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DUNLOP TIRE CORPORATION
TONAWANDA, NEW YORK

CONSTRUCTION MONITORING REPORT

CLOSURE PLAN
FOR
INACTIVE WASTE SITES NYSDEC NO's 915018 A, B, C

SUPPLEMENT 1
SOUTHEAST AREA "A"

SEPTEMBER 1994

Submitted to:

DUNLOP TIRE CORPORATION
Tonawanda, New York

Prepared By:

URS CONSULTANTS, INC.
282 Delaware Avenue
Buffalo, New York 14202

G1860

DUNLOP TIRE CORPORATION

TONAWANDA, NEW YORK

CONSTRUCTION MONITORING REPORT

CLOSURE PLAN FOR

INACTIVE WASTE SITE NYSDEC NOS. 915018 A, B, C

SUPPLEMENT 1

SOUTHEAST AREA "A"

PREPARED FOR:

DUNLOP TIRE CORPORATION

TONAWANDA, NEW YORK

SEPTEMBER 1994

PREPARED BY:

URS CONSULTANTS, INC.

282 DELAWARE AVENUE

BUFFALO, NEW YORK 14202

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1.0 INTRODUCTION

This report is a supplement to the February 1994 report issued by URS Consultants, Inc., entitled "Construction Monitoring Report - Closure Plan for Inactive Waste Sites NYSDEC Nos. 915018 A, B, C" (CMR). Section 11 of the CMR discussed the need to extend the completed closure system over the area of the project designated Southeast Area A (SEA). Appendix M of the CMR presented the "Southeast Area A Investigation Report" that provided the data upon which the decision to extend the closure limits was based.

The reader is referred to Section 1.0 of the CMR for background information on the project. Subsequent to issuance of the CMR, a closure design was developed for SEA. Construction was performed in the summer of 1994.

The closure of SEA completes the remediation of the three (3) inactive waste sites located on the Dunlop Tire Corporation (DTC) property in Tonawanda, New York. As a result, the requirements of the Record of Decision, dated March 1993, as issued by the New York State Department of Environmental Conservation, have been satisfied.

This CMR Supplement finalizes the documentation required by Section 4.7 of the NYSDEC approved Quality Assurance/Quality Control Plan dated March 1993. It presents the observations made and the data collected during the construction of the closure system of SEA. In addition, this report provides a comprehensive overview of the project tasks performed during the site remediation. The area of construction is presented in Figure 1-1.

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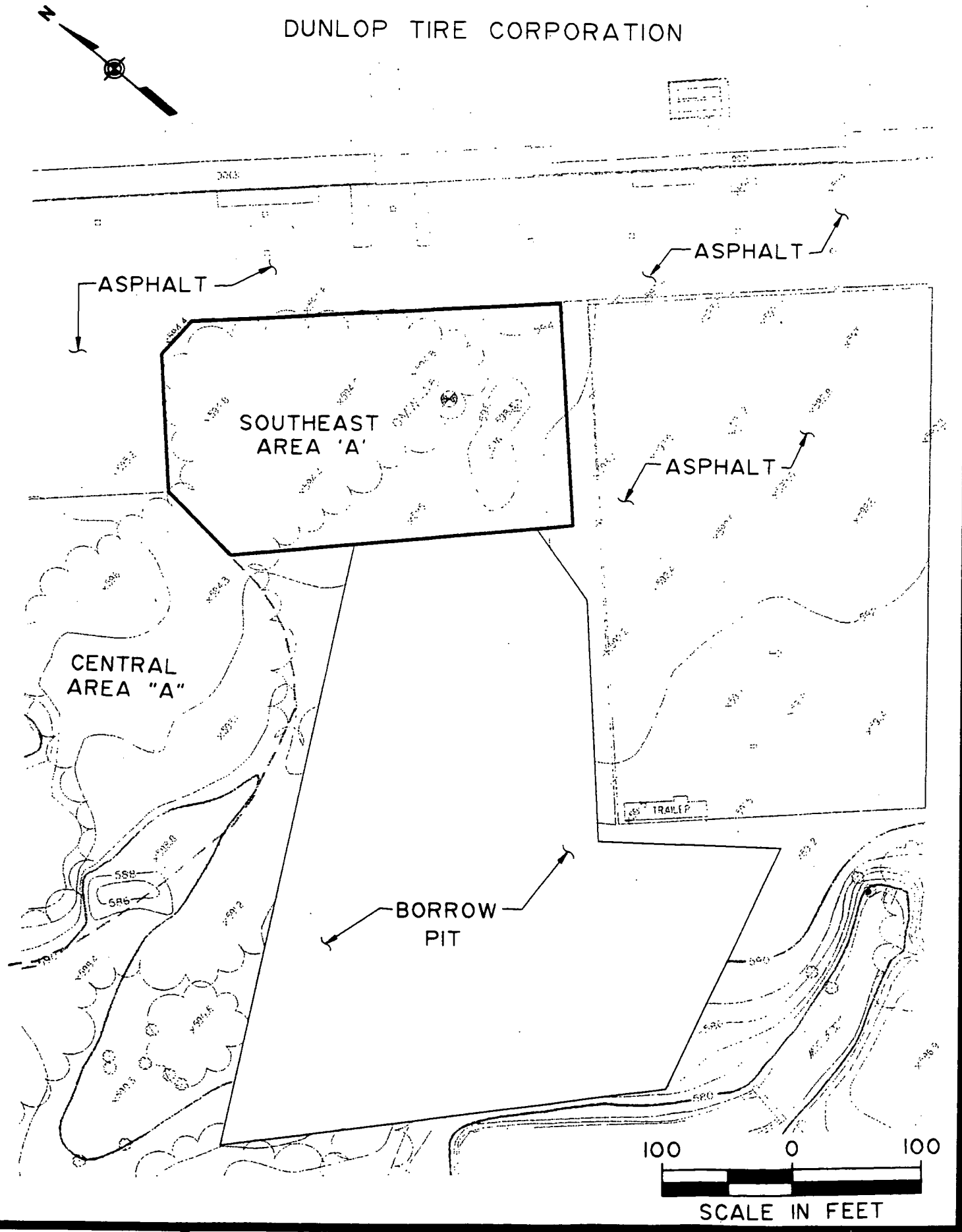

AC-5515A

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SITE LOCATION MAP

FIGURE 1-1

Also included is a discussion of the methods and equipment employed in construction, quality control requirements, testing (with results), and procedures and criteria used in observation of the work. Specifically, this report includes the following:

- Description of the 18-inch Low-Permeability Soil (LPS) cover and 6-inch vegetative cover layer
- Construction material requirements
- Construction methods and equipment
- Discussion of changes from NYSDEC-approved engineering plans
- Quality assurance/quality control requirements and test results
- Record drawings

The closure system was constructed by Site Contractors, Inc., under contract to Dunlop. URS Consultants, Inc. provided technical monitoring and construction observation for Dunlop.

Empire Soils Investigations, Inc. (ESI) of Hamburg, New York provided both on-site and laboratory materials testing services.

Survey control for grade, slope, and thickness verification of the LPS cover system was performed by Site Contractor's subcontractor, Douglas C. Myers, P.L.S, P.C. of Arcade, New York.

1.1 Schedule

A preconstruction meeting for the site closure project was held on May 17, 1994. Site Contractors, Inc. began submitting shop drawings shortly thereafter, with project mobilization commencing on May 23, 1994. Mobilization consisted of setting up the field office trailer and moving equipment onsite. On May 31, 1994, long term monitoring well OMW-A5 was decommissioned by SJB Services, Inc., subcontractor to Site Contractors, Inc. Subsequently, replacement well OMW-A6 was installed by Buffalo Drilling, also subcontractor to Site Contractors, on July 13, 1994. The long term monitoring wells are discussed further in Section 10.0 of this report.

Earthwork operations commenced on June 7, 1994 with the construction of subgrade from clay excavated from the onsite borrow pit. After subgrade was constructed, test pad installation occured on June 9, 1994. Subsequently, the 18-inch LPS cap and 6-inch vegetative cover were constructed with earthwork operations being completed on July 14, 1994. The 18-inch LPS layer for the 1.2 acre landfill was placed in two days (June 15 and June 16, 1994). In-place density (IPD) testing and Shelby tube sampling were performed on June 16, 1994 at the end of the placement operations. Subsequent record survey of the LPS layer for cover thickness and slope verification took place on June 20, 1994 by Douglas C. Myers, P.L.S., P.C. No earthwork operations were performed the week of June 27, 1994 due to daily rains that resulted in wet field conditions. Vegetative cover placement resumed July 5, 1994 and was completed on July 14, 1994. Seeding of the cap was completed on July 18, 1994.

During the landfill seeding operations, concurrent grading operations were being performed in the borrow pit. Seeding and mulching operations on the borrow pit floor and side slopes were completed on July 20, 1994. Demobilization was completed on July 25, 1994.

2.0 DESCRIPTION OF CLOSURE PLAN

The closure plan for SEA consisted of construction of an LPS cap with the following components:

- Subgrade - Subgrade was constructed from on-site clay and graded in accordance within the specified scopes.

- Low-Permeability Soil Layer - a minimum 18-inch thick layer having a maximum permeability of $1x10^{-7}$ cm/sec. Material to construct this layer was obtained from an onsite source (Section 7.1). This layer was placed over the waste areas on top of a prepared subgrade.

- Low-Permeability Soil Keyway - minimum 2-foot wide trenches excavated around the perimeter of the waste and at least 12 inches into the existing clay layer. The trenches are backfilled with LPS and tied into the 18-inch LPS layer. The keyways surround the waste areas except where the sites are bounded by asphalt pavement. They serve as cutoff walls to minimize groundwater flow into or out of the closure area.

- Vegetative Cover Layer - a minimum 6-inch thick soil layer of sufficient quality to support vegetative growth. The purpose of the vegetative layer is to help prevent erosion and desiccation of the cover system. The material used for this layer was clay obtained from the onsite borrow pit with 2 inches of topsoil from an offsite source incorporated into the upper portion of the layer.

- Site Drainage - slopes of the final cover system ranged from a minimum of 3% to a maximum of 33% to promote surface water drainage. A series of swales and ditches located around the perimeter of the final cover system carries surface water away from the waste areas. Final contours of the cover areas are included in the project record drawings.

- Monitoring Wells - upgradient monitoring well OMW-A5, located in an area to be capped, was decommissioned and replaced by monitoring well OMW-A6.

3.0 QA/QC PROJECT MANAGEMENT AND ORGANIZATION

The closure of SEA involved the participation and services of the New York State Department of Environmental Conservation (NYSDEC), Dunlop Tire Corporation, URS Consultants, Inc., Empire Soils Investigations, Site Contractors, Inc., and their surveying subcontractor Douglas C. Myers, P.L.S., P.C. Figure 3-1 presents an organization chart of the principal QA/QC personnel for the project. The responsibilities of each project participant and of that participant's QA/QC staff are discussed in the following subsections.

3.1 NYSDEC

SEA was closed under the direction of NYSDEC. Upon completion, Dunlop Tire Corporation will obtain confirmation from NYSDEC that the work was completed in conformance with the approved design. The NYSDEC Project Manager, Mr. Glenn May, was the agency's representative for day-to-day operations and Dunlop's contact for obtaining final approval following submittal and review of this Construction Monitoring Report Supplement and the Record Drawings.

3.2 Dunlop Tire Corporation

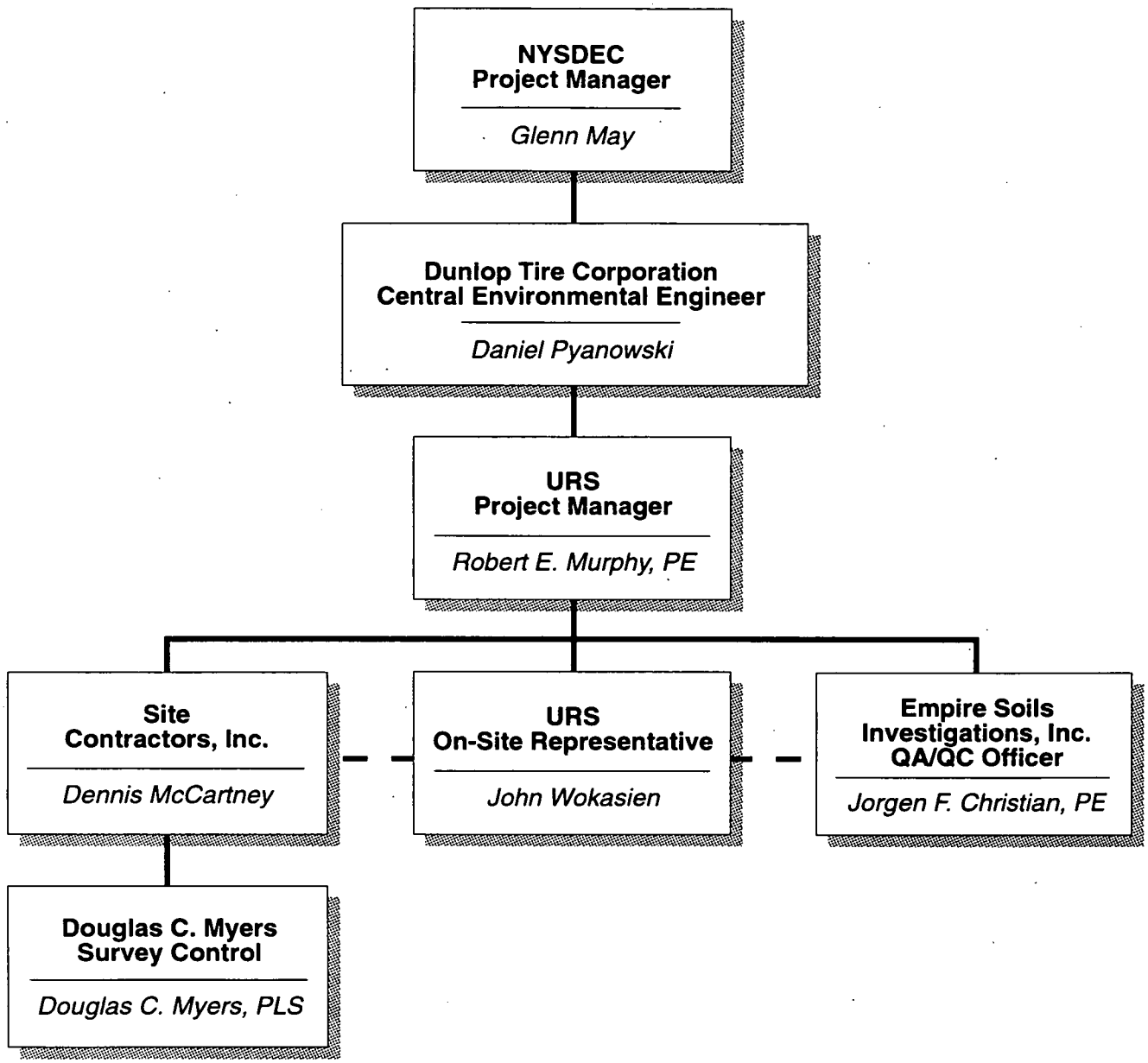
Dunlop Tire Corporation (DTC) as the Owner, performed the site closures under direction of NYSDEC. DTC's Central Environmental Engineer, Mr. Daniel Pyanowski, represented DTC in administration of the closures, and served as its contact with NYSDEC. In addition, he directly supervised the activities of URS Consultants, Inc., Site Contractors, and Empire Soils Investigations.

3.3 URS Consultants, Inc.

DTC retained the services of URS Consultants, Inc. (URS), a New York State-licensed professional engineering firm with extensive experience in solid and hazardous waste sites and in particular, with closure of inactive waste sites. URS provided both design and construction

QA/QC ORGANIZATION

Dunlop Tire Corporation
Closure of Sites No. 915018 A, B, C



URS
CONSULTANTS, INC.

Figure 3-1

oversight services on this project, and was responsible for implementation of the QA/QC Plan. The QA/QC responsibilities of key engineering staff members are presented below:

URS Project Manager - The Project Manager was responsible for implementation of and ensuring compliance with the QA/QC plan through his subordinates. He acted as the interface with Dunlop and, through Dunlop, with NYSDEC. The Project Manager for this project is a licensed New York State Professional Engineer with more than 10 years experience, including experience in closure of solid waste and hazardous waste landfills.

Specific responsibilities of the Project Manager included:

- Review of design criteria, plans, and specifications for clarity and completeness of QA/QC requirements;
- Supporting DTC in meetings with NYSDEC and the Contractor as necessary;
- Consulting with the Construction Manager on field problems and corrective measures;
- Review of required QA/QC and other documentation;
- Review of Record Drawings and Construction Monitoring Report;
- Providing technical support as necessary to the URS Onsite Representative;
- Working with the Contractor to correct deficiencies;
- Making periodic site visits to ensure adequacy of construction methods;
- Inspecting QA/QC-related methods, procedures, and documentation;
- Reviewing daily construction reports prepared by the URS Onsite Representative
- Assisting the URS Onsite Representative with implementation of contract requirements and resolution of disputes with the Contractor.

URS Onsite Representative - The URS Onsite Representative, who was responsible to the URS Project Manager, is a civil engineering technician with experience in construction projects similar to the DTC project. The URS Onsite Representative was responsible for inspecting construction activities to ensure conformance with plans and specifications.

He also was responsible for obtaining and organizing the field QA/QC data, as well as for supplying regular photographic documentation of construction progress.

The URS Onsite Representative was responsible for informing the Project Manager of any deficiencies and for documenting the corrective action taken. He also was responsible for writing the Construction Monitoring Report Supplement, maintaining project files, documenting revisions to the contract, and reviewing the Contractor's monthly payment estimates prior to submittal to DTC for payment.

3.4 Site Contractors, Inc.

Site Contractors, Inc. is a site remediation contractor with specialized experience in LPS placement projects. Site Contractors, Inc. was responsible for constructing the work in accordance with the design plans, specifications and QA/QC requirements; and, was solely responsible for the techniques and sequence of construction. The firm was responsible for furnishing all labor, materials, equipment, tools, and other facilities and incidentals necessary for completion of the work. QA/QC requirements affecting the Contractor's work were included in the contract documents (namely, the plans and specifications). The Contractor was required to coordinate his activities with the URS Onsite Representative.

The Contractor subcontracted Douglas C. Myers, P.L.S., P.C., a land surveying firm licensed in the State of New York, to perform survey work required for construction layout, cover system layer elevations, and documentation of final conditions.

3.5 Empire Soils Investigations, Inc.

Empire Soils Investigations (ESI), an independent testing laboratory, performed the geotechnical analysis specified in the QA/QC plan. The Laboratory Project Manager, who had six years experience in the testing methods being employed on this project, was responsible for certifying the accuracy of reported results. He responded to inquiries, directions, and requests

of the URS Onsite Representative. He also was responsible for tracking of samples and for reporting test results promptly.

4.0 CHANGES FROM DESIGN DOCUMENTS

The LPS cover system was constructed in accordance with the approved design documents, with minimal revision. As discussed below, there were three minor changes from the design.

4.1 Revised Landfill Slope Adjacent to Pavement

The landfill slope adjacent to the asphalt concrete pavement was revised from a 1 on 2 slope to a 1 on 4 slope as shown on the record drawings. The slope was changed to reduce the possibility of slope erosion and to facilitate mowing operations on the cap. This revision was approved by Mr. Glenn May, NYSDEC onsite representative on June 15, 1994, as presented in Appendix A.

4.2 Revised Vegetative Cover

The placement of the 6-inch vegetative cover layer was revised at the request of Site Contractors, Inc. and this revision was approved by DTC. The request and approval letter are presented in Appendix B. The contract specifications called for a manufactured vegetative cover consisting of clay from the borrow pit mixed with compost. The revision consisted of mixing offsite topsoil into the upper 2-inches of the previously placed 6-inch clay layer and the placement of an additional application of a dry seed mix prior to mulching and hydroseeding. At the discretion of the Contractor, the vegetative cover was mulched prior to hydroseeding.

The Contractor requested these changes due to the hot and dry season in which seeding would occur. Under these conditions, topsoil would retain moisture and support growth after seed germination better than the compost/clay mixture.

4.3 Keyway Trench Revision

The perimeter keyways were constructed 4 ± feet wider than detailed on the contract drawings. This revision allowed the use of the compaction equipment used on the LPS cap with no adverse impact to the project.

5.0 MAJOR CONSTRUCTION COMPONENTS AND EQUIPMENT

The major components of construction for the closure of the SEA were as follows:

- Clearing and grubbing
- Subgrade preparation
- LPS layer construction
- Stormwater drainage controls
- Vegetative cover

These operations were carried out by the Contractor using the equipment listed on Table 5-1.

TABLE 5-1

EQUIPMENT LISTING

DOZERS AND COMPACTORS
Terex TS-14B Pans (2 ea.) Terex 82-30 Dozer International TD-15E Dozers (2 ea.) International TD-8G/ST Dozer Bomag BW 213 PD Vibratory Compactor Dynapac CA25 Vibratory Roller Sheepsfoot Roller (tow-behind)
<u>Others</u>
Ford 750 Backhoe Disc Pulverizer White Tractor w/Rototiller Water Truck Fiat-Allis 65 Grader Finn Hydroseeder Finn Mulcher John Deere Tractor w/seeder John Deere Tractor w/crimper

6.0 SUBGRADE PREPARATION AND CONSTRUCTION

After SEA was cleared and grubbed, subgrade was constructed to receive the LPS cover system. Cleared and grubbed trees and other vegetation was taken offsite for disposal. Subgrade slopes were constructed with grades ranging from 3% to 33%.

Prior to the placement of grading fill surface, debris was removed and deposited in Dunlop's roll off containers. These containers were hauled to an offsite disposal facility, Modern Landfill. The type and nature of the surface debris encountered in SEA was similar in type to the debris encountered and tested during last year's landfill closure operations (miscellaneous wood and tire fragments). The analytical test results for the tire fragments are presented in Appendix E.3 of the CMR.

7.0 COVER MATERIALS

Onsite materials were used for the construction of the LPS layer and the vegetative cover layer. Topsoil for the vegetative layer was brought in from off-site in small quantities. The following sections summarize the characteristics of each material.

7.1 LPS

The existing onsite borrow pit was the source for the LPS. Its location is shown on the project record drawings. The bulk of the material excavated was used as LPS, with the remainder used to support vegetative cover or to create the subgrade fill. The LPS is classified by the soils testing laboratory as silty clay (CL) in the Unified Soil Classification System.

7.2 Vegetative Cover

The 6-inch vegetative cover consisted of clay obtained from the onsite borrow pit amended with offsite topsoil as discussed in Section 9.0.

8.0 CONSTRUCTION OF LPS LAYER

8.1 Borrow Source Testing

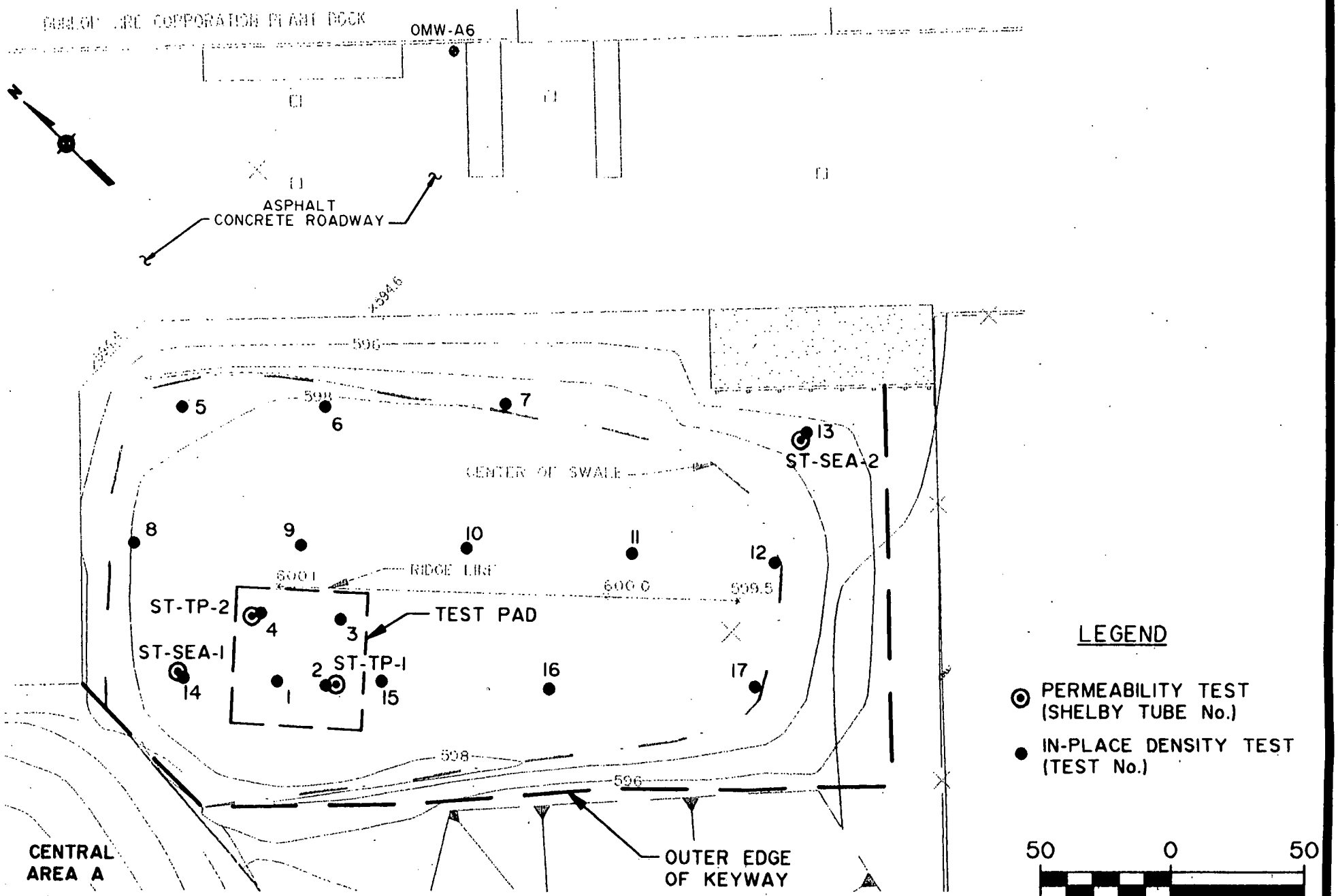
The 18-inch LPS layer was constructed from material obtained from Zone 5 of the onsite borrow pit. This material previously was characterized and tested as low permeability soil for the closure operations performed in 1993. All required materials quality testing was performed. Refer to Section 8.0 of the CMR for further discussions.

8.2 Test Pad

A test pad was constructed in accordance with Item 5.3, Section 3.1.3 of the contract specifications and was placed as an integral part of the LPS cover system for SEA. The approximate dimensions of the test pad were 50 by 50 feet.

The source of material for the test pad was Zone 5 of the onsite borrow pit. The material was placed in a loose, 20-inch lift prior to being rough-graded with a TD-15E dozer. The test pad then was compacted with a sheepsfoot roller with 10-inch tines. This was a static compactive effort. The clay was then compacted until the tine penetration was less than 5 inches. The test pad was compacted dynamically using a Bomag BW 213 PD Vibratory Padfoot Compactor and a Dynapac CA 25 Vibratory Steel Wheel Roller. Dynamic compaction consisted of four passes with the Bomag compactor, followed by four perpendicular passes with the Dynapac roller.

QA for the test pad was represented by a total of four (4) IPD tests and two (2) Shelby tube (permeability) samples. IPD and permeability test results are presented in Appendices A and B respectively. The test pad location and the locations of the QA tests are presented in Figure 8-1.



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QA TEST LOCATIONS SOUTHEAST AREA "A"

FIGURE 8-1

The QA tests of the test pad produced acceptable density results. Shelby tube samples for permeability testing were obtained from the entire 18-inch LPS depth. Two (2) samples were taken from each tube; one from the bottom 6 inches, and one from the middle 6 inches. All four samples were tested, and all showed permeability results less than the specified 1.0×10^{-7} cm/sec.

The test pad QA test results demonstrated that, using the Contractor's equipment, methods, and construction procedures, placement of an LPS cover system having a minimum in-place density of 95% and a maximum permeability of 1×10^{-7} cm/sec could be achieved.

8.3 Placement Methods

The following sections discuss the placement of LPS used in the closure for SEA.

8.3.1 18-Inch Layer

The general methods and procedures employed in the successful completion of the test pad also were used for the placement of the 18-inch LPS layer.

During placement, the natural moisture content of the LPS usually was adjusted by adding water. The water was hauled via water truck to the location of placement and applied with spray bars located at the front and rear of the truck. The water was mixed into the soil during grading and compacting operations.

8.3.2 Keyway Trench

LPS was placed in the keyway trenches in a single compacted lift. The material was compacted with the same method utilized for the 18-inch LPS layer.

8.4 Construction QA/QC

Construction monitoring during placement of the LPS cover system was performed in accordance with the approved QA/QC plan found in Appendix I.1 of the CMR. The following sections discuss the main requirements of the QA/QC plan, the actual IPD and permeability test results, and the method utilized for thickness verification.

8.4.1 QA Test Requirements

The main QA test requirements for this project were IPD testing and constant-head triaxial permeability tests on undisturbed samples (Shelby tubes). The minimum testing frequency for the IPD and permeability tests were nine (9) per acre and one (1) per acre, respectively.

IPD testing was performed with a Nuclear Densitometer (Troxler Model 3440). IPD tests were taken on a smooth LPS surface, following grading and compaction of the LPS layer. The voids left from the Nuclear Densitometer rod were filled with bentonite pellets and rodded to a compact state in order to maintain the integrity of the cover system.

The 3-inch diameter Shelby tubes were pushed through the compacted LPS surface with a dozer blade, allowed to rest, then twisted by hand and carefully extracted. The tubes were sealed with wax, and shipped in a upright position to the laboratory for testing. The voids left from the Shelby tubes were filled with bentonite pellets and rodded to a compact state in order to maintain the integrity of the cover system. In the laboratory the samples were extruded, transferred to the testing equipment, saturated using back-pressure, and tested for permeability under constant head in accordance with U.S. Army Corps of Engineers test method EM 111-2-1906.

8.4.2 QA Test Results

The following sections discuss and summarize the results of the IPD and permeability testing. Permeability test results are summarized on Table 8-1. Copies of the IPD and permeability test results are presented in Appendix C and D respectively.

TABLE 8-1

SUMMARY OF IN-PLACE PERMEABILITY TEST RESULTS

SAMPLE NUMBER	IPD REF NUMBER	DATE SAMPLED	IN-PLACE PERMEABILITY (CM/SEC)	TUBE PORTION TESTED	COMMENTS
ST-TP-1	2	6/9/94	8.77×10^{-9} 7.10×10^{-9}	Bottom Midpoint	Pass Pass
ST-TP-2	4	6/9/94	7.32×10^{-9} 7.78×10^{-9}	Bottom Midpoint	Pass Pass
ST-SEA-1	14	6/16/94	6.87×10^{-9} 7.66×10^{-9}	Bottom Midpoint	Pass Pass
ST-SEA-2	13	6/16/94	1.41×10^{-8} 7.75×10^{-9}	Bottom Midpoint	Pass Pass

QA for the LPS layer placed in this area was represented by a total of 17 IPD tests. The locations of IPD tests for the LPS layer are presented in Figure 8-1. Since the surface area of the LPS layer is 1.2 acres, the actual IPD test frequency for the layer was fourteen (14) per acre, exceeding the minimum required frequency of nine (9) IPD tests per acre.

Four (4) Shelby tube samples were taken in this area, exceeding the minimum required frequency of one Shelby tube per acre. Two (2) samples were obtained from each tube. The locations of Shelby tube samples are presented in Figure 8-1. The average in-place permeability for the eight (8) samples was 8.4×10^{-9} cm/sec.

8.4.3 Minimum Thickness Verification

In each area, prior to LPS placement, the Contractor's surveyor Douglas C. Myers, P.L.S., P.C. shot top-of-subgrade elevations. After LPS placement, they shot top-of-LPS elevations in the same locations as the previous shots. From these elevations, the thickness of the LPS could be derived by subtracting the top-of-subgrade elevation from the top-of-LPS elevation in each respective location. These thicknesses were reviewed to determine if the 18-inch layer was at least 17 inches (1.41 feet) thick (the approved tolerance being 1 inch).

Survey data sometimes conflicted with field-thickness verification data. For example, the survey data might show less than 18 inches minus the specified 1-inch tolerance and the corresponding field-measured thickness would be 17 inches or more. This occurred at five (5) locations on the LPS layer. Hand augers were used by Site Contractors to obtain the actual depth verification and this was observed by URS. The actual field measured depths are recorded on the record LPS thickness drawings. A possible explanation for the discrepancy is that although the surface of subgrade was usually smooth, some surface irregularities existed due to grading and compaction procedures carried out for subgrade preparation. After the depth verification was complete, the hand auger holes were filled with bentonite pellets and rodded to a dense state.

Included with this report are project record drawings showing top-of-LPS elevations for all the waste areas that received the cover system. These drawings verify that the LPS layer was constructed with a 17-inch minimum thickness as derived by the associated survey and field thickness verification data.

8.4.4 Slope Verification

Prior to LPS placement, the Contractor submitted contour maps of the prepared subgrade. This allowed the Engineer to check that as-built slopes were within the specified range. Where corrective grading was required, the affected area was resurveyed and revised subgrade contour maps were submitted.

9.0 PLACEMENT OF SOIL LAYER FOR VEGETATIVE COVER

The soil layer for vegetative cover was placed above the LPS layer to complete the cover system. Onsite material from the borrow pit was used to construct this layer. In addition, two inches of topsoil was incorporated into the upper portion of the 6-inch soil layer. The area subsequently was dry seeded, followed by mulching and hydroseeding. Construction details and approvals for this specification variance are presented in Appendix A.

This variance from the specifications produced the desired results as the establishment of turf was recognized after approximately three weeks.

10.0 LONG-TERM MONITORING WELLS

10.1 Monitoring Well Abandonment

Monitoring well OMW-A5 was decommissioned prior to SEA closure operations due to the discovery of existing waste surrounding the well. Therefore, it was not suitable for its intended use as an upgradient monitoring well.

Monitoring well OMW-A5 was abandoned in-place by overdrilling and sealing with Bentonite grout. The locations of the monitoring wells and the decommissioning report for OMW-A5 are presented in Figure 10-1 and Appendix E, respectively.

10.2 Monitoring Well Construction

Upgradient monitoring well OMW-A6 was installed in place of decommissioned monitoring well OMW-A5. The well construction details, boring log, and well development log are presented in Appendix F.

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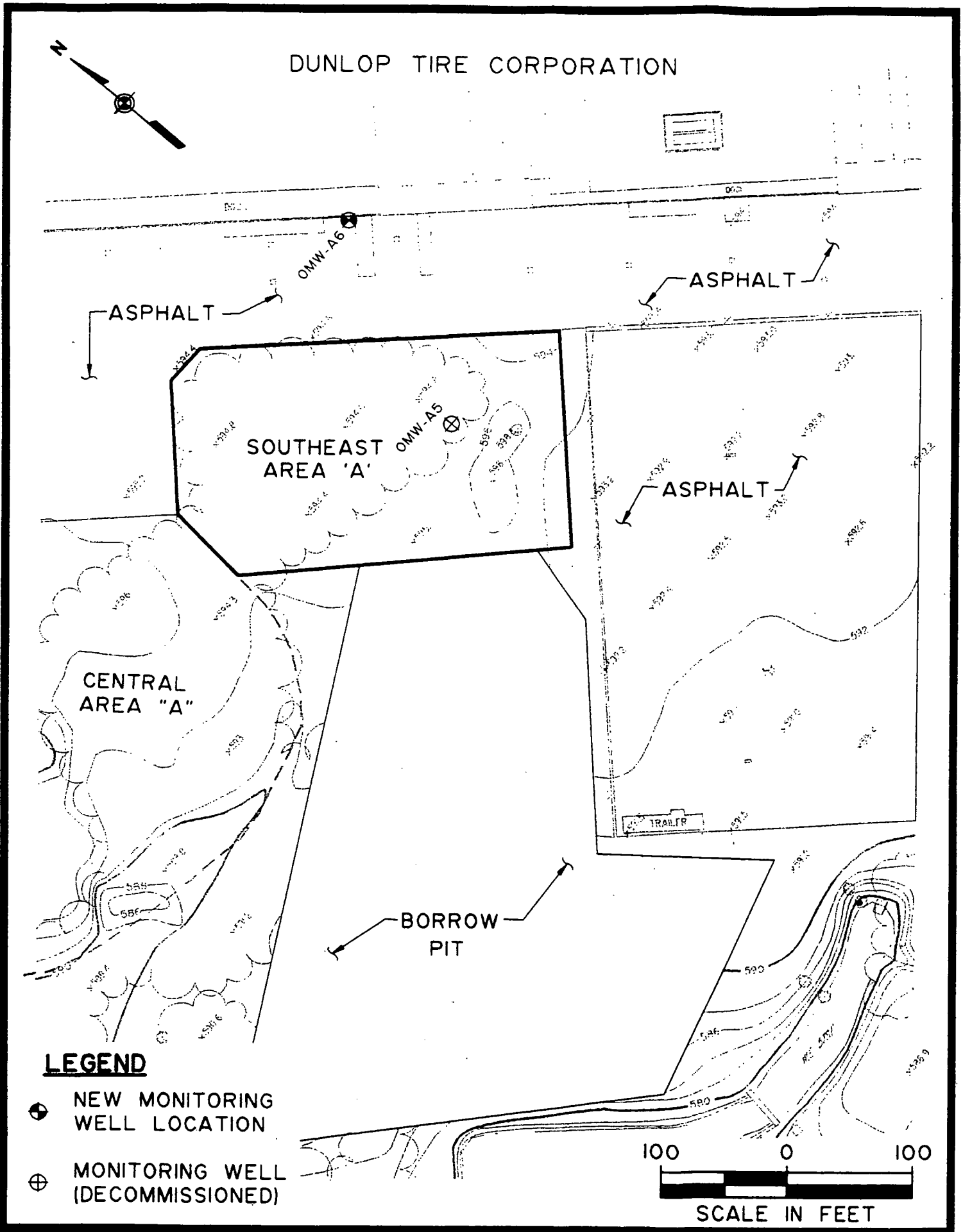


AC-6161

URS CONSULTANTS, INC.

LONG-TERM MONITORING WELL LOCATIONS SOUTHEAST AREA "A"

FIGURE 10-1

APPENDIX A
SOUTHEAST AREA A PERIMETER SLOPE REVISION APPROVAL (DIARY ENTRY)

6/14/94

645 Onsite
710 Rainy, party chief
dropped off the
revised subgrade dwg.
and started the
remaining subgrade
surveys.
Logged in progress
photos.
Contractor dewatered
borrow pit in AM.
No other work
preformed by Site
Contractor in AM.
Placed 108.12 Ton
of #2 RDC for
subbase for the
truck turnaround.
Photos of stone
installation.
Received perm tests
& invoices w/ RFM
in main office.

6/15/94

640 Onsite
705 Started hauling
clay for cover
system → North
end of fill. →
Test pad sides were
cut open for proper
cap tie in →
Photos →

I reviewed the proposed
change of slopes from
a 1:2 to a 1:4 next
adjacent to the
paved area with Dan
Ryy and Glenn Way.
After reviewing the
sketch which I had
prepared, Glenn gave
me verbal approval
to change the slope
from a 1:2 to 1:4.

Field clarification #1
was issued to the

APPENDIX B
REQUEST AND APPROVAL LETTERS FOR VEGETATIVE COVER SPECIFICATION VARIANCE

SITE CONTRACTORS, INC.

JUN 22 1994

JOB 35246.03

Site Development

3-3480 BENZING ROAD, ORCHARD PARK, NEW YORK 14127
Telephone (716) 826-1819

June 20, 1994

Mr. Robert Murphy
URS Consultants Inc.
282 Delaware Avenue
Buffalo, New York

Re: Colsure Plan
Inactive Waste Site
Dunlop Tire Corp.

Dear Mr. Murphy

With your permission we would like to make the following changes to our contract with regard to the six inch vegative cover on the above referenced project.

We feel because of the time of year (hot and dry) it is not favorable to the growing of grass.

We propose after placing 6 inches of vegative cover as per plans and specs, we would add 2 inches of top soil in lieu of compost.

The top soil would be obtained from either of two abandoned farms in the Town of Hamburg. The topsoil is of good quaility and we have had experience using it in the past.

The topsoil placing, fine grading and preperation would also be in accordance with the plans and specs.

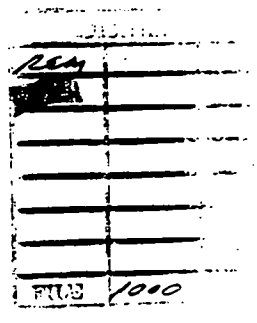
Although this is of substantially greater cost to perform than the compost we will elect to do this at no extra charge to the owner.

Hoping this meets with your approval. We will await your decision.

Very truly yours,

Raymond Zylinski

Raymond Zylinski / Pres.



URS
AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZATION

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SAN MATEO
SEATTLE
VIRGINIA BEACH
WASHINGTON DC

June 30, 1994

Mr. R. Zylinski, President
Site Contractors, Inc.
S-3480 Benzing Road
Orchard Park, New York 14127

RE: DUNLOP INACTIVE WASTE SITE CLOSURES
SOUTHEAST AREA A

Dear Mr. Zylinski:

In response to your letter dated June 20, 1994 and as discussed in Weekly Job Progress Meeting No. 4, June 27, 1994, your request for a specification variance concerning vegetative cover is approved as itemized below:

- Placement of a 6-inch lift of clay (from the onsite borrow pit) over the 18-inches of low permeability soil previously placed.
- Placement of a 2-inch lift of topsoil over the 6-inch lift of clay. The topsoil will be supplied from an offsite source (to be approved). The clay surface shall be loosened to a depth of 3"± and the topsoil mixed in to this depth.
- A dry seed mixture (Seed Mix 1) shall be applied and covered using hay/straw mulch. Coverage will be at the discretion of Site Contractors.
- A second application of Seed Mix 1 shall be applied by hydroseeding and maintained in accordance with Specification Item 5.6, paragraphs 3.1 through 3.10, inclusive.

The above work shall be performed in lieu of the manufactured vegetative soil specified in Specification Item 5.3, paragraphs 2.2.1 through 2.2.4.

This variance shall be performed at no additional cost to the Dunlop Tire Corporation.

Should any questions arise, please contact the undersigned.

Very truly yours,

URS CONSULTANTS, INC.

for Robert E. Murphy, P.E.
Project Manager

cc: D. Pyanowski/DTC
File: 35246.06

J:/35246/WP/COR/6-30-94.RZ/lt
6/30/94 3:01

APPENDIX C
LOW PERMEABILITY SOIL LAYER IN-PLACE DENSITY (IPD) TEST REPORTS

URS
AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZATION

FIELD IN-PLACE DENSITY TEST REPORT

94. 3/3

PROJECT: Closure of Inactive Waste Sites
CLIENT: Dunlop Tire Corp.
CONTRACTOR: [illegible]
REPORT NO. 1 IR #7
DATE: June 7, 1994
JOB NO.: [illegible]

TEST NO.	ELEV.	DEPTH	DC	MC	WD	DD	M	%M	% COMP	PROCT. CODE	Pass Fail	LOCATION AND REMARKS	RPT. No. RETEST OF / EFFECT DATE.
1	591.6	12"	2981	719	131.7	112.7	19	16.8	104.5	5	P	NW CORNER TEST PAD	
2	591.7	12"	"	"	134.6	116.4	18.2	15.6	107.9	5	P	SW CORNER SHELBY TEST PAD TUBE	
3	598.5	12"	"	"	131.8	112.6	19.2	17.1	104.4	5	P	SE CORNER TEST PAD	
4	598.1	12"	"	"	131.4	112.3	19.1	17.0	104.1	5	P	NE CORNER SHELBY TEST PAD TUBE	
												IPD #2	
												ST-TP-1	
												IPD #4	
												ST-TP-2	

PROCT CODE	MAX DENSITY (pcf)	OPTM. MOISTURE (%)	MATERIAL TYPE AND SOURCE	PROCT CODE	MAX DENSITY (pcf)	OPTM. MOISTURE (%)	MATERIAL TYPE AND SOURCE
Zone 5	107.8	18.0	CLAY FROM WHITE BORROW PIT				

METHOD: NUCLEAR DENSITY/MOISTURE GAUGE (TROXLER)

REMARKS: 2 SHELBY TUBES PUSHED [illegible]

OPERATOR: Christopher Barton

REVIEWED BY: [signature]

URS
AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZATION

FIELD IN-PLACE DENSITY TEST REPORT IR# 11

SH. 2/2

PROJECT: Closure of Inactive Waste Sites
CLIENT: Dunlop Tire Corp.
CONTRACTOR: Site Contractor

REPORT NO. 2
DATE: June 15, 1994
JOB NO.: 35246.06

TEST NO.	ELEV.	DEPTH	DC	MC	WD	DD	M	%M	% COMP	PROCT. CODE	PASS FAIL	LOCATION AND REMARKS	RPT. No. RETEST No. / RETEST DATE
5	591.5	12"	~~238~~ 510	238	128.7	110.2	18.4	16.7	102.2	5	P		
6	591.6	12"	485	225	130.3	162.9	17.3	15.3	104.7	5	P		
7	591.1	12"	481	239	130.5	111.9	18.5	16.5	103.8	5	P		
8	591.5	12"	453	239	132.3	113.8	18.5	16.3	105.6	5	P		
9	591.6	12"	430	235	134.0	115.8	18.2	15.7	107.4	5	P		

PROCT CODE	MAX DENSITY (pcf)	OPTM. MOISTURE (%)	MATERIAL TYPE AND SOURCE
5	107.8	18.0	CLAY -> ONSITE BORROW PIT

PROCT CODE	MAX DENSITY (pcf)	OPTM. MOISTURE (%)	MATERIAL TYPE AND SOURCE

METHOD: NUCLEAR DENSITY/MOISTURE GAUGE (TROXLER)

REMARKS:

OPERATOR: Louis J. Barrios

REVIEWED BY:

URS
AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZATION

FIELD IN-PLACE DENSITY TEST REPORT IR #12

PROJECT: Closure of Inactive Waste Sites
CLIENT: Dunlop Tire Corp.
CONTRACTOR: SITE CONTRACTOR

REPORT NO. 3
DATE: JUNE 16, 1994
JOB NO.: 35246.06

TEST NO.	ELEV.	DEPTH	DC	MC	WD	DD	M	%M	% COMP	PROCT. CODE	Pass Fail	LOCATION AND REMARKS	RPT. No. / RETEST NO. / EFFT. DATE.
10	599.8	12"	462	222	131.3	113.8	17.4	15.3	105.6	5	P		
11	599.3	12"	461	217	131.4	114.4	17.0	14.9	106.1	5	P		
12	598.4	12"	425	221	133.9	116.6	17.3	14.9	108.1	5	P		
13	598.8	12"	435	197	133.3	118.0	15.3	12.9	109.4	5	P	SHELBY TUBE ST-SEA-2	
14	598.0	12"	486	238	129.6	110.8	18.8	17.0	102.8	5	P	SHELBY TUBE ST-SEA-1	
15	598.1	12"	429	249	133.5	113.7	19.7	17.4	105.5	5	P		
16	598.5	12"	446	214	132.4	115.7	16.7	14.5	107.3	5	P		
17	598.2	12"	471	254	130.5	110.4	20.2	18.3	102.4	5	P		

PROCT CODE	MAX DENSITY (pcf)	OPTM. MOISTURE (%)	MATERIAL TYPE AND SOURCE
5	107.8	18.0	CLAY → ONSITE BORROW PIT

PROCT CODE	MAX DENSITY (pcf)	OPTM. MOISTURE (%)	MATERIAL TYPE AND SOURCE

METHOD: NUCLEAR DENSITY/MOISTURE GAUGE (TROXLER)

REMARKS: TEST #13 → ST-SEA-2
TEST #14 → ST-SEA-1

OPERATOR: Louis Barrios

REVIEWED BY: [signature]

APPENDIX D
LOW PERMEABILITY SOIL IN-PLACE PERMEABILITY TEST REPORTS

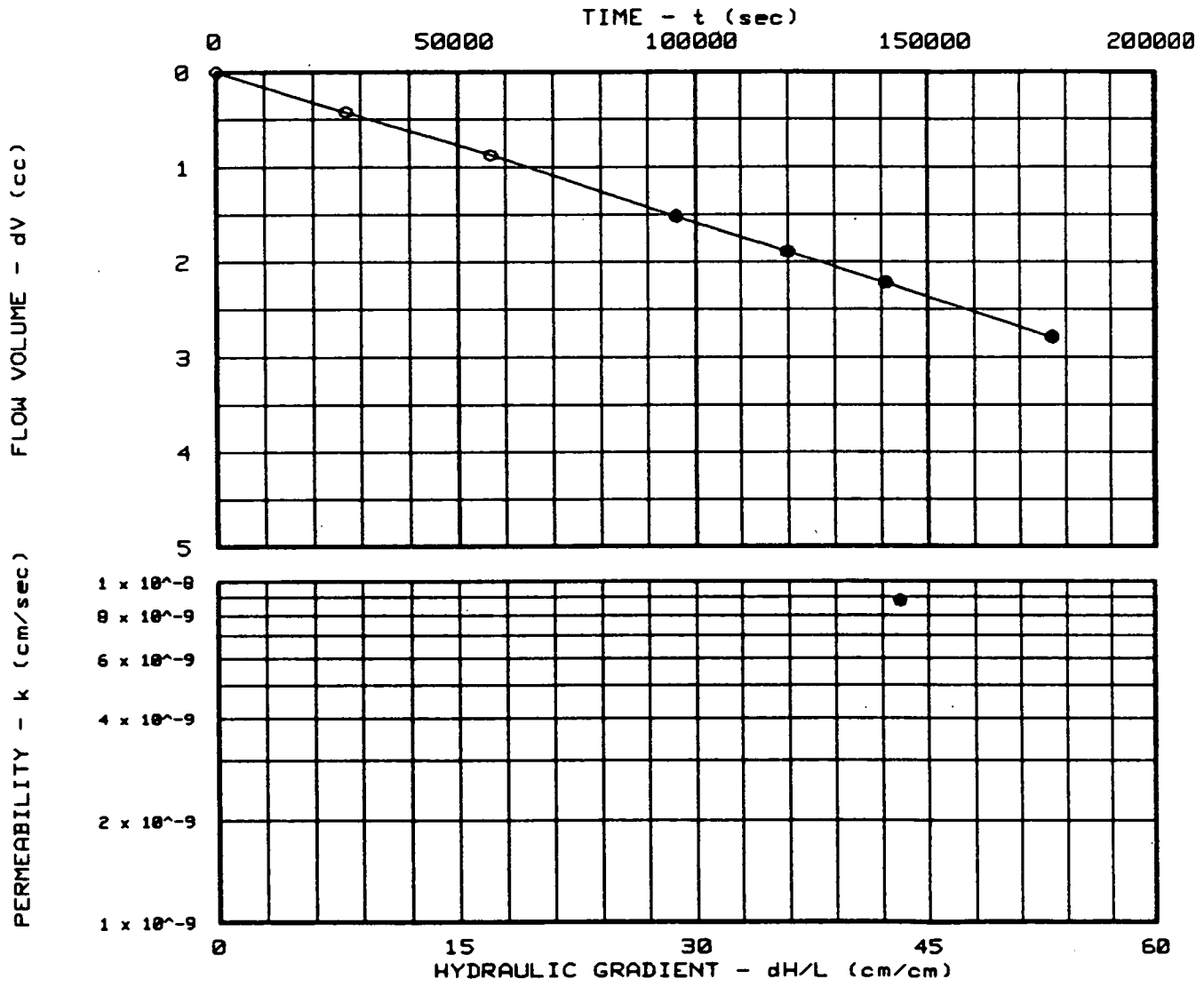
PERMEABILITY TEST REPORT

TEST DATA:
Specimen Height (cm): 8.89
Specimen Diameter (cm): 7.27
Dry Unit Weight (pcf): 108.5
Moisture Before Test (%): 19.9
Moisture After Test (%): 18.8
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.1
Back Pressure (psi): 79.6
Diff. Head (psi): 5.5
Flow Rate (cc/sec): 1.57 x 10^-5
Perm. (cm/sec): 8.77 x 10^-9

SAMPLE DATA: ST-TP-1
Sample Identification: TEST PAD
S W CORNER BOTTOM 6"
Visual Description: BROWN CLAY AND SILT, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: TONAWANDA, NEW YORK
Date: JUNE 1994

PERMEABILITY TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Project No.: BT-94-032
File No.: G002.111
Lab No.: 2017.002 BOT
Tested by: KJC
Checked by: JFC ✓
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G002.111
Project Location:	TONAWANDA, NEW YORK
Project No.:	BT-94-032
Sample Identification:	TEST PAD S W CORNER BOTTOM 6" ST-TP-1
Lab No.:	2017.002 BOT
Description:	BROWN CLAY AND SILT, trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JUNE 1994
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC
Checked by:	JFC
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.855 in	2.856 in		2.822 in	2.817 in	
Middle:	2.872 in	2.865 in		2.842 in	2.831 in	
Bottom:	2.856 in	2.869 in		2.838 in	2.851 in	
Average:	2.86 in	7.27 cm		2.83 in	7.20 cm	
Length:	1	2	3	1	2	3
	3.450 in	3.506 in	3.545 in	3.401 in	3.439 in	3.461 in
Average:	3.50 in	8.89 cm		3.43 in	8.72 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	998.91	992.20
Dry Wt. & Tare:	871.20	871.20
Tare Wt.:	229.28	229.28
Moisture Content:	19.9 %	18.8 %
Dry Unit Weight:	108.5 pcf	112.9 pcf
Porosity:	0.3682	0.3425
Saturation:	93.9 %	99.5 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-27 Panel No.: 3 Positions: 6&5

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	80.0 psi	0.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	20.0 °C	0.0 °C

PERMEABILITY TEST READINGS DATA

CASE D S	X R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	FLOW VOLUME-cc AVERAGE
D	X	6/10/94	7:48:00	0	85.1	80.2	0.05	24.80	0.00
	X	6/10/94	15:18:00	27,000	85.0	80.0	0.40	24.30	0.43
	X	6/10/94	23:38:00	57,000	85.0	80.0	0.75	23.75	0.88
		6/11/94	10:28:00	96,000	85.1	80.0	1.50	23.20	1.53
		6/11/94	17:08:00	120,000	85.1	80.0	1.85	22.80	1.90
		6/11/94	22:58:00	141,000	85.1	80.0	2.20	22.50	2.23
		6/12/94	8:58:00	177,000	85.2	80.0	2.80	21.95	2.80

T Pressure = 85.1 psi Differential Head = 5.5 psi, 383.6 cm H2O
Gradient = 4.315E 01 Flow rate = 1.573E-05 cc/sec R squared = 0.99995
Permeability, K20.0° = 8.774E-09 cm/sec, K20° = 8.774E-09 cm/sec

Huntingdon

LAB NO 2017.002 BOT

LABORATORY PERMEABILITY TEST

PROJ NO _____

PROJECT: Dunlop Landfill ST-TPO-1 TECHNICIAN: RH DATE: 6/9/94

BORING NO: _____ SAMPLE NO: Test Pad SW Corner Bottom CALCULATED: _____ DATE: _____

DEPTH: _____ ft to _____ ft CHECKED: _____ DATE: _____

SAMPLE DATA		MOISTURE CONTENT DETERMINATION	BEFORE TEST	AFTER TEST
LENGTH OF SAMPLE, L:	n x 2.54 = 8.89 cm	TARE NUMBER	—	505-A
DIAMETER OF SAMPLE, D:	n x 2.54 = 7.27 cm	WET WT OF SOIL & TARE g	769.63	992.2
AREA: $A = 0.7854 D^2$ =	in^2 x 6.45 = cm^2	DRY WT. OF SOIL & TARE g		871.2
VOLUME: V = L x A =	in^3 x 16.39 = cm^3	WEIGHT OF WATER g		
WET WT. OF SAMPLE, W:	g	TARE WEIGHT g		239.38
DRY WT OF SAMPLE, $W_s = W/(1+w)$ =	g	DRY WEIGHT OF SOIL g		
DRY UNIT WT., $\gamma d = (W_s/V) \times 62.4$ =	lbs/ft^3	MOISTURE CONTENT, w %		
SPECIFIC GRAVITY, G =				
VOLUME OF VOIDS, $V_v = V - W_s/G$ =	cm^3	CELL PRESSURE,		lbs/in^2
VOID RATIO, $e = (V_v \times G)/W_s$ =		TEST PRESSURE, H+Δh	85.13	lbs/in^2
WEIGHT OF WATER IN SAMP, $W_w = W_s \times w$	g	SATURATION PRESSURE, H:	80.00	lbs/in^2
DEGREE OF SATURATION, $S = \frac{w}{V_v} \times 1000$		DIFFERENTIAL HEAD, Δh = 5.13 lbs/in^2 x 70.3 = 360.29 $cm H_2O$		

PANEL NO. 3 | PANEL POSITION: 6 | 5 | CALIBR. FACTOR: — | — | CELL NO. FP-27

DATE	TIME	ELAPSED TIME t (sec)	GAUGE PRES. (psi) HEAD	GAUGE PRES. (psi) TAIL	BUCET READING (cm^3) INFLOW	BUCET READING (cm^3) OUTFLOW	FLOW VOLUME ΔV, (cm^3) INFLOW	FLOW VOLUME ΔV, (cm^3) OUTFLOW	FLOW VOLUME ΔV, (cm^3) AVER.
6/10	7:48	0	85.1	80.2	0.05	24.8	0	0	—
	15:18	27,000	85.0	80.0	0.40	24.30	0.35	0.50	0.43
	23:38	57,000	85.0	80.0	0.75	23.75	0.70	1.05	0.88
6/11	10:28	96,000	85.1	80.0	1.50	23.20	1.45	1.60	1.53
	17:08	120,000	85.1	80.0	1.85	22.80	1.80	2.00	1.90
	22:58	141,000	85.1	80.0	2.20	22.50	2.15	2.30	2.23
6/12	8:58	177,000	85.2	80.0	2.80	21.95	2.75	2.85	2.80

Δ Exclude

EVALUATION

GRADIENT: $i = \Delta h/L$ =

TEST CONSTANT: 43.15

$C = \frac{L}{\Delta h A}$ =

FLOW RATE: 1.57×10^{-5}

$\Delta V/t$ = _____ =

CORRELATION, r = 0.99997

PERMEABILITY:

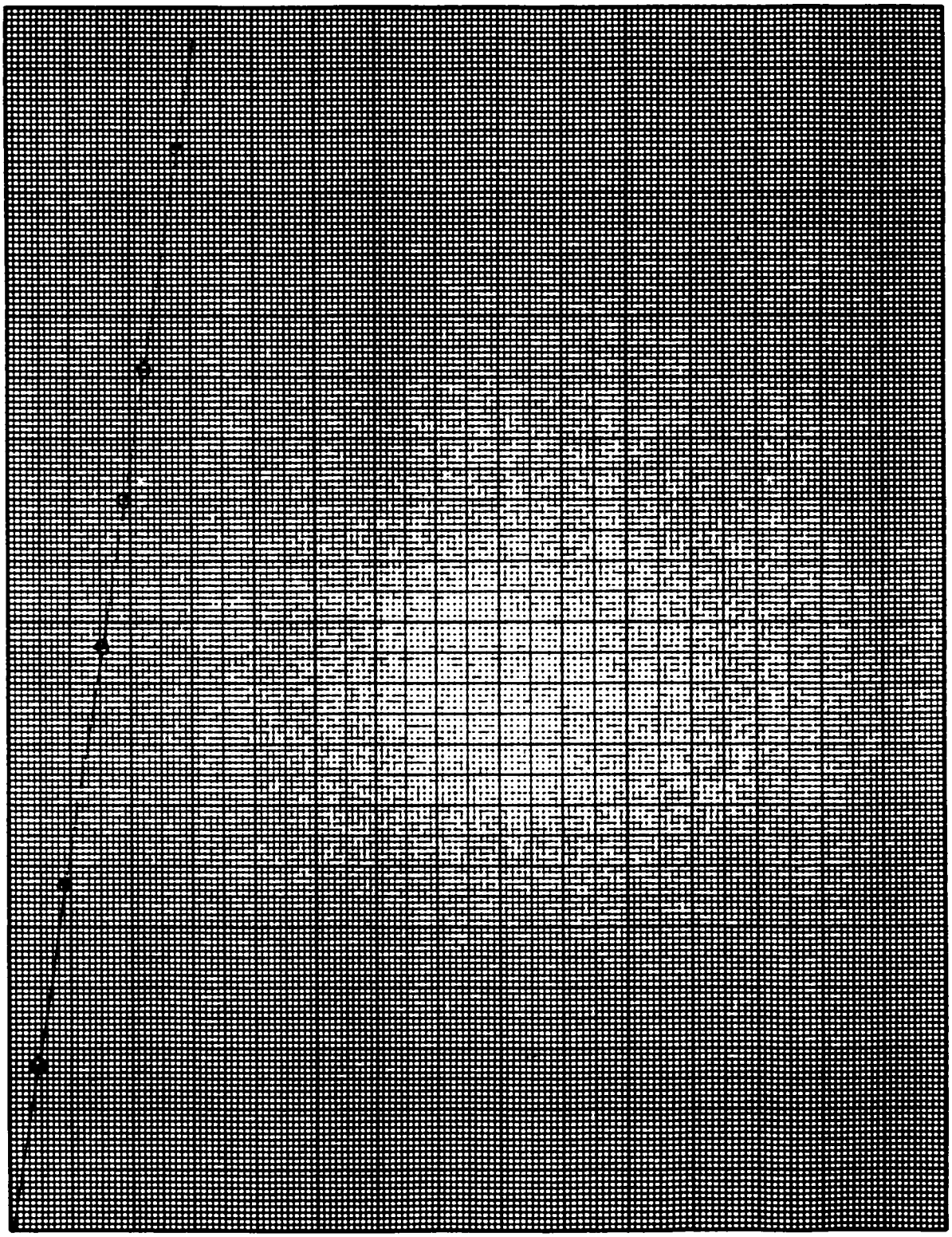
$K_T = \Delta V/t \times C$ = 8.78×10^{-9}

$K_{20} = K_T \times \mu_T/\mu_{20}$ =

REMARKS: 15.00 cm/s

Huntingdon
Consulting Engineers Environmental Scientists

Dunlop Landfill
Test Pad
SW corner Bottom
2017.002
ST-TP-1



PERMEABILITY TEST REPORT

TEST DATA:

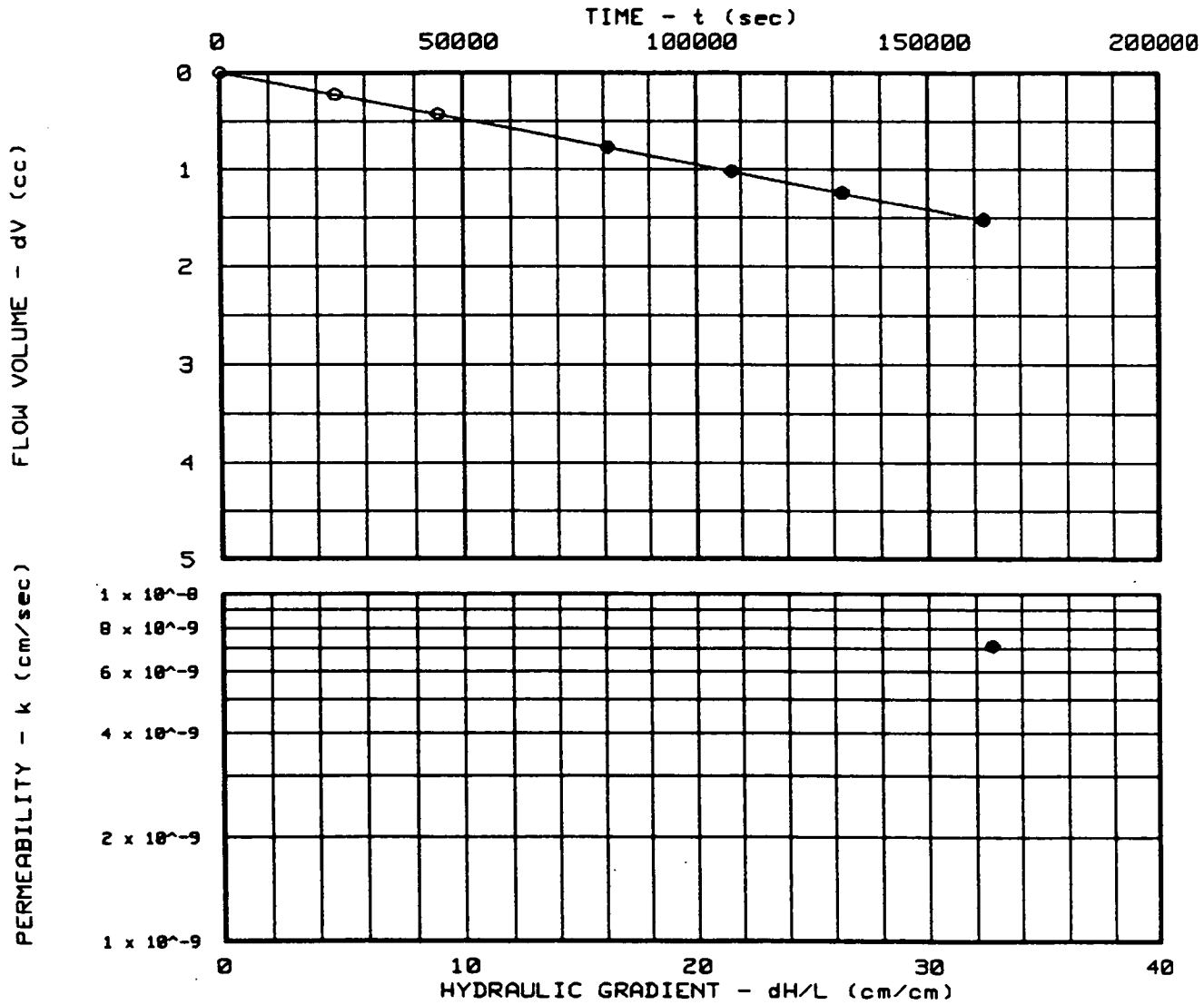
Specimen Height (cm): 11.48
Specimen Diameter (cm): 7.13
Dry Unit Weight (pcf): 113.5
Moisture Before Test (%): 19.1
Moisture After Test (%): 17.9
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.0
Back Pressure (psi): 79.7
Diff. Head (psi): 5.3
Flow Rate (cc/sec): 9.27 x 10^-6
Perm. (cm/sec): 7.10 x 10^-9

SAMPLE DATA: ST-TYP-1

Sample Identification: TEST PAD
S W CORNER TOP 12"
Visual Description: BROWN CLAY AND SILT, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: TONAWANDA, NEW YORK
Date: JUNE 1994

PERMEABILITY TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Project No.: BT-94-032
File No.: G002.111
Lab No.: 2017.002 TOP
Tested by: KJC
Checked by: JFC ✓
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G002.111
Project Location:	TONAWANDA, NEW YORK
Project No.:	BT-94-032
Sample Identification:	TEST PAD
	S W CORNER TOP 12" ST-TP-1
Lab No.:	2017.002 TOP
Description:	BROWN CLAY AND SILT,
	trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JUNE 1994
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC
Checked by:	JFC
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.810 in	2.789 in		2.793 in	2.805 in	
Middle:	2.791 in	2.817 in		2.799 in	2.764 in	
Bottom:	2.826 in	2.819 in		2.817 in	2.773 in	
Average:	2.81 in	7.13 cm		2.79 in	7.08 cm	
Length:	1	2	3	1	2	3
	4.511 in	4.527 in	4.516 in	4.496 in	4.430 in	4.483 in
Average:	4.52 in	11.48 cm		4.47 in	11.35 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	1217.27	1207.90
Dry Wt. & Tare:	1058.30	1058.30
Tare Wt.:	224.65	224.65
Moisture Content:	19.1 %	17.9 %
Dry Unit Weight:	113.5 pcf	116.3 pcf
Porosity:	0.3386	0.3227
Saturation:	102.4 %	103.6 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-26 Panel No.: 9 Positions: 2&1

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	80.0 psi	0.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	20.0 °C	0.0 °C

PERMEABILITY TEST READINGS DATA

CASE D S	X R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	FLOW VOLUME-cc AVERAGE
D	X	6/11/94	10:29:00	0	85.1	80.0	0.00	24.65	0.00
	X	6/11/94	17:09:00	24,000	85.1	80.0	0.20	24.40	0.23
	X	6/11/94	22:59:00	45,000	85.1	80.0	0.40	24.20	0.43
		6/12/94	8:59:00	81,000	85.0	80.0	0.70	23.80	0.78
		6/12/94	16:29:00	108,000	85.0	80.0	0.90	23.50	1.03
		6/12/94	23:09:00	132,000	84.9	80.0	1.10	23.25	1.25
		6/13/94	7:29:00	162,000	85.0	80.0	1.40	23.00	1.53

T t Pressure = 85.0 psi Differential Head = 5.3 psi, 375.2 cm H2O
Gradient = 3.269E 01 Flow rate = 9.268E-06 cc/sec R squared = 0.99998
Permeability, K20.0° = 7.098E-09 cm/sec, K20° = 7.098E-09 cm/sec

Huntingdon

LAB NO 2017.002 TOP

LABORATORY PERMEABILITY TEST

PROJ NO _____

PROJECT: Dunlop Landfill ST-750-1 TECHNICIAN: RH DATE: 6/9/94
BORING NO.: _____ SAMPLE NO: Test Pad SW corner Top CALCULATED: _____ DATE: _____
DEPTH: _____ ft to _____ ft CHECKED: _____ DATE: _____

SAMPLE DATA		MOISTURE CONTENT DETERMINATION		BEFORE TEST	AFTER TEST
LENGTH OF SAMPLE, L:	n x 2.54 = 11.48 cm	TARE NUMBER		—	CF-9
DIAMETER OF SAMPLE, D:	n x 2.54 = 7.13 cm	WET WT. OF SOIL & TARE	g	992.62	1207.9
AREA: A = 0.7854 D² =	in² x 6.45 = cm²	DRY WT. OF SOIL & TARE	g		1052.3
VOLUME: V = L x A =	in³ x 16.39 = cm³	WEIGHT OF WATER	g		
WET WT. OF SAMPLE, W:	g	TARE WEIGHT	g		224.65
DRY WT. OF SAMPLE, $W_s = W/(1+w)$ =	g	DRY WEIGHT OF SOIL	g		
DRY UNIT WT., $\gamma_d = (W_s/V) \times 62.4$ =	lbs/ft³	MOISTURE CONTENT, w	%		
SPECIFIC GRAVITY, G =					
VOLUME OF VOIDS, $V_v = V - W_s/G$ =	cm³	CELL PRESSURE,			lbs/in²
VOID RATIO, $e = (V_v \times G)/W_s$ =		TEST PRESSURE, H+Δh		84.98	lbs/in²
T. OF WATER IN SAMP, $W_w = W_s \times W$	g	SATURATION PRESSURE, H:		80.00	lbs/in²
DEGREE OF SATURATION, $S = {}^{W} \times {}^{V_v}/_{1000}$		DIFFERENTIAL HEAD, Δh = 4.98 lbs/in² x 70.3 = 349.74 cm H_2O			

PANEL NO. 9 | PANEL POSITION: 2 | 1 | CALIBR. FACTOR: — | — | CELL NO. FP-26

DATE	TIME	ELAPSED TIME t (sec)	GAUGE PRES. (psi) HEAD	GAUGE PRES. (psi) TAIL	BURET READING (cm³) INFLOW	BURET READING (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) INFLOW	FLOW VOLUME ΔV, (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) AVER.
~~6/10~~	~~7:49~~	~~0~~	~~85.0~~	~~80.2~~	~~0.05~~	~~24.4~~	~~0~~	~~0~~	—
6/11	10:29	0	85.1	80.0	0.00	24.65	0	0	—
	17:09	24,000	85.1	80.0	0.20	24.40	0.20	0.25	0.23
	22:59	45,000	85.1	80.0	0.40	24.20	0.40	0.45	0.43
6/12	8:59	81,000	85.0	80.0	0.70	23.80	0.70	0.85	0.78
	16:29	108,000	85.0	80.0	0.9	23.50	0.9	1.15	1.03
	23:09	132,000	84.9	80.0	1.10	23.25	1.10	1.40	1.25
6/13	7:29	162,000	85.0	80.0	1.40	23.0	1.4	1.65	1.53

EVALUATION ▲ Exclude

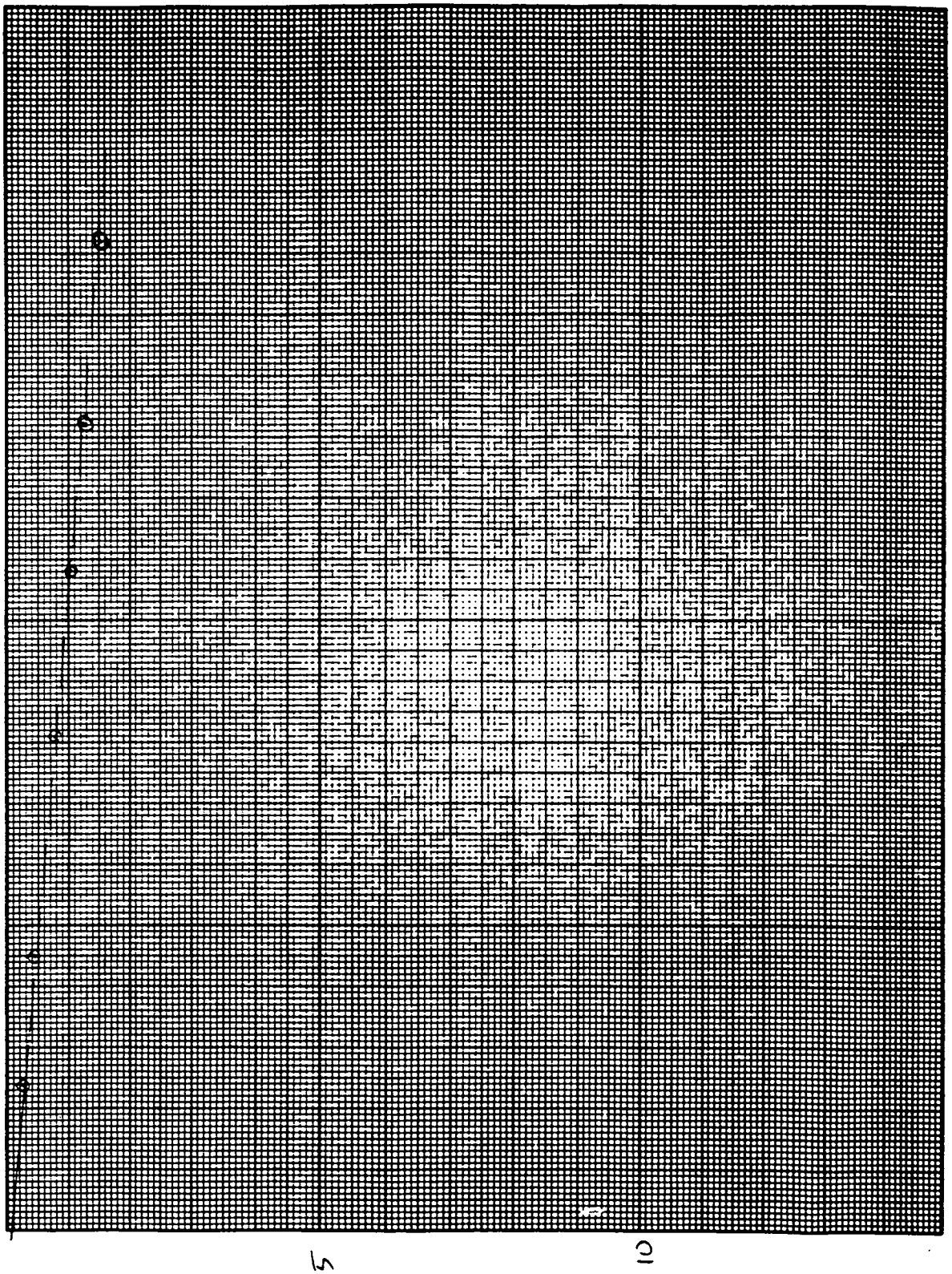
GRADIENT: $i = \Delta h/L$ =
TEST CONSTANT: 32.69
$C = \frac{L}{\Delta h A}$ =
FLOW RATE: 9.27×10^{-6}
$\Delta V/t$ = _____ =
CORRELATION, r = 1.999:9
PERMEABILITY: 7.10×10^{-9}
$K_T = \Delta V/t \times C$ =

$K_{20} = K_T \times \mu_T/\mu_{20}$ =

REMARKS: 1:20 0/20 * No Forward Flow Reset 1.

Huntingdon
Consulting Engineers & Environmental Scientists

Test Pad
SW corner Top
2017.002
ST-TP-1



LABORATORY WORK ORDER

6002.111

PROJECT: DUNLOP LANDFILL JOB NO.: BT-94-032

CLIENT: _____ SHEET: 1 OF 1

ISSUED BY: KJC DATE: 6-9-94 SAMPLED BY: _____ DATE: _____

SAMPLE TYPE & SOURCE:	TEST PAD ST-TP-2 NE CORNER	TEST PAD ST-TP-1 SW CORNER				
LABORATORY NO.	2017.001	2017.002				
Atterberg Limits						
Natural Water Content						
Hydrometer Analysis						
Sieve Analysis Sizes Required:						
Proctor Test: ASTM D 698 (Standard) ASTM D1557 (Modified)						
Permeability Test: X Undisturbed ___ Remolded ____ %	1 BOTTOM 1 TOP	1 BOTTOM 1 TOP				
Unconfined Compression						
Specific Gravity						
Sample Classifications						

Specifications: ___ Job (list) ___ NYSDOT ___ ASTM

REMARKS:

URS JOB NO
35246.06

356-5636 · 866-5072 SW SYR CAY 856-2545 WORCESTER

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 8.21
Specimen Diameter (cm): 7.18
Dry Unit Weight (pcf): 113.7
Moisture Before Test (%): 18.4
Moisture After Test (%): 17.8

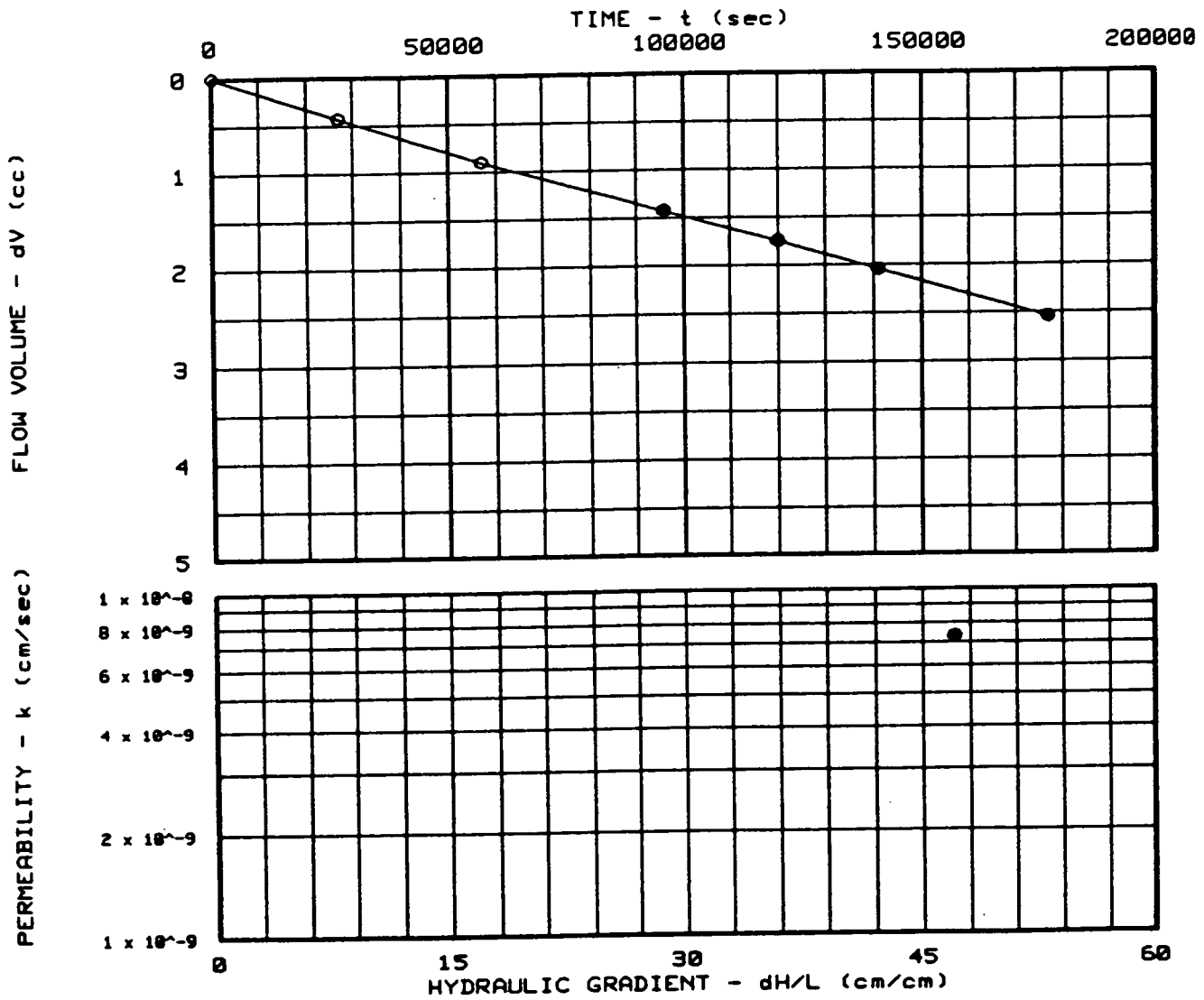
Run Number:	1 ●	2 ▲
Cell Pressure (psi):	95.0	
Test Pressure (psi):	85.2	
Back Pressure (psi):	79.7	
Diff. Head (psi):	5.5	
Flow Rate (cc/sec):	1.39 x 10^-5	
Perm. (cm/sec):	7.32 x 10^-9	

SAMPLE DATA: ST-TP-2

Sample Identification: TEST PAD
N E CORNER BOTTOM 6"
Visual Description: BROWN CLAY AND SILT, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: TONAWANDA, NEW YORK
Date: JUNE 1994

PERMEABILITY TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Project No.: BT-94-032
File No.: G002.111
Lab No.: 2017.001 BOT
Tested by: KJC
Checked by: JFC ✓
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G002.111
Project Location:	TONAWANDA, NEW YORK
Project No.:	BT-94-032
Sample Identification:	TEST PAD N E CORNER BOTTOM 6" ST-TP-2
Lab No.:	2017.001 BOT
Description:	BROWN CLAY AND SILT, trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JUNE 1994
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC
Checked by:	JFC
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.826 in	2.805 in		2.802 in	2.784 in	
Middle:	2.843 in	2.797 in		2.827 in	2.794 in	
Bottom:	2.856 in	2.839 in		2.835 in	2.833 in	
Average:	2.83 in	7.18 cm		2.81 in	7.14 cm	
Length:	1	2	3	1	2	3
	3.227 in	3.228 in	3.244 in	3.176 in	3.194 in	3.219 in
Average:	3.23 in	8.21 cm		3.20 in	8.12 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	941.20	937.60
Dry Wt. & Tare:	829.70	829.70
Tare Wt.:	224.79	224.79
Moisture Content:	18.4 %	17.8 %
Dry Unit Weight:	113.7 pcf	116.1 pcf
Porosity:	0.3379	0.3238
Saturation:	99.3 %	102.4 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-29 Panel No.: 3 Positions: 2&1

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	80.0 psi	0.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	20.0 °C	0.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	FLOW VOLUME-cc AVERAGE
D X	6/10/94	7:46:00	0	85.2	80.1	0.00	24.90	0.00
X	6/10/94	15:16:00	27,000	85.1	80.0	0.45	24.50	0.43
X	6/10/94	23:36:00	57,000	85.1	80.0	0.95	24.05	0.90
	6/11/94	10:26:00	96,000	85.2	80.1	1.50	23.55	1.43
	6/11/94	17:06:00	120,000	85.2	80.0	1.80	23.20	1.75
	6/11/94	22:56:00	141,000	85.2	80.0	2.10	22.90	2.05
	6/12/94	8:56:00	177,000	85.1	80.0	2.60	22.40	2.55

Test Pressure = 85.2 psi Differential Head = 5.5 psi, 386.0 cm H2O
Gradient = 4.700E 01 Flow rate = 1.392E-05 cc/sec R squared = 0.99993
ermeability, K20.0° = 7.320E-09 cm/sec, K20° = 7.320E-09 cm/sec

Huntingdon

LAB NO 207.001 BOT

LABORATORY PERMEABILITY TEST

PROJ. NO _____

PROJECT: Dunlop Land S.11 TECHNICIAN: RH DATE: 6/9/94

BORING NO.: _____ SAMPLE NO: Test Pad NE Corner Bottom CALCULATED: _____ DATE: _____

DEPTH: _____ ft to _____ ft CHECKED: _____ DATE: _____

SAMPLE DATA		MOISTURE CONTENT DETERMINATION	BEFORE TEST	AFTER TEST
LENGTH OF SAMPLE, L:	n x 2.54 = 8.21 cm	TARE NUMBER	—	23
DIAMETER OF SAMPLE, D:	n x 2.54 = 7.18 cm	WET WT. OF SOIL & TARE g	716.41	[illegible]
AREA: $A = 0.7854 D^2$ =	in^2 x 6.45 = cm^2	DRY WT. OF SOIL & TARE g		829.7
VOLUME: V = L x A =	in^3 x 16.39 = cm^3	WEIGHT OF WATER g		
WET WT. OF SAMPLE, W:	g	TARE WEIGHT g		22[illegible].3
DRY WT. OF SAMPLE, $W_s = W/(1+w)$ =	g	DRY WEIGHT OF SOIL g		
DRY UNIT WT., $\gamma d = (W_s/V) \times 62.4$ =	lbs/ft^3	MOISTURE CONTENT, w %		
SPECIFIC GRAVITY, G =				
VOLUME OF VOIDS, $V_v = V - W_s/G$ =	cm^3	CELL PRESSURE,		lbs/in^2
VOID RATIO, $e = (V_v \times G)/W_s$ =		TEST PRESSURE, H+Δh	85.18	lbs/in^2
WT. OF WATER IN SAMP, $W_w = W_s \times w$	g	SATURATION PRESSURE, H:	80.03	lbs/in^2
DEGREE OF SATURATION, $S = {}^{W}\!/_{V_v \times 1000}$		DIFFERENTIAL HEAD, Δh = 5.15 lbs/in^2 x 70.3 = 362.05 cm H_2O		

PANEL NO. 3

PANEL POSITION		CALIBR. FACTOR	
2	1	—	—

CELL NO. FP-29

DATE	TIME	ELAPSED TIME t (sec)	GAUGE PRES. (psi) HEAD	GAUGE PRES. (psi) TAIL	BURET READING (cm^3) INFLOW	BURET READING (cm^3) OUTFLOW	FLOW VOLUME ΔV, (cm^3) INFLOW	FLOW VOLUME ΔV, (cm^3) OUTFLOW	FLOW VOLUME ΔV, (cm^3) AVER.
6/10	7:46	0	85.2	80.1	0.0	24.9	0	0	—
	15:16	27,000	85.1	80.0	0.45	24.5	0.45	0.40	0.43
	23:36	57,000	85.1	80.0	0.95	24.05	0.95	0.85	0.90
6/11	10:26	96,000	85.2	80.1	1.50	23.55	1.50	1.35	1.43
	17:06	120,000	85.2	80.0	1.80	23.20	1.80	1.70	1.75
	22:56	141,000	85.2	80.0	2.10	22.90	2.10	2.00	2.05
6/12	8:56	177,000	85.1	80.0	2.60	22.40	2.60	2.50	2.55

EVALUATION

Exclude

GRADIENT: $i = \Delta h/L$ =

TEST CONSTANT: 47.00

$C = \frac{L}{\Delta h \, A}$ =

FLOW RATE: 1.39×10^{-5}

$\Delta V/I$ = _____ =

CORRELATION, r = 0.99996

PERMEABILITY:

$K_T = \Delta V/I \times C$ = 7.23×10^{-5}

$K_{20} = K_T \times \gamma_T/\gamma_{20}$ =

REMARKS: 16.00 0/20

Dunlop Land 3.11
Test Pad NE corner
Bottom
2017.001

Huntingdon
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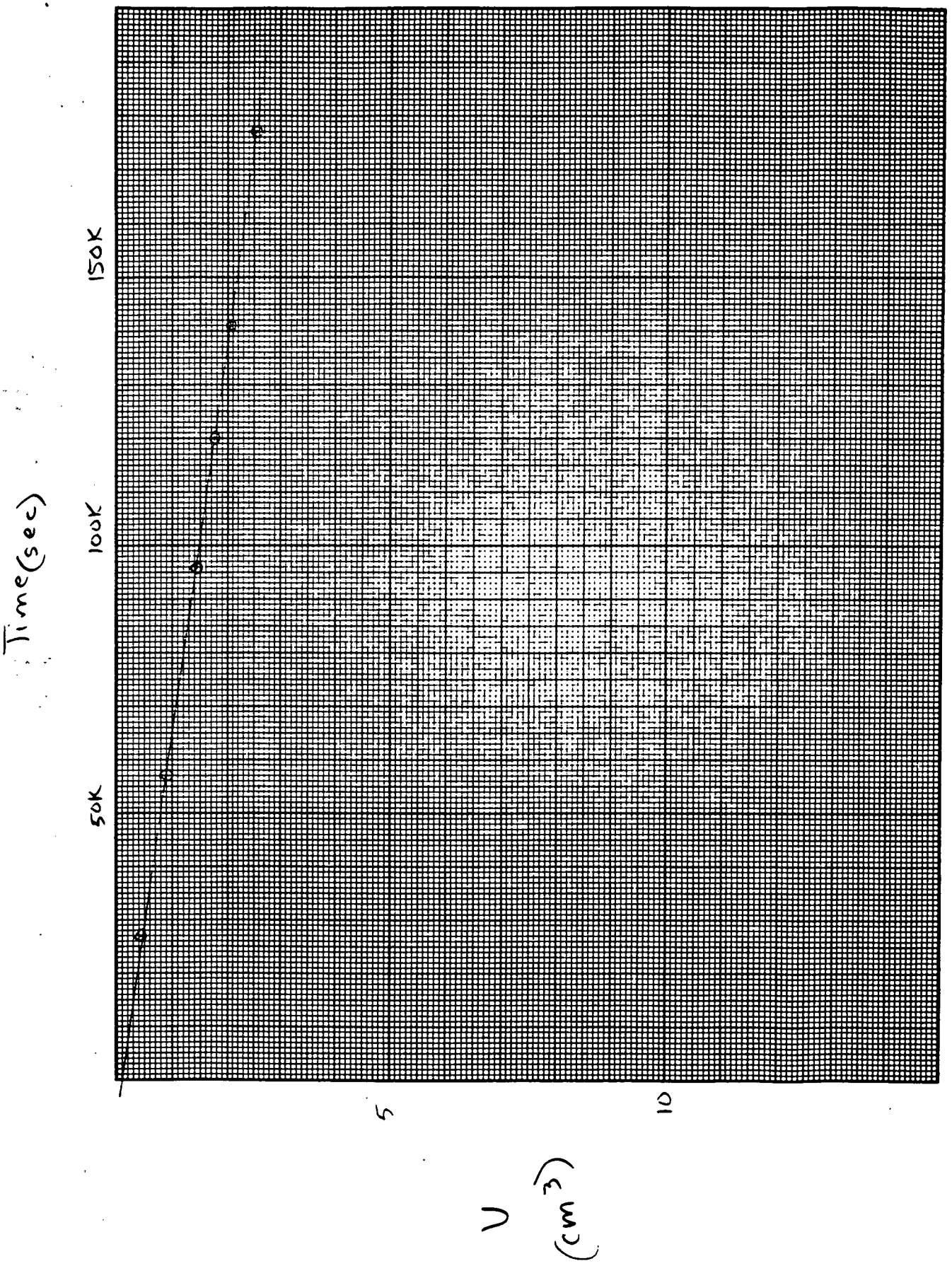


PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 9.51
Specimen Diameter (cm): 7.23
Dry Unit Weight (pcf): 111.9
Moisture Before Test (%): 19.6
Moisture After Test (%): 18.5

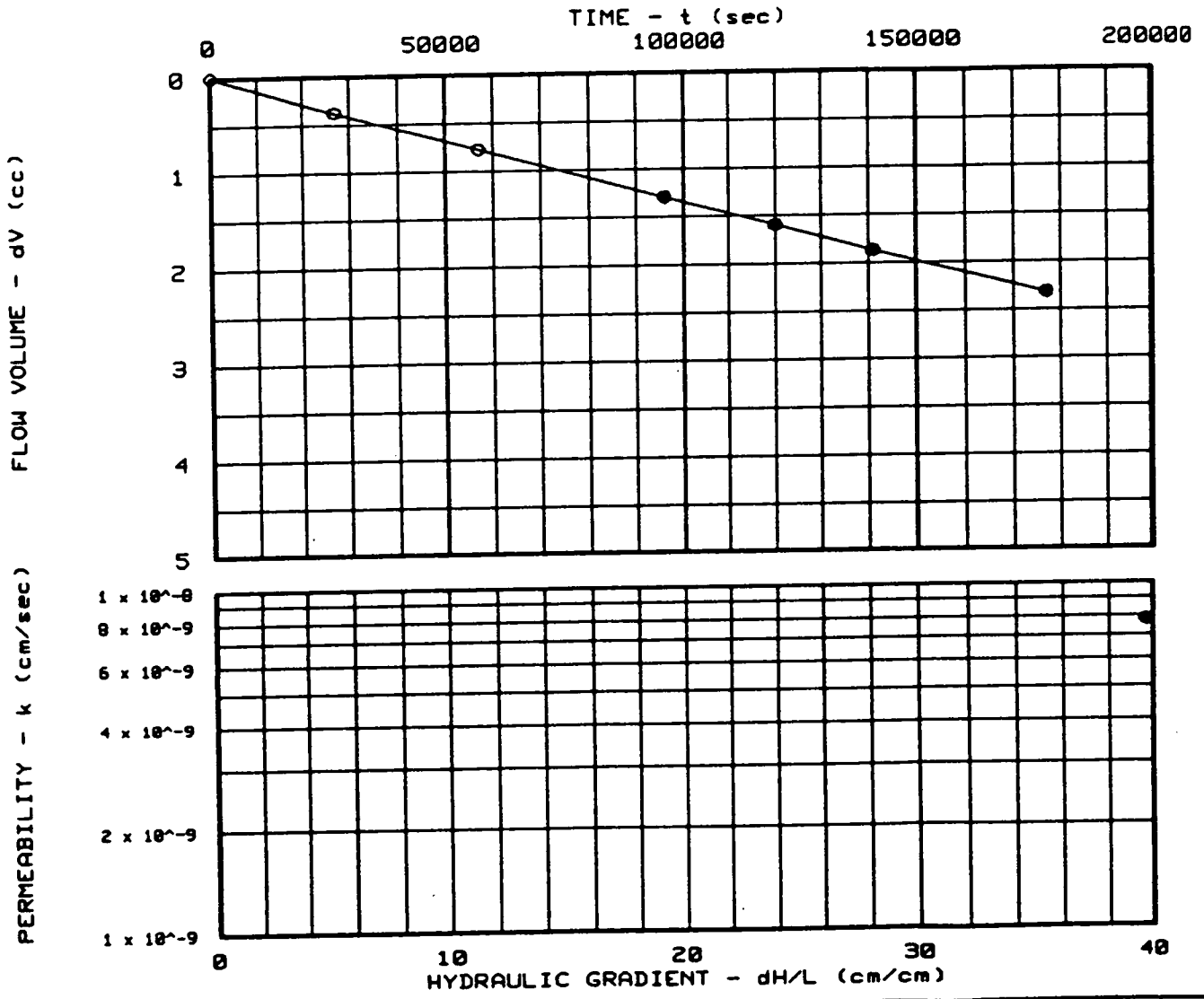
Run Number:	1 ●	2 ▲
Cell Pressure (psi):	95.0	
Test Pressure (psi):	85.1	
Back Pressure (psi):	79.7	
Diff. Head (psi):	5.4	
Flow Rate (cc/sec):	1.27 x 10^-5	
Perm. (cm/sec):	7.78 x 10^-9	

SAMPLE DATA:

Sample Identification: TEST PAD
N E CORNER TOP 12" ST-TP-2
Visual Description: BROWN CLAY AND SILT, trace gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: TONAWANDA, NEW YORK
Date: JUNE 1994

PERMEABILITY TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Project No.: BT-94-032
File No.: G002.111
Lab No.: 2017.001 TOP
Tested by: KJC
Checked by: JFC
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G002.111
Project Location:	TONAWANDA, NEW YORK
Project No.:	BT-94-032
Sample Identification:	TEST PAD N E CORNER TOP 12" ST-TP-2
Lab No.:	2017.001 TOP
Description:	BROWN CLAY AND SILT, trace gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JUNE 1994
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC
Checked by:	JFC
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.848 in	2.832 in		2.814 in	2.828 in	
Middle:	2.844 in	2.849 in		2.837 in	2.826 in	
Bottom:	2.856 in	2.859 in		2.829 in	2.850 in	
Average:	2.85 in	7.23 cm		2.83 in	7.19 cm	
Length:	1	2	3	1	2	3
	3.750 in	3.747 in	3.741 in	3.707 in	3.723 in	3.736 in
Average:	3.75 in	9.51 cm		3.72 in	9.45 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	1075.61	1067.80
Dry Wt. & Tare:	938.40	938.40
Tare Wt.:	237.72	237.72
Moisture Content:	19.6 %	18.5 %
Dry Unit Weight:	111.9 pcf	113.9 pcf
Porosity:	0.3483	0.3363
Saturation:	100.8 %	100.2 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP-19 Panel No.: 3 Positions: 4&3

Run Number:	1	2
Cell Pressure:	95.0 psi	0.0 psi
Saturation Pressure:	80.0 psi	0.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	20.0 °C	0.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	FLOW VOLUME-cc AVERAGE
D X	6/10/94	7:47:00	0	85.2	80.3	0.10	24.80	0.00
X	6/10/94	15:17:00	27,000	85.0	80.0	0.30	24.25	0.38
X	6/10/94	23:37:00	57,000	85.1	80.1	0.50	23.65	0.78
	6/11/94	10:27:00	96,000	85.1	80.0	1.10	23.20	1.30
	6/11/94	17:07:00	120,000	85.1	80.1	1.40	22.90	1.60
	6/11/94	22:57:00	141,000	85.1	80.1	1.70	22.65	1.88
	6/12/94	8:57:00	177,000	85.1	80.1	2.15	22.20	2.33

Test Pressure = 85.1 psi Differential Head = 5.4 psi, 377.3 cm H2O
Gradient = 3.966E 01 Flow rate = 1.268E-05 cc/sec R squared = 0.99993
ermeability, K20.0° = 7.782E-09 cm/sec, K20° = 7.782E-09 cm/sec

Huntingdon

LAB NO. 2017.001 TOP

LABORATORY PERMEABILITY TEST

PROJ. NO.

PROJECT: Dunlop Landfill TECHNICIAN: RH DATE: 6/9/94

BORING NO.: SAMPLE NO: Test Pad NE Corner Top CALCULATED: DATE:

DEPTH: ft to ft CHECKED: DATE:

SAMPLE DATA		MOISTURE CONTENT DETERMINATION	BEFORE TEST	AFTER TEST
LENGTH OF SAMPLE, L:	n x 2.54 = 9.51 cm	TARE NUMBER	—	
DIAMETER OF SAMPLE, D:	n x 2.54 = 7.23 cm	WET WT. OF SOIL & TARE g	837.89	
AREA: A = 0.7854 D² =	in² x 6.45 = cm²	DRY WT. OF SOIL & TARE g		738.4
VOLUME: V = L x A =	in³ x 16.39 = cm³	WEIGHT OF WATER g		
WET WT. OF SAMPLE, W:	g	TARE WEIGHT g		
DRY WT. OF SAMPLE, $W_o = W/(1+w)$ =	g	DRY WEIGHT OF SOIL g		
DRY UNIT WT., $\gamma_d = (W_o/V) \times 62.4$ =	lbs/ft³	MOISTURE CONTENT, w %		
SPECIFIC GRAVITY, G =				
VOLUME OF VOIDS, $V_v = V - W_o/G$ =	cm³	CELL PRESSURE,		lbs/in²
VOID RATIO, $e = (V_v \times G)/W_o$ =		TEST PRESSURE, H+Δh	85.10	lbs/in²
WT. OF WATER IN SAMP, $W_w = W_o \times w$	g	SATURATION PRESSURE, H:	80.08	lbs/in²
DEGREE OF SATURATION, $S = {}^{W_w}/_{V_v} \times 1000$		DIFFERENTIAL HEAD, Δh = 5.03 lbs/in² x 70.3 = 353.26 cm H_2O		

PANEL NO. 3 | PANEL POSITION: 4, 3 | CALIBR. FACTOR: —, — | CELL NO. FP-19

DATE	TIME	ELAPSED TIME t (sec)	GAUGE PRES. (psi) HEAD	GAUGE PRES. (psi) TAIL	BUCET READING (cm³) INFLOW	BUCET READING (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) INFLOW	FLOW VOLUME ΔV, (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) AVER.
6/10	7:47	0	85.2	80.3	0.1	24.8	0	0	—
	15:17	27,000	85.0	80.0	0.30	24.25	0.20	0.55	0.38
	23:37	57,000	85.1	80.1	0.50	23.65	0.40	1.15	0.78
6/11	10:27	96,000	85.1	80.0	1.10	23.20	1.00	1.60	1.30
	17:07	120,000	85.1	80.1	1.40	22.90	1.30	1.90	1.60
	22:57	141,000	85.1	80.1	1.70	22.65	1.60	2.15	1.88
6/12	8:57	177,000	85.1	80.1	2.15	22.20	2.05	2.60	2.33

EVALUATION Exclude

GRADIENT: $i = \Delta h/L$ =

TEST CONSTANT: 39.65

$C = \frac{L}{\Delta h\, A}$ =

FLOW RATE: 1.27×10^{-5}

$\Delta V/t$ = ——— =

CORRELATION, r = 0.99196

PERMEABILITY: 7.78×10^{-9}

$K_T = \Delta V/t \times C$ =

$K_{20} = K_T \times \mu_T/\mu_{20}$ =

REMARKS: 16.00 0/2

Huntingdon
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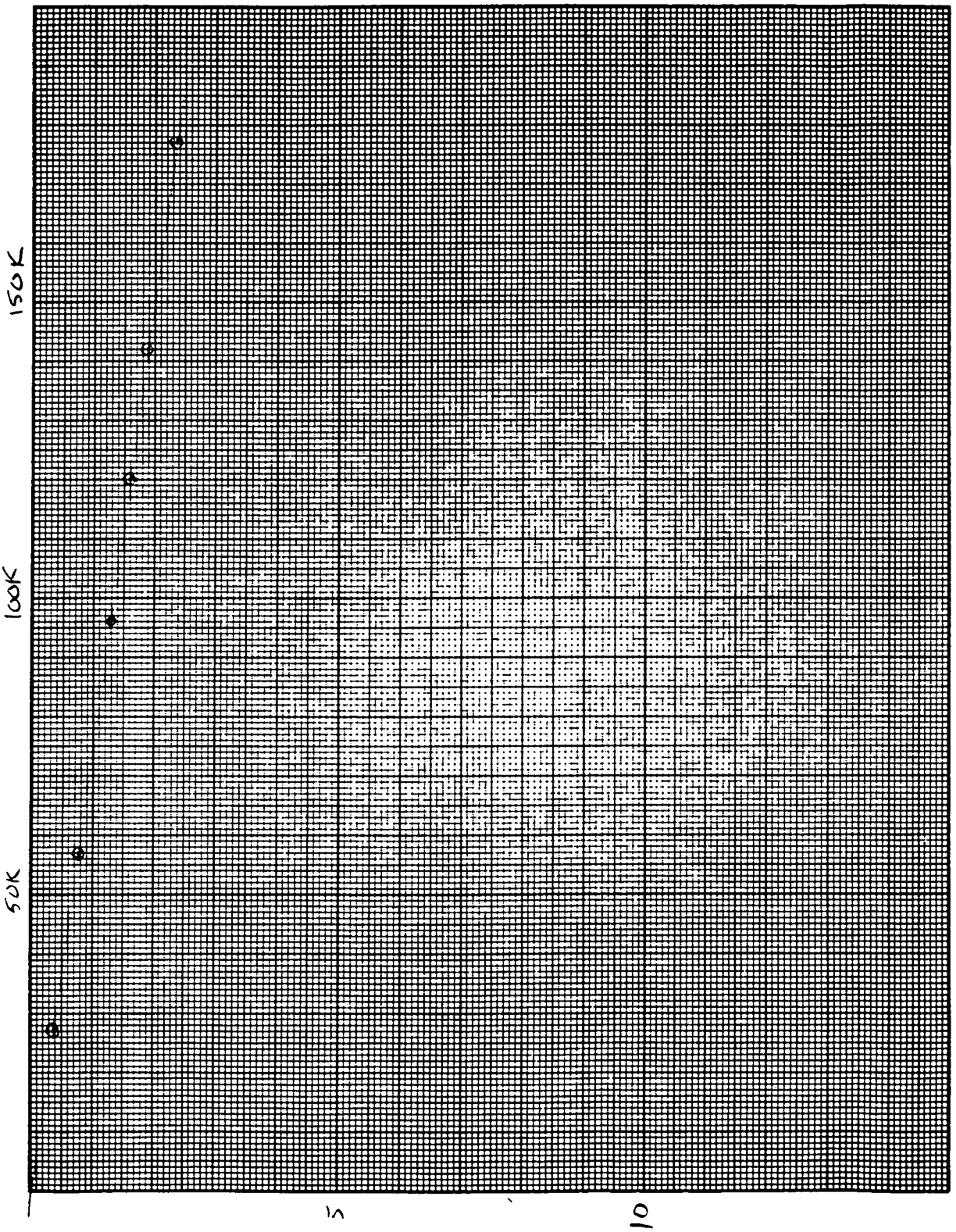
Dunlop Lands: 11
Test Pad
NE Corner
Top
2017.001



V (cm³)

PERMEABILITY TEST REPORT

TEST DATA:

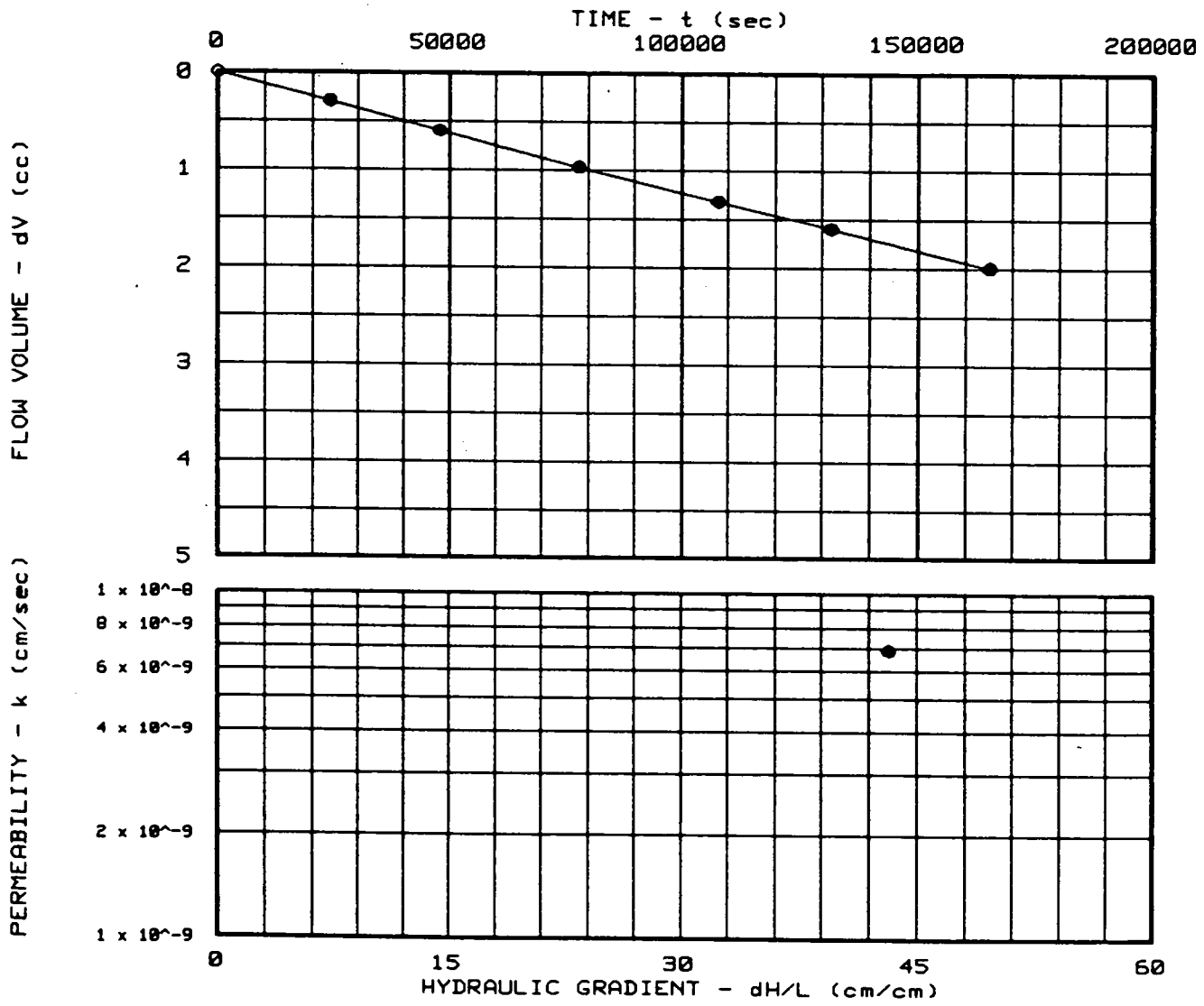
Specimen Height (cm): 8.84
Specimen Diameter (cm): 7.18
Dry Unit Weight (pcf): 112.1
Moisture Before Test (%): 17.0
Moisture After Test (%): 17.9
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.2
Back Pressure (psi): 79.8
Diff. Head (psi): 5.4
Flow Rate (cc/sec): 1.20 x 10^-5
Perm. (cm/sec): 6.07 x 10^-9

SAMPLE DATA:

Sample Identification: ST-SEA-1 BOTTOM 6"
Visual Description: BROWN CLAY, Little Gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: TONAWANDA, NEW YORK
Date: JUNE 1994

PERMEABILITY TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Project No.: BT-94-032
File No.: G002.111
Lab No.: 2023.001
Tested by: KJC
Checked by: JFC ✓
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G002.111
Project Location:	TONAWANDA, NEW YORK
Project No.:	BT-94-032
Sample Identification:	ST-SEA-1 BOTTOM 6"
Lab No.:	2023.001
Description:	BROWN CLAY, Little Gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JUNE 1994
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC
Checked by:	JFC
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.869 in	2.812 in		2.813 in	2.766 in	
Middle:	2.831 in	2.796 in		2.773 in	2.808 in	
Bottom:	2.840 in	2.828 in		2.837 in	2.822 in	
Average:	2.83 in	7.18 cm		2.80 in	7.11 cm	
Length:	1	2	3	1	2	3
	3.482 in	3.504 in	3.460 in	3.465 in	3.441 in	3.484 in
Average:	3.48 in	8.84 cm		3.46 in	8.80 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	971.31	977.10
Dry Wt. & Tare:	861.80	861.80
Tare Wt.:	219.41	219.41
Moisture Content:	17.0 %	17.9 %
Dry Unit Weight:	112.1 pcf	114.8 pcf
Porosity:	0.3470	0.3316
Saturation:	88.2 %	99.5 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP - 29 Panel No.: 3 Positions: 2 & 1

Run Number:	1	2
Cell Pressure:	95.0 psi	95.0 psi
Saturation Pressure:	80.0 psi	80.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	FLOW VOLUME-cc AVERAGE
D X	6/19/94	9:53:00	0	85.1	80.0	0.00	24.20	0.00
	6/19/94	16:33:00	24,000	85.1	80.0	0.30	23.90	0.30
	6/19/94	23:13:00	48,000	85.1	80.0	0.60	23.60	0.60
	6/20/94	7:33:00	78,000	85.3	80.2	0.95	23.20	0.98
	6/20/94	15:53:00	108,000	85.1	80.1	1.30	22.85	1.33
	6/20/94	22:33:00	132,000	85.2	80.1	1.60	22.60	1.60
	6/21/94	7:43:00	165,000	85.2	80.1	2.00	22.20	2.00

Pressure = 85.2 psi Differential Head = 5.4 psi, 382.3 cm H2O
Gradient = 4.323E 01 Flow rate = 1.201E-05 cc/sec R squared = 0.99977
Permeability, K20.0° = 6.866E-09 cm/sec, K20° = 6.866E-09 cm/sec

Huntingdon

LAB NO 2023.001

LABORATORY PERMEABILITY TEST

PROJ NO ET-94-032

PROJECT: Dorlyn [illegible] TECHNICIAN: KSC DATE: 6-17-94

BORING NO: _____ SAMPLE NO: ET-94-A-1 CALCULATED: _____ DATE: _____

DEPTH: _____ ft to _____ ft Bottom Ejection CHECKED: _____ DATE: _____

SAMPLE DATA		MOISTURE CONTENT DETERMINATION	BEFORE TEST	AFTER TEST
LENGTH OF SAMPLE, L:	n x 2.54 = 8.84 cm	TARE NUMBER	–	302
DIAMETER OF SAMPLE, D:	n x 2.54 = 7.18 cm	WET WT OF SOIL & TARE g	751.9	977.1
AREA: A = 0.7854 D² =	in² x 6.45 = cm²	DRY WT. OF SOIL & TARE g		861.8
VOLUME: V = L x A =	in³ x 16.39 = cm³	WEIGHT OF WATER g		
WET WT. OF SAMPLE, W:	g	TARE WEIGHT g	–	219.41
DRY WT OF SAMPLE, $W_o = W/(1+w)$ =	g	DRY WEIGHT OF SOIL g		
DRY UNIT WT., $\gamma_d = (W_o/V) \times 62.4$ =	lbs/ft³	MOISTURE CONTENT, w %		
SPECIFIC GRAVITY, G =				
VOLUME OF VOIDS, $V_v = V - W_o/G$ =	cm³	CELL PRESSURE,		lbs/in²
VOID RATIO, $e = (V_v \times G)/W_o$ =		TEST PRESSURE, H+Δh		lbs/in²
WT. OF WATER IN SAMP, $W_w = W_o \times w$	g	SATURATION PRESSURE, H:		lbs/in²
DEGREE OF SATURATION, $S = {}^{W_w}/_{V_v} \times 100$		DIFFERENTIAL HEAD, Δh = lbs/in² x 703 =		cm H_2O

PANEL NO. 3

PANEL POSITION		CALIBR. FACTOR	
2	1	–	–

CELL NO FP-29

DATE	TIME	ELAPSED TIME t (sec)	GAUGE PRES. (psi) HEAD	GAUGE PRES. (psi) TAIL	BUCKET READING (cm³) INFLOW	BUCKET READING (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) INFLOW	FLOW VOLUME ΔV, (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) AVER.
6/18	3:03	0	85.1	80.1	0.0	24.8	0	0	–
	15:33	27,000	85.1	80.1	0.0	24.8	0	0	0
		Found	Inflow	Return	Off	Cell	Restart	Im Air	
6/19	9:53	0	85.1	80.0	0.00	24.20	0	0	–
	16:33	24,000	85.1	80.0	0.30	23.90	0.30	0.30	0.30
	23:13	48,000	85.1	80.0	0.60	23.60	0.60	0.60	0.60
6/20	7:33	78,000	85.3	80.2	0.95	23.20	0.95	1.00	0.98
	15:53	103,000	85.1	80.1	1.30	22.85	1.30	1.35	1.33
	22:33	132,000	85.2	80.1	1.6	22.6	1.60	1.60	1.60
6/21	7:43	165,000	85.2	80.1	2.00	22.20	2.00	2.00	2.00

EVALUATION

GRADIENT: $i = \Delta h/L$ =

TEST CONSTANT: $C = \frac{L}{\Delta h\, A}$ =

FLOW RATE:

$\Delta V/t$ = _____ =

CORRELATION, r = 1.0000

PERMEABILITY:

$K_T = \Delta V/t \times C$ = 7.11×10^{-9}

$K_{20} = K_T \times \mu_T/\mu_{20}$ =

REMARKS: [illegible]

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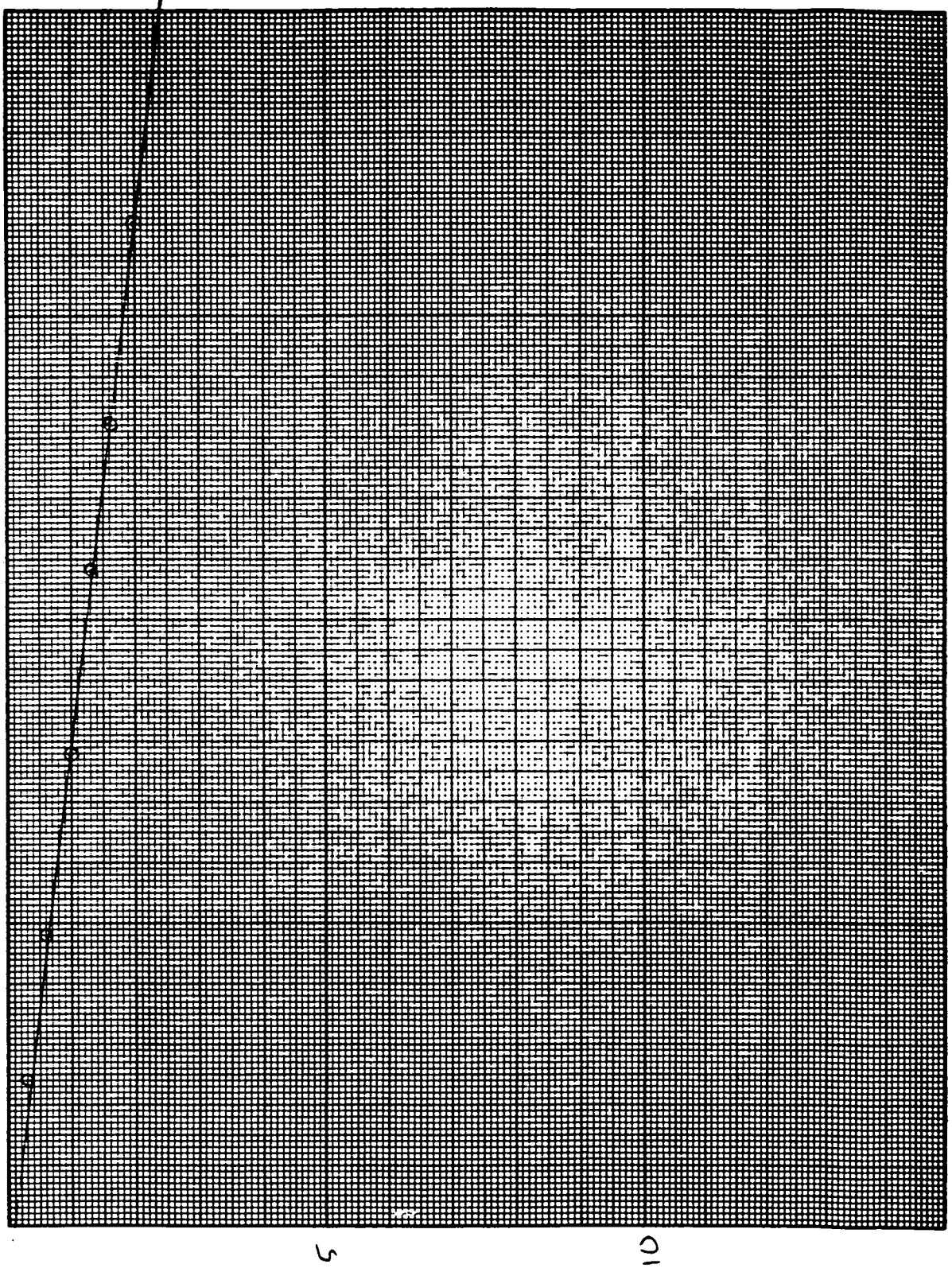
1
ST-SEA-1
Bottom
[illegible] ET-1-1-SEA



PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 8.19
Specimen Diameter (cm): 7.21
Dry Unit Weight (pcf): 112.9
Moisture Before Test (%): 18.8
Moisture After Test (%): 18.2

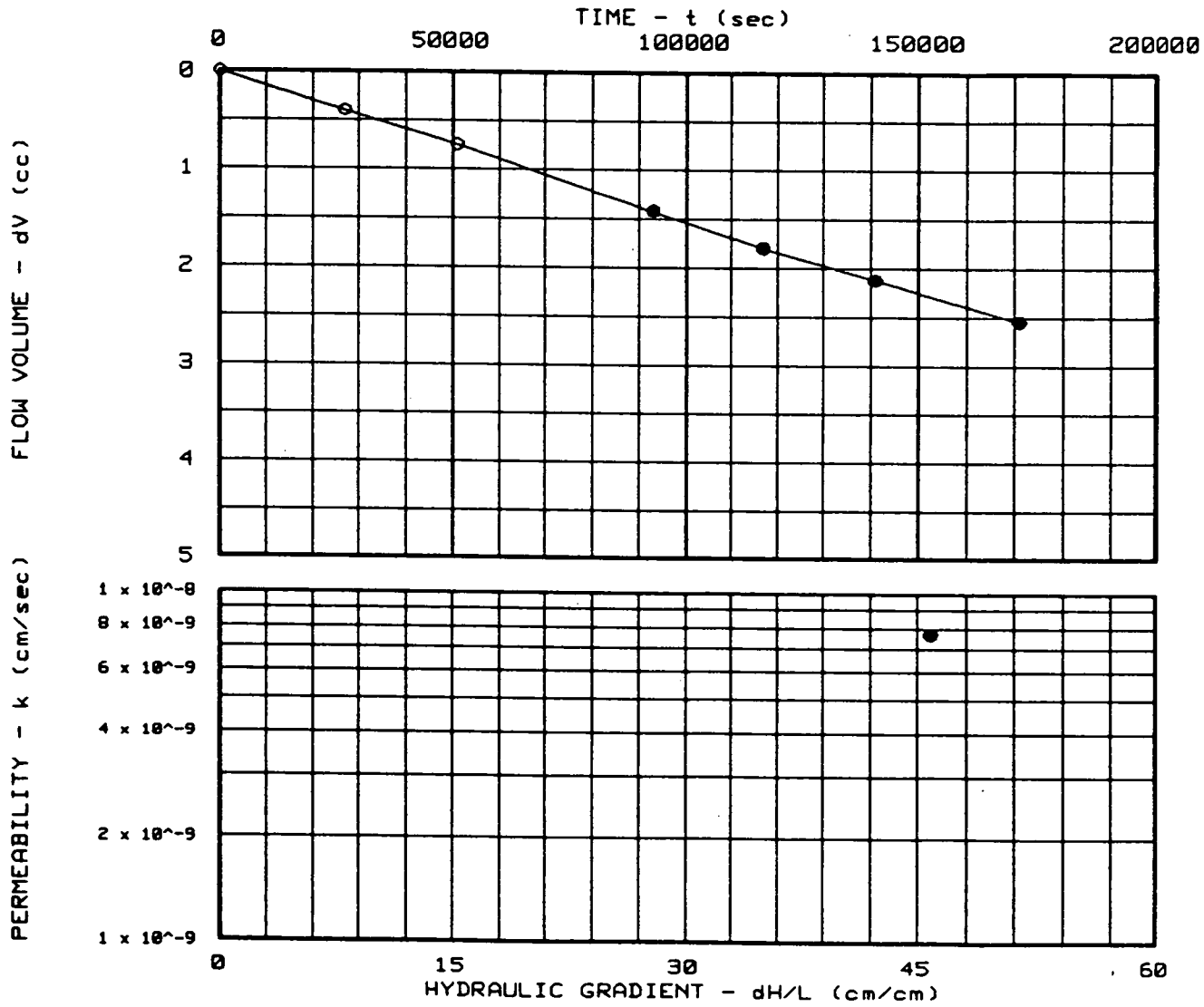
Run Number:	1 ●	2 ▲
Cell Pressure (psi):	95.0	
Test Pressure (psi):	85.2	
Back Pressure (psi):	79.9	
Diff. Head (psi):	5.3	
Flow Rate (cc/sec):	1.43 x 10^-5	
Perm. (cm/sec):	7.66 x 10^-9	

SAMPLE DATA:

Sample Identification: ST-SEA-1
TOP 12"
Visual Description: BROWN CLAY,
Little Gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: TONAWANDA, NEW YORK
Date: JUNE 1994

PERMEABILITY TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Project No.: BT-94-032
File No.: G002.111
Lab No.: 2023.001
Tested by: KJC
Checked by: JFC ✓
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

I ject Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G002.111
Project Location:	TONAWANDA, NEW YORK
Project No.:	BT-94-032
Sample Identification:	ST-SEA-1 TOP 12"
Lab No.:	2023.001
Description:	BROWN CLAY, Little Gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JUNE 1994
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC
Checked by:	JFC
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.843 in	2.853 in		2.824 in	2.855 in	
Middle:	2.835 in	2.826 in		2.809 in	2.818 in	
Bottom:	2.859 in	2.825 in		2.841 in	2.826 in	
Average:	2.84 in	7.21 cm		2.83 in	7.18 cm	
Length:	1	2	3	1	2	3
	3.231 in	3.213 in	3.231 in	3.219 in	3.201 in	3.189 in
Average:	3.23 in	8.19 cm		3.20 in	8.14 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	951.82	948.20
Dry Wt. & Tare:	838.40	838.40
Tare Wt.:	233.92	233.92
Moisture Content:	18.8 %	18.2 %
Dry Unit Weight:	112.9 pcf	114.7 pcf
Porosity:	0.3424	0.3319
Saturation:	99.1 %	100.6 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP - 19 Panel No.: 3 Positions: 4 & 3

Run Number:	1	2
Cell Pressure:	95.0 psi	95.0 psi
Saturation Pressure:	80.0 psi	80.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	FLOW VOLUME-cc AVERAGE
D X	6/18/94	8:04:00	0	85.2	80.4	0.00	24.90	0.00
X	6/18/94	15:34:00	27,000	85.2	80.3	0.35	24.45	0.40
X	6/18/94	22:14:00	51,000	85.2	80.3	0.70	24.10	0.75
	6/19/94	9:54:00	93,000	85.2	80.2	1.40	23.45	1.43
	6/19/94	16:34:00	117,000	85.2	80.2	1.75	23.05	1.80
	6/19/94	23:14:00	141,000	85.2	80.2	2.10	22.75	2.13
	6/20/94	7:34:00	171,000	85.3	80.3	2.50	22.30	2.55

Cell Pressure = 85.2 psi Differential Head = 5.3 psi, 375.3 cm H2O
Gradient = 4.582E 01 Flow rate = 1.433E-05 cc/sec R squared = 0.99923
Permeability, K20.0° = 7.665E-09 cm/sec, K20° = 7.665E-09 cm/sec

Huntingdon

LAB NO 2023.001

LABORATORY PERMEABILITY TEST

PROJ. NO BT-94-032

PROJECT: Dunlap Landfill TECHNICIAN: KSC DATE: 6-17-94

BORING NO: _____ SAMPLE NO: ST-SE1-1 CALCULATED: _____ DATE: _____

DEPTH: _____ ft to _____ ft Top [illegible] CHECKED: _____ DATE: _____

SAMPLE DATA		MOISTURE CONTENT DETERMINATION	BEFORE TEST	AFTER TEST
LENGTH OF SAMPLE, L:	n x 2.54 = 8.19 cm	TARE NUMBER	-	A
DIAMETER OF SAMPLE, D:	n x 2.54 = 7.21 cm	WET WT. OF SOIL & TARE g	717.9	948.2
AREA: A = 0.7854 D² =	in² x 6.45 = cm²	DRY WT. OF SOIL & TARE g		838.4
VOLUME: V = L x A =	in³ x 16.39 = cm³	WEIGHT OF WATER g		
WET WT. OF SAMPLE, W:	g	TARE WEIGHT g	-	223.75
DRY WT. OF SAMPLE, W_o = W/(1+w) =	g	DRY WEIGHT OF SOIL g		
DRY UNIT WT., γ_d = (W_o/V) x 62.4 =	lbs/ft³	MOISTURE CONTENT, w %		
SPECIFIC GRAVITY, G =				
VOLUME OF VOIDS, V_v = V - W_o/G =	cm³	CELL PRESSURE,		lbs/in²
VOID RATIO, e = (V_v x G)/W_o =		TEST PRESSURE, H+Δh	85.23	lbs/in²
WT. OF WATER IN SAMP, W_w = W_o x w	g	SATURATION PRESSURE, H:	80.23	lbs/in²
DEGREE OF SATURATION, S = $^{W_w}/_{V_v}$ x 100		DIFFERENTIAL HEAD, Δh = 5.00 lbs/in² x 703 =	3,515	cm H_2O

PANEL NO. 3

PANEL POSITION		CALIBR. FACTOR	
4	3	-	-

CELL NO. FP-19

DATE	TIME	ELAPSED TIME t (sec)	GAUGE PRES. (psi) HEAD	GAUGE PRES. (psi) TAIL	BURET READING (cm³) INFLOW	BURET READING (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) INFLOW	FLOW VOLUME ΔV, (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) AVER.
6/13	9:00	0	85.2	80.4	0.0	24.9	0	0	-
	15:34	27,000	85.2	80.3	0.35	24.45	0.35	0.45	0.40
	22:14	51,000	85.2	80.3	0.70	24.10	0.7	0.8	0.75
6/19	9:51	93,000	85.2	80.2	1.40	23.45	1.40	1.45	1.43
	16:34	117,000	85.2	80.2	1.75	23.05	1.75	1.85	1.80
	23:14	141,000	85.2	80.2	2.10	22.75	2.10	2.15	2.13
6/20	7:34	171,000	85.3	80.3	2.50	22.30	2.50	2.60	2.55

EVALUATION

GRADIENT: i = Δh/L =

TEST CONSTANT: 4582

$C = \frac{L}{\Delta h\, A}$ =

FLOW RATE: 1.43x10⁻⁵

ΔV/t = _____ =

CORRELATION, r = 0.99961

PERMEABILITY:

K_T = ΔV/t x C = 7.67x10⁻⁹

K_{20} = K_T x μ_T/μ_{20} =

REMARKS:

Dunlop Landfill
ST-SEA-1
Top
2023.001- BT-94-032

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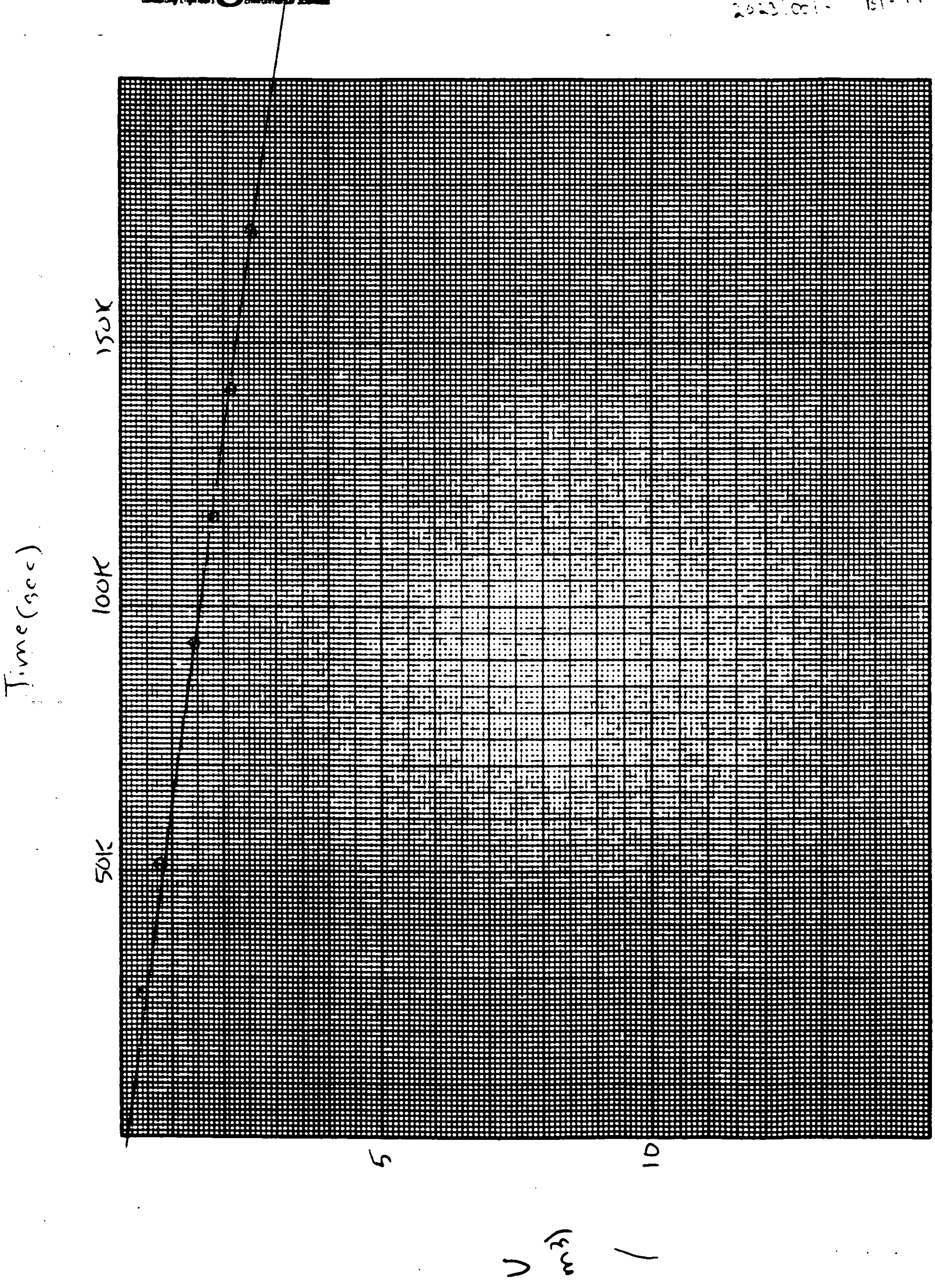


PERMEABILITY TEST REPORT

TEST DATA:

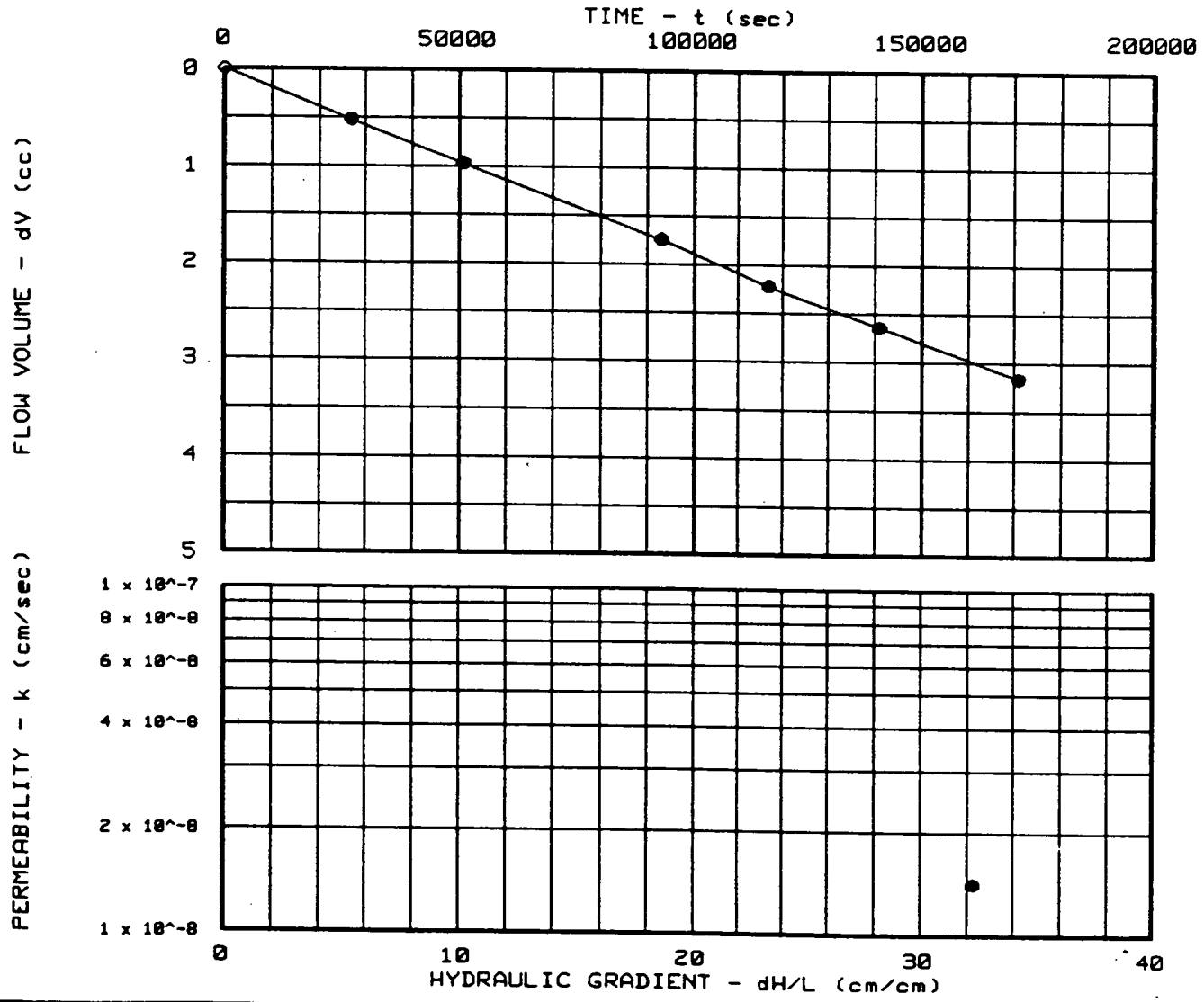
Specimen Height (cm): 11.35
Specimen Diameter (cm): 7.19
Dry Unit Weight (pcf): 110.0
Moisture Before Test (%): 19.2
Moisture After Test (%): 19.2
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 95.0
Test Pressure (psi): 85.0
Back Pressure (psi): 79.8
Diff. Head (psi): 5.2
Flow Rate (cc/sec): 1.85 x 10^-5
Perm. (cm/sec): 1.41 x 10^-8

SAMPLE DATA:

Sample Identification: ST-SEA-2 BOTTOM 6"
Visual Description: BROWN CLAY, Little Gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: TONAWANDA, NEW YORK
Date: JUNE 1994

PERMEABILITY TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Project No.: BT-94-032
File No.: G002.111
Lab No.: 2023.002
Tested by: KJC
Checked by: JFC ✓
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G002.111
Project Location:	TONAWANDA, NEW YORK
Project No.:	BT-94-032
Sample Identification:	ST-SEA-2
	BOTTOM 6"
Lab No.:	2023.002
Description:	BROWN CLAY,
	Little Gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JUNE 1994
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC
Checked by:	JFC
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.820 in	2.824 in		2.797 in	2.827 in	
Middle:	2.839 in	2.818 in		2.802 in	2.814 in	
Bottom:	2.841 in	2.848 in		2.824 in	2.826 in	
Average:	2.83 in	7.19 cm		2.81 in	7.15 cm	
Length:	1	2	3	1	2	3
	4.511 in	4.480 in	4.419 in	4.483 in	4.432 in	4.450 in
Average:	4.47 in	11.35 cm		4.46 in	11.32 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	1199.53	1199.80
Dry Wt. & Tare:	1043.60	1043.60
Tare Wt.:	231.13	231.13
Moisture Content:	19.2 %	19.2 %
Dry Unit Weight:	110.0 pcf	111.8 pcf
Porosity:	0.3592	0.3489
Saturation:	94.2 %	98.6 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP - 27 Panel No.: 3 Positions: 6 & 5

Run Number:	1	2
Cell Pressure:	95.0 psi	95.0 psi
Saturation Pressure:	80.0 psi	80.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	FLOW VOLUME-cc AVERAGE
D X	6/18/94	8:05:00	0	85.0	80.3	0.00	24.85	0.00
	6/18/94	15:35:00	27,000	85.0	80.2	0.60	24.40	0.53
	6/18/94	22:15:00	51,000	85.0	80.2	1.15	24.05	0.98
	6/19/94	9:55:00	93,000	85.0	80.1	2.00	23.35	1.75
	6/19/94	16:35:00	117,000	85.0	80.1	2.50	22.90	2.23
	6/19/94	23:15:00	141,000	85.0	80.1	3.00	22.55	2.65
	6/20/94	7:35:00	171,000	85.1	80.2	3.50	22.00	3.18

T t Pressure = 85.0 psi Differential Head = 5.2 psi, 366.1 cm H2O
Gradient = 3.225E 01 Flow rate = 1.850E-05 cc/sec R squared = 0.99973
Permeability, K20.0° = 1.413E-08 cm/sec, K20° = 1.413E-08 cm/sec

Huntingdon

LAB NO 2023.002

LABORATORY PERMEABILITY TEST

PROJ NO BT-94-032

PROJECT: Dunlap Landfill TECHNICIAN: KSC DATE: 6-17-94

BORING NO: _____ SAMPLE NO: ST-SEA-2 CALCULATED: _____ DATE: _____

DEPTH: _____ ft to _____ ft CHECKED: _____ DATE: _____

SAMPLE DATA		MOISTURE CONTENT DETERMINATION	BEFORE TEST	AFTER TEST
LENGTH OF SAMPLE, L:	n x 2.54 = 11.75 cm	TARE NUMBER	-	CP-4
DIAMETER OF SAMPLE, D:	n x 2.54 = 7.19 cm	WET WT OF SOIL & TARE g	968.4	1199.8
AREA: A = 0.7854 D² =	in² x 6.45 = cm²	DRY WT. OF SOIL & TARE g		1043.6
VOLUME: V = L x A =	in³ x 16.39 = cm³	WEIGHT OF WATER g		
WET WT. OF SAMPLE, W:	g	TARE WEIGHT g	-	231.13
DRY WT OF SAMPLE, $W_o = W/(1+w)$ =	g	DRY WEIGHT OF SOIL g		
DRY UNIT WT., $\gamma_d = (W_o/V) \times 62.4$ =	lbs/ft³	MOISTURE CONTENT, w %		
SPECIFIC GRAVITY, G =				
VOLUME OF VOIDS, $V_v = V - W_o/G$ =	cm³	CELL PRESSURE,		lbs/in²
VOID RATIO, $e = (V_v \times G)/W_o$ =		TEST PRESSURE, H+Δh	85.0	lbs/in²
WT. OF WATER IN SAMP, $W_w = W_o \times w$	g	SATURATION PRESSURE, H:	80.15	lbs/in²
DEGREE OF SATURATION, $S = \frac{W}{V_v} \times 100$		DIFFERENTIAL HEAD, Δh = 4.97 lbs/in² x 703 =	342.13	cm H_2O

PANEL NO. 3 | PANEL POSITION: 6, 5 | CALIBR. FACTOR: -, - | CELL NO. FP-27

DATE	TIME	ELAPSED TIME t (sec)	GAUGE PRES. (psi) HEAD	GAUGE PRES. (psi) TAIL	BUCET READING (cm³) INFLOW	BUCET READING (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) INFLOW	FLOW VOLUME ΔV, (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) AVER.
6/18	9:05	0	85.0	80.3	0.0	24.85	0	0	-
	[illegible]	27,000	85.0	80.2	0.60	24.40	0.60	0.45	.53
	22:15	51,000	85.0	80.2	1.15	24.05	1.15	0.8	0.98
6/19	9:55	93,000	85.0	80.1	2.00	23.35	2.00	1.50	1.75
	16:35	117,000	85.0	80.1	2.50	22.90	2.50	1.95	2.23
	23:15	141,000	85.0	80.1	3.00	22.55	3.00	2.30	2.65
6/20	7:35	171,000	85.1	80.2	3.50	22.00	3.50	2.85	3.18

EVALUATION

GRADIENT: i = Δh/L =

TEST CONSTANT: 31.24

$C = \frac{L}{\Delta h A}$ =

FLOW RATE: 1.85×10^{-5}

ΔV/t = _____ =

CORRELATION, r = 0.99987

PERMEABILITY:

K_T = ΔV/t x C = 1.41×10^{-8}

$K_{20} = K_T \times \mu_T/\mu_{20}$ =

REMARKS:

16.00 6/20

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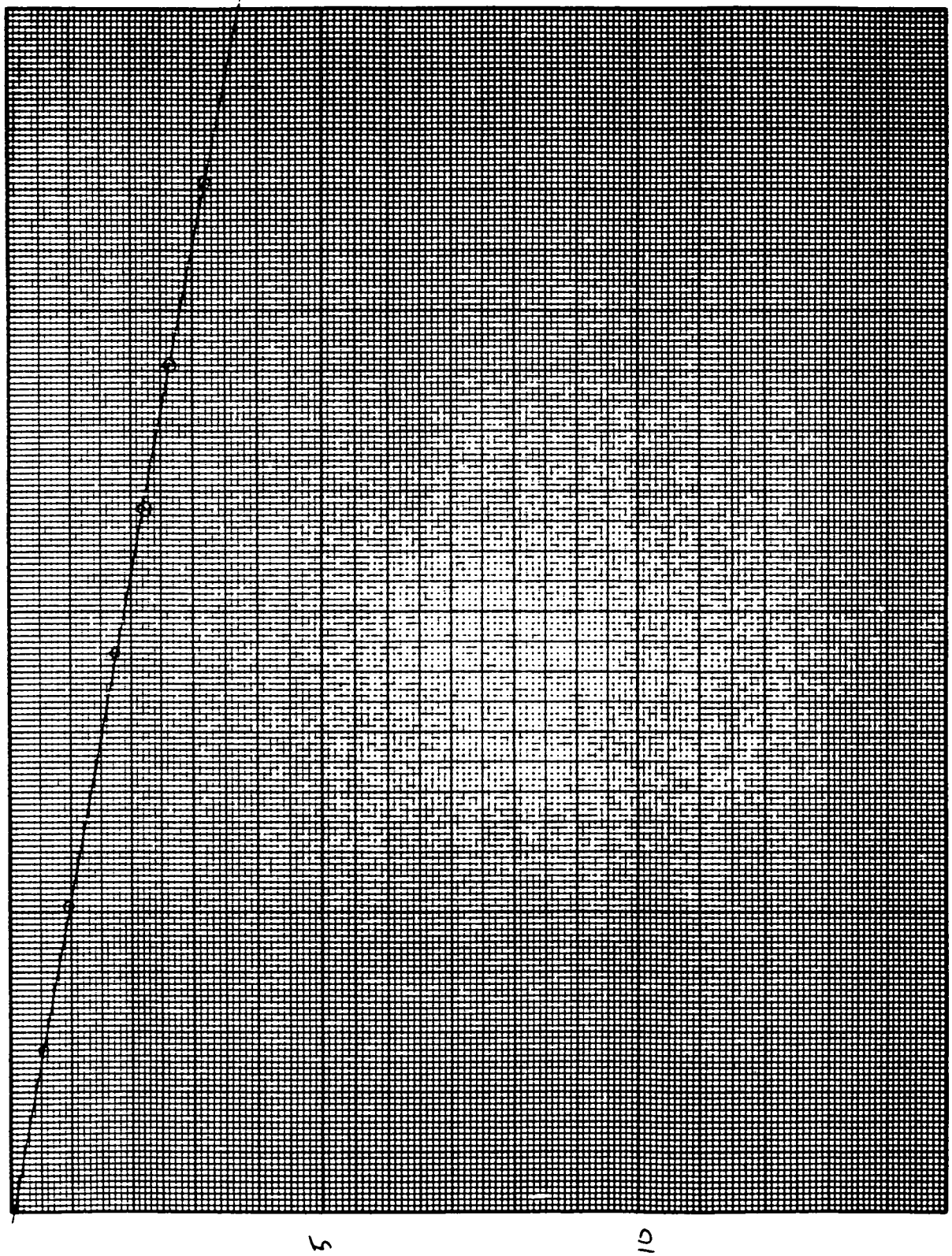
ST-SEA-2
Bottom
2023.002 BT-94-032



PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 9.49
Specimen Diameter (cm): 7.16
Dry Unit Weight (pcf): 114.4
Moisture Before Test (%): 18.6
Moisture After Test (%): 18.3

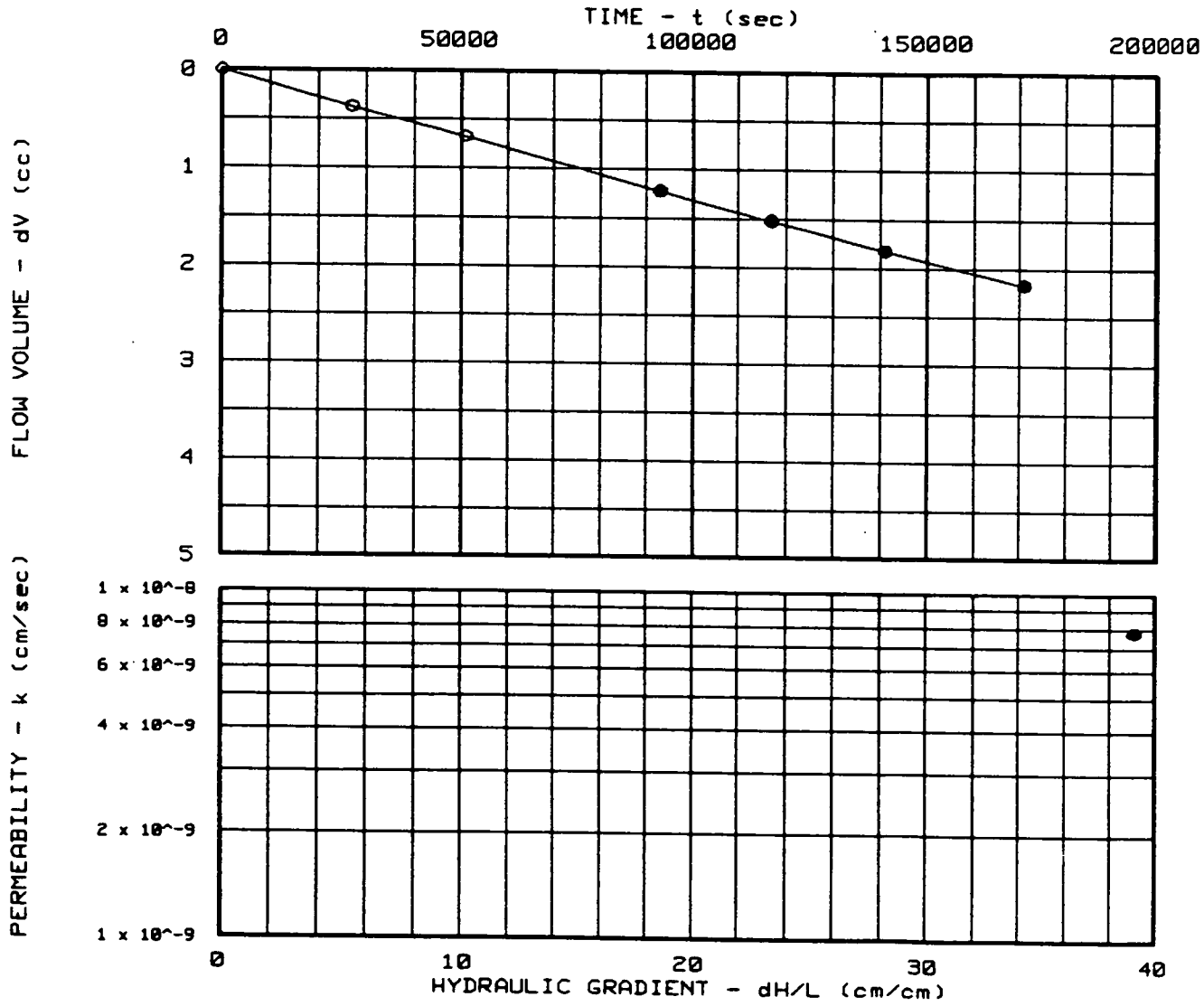
Run Number:	1 ●	2 ▲
Cell Pressure (psi):	95.0	
Test Pressure (psi):	85.5	
Back Pressure (psi):	80.2	
Diff. Head (psi):	5.3	
Flow Rate (cc/sec):	1.22 x 10^-5	
Perm. (cm/sec):	7.75 x 10^-9	

SAMPLE DATA:

Sample Identification: ST-SEA-2 TOP 12"
Visual Description: BROWN CLAY, Little Gravel
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: UNDISTURBED



Project: DUNLOP INACTIVE WASTE SITE CLOSURE
Location: TONAWANDA, NEW YORK
Date: JUNE 1994

PERMEABILITY TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Project No.: BT-94-032
File No.: G002.111
Lab No.: 2023.002
Tested by: KJC
Checked by: JFC ✓
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

I ject Name:	DUNLOP INACTIVE WASTE SITE CLOSURE
File No.:	G002.111
Project Location:	TONAWANDA, NEW YORK
Project No.:	BT-94-032
Sample Identification:	ST-SEA-2 TOP 12"
Lab No.:	2023.002
Description:	BROWN CLAY, Little Gravel
Sample Type:	UNDISTURBED
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	JUNE 1994
Remarks:	
Permeameter Type:	FLEXIBLE WALL
Tested by:	KJC
Checked by:	JFC
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.810 in	2.830 in		2.819 in	2.823 in	
Middle:	2.812 in	2.827 in		2.810 in	2.809 in	
Bottom:	2.809 in	2.828 in		2.807 in	2.824 in	
Average:	2.82 in	7.16 cm		2.81 in	7.15 cm	
Length:	1	2	3	1	2	3
	3.753 in	3.748 in	3.708 in	3.739 in	3.748 in	3.723 in
Average:	3.74 in	9.49 cm		3.74 in	9.49 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	1051.08	1048.70
Dry Wt. & Tare:	920.50	920.50
Tare Wt.:	220.08	220.08
Moisture Content:	18.6 %	18.3 %
Dry Unit Weight:	114.4 pcf	114.8 pcf
Porosity:	0.3337	0.3311
Saturation:	102.4 %	101.7 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: FP - 26 Panel No.: 9 Positions: 2 & 1

Run Number:	1	2
Cell Pressure:	95.0 psi	95.0 psi
Saturation Pressure:	80.0 psi	80.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	20.0 °C	20.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	FLOW VOLUME-cc AVERAGE
D X	6/18/94	8:06:00	0	85.5	80.6	0.05	24.90	0.00
X	6/18/94	15:36:00	27,000	85.5	80.6	0.40	24.50	0.38
X	6/18/94	22:16:00	51,000	85.5	80.6	0.70	24.20	0.68
	6/19/94	9:56:00	93,000	85.5	80.6	1.30	23.70	1.23
	6/19/94	16:36:00	117,000	85.5	80.6	1.60	23.40	1.53
	6/19/94	23:16:00	141,000	85.5	80.6	1.95	23.15	1.83
	6/20/94	7:36:00	171,000	85.5	80.5	2.25	22.75	2.18

T t Pressure = 85.5 psi Differential Head = 5.3 psi, 370.7 cm H2O
Gradient = 3.906E 01 Flow rate = 1.220E-05 cc/sec R squared = 0.99967
Permeability, K20.0° = 7.753E-09 cm/sec, K20° = 7.753E-09 cm/sec

Huntingdon

LAB NO. 2023.002

LABORATORY PERMEABILITY TEST

PROJ. NO. BT-94-032

PROJECT: Dunlap Landfill TECHNICIAN: KJC DATE: 6-17-94

BORING NO.: _____ SAMPLE NO: ST-SEA-2 CALCULATED: _____ DATE: _____

Top 12 inches

DEPTH: _____ ft to _____ ft CHECKED: _____ DATE: _____

SAMPLE DATA		MOISTURE CONTENT DETERMINATION	BEFORE TEST	AFTER TEST
LENGTH OF SAMPLE, L:	n x 2.54 = 9.49 cm	TARE NUMBER	-	25
DIAMETER OF SAMPLE, D:	n x 2.54 = 7.16 cm	WET WT OF SOIL & TARE g	731.0	1048.7
AREA: A = 0.7854 D² =	in² x 6.45 = cm²	DRY WT. OF SOIL & TARE g		920.5
VOLUME: V = L x A =	in³ x 16.39 = cm³	WEIGHT OF WATER g		
WET WT. OF SAMPLE, W:	g	TARE WEIGHT g	-	220.08
DRY WT OF SAMPLE, $W_s = W/(1+w)$ =	g	DRY WEIGHT OF SOIL g		
DRY UNIT WT., $\gamma_d = (W_s/V) \times 62.4$ =	lbs/ft³	MOISTURE CONTENT, w %		
SPECIFIC GRAVITY, G =				
VOLUME OF VOIDS, $V_v = V - W_s/G$ =	cm³	CELL PRESSURE,		lbs/in²
VOID RATIO, $e = (V_v \times G)/W_s$ =		TEST PRESSURE, H+Δh	65.5	lbs/in²
WT. OF WATER IN SAMP, $W_w = W_s \times w$	g	SATURATION PRESSURE, H:	60.58	lbs/in²
DEGREE OF SATURATION, $S = {}^{W}\!/_{V_v} \times 100$		DIFFERENTIAL HEAD, Δh = 4.92 lbs/in² x 703 =	346.27	cm H_2O

PANEL NO. 7 | PANEL POSITION: 2 | 1 | CALIBR. FACTOR: - | - | CELL NO. FF-26

DATE	TIME	ELAPSED TIME t (sec)	GAUGE PRES. (psi) HEAD	GAUGE PRES. (psi) TAIL	BUCKET READING (cm³) INFLOW	BUCKET READING (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) INFLOW	FLOW VOLUME ΔV, (cm³) OUTFLOW	FLOW VOLUME ΔV, (cm³) AVER.
6/19	8:06	0	85.5	80.6	0.05	24.9	0	0	-
	16:36	30,000	85.5	80.6	0.40	24.5	0.35	0.40	0.37
	22:16	51,000	85.5	80.6	0.70	24.2	0.65	0.70	0.68
6/19	9:56	93,000	85.5	80.6	1.30	23.70	1.25	1.20	1.23
	16:36	117,000	85.5	80.6	1.60	23.40	1.60	1.50	1.55
	23:16	141,000	85.5	80.6	1.95	23.15	1.90	1.75	1.83
6/20	7:26	171,000	85.5	80.5	2.25	22.75	2.20	2.15	2.18

EVALUATION

GRADIENT: $i = \Delta h/L$ = 39.55

TEST CONSTANT: $C = \frac{L}{\Delta h\, A}$ =

FLOW RATE: $\Delta V/t$ = _____ = 1.22×10^{-5}

CORRELATION, r = 0.99984

PERMEABILITY:

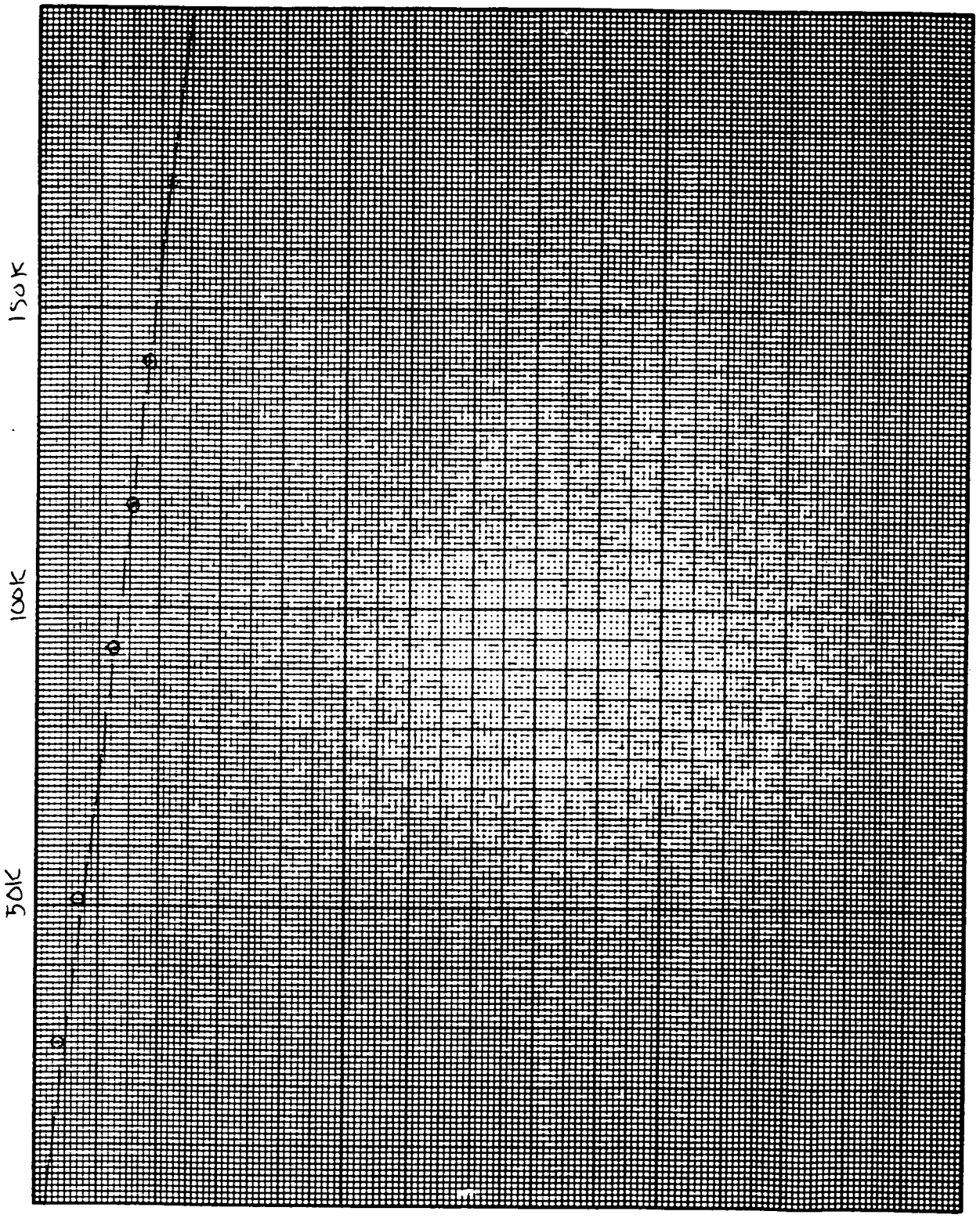
$K_T = \Delta V/t \times C$ = 7.75×10^{-7}

$K_{20} = K_T \times \gamma_T/\gamma_{20}$ =

REMARKS:

Huntingdon
Consulting Engineers Environmental Scientists

Dunlop Land
ST-SEA-2
Top
0323.032 BT 04-032



(cm)

Huntingdon

Corporate Offices
140 Telegraph Road
Box 797
[illegible] New York 14105

LABORATORY WORK ORDER

G082.111

PROJECT: Dunlop Landfill JOB NO.: BT-94-032

CLIENT: URS Consultants SHEET: 1 OF 1

ISSUED BY: KJC DATE: 6-17-94 SAMPLED BY: _____ DATE: _____

SAMPLE TYPE & SOURCE:	ST-SEA 1	ST-SEA 2				
LABORATORY NO.	2023.001	2023.002				
Atterberg Limits						
Natural Water Content						
Hydrometer Analysis						
Sieve Analysis Sizes Required:						
Proctor Test: ___ ASTM D 698 (Standard) ___ ASTM D1557 (Modified)						
Permeability Test: X Undisturbed ___ Remolded _____'	X 2	X 2				
Specific Gravity						
Sample Classifications						

Specifications: ___ Job (list) ___ NYSDOT ___ ASTM

REMARKS:

1 TEST - Bottom 6"

1 TEST - Top 12"

APPENDIX E
OMW-A5 WELL DECOMMISSIONING REPORT

SJB SERVICES, INC.

Contract Drilling and Testing

1951-1 Hamburg Turnpike
Buffalo, NY 14218
Phone: (716) 821-5911
Fax: (716) 821-0163

P.O. BOX 515
New Holland, PA 17557
Phone: (717) 354-7389
Fax: (717) 354-7619

WELL DECOMMISSIONING REPORT
OMW-A5
DUNLOP TIRE FACILITY

PREPARED FOR:

SITE CONTRACTORS, INC.
S-3480 BENZING ROAD
ORCHARD PARK, NEW YORK 14127

PREPARED BY:

SJB SERVICES, INC.
JUNE 1994

SJB-D372

SJB SERVICES, INC.

Contract Drilling and Testing

1951-1 Hamburg Turnpike
Buffalo, NY 14218
Phone: (716) 821-5911
Fax: (716) 821-0163

P.O. BOX 515
New Holland, PA 17557
Phone: (717) 354-7389
Fax: (717) 354-7619

June 2, 1994

Site Contractors, Inc.
S-3480 Benzing Road
Orchard Park, New York 14127

Attention: Dennis McCartney

Reference: Documentation Related to the Decommissioning of Well OMW-A5 at the Dunlop Tire Facility
SJB-D372

Dear Mr. McCartney,

Pursuant to your request and authorization, SJB Services, Inc. performed and documented the decommissioning of one (1) groundwater monitoring well at the Dunlop Tire Facility in Tonawanda, New York. The decommissioning activities included removal of the existing monitoring well, redrilling and grouting of the borehole, and documentation of the well abandonment.

On May 31, 1994, a SJB Service Drill Rig and Crew was present at the Dunlop Tire Facility on Sheridan Drive and River Road in Tonawanda, New York. Well OMW-A5 was located adjacent to a retention pond under construction in the southwest portion of the facility.

The following well information was noted by the drill foreman prior to abandonment,

Well Size -	2" Diameter Stainless Steel
Depth to Water -	3.5 Feet Below Grade
Total Depth of Well-	22.6 Feet Below Grade
Riser Stick-Up-	2.5 Feet Above Grade

Initially, the stainless steel well and steel procasing was removed by the drill crew. The stainless well materials were recovered intact. The existing borehole was then overdrilled using rotary drilling methods/4-1/4" hollow stem augers to a depth of 24.0 feet below grade. A cement/bentonite slurry was tremied into the hollow stem augers, and the augers removed. All drilling equipment introduced into the borehole as well as the recovered stainless well materials was cleaned on site at the completion.

Attached as part of this report is a completed well abandonment form provided to SJB Services by John Wokasien of URS Consultants, Inc.

We trust this report satisfied your requirements. We appreciate the opportunity to be of service on this project. If you have any questions, or require further services, please feel free to contact the undersigned.

Sincerely,
SJB Services, Inc.

Frank R. Minnolera, Jr.
Staff Geologist

mrm
Attachment

SUMMERY OF WELL ABANDONMENT

DATE 5-31-94 PROJECT D372 CLIENT Site Contractors, Inc.

DRILLERS J. Leavell

LEVEL --- RIG CME-550 WELL ID # OMW-A5

DEPTH OF WELL CASING 22.6'

DIAMETER OF WELL 2" Stainless Steel Riser

TYPE OF PROTECTIVE CASING Lockable Steel

AUGER SIZE USED TO OVER DRILL 4-1/4" I.D.

DEPTH OVER DRILLED 1.4' (To 24.0' BGS)

TOTAL LENGTH OF WELL RECOVERED 25.1'

TYPE OF BACK FILL Cement/Bentonite Grout

AMOUNT OF CEMENT USED 5 Bags

AMOUNT OF BENTONITE USED 1 Bag

TYPE OF BENTONITE USED Granular

Notes: 2" Stainless Well was extracted and recovered in one intact section. 5.0' of screen was noted at the bottom of the well.

SIGNATURE

APPENDIX F
OMW-A6 WELL CONSTRUCTION DETAILS AND BORING LOG
OMW-A6 WELL DEVELOPMENT LOG

DRILLING SUMMARY

Geologist: MICHAEL GUTMANN

Drilling Contractor: BUFFALO DRILLING Co.

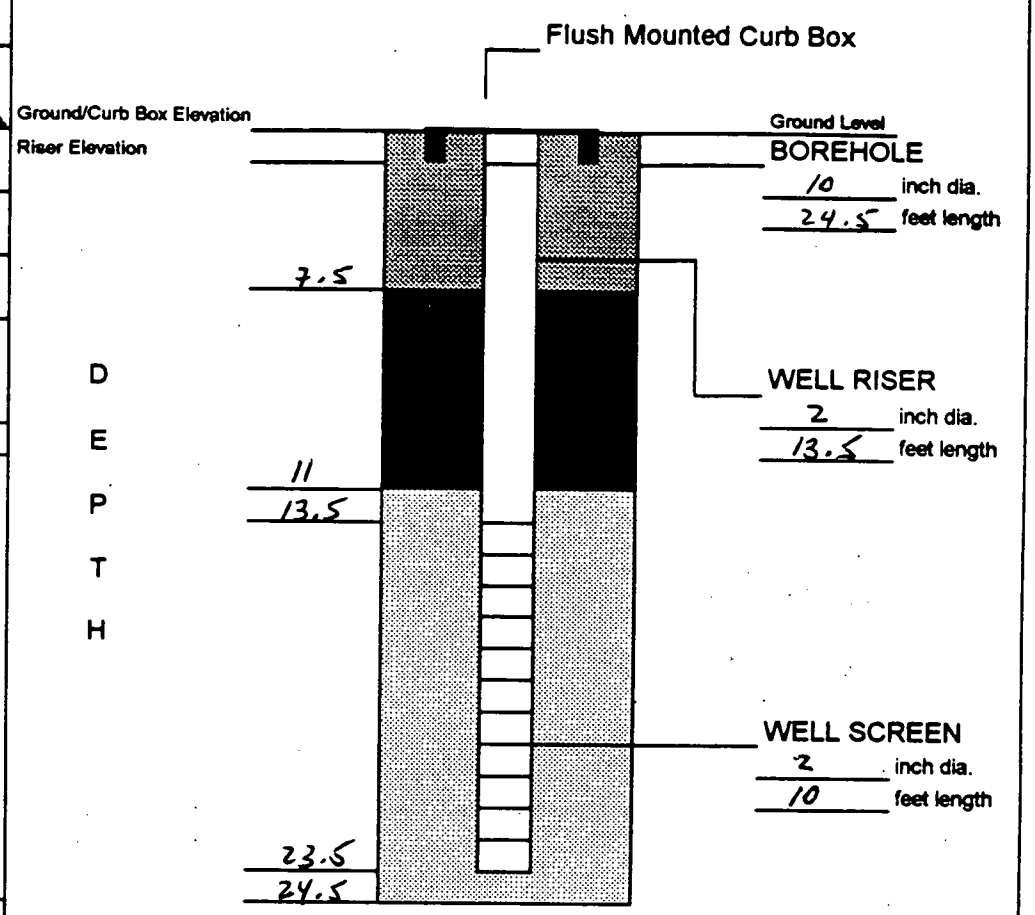
Driller: LARRY SCHROEDER

Date: 7/13/94

GEOLOGIC LOG

depth(ft.)	lithology
0 - 1	ASPHALT + SUBBASE
1 - 6.5	GRAY/BROWN SILTY CLAY TR. BRICK FRAGMENTS
6.5 - 24.5	RED/BROWN SILTY CLAY

WELL DESIGN



CASING MATERIAL

Surface: FLUSH MOUNTED CURB BOX

Monitor: STAINLESS - STEEL TYPE 304

SCREEN MATERIAL

Type: TYPE 304 STAINLESS STEEL

Slot Size: 0.010 INCH - CONTINUOUS WRAP

SEAL MATERIAL

Seal Type #1: BENTONITE PELLETS
Setting:

Seal Type #2:
Setting:

FILTER MATERIAL

Type: #00 N

Setting: 11 - 24.5 FT

ROCK CORING

Cored Interval: NA

Core Diameter: NA

Reamed Diameter: NA

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: DUNLOP TIRE CORP.

Project: DUNLOP

Project No.: 05.35246

URS Consultants, Inc.

Monitoring Well Construction Details

Well Number: OMW-A6

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. OMW-A6

PROJECT: DUNLOP
CLIENT: DUNLOP TIRE CORP.
BORING CONTRACTOR: BUFFALO DRILLING CO.
GROUND WATER:

DATE	TIME	LEV	TYPE
7/13/94	4:30PM	DRY	—

	CAS.	SAMP	CORE	TUBE
TYPE				
DIA.				
WT.				
FALL				

* POCKET PENETROMETER READING

SHEET NO. 1 OF 1
JOB NO.: 05.35246
BORING LOCATION:
GROUND ELEVATION:
DATE STARTED: 7/13/94
DATE FINISHED: 7/14/94
DRILLER: LARRY SCHROEDER
GEOLOGIST: MICHAEL GUTMANN
REVIEWED BY:

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY / RQD %	COLOR	CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	USCS	HNU (PPM)	REMARKS
1		—	—		—	BLACK	—	ASPHALT COVER - 4" OVER GRAVEL SUBBASE TO 1 FT	GW	0	
						GRAY/ BROWN	—				
5								SILTY CLAY - TRACE OF BRICK FRAGMENTS	ML/ CL	0	
		—	—		—	RED/ BROWN	—	SILTY CLAY	CL		VERY SLOW HSA DRILLING
10										0	VERY STIFF CLAY
											SLIGHTLY MOIST, MED. PLASTIC
15										0	
											HSA BECOMES EASIER, MOISTER
20										0	CLAY
											MED - HIGH PLASTICITY
25										0	
								BORING COMPLETE AT 24.5 FT			
30											
35											

COMMENTS: BOREHOLE LOGGED FROM AUGER CUTTINGS

PROJECT NO. 05.35246
BORING NO.

URS CONSULTANTS, INC.

WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: DUNLOP

PROJECT NO.: 35246

STAFF: J. CARUSO

DATE: 7/26/94

WELL NO.: [redacted] OMW46

		WELL I.D.	VOL. GAL./FT.
① TOTAL CASING AND SCREEN LENGTH (FT.):	23.3	1"	0.04
② CASING INTERNAL DIAMETER (in.):	2	(2")	0.17
③ WATER LEVEL BELOW TOP OF CASING (FT.)	21.4	3"	0.38
④ VOLUME OF WATER IN CASING (GAL.)	0.32	4"	0.66
		5"	1.04
		6"	1.50
		8"	2.6

$V = 0.0408 (②)^2 \times (① - ③) =$ _____ GAL. (3 casings)

PARAMETERS	ACCUMULATED VOLUME PURGED (~~GALLONS~~) LITERS										
	0	2.25	2.5								
pH	7.50	7.80	7.7								
Spec. Cond. (µmho)	1600	1450	1500								
Turbidity (NTU)	163	867	210								
Temperature (°F) (°C)	62.2	60.3	64.0								
Obs.	S. turbid tan tint	turbid tan tint	s. turbid tan tint								

COMMENTS: Slow recharge.

A-2347