

**OCCIDENTAL CHEMICAL CORPORATION  
OLIN CORPORATION**

**REMEDIAL ACTION REPORT  
TRIANGULAR AREA NORTH OF BUFFALO AVENUE**

**102nd STREET LANDFILL SITE  
NIAGARA FALLS, NEW YORK**

**DECEMBER 23, 1993**

**FLUOR DANIEL, INC.  
Philadelphia Operations Center  
Marlton, New Jersey**

DEC 23 1993

## TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
<b>1.0 INTRODUCTION</b> .....	1
1.1 Background .....	1
1.2 Site Description .....	2
1.3 Purpose/Scope of Work .....	3
<b>2.0 REMEDIAL ACTION PROGRAM</b> .....	4
2.1 Preconstruction Activities .....	4
2.2 Verification Soil Sampling and Testing Program .....	5
2.3 Tree Removal/Clearing and Grubbing .....	5
2.4 Fencing/Demarcation of Work Zone .....	6
2.5 Equipment Cleaning .....	6
2.6 Haul Road .....	6
2.7 Excavation/Staging/Loading/Hauling/Disposal .....	7
2.8 Temporary Traffic Control .....	10
2.9 Stormwater Management/Erosion Control .....	10
2.10 Placement of Excavated Soils .....	10
2.11 Backfill/Restoration .....	10
<b>3.0 HEALTH AND SAFETY PLAN IMPLEMENTATION</b> .....	11
<b>4.0 CERTIFICATIONS</b> .....	14

OxyChem/Olin  
102nd Street Landfill Site

**APPENDICES**

APPENDIX A - PERMITTING DOCUMENTATION

APPENDIX B - IN-SITU BACKFILL DENSITY & MOISTURE TEST RESULTS

### LIST OF TABLES

<u>TABLE</u>	<u>TITLE</u>	<u>PAGE</u>
1	Geotechnical Test Results - Backfill Material .....	12
2	Analytical Test Results - Backfill Material .....	13

### LIST OF DRAWINGS

<u>DRAWING NUMBER</u>	<u>TITLE</u>
594000-30L-02	Master Site Remediation Plan

### LIST OF FIGURES

<u>FIGURE</u>	<u>TITLE</u>
Figure 1.2.1	Composite Topographic Map of Triangular Area at 102nd Street Landfill

## 1.0 INTRODUCTION

This Remedial Action Report (RAR) documents the execution of the Remedial Action Program for remediation of the off-site soils in the Triangular Area north of Buffalo Avenue. These off-site soils constitute a part of Operable Unit-1 (OU-1) at the 102nd Street Landfill Site (Site).

The Remedial Action Program for the Triangular Area north of Buffalo Avenue includes four inter-related tasks:

- Task 1:** Preparation of the Remedial Design Document (RDD) presenting the activities to be completed in order to implement the selected remedy presented in the Record of Decision (ROD) and in conformance with the objectives presented in the Remedial Design Work Plan (RDWP) for the Site.
- Task 2:** Execution of the Remedial Action Program, presented in the RDD, with oversight and monitoring of construction activities by an Environmental Protection Agency/New York State Department of Environmental Conservation (EPA/NYSDEC) on-site representative.
- Task 3:** Inspection of the completed remedy by an EPA/NYSDEC Representative.
- Task 4:** Certification and summary of the remedial activities as documented in this RAR.

### 1.1 Background

The selected remedial action for the Site, located in Niagara Falls, New York was presented in the ROD issued on September 26, 1990. The Remedial Design Work Plan

for the Site, which describes the overall approach to the design of remedial measures, was approved by EPA on May 6, 1992. The RDD for the Triangular Area North of Buffalo Avenue was approved by the EPA on October 12, 1993, and included the following documents:

- Description of Remedial Program (Exhibit D);
- Health and Safety Plan (Exhibit F);
- Construction Drawings (Exhibit G);
- Construction Specifications (Exhibit H);
- Milestone Report No. 4, Off-Site Soils Survey, Rev. 1, October 1988 (Exhibit I); and
- OCC Fill Material Cell Management Plan, August 16, 1991 (Exhibit J).

One of the components of the selected remedy is the excavation and consolidation of the off-site soils onto the 102nd Street Landfill Site. Off-site soils were present at the Triangular Area adjacent to the Landfill, north of Buffalo Avenue and south of the LaSalle Expressway. The extent of the off-site soils within the Triangular Area with organic Site Specific Indicators (SSIs) concentrations above the survey level, as shown on Drawing No. 594000-30L-02, revision 3, dated 12/10/93, was reported in Milestone Report No. 4, Off-Site Soils Survey, Rev. 1, October 1988 and the Remedial Investigation report (July 1990).

## **1.2 Site Description**

The Triangular Area is part of the 102nd Street Landfill Site. It is a narrow triangular parcel of land with its long axis trending roughly east-west and varies in width from approximately 10 feet to 125 feet (west to east) and is approximately 1110 feet long. The triangular parcel is bordered on the south by Buffalo Avenue and on the north by the LaSalle Expressway. This parcel is located north of the Landfill, across Buffalo Avenue. The northern boundary of the parcel is physically delineated (approximately) by a chain link fence running along the right-of-way of the LaSalle Expressway. Three feet from the

edge of pavement of Buffalo Avenue approximately defines the southern boundary of the parcel. The location of the sample points that define the boundaries of the Triangular Area are shown on Drawing No. 594000-30L-02. The eastern limit of the parcel is located half way between sampling vectors J and K, as indicated on Drawing No. 594000-30L-02. The western boundary is represented by a line perpendicular to Buffalo Avenue beginning at a point which is approximately 500 feet west of the northwest corner of OxyChem's property and extending a distance of 10 feet from the edge of the pavement.

The surface of the Triangular Area slopes gently (one percent or less) to the south and east. The present drainage patterns of the parcel are predominantly from north to south toward Buffalo Avenue, and runoff from the LaSalle Expressway is collected by existing catch basins along the northern boundary of the Triangular Area. The majority of the Triangular Area is vegetated with grass and some trees. Most of the trees are located in the westerly portion of the parcel. The only structure remaining on the area is a billboard located near the middle portion. This billboard is identified on Figure 1.2.1. An asphalt-paved parking area exists around and adjacent to the site of a previously existing restaurant. Additionally, an area immediately west and adjacent to this pavement was covered with gravel and was used for parking.

### **1.3 Purpose/Scope of Work**

The purpose of the remedial program was to consolidate off-site soils, that exhibited concentrations of organic SSI's above the survey level, in the Fill Material Placement Cell on the Landfill, as illustrated on Drawing No. 594000-30L-02. These materials will be used as fill for grading beneath the cap to be placed over the Landfill. The scope of the remedial action program for the off-site soils within the Triangular Area is discussed in Section 2.0 and includes the following activities:

- clearing and grubbing,

- fencing/delineation of Work Zone,
- excavation,
- traffic controls,
- stormwater management,
- placement of excavated soils in the Fill Material Placement Cell on the Landfill, and
- backfill and restoration of excavated areas.

## **2.0 REMEDIAL ACTION PROGRAM**

The Remedial Action Program was executed by Severson Environmental Services, Inc. between October 26 and November 19, 1993 and is described in the following sections. Field activities were monitored by Mr. James Tuk, Division of Hazardous Waste Remediation, Region 9, NYSDEC.

### **2.1 Preconstruction Activities**

The following activities were completed prior to commencing field work:

- Access agreements for properties within the Triangular Area were obtained by OxyChem/Olin.
- The former restaurant building (9802 Buffalo Avenue) within the Triangular Area was demolished, in May, 1993.
- A pre-excavation topographic survey was performed by McIntosh & McIntosh, P.C., a New York State licensed surveyor, on October 28, 1993. A plan of this topographic survey is presented in Figure 1.2.1. The locations of the sampling points that define the boundaries of the entire excavation area (Milestone Report No. 4), as shown on Drawing No. 594000-30L-02, and the sampling points that define the sampling grid quadrants S01 through S30 were identified by survey stakes. After the initial round of verification sampling/testing, the boundaries of



grid quadrants S01 and S04 were marked in the field to delineate those areas requiring excavation to a greater depth than the remainder of the Triangular Area.

- City of Niagara Falls permit for the work was obtained on October 19, 1993. Inquiries were made to the New York State Department of Transportation (NYSDOT) for obtaining a Highway Work Permit, but NYSDOT did not require a Permit to be issued. The City of Niagara Falls permit and letter regarding the NYSDOT response are attached in Appendix A.
- Public utility companies were notified of the work via the New York State utility one-call system, on October 18, 1993, and the City of Niagara Falls Sewer and Water Departments were notified. The utility companies visited the site and marked their respective underground lines in the field.

## **2.2 Verification Soil Sampling and Testing Program**

A soil sampling and testing program was performed, prior to site remedial activities, to determine the required depths of excavation for the Triangular Area Remedial Action. The results of the sampling and testing program are presented in Verification Sampling, Data Summary Report, Accelerated Remedial Program for the Off-Site Soils, Triangular Area North of Buffalo Avenue. This report was submitted to the EPA/NYSDEC on December 1, 1993. Based on the results of the program, the depth of excavation was set at 18 inches for all grid areas with the exception of grid quadrants S01 and S04 where the required depth of excavation was established at 36 inches and 54 inches, respectively. The grid quadrants are shown diagrammatically on Figure 1.2.1.

## **2.3 Tree Removal/Clearing and Grubbing**

Trees and shrubs within the Triangular Area were removed, hauled onto the Landfill

and stockpiled for further processing to be completed as part of the remedial activities planned for the Landfill. The chain link fence that ran approximately along the northern boundary of the Triangular Area was removed and scrapped.

#### **2.4 Fencing/Demarcation of Work Zone**

The boundary of the work site was enclosed with a four-foot orange snow fence, secured by temporary fence posts driven into the ground. The chain link fencing, removed prior to the excavation activities, was replaced with new chain link fencing.

#### **2.5 Equipment Cleaning**

Trucks and excavation equipment were inspected for cleanliness upon mobilization to the Triangular Area and found to be acceptable. At the completion of excavation activities, polyethylene sheeting was placed over the area just east of the limits of the excavation. The excavation equipment was then moved onto the sheeting, and loose soil was manually scraped clean from the equipment. After this pre-cleaning, the equipment was loaded onto low-boy trailers and transported to the decontamination pad at the OxyChem Buffalo Avenue facility for further cleaning with a high-pressure water spray.

#### **2.6 Haul Road**

A temporary haul road was constructed along the east-west length of the site to provide truck access for hauling the excavated material. The haul road was located approximately 15 feet north of the southern excavation boundary extending from the western edge of the gravel parking lot to approximately 550 feet to the west. Construction of the haul road consisted of a six-inch layer of aggregate placed over a woven geotextile fabric laid directly on the ground surface. This haul road served

to inhibit contact of the haul trucks with the soils to be excavated. The haul road construction materials were excavated along with the off-site soils, as the work progressed from west to east, and placed in the Fill Material Placement Cell at the Landfill.

## **2.7 Excavation/Staging/Loading/Hauling/Disposal**

On Thursday, October 28, 1993, excavation began at the west end of the Triangular Area, and proceeded to the east. A backhoe was used to excavate an approximately 140-foot long narrow strip at the western-most portion of the excavation. A hydraulic excavator mounted on crawler tracks (trackhoe) was used for the balance of the excavation. The material was excavated, and either temporarily staged near the haul truck loading location or loaded directly into the haul trucks. During truck loading, care was taken to avoid spilling material over the sides of the trucks. After loading, the excavated material was transported to the Fill Material Placement Cell at the Landfill for disposal.

The Triangular Area was excavated to a depth of 18 inches, except for grid quadrants S01 and S04 which were excavated to depths of 36 inches and 54 inches, respectively (refer to Figure 1.2.1 for layout of grid quadrants). An approximate 1:1 horizontal to vertical slope was maintained along the southern edge of the excavation which borders Buffalo Avenue. Grid quadrant S01 was excavated to a depth of 36 inches with the exception of an area that extended approximately 11 feet on either side of the utility pole and guy wire located within the grid area. In order to ensure the structural integrity of the utility pole and guy-wire, the soil was excavated to an 18-inch depth in the vicinity of the pole and guy-wire.

Throughout the execution of excavation work, the bottom of the excavation was surveyed by McIntosh & McIntosh, P.C., a New York State licensed surveyor, to

verify that the required depths were met. The surveyed elevations at the bottom of the excavation are shown on Figure 1.2.1.

The excavation proceeded to the east sequentially from grid quadrant S01. However, grid quadrant S04 was not excavated in sequence because additional soil sampling was required to determine the ultimate depth of excavation in that grid quadrant. The excavation activities were completed, with the exception of grid quadrant S04, on Thursday, November 4, 1993. During this period, grid quadrant S04 was covered with polyethylene sheeting and berms were constructed along the east and west sides to prevent migration of stormwater runoff from grid quadrant S04 to the adjacent excavated areas.

On Tuesday, November, 9, 1993, grid quadrant S04 was excavated to the required depth of 54 inches to complete the excavation activities. Special care was taken during excavating and loading of trucks to avoid spilling material over the adjacent, previously excavated areas. In order to maintain the structural integrity of a utility pole located in grid quadrant S04, the soil within an approximate five-foot radius around the pole was excavated to an 18-inch depth. The excavation was then extended to a depth of 54 inches on an approximate 1:1 slope.

Several buried structures were encountered during the excavation activities. These structures are identified on Figure 1.2.1 and described briefly in the following paragraphs.

Two concrete "septic" tanks were uncovered east of the location of the previously existing restaurant. One tank was approximately 24 inches in diameter and three feet deep, and the other was approximately six feet square and 3 feet-6 inches deep. The bottom of both septic tanks were at approximately five feet below grade. These tanks were demolished and removed along with excavated soils and

transported to the Fill Material Placement Cell at the Landfill. Verbal approval for the decommissioning of the two septic tanks was given by Robert Buzelli, of the Niagara County Department of Health.

A sewer manhole was also encountered during excavation activities near the southeast corner of the Triangular Area. The top of the manhole lid was located approximately six inches below existing grade and the bottom of the manhole was approximately 3 feet-8 inches below existing grade. Inlet and outlet pipes both approximately eight inches in diameter, with invert elevations approximately 3 feet-8 inches below existing grade, were observed emanating from the manhole extending parallel to Buffalo Avenue. The City of Niagara Falls Sewer Department was notified, and Mr. Jim Hook, Sewer Department Inspector, visited the site to inspect the manhole. Mr. Hook stated that the sewer appeared to be active. Therefore, the elevation of the manhole's frame and cover were adjusted to match the planned final grade.

During the excavation of grid quadrant S04, a two-inch plastic, natural gas line, was encountered at approximately 3 feet-4 inches below existing grade and damaged. The location or presence of this line had not been identified in the area by National Fuel Gas Company when they marked their lines in the field prior to excavation. The Gas Company was immediately notified, and they subsequently repaired the line.

A concrete headwall was encountered during the excavation of grid quadrant S04 at the southern boundary of the grid quadrant. The top of the headwall was approximately 18 inches below existing grade, with a corrugated steel pipe (culvert) apparently extending north to south beneath Buffalo Avenue. The invert elevation of the culvert was approximately three feet below existing grade. The culvert appeared to be clogged with soil. Both the headwall and pipe were left in-place.

## **2.8 Temporary Traffic Control**

Reflective traffic warning signs, with top-mounted flashing lights, were placed along the north edge of Buffalo Avenue over the length of the work area. A flagman was used to control traffic when trucks were crossing Buffalo Avenue during excavation and backfilling activities.

## **2.9 Stormwater Management/Erosion Control**

After excavation of the Triangular Area and prior to backfilling, stormwater accumulated within some portions of the excavation. Approximately 2000 gallons of water were removed from the excavation using a vacuum tanker truck and the water was transported to a holding tank at the Site. The water will be disposed as part of later planned remedial activities at the Site.

## **2.10 Placement of Excavated Soils**

Excavated materials were transported to the Fill Material Placement Cell (Cell) at the Landfill and the material was continuously spread in layers approximately 18 inches thick, and compacted. Temporary cover was not necessary due to the moisture content of the excavated material. Sediment/erosion control measures are in place at the Cell as part of the work plan for operation and maintenance of the Cell.

## **2.11 Backfill/Restoration**

Backfill material was obtained from the Wheatfield Lakes Project (Summit Lake borrow source), Wheatfield, New York. Analytical and geotechnical tests were conducted by the Contractor prior to placement of the backfill at the site. Test results are presented in Tables 1 and 2. The quality control (QC) limits, established by Waste Stream Technology, Inc., the analytical laboratory, were met.

The backfill material was spread in layers approximately 12 inches thick by a dozer, then compacted with a vibratory compaction roller. Backfilling operations occurred from November 4 to 12, 1993. In-situ compaction and moisture testing were performed during backfilling by SJB Services, Inc. in order to verify that the specified backfill requirements were met. The results of the compaction testing, that substantiate compliance with the specification for compaction, are presented in Appendix B. Backfill material was placed to approximately six inches below the planned finish grade. After obtaining the required compaction of the backfill material, six inches of topsoil was placed over the entire Triangular Area and graded to generally reflect the pre-excitation topography. A temporary drainage swale has been established for stormwater drainage. The swale is located approximately 460 feet from the western edge of the Triangular Area and runs perpendicular to Buffalo Avenue, from Buffalo Avenue to the existing drainage swale north of the Triangular Area (see Figure 1.2.1). Minor regrading of the site will be performed when weather permits to minimize stormwater runoff from the Triangular Area on to Buffalo Avenue.

Pre-existing and final topography of the Triangular Area, prepared by McIntosh & McIntosh, P.C., a New York State licensed surveyor, are shown on Figure 1.2.1. Subsequent to topsoil placement, a mixture comprised of seed, fertilizer and mulch, was applied over the Triangular Area by hydroseeding.

### **3.0 HEALTH AND SAFETY PLAN IMPLEMENTATION**

Air monitoring for volatiles, particulate and mercury vapor was performed during excavation activities. An HNU photo-ionization detector (PID) was used to monitor volatile concentrations and an MIE MiniRam was used to monitor particulate levels. No readings that exceeded the background concentrations were observed. Draeger Tubes were used for monitoring mercury vapor, and no indications of mercury vapor were detected. An Air Monitoring Logbook for the project is available for inspection at the OxyChem Niagara Falls Plant, S-Area Office (Buffalo Avenue and 53rd Street).

**TABLE 1**  
**GEOTECHNICAL TEST RESULTS**  
**BACKFILL MATERIAL**  
**TRIANGULAR AREA REMEDIAL ACTION**  
**102ND STREET LANDFILL SITE**  
**NIAGARA FALLS, NEW YORK**

Maximum Dry Density	116 pounds per cubic foot
Optimum Moisture Content	16.5%
USCS Soil Classification	CL
Atterberg Limits:	
Liquid Limit	30
Plastic Limit	16
Plasticity Index	14

**NOTE:**

1. Soil testing performed by Glynn Geotechnical Engineering, Lockport, New York. Test data reported on November 2, 1993.



TABLE 2  
ANALYTICAL TEST RESULTS  
TRIANGULAR AREA REMEDIAL ACTION  
102ND STREET LANDFILL SITE

Sample I.D.	WS02605	WS02833	WS02834	WS02835
Sample Description	Backfill	Backfill	Backfill	Topsoil
Analysis Date	10/29/93	11/04/93	11/04/93	11/04/93

**TAL Inorganics**

Analyte	Units	WS02605	WS02833	WS02834	WS02835
Aluminum	mg/kg	21580	29440	24334	19432
Antimony	mg/kg	ND	0.6	0.7	0.5
Arsenic	mg/kg	3.3	5.6	4.2	2.5
Barium	mg/kg	51.1	73.5	253	94.7
Beryllium	mg/kg	ND	ND	ND	1.9
Cadmium	mg/kg	8.4	3.18	2.47	3.02
Calcium	mg/kg	76970	33347	68401	3532
Chromium	mg/kg	20.2	31.2	27.4	18.6
Cobalt	mg/kg	8.5	9.9	12.1	6.2
Copper	mg/kg	17.2	17.9	21.4	14.9
Iron	mg/kg	27130	38849	38806	14871
Lead	mg/kg	10.6	ND	8.9	16.9
Manganese	mg/kg	415	332	553	81.7
Magnesium	mg/kg	15740	18660	17653	3563
Mercury	mg/kg	ND	ND	ND	ND
Nickel	mg/kg	22.4	30.9	28.1	16.4
Potassium	mg/kg	6345	11228	11821	1281
Selenium	mg/kg	0.1	ND	ND	0.32
Silver	mg/kg	ND	ND	ND	ND
Sodium	mg/kg	730	882	790	342
Thallium	mg/kg	0.15	0.2	0.1	0.2
Vanadium	mg/kg	17.4	41.6	35.3	23.1
Zinc	mg/kg	52.1	70.6	61.7	62.4

Note: All analytical testing in Table 2 conducted by Waste Stream Technology, Inc.

TABLE 2 (Cont'd.)  
ANALYTICAL TEST RESULTS  
BACKFILL MATERIAL  
TRIANGULAR AREA REMEDIAL ACTION  
102ND STREET LANDFILL SITE

Sample I.D.	WS02605	WS02924	WS02925	WS02926
Sample Description	Backfill	Backfill	Backfill	Topsoil
Analysis Date	10/29/93	11/09/93	11/09/93	11/09/93

**TCL - Volatiles, Method 8240**

Compound	Units				
Chloromethane	ug/kg	ND10	ND10	ND10	ND10
Bromomethane	ug/kg	ND10	ND10	ND10	ND10
Vinyl Chloride	ug/kg	ND10	ND10	ND10	ND10
Chloroethane	ug/kg	ND10	ND10	ND10	ND10
Methylene Chloride	ug/kg	ND5	ND10	ND10	ND10
Acetone	ug/kg	ND100	ND100	ND100	ND100
Carbon Disulfide	ug/kg	ND5	ND5	ND5	ND5
1,1-Dichloroethene	ug/kg	ND5	ND5	ND5	ND5
1,1-Dichloroethene	ug/kg	ND5	ND5	ND5	ND5
1,2-Dichloroethene (total)	ug/kg	ND5	ND5	ND5	ND5
Chloroform	ug/kg	ND5	ND5	ND5	ND5
2-Butanone	ug/kg	ND100	ND100	ND100	ND100
1,2-Dichloroethane	ug/kg	ND5	ND5	ND5	ND5
1,1,1-Trichloroethane	ug/kg	ND5	ND5	ND5	ND5
Carbon Tetrachloride	ug/kg	ND5	ND5	ND5	ND5
Vinyl Acetate	ug/kg	ND50	ND50	ND50	ND50
Bromodichloromethane	ug/kg	ND5	ND5	ND5	ND5
1,2-Dichloropropane	ug/kg	ND5	ND5	ND5	ND5
Cis-1,3-Dichloropropene	ug/kg	ND5	ND5	ND5	ND5
Trichloroethene	ug/kg	ND5	ND5	ND5	ND5
Benzene	ug/kg	ND5	ND5	ND5	ND5
Dibromochloromethane	ug/kg	ND5	ND5	ND5	ND5
Trans-1,3-Dichloropropene	ug/kg	ND5	ND5	ND5	ND5
1,1,2-Trichloroethane	ug/kg	ND5	ND5	ND5	ND5
2-Chloroethylynyl ether	ug/kg	ND10	ND10	ND10	ND10
Bromoform	ug/kg	ND5	ND5	ND5	ND5
4-Methyl-2-Pentanone	ug/kg	ND50	ND50	ND50	ND50
2-Hexanone	ug/kg	ND50	ND50	ND50	ND50
1,1,2,2-Tetrachloroethane	ug/kg	ND5	ND5	ND5	ND5
Tetrachloroethene	ug/kg	ND5	ND5	ND5	ND5
Toluene	ug/kg	ND5	ND5	ND5	ND5
Chlorobenzene	ug/kg	ND5	ND5	ND5	ND5
Ethylbenzene	ug/kg	ND5	ND5	ND5	ND5
Styrene	ug/kg	ND5	ND5	ND5	ND5
O & P-Xylene	ug/kg	ND5	ND5	ND5	ND5
M-Xylene	ug/kg	ND5	ND5	ND5	ND5

Continued

TABLE 2 (Cont'd.)  
ANALYTICAL TEST RESULTS  
BACKFILL MATERIAL  
TRIANGULAR AREA REMEDIAL ACTION  
102ND STREET LANDFILL SITE

Sample I.D.	WS02605	WS02911	WS02912	WS02910
Sample Description	Backfill	Backfill	Backfill	Topsoil
Analysis Date	10/29/93	11/08/93	11/08/93	11/08/93

**TCL - Semi-volatiles, Method 8270**

Compound	Units	WS02605	WS02911	WS02912	WS02910
N-Nitrosodimethylamine	ug/kg	ND330	ND330	ND330	ND330
Phenol	ug/kg	ND330	ND330	ND330	ND330
Aniline	ug/kg	ND330	ND330	ND330	ND330
Bis (2-Chloroethyl) ether	ug/kg	ND330	ND330	ND330	ND330
2-Chlorophenol	ug/kg	ND330	ND330	ND330	ND330
1,3-Dichlorobenzene	ug/kg	ND330	ND330	ND330	ND330
1,4-Dichlorobenzene	ug/kg	ND330	ND330	ND330	ND330
Benzyl Alcohol	ug/kg	ND660	ND660	ND660	ND660
1,2-Dichlorobenzene	ug/kg	ND330	ND330	ND330	ND330
2-Methylphenol	ug/kg	ND330	ND330	ND330	ND330
Bis (2-Chloroisopropyl) ether	ug/kg	ND330	ND330	ND330	ND330
4-Methylphenol	ug/kg	ND330	ND330	ND330	ND330
N-nitrosodi-n-propylamine	ug/kg	ND330	ND330	ND330	ND330
Hexachloroethane	ug/kg	ND330	ND330	ND330	ND330
Nitrobenzene	ug/kg	ND330	ND330	ND330	ND330
Isophorone	ug/kg	ND330	ND330	ND330	ND330
2-Nitrophenol	ug/kg	ND330	ND330	ND330	ND330
2,4-Dimethylphenol	ug/kg	ND330	ND330	ND330	ND330
Bis (2-Chloroethoxy) methane	ug/kg	ND330	ND330	ND330	ND330
Benzoic Acid	ug/kg	ND1650	ND1650	ND1650	ND1650
2,4-Dichlorophenol	ug/kg	ND330	ND330	ND330	ND330
1,2,4-Trichlorobenzene	ug/kg	ND330	ND330	ND330	ND330
Naphthalene	ug/kg	ND330	ND330	ND330	ND330
4-Chloroaniline	ug/kg	ND660	ND660	ND660	ND660
Hexachlorobutadiene	ug/kg	ND330	ND330	ND330	ND330
4-Chloro-3-Methylphenol	ug/kg	ND660	ND660	ND660	ND660
2-Methylnaphthalene	ug/kg	ND330	ND330	ND330	ND330
Hexachlorocyclopentadiene	ug/kg	ND330	ND330	ND330	ND330
2,4,6-Trichlorophenol	ug/kg	ND330	ND330	ND330	ND330
2,4,5-Trichlorophenol	ug/kg	ND330	ND330	ND330	ND330
2-Chloronaphthalene	ug/kg	ND330	ND330	ND330	ND330
2-Nitroaniline	ug/kg	ND1650	ND1650	ND1650	ND1650
Dimethylphthalate	ug/kg	ND330	ND330	ND330	ND330
Acenaphthylene	ug/kg	ND330	ND330	ND330	ND330
3-Nitroaniline	ug/kg	ND1650	ND1650	ND1650	ND1650
2,6-Dinitrotoluene	ug/kg	ND330	ND330	ND330	ND330
Acenaphthene	ug/kg	ND330	ND330	ND330	ND330
2,4-Dinitrophenol	ug/kg	ND1650	ND1650	ND1650	ND1650
4-Nitrophenol	ug/kg	ND1650	ND1650	ND1650	ND1650
Dibenzofuran	ug/kg	ND330	ND330	ND330	ND330

Continued

TABLE 2 (Cont'd.)  
ANALYTICAL TEST RESULTS  
BACKFILL MATERIAL  
TRIANGULAR AREA REMEDIAL ACTION  
102ND STREET LANDFILL SITE

Sample I.D. Sample Description	WS02605 Backfill	WS02911 Backfill	WS02912 Backfill	WS02910 Topsoil
Analysis Date	11/08/93	11/08/93	11/08/93	11/08/93

**Method 8270 (Cont'd.)**

Compound	Units				
2,4-Dinitrotoluene	ug/kg	ND330	ND330	ND330	ND330
Diethylphthalate	ug/kg	ND330	ND330	ND330	ND330
Fluorene	ug/kg	ND330	ND330	ND330	ND330
4-Nitroaniline	ug/kg	ND660	ND660	ND660	ND660
4-Chlorophenylphenylether	ug/kg	ND330	ND330	ND330	ND330
4,6-Dinitro 2-Methylphenol	ug/kg	ND1650	ND1650	ND1650	ND1650
N-Nitrosodiphenylamine	ug/kg	ND330	ND330	ND330	ND330
4-Bromophenylphenylether	ug/kg	ND330	ND330	ND330	ND330
Hexachlorobenzene	ug/kg	ND330	ND330	ND330	ND330
Pentachlorophenol	ug/kg	ND1650	ND1650	ND1650	ND1650
Phenanthrene	ug/kg	ND330	ND330	ND330	ND330
Anthracene	ug/kg	ND330	ND330	ND330	ND330
Carbazole	ug/kg	ND330	ND330	ND330	ND330
Di-n-butylphthalate	ug/kg	ND330	ND330	ND330	ND330
Fluoranthene	ug/kg	ND330	ND330	ND330	ND330
Benzidine	ug/kg	ND3300	ND3300	ND3300	ND3300
Pyrene	ug/kg	ND330	ND330	ND330	ND330
Butylbenzylphthalate	ug/kg	ND330	ND330	ND330	ND330
3,3'-Dichlorobenzidine	ug/kg	ND660	ND660	ND660	ND660
Benzo (a) Anthracene	ug/kg	ND330	ND330	ND330	ND330
Chrysene	ug/kg	ND330	ND330	ND330	ND330
Bis (2-ethylhexyl) Phthalate	ug/kg	ND330	ND330	ND330	ND330
Di-n-octylphthalate	ug/kg	ND330	ND330	ND330	ND330
Benzo (b) Fluoranthene	ug/kg	ND330	ND330	ND330	ND330
Benzo (k) Fluoranthene	ug/kg	ND330	ND330	ND330	ND330
Benzo (a) Pyrene	ug/kg	ND330	ND330	ND330	ND330
Indeno (1,2,3-cd) Pyrene	ug/kg	ND330	ND330	ND330	ND330
Dibenzo (a,h) Anthracene	ug/kg	ND330	ND330	ND330	ND330
Benzo (g,h,i) Perylene	ug/kg	ND330	ND330	ND330	ND330

TABLE 2 (Cont'd.)  
 ANALYTICAL TEST RESULTS  
 BACKFILL MATERIAL  
 TRIANGULAR AREA REMEDIAL ACTION  
 102ND STREET LANDFILL SITE

Sample I.D.	WS02605	WS02833	WS02834	WS02835
Sample Description	Backfill	Backfill	Backfill	Topsoil
Analysis Date	10/29/93	11/06/93	11/06/93	10/06/93

**TCL - Pesticides**

Compound	Units				
Endrin	ug/kg	ND	ND	ND	ND
Endrin Aldehyde	ug/kg	ND	ND	ND	ND
Heptachlor	ug/kg	ND	ND	ND	ND
Heptachlor Epoxide	ug/kg	ND	ND	ND	ND
Methoxychlor	ug/kg	ND	ND	ND	ND
Toxaphene	ug/kg	ND	ND	ND	ND
Aldrin	ug/kg	ND	ND	ND	ND
Alpha-BHC	ug/kg	ND	ND	ND	ND
Beta-BHC	ug/kg	ND	ND	ND	ND
Delta-BHC	ug/kg	ND	ND	ND	ND
Gamma-BHC (Lindane)	ug/kg	ND	ND	ND	ND
Chlordane	ug/kg	ND	ND	ND	ND
4,4'-DDD	ug/kg	ND	ND	ND	ND
4,4'-DDE	ug/kg	ND	ND	ND	ND
4,4'-DDT	ug/kg	ND	ND	ND	ND
Dieldrin	ug/kg	ND	ND	ND	ND
Endosulfan I	ug/kg	ND	ND	ND	ND
Endosulfan II	ug/kg	ND	ND	ND	ND
Endosulfan Sulfate	ug/kg	ND	ND	ND	ND

**TCL - PCB, Method 8080**

Aroclor 1016	mg/kg	ND	ND	ND	ND
Aroclor 1221	mg/kg	ND	ND	ND	ND
Aroclor 1232	mg/kg	ND	ND	ND	ND
Aroclor 1242	mg/kg	ND	ND	ND	ND
Aroclor 1248	mg/kg	ND	ND	ND	ND
Aroclor 1254	mg/kg	ND	ND	ND	ND
Aroclor 1260	mg/kg	ND	ND	ND	ND

#### 4.0 CERTIFICATIONS

**RESPONDENT'S CERTIFICATION for REMEDIAL ACTION REPORT, TRIANGULAR AREA NORTH OF BUFFALO AVENUE, 102nd STREET LANDFILL SITE, NIAGARA FALLS, NEW YORK, dated December 23, 1993, prepared by FLUOR DANIEL, INC.**

*I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or these persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete.*



---

Alan F. Weston, Ph.D., Occidental Chemical Corporation



---

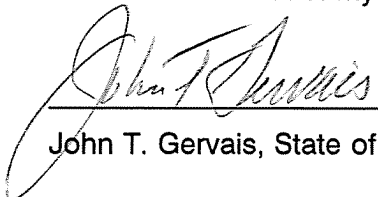
David L. Cummings, Olin Chemicals

OxyChem/Olin  
102nd Street Landfill Site

**THIS PAGE INTENTIONALLY LEFT BLANK**

**NEW YORK STATE PROFESSIONAL ENGINEER'S CERTIFICATION for REMEDIAL ACTION REPORT, TRIANGULAR AREA NORTH OF BUFFALO AVENUE, 102nd STREET LANDFILL SITE, NIAGARA FALLS, NEW YORK, dated 12/23/93, prepared by FLUOR DANIEL, INC.**

This report documents the remedial activities completed at the Triangular Area North of Buffalo Avenue, 102nd Street Landfill Site. I certify that the remedial activities implemented at the Triangular Area were completed in substantial conformance with the requirements of the Remedial Design Documents, the ROD and the Administrative Order. The data presented is considered to be technically correct to the best of my knowledge.



John T. Gervais, State of New York Professional Engineer (057744-1)



The accounts of the remedial activities executed at the Triangular Area presented herein are a true and accurate summary of the observations made during the implementation period.



Larry Bell, Engineer



**APPENDIX A**

**PERMITTING DOCUMENTATION**



# City of Niagara Falls, New York

PERMIT APPLICATION: 93-42368 Type: 0195 OTHER Issued By: RCD

Property Owner: \_\_\_\_\_ Property Address Location: \_\_\_\_\_ Tax Map Number (SBL): \_\_\_\_\_

CITY OWN BUFFALO AVE @ 10 CITY

Permit: 93-42368 Received: 10/18/93 Issue: 10/19/93 Expire: 11/19/93

THE CITY ENGINEER: I, the undersigned property owner request permission to perform work in front of or adjacent to premises known as: BUFFALO AVE @ 102ND, on Lot Number between and , on S side of street

to: EXCAVATE 18" OF SOIL ON SOUTH SHOULDER OF BUFFALO AVE @ REPLACE W/ NEW

----- Applicant -----

Name: CITY  
Addr: BUFFALO AVE @ 102ND  
, S, Z: NIAGARA FALLS, NY 14302  
Phone: 716- - Wk: 716- -

2035 <---- Contractor -----  
SEVENSON ENVIRONMENTAL SERV.  
PO BOX 760  
NIAGARA FALLS, NY 14302  
Exp: 09/30/94  
WARREN HOFFMAN & ASSOC. INC.

Signature: \_\_\_\_\_

Applicant acknowledges that receipt of all information & specifications required for this permit.

\*\*\*\*\*

## ENGINEERING DEPARTMENT PERMIT (This permit valid for 30 days from date of issuance)

Permit is hereby granted to the above named property owner to proceed with the work requested. The contractor shall abide by Chapter 901 (Amended 12/17/1990) and 903 Amended 10/03/1990 of the Codified Ordinances of the CITY OF NIAGARA FALLS, NEW YORK.

Approved By: KEVIN P. O'BRIEN P.E. City Engineer O/C: 23 PERMIT ISSUED

Initial Inspection Date: \_\_\_\_\_ Inspected By: \_\_\_\_\_

Final Inspection Date: \_\_\_\_\_ Inspected By: \_\_\_\_\_

Initial Fee Paid #: 30.00 Date Paid: 10/19/93 Check #: 56757 By: \_\_\_\_\_

Add'l Amount Due #: \_\_\_\_\_ Date Paid: \_\_\_\_\_ Check #: \_\_\_\_\_ By: \_\_\_\_\_

NOTES: This permit shall be kept ON THE SITE OF THE WORK AT ALL TIMES AND IN THE POSSESSION OF THE PERSON IN CHARGE OF THE WORK and shall be exhibited upon demand to the City Engineer or his designee.

Applicant or Contractor must notify City Engineer's Office 24 hours in advance of starting work. All work shall be done in a manner approved by and under direct supervision of the City Engineer and must comply with the Construction Specifications and Standards for The CITY OF NIAGARA FALLS, NEW YORK, dated 1/1/1991.

===== (EPFERLH.CNF) =====





October 29, 1993

**OCCIDENTAL CHEMICAL CORPORATION**  
360 Rainbow Boulevard South  
Niagara Falls, New York 14302

Attention: **Mr. Ron Ganguley**

Regarding: **Triangular Area/102<sup>nd</sup> Street**  
**Street Detour Permit**

Gentlemen:

We have contacted the New York State Department of Transportation Lockport office and they have instructed us that no state permit is required for any work on Buffalo Avenue, and specifically where the above referenced jobsite is located.

The reasoning for no permit requirements which Georgia Davis had given us was that Buffalo Avenue is not a state road but only a state touring route. Therefore not in there jurisdiction for temporary traffic control.

If there are any questions regarding this matter please call me.

Very truly yours,

**SEVENSON ENVIRONMENTAL SERVICES, INC.**

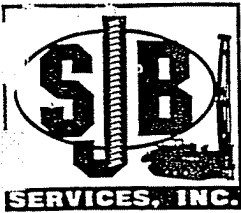
A handwritten signature in cursive script that reads 'David G. Warda'.

David G. Warda  
Project Engineer

DGW:tat  
cc: File

**APPENDIX B**

**IN-SITU BACKFILL DENSITY & MOISTURE TEST RESULTS**



**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

## *SJB Services, Inc.* Laboratory Test Report

**PROJECT :** 102ND STREET LANDFILL

**CLIENT :** FLUOR- DANIEL

**DATE :** NOVEMBER 17, 1993

**PROJECT NO.:** SJB-T173  
**REPORT NO.:** LTR-1

**SAMPLE INFORMATION :**

Sample No. 93-663 was collected at the work site by SJB Services, Inc. on November 4, 1993. Sample is described as Clay representing 5000 cyds of placed material. Source of the clay is Twin Lakes.

**ASTM D 4318 : Test Method for Liquid Limit, Plastic limit, and Plasticity Index of Soils**

Liquid Limit	Plastic Limit	Plasticity Index
33	17	16

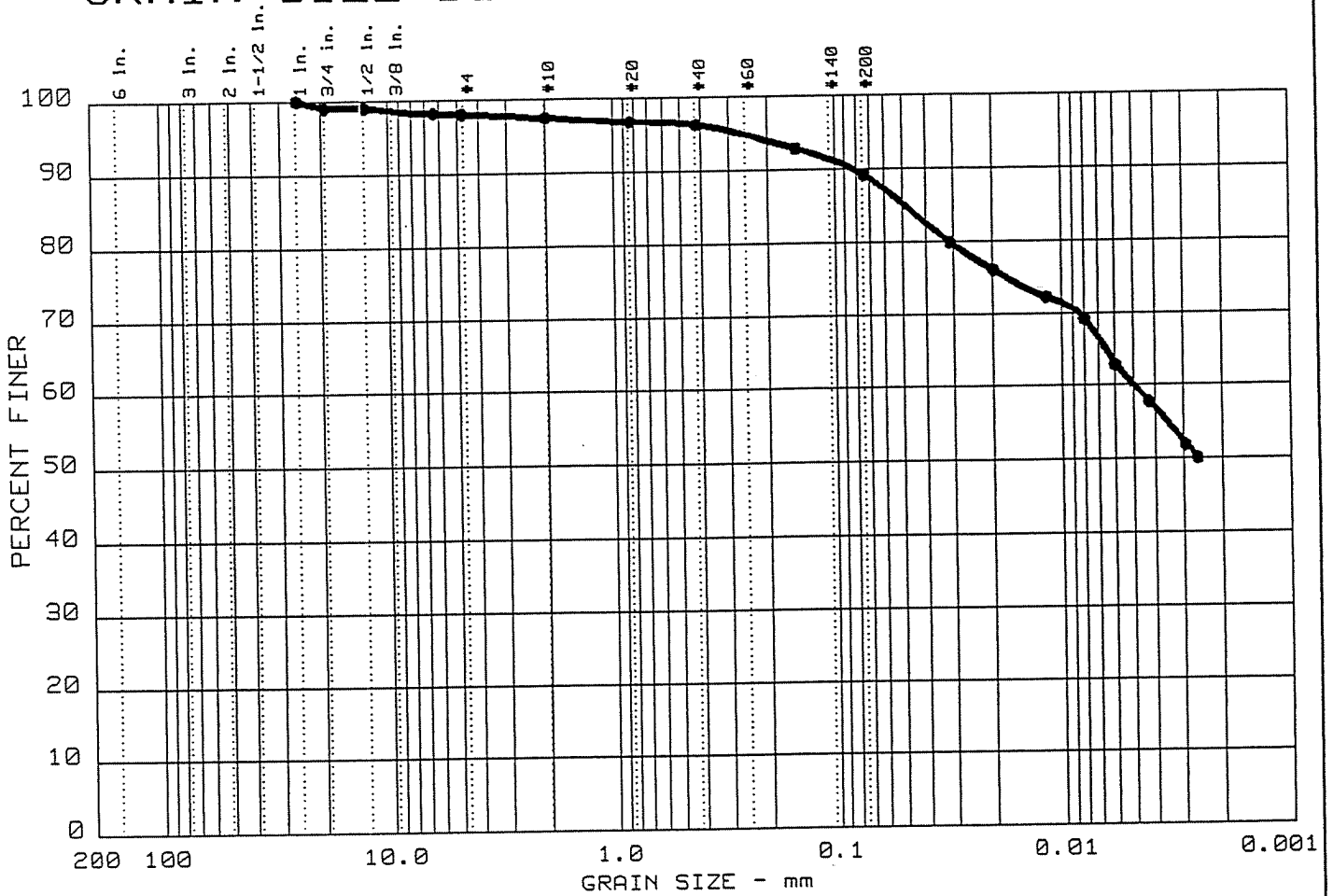
**ASTM D-422 : Particle Size Analysis of Soils**

COMPONENT PERCENTAGE			
GRAVEL	SAND	SILT	CLAY
1.9 %	8.9 %	29.3 %	59.9 %

SJB Services, Inc.

*Stanley J. Bias*  
Stanley J. Bias  
President

# GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 3	0.0	1.9	8.9	29.3	59.9

LL	PI	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
● 33	16								

MATERIAL DESCRIPTION	USCS	AASHTO
● CLAY REPRESENTING 5000 CYD OF PLACED MATERIAL	CL	A-6(13.4)

Project No.: SJB-T173 : LTR-1  
 Project: 102ND STREET LANDFILL - NIAGARA FALLS NY  
 ● Location: TWIN LAKES

Date: NOVEMBER 17, 1993

GRAIN SIZE DISTRIBUTION TEST REPORT  
**SJB Services, Inc.**

Remarks:  
 Collected by SJB from an on-site stockpile on November 4, 1993.  
 Sample ID# is 93-663

Figure No. *11-17*



**Contract  
Drilling  
and  
Testing**

BOX 5793-1  
1951 Hamburg Turnpike  
Buffalo, NY 14218

**FIELD IN-PLACE  
DENSITY TEST REPORT**

Phone: (716) 821-5911  
Fax: (716) 821-0163

PROJECT: OCCIDENTAL TRIANGULAR AREA LOCATION: NIAGARA FALLS  
 CLIENT: FLUOR DANIEL REPORT NO: FDR-1  
 CONTRACTOR: SEVENSON PROJECT NO: T173  
 WEATHER: Overcast DATE: 11-4-93  
 TEMPERATURE: 52°

Test No.	Date of Test	Depth or Elevation	In-place Density (pcf)	In-place Moisture (%)	% Compaction	Proctor Code	Location and Remarks
1	11-4-93	TOP OF CLAY	107.2	19.8	92.4		30' WEST OF EAST END 36' NORTH OF SOUTH END
2	"	"	105.7	19.8	91.1		141' WEST OF EAST END 54' NORTH OF SOUTH END
Proctor Code	Maximum Density (pcf)	Optimum Moisture (%)	Material Type and Source				
	116.0	16.5	CLAY (TWIN LAKES)				

Comments: NUCLEAR METHOD (20960)  
 Technician: LARRY BLAS  
 Time On Site: 4:00pm - 5:30pm

Respectfully Submitted,  
 SJB SERVICES, INC.  
Stanley J. Blas



**Contract  
Drilling  
and  
Testing**

BOX 5793-1  
1951 Hamburg Turnpike  
Buffalo, NY 14218

**FIELD IN-PLACE  
DENSITY TEST REPORT**

Phone: (716) 821-5911  
Fax: (716) 821-0163

PROJECT: TRIANGULAR REMEDIATION AREA LOCATION: NIAGARA FALLS N.Y.  
 CLIENT: FLUOR DANIEL REPORT NO: FDR-2  
 CONTRACTOR: SEVENSON PROJECT NO: T173  
 WEATHER: CLEAR DATE: 11-8-93  
 TEMPERATURE 42°

Test No.	Date of Test	Depth or Elevation	In-place Density (pcf)	In-place Moisture (%)	% Compaction	Proctor Code	Location and Remarks
1	11-8-93	TOP OF CLAY	103.3	11	93.3		36' WEST OF EAST END 21' SOUTH OF NORTH END
2	"	"	109.8	17.8	94.6		210' WEST OF EAST END 36' SOUTH OF NORTH END
Proctor Code	Maximum Density (pcf)	Optimum Moisture (%)	Material Type and Source				
	116.0	16.5	CLAY - TWIN LAKES				

Comments: NUCLEAR METHOD USED

Technician: LARRY BLAS

Time On Site: 1230PM - 430PM

Respectfully Submitted,  
SJB SERVICES, INC.

Larry Blas





Contract Drilling and Testing

BOX 5793-1  
1951 Hamburg Turnpike  
Buffalo, NY 14218

FIELD IN-PLACE  
DENSITY TEST REPORT

Phone: (716) 821-5911  
Fax: (716) 821-0163

PROJECT: TRIANGLE REMEDIATION AREA LOCATION: NIAGARA FALLS N.Y.  
CLIENT: FLUOR DANIEL REPORT NO: FDR-3  
CONTRACTOR: SEVENSON PROJECT NO: T173  
WEATHER/: OVERCAST DATE: 11-10-93  
TEMPERATURE 45°

Test No.	Date of Test	Depth or Elevation	In-place Density (pcf)	In-place Moisture (%)	% Compaction	Proctor Code	Location and Remarks
1	11-10-93	TOP OF CLAY	107.4	19.8	92.6	*	320' WEST OF EAST EDGE 10' NORTH OF SOUTH EDGE (96702010)
2	"	"	105.1	20.1	90.6		380' WEST OF EAST EDGE 15' SOUTH OF NORTH EDGE
3	"	"	109.3	19.7	94.2		400' WEST OF EAST EDGE 36' NORTH OF SOUTH EDGE

Proctor Code	Maximum Density (pcf)	Optimum Moisture (%)	Material Type and Source
*	116.0	16.5	CLAY (TWIN LAKES)

Comments: \* PROCTOR VALUES DETERMINED BY GLENN GEOTECHNICAL  
NUCLEAR METHOD USED (20968)

Technician: LARRY BLAS

Time On Site: 200AM - 600PM

Respectfully Submitted,  
SJB SERVICES, INC.  
Steve JBs



Contract Drilling and Testing

BOX 5793-1  
1951 Hamburg Turnpike  
Buffalo, NY 14218

FIELD IN-PLACE  
DENSITY TEST REPORT

Phone: (716) 821-5911  
Fax: (716) 821-0163

PROJECT: TRIANGLE REMEDIATION AREA LOCATION: NIAGARA FALLS N.Y.  
CLIENT: FLUOR DANIEL REPORT NO: FDR-4  
CONTRACTOR: SEVENSON PROJECT NO: T173  
WEATHER: OVERCAST DATE: 11-11-93  
TEMPERATURE: 43°

Test No.	Date of Test	Depth or Elevation	In-place Density (pcf)	In-place Moisture (%)	% Compaction	Proctor Code	Location and Remarks
1	11-11-93	FIRST LIFT	102.5	21.4	88.4	*	STATION 5+00 20' NORTH OF SOUTH EDGE (90% LEQ.1.0)
2	"	TOP OF CLAY	98.6	19.4	85.0	"	6' NORTH OF SOUTH EDGE STATION 3+00
3	"	"	106.0	19.2	91.4	"	RETEST OF TEST LOCATION # 2 AFTER FURTHER COMPACTION
4	"	FIRST LIFT	112.9	15.2	97.4	"	RETEST OF TEST LOCATION # 1 AFTER MATERIAL REWORKED AND RECOMPACTED
5	"	SECOND LIFT	105.0	19.8	90.5	"	STATION 5+70 25' NORTH OF SOUTH EDGE
6	"	SECOND LIFT	108.1	19.2	93.2	"	STATION 1+50 4' NORTH OF SOUTH EDGE

Proctor Code	Maximum Density (pcf)	Optimum Moisture (%)	Material Type and Source
*	116.0	16.5	CLAY (TWIN LAKES)

Comments: \* PROCTOR VALUES DETERMINED BY GLYNW GEOTECHNICAL; NUCLEAR METHOD USED

Technician: LARRY BLAS

Respectfully Submitted,  
SJB SERVICES, INC.

Time On Site: 8:30 AM - 5:00 PM



**Contract  
Drilling  
and  
Testing**

BOX 5793-1  
1951 Hamburg Turnpike  
Buffalo, NY 14218

Phone: (716) 821-5911  
Fax: (716) 821-0163

**FIELD IN-PLACE  
DENSITY TEST REPORT**

PROJECT: TRIANGLE REMEDIATION AREA

LOCATION: NIAGARA FALLS N.Y.

CLIENT: FLUOR DANIEL

REPORT NO: FDR-5

CONTRACTOR: SEVENSON

PROJECT NO: T-173

WEATHER: OVERCAST / CLEAR  
TEMPERATURE: 40° / 48°

DATE: 11-12-93

Test No.	Date of Test	Depth or Elevation	In-place Density (pcf)	In-place Moisture (%)	% Compaction	Proctor Code	Location and Remarks
1	11-12-93	THIRD LIFT	102.4	20.5	88.3	*	STATION 4+85 10' NORTH OF SOUTH EDGE (90% READ)
2	"	"	104.7	19.6	90.3	"	RETEST OF TEST LOCATION #1 AFTER FURTHER COMPACTION
3	"	"	105.0	20.3	90.5	"	STATION 4+35 5' NORTH OF SOUTH EDGE
4	"	FOURTH LIFT	104.9	20.4	90.4	"	STATION 4+80 24' NORTH OF SOUTH EDGE

Proctor Code	Maximum Density (pcf)	Optimum Moisture (%)	Material Type and Source
*	116.0	16.5	CLAY - TWIN LAKES

Comments: \* PROCTOR VALUE DETERMINED BY GLYNN GEOTECHNICAL; NUCLEAR METHOD USED

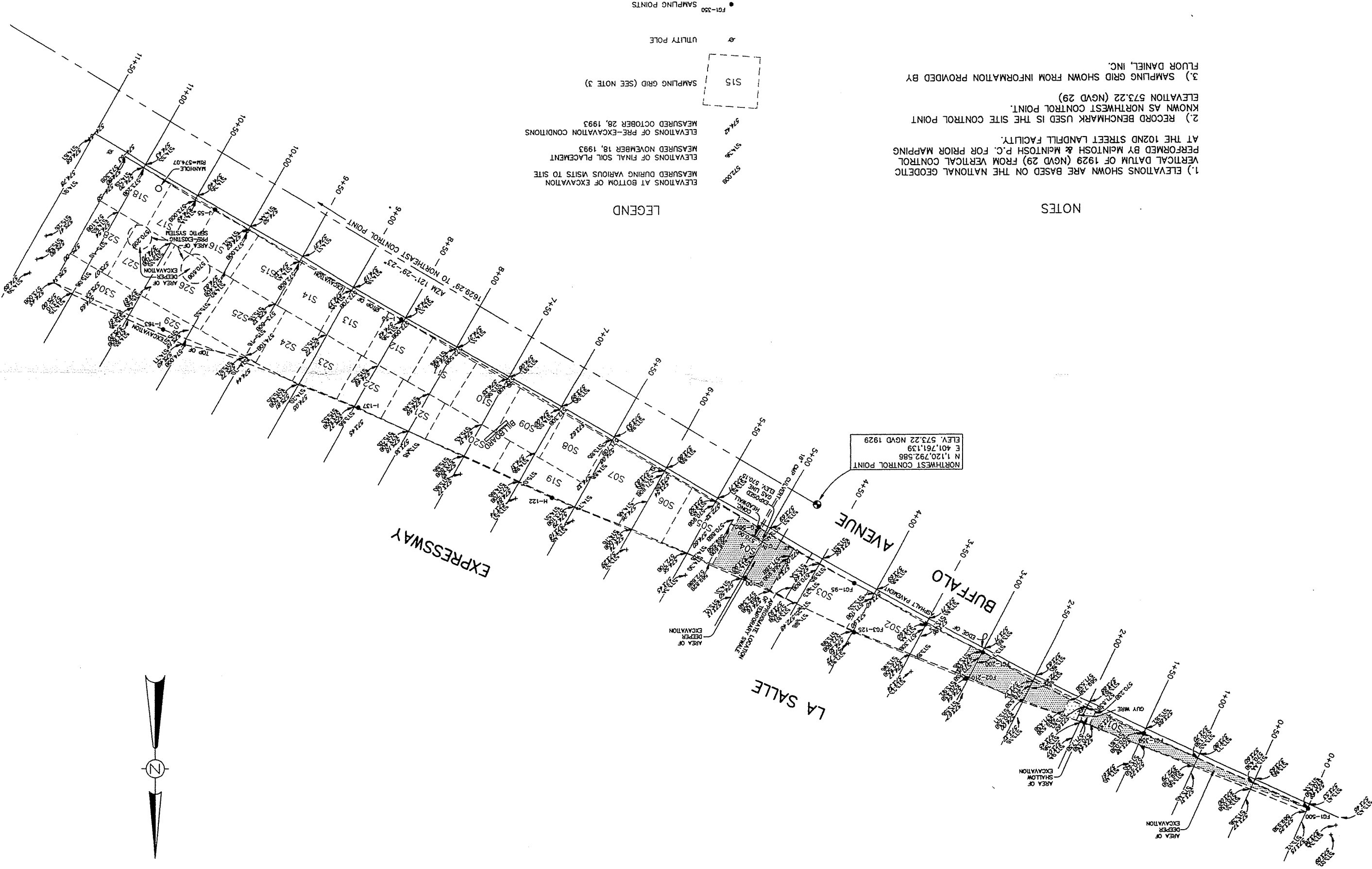
Technician: LARRY BLAS

Time On Site: 8:00AM - 4:30PM

Respectfully Submitted,  
SJB SERVICES, INC.

REVISION	RESURVEY
NOVEMBER 18, 1993	FINAL SOIL TOPG ADDED

*[Signature]*



LEGEND

- ELEVATIONS AT BOTTOM OF EXCAVATION MEASURED DURING VARIOUS VISITS TO SITE
- ELEVATIONS OF FINAL SOIL PLACEMENT MEASURED NOVEMBER 18, 1993
- ELEVATIONS OF PRE-EXCAVATION CONDITIONS MEASURED OCTOBER 28, 1993
- S15 SAMPLING GRID (SEE NOTE 3)
- UTILITY POLE
- FGI-350 SAMPLING POINTS

NOTES

- ELEVATIONS SHOWN ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29) FROM VERTICAL CONTROL PERFORMED BY MAINTOSH & MAINTOSH P.C. FOR PRIOR MAPPING AT THE 102ND STREET LANDFILL FACILITY.
- RECORD BENCHMARK USED IS THE SITE CONTROL POINT KNOWN AS NORTHWEST CONTROL POINT. ELEVATION 573.22 (NGVD 29)
- SAMPLING GRID SHOWN FROM INFORMATION PROVIDED BY FLUOR DANIEL, INC.

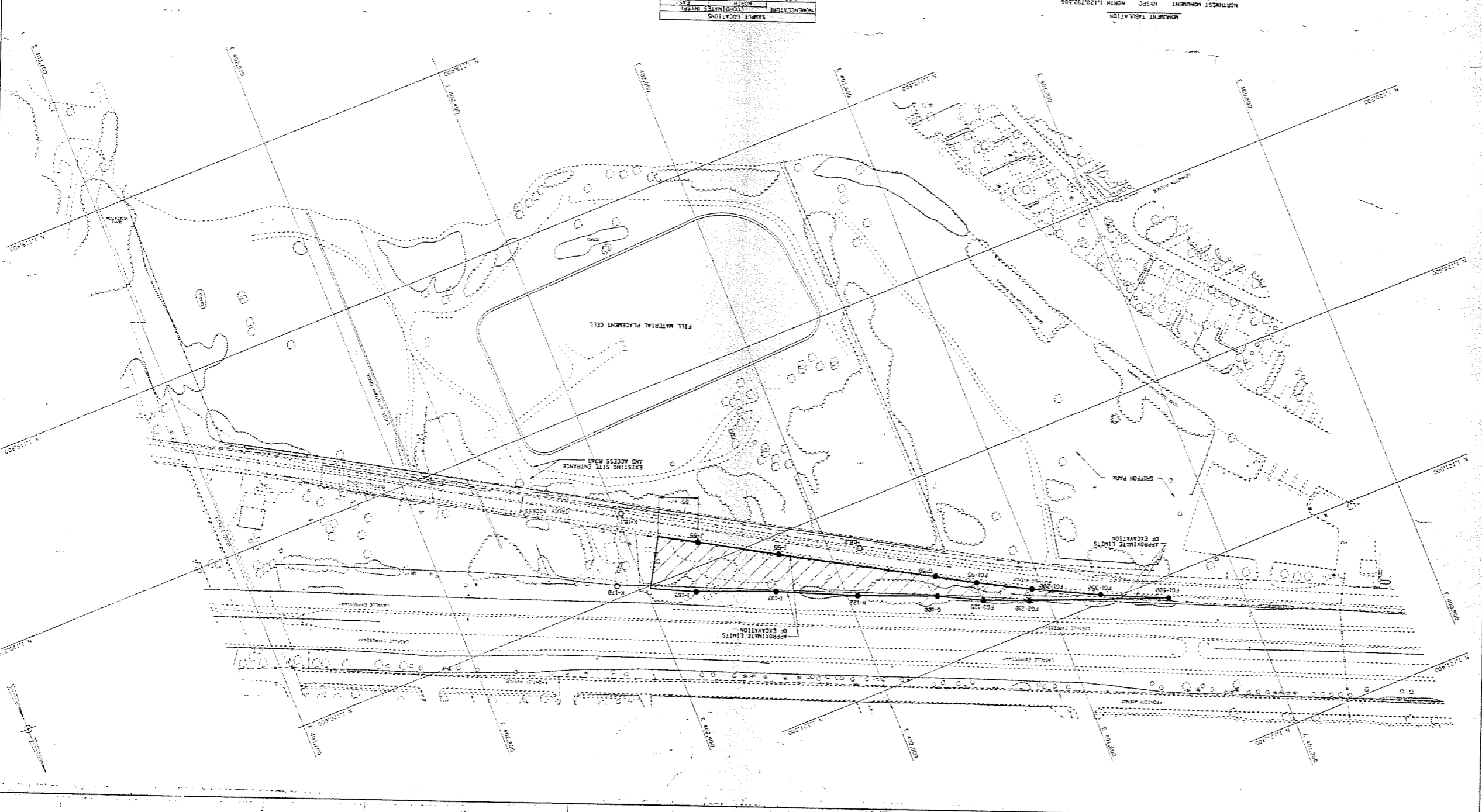
NORTHWEST CONTROL POINT  
 N 1:20.792.586  
 E 401.761.139  
 ELEV. 573.22 NGVD 1929

DATE PLOTTED: 12/15/2011 10:52 AM  
 PROJECT: 594000-30L-02

NO. 3	DATE: 12/15/2011	TIME: 10:52 AM	SCALE: 1" = 100'
<b>REMEDIAL ACTION PLAN</b> TRIANGULAR AREA NORTH OF BUFFALO AVE. NIAGARA FALLS, NEW YORK			
<b>FLUOR DANIEL</b> 102ND STREET LABORATORY - AUGUST 7, 1992			
ORDER / DATE: 2/18/93 DESIGN: 2/18/93 LOCATION:			



**LEGEND:**  
 ● SAMPLE LOCATION WITH CHEMICAL PRESENT  
 ○ SAMPLE LOCATION WITHOUT CHEMICAL PRESENT



**SAMPLE LOCATIONS**

MONUMENTAL POINT	EASTING	NORTHING	INSTRUMENT
F01-500	112091.47	401157.70	E
F01-501	112091.50	401157.70	E
F01-502	112091.53	401157.70	E
F01-503	112091.56	401157.70	E
F01-504	112091.59	401157.70	E
F01-505	112091.62	401157.70	E
F01-506	112091.65	401157.70	E
F01-507	112091.68	401157.70	E
F01-508	112091.71	401157.70	E
F01-509	112091.74	401157.70	E
F01-510	112091.77	401157.70	E
F01-511	112091.80	401157.70	E
F01-512	112091.83	401157.70	E
F01-513	112091.86	401157.70	E
F01-514	112091.89	401157.70	E
F01-515	112091.92	401157.70	E
F01-516	112091.95	401157.70	E
F01-517	112091.98	401157.70	E
F01-518	112092.01	401157.70	E
F01-519	112092.04	401157.70	E
F01-520	112092.07	401157.70	E
F01-521	112092.10	401157.70	E
F01-522	112092.13	401157.70	E
F01-523	112092.16	401157.70	E
F01-524	112092.19	401157.70	E
F01-525	112092.22	401157.70	E
F01-526	112092.25	401157.70	E
F01-527	112092.28	401157.70	E
F01-528	112092.31	401157.70	E
F01-529	112092.34	401157.70	E
F01-530	112092.37	401157.70	E
F01-531	112092.40	401157.70	E
F01-532	112092.43	401157.70	E
F01-533	112092.46	401157.70	E
F01-534	112092.49	401157.70	E
F01-535	112092.52	401157.70	E
F01-536	112092.55	401157.70	E
F01-537	112092.58	401157.70	E
F01-538	112092.61	401157.70	E
F01-539	112092.64	401157.70	E
F01-540	112092.67	401157.70	E
F01-541	112092.70	401157.70	E
F01-542	112092.73	401157.70	E
F01-543	112092.76	401157.70	E
F01-544	112092.79	401157.70	E
F01-545	112092.82	401157.70	E
F01-546	112092.85	401157.70	E
F01-547	112092.88	401157.70	E
F01-548	112092.91	401157.70	E
F01-549	112092.94	401157.70	E
F01-550	112092.97	401157.70	E

**MONUMENT TABLE**

MONUMENT	DESCRIPTION	EASTING	NORTHING
NORTHWEST MONUMENT	N 120° 29' 28.68" E	112092.68	401157.19
NORTH EAST MONUMENT	N 120° 29' 28.68" E	401157.19	112092.68
NORTHWEST MONUMENT	N 58° 0' 11.65" E	111945.91	401157.19
NORTH EAST MONUMENT	N 58° 0' 11.65" E	401157.19	111945.91

DATE PLOTTED: 12/15/2011 10:52 AM  
 PROJECT: 594000-30L-02