

WORK/QA PROJECT PLAN
for the
REMEDIAL INVESTIGATION
AND FEASIBILITY STUDY
at the
VOLNEY LANDFILL SITE
OSWEGO COUNTY, NEW YORK

*Minister
to the...*



Prepared for :

**NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

50 Wolf Road, Albany, New York 12233

Henry G. Williams, Commissioner

DIVISION OF SOLID AND HAZARDOUS WASTE

Norman H. Nosenchuck, P.E. - Director

**URS Company, Inc.
625 Delaware Avenue
Buffalo, New York**

September 1985

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50 WOLF ROAD, ALBANY, NEW YORK 12233

(Project Officer's Signature) _____

(Project Officer's Name) Daniel W. Rothman

(Project Quality Assurance Officer's Signature) _____

(Project Quality Assurance Officer's Name) George C. Moretti

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APPENDICES FOR WORK/QUALITY ASSURANCE PLAN
FOR THE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
AT THE
VOLNEY LANDFILL SITE
IN
OSWEGO COUNTY, NEW YORK

Parameter No./Name	Container ¹	Preservation ^{2,3}	Maximum Ho.
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Table 1A-Bacterial Tests:

- 1-4. Coliform, fecal and total
- 5. Fecal streptococci

Table 1B-Inorganic Tests:

- 1. Acidity
- 2. Alkalinity
- 4. Ammonia
- 9. Biochemical oxygen demand
- 11. Bromide
- 14. Biochemical oxygen demand, carbonaceous
- 15. Chemical oxygen demand
- 16. Chloride
- 17. Chlorine, total residual
- 21. Color
- 23-24. Cyanide, total and amenable to chlorination

25. Fluoride

27. Hardness

28. Hydrogen ion (pH)

31. Kjeldahl and organic nitrogen

Metals

18. Chromium VI

35. Mercury

- 3. 5-8, 10, 12, 13, 19, 20, 22, 26, 29, 30, 32-34, 36, 37, 45, 47, 51, 52, 58-60, 62, 63, 70-72, 74, 75. Metals, except chromium VI and mercury.

38. Nitrate

39. Nitrate-nitrite

40. Nitrite

41. Oil and grease

42. Organic carbon

44. Orthophosphate

46. Oxygen, Dissolved Probe

47. Winkler

48. Phenols

49. Phosphorus (elemental)

50. Phosphorus, total

53. Residue, total

54. Residue, Filterable

55. Residue, Nonfilterable (TSS)

P,G	Cool, 4°C, 0.008% Na ₂ S ₂ O ₃	6 hours
P,G	..do	Do
P,G	Cool, 4°C	14 days
P,G	..do	Do
P,G	Cool, 4°C, H ₂ SO ₄ to pH<2	28 days
P,G	Cool, 4°C	48 hours
P,G	None required	28 days
P,G	Cool, 4°C	48 hours
P,G	Cool, 4°C, H ₂ SO ₄ to pH<2	28 days
P,G	None required	Do
P,G	..do	Analyze immediately
P,G	Cool, 4°C	48 hours
P,G	Cool, 4°C, NaOH to pH>12,	
	0.6g ascorbic acid	14 days
P	None required	28 days
P,G	HNO ₃ to pH<2, H ₂ SO ₄ to pH<2	6 months
P,G	None required	Analyze immediately
P,G	Cool, 4°C, H ₂ SO ₄ to pH<2	28 days
P,G	Cool, 4°C	24 hours
P,G	HNO ₃ to pH<2	28 days
P,G	..do	6 months
P,G	Cool, 4°C	48 hours
P,G	Cool, 4°C, H ₂ SO ₄ to pH<2	28 days
P,G	Cool, 4°C	48 hours
G	Cool, 4°C, H ₂ SO ₄ to pH<2	28 days
P,G	Cool, 4°C, HCl or H ₂ SO ₄ to pH<2	Do
P,G	Filter immediately, Cool, 4°C	48 hours
G	None required	Analyze immediately
G	Fix on site and store in dark	8 hours
..do	Cool, 4°C, H ₂ SO ₄ to pH<2	28 days
G	Cool, 4°C	48 hours
P,G	Cool, 4°C, H ₂ SO ₄ to pH<2	28 days
P,G	Cool, 4°C	7 days
P,G	..do	48 hours
P,G	..do	7 days

56. Residue, Settleable	P,G	..do	48 hours
57. Residue, volatile	P,G	..do	7 days
61. Silica	P	..do	28 days
64. Specific conductance	P,G	..do	Do
65. Sulfate	P,G	..do	Do
66. Sulfide	P,G	Cool 4°C add zinc acetate plus sodium hydroxide to pH>9	7 days
67. Sulfite	P,G	None required	Analyze immediately
68. Surfactants	P,G	Cool, 4°C	48 hours
69. Temperature	P,G	None required	Analyze
73. Turbidity	P,G	Cool, 4°C	48 hours
Table 1C - Organic Tests ⁸			
13. 18-20, 22, 24-28, 34-37, 39-43, 45-47, 56, 66, 88, 89, 92-95, 97	G, Teflon-lined septum	Cool, 4°C, 0.008% Na ₂ S ₂ O ₃ (5)	14 days
Purgeable Halocarbons			
6, 57, 90. Purgeable aromatic hydrocarbons	..do	Cool, 4°C, 0.008% Na ₂ S ₂ O ₃ HCl to pH 2 (5)	Do
3,4. Acrolein and acrylonitrile	..do	Cool, 4°C, 0.008% Na ₂ S ₂ O ₃ , Adjust pH to 4-5 (5)	Do
23, 30, 44, 49, 53, 67, 70, 71, 83, 96 Phenols ¹¹	G, Teflon-lined cap	Cool, 4°C, 0.008% Na ₂ S ₂ O ₃ (5)	7 days until extractor
7,38. Benzidines ¹¹	..do	..do	40 days after extractor
14, 17, 48, 50-52. Phthalate esters ¹¹	..do	Cool, 4°C	7 days until extractor
72-74. Nitrosamines ^{11, 14}	..do	Cool, 4°C, store in dark, 0.008% Na ₂ S ₂ O ₃	7 days until extractor
76-82 PCB's acrylonitrile ¹¹	..do	Cool, 4°C	40 days after extractor
54, 55, 65, 69 Nitroaromatics and isophorone ¹¹	..do	Cool, 4°C, 0.008% Na ₂ S ₂ O ₃ store in dark	Do
1, 2, 5, 8-12, 32, 33, 58, 59, 64, 68, 84, 86. Polynuclear aromatic hydrocarbons ¹¹	..do	..do	Do
15,16,21, 31, 75 Haloethers ¹¹	..do	Cool, 4°C, 0.008% Na ₂ S ₂ O ₃	Do
29, 35-37, 60-63, 91. Chlorinated hydrocarbons ¹¹	..do	Cool, 4°C	Do
87. TCDD	..do	Cool 4°C, 0.008% Na ₂ S ₂ O ₃	Do
Table 1D - Pesticides Tests			
1-70 Pesticides	..do	Cool, 4°C, pH 5-9 ¹⁵	Do
Table 1E - Radiological Tsts			
1-5 Alpha, beta and radium	P,G	HNO ₃ to pH<2	6 months

TABLE II NOTES

- 1 Polyethylene (P) or Glass (G)
- 2 Sample preservation should be performed immediately upon sample collection. For composite chemical samples each aliquot should be preserved at the temperature of collection. When use of an automated sampler makes it impossible to preserve each aliquot, then chemical samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.
- 3 When any sample is to be shipped by common carrier or sent through the United States Mails, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR Part 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirements of Table II, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following materials: Hydrochloric acid (HCl) in water solutions at concentrations of 0.04% by weight or less (pH about 1.96 or greater); Nitric acid (HNO₃) in water solutions at concentrations of 0.15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H₂SO₄) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); and Sodium hydroxide (NaOH) in water solutions at concentrations of 0.080% by weight or less (pH about 12.30 or less).
- 4 Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still be considered valid. Samples may be held for longer periods only if the permittee, or monitoring laboratory, has data on file to show that the specific types of samples under study are stable for the longer time, and has received a variance from the Regional Administrator under § 136.3 (e). Some samples may not be stable for the maximum time period given in the table. A permittee, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show that this is necessary to maintain sample stability. See § 136.3(e) for details.
- 5 Should only be used in the presence of residual chlorine.
- 6 Maximum holding time is 24 hours when sulfide is present. Optionally all samples may be tested with lead acetate paper before pH adjustments in order to determine if sulfide is present. If sulfide is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12.
- 7 Samples should be filtered immediately on-site before adding preservative for dissolved metals.
- 8 Guidance applies to samples to be analyzed by GC, LC, or GC/MS for specific compounds.
- 9 Sample receiving no pH adjustment must be analyzed within seven days of sampling.
- 10 The pH adjustment is not required if acrolein will not be measured. Samples for acrolein receiving no pH adjustment must be analyzed within 3 days of sampling.
- 11 When the extractable analytes of concern fall within a single chemical category, the specified preservative and maximum holding times should be observed for optimum safeguard of sample integrity. When the analytes of concern fall within two or more chemical categories, the sample may be preserved by cooling to 4°C, reducing residual chlorine with 0.008% sodium thiosulfate, storing in the dark, and adjusting the pH to 6-9; samples preserved in this manner may be held for seven days before extraction and for forty days after extraction. Exceptions to this optional preservation and holding time procedure are noted in footnote 5 (re the requirement for thiosulfate reduction of residual chlorine), and footnotes 12, 13 (re the analysis of benzidine).
- 12 If 1,2-diphenylhydrazine is likely to be present, adjust the pH of the sample to 4.0±0.2 to prevent rearrangement to benzidine.
- 13 Extracts may be stored up to 7 days before analysis if storage is conducted under an inert (oxidant-free) atmosphere.
- 14 For the analysis of diphenylnitrosamine, add 0.008% Na₂SO₃ and adjust pH to 7-10 with NaOH within 24 hours of sampling.
- 15 The pH adjustment may be performed upon receipt at the laboratory and may be omitted if the samples are extracted within 72 hours of collection. For the analysis of aldrin, add 0.008% Na₂S₂O₃.

- 1.0 Project Name: Remedial Investigation and Feasibility Study of Volney Landfill in Oswego County, New York
- 2.0 Project Requested By: New York State Department of Environmental Conservation
- 3.0 Date of Request: June 1985
- 4.0 Date of Project Initiation: August 19, 1985
- 5.0 Project Officer: Daniel W. Rothman
- 6.0 Quality Assurance Officer: George C. Moretti
- 7.0 Project Description:

- A. Objective and Scope Statement: The objective of this study will be to assess the degree and extent of onsite contamination. This assessment will involve an extensive site investigation to include: 1. Mapping and Surveying 2. Surface Geophysical Studies 3. Borings and Groundwater Monitoring Well Installation 4. Physical Soil Testing 5. Environmental Sampling and Analysis of Soils, Surface Water, Stream Sediments, Groundwater and Leachate.
- B. Data Usage: The data obtained from the site investigation will be used to recommend remedial alternatives which may include one or more of the following: 1. Grading and Capping, Slurry Walls, Groundwater Pumping, Leachate Treatment, Interceptor Trenches.
- C. Monitoring Network Design and Rationale: The site will be surveyed and a grid layed out for a geophysical survey using electromagnetic terrain conductivity, electrical resistivity and seismic refraction methods. Borings and monitoring wells will be drilled to assess soil and groundwater contamination. Samples from the test borings will undergo physical soil testing to assess structural characteristics and permeability of the soil. Environmental samples will be collected and analyzed to include test boring soils, surface soils, surface waters, stream sediments, groundwater and leachate.
- D. Monitoring Parameters and their Frequency of Collection: A single collection will be made of the following samples -
(7) Surface Waters - Priority pollutants (except asbestos) (actually hazardous substance list from EPA contract lab protocol) plus alkalinity, ammonia nitrogen, COD, Total Hardness, TDS, TOC, Methyethyl Keytone, pH, Conductivity, Temperature
(7) Stream Sediments - Priority pollutants
Soil Borings - OVA screening. Priority pollutants (as above) on surface and just above water table on two holes

(19) Groundwater - Priority pollutants plus indicator parameters above

(3) Leachate - Priority pollutants plus indicator parameters above

Physical Soil Testing

(40) Moisture content

(30) Grain size

(20) Atterberg limit

(6) Permeability (Shelby Tube)

E. Parameter Table: A parameter table is presented in Table 7-1

8.0 Project Fiscal Information (Optional): The project budget will not be presented in this document. For fiscal information concerning the project the reader is directed to the document titled: Agreement between the State of New York and URS Company, Inc. for Remedial Investigation and Feasibility Study at Fulton Terminals, Clothier and Volney Landfill Sites in Oswego County, New York.

9.0 Schedule of Tasks and Products:

A. A schedule of task and products is presented in Figure 9-1.

10.0 Project Organization and Responsibility:

The following is a list of key project personnel and their corresponding responsibilities:

Mark Hanna - URS - Sampling operations

George C. Moretti - URS - Sampling QC

Remo Gigante - (NYTEST) - Laboratory analysis

Peggy Sachs - (NYTEST) - Laboratory QC

Jeffrey Zdrojewski - URS - Data processing activities

Donald Sennett - URS - Data processing QC

Daniel W. Rothman - URS - Data quality review

George C. Moretti - URS - Performance auditing

George C. Moretti - URS - Systems auditing

George C. Moretti - URS - Overall QA

Daniel W. Rothman - URS - Overall project coordination

A project management plan is presented in Figure 10-1.

11.0 Data Quality Requirements and Assessments:

All analytical data will meet the requirements outlined in the USEPA Contract Labor Program protocol of which NYTEST Environmental Inc. is a participant.

A. Data Representativeness: Sample locations have been selected to yield the greatest amount of useful information for the least cost. Soil borings and monitoring wells have been placed at upgradient and downgradient locations and onsite as

well as offsite to assess the extent and degree of contaminant plumes which may be generated from the site. Stream samples will be collected at both upstream and downstream of the site to assess the site's contribution of contamination to the stream. Groundwater samples will be collected only from recently purged wells this ensuring samples which are more representative of the water contained in the aquifer.

- B. Data Comparability: To ensure comparability, all field and analytical tasks will be performed according to accepted EPA approved methodologies as outlined in the USEPA contract laboratory program protocol, SW846 2nd Edition or EPA Field Sampling Manuals.
 - C. Data Completeness: The objective of this study is to evaluate the degree and extent of chemical contamination and recommended remedial alternatives to this end, analysis will be performed and measurements taken to evaluate contamination including the air, soil, water, groundwater, and waste materials in and around the site.
- 12.0 Sampling Procedures: All sampling will be conducted according to acceptable EPA approved methodologies. Every attempt will be made to eliminate contamination or cross-contamination of samples. Every attempt will be made to ensure representativeness of samples.
- 13.0 Sample Custody Procedures: Strict chain-of-custody procedures will be followed from the preparation of the sample bottles to field sampling activities through to delivery of samples to the laboratory for analysis. Standard preprinted chain-of-custody logs and numbered security tapes will be used throughout this study to document custody.
- 14.0 Calibration Procedures and Preventive Maintenance: All field and laboratory instruments will be calibrated at least daily (or more frequently as dictated by EPA approved laboratory methodologies). All equipment will be maintained according to recommended schedules outlined in the operator's manuals (including factory recalibration).
- 15.0 Documentation, Data Reduction, and Reporting:
- A. Documentation: All field data will be recorded into bound field notebooks in standard formation on preprinted logs of data sheets. All laboratory analytical data including calibration and QC data will be recorded on preprinted forms. All raw data form logs and notebooks will become part of the permanent project file.
 - B. Data Reduction and Reporting: Data will generally be reduced manually from raw data forms onto work processors (or in the

case of calculations - into computer). The computer or word processor will generate the final report for review.

- 16.0 Data Validation: Throughout the report generation process a system of reviews and checks by various personnel within the various data contributing organizations will be conducted to ensure data correctness and validity. The QC Officer will monitor the system with the final review conducted by the Project Manager.
- 17.0 Performance and Systems Audits: The laboratory has been certified by the New York State DEC through analysis of blind check samples submitted by the agency. This certification process was last conducted in April of 1985 and is effective for a six month period.
- 18.0 Corrective Action: Throughout the study review of data and equipment performance (via calibration procedures) will be conducted. If this review reveals data outside acceptable limits then corrective action will be taken. This action will include restandardizing or calibrating equipment or replacing equipment. System audits and calibration procedures with data review will be conducted at a frequency to detect problems early so that large segments of work will not have to be redone.
- 19.0 The Following Reports will be Generated During the Course of This Study:
 - A. Work/QA Project Plan: This document.
 - B. Health and Safety Plan: Outlining the health/safety protocols to be followed during all phases of the Remedial Investigation.
 - C. Remedial Investigation Report: Presenting the results of the Remedial Investigation activities and providing a detailed characterization of the site.
 - D. Feasibility Study Report: Identifying, screening, evaluating and recommending remedial measures for the site, based upon data provided during the Remedial Investigation.
 - E. Cost Control Reports: Providing monthly status reports on the technical, schedule, and budgetary status of the project.

APPENDIX A

REQUIRED SAMPLE PRESERVATION HOLDING TIMES
AND CONTAINERS

GROUNDWATER MONITORING WELL SUMMARY

Monitoring Well	No. of Wells in Cluster	Bottom of Deep Well
BW1	2	Just above till
BW2	1	Below water table
BW3	1	Below water table
BW4	1	Below water table
BW5	2	Just above till
BW6	1	Below water table
BW7	2	Just above till
BW8	1	Below water table
BW9	2	Just above till
BW10	1	Below water table
BW11	3	In bedrock
BW12	1	Just above till
BW13	1	Just above till
BW14	1	Just above till
BW15	1	Just above till
BW16	3	In bedrock
BW17	3	In bedrock
BW18	1	Bottom of refuse
BW19	1	Bottom of refuse

LEGEND

- ⊙ BW - SOIL BORING CONVERTED TO MONITORING WELLS OR MONITORING WELL CLUSTER
- ▲ SS - SURFACE WATER AND SEDIMENT SAMPLING LOCATION

Approximate Scale
1" = 576'

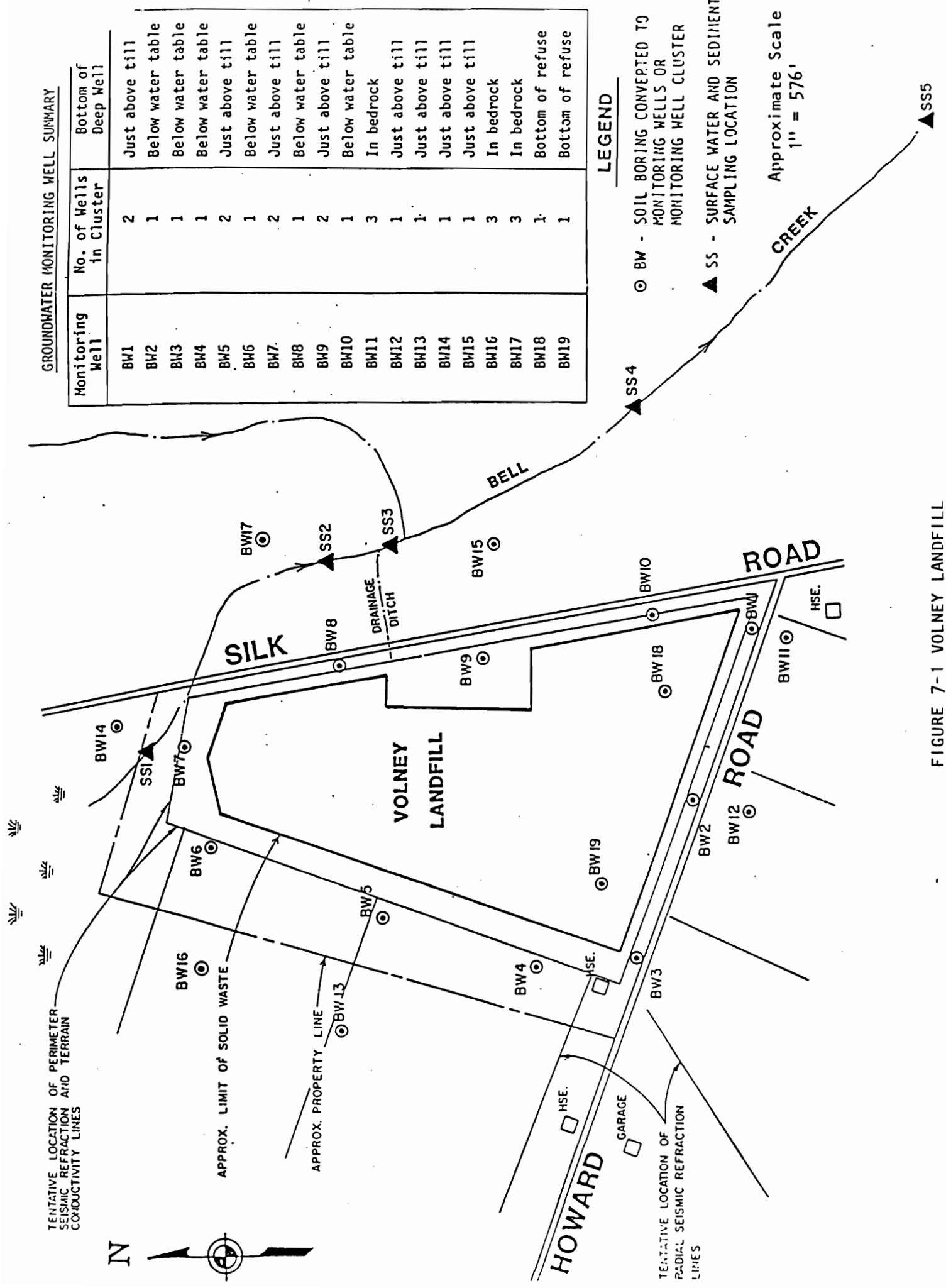


FIGURE 7-1 VOLNEY LANDFILL

Time (Weeks)

Aug. 19	26	Sept 2	9	16	23	30	Oct 7	14	21	28	Nov 4	11	18	25	Dec 2
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Project Initiation

Acquire Data

Work Plans Agency Review & Comments Finalize Work Plans

Mobilize Facilities

Survey & Prelim Orientation Stakes Mapping

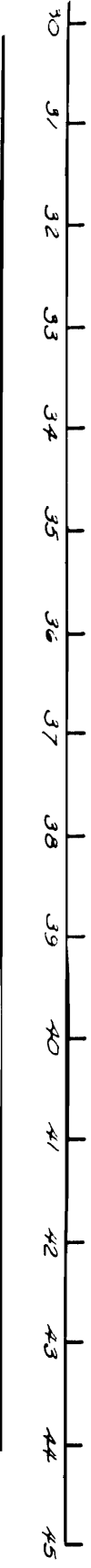
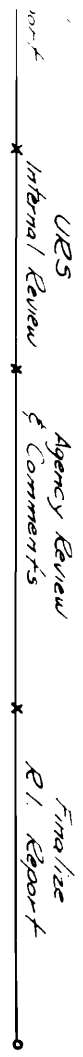
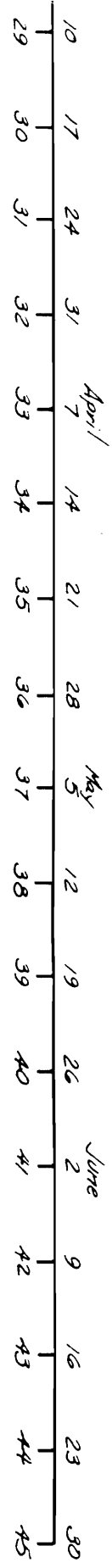
Surface Geophysics Down Surface Geophysics Report Revise Field Invest Plan (if necessary) Agency Approval

Drilling

Aerial Photography

Survey & Data

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15



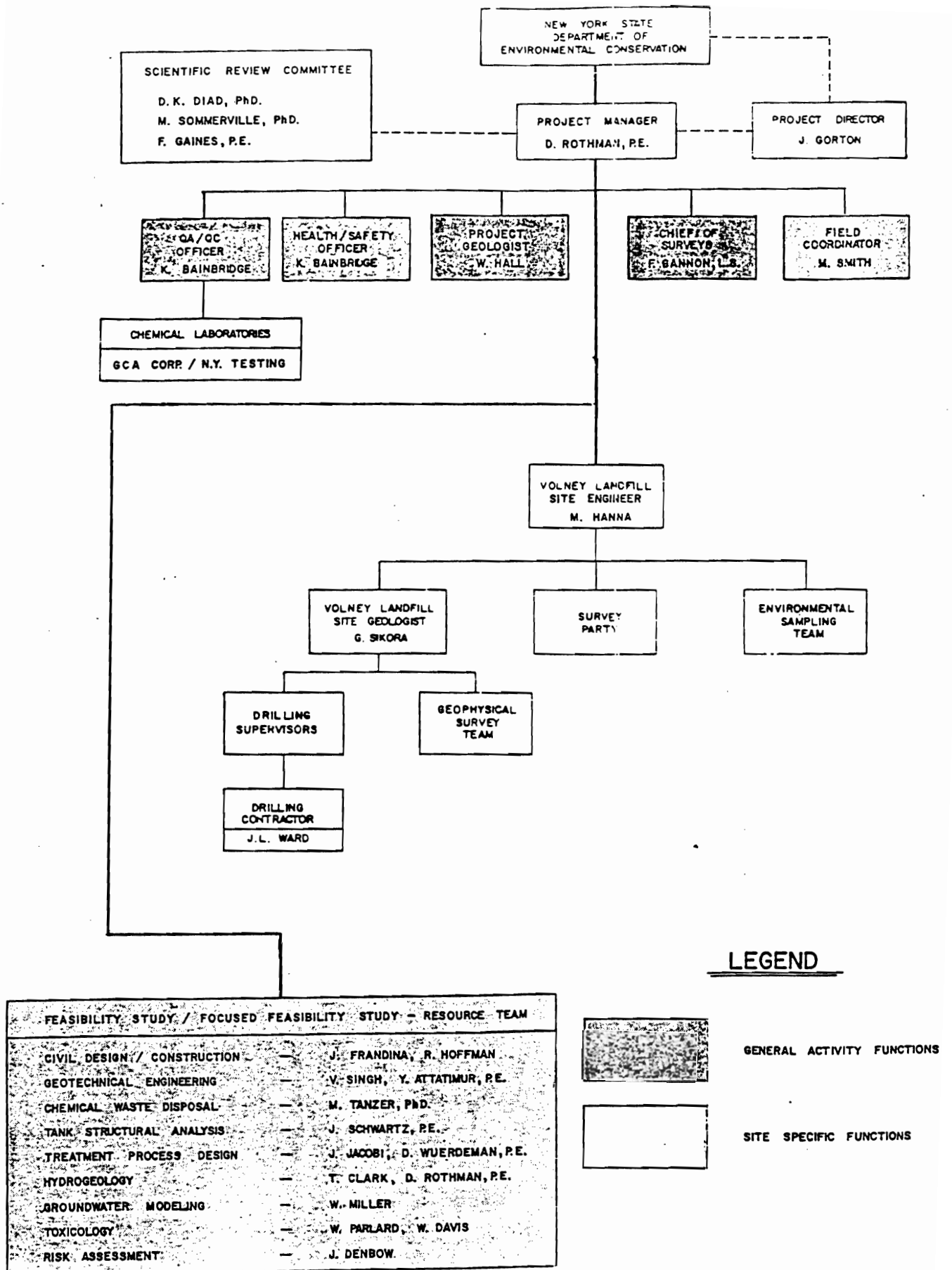


Figure 10-1 Project Management Plan - Volney Landfill

TABLE 7-1

PARAMETERS FOR CHEMICAL ANALYSIS

Analysis	Number of Samples		Method No.	Reference	Preservation	Holding Times
	Waters	Soils				
1. Volatile Organics (GC/MS)	29	7	624	1	*	*
2. Base Neutral/Acid Fractions (GC/MS)	29	7	625	1	*	*
3. Pesticides/PCB's (GC)	29	7	608	1	*	*
4. Metals						
Antimony	29	7	204.2	2	*	*
Arsenic	29	7	202.2	2	*	*
Beryllium	29	7	210.2	2	*	*
Cadmium	29	7	213.2	2	*	*
Chromium	29	7	218.2	2	*	*
Copper	29	7	220.2	2	*	*
Lead	29	7	239.2	2	*	*
Mercury	29	7	245.1	2	*	*
Nickel	29	7	249.2	2	*	*
Selenium	29	7	270.2	2	*	*
Silver	29	7	272.2	2	*	*
Thallium	29	7	279.2	2	*	*
Zinc	29	7	289.2	2	*	*
5. Cyanide	29	7	335.2	2	*	*
6. Phenol	29	7	430.3	2	*	*
7. Specific Conductance	29	--	120.1	2	*	*
8. pH	29	--	150.1	2	*	*
9. Temperature	29	--	170.1	2	*	*
10. Alkalinity	29	--	310.1	2	*	*
11. Ammonia Nitrogen	29	--	350.1	2	*	*
12. Chemical Oxygen Demand (COD)	29	--	410.2	2	*	*
13. Total Hardness	29	--	130.1	2	*	*
14. Total Dissolved Solids (TDS)	29	--	160.1	2	*	*
15. Total Organic Carbon (TOC)	29	--	415.1	2	*	*
16. Methyl Ethyl Keytone	29	--	624	1	*	*

1. Method for Organic Chemical Analysis of Municipal and Industrial Wastewater, USEPA Cincinnati, Ohio EPA 600/4-82-057 July 1982 (updated December 3, 1979 Federal Register Methods)

2. Methods for Chemical Analysis of Water and Wastes, USEPA Cincinnati, Ohio, EPA 600/4-79-020, Revised March 1983

3. Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, SW 846, 2nd Edition July 1982

* All samples will be preserved and analyzed within the holding times presented in Appendix A.