PHASE I REPORT

ENGINEERING INVESTIGATIONS AND EVALUATIONS AT INACTIVE HAZARDOUS WASTE DISPOSAL SITES

Wellsville Andover
Allegany County, NY

SUBMITTED TO

New York State Department of Environmental Conservation

SUBMITTED BY

ENGINEERING-SCIENCE, INC.
in association with
DAMES & MOORE

JUNE 1983

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SITE IDENTIFICATION

USEPA Not Assigned

NYSDEC #902004

SECTION I

EXECUTIVE SUMMARY

Wellsville/Andover Landfill

Objective

The purpose of this two phase program is to conduct engineering investigations and evaluations at inactive hazardous waste disposal sites in New York State in order to calculate a Hazard Ranking System (HRS) score for each site and estimate the cost of any recommended remedial action. During the initial portion of this investigation (Phase I) all available data and records combined with information collected from a site inspection were reviewed and evaluated to determine the adequacy of existing information for calculating an HRS score. On the basis of this evaluation, a Phase II Work Plan was prepared for collecting additional HRS data (if necessary), evaluating remedial alternatives and preparing a cost estimate for recommended remedial action. The results of the Phase I study for this site are summarized below and detailed in the body of the report.

Site Background

Wellsville/Andover Consolidated Landfill is an active landfill located on Gorman Road in the Townships of Andover and Wellsville, Allegany County, New York. The site is located on a hillside in a sparsely populated rural area and is owned by the Village of Wellsville and operated by the Village of Wellsville Department of Public Works.

The landfill is composed of two sections. The new section located in the northeast corner receives municipal refuse and has a leachate collection system. The larger old section was closed in 1978 and used to dispose of municipal and industrial wastes including methylene chloride, polyester scraps, and oils. Although this section is currently covered and seeded, a leachate runoff problem exists. Investigations have determined that nearby private drinking wells are being contaminated by cyanides and zinc. Although surface water samples (Duffy Hollow Creek) were analyzed on at least two occassions the results are inconclusive since the parameters analyzed are not normally associated with toxics. However, leachate has been observed entering Duffy Hollow Creek and past leachate analyses have determined the

presence of heavy metals and phenols. Current plans call for leachate collection and offsite treatment in June 1983.

Assessment

Insufficient data was available for completion of a final HRS scoring. The preliminary HRS scoring for this site was:

S_M =28.72	S_A =0
S_{GW}=48.74	S_{FE}=0
S_{SW}= 9.65	S_{DC}=12.50

Additional target information and an air survey are required. Although an analysis of surface water was not available, leachate has been observed entering Duffy Hollow Creek.

Recommendations

An air monitoring survey with an OVA meter is recommended to check air quality above the site. The estimated manhour requirements for Phase II are 158, while the estimated cost is $6937.

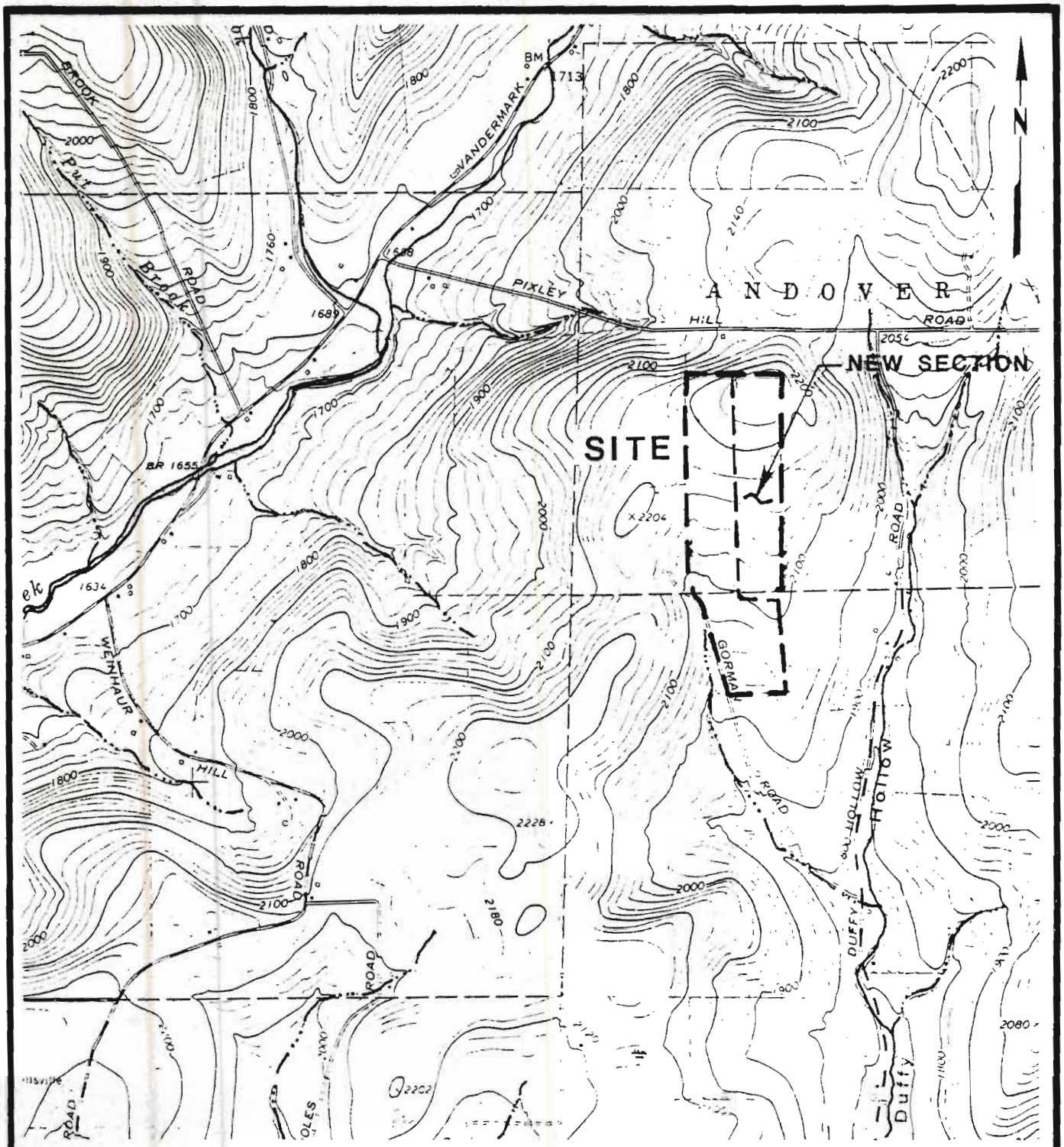
SECTION II

SITE DESCRIPTION

Wellsville/Andover Landfill

Wellsville/Andover Consolidated Landfill is an active landfill, located in the Townships of Andover and Wellsville, Allegany County (NYS) and is operated by the Village of Wellsville Department of Public Works. The site on Gorman Road is approximately rectangular, 4000 ft by 1500 ft in size. The landfill is located on a hillside in a rural, sparsely populated area, and is completely fenced.

The landfill is composed of two sections. The larger older section was used from 1962 to 1978 as a municipal and industrial dump site, and contains wastes including methylene chloride and polyester scraps. Currently, it is covered and seeded, but has a leachate runoff problem. The new section, located in the northeast corner of the site, contains municipal refuse, and has a leachate collection system. According to the Village of Wellsville Department of Public Works, the landfill is scheduled to close in June 1983. Current concern focuses on the effect of leachate upon nearby drinking water supplies.



SITE LOCATION MAP
WELLSVILLE-ANDOVER

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP
WELLSVILLE NORTH, NY (1965) QUADRANGLE

SECTION III

HRS SCORING

HRS COVER SHEET

Facility name: Wellsville Andover Landfill

Location: Wellsville, NY

EPA Region: II

Person(s) in charge of the facility: Mr. Donald MacFarquhar (DPW)

Village of Wellsville

Wellsville, NY

Name of Reviewer: John Kubarewicz/Art Seanor Date: May 22, 1983

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

Runoff from a portion of this municipal landfill, which was closed in 1978, is currently entering an adjacent stream, Duffy Hollow Creek. Cyanide contamination has also been found in neighboring drinking wells.

Scores: $S_M = 28.72$ ($S_{gw} = 48.74$ $S_{sw} = 9.65$ $S_a = 0$)

$S_{FE} = 0$

$S_{DC} = 12.50$

GROUND WATER ROUTE WORK SHEET

Ground Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Sectio
1 Observed Release	0 (45)	1	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	3.3
4 Waste Characteristics					3.4
Toxicity / Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
Total Waste Characteristics Score			23	26	
5 Targets					3.5
Ground Water Use	0 1 2 (3)	3	9	9	
Distance to Nearest Well / Population Served	0 4 6 8 10 / 12 16 (18) 20 / 24 30 32 35 40	1	18	40	
Total Targets Score			27	49	
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			27945	57,330	
7 Divide line 6 by 57,330 and multiply by 100 -7-		S_{gw} =		48.74	

SURFACE WATER ROUTE WORK SHEET

Surface Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 (45)	1	45	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 3	1		3	
1-yr. 24-hr. Rainfall	0 1 2 3	1		3	
Distance to Nearest Surface Water	0 1 2 3	2		6	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score				15	
3 Containment	0 1 2 3	1		3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
Hazardous Waste Quantity	0 1 2 3 4 (5) 6 7 8	1	5	8	
Total Waste Characteristics Score			23	26	
5 Targets					4.5
Surface Water Use	0 1 (2) 3	3	6	9	
Distance to a Sensitive Environment	(0) 1 2 3	2	0	6	
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	0	40	
Total Targets Score			6	55	
6 If line 1 is 45, multiply 1 x 4 x 5. If line 1 is 0, multiply 2 x 3 x 4 x 5			6210	64,350	
7 Divide line 6 by 64,350 and multiply by 100			S_{sw} = 9.65		

AIR ROUTE WORK SHEET

Air Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	(0) 45	1	◯	45	5.1
Date and Location:					
Sampling Protocol:					
If line 1 is 0, the S_a = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
Total Targets Score				39	
4 Multiply 1 x 2 x 3				35,100	
5 Divide line 4 by 35,100 and multiply by 100			S_a = ◯		

DIRECT CONTACT WORK SHEET

Direct Contact Work Sheet						
	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Sectio
1	Observed Incident	(0) 45	1	0	45	8.1
	If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2					
2	Accessibility	0 1 2 (3)	1.	3	3	8.2
3	Containment	0 (15)	1	15	15	8.3
4	Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4
5	Targets					8.5
	Population Within a 1-Mile Radius	0 (1) 2 3 4 5	4	4	20	
	Distance to a Critical Habitat	(0) 1 2 3	4	0	12	
	Total Targets Score			4	32	
6	If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			2700	21,600	
7	Divide line 6 by 21,600 and multiply by 100			SOC = 12.50		

Fire and Explosion Work Sheet

	Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1	Containment	1 3	1		3	7.1
2	Waste Characteristics					7.2
	Direct Evidence	0 3	1		3	
	Ignitability	0 1 2 3	1		3	
	Reactivity	0 1 2 3	1		3	
	Incompatibility	0 1 2 3	1		3	
	Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score				20	
3	Targets					7.3
	Distance to Nearest Population	0 1 2 3 4 5	1		5	
	Distance to Nearest Building	0 1 2 3	1		3	
	Distance to Sensitive Environment	0 1 2 3	1		3	
	Land Use	0 1 2 3	1		3	
	Population Within 2-Mile Radius	0 1 2 3 4 5	1		5	
	Buildings Within 2-Mile Radius	0 1 2 3 4 5	1		5	
	Total Targets Score				24	
4	Multiply 1 x 2 x 3				1,440	
5	Divide line 4 by 1,440 and multiply by 100					

SFE = ( )

WORKSHEET FOR COMPUTING S_M

	S	S^2
Groundwater Route Score (S_{gw})	48.74	2375.59
Surface Water Route Score (S_{sw})	9.65	93.12
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		2468.71
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		49.69
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		28.72

June 23, 1982

DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: WELLSVILLE ANDOVER LANDFILL

LOCATION: TOWN OF ANDOVER

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

CYANIDE

Rationale for attributing the contaminants to the facility:

ON-SITE WELLS

* * *

2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifers(s) of concern:

SHALLOW AQUIFER

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

14'–38'

Depth from the ground surface to the lowest point of waste disposal/ storage:

UNKNOWN

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

36

Mean annual lake or seasonal evaporation (list months for seasonal):

28

Net precipitation (subtract the above figures):

8

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

VARIABLE, SILT LOAM

Permeability associated with soil type:

10^{-4} CM/SEC

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

LIQUIDS AND SOLIDS

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

LAND FILL BURIAL NO LINER

Method with highest score:

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

CYANIDE, TRICHLORO ETHYLENE
CADMIUM METHYLENE CHLORIDE
CHROMIUM PHENOLS (NYS DoH, 1979)
(Recra Research, 1979)

Compound with highest score:

CADMIUM
CYANIDE 3,3 => 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

>300 TONS

Basis of estimating and/or computing waste quantity:

VARIOUS MEMOS FROM FIRMS which Disposed of Wastes to DEPT. OF PUBLIC WORKS - WELLSVILLE.

* * *

5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

DRINKING WATER

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

ALONG DUFFY HOLLOW CREEK

Distance to above well or building:

FROM TOPOGRAPHIC MAP
2500 ft

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

HARLOFF'S TRAILER COURT SERVING 33 WELLS
2.1 miles from site.

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

N/A

Total population served by ground water within a 3-mile radius:

380 based upon house count.

USE 3,2 matrix
⇒ 18

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum): UNKNOWN, ~~40~~ P

(WAITING FOR RESULTS FROM ALFRED UNIV. STUDY)

Rationale for attributing the contaminants to the facility:
Past analyses of surface water did not include toxics, however leachate observed running into creek. Past analysis of leachate determined heavy metals and organic (phenols) contamination.

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

5.7

Name/description of nearest downslope surface water:

DUFFY HOLLOW
+ UNNAMED STREAM

Average slope of terrain between facility and above-cited surface water body in percent:

6.3

Is the facility located either totally or partially in surface water?

NO

Is the facility completely surrounded by areas of higher elevation?

NO

1-Year 24-Hour Rainfall in Inches

2.3

Distance to Nearest Downslope Surface Water

0.01

Physical State of Waste

LIQUID + SOLID

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

LANDFILL
UNLINED

Method with highest score:

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

CYANIDE TRICHLOROETHYLINE
METHYLENE CHLORIDE
PHENOLS CYANIDES, CHROMIUM (NYSDOH, 1979) (Recra Research, 1979)

Compound with highest score:

CYANIDES CHROMIUM

3, 3 => 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

> 300 TONS

Basis of estimating and/or computing waste quantity:

VARIOUS MEMOS TO D.P.W. IN WELLSVILLE

* * *

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

FISHING
RECREATION => 2

Is there tidal influence?

NO

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

N/A

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

UNKNOWN

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

UNKNOWN

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

None

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

N/A

Total population served:

N/A

Name/description of nearest of above water bodies:

N/A

Distance to above-cited intakes, measured in stream miles.

N/A

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

NONE DETECTED

Date and location of detection of contaminants

N/A

Methods used to detect the contaminants:

N/A

Rationale for attributing the contaminants to the site:

N/A

* * *

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

N/A

Most incompatible pair of compounds:

N/A

Toxicity

Most toxic compound:

N/A

Hazardous Waste Quantity

Total quantity of hazardous waste:

N/A

Basis of estimating and/or computing waste quantity:

N/A

* * *

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi (0 to 1 mi) 0 to 1/2 mi 0 to 1/4 mi

34 PEOPLE

COUNT 9 HOMES AND CAMPS

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

N/A

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

N/A

Distance to critical habitat of an endangered species, if 1 mile or less:

UNKNOWN

Land Use

Distance to commercial/industrial area, if 1 mile or less:

N/A

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

N/A

Distance to residential area, if 2 miles or less:

N/A

Distance to agricultural land in production within past 5 years, if 1 mile or less:

N/A

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

N/A

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

N/A

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
WELLSVILLE-ANDOVER LANDFILL	SYNDER HILL ROAD				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
WELLSVILLE	NY	14895	ALLEGANY	-	-

09 COORDINATES: LATITUDE 22° 53' 10.4" W | LONGITUDE 42° 10' 26" N

10 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☒ E. MUNICIPAL
☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
4 27 83 (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	1962 (BEGINNING YEAR) | 1978 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
JOHN KUBAREWICZ	CHEMICAL ENGINEER	ES	(703) 591-7575
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
ART SEANOR	GEOLOGIST	D+M	(315) 638 2572
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
DONALD MACFARQUHAR	DIRECTOR DPW	VILLAGE OF WELLSVILLE	(716) 593-1850
JOHN PALMER	DPW	" "	(716) 593-1850
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	18:48	CLEAR

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
JOHN KUBAREWICZ	ES	(703) 591-7575

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
SAME				5 2 83 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☑ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER (Specify) _____
- ☐ E. SLURRY
- ☑ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS: 7300 TONS

CUBIC YARDS: _____

NO. OF DRUMS: _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☑ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☑ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
(OLW)	OILY WASTE			CUTTING HYDRAULIC OILS PLASTICS
(SOL)	SOLVENTS	50-100,000	LBS/YR	OILS, METHYLENE CHLORIDE WASTES
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	250000	LBS	INERT POLYESTER SCRAP
(IOC)	INORGANIC CHEMICALS			CYANIDES
ACD	ACIDS			
BAS	BASES			
(MES)	HEAVY METALS			CHROMIUM, PAINT, PIGMENTS

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	CYANIDE	999	LF	.006-.012	MG/L
MES	CHROMIUM	7440-47-3	LF	20-78	MG/L
OCC	PHENOL	108-95-2	LF	2-285	MG/L
MES	CADMIUM	7446-43-9	LF	.018	MG/L
MES	MAGANESE	999	LF	-	-
OCC	METHYLENE CHLORIDE	999	LF	-	-
OCC	TRICHLOROETHYLENE	79-01-6	LF	-	-

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYS DOH LABORATORY DATA 7/25/79

RECRA RESEARCH - "LEACHATE TREATMENT FEASIBILITY STUDY" 10/15/79

EPA FORM 2070-13(7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 9/26/79) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

CYANIDES IN WELLS NEARBY

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 8/31/79) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

LEACHATE ENTERING DUFFY HOLLOW CREEK, ODOROUS (SEPTIC), STAINING ROCKS IN CREEK RED

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

UNKNOWN

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

UNKNOWN

01 ☒ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 1 — 04 NARRATIVE DESCRIPTION

ONE MAN ON SITE

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) — 04 NARRATIVE DESCRIPTION

DUE TO GROUNDWATER CONTAMINATION

01 ☒ G. DRINKING WATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 9/26/79) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

DOWNGRADIENT DRINKING WATER WELLS AND SPRINGS HAVE BEEN TESTED AND FOUND TO CONTAIN CYANIDES

01 ☒ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: 1 — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

UNKNOWN

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE 02 SITE NUMBER
NY EPA No.

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☑ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN

01 ☑ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☑ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☑ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☑ OBSERVED (DATE: 4/27/82) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
LEACHATE MOVING OVER GROUND OFFSITE (on surface)

01 ☑ N. DAMAGE TO OFFSITE PROPERTY — 02 ☑ OBSERVED (DATE: 9/26/79) — ☐ POTENTIAL — ☑ ALLEGED
04 NARRATIVE DESCRIPTION
CONTAMINATED DRINKING WATER SUPPLIES

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NO

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS
UNKNOWN

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS
LANDFILL WILL CEASE OPERATIONS IN JUNE 1983

V. SOURCES OF INFORMATION (Cite specific references, e. g., state files, sample analysis, reports)
INTERVIEW ON 5/16/83 WITH JOHN PALMER, WELLSVILLE DEPT. PUBLIC WORKS

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER:

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify) 360	02510			
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☑ F. LANDFILL	>300	TONS
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER

☑ A. BUILDINGS ON SITE

06 AREA OF SITE

24 (Acres)

07 COMMENTS

PORTION OF SITE UNDER QUESTION WAS CLOSED IN 1978 AND COVERED. LEACHATE CURRENTLY RUNS OFF TO STREAM. STARTING IN JUNE LEACHATE WILL BE COLLECTED AND HAULED OFFSITE FOR DISPOSAL.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☑ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

LEACHATE RUNNOFF TO STREAMS

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☑ YES ☐ NO

02 COMMENTS

GATE TO BLOCK VEHICULAR ACESS, OTHERWISE OPEN

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

JOHN PALMER WELLSVILLE DPW 5/16/83

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE: NY | 02 SITE NUMBER:

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL	02 STATUS	ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☐	B. ☐		A. ☐	B. ☐	C. ☐	A. _____ (mi)
NON-COMMUNITY	C. ☐	D. ☐		D. ☐	E. ☐	F. ☐	B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☑ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available). ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available). ☐ D. NOT USED, UNUSEABLE

COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available)

02 POPULATION SERVED BY GROUND WATER	03 DISTANCE TO NEAREST DRINKING WATER WELL
9	.2 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
14'-38' (ft)	SE	_____ (ft)	_____ (gpd)	☐ YES ☐ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

SIX ON-SITE MONITORING WELLS, NEARBY DOWNSTREAM DRINKING WATER WELLS

10 RECHARGE AREA		11 DISCHARGE AREA	
☑ YES ☐ NO	COMMENTS	☐ YES ☑ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
UNNAMED INTERMITTENT STREAM	☐	0.01 (mi)
DYKE CREEK	☐	.06 (mi)
	☐	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE	02 DISTANCE TO NEAREST POPULATION
A. 34 NO. OF PERSONS	B. 152 NO. OF PERSONS	C. 350 NO. OF PERSONS	2500' (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE	04 DISTANCE TO NEAREST OFF-SITE BUILDING
~60	2500' (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER:

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☑ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☑ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
13-30' (ft)	0 (ft)	UNKNOWN	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
36-28=8 (in)	2.3 (in)	5.7 %	E	6.3 %

09 FLOOD POTENTIAL
SITE IS IN >500 YEAR FLOODPLAIN

10
☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. _____ (mi)	B. 2⅓ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)
UNKNOWN (mi)
ENDANGERED SPECIES: PEREGRINE FALCON, GOLDEN EAGLE

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. NONE (mi)	B. NONE (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

SITE IS ON SOUTHEAST SIDE OF A NE-SW TRENDRIP RIDGE, LOCATTED BETWEEN 2 PEAKS ALONG THE RIDGE.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

USGS

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE | 02 SITE NUMBER
NY

II. SAMPLES TAKEN

NA

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☑ GROUND ☐ AERIAL

02 IN CUSTODY OF D+M OFFICE
(Name of organization or individual)

03 MAPS ☑ YES ☐ NO

04 LOCATION OF MAPS D+M OFFICE

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
VILLAGE OF WELLSVILLE	
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**04 SIC CODE**
MUNICIPAL BLDG	
05 CITY	**06 STATE** / **07 ZIP CODE**
WELLSVILLE	NY 14895

01 NAME	02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**04 SIC CODE**
05 CITY	**06 STATE** / **07 ZIP CODE**

01 NAME	02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**04 SIC CODE**
05 CITY	**06 STATE** / **07 ZIP CODE**

01 NAME	02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**04 SIC CODE**
05 CITY	**06 STATE** / **07 ZIP CODE**

PARENT COMPANY *(If applicable)*

08 NAME	09 D+B NUMBER
10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**11 SIC CODE**
12 CITY	**13 STATE** / **14 ZIP CODE**

08 NAME	09 D+B NUMBER
10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**11 SIC CODE**
12 CITY	**13 STATE** / **14 ZIP CODE**

08 NAME	09 D+B NUMBER
10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**11 SIC CODE**
12 CITY	**13 STATE** / **14 ZIP CODE**

08 NAME	09 D+B NUMBER
10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**11 SIC CODE**
12 CITY	**13 STATE** / **14 ZIP CODE**

III. PREVIOUS OWNER(S) *(List most recent first)*

01 NAME	02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**04 SIC CODE**
05 CITY	**06 STATE** / **07 ZIP CODE**

01 NAME	02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**04 SIC CODE**
05 CITY	**06 STATE** / **07 ZIP CODE**

01 NAME	02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**04 SIC CODE**
05 CITY	**06 STATE** / **07 ZIP CODE**

IV. REALTY OWNER(S) *(If applicable; list most recent first)*

01 NAME	02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**04 SIC CODE**
05 CITY	**06 STATE** / **07 ZIP CODE**

01 NAME	02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**04 SIC CODE**
05 CITY	**06 STATE** / **07 ZIP CODE**

01 NAME	02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*	**04 SIC CODE**
05 CITY	**06 STATE** / **07 ZIP CODE**

V. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

NYS Tax Records

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER:

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
VILLAGE OF WELLSVILLE	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
MUNICIPAL BLDG.	

05 CITY	06 STATE	07 ZIP CODE
WELLSVILLE	NY	14895

08 YEARS OF OPERATION	09 NAME OF OWNER
1963 -	

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

John Palmer
Wellsville DPW

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	NO EPA NO.

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
N/A	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
ROCHESTER BUTTON Co		TOWN ANDOVER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
	?	CITY HALL	
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
		ANDOVER	NY
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
VILLAGE WELLSVILLE			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
MUNICIPAL BLDG.			
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
WELLSVILLE	NY		

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

JOHN PALMER WELLSVILLE DPW

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	NO EPA NO.

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE 02 SITE NUMBER
NY NO EPA NO.

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
PART OF SITE HAS >2FT SOIL COVER

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ X. FIRE CONTPOL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
CURRENTLY SOME LEACHATE IS COLLECTED AND PROCESSED OFFSITE

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
FENCED

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NO

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
NONE

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

INTERVIEW WITH JOHN PALMER OF WELLSVILLE DEPT OF PUBLIC WORKS 5/16/83

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	NO EPA NO.

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☑ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

APRIL 1983 REFERRED TO NYS ATTORNEY GENERAL

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

OFFICE NYS ATTORNEY GENERAL APRIL 21, 1983

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: NO EPA NO.

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
WELLSVILLE - ANDOVER LANDFILL	SNYDER HILL RD				
03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
WELLSVILLE	NY	14895	ALLEGANY		
09 COORDINATES LATITUDE: 42°10'30.0"	LONGITUDE: 077°53'38.8"				

10 DIRECTIONS TO SITE (Starting from nearest public road): off Gorman Road.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)		
VILLAGE OF WELLSVILLE	MUNICIPAL BLDG N. MAIN ST		
03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
WELLSVILLE	NY	14895	(716) 593-1850
07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)		
SAME			
09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☑ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☑ YES DATE 4/27/83 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☑ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): Engineering Science, Dames + Moore

02 SITE STATUS (Check one)
☐ A. ACTIVE ☑ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION: 1962 (BEGINNING YEAR) | 1978 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
CYANIDES, CHROMIUM, CADMIUM
PHENOLS, MAGANESE TOTAL VOLATILE ORGANICS

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
CONTAMINANTS LEACHING INTO GROUNDWATER AND SURFACE WATER RUNOFF FROM LANDFILL

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☑ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
JOHN KUBAREWICZ	ES			(703) 591-7575
04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
SAME			( )	5/2/83 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	NO EPA NO.

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☑ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☑ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE
(Measures of waste quantities must be independent)

TONS 2300 TONS
CUBIC YARDS _____
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☑ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☑ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
(OLW)	OILY WASTE			CUTTING HYDRAULIC OILS PLASTIC
(SOL)	SOLVENTS	50-100,000	LBS/YR	OILS, METHYLCHLORIDE WASTES
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	250000	LBS	INERT POLYESTER SCRAP
(IOC)	INORGANIC CHEMICALS			CYANIDES
ACD	ACIDS			
BAS	BASES			
(MES)	HEAVY METALS			CHROMIUM, PAINT, PIGMENTS

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	CYANIDE	999	LF	.006-.012	MG/L
MES	CHROMIUM	7440-47-3	LF	20-78	MG/L
OCC	PHENOL	108-95-2	LF	2-285	MG/L
MES	CADMIUM	7446-43-9	LF	.018	MG/L
MES	MAGANESE	999	LF	-	-
OCC	METHYLENE CHLORIDE	999	LF	-	-
OCC	TRICHLOROETHYLENE	79-01-6	LF	-	-

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

NYS DOH LABORATORY DATA 7/25/79
RECRA RESEARCH- "LEACHATE TREATMENT FEASIBILITY STUDY"
10/15/79

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER
NY NO EPA NO.

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☑ A. GROUNDWATER CONTAMINATION — 02 ☑ OBSERVED (DATE: 9/26/79) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION
CYANIDES IN WELLS NEARBY

01 ☑ B. SURFACE WATER CONTAMINATION — 02 ☑ OBSERVED (DATE: 8/31/79) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION
LEACHATE ENTERING DUFFY HOLLOW CREEK, ODOROUS (SEPTIC), STAINING ROCKS IN CREEK RED

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION
UNKNOWN

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION
UNKNOWN

01 ☑ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 1 — 04 NARRATIVE DESCRIPTION
ONE MAN ON SITE AT ALL TIMES

01 ☑ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) — 04 NARRATIVE DESCRIPTION
DUE TO GROUNDWATER CONTAMINATION

01 ☑ G. DRINKING WATER CONTAMINATION — 02 ☑ OBSERVED (DATE: 9/26/79) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION
DOWN GRADIENT DRINKING WATER WELLS AND SPRINGS HAVE BEEN TESTED AND FOUND TO CONTAIN CYANIDE

01 ☑ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: 2 — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION
UNKNOWN

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: NO EPA NO.

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☑ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN

01 ☑ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☑ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☑ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☑ OBSERVED (DATE: 9/26/79) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
LEACHATE MOVING OVER GROUND OFFSITE

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☑ ALLEGED
04 NARRATIVE DESCRIPTION
CONTAMINATED DRINKING WATER SUPPLIES

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NO

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS
UNKNOWN

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS
LANDFILL WILL CEASE OPERATIONS IN JUNE 1983

V. SOURCES OF INFORMATION (Cite specific references, e. g., state files, sample analysis, reports)
INTERVIEW ON 5/16/83 WITH JOHN PALMER, WELLSVILLE DEPT. PUBLIC WORKS

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SECTION IV

SITE HISTORY

Wellsville-Andover Landfill

The landfill operation on the site began in 1962, and accepted waste materials from the Towns of Wellsville and Andover, and the Villages of Wellsville and Andover, as well as from industrial waste producers located outside these towns. Rochester Button Company disposed of unknown amounts of methylene chloride and possibly trichloroethylene between 1968 and 1973. Other companies disposed of plastics, oils, polyester scraps, talc pumice, and detergents, totaling approximately 480,000 pounds.

The landfill is divided into two sections; the old section operated from 1962 to 1978 and the new section from 1978 to 1983 (anticipated closure June 1983). There is abundant leachate generation in the old section; it is collected around the periphery and runs off across the ground surface. The new site has a leachate collection system, although little leachate is generated.

Although the area surrounding the site is sparsely populated, nearby residents question the impact of landfill leachate upon their drinking water wells and springs. Chemical analyses (NYSDOH, 1979) of drinking water indicated the presence of hydrolyzable cyanides.

Several investigations have been performed on the site. In 1975, a general soils investigation was performed by the Soil Conservation Service. In 1977, six groundwater sampling wells were installed and water samples were analyzed (Friend, 1977).

In 1979, the water quality in Duffy Creek was analyzed (RECRA Research, 1979). When contamination was discovered, RECRA Research Inc. and Wehran Engineers were contracted to perform a leachate migration

investigation and a leachate treatment feasibility study (RECRA Research and Wehren Engineering, 1980).

In spring of 1983, a study was performed by Alfred University Geology and Biology Departments to examine the severity and cause of the contamination problem. Preliminary results of this study suggest that the soil covering the old section of the landfill may be more permeable than the soil underlying the waste, thereby allowing rain water to percolate through the waste and flow laterally off-site, on top of the underlying soil (Gilligan, 1983). The final study is expected to be available in November, 1983.

SECTION V

SUMMARY OF AVAILABLE DATA

Wellsville-Andover

Regional Geology and Hydrology

The Wellsville-Andover Landfill site is located in the Appalachian Highlands physiographic province.

The geology of this province is characterized by thick accumulations of clastic sedimentary rocks. In New York State, these rocks are Devonian in age, dip gently to the south, and reach several thousand feet in thickness. Most of these rocks are deep aquifers; water flow is approximately southward. After the deposition of the bedrock, tectonic activity uplifted and fractured the bedrock, resulting in NE trending faults and modifications of deep fluid-flow regimes.

In the recent past, most of New York State, including the site, has been repeatedly covered by a series of continental ice sheets. The activity of the glacier widened preexisting valleys and deposited widespread accumulations of till. The melting of ice, ending approximately 12,000 years ago, produced large volumes of meltwater; this water subsequently shaped channels and deposited thick accumulations of stratified, granular sediments. Occasionally, meltwater was dammed, forming lakes and associated lacustrine deposits.

At the present time, the land surface is being shaped largely by subaerial erosion. Frequently streams flow in valleys previously shaped by larger rivers, and cut into former lake or meltwater channel deposits. In these valleys, granular deposits frequently act as shallow aquifers, whereas lacustrine clays and tills often inhibit groundwater movement. However, fine-grained, water-lain sediments, such as silts and clays, frequently contain horizontal laminations and sand seams. These internal features facilitate lateral groundwater movement through otherwise low permeability materials.

Recharge of shallow aquifers generally occurs in the uplands, whereas discharge occurs either along hillsides or in valleys. Also, water from shallow aquifers may be vertically connected to underlying bedrock aquifers.

Site Geology

The geology of the site is known from several on-site test pits and borings, a soils report prepared by the Soil Conservation Service (Puglia, 1975), a RECRA Research Inc. Report (1980), USGS topographic maps, NYS Museum and Science Service Bedrock Geology Maps, and an NYSGA Guidebook (1957).

The bedrock on the site is shale, part of the Conneaut Group of shales and siltstones (Whitesville Fm., according to RECRA, Chadakoin Fm., according to NSYGA). The bedrock surface occurs at depths ranging from 4 feet to 30 feet, and slopes to the southwest. Overlying the bedrock are various soil units composed of silt, sand and gravel. The permeability of the soil varies from relatively permeable to relatively impermeable.

Site Hydrology

The site groundwater hydrology has been interpreted by RECRA Research Inc. using data from 6 existing on-site wells and from other observations. According to RECRA, a shallow aquifer exists in the on-site soils and waste materials at depths varying from 0 to 35 feet. The depth may fluctuate occasionally as much as 10 feet.

The site is a recharge area for the shallow aquifer; it discharges on the hillsides surrounding the site, and also probably recharges a deeper bedrock aquifer located at depths beyond 50 feet. Flow in the shallow aquifer probably approximately parallels the ground surface, i.e., flow is to the south and southeast. The direction of flow in the deep bedrock aquifer may be to the south (regional trend).

Surface water on the site occurs as 1) a stream along the southwestern boundary of the site carrying rainwater as well as leachate

and 2) an on-site pond, which occasionally overflows, containing leachate. Off-site, the stream enters Duffy Hollow Creek. It is this surface water pathway that has been the apparent source of stream contamination.

Sampling and Analysis

The NYSDOH sampled well water at three private wells in the vicinity of the landfill (NYSDOH, 1979). The three sampling points are located adjacent to Duffy Hollow Creek. All samples were analyzed for cyanides, chromium, zinc, and total organic carbon. The results are summarized below:

Location	Cyanide (ppm)	Zinc (ppm)	TOC (ppm)
Green	0.012	0.06	1.0
Kelly	0.006	BDL	1.0
Teller	BDL	0.12	BDL

Analysis of composite leachate samples (no location in file) are shown in Table V-1. As shown, phenols, cadmium, chromium, and lead were detected (RECRA, 1979). A surface water and an additional leachate analysis are contained in Appendix A (Friend, 1979). Zinc at low concentrations (.04-.06 ppm) was detected in Duffy Hollow Creek. There were no analyses performed for toxics at that time.

The site location map shown in Figure 1 was obtained from the Wellsville Department of Public Works (Gilligan, 1983). Although the origin of the map is unknown, it was most likely prepared by Recra Research. The white area in the northeast corner is the new section of the landfill.

In the spring of 1983, a study was performed by Alfred University to examine the cause and severity of the contamination problem; however, results from this study are not available at this time (Gilligan, 1983). Although study results will be available in November it is anticipated

TABLE V-1

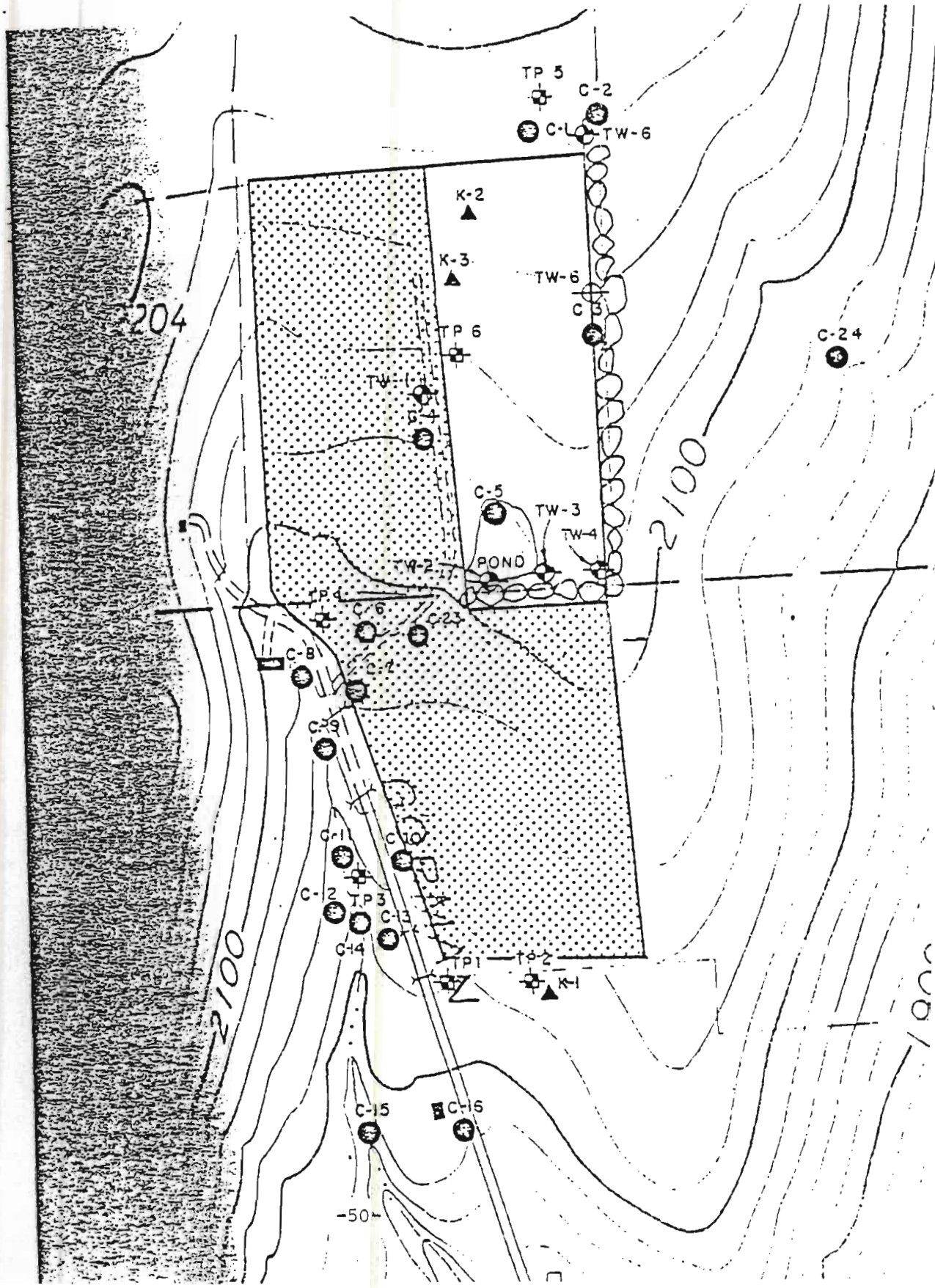
WELLSVILLE LEACHATE ANALYSIS (RECRA, 1979)

Report Date: 10/15/79
Sample Date: 9/26/79

COMPOSITE SAMPLES

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION		
		Northwest Comp.	Central Comp.	South Comp.
pH	Standard Units	6.27	6.36	6.59
Total Acidicy (pH = 8.3)	% as HCl	0.26	0.54	0.15
Total Alkalinity (pH = 4.5)	mg/l as $CaCO_3$	3,720	3,260	2,790
Conductivity	µmhos/cm	7,050	6,100	5,650
Total Solids (103°C)	mg/l	10,500	8,370	6,890
Total Dissolved Solids (103°C)	mg/l	10,400	7,450	6,190
Total Suspended Solids	mg/l	102	915	708
Chloride	mg/l	808	863	590
Fluoride	mg/l	0.716	0.514	0.315
Biochemical Oxygen Demand - 5 day	mg/l	2,910	1,770	930
Chemical Oxygen Demand	mg/l	16,300	10,900	8,230
Sulfate	mg/l	24	36	6.0
Sulfide	mg/l	22.1	47.0	43.6
Total Cyanide	mg/l	<0.05	<0.05	<0.05
Nitrate	mg N/l	1.8	1.1	1.5
Nitrite	mg N/l	0.500	0.650	1.82
Ammonia	mg N/l	61.8	96.4	108
Total Kjeldhal Nitrogen	mg N/l	62	98	110
Total Phosphorus	mg P/l	0.056	0.300	0.183
Total Organic Carbon	mg/l	3,640	3,010	2,300
Total Inorganic Carbon	mg/l	210	194	196
Total Grease and Oils	mg/l	579	921	291
Total Phenol	mg/l	3.78	2.00	28.5
Soluble Cadmium	mg/l	0.018	<0.003	<0.003
Soluble Chromium	mg/l	0.018	0.006	<0.002
Soluble Copper	mg/l	0.072	0.003	0.003
Soluble Iron	mg/l	1,300	420	460
Soluble Lead	mg/l	<0.02	<0.02	<0.02
Soluble Manganese	mg/l	84.0	78.0	20.0
Soluble Nickel	mg/l	<0.02	<0.02	<0.02
Soluble Mercury	µg/l	<0.7	<0.7	<0.7
Soluble Zinc	mg/l	0.132	0.296	0.041
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	0.33	0.51	0.24
Total Volatile Chlorinated Organic Scan	µg/l as Chlorine; Carbon Tetrachloride Standard	33,800	18,900	12,200

FIGURE 1. WELLSVILLE-ANDOVER SITE LOCATION MAP



that their usefulness will be limited since the parameters analyzed are not normally associated with toxic contaminants. In addition only field test procedures (colormetric) were used to analyze the samples.

Although other analytical data are available, the parameters investigated are not normally associated with toxic contaminants.

SECTION VI

ASSESSMENT OF ADEQUACY OF DATA

Site: Wellsville Andover

HRS Data Requirement	Comments on Data
Observed Release	
Ground Water	Data available, adequate for HRS evaluation.
Surface Water	Data available, adequate for HRS evaluation.
Air	No available data, field data collection recommended.
Route Characteristics	
Ground Water	Data available, adequate for HRS evaluation.
Surface Water	Data available, adequate for HRS evaluation.
Air	Data available, adequate for HRS evaluation.
Containment	Information available, adequate for HRS evaluation.
Waste Characteristics	Information available, adequate for HRS evaluation.
Targets	Information available; adequate for HRS evaluation.
Observed Incident	Information available revealed no report of incident. No further investigation recommended.
Accessibility	Adequate information available.

SECTION VII

PHASE II WORK PLAN

Site: Wellsville Andover

Objectives

The objectives of the Phase II activities are:

- To collect additional field data necessary to complete the HRS scoring.
- To perform a conceptual evaluation of remedial alternatives and estimate budgetary costs for the most likely alternative.
- To prepare a site investigation report.

The additional field data required to complete the HRS are defined as follows:

Air - An air monitoring survey with an OVA meter is recommended to check the air quality above the surface of the site.

TASK DESCRIPTION

The proposed Phase II tasks are described in Table VII-1.

COST ESTIMATE

The estimated manhours required for the Phase II project are presented in Table VII-2 and the estimated project costs by tasks are presented in Table VII-3. The cost for performing the Phase II project is $6937.

TABLE VII-1
PHASE II WORK PLAN - TASK DESCRIPTION
Site: Wellsville Andover

Tasks		Description of Task
TASK		
II-A	Update Work Plan	Review the information in the Phase I report, conduct a site visit, and revise the Phase II work plan.
II-B	Conduct Geophysical studies	No further studies necessary.
II-C	Conduct Boring/Install Install Monitoring Wells	No further installation of monitoring wells necessary.
II-D	Construct Test Pits/ Auger Holes	No further construction of test pits/auger holes necessary.
II-E	Perform Sampling and Analysis	
	Soil samples from borings	No further sampling necessary.
	Soil samples from surface soils	No further sampling necessary.
	Soil samples from test pits and auger holes	No further sampling necessary.
	Sediment samples from surface water	No further sampling necessary.
	Ground-water samples	No further sampling necessary.
	Surface water samples	No further sampling necessary.
	Air samples	Using the OVA, determine the presence of organics.
	Waste samples	No further sampling necessary.
II-F	Calculate Final HRS	Based on the field data collected in Tasks IIB - IIE, complete the HRS form.
II-G	Conduct Site Assessment	Prepare final report containing Phase I report, additional field data, final HRS and HRS documentation records, and site assessments. The site assessment will consist of a conceptual evaluation of alternatives and a preliminary cost estimate of the most probable alternative.
II-H	Project Management	Project coordination, administration and reporting.

TABLE VII-2
PERSONNEL RESOURCES BY TASK
PHASE II HRS SITE INVESTIGATION (SITE: WELLSVILLE ANDOVER)

TASK DESCRIPTION	TEAM MEMBERS, MANHOURS												TOTAL HOURS	TOTAL $
	PIC	TRB	PM	DPM	PCM	QAM	HSM	FTL	FT	RAAL	RAAT	SS		
II-A UPDATE WORK PLAN	1		4	1			1	2		6		8	23	376.8
II-B CONDUCT GEOPHYSICAL STUDIES													0	0
II-C CONDUCT BORING/INSTALL MONITORING WELLS													0	0
II-D CONSTRUCT TEST PITS/AUGER HOLES													0	0
II-E PERFORM SAMPLING AND ANALYSIS														
SOIL SAMPLES FROM BORINGS													0	0
SOIL SAMPLES FROM SURFACE SOILS													0	0
SOIL SAMPLES FROM TEST PITS AND AUGER HOLES													0	0
SEDIMENT SAMPLES FROM SURFCE WATER													0	0
GROUND-WATER SAMPLES													0	0
SURFACE WATER SAMPLES													0	0
AIR SAMPLES			1					1	8			2	12	133.66
WASTE SAMPLES													0	0
II-F CALCULATE FINAL HRS			2	2				2	6			8	20	262.7
II-G CONDUCT SITE ASSESSMENT	1	2	4	2				4	8	6	24	32	83	1029.44
II-H PROJECT MANAGEMENT	2		6	2			2					8	20	369.16
TOTALS	4	2	17	7	0	0	3	9	22	12	24	58	158	2171.76

TABLE VII-3
COST ESTIMATE BREAKDOWN BY TASK
PHASE II HRS SITE INVESTIGATION (SITE: WELLSVILLE ANDOVER)

TASK DESCRIPTION	DIRECT LABOR HOURS	DIRECT LABOR COST	OTHER DIRECT COSTS (ODC), $ LAB ANALYSIS	TRAVEL AND SUBSISTANCE	SUPPLIES	EQUIP. CHARGES	SUBCON-TRACTORS	MISC.	SUBTOTAL ODC	TOTAL ($)
II-A UPDATE WORK PLAN	23	376.8		100	50	50		25	225	601.8
II-B CONDUCT GEOPHYSICAL STUDIES									0	0
II-C CONDUCT BORING/INSTALL MONITORING WELLS									0	0
II-D CONSTRUCT TEST PITS/AUGER HOLES									0	0
II-E PERFORM SAMPLING AND ANALYSIS										
SOIL SAMPLES FROM BORINGS									0	0
SOIL SAMPLES FROM SURFACE SOILS									0	0
SOIL SAMPLES FROM TEST PITS AND AUGER HOLES									0	0
SEDIMENT SAMPLES FROM SURFACE WATER									0	0
GROUND-WATER SAMPLES									0	0
SURFACE WATER SAMPLES									0	0
AIR SAMPLES	12	133.66		85	25	15		5	130	263.66
WASTE SAMPLES									0	0
II-F CALCULATE FINAL HRS	20	262.7			50	50		25	125	387.7
II-G CONDUCT SITE ASSESSMENT	83	1029.44			100	200		75	375	1404.44
II-H PROJECT MANAGEMENT	20	369.16		150	150	50		50	400	769.16
TOTALS	158	2171.76	0	335	375	365	0	180	1255	3426.76

OVERHEAD =	3101.27
SUBTOTAL =	6528.00
FEE =	408.66
TOTAL PROJECT COST =	6936.66

APPENDIX A

BIBLIOGRAPHY

APPENDIX A

Bibliography

Wellsville-Andover

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(12/75)

file

New York State Department of Environmental Conservation

MEMORANDUM

TO: Robert Mitrey, Region 9
FROM: Cheruvu Sastry C.L.S.
SUBJECT: Wellsville - Andover LF - 02S10

DATE: July 16, 1980

The "Leachate Control Investigation" and "Proposed Interim Treatment Design for the Leachate" prepared by Wehran Engineering and RCRA Research (May 1980) were reviewed by the staff and we have the following comments:

1. The overall quality of the report was impressive, especially the format in which it was presented.

2. The report makes it very clear that the groundwater monitoring system as it is established now cannot evaluate the facility's impact on the groundwater. The applicant should make necessary arrangements to modify and improve the monitoring system.

3. We agree with the observation "modification of present collection system is necessary .....". This problem deserves immediate attention and should be assigned the highest order of priority by the applicant.

4. We agree, in general, with the conclusions of the report as presented on p. 27 and 28.

5. The groundwater conditions as described on p. 14-17 do suggest that the trench method of landfilling should not be used at this site.

6. We agree with the recommendations as suggested on p. 29 of the report. This site should be able to meet the RCRA criteria, if the applicant can implement all the recommendations.

7. The discussion of the alternative methods for leachate treatment is very practical and we do agree with the conclusions.

cc: J. McMahon
E. Barcomb

CLS:ke

TESTING
ANALYTICAL
BACTERIAL
DAIRY PRODUCTS
FOODS

Certified by U.S. Public Health Service

D. W. FRIEND LABORATORY

CONSULTANT
30 LINCOLN STREET
WAVERLY, N.Y. 14892
607 565–2064

WATER
STREAM POLLUTION
SEWAGE
SALMONELLA
STAPH

Date December 1, 1977 (Received) SAMPLE

SOURCE	337NT DYKE CREEK @ DUFFY HOLLOW	339 NT CEGLIA'S SPRING	341 NT LEACHATE	343 NT TEST WELL 1	345NT TEST WELL 2	347 NT TEST WELL 3
Village of Wellsville 136 North MainSt. Box #591 Wellsville, New York						
Temperature F.						
pH	8.4	8.1	5.7	7.0	7.0	7.9
B.O.D. mg/L [5 day]	30.0	30.0	2,340	22.0	0.3	420
C.O.D. mg/L [ultimate]						
C.O.D. mg/L	69.6	-0.1	15,103	375	69.6	2,430
Total Solids mg/L	98	130	11,348	2,250	33,556	93,520
Suspended Solids mg/L	60	64	600	1,210	31,600	32,400
Dissolved Solids mg/L	38	66	10,748	1,040	1,956	61,280
Volatile Solids mg/L						
Vol. Susp. Solids mg/L						
Vol. Diss. Solids mg/L						
Settleable Solids ml/L						
Kjeldahl Nitrogen mg/L						
Organic Nitrogen mg/L	-0.6	0.6	19.6	-5.6	89.6	12.9
Ammonia mg/L N	5.6	11.2	-5.6	-5.6	-2.8	-2.8
NO3 mg/L N						
NO2 mg/L N						
Total PO4 mg/L						
Ortho PO4 mg/L						
Poly PO4 mg/L						
Alkalinity mg/L as CaCO3						
Acidity						
Total Hardness as CaCO3						
Calcium Hardness CaCO3						
Magnesium Hardness CaCO3						
Iron mg/L	-0.2	-0.2	380	220	180	8.0
Chloride mg/L as Cl	15.0	12.5	-1.0	20	7.5	10
Sulfate mg/L	10	7	700	320	68	-20
Detergents, anionic mg/L						
Oil and Grease mg/L						
Dissolved Oxygen						
ColiformMPN/100m1	21	7	-1	-1	-1	4
Fecal Coliform MPN/100m1						
Phenols						
Aluminum mg/L						
Calcium mg/L	30	22	500	75	270	1,100
Magnesium mg/L	5	4.6	190	27.2	18	110
Sodium mg/L	5	1.7	490	33	22	50
Potassium mg/L	1.7	1.3	160	16	33	56
Zinc mg/L	0.06	0.04	5	95	550	13
Nickel mg/L	-0.1	-0.1	0.5	0.7	1.3	-2

D.W. Friend
Director

TESTING
ANALYTICAL
BACTERIAL
DAIRY PRODUCTS
FOODS

Certified by U.S. Public Health Service

D. W. FRIEND LABORATORY

CONSULTANT
30 LINCOLN STREET
WAVERLY, N.Y. 14892
607 565–2064

WATER
STREAM POLLUTION
SEWAGE
SALMONELLA
STAPH

Date December 1, 1977 (Received) SAMPLE

SOURCE Village of Wellsville 156 N. Main St. Box 391 Wellsville, New York	TEST WELL 4 349 NE	TEST WELL 5 351 NE	TEST WELL 6 353 NE	DUFFY HOLLOW CREEK & SNYDER RD 355 NE		
Temperature F.						
pH	7.2	7.1	7.6	7.9		
B.O.D. mg/L [5 day]	55.0	46.5	92.0	42.0		
B.O.D. mg/L [ultimate]						
C.O.D. mg/L	-0.1	504	1,193	189		
Total Solids mg/L	31,004	120,144	23,104	136		
Suspended Solids mg/L	20,200	86,621	14,130	24		
Dissolved Solids mg/L	10,204	33,324	8,974	112		
Volatile Solids mg/L						
Vol. Susp. Solids mg/L						
Vol. Diss. Solids mg/L						
Settleable Solids ml/L						
Kjeldahl Nitrogen mg/L						
Organic Nitrogen mg/L	31.6	145.6	42.6	-0.6		
Ammonia mg/L N	-2.0	-2.0	-2.0	-2.0		
NO3 mg/L N						
NO2 mg/L N						
Total PO4 mg/L						
Ortho PO4 mg/L						
Poly PO4 mg/L						
Alkalinity mg/L as CaCO3						
Acidity						
Total Hardness as CaCO3						
Calcium Hardness CaCO3						
Magnesium Hardness CaCO3						
Iron mg/L	140	490	124	2.0		
Chloride mg/L as Cl	30	17.5	12	22.5		
Sulfate mg/L	23	40	43	11		
Detergents, anionic mg/L						
Oil and Grease mg/L						
Dissolved Oxygen						
ColiformMPN/100ml	4	9	-1	4		
Fecal Coliform MPN/100ml						
Phenols						
Aluminum mg/L						
Calcium mg/l	[illegible]	[illegible]	[illegible]	[illegible]		
Magnesium mg/L	24	30.5	14	3.5		
Sodium mg/L	10	12	14	5.9		
Potassium mg/L	19	25	30	3.0		
Zinc mg/L	11	900	22.5	0.04		
Nickel mg/L	1.0	3.1	0.9	-0.1		

D. W. Friend
Director

RECORD OF TELEPHONE CONVERSATION

DATE 5/18/83, ~ 1pm JOB NO.: 13305-001

RECORDED BY: EDG OWNER/CLIENT: Superfund

TALKED WITH: Dr. Davis OF Geology Dept. Alfred Univ

NATURE OF CALL: INCOMING ☒ OUTGOING ☐

ROUTE TO: INFORMATION ACTION

E.

Geol. Dept
Alfred Univ
(607) 871-2203

Project by James Sarton (student)

MAIN SUBJECT OF CALL: re: Wellsville/Andover Site

ITEMS DISCUSSED:

Sarton completed his senior thesis, which studied the movement of gdwtr from landfill into nearby creeks + the chemical quality of the surface water. He performed lab tests on samples he collected, as well as reviewed available literature from Wellsville Dept of Public Works. The results (tentative, preliminary, etc.) suggest that waste is deposited ontop of impermeable site soil, + covered by other permeable site soil. Rain water therefore percolates into waste + moves contaminants laterally through waste, seeping out along sides of hill

cover
waste
imperm.

Dr. Davis was 1 of 2 advisors on this study. Dr. Gaylord Rough is Biologist + other advisor. He suggested I call Rough to obtain a copy of the report.

(607) 871-2205

0757

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

LAB ACCESSION NO: 04420 YR/MO/DAY/HR SAMPLE REC'D: 79/07/26/11

REPORTING LAB: 10 EHC ALBANY
PROGRAM: 520 INDUSTRIAL WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: 04 NY GAZETTEER NO: 0275 COUNTY: ALLEGANY
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBW'SHED: DUFFY HOLLOW CK

EXACT SAMPLING POINT: HOUSEHOLD OF ARNOLD GREEN ON DUFFY HOLLOW CK
TYPE OF SAMPLE: 11 WATER, DRIVEN WELL
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 07/25/10
REPORT SENT TO: CO (1) RO (2) LPHE (1) LHO (0) FED (0) CHEM (1)

	PARAMETER	UNIT	RESULT	NOTATION
002901	HYDROLYZABLE CYANIDES	MG/L	0.012	
309801	CHROMIUM	MG/L	0.01	LT
010901	ZINC	MG/L	0.06	
009201	CARBON, ORGANIC (TOC)	MG/L	1.0	
106401	NITROGEN TOTAL KJELDAHL	MG/L	0.16	
001001	CHLORIDE	MG/L	32.	

DATE COMPLETED: 8/28/79

NYS DEPT. OF ENVIRONMENTAL CON
REGION 9
584 DELAWARE AVENUE
BUFFALO NEW YORK 14202

SUBMITTED BY: HINTZ

0123

NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

LAB ACCESSION NO: 04419 YR/MO/DAY/HR SAMPLE REC'D: 79/07/26/11

REPORTING LAB: 10 EHC ALBANY
PROGRAM: 520 INDUSTRIAL WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: 04 NY GAZETTEER NO: 0275 COUNTY: ALLEGANY
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBW'SHED: DUFFY HOLLOW CK T. WELLSVILLE

EXACT SAMPLING POINT: HOUSEHOLD OF FRED KELLY JR ON DUFFY HOL.CK
TYPE OF SAMPLE: 11 WATER, DRIVEN WELL
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 07/25/09
REPORT SENT TO: CO (1) RO (2) LPHE (1) LHO (0) FED (0) CHEM (0)

PARAMETER		UNIT	RESULT	NOTATION
000301	NITROGEN,NITRATE&NITRITE	MG/L		NA
001001	CHLORIDE	MG/L	9.	
002901	HYDROLYZABLE CYANIDES	MG/L	0.006	
009801	CHROMIUM	MG/L	0.01	LT
010901	ZINC	MG/L	0.05	LT
009201	CARBON, ORGANIC (TOC)	MG/L	1.0	
106401	NITROGEN TOTAL KJELDAHL	MG/L	0.04	LT

DATE COMPLETED: 9/12/79

NYS DEPT. OF ENVIRONMENTAL CON
REGION 9
584 DELAWARE AVENUE
BUFFALO NEW YORK 14202

SUBMITTED BY: HINTZ

1041 NEW YORK STATE DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

LAB ACCESSION NO: 0441 YR/MO/DAY/HR SAMPLE RECD: 79/07/25/11

REPORTING AGENCY: 10 ERIE COUNTY
PROGRAM: 01 INDUSTRIAL WASTES
STATION (LOCATION) NO:
DRAINAGE BASIN: 04 LK ERIE TRIB NO: 0275 COUNTY: ALLEGANY
DISPOSITATE: DEG ' " DEG ' "
DESIGN WATER BODY SUBBASIN: DUFFY HOLLOW CREEK WELLSVILLE

EXACT SAMPLING POINT: TELLER RESIDENCE ABOVE DUFFY HOLLOW CREEK
TYPE OF SAMPLE: 11 WATER, DRIVEN WELL
MO/DAY/HR OF SAMPLING: FROM 07/25 TO 07/25/10
REPORT SENT TO: CO (1) PO (2) LPHE (0) LHO (0) FEO (0) CHEM (0)

PARAMETER		UNIT	RESULT	NOTATION
001051	CHLORIDE	MG/L	3.	LT
002901	NON-HYDROLYZABLE CYANIDES	MG/L	0.005	LT
010701	CADMIUM	MG/L	0.01	LT
010901	ZINC	MG/L	0.12	
009201	CARBON, ORGANIC (TOC)	MG/L	2.2	
100401	NITROGEN TOTAL KJELDAHL	MG/L	1.6	

DATE COMPLETED: 79/07/30

NYS DEPT. OF ENVIRONMENTAL CONS
REGION 9
584 DELAWARE AVE
BUFFALO NEW YORK 14202

SUBMITTED BY: HINTZ

File
Kevin Hintz KRH
Contravention of Duffy Hollow Creek by leachate leaving the old Wellsville-Andover Landfill
September 5, 1979

On August 31, 1979 this writer sampled Duffy Hollow Creek to determine if the leachate entering the creek from the old landfill is contravening surface water standards. See attached sheet for the results. In summary, contravention of surface water standards is occurring in Duffy Hollow Creek as the result of the leachate. Contravention is occurring in the following manner:

1. Dissolved oxygen - ranges from 10.2 to 2.4. DO below 5 ppm in spots downstream of the landfill.

2. Sediment - red iron oxide colored sediment lies on the bottom of the stream and in pockets along the stream. Black and/or gray-black sediment can also be found in the stream bottom.

3. Floating Substance-iron oxide colored scum or foam was floating on top of the water.

KH:dd
Attachment

Stream Sampling - Duffy Hollow Creek
8/31/79

	Time	pH	DO	Comments
a[illegible] Rt. 417	11:05 a.m.	5.5	10.2	Rocks red stained and bottom [illegible] creek covered with lots of da[illegible] green algae.
f[illegible]st bridge on Duffy Hollow Rd.	11:15 a.m.	5.5	8.1	Red stain on rocks, iron sediment in pockets on stream bottom. Rocks also stained black in mainstream of creek.
second bridge o[illegible] Duffy Hollow R[illegible] near Green residence	11:24 a.m.	5.5	7.6	Slight septic smell, iron stained rock, rocks in main-stream stained black. Red brown sediment in pockets in stream. Some minnows present.
Intersection of Duffy Hollow Rd. [illegible] Synder Hill	11:35 a.m.	5.5	2.4	Septic smell more evident, water was cloudy. Oil like sheem along banks. Scum caugh in rocks. Black-green sedimen on stream bottom. No fish or life present
Just below [illegible]dfill - below [illegible] th[illegible]n most ntra[illegible]e of ditch to [illegible]ffy Creek	11:45 a.m.	3.6	4.5	Water flowing is red - septic smell quite obnoxious. Stream bottom covered with iron sediment as well as rocks. Sheem on top, scum too. Sand gravel is gray black below red sediment. No fish or life present.
[illegible]ch coming ff landfill [illegible]r access road to [illegible] landfill	11:50 a.m.	6.	3.0	Water was stained with iron oxides. Odorous as well.

15 (12/78)

New York State Department of Environmental Conservation

MEMORANDUM

TO: Carl Stiles, NYS Health Dept.
FROM: Kevin Hintz, NYSDEC
SUBJECT: Groundwater testing of residential wells below Wellsville-Andover Landfill

DATE: September 18, 1979

Attached please find the sampling results for three residences in the area of the landfill. The sampling was conducted in response to complaints by individuals about their private water supplies. The Teller residence is located northwest of the old landfill and near the head of Duffy Hollow Creek. The Arnold Green residence is located downstream of the landfill adjacent to Duffy Hollow Creek. The Fred Kelly residence is located downstream of the landfill and adjacent to Duffy Hollow Creek just north of Rt. 417. The hydrolyzable cyanides for these residences are 0.005 mg/l, 0.012 mg/l and 0.006 mg/l respectively. Cyanides results appear to be the only significant results of the testing. Apparently cyanides are migrating off site but the concentration is still below groundwater standards. As part of the Consent Order placed on the Village of Wellsville, this Department will require that the Village monitor the groundwater below the landfill.

KH:dd

cc: Bob Mitrey
Peter Burke
John McMahon

Attachment

FILE: 0250

DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

ACCESSION NO: 04419 YR/MO/DAY/HR SAMPLE REC'D: 79/07/26/11

REPORTING LAB: 10 EHC ALBANY
PROGRAM: 520 INDUSTRIAL WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: 04 NY GAZETTEER NO: 0275 COUNTY: ALLEGANY
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBA'SHED: DUFFY HOLLOW CK T. WELLSVILLE

EXACT SAMPLING POINT: HOUSEHOLD OF FRED KELLY JR ON DUFFY HOLLOW CK
TYPE OF SAMPLE: 11 WATER, DRIVEN WELL
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 07/25/09
REPORT SENT TO: CO (1) RO (2) LPHE (1) LHO (0) FED (0) CHEM (0)

Downstream.

PARAMETER		UNIT	RESULT	NOTATION
000601	NITROGEN,NITRATE&NITRITE	MG/L		NA
001001	CHLORIDE	MG/L	9.	
002901	HYDROLYZABLE CYANIDES	MG/L	0.006	
308901	CHROMIUM	MG/L	0.01	LT
010901	ZINC	MG/L	0.05	LT
009201	CARBON, ORGANIC (TOC)	MG/L	1.0	
100401	NITROGEN TOTAL KJELDAHL	MG/L	0.04	LT

DATE COMPLETED: 9/12/79

NYS DEPT. OF ENVIRONMENTAL CON
REGION 9
584 DELAWARE AVENUE
BUFFALO NEW YORK 14202

SUBMITTED BY: HINTZ

DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH CENTER

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

ACCESSION NO: 04420 YR/MO/DAY/HR SAMPLE REC'D: 79/07/26/11

REPORTING LAB: 10 EHC ALBANY
PROGRAM: 520 INDUSTRIAL WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: 04 NY GAZETTEER NO: 0275 COUNTY: ALLEGANY
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUB'SHED: DUFFY HOLLOW CK

EXACT SAMPLING POINT: HOUSEHOLD OF ARNOLD GREEN ON DUFFY HOLLOW CK
TYPE OF SAMPLE: 11 WATER, DRIVEN WELL
MO/DAY/HR OF SAMPLING: FROM 00/00 TO 07/25/10
REPORT SENT TO: CO (1) RO (2) LPHE (1) LHO (0) FED (C) CHEM (1)

PARAMETER		UNIT	RESULT	NOTATION
002901	HYDROLYZABLE CYANIDES	MG/L	0.012	
309801	CHROMIUM	MG/L	0.01	LT
010901	ZINC	MG/L	0.06	
006201	CARBON, ORGANIC (TOC)	MG/L	1.0	
106401	NITROGEN TOTAL KJELDAHL	MG/L	0.16	
001001	CHLORIDE	MG/L	32.	

DATE COMPLETED: 8/28/79

NYS DEPT. OF ENVIRONMENTAL CON
REGION 9
584 DELAWARE AVENUE
BUFFALO NEW YORK 14202

SUBMITTED BY: HINTZ

for the results.

RESULTS OF EXAMINATION
(PAGE 1 OF 1)

LAB ACCESSION NO: 04422 YR/MO/DAY/HR SAMPLE REC'D: 79/07/25/10

REPORTING LAB: 10 EHO ALBANY
PROGRAM: 520 INDUSTRIAL WASTES
STATION (SOURCE) NO:
DRAINAGE BASIN: 04 NY GAZETTEER NO: 0275 COUNTY: ALLEGANY
COORDINATES: DEG ' "N, DEG ' "W
COMMON NAME INCL SUBWATERSHED: DUFFY HOLLOW CREEK WELLSVILLE

EXACT SAMPLING POINT: TELLER RESIDENCE ABOVE DUFFY HOLLOW CREEK
TYPE OF SAMPLE: 11 WATER, DRIVEN WELL UPSTREAM
MO/DAY/HR OF SAMPLING: FROM 06/26 TO 07/25/10
REPORT SENT TO: CO (1) PO (2) LPHE (3) LHO (6) FED (9) CHEM (A)

PARAMETER		UNIT	RESULT	NOTATION
001001	CHLORIDE	MG/L	3.	LT
002701	HYDROLYZABLE CYANIDES	MG/L	0.005	LT
009501	[illegible]	MG/L	0.01	LT
010701	IRON	MG/L	0.12	
[illegible]201	CARBON, ORGANIC (TOC)	MG/L	2.2	
100401	NITROGEN TOTAL KJELDAHL	MG/L	1.6	

DATE COMPLETED: 7/31/79

[illegible] DEPT. OF ENVIR. CONS. - FINAL COPY
REGION 9
584 DELAWARE AVENUE
BUFFALO NEW YORK 14202

SUBMITTED BY: [illegible]

VILLAGE OF WELLSVILLE
MUNICIPAL BUILDING 156 NORTH MAIN
Post Office Box 591
WELLSVILLE, NEW YORK 14895
TELEPHONE - AREA CODE 716

Water ✓
Air
Gen.
Circ.
File

Heintz

File 0251C

January 18, 1978

Mr. John S. Tygert
New York State Department of Environmental Conservation
584 Delaware Avenue
Buffalo, New York 14202

Dear Jack:

Once again a project that looked simple at the beginning is anything but simple now that I'm in the middle of it. The project is the sampling and chemical analysis of the groundwater at our proposed landfill.

The problem is analysis of the lab test results, they don't look right to me but then I wasn't much of a chemist twenty years ago when I took it, and I'm even less of one now.

To start, we had six groundwater observation/sampling wells drilled at locations around the landfill as shown on the attached plan view. A description of the wells is given in the letter and drilling log (August 1, 1977) from Parratt-Wolff. The work was inspected in the field during drilling and setting and was in accordance with the description. The wells were drilled to bedrock.

I obtained quotations for lab analysis from several firms and selected the D. W. Friend Laboratory in Waverly on the basis of price and convenience, possibly mistake 'A'. Do you know anything of this laboratory?

Samples were taken from the well by tube lowered into the well on the end of a line. The samples were then transferred to sterilized bottles. Two samples were taken from each source, one was treated with 1 ml of H_2SO_4, the other was untreated. The samples were delivered to the laboratory the morning after they were taken.

Now we come to what in retrospect looks like mistake 'B' - sampling technique. Several of the test wells have very little water in them and it is difficult to get much of a sample, in addition the silt from the surrounding soil seems to be filtering through the sand and into the wellpoint and the result is that some of the samples were pretty dirty. Since we are interested in testing the water, not the dirt, I think we should have either filtered the sample or allowed it to settle and pipetted the test sample off the top. I think the solids information we obtained is worthless because of this oversight. What are your thoughts on this?

In addition to the groundwater we took four surface water samples including the rankest leachate on the site, and you may be interested in that analysis. The adjacent stream samples look pretty consistent to me - again I would appreciate your comments.

Obviously the results we obtained are unsatisfactory as baseline data without confirmation and if they can't be confirmed they are no good at all. I would like to select another lab, preferably in DEC, Region 9, and known to your department, for another series of tests. Do you have some suggestions on independent laboratories we might contact?

I would also appreciate your looking over the lab test results we obtained and giving me your general comments. Some of the things that bother me are:

1. The very high B.O.D. in test wells No. 3 and 6. I just can't see what the source of this pollution would be

2. The high readings for zinc in test wells 2 and 5.

I plan on running some B.O.D.'s in our treatment plant lab once we get moved over to the new lab but the rest of the testing will be done outside. I don't want the Village evaluating the Village, particularly on baseline data.

Jack, I would very much appreciate any guidance and information you could give me in solving this problem and getting an accurate picture of the groundwater quality in the area. Thanks very much.

Yours truly,

VILLAGE OF WELLSVILLE

D. A. MacFarquhar
Director of Public Works

DAM/bjs

GUIDEBOOK

NEW YORK STATE GEOLOGICAL ASSOCIATION

Twenty-ninth Annual Meeting

Wellsville, New York

May 9-12, 1957

* *

Prepared
by
Authors of the Various Chapters

Edited and Compiled
by
W. H. Young, Jr. and W. L. Kreidler

HOSTS

New York State Geological Survey
Sinclair Refining Co.
Oil and Gas Companies of the Area

* *

Permanent Secretary for New York State Geological Association
Dr. Kurt E. Lowe
The City College, Dept. of Geology, 139th St. & Convent Ave., New York City 31, N.Y.

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Robert F. Flacke
Commissioner

June 22, '79

Mr. Michael F. DeBonis, Chief
Solid Waste Branch
United States Environmental Protection Agency
Region 2
26 Federal Plaza
New York, New York 10007

file 702 S 10

Dear Mr. DeBonis:

This is in response to the complaints referred to us regarding the Steuben County Sanitary Landfill at Lindley and the Sanitary Landfill at the village of Wellsville, by your office.

We checked with our Regional office at Avon, about the problems at the Steuben County Landfill. Mr. Frank Clark, Regional Solid Waste Engineer, got in touch with Mr. Myron Crouch, Division of Solid Waste, Steuben County and requested him to come up with a solution to alleviate the leachate problem. As soon as a proposal is submitted by Steuben County, we will review it and oversee its implementation.

Mr. Robert Mitrey, Region 9 office at Buffalo has looked into the complaint brought by Mr. Paul Bird about the Sanitary Landfill at Wellsville. A letter has been recently sent from Mr. Mitrey to Mr. Bird. Your office will be receiving a copy of this letter.

If there are any questions, please contact Mr. Cheruvu Sastry, P.E. of our Waste Disposal Bureau at (518) 457-6605.

Sincerely,

S/S

Norman H. Nosenchuck, P.E.
Director,
Division of Solid Waste Management

CS:bw
cc: Region 8
Region 9
Mr. Sastry
bcc: Mr. Nosenchuck - 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

FILE COPY

RECEIVED
JUN 7 1979
DIRECTOR, DIVISION OF
SOLID WASTE MANAGEMENT

June 4, 1979

Mr. Norman H. Nosenchuck, P.E.
Director, Div. of Solid Waste Management
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233

Dear Mr. Nosenchuck:

This is to inform you of a citizen's complaint received at this office on May 31, 1979, concerning the Steuben County sanitary landfill in Lindley, New York. According to Mrs. William Rhodes, 1131 Glendenning Road, Painted Post, New York 14870 (607) 523-7735, the following problems regarding the landfill have been noted:

1. litter on the town road (Gibson Hill Road) leading to the landfill

2. absence of the required daily cover

3. visible leachate in receiving waters

In the past, Mrs. Rhodes has voiced her complaints to Mr. Frank Clark of the Department of Environmental Conservation's Avon Regional Office.

Since the facility is under Department of Environmental Conservation's jurisdiction, we have forwarded this information to you for appropriate action. Please inform us of your findings regarding Mrs. Rhodes' complaint and what action your agency has taken. We look forward to hearing from you concerning this matter in the near future.

If you have any questions, feel free to contact either me or Helen Shannon of my staff at (212) 264-0505.

Sincerely yours,

Michael F. DeBonis
Chief
Solid Waste Branch

cc: Mr. David Mafrici, NYSDEC
Mr. Frank Clark, Region 8, NYSDEC
Mrs. William Rhodes

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

FILE COPY

June 4, 1979

RECEIVED
JUN 7 1979
DIRECTOR, DIVISION OF
SOLID WASTE MANAGEMENT

Mr. Norman H. Nosenchuck, P.E.
Director, Division of Solid Waste
Management
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12233

Dear Mr. Nosenchuck:

This is to inform you of a citizen complaint recently received by our office regarding the Village of Wellsville's Sanitary Landfill. According to Mr. Paul Bird, 426 Custer, Evanston, Illinois 60202, a property owner in Alleghany County, a creek which runs through his property is "heavily polluted." Mr. Bird claims that the source of this pollution is the Village of Wellsville's Landfill. Apparently, raw sewage is running from the landfill to the creek that leads to Dike Creek and the Genesee River.

Since the facility is under DEC's jurisdiction, we have forwarded this information to you for appropriate action. Please inform us of your findings regarding Mr. Bird's complaint and what action your agency has taken. We look forward to hearing from you concerning this matter in the near future.

If you have any questions, feel free to contact either me or Helen Shannon of my staff at (212) 264-0505.

Sincerely yours,

Michael F. DeBonis

Michael F. DeBonis
Chief
Solid Waste Branch

cc: Mr. David Mafrici, NYSDEC
Mr. Jack Tygert, NYSDEC

5/23/79

RECEIVED
MAY 25 1979
ROCHESTER FIELD OFFICE
AM PM
7 8 9 10 11 12 1 2 3 4 5 6

POLLUTION PROBLEM AT LANDFILL
WELLSVILLE NEW YORK'S
(SANDERS ROAD).

Dear Mr. Mor[illegible],

This is to advise you of a serious problem that requires immediate attention.

I am a property owner in Allegheny County and recently (5/19/79) visited this site

The creek that runs through my property is heavily pollated. The source of this is the pollution is the Village of Wellsville's Land Fill.

It appears that raw sewage is running from the land fill to the creek that leads to Dyke Creek - Genesee River etc.

The water and rocks in the creek are dirty brown

Would you please look into this situation and advise me as to what further action may be take to alleviate this situation

Sincerely,

Paul C Bird
426 CUSTER
[illegible] NY 14207

ESR
5/25/79

cc: Reg 9

June 5, 1979

Mr. Paul Bird
426 Custer
Evanston, Illinois 60202

Dear Mr. Bird:

This is in response to your recent letter to the U.S. Environmental Protection Agency concerning the Village of Wellsville's Sanitary Landfill. We can understand your concerns regarding the possible pollution coming from this landfill to the creek on your property.

Since this facility is under the jurisdiction of the New York State Department of Environmental Conservation (DEC), we have forwarded the information in your letter to:

Mr. Norman H. Nosenchuck, P.E.
Director, Division of Solid
Waste Management
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, New York 12233

for appropriate action. You should anticipate hearing from Mr. Nosenchuck or a member of his staff within the near future.

Thank you for expressing your interest in the environment.

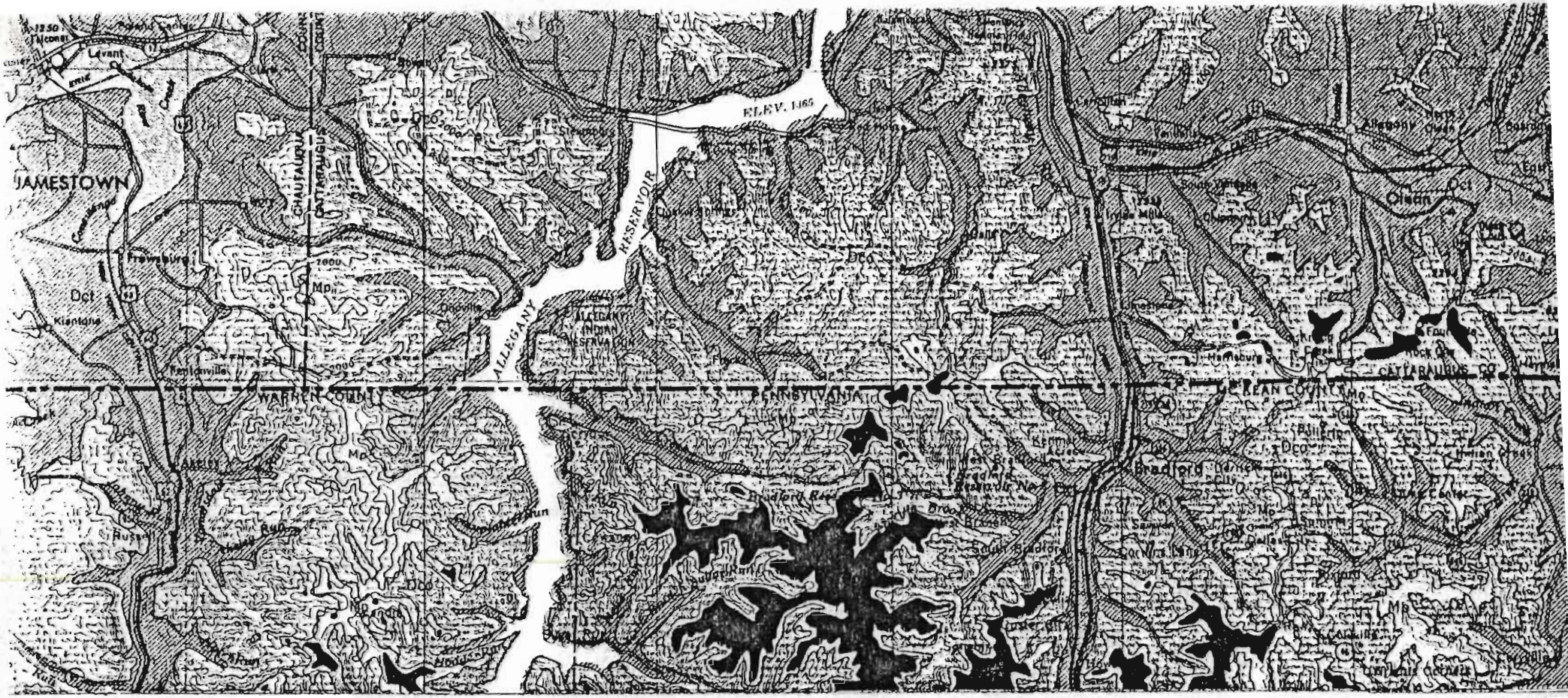
If you have any questions, feel free to call either me or Helen Shannon of my staff at (212) 264-0505.

Sincerely yours,

Michael F. DeBonis
Chief
Solid Waste Branch

cc: Mr. Norman H. Nosenchuck, P.E.✓
Director, Div. of Solid Waste Management, NYSDEC

Mr. Jack Tygert
Region IX Headquarters, NYSDEC



GEOLOGIC MAP OF NEW YORK

1970

Niagara Sheet

Scale 1:250,000

5 0 5 10 15 Statute Miles 20

5 0 5 10 15 20 25 Kilometers 30

CONTOUR INTERVAL 100 FEET

VILLAGE OF WELLSVILLE SANITARY LANDFILL

SOILS REPORT

December, 1975

Prepared by: Paul S. Puglia
Soil Resource Specialist
USDA-Soil Conservation Service

Copied from Dept of Public Works
Wellsville

LEACHATE MIGRATION INVESTIGATION

Prepared for:
Village of Wellsville

Prepared by:
Recra Research, Inc./
Wehran Engineering, P.C.

RECRA RESEARCH, INC.
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH

P.O. Box 448 / Tonawanda, New York 14150

1960

LEACHATE TREATMENT FEASIBILITY STUDY

Prepared For:

Village of Wellsville
Department of Public Works
Wellsville, New York 14895

Prepared By:

Recra Research, Inc.
111 Wales Avenue
Tonawanda, New York 14150

RECRA RESEARCH, INC.
TOTAL CHEMICAL WASTE MANAGEMENT THROUGH APPLIED RESEARCH
P.O. Box 448 / Tonawanda, New York 14150 / (716) 838-6200

TABLE I

VILLAGE OF WELLSVILLE
SANITARY LANDFILL LEACHATE

Report Date: 10/15/79
Sample Date: 9/26/79

COMPOSITE SAMPLES

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION		
		Northwest Comp.	Central Comp.	South Comp.
pH	Standard Units	6.27	6.36	6.59
Total Acidicy (pH = 8.3)	% as HCl	0.26	0.54	0.15
Total Alkalinity (pH = 4.5)	mg/l as $CaCO_3$	3,720	3,260	2,790
Conductivity	µmhos/cm	7,050	6,100	5,650
Total Solids (103°C)	mg/l	10,500	8,370	6,890
Total Dissolved Solids (103°C)	mg/l	10,400	7,450	6,190
Total Suspended Solids	mg/l	102	915	708
Chloride	mg/l	808	863	590
Fluoride	mg/l	0.716	0.514	0.315
Biochemical Oxygen Demand - 5 day	mg/l	2,910	1,770	930
Chemical Oxygen Demand	mg/l	16,300	10,900	8,230
Sulfate	mg/l	24	36	6.0
Sulfide	mg/l	22.1	47.0	43.6
Total Cyanide	mg/l	<0.05	<0.05	<0.05
Nitrate	mg N/l	1.8	1.1	1.5
Nitrite	mg N/l	0.500	0.650	1.82
Ammonia	mg N/l	61.8	96.4	108
Total Kjeldhal Nitrogen	mg N/l	62	98	110
Total Phosphorus	mg P/l	0.056	0.300	0.183
Total Organic Carbon	mg/l	3,640	3,010	2,300
Total Inorganic Carbon	mg/l	210	194	196
Total Grease and Oils	mg/l	579	921	291
Total Phenol	mg/l	3.78	2.00	28.5
Soluble Cadmium	mg/l	0.018	<0.003	<0.003
Soluble Chromium	mg/l	0.018	0.006	<0.002
Soluble Copper	mg/l	0.072	0.003	0.003
Soluble Iron	mg/l	1,300	420	460
Soluble Lead	mg/l	<0.02	<0.02	<0.02
Soluble Manganese	mg/l	84.0	78.0	20.0
Soluble Nickel	mg/l	<0.02	<0.02	<0.02
Soluble Mercury	µg/l	<0.7	<0.7	<0.7
Soluble Zinc	mg/l	0.132	0.296	0.041
Halogenated Organic Scan	µg/l as Chlorine; Lindane Standard	0.33	0.51	0.24
Total Volatile Chlorinated Organic Scan	µg/l as Chlorine; Carbon Tetrachloride Standard	93,800	18,900	12,200

APPENDIX B

NYS REGISTRY FORM

HAZARDOUS WASTE DISPOSAL SITES REPORT
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Code: _____

Site Code: 902004

Name of Site: Wellsville-Andover Landfill Region: 9

County: Allegany Town/City Wellsville

Street Address Snyder Hill Road

Status of Site Narrative:

Landfill consisting of two sections. The new section located in the northeast corner is currently active although scheduled for closure in June 1983. The older section was closed in 1978. A leachate runoff problem exists in this section. Groundwater contamination from cyanides is confirmed, while surface water contamination is suspected.

Type of Site: Open Dump ☐ Treatment Pond(s) ☐ Number of Ponds ____
Landfill ☒ Lagoon(s) ☐ Number of Lagoons ____
Structure ☐

Estimated Size 24 Acres

Hazardous Wastes Disposed? Confirmed ☒ Suspected ☐

*Type and Quantity of Hazardous Wastes:

TYPE	QUANTITY (Pounds, drums, tons, gallons)
Sodium cyanide	155 gal
Chromium & Zinc Chromate paint	
Cutting and Hydraulic oils	
Sludge-pumice, ployester fines,	78 tons/yr.
tak, & detergent (lead carbonate)	

* Use additional sheets if more space is needed.

APPENDIX C

GENERIC HEALTH AND SAFETY PLAN

APPENDIX C

HEALTH AND SAFETY PLAN OUTLINE

I. PURPOSE

The purpose of this plan is to assign responsibilities, establish personnel protection standards, mandatory operating procedures, and provide for contingencies that may arise while operations are being conducted at the site.

II. APPLICABILITY

The provisions of the plan are mandatory for all on-site investigation personnel and personnel under contract while initial site reconnaissance and/or preliminary investigation activities are being conducted at the site. These activities include investigation, sampling, and monitoring undertaken on the site or at any off-site areas which may be affected by contamination from the site.

III. RESPONSIBILITY

1. Principal Investigator (PI)

a. The PI shall direct on-site investigation efforts for each discipline. At the site, the PI, assisted by the Team Safety Officer, has the primary responsibility for:

1) Assuring that appropriate personnel protection equipment is available and properly utilized by all on-site personnel and subcontractor personnel.

2) Assuring that personnel are aware of the provisions of this plan, are instructed in the work practices necessary to

ensure safety, and in planned procedures for dealing with emergencies (Provisions, Work Practices and Emergency Procedures) appropriate to this investigation.

3) Assuring that personnel are aware of the potential hazards associated with site operations.
4) Supervising the monitoring of safety performance by all personel to ensure that required work practices are employed.
5) Correcting any work practices or conditions that may result in injury to personnel or exposure to hazardous substances.

HEALTH AND SAFETY PRELIMINARY SITE INVESTIGATION

Based on the appropriate listed field activity plans, as well as other site information (such as waste types and chemistry) as learned from the data collecting and analysis, the Principal Investigator/Team Safety Officer will develop an appropriate health and safety plan for the site.

Planning for Site Entry

In order to determine whether it is safe for the investigative team to proceed with the study and/cr to determine what appropriate level of protective clothing and equipment should be used, the nature and extent of the on-site hazards will be assessed prior to site inspection. An on-site reconnaissance utilizing appropriate monitoring equipiment will check for:

- exposivity
- atmospheric concentrations of hazardous vapors, bases, fumes, and dusts
- oxygen deficiencies
- physical hazards posed by site features/topography

If during the initial site reconnaissance, the monitoring equipment detects evidence of fire or explosion potential or high levels of radiation, further entry into the site will not be allowed. The site inspection will be delayed until such problems can be resolved appropriately.

The initial site reconnaissance will be performed by team personnel equipped with the level of protective clothing and any additional gear

that is required for their safe entry to the site. In order to provide sufficient lead time to "fine tune" safety and data gathering plans, this initial site reconaissance should be performed at least one week before the scheduled site investigation.

Based on this information regarding the associated conditions, a detailed plan providing for the safety of field personnel and the public will be developed in accordance with EPA and OSHA and regulations and USAF operating procedures. This plan may address such factors as (dependent on specific site/waste conditions):

- Types of exposures to hazardous materials (e.g., inhalation, skin absorption, ingestion, and eye contact), and the potential effects of each exposure pathway for each hazardous waste.
- High risk areas (surface contamination, exposed containers, or areas containing concentrations of chemical vapor, oxygen deficiency, explosive or flammable potential or radioactivity).
- Required protective and related equipment and procedures to adequately protect field personnel from perceived hazards on site.
- Decontamination procedures.
- Procedures for the prevention of accidental releases of hazardous substances to the air, soil, or surface water and procedures for implementation of proper contingency plans if such releases do occur.
- Procedures for the proper disposal of hazardous wastes generated in the course of the site inspection.
- Equipment and procedures for handling special site inspection conditions (e.g., prolonged operations, weather extremes, etc.).
- Emergency procedures.
- Arrangements with local hospitals and other local authorities.

The site-specific safety plan should be sufficient to provide the site inspection team with all applicable information assure health and safety. However, additional procedures may need to be considered and developed given site-specific conditions identified both before and during the site inspection.

Site Entry and Field Activities

Three sequential stages are identified to constitute the field activities:

- Initial setup
- Exploration and sampling
- Demobilization

Initial Setup

The main functions in this step are to secure entry and establish safety criteria. All operations will be managed from a central point, including:

- General supervision of area activities
- Decontamination process coordination
- Field communication
- Safety and medical coordination
- Equipment staging
- Recordkeeping
- Other functions as required

Exploration and Sampling

During this stage most field activities will be performed by pairs or small groups of team members. These tasks will include the following:

- Observation of visible spills, leachate seeps, etc., and sampling water and/or soils at these areas.
- Photography.
- Geophysical surveys (Electromagnetic or Metal Detection).
- Electrical resistivity measurements to detect ground-water contamination.
- Soil sampling using hand-operated equipment and drilling rigs.
- Ground-water sampling and water level measurements from existing wells.
- Surface water sampling.

Demobilization

This is the final stage of field activities in which field personnel will:

- Decontaminate used equipment.
- Transfer equipment and samples obtained to the decontamination staging area.
- Undergo personnel decontamination procedures.
- Load all equipment and samples on to the project vehicle(s).

The PI will supervise all the above steps through its conclusion. Field team members should not depart until all subcontractors personnel and equipment have left the site.

APPENDIX D

GENERAL FIELD PROCEDURES

APPENDIX D

General Field Procedures

Installation of Groundwater Quality Monitoring Wells

To investigate the groundwater quality within the aquifer of concern, groundwater monitoring wells will be installed. To accomplish the purposes of the monitoring wells a series of separate field procedures have been prepared. These include:

A - Drilling Procedures
B - Monitoring Well Construction Procedures
C - Water Sampling Procedures

The field program will be under the overall direction of the geologist in charge. Detailed supervision of the field work will be the responsibility of the field geologist. In particular, the field geologist will have the following responsibilities.

- Supervision of all drilling work and well construction
- Maintenance of the boring log for each boring
- Collection, labeling, and identification of formation samples, including rock cores.
- Conducting in cooperation with the driller, required in situ falling head tests and pumping tests.
- Performance of the water sampling program.
- Maintenance of pertinent notes in his/her field notebook and on daily field memos.

Health and safety procedures as set forth by the site Health and Safety Plan will be adhered to for all field operations.

A. Drilling Procedures

General Procedures

A qualified drilling subcontractor will be selected to provide all the equipment materials and skilled labor necessary to advance the test borings to the depths specified by the field geologist.

Order of Drilling Wells All wells will be drilled in numerical sequence from what is considered the upgradient location (least contaminated) to the downgradient (most contaminated) with the upgradient boring being labeled "B-1".

Method of Drilling Minimum of 4" ID hollow stem augers. If formational materials preclude the use of augers rotary drilling methods will be employed (e.g. for coring of bedrock).

Formational Sampling Samples will be collected at a minimum of every 5 feet in the borings and at each lithographic change noted. A D&M sampler will be used to obtain one sample from each major layer in each boring. Other samples will be obtained with a standard split spoon sampler. Bedrock will be sampled continuously by coring with an NX double tube core barrel. All sampling equipment will be thoroughly cleaned after obtaining each sample.

The cleaning method employed will be dependent upon the type of contaminant suspected to be present at that location.

Measurements The depth to the water level in each boring being drilled should be measured each morning and just prior to installation of any monitoring devices into a boring. The depth of the boring should be measured and recorded on the boring log upon reaching final depth.

Decontamination Requirements

All downhole equipment and above hole equipment that may come in contact with subsurface materials will be steam cleaned at the drilling location prior to initiating any drilling and between each boring and at the conclusion of the drilling program. The steam cleaning rinse water will be allowed to discharge to the ground surface at the well site. Care will be taken to assure this water does not come in contact with any surface water source.

Site Cleanup

All drill cuttings remaining after well installation will be removed for proper disposal.

All debris, paper, etc. will be removed and all depressions resulting from drilling operations will be filled in.

Drilling Procedures for Bedrock Boring

1. Sample formation every 5 feet and at every major lithologic change.

2. Drill and sample the unconsolidated formations until bedrock is encountered.

3. Ream the hole to at least 6 inches in diameter.

4. Make ready an appropriate length of steel casing by cleaning.

5. Place enough volclay pellets in the hole to make a layer of about one-foot thickness at the bottom of the boring.

6. Place the steel casing in the hole, and bottom it snugly into the bentonite. Once the casing is set, it should not be lifted until the completion of the well.

7. Circulate the drilling fluid; drill a few inches below the bottom of the volclay layer and circulate for a few minutes to clean the boring of most of the bentonite. Clean out this part of the boring by circulating clean water.

8. Drill into the bedrock the required depth using the NX double-tube core barrel.

9. Store the rock cores in specially constructed wooden rock-core boxes, for inspection and description by the field geologist.

10. Measure water level in boring.

11. Construct well in the boring

Drilling Procedures for Soil Borings

1. Sample formation every 5 feet and at every major lithologic change.

2. Drill to the depth estimated.

3. Measure water level in boring.

4. Construct well in boring.

Procedure for Abandoning a Boring

A cement slurry containing about 5 lbs. bentonite and one bag of cement per 8 to 10 gallons of water should be pumped into the hole to the ground surface.

B. MONITORING WELL CONSTRUCTION PROCEDURES

General Specifications and Procedures

Casing and Well Screen:	2-inch I.D. Schedule 40 PVC with flush screw joints or 2-inch I.D. stainless steel with flush screw joints.
Screen Slot Size:	Based upon materials encountered in boring.
Storage of Casing and Screen:	The casing and screen lengths will not be stored directly on the ground. The well string shall be prepared on a clean plastic sheet spread out over level ground.
Cleaning of Casing and Screen:	Casing and screen shall be cleaned before installing in the boring.
Bottom Cap and Blank Casing:	A length of blank casing of about two feet complete with a bottom cap shall be placed below the well screen in all cases.
Gravel Pack:	The gravel pack material will be 90 percent by weight larger than the screen size and should have a uniformity coefficient of 2.5 or less.
Placement of the Gravel Pack:	The gravel pack should be emplaced so that it extends to three feet above the top of the well screen. This should be confirmed by measuring down the annular space with a weighted tape or with a measured small-diameter pipe. The volume of gravel pack material emplaced should be compared with the volume computed as required, based on the screen diameter and length. The gravel pack may be poured directly down the annular space provided the well is pressurized and an upward flow of pure water is maintained in the annular space by introducing the water at a low rate through the well casing which would enter the annular space through the well screen openings.

Bentonite Seal: A bentonite seal shall be placed in the annular space above the gravel pack in each well by emplacing 1/4-inch diameter volclay pellets in the annular space during which time the low flow rate up the annular space in maintained. This bentonite seal should be at least 2 feet thick. The bentonite shall be compacted with a donut shaped weight that slides over the well casing.

Well Development: Each well should be developed for about 30 minutes to one hour using an air-lift surging method. Appropriate piping should be assembled for the discharge water so as to discharge it and dispose of it in a manner to limit contamination of the surrounding area. The discharge during development should be estimated by using a 5-gallon bucket and a stop watch. In the course of development, if a well turns out to have a very low specific capacity, it may prove necessary to add some clean water in order to remove as many fines as possible from the vicinity of the well screen. Development should be continued until all but a trace amount of fines and suspended solids appear in the discharge water. Following development, the air line hose or pipe and associated fittings should be thoroughly cleaned and then rinsed.

Grouting Annular Space: A bentonite-cement grout (5 lbs. bentonite and one bag of cement to 8-10 gallons of water) will be pumped into the annular space to fill the space from the top of the volclay bentonite seal to the ground surface.

Protective Casing: A length of 6-inch I.D. steel casing with a lockable cap should be placed over the well casing in each case to protect it. It should be set about one foot into the bentonite cement grout in the annular space, and should stick up above ground about 2 to 3 feet.

Well Labeling: The full number of each monitoring well should be painted on the protective casing and cap.

Surveying: A level survey will be performed in which the elevation of the top of the inside casing of each well will be determined 0.01 ft. and the reference point marked.

The Construction site makes it impossible to prescribe one single Deep or Shallow well construction configuration. Therefore a generic well construction configuration for both deep and shallow wells has been developed.

Deep Well Construction

1. Place well screen so as to screen entire thickness of lower sand and gravel layer (if it exists), unless the layer exceeds 20 feet in thickness; the well screen should extend about two feet into the top of bedrock.

2. If a clay layer immediately overlies the bedrock and the overlying surficial sand and gravel is less than 30 feet, place the screen in only the upper five feet of bedrock.

3. If no significant clay/lacustrine layer exists and if the surficial sand and gravel layer is greater than 20 feet thick place screen in lower 15 to 20 feet of the sand and gravel layer, extending also two feet into bedrock.

4. If no significant clay/lacustrine layer exists and if the surficial sand and gravel layer is less than 20 feet in thickness screen entire saturated thickness, in addition to about 5 feet above the summer static water level and about two feet into the underlying bedrock.

5. After installation of the well screen and casing, and the gravel pack, emplace volclay pellets to form a 2 to 4 foot thick seal in the annular space above the gravel pack. Use 1/4-inch diameter pellets and maintain a low flow rate up the annular space during emplacement so as to insure that they settle in place evenly around the annular space. Measure the depth to the top of the seal.

6. Using a bentonite-cement grout (described in the foregoing section), pump grout into the annular space so as to grout up to the top of the clay layer.

7. Jack the 6-inch casing out of the hole.

8. Develop the well and complete it as described under the foregoing section.

Shallow Well Construction

1. Place the well screen so that it extends from the top of any clay layer (if it exists) to about 5 feet above the summer static water level, unless the saturated thickness is greater than 20 feet, in which case the screen should be placed opposite the upper 20 feet of the saturated part of the unit, extending as well about 5 feet above the summer static water level. In the case of shallower wells less than 20 feet deep, place screen from bottom of hole to within 5 feet of land surface. For very shallow water table, the top of screen should be two feet above the estimated high water table or no closer than two feet to the land surface.

2. Emplace the volclay pellets as described above for the deep wells. A one-foot thick bentonite seal should be adequate.

3. Develop and complete the well as described under General Specifications Procedures.

C. GROUNDWATER SAMPLING PROCEDURES

Following the installation of the well, individual groundwater samples will be collected according to the procedures included below from each well for analyses. These samples will be collected using a positive displacement sampling device made entirely from stainless steel and teflon. This procedure will permit us to collect a sample that is more representative of the aquifer water and to limit the possibility of degassing and volatilization. The well storage water will be evacuated with a submersible pump or air lift system whereby the air is not permitted to come in direct contact with the aquifer. The

sampling pump will be cleaned between wells by immersion into a solvent, followed by a distilled deionized water rinse. A quantity of each of these will be pumped through the pump and teflon tubing.

As a part of our ongoing QA program, field blanks, consisting of distilled deionized water from the discharge of the pump following cleaning will be taken between selected wells to monitor the effectiveness of the cleaning procedures. Two typed of trip blanks will also be taken. The first type consists of a sample bottle filled with distilled, deionized water that will be capped and accompany the samples at all times. The second type will consist of a sample bottle filled with distilled, deionized water and set aside open to the atmosphere, during the sampling of the wells. The purpose of these trip blanks is to evaluate the potential for atmospheric contamination, and to assure that proper sample bottle preparation and handling techniques have been employed.

The samples collected from these sampling efforts will be analyzed for indicator parameters identified during the Phase I.

WATER SAMPLING PROCEDURES.

1. Open well and trip blank and record initial static water levels.

2. Wash down pump:

- For organics use hexane followed by methanol and finally distilled water
- Collect wash solvents and rinse in a bucket, etc. (a 5 gal. container w/ a large funnel works well)
- Wash pump inside and outside

3. Install pump in well: Use stainless steel pump and teflon tubing

- Each well should have its own tubing. Tubing should be cleaned and thoroughly rinsed between sampling events.
- Pump should have a check valve, preventing water having been in internal contact with the pump and the tubing from draining back into the well.

4. Pump at least two exchanges of water

- Care should be taken so as not to over pump, whereby excessive concentrations are drawn into the well. The number of exchanges pumped should be based upon the soil typed, flow patterns and aquifer properties of each well.

5. Take a sample:

- From pump discharge: Insert discharge tube to bottom of jar. Withdraw tube ahead of the sample so that aeration and turbulence is minimized.

- Some samples must be filtered in the field. This should be done prior to filling the sample container.

- For volatile organics samples should not be taken from the pump discharge. Aeration from the pump will destroy organic volatiles.

6. Immediately perform field tests such as temperature, pH, specific conductivity and D.O.

7. Refrigerate samples at $4^{o}C$.

8. Cap well and trip blank.

9. Wash all equipment.

NOTES: - The sampling procedures should reflect the sample parameters. Those parameters subject to change with changes in pH, D.O. may need to be sampled using stainless steel bailers.

- Some sample parameters require filtering in the field.

- For accountability and traceability of the samples, two forms are included which are examples of what we presently use.

EQUIPMENT BLANKS:

- Wash pump with solvents, collecting solvent rinse. Care must be taken in the selection of solvents, so damage to the pump will not occur. Rinse with distilled water.

- Take a sample of "clean" water,

- Turn on pump, sample first "slug" of water from the pump

- Pump volume equivalent to amount typically pumped from the well. DO NOT recirculate the water.

- Take sample from pump at end of pumping period

- Refrigerate samples.

APPENDIX D

General Field Procedures

Installation of Groundwater Quality Monitoring Wells

To investigate the groundwater quality within the aquifer of concern, groundwater monitoring wells will be installed. To accomplish the purposes of the monitoring wells a series of separate field procedures have been prepared. These include:

A - Drilling Procedures
B - Monitoring Well Construction Procedures
C - Water Sampling Procedures

The field program will be under the overall direction of the geologist in charge. Detailed supervision of the field work will be the responsibility of the field geologist. In particular, the field geologist will have the following responsibilities.

- Supervision of all drilling work and well construction
- Maintenance of the boring log for each boring
- Collection, labeling, and identification of formation samples, including rock cores.
- Conducting in cooperation with the driller, required in situ falling head tests and pumping tests.
- Performance of the water sampling program.
- Maintenance of pertinent notes in his/her field notebook and on daily field memos.

Health and safety procedures as set forth by the site Health and Safety Plan will be adhered to for all field operations.

A. Drilling Procedures

General Procedures

A qualified drilling subcontractor will be selected to provide all the equipment materials and skilled labor necessary to advance the test borings to the depths specified by the field geologist.

Order of Drilling Wells: All wells will be drilled in numerical sequence from what is considered the upgradient location (least contaminated) to the downgradient (most contaminated) with the upgradient boring being labeled "B-1".

Method of Drilling: Minimum of 4" ID hollow stem augers. If formational materials preclude the use of augers rotary drilling methods will be employed (e.g. for coring of bedrock).

Formational Sampling: Samples will be collected at a minimum of every 5 feet in the borings and at each lithographic change noted. A D&M sampler will be used to obtain one sample from each major layer in each boring. Other samples will be obtained with a standard split spoon sampler. Bedrock will be sampled continuously by coring with an NX double tube core barrel. All sampling equipment will be thoroughly cleaned after obtaining each sample.

The cleaning method employed will be dependent upon the type of contaminant suspected to be present at that location.

Measurements: The depth to the water level in each boring being drilled should be measured each morning and just prior to installation of any monitoring devices into a boring. The depth of the boring should be measured and recorded on the boring log upon reaching final depth.

Decontamination Requirements

All downhole equipment and above hole equipment that may come in contact with subsurface materials will be steam cleaned at the drilling location prior to initiating any drilling and between each boring and at the conclusion of the drilling program. The steam cleaning rinse water will be allowed to discharge to the ground surface at the well site. Care will be taken to assure this water does not come in contact with any surface water source.

Site Cleanup

All drill cuttings remaining after well installation will be removed for proper disposal.

All debris, paper, etc. will be removed and all depressions resulting from drilling operations will be filled in.

Drilling Procedures for Bedrock Boring

1. Sample formation every 5 feet and at every major lithologic change.

2. Drill and sample the unconsolidated formations until bedrock is encountered.

3. Ream the hole to at least 6 inches in diameter.

4. Make ready an appropriate length of steel casing by cleaning.

5. Place enough volclay pellets in the hole to make a layer of about one-foot thickness at the bottom of the boring.

6. Place the steel casing in the hole, and bottom it snugly into the bentonite. Once the casing is set, it should not be lifted until the completion of the well.

7. Circulate the drilling fluid; drill a few inches below the bottom of the volclay layer and circulate for a few minutes to clean the boring of most of the bentonite. Clean out this part of the boring by circulating clean water.

8. Drill into the bedrock the required depth using the NX double-tube core barrel.

9. Store the rock cores in specially constructed wooden rock-core boxes, for inspection and description by the field geologist.

10. Measure water level in boring.

11. Construct well in the boring

Drilling Procedures for Soil Borings

1. Sample formation every 5 feet and at every major lithologic change.

2. Drill to the depth estimated.

3. Measure water level in boring.

4. Construct well in boring.

Procedure for Abandoning a Boring

A cement slurry containing about 5 lbs. bentonite and one bag of cement per 8 to 10 gallons of water should be pumped into the hole to the ground surface.

B. MONITORING WELL CONSTRUCTION PROCEDURES

General Specifications and Procedures

Casing and Well Screen:	2-inch I.D. Schedule 40 PVC with flush screw joints or 2-inch I.D. stainless steel with flush screw joints.
Screen Slot Size:	Based upon materials encountered in boring.
Storage of Casing and Screen:	The casing and screen lengths will not be stored directly on the ground. The well string shall be prepared on a clean plastic sheet spread out over level ground.
Cleaning of Casing and Screen:	Casing and screen shall be cleaned before installing in the boring.
Bottom Cap and Blank Casing:	A length of blank casing of about two feet complete with a bottom cap shall be placed below the well screen in all cases.
Gravel Pack:	The gravel pack material will be 90 percent by weight larger than the screen size and should have a uniformity coefficient of 2.5 or less.
Placement of the Gravel Pack:	The gravel pack should be emplaced so that it extends to three feet above the top of the well screen. This should be confirmed by measuring down the annular space with a weighted tape or with a measured small-diameter pipe. The volume of gravel pack material emplaced should be compared with the volume computed as required, based on the screen diameter and length. The gravel pack may be poured directly down the annular space provided the well is pressurized and an upward flow of pure water is maintained in the annular space by introducing the water at a low rate through the well casing which would enter the annular space through the well screen openings.

Bentonite Seal: A bentonite seal shall be placed in the annular space above the gravel pack in each well by emplacing 1/4-inch diameter volclay pellets in the annular space during which time the low flow rate up the annular space in maintained. This bentonite seal should be at least 2 feet thick. The bentonite shall be compacted with a donut shaped weight that slides over the well casing.

Well Development: Each well should be developed for about 30 minutes to one hour using an air-lift surging method. Appropriate piping should be assembled for the discharge water so as to discharge it and dispose of it in a manner to limit contamination of the surrounding area. The discharge during development should be estimated by using a 5-gallon bucket and a stop watch. In the course of development, if a well turns out to have a very low specific capacity, it may prove necessary to add some clean water in order to remove as many fines as possible from the vicinity of the well screen. Development should be continued until all but a trace amount of fines and suspended solids appear in the discharge water. Following development, the air line hose or pipe and associated fittings should be thoroughly cleaned and then rinsed.

Grouting Annular Space: A bentonite-cement grout (5 lbs. bentonite and one bag of cement to 8-10 gallons of water) will be pumped into the annular space to fill the space from the top of the volclay bentonite seal to the ground surface.

Protective Casing: A length of 6-inch I.D. steel casing with a lockable cap should be placed over the well casing in each case to protect it. It should be set about one foot into the bentonite cement grout in the annular space, and should stick up above ground about 2 to 3 feet.

Well Labeling: The full number of each monitoring well should be painted on the protective casing and cap.

Surveying: A level survey will be performed in which the elevation of the top of the inside casing of each well will be determined 0.01 ft. and the reference point marked.

The Construction site makes it impossible to prescribe one single Deep or Shallow well construction configuration. Therefore a generic well construction configuration for both deep and shallow wells has been developed.

Deep Well Construction

1. Place well screen so as to screen entire thickness of lower sand and gravel layer (if it exists), unless the layer exceeds 20 feet in thickness; the well screen should extend about two feet into the top of bedrock.

2. If a clay layer immediately overlies the bedrock and the overlying surficial sand and gravel is less than 30 feet, place the screen in only the upper five feet of bedrock.

3. If no significant clay/lacustrine layer exists and if the surficial sand and gravel layer is greater than 20 feet thick place screen in lower 15 to 20 feet of the sand and gravel layer, extending also two feet into bedrock.

4. If no significant clay/lacustrine layer exists and if the surficial sand and gravel layer is less than 20 feet in thickness screen entire saturated thickness, in addition to about 5 feet above the summer static water level and about two feet into the underlying bedrock.

5. After installation of the well screen and casing, and the gravel pack, emplace volclay pellets to form a 2 to 4 foot thick seal in the annular space above the gravel pack. Use 1/4-inch diameter pellets and maintain a low flow rate up the annular space during emplacement so as to insure that they settle in place evenly around the annular space. Measure the depth to the top of the seal.

6. Using a bentonite-cement grout (described in the foregoing section), pump grout into the annular space so as to grout up to the top of the clay layer.

7. Jack the 6-inch casing out of the hole.

8. Develop the well and complete it as described under the foregoing section.

Shallow Well Construction

1. Place the well screen so that it extends from the top of any clay layer (if it exists) to about 5 feet above the summer static water level, unless the saturated thickness is greater than 20 feet, in which case the screen should be placed opposite the upper 20 feet of the saturated part of the unit, extending as well about 5 feet above the summer static water level. In the case of shallower wells less than 20 feet deep, place screen from bottom of hole to within 5 feet of land surface. For very shallow water table, the top of screen should be two feet above the estimated high water table or no closer than two feet to the land surface.

2. Emplace the volclay pellets as described above for the deep wells. A one-foot thick bentonite seal should be adequate.

3. Develop and complete the well as described under General Specifications Procedures.

C. GROUNDWATER SAMPLING PROCEDURES

Following the installation of the well, individual groundwater samples will be collected according to the procedures included below from each well for analyses. These samples will be collected using a positive displacement sampling device made entirely from stainless steel and teflon. This procedure will permit us to collect a sample that is more representative of the aquifer water and to limit the possibility of degassing and volatilization. The well storage water will be evacuated with a submersible pump or air lift system whereby the air is not permitted to come in direct contact with the aquifer. The

sampling pump will be cleaned between wells by immersion into a solvent, followed by a distilled deionized water rinse. A quantity of each of these will be pumped through the pump and teflon tubing.

As a part of our ongoing QA program, field blanks, consisting of distilled deionized water from the discharge of the pump following cleaning will be taken between selected wells to monitor the effectiveness of the cleaning procedures. Two typed of trip blanks will also be taken. The first type consists of a sample bottle filled with distilled, deionized water that will be capped and accompany the samples at all times. The second type will consist of a sample bottle filled with distilled, deionized water and set aside open to the atmosphere, during the sampling of the wells. The purpose of these trip blanks is to evaluate the potential for atmospheric contamination, and to assure that proper sample bottle preparation and handling techniques have been employed.

The samples collected from these sampling efforts will be analyzed for indicator parameters identified during the Phase I.

WATER SAMPLING PROCEDURES.

1. Open well and trip blank and record initial static water levels.

2. Wash down pump:

- For organics use hexane followed by methanol and finally distilled water

- Collect wash solvents and rinse in a bucket, etc. (a 5 gal. container w/ a large funnel works well)

- Wash pump inside and outside

3. Install pump in well: Use stainless steel pump and teflon tubing

- Each well should have its own tubing. Tubing should be cleaned and thoroughly rinsed between sampling events.

- Pump should have a check valve, preventing water having been in internal contact with the pump and the tubing from draining back into the well.

4. Pump at least two exchanges of water

- Care should be taken so as not to over pump, whereby excessive concentrations are drawn into the well. The number of exchanges pumped should be based upon the soil typed, flow patterns and aquifer properties of each well.

5. Take a sample:

- From pump discharge: Insert discharge tube to bottom of jar. Withdraw tube ahead of the sample so that aeration and turbulence is minimized.

- Some samples must be filtered in the field. This should be done prior to filling the sample container.

- For volatile organics samples should not be taken from the pump discharge. Aeration from the pump will destroy organic volatiles.

6. Immediately perform field tests such as temperature, pH, specific conductivity and D.O.

7. Refrigerate samples at $4^{o}C$.

8. Cap well and trip blank.

9. Wash all equipment.

NOTES: - The sampling procedures should reflect the sample parameters. Those parameters subject to change with changes in pH, D.O. may need to be sampled using stainless steel bailers.

- Some sample parameters require filtering in the field.

- For accountability and traceability of the samples, two forms are included which are examples of what we presently use.

EQUIPMENT BLANKS:

- Wash pump with solvents, collecting solvent rinse. Care must be taken in the selection of solvents, so damage to the pump will not occur. Rinse with distilled water.

- Take a sample of "clean" water,

- Turn on pump, sample first "slug" of water from the pump

- Pump volume equivalent to amount typically pumped from the well. DO NOT recirculate the water.

- Take sample from pump at end of pumping period

- Refrigerate samples.

APPENDIX E

QUALITY ASSURANCE

APPENDIX E

OUTLINE OF QUALITY ASSURANCE PROCEDURES

1.0 GROUND-WATER SAMPLING

1.1 General Requirements

(a) Obtain representative ground-water quality samples
  (1) Wells located properly
  (2) Sampling zone defined
  (3) Well constructed properly
  (4) Well developed properly
(b) Select sampling method in accordance with analyses of interest and well characteristics, see Figure B.1.
(c) Sampling procedures should not materially alter sample, see Figure B.2.
(d) Storage/shipment procedure must not alter sample

1.2 Procedures for Monitoring Well Development

(a) Perform prior to each sampling effort
(b) Measure water level
(c) Determine volume of water stored in casing
(d) Remove three to five volumes of water from well
  (1) Bail
  (2) Pump
(e) Insure that device does not introduce contaminants into well
(f) Measure water level recovery
(g) Sample after complete recovery
(h) Perform in-situ tests
  (1) Flow direction & velocity (Flow Meter®)
  (2) Quality (Hydrolab®)
  (3) Permeability
(i) Insure that in-place testing does not contaminate well prior to sample acquisition

1.3 Sampler Construction Material

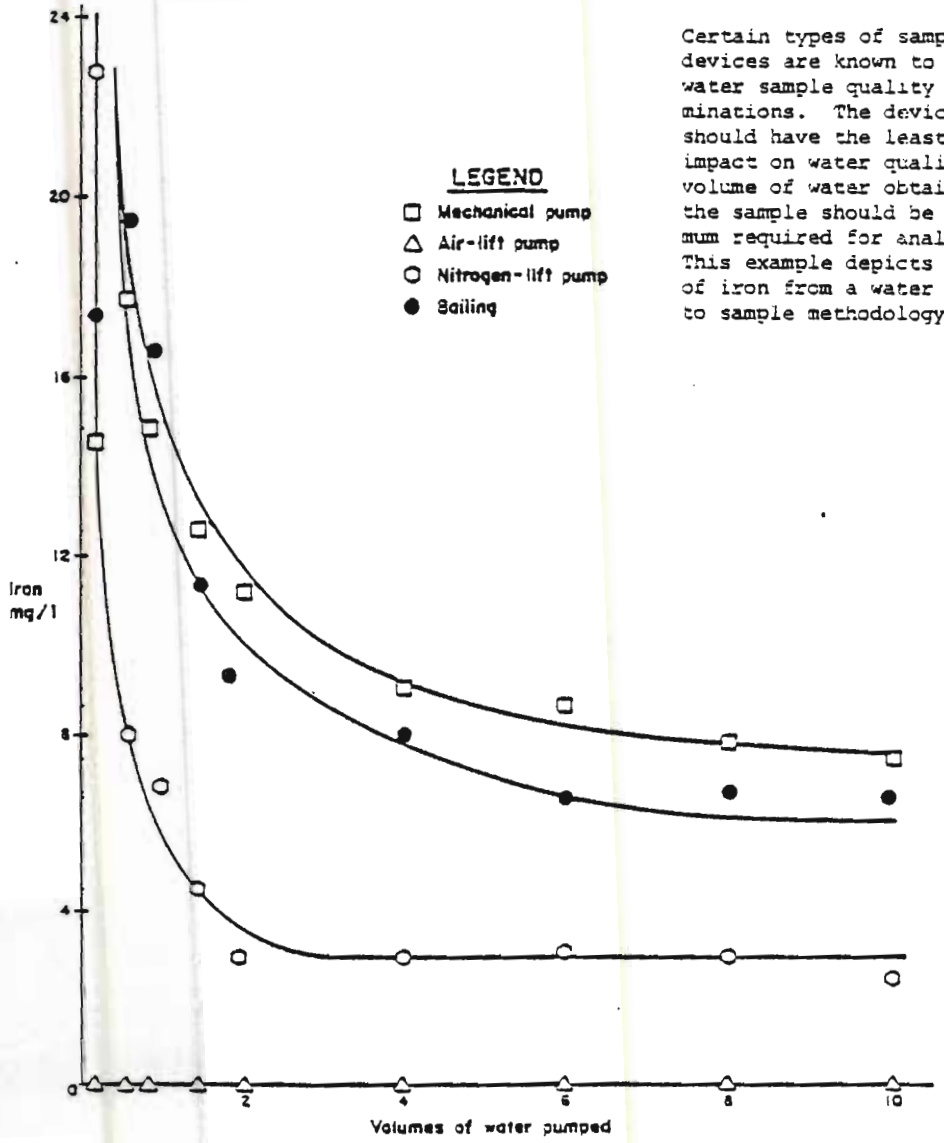
A major point to consider is the type of contaminants anticipated in the ground-water system. A sampling device should be constructed of inert materials that will not alter the trace concentrations of chemical parameters. Sampler construction materials are listed in order of preference.

Sampler Construction Materials:

(a) Glass®
(b) Teflon®

FIGURE E.1

Effects of Various Sampling Methodologies on Water Quality



Certain types of sampling devices are known to impact water sample quality determinations. The device selected should have the least negative impact on water quality. The volume of water obtained for the sample should be the minimum required for analysis. This example depicts the loss of iron from a water sample due to sample methodology.

SOURCE: "Monitoring Well Sampling and Preservation Techniques," Proceedings of the Sixth Annual Research Symposium / Disposal of Hazardous Wastes, March, 1980.

FIGURE E.2

SAMPLING EQUIPMENT SELECTION

Diameter Casing	Bailer	Peristaltic Pump	Vaccum Pump	Airlift	Diaphragm "Trash" Pump	Submersible Diaphragm Pump	Submersible Electric Pump	Submersible Electric Pump w/Packer
1.25-inch								
Water level <20 ft.		X	X	X	X			
Water level >20 ft.				X				
2-inch								
Water level <20 ft.	X	X	X	X	X	X	X	
Water level >20 ft.	X			X		X	X	
4-inch								
Water level <20 ft.	X	X	X	X	X	X	X	X
Water level >20 ft.	X			X		X	X	X
6-inch								
Water level <20 ft.				X	X		X	X
Water level >20 ft.				X			X	X
8-inch								
Water level <20 ft.				X	X		X	X
Water level >20 ft.				X			X	X

(c) Stainless Steel
(d) PVC
(e) Other dense plastics

Note: Do not use rubber or synthetic rubber such as that used in packers or older bladder pumps.

1.4 Sampling

1.4.1 Typical Ground-Water Sampling Devices

(a) Bailers
  Kemmerer
  Tube
(b) Suction Lift Pump
  Peristaltic
  Hand operated diaphragm
(c) Submersible Pump
(d) Air-lift Device
(e) Tomson Pump (all glass)
(f) Gas Operated Bladder Pump
(g) Gas Driven Piston Pump
(h) Specialized Organic Material Samplers
  Grab Sampler
  Continuous Sampler
  Microbiological Sampler
  Soil-Water Sampler

Detailed discussion of the above listed sampling devices is given in the Manual of Ground-Water Sampling Procedures, pp. 45-54.

1.4.4 Specialized Organic Material Samplers

(a) Grab Sampler (at well head) for non-volatile organics may be used with peristaltic pumps (ground-water depth 20 ft)® or non-contaminating submersible pumps. A Teflon bailer may be used for volatile organic sample acquisition.

(b) Continuous Sampler (at well head) uses a peristaltic pump (shallow conditions) or a non-contaminating submersible pump to force a continuous stream of water through a fixing column using selected adsorbents to concentrate organic materials.

(c) Microbiological Sampler (at well head) uses a vacuum pumping system to draw water samples from shallow depths. Samples to be tested for microbial agents may be collected in a flask; samples to be tested for viruses of pathogenic bacteria may be collected on filters installed in the system.

(d) Soil-Water Sampler (unsaturated zone) can be used to obtain small unsaturated zone samples drawn through a collection trap in shallow applications.

A detailed discussion of these devices and their utilization is presented in the Manual of Ground-Water Sampling Procedures, pp 53-60.

1.5 Field Tests and Sample Preservation

1.5.1 Field Testing

Many parameters are relatively stable. Others such as pH, temperature, etc., will begin to alter immediately upon collection. In order to mitigate this unwanted modification of water quality, testing of sensitive parameters must be performed in the field. Testing may be performed at the well head following sample removal or in-situ by use of a Hydrolab or similar down-hole device.

Samples requiring more complicated analysis procedures must be preserved and transported to a laboratory. Preservation must be performed in the field, contingent upon analytical parameters of interest. Laboratory analyses should be performed as soon as possible in accordance with EPA Guidelines.

1.5.2 Sample Preservation

1.5.2.1 General typical preservatives currently employed, actions and applications are given:

Preservative	Action	Applicable to:
$HgCl_2$	Bacterial Inhibitor	Nitrogen forms, phosphorus forms
Acid (HNO_3)	Metals solvent, prevents precipitation	Metals
Acid (H_2SO_4)	Bacterial Inhibitor	Organic samples (COD, oil and grease, organic carbon)
	Salt formation with organic bases	Ammonia, amines
Alkali (NaOH)	Salt formation with volatile compounds	Cyanides, organic acids

Preservative	Action	Applicable to:
Refrigeration	Bacterial Inhibitor	Acidity - alkalinity, organic materials, BOD, color, odor, organic P, organic N, carbon, etc., biological organism (coliform, etc.)

1.5.2.2 Organic Parameters

The general method of preserving samples for organic analysis is to exclude air, pack in ice, and transport promptly. Specific recommendations are furnished in the Manual of Ground Water Sampling Procedures, p. 62.

1.5.2.3 Microbiological Parameters

Due to the complicated nature of this type of sampling, reference is made to the Manual of Ground-Water Sampling Procedures, p. 62.

1.5.2.4 Sampling and Preservation Requirements

The following Table B.1, presented from the Manual of Ground-Water Quality Sampling Procedures, pp 63-66, is included to provide specific collection and preservation data in accordance with the analyses of interest. It may be quickly observed that numerous variations occur in volume of sample required per test, type of container, preservative, and holding time. Preservation techniques must be chosen to be consistent with the selected analyses.

TABLE E.1.

RECOMMENDATION FOR SAMPLING AND PRESERVATION OF SAMPLES ACCORDING TO MEASUREMENT[a]

Measurement	Vol. Req. (ml)	Container[b]	Preservative	Holding Time[c]
Physical Properties				
Color	50	P, G	Cool, 4°C	24 Hrs.[d]
Conductance	100	P, G	Cool, 4°C	24 Hrs.[d]
Hardness	100	P, G	Cool, 4°C HNO_3 to pH<2	6 Mos.[e]
Odor	200	G only	Cool, 4°C	24 Hrs.
pH	25	P, G	Det. on site	6 Hrs.
Residue				
Filterable	100	P, G	Cool, 4°C	7 Days
Non-Filterable	100	P, G	Cool, 4°C	7 Days
Total	100	P, G	Cool, 4°C	7 Days
Volatile	40	P, G	Cool, 4°C	7 Days
Settleable Matter	1000	P, G	None Req.	24 Hrs.
Temperature	1000	P, G	Det. on site	No Holding
Turbidity	100	P, G	Cool, 4°C	7 Days
Metals				
Dissolved	200	P, G	Filter on site HNO_3 to pH<2	6 Mos.[e]
Suspended	200		Filter on site	6 Mos.
Total	100	P, G	HNO_3 to pH<2	6 Mos.[e]
Mercury				
Dissolved	100	P, G	Filter on site HNO_3 to pH<2	38 Days (Glass) 13 Days (Hard Plastic)
Total	100	P, G	HNO_3 to pH<2	38 Days (Glass) 13 Days (Hard Plastic)

TABLE E.1 (Continued)

Measurement	Vol. Req. (ml)	Container[b]	Preservative	Holding Time[c]
Inorganics, Non-Metallics				
Acidity	100	P, G	None Req.	24 Hrs.
Alkalinity	100	P, G	Cool, 4°C	24 Hrs.
Bromide	100	P, G	Cool, 4°C	24 Hrs.
Chloride	50	P, G	None Req.	7 Days
Chlorine	200	P, G	Det. on site	No Holding
Cyanides	500	P, G	Cool, 4°C NaOH to pH 12	24 Hrs.
Fluoride	300	P, G	None Req.	7 Days
Iodide	100	P, G	Cool, 4°C	24 Hrs.
Nitrogen				
Ammonia	400	P, G	Cool, 4°C H_2SO_4 to pH<2	24 Hrs.
Kjeldahl, Total	500	P, G	Cool, 4°C H_2SO_4 to pH<2	24 Hrs.[f]
Nitrate plus Nitrite	100	P, G	Cool, 4°C H_2SO_4 to pH 2	24 Hrs.[f]
Nitrate	100	P, G	Cool, 4°C	24 Hrs.
Nitrite	50	P, G	Cool, 4°C	48 Hrs.
Dissolved Oxygen				
Probe	300	G only	Det. on site	No Holding
Winkler	300	G only	Fix on site	4-8 Hrs.
Phosphorus	50	P, G	Filter on site Cool, 4°C	24 Hrs.
Ortho-phosphate, Dissolved				
Hydrolyzable	50	P, G	Cool, 4°C H_2SO_4 to pH<2	24 Hrs.[f]
Total	50	P, G	Cool, 4°C H_2SO_4 to pH<2	24 Hrs.[f]

TABLE E.1 (Continued)

Measurement	Vol. Req. (ml)	Container[b]	Preservative	Holding[c] Time
Total, Dissolved	50	P, G	Filter on site Cool, 4°C H_2SO_4 to pH<2	24 Hrs.[f]
Silica	50	P only	Cool, 4°C	7 Days
Sulfate	50	P, G	Cool, 4°C	7 Days
Sulfide	500	P, G	2 ml zinc acetate	24 Hrs.
Sulfite	50	P, G	Det. on site	No Holding
Routine Organics				
BOD	1000	P, G	Cool, 4°C	24 Hrs.
COD	50	P, G	H_2SO_4 to pH<2	7 Days[f]
Oil & Grease	1000	G only	Cool, 4°C H_2SO_4 or HCL to pH<2	24 Hrs.
Organic Carbon	25	P, G	Cool, 4°C H_2SO_4 or HCL to pH<2	24 Hrs.
Phenolics	500	G only	Cool, 4°C H_3PO_4 to pH<4 1.0 g $CuSO_4$/l	24 Hrs.
MBAS	250	P, G	Cool, 4°C	24 Hrs.
NTA	50	P, G	Cool, 4°C	24 Hrs.

a. A general discussion on sampling of water and industrial wastewater may be found in ASTM, Part 31, p. 72-82 (1976) Method D-3370.

b. Plastic (P) or Glass (G). For metals polyethylene with a polypropylene cap (no liner) is preferred.

c. It should be pointed out that holding times listed above are recommended for properly preserved samples based on currently available data. It is recognized that for some sample types, extension of these times may be possible while for other

types, these times may be too long. Where shipping regulations prevent the use of the proper preservation technique or the holding time is exceeded, such as the case of a 24-hr composite, the final reported data for these samples should indicate the specific variance procedures.

d. If the sample is stabilized by cooling, it should be warmed to 25°C for reading, or temperature correction made and results reported at 25°C.

e. Where HNO_3 cannot be used because of shipping restrictions, the sample may be initially preserved by icing and immediately shipped to the laboratory. Upon receipt in the laboratory, the sample must be acidified to a pH <2 with HNO_3 (normally 3 ml 1:1 HNO_3/liter is sufficient). At the time of analysis, the sample container should be thoroughly rinsed with 1:1 HNO_3 and the washings added to the sample (volume correction may be required).

f. Data obtained from National Enforcement Investigations Center-Denver, Colorado, support a four-week holding time for this parameter in Sewerage Systems. (SIC 4952).

2.0 SAMPLING SUBSURFACE SOLIDS (Earth Materials)

2.1 General

The sampling and testing of earth materials may be necessary to augment a ground-water quality study as contamination typically occurs in the unsaturated zone first, before entering the saturated zone. Several reasons exist for solids testing:

(a) Study effects of alteration
(b) Determine actual extent of contamination - not just in saturated zones
(c) Obtain accurate evaluation of microbial populations that may alter pollutants
(d) Solids provide best samples of aquifer microorganisms (samples obtained from saturated zone).

2.2 Sampling Procedures

Sampling of subsurface solids may be conducted by split spoon by Standard Penetration Test (ASTM D-1586-67) equipped with non-contaminating soil sample retainer or by undisturbed methods (ASTM D-1587-67). In any event, sampling, sample extrusion, preservation, shipment and testing must be accomplished in a sterile environment.

Due to the complex nature of the task, the possibility of introducing cross-contamination and the difficulty involved in sample processing, reference is made to the Manual of Ground-Water Sampling Procedures, pp. 72-79, which provides detailed guidelines for soil sample handling.

3.0 SAMPLE RECORDS AND CHAIN-OF-CUSTODY

3.1 General

The maintenance of complete sample records is critical to the monitoring process. The following is a basic guideline for development of sample records and chain-of-custody procedures:

3.2 Sample Records

(a) Sample description--type (ground water, surface water), volume;

(b) Sample source--well number, location;

(c) Sampler's identity--chain of evidence should be maintained; each time transfer of a sample occurs, a record including signatures of parties involved in transfer should be made. (This procedures has legal significance.);

(d) Time and date of sampling;

(e) Significant weather conditions;

(f) Sample laboratory number;

(g) Pertinent well data--depth, depth to water surface, pumping schedule, and method;

(h) Sampling method--vacuum, bailer, pressure;

(i) Preservatives, (if any)--type and number (e.g., NaOH for cyanide, H_3PO and $CuSO_4$ for phenols, etc.);

(j) Sample containers--type, size, and number (e.g., three liter glass-stoppered bottles, one gallon screw-cap bottle, etc.);

(k) Reason for sampling--initial sampling of new landfill, annual sampling, quarterly sampling, special problem sampling in conjunction with contaminant discovered in nearby domestic well, etc.;

(l) Appearance of sample--color, turbidity, sediment, oil on surface, etc.;

(m) Any other information which appears to be significant--(e.g., sampled in conjunction with state, county, local regulatory authorities; samples for specific conductance value only; sampled for key indicator analysis; sampled for extended analysis; resampled following engineering corrective action, etc.);

(n) Name and location of laboratory performing analysis;

(o) Sample temperature upon sampling;

(p) Thermal preservaton--(e.g., transportation in ice chest);

(q) Analytical determinations (if any) performed in the field at the time of sampling and results obtained--(e.g., pH, temperature, dissolved oxygen, and specific conductance, etc.);

(r) Analyst's identity and affiliation.

3.3 Chain-of-Custody

(a) As few people as possible should handle the sample.

(b) Samples should be obtained by using standard field sampling techniques, if available.

(c) The chain-of-custody records should be attached to the sample container at the time the sample is collected, and should contain the following information: sample number, date and time taken, source of the sample (include type of sample and name of firm), the preservative and analysis required, name of person taking sample, and the name of witness. The prefilled side of the card should be signed, timed, and dated by the person sampling. The sample container should then be sealed, containing the regulatory agency's designation, date, and sampler's signature. The seal should cover the string or wire tie of the chain of custody record, so that the record or tag cannot be removed and the container cannot be opened without breaking the seal. The tags and seals should be filled out in legible handwriting. When transferring the possession of samples, the transferee should sign and record the date and time on the chain-of-custody record. Custody transfers, if made to a sample custodian in the field, should be recorded for each individual sample. To prevent undue proliferation of custody records, the number of custodians in the chain of possession should be as few as possible. If samples are delivered to the laboratory when appropriate personnel are not there to receive them, the samples should be locked in a designated area within the laboratory so that no one can tamper with them.

(d) Blank samples should be collected in containers, with and without preservatives, so that the laboratory analysis can be performed to show that there was no container contamination.

(e) A field book or log should be used to record field measurements and other pertinent information necessary to refresh the sampler's memory in the event he later becomes a witness in an enforcement proceeding. A separate set of field notebooks should be maintained for each survey and stored in a safe place where they can be protected and accounted for at all times. A standard format should be established to minimize field entries and should include the types of information listed above. The entries should then be signed by the field sampler. The responsibility for preparing and retaining field notebooks during and after the survey should be assigned to a survey coordinator or his designated representative.

(f) The field sampler is responsible for the care and custody of the samples collected until properly dispatched to the receiving laboratory or turned over to an assigned custodian. He must assure that each container is in his physical possession or in his view at all times or stored in a locked place where no one can tamper with it.

(g) Photographs can be taken to establish exactly where the particular samples were obtained. Written documentation on the back of the photograph should include the signature of the photographer, the time, date, and site location.

(h) Each laboratory should have a sample custodian to maintain a permanent log book in which he records for each sample the person delivering the sample, the person receiving the sample, date and time received, source of sample, sample number, method of transmittal to the lab, and a number assigned to each sample by the laboratory. A standardized format should be established for log-book entries. The custodian should insure that heat-sensitive or light-sensitive samples or other sample materials having unusual physical characteristics or requiring special handling are properly stored and maintained. Distribution of samples to laboratory personnel who are to perform analyses should be made only by the custodian. The custodian should enter into the log the laboratory sample number, time, date, and the signature of the person to whom the samples were given. Laboratory personnel should examine the seal on the container prior to opening and should be prepared to testify that their examination of the containers indicated that it had not been tampered with or opened.