAB PASS/ FAIL	LOCATION / COMMENTS
30-Aug	DT#18	13	1654	RC	PEEL	81/71	78/63	84/74	70/64	73/69	P			162'
					SHEAR	89	91	91	95	97	P			

NEW ENGLAND LINER SYSTEMS, INC.

DESTRUCTIVE TEST LOG

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT NO.:

40 MIL TEXTURED HDPE

FIELD DESTRUCTIVE TESTING

DATE	SAMPLE I.D. #	SEAM NO.	MACH #	SEAMER INIT		LBS. PER INCH SAMPLE NUMBER #1	#2	#3	#4	#5	FIELD PASS/ FAIL	LAB TEST DATE	LAB PASS FAIL	LOCATION / COMMENTS
8-24	DT 1	T5	1654	R. Cook	PEEL	73 / 69	72 / 78	74 / 71	73 / 70	69 / 72	PASS	N/A	N/A	AT 23 FT
					SHEAR	110	111	115	109	112	PASS	N/A	N/A	
8-24	DT 2	T9	1654	R. Cook	PEEL	80 / 73	72 / 71	70 / 73	69 / 74	74 / 74	PASS	N/A	N/A	AT 143 FT
					SHEAR	100	107	109	106	103	PASS	N/A	N/A	
8-24	DT 3	T12	1620	D. Blier	PEEL	70 / 68	67 / 69	69 / 71	73 / 70	68 / 65	PASS	N/A	N/A	AT 37 FT
					SHEAR	101	107	109	106	100	PASS	N/A	N/A	
8-24	DT 4	T15	1654	R. Cook	PEEL	77 / 75	74 / 71	68 / 65	67 / 73	70 / 70	PASS	N/A	N/A	AT 1 FT
					SHEAR	109	111	105	107	110	PASS	N/A	N/A	
8-24	DT 5	T17	1654	R. Cook	PEEL	73 / 70	78 / 75	74 / 71	76 / 76	80 / 78	PASS	N/A	N/A	AT 27 FT
					SHEAR	115	111	107	114	109	PASS	N/A	N/A	
8-24	DT 6	T24	1654	R. Cook	PEEL	68 / 69	65 / 67	70 / 67	66 / 69	70 / 71	PASS	N/A	N/A	AT 40 FT
					SHEAR	101	106	103	100	98	PASS	N/A	N/A	
8-24	DT 7	T28	1654	R. Cook	PEEL	71 / 74	75 / 70	68 / 67	71 / 70	70 / 73	PASS	N/A	N/A	AT 19 FT
					SHEAR	100	98	104	109	99	PASS	N/A	N/A	
8-24	DT 8	T33	1654	R. Cook	PEEL	71 / 72	70 / 73	70 / 73	74 / 73	66 / 65	PASS	N/A	N/A	AT 25 FT
					SHEAR	104	101	103	104	103	PASS	N/A	N/A	
														ALL SAMPLES EXHIBIT
														A FILM TEAR BOND

NEW ENGLAND LINER SYSTEMS
REPAIR REPORT

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT #: N/A

PRODUCT: 40 MIL HDPE Smooth

REPAIR DATE	PANEL NUMBER	REPAIR CREW	MACHINE NUMBER	TEST DATE	TEST CREW	TEST P / F	LOCATION COMMENTS
30-Aug	P24/P22	BW/DC	# 1	30-Aug	DQ/MN	P	6' End of Seam #13
30-Aug	P17/P20-21	DB/DQ	# 1	30-Aug	DQ/MN	P	263' on Seam #11
30-Aug	P20	BW/DC	# 1	30-Aug	DQ/MN	P	27' down 1' off of Seam #11B (pipe)
30-Aug	P18/P20	BW/DC	# 1	30-Aug	DQ/MN	P	27' DT#16 on Seam #11B
30-Aug	P20/P18-19	DB/DQ	# 1	30-Aug	DQ/MN	P	30' at Cross Seam on Seam #11B
30-Aug	P17/P18-19	DB/DQ	# 1	30-Aug	DQ/MN	P	30' at Cross Seam on Seam #11
30-Aug	P17/P19-20	DB/DQ	# 1	30-Aug	DQ/MN	P	126' on Seam #11 in the corner
30-Aug	P17/P20-21	BW/DC	# 1	30-Aug	DQ/MN	P	263' on Seam #11
30-Aug	P16/P17	BW/DC	# 1	30-Aug	DQ/MN	P	97' DT#15 on Seam #10
30-Aug	P16/P15	BW/DC	# 1	30-Aug	DQ/MN	P	27' on SEam #9
30-Aug	P15/P16	DB/DQ	# 1	30-Aug	DQ/MN	P	252' DT#14 on Seam #9
30-Aug	P15/P16	BW/DC	# 1	30-Aug	DQ/MN	P	522' in Trench on Seam #9

NEW ENGLAND LINER SYSTEMS
REPAIR REPORT

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT #: N/A

PRODUCT: 40 MIL HDPE Smooth

REPAIR DATE	PANEL NUMBER	REPAIR CREW	MACHINE NUMBER	TEST DATE	TEST CREW	TEST P / F	LOCATION COMMENTS
30-Aug	P13-14/P12	BW/DC	# 1	28-Aug	DQ/MN	P	306' at Cross Seam
30-Aug	P12/P13	BW/DC	# 1	28-Aug	DQ/MN	P	244' DT#12 on SEan #7
30-Aug	P15/P13	BW/DC	# 1	28-Aug	DQ/MN	P	255' DT#13 on Seam #8
30-Aug	P15/P13	BW/DC	# 1	28-Aug	DQ/MN	P	222' on Seam #8
30-Aug	P13-14/P15	BW/DC	# 1	28-Aug	DQ/MN	P	308' at Cross Seam
30-Aug	P15	BW/DC	# 1	28-Aug	DQ/MN	P	510' Boot on panel 15
30-Aug	P15/P14	DB/DQ	# 1	30-Aug	DQ/MN	P	End of Seam #8
30-Aug	P12/P11	BW/DC	# 1	30-Aug	DQ/MN	P	End of Seam #6
30-Aug	P12/P14	DB/DQ	# 1	30-Aug	DQ/MN	P	End of Seam #7
30-Aug	P22/P24	DB/DQ	# 1	30-Aug	DQ/MN	P	6' on Seam #13
30-Aug	P22/P24	DB/DQ	# 1	30-Aug	DQ/MN	P	162' DT#18 on Seam #13
30-Aug	P24/P22-23	BW/DC	# 1	30-Aug	DQ/MN	P	350' at Cross Seam on Seam #13
30-Aug	P24/P23	DB/DQ	# 1	30-Aug	DQ/MN	P	End of Seam #13
30-Aug	P22/P20	DB/DQ	# 1	30-Aug	DQ/MN	P	156' DT#17 on Seam #12
30-Aug	P21/P23,17	DB/DQ	# 1	30-Aug	DQ/MN	P	End of Seam #11
30-Aug	P22-23/P21	DB/DQ	# 1	30-Aug	DQ/MN	P	336' at Cross Seam on Seam #12
30-Aug	P22/P21	DB,DQ	# 1	30-Aug	DQ/MN	P	323' on Seam #12
30-Aug	P22/P21	BW/DC	# 1	30-Aug	DQ/MN	P	283' on Seam #12
30-Aug	P22/P21-20	BW/DC	# 1	30-Aug	DQ/MN	P	252' on Seam #12

NEW ENGLAND LINER SYSTEMS

REPAIR REPORT

PROJECT: Laskin Poplar Oil

LOCATION: Jefferson, Ohio

PROJECT #: N/A

PRODUCT: 40 MIL HDPE Smooth

REPAIR DATE	PANEL NUMBER	REPAIR CREW	MACHINE NUMBER	TEST DATE	TEST CREW	TEST P / F	LOCATION COMMENTS
27-Aug	T35-34/P6	BW/DC	# 1	27-Aug	DQ/BK	P	437' at JCT of p6/T35-34 on Smooth Everything Measured West to East
27-Aug	T35-36/P6	BW/DC	# 1	27-Aug	DQ/BK	P	450' on Seam #1
27-Aug	T36/P6	BW/DC	# 1	27-Aug	DQ/BK	P	458' on Seam #1
27-Aug	T36-37/6	BW/DC	# 1	27-Aug	DQ/BK	P	466' on Seam #1
27-Aug	T42/P6	BW/DC	# 1	27-Aug	DQ/BK	P	550'-556 End of Seam
27-Aug	P7/P4	BW/DC	# 1	27-Aug	DQ/BK	P	29' on Seam#2
27-Aug	P4/P7	BW/DC	# 1	27-Aug	DQ/BK	P	70' on Seam #2
27-Aug	P6/P7	BW/DC	# 1	27-Aug	DQ/BK	P	201' on Seam #2
27-Aug	P6-7/P8	BW/DC	# 1	27-Aug	DQ/BK	P	465' JCT Seam #2-3
28-Aug	P7/P8	BW/DC	# 1	30-Aug	DQ/BK	P	349' on Seam #3
28-Aug	P7/P8	BW/DC	# 1	30-Aug	DQ/BK	P	0' Seam #2
28-Aug	P9/P8	BW/DC	# 1	30-Aug	DQ/BK	P	229' on Seam #4
28-Aug	P10-9/P8	BW/DC	# 1	30-Aug	DQ/BK	P	235' at Cross Seam
28-Aug	P9-10/11	BW/DC	# 1	30-Aug	DQ/BK	P	257' at Cross Seam
28-Aug	P10/P11	BW/DC	# 1	30-Aug	DQ/BK	P	388' on Seam #5
28-Aug	P10/P11	BW/DC	# 1	30-Aug	DQ/MN	P	471' on Seam #5
28-Aug	P10/P11	BW/DC	# 1	30-Aug	DQ/MN	P	519' on Seam #5
28-Aug	P11/P12	BW/DC	# 1	30-Aug	DQ/MN	P	250' DT#11 on Seam #6
28-Aug	P13	BW/DC	# 1	30-Aug	DQ/MN	P	282' Boot on Panel 13

NEW ENGLAND LINER SYSTEMS

REPAIR REPORT

PROJECT: LAKSIN POPLAR

PRODUCT:40 MIL TEX HDPE

LOCATION: JEFFERSON, OH

PROJECT #:

DATE	PANEL NUMBER	REPAIR DATE	REPAIR CREW	MACHINE NUMBER	TEST DATA	TEST CREW	TEST P / F	LOCATION COMMENTS
25-Aug	4,3/5	24-Aug	BW	U4		BK	P	20' CROSS SEAM
25-Aug	4,3	24-Aug	BW	U4		BK	P	EXT CROSS SEAM
25-Aug	2/4,3	24-Aug	BW	U4		BK	P	20' CROSS SEAM
25-Aug	6,7	24-Aug	BW	U4		BK	P	23' DT #1
25-Aug	7,8	24-Aug	BW	U4		BK	P	IN TRENCH
25-Aug	9,10	24-Aug	DC	U4		BK	P	IN TRENCH
25-Aug	10,11	24-Aug	DC	U4		BK	P	IN TRENCH
25-Aug	10,11	24-Aug	BW	U4		GE	P	143' DT #2
25-Aug	11,12	24-Aug	DC	U4		BK	P	72' V-BOX 72 - E
25-Aug	11,12	24-Aug	BW	U4		BK	P	154'
25-Aug	11,12	24-Aug	DC	U4		BK	P	165'
25-Aug	13,15	24-Aug	BW	U4		GE	P	37' DT #3
25-Aug	13/15,14	24-Aug	BW	# 1		BK	P	121' CROSS SEAM
25-Aug	13,14	24-Aug	MN	# 1		BK	P	135'
25-Aug	16/15,14	24-Aug	BW	U4		BK	P	121' CROSS SEAM
25-Aug	16,15	24-Aug	BW	U4		BK	P	117'
25-Aug	16,17	24-Aug	BW	U4		GE	P	16'
25-Aug	17,18	24-Aug	BW	# 1		GE	P	IN TRENCH
25-Aug	18/19,20	25-Aug	DC	# 1		GE	P	126' CROSS SEAM
25-Aug	20,21	25-Aug	DC	# 1		GE	P	30' DT #5
25-Aug	21/19,20	25-Aug	PT	# 1		GE	P	126' CROSS SEAM
25-Aug	21,19	25-Aug	DC	# 1		GE	P	IN TRENCH
25-Aug	21,22	25-Aug	DC	# 1		GE	P	IN TRENCH
25-Aug	21,22	25-Aug	PT	# 1		GE	P	IN TRENCH
25-Aug	21,22	25-Aug	DC	# 1		GE	P	61'
25-Aug	21,22	25-Aug	PT	# 1		GE	P	27"
25-Aug	23/25,24	25-Aug	DC	# 1		GE	P	11' CROSS SEAM

DATE	PANEL NUMBER	REPAIR DATE	REPAIR CREW	MACHINE NUMBER	TEST DATA	TEST CREW	TEST P / F	LOCATION COMMENTS
25-Aug	26,24	25-Aug	DC	# 1		GE	P	IN TRENCH
25-Aug	26,24	25-Aug	DC	# 1		GE	P	115'
25-Aug	26/24,25	25-Aug	PT	# 1		GE	P	CROSS SEAM
25-Aug	26,25	25-Aug	DC	# 1		GE	P	113'
25-Aug	26,25	25-Aug	PT	# 1		GE	P	49'
25-Aug	26,25	25-Aug	DC	# 1		GE	P	1'
25-Aug	28,30	25-Aug	PT	# 1		GE	P	40' DT #6
25-Aug	20,29/28	25-Aug	PT	# 1		GE	P	48' @ CROSS SEAM
25-Aug	29,30/31	25-Aug	PT	# 1		GE	P	48' @ CROSS SEAM
25-Aug	29,31	25-Aug	DC	# 1		GE	P	150' IN TRENCH
25-Aug	34,33	25-Aug	DC	# 1		GE	P	19' DT #7
25-Aug	3,2/T17	25-Aug	DC	# 1		GE	P	219' ON SEAM 1
25-Aug	1,2/T9	25-Aug	DC	# 1		GE	P	111' ON SEAM 1
25-Aug	2/T16	25-Aug	DC	# 1		GE	P	204' ON SEAM 1
25-Aug	5,4/T26,25	25-Aug	DC	# 1		GE	P	311' ON SEAM 1
25-Aug	4/T24	25-Aug	PT	# 1		GE	P	297' ON SEAM 1
27-Aug	35,34	27-Aug	BW/DC	# 1		BK	P	BEAD 32' - 37'
27-Aug	35,34	27-Aug	BW	# 1		BK	P	88'
27-Aug	35,34	27-Aug	BW	# 1		BK	P	92'
27-Aug	35,34	27-Aug	BW	# 1		BK	P	94'
27-Aug	35,34	27-Aug	DC	# 1		BK	P	118'
27-Aug	35,34	27-Aug	DC	# 1		BK	P	121'-133'
27-Aug	35,36	27-Aug	BW	# 1		BK	P	115'
27-Aug	35,36	27-Aug	BW	# 1		BK	P	117'
27-Aug	37,38	27-Aug	BW	# 1		BK	P	96'
27-Aug	38,39	27-Aug	DC	# 1		BK	P	25' DT #8
27-Aug	38,39	27-Aug	DC	# 1		BK	P	BEAD 92' - 95'
27-Aug	38,39	27-Aug	BW	# 1		BK	P	71'
27-Aug	39,40	27-Aug	BW	# 1		BK	P	75'-77'

NEW ENGLAND LINER SYSTEMS
TRIAL WELD INFORMATION

PROJECT: Laskin Poplar Oil
LOCATION: Jefferson, Ohio
PROJECT #: N/A

PRODUCT: 40 Mil HDPE Smooth

					EXTRUDER		FUSION WELDER				DESTRUCTIVE TESTING					
DATE /	AMBIENT	Q.C.	MACH	SEAMER	BARREL	PREHEAT	WEDGE	SPEED	SPEED		LBS/IN					PASS/
TIME	TEMP	INITIALS	NUMBER	INITIALS	TEMP	TEMP	TEMP	FT/MIN	SETTING							FAIL
27-Aug	74	JFS	1654	RC			750	15	75	PEEL	85/80	74/81	87/80			P
										SHEAR	105	106	105			P
27-Aug	75	JFS	#1	DC	455	6				PEEL	74	75	76			P
										SHEAR						
27-Aug	95	JFS	#1	DC	455	3.5				PEEL	68	65	63			P
										SHEAR						
28-Aug	71	JFS	1654	RC			750	15	75	PEEL	85/81	72/72	79/81			P
										SHEAR	103	105	106			P
28-Aug	71	JFS	#1	DC	455	4				PEEL	67	84	78			P
										SHEAR						
28-Aug	75	JFS	1620	JFS			750	15	75	PEEL	78/82	83/83	90/84			P
										SHEAR	104	105	110			
30-Aug	70	JFS	1654	RC			750	15	75	PEEL	85/88	78/79	83/89			P
										SHEAR	1123	109	108			P
30-Aug	70	JFS	#1	DC	455	4				PEEL	69	71	84			P
										SHEAR						
30-Aug	72	JFS	#3	DB	480	4				PEEL	63	70	69			P
										SHEAR						

NSC

GEOMEMBRANE CERTIFICATION

Customer: New England Liner

Ship Date: August 25, 1993

Project: Jefferson, OH

Number of Rolls Shipped: 1

Order Number: 3351-100

Nominal Thickness: 40 mil

We hereby certify that the resin and polyethylene geomembrane for the above identified shipment, meets or exceeds National Seal Company's specifications, below. The tests listed below in the resin specifications have been performed on each batch of resin. The tests listed below in the geomembrane specifications have been performed at least every 25,000 square feet of geomembrane.

BASE SHEET SPECIFICATIONS

Thickness	40.0 mil Minimum
Carbon Black Content	2.0 to 3.0%
Carbon Black Dispersion	A1 or A2

RESIN SPECIFICATIONS
(precompounded)

Melt Flow Index	1.0 Maximum
Density	0.94 Minimum
Carbon Black Content	2.0 to 3.0%

GEOMEMBRANE SPECIFICATIONS

Stress at Yield	2200 psi Minimum
Stress at Break	2200 psi Minimum
Strain at Yield	13% Minimum
Strain at Break	200% Minimum

Jane Allen

Jane Allen
Quality Control Manager

8-27-93

Date

NSC

August 27, 1993

GEOMEMBRANE CERTIFICATE OF ANALYSIS

Customer: New England Liner

Project: Jefferson, OH

Order Number: 3351-100

Number of Rolls Shipped: 1

Number of Rolls Tested: 1

Nominal Thickness: 40 mil

The geomembrane referenced above was tested for tensile properties. Tensile properties were tested according to ASTM D 638 using a type IV dumbbell specimen, a strain rate of two inches per minute and grip movement for strain determinations. The raw polymeric material used to manufacture the base sheet prior to friction coating contains not more than two percent clean reworked plastic by weight. The average test results are reported below.

Roll Number	S04F-215A-3C1406-AA3	
Stress at Yield (psi)	MD	3210
	TD	3150
Stress at Break (psi)	MD	3190
	TD	2560
Strain at Yield (percent)	MD	17
	TD	16
Strain at Break (percent)	MD	420
	TD	380

Jane Allen

Jane Allen
Quality Control Manager

NSC

July 28, 1993

TEX-NET CERTIFICATE OF ANALYSIS

Customer: New England Liner

Order Number: 3221-100

Project: Jefferson, OH

Type: TN3002/1145

Ship Date: July 27, 1993

Number of Rolls Shipped: 11

Bill of Lading(s): 01186

The Tex-Net referenced above was manufactured using first quality Poly-Net and Trevira. The Poly-Net meets all of National Seal Company's specifications for Poly-Net. The geotextile has been certified by Hoechst Celanese to meet all of their specifications for Trevira geotextiles.

The Tex-Net was tested for percent adhesion, ply adhesion strength and thickness according to National Seal Company's specifications. The values are reported on the following pages:

NATIONAL SEAL COMPANY

Jane Allen

Jane Allen
Quality Control Manager

07/28/93

TEX-NET QUALITY CONTROL TEST DATA

ORDER NUMBER: 6542 TYPE: TN3002/1128

DATE OF MANUFACTURE	ROLL NUMBER	PLY ADHESION (ppi) TOP	BOTTOM	PERCENT ADHESION TOP	BOTTOM	THICKNESS (inches)
07/22/93	3G2201B6	5.0 -	5.4	92 -	95	0.3777
	3G2204B6	2.4 -	3.5	97 -	96	0.4702
	3G2206B6	2.2 -	3.5	99 -	96	0.4757
	3G2208B6	3.2 -	3.1	99 -	96	0.4565
	3G2210B6	4.1 -	3.6	99 -	96	0.4748
07/23/93	3G2301B6	2.1 -	3.3	96 -	97	0.4779
	3G2303B6	2.1 -	2.6	99 -	95	0.4787
	3G2305B6	1.9 -	1.9	99 -	95	0.4793
	3G2307B6	1.7 -	2.1	99 -	95	0.4743
	3G2309B6	1.8 -	2.9	99 -	96	0.4841
	3G2311B6	2.0 -	2.6	99 -	95	0.4903
	3G2313B6	2.7 -	1.9	96 -	98	0.4604
07/24/93	3G2401B6	4.0 -	2.4	99 -	95	0.4702
	3G2403B6	1.8 -	2.4	99 -	96	0.4595
	3G2405B6	1.5 -	3.4	94 -	97	0.4770
	3G2407B6	2.6 -	1.4	93 -	93	0.4600
	3G2409B6	2.0 -	3.2	98 -	98	0.4632
	3G2411B6	2.2 -	1.3	97 -	97	0.4633
	3G2413B6	2.6 -	3.3	97 -	96	0.4539

07/28/93

CORRELATION OF POLY-NET AND TREVIRA NUMBERS
FOR JOB NUMBER - 6542

TEXNT NUM	MFG DATE	NET NUM	MFG DATE	TREVIRA 1	TREVIRA 2
3G2201B6	07/22/93	3G1509-4	07/15/93	21149723	21149641
3G2202B6	07/22/93	3G1509-4	07/15/93	21149723	21149641
3G2203B6	07/22/93	3G0909-4	07/09/93	21176017	21176021
3G2204B6	07/22/93	3G0909-4	07/09/93	21176017	21176021
3G2205B6	07/22/93	3G0909-4	07/09/93	21176017	21176021
3G2206B6	07/22/93	3G1023-4	07/10/93	21176020	21176042
3G2207B6	07/22/93	3G1023-4	07/10/93	21176020	21176042
3G2208B6	07/22/93	3G1022-4	07/10/93	21176019	21176048
3G2209B6	07/22/93	3G1022-4	07/10/93	21176019	30076048
3G2210B6	07/22/93	3G1612-4	07/16/93	21176041	21176016
3G2211B6	07/22/93	3G1612-4	07/16/93	21176041	21176016
3G2212B6	07/22/93	3G0823-4	07/08/93	21176045	21176046
3G2301B6	07/23/93	3G0823-4	07/08/93	21176045	21176046
3G2302B6	07/23/93	3G1429-4	07/14/93	21176044	21176049
3G2303B6	07/23/93	3G0903-4	07/09/93	21176044	21176049
3G2304B6	07/23/93	3G0903-4	07/09/93	21176047	21176037
3G2305B6	07/23/93	3G0904-4	07/09/93	21176047	21176037
3G2306B6	07/23/93	3G0904-4	07/09/93	211076040	211076050
3G2307B6	07/23/93	3G1025-4	07/10/93	211076040	211076050
3G2308B6	07/23/93	3G1025-4	07/10/93	211076043	211076038
3G2309B6	07/23/93	3G1026-4	07/10/93	211076043	211076038
3G2310B6	07/23/93	3G1026-4	07/10/93	211076028	211076034
3G2311B6	07/23/93	3G1101-4	07/11/93	211076028	211076034
3G2312B6	07/23/93	3G1101-4	07/11/93	211076026	211076036
3G2313B6	07/23/93	3G1104-4	07/11/93	211076026	211076036
3G2314B6	07/23/93	3G1104-4	07/11/93	211076035	211076022
3G2401B6	07/24/93	3G1103-4	07/11/93	211076035	211076022
3G2402B6	07/24/93	3G1103-4	07/11/93	211076032	211076024
3G2403B6	07/24/93	3G0902-4	07/09/93	211076032	211076024
3G2404B6	07/24/93	3G0902-4	07/09/93	211076032	211076024
3G2405B6	07/24/93	3G0902-4	07/09/93	211076025	211076033
3G2406B6	07/24/93	3G1009-4	07/10/93	211076025	211076033
3G2407B6	07/24/93	3G1009-4	07/10/93	211076023	211076027
3G2408B6	07/24/93	3G0905-4	07/09/93	211076023	211076027
3G2409B6	07/24/93	3G0905-4	07/09/93	211076031	211076030
3G2410B6	07/24/93	3G1020-4	07/10/93	211076031	211076030
3G2411B6	07/24/93	3G1020-4	07/10/93	211076012	211076010
3G2412B6	07/24/93	3G0916-4	07/09/93	211076012	211076010
3G2413B6	07/24/93	3G0916-4	07/09/93	211076052	211076058
3G2414B6	07/24/93	3G1014-4	07/10/93	211076052	211076058

POLY-NET QUALITY CONTROL TEST DATA

DATE	BATCH NUMBER	ROLL NUMBER	AVERAGE THICKNESS (inches)	TENSILES MD (ppi)	WEIGHT (lbs/ft2)
07/08/93	7300	3G0804-4	0.2278	56.2	0.1893
	7300	3G0809-4	0.2274	59.7	0.1906
	7300	3G0816-4	0.2265	56.6	0.1893
	7300	3G0822-4	0.2259	56.5	0.1894
	7300	3G0826-4	0.2244	53.7	0.1846
	7300	3G0830-4	0.2241	56.2	0.1862
	7300	3G0834-4	0.2232	55.5	0.1845
07/09/93	7300	3G0904-4	0.2240	54.6	0.1879
	7300	3G0908-4	0.2235	56.9	0.1835
	7300	3G0912-4	0.2270	56.8	0.1846
	7300	3G0916-4	0.2253	58.7	0.1885
	7300	3G0920-4	0.2256	57.7	0.1875
	7300	3G0925-4	0.2257	55.9	0.1880
07/10/93	7300	3G1003-4	0.2273	56.5	0.1876
	7300	3G1007-4	0.2288	55.5	0.1917
	7300	3G1011-4	0.2260	55.6	0.1822
	7300	3G1015-4	0.2260	55.7	0.1831
	7300	3G1019-4	0.2246	56.6	0.1895
	7300	3G1023-4	0.2253	54.6	0.1868
	7300	3G1026-4	0.2273	55.4	0.1919
07/11/93	7300	3G1104-4	0.2280	56.4	0.1919
	7300	3G1108-4	0.2263	50.7	0.1867
	7300	3G1112-4	0.2290	53.4	0.1908
	7300	3G1116-4	0.2247	57.2	0.1895
	7300	3G1123-4	0.2233	57.5	0.1898
	7298	3G1130-4	0.2267	58.7	0.1895
07/14/93	7298	3G1405-4	0.2260	56.7	0.1898
	7298	3G1412-4	0.2273	56.7	0.1915
	7298	3G1419-4	0.2259	56.8	0.1889
	5850	3G1426-4	0.2174	58.8	0.2128
	5850	3G1433-4	0.2349	74.4	0.2421
07/15/93	5850	3G1501-4	0.2352	73.5	0.2392
	5850	3G1505-4	0.2336	73.5	0.2443
	5850	3G1509-4	0.2365	78.7	0.2487
	5850	3G1513-4	0.2392	75.0	0.2559
07/16/93	5850	3G1604-4	0.2375	77.2	0.2502
	5850	3G1608-4	0.2329	72.6	0.2480
	5850	3G1612-4	0.2382	82.1	0.2545

NSC

July 27, 1993

TEX-NET CERTIFICATE OF ANALYSIS

Customer: New England Liner

Order Number: 3221-100

Project: Jefferson, OH

Type: TN3002/1145

Ship Date: July 26, 1993

Number of Rolls Shipped: 12

Bill of Lading(s): 01168

The Tex-Net referenced above was manufactured using first quality Poly-Net and Trevira. The Poly-Net meets all of National Seal Company's specifications for Poly-Net. The geotextile has been certified by Hoechst Celanese to meet all of their specifications for Trevira geotextiles.

The Tex-Net was tested for percent adhesion, ply adhesion strength and thickness according to National Seal Company's specifications. The values are reported on the following pages:

NATIONAL SEAL COMPANY

Jane Allen

Jane Allen
Quality Control Manager

07/27/93

TEX-NET QUALITY CONTROL TEST DATA

ORDER NUMBER: 6542 TYPE: TN3002/1128

DATE OF MANUFACTURE	ROLL NUMBER	PLY ADHESION (ppi) TOP	BOTTOM	PERCENT ADHESION TOP	BOTTOM	THICKNESS (inches)
07/22/93	3G2201B6	5.0 -	5.4	92 -	95	0.3777
	3G2204B6	2.4 -	3.5	97 -	96	0.4702
	3G2206B6	2.2 -	3.5	99 -	96	0.4757
	3G2208B6	3.2 -	3.1	99 -	96	0.4565
	3G2210B6	4.1 -	3.6	99 -	96	0.4748
07/23/93	3G2301B6	2.1 -	3.3	96 -	97	0.4779
	3G2303B6	2.1 -	2.6	99 -	95	0.4787
	3G2305B6	1.9 -	1.9	99 -	95	0.4793
	3G2307B6	1.7 -	2.1	99 -	95	0.4743
	3G2309B6	1.8 -	2.9	99 -	96	0.4841
	3G2311B6	2.0 -	2.6	99 -	95	0.4903
	3G2313B6	2.7 -	1.9	96 -	98	0.4604
07/24/93	3G2401B6	4.0 -	2.4	99 -	95	0.4702
	3G2403B6	1.8 -	2.4	99 -	96	0.4595
	3G2405B6	1.5 -	3.4	94 -	97	0.4770
	3G2407B6	2.6 -	1.4	93 -	93	0.4600
	3G2409B6	2.0 -	3.2	98 -	98	0.4632
	3G2411B6	2.2 -	1.3	97 -	97	0.4633
	3G2413B6	2.6 -	3.3	97 -	96	0.4539

07/27/93

CORRELATION OF POLY-NET AND TREVIRA NUMBERS
FOR JOB NUMBER - 6542

TEXNT NUM	MFG DATE	NET NUM	MFG DATE	TREVIRA 1	TREVIRA 2
3G2201B6	07/22/93	3G1509-4	07/15/93	21149723	21149641
3G2202B6	07/22/93	3G1509-4	07/15/93	21149723	21149641
3G2203B6	07/22/93	3G0909-4	07/09/93	21176017	21176021
3G2204B6	07/22/93	3G0909-4	07/09/93	21176017	21176021
3G2205B6	07/22/93	3G0909-4	07/09/93	21176017	21176021
3G2206B6	07/22/93	3G1023-4	07/10/93	21176020	21176042
3G2207B6	07/22/93	3G1023-4	07/10/93	21176020	21176042
3G2208B6	07/22/93	3G1022-4	07/10/93	21176019	21176048
3G2209B6	07/22/93	3G1022-4	07/10/93	21176019	30076048
3G2210B6	07/22/93	3G1612-4	07/16/93	21176041	21176016
3G2211B6	07/22/93	3G1612-4	07/16/93	21176041	21176016
3G2212B6	07/22/93	3G0823-4	07/08/93	21176045	21176046
3G2301B6	07/23/93	3G0823-4	07/08/93	21176045	21176046
3G2302B6	07/23/93	3G1429-4	07/14/93	21176044	21176049
3G2303B6	07/23/93	3G0903-4	07/09/93	21176044	21176049
3G2304B6	07/23/93	3G0903-4	07/09/93	21176047	21176037
3G2305B6	07/23/93	3G0904-4	07/09/93	21176047	21176037
3G2306B6	07/23/93	3G0904-4	07/09/93	211076040	211076050
3G2307B6	07/23/93	3G1025-4	07/10/93	211076040	211076050
3G2308B6	07/23/93	3G1025-4	07/10/93	211076043	211076038
3G2309B6	07/23/93	3G1026-4	07/10/93	211076043	211076038
3G2310B6	07/23/93	3G1026-4	07/10/93	211076028	211076034
3G2311B6	07/23/93	3G1101-4	07/11/93	211076028	211076034
3G2312B6	07/23/93	3G1101-4	07/11/93	211076026	211076036
3G2313B6	07/23/93	3G1104-4	07/11/93	211076026	211076036
3G2314B6	07/23/93	3G1104-4	07/11/93	211076035	211076022
3G2401B6	07/24/93	3G1103-4	07/11/93	211076035	211076022
3G2402B6	07/24/93	3G1103-4	07/11/93	211076032	211076024
3G2403B6	07/24/93	3G0902-4	07/09/93	211076032	211076024
3G2404B6	07/24/93	3G0902-4	07/09/93	211076032	211076024
3G2405B6	07/24/93	3G0902-4	07/09/93	211076025	211076033
3G2406B6	07/24/93	3G1009-4	07/10/93	211076025	211076033
3G2407B6	07/24/93	3G1009-4	07/10/93	211076023	211076027
3G2408B6	07/24/93	3G0905-4	07/09/93	211076023	211076027
3G2409B6	07/24/93	3G0905-4	07/09/93	211076031	211076030
3G2410B6	07/24/93	3G1020-4	07/10/93	211076031	211076030
3G2411B6	07/24/93	3G1020-4	07/10/93	211076012	211076010
3G2412B6	07/24/93	3G0916-4	07/09/93	211076012	211076010
3G2413B6	07/24/93	3G0916-4	07/09/93	211076052	211076058
3G2414B6	07/24/93	3G1014-4	07/10/93	211076052	211076058

POLY-NET QUALITY CONTROL TEST DATA

DATE	BATCH NUMBER	ROLL NUMBER	AVERAGE THICKNESS (inches)	TENSILES MD (ppi)	WEIGHT (lbs/ft2)
07/08/93	7300	3G0804-4	0.2278	56.2	0.1893
	7300	3G0809-4	0.2274	59.7	0.1906
	7300	3G0816-4	0.2265	56.6	0.1893
	7300	3G0822-4	0.2259	56.5	0.1894
	7300	3G0826-4	0.2244	53.7	0.1846
	7300	3G0830-4	0.2241	56.2	0.1862
	7300	3G0834-4	0.2232	55.5	0.1845
07/09/93	7300	3G0904-4	0.2240	54.6	0.1879
	7300	3G0908-4	0.2235	56.9	0.1835
	7300	3G0912-4	0.2270	56.8	0.1846
	7300	3G0916-4	0.2253	58.7	0.1885
	7300	3G0920-4	0.2256	57.7	0.1875
	7300	3G0925-4	0.2257	55.9	0.1880
07/10/93	7300	3G1003-4	0.2273	56.5	0.1876
	7300	3G1007-4	0.2288	55.5	0.1917
	7300	3G1011-4	0.2260	55.6	0.1822
	7300	3G1015-4	0.2260	55.7	0.1831
	7300	3G1019-4	0.2246	56.6	0.1895
	7300	3G1023-4	0.2253	54.6	0.1868
	7300	3G1026-4	0.2273	55.4	0.1919
07/11/93	7300	3G1104-4	0.2280	56.4	0.1919
	7300	3G1108-4	0.2263	50.7	0.1867
	7300	3G1112-4	0.2290	53.4	0.1908
	7300	3G1116-4	0.2247	57.2	0.1895
	7300	3G1123-4	0.2233	57.5	0.1898
	7298	3G1130-4	0.2267	58.7	0.1895
07/14/93	7298	3G1405-4	0.2260	56.7	0.1898
	7298	3G1412-4	0.2273	56.7	0.1915
	7298	3G1419-4	0.2259	56.8	0.1889
	5850	3G1426-4	0.2174	58.8	0.2128
	5850	3G1433-4	0.2349	74.4	0.2421
07/15/93	5850	3G1501-4	0.2352	73.5	0.2392
	5850	3G1505-4	0.2336	73.5	0.2443
	5850	3G1509-4	0.2365	78.7	0.2487
	5850	3G1513-4	0.2392	75.0	0.2559
07/16/93	5850	3G1604-4	0.2375	77.2	0.2502
	5850	3G1608-4	0.2329	72.6	0.2480
	5850	3G1612-4	0.2382	82.1	0.2545

NSC

July 27, 1993

TEX-NET CERTIFICATE OF ANALYSIS

Customer: New England Liner

Order Number: 3221-100

Project: Jefferson, OH

Type: TN3002/1145

Ship Date: July 26, 1993

Number of Rolls Shipped: 12

Bill of Lading(s): 01162

The Tex-Net referenced above was manufactured using first quality Poly-Net and Trevira. The Poly-Net meets all of National Seal Company's specifications for Poly-Net. The geotextile has been certified by Hoechst Celanese to meet all of their specifications for Trevira geotextiles.

The Tex-Net was tested for percent adhesion, ply adhesion strength and thickness according to National Seal Company's specifications. The values are reported on the following pages:

NATIONAL SEAL COMPANY

Jane Allen

Jane Allen
Quality Control Manager

07/27/93

TEX-NET QUALITY CONTROL TEST DATA

ORDER NUMBER: 3221 TYPE: TN3002/1145

DATE OF MANUFACTURE	ROLL NUMBER	PLY ADHESION (ppi) TOP	BOTTOM	PERCENT ADHESION TOP	BOTTOM	THICKNESS (inches)
07/23/93	3G2301B6	2.1	3.3	96	97	0.4779
	3G2303B6	2.1	2.6	99	95	0.4787
	3G2305B6	1.9	1.9	99	95	0.4793
	3G2307B6	1.7	2.1	99	95	0.4743
	3G2309B6	1.8	2.9	99	96	0.4841
	3G2311B6	2.0	2.6	99	95	0.4903
	3G2313B6	2.7	1.9	96	98	0.4604
07/24/93	3G2401B6	4.0	2.4	99	95	0.4702
	3G2403B6	1.8	2.4	99	96	0.4595
	3G2405B6	1.5	3.4	94	97	0.4770
	3G2407B6	2.6	1.4	93	93	0.4600
	3G2409B6	2.0	3.2	98	98	0.4632
	3G2411B6	2.2	1.3	97	97	0.4633
	3G2413B6	2.6	3.3	97	96	0.4539
07/25/93	3G2501B6	2.7	3.0	99	96	0.4649
	3G2503B6	2.0	2.5	97	94	0.4612
	3G2505B6	2.6	2.3	97	97	0.4472
	3G2508B6	1.8	3.5	97	97	0.4728
	3G2510B6	1.5	2.1	97	97	0.4496
	3G2512B6	1.8	1.9	98	93	0.4478

07/27/93

CORRELATION OF POLY-NET AND TREVIRA NUMBERS
FOR JOB NUMBER - 3221

TEXNT NUM	MFG DATE	NET NUM	MFG DATE	TREVIRA 1	TREVIRA 2
3G2301B6	07/23/93	3G0823-4	07/08/93	21176045	21176046
3G2302B6	07/23/93	3G1429-4	07/14/93	21176044	21176049
3G2303B6	07/23/93	3G0903-4	07/09/93	21176044	21176049
3G2304B6	07/23/93	3G0903-4	07/09/93	21176047	21176037
3G2305B6	07/23/93	3G0904-4	07/09/93	21176047	21176037
3G2306B6	07/23/93	3G0904-4	07/09/93	211076040	211076050
3G2307B6	07/23/93	3G1025-4	07/10/93	211076040	211076050
3G2308B6	07/23/93	3G1025-4	07/10/93	211076043	211076038
3G2309B6	07/23/93	3G1026-4	07/10/93	211076043	211076038
3G2310B6	07/23/93	3G1026-4	07/10/93	211076028	211076034
3G2311B6	07/23/93	3G1101-4	07/11/93	211076028	211076034
3G2312B6	07/23/93	3G1101-4	07/11/93	211076026	211076036
3G2313B6	07/23/93	3G1104-4	07/11/93	211076026	211076036
3G2314B6	07/23/93	3G1104-4	07/11/93	211076035	211076022
3G2401B6	07/24/93	3G1103-4	07/11/93	211076035	211076022
3G2402B6	07/24/93	3G1103-4	07/11/93	211076032	211076024
3G2403B6	07/24/93	3G0902-4	07/09/93	211076032	211076024
3G2404B6	07/24/93	3G0902-4	07/09/93	211076032	211076024
3G2405B6	07/24/93	3G0902-4	07/09/93	211076025	211076033
3G2406B6	07/24/93	3G1009-4	07/10/93	211076025	211076033
3G2407B6	07/24/93	3G1009-4	07/10/93	211076023	211076027
3G2408B6	07/24/93	3G0905-4	07/09/93	211076023	211076027
3G2409B6	07/24/93	3G0905-4	07/09/93	211076031	211076030
3G2410B6	07/24/93	3G1020-4	07/10/93	211076031	211076030
3G2411B6	07/24/93	3G1020-4	07/10/93	211076012	211076010
3G2412B6	07/24/93	3G0916-4	07/09/93	211076012	211076010
3G2413B6	07/24/93	3G0916-4	07/09/93	211076052	211076058
3G2414B6	07/24/93	3G1014-4	07/10/93	211076052	211076058
3G2501B6	07/25/93	3G1014-4	07/10/93	211076054	211076062
3G2502B6	07/25/93	3G0714-4	07/10/93	211076054	211076062
3G2503B6	07/25/93	3G0714-4	07/10/93	211076064	211076053
3G2504B6	07/25/93	3G0911-4	07/09/93	211076064	211076053
3G2505B6	07/25/93	3G0911-4	07/09/93	211076066	211076065
3G2506B6	07/25/93	3G1106-4	07/11/93	211076066	211076065
3G2508B6	07/25/93	3G1106-4	07/11/93	211076029	211076057
3G2509B6	07/25/93	3G1019-4	07/10/93	211076029	211076057
3G2510B6	07/25/93	3G1019-4	07/10/93	211076059	322076060

POLY-NET QUALITY CONTROL TEST DATA

DATE	BATCH NUMBER	ROLL NUMBER	AVERAGE THICKNESS (inches)	TENSILES MD (ppi)	WEIGHT (lbs/ft2)
07/08/93	7300	3G0804-4	0.2278	56.2	0.1893
	7300	3G0809-4	0.2274	59.7	0.1906
	7300	3G0816-4	0.2265	56.6	0.1893
	7300	3G0822-4	0.2259	56.5	0.1894
	7300	3G0826-4	0.2244	53.7	0.1846
	7300	3G0830-4	0.2241	56.2	0.1862
	7300	3G0834-4	0.2232	55.5	0.1845
07/09/93	7300	3G0904-4	0.2240	54.6	0.1879
	7300	3G0908-4	0.2235	56.9	0.1835
	7300	3G0912-4	0.2270	56.8	0.1846
	7300	3G0916-4	0.2253	58.7	0.1885
	7300	3G0920-4	0.2256	57.7	0.1875
	7300	3G0925-4	0.2257	55.9	0.1880
07/10/93	7300	3G1003-4	0.2273	56.5	0.1876
	7300	3G1007-4	0.2288	55.5	0.1917
	7300	3G1011-4	0.2260	55.6	0.1822
	7300	3G1015-4	0.2260	55.7	0.1831
	7300	3G1019-4	0.2246	56.6	0.1895
	7300	3G1023-4	0.2253	54.6	0.1868
	7300	3G1026-4	0.2273	55.4	0.1919
07/11/93	7300	3G1104-4	0.2280	56.4	0.1919
	7300	3G1108-4	0.2263	50.7	0.1867
	7300	3G1112-4	0.2290	53.4	0.1908
	7300	3G1116-4	0.2247	57.2	0.1895
	7300	3G1123-4	0.2233	57.5	0.1898
	7298	3G1130-4	0.2267	58.7	0.1895
07/14/93	7298	3G1405-4	0.2260	56.7	0.1898
	7298	3G1412-4	0.2273	56.7	0.1915
	7298	3G1419-4	0.2259	56.8	0.1889
	5850	3G1426-4	0.2174	58.8	0.2128
	5850	3G1433-4	0.2349	74.4	0.2421

NSC

July 27, 1993

TEX-NET CERTIFICATE OF ANALYSIS

Customer: New England Liner

Order Number: 3221-100

Project: Jefferson, OH

Type: TN3002/1145

Ship Date: July 26, 1993

Number of Rolls Shipped: 12

Bill of Lading(s): 01157

The Tex-Net referenced above was manufactured using first quality Poly-Net and Trevira. The Poly-Net meets all of National Seal Company's specifications for Poly-Net. The geotextile has been certified by Hoechst Celanese to meet all of their specifications for Trevira geotextiles.

The Tex-Net was tested for percent adhesion, ply adhesion strength and thickness according to National Seal Company's specifications. The values are reported on the following pages:

NATIONAL SEAL COMPANY

Jane Allen

Jane Allen
Quality Control Manager

07/27/93

TEX-NET QUALITY CONTROL TEST DATA

ORDER NUMBER: 3221 TYPE: TN3002/1145

DATE OF MANUFACTURE	ROLL NUMBER	PLY ADHESION (ppi) TOP	BOTTOM	PERCENT ADHESION TOP	BOTTOM	THICKNESS (inches)
07/24/93	3G2401B6	4.0 -	2.4	99 -	95	0.4702
	3G2403B6	1.8 -	2.4	99 -	96	0.4595
	3G2405B6	1.5 -	3.4	94 -	97	0.4770
	3G2407B6	2.6 -	1.4	93 -	93	0.4600
	3G2409B6	2.0 -	3.2	98 -	98	0.4632
	3G2411B6	2.2 -	1.3	97 -	97	0.4633
	3G2413B6	2.6 -	3.3	97 -	96	0.4539
07/25/93	3G2501B6	2.7 -	3.0	99 -	96	0.4649
	3G2503B6	2.0 -	2.5	97 -	94	0.4612
	3G2505B6	2.6 -	2.3	97 -	97	0.4472
	3G2508B6	1.8 -	3.5	97 -	97	0.4728
	3G2510B6	1.5 -	2.1	97 -	97	0.4496
	3G2512B6	1.8 -	1.9	98 -	93	0.4478

07/27/93

CORRELATION OF POLY-NET AND TREVIRA NUMBERS
FOR JOB NUMBER - 3221

TEXNT NUM	MFG DATE	NET NUM	MFG DATE	TREVIRA 1	TREVIRA 2
3G2401B6	07/24/93	3G1103-4	07/11/93	211076035	211076022
3G2402B6	07/24/93	3G1103-4	07/11/93	211076032	211076024
3G2403B6	07/24/93	3G0902-4	07/09/93	211076032	211076024
3G2404B6	07/24/93	3G0902-4	07/09/93	211076032	211076024
3G2405B6	07/24/93	3G0902-4	07/09/93	211076025	211076033
3G2406B6	07/24/93	3G1009-4	07/10/93	211076025	211076033
3G2407B6	07/24/93	3G1009-4	07/10/93	211076023	211076027
3G2408B6	07/24/93	3G0905-4	07/09/93	211076023	211076027
3G2409B6	07/24/93	3G0905-4	07/09/93	211076031	211076030
3G2410B6	07/24/93	3G1020-4	07/10/93	211076031	211076030
3G2411B6	07/24/93	3G1020-4	07/10/93	211076012	211076010
3G2412B6	07/24/93	3G0916-4	07/09/93	211076012	211076010
3G2413B6	07/24/93	3G0916-4	07/09/93	211076052	211076058
3G2414B6	07/24/93	3G1014-4	07/10/93	211076052	211076058
3G2501B6	07/25/93	3G1014-4	07/10/93	211076054	211076062
3G2502B6	07/25/93	3G0714-4	07/10/93	211076054	211076062
3G2503B6	07/25/93	3G0714-4	07/10/93	211076064	211076053
3G2504B6	07/25/93	3G0911-4	07/09/93	211076064	211076053
3G2505B6	07/25/93	3G0911-4	07/09/93	211076066	211076065
3G2506B6	07/25/93	3G1106-4	07/11/93	211076066	211076065
3G2508B6	07/25/93	3G1106-4	07/11/93	211076029	211076057
3G2509B6	07/25/93	3G1019-4	07/10/93	211076029	211076057
3G2510B6	07/25/93	3G1019-4	07/10/93	211076059	322076060
3G2511B6	07/26/93	3G0824-4	07/08/93	211076059	211076060
3G2512B6	07/26/93	3G0824-4	07/08/93	211076011	211076051
3G2601B6	07/26/93	3G1006-4	07/10/93	211076011	211076051
3G2602B6	07/26/93	3G1006-4	07/10/93	211068860	211068846

POLY-NET QUALITY CONTROL TEST DATA

DATE	BATCH NUMBER	ROLL NUMBER	AVERAGE THICKNESS (inches)	TENSILES MD (ppi)	WEIGHT (lbs/ft2)
07/08/93	7300	3G0804-4	0.2278	56.2	0.1893
	7300	3G0809-4	0.2274	59.7	0.1906
	7300	3G0816-4	0.2265	56.6	0.1893
	7300	3G0822-4	0.2259	56.5	0.1894
	7300	3G0826-4	0.2244	53.7	0.1846
	7300	3G0830-4	0.2241	56.2	0.1862
	7300	3G0834-4	0.2232	55.5	0.1845
07/09/93	7300	3G0904-4	0.2240	54.6	0.1879
	7300	3G0908-4	0.2235	56.9	0.1835
	7300	3G0912-4	0.2270	56.8	0.1846
	7300	3G0916-4	0.2253	58.7	0.1885
	7300	3G0920-4	0.2256	57.7	0.1875
	7300	3G0925-4	0.2257	55.9	0.1880
07/10/93	7300	3G1003-4	0.2273	56.5	0.1876
	7300	3G1007-4	0.2288	55.5	0.1917
	7300	3G1011-4	0.2260	55.6	0.1822
	7300	3G1015-4	0.2260	55.7	0.1831
	7300	3G1019-4	0.2246	56.6	0.1895
	7300	3G1023-4	0.2253	54.6	0.1868
	7300	3G1026-4	0.2273	55.4	0.1919
07/11/93	7300	3G1104-4	0.2280	56.4	0.1919
	7300	3G1108-4	0.2263	50.7	0.1867
	7300	3G1112-4	0.2290	53.4	0.1908
	7300	3G1116-4	0.2247	57.2	0.1895
	7300	3G1123-4	0.2233	57.5	0.1898
	7298	3G1130-4	0.2267	58.7	0.1895

NSC

MEMORANDUM

TO: Rich Magnoli

FROM: Maxine Prange

DATE: June 11, 1993

RE: Certifications

Enclosed please find the original Certifications for materials shipped to CHM/Laskin Polar Oil -- N.S.C.Job # 3220.

cc: File

Hoechst Celanese

CERTIFICATE OF COMPLIANCE

(COM-93-379)

Fibers & Film Group
Hoechst Celanese Corporation
Spunbond Business Unit
Post Office Box 5887
Spartanburg, SC 29304-5887
803 579 5551
Toll Free 1 800 845 7597
Telex 9102404053
Fax 803 579 5930

June 4, 1993

NATIONAL SEAL COMPANY
SUITE 300
1245 CORPORATE BOULEVARD
AURORA IL 60504-6419

HOECHST CELANESE ORDER NO.	25817363
CUSTOMER ORDER NO.	3220/1T
SPECIFICATION NO.	
PROJECT NO.	Laskan Poplar Site

Manufacturer: Hoechst Celanese Corporation
Product Description: Nonwoven, Needlepunched Continuous Filament, 100 Percent Polyester

Product Identification: 1145

This letter is to state that the TREVIRA® Spunbond fabric specified above complies with published physical property data. Actual test values are attached. The material has been continuously inspected for the presence of needles and no needles were detected.

Sincerely,

Jack Hodge
Manager Quality Control
TREVIRA® Spunbond
Hoechst Celanese Corporation

STATE OF SOUTH CAROLINA
COUNTY OF SPARTANBURG
SWORN TO BEFORE ME THIS
04TH DAY OF JUNE 1993.

NOTARY PUBLIC FOR SOUTH CAROLINA
MY COMMISSION EXPIRES OCTOBER 2002

JWH/dq
cc: File

PLEASE REFERENCE CERTIFICATE (COM. NO.) IF YOU HAVE QUESTIONS CONCERNING THIS LETTER (803-579-5361).

Hoechst

NSC

MEMORANDUM

TO: Rich Magnoli

FROM: Maxine Prange mp

DATE: July 19, 1993

RE: Certifications

Enclosed please find the original Certifications for materials shipped to Laskin Poplar Site -- N.S.C. Job # 3340.

cc: File

Hoechst Celanese

CERTIFICATE OF COMPLIANCE

(COM-93-532)

Fibers & Film Group
Hoechst Celanese Corporation
Spunbond Business Unit
Post Office Box 5887
Spartanburg, SC 29304-5887
803 579 5551
Toll Free 1 800 845 7597
Telex 9102404053
Fax 803 579 5930

July 13, 1993

NATIONAL SEAL COMPANY
SUITE 300
1245 CORPORATE BOULEVARD
AURORA IL 60504-6419

HOECHST CELANESE ORDER NO. 25818816
CUSTOMER ORDER NO. 3340/1T
SPECIFICATION NO.
PROJECT NO.

Manufacturer: Hoechst Celanese Corporation
Product Description: Nonwoven, Needlepunched Continuous Filament, 100 Percent Polyester

Product Identification: 1145

This letter is to state that the TREVIRA® Spunbond fabric specified above complies with published physical property data. Actual test values are attached. The material has been continuously inspected for the presence of needles and no needles were detected.

Sincerely,

Jack Hodge
Manager Quality Control
TREVIRA® Spunbond
Hoechst Celanese Corporation

STATE OF SOUTH CAROLINA
COUNTY OF SPARTANBURG
SWORN TO BEFORE ME THIS
13TH DAY OF JULY 1993.

Myra U. Blanton
NOTARY PUBLIC FOR SOUTH CAROLINA
MY COMMISSION EXPIRES OCTOBER 1997.

JWH/mm
cc: File

Fax - 708-898-2567

PLEASE REFERENCE CERTIFICATE (COM. NO.) IF YOU HAVE QUESTIONS CONCERNING THIS LETTER (803-579-5561).

Hoechst

EE0670 011450 02/22/93 - 02/23/93 LOT# 450-1-670 03/03/93

ROLL NO.	WEIGHT OZ/YD2	COEF VAR %	THICK MILS	GRAB TENSILE BRK STR LBS MD	GRAB TENSILE ELONG % MD	GRAB TENSILE BRK STR LBS CD	GRAB TENSILE ELONG % CD	RATIO S/W CD	TRAPEZOID TEAR LBS MD	TRAPEZOID TEAR LBS CD	MULLEN BURST PSI	PUNC 5/16" LBS	WATER PERM GPM/FT2 VERT	EOS	SHRINKAGE @200 C % MD	SHRINKAGE @200 C % CD
11062820	13.7	6.32	179	538	77	441	79	0.42	160	144	728	207	92	100	.	.
11062835	13.5	5.49	187	522	75	459	80	0.44	185	162	768	214	.	.	.	.
11062854	13.6	6.46	184	522	78	439	79	0.42	196	158	759	203	.	.	.	.
11062866	13.5	3.89	187	551	77	461	80	0.45	187	164	745	216	.	.	.	.
11062878	13.6	5.68	186	542	76	486	83	0.47	182	169	756	234	.	.	.	.
11062889	13.4	5.21	183	524	79	468	84	0.46	196	162	744	218	.	.	.	.
11062901	13.7	4.82	186	558	80	468	82	0.45	169	153	769	212	103	100	.	.
11062015	13.1	6.17	186	538	81	459	83	0.45	171	160	755	205	.	.	.	.
11062922	13.6	5.09	184	558	79	452	83	0.43	185	173	778	203	.	.	.	.
11062936	14.0	6.20	190	565	81	479	82	0.45	218	173	781	218	.	.	.	.
11062945	.	.	184	.	.	.	.	.	.	.	.	.	.	.	.	.
11062946	13.7	7.46	185	574	83	466	83	0.44	185	169	770	227	.	.	.	.
AVERAGE:	13.6	5.73	185	545	79	462	82	0.44	185	162	759	214	98	100	0.0	0.0
ST DEV :	0.2	0.96	2.7	17.9	2.4	14.3	1.8	0.02	16	8.8	16.0	10.1	7.8	0.0	0.0	0.0
MINIMUM:	13.1	3.89	179	522	75	439	79	0.42	160	144	728	203	92	100	0.0	0.0
MAXIMUM:	14.0	7.46	190	574	83	486	84	0.47	218	173	781	234	103	100	0.0	0.0
NO OBS.:	11	11	12	11	11	11	11	11	11	11	11	11	2	2	0	0
NO. ROLLS:	12															

GE0695 011450 05/20/93 - 05/21/93 LOT# 450-1-695 05/21/93

ROLL NO.	WEIGHT OZ/YD2	COEF VAR %	THICK MILS	BRK STR LBS 2IN MD	ELONG % MD	REL ELONG % MD	BRK STR LBS 2IN CD	ELONG % CD	REL ELONG % CD	REL ELONG @356 F % 11LBF MD	REL ELONG @356 F % 18LBF MD	SHRINKAGE @392 F % MD	SHRINKAGE @392 F % CD	AVERAGE TEAR STRENGTH LBS MD	AVERAGE TEAR STRENGTH LBS CD
11070394	13.9	4.22	187	543	78.9	210	180	.	98.8	85.1	736	92.8	112.0	270	.
1070408	13.7	4.42	187	501	84.3	225	223	.	86.2	69.9	762	93.0	.	.	.
1070423	13.9	4.66	184	527	82.0	217	215	.	91.4	75.9	752	92.3	.	.	.
11070443	13.7	6.37	.	.	.	210	178	.	.	.	768	.	.	.	.
AVERAGE:	13.8	4.92	186	523	81.7	215	199	0.0	92.1	77.0	755	92.7	112.0	270	0.0
STD DEV:	0.1	0.98	1.7	21.2	2.71	7.09	23.0	0.00	6.35	7.66	13.99	0.36	0.00	0.00	0.00
MINIMUM:	13.7	4.22	184	501	78.9	210	178	0.0	86.2	69.9	736	92.3	112.0	270	0.0
MAXIMUM:	13.9	6.37	187	543	84.3	225	223	0.0	98.8	85.1	768	93.0	112.0	270	0.0
OBS:	4	4	3	3	3	4	4	0	3	3	4	3	1	1	0

NO. ROLLS: 4

NSC

MEMORANDUM

TO: Rich Magnoli

FROM: Maxine Prange MP

DATE: July 27, 1993

RE: Certifications

Enclosed please find the original Certifications for materials shipped to Laskan Popla- Site -- N.S.C.Job # 3244.

cc: File

Hoechst Celanese

CERTIFICATE OF COMPLIANCE

(COM-93-556)

Fibers & Film Group
Hoechst Celanese Corporation
Spunbond Business Unit
Post Office Box 5887
Spartanburg, SC 29304-5887
803 579 5551
Tol Free 1 800 845 7597
Telex 9102404053
Fax 803 579 5930

July 22, 1993

NATIONAL SEAL COMPANY
SUITE 300
1245 CORPORATE BOULEVARD
AURORA IL 60504-6419

HOECHST CELANESE ORDER NO.	25819218
CUSTOMER ORDER NO.	3244/1T
SPECIFICATION NO.	
PROJECT NO.	Laskan Poplar Site

Manufacturer:	Hoechst Celanese Corporation
Product Description:	Nonwoven, Needlepunched Continuous Filament, 100 Percent Polyester

Product Identification: 1145

This letter is to state that the TREVIRA® Spunbond fabric specified above complies with published physical property data. Actual test values are attached. The material has been continuously inspected for the presence of needles and no needles were detected.

Sincerely,

Jack Hodge
Manager Quality Control
TREVIRA® Spunbond
Hoechst Celanese Corporation

STATE OF SOUTH CAROLINA
COUNTY OF SPARTANBURG
SWORN TO BEFORE ME THIS
22ND DAY OF JULY 1993.

Myra U. Blanton
NOTARY PUBLIC FOR SOUTH CAROLINA
MY COMMISSION EXPIRES OCTOBER 1997.

JWH/mm
cc: File

Fax - 708-898-2567

PLEASE REFERENCE CERTIFICATE (COM. NO.) IF YOU HAVE QUESTIONS CONCERNING THIS LETTER (803 579-5561).

Hoechst

GE0670 011450 02/22/93 - 02/23/93 LOT# 450-1-670 03/03/93

ROLL NO.	WEIGHT OZ/YD2	COEF VAR %	THICK MILS	GRAB TENSILE BRK STR LBS MD	GRAB TENSILE ELONG % MD	GRAB TENSILE BRK STR LBS CD	GRAB TENSILE ELONG % CD	RATIO S/W CD	TRAPEZOID TEAR LBS MD	TRAPEZOID TEAR LBS CD	MULLEN BURST PSI	PUNC 5/16" LBS	WATER PERM GPM/FT2 VERT	EOS	SHRINKAGE #200 % MD	SHRINKAGE C % CD
11GE2820	13.7	6.32	179	538	77	441	79	0.42	160	144	728	207	92	100	.	.
11GE2835	13.5	5.49	187	522	75	459	80	0.44	185	162	768	214	.	.	.	.
GE2854	13.6	6.46	184	522	78	439	79	0.42	196	158	759	203	.	.	.	.
GE2866	13.5	3.89	187	551	77	461	80	0.45	187	164	745	216	.	.	.	.
11GE2878	13.6	5.88	186	542	76	486	83	0.47	182	169	756	234	.	.	.	.
GE2889	13.4	5.21	183	524	79	468	84	0.46	196	162	744	218	.	.	.	.
GE2901	13.7	4.82	186	558	80	468	82	0.45	169	153	769	212	103	100	.	.
11GE2015	13.1	6.17	186	538	81	459	83	0.45	171	160	755	205	.	.	.	.
GE2922	13.6	5.09	184	558	79	452	83	0.43	185	173	778	203	.	.	.	.
GE2936	14.0	6.20	190	565	81	479	82	0.45	218	173	781	218	.	.	.	.
GE2945	.	.	184	.	.	.	.	.	.	.	.	.	.	.	.	.
11GE2946	13.7	7.46	185	574	83	466	83	0.44	185	169	770	227	.	.	.	.
AVERAGE:	13.6	5.73	185	545	79	462	82	0.44	185	162	759	214	98	100	0.0	0.0
ST DEV :	0.2	0.96	2.7	17.9	2.4	14.3	1.8	0.02	16	8.8	16.0	10.1	7.8	0.0	0.0	0.0
MINIMUM:	13.1	3.89	179	522	75	439	79	0.42	160	144	728	203	92	100	0.0	0.0
MAXIMUM:	14.0	7.46	190	574	83	486	84	0.47	218	173	781	234	103	100	0.0	0.0
NO OBS.:	11	11	12	11	11	11	11	11	11	11	11	11	2	2	0	0

NO. ROLLS: 12

NSC

July 20, 1993

POLYETHYLENE RESIN CERTIFICATE OF ANALYSIS

Customer: New England Liner

Resin Type: UC 1527 BK

Project: Jefferson, OH

Order Number: 3221-100

The polyethylene resin referenced above was tested for melt flow index, density and carbon black content. Melt flow index was determined according to ASTM D 1238. Density was determined according to ASTM D 1505. Carbon black content was determined according to ASTM D 1603. The average test results are reported below.

Resin Blend Number	6016	2587
Melt Flow Index (g/10 min)	0.17	0.21
Density (g/cm^3)	0.949	0.947
Carbon Black Content (percent)	2.28	2.48

Jane Allen

Jane Allen
Quality Control Manager

NSC

LISTING OF ROLLS SHIPPED

Customer: New England Liner

Order Number: 3221-100

01) C04F-6016-3G1606-BA3
02) C04F-6016-3G1608-BA3
03) C04F-2587-1L0520-BA2

NSC

GEOMEMBRANE CERTIFICATION

Customer: New England Liner

Ship Date: July 19, 1993

Project: Jefferson, OH

Number of Rolls Shipped: 3

Order Number: 3221-100

Nominal Thickness: 40 mil

We hereby certify that the resin and polyethylene geomembrane for the above identified shipment, meets or exceeds National Seal Company's specifications, below. The tests listed below in the resin specifications have been performed on each batch of resin. The tests listed below in the geomembrane specifications have been performed at least every 25,000 square feet of geomembrane.

BASE SHEET SPECIFICATIONS

Thickness	40.0 mil Minimum
Carbon Black Content	2.0 to 3.0%
Carbon Black Dispersion	A1 or A2

RESIN SPECIFICATIONS
(precompounded)

Melt Flow Index	1.0 Maximum
Density	0.94 Minimum
Carbon Black Content	2.0 to 3.0%

GEOMEMBRANE SPECIFICATIONS

Stress at Yield	2200 psi Minimum
Stress at Break	2200 psi Minimum
Strain at Yield	13% Minimum
Strain at Break	200% Minimum

Jane Allen

Jane Allen
Quality Control Manager

7-20-93
Date

NSC

July 20, 1993

GEOMEMBRANE CERTIFICATE OF ANALYSIS

Customer: New England Liner

Project: Jefferson, OH

Order Number: 3221-100

Number of Rolls Shipped: 3

Number of Rolls Tested: 2

Nominal Thickness: 40 mil

The geomembrane referenced above was tested for tensile properties. Tensile properties were tested according to ASTM D 638 using a type IV dumbbell specimen, a strain rate of two inches per minute and grip movement for strain determinations. The raw polymeric material used to manufacture the base sheet prior to friction coating contains not more than two percent clean reworked plastic by weight. The average test results are reported below.

Roll Number		C04F-2587-1L0520-BA2	C04F-6016-3G1606-BA3
Stress at Yield (psi)	MD	3080	3360
	TD	3230	3340
Stress at Break (psi)	MD	3660	3400
	TD	3710	2510
Strain at Yield (percent)	MD	18	18
	TD	16	16
Strain at Break (percent)	MD	570	470
	TD	670	250

Jane Allen
Quality Control Manager

NSC

LISTING OF ROLLS SHIPPED

Customer: New England Liner

Order Number: 3221-100

01) C4L-6016-3F0703-1
02) C4L-5847-3F3012-2
03) C4L-5847-3F3013-2
04) C4L-6016-3F0614-1
05) C4L-6180-3C2713-2
06) C04F-6016-3G0806-AA3
07) C04F-6016-3G0807-BA3
08) C04F-6016-3G0804-AA3
09) C04F-5847-3G0803-BA3

NSC

July 9, 1993

POLYETHYLENE RESIN CERTIFICATE OF ANALYSIS

Customer: New England Liner

Resin Type: UC 1527 BK

Project: Jefferson, OH

Order Number: 3221-100

The polyethylene resin referenced above was tested for melt flow index, density and carbon black content. Melt flow index was determined according to ASTM D 1238. Density was determined according to ASTM D 1505. Carbon black content was determined according to ASTM D 1603. The average test results are reported below.

Extrusion Rod Resin Blend Number	6167
Melt Flow Index (g/10 min)	0.23
Density (g/cm^3)	0.950
Carbon Black Content (percent)	2.30

Jane Allen

Jane Allen
Quality Control Manager

NSC

July 9, 1993

POLYETHYLENE RESIN CERTIFICATE OF ANALYSIS

Customer: New England Liner

Resin Type: UC 1527 BK

Project: Jefferson, OH

Order Number: 3221-100

The polyethylene resin referenced above was tested for melt flow index, density and carbon black content. Melt flow index was determined according to ASTM D 1238. Density was determined according to ASTM D 1505. Carbon black content was determined according to ASTM D 1603. The average test results are reported below.

Resin Blend Number	6016	5847	6180
Melt Flow Index (g/10 min)	0.17	0.25	0.17
Density (g/cm^3)	0.949	0.948	0.949
Carbon Black Content (percent)	2.28	2.30	2.33

Jane Allen

Jane Allen
Quality Control Manager

NSC

GEOMEMBRANE CERTIFICATION

Customer: New England Liner

Project: Jefferson, OH

Order Number: 3221-100

Ship Date: July 9, 1993

Number of Rolls Shipped: 5

Nominal Thickness: 40 mil

We hereby certify that the resin and polyethylene geomembrane for the above identified shipment, meets or exceeds National Seal Company's specifications, below. The tests listed below in the resin specifications have been performed on each batch of resin. The tests listed below in the geomembrane specifications have been performed at least every 50,000 square feet of geomembrane.

RESIN SPECIFICATIONS
(precompounded)

Melt Flow Index	1.0 Maximum
Density	0.94 Minimum
Carbon Black Content	2.0 to 3.0

GEOMEMBRANE SPECIFICATIONS

Thickness	40.0 mil Minimum
Stress at Yield	2200 psi Minimum
Stress at Break	3800 psi Minimum
Strain at Yield	13% Minimum
Strain at Break	700% Minimum
Carbon Black Dispersion	A1 or A2

Jane Allen

Jane Allen
Quality Control Manager

7-09-93

Date

NSC

July 9, 1993

GEOMEMBRANE CERTIFICATE OF ANALYSIS

Customer: New England Liner

Project: Jefferson, OH

Order Number: 3221-100

Number of Rolls Shipped: 5

Number of Rolls Tested: 3

Nominal Thickness: 40 mil

The geomembrane referenced above was tested for thickness, tensile properties, carbon black dispersion and dimensional stability. The raw polymeric material is first quality polyethylene resin containing no more than two percent clean reworked plastic by weight. Thickness was tested according to ASTM D 751. Tensile properties were tested according to ASTM D 638 using a type IV dumbbell specimen, a strain rate of two inches per minute and grip movement for strain determinations. Carbon black dispersion slides were prepared according to ASTM D 3015 and rated according to the ASTM D 2663 classification chart when viewed under 100X magnification. Dimensional stability was determined according to ASTM D 1204 at 100°C for one hour. The average test results are reported below.

Roll Number		C4L-6180-3C2713-2	C4L-6016-3F0614-1	C4L-5847-3F3012-2
Thickness (mils)		41.1	41.5	41.4
Stress at Yield (psi)	MD	2580	2680	2630
	TD	2550	2830	2710
Stress at Break (psi)	MD	5270	5060	5260
	TD	5310	5070	5090
Strain at Yield (percent)	MD	17	17	17
	TD	18	15	16
Strain at Break (percent)	MD	980	820	880
	TD	880	930	940
Carbon Black Dispersion		A1	A1	A1
Dimensional Stability	MD	-0.4	-0.4	-0.4
	TD	0.0	0.0	0.0

Jane Allen

Jane Allen
Quality Control Manager

NSC

July 9, 1993

POLYETHYLENE RESIN CERTIFICATE OF ANALYSIS

Customer: New England Liner

Resin Type: UC 1527 BK

Project: Jefferson, OH

Order Number: 3221-100

The polyethylene resin referenced above was tested for melt flow index, density and carbon black content. Melt flow index was determined according to ASTM D 1238. Density was determined according to ASTM D 1505. Carbon black content was determined according to ASTM D 1603. The average test results are reported below.

Resin Blend Number	6016	5847
Melt Flow Index (g/10 min)	0.17	0.25
Density (g/cm^3)	0.949	0.948
Carbon Black Content (percent)	2.28	2.30

Jane Allen

Jane Allen
Quality Control Manager

NSC

GEOMEMBRANE CERTIFICATION

Customer: New England Liner

Ship Date: July 9, 1993

Project: Jefferson, OH

Number of Rolls Shipped: 4

Order Number: 3221-100

Nominal Thickness: 40 mil

We hereby certify that the resin and polyethylene geomembrane for the above identified shipment, meets or exceeds National Seal Company's specifications, below. The tests listed below in the resin specifications have been performed on each batch of resin. The tests listed below in the geomembrane specifications have been performed at least every 25,000 square feet of geomembrane.

BASE SHEET SPECIFICATIONS

Thickness	40.0 mil Minimum
Carbon Black Content	2.0 to 3.0%
Carbon Black Dispersion	A1 or A2

RESIN SPECIFICATIONS
(precompounded)

Melt Flow Index	1.0 Maximum
Density	0.94 Minimum
Carbon Black Content	2.0 to 3.0%

GEOMEMBRANE SPECIFICATIONS

Stress at Yield	2200 psi Minimum
Stress at Break	2200 psi Minimum
Strain at Yield	13% Minimum
Strain at Break	200% Minimum

Jane Allen

Jane Allen
Quality Control Manager

7-09-93

Date

NSC

July 9, 1993

GEOMEMBRANE CERTIFICATE OF ANALYSIS

Customer: New England Liner

Project: Jefferson, OH

Order Number: 3221-100

Number of Rolls Shipped: 4

Number of Rolls Tested: 2

Nominal Thickness: 40 mil

The geomembrane referenced above was tested for tensile properties. Tensile properties were tested according to ASTM D 638 using a type IV dumbbell specimen, a strain rate of two inches per minute and grip movement for strain determinations. The raw polymeric material used to manufacture the base sheet prior to friction coating contains not more than two percent clean reworked plastic by weight. The average test results are reported below.

Roll Number		C04F-5847-3G0803-BA3	C04F-6016-3G0806-AA3
Stress at Yield (psi)	MD	3270	3390
	TD	3200	3310
Stress at Break (psi)	MD	3730	3560
	TD	2690	2710
Strain at Yield (percent)	MD	18	18
	TD	16	16
Strain at Break (percent)	MD	560	490
	TD	400	410

Jane Allen

Jane Allen
Quality Control Manager

NSC

LISTING OF ROLLS SHIPPED

Customer: New England Liner

Order Number: 3221-100

01) C4L-6016-3F0703-1
02) C4L-5847-3F3012-2
03) C4L-5847-3F3013-2
04) C4L-6016-3F0614-1
05) C4L-6180-3C2713-2
06) C04F-6016-3G0806-AA3
07) C04F-6016-3G0807-BA3
08) C04F-6016-3G0804-AA3
09) C04F-5847-3G0803-BA3

NSC

July 9, 1993

POLYETHYLENE RESIN CERTIFICATE OF ANALYSIS

Customer: New England Liner

Resin Type: UC 1527 BK

Project: Jefferson, OH

Order Number: 3221-100

The polyethylene resin referenced above was tested for melt flow index, density and carbon black content. Melt flow index was determined according to ASTM D 1238. Density was determined according to ASTM D 1505. Carbon black content was determined according to ASTM D 1603. The average test results are reported below.

Extrusion Rod Resin Blend Number	6167
Melt Flow Index (g/10 min)	0.23
Density (g/cm^3)	0.950
Carbon Black Content (percent)	2.30

Jane Allen
Quality Control Manager

NSC

July 9, 1993

POLYETHYLENE RESIN CERTIFICATE OF ANALYSIS

Customer: New England Liner

Resin Type: UC 1527 BK

Project: Jefferson, OH

Order Number: 3221-100

The polyethylene resin referenced above was tested for melt flow index, density and carbon black content. Melt flow index was determined according to ASTM D 1238. Density was determined according to ASTM D 1505. Carbon black content was determined according to ASTM D 1603. The average test results are reported below.

Resin Blend Number	6016	5847	6180
Melt Flow Index (g/10 min)	0.17	0.25	0.17
Density (g/cm^3)	0.949	0.948	0.949
Carbon Black Content (percent)	2.28	2.30	2.33

Jane Allen
Quality Control Manager

NSC

July 9, 1993

POLYETHYLENE RESIN CERTIFICATE OF ANALYSIS

Customer: New England Liner

Resin Type: UC 1527 BK

Project: Jefferson, OH

Order Number: 3221-100

The polyethylene resin referenced above was tested for melt flow index, density and carbon black content. Melt flow index was determined according to ASTM D 1238. Density was determined according to ASTM D 1505. Carbon black content was determined according to ASTM D 1603. The average test results are reported below.

Resin Blend Number	6016	5847
Melt Flow Index (g/10 min)	0.17	0.25
Density (g/cm^3)	0.949	0.948
Carbon Black Content (percent)	2.28	2.30

Jane Allen

Jane Allen
Quality Control Manager

NSC

GEOMEMBRANE CERTIFICATION

Customer: New England Liner

Ship Date: July 9, 1993

Project: Jefferson, OH

Number of Rolls Shipped: 5

Order Number: 3221-100

Nominal Thickness: 40 mil

We hereby certify that the resin and polyethylene geomembrane for the above identified shipment, meets or exceeds National Seal Company's specifications, below. The tests listed below in the resin specifications have been performed on each batch of resin. The tests listed below in the geomembrane specifications have been performed at least every 50,000 square feet of geomembrane.

RESIN SPECIFICATIONS
(precompounded)

Melt Flow Index	1.0 Maximum
Density	0.94 Minimum
Carbon Black Content	2.0 to 3.0

GEOMEMBRANE SPECIFICATIONS

Thickness	40.0 mil Minimum
Stress at Yield	2200 psi Minimum
Stress at Break	3800 psi Minimum
Strain at Yield	13% Minimum
Strain at Break	700% Minimum
Carbon Black Dispersion	A1 or A2

Jane Allen

Jane Allen
Quality Control Manager

7-9-93

Date

NSC

GEOMEMBRANE CERTIFICATION

Customer: New England Liner

Ship Date: July 9, 1993

Project: Jefferson, OH

Number of Rolls Shipped: 4

Order Number: 3221-100

Nominal Thickness: 40 mil

We hereby certify that the resin and polyethylene geomembrane for the above identified shipment, meets or exceeds National Seal Company's specifications, below. The tests listed below in the resin specifications have been performed on each batch of resin. The tests listed below in the geomembrane specifications have been performed at least every 25,000 square feet of geomembrane.

BASE SHEET SPECIFICATIONS

Thickness	40.0 mil Minimum
Carbon Black Content	2.0 to 3.0%
Carbon Black Dispersion	A1 or A2

RESIN SPECIFICATIONS
(precompounded)

Melt Flow Index	1.0 Maximum
Density	0.94 Minimum
Carbon Black Content	2.0 to 3.0%

GEOMEMBRANE SPECIFICATIONS

Stress at Yield	2200 psi Minimum
Stress at Break	2200 psi Minimum
Strain at Yield	13% Minimum
Strain at Break	200% Minimum

Jane Allen

Jane Allen
Quality Control Manager

7-9-93

Date

NSC

July 9, 1993

GEOMEMBRANE CERTIFICATE OF ANALYSIS

Customer: New England Liner

Project: Jefferson, OH

Order Number: 3221-100

Number of Rolls Shipped: 5

Number of Rolls Tested: 3

Nominal Thickness: 40 mil

The geomembrane referenced above was tested for thickness, tensile properties, carbon black dispersion and dimensional stability. The raw polymeric material is first quality polyethylene resin containing no more than two percent clean reworked plastic by weight. Thickness was tested according to ASTM D 751. Tensile properties were tested according to ASTM D 638 using a type IV dumbbell specimen, a strain rate of two inches per minute and grip movement for strain determinations. Carbon black dispersion slides were prepared according to ASTM D 3015 and rated according to the ASTM D 2663 classification chart when viewed under 100X magnification. Dimensional stability was determined according to ASTM D 1204 at 100°C for one hour. The average test results are reported below.

Roll Number		C4L-6180-3C2713-2	C4L-6016-3F0614-1	C4L-5847-3F3012-2
Thickness (mils)		41.1	41.5	41.4
Stress at Yield (psi)	MD	2580	2680	2630
	TD	2550	2830	2710
Stress at Break (psi)	MD	5270	5060	5260
	TD	5310	5070	5090
Strain at Yield (percent)	MD	17	17	17
	TD	18	15	16
Strain at Break (percent)	MD	980	820	880
	TD	880	930	940
Carbon Black Dispersion		A1	A1	A1
Dimensional Stability	MD	-0.4	-0.4	-0.4
	TD	0.0	0.0	0.0

Jane Allen
Quality Control Manager

NSC

July 9, 1993

GEOMEMBRANE CERTIFICATE OF ANALYSIS

Customer: New England Liner

Project: Jefferson, OH

Order Number: 3221-100

Number of Rolls Shipped: 4

Number of Rolls Tested: 2

Nominal Thickness: 40 mil

The geomembrane referenced above was tested for tensile properties. Tensile properties were tested according to ASTM D 638 using a type IV dumbbell specimen, a strain rate of two inches per minute and grip movement for strain determinations. The raw polymeric material used to manufacture the base sheet prior to friction coating contains not more than two percent clean reworked plastic by weight. The average test results are reported below.

Roll Number		C04F-5847-3G0803-BA3	C04F-6016-3G0806-AA3
Stress at Yield (psi)	MD	3270	3390
	TD	3200	3310
Stress at Break (psi)	MD	3730	3560
	TD	2690	2710
Strain at Yield (percent)	MD	18	18
	TD	16	16
Strain at Break (percent)	MD	560	490
	TD	400	410

Jane Allen
Quality Control Manager

NSC

August 27, 1993

POLYETHYLENE RESIN CERTIFICATE OF ANALYSIS

Customer: New England Liner

Resin Type: G36-24-149

Project: Jefferson, OH

Order Number: 3351-100

The polyethylene resin referenced above was tested for melt flow index, density and carbon black content. Melt flow index was determined according to ASTM D 1238. Density was determined according to ASTM D 1505. Carbon black content was determined according to ASTM D 1603. The average test results are reported below.

Extrusion Rod Resin Blend Number	720A
Melt Flow Index (g/10 min)	0.30
Density (g/cm^3)	0.950
Carbon Black Content (percent)	2.35

Jane Allen

Jane Allen
Quality Control Manager

NSC

August 27, 1993

POLYETHYLENE RESIN CERTIFICATE OF ANALYSIS

Customer: New England Liner

Resin Type: G36-24-149

Project: Jefferson, OH

Order Number: 3351-100

The polyethylene resin referenced above was tested for melt flow index, density and carbon black content. Melt flow index was determined according to ASTM D 1238. Density was determined according to ASTM D 1505. Carbon black content was determined according to ASTM D 1603. The average test results are reported below.

Resin Blend Number	215A
Melt Flow Index (g/10 min)	0.29
Density (g/cm^3)	0.950
Carbon Black Content (percent)	2.36

Jane Allen

Jane Allen
Quality Control Manager

COVER SOIL

The cover soil was sampled and tested as per the Specification before being brought to the site and periodically as specified. Included here in the appendix are the results of this analytical testing. This part of the appendix includes the following test results:

1. Classification - ASTM D2487
2. Atterberg Limits - Plastic Index, Liquid limit, Plasticity Index.
3. Grain-Size Analysis.
4. Applicable physical properties.
5. Standard Proctor compaction results.
6. Permeability results.
7. Chemical screening.
8. A list of in-place compaction results.

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
1	Cover Soil	B+00,0+50	1	2	9/2/93	20	95.8	7.7	P
2	Cover Soil	C+00,1+25	1	2	9/2/93	20	92.8	11.2	P
3	Cover Soil	D+50,0+75	1	2	9/2/93	20	96.5	13.2	P
1	Cover Soil	A+50,1+75	1	2	9/4/93	20	99.6	13.6	P
2	Cover Soil	C+00,2+50	1	2	9/4/93	20	95.0	10.1	P
3	Cover Soil	D+75,2+25	1	2	9/4/93	20	98.4	10.5	P
1	Cover Soil	A+50,1+70	2	2	9/7/93	20	94.6	9.5	P
2	Cover Soil	B+25,2+15	2	2	9/7/93	20	90.5	9.2	P
3	Cover Soil	B+25,2+25	2	2	9/7/93	20	94.5	11.3	P
4	Cover Soil	B+75,2+25	2	2	9/7/93	20	95.0	10.7	P
5	Cover Soil	B+00,0+75	2	2	9/7/93	20	98.6	8.1	P
6	Cover Soil	C+50,1+25	2	2	9/7/93	20	94.2	7.9	P
7	Cover Soil	E+00,1+25	2	2	9/7/93	20	99.8	10.3	P

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-39
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	9-2-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 2

Two soil samples were submitted to this laboratory for grain size analyses and moisture contents. Following are the test results:

SIEVE SIZE	PARTICLE SIZE (mm)	PERCENT PASSING	
		SIDC-5	SIDC-7
3/8"	9.510	100.0	100.0
#4	4.750	99.2	99.2
#10	2.000	98.2	98.2
#20	0.850	96.9	96.3
#40	0.425	95.0	93.6
#100	0.150	56.8	51.7
#200	0.075	17.3	24.7
	0.034	11.3	9.3
	0.022	9.3	7.9
	0.013	7.9	7.4
	0.009	7.4	6.9
	0.006	7.4	6.4
	0.003	6.9	5.9
	0.001	5.9	4.9

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-39
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	9-2-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	2 OF 2

	PERCENT PASSING	
	SIDC-5	SIDC-7
Percent Coarse	1.8	1.8
Percent Sand	80.9	73.5
Percent Silt	10.9	19.3
Percent Clay	6.4	5.4
Percent Moisture (As Received)	11.1	10.3

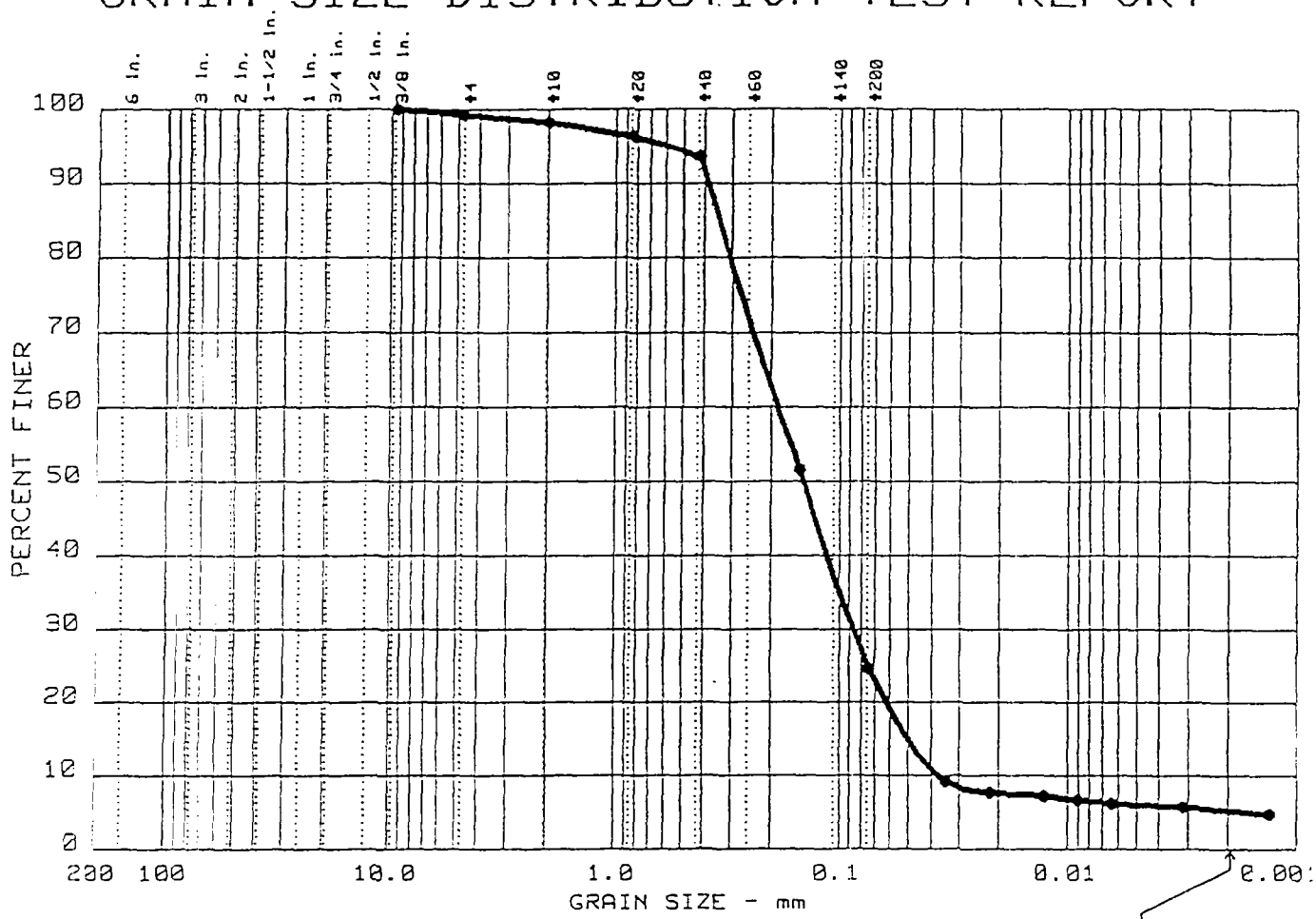
TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

Attachments (2)

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
•	2	0.0	1.8	73.5	19.3	5.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
•			0.34	0.19	0.14	0.087	0.0506	0.0367	1.10	5.1

	MATERIAL DESCRIPTION	USCS	AASHTO
•			

Project No.: A93196x12
Project: Laskin\Poplar Site
• Location: SIDC - 7

Date: 09-02-1993

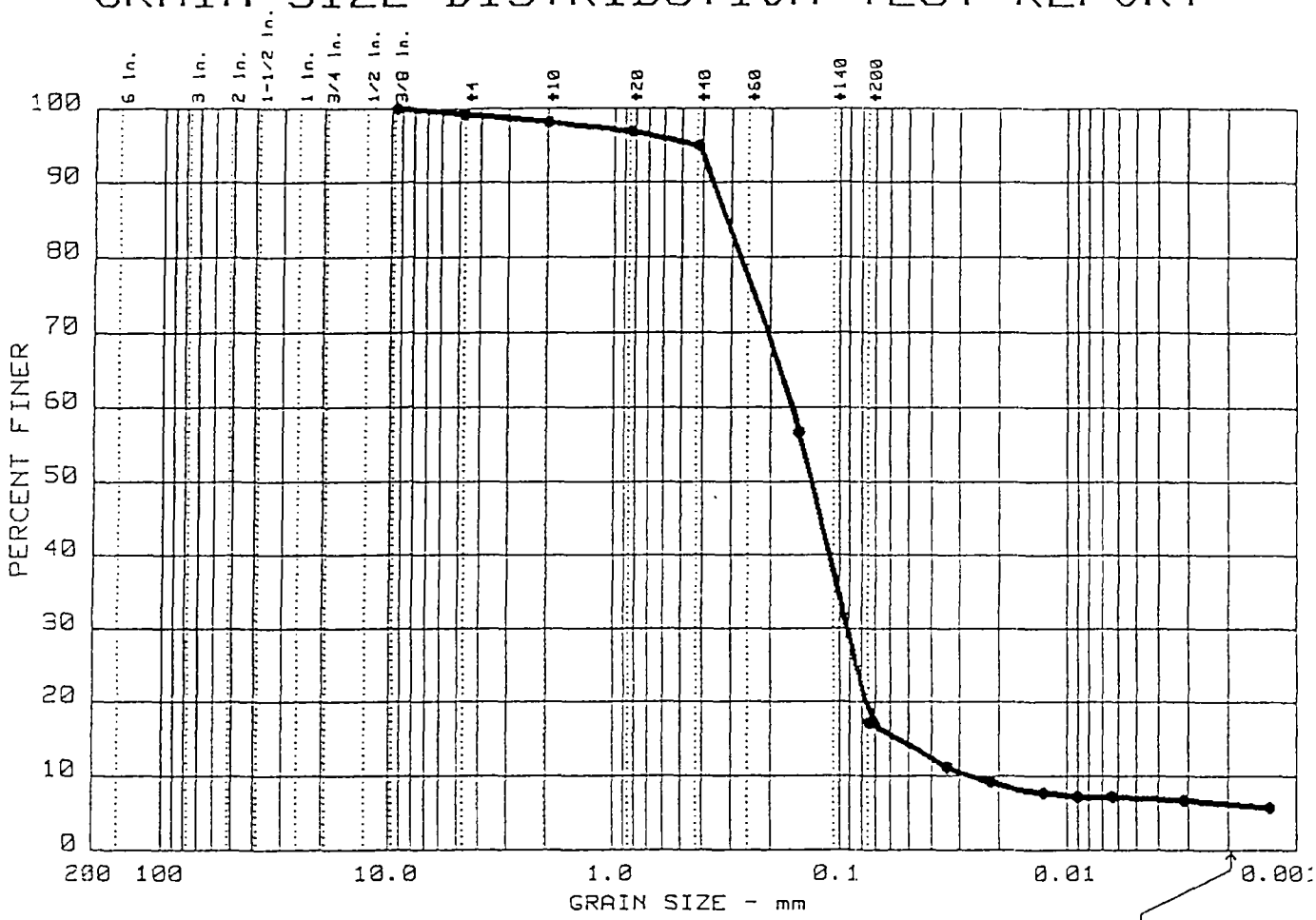
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	1.8	80.9	10.9	6.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.32	0.16	0.13	0.093	0.0546	0.0261	2.05	6.1

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: A93196x12
Project: Laskin\Poplar Site
● Location: SIDC - 5

Date: 09-02-1993

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-38
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	9-2-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 1

A sample, identified as SIDC-6, was submitted to this laboratory for a material analysis. Following are the test results:

Percent Moisture (As Received)	- 9.30
Specific Gravity	- 2.66
Plasticity Index	- Non Plastic
Soil Classification	- SM

Standard Proctor (ASTM D698)

Maximum Dry Density (pcf)	- 107.1
Optimum Moisture (Percent)	- 15.0

TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

Attachment (1)

DATA SUMMARY REPORT

DATE: 06/28/93

PAGE: 1

Company: OGB REMEDIATION SERVICES CORPORATION

Sample Point ID:	SCA	STA	SDA
ASC Sample Number:	JK8016	JK8017	JK8018
Sample Date:	930618	930618	930618
Facility Code:	013988	013988	013988

Parameters	Units			
Halogenated Volatile Analysis, GC, (SV30)				
Bromoform	mg/kg	<.001	<.001	<.001
Bromomethane	mg/kg	<.001	<.001	<.001
Carbon tetrachloride	mg/kg	<.001	<.001	<.001
Chlorobenzene	mg/kg	<.001	<.001	<.001
Chlorodibromomethane	mg/kg	<.001	<.001	<.001
Chloroethane	mg/kg	<.001	<.001	<.001
2-Chloroethylvinyl ether	mg/kg	<.001	<.001	<.001
Chloroform	mg/kg	<.001	<.001	<.001
Chloromethane	mg/kg	<.001	<.001	<.001
1,2-Dichlorobenzene	mg/kg	<.001	<.001	<.001
1,3-Dichlorobenzene	mg/kg	<.001	<.001	<.001
1,4-Dichlorobenzene	mg/kg	<.001	<.001	<.001
Dichlorobromomethane	mg/kg	<.001	<.001	<.001
Dichlorodifluoromethane	mg/kg	<.001	<.001	<.001
1,1-Dichloroethane	mg/kg	<.001	<.001	<.001
1,2-Dichloroethane	mg/kg	<.001	<.001	<.001
1,1-Dichloroethylene	mg/kg	<.001	<.001	<.001
trans-1,2-Dichloroethene	mg/kg	<.001	<.001	<.001
1,2-Dichloropropane	mg/kg	<.001	<.001	<.001
cis-1,3-Dichloropropylene	mg/kg	<.001	<.001	<.001
trans-1,3-Dichloropropylene	mg/kg	<.001	<.001	<.001
Methylene chloride	mg/kg	<.001	<.001	<.001
1,1,2,2-Tetrachloroethane	mg/kg	<.001	<.001	<.001
Tetrachloroethylene	mg/kg	<.001	<.001	<.001
1,1,1-Trichloroethane	mg/kg	<.001	<.001	<.001
1,1,2-Trichloroethane	mg/kg	<.001	<.001	<.001
Trichloroethylene	mg/kg	<.001	<.001	<.001
Trichlorofluoromethane	mg/kg	<.001	<.001	<.001
Vinyl chloride	mg/kg	<.001	<.001	<.001
Benzene	mg/kg	<.001	<.001	<.001
Ethylbenzene	mg/kg	<.001	<.001	<.001
Toluene	mg/kg	<.001	<.001	<.001
Xylenes	mg/kg	<.001	<.001	<.001

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To Bill Fenwick	From Bill Guthrie
Co.	Co.
Dept.	Phone #
Fax #	Fax #

DATA SUMMARY REPORT

DATE: 06/28/93

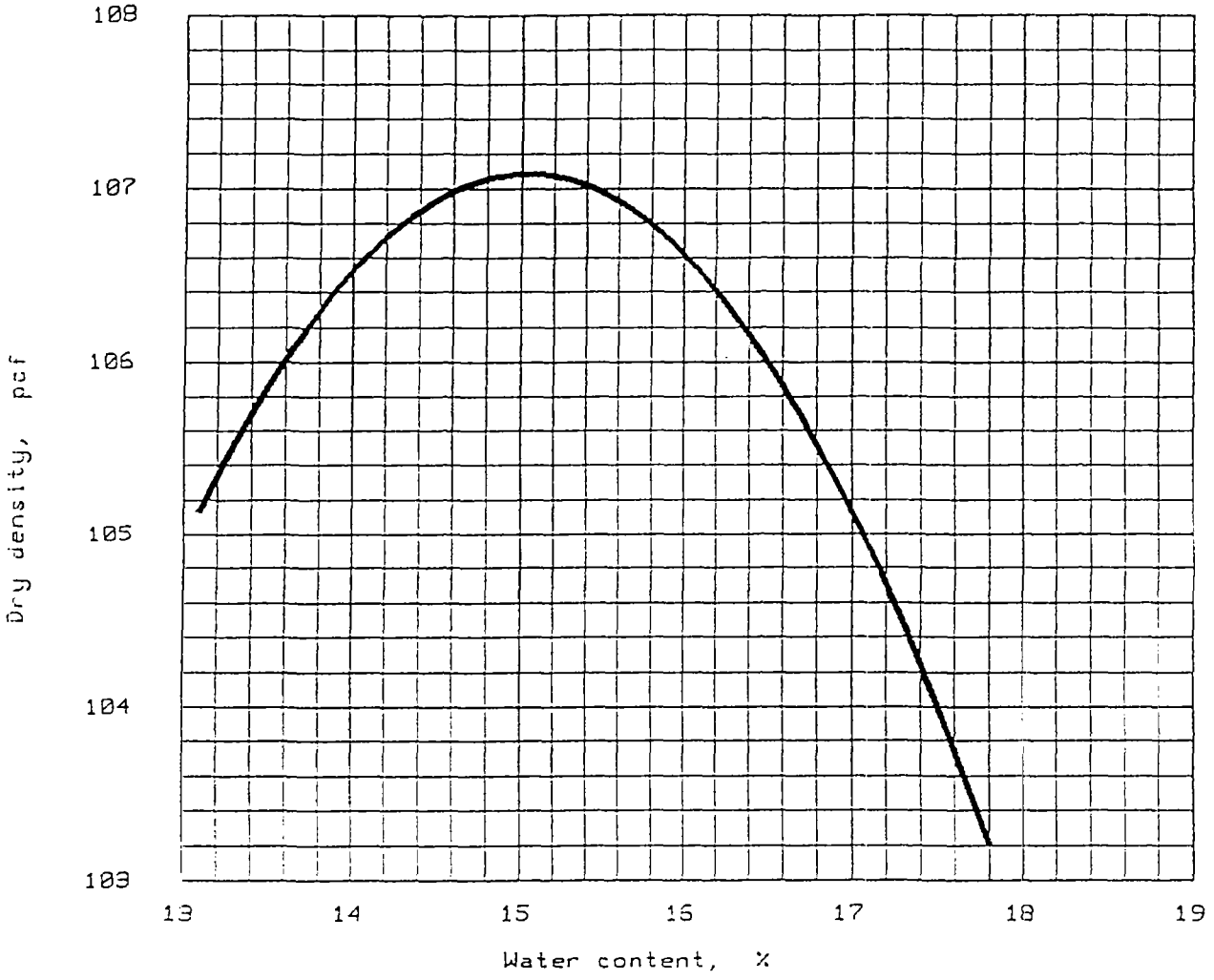
Company: OHM REMEDIATION SERVICES CORPORATION

	Sample Point ID:	SCA	STA	SDA
	ASC Sample Number:	JX8016	JX8017	JX8018
	Sample Date:	930618	930618	930618
	Facility Code:	013988	013988	013988
Parameters	Units			
RCRA Total Metals Analysis, (ME50)				
Arsenic	mg/kg	<5.00	<5.00	8.23
Barium	mg/kg	12.7	50.0	45.3
Cadmium	mg/kg	<1.00	<1.00	<1.00
Chromium	mg/kg	4.25	6.55	9.07
Lead	mg/kg	5.65	13.0	10.8
Mercury	mg/kg	<.050	<.050	<.050
Selenium	mg/kg	<.500	<.500	<.500
Silver	mg/kg	<1.00	<1.00	<1.00

FILE NO.: A93196X1
REPORT NO.: A-38

PROCTOR TEST REPORT

CURVE NO. 30



"Standard" Proctor, ASTM D 698, Method A

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No. 4	% < No. 20
	USCS	AASHTO						
			9.3 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 15.0 % Maximum dry density = 107.1 pcf	Brown FINE SAND, little silt

Project No.: A93196x1
Project: Laskin\Poplar Site
Location: SIDC - 6

Date: 9-01-1993

Remarks:

PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-40
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	9-11-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 2

On September 8, 1993, a sample identified as SIDC-8, was submitted to this laboratory for a material analysis. Following are the test results:

SIEVE SIZE	PARTICLE SIZE (mm)	PERCENT PASSING
3/8"	9.510	100.0
#4	4.750	99.5
#10	2.000	98.5
#20	0.850	97.6
#40	0.425	96.4
#100	0.150	61.4
#200	0.075	18.7
	0.035	10.3
	0.022	8.4
	0.013	6.4
	0.009	5.9
	0.007	5.4
	0.003	4.9
	0.001	4.4

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-40
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	9-11-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	2 OF 2

Percent Coarse	1.50
Percent Sand	79.80
Percent Silt	14.00
Percent Clay	4.70
Percent Moisture (As-received)	10.40

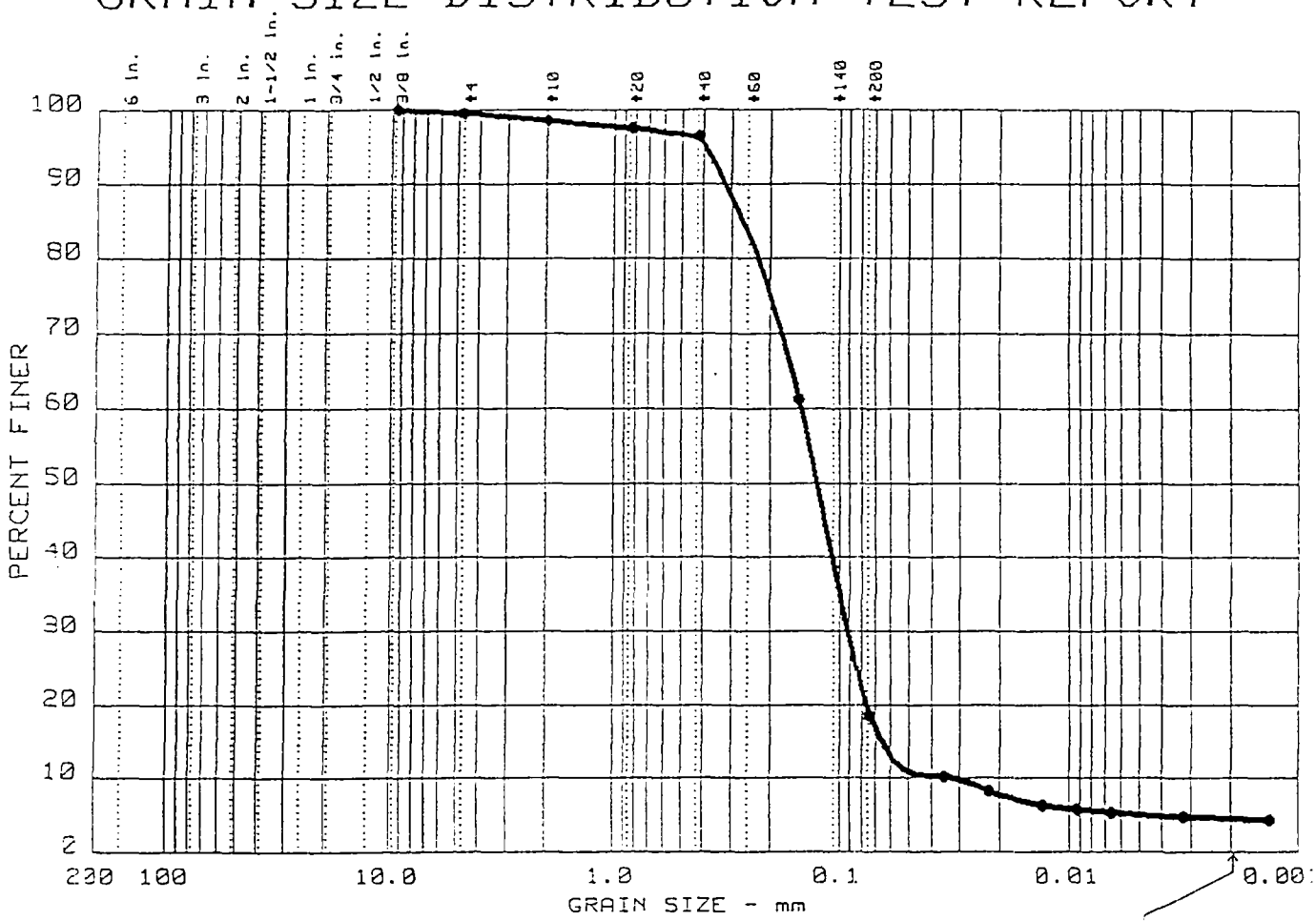
TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

Attachments (2)

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	13	0.0	1.5	79.8	14.0	4.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.27	0.15	0.13	0.092	0.0660	0.0305	1.92	4.8

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: A93196x12
Project: Laskin\Poplar Site
● Location: SIDC - 8

Date: 09-10-1993

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-34
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	9-1-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 1

On August 27, 1993, sample SIDC-3 was submitted to this laboratory for a material analysis. Following are the test results:

Percent Moisture (As Received)	- 8.3
Specific Gravity	- 2.65
Plasticity Index	- Non Plastic
Soil Classification	- (SP-SM)

Standard Proctor Results

Maximum Dry Density (pcf)	- 106.3
Optimum Moisture (Percent)	- 15.1

TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-35
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	9-1-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 2

On August 27, 1993, two samples were submitted to this laboratory for grain size and moisture content tests. Following are the test results:

SIEVE SIZE	PARTICLE SIZE (mm)	PERCENT PASSING	
		SIDC-2	SIDC-4
3/8"	9.510	100.0	100.0
#4	4.750	99.6	99.4
#10	2.000	98.3	98.1
#20	0.850	97.0	96.5
#40	0.425	95.2	94.6
#100	0.150	55.4	48.9
#200	0.075	15.4	13.4
	0.035	5.9	4.9
	0.022	4.9	3.9
	0.013	3.9	2.9
	0.009	3.4	2.5
	0.007	3.0	2.5
	0.003	3.0	2.0
	0.001	2.0	1.5

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-35
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	9-1-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	2 OF 2

	PERCENT PASSING	
	SIDC-2	SIDC-4
Percent Coarse	1.7	1.9
Percent Sand	82.9	84.7
Percent Silt	12.8	11.7
Percent Clay	2.6	1.7
Percent Moisture (As Received)	9.1	8.6

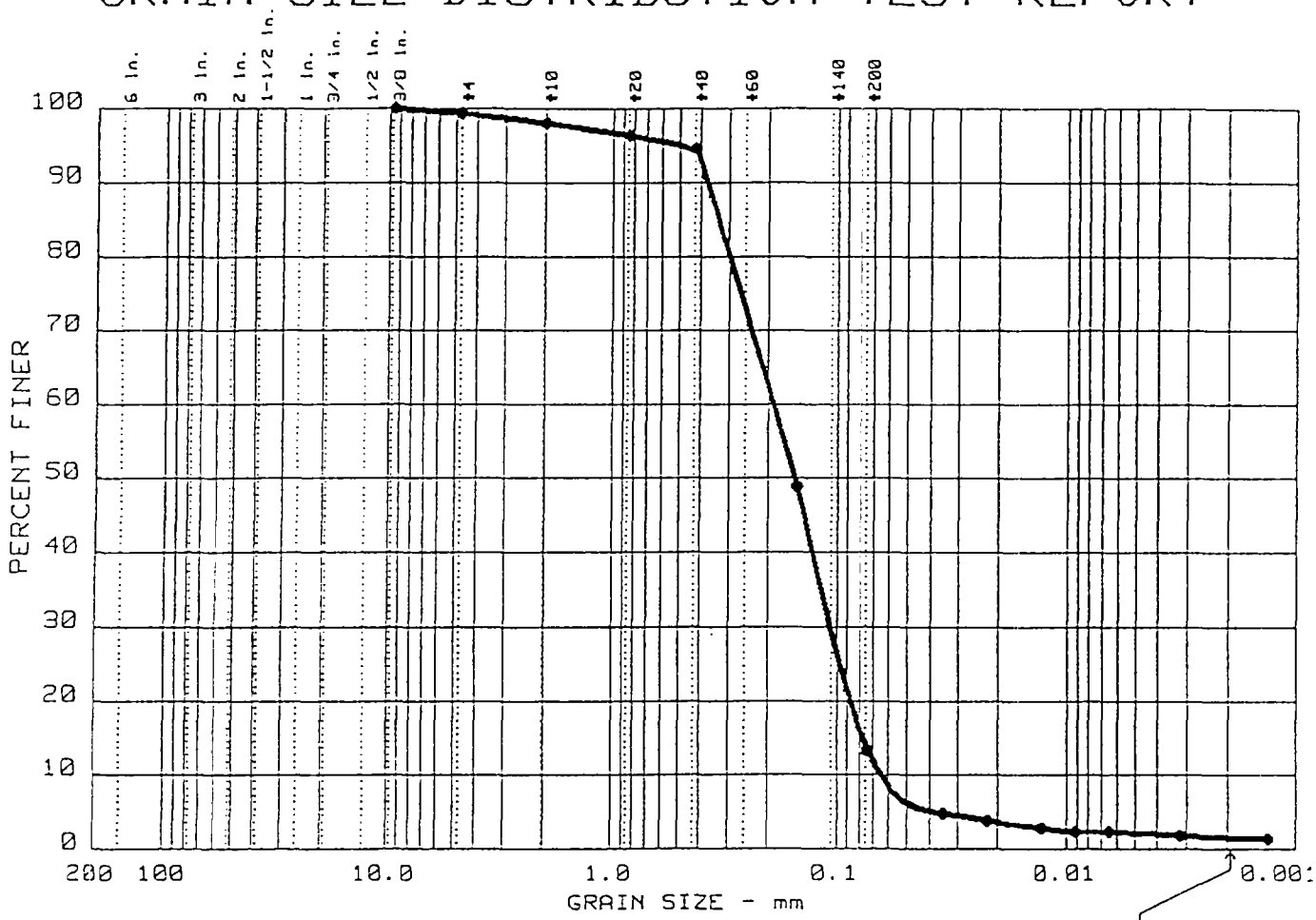
TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

Attachments (2)

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	2	0.0	1.9	84.7	11.7	1.7

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.30	0.18	0.15	0.107	0.0775	0.0652	0.98	2.8

MATERIAL DESCRIPTION	USCS	AASHTO
●		

Project No.: A93196x:2
Project: Laskin\Poplar Site
● Location: SIDC - 4

Date: 09-01-1993

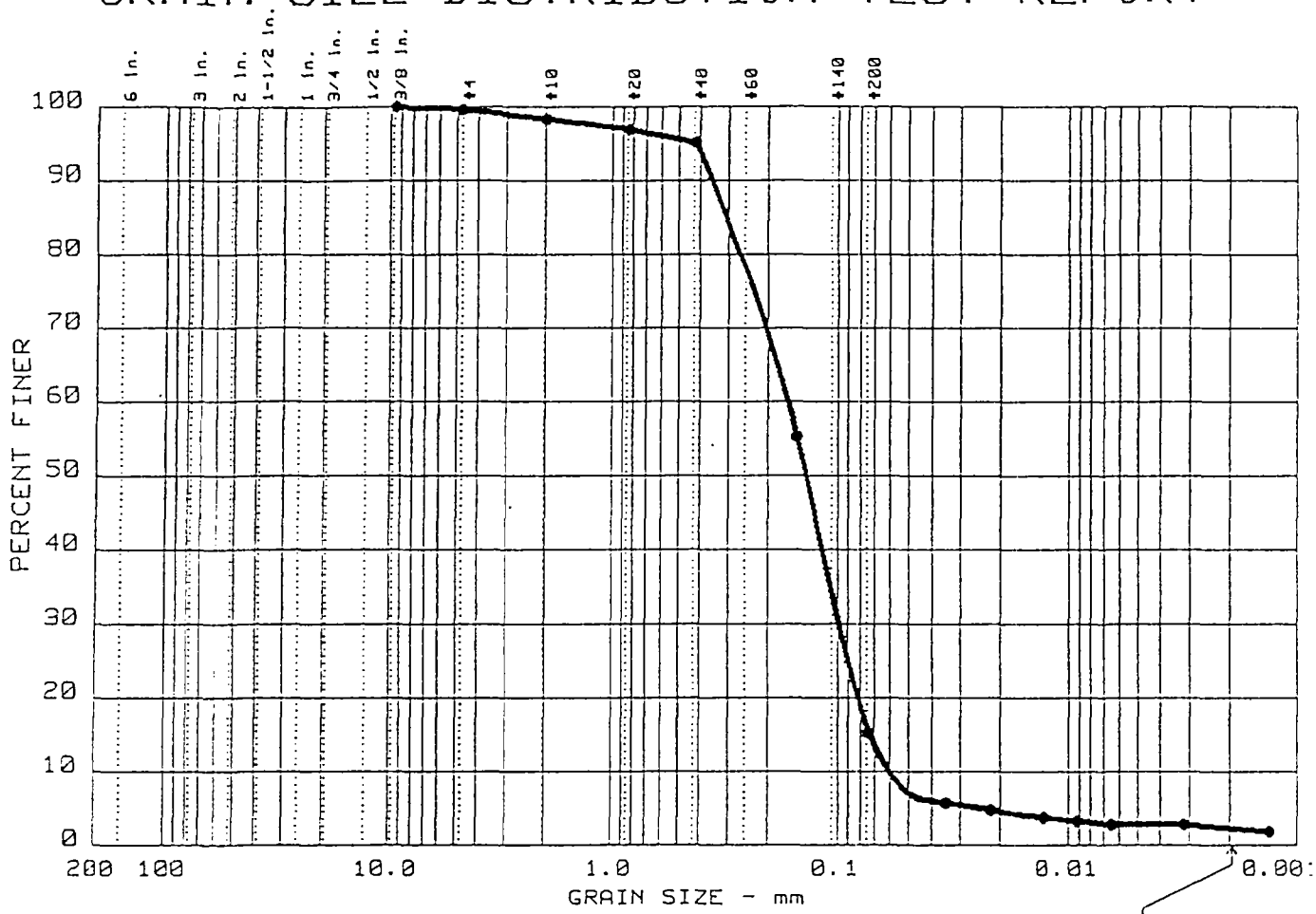
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	1.7	82.9	12.8	2.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.28	0.16	0.14	0.099	0.0732	0.0609	1.00	2.6

	MATERIAL DESCRIPTION	USCS	AASHTO
●			

Project No.: A93196x12
Project: Laskin\Poplar Site
● Location: SIDC - 2

Date: 09-01-1993

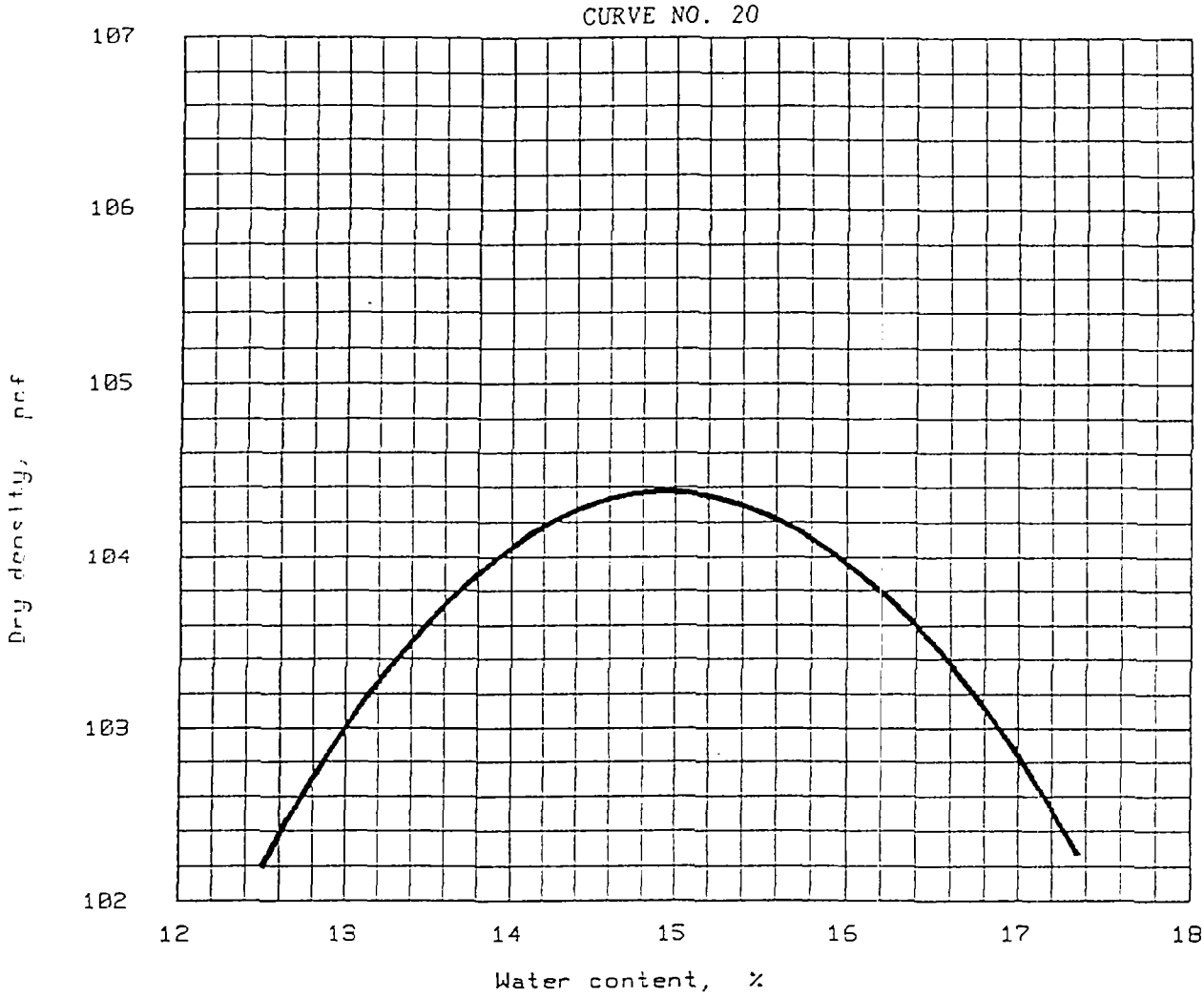
Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

PROCTOR TEST REPORT



"Standard" Proctor, ASTM D 698, Method A

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No. 4	% < No. 200
	USCS	AASHTO						
			5.6 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 14.9 % Maximum dry density = 104.4 pcf	Brown FINE SAND, little silt

Project No.: A93196x12

Project: Laskin\Poplar Site

Location: R.W. Sidley

Date: 06-18-1993

Remarks:

Cover soil

sample SIDC-1

PROCTOR TEST REPORT

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Figure No. _____

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-21
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	6-19-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 2

On June 14, 1993, a soil sample, identified as Sample SIDC-1, cover soil from R.W. Sidley, was submitted to this laboratory for a material analysis. Following are the test results:

SIEVE SIZE	PARTICLE SIZE (mm)	PERCENT PASSING
3/8"	9.510	100.0
#4	4.750	99.9
#10	2.000	99.1
#20	0.850	98.1
#40	0.425	96.6
#100	0.150	51.5
#200	0.075	12.8
	0.036	5.0
	0.023	4.5
	0.013	3.5
	0.009	3.0
	0.007	3.0
	0.003	2.5
	0.001	2.0

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-21
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	6-19-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	2 OF 2

Percent Gravel	0.90
Percent Sand	86.30
Percent Silt	10.60
Percent Clay	2.20
Specific Gravity	2.64
Percent Moisture (As-received)	5.60
Plasticity Index	Non Plastic
Classification	SM

<u>Standard Proctor</u> - Maximum Dry Density - 104.4 pcf
Optimum Moisture - 14.9%

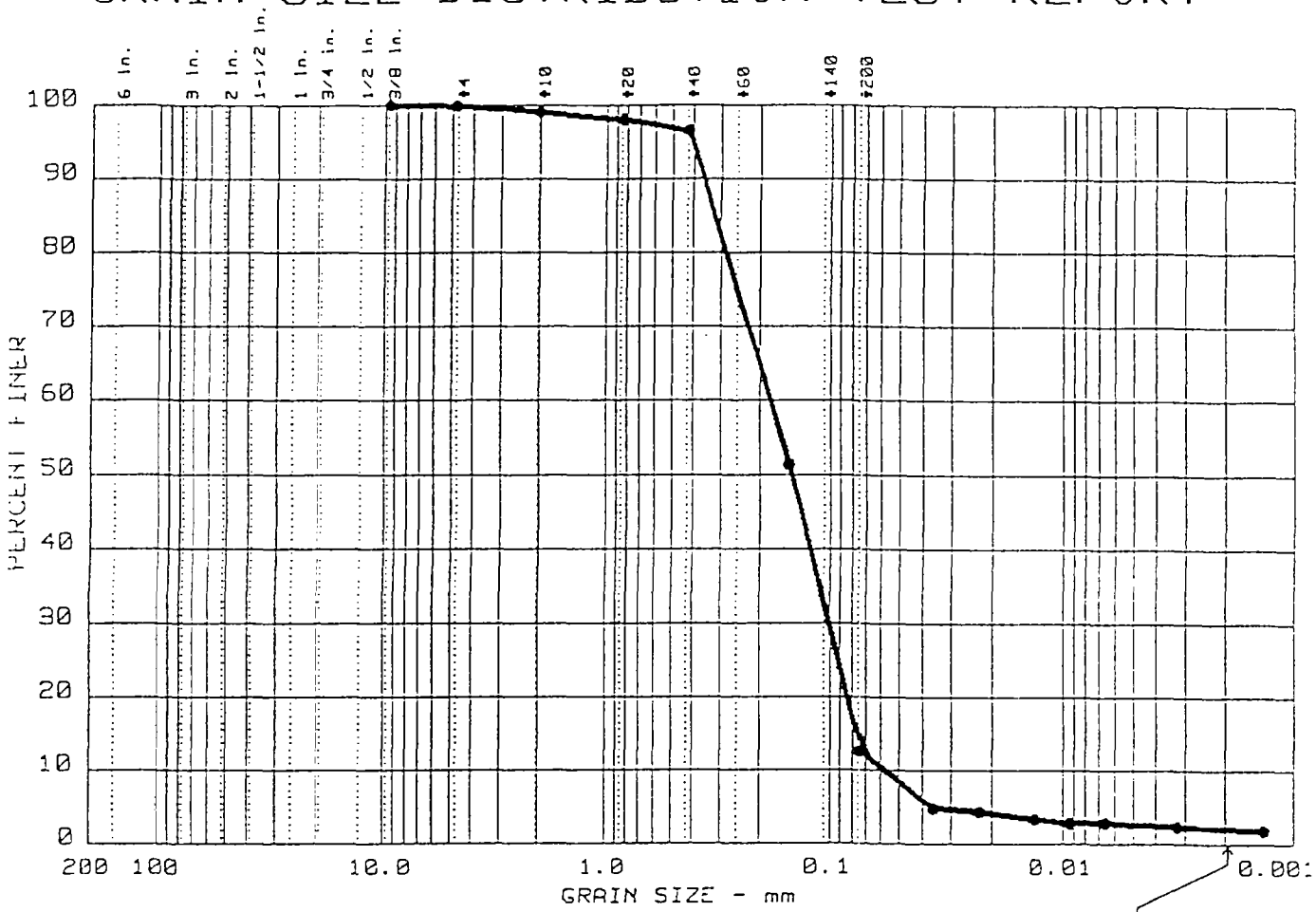
TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

Attachments (2)

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	10	0.0	0.9	86.3	10.5	2.2

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.32	0.18	0.14	0.101	0.0769	0.0570	1.00	3.1

MATERIAL DESCRIPTION	USCS	AASHTO
● Cover soil sample SIDC-1		

Project No.: A93196x12
Project: Laskin\Poplar Site
● Location: R.W. Sidley

Date: 6-18-93

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

TOP SOIL

The topsoil was sampled and tested as per the Specification before being brought to the site and periodically as specified. Included here in the appendix are the results of this analytical testing. This part of the appendix includes the following test results:

1. Grain-Size Analysis.
2. Chemical screening.

SOLAR TESTING LABORATORIES, INC.

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PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
		REPORT NO.:	A-22
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	6-19-93
DESCRIPTION:	MATERIAL ANALYSIS	PAGE NO.:	1 OF 2

On June 14, 1993, a sample of topsoil, identified as Sample SIDT-1, from R.W. Sidley, was submitted to this laboratory for a material analysis. Following are the test results:

SIEVE SIZE	PARTICLE SIZE (mm)	PERCENT PASSING
3/8"	9.510	100.0
#4	4.750	99.1
#10	2.000	94.4
#20	0.850	88.7
#40	0.425	75.9
#100	0.150	41.3
#200	0.075	35.6
	0.031	28.6
	0.020	23.9
	0.012	18.1
	0.009	14.3
	0.006	12.4
	0.003	8.6
	0.001	4.8

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X12
CLIENT:	OHM REMEDIATION SERVICES CORP.	REPORT NO.:	A-22
DESCRIPTION:	MATERIAL ANALYSIS	DATE:	6-19-93
		PAGE NO.:	2 OF 2

Percent Gravel	5.60
Percent Sand	58.80
Percent Silt	29.20
Percent Clay	6.40

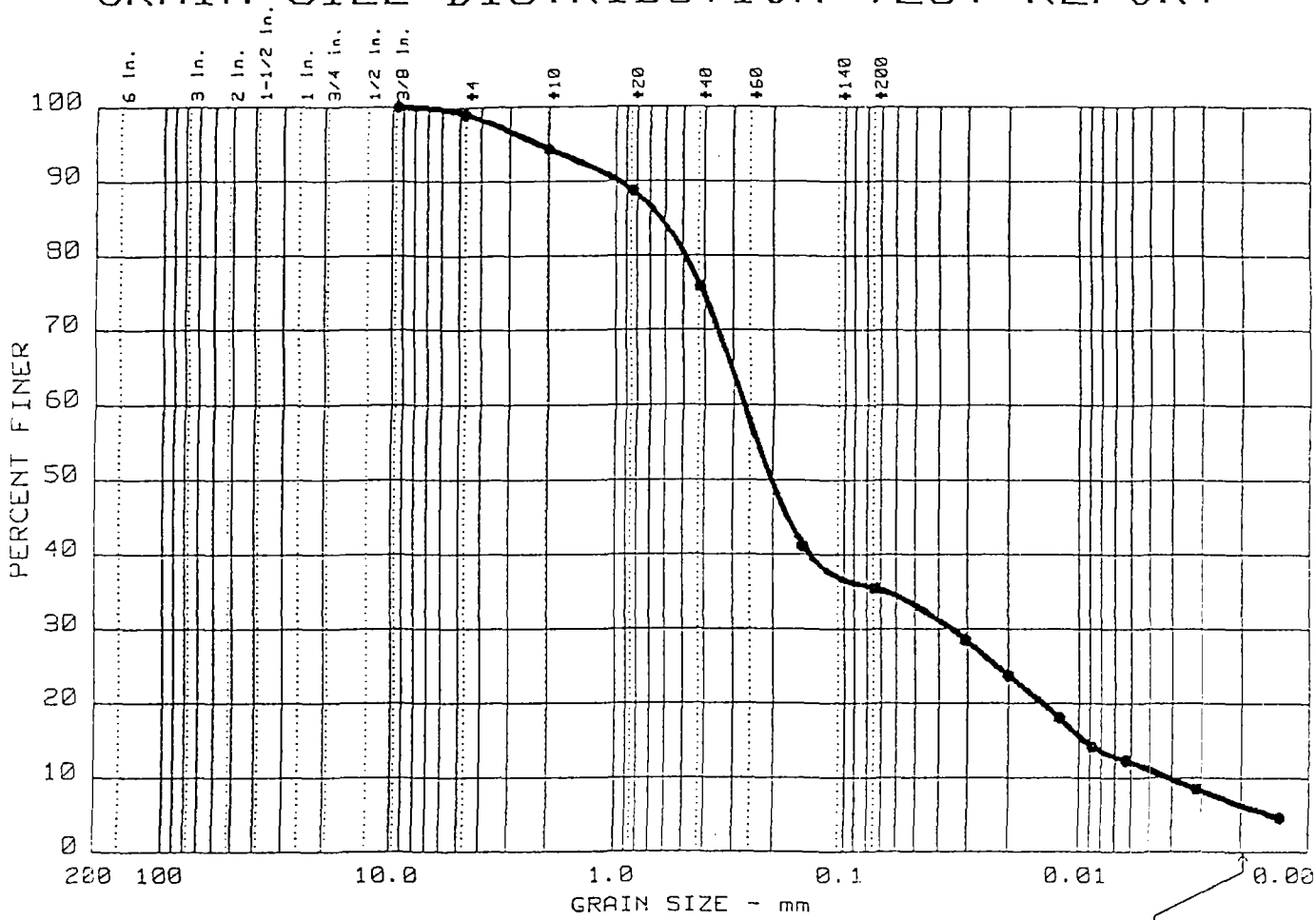
TECHNICIAN: DONALD HOLLENBAUGH

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

Attachment (1)

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	11	0.0	5.6	58.8	29.2	6.4

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.63	0.27	0.20	0.035	0.0094	0.0040	1.15	67.6

MATERIAL DESCRIPTION	USCS	AASHTO
● Topsoil sample SIDT-1		

Project No.: A93196x12
Project: Laskin\Poplar Site
● Location: R.W. Sidley

Date: 6-18-93

Remarks:

GRAIN SIZE DISTRIBUTION TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

DATA SUMMARY REPORT

DATE: 06/28/93

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

Sample Point ID:	SCA	STA	SBA
AGC Sample Number:	JK8016	JK8017	JK8018
Sample Date:	930618	930618	930618
Facility Code:	013988	013988	013988

Parameters	Units			
Halogenated Volatile Analysis, GC, (GV30)				
Bromoform	mg/kg	<.001	<.001	<.001
Bromomethane	mg/kg	<.001	<.001	<.001
Carbon tetrachloride	mg/kg	<.001	<.001	<.001
Chlorobenzene	mg/kg	<.001	<.001	<.001
Chlorodibromomethane	mg/kg	<.001	<.001	<.001
Chloroethane	mg/kg	<.001	<.001	<.001
2-Chloroethylvinyl ether	mg/kg	<.001	<.001	<.001
Chloroform	mg/kg	<.001	<.001	<.001
Chloromethane	mg/kg	<.001	<.001	<.001
1,2-Dichlorobenzene	mg/kg	<.001	<.001	<.001
1,3-Dichlorobenzene	mg/kg	<.001	<.001	<.001
1,4-Dichlorobenzene	mg/kg	<.001	<.001	<.001
Dichlorobromomethane	mg/kg	<.001	<.001	<.001
Dichlorodifluoromethane	mg/kg	<.001	<.001	<.001
1,1-Dichloroethane	mg/kg	<.001	<.001	<.001
1,2-Dichloroethane	mg/kg	<.001	<.001	<.001
1,1-Dichloroethylene	mg/kg	<.001	<.001	<.001
trans-1,2-Dichloroethene	mg/kg	<.001	<.001	<.001
1,2-Dichloropropane	mg/kg	<.001	<.001	<.001
cis-1,3-Dichloropropylene	mg/kg	<.001	<.001	<.001
trans-1,3-Dichloropropylene	mg/kg	<.001	<.001	<.001
Methylene chloride	mg/kg	<.001	<.001	<.001
1,1,2,2-Tetrachloroethane	mg/kg	<.001	<.001	<.001
Tetrachloroethylene	mg/kg	<.001	<.001	<.001
1,1,1-Trichloroethane	mg/kg	<.001	<.001	<.001
1,1,2-Trichloroethane	mg/kg	<.001	<.001	<.001
Trichloroethylene	mg/kg	<.001	<.001	<.001
Trichlorofluoromethane	mg/kg	<.001	<.001	<.001
Vinyl chloride	mg/kg	<.001	<.001	<.001
Benzene	mg/kg	<.001	<.001	<.001
Ethylbenzene	mg/kg	<.001	<.001	<.001
Toluene	mg/kg	<.001	<.001	<.001
Xylenes	mg/kg	<.001	<.001	<.001

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 2

To Bill Fenwick	From Bill Arthur
Co.	Co.
Dept.	Phone #
Fax #	Fax #

DATA SUMMARY REPORT

DATE: 06/28/93

Company: OHM REMEDIATION SERVICES CORPORATION

	Sample Point ID:	8CA	8UA	8BA
	ASC Sample Number:	JK8016	JK8017	JK8018
	Sample Date:	930618	930618	930618
	Facility Code:	013988	013988	013988
Parameters	Units			
RCRA Total Metals Analysis, (MK50)				
Arsenic	mg/kg	<5.00	<5.00	8.23
Barium	mg/kg	12.7	50.0	45.3
Cadmium	mg/kg	<1.00	<1.00	<1.00
Chromium	mg/kg	4.25	6.55	9.07
Lead	mg/kg	5.65	13.0	10.8
Mercury	mg/kg	<.050	<.050	<.050
Selenium	mg/kg	<.500	<.500	<.500
Silver	mg/kg	<1.00	<1.00	<1.00

COMPACTION TEST RESULTS FOR THE EXCLUSION ZONE MATERIALS

Included here in the appendix are the results of the compaction testing for the North Slope material that was moved and added under the Cap. Also included are the compaction results for the stained soil taken from the North Ditch Line and added under the Cap. The Modified Proctor results for the various types of soil are included here also.

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
1	N. Slope Haz.	C+50,1+00	1	2	6/16/93	16	79.3	15.0	F
2	N. Slope Haz.	B+75,1+00	1	2	6/16/93	16	90.8	11.5	F
3	N. Slope Haz.	B+00,1+00	1	2	6/16/93	16	91.8	9.8	F
4	N. Slope Haz.	C+25,1+75	1	2	6/16/93	16	92.8	11.7	F
5	N. Slope Haz.	C+25,2+00	1	2	6/16/93	16	93.6	13.8	F
6	N. Slope Haz.	C+00,1+75	1	2	6/16/93	16	97.9	11.8	P
1	N. Slope Haz.	See Note 2	2	2	6/17/93	17	96.8	13.1	P
2	N. Slope Haz.	See Note 3	2	2	6/17/93	17	98.6	13.3	P
3	N. Slope Haz.	See Note 4	2	2	6/17/93	17	91.5	14.4	F
4	N. Slope Haz.	See Note 5	2	2	6/17/93	17	92.4	15.8	F
5	N. Slope Haz.	See Note 6	2	2	6/17/93	17	96.4	14.6	P
6	N. Slope Haz.	D+00,2+50	3	2	6/17/93	17	96.2	11.8	P
7	N. Slope Haz.	D+30,3+00	3	2	6/17/93	17	96.8	12.0	F
8	N. Slope Haz.	D+00,3+00	3	2	6/17/93	17	96.6	12.5	P
15	N. Slope Haz.	C+50,3+00	4	2	6/17/93	17	87.6	18.8	F
16	N. Slope Haz.	D+30,3+25	4	2	6/17/93	17	96.2	14.7	P
17	N. Slope Haz.	E+00,4+00	4	2	6/17/93	17	90.7	14.4	F
18	N. Slope Haz.	C+00,5+00	4	2	6/17/93	19	91.3	13.8	F
19	N. Slope Haz.	B+00,4+00	4	2	6/17/93	19	93.2	14.5	F
1	N. Slope Haz.	D+00,3+00	4	2	6/18/93	17	95.8	12.5	P
2	N. Slope Haz.	C+75,3+50	4	2	6/18/93	17	90.0	14.7	F
3	N. Slope Haz.	D+00,4+00	4	2	6/18/93	17	93.3	14.0	F
4	N. Slope Haz.	D+40,4+75	4	2	6/18/93	17	99.9	12.6	P
5	N. Slope Haz.	C+00,3+50	4	2	6/18/93	19	90.1	15.7	P
6	N. Slope Haz.	C+00,3+50	4	2	6/18/93	19	90.8	13.9	P
7	N. Slope Haz.	B+75,2+00	4	2	6/18/93	19	92.4	15.4	F
8	N. Slope Haz.	B+75,2+00	4	2	6/18/93	19	92.3	12.8	F
9	N. Slope Haz.	B+75,2+00	4	2	6/18/93	19	93.6	13.2	F
10	N. Slope Haz.	B+50,2+00	4	2	6/18/93	19	89.8	15.4	P
11	N. Slope Haz.	C+00,3+50	4	2	6/18/93	19	94.6	8.5	F
12	N. Slope Haz.	B+50,2+00	4	2	6/18/93	19	91.1	13.4	F
13	N. Slope Haz.	B+50,2+00	4	2	6/18/93	19	93.8	13.6	P
14	N. Slope Haz.	B+50,2+00	4	2	6/18/93	19	94.1	12.7	F
15	N. Slope Haz.	B+50,2+00	4	2	6/18/93	19	94.9	12.4	P
1	N. Slope Haz.	B+00,0+75	5	2	6/23/93	19	97.4	11.0	P
2	N. Slope Haz.	D+50,1+00	5	2	6/23/93	17	98.7	11.4	P
9	N. Slope Haz.	D+25,1+00	6	2	6/23/93	17	92.2	17.9	F
10	N. Slope Haz.	D+25,1+00	6	2	6/23/93	17	94.5	16.2	F
11	N. Slope Haz.	D+25,1+00	6	2	6/23/93	17	94.7	15.7	F
12	N. Slope Haz.	C+50,1+50	6	2	6/23/93	17	95.4	14.0	P
13	N. Slope Haz.	B+50,1+75	6	2	6/23/93	17	94.4	13.5	F

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
14	N. Slope Haz.	D+25,1+00	6	2	6/23/93	17	91.9	19.8	F
15	N. Slope Haz.	D+25,1+50	6	2	6/23/93	17	93.0	13.3	F
16	N. Slope Haz.	D+25,1+50	6	2	6/23/93	17	87.7	19.1	F
17	N. Slope Haz.	C+25,1+50	6	2	6/23/93	17	88.2	15.4	F
18	N. Slope Haz.	B+00,1+50	6	2	6/23/93	17	93.7	14.0	F
19	N. Slope Haz.	A+50,1+00	6	2	6/23/93	17	95.9	12.3	P
20	N. Slope Haz.	C+25,0+75	6	2	6/23/93	17	102.0	11.0	P
1	N. Slope Haz.	B+75,1+25	6	2	6/24/93	17	90.2	18.0	F
2	N. Slope Haz.	C+40,1+00	6	2	6/24/93	17	88.5	18.8	F
3	N. Slope Haz.	D+25,1+25	6	2	6/24/93	17	95.5	14.5	P
4	N. Slope Haz.	C+25,1+60	6	2	6/24/93	17	94.7	16.0	F
5	N. Slope Haz.	B+50,1+80	6	2	6/24/93	17	93.1 (1)	14.5	F
6	N. Slope Haz.	B+25,1+50	6	2	6/24/93	19	94.4	12.1	F
7	N. Slope Haz.	B+00,1+00	6	2	6/24/93	19	95.1	14.6	P
10	N. Slope Haz.	B+75,1+25	6	2	6/24/93	17	97.2	13.6 (2)(3)	P
11	N. Slope Haz.	C+40,1+00	6	2	6/24/93	17	91.7	15.6 (2)(3)	F
12	N. Slope Haz.	B+00,1+00	7	2	6/24/93	17	91.6	16.5	F
13	N. Slope Haz.	B+00,1+25	7	2	6/24/93	17	92.3	15.4	F
14	N. Slope Haz.	C+75,1+50	7	2	6/24/93	17	97.4	10.9	P
15	N. Slope Haz.	D+50,1+50	7	2	6/24/93	17	94.9	12.0 (3)	P
1	N. Slope Haz.	B+00,1+50	8	2	6/25/93	17	91.7	16.8	P
2	N. Slope Haz.	B+25,2+00	8	2	6/25/93	17	91.9	15.6	P
3	N. Slope Haz.	D+00,1+50	8	2	6/25/93	17	90.4	15.2	P
1	N. Slope Haz.	A+00,0+50	9	2	6/28/93	17	93.2	10.6	F
2	N. Slope Haz.	A+00,0+75	9	2	6/28/93	17	100.3	12.1	P
3	N. Slope Haz.	C+00,1+00	9	2	6/28/93	17	95.4	14.1	P
4	N. Slope Haz.	D+50,0+75	9	2	6/28/93	17	92.4	14.4	F
7	N. Slope Haz.	B+00,1+50	10	2	6/30/93	17	92.2	13.0	F (5)
8	N. Slope Haz.	D+50,1+00	10	2	6/30/93	17	92.4	13.8	F (5)
8	N. Slope Haz.	B+50,1+00	11	2	7/1/93	17	92.4	16.4	P (2)
9	N. Slope Haz.	C+00,1+00	11	2	7/1/93	17	90.7	16.4	F
10	N. Slope Haz.	D+50,1+00	11	2	7/1/93	17	95.8	13.1	P
1	N. Slope Haz.	D+00,1+00	10	2	6/29/93	17	90.4	17.7	F
2	N. Slope Haz.	C+25,1+00	10	2	6/29/93	17	85.3	19.7	F
3	N. Slope Haz.	B+25,1+50	10	2	6/29/93	17	94.4	16.3	P
4	N. Slope Haz.	B+25,1+50	10	2	6/29/93	17	94.7	14.0	P(3)(4)
5	N. Slope Haz.	C+25,1+90	10	2	6/29/93	17	101.1	11.4	P(3)(4)
6	N. Slope Haz.	B+50,0+50	10	2	6/29/93	17	92.4	16.1	F
7	N. Slope Haz.	B+50,1+25	10	2	6/29/93	17	85.3	20.1	F
8	N. Slope Haz.	D+50,0+50	10	2	6/29/93	17	90.8	16.8	F
1	N. Slope Haz.	B+25,0+60	11	2	7/2/93	17	93.0	15.6	F

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
1	N. Slope Haz.	B+50,1+00	11	2	7/3/93	17	86.2	19.0	F
2	N. Slope Haz.	2+75	11	2	7/3/93	22	102.9	11.7	P
1	N. Slope Haz.	D+50,1+00	11	2	7/6/93	17	87.3	15.3	F
2	N. Slope Haz.	B+15,1+15	11	2	7/6/93	17	91.6	11.6	F
2	N. Slope Haz.	D+25,1+80	11	2	7/9/93	17	92.2	15.1	F
3	N. Slope Haz.	B+25,1+80	11	2	7/9/93	17	95.0	13.4	P
1	N. Slope Haz.	B+50,1+00	12	2	7/10/93	17	89.9	11.7	F
2	N. Slope Haz.	B+25,1+50	12	2	7/10/93	17	91.4	11.2	F
3	N. Slope Haz.	C+75,1+50	12	2	7/10/93	17	96.6	12.8	P
4	N. Slope Haz.	D+25,2+00	12	2	7/10/93	17	96.9	11.9	P
7	N. Slope Haz.	C+80,0+60	12	2	7/10/93	17	94.1	13.2	F
8	N. Slope Haz.	C+80,0+60	12	2	7/10/93	17	95.2	13.7	P
9	2:1 Face Haz.	D+00,0+25	1	2	7/10/93	17	84.6	15.8	F
10	2:1 Face Haz.	D+00,0+25	2	2	7/10/93	17	87.4	16.7	F
11	2:1 Face Haz.	D+00,0+25	2	2	7/10/93	17	89.0	15.2	F
6	2:1 Face Haz.	C+50,0+25	7	2	7/12/93	17	93.2	14.8	P(1)
7	2:1 Face Haz.	D+00,0+25	8	2	7/12/93	17	85.6	16.6	F
8	2:1 Face Haz.	D+00,0+25	8	2	7/12/93	17	91.5	14.8	P(1)
1	N. Slope Haz.	D+50,0+25	3	2	7/11/93	17	92.0	13.3	P
2	N. Slope Haz.	D+70,0+25	4	2	7/11/93	17	91.9	13.3	P
3	N. Slope Haz.	D+25,0+25	5	2	7/11/93	17	89.9	13.6	P
4	N. Slope Haz.	D+00,0+25	6	2	7/11/93	17	91.0	16.7	P
5	N. Slope Haz.	D+00,0+25	6	2	7/11/93	17	89.6	14.7	P
5	N. Slope Haz.	D+00,0+25	9	2	7/13/93	17	88.4	15.8	F
1	N. Slope Haz.	D+50,0+25	13	2	7/14/93	17	90.7	13.8	P(1)
2	N. Slope Haz.	E+20,0+25	14	2	7/14/93	17	94.1	13.4	P(1)
3	N. Slope Haz.	D+00,0+25	15	2	7/14/93	17	89.6	13.4	F
4	N. Slope Haz.	D+80,0+50	15	2	7/14/93	17	94.7	13.3	P
5	N. Slope Haz.	F+00,1+50	1	2	7/14/93	17	89.1	13.1	F
6	N. Slope Haz.	F+00,1+50	3	2	7/14/93	17	96.4	14.3	P
7	N. Slope Haz.	F+00,1+00	3	2	7/14/93	17	94.7	14.4	P
1	N. Slope Haz.	D+00,1+00	16	2	7/15/93	17	87.5	21.3	F
2	N. Slope Haz.	D+00,1+00	16	2	7/15/93	17	94.7	16.4	P
1	N. Slope Haz.	C+00,1+00	17	2	7/16/93	17	82.0	23.3	F
2	N. Slope Haz.	C+00,1+00	17	2	7/16/93	17	84.5	19.1	F
3	N. Slope Haz.	C+00,1+00	17	2	7/16/93	17	90.8	15.0	F
1	N. Slope Haz.	B+25,1+75	18	2	7/23/93	17	93.0	14.9	F
2	N. Slope Haz.	B+25,1+75	18	2	7/23/93	17	99.0	12.2	P
3	N. Slope Haz.	E+35,1+15	18	2	7/23/93	17	101.1	12.9	P
1	N. Slope Haz.	A+75,1+00	19	2	8/13/93	17	97.2	11.3	P
2	N. Slope Haz.	E+50,1+00	19	2	8/13/93	17	101.2	10.4	P

SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
1	N. Slope Haz.	B+00,0+75	20	2	8/14/93	3	102.2	12.8	P
2	N. Slope Haz.	C+50,1+50	20	2	8/14/93	3	104.9	13.3	P
3	N. Slope Haz.	B+00,1+00	20	2	8/14/93	3	102.5	14.3	P

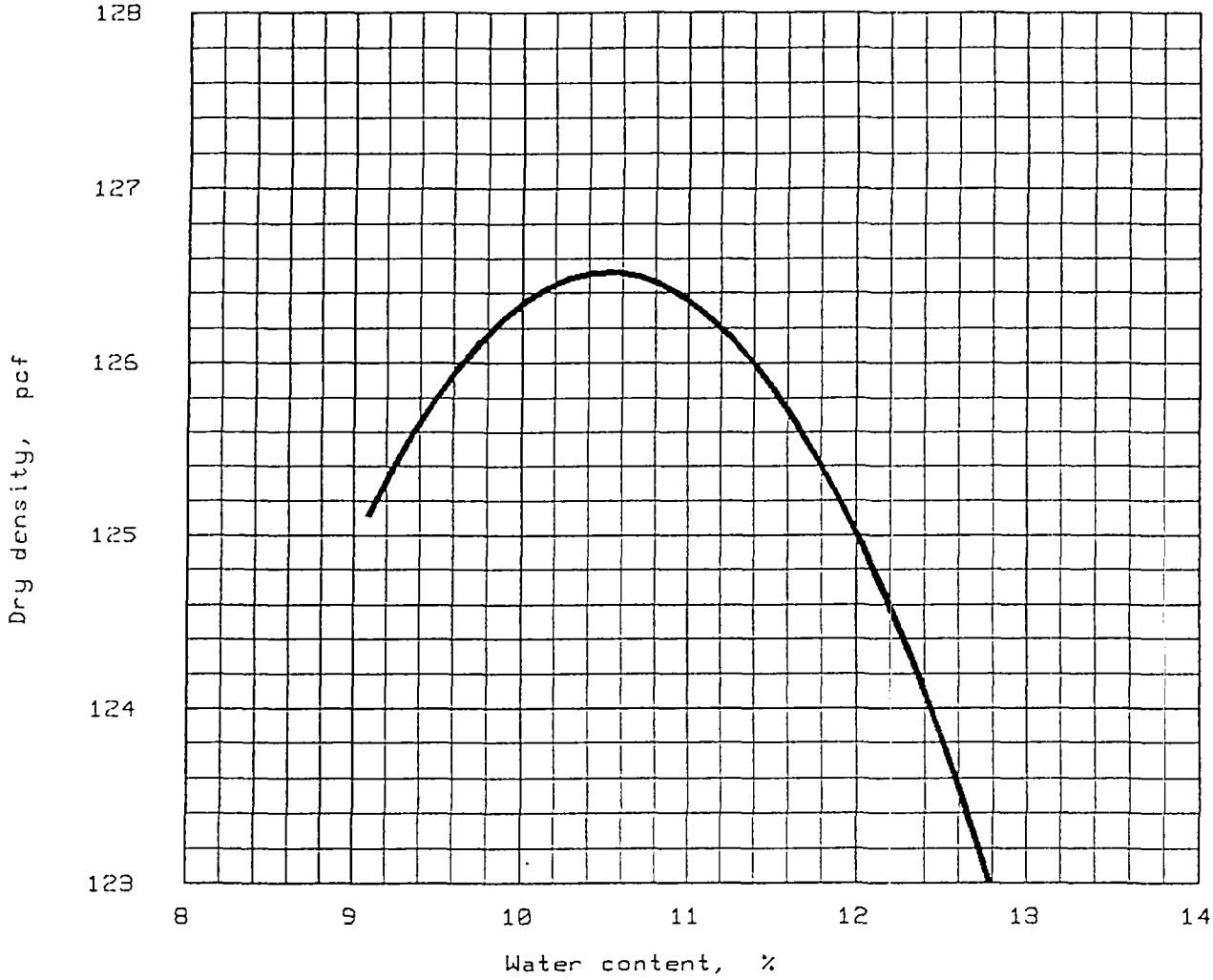
SOIL COMPACTION TEST RESULTS
LASKIN/POPLAR SITE
OHM JOB NO. 13988

TEST NO.	LOCATION	STATION	LIFT NO.	GRID NO.	DATE	CURVE NUMBER USED	PERCENT COMPACTION	MOISTURE CONTENT	PASS OR FAIL
1	Stained Soil	NA	1	NA	8/5/93	4	105.0	13.5	P
3	Stained Soil	NA	2	NA	8/5/93	4	104.3	14.3	P
1	Stained Soil	NA	E. Lift	NA	8/6/93	4	105.9	13.1	P
2	Stained Soil	NA	E. Lift	NA	8/6/93	4	102.4	12.5	P
3	Stained Soil	NA	E. Lift	NA	8/6/93	4	106.4	11.3	P
4	Stained Soil	NA	W. Lift	NA	8/6/93	4	109.6	11.7	P
5	Stained Soil	NA	W. Lift	NA	8/6/93	4	104.1	11.7	P
6	Stained Soil	NA	W. Lift	NA	8/6/93	4	100.6	14.3	P
7	Stained Soil	NA	W. Lift	NA	8/6/93	4	101.8	12.5	P

FILE NO.: A93196X1
REPORT NO.: A-17

PROCTOR TEST REPORT

CURVE NO. 16



"Modified" Proctor, ASTM D 1557, Method B

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in	% < No. 200
	USCS	AASHTO						
			16.3 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 10.5 % Maximum dry density = 126.5 pcf	Brown SILT AND CLAY, little sand, trace gravel, shale fragments

Project No.: A93196x1
Project: Laskin Poplar Site
Location: on site sample

Date: 6-08-1993

Ahmad M. Arayssi

PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

Remarks:

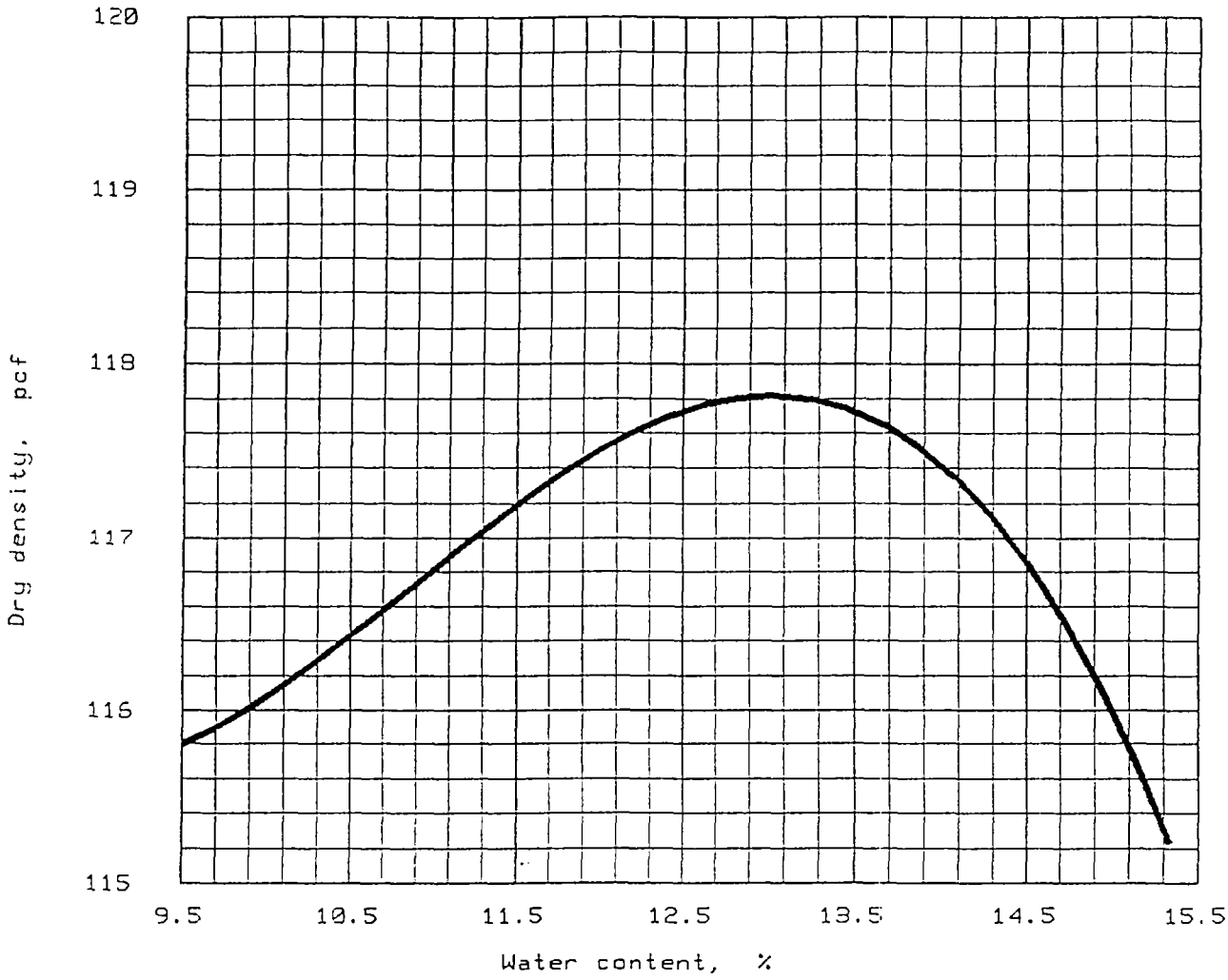
HF-1

Figure No. _____

FILE NO.: A93196X1
REPORT NO.: A-18

PROCTOR TEST REPORT

CURVE NO. 17



"Modified" Proctor, ASTM D 1557, Method B

E ev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in	% < No. 200
	USCS	AASHTO						
			17.9 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 13.0 % Maximum dry density = 117.8 pcf	Gray-brown SILT AND CLAY, some sand, tr shale,glass,metal,rubber,plastic,

Project No.: A93196x1
Project: Laskin\Poplar site
Location: Excavated pile

Date: 6-17-1993

Remarks:
Sample HF-2

cont. gravel,brick,nails

PROCTOR TEST REPORT

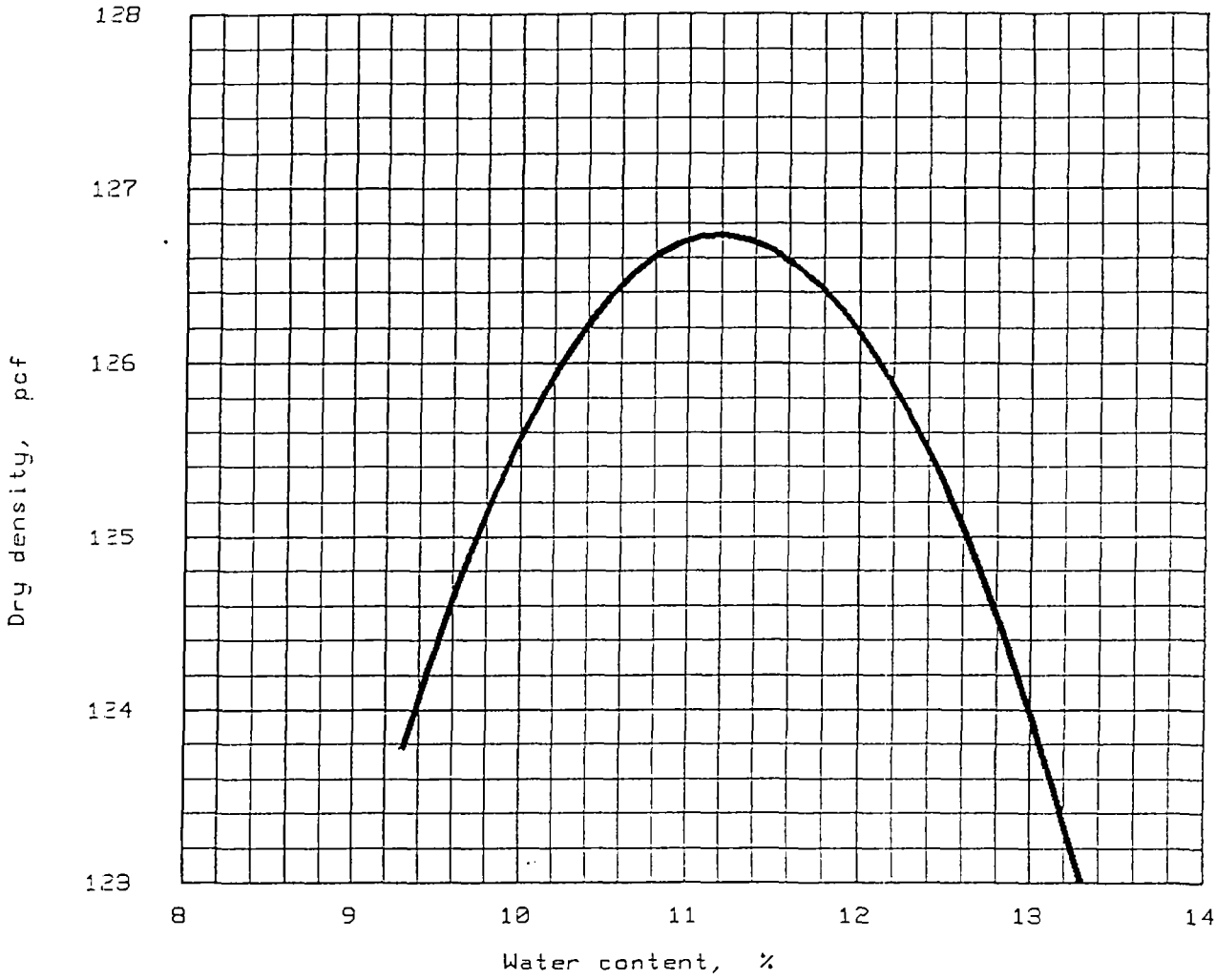
SOLAR TESTING LABORATORIES

Figure No. _____

FILE NO.: A93196X1
REPORT NO.: A-19

PROCTOR TEST REPORT

CURVE NO. 18



"Modified" Proctor, ASTM D 1557, Method C

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No. 200
	USCS	AASHTO						
			13.8 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 11.2 % Maximum dry density = 126.7 pcf	Gray SILT AND CLAY, little sand, shale gravel, tr. glass, wire, plastic, slag

Project No.: A93196x1
Project: Laskin\Poplar Site
Location: placed material just southeast of excavated pile
Date: 6-17-1993

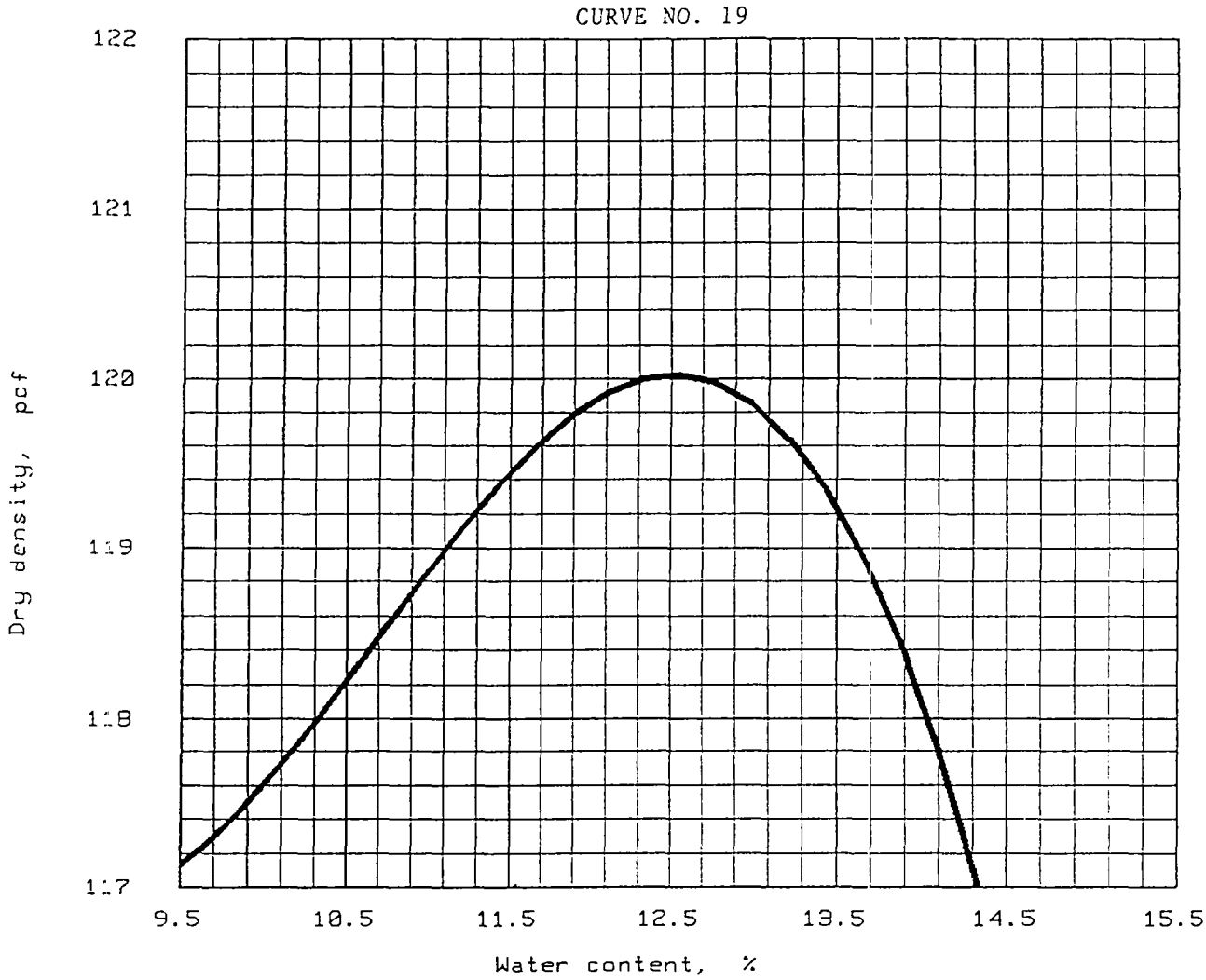
Remarks:
sample HF-3

PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

PROCTOR TEST REPORT



"Modified" Proctor, ASTM D 1557, Method B

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in	% < No. 200
	USCS	AASHTO						
			11.8 %					

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 12.5 % Maximum dry density = 120.0 pcf	Gray SILT AND CLAY, some sand, little gravel,tr glass,slag,plastic,brick

Project No.: A93196x1

Project: Laskin\Poplar Site

Location: surface sample - eastern section

Date: 6-17-1993

Remarks:

Sample HF-4

PROCTOR TEST REPORT

SOLAR TESTING LABORATORIES

Figure No. _____

DECONTAMINATION WATER

The Decontamination water accumulated during the project was sampled for RCRA Characteristics and found to be non-hazardous. The test results are included here.

DATA SUMMARY REPORT

DATE: 08/27/93

Company: OHM REMEDIATION SERVICES CORPORATION

	Sample Point ID:	0001/0002	0003/0004
	ASC Sample Number:	JL3380	JL3381
	Sample Date:	930819	930819
	Facility Code:	013988	013988
Parameters	Units		
RCRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)			
Nitrobenzene	mg/L	<.100	<.100
Pentachlorophenol	mg/L	<.100	<.100
Pyridine	mg/L	<.100	<.100
2,4,5-Trichlorophenol	mg/L	<.100	<.100
2,4,6-Trichlorophenol	mg/L	<.100	<.100
RCRA TCLP Leachate (XXX) Volatile Analysis, MS, (MV50)			
Benzene	mg/L	<.125	<.125
Carbon tetrachloride	mg/L	<.125	<.125
Chlorobenzene	mg/L	<.125	<.125
Chloroform	mg/L	<.125	<.125
1,4-Dichlorobenzene	mg/L	<.125	<.125
1,2-Dichloroethane	mg/L	<.125	<.125
1,1-Dichloroethylene	mg/L	<.125	<.125
Methyl ethyl ketone	mg/L	<.250	<.250
Tetrachloroethylene	mg/L	<.125	<.125
Trichloroethylene	mg/L	<.125	<.125
Vinyl chloride	mg/L	<.125	<.125

DATA SUMMARY REPORT

DATE: 08/27/93

Company: OHM REMEDIATION SERVICES CORPORATION

	Sample Point ID:	0001/0002	0003/0004
	ASC Sample Number:	JL3380	JL3381
	Sample Date:	930819	930819
	Facility Code:	013988	013988
Parameters	Units		
Conventional Data (CV10)			
Flash Point, Seta Flash 60	Deg C	>60	>60
Reactive Cyanide	mg/L	<250	<250
Reactive Sulfide	mg/L	<10.0	<10.0
pH (Test Strip)	std	7	7
RCRA TCLP Leachate Herbicide Analysis, GC, (G852)			
2,4-D	mg/L	<.250	<.250
2,4,5-TP (Silvex)	mg/L	<.250	<.250
RCRA TCLP Leachate Pesticide Analysis, GC, (G854)			
Chlordane	mg/L	<.020	<.020
Endrin	mg/L	<.002	<.002
Heptachlor	mg/L	<.002	<.002
Heptachlor epoxide	mg/L	<.002	<.002
Toxaphene	mg/L	<.040	<.040
RCRA TCLP Leachate Metals Analysis, (ME52)			
Arsenic	mg/L	<.100	<.100
Barium	mg/L	.104	.140
Cadmium	mg/L	<.005	<.005
Chromium	mg/L	<.020	<.020
Lead	mg/L	<.100	<.100
Mercury	mg/L	<.001	<.001
Selenium	mg/L	<.100	<.100
Silver	mg/L	<.020	<.020
RCRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)			
2,4-Dinitrotoluene	mg/L	<.100	<.100
Hexachlorobenzene	mg/L	<.100	<.100
Hexachloroethane	mg/L	<.100	<.100
Hexachlorobutadiene	mg/L	<.100	<.100
Lindane	mg/L	<.100	<.100
Methoxychlor	mg/L	<.100	<.100
2-Methylphenol	mg/L	<.100	<.100
4-Methylphenol	mg/L	<.100	<.100

DATA SUMMARY REPORT

DATE: 08/27/93

Company: OHM REMEDIATION SERVICES CORPORATION

	Sample Point ID:	0001/0002	0003/0004
	ASC Sample Number:	JL3380	JL3381
	Sample Date:	930819	930819
	Facility Code:	013988	013988
Parameters	Units		
RCRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)			
2,4-Dinitrotoluene	mg/L	<.100	<.100
Hexachlorobenzene	mg/L	<.100	<.100
Hexachloroethane	mg/L	<.100	<.100
Hexachlorobutadiene	mg/L	<.100	<.100
Lindane	mg/L	<.100	<.100
Methoxychlor	mg/L	<.100	<.100
2-Methylphenol	mg/L	<.100	<.100
4-Methylphenol	mg/L	<.100	<.100
Nitrobenzene	mg/L	<.100	<.100
Pentachlorophenol	mg/L	<.100	<.100
Pyridine	mg/L	<.100	<.100
2,4,5-Trichlorophenol	mg/L	<.100	<.100
2,4,6-Trichlorophenol	mg/L	<.100	<.100
RCRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)			
Benzene	mg/L	<.125	<.125
Carbon tetrachloride	mg/L	<.125	<.125
Chlorobenzene	mg/L	<.125	<.125
Chloroform	mg/L	<.125	<.125
1,4-Dichlorobenzene	mg/L	<.125	<.125
1,2-Dichloroethane	mg/L	<.125	<.125
1,1-Dichloroethylene	mg/L	<.125	<.125
Methyl ethyl ketone	mg/L	<.250	<.250
Tetrachloroethylene	mg/L	<.125	<.125
Trichloroethylene	mg/L	<.125	<.125
Vinyl chloride	mg/L	<.125	<.125

DATA SUMMARY REPORT

DATE: 08/27/93

PAGE: 1

Company: OHM REMEDIATION SERVICES CORPORATION

	Sample Point ID:	0001/0002	0003/0004
	ASC Sample Number:	JL3380	JL3381
	Sample Date:	930819	930819
	Facility Code:	013988	013988
Parameters	**Units**		
Conventional Data (CV10)			
Flash Point, Seta Flash 60	Deg C	>60	>60
Reactive Cyanide	mg/L	<250	<250
Reactive Sulfide	mg/L	<10.0	<10.0
pH (Test Strip)	std	7	7
Priority Pollutant PCB Analysis, GC, (GS13)			
Aroclor 1016	mg/L	<.005	<.005
Aroclor 1221	mg/L	<.005	<.005
Aroclor 1232	mg/L	<.005	<.005
Aroclor 1242	mg/L	<.005	<.005
Aroclor 1248	mg/L	<.005	<.005
Aroclor 1254	mg/L	<.005	<.005
Aroclor 1260	mg/L	<.005	<.005
RCRA TCLP Leachate Herbicide Analysis, GC, (GS52)			
2,4-D	mg/L	<.250	<.250
2,4,5-TP (Silvex)	mg/L	<.250	<.250
RCRA TCLP Leachate Pesticide Analysis, GC, (GS54)			
Chlordane	mg/L	<.020	<.020
Endrin	mg/L	<.002	<.002
Heptachlor	mg/L	<.002	<.002
Heptachlor epoxide	mg/L	<.002	<.002
Toxaphene	mg/L	<.040	<.040
RCRA TCLP Leachate Metals Analysis, (ME52)			
Arsenic	mg/L	<.100	<.100
Barium	mg/L	.104	.140
Cadmium	mg/L	<.005	<.005
Chromium	mg/L	<.020	<.020
Lead	mg/L	<.100	<.100
Mercury	mg/L	<.001	<.001
Selenium	mg/L	<.100	<.100
Silver	mg/L	<.020	<.020

COMPACTION TEST REPORTS

This part of the appendix contains the individual compaction test results listed on the spreadsheets for the various types of fill associated with this project.

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
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PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X1
		REPORT NO.:	A-1
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-12-93
DESCRIPTION:	GENERAL FIELD REPORT		

No work was performed on this date.

TECHNICIAN: R. M. MC KINLEY

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William R. Dash, P.E.
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SOLAR TESTING LABORATORIES, INC.

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-2
OWNER:	ENGINEER SCIENCE	DATE:	4-13-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	BURIED RAVINE					
1	A Line, Station 0+75 O Line, Station 2+50	Approx. 888' First Lift	109.8	19.8	94.1	1
2	A Line, Station 1+00 O Line, Station 2+25	Approx. 888' First Lift	103.7	24.5	88.9	1
3	Retest of #2	Approx. 888' First Lift	103.0	26.0	88.3	1
4	Loose Pile, Smooth Rolled Once	N/A	101.7	25.8	87.1	1
5	Retest of Number 3	Approx. 888' First Lift	103.7	26.7	88.9	1
6	Retest of Number 5	Approx. 888' First Lift	103.3	28.4	88.5	1
7	Loose Pile Number 2, Smooth Rolled	N/A	111.9	14.4	95.9	1
8	Loose Pile, Number 2, Smooth Rolled	N/A	108.5	11.9	93.0	1
9	A Line, Station 1+25 O Line, Station 2+50	Approx. 888.5' Second Lift	118.2	11.5	101.3	1
10	Retest of Number 13	Approx. 888.5' Second Lift	118.6	11.8	101.6	1

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-2
OWNER:	ENGINEER SCIENCE	DATE:	4-13-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
11	Retest of Number 14 O Line, Station 2+50	Approx. 888.5' Second Lift	111.0	12.8	95.1	1
12	A Line, Station 1+00 O Line, Station 2+50	Approx. 888' First Lift	114.2	13.0	97.9	1
13	A Line, Station 1+25 O Line, Station 2+50	Approx. 888' First Lift	113.4	14.2	97.2	1

Note: Material was completely removed from buried ravine following test number six.

The material was placed in 6" lifts. Test numbers 7 and 8, were performed on loose piles and had unusual results. Therefore, recalibration was performed.

CURVE NO. 1 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
116.7	14.2

TECHNICIAN: R. M. MC KINLEY

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5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-3
OWNER:	ENGINEER SCIENCE	DATE:	4-14-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	BURIED RAVINE					
1	A Line, Station 0+75 O Line, Station 2+50	Approx. 888.5' Second Lift	111.6	16.8	95.6	1
2	A Line, Station 1+00 O Line, Station 2+50	Approx. 888.5' Second Lift	114.0	16.2	97.7	1
3	A Line, Station 1+00 O Line, Station 2+50	Approx. 889' Third Lift	109.5	13.0	93.8	1
4	A Line, Station 0+80 O Line, Station 2+50	Approx. 889' Third Lift	111.2	17.1	95.3	1
5	A Line, Station 1+25 O Line, Station 2+50	Approx. 889.5' Fourth Lift	109.3	19.4	93.7	1
6	Retest of Number 5	Approx. 889.5' Fourth Lift	107.2	20.9	91.9	1
7	Loose Pile	N/A	102.9	18.1	88.2	1
8	Retest of Number 6	Approx. 889.5' Fourth Lift	112.6	16.5	96.5	1
9	A Line, Station 0+75 O Line, Station 2+50	Approx. 889.75' Fifth Lift	108.6	19.6	93.1	1
10	Retest of Number 9	Approx. 889.75' Fifth Lift	110.8	17.6	94.4	1

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-3
OWNER:	ENGINEER SCIENCE	DATE:	4-14-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
11	Fifth Lift Removed and Replaced With a 3" Lift from Pile A Line, Station 1+00 O Line, Station 2+50	Approx. 889.75' Fifth Lift	111.1	15.8	95.2	1
12	A Line, Station 1+00 O Line, Station 2+50	Approx. 890' Sixth Lift	109.2	17.9	93.6	1
13	A Line, Station 0+75 O Line, Station 2+50	Approx. 890' Sixth Lift	113.5	15.0	97.3	1
14	A Line, Station 1+00 O Line, Station 2+30	Approx. 893' (3" Lift) 7th Lift	110.9	18.4	95.0	1
15	Retest Number 14	Approx. 893' (3" Lift) 7th Lift	108.7	18.5	93.1	1

CURVE NO. 1 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
116.7	14.2

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-4
DATE: 4-15-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	BURIED RAVINE					
1	A Line, Station 1+20 O Line, Station 2+40	Approx. 8'	112.6	16.3	96.5	1

CURVE NO. 1 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
116.7	14.2

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-5
DATE: 4-24-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	BURIED RAVINE					
1	Station 2+50 Line B+0	8th Lift	105.6	22.3	90.5	1
2	Station 2+50 Line B+50	8th Lift	105.9	20.1	90.7	1

CURVE NO. 1 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
116.7	14.2

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-6
DATE: 5-1-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	BURIED RAVINE					
1	Station B+25/0+225	6th Lift	115.3	15.4	98.8	1
2	Station B+25/0+220	7th Lift	112.8	14.4	96.7	1
3	Station B+40/0+230	8th Lift	114.9	14.4	98.5	1
4	Station B+30/0+240	9th Lift	111.2	14.9	95.3	1
5	Station B+25/0+220	10th Lift	113.4	15.0	97.2	1
6	Station B+30/0+235	11th Lift	114.4	14.9	98.0	1
7	Station B+25/0+245	12th Lift	114.5	14.5	98.1	1
8	Station B+25/0+230	13th Lift	117.5	13.4	100.7	1

Original 7th and 8th lift was removed and tested before placing material due to moisture problem. Material was placed in 6" lifts.

CURVE NO. 1 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
116.7	14.2

TECHNICIAN: R. M. MC KINLEY

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PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X1
		REPORT NO.:	A-7
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	4-30-93
DESCRIPTION:	GENERAL FIELD REPORT		

No work was performed on this date due to rain.

TECHNICIAN: R. M. MC KINLEY

SOLAR TESTING LABORATORIES, INC.

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-8
DATE: 5-2-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	BURIED RAVINE					
1	Station B+30/0+240	13th Lift	112.5	17.2	96.4	1
2	Station B+25/0+240	14th Lift	110.9	14.9	95.0	1
3	Station B+35/0+245	15th Lift	115.7	14.2	99.1	1
4	Station B+25/0+250	16th Lift	114.0	14.3	97.7	1
5	Station B+20/0+260	17th Lift	111.1	16.7	95.2	1
6	Station B+25/0+240	18th Lift	116.5	15.0	99.8	1
7	Station B+15/0+270	19th Lift	114.6	15.8	98.2	1
8	Station B+25/0+250	20th Lift	111.0	17.2	95.1	1

Material was placed in 6" lifts.

CURVE NO. 1 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
116.7	14.2

TECHNICIAN: R. M. MC KINLEY

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-10
OWNER:	ENGINEER SCIENCE	DATE:	5-10-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	SUITABLE FILL FOR POND					
1	Station B+50/0+225 (First Modified Lift)	Approx. 900' (About 21st Lift Overall) 1st Lift	119.4	10.6	97.9	5
2	Station B+25/0+50	Approx. 906' 1st Lift	117.0	12.6	96.0	5
3	Station C+65/0+50	Approx. 909.5' First Lift	118.0	8.5	96.8	5
4	Retest of Number 3 Station C+50/0+100	Approx. 909.5' First Lift	109.7	12.9	90.0	5
5	Retest of Number 4 Station C+50/0+150	Approx. 908.5' First Lift	114.2	11.1	93.7	5
6	Retest of Number 5 Station C+00/0+150	Approx. 910.5' First Lift	120.7	11.2	99.0	5
7	Station B+0/0+240	Approx. 8" Lift Second Lift	119.1	13.0	97.7	5
8	Station B+0/0+70	Approx. 8" Lift Second Lift	118.5	13.9	97.2	5

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-10
OWNER:	ENGINEER SCIENCE	DATE:	5-10-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
9	Station B+40/0+60 (First Modified Lift)	Approx. 8" Lift, Third Lift	118.1	12.6	96.9	5
10	Station B+50/0+250	Approx. 8" Lift, Third Lift	126.7	12.7	103.9	5
11	Station B+00/0+50	Approx. 8" Lift, Fourth Lift	115.9	15.2	95.1	5

CURVE NO. 5 (SILT)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
121.9	12.8

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-9
DATE: 5-14-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	SUITABLE FILL FOR POND					
1	Station B+25/0+270	Approx. 907.7' 11th Lift	118.2	12.5	97.0	5
2	Station A+75/0+225	Approx. 907.7' 11th Lift	116.4	13.3	95.5	5

CURVE NO. 5 (SILT)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
121.9	12.8.

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-11
OWNER:	ENGINEER SCIENCE	DATE:	5-11-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	SUITABLE FILL FOR POND					
1	Station A+90/0+50	Approx. 908' 4th Lift	112.3	16.2	92.1	5
2	Retest of Number 1	Approx. 908' 4th Lift	114.8	15.8	94.2	5
3	Station C+20/0+50 Retest of Number 2	Approx. 908' 4th Lift	118.4	14.0	97.1	5
4	Station B+50/0+225	Approx. 901.5' Third Lift	109.3	15.9	89.7	5
5	Retest of Number 4	Approx. 901.5' Third Lift	114.2	13.3	93.7	5
6	Retest of Number 5	Approx. 901.5' Third Lift	111.7	18.3	91.6	5
7	Retest of Number 6	Approx. 901.5' Third Lift	117.6	14.9	96.5	5
8	Retest of Number 7	Approx. 901.5' Third Lift	114.8	17.0	94.2	5
9	Station B+25/0+230 Retest of Number 8	Approx. 901.5 Third Lift	116.4	14.6	95.5	5
10	Station A+70/0+60	Approx. 908.7' Fifth Lift	115.1	15.9	94.4	5

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-11
OWNER:	ENGINEER SCIENCE	DATE:	5-11-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
11	Station B+25/0+60 Retest of Number 10	Approx. 908.7' Fifth Lift	118.0	13.3	96.8	5
12	Station C+0/0+275	Approx. 902' Fourth Lift	119.1	11.7	97.7	5
13	Station A+70/0+50	Approx. 909.2 Sixth Lift	114.2	16.2	93.7	5
14	Station B+25/0+80	Approx. 909.2 Sixth Lift	117.8	13.3	96.6	5

Note: Test number 10 of May 10, 1993, is not considered passing and was redone on May 11, 1993. It was believed that underground object influenced results.

CURVE NO. 5 (SILT)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
121.9	12.8

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-12
DATE: 5-12-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	SUITABLE FILL FOR POND					
1	Station B+00/0+225	Approx. 902.8' Fifth Lift	116.2	13.7	95.3	5
2	Station A+85/0+50	Approx. 910' Seventh Lift	117.0	12.8	96.0	5
3	Station B+25/0+225	Approx. 903.5' Sixth Lift	115.4	13.8	94.7	5
4	Retest of Number 3	Approx. 903.5' Sixth Lift	115.9	13.5	95.1	5
5	Station B+25/0+225	Approx. 904.2' Seventh Lift	116.1	15.3	95.2	5

CURVE NO. 5 (SILT)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
121.9	12.8.

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-13
DATE: 5-13-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	SUITABLE FILL FOR POND					
1	Station B+00/0+225	905.5' Eighth Lift	118.5	12.8	97.2	5
2	Station B+40/0+270	Approx. 906.2' Ninth Lift	118.4	12.1	97.1	5
3	Station B+60/0+225	Approx. 907' Tenth Lift	122.1	12.0	100.2	5
4	Station B+15/0+270	Approx. 907' Sixth Lift	119.0	12.3	97.6	5

CURVE NO. 5 (SILT)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD A

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
121.9	12.8.

TECHNICIAN: R. M. MC KINLEY

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PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X1
		REPORT NO.:	A-14
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	5-15-93
DESCRIPTION:	GENERAL FIELD REPORT		

No tests were performed due to lack of soil delivery.

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-15
DATE: 5-18-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	SUITABLE FILL FOR POND					
1	Station B+40/0+185	Approx. 908.5' First Lift	121.3	9.4	99.5	5
2	Station C+45/0+60	Approx. 910.3' First Lift	115.9	13.0	95.1	5
3	Station C+25/0+50	Approx. 911' Second Lift	116.1	13.1	95.2	5
4	Station B+55/0+50	Approx. 911.8' Second Lift	119.6	12.4	98.1	5
5	See Note Below	Approx. 912.6' Fourth Lift	---	---	---	---

Note: The fourth lift encompassing stations B+75 to C+90 and 0+15 to 0+65 is composed of a composite material which was not tested.

CURVE NO. 5 (SILT)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD A

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
121.9	12.8

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-16
DATE: 5-19-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	SUITABLE FILL FOR POND					
1	Station C+40/0+50	Approx. 913' Fifth Lift	117.9	11.7	96.7	5
2	Station B+0/0+47	Approx. 913' Fifth Lift	116.1	13.3	95.2	5
3	Station A+75/0+40	Approx. 913.8' Sixth Lift	119.7	12.4	98.2	5
4	Station C-25/0+35	Approx. 913.8' Sixth Lift	118.5	12.4	97.2	5

CURVE NO. 5 (SILT)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD A

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
121.9	12.8

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-17
OWNER:	ENGINEER SCIENCE	DATE:	5-20-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	SUITABLE FILL FOR POND					
1	Station C+25/0+90	Approx. 909' First Lift	114.6	12.7	94.0	5
2	Station C+45/0+80 Retest of Number 1	Approx. 909' First Lift	117.3	12.3	96.2	5
3	Station C+45/0+85	Approx. 909.6' Second Lift	118.1	12.8	96.9	5
4	Station C+50/0+100	Approx. 910' Third Lift	117.2	11.0	96.1	5
5	Station C+75/0+100	Approx. 910.6' Fourth Lift	113.4	13.5	93.0	5
6	Retest of Number 4	Approx. 910.6' Fourth Lift	117.3	12.3	96.2	5
7	Station C+00/0+75	Approx. 910.6' Fourth Lift	119.6	12.6	98.1	5
8	Station B+70/0+100	Approx. 910.6' First Lift	117.6	13.0	96.5	5
9	Station B+15/0+115 Retest of Number 8	Approx. 910.6' First Lift	121.2	11.9	99.4	5

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-17
OWNER:	ENGINEER SCIENCE	DATE:	5-20-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

CURVE NO. 5 (SILT)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD A

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
121.9	12.8

TECHNICIAN: R. M. MC KINLEY

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CANCELLATION REPORT

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-18
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	6-7-93
CONTRACTOR:	OHM REMEDIATION SERVICES CORP.		
SCHEDULED FOR:	SOILS		

On this date, Solar Testing's technician arrived on the jobsite to find the project had been cancelled because the contractor was not prepared for testing.

TECHNICIAN: RON McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-19
OWNER:	ENGINEER SCIENCE	DATE:	6-14-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	WEST SLURRY WALL					
1	Station 0+50	Approx. 906' First Lift	93.2	22.7	82.8	7
2	Station 1+00	Approx. 906' First Lift	115.4	17.7	102.6	7
3	Station 2+00	Approx. 906' First Lift	111.1	14.5	98.8	7
	WEST SLURRY WALL AND DIVERSION TRENCH					
4	Station 2-80/0+12	Approx. 906' First Lift	112.8	12.6	100.3	7
	DIVERSION TRENCH					
5	Station 1+15	Approx. 906' First Lift	111.8	14.6	99.4	7
6	Station 2+60	Approx. 906' First Lift	115.8	12.2	102.9	7
7	Station 3+90	Approx. 906' First Lift	104.0	15.7	92.4	7
8	Station 4+50	Approx. 906' First Lift	102.0	14.8	90.7	7
	EAST SLURRY WALL					
9	Station 1+25	Approx. 906' First Lift	110.7	16.9	98.4	7
10	Station 2+25	Approx. 906' First Lift	110.8	17.1	98.5	7

SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-19
OWNER:	ENGINEER SCIENCE	DATE:	6-14-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
11	Station 0+20	Approx. 906' First Lift	109.1	16.2	97.0	7
12	Station 2+50	Approx. 906.5' Second Lift	104.4	21.8	92.8	7
13	Station 1+50	Approx. 906.5' Second Lift	103.2	23.3	91.7	7

Note: Second lift of E. Slurry Wall is incomplete due to machinery breakdown.

CURVE NO. 7 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD B

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
112.5	16.1

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-20
OWNER:	ENGINEER SCIENCE	DATE:	6-16-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	NORTH SLOPE HAZARDOUS CUT					
1	Station C+50/1+00	Approx. 910' First Lift	100.3	15.0	79.3	16
2	Station B+75/1+00	Approx. 910' First Lift	114.8	11.5	90.8	16
3	Station B-0/1+00	Approx. 910' First Lift	116.3	9.8	91.9	16
4	Station C-25/1+75	Approx. 910' First Lift	117.4	11.7	92.8	16
5	Station C+25/2+00	Approx. 910' First Lift	118.4	13.8	93.6	16
6	Station C+0/1+75	Approx. 910' First Lift	123.9	11.8	97.9	16
	DIVERSION TRENCH					
7	Station 1+50	Approx. 906.5' Second Lift	98.2	25.7	87.3	7
8	Station 0+60	Approx. 906.5' Second Lift	95.8	28.9	85.2	7
	WEST SLURRY WALL					
9	Station 0+40	Approx. 907' Second Lift	112.1	14.9	99.6	7
10	Station 1+05	Approx. 907' Second Lift	107.9	17.0	95.9	7

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-20
OWNER:	ENGINEER SCIENCE	DATE:	6-16-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	WEST SLURRY WALL AND DIVERSION TRENCH					
11	Station 2+80 and Station 0+15	Approx. 907' Second Lift	109.8	16.9	97.6	7
12	Retest of Number 7	Approx. 906.5' Second Lift	110.2	17.0	98.0	7
	DIVERSION TRENCH					
13	Station 2+25	Approx. 906.5' Second Lift	111.9	16.0	99.5	7
14	Station 2+20	Approx. 907' Third Lift	106.8	17.4	94.9	7
15	Station 1+50	Approx. 907' Third Lift	107.4	18.7	95.5	7
16	Station 0+65	Approx. 907' Third Lift	107.5	17.9	95.6	7

CURVE NO. 7 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
112.5	16.1

CURVE NO. 16 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
126.5	10.5

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-21
OWNER:	ENGINEER SCIENCE	DATE:	6-17-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 3

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
1	Station D+25/2+00	Approx. 910.5' Second Lift	114.0	13.1	96.8	17
	FROM BURIED RAVINE					
2	20' North of Test Number 1	Approx. 910.5' Second Lift	116.1	13.3	98.6	17
3	18' North of Test Number 2	Approx. 910.5' Second Lift	107.8	14.4	91.5	17
4	20' East of Test Number 3	Approx. 910.5' Second Lift	108.9	15.8	92.4	17
5	20' East of Test Number 1	Approx. 910.5' Second Lift	113.6	14.6	96.4	17
6	Station D/2+50	Approx. 911' Third Lift	113.3	11.8	96.2	17
7	Station D+30/3+00	Approx. 911' Third Lift	114.0	12.0	96.8	17
8	Station D/3+00	Approx. 911' Third Lift	113.8	12.5	96.6	17
	DIVERSION TRENCH					
9	Station 2+75	Approx. 907.5' Fourth Lift	108.9	14.7	96.8	7
10	Station 1+50	Approx. 907.5' Fourth Lift	104.3	17.2	92.7	7

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-21
OWNER:	ENGINEER SCIENCE	DATE:	6-17-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 3

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
11	Retests of Number 10 After Additional Compaction	Approx. 907.5' Fourth Lift	108.6	16.7	96.5	7
12	Station 0+75	Approx. 907.5' Fourth Lift	114.2	13.9	101.5	7
13	Suitable Fill for Pond Station C+50/D+225	Approx. 908.5' Twelfth Lift	109.7	17.0	90.0	8
14	Retest of Number 13 After Additional Compaction	Approx. 908.5' Twelfth Lift	113.2	14.7	92.9	8
	HAZARDOUS MATERIAL FILL NORTH SLOPE CUT					
15	Station C+50/3+00	Approx. 911.5' Fourth Lift	103.2	18.8	87.6	17
16	Station D+30/3+25	Approx. 911.5' Fourth Lift	113.3	14.7	96.2	17
17	Station E+00/4+00	Approx. 911.5' Fourth Lift	106.8	14.4	90.7	17
18	Station C+00/5+00	Approx. 911.5' Fourth Lift	109.6	13.8	91.3	19
19	Station B+00/4+00	Approx. 911.5' Fourth Lift	111.8	14.5	93.2	19

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-21
OWNER:	ENGINEER SCIENCE	DATE:	6-17-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	3 OF 3

Note: Area of test number 1 through 5 appeared to contain a large amount of debris.

CURVE NO. 7 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
112.5	16.1

CURVE NO. 8 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
121.9	12.3

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

CURVE NO. 19 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
120.0	12.5

TECHNICIAN: R. M. MC KINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-22
OWNER:	ENGINEER SCIENCE	DATE:	6-18-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 4

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	HAZARDOUS MATERIAL FILL NORTH SLOPE CUT					
1	Station D+0/3+00	Approx. 911.5' Fourth Lift	112.8	12.5	95.8	17
2	Station C+75/3+50	Approx. 911.5' Fourth Lift	106.0	14.7	90.0	17
3	Station D+00/4+00	Approx. 911.5' Fourth Lift	109.9	14.0	93.3	17
4	Retest of Test No. 3, Station D+40/4+75	Approx. 911.5' Fourth Lift	117.7	12.6	99.9	17
5	Station C+00/3+50	Approx. 911.5' Fourth Lift	108.1	15.7	90.1	19
6	Retest of Test No. 5, After Additional Compaction	Approx. 911.5' Fourth Lift	108.9	13.9	90.8	19
7	Station B+75/2+00	Approx. 911.5' Fourth Lift	110.9	15.4	92.4	19
8	Retest of Test No. 7	Approx. 911.5' Fourth Lift	110.7	12.8	92.3	19
9	Retest of Test No. 8	Approx. 911.5' Fourth Lift	112.3	13.2	93.6	19

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-22
OWNER:	ENGINEER SCIENCE	DATE:	6-18-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 4

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
10	Station B+50/2+00	Approx. 911.5' Fourth Lift	107.7	15.4	89.8	19
11	Retest of Test No. 6	Approx. 911.5' Fourth Lift	113.5	8.5	94.6	19
12	Retest of Test No. 10	Approx. 911.5' Fourth Lift	109.3	13.4	91.1	19
13	Retest of Test No. 12	Approx. 911.5' Fourth Lift	112.6	13.6	93.8	19
14	Retest of Test No. 13	Approx. 911.5' Fourth Lift	112.9	12.7	94.1	19
15	Retest of Test No. 14	Approx. 911.5' Fourth Lift	113.9	12.4	94.9	19
	DIVERSION TRENCH					
16	Station 2+30	Approx. 908.0' Fifth Lift	110.9	15.3	98.6	7
17	Station 1+40	Approx. 908.0' Fifth Lift	110.5	14.7	98.2	7
18	Station 0+75	Approx. 908.0' Fifth Lift	104.9	19.9	93.2	7
19	Retest of Test No. 18	Approx. 908.0' Fifth Lift	106.5	19.2	94.7	7
20	Retest of Test No. 19	Approx. 908.0' Fifth Lift	107.2	18.0	95.3	7

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-22
OWNER:	ENGINEER SCIENCE	DATE:	6-18-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	3 OF 4

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	SUITABLE POND FILL					
21	Station B+0/2+15	Approx. 908.5' 12th Lift	110.0	16.3	90.2	8
22	Station C+50/2+00	Approx. 908.5' 12th Lift	107.0	15.3	87.8	8
23	Retest of Test No. 22	Approx. 908.5' 12th Lift	116.8	12.3	95.8	8
24	Station B+50/2+00	Approx. 909.0' 13th Lift	116.0	12.1	95.2	8
25	Station B+50/1+80	Approx. 909.0' 13th Lift	113.2	13.4	92.9	8
26	Station C+0/1+50	Approx. 909.0' 13th Lift	113.1	14.4	92.8	8
27	Retest of No. 26	Approx. 909.0' 13th Lift	112.9	14.8	92.6	8
28	Second Retest of Test No. 27	Approx. 909.0' 13th Lift	117.0	13.4	96.0	8
29	Station C+50/1+80	Approx. 909.0' 13th Lift	114.8	13.6	94.2	8
30	Retest of No. 29	Approx. 909.0' 13th Lift	115.4	12.9	94.7	8
31	Retest of No. 30	Approx. 909.0' 13th Lift	115.6	13.4	94.8	8

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-22
OWNER:	ENGINEER SCIENCE	DATE:	6-18-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	4 OF 4

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	DIVERSION TRENCH					
32	Station 1+50	Approx. 908.5' Sixth Lift	108.5	15.5	96.4	7
33	Station 2+30	Approx. 908.5' Sixth Lift	111.6	15.7	99.2	7

Mr. Keith Rankin of Engineering Science approved Test Numbers 4 through 6.

CURVE NO. 7 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
112.5	16.1

CURVE NO. 8 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
121.9	12.3

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
117.8	13.0

CURVE NO. 19 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
120.0	12.5

TECHNICIAN: R. McKINLEY

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PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X1
		REPORT NO.:	A-23
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	6-19-93
DESCRIPTION:	GENERAL FIELD REPORT		

This technician monitored the placement of haz cut/place and low permeability fill material for the diversion trench. Due to weather conditions, compaction requirements could not be achieved.

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-24
OWNER:	ENGINEER SCIENCE	DATE:	6-23-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 4

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
1	Station B/0+75	914.50' Fifth Lift	116.9	11.03	97.4	19
2	Station D+50/1+00	914.50' Fifth Lift	116.3	11.4	98.7	17
	DIVERSION TRENCH					
3	Station 3+50	Approx. 909.00' First Lift	110.2	16.1	98.0	7
4	Station 4+50	Approx. 909.00' First Lift	109.9	14.9	97.7	7
5	Station 3+65	Approx. 909.50' Second Lift	110.0	13.3	97.8	7
6	Station 4+30	Approx. 909.50' Second Lift	110.1	16.3	97.9	7
7	Station 3+70	Approx. 910.00' Third Lift	110.2	14.5	98.0	7
8	Station 4+25	Approx. 910.00' Third Lift	107.2	14.4	95.3	7
	NORTH SLOPE CUT					
9	Station D+25/1+00	Approx. 915.00' Sixth Lift	108.6	17.9	92.2	17

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-24
OWNER:	ENGINEER SCIENCE	DATE:	6-23-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 4

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
10	Retest of Test No. 9	Approx. 915.00' Sixth Lift	111.3	16.2	94.5	17
11	Retest of Test No. 10	Approx. 915.00' Sixth Lift	111.6	15.7	94.7	17
12	Station C+50/1+50	Approx. 915.00' Sixth Lift	112.4	14.0	95.4	17
13	Station B+50/1+75	Approx. 915.00' Sixth Lift	111.2	13.5	94.4	17
14	Station D+25/1+00	Approx. 915.00' Sixth Lift	108.3	19.8	91.9	17
15	Station D+25/1+50	Approx. 915.00' Sixth Lift	109.5	13.3	93.0	17
16	Retest of Test No. 15	Approx. 915.00' Sixth Lift	103.3	19.1	87.7	17
17	Station C+25/1+50	Approx. 915.00' Sixth Lift	103.9	15.4	88.2	17
18	Station B/1+50	Approx. 915.00' Sixth Lift	112.4	14.0	93.7	19
19	Station A+50/1+00	Approx. 915.00' Sixth Lift	115.1	12.3	95.9	19
20	Station C+25/0+75	Approx. 915.00' Sixth Lift	120.1	11.0	102.0	17

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-24
OWNER:	ENGINEER SCIENCE	DATE:	6-23-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	3 OF 4

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	DIVERSION TRENCH					
21	Station 3+50	Approx. 910.50' Fourth Lift	109.5	16.2	97.3	7
22	Station 4+60	Approx. 910.50' Fourth Lift	112.5	15.0	100.0	7
23	Station 4+00	Approx. 911.00' Fifth Lift	106.9	19.8	95.0	7
24	Station 4+90	Approx. 911.00' Fifth Lift	109.0	16.7	96.9	7
25	Station 3+50	Approx. 911.50' Sixth Lift	112.7	15.3	100.2	7
26	Station 4+65	Approx. 911.50' Sixth Lift	112.0	15.9	99.6	7

The contractor was notified of the results.

CURVE NO. 7 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
112.5	16.1

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-24
OWNER:	ENGINEER SCIENCE	DATE:	6-23-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	4 OF 4

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
117.8	13.0

CURVE NO. 19 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
120.0	12.5

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-25
OWNER:	ENGINEER SCIENCE	DATE:	6-24-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 3

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
1	Station B+75/1+25	Approx. 915.00' Sixth Lift	106.2	18.0	90.2	17
2	Station C+40/1+00	Approx. 915.00' Sixth Lift	104.3	18.8	88.5	17
3	Station D+25/1+25	Approx. 915.00' Sixth Lift	112.5	14.5	95.5	17
4	Station C+25/1+60	Approx. 915.00' Sixth Lift	111.5	16.0	94.7	17
5	Station B+50/1+80	Approx. 915.00' Sixth Lift	109.7	14.5	93.1	17
6	Station B+25/1+50	Approx. 915.00' Sixth Lift	113.3	12.1	94.4	19
7	Station B/1+00	Approx. 915.00' Sixth Lift	114.1	14.6	95.1	19
	DIVERSION TRENCH					
8	Station 3+30	Approx. 912.00' Seventh Lift	110.5	14.8	98.2	7
9	Station 4+40	Approx. 912.00' Seventh Lift	109.9	16.3	97.7	17

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-25
OWNER:	ENGINEER SCIENCE	DATE:	6-24-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 3

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	NORTH SLOPE CUT					
10	Retest of Test No. 1	Approx. 915.00' Sixth Lift	114.5	13.6	97.2	17
11	Retest of Test No. 2	Approx. 915.00' Sixth Lift	108.0	15.6	91.7	17
12	Station B/1+00	Approx. 915.50' Seventh Lift	107.9	16.5	91.6	17
13	Station B/1+25	Approx. 915.50' Seventh Lift	108.7	15.4	92.3	17
14	Station C+75/1+50	Approx. 915.50' Seventh Lift	114.7	10.9	97.4	17
15	Station D+50/1+50	Approx. 915.50' Seventh Lift	111.8	12.0	94.9	17

Test number 5's area had rubble interference at 10" depth.

Tests number 10 and 11 performed for determination of moisture content only after area had been reworked.

Tests number 10, 11 and 15 results were approved by Mr. Keith Rankin with Engineering Science.

The contractor was notified of the results.

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-25
OWNER:	ENGINEER SCIENCE	DATE:	6-24-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	3 OF 3

CURVE NO. 7 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
112.5	16.1

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

CURVE NO. 19 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
120.0	12.5

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-26
DATE: 6-25-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
1	Station B/1+50	Approx. 916.00' Eighth Lift	108.0	16.8	91.7	17
2	Station B+25/2+00	Approx. 916.00' Eighth Lift	108.2	15.6	91.9	17
3	Station D/1+50	Approx. 916.00' Eighth Lift	106.5	15.2	90.4	17

Test lifts were approved by Mr. Keith Rankin with Engineering Science based on visual inspection of the area. Material contained approximately 70 percent debris.

The contractor was notified of the results.

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD B

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-27
DATE: 6-28-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
1	Station A/0+50	Approx. 916.50' Ninth Lift	109.8	10.6	93.2	17
2	Station A/0+75	Approx. 916.50' Ninth Lift	118.1	12.1	100.3	17
3	Station C/1+00	Approx. 916.50' Ninth Lift	112.4	14.1	95.4	17
4	Station D+50/0+75	Approx. 916.50' Ninth Lift	108.8	14.4	92.4	17

The contractor was notified of the results.

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD B

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-28
OWNER:	ENGINEER SCIENCE	DATE:	6-30-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
1	Suitable Pond Fill Material. Station A+70/2+30	Approx. 912.00' 14th Lift	109.1	17.20	89.5	8
	DIVERSION TRENCH					
2	Station 2+55	Approx. 909.00' 7th Lift	104.1	15.80	92.5	7
3	Retest of Test No. 2	Approx. 909.00' 7th Lift	114.6	14.57	101.9	7
4	Retest of Test No. 3	Approx. 909.00' 7th Lift	116.2	11.70	103.3	7
5	Retest of Test No. 4	Approx. 909.00' 7th Lift	115.1	14.00	102.3	7
6	Retest of Test No. 5	Approx. 909.00' 7th Lift	116.2	13.80	103.3	7
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
7	Station B/1+50	Approx. 917.00' 10th Lift	108.6	13.00	92.2	17
8	Station D+50/1+00	Approx. 917.00' 10th Lift	108.8	13.80	92.4	17

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-28
OWNER:	ENGINEER SCIENCE	DATE:	6-30-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
9	Diversion Trench Station 1+25	Approx. 909.00' 7th Lift	110.0	14.40	97.8	7
10	Suitable Pond Fill Material. Retest of Test No. 1	Approx. 912.00' 14th Lift	118.4	13.90	97.1	8
11	Diversion Trench Retest of Test No. 2	Approx. 909.00' 7th Lift	108.5	16.80	96.4	7

Note: Test numbers 7 and 8 were approved by Mr. Keith Rankin with Engineering Science.

This completes the tenth lift as passing.

The contractor was notified of the results.

CURVE NO. 7 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
112.5	16.1

CURVE NO. 7 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
112.5	16.1

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-29
OWNER:	ENGINEER SCIENCE	DATE:	7-1-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
1	Diversion Trench Station 2+75	Approx. 913.00' 8th Lift	114.8	13.80	102.0	7
2	Suitable Pond Fill Material. Station A+70/2+20	Approx. 913.00' 15th Lift	114.8	13.30	94.2	8
	DIVERSION TRENCH					
3	Station 1+90	Approx. 913.00' 8th Lift	112.7	14.70	100.2	7
4	Station 2+40	Approx. 913.00' 8th Lift	106.4	19.40	94.6	7
5	Retest of Test No. 4	Approx. 913.00' 8th Lift	106.7	19.80	94.8	7
6	Retest of Test No. 5	Approx. 913.00' 8th Lift	106.9	19.30	95.0	7
7	Retest of Test No. 6	Approx. 913.00' 8th Lift	107.7	18.80	95.7	7
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
8	Station B+50/1+00	Approx. 918.00' 11th Lift	108.8	16.41	92.4	17

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-29
OWNER:	ENGINEER SCIENCE	DATE:	7-1-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
9	Station C/1+00	Approx. 918.00' 11th Lift	106.9	16.40	90.7	17
10	Station D+50/1+100	Approx. 918.00' 11th Lift	112.9	13.10	95.8	17

Test number 2 was accepted by Mr. Keith Rankin with Engineering Science as well as the small area of test number 8.

The eleventh lift of the hazardous material fill was accepted at the western half only.

The contractor was notified of the results.

CURVE NO. 7 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
112.5	16.1

CURVE NO. 8 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
121.9	12.3

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-30
OWNER:	ENGINEER SCIENCE	DATE:	6-29-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
1	Station D/1+100	Approx. 917.00' Tenth Lift	106.5	17.7	90.4	17
2	Station C+25/1+00	Approx. 917.00' Tenth Lift	100.5	19.7	85.3	17
3	Station B+25/1+50	Approx. 917.00' Tenth Lift	111.2	16.3	94.4	17
4	Retest of Test No. 3	Approx. 917.00' Tenth Lift	111.5	14.0	94.7	17
5	Station C+25/1+90	Approx. 917.00' Tenth Lift	119.1	11.4	101.1	17
6	Station B+50/0+50	Approx. 917.00' Tenth Lift	108.8	16.1	92.4	17
7	Station B+50/1+25	Approx. 917.00' Tenth Lift	100.5	20.1	85.3	17
8	Station D+50/0+50	Approx. 917.00' Tenth Lift	107.0	16.8	90.8	17

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-30
OWNER:	ENGINEER SCIENCE	DATE:	6-29-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

Test number 4 was accepted by Mr. Keith Rankin with Engineering Science.

The tenth lift area, north of line 1+50 of chart #2, is acceptable (representing 50 percent of total lift).

The contractor was notified of the results.

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-31
OWNER:	ENGINEER SCIENCE	DATE:	7-2-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
1	Station B+25/0+60	Approx. 918.00' 11th Lift	109.6	15.6	93.0	17
	DIVERSION TRENCH					
2	Station 2+25	Approx. 913.50' 9th Lift	119.0	11.9	105.8	7
3	Retest of Test No. 2 Area	Approx. 913.50' 9th Lift	118.9	13.6	105.7	7
4	Station 2+45	Approx. 913.50' 9th Lift	116.4	13.7	101.0	22
5	Retest of Test No. 4	Approx. 913.50' 9th Lift	111.7	17.0	97.0	22
6	Station 1+75	Approx. 914.00' 10th Lift	116.4	13.9	101.0	22
7	Retest of Test No. 6	Approx. 914.00' 10th Lift	110.0	15.5	95.5	22
8	Retest of Test No. 3	Approx. 914.00' 9th Lift	112.1	15.7	99.6	7

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-31
OWNER:	ENGINEER SCIENCE	DATE:	7-2-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

The contractor was notified of the results.

CURVE NO. 7 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
112.5	16.1

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
117.8	13.0

CURVE NO. 22 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
115.2	14.6

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-32
DATE: 7-3-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	HAZ CUT/PLACE MATERIAL					
1	North Slope Cut Station B+50/1+00	Approx. 918.00' 11th Lift	101.6	19.0	86.2	17
2	Station 2+75	Approx. 918.00' 11th Lift	118.5	11.7	102.9	22
	DIVERSION TRENCH					
3	Station 3+00	Approx. 914.00' 10th Lift	113.5	15.3	98.5	22

The contractor was notified of the results.

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

CURVE NO. 22 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
115.2	14.6

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-33
DATE: 7-6-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
1	Station D+50/1+00	Approx. 918.00' 11th Lift	102.8	15.3	87.3	17
2	Station B+15/1+15	Approx. 918.00' 11th Lift	107.9	11.6	91.6	17

The contractor was notified of the results.

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-34
DATE: 7-9-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
1	Diversion Trench Station 2+75	Approx. 915.00' 11th Lift	112.7	15.2	97.8	22
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
2	Station D+25/1+80	Approx. 918.00' 11th Lift	108.6	15.1	92.2	17
3	Station B+25/1+25	Approx. 918.00' 11th Lift	111.9	13.4	95.0	17
4	Diversion Trench Station 2+25	Approx. 916.00' 12th Lift	117.7	13.5	102.2	22
5	Retest of Test No. 4	Approx. 916.00' 12th Lift	110.7	17.2	96.1	22

Mr. Keith Rankin of Engineering Science approved test number 2.

The contractor was notified of the results.

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
117.8	13.0

CURVE NO. 22 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
115.2	14.6

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-35
OWNER:	ENGINEER SCIENCE	DATE:	7-10-93
CONTRACTOR:	CHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	HAZARDOUS FILL MATERIAL NORTH SLOPE CUT					
1	Station B+50/1+00	Approx. 919.00' 12th Lift	105.9	11.7	89.9	17
2	Station B+25/1+50	Approx. 919.00' 12th Lift	107.7	11.2	91.4	17
3	Station C+75/1+50	Approx. 919.00' 12th Lift	113.8	12.8	96.6	17
4	Station D+25/2+00	Approx. 919.00' 12th Lift	114.2	11.9	96.9	17
	DIVERSION TRENCH					
5	Station 4+25	Approx. 913.00' 8th Lift	115.7	13.1	100.4	22
6	Station 4+20	Approx. 913.00' 8th Lift	117.5	15.6	102.0	22
	HAZ CUT/PLACE MATERIAL NORTH SLOPE CUT					
7	Station C+80/0+60	Approx. 919.50' 12th Lift	110.8	13.2	94.1	17
8	Retest of Test No. 7	Approx. 919.50' 12th Lift	112.2	13.7	95.2	17

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-35
OWNER:	ENGINEER SCIENCE	DATE:	7-10-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	2:1 HAZ CUT/PLACE DITCH					
9	Station D/0+25	Approx. 903.00' 1st Lift	99.7	15.8	84.6	17
10	Station D/0+25	Approx. 904.00' 2nd Lift	103.0	16.7	87.4	17
11	Retest of Test No. 10	Approx. 904.00' 2nd Lift	104.9	15.2	89.0	17

Note: Heavy amounts of debris was apparent in the fill plus water accumulation in the bottom.

The contractor was notified of the results.

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
117.8	13.0

CURVE NO. 22 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
115.2	14.6

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-36
DATE: 7-11-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	2:1 HAZ CUT/PLACE DITCH					
1	Station D+50/0+25	Approx. 905.00' 3rd Lift	108.4	13.3	92.0	17
2	Station D+70/0+25	Approx. 906.00' 4th Lift	108.3	13.3	91.9	17
3	Station D+25/0+25	Approx. 907.00' 5th Lift	105.9	13.6	89.9	17
4	Station D/0+25	Approx. 910.00' 6th Lift	107.2	16.7	91.0	17
5	Retest of Test No. 4	Approx. 910.00' 6th Lift	105.6	14.7	89.6	17

Heavy amounts of debris in fill. Lifts were approved by Engineering Science's Representative based on moisture readings.

The contractor was notified of the results.

CURVE NO.17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD B

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-37
OWNER:	ENGINEER SCIENCE	DATE:	7-12-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	DIVERSION TRENCH					
1	Station 2+25	Approx. 914.00' 9th Lift	118.0	13.2	102.4	22
2	Retest of Test #1	Approx. 914.00' 9th Lift	111.2	14.8	96.5	22
3	Station 2+75	Approx. 915.00' 10th Lift	119.9	13.7	104.1	22
4	Retest of Test #3	Approx. 915.00' 10th Lift	110.0	16.3	95.5	22
5	Station 2+75	Approx. 916.00' 11th Lift	120.2	12.3	104.3	22
	2:1 HAZ CUT/PLACE DITCH					
6	Station C+50/0+25	Approx. 909.00' 7th Lift	109.8	14.8	93.2	17
7	Station D/0+25	Approx. 910.00' 8th Lift	100.8	16.6	85.6	17
8	Retest of Test No. 7	Approx. 910.00' 8th Lift	107.8	14.8	91.5	17

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-37
OWNER:	ENGINEER SCIENCE	DATE:	7-12-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

Moisture reading is determining factor for passing on the haz cut/place fill due to amount of debris.

The contractor was notified of the results.

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

CURVE NO. 22 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
115.2	14.6

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-38
OWNER:	ENGINEER SCIENCE	DATE:	7-13-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	DIVERSION TRENCH					
1	Station 2+55	Approx. 917.00' 11th Lift	122.9	12.1	106.7	22
2	Retest of Test #1	Approx. 917.00' 11th Lift	107.7	16.9	93.5	22
3	Retest of Test #2	Approx. 917.00' 11th Lift	108.2	16.2	93.9	22
4	Third Retest of Test #1	Approx. 917.00' 11th Lift	110.2	17.0	95.7	22
5	Haz Cut/Place (Formerly 2:1 Haz Fill Ditch) Station D/0+25	Approx. 911.00' 9th Lift	104.1	15.8	88.4	17
	POND FILL 4:1 SLOPE					
6	Station 3+00/A+75	Approx. 914.00' 16th Lift	117.2	12.1	101.7	22
7	Retest of Test #6	Approx. 914.00' 16th Lift	112.5	16.2	97.7	22
8	Haz Cut/Place Area 1 Station E+50/0+25	Approx. 914.00' 12th Lift	103.3	15.0	87.7	17

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-38
OWNER:	ENGINEER SCIENCE	DATE:	7-13-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

The contractor was notified of the results.

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

CURVE NO. 22 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
115.2	14.6

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-39
DATE: 7-14-93
PAGE NO.: 1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	HAZ CUT/PLACE					
1	Station D+50/0+25	2' Below Grade 13th Lift	106.9	13.8	90.7	17
2	Station E+20/0+25	1'6" Below Grade 14th Lift	110.9	13.4	94.1	17
3	Station D/0+25	1' Below Grade 15th Lift	105.5	13.4	89.6	17
4	Station D+80/0+50	1' Below Grade 15th Lift	111.5	13.3	94.7	17
5	Station F/1+50	Approx. 911.00' 1st Lift	105.0	13.1	89.1	17
6	Station F/1+50	Approx. 911.50' 3rd Lift	113.6	14.3	96.4	17
7	Station F/1+00	Approx. 912.00' 3rd Lift	111.5	14.4	94.7	17

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-39
OWNER:	ENGINEER SCIENCE	DATE:	7-14-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

The contractor was notified of the results.

CURVE NO. 17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-40
DATE: 7-15-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	HAZ CUT/PLACE					
1	Station D/1+00	Approx. 6" Below Grade 16th Lift	103.1	21.3	87.5	17
2	Retest of Test #1	Approx. 6" Below Grade 16th Lift	111.6	16.4	94.7	17

The contractor was notified of the results.

CURVE NO.17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD B

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-41
DATE: 7-16-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
	HAZ CUT/PLACE					
1	Station C/1+00	Approx. 6" Below Grade	96.6	23.3	82.0	17
2	Station C+25/0+75 Retest of Test #1	Approx. 6" Below Grade	99.5	19.1	84.5	17
3	Station C+75/0+75 Retest of Test #2	Approx. 6" Below Grade	107.0	15.0	90.8	17

The contractor was notified of the results.

CURVE NO.17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD B

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights, Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

PROJECT:	LASKIN/POPLAR SITE JEFFERSON, OHIO	FILE NO.:	A93196X1
		REPORT NO.:	A-42
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	7-21-93
DESCRIPTION:	GENERAL FIELD REPORT		

This technician monitored the placement of the haz cut/place.

No tests were performed on this date.

TECHNICIAN: R. M. MC KINLEY

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Civil Engineer

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-43
DATE: 7-23-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	HAZ CUT/PLACE					
1	Station B+25/1+75 (E4623)	Top of Grade	109.6	14.9	93.0	17
2	Retest of Test Number 1 After Additional Compaction	Top of Grade	116.6	12.2	99.0	17
3	Station E+35/1+15 (E4384)	Top of Grade	119.1	12.9	101.1	17

The contractor was notified of the results.

CURVE NO.17 (SILT AND CLAY)
MODIFIED PROCTOR TEST ASTM D-1557
METHOD B

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
117.8	13.0

TECHNICIAN: R. McKINLEY

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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-44
OWNER:	ENGINEER SCIENCE	DATE:	7-25-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
	EAST DIVERSION TRENCH					
1	25' From South End	Approx. 3 1/2' of Grade on Slurry Wall, 1st Lift	93.9	19.0	81.5	22
2	75' From North End	Approx. 3 1/2' of Grade on Slurry Wall, 1st Lift	97.6	17.0	84.7	22
3	Retest of Test Number 2	Approx. 3 1/2' of Grade on Slurry Wall, 1st Lift	101.3	15.4	87.9	22
4	Retest of Test Number 3	Approx. 3 1/2' of Grade on Slurry Wall, 1st Lift	103.7	16.1	90.0	22
5	75' From North End	Approx. 2.8' From Grade, 2nd Lift	102.3	17.4	88.8	22
6	75' From South End	Approx. 2.1' From Grade, 3rd Lift	113.3	12.7	98.4	22
7	25' From South End	Approx. 1.4' From Grade, 4th Lift	112.0	15.3	97.2	22
8	100' From South End	Approx. 8" From Grade, 5th Lift	112.8	15.0	97.9	22
9	Retest of Test Number 5	Approx. 2.8' From Grade, 2nd Lift	105.4	16.3	91.5	22
10	Retest of Test Number 9	Approx. 2.8' From Grade, 2nd Lift	112.0	15.5	97.2	22

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-44
OWNER:	ENGINEER SCIENCE	DATE:	7-25-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
11	Retest of Test Number 6	Approx. 2.1' From Grade, 3rd Lift	110.0	13.9	95.5	22
12	25' From South End	Top of Grade 6th Lift	112.0	13.2	97.2	22

Test Number 4 was approved by Mr. Bill Fenwick, Supv. with OHM Corp. Test Number 12 was approved by Mr. Keith Rankin with Engineering Science.

The contractor was notified of the results.

CURVE NO. 22 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
115.2	14.6

TECHNICIAN: R. McKINLEY

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

SOLAR TESTING LABORATORIES, INC.

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Telephone: (216) 741-7007 • FAX: (216) 741-7011

SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT: LASKIN/POPLAR
JEFFERSON, OHIO
OWNER: ENGINEER SCIENCE
CONTRACTOR: OHM CORPORATION

FILE NO.: A93196X1
REPORT NO.: A-45
DATE: 8-5-93

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NO.
1	Stained Material Backfill	First Lift	114.8	13.5	105.0	4
2	West Diversion Trench Backfill	First Lift	110.1	16.5	95.6	22
3	Stained Material Backfill	Second Lift	114.0	14.3	104.3	4
4	West Diversion Trench Backfill	Second Lift	109.0	17.0	94.6	22
5	West Diversion Trench Backfill	Third Lift	114.9	13.4	99.7	22
6	West Diversion Trench Backfill	Fourth Lift	114.9	12.6	99.7	22
7	West Diversion Trench Backfill	Fifth Lift	111.6	14.6	96.9	22

The contractor was notified of the results.

CURVE NO. 4 (SILT)
STANDARD PROCTOR TEST ASTM D-698
METHOD "A"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
109.3	14.9

CURVE NO. 22 (SILT AND CLAY)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT³	% OPTIMUM MOISTURE
115.2	14.6

TECHNICIAN: D. McCLUGGAGE

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
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SOIL COMPACTION TESTS
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-46
OWNER:	ENGINEER SCIENCE	DATE:	8-6-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	1 OF 2

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/CU FT)	PERCENT FIELD MOISTURE	PERCENT COMPAC-TION	CURVE NO.
1	Stained Material's Backfill North Side of 4:1	Approx. 872.0 Overall, First Lift (E.)	115.8	13.1	105.9	4
2	Stained Material's Backfill North Side of 4:1	Approx. 872.0 Overall, Second Lift (E.)	111.9	12.5	102.4	4
3	Stained Material's Backfill North Side of 4:1	Approx. 872.0 Overall, Third Lift (E.)	116.3	11.3	106.4	4
4	Stained Material's Backfill North Side of 4:1	Approx. 872.0 Overall, Fourth Lift (W.)	119.8	11.7	109.6	4
5	Stained Material's Backfill North Side of 4:1	Approx. 872.0 Overall, Fifth Lift (W.)	113.8	11.7	104.1	4
6	Stained Material's Backfill North Side of 4:1	Approx. 872.0 Overall, Sixth Lift (W.)	110.0	14.3	100.6	4
7	Stained Material's Backfill North Side of 4:1	Approx. 872.0 Overall, Seventh Lift (W.)	111.3	12.5	101.8	4

The contractor was notified of the results.

PROJECT:	LASKIN/POPLAR	FILE NO.:	A93196X1
	JEFFERSON, OHIO	REPORT NO.:	A-46
OWNER:	ENGINEER SCIENCE	DATE:	8-6-93
CONTRACTOR:	OHM CORPORATION	PAGE NO.:	2 OF 2

CURVE NO. 4 (SILT)
STANDARD PROCTOR TEST ASTM D-698
METHOD "B"

MAXIMUM DRY DENSITY LBS/FT^3	% OPTIMUM MOISTURE
109.3	14.9

TECHNICIAN: R. McKINLEY

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

SOLAR TESTING LABORATORIES, INC.

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Telephone: (216) 741-7007 • FAX: (216) 741-7011

SOIL COMPACTION REPORT
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR JEFFERSON, OHIO	FILE NO.:	A93196X1
		REPORT NO.:	A-47
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	8-13-93
TECHNICIAN(S):	RON MCKINLEY		

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/FT^3)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NUMBER
	HAZ CUT/PLACE					
1	Station A+75/1+00	Approximately 929.00 Final Lift	114.5	11.3	97.2	17
2	Station E+50/1+00	Approximately 929.00 Final Lift	119.2	10.4	101.2	17
	SUITABLE FILL					
3	Station B+50/0+50	Approximately 916.00 First Lift	115.7	13.8	93.7	24
4	Retest of Test #3	Approximately 916.00 First Lift	117.1	12.8	94.8	24
5	Second Retest of Test #4	Approximately 916.00 First Lift	122.9	11.7	99.5	24
6	Station B+25/0+50	Approximately 916.50 Second Lift	117.7	12.0	95.3	24
7	Station B+50/0+50	Approximately 917.00 Third Lift	117.6	13.1	95.2	24
8	Station A+00/0+25	Approximately 917.00 Third Lift	119.4	8.5	96.7	24
9	Station A+50/0+25, Retest of Test #8	Approximately 917.00 Third Lift	117.3	11.5	95.0	24

PROJECT:	LASKIN/POPLAR JEFFERSON, OHIO	FILE NO.:	A93196X1
		REPORT NO.:	A-47
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	8-13-93
TECHNICIAN(S):	RON MCKINLEY		

MODIFIED PROCTOR TEST ASTM D-1557 METHOD "B"		
CURVE NO.	MAXIMUM DRY DENSITY LBS/FT^3	(%) OPTIMUM MOISTURE
17	117.8	13.0
24	123.5	11.3

REMARKS: The contractor was notified of the test results.

SOLAR TESTING LABORATORIES, INC.

William R. Dash, P.E.
Civil Engineer

cc: OHM Remediation Services Corp.
Laskin/Poplar (Jobsite)

SOLAR TESTING LABORATORIES, INC.

5399 Lancaster Drive, Brooklyn Heights Ohio 44131
Telephone: (216) 741-7007 • FAX: (216) 741-7011

SOIL COMPACTION REPORT
(NUCLEAR MOISTURE DENSITY METHOD)

PROJECT:	LASKIN/POPLAR JEFFERSON, OHIO	FILE NO.:	A93196X1
		REPORT NO.:	A-48
CLIENT:	OHM REMEDIATION SERVICES CORP.	DATE:	8-14-93
TECHNICIAN(S):	RON MCKINLEY		

TEST NO.	LOCATION	ELEVATION	IN-PLACE DRY DENSITY (LB/FT^3)	PERCENT FIELD MOISTURE	PERCENT COMPACTION	CURVE NUMBER
	HAZ CUT/PLACE					
1	Station B/0+75	6" Lift over Hazmat's Final Lift	114.5	12.8	102.2	3
2	Station C+50/1+50	6" Lift over Hazmat's Final Lift	117.5	13.3	104.9	3
3	Station B/1+50	6" Lift over Hazmat's Final Lift	114.8	14.3	102.5	3

CURVE NO. 3 (SILT) STANDARD PROCTOR TEST ASTM D-698 METHOD "A"	
MAXIMUM DRY DENSITY (LB/FT^3)	(%) OPTIMUM MOISTURE
112.0	15.6

REMARKS: The contractor was notified of the test results.

SOLAR TESTING LABORATORIES, INC.

William R. Dash

William R. Dash, P.E.
Civil Engineer

cc: OHM Remediation Services Corp.
Laskin/Poplar (Jobsite)

APPENDIX C

DATA COMPILATION LIST FOR PROJECT RESOURCES

FINAL REMEDIAL ACTION

INTRODUCTION

The Data Compilation List for Project Resources has been prepared for the Laskin/Poplar Oil Company (LPO) Site. This Compilation List is submitted to document the results of laboratory analytical work, reports, contractor's submittals, photographs and miscellaneous documents submitted to the USEPA and OEPA during the Final Remedial Action Operable Unit phase of work.

PURPOSE OF THE FRA COMPILATION LIST FOR PROJECT RESOURCES

The Final Remedial Action Compilation List for Project Resources was requested by the USEPA, and is intended for use in simplifying the location of necessary FRA documents in the future. These resources are divided into four tables in the following manner:

- **TABLE 1.1** - *List of Monthly Air Monitoring Reports;*
- **TABLE 1.2** - *List of Contractor's Submittals*;
- **TABLE 1.3** - *List of Photographic Material and Design Documents Submitted During the FRA;*
- **TABLE 1.4** - *List of Documents (letters, memorandums, etc.), submitted to the Ohio and United States Environmental Protection Agencies, dealing with the FRA;*

Table 1.1 - Monthly Air Monitoring Reports

The purpose of this table is to list all monthly reports that were submitted to the EPA regarding air sampling and monitoring at the site. Three separate air monitoring reports were submitted per month, and are as follows: a.) Data Summary, b.) Monthly Quality Assurance Report - Off-Site Laboratory Analysis, and c.) Monthly Quality Assurance Report - On-Site Air Monitoring and Off-Site Laboratory analysis of Collocated Duplicates.

The Data Summary report contained a summary of meteoritical observations, as well as all on-site instrument data (including particulate data and gas chromatograph (GC) data for all of the instruments present at the site, and for samples sent to the laboratory for analysis.

The Off-Site Laboratory Analysis report contains information on the following: internal and external laboratory audits, field audits, corrective actions, data validation reports, comments on the previous quality assurance report, validated laboratory reports, and laboratory response to comments.

The reports on On-Site Air Monitoring and Off-Site Laboratory Analysis of Collocated Duplicates dealt with the following issues: quality assurance activities (internal audits, external audits and corrective action requests/reports), summary of on-site air monitoring (PID and Miniram data) and GC data, data validation reports, and summary reports for the off-site analysis of collocated duplicate samples, comments on previous QA reports, data validation reports, and data summaries.

Since air monitoring at the site began in May 1993, and concluded in August 1993, four sets of air monitoring reports were submitted during the course of the FRA. Table 1.1 contains the report title, and the relevant time period for which each report is intended.

Table 1.2 - List of Contractor's Submittals

The purpose of this table is to catalog the miscellaneous documents submitted by OHM Corporation, regarding the Final Remedial Action activities at the site. This list includes all pertinent contractor work plans, as well as information regarding various materials which were submitted for approved use at the site (e.g., HDPE geomembrane by National Seal Company, etc.).

Table 1.3 - List of Photographic Resources and Miscellaneous Documents

The purpose of this table is to catalog miscellaneous documents and photographs which were developed for or during the FRA. These documents include all volumes of the Plans and Specifications for the FRA, the Construction Management Plan, and one box of photographs, taken over the period of time beginning in January 1993, and ending in November 1993.

Table 1.4 - List of Documents (letters, memorandums, etc.), submitted to and received from the OEPA and USEPA

The purpose of this table is to list documents (letters, memorandums, etc.) that were submitted to, or received from the OEPA and/or USEPA throughout the duration of the FRA phase of work at the site. These documents address changes in operations or deadlines at the site, and are listed in chronological order, beginning in 1991, and ending in November 1993.

TABLE 1.1
LIST OF MONTHLY AIR MONITORING REPORTS

TABLE 1.1

Final Remedial Action Operable Unit
Laskin/Poplar Oil Company Site
Air Monitoring Reports

#	Title	Monitoring Period	Date Submitted
1	A. **DATA SUMMARY** B. **Monthly Quality Assurance Report Number 1** *Off-Site Laboratory Analysis* C. **Monthly Quality Assurance Report Number 1** *On-Site Air Monitoring and Off-Site Laboratory Analysis of Collocated Duplicates*	May 2 through May 28, 1993	08/18/93
2	A. **DATA SUMMARY** B. **Monthly Quality Assurance Report Number 2** *Off-Site Laboratory Analysis* C. **Monthly Quality Assurance Report Number 2** *On-Site Air Monitoring and Off-Site Laboratory Analysis of Collocated Duplicates*	May 30 through June 26, 1993	09/10/93
3	A. **DATA SUMMARY** B. **Monthly Quality Assurance Report Number 3** *Off-Site Laboratory Analysis* C. **Monthly Quality Assurance Report Number 3** *On-Site Air Monitoring and Off-Site Laboratory Analysis of Collocated Duplicates*	June 27 through July 24, 1993	10/12/93
4	A. **DATA SUMMARY** B. **Monthly Quality Assurance Report Number 4** *Off-Site Laboratory Analysis* C. **Monthly Quality Assurance Report Number 4** *On-Site Air Monitoring and Off-Site Laboratory Analysis of Collocated Duplicates*	July 25 through August 23, 1993	11/05/93

TABLE 1.2
CONTRACTOR'S SUBMITTALS

TABLE 1.2

FINAL REMEDIAL ACTION OPERABLE UNIT
Laskin/Poplar Oil Company Site
Contractor's Submittals

#	Title	Contractor Providing Submittal	Date Submitted
1	OHM QUALIFICATIONS for the *Laskin/Poplar Oil Company Site* Ashtabula County, Ohio	OHM	October 7, 1992
2	Materials Handling and Work Plan Final Remedial Action for the *Laskin/Poplar Oil Company Site* Ashtabula County, Ohio	OHM	February 11, 1993
3	Comprehensive Spill and Emission Control Plan Final Remedial Action for the *Laskin/Poplar Oil Company Site* Ashtabula County, Ohio	OHM	February 11, 1993
4	Contingency Plan (Appendix B) Final Remedial Action for the *Laskin/Poplar Oil Company Site* Ashtabula County, Ohio	OHM	February 11, 1993
5	OHM Health and Safety Plan (Appendix D) Final Remedial Action for the *Laskin/Poplar Oil Company Site* Ashtabula County, Ohio	OHM	February 11, 1993
6	Proposed Geosynthetic Cutoff Wall Construction Plan *Laskin/Poplar Site* Jefferson, Ohio	OHM	March 23, 1993
7	Slurry Wall Construction Plan Laskin/Poplar Final Remediation Trust Fund Jefferson, Ashtabula County, Ohio	OHM	May 14, 1993
8	Manufacturers Product Approval Submittal Laskin/Poplar Final Remediation Trust Fund Jefferson, Ashtabula County, Ohio	OHM	March 17, 1993
9	Transmittal Letter No. 00100–00 Construction Progress Schedule–Vol. 1, Sections 105 & 107 OHM Project Organization–Vol. 1, Section 105 OHM Key Personnel List–Vol. 1, Section 105 Slurry Wall Mix Design Test Program–Vol. 1, Section 323 Laskin/Poplar Final Remediation Trust Fund	OHM	January 19, 1993

TABLE 1.3
LIST OF PHOTOGRAPHIC MATERIAL AND DESIGN DOCUMENTS

TABLE 1.3

Final Remedial Action Operable Unit
Laskin/Poplar Oil Company Site
List of Potographic Resources and Design Documents

Item	Title	Description of Contents
(not applicable)	CONSENT DECREE (17 September 1990)	
VOLUME I	SPECIFICATIONS (December 1991)	GROUP 1 – General Requirements GROUP 2 – Site Characterization Infromation and Project Description GROUP 3 – Site Work GROUP 4 – Equipment GROUP 5 – Faclities
VOLUME II	HEALTH and SAFETY PLAN (December 1991)	SECTION 1 – Introduction SECTION 2 – Project Organization and Responsibility SECTION 3 – Employee Training and Medical Surveillance SECTION 4 – Safety and Health Risk Analysis SECTION 5 – Personal Protective Requirements SECTION 6 – Site Work Zones SECTION 7 – Site Visitor Policies SECTION 8 – Air Monitoring for Protection of Site Workers APPENDIX A – List of References APPENDIX B – Emergency Procedures and Notifications APPENDIX C – Decontamination APPENDIX D – Air Monitoring Equipment and Methods APPENDIX E – Forms
VOLUME III	NOT USED	
VOLUME IV	PRELIMINARY INSPECTION MAINTENANCE and MONITORING PLAN (December 1991)	SECTION 1 – Introduction SECTION 2 – Objectives of the Inspection, Maintenance and Monitoring Program SECTION 3 – Groundwater Monitoring Program SECTION 4 – Inspection Program SECTION 5 – Maintenance Program

TABLE 1.3 (continued)

Final Remedial Action Operable Unit
Laskin/Poplar Oil Company Site
List of Potographic Resources and Design Documents

Item	Title	Description of Contents
VOLUME V	AIR MONITORING PLAN (December 1991)	SECTION 1 – Approval Page SECTION 2 – Table of Contents SECTION 3 – Project Description SECTION 4 – Project Organization and Responsibility SECTION 5 – Quality Assurance Objectives for Measurement Data in Terms of Precision, Accuracy, Representativeness, Comparability, and Completeness SECTION 6 – Sampling Procedures SECTION 7 – Sample Custody SECTION 8 – Calibration Procedures and Frequency SECTION 9 – Analytical Procedures SECTION 10 – Internal Quality Control Checks SECTION 11 – Data Reduction, Validation, and Reporting SECTION 12 – Performance and System Audits SECTION 13 – Preventative Maintenance SECTION 14 – Specific Routine Procedures used to Assess Data Precision Accuracy, and Completeness SECTION 15 – Corrective Action SECTION 16 – Quality Assurance Reports to Management APPENDIX A – References APPENDIX B – S O P 1.0 – Met. Tower Operation APPENDIX C – S O P 4.0 – Data Acquisition and Processing APPENDIX D – S O P 2.1 – Routine Portable Monitoring PID APPENDIX E – S O P 2.2 – Portable Aerosol Monitor (MINIRAM) APPENDIX F – S O P 5.2 – Sample Collection for PAHs and PCBs APPENDIX G – S O P 5.3 – Sample Collection for PM 10, TSP, and metals APPENDIX H – Chester LabNet Analytical SOPs APPENDIX I – Data Validation SOPs (ES) APPENDIX J – Chain–of–Custody SOP (ES)
VOLUME VI	NOT USED	

TABLE 1.3 (continued)

Final Remedial Action Operable Unit
Laskin/Poplar Oil Company Site
List of Potographic Resources and Design Documents

Item	Title	Description of Contents
VOLUME VII	Contingency Plan (December 1991 – Rev. March 1993)	SECTION 1 – Introduction SECTION 2 – Hazardous Operations, Safety Factors, and Emergency Response Procedures SECTION 3 – Coordination and Implementation of Emergency Response SECTION 4 – Emergency Response Procedures SECTION 5 – On–Site Emergency Equipment and Control Procedures SECTION 6 – Coordination Agreements SECTION 7 – Written Reports SECTION 8 – Site Security and Control APPENDIX A – List of References APPENDIX B – Contractor Specific Duties and Training Requirements
VOLUME VIII	Regulatory Compliance Plan (December 1991)	SECTION 1 – Introduction SECTION 2 – Requirements of Environmental Regulations Other than CERCLA (ARARs) APPENDIX A – List of References
VOLUME IX	Site Secutiry Plan (December 1991)	SECTION 1 – Introduction SECTION 2 – Access Restriction Measures SECTION 3 – Authority and Responsibilities SECTION 4 – Access Requirements APPENDIX A – List of References
(not applicable)	Construction Management Plan (March 1992 – Rev. October 1992)	SECTION 1 – Introduction SECTION 2 – Project Organization SECTION 3 – Construction Schedule SECTION 4 – Review of Contractor Pland SECTION 5 – Progress Monitoring and Reporting SECTION 6 – Change Orders SECTION 7 – Special Procedures SECTION 8 – Compilation of Project Documentation SECTION 9 – Site Security APPENDIX A – Project Description APPENDIX B – Construction Forms

TABLE 1.3 (continued)

Final Remedial Action Operable Unit
Laskin/Poplar Oil Company Site
List of Potographic Resources and Design Documents

Item	Title	Description of Contents
(not applicable)	Construction Completion Report (December 1991)	SECTION 1 – Introduction SECTION 2 – Chronology of Events SECTION 3 – Performance Standards and Construction Quality Control SECTION 4 – Construction/Remediation Activities SECTION 5 – Construction Inspection APPENDIX A – Summary of Waste Quantities and Disposition APPENDIX B – Analytical Results APPENDIX C – List of Project Resources
(not applicable)	Remedial Design / Remedial Action Work Plan (January 1991)	SECTION 1 – Introduction SECTION 2 – Final Remedial Action SECTION 3 – Project Organization for Final Remedial Action Design SECTION 4 – Final Remedial Action Design Schedule APPENDIX A – List of References
(not applicable)	Confirmation of the Required Cap Limits along the Western Property Line [Design Menorandum] (November 1991)	SECTION 1 – Introduction SECTION 2 – Field Activities SECTION 3 – Lab Analysis and Data Validation SECTION 4 – Data Evaluation and Selection fo Chemicals for use in the Risk Assessment SECTION 5 – Risk Assessment SECTION 6 – Summary and Recommendations
(not applicable)	Confirmation of the Required Cap Limits along the Western Property Line (continued)	APPENDIX A – Work Plan for Confirmation of the Required Cap Limits along the Western Property Line APPENDIX B – Work Plan Approval Letter APPENDIX C – ES Internal Memorandum dated 9 August 1991 Documenting Field Activities Related to Implementation of the Work Plan APPENDIX D – Validated Data Summaries APPENDIX E – Data Validation Report APPENDIX F – Tables H–4 and H–5 from the RI Showing Background Inorganic Chemical Concentrations
PHOTOGRAPHS	1 Box	Contract Photographs – March 1993 through September 1993

TABLE 1.4

LIST OF DOCUMENTS (LETTERS, MEMORANDUMS, ETC.), SUBMITTED TO/RECEIVED FROM THE OHIO AND UNITED STATES ENVIRONMENTAL PROTECTION AGENCIES

TABLE 1.4

FINAL REMEDIAL ACTION OPERABLE UNIT
Laskin/Poplar Oil Company Site
Correspondence between the Engineering–Science (ES) and the Ohio and Federal EPA

#	Subject of Correspondence	Submitted To / From	Date Submitted
1	Draft Cap Design Evaluation Report	To: John A. DeLashmit (U.S. EPA) From: Peter Gelman (ES)	27–Feb–91
2	Draft Support Plans	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	09–Apr–91
3	Draft Support Plans	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	03–May–91
4	Response to agency comments on the Draft Cap Design Evaluation Report	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	27–Jun–91
5	Draft Comments on the Final Remedy Support Plans from CH2M Hill and OEPA	To: Peter Gelman (ES) From: Kathleen Warren (U.S. EPA)	28–Jun–91
6	Reportable Quantities (RQ) for Hydrocarbons (Telephone (Memorandum to File–Emergency Response Commission)	To: OEPA Emergency Response Com. From: Louise Watson (ES)	11–Jul–91
7	Approval of the proposal Submitted on July 11. 1991 for Confirmation of the Western Boundary of the Cap	To: Peter Gelman (ES) From: Kathleen Warren (U.S. EPA)	25–Jul–91
8	Final Comments for the Final Remedy Support Plan Addenda (Fax)	To: Peter Gelman (ES) From: Kathleen Warren (U.S. EPA)	27–Jul–91
9	Comments on the Final Remedy Draft Support Plan Addenda	To: Peter Gelman (ES) From: Kathleen Warren (U.S. EPA)	29–Jul–91
10	Comments on the 60% Final Remedy Specifications (Volume I)	To: Peter Gelman (ES) From: Kathleen Warren (U.S. EPA)	31–Jul–91
11	Ohio EPA regs for SPCC Plan (Telephone Memoradum to File)	To: Pam Doener (OEPA–Columbus) From: Louise Watson (ES)	22–Aug–91

TABLE 1.4 (continued)

FINAL REMEDIAL ACTION OPERABLE UNIT
Laskin/Poplar Oil Company Site
Correspondence between the Engineering–Science (ES) and the Ohio and Federal EPA

#	Subject of Correspondence	Submitted To / From	Date Submitted
12	Final Support Plans	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	27–Aug–91
13	Pre–Final (95%) Design Specifications and Drawings	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	27–Sep–91
14	Responses to Agency Comments on the 60% Intermediate Design Specifications	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	22–Oct–91
15	Confirmation of the Required Cap Limits along the Western Property Line	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	11–Nov–91
16	Final Support Plans	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	13–Dec–91
17	Final – 100 Percent Design Drawings and Specifications	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	20–Dec–91
18	Telephone Memo to File: Completion of Remedial Action	To: P.Gelman/R.Willse/G.Dieterle (ES) From: Kathleen Warren (U.S. EPA)	24–Jan–92
19	Final Remedial Action 100% Design	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	08–Apr–92
20	Results of Physical/Chemical Testing for Off site Fill Materials	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	13–Apr–93
21	Modifications to the Geosynthetic Cutoff Wall Plan	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	10–May–93
22	Proposed changes to the cement bentonite slurry wall sampling	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	06–Jun–93

TABLE 1.4 (continued)

FINAL REMEDIAL ACTION OPERABLE UNIT
Laskin/Poplar Oil Company Site
Correspondence between the Engineering-Science (ES) and the Ohio and Federal EPA

#	Subject of Correspondence	Submitted To / From	Date Submitted
23	OHM's Request to substitute #8 Stone for the #4 Stone Specified in Section 327 (Cap Infiltration Drainage System)	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	10-Jun-93
24	OHM's Request for substitution of materials for the Infiltration Drain	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	25-Jun-93
25	Revision of cement bentonite slurry wall sampling technique	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	30-Jun-93
26	Scope of Work for the East and West Diversion Trenches ALTERNATIVE 'B'	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	19-Jul-93
27	OHM's request for change in the infiltration drain fabric seam closure method	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	28-Jul-93
28	Final permeability results for the CB slurry wall	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	24-Sep-93
29	Request for a Change in the Compaction Requirement for the North Slope Bedding Soil	To: Kathleen Warren (U.S. EPA) From: Peter Gelman (ES)	25-Aug-93

TABLE 1.4 (continued)

FINAL REMEDIAL ACTION OPERABLE UNIT
Laskin/Poplar Oil Company Site
Correspondence between the Laskin Final Remediation Trust Fund and the Ohio and Federal EPA

#	Subject of Correspondence	Submitted To / From	Date Submitted
1	Letter of Transmittal: Six copies of the Final Remedial Design/Remedial Action Work Plan for the Final Remedial Action	To: John A. DeLashmit (U.S. EPA) From: James R. Campbell (Trustee)	15–Jan–91
2	Laskin/Poplar Oil Site – Remedial Design/Remedial Action Work Plan for the Final Remedy	To: James R. Campbell (Trustee) From: John A. DeLashmit (U.S. EPA)	13–Feb–91
3	Review of the eight (8) revised volumes of the support plans for the Final Remedial Action	To: James R. Campbell (Trustee) From: Richard Smith (OEPA)	10–Sep–91
4	Comments on the Final Remedy Support Plans and Specifications	To: James R. Campbell (Trustee) From: Kathleen Warren (U.S. EPA)	14–Nov–91
5	Approval of Remedial Action Contractor for the Final Remedy	To: James R. Campbell (Trustee) From: Kathleen Warren (U.S. EPA)	21–Jan–93
6	Initiation of site activities prior to full approval of all project plans	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	23–Feb–93
7	Substitution of geosynthetic cutoff (GUNDWALL) for the slurry wall	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	02–Mar–93
8	Final Remedy Project Schedule	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	12–Mar–93
9	Final Remedy Project Milestone	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	15–Mar–93
10	Approval of the Remedial Design Plans and Specifications for the Final Remedial Action	To: James R. Campbell (Trustee) From: Kathleen Warren (U.S. EPA)	23–Mar–93

TABLE 1.4 (continued)

FINAL REMEDIAL ACTION OPERABLE UNIT
Laskin/Poplar Oil Company Site
Correspondence between the Laskin Final Remediation Trust Fund and the Ohio and Federal EPA

#	Subject of Correspondence	Submitted To / From	Date Submitted
11	Progress Report for March 1993	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	06-Apr-93
12	Mobilization for Final Remedy Construction (March 29) Project Initiation Milestone, Site Survey (March 30)	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	06-Apr-93
13	Approval of the OHM Contractor Plans	To: James R. Campbell (Trustee) From: Kathleen Warren (U.S. EPA)	22-Apr-93
14	Progress Report for April 1993	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	08-May-93
15	Final Approval of the OHM Contractor Plans	To: James R. Campbell (Trustee) From: Kathleen Warren (U.S. EPA)	07-May-93
16	Final Approval of the OHM Slurry Wall Construction Plan	To: James R. Campbell (Trustee) From: Kathleen Warren (U.S. EPA)	20-May-93
17	Progress Report for May 1993	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	04-Jun-93
18	Responses to the CH2M Hill Air Monitoring Program Audit Report	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	07-Jul-93
19	Progress Report for June 1993	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	09-Jul-93
20	Progress Report for July 1993	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	06-Aug-93
21	Oil stained soil at the north perimeter	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	09-Aug-93

TABLE 1.4 (continued)

FINAL REMEDIAL ACTION OPERABLE UNIT
Laskin/Poplar Oil Company Site
Correspondence between the Laskin Final Remediation Trust Fund and the Ohio and Federal EPA

#	Subject of Correspondence	Submitted To / From	Date Submitted
22	Diversion trench alternative to the East and West Slurry Walls due to questionable slurry wall permeability	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	19-Aug-93
23	Extension of Project Completion Milestone to September 15, 1993	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	20-Aug-93
24	Progress Report for August 1993	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	09-Sep-93
25	Final Remedy Construction completion September 15, 1993	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	21-Sep-93
26	Progress Report for September 1993	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	08-Oct-93
27	Progress Report for October 1993	To: Kathleen Warren (U.S. EPA) From: James R. Campbell (Trustee)	08-Nov-93