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Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS

Remedial Design Report Farwell Road Landfill Remediation

Cattaraugus County, New York

July 2002

Stearns & Wheler, LLC
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July 17, 2002

Mr. David Locey
Environmental Engineer I
Division of Environmental Remediation, Region 9
NYS Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

Re: Remedial Design Report
Farwell Landfill - Cattaraugus County
S&W No. 10010.5

Dear Mr. Locey:

We have received your March 15, 2002 letter containing NYSDEC comments regarding the Remedial Design Report. This letter can be considered Addendum I, to the Remedial Design Report dated January 2002.

1. The Remedial Design Report and Technical Specifications have been stamped and signed by a New York State Professional Engineer. New covers are enclosed for substitution.

2. Cattaraugus County will implement the remedy selected by the NYSDEC to repair the settled areas of the existing landfill cover thus reducing the potential for groundwater contamination as prescribed in the ROD. Insert enclosed revised Page 1-1.

3. The Remedial Design Report and the Citizen Participation Plan list the following four locations as documents repositories: Ischua Town Hall, NYSDEC Region 9 Office, Cattaraugus County Department of Public Works, and the Olean Public Library. The Town Ischua has been provided with the Remedial Investigation and Feasibility Study. Insert enclosed revised Page 2-4.

4. The use of a geosynthetic clay liner (GCL) was discussed during the initial stages of remedial design. The proposed remedial design does not include use of a GCL as part of the remediation. The reference to the GCL in Chapter 5.3.C Stormwater Control of the Remedial Design Report is hereby eliminated. Insert revised Page 5-3.

5. The first paragraph of Chapter 5 of the Remedial Design Report has been modified to reference the previously accepted *Comprehensive Document* that specifies the sampling of twenty-one groundwater monitoring wells, landfill leachate and surface water from Ischua Creek. Insert revised Page 5-1.

6. Chapter 5, Section 5.2-Premobilization, of the Remedial Design Report has been corrected to reference the monitoring program detailed in Chapter 10, not Chapter 11. The comprehensive document has been referenced in Chapter 10. Insert revised Page 5-2.

7. The County agrees to collect two grab samples from the stockpiled covered material originally used during the landfill closure to make sure the material is not contaminated. The representative samples will be collected by the County and analyzed for the full USEPA Target Compound List and Target Analyte List of Parameters. The County will compare the results to the recommended soil cleanup objectives of the NYSDEC's TAGM #4046.

   There is no plan to use off-site topsoil on this project. It is the County's intent to remove and eventually replace the existing topsoil once proper subgrade elevation has been achieved. Per our discussion on April 9, 2002, the County will not be testing in-place topsoil. If off-site topsoil is needed, it will be tested for TCL and TAL and compared to TAGM #4046. Insert revised Page 5-5.

   Topsoil amendments are not appropriate for this project and reference to these amendments have been deleted from the Contract (Bid) Documents, Specification Section 02268 subpart 2.01.E (Topsoil Amendments).

   Cattaraugus County has elected to dispose of the 55-gallon drums containing drill cuttings at the Cattaraugus County Ellery Landfill. Therefore, no work will impact the existing barrier layer at Farwell. Insert Page 5-4, which has been modified accordingly.

8. Fugitive dust monitoring will be conducted during construction activities in compliance with NYSDEC TAGM #4031. Chapter 6 of the Remedial Design Report has been modified to reference this air-monitoring requirement. The Contract (Bid) Documents, Specification Section 01400 will reference this testing requirement. Insert revised Page 6-1.

9. As detailed in the *Comprehensive Document*, the Part 360 Monitoring Program and the Supplemental Monitoring Program were combined into one program, the

Environmental Monitoring Program. Chapter 10 of the Remedial Design Report has been revised to correctly reference the complete list of monitoring wells sampled as part of this program. Insert revised Page 10-1.

10. The site monitoring, as described in Chapter 10 of the Remedial Design Report, and as previously accepted in the July 31, 2001 *Addendum to the Comprehensive Document*, will be continued for a minimum of 30 years. At the time of the annual monitoring report, the monitoring program will be evaluated for appropriate modifications. Insert revised Pages 10-2 and 10-3.

11. Monitoring wells MW-3, -4 and -7 were decommissioned when the first two of the required three central wells were installed. Decommissioning consisted of over drilling the top 5-feet of the well and grouting the entire well length in place. Insert Page 10-2 has been modified accordingly. Insert revised Pages CPP-6 to -9.

12. Attached is an updated schedule for the remediation of the Farwell Landfill.

13. Citizen Participation Plan. Insert revised Pages CPP-6 to -9.

    a. Cattaraugus County acknowledges its responsibility to maintain the public mailing lists and fact sheets with the assistance and approval of the NYSDEC.

    b. Page 7 of the Citizen Participation Plan has been revised to add Mr. Cameron O'Connor of the NYSDOH to the contact list and delete Mr. Tuers and Ms. Knapp from the contact list.

    c. The document repositories listed in the Citizen Participation Plan have been modified to include the following: the Ischua Town Hall, NYSDEC Region 9 Office, Cattaraugus County Department of Public Works and the Olean Public Library.

    d. The Ischua Town Hall has been provided with a copy of the RI/FS reports, the NYSDEC Record of Decision, and the Order on Consent for the remedial construction.

    e. The County will perform the following activities: A fact sheet/mailing to the public and news media announcing that the Remedial Design is complete and the project is out to bid; a fact sheet/mailing and a public availability session/meeting prior to the start of construction; and a fact sheet/mailing announcing the completion of remedial construction.

14. Health and Safety Plan. Insert revised Pages HSP, HSP-I, -ii, -iii, -9, and Map.

    a. A map depicting the shortest route to the local hospital is attached and is to be inserted as part of the Health and Safety Plan, Appendix E of the Remedial Design Report. This map and written directions to the hospital shall be posted on-site during construction.

    b. Fugitive dust monitoring requirements will be added to the Contract (Bid) Documents as discussed earlier.

We trust that the above items and the enclosed revised pages address the comments provided in NYSDEC's March 15, 2002 letter and will allow NYSDEC to approve the Remedial Design Report as amended herein. Please call if you have any further questions or comments.

Sincerely,

STEARNS & WHELER, LLC

Robert Armstrong for

Paul J. McGarvey, P.E.
Project Manager

PJM/RBC/tld

Enclosure

Pc: Mr. David Rivet – Cattaraugus County (w/enc.)
Mr. Allan Ormond - Cattaraugus County (w/enc.)
Mr. Bradford Smith, P.E. – Stearns & Wheler, LLC (w/enc.)

REMEDIAL DESIGN REPORT

FARWELL ROAD LANDFILL REMEDIATION

CATTARAUGUS COUNTY, NEW YORK

Prepared for

Cattaraugus County

Prepared by

STEARNS & WHELER, LLC
Environmental Engineers and Scientists
University Center Suite 100
415 North French Road
Amherst, NY 14228

July 2002

Project No. 10010

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CHAPTER 1

INTRODUCTION

This remedial design document presents the remedial program proposed for the Farwell Landfill site located on Farwell Road, off Route 16, in the Town of Ischua, Cattaraugus County, New York (Figure 1). The remedial program, as presented herein, will be undertaken by Cattaraugus County, the owner of the site. This remedial design report provides information on the remediation goals and presents the remedial design details (Sheets G-1 through G-3) and specifications necessary for the implementation of this effort.

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy that Cattaraugus County will implement in order to eliminate the significant threats to the environment at the Farwell Landfill. The remedy will include repair to the settled sections of the existing landfill cover in order to reduce the potential for groundwater contamination. This is detailed in a Record of Decision (ROD) Number 9-05-024, issued March 30, 2001 (Appendix A). This remedial action was chosen in accordance with New York State Environmental Law. The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300). The decision was based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Farwell Landfill site, upon criteria identified in the RI/FS for evaluation of alternatives, and upon public input.

This remedial design has been prepared to provide specifics on the materials and details of the remedial design and a QA/QC Plan. This effort will be performed under NYSDEC oversight in accordance with Order on Consent File #B-0489-96-02, Site Code #9-05-024.

A Record of Decision excerpt, Citizen Participation Plan (CPP), Contingency Plan, Quality Assurance/Quality Control (QA/QC) Plan, Health and Safety Plan (HSP), and Field Sampling Plan (FSP) are attached as appendices to this document.

CHAPTER 2

SITE BACKGROUND

2.1 SITE LOCATION

The Farwell Landfill is located on Farwell Road, off of Route 16, in the Town of Ischua, Cattaraugus County, NY. The landfill occupies approximately 16-acres of the northern portion of property owned by the County, located along the western wall of the Ischua Creek valley. Farwell Road passes along the southern side of the site, while the western side is bounded by a narrow strip of trees and fields. The northern and eastern sides are bounded by a bend in Ischua Creek and an active Norfolk and Southern railroad line (Figure 2). At its closest point, the creek is approximately 400 feet from the landfill.

The scarcely populated area surrounding the landfill is primarily rural and agricultural. The closest off site structure to the landfill is a former schoolhouse located 600 feet from the landfill on the northwest corner of Route 16 and Farwell Road. There are nine residences located with one mile downgradient of the landfill. All drinking water for the residences in the area is supplied by private wells or springs.

2.2 SITE HISTORY

The landfill was constructed in phases to form three contiguous areas. Phase I and II areas of the landfill are unlined. Active disposal of municipal solid wastes, resource recovery ash, and New York State Department of Environmental Conservation (NYSDEC) approved non-hazardous industrial wastes took place in these areas until 1984, when these areas reached capacity. The Phase III area of the landfill was constructed with a compacted soil liner and leachate collection system. This particular area accepted only commercial, permitted industrial, C&D waste, and incinerator ash. The ash was used primarily as daily cover material. The Phase III portion of the landfill was utilized until 1989.

In 1989 the landfill was closed and capped with a minimum of 18-inches of compacted soil and 6-inches of topsoil following NYSDEC guidelines. Since closure, the cap has an established vegetative cover consisting of mixed grasses and shrubbery. Portions of this cap have settled and ponding has been observed in the depressions. During closure, leachate collection piping was

added to the southeastern, eastern, and western sides of the landfill in areas where leachate outbreaks had been observed. Currently, leachate is collected in two 10,000-gallon storage tanks located on the eastern portion of the site, near the garage and transfer station. Leachate is pumped from the tanks as needed and transported off site to a permitted wastewater treatment facility.

South of the landfill, two buildings are present on the site. One building has been utilized as a transfer station since closure of the landfill. The other building is used by the Cattaraugus County Department of Public Works for vehicle storage. The water supply well at this site has been deemed non-potable and is accordingly posted.

A number of investigations have been completed over the years at the landfill in order to determine the extent of groundwater contamination. Water quality data from the monitoring wells and Ischua Creek is available from the 1970s to the present. Groundwater monitoring undertaken prior to the remedial investigation indicated the principal contaminants of concern at the Farwell Landfill are chlorinated volatile organic compounds (VOCs). These include trichloroethene (TCE), vinyl chloride (VC), chloroethane, 1,1-Dichloroethene (1,1-DCE), 1,1-Dichloroethane (1,1-DCA), 1,1,1-Trichloroethane (TCA), and the two isomeric forms of 1,2-Dichloroethene (1,2-DCE) (RI, Stearns & Wheler, 1999). The origin of these compounds is believed to be hazardous waste that was dumped into the landfill.

The following is a historic summary of actions to date.

- In 1975 the former farmland was developed and disposal operations on the Phase I and II areas begin. The landfill received residential, commercial and industrial wastes along with incinerator ash, sewage treatment sludge, and construction debris until capacity is reached in 1985 and the Phase III area is opened.

- Between 1975 and 1980, according to Community Right to Know records, 8.5 tons of hazardous waste consisting of trichloroethene (TCE) sludge and sawdust were disposed of in the landfill, apparently in the Phase I and II areas.

- In October 1984, an Order on Consent (File # 84-106) is issued to the County to bring the landfill into compliance with New York State regulations (6NYCRR Part 360) for solid waste facilities. The order requires the County to begin hydrogeologic studies, install a groundwater monitoring system and close the landfill.

- In 1987 monitoring for USEPA pollutants is added to the groundwater monitoring program. Results show that groundwater downgradient of the landfill is polluted with chlorinated volatile organic compounds (VOCs), including trichloroethene.

- In 1988, the landfill stops accepting waste, a closure plan and a quarterly groundwater monitoring plan is established.

- In 1989, closure of the landfill is completed in agreement with the consent order and closure plan. The landfill is capped with 18-inches of low permeability soil, 6-inches of topsoil and seeded. Two former leachate collection ponds are dredged and the debris disposed of in the landfill. One pond is permanently backfilled with clean soils and the other is lined with low permeability compacted soil in order to receive surface runoff from the landfill. The 1990 construction monitoring report certified that the landfill was closed in accordance to the closure plan.

- In 1989, an Order on Consent (File # 89-71) was issued to the County to uphold a 30-year post closure maintenance and monitoring program under New York State solid waste regulations.

- In 1996, the NYSDEC classified the landfill as a Class 2 inactive hazardous waste site following results from the post-closure monitoring data and documentation of hazardous waste disposal in Phase I and II areas of the landfill. Such a classification suggested that the site might represent a significant threat to the public health or environment, and that action might be required.

- An Order on Consent (File # B0489-96-02) was issued to the County in 1998 to complete a Remediation Investigation (RI) to supplement past site investigations and a Feasibility Study (FS) to examine remedial alternatives.

- In February 1999, the Remedial Investigation/Feasibility Study (RI/FS) was completed for Cattaraugus County by Stearns & Wheler, LLC.

- In March 2000, the NYSDEC issued a Record of Decision (ROD) which identified **Alternative 3B, Repaired Cap, Institutional Controls and Natural Attenuation** as the remedy for this site.

- In July 2001, Stearns & Wheler, Environmental Engineers and Scientists, was hired by Cattaraugus County to complete this remedial design and oversee the implementation of the remedial action.

All documents referenced in the site history are available for public review at the following document repositories:

NYSDEC Region 9
270 Michigan Avenue
Buffalo, New York 14203-2999

Cattaraugus County
Department of Public Works
8810 Route 242
Little Valley, NY 14755

Ischua Town Hall
1850 Mill Street, Unit 36
Hinsdale, New York 14743

Olean Public Library
134 North 2nd Street
Olean, New York 14760

The RI/FS (Stearns & Wheler, LLC, February 1999) defined the extent of on-site and off-site groundwater contamination in two phases. Chemical evidence of pollution was highest in monitoring wells closest to the waste mass. Results from monitoring further downgradient of the landfill showed decreased levels of contamination. The concentrations of chlorinated compounds decline from near the waste mass to areas downgradient at a rate that exceeds the decline of conservative tracer chloride. Geochemical indicators suggest that natural attenuation is occurring on-site. Sediment and surface water tests of the landfill pond, railroad pond and Ischua Creek show no evidence of contamination impacts. Upstream and downstream samples of Ischua Creek show similar results.

The FS (Stearns & Wheler, LLC, February 1999) identified possible remedial action technologies; then developed, evaluated, and recommended remedial action alternatives for the remediation of the Farwell site.

The recommended alternative chosen by the New York State Department of Environmental Conservation in the FS included repair of the damaged or settled sections of the existing landfill cover to reduce the potential for infiltration and production of leachate.

CHAPTER 3

ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

Cattaraugus County, NYSDEC, and NYSDOH are actively participating in a cooperative effort in the remedial action of the Farwell site. Cattaraugus County is the site owner and has assumed responsibility for the remediation. NYSDEC and NYSDOH personnel are anticipated to be on site for purposes of general program oversight. Stearns & Wheler is responsible for the maintenance of non-construction personnel and community health and safety, verifying that the remedial program is implemented in accordance with this remedial design; and for monitoring that the site cleanup goals are met and documented. A remedial contractor will be hired by Cattaraugus County upon NYSDEC approval of this remedial design. The contractor will be responsible for site construction activities to implement this remedial program.

Key personnel and assigned responsibilities for the implementation of the Farwell remedial action are presented on Figure 5.

CHAPTER 4

REMEDIAL OBJECTIVE

The remedial objectives, as detailed in the ROD, are to: (1) repair the existing cap (2) long term groundwater monitoring, (3) installation of a barrier hedge and (4) institutional controls to eliminate and/or effectively mitigate the potential for direct human or animal contact with contaminated soils and sediments on site.

CHAPTER 5

REMEDIAL PROGRAM

The remedial action selected to achieve the remedial objectives includes repair of damaged and settled areas of the existing cap, long-term groundwater monitoring, and use of institutional controls. The repair of the settled areas of the landfill cap will consist of removal of the topsoil layer, placing fill in depressed areas and replacement of the vegetative topsoil layer to match the existing grade of the area. The ongoing leachate collection with off-site disposal will be continued at the Farwell site. The current post-closure groundwater monitoring program will be expanded to include two additional monitoring wells that were installed during the Remedial Investigation (RI). As detailed in the August 2001 Comprehensive Document, a total of twenty one wells will be monitored on the site and three "compliance monitoring wells" will also be installed farther downgradient of the site at an area where groundwater is expected to meet all Standards, Criteria and Guidance values (SCGs). A vegetative barrier hedge will be constructed along the perimeter of the site to supplement the existing fence to prevent trespassing. Finally, property use restrictions will be placed on the Farwell property deed by Cattaraugus County to prevent future exposure to residual contamination.

5.1 SITE CHARACTERISTICS

A. **GEOLOGY.** Site geology consists of glacial deposits dated back to the advance and retreat of the last ice age. The uppermost layer is comprised of glacial till containing silt, clay, sand and gravel underlain by a 10-15 feet thick layer of more coarse silty sand and gravel. Below the coarser silty sand and gravel is another 40-70 feet thick layer of glacial till. The upper till layer is approximately 70-80 feet thick on the western side of the site and decreases to approximately 30 feet thick on the eastern side of the site. Alluvial silt deposits are present on the eastern portion of the site, adjacent to Ischua Creek. The overburden is supported by a fine-grained sandstone bedrock intermixed with thin layers of shale. The sandstone bedrock is highly fractured.

B. **HYDROGEOLOGY.** Groundwater flows from northwest to the southeast on the Farwell site where it converges into Ischua Creek. Historical data reports that there is vertical groundwater flow between the overburden layers. Based on hydraulic conductivity tests, the groundwater seepage velocity across the site is approximately 0.2 feet per day (on average).

5.2 PREMOBILIZATION

Prior to contractor mobilization, the following activities will have been completed and/or started:

1. Addition of monitoring wells MW-19S and MW-20D and the three compliance boundary wells to the post-closure monitoring program and as detailed in Chapter 10. Decommissioning of any monitoring wells will be performed prior to mobilization as detailed in Chapter 10.

2. Notification of local agencies, including the Town of Ischua and the Citizen Advisory Committee.

3. A preconstruction conference will be held. Required attendance at this meeting will include the Owner, contractor, Engineer, and NYSDEC. This meeting will occur at least 14 days prior to mobilizing to the site. The contractor will submit preliminary schedules, a schedule of values, list of anticipated submittals, and a health and safety plan at this meeting. The Owner, Engineer, and NYSDEC will then have two weeks to review and comment on the plan.

The next several sections will discuss the initial operations anticipated at the site and the sequence in which they will occur.

5.3 MOBILIZATION

Equipment and materials will be mobilized and stored on site in the parking area located to the southeast of the landfill. Materials and equipment to be mobilized to the site may include, but not be limited to: portable toilet; construction and storage trailers; various pieces of equipment, including dozers, and front-end loaders; and miscellaneous equipment such as hand tools; and will be stored in the staging area.

5.4 SITE PREPARATION

Site preparation activities will include construction of a support zone (staging area) area on the property located on the southeast corner of the site, in the facilities parking lot as shown on Sheet 1. This area will be used for access by trucks, vehicles and placement of any necessary

construction trailers. Disturbance of the barrier material capping the landfill will be kept to a minimum to prevent the spread of contaminants. Specific work elements to be completed by the remedial contractor for site preparation are described in the following subsections and in the sequence required in Section 01010 of the Contract Documents.

A. **Notification.** Prior to any on-site activities, the Underground Facilities Protection Organization (UFPO, 1-800-962-7962) will be notified by the contractor and all utilities will be marked in the field.

B. **Site Security.** Unauthorized access to this site is to be prevented. The Farwell site is a County owned facility, which significantly reduces the possibility of public access. The landfill is bounded by a fence on the south side of the site near the driveway/parking lot entrance. There also is a fence bounding the property on the eastern side of the site. A tree line bounds the property in all other areas. The nature of the work being performed at the site does not require the addition of full time OSHA/HAZWOPER trained security personnel.

C. **Stormwater Control.** Localized depressions in the cap are primarily located in the terraces that provide stormwater control of surface flow. Further, the relatively small and localized depressed areas lend themselves to sequential completion. As such, the Contractor will be required to work in discrete areas such that stormwater control provided by terraces is re-established prior to a storm event.

D. **Sediment and Erosion Control.** As repair activities progress, site erosion and sediment controls will be instituted to reduce the potential migration of disturbed site soils. Such a system will consist of hay bales and other non-intrusive devices in order to prevent damage to the existing barrier layer. Additional controls may be installed during construction to address observed conditions. Erosion and sediment controls are further detailed in Section 01564 of the Contract Documents and detailed on Sheet G-2.

E. **Decontamination.** Although the Farwell site contains hazardous waste, the work being performed will not cause contact with the waste. The barrier layer capping the landfill will be minimally disturbed during the repair of depression areas. Decontamination actions will not be necessary at this site, but protocol will be addressed in the Contractor's Health and Safety Plan.

5.5 REMEDIAL ACTIONS

Based on the results of the RI/FS, the NYSDEC selected the following site remediation goals:

A. **Repair of Existing Cap.** The original design of the landfill cap consisted of 18-inches of compacted barrier soil below a 6-inch layer of vegetated topsoil. The barrier soil was placed with an insitu permeability of $\leq 1x10^{-7}$ cm/sec in accordance with regulations in place at the time. Details from the original construction show the barrier layer installed at a constant 3H:1V slope on the landfill face. On-site cover material was then placed on top of the barrier layer to create terraces. From the survey of the site, settlement appears to have occurred in the waste below the barrier material layer. The ROD describes repairing depressed areas by filling with compacted soils that match the low permeability characteristics of the original barrier layer.

Where settlement or damage has occurred, the existing topsoil layer of the landfill cap will be removed to the limits identified on Sheets G-1 and G-2. A fine-grained fill material, similar in nature to the original barrier material, will be placed in the depressed area over the monitoring well spoils to re-establish the elevation 6-inches below original final grade as shown on Sheet G-2. On-site borrow material used in the original capping operation is also available for use as the barrier material. The barrier soil would be lightly compacted using smaller conventional equipment in order to minimize the potential for damage to the remainder of the cap. After the backfill and compaction processes are complete, six (6) inches of topsoil will be placed over the backfill to meet final grade. A seed mixture similar to that originally used on the landfill will be applied. The area will be covered with an erosion control material to protect it from damage until the vegetation is established.

B. **Installation of Barrier Hedge.** To limit access to the property, a thorny, vegetative hedge will be added to the site as detailed on Sheet G-3. The plant species selection will be made from the attached general list of vegetation (Table 1). This barrier will be installed on the outer perimeter of site. This barrier is to minimize trespassing on the property in order to decrease the potential for damage to the cap.

C. **Expansion of the Groundwater Monitoring Program.** The current monitoring program will be expanded to include MW-19S and MW-20D and three compliance wells located on the site boundary. The details of the monitoring program are described in Chapter 11 of this report.

D. **Leachate Collection.** The ongoing leachate collection system will be continued with disposal of leachate occurring at an off-site location.

E. **Institutional Controls.** Cattaraugus County will place "property use restrictions" on the deed to the Farwell site, limiting land use to prevent future exposure from residual contamination.

5.6 BACKFILL

Suitable clean fill will obtained from onsite, stockpiled material (same material used in original cap) or will be imported to the site for use as backfill. The backfill materials, used either from the on-site stockpile or from off-site sources will be analyzed for the full USEPA Target Compound List and Target Analyte List of parameters and the results compared to the recommended soil cleanup objectives of the NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) #4046. The results will be submitted to the Engineer for approval prior to importation to the site. Material used to backfill settled areas will be similar to the material excavated, using fine-grained soils matching the low permeability of the original barrier layer. A 6-inch layer of topsoil will be placed on top of the backfill material to provide support for vegetative cover. Backfill details are described in Section 02223 of the Contract Documents and as detailed on Sheet G-1.

CHAPTER 6

EMISSION CONTROL PLAN

The remediation efforts at the Farwell Landfill site are concerned with repairing damage to the cap in order to control water infiltration into the landfill. There is evidence of groundwater contamination from the leachate produced by landfill. Repair work on the landfill cap is not expected to cause any hazardous air emissions since there will not be any contact with contaminated materials. However, an air monitoring program for fugitive dust emissions, in compliance with NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4031, will be implemented and executed during construction activities.

CHAPTER 7

REMEDIATION DOCUMENTATION

The following items shall provide documentation of the remediation project activities.

7.1 DAILY FIELD REPORT

A daily field report (DRF) will be used to document daily on-site activities. Each day, a report will document significant construction work accomplished, manpower and equipment used, any special incidents, special instructions to contractor (and response), damages to property, claims, weather conditions (precipitation, skies, air temperature, wind, ground moisture), site conditions, any visitors to the site, work not in compliance, and documentation of photographs taken. A binder containing the DFRs will be kept in the field office.

7.2 SAMPLE LOG

A laboratory notebook will remain in the field office to record each sample collected. This will include type of sample (water, air, or soil), location, time when sample was taken, whether the sample is analyzed in the field (and result), or sent to a laboratory. Waybill numbers will be logged at the end of each day.

7.3 CHAIN-OF-CUSTODY RECORDS

A chain-of-custody form will document custody of all samples from the field to the laboratory during the monitoring plan.

7.4 WAYBILLS

A waybill receipt will be obtained at the time of accepted sample shipment by Federal Express or courier and will be attached to the sample log.

7.5 ACCIDENT REPORTING

Incident Report, Daily First Aid Report, Employer's First Report of Injury, and OSHA 200 forms will be used to document any accident occurring on site during the remedial action. These form are attached to the Health and Safety Plan (Appendix E), and will be located in the field office.

CHAPTER 8

DEMOBILIZATION

Once site restoration is complete, all equipment, materials, construction debris, and personnel will be demobilized from the site at the conclusion of the project.

CHAPTER 9

PERMITS

The trucking company and vehicles used for the transportation of waste will do so in accordance with all applicable regulations, including the NYSDEC Part 364 waste haulers permit requirements.

Because this is a listed inactive hazardous waste site, no additional state permits are required.

CHAPTER 10

MONITORING WELL DECOMMISSIONING AND SUPPLEMENTARY PROGRAM

10.1 INTRODUCTION

A 1984 NYSDEC Order on Consent mandated that the Farwell Landfill bring the then-active landfill into compliance with New York State solid waste regulations. As part of Cattaraugus County's closure plan, a program had been established for collecting groundwater, surface water, and leachate samples. The program provides a long-term monitoring strategy for the site that fulfills the requirements of 6 NYCRR Part 360 (December 1988). The August 2001 Comprehensive Document along with the July 31, 2001 Addendum I specifies this monitoring plan.

A. **Groundwater.** Groundwater monitoring wells have been installed around the landfill in various phases since the 1970s, as illustrated on Figure 1. Water quality data from site groundwater monitoring wells and the creek go back to the early 1970s. Records indicate that eight monitoring wells were in place by the early 1980s. As part of the County's landfill closure strategy of 1984, seven additional monitoring wells were installed in 1987, followed by four more in 1989 and another four in 1990. Four additional wells were installed between 1998 and 1999 as part of the recent Remedial Investigation.

The monitoring wells that have been sampled under the County's current Part 360 monitoring program includes quarterly sampling of Wells MW-13D, MW-14S, MW-14I, MW-15S, MW-15I, MW-16S, MW-16D, MW-17S, and MW-17I; and annual sampling of Wells MW-9S, MW-9D, MW-10S, MW-10D, MW-11S, and MW-11D. In addition, annual sampling of up-gradient well location MW-6 will be included as a background sampling point.

As detailed in the August 2001 Comprehensive Document, the Part 360 Monitoring Program and the Supplemental Monitoring Program will be combined to form one Environmental Monitoring Program. Wells MW-14S/I, MW-15S/I, MW-16S/D, MW-17S/I, MW-19S, MW-20D, MW-21S, MW-22S, and MW-23S will be sampled as part of the supplemental monitoring requirements of the ROD. Wells MW-6 -9D, -9S, -10S, -10D, -11S, -11D, and 13D will remain in the Part 360 monitoring program, and be sampled annually for routine parameters, and once every third year for baseline parameters. The annual sampling events will occur in the second sampling quarter each year, at the same time as the second quarter of supplemental compliance well sampling.

B. **Surface Water.** In addition to the sampling of groundwater, annual surface water samples will be collected from the landfill pond and Ischua creek locations upstream (Dutch Hill Road

bridge), downstream (Kent Road bridge), and adjacent (Farwell bridge). This monitoring program will be implemented for the minimum of 30 years from the date of final closure in 1989, as required by NYSDEC, with periodic review and modification as appropriate and allowable by regulation. Concurrent with the groundwater program, the surface water samples will be analyzed for routine parameters, and once every third year for baseline parameters. Sampling will occur in the second quarter of each year.

C. **Leachate.** Leachate samples will be collected each quarter from the on-site leachate storage tank, including three routine events and one baseline event. Baseline sampling will be rotated forward by one quarter each year in order to determine any seasonal variation in leachate composition.

10.2 WELL DECOMMISSIONING. Monitoring Wells MW-3, MW-4, and MW-7 were decommissioned in conformance with the approved Comprehensive Document. The monitoring wells were decommissioned by over-drilling the top five feet of the well and then filling the area with a cement/bentonite grout.

10.3 COMPLIANCE WELL INSTALLATION. Three proposed monitoring wells, MW-21S, MW-22S, and MW-23S will be installed in accordance with the site remedy described in the ROD. The three wells will be installed at a compliance boundary, downgradient (south) of the landfill, to assure that natural attenuation maintains landfill impacts at or below applicable water quality standards before groundwater migrates off Cattaraugus County property (Figure 4). The compliance monitoring wells will be installed approximately 1,500 feet south of the landfill in the overburden at an estimated total depth of 80 to 100 feet. Once completed, these wells will be incorporated into the final proposed groundwater monitoring network as required by the ROD.

Each monitoring well will be constructed of a 10-foot, 2-inch diameter PVC screen and separate riser. All Part 360 well construction materials, including sand filter pack, fine-grained "choker" pack, bentonite, grout, and protective casings will be appropriately used. Drilling can be completed by hollow-stem augers or by spun casings, depending on the difficulty of drilling conditions. Soil samples will be collected during drilling by split-spoon samplers at standard 5-foot intervals for the first 70 feet, at which point continuous sampling will begin to characterize the anticipated screened horizons. During the drilling procedure, a geologist will maintain

drilling logs describing soil classifications, as well as monitoring well completion diagrams showing the depths of installation and materials used.

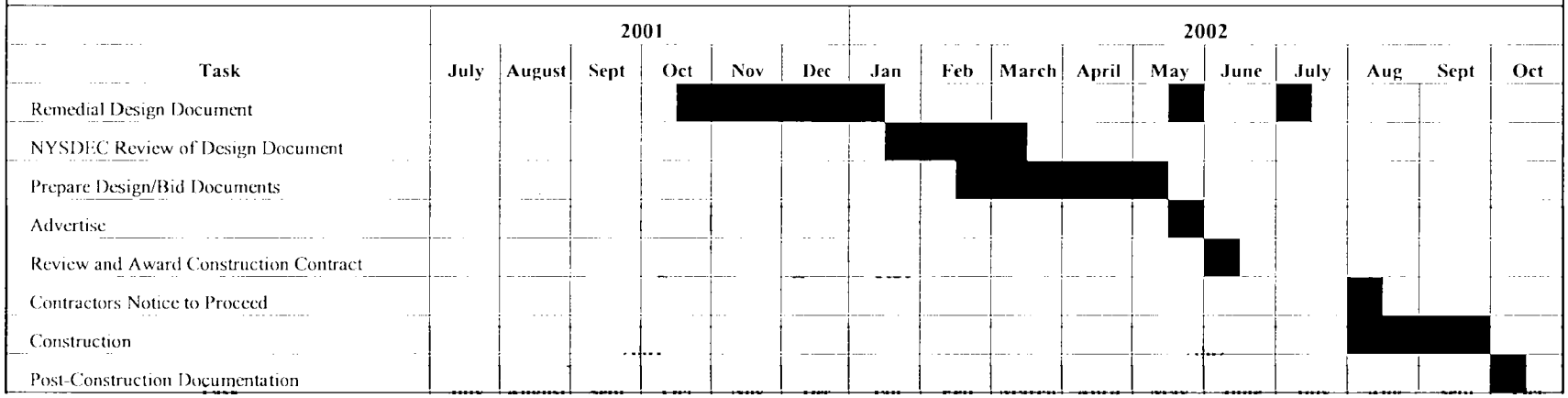
Following completion, when well materials have set, wells will be developed by a combination of pumping and bailing. Well development will continue until turbidity is below 50 NTU or until the turbidity approaches a stable limit to ensure that representative water samples can be collected and analyzed. County surveying personnel will establish the locations and elevations for the top of PVC for each well with respect to the existing site monitoring array. The well elevation is necessary to compute the groundwater elevation in the well during sampling.

The compliance boundary wells will be sampled on a quarterly basis as part of the post-closure monitoring and maintenance program for the landfill.

CHAPTER 11

FARWELL LANDFILL SITE REMEDIATION SCHEDULE

Remedial Design and Construction
Farwell Landfill
Cattaraugus County, NY



1001030.1

CHAPTER 12

REFERENCES

Stearns & Wheler, LLC, October 1999. Remedial Investigation Report for the Farwell Landfill, Cattaraugus County, NY.

Stearns & Wheler, LLC, October 1999. Feasibility Study for the Farwell Landfill, Cattaraugus County, NY.

Stearns & Wheler, LLC, August 2001. Comprehensive Document for the Farwell Landfill, Cattaraugus County, NY.

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Stearns & Wheler, LLC, August 2001. Comprehensive Document for the Farwell Landfill, Cattaraugus County, NY.

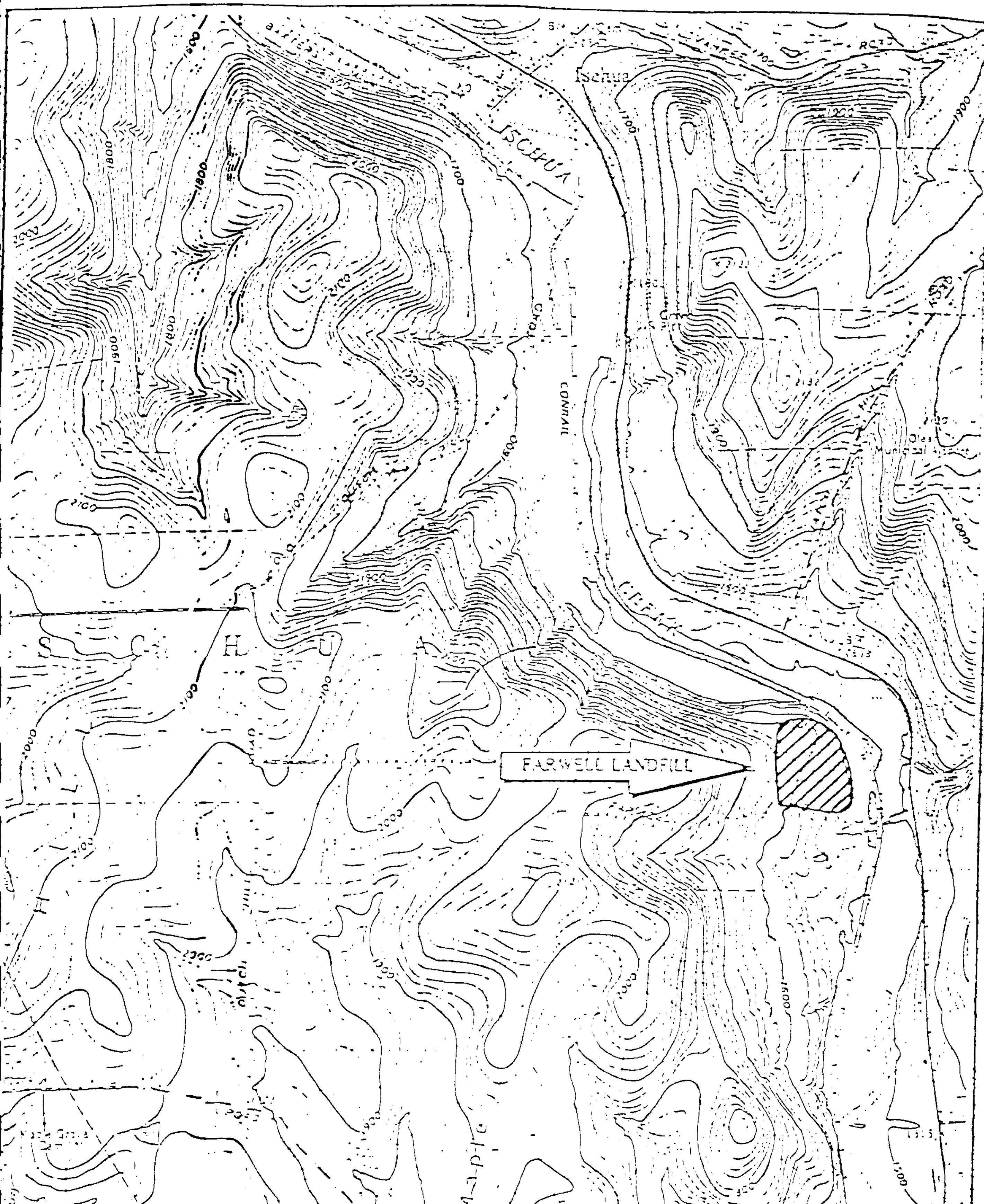
TABLES

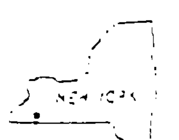
TABLE 1

TYPICAL PLANT SPECIES FOR BARRIER HEDGE

NUMBER	COMMON NAME	BOTANICAL NAME	SIZE	SPACING
1	**Cocks**pur Hawthorne	*Crataegus crus-gali*	1"-2" CAL.	12' OC from trees
2	**Honey**locust	*Gleditsia triacanthos*	1"-2" CAL.	12' OC
3	**R**ed Cedar	*Juniperus virginiana*	4' TALL	8' OC from cedars, 12' OC from Nos. 1 & 2
4	**Rugos**a Rose	*Rosa rugosa*	2 GAL.	5' OC
5	**Bl**ackberry	*Rubus alleghaniensis*	2 GAL.	3' OC

FIGURES





Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS

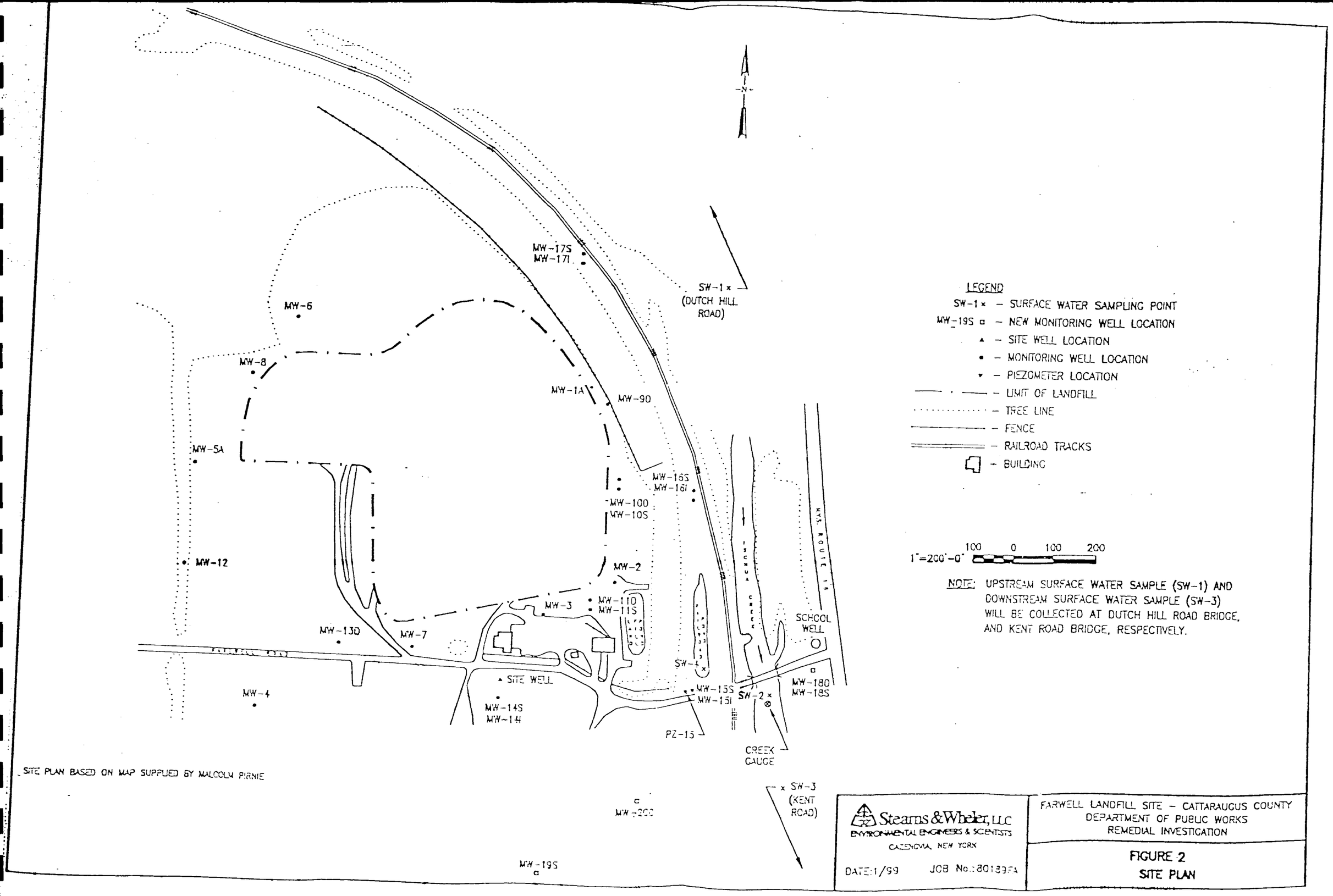
CAZENOVIA, NEW YORK

DATE 12/93 JOB NO. 8013?FA

FARWELL LANDFILL
REMEDIAL INVESTIGATION
CATTARAUGUS COUNTY, NY

FIGURE 1
SITE LOCATION

HINSDALE QUADRANGLE
... TTARAUGUS CO



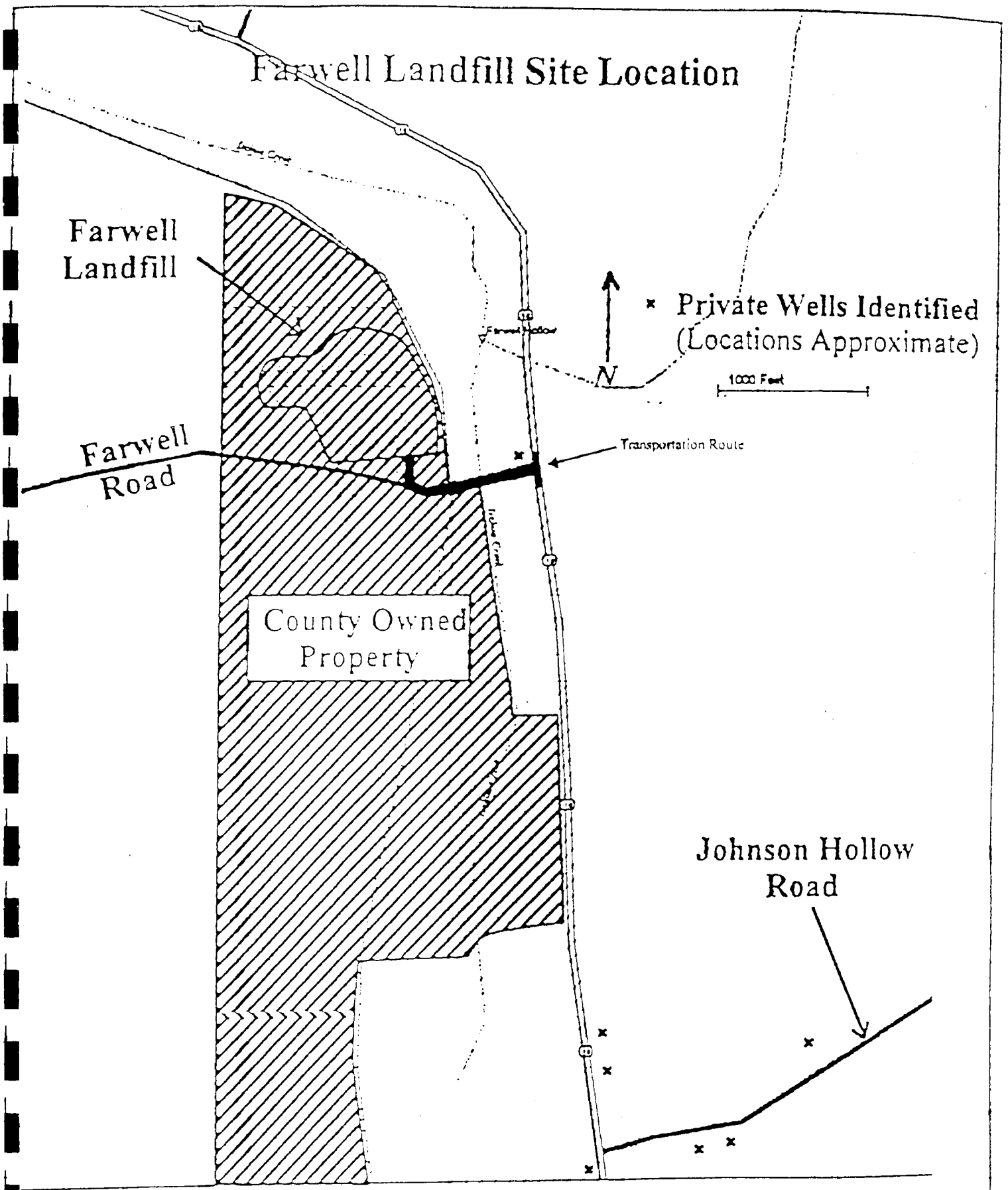
SITE PLAN BASED ON MAP SUPPLIED BY MALCOLM PIRNIE

Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS
CAZENOVIA, NEW YORK

DATE: 1/99 JOB No.: 80139FA

FARWELL LANDFILL SITE – CATTARAUGUS COUNTY
DEPARTMENT OF PUBLIC WORKS
REMEDIAL INVESTIGATION

FIGURE 2
SITE PLAN



Farwell Landfill
Remedial Design Document
Cattaraugus County, NY

Figure 3
Transportation Route

Date: 11/2001
Job No: 1001020.1

County owned parcels
bounded by thick lines

Landfill

1 mile radius

1/4 mile radius

Compliance well boundary
(MW-21S, MW-22S, MW-23S)

68.001

68.003

Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS

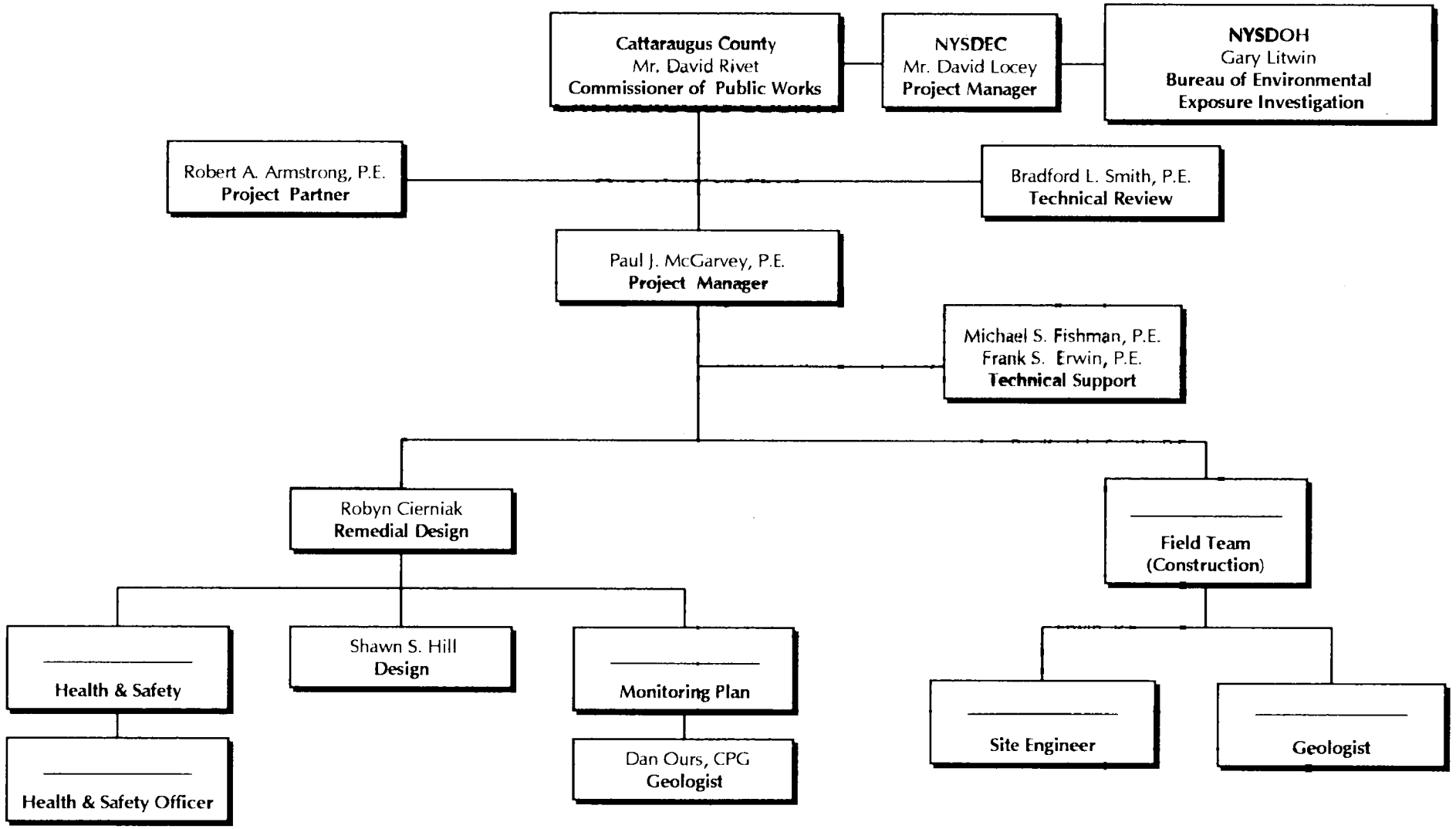
DATE: 3-01 JOB No. 10010

FARWELL LANDFILL
REMEDIAL DESIGN DOCUMENT
CATTARAUGUS COUNTY, NY

FIGURE 4
COMPLIANCE WELL BOUNDARY

Figure 5
CATTARAUGUS COUNTY

Farwell Landfill Remedial Action Design Project
Organization Chart



1001030.1

APPENDIX A

CONSENT ORDER and RECORD OF DECISION

STATE OF NEW YORK: DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of the
Development and Implementation
of a Remedial Program for an
Inactive Hazardous Waste Disposal
Site, Under Article 27, Title 13,
and Article 71, Title 27 of the
Environmental Conservation Law
of the State of New York by

Cattaraugus County, Respondent
and Alcas Corporation, Settling Party

ORDER
ON
CONSENT
INDEX # B9-0489-96-02

Site Code #905024

WHEREAS,

1. The New York State Department of Environmental Conservation (the "Department") is responsible for enforcement of Article 27, Title 13 of the Environmental Conservation Law of the State of New York ("ECL"), entitled "Inactive Hazardous Waste Disposal Sites." This Order is issued pursuant to the Department's authority under, inter alia, ECL Article 27, Title 13, ECL 3-0301and 42 U.S.C. Sec. 9601, et seq.

2. Cattaraugus County ("Respondent") is the owner and operator of the Site known as the Farwell Road Landfill (the "Site") located in the Town of Ischua, Cattaraugus County. The Department alleges that Alcas Corporation ("Settling Party") is a corporation or a successor corporation which disposed wastes at the Site. Settling Party has an agreement with Respondent concerning performance of work and other obligations under this Order.

3. The Site is an inactive hazardous waste disposal site, as that term is defined at ECL 27-1301.2, and presents a significant threat to the public health or environment. The Site has been listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 905024. The Department has classified the Site as a Classification "2" pursuant to ECL 27-1305.4.b.

4. A. Pursuant to ECL 27-1313.3.a, whenever the Commissioner of Environmental Conservation (the "Commissioner") "finds that hazardous wastes at an inactive hazardous waste disposal site constitute a significant threat to the environment, he may order the owner of such site and/or any person responsible for the disposal of hazardous wastes at such site (i) to develop an inactive hazardous waste disposal site remedial program, subject to the approval of the department, at such site, and (ii) to implement such program within reasonable time limits specified in the order."

B. Any person under order pursuant to ECL 27-1313.3.a has a duty imposed by ECL Article 27, Title 13 to carry out the remedial program committed to under order. ECL 71-2705 provides that any person who fails to perform any duty imposed by ECL Article 27, Title 13 shall be liable for civil, administrative and/or criminal sanctions.

C. The Department also has the power, inter alia, to provide for the prevention and abatement of all water, land, and air pollution. See, e.g., ECL 3-0301.1.i.

5. The Department issued a Remedial Investigation/Feasibility Study ("RI/FS") Consent Order on July 23, 1998 pursuant to which Respondent conducted a remedial investigation and prepared a feasibility study. Settling Party has an agreement with Respondent concerning performance of the RI/FS and was a settling party under the RI/FS Consent Order.

6. Pursuant to the RI/FS Consent Order the Department approved a Remedial Investigation Report and a Feasibility Study Report.

7. Following a period of public comment, the Department selected a final remedial alternative for the Site in a Record of Decision ("ROD") on March 31, 2000. The ROD, attached to this Order as Appendix "A," is incorporated as an enforceable part of this Order.

8. The Department, Respondent and Settling Party agree that the goals of this Order are for Respondent to (i) develop and implement, in accordance with the ROD and the Department-approved Farwell Landfill Comprehensive Document, which is attached to and incorporated into this Order as Appendix "B", an inactive hazardous waste disposal site remedial program ("Remedial Program") for the Site that shall include repair of the landfill cover, continued collection and off-Site treatment of landfill leachate, long-term groundwater monitoring, and filing of the required deed restrictions, and (ii) reimburse the State's administrative costs in accordance with Paragraph VIII of this Order.

9. Respondent and Settling Party neither admit nor deny the allegations herein. Respondent specifically denies having disposed of any hazardous wastes or hazardous substances at the Site.

10. Respondent and Settling Party, having waived their rights to a hearing herein as provided by law, and having consented to the issuance and entry of this Order, agree to be bound by the terms applicable to them. Respondent and Settling Party consent to and agree not to contest the authority or jurisdiction of the Department to issue or enforce this Order, and agree not to contest the validity of this Order or its terms.

NOW, having considered this matter and being duly advised, IT IS ORDERED THAT:

I. Remedial Design Contents

A. In accordance with the attached Department-approved Farwell Landfill Comprehensive Document Respondent shall submit to the Department a remedial design to implement the remedial alternative for the Site selected by the Department in the ROD (the

"Remedial Design"). The Remedial Design shall be prepared by and have the signature and seal of a professional engineer who shall certify that the Remedial Design was prepared in accordance with this Order.

B. The Remedial Design shall include the following:

1. A detailed description of the remedial objectives and the means by which each element of the selected remedial alternative will be implemented to achieve those objectives, including, but not limited to:

a. the construction and operation of any structures;

b. the collection, destruction, treatment, and/or disposal of hazardous wastes and substances and their constituents and degradation products and of any soil or other materials contaminated thereby;

c. the collection, destruction, treatment, and/or disposal of contaminated groundwater, leachate, and air;

d. physical security and posting of the Site;

e. quality control and quality assurance procedures and protocols to be applied during implementation of the Remedial Construction; and

f. monitoring which integrates needs which are present on-Site and off-Site during implementation of the Department-selected remedial alternative.

2. "Biddable Quality" documents for the Remedial Design including, but not limited to, documents and specifications prepared, signed, and sealed by a professional engineer. These plans shall satisfy all applicable local, state and federal laws, rules and regulations;

3. A time schedule to implement the Remedial Design;

4. The parameters, conditions, procedures, and protocols to determine the effectiveness of the Remedial Design, including a schedule for periodic sampling of groundwater monitoring wells on-Site and off-Site;

5. A description of operation, maintenance, and monitoring activities to be undertaken after the Department has approved construction of the Remedial Design, including the number of years during which such activities will be performed (where appropriate), and a specific description of the criteria to be used to decide when an operation of the remedy may be discontinued.

6. A contingency plan to be implemented if any element of the Remedial Design fails to achieve any of its objectives or otherwise fails to protect human health or the

environment;

7. A health and safety plan for the protection of persons at and in the vicinity of the Site during construction and after completion of construction. This plan shall be prepared in accordance with 29 CFR 1910 by a certified health and safety professional; and

8. A citizen participation plan which incorporates appropriate activities outlined in the Department's publication "Citizen Participation in New York's Hazardous Waste Site Remediation Program: A Guidebook" dated June 30, 1998.

II. Remedial Construction

A. In accordance with the schedule in the Department-approved Remedial Design, Respondent shall commence construction of the Department-approved Remedial Design.

B. Respondent shall implement the Remedial Design in accordance with the Department-approved Remedial Design Work Plan.

C. During implementation of all construction activities identified in the Remedial Design Work Plan, Respondent shall have on-Site a full-time representative who is qualified to supervise the work done.

D. Within 60 days after completion of the construction activities identified in the Department-approved Remedial Design Work Plan, Respondent shall submit to the Department "as-built" drawings and a final engineering report (each including all changes made to the Remedial Design during construction); and a certification that the Remedial Design was implemented and that all construction activities were completed in accordance with the Department-approved Remedial Design Work Plan and were personally witnessed by him or her or by a person under his or her direct supervision. The "as built" drawings, final engineering report, and certification must be prepared, signed, and sealed by a professional engineer.

E. Respondent shall implement the operation, monitoring and maintenance in accordance with the requirements of the Department-approved Farwell Landfill Comprehensive Document, and any Department-approved revisions thereto, and shall submit to the Department Monitoring, Maintenance and Operations performance reports in accordance with that document.

F. After receipt of the "as-built" drawings, final engineering report, and certification, the Department shall notify Respondent in writing whether the Department is satisfied that all construction activities have been completed in compliance with the Department-approved Remedial Design Work Plan.

G. If the Department concludes that any element of the Department-approved Remedial Program fails to achieve its objectives or otherwise fails to protect human health or the environment, Respondent shall take whatever action the Department determines necessary to achieve those objectives or to ensure that the Remedial Program otherwise protects human health

and the environment. If Respondent disagrees with the Department determination the Department and Respondent shall attempt in good faith to resolve the dispute informally. If within thirty (30) days of the Department's written notice of its determination the dispute cannot be resolved the Department may take any action or pursue whatever rights it has and Respondent may interpose any defense and/or assert any right in response.

III. Progress Reports

Respondent shall submit to the parties identified in Paragraph XIII in the numbers specified therein copies of written progress reports that:

A. describe the actions which have been taken toward achieving compliance with this Order during the previous reporting period;

B. include all results of sampling and tests and all other data received or generated by Respondent or Respondent's contractors or agents in the previous reporting period, including quality assurance/quality control information, whether conducted pursuant to this Order or conducted independently by Respondent;

C. identify all work plans, reports, and other deliverables required by this Order that were completed and submitted during the previous reporting period;

D. describe all actions, including, but not limited to, data collection and implementation of work plans, that are scheduled for the next reporting period and provide other information relating to the progress at the Site;

E. include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of Respondent's obligations under the Order, and efforts made to mitigate those delays or anticipated delays;

F. include any modifications to any work plans that Respondent has proposed to the Department or that the Department has approved; and

G. describe all activities undertaken in support of the Citizen Participation Plan during the previous reporting period and those to be undertaken in the next reporting period . Respondent shall submit these progress reports to the Department by the tenth day of every reporting period following the effective date of this Order.

H. Reporting periods shall be monthly commencing with the effective date of this Order and continuing until Department approval of the final engineering report.

Reporting periods during Monitoring, Maintenance and Operations performance shall be in accordance with the Fanwell Landfill Comprehensive Document.

Respondent also shall allow the Department to attend, and shall provide the Department at least seven days advance notice of, any of the following: prebid meetings, job progress meetings, substantial completion meeting and inspection, and final inspection and meeting.

IV. Review of Submittals

A. 1. The Department shall review each of the submittals Respondent makes pursuant to this Order to determine whether it was prepared, and whether the work done to generate the data and other information in the submittal was done, in accordance with this Order and generally accepted technical and scientific principles. The Department shall notify Respondent in writing of its approval or disapproval of the submittal, except for the submittal discussed in Subparagraph I.B.7. All Department-approved submittals shall be incorporated into and become an enforceable part of this Order.

2. a. If the Department disapproves a submittal, it shall so notify Respondent in writing and shall specify the reasons for its disapproval. Within 20 days after Respondent receives written notice of the Department disapproval Respondent may request a meeting with the Department to discuss this disapproval. Within 30 days after receiving written notice that Respondent's submittal has been disapproved if no meeting is held, or within 30 days after such meeting is held, Respondent shall make a revised submittal to the Department that addresses and resolves all of the Department's stated reasons for disapproving the first submittal or is otherwise consistent with any understandings reached at any meeting held pursuant to this Subparagraph.

b. After receipt of the revised submittal, the Department shall notify Respondent in writing of its approval or disapproval. If the Department approves the revised submittal, it shall be incorporated into and become an enforceable part of this Order. If the Department disapproves the revised submittal, Respondent shall be in violation of this Order and the Department may take any action or pursue whatever rights it has unless Respondent invokes the dispute resolution procedure set forth in Paragraph V of this Order within 30 days of receipt of written notice of Department disapproval.

B. Respondent shall modify and/or amplify and expand a submittal upon the Department's direction to do so if the Department determines, as a result of reviewing data generated by an activity required under this Order or as a result of reviewing any other data or facts, that further work is necessary.

V. Dispute Resolution

A. The Department and Respondent shall in the first instance attempt to resolve expeditiously and informally any disagreements which arise during implementation of this Order.

B. 1. If the Department disapproves a revised submittal, Respondent shall be in violation of this Order unless, within thirty (30) days after receipt of the Department's written

notice of disapproval of the revised submittal, Respondent serves on the Department a request for appointment of an Administrative Law Judge ("ALJ"), and a written statement setting forth the issues in dispute, the relevant facts upon which the dispute is based, and the factual data, analysis, or opinion supporting its position, and all supporting documentation on which Respondent relies (hereinafter after called the "Statement of Position"). The Department shall serve its Statement of Position, including supporting documentation no later than twenty (20) business days after receipt of Respondent's Statement of Position.

2. Respondent shall be given the opportunity to meet with the appointed ALJ and the Department to present their responses to the Department's disapproval. The time periods for service of Statements of Position may be shortened or extended in accordance with a written agreement between the Department and Respondent.

3. The Department shall maintain an administrative record of any dispute under this Paragraph. The record shall include the Statement of Position of each party served pursuant to the preceding Subparagraph and any relevant information. The record shall be available for review of all parties and the public in accordance with the Freedom of Information Law.

4. Upon review of the administrative record as developed pursuant to this Paragraph, the ALJ shall issue a final decision and order resolving the dispute. Respondent shall revise the submittal in accordance with the Department's specific comments, as may be modified by the ALJ and except for those which have been withdrawn by the ALJ, and shall submit a revised submittal. The length of time within which the submittal must be revised as specified by the Department in its notice of disapproval shall control unless the ALJ revises the time frame in the ALJ's final decision and order resolving the dispute.

5. After receipt of the revised submittal the Department shall notify Respondent in writing of its approval or disapproval of the revised submittal. If the revised submittal fails to address and resolve the Department's specific comments, as may be modified and/or withdrawn by the ALJ, and the Department disapproves the submittal for this reason, Respondent shall be in violation of this Order and the ECL.

6. In review by the ALJ of any dispute pursued under this Paragraph, Respondent shall have the burden of proving that there is no rational basis for the Department's position.

7. Respondent shall retain those rights available pursuant to Article 78 of the Civil Practice Law and Rules of the State of New York ("CPLR"), provided that a petition under Article 78 is filed within thirty (30) days after the Respondent's receipt of the written decision and order issued by the ALJ.

8. The invocation of the procedures stated in this Paragraph shall not extend, postpone or modify Respondent's obligations under this Order with respect to any undisputed items unless and until the Department agrees or a court determines otherwise. Respondent shall

not be in violation of this Order for failure to perform tasks or obligations which are directly related to issues in dispute or which may be altered or revised in the resolution of issues in dispute.

9. The invocation of the procedures stated in this Paragraph shall constitute an election of remedies by Respondent, and such election of this remedy shall constitute a waiver of any and all other remedies which may otherwise be available to Respondent regarding the issue in dispute.

VI. Penalties

A. Respondent's failure to comply with any term of this Order constitutes a violation of this Order and the ECL.

B. Respondent shall not suffer any penalty under this Order or be subject to any proceeding or action if it cannot comply with any requirement hereof because of war, riot, or an unforeseeable disaster arising exclusively from natural causes which the exercise of ordinary human prudence could not have prevented. Respondent shall, within five days of when it obtains knowledge of any such condition, notify the Department in writing. Respondent shall include in such notice the measures taken and to be taken by Respondent to prevent or minimize any delays and shall request an appropriate extension or modification of this Order. Failure to give such notice within such five-day period constitutes a waiver of any claim that a delay is not subject to penalties. Respondent shall have the burden of proving that an event is a defense to compliance with this Order pursuant to Subparagraph VI.B.

VII. Entry upon Site

Respondent hereby consents to the entry upon the Site or areas in the vicinity of the Site which may be under the control of Respondent by any duly designated employee, consultant, contractor, or agent of the Department or any State agency for purposes of inspection, sampling, and testing and to ensure Respondent's compliance with this Order. The Department shall make reasonable efforts to provide reasonable notice in advance of any such entry. During Remedial Construction, Respondent shall provide the Department with access to a telephone. Respondent shall permit the Department full access to all records relating to matters addressed by this Order and to job meetings.

VIII. Payment of State Costs

A. 1. Within 45 days after receipt of an itemized invoice from the Department, Respondent shall pay to the Department a sum of money which shall represent reimbursement for the State's expenses including, but not limited to, direct labor, fringe benefits, indirect costs, travel, analytical costs, and contractor costs incurred by the State of New York for work related to the Site to the effective date of this Order, as well as for reviewing and revising submittals made pursuant to this Order, overseeing activities conducted pursuant to this Order, collecting and analyzing samples, and administrative costs associated with this Order.

2. Such invoice shall be sent to Respondent at the following address:

David J. Rivet
Commissioner
Cattaraugus County Department of Public Works
8810 Route 242
Little Valley, New York 14755

3. For the period commencing with the effective date of this Order until the written Department approval of the final engineering report and certification Respondent shall pay for the State's expenses incurred during that period up to the amount of $20,000 per year. From the date of written Department approval of the final engineering report and certification until termination of operation and maintenance activities at the Site Respondent shall pay for the State's expenses up to the amount of $7,500 per year.

B. Such payment shall be made by certified check payable to the Department of Environmental Conservation and shall be sent to:

Bureau of Program Management
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233

C. Personal service costs shall be documented by reports of Direct Personal Service, which shall identify the employee name, title, biweekly salary, and time spent (in hours) on the project during the billing period, as identified by an assigned time and activity code. Approved agency fringe benefit and indirect cost rates shall be applied. Non-personal service costs shall be summarized by category of expense (e.g., supplies, materials, travel, contractual) and shall be documented by expenditure reports.

D. Each party shall provide written notification to the other within 90 days of any changes in the above addresses.

IX. Department Reservation of Rights

A. Nothing contained in this Order shall be construed as barring, diminishing, adjudicating, or in any way affecting any of the Department's civil, criminal, or administrative rights (including, but not limited to, nor exemplified by, the right to recover natural resource damages) or authorities.

B. Nothing contained in this Order shall be construed to prohibit the Commissioner or the Commissioner's duly authorized representative from exercising any summary abatement powers.

X. Indemnification

Respondent shall indemnify and hold the Department, the State of New York, and their representatives and employees harmless for all claims, suits, actions, damages, and costs of every name and description arising out of or resulting from the fulfillment or attempted fulfillment of this Order by Respondent and/or any of Respondent's directors, officers, employees, servants, agents, successors, and assigns provided, however, that Respondent shall not be required to indemnify and hold the Department, State of New York or their representatives and employees harmless for any claims, suits, actions, damages and costs of every name and description arising out of or resulting from the gross negligence or willful misconduct of the Department, the State of New York and their representatives and employees.

XI. Contribution Protection

I. Nothing in this Order shall be construed to create any rights in, or grant any cause of action to, any person not a party to this Order. The Department, Respondent and Settling Party expressly reserve any and all rights (including, but not limited to, any right to contribution), defenses, claims, demands, and causes of action which each party may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a party hereto.

2. With respect to potential actions or claims for contribution against Respondent and/or Settling Party for matters addressed in this Order, the Department agrees that Respondent and/or Settling Party are entitled to protection from any such contribution action and/or claim to the extent authorized by the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), §113(f)(2), 42 U.S.C. §9613(f)(2).

XII. Public Notice

A. Within 30 days after the effective date of this Order, Respondent shall file a Notice of Order with the Clerk of Cattaraugus County to give all parties who may acquire any interest in the Site notice of this Order and shall provide the Department with a copy with the date and time stamped by the Cattaraugus County Clerk.

B. If Respondent proposes to convey the whole or any part of its ownership interest in the Site, Respondent shall, not fewer than 60 days before the date of conveyance, notify the Department in writing of the identity of the transferee and of the nature and proposed date of the conveyance and shall notify the transferee in writing, with a copy to the Department, of the applicability of this Order.

C. Within 30 days after receipt of the Department's notification pursuant to Subparagraph II.F of this Order, Respondent shall record an instrument with the Cattaraugus County Clerk which cannot be removed without the Department's written approval, to run with the land, that shall require Respondent and its successors and assigns to implement and/or continue in full force and effect any institutional and engineering controls and/or operation and

maintenance required by this Order, the ROD, the Farwell Landfill Comprehensive Document and the Remedial Design.

XIII. Communications

A. All written communications required by this Order shall be transmitted by United States Postal Service, by private courier service, or hand delivered as follows:

1. Communication from Respondents shall be sent to:

Martin Doster, Region 9
Division of Environmental Remediation
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York

with copies to:

Gerald Rider, Jr.
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233

Gary Litwin, Bureau of Environmental Exposure Investigation
New York State Department of Health
Flanigan Square
547 River Street
Troy, New York 12180-2216

Division of Environmental Enforcement
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203

2. Communication to be made from the Department to Respondent shall be sent to:

David J. Rivet
Commissioner
Cattaraugus County Department of Public Works
8810 Route 242
Little Valley, New York 14755

Craig A. Slater, Esq.
Harter, Secrest & Emery
One HSBC Center
Suite 3550
Buffalo, New York 14203-2884

B. Copies of work plans and reports shall be submitted as follows:

Four copies to Martin Doster, Division of Environmental Remediation.

One copy to Division of Environmental Remediation, Albany.

Two copies to Bureau of Environmental Exposure Investigation.

One copy to Division of Environmental Enforcement.

C. 1. Within 30 days of the Department's approval of any report submitted pursuant to this Order, Respondent shall submit to Director, Division of Environmental Remediation, a computer readable magnetic media copy of the approved report in American Standard Code for Information Interchange (ASCII) format.

2. Within 30 days after its approval of the drawings and submittals described in Subparagraph II.D of this Order, Respondent shall submit one microfilm copy (16 millimeter roll film M type cartridge) of such Department-approved drawings and submittals, as well as all other Department-approved submittals. Respondent shall submit same to Martin Doster.

D. The Department and Respondent reserve the right to designate additional or different addressees for communication or written notice to the other.

XIV. Miscellaneous

A. All activities and submittals required by this Order shall address both on-Site and off-Site contamination resulting from the disposal of hazardous wastes at the Site.

B. Respondent shall retain professional consultants, contractors, laboratories, quality assurance/quality control personnel, and third party data validators acceptable to the Department to perform the technical, engineering, and analytical obligations required by this Order. The experience, capabilities, and qualifications of the firms or individuals selected by Respondent shall be submitted to the Department within 30 days after the effective date of this Order. The Department's approval of these firms or individuals shall be obtained before the start of any activities for which Respondent and such firms or individuals will be responsible. The Department's approval of any such individual or firm shall not be unreasonably withheld. The responsibility for the performance of the professionals retained by Respondent shall rest solely with Respondent.

C. The Department shall have the right to obtain split samples, duplicate samples, or both, of all substances and materials sampled by Respondent, and the Department also shall have the right to take its own samples. Respondent shall make available to the Department the results of all sampling and/or tests or other data generated by Respondent with respect to implementation of this Order and shall submit these results in the progress reports required by this Order.

D. Respondent shall notify the Department at least 10 working days in advance of any field activities to be conducted pursuant to this Order.

E. 1. Respondent shall use their best efforts to obtain all permits, easements, rights-of-way, rights-of-entry, approvals, or authorizations necessary to perform Respondent's obligations under this Order.

2. The Department may, at its option, assist Respondent to the extent authorized by law in the event such assistance is necessary to secure any such necessary off-Site permits, easements, rights-of-ways, rights-of-entries, approvals or authorizations needed to perform this Order.

F. Respondent and Respondent's officers, directors, agents, servants, employees, successors, and assigns shall be bound by this Order. Any change in ownership or corporate status of Respondent including, but not limited to, any transfer of assets or real or personal property shall in no way alter Respondent's responsibilities under this Order. Respondent's officers, directors, employees, servants, and agents shall be obliged to comply with the relevant provisions of this Order in the performance of their designated duties on behalf of Respondent.

G. Respondent shall provide a copy of this Order to each contractor hired to perform work required by this Order and to each person representing Respondent with respect to the Site and shall condition all contracts entered into in order to carry out the obligations identified in this Order upon performance in conformity with the terms of this Order. Respondent or Respondent's contractors shall provide written notice of this Order to all subcontractors hired to perform any portion of the work required by this Order. Respondent shall nonetheless be responsible for ensuring that Respondent's contractors and subcontractors perform the work in satisfaction of the requirements of this Order.

H. All references to "professional engineer" in this Order are to an individual registered as a professional engineer in accordance with Article 145 of the New York State Education Law. If such individual is a member of a firm, that firm must be authorized to offer professional engineering services in the State of New York in accordance with Article 145 of the New York State Education Law.

I. All references to "days" in this Order are to calendar days unless otherwise specified.

J. The paragraph headings set forth in this Order are included for convenience of

reference only and shall be disregarded in the construction and interpretation of any of the provisions of this Order.

K. 1. No term, condition, understanding, or agreement purporting to modify or vary any term of this Order shall be binding unless made in writing and subscribed by the party to be bound. No informal advice, guidance, suggestion, or comment by the Department regarding any report, proposal, plan, specification, schedule, or any other submittal shall be construed as relieving Respondent of Respondent's obligation to obtain such formal approvals as may be required by this Order.

2. If Respondent or Settling Party desire that any provision of this Order be changed, Respondent or Settling Party shall make timely written application, signed by Respondent or Settling Party, to the Commissioner setting forth reasonable grounds for the relief sought. Copies of such written application shall be delivered or mailed to the Division of Environmental Enforcement and to the Site Project Manager.

L. The effective date of this Order is the date the Commissioner or the Commissioner's designee signs it.

DATED:

ERIN M. CROTTY
Commissioner
New York State Department
of Environmental Conservation

By:

_____
Michael J. O'Toole, Jr.

CONSENT BY RESPONDENT

Respondent hereby consents to the issuing and entering of this Order, waives Respondent's right to a hearing herein as provided by law, and agrees to be bound by this Order.

CATTARAUGUS COUNTY

By:_____
(TYPE NAME OF SIGNER)

Title:_____

Date:_____

STATE OF NEW YORK)
) s.s.:
COUNTY OF)

On this _____ day of _____ in the year 2001 before me, the undersigned, a notary public in and for said State, personally appeared _____ personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s) or the person upon behalf of which the individual(s) acted, executed this instrument.

_____
Notary Public

CONSENT BY SETTLING PARTY

Settling Party hereby consents to the issuing and entering of this Order, waives Settling Party's right to a hearing herein as provided by law, and agrees to be bound by this Order.

ALCAS CORPORATION

By:_____
(TYPE NAME OF SIGNER)

Title:_____

Date:_____

STATE OF NEW YORK)
) s.s.:
COUNTY OF)

On this _____ day of _____in the year 2001 before me, the undersigned, a notary public in and for said State, personally appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s) or the person upon behalf of which the individual(s) acted, executed this instrument.

_____
Notary Public

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue, Buffalo, New York, 14203-2999
Phone: (716) 851-7220 • FAX: (716) 851-7226
Website: www.dec.state.ny.us

John P. Cahill
Commissioner

April 20, 2000

Mr. David Rivet
Commissioner
Cattaraugus County Department of Public Works
214 Main Street
Little Valley, New York 14755

Dear Mr. Rivet:

Farwell Road Landfill, Site #905024
Ischua (T), Cattaraugus County

Enclosed for your information is a signed copy of the NYSDEC's Record of Decision for the Farwell Landfill.

If you have any questions, please call me at (716) 851-7220.

Sincerely,

David P. Locey
Environmental Engineer I

Enclosure

cc.w/encl.: Mr. Martin Doster, NYSDEC
Mr. Doug Preston, Cattaraugus County DPW
Mr. Dan Ours, Stearns & Wheler
Mr. Paul McGarvey, Stearns & Wheler ✓
Mr. Eric Wohlers, Cattaraugus County Health Department

FL 90180.5

Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Farwell Landfill Site
Ischua (T), Cattaraugus County
Site Number 9-05-024

March 2000

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Farwell Landfill Inactive Hazardous Waste Site
Ischua (T), Cattaraugus County, New York
Site No. 9-05-024

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Farwell Landfill class 2 inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law. The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Farwell Landfill inactive hazardous waste site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Farwell Landfill and the criteria identified for evaluation of alternatives, the NYSDEC has selected repair of the existing cap, long-term groundwater monitoring, and institutional controls as the site remedy. The components of the remedy are as follows:

- repair damaged or settled portions of the existing landfill cover;
- continue the on-going collection and off-site treatment of leachate from the landfill;
- implement a long-term groundwater sampling program, analyzing the samples for volatile organic compounds, metals and various parameters required for evaluating the progress of natural attenuation;
- place deed restrictions on the impacted County-owned property to preclude the installation of drinking water wells.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

3/31/2000
Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

TABLE OF CONTENTS

RECORD OF DECISION

Farwell Landfill Site
Ischua (T), Cattaraugus County
Site No. 9-05-024
March 2000

SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy to address the significant threat to the environment created by the presence of hazardous waste at the Farwell Landfill, a class 2 inactive hazardous waste disposal site. As more fully described in Sections 3 and 4 of this document, the landfill accepted industrial wastes, including some material containing the chlorinated hazardous waste solvent trichloroethene. Some of the hazardous waste was released or migrated with groundwater from the site toward Ischua Creek and County-owned property south of the landfill. These disposal activities have resulted in the following significant threats associated with contamination at the site:

- a threat posed by the continuing leaching of contaminants from the wastes into the groundwater;
- a threat posed by the potential for the release of site contaminants into the adjacent Ischua Creek;
- a threat posed if the existing landfill cover system erodes exposing wastes and contaminants resulting in a surface contact threat and possible releases of contaminants; and
- a threat posed by the potential for public contact with contaminated groundwater either through consumption or dermal contact.

Portions of the landfill cover have settled, producing low areas which collect storm water. The ponded water has resulted in localized areas of with higher groundwater recharge. If the landfill cover is allowed to continue to deteriorate, the observed groundwater contamination would be expected to increase in severity and extent.

In order to eliminate or mitigate the significant threats to the environment that the hazardous wastes disposed at the Farwell Landfill have caused, the following remedy was selected:

- repair damaged or settled portions of the existing landfill cover,
- supplement the existing perimeter fence with vegetation barriers to restrict public access to the landfill,
- continue the on-going collection and off-site treatment of leachate from the landfill,
- conduct long-term groundwater sampling to monitor the natural attenuation of contaminants in the area of groundwater impact, and
- place deed restrictions on the impacted County owned property to preclude the installation of drinking water wells.

The selected remedy, discussed in detail in Section 7 of this document, is intended to attain the remediation goals selected for this site in Section 6 of this Record of Decision (ROD), in conformity with applicable Standards, Criteria, and Guidance (SCGs).

SECTION 2: SITE LOCATION AND DESCRIPTION

The landfill is owned by Cattaraugus County and has been closed since 1989. It is located on Farwell Road, off of Route 16, in the Town of Ischua, Cattaraugus County, NY (Figure 1). The landfill occupies approximately 16 acres, the northern end of a 205-acre, County-owned parcel along the western slopes of the Ischua Creek valley. The landfill is bounded on the south by Farwell Road and old farm fields, and on the west by a narrow strip of trees and fields (Figure 2). On the north and east sides, the landfill is bounded by a bend in Ischua Creek and an active Conrail railroad line. At its closest point, the creek is approximately 400 feet from the landfill. Ischua Creek flows south into Olean Creek, which in turn discharges into the Allegheny River. The land surface rises steeply to the west.

The area surrounding the landfill is primarily rural and agricultural. The area is sparsely populated, with only nine year-round or seasonal residences located within 1 mile southeast (downgradient) of the site, all on the eastern side of Ischua Creek. The closest off-site structure is a former one-room schoolhouse, located on the northwest corner of Farwell Road and Route 16, approximately 600 feet from the landfill and on the eastern side of Ischua Creek. Drinking water for the residences in the area is supplied by private wells or springs.

The landfill was closed in 1989 and capped with a minimum of 18 inches of compacted soil and 6 inches of topsoil in accordance with NYSDEC regulations. The cap has an established vegetative cover of mixed grasses and shrubs. Portions of the cover have settled and precipitation occasionally ponds on its surface. However, surface runoff from the landfill generally drains into either a pond located off the southeast corner of the landfill, or a depression located southwest of the landfill.

The site has served as a transfer station since closure. Two buildings are located on the site, south of the landfill. One of the buildings is used by the Cattaraugus County Department of Public Works as a garage for heavy equipment. The other building is used for the transfer operations. The site has a water supply well, but because of the site's groundwater contamination a warning sign has been posted that the water is non-potable.

The landfill was constructed in phases to form three contiguous areas. The Phase I and II areas that make up the eastern portion of the landfill, were built without a liner. Because of inadequate cover material and apparent groundwater mounding, leachate outbreaks were a common occurrence. So in 1986, a leachate collection system of gravel collection trenches and perforated pipe was extended into the western, eastern and southeastern faces of the Phase I and II areas where leachate seeps had been observed. The Phase III area of the landfill was built with a liner and a separate leachate collection system. Leachate from the Phase I/II and Phase III areas is collected and combined in two storage tanks located south of the landfill, near the garage and transfer station. The stored leachate is periodically pumped from the tanks and transported off site to a permitted wastewater treatment facility.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

- 1975 - Disposal operations begin. The site was used for farming prior to development. Little information is available on the type and quantity of wastes contained in the Phase I and II areas;

however, the landfill is known to have received various types of residential, commercial and industrial wastes along with resource recovery (incinerator) ash, sewage treatment sludge and construction debris. In 1985, the Phase I and II areas reach capacity and the Phase III area is opened.

- 1975-80 - According to Community Right-to-Know records, 8.5 tons of a hazardous waste mixture consisting of trichloroethene (TCE) sludge and sawdust from the Alcas Cutlery Corporation was disposed at the landfill, evidently in the Phase I and II areas.
- 1984 - An Order on Consent (File # 84-106) is issued to the County to bring the landfill into compliance with New York State regulations (6 NYCRR Part 360) for solid waste management facilities. The order requires the County to initiate comprehensive hydrogeologic studies, install an adequate groundwater monitoring system and properly close the landfill.
- 1987 - USEPA priority pollutants are added to the groundwater monitoring program. Results reveal that groundwater downgradient of the landfill is contaminated with chlorinated volatile organic compounds (VOCs), including trichloroethene.
- 1988 - A closure plan is developed and a quarterly groundwater monitoring program is initiated. The landfill stops accepting wastes at the end of the year.
- 1989 - Closure of the landfill is completed in accordance with the order on consent and approved closure plan. The entire landfill (Phase I, II and III areas) is capped with a minimum 18-inch layer of compacted, low-permeability soils and 6 inches of vegetated topsoil. Two former leachate collection ponds at the southeastern corner of the landfill are dredged and the sediments disposed in the landfill. One of the two ponds is completely backfilled with clean soils, the other is lined with compacted low-permeability soils and continues to receive surface runoff from the landfill. A construction monitoring report was prepared in early 1990, certifying that the landfill closure construction complied with the approved closure plan.
- 1989 - An Order on Consent (File # 89-71) is issued to the County to undertake a 30-year post-closure maintenance and monitoring program in compliance with New York State solid waste regulations.

3.2: Remedial History

- 1996 - Post-closure monitoring data indicate significant groundwater contamination immediately downgradient of the landfill. With documented evidence of hazardous waste disposal in the Phase I and II areas of the landfill, the NYSDEC adds the landfill to its registry of inactive hazardous waste disposal sites. The landfill is designated a class 2 hazardous waste disposal site; a site which poses a significant threat to public health and the environment which requires remedial action.
- 1998 - An Order on Consent (File #B-0489-96-02) is issued to the County for the completion of a Remedial Investigation of the site to supplement previous site investigations and a Feasibility Study of remedial alternatives.

SECTION 4: SITE CONTAMINATION

Cattaraugus County has recently conducted a Remedial Investigation/Feasibility Study (RI/FS) to further evaluate the extent of contamination at the site and evaluate remedial alternatives to mitigate any significant threat to human health and the environment posed by the presence of hazardous waste.

4.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted in two phases, supplementing the information gathered during previous hydrogeologic studies and groundwater monitoring program which were conducted as part of the landfill closure/post-closure activities. The first phase of the RI was conducted between August and September 1998 and the second phase between August and September 1999. A report entitled *Remedial Investigation-Farwell Landfill* has been prepared which describes the field activities and findings of the RI in detail.

The RI included the following activities:

- Installation of four additional groundwater monitoring wells to further define hydrogeological conditions;
- Sampling and analysis of groundwater from twenty of the site monitoring wells to determine the extent of contamination;
- Sampling of surface water and sediment from Ischua Creek, the pond located on the eastern edge of the landfill and the pond located near the railroad track;
- Sampling of the leachate from the landfill collection system;
- Conducting a survey to identify private drinking water wells in the area;
- Performing a qualitative Health Risk Assessment;
- Completing a Fish and Wildlife Impact Analysis.

To determine which media (soil, groundwater, etc.) are contaminated at levels of concern, the RI analytical data were compared to environmental Standards, Criteria and Guidance values (SCGs). Groundwater, drinking water and surface water SCGs identified for the Farwell Road landfill are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of New York State Sanitary Code. Guidance values for evaluating contamination in sediments are provided by the NYSDEC "Technical Guidance for Screening Contaminated Sediments." Since the landfill cap effectively eliminated exposure to any contaminated soils, the RI focused on the groundwater, surface water and sediments.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). For comparison purposes, where applicable, SCGs are provided for each medium.

4.1.1: Site Geology and Hydrogeology

The surficial geology of the site consists of a layered assortment of glacial deposits from the advance and retreat of glacial ice during the last ice age. The uppermost stratigraphic unit is a layer of glacial till containing silts, clay, sand and gravel, which is underlain by a coarser-grained deposit of silty sand and gravel (glaciofluvial layer). Below the silty sand and gravel is another layer of till.

The upper till layer is reported to be greater than 70 to 80 feet thick in the western portion of the site and thins to approximately 30 feet thick along the eastern portion of the site, eventually being replaced by alluvial deposits of silt adjacent to Ischua Creek. The glaciofluvial layer is approximately 10 to 15 feet thick. The lower till layer is estimated to be 40 to 70 feet thick. These overburden layers rest on sedimentary bedrock consisting of highly fractured, fine-grained sandstone interbedded with thin layers of shale.

Hydraulic data from the site, recorded over the past several years, indicate that there is vertical flow of groundwater (upwards and downwards) between the overburden units at the site. Groundwater flow converges toward Ischua Creek from either side and upward from below. Groundwater flow direction across the landfill is from northwest to southeast. The average groundwater seepage velocity across the site was estimated to be 0.2 feet per day based on hydraulic conductivity tests in site wells.

4.1.2: Nature of Contamination

As described in the RI report, many groundwater, surface water and sediment samples were collected at the site to characterize the nature and extent of contamination. Sampling locations are shown in Figure 2 (sediments were sampled at each of the surface water sample locations). On the basis of sampling conducted previously during the operation and closure of the landfill, samples collected during the RI were analyzed for:

- Target Compound List (TCL) volatile organic compounds
- Target Analyte List (TAL) metals
- 6 NYCRR Part 360 parameters: chloride, alkalinity, biological oxygen demand, total organic carbon, sulfate, ammonia and chemical oxygen demand
- dissolved oxygen, carbon dioxide, methane, and hydrogen sulfide

4.1.3: Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in groundwater and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Groundwater

Groundwater monitoring wells have been installed around the landfill in various phases since the 1970s. Since 1988, when quarterly groundwater monitoring for VOCs began, a number of VOCs have been detected, including trichloroethene (TCE), 1,1,1 trichloroethane (1,1,1 TCA) and benzene. Other VOCs detected include compounds that may have been produced from the chemical and/or biological degradation of TCE and 1,1,1 TCA; "degradation daughter" products such as 1,2 dichloroethene (1,2 DCE), 1,1 dichloroethene (1,1 DCE), vinyl chloride, 1,1 dichloroethane (1,1 DCA), and chloroethane have been found.

Eleven of the 19 monitoring wells sampled in the first phase of the RI contained at least one of the VOCs of concern at a concentration exceeding its SCG. It appeared that the majority of the landfill-related impacts to groundwater were confined to the immediate downgradient vicinity of the landfill. Only 2 of the 19 monitoring wells sampled are installed in the bedrock, MW-6 upgradient of the landfill

and MW-18D located east of Ischua Creek. The other monitoring wells were installed in overburden: the upper till, the glaciofluvial layer and the lower till/bedrock interface. Contaminated groundwater was found in all of the overburden units at the site, including the lower till at the overburden/bedrock interface. This reflects the degree of vertical flow of groundwater between the overburden units.

The second phase of the RI included follow-up sampling of the monitoring well MW-19S and bedrock well MW-20D, which had recently been installed. Both monitoring wells are located south (downgradient) of the landfill and were placed near the anticipated edge of the area of impacted groundwater. In this second groundwater sample from MW-19S, 1,1 DCA was the only VOC detected; the 0.3 ppb found was well below the 5 ppb groundwater quality standard. In contrast, the first sample collected from MW-19S contained 20 ppb of 1,1 DCA as well as chloroethane (9 ppb) and 1,1,1 TCA (12 ppb).

Acetone and 2-butanone were the only two VOCs detected in the bedrock monitoring well MW-20D, but these two VOCs were also found in similar concentrations in the method blanks, indicating that they were likely due to laboratory contamination. Monitoring well MW-20D was installed below the fractured surface of the bedrock. The findings from the bedrock monitoring well MW-20D suggests that the groundwater contamination is confined to the overburden.

Metals detected above SCGs in one or more the unfiltered samples of groundwater included: iron, manganese, sodium, magnesium, arsenic, lead, antimony, barium, cadmium and zinc. In the one background/upgradient well sampled (MW-6), the concentrations of iron (1,830 ppb), manganese (515 ppb) and sodium (21,700 ppb) detected were above groundwater SCGs, suggesting that these substances are naturally elevated. Similarly, the concentration of magnesium (22,500 ppb) in the background well, while below the 35,000 ppb SCG, also suggests naturally elevated levels. The only instances of elevated arsenic concentrations were found in monitoring wells MW-18S and -18D located on the opposite side of Ischua Creek, and therefore unlikely attributable to the landfill. Lead exceeded the groundwater SCG in only the unfiltered samples of groundwater; it was not detected in filtered samples. The instances of elevated concentrations of antimony, barium, cadmium and zinc were generally few; the geometric mean concentrations of these metals were all below their respective groundwater SCGs.

In general, there was little correlation found between the occurrence of metals and the frequency of detection for VOCs in the site monitoring wells. For example, monitoring wells MW-18S and -18D, located east of Ischua Creek and hydraulically separated from the landfill, contained five metals above SCGs which were comparable to the six metals found in monitoring well MW-9D located west of the creek and immediately downgradient of the landfill. It is suggested that proximity to the landfill evidently has little influence over the concentrations of metals found and that the concentrations are perhaps a consequence of the natural mineralogy.

As part of the RI, the historical groundwater monitoring data were examined for trends in contaminant concentrations. In a number of the monitoring wells it was found that the concentrations of certain VOCs have been declining or attenuating over the last several years (Table 2). It was also found that certain geochemical indicators of natural attenuation reactions, such as dissolved oxygen, carbon dioxide, pH, and alkalinity were present in ways that support the likelihood that biological and chemical attenuation reactions are occurring.

The concentrations of certain chlorinated VOCs were also found to decline from upgradient to downgradient locations at rates that exceeded the decline in chloride concentration. Chloride is a conservative tracer; it is a contaminant that cannot be degraded or readily removed from solution. A declining chloride concentration is indicative of the rate of groundwater dilution. Contaminants that decline faster than this rate are not only being diluted but are also being destroyed.

The historical decline in concentrations, the presence of TCE degradation daughters, and the chloride tracer assessment all support the conclusion that natural attenuation of the groundwater contamination is occurring. Estimates of the natural attenuation half-life, together with estimated groundwater velocities, suggests that average concentrations for individual contaminants would be reduced to groundwater quality standards at a point approximately 1,500 feet downgradient of the landfill which is within the limits of the County-owned property.

Surface Water

VOCs were not detected in any of the water samples collected from Ischua Creek or the landfill pond. Only two VOCs, traces of 2-butanone (26 ppb) and carbon disulfide (4 ppb), were detected in the water sample collected from the railroad pond. The concentrations found were below surface water SCGs. Neither of these two compounds were detected in any of the groundwater samples; their presence in the pond was not from the seepage of groundwater to the pond. Carbon disulfide is a common metabolic breakdown product found in organic-rich sediments such as occurs in ponds and wetlands. The absence of VOCs in the landfill pond suggests that runoff from the landfill is not conveying the VOCs to the railroad pond; the railroad tracks themselves may be the source of the 2-butanone.

Iron and aluminum were the only metals found in the water sampled from Ischua Creek at concentrations exceeding surface water quality standards. The presence of similarly elevated concentrations of iron and aluminum in the upstream sample suggests that the landfill is not the contributor and that the concentrations found might be naturally occurring. Water in the landfill pond did not contain any metals above surface water quality standards. The railroad pond contained several metals above water quality standards, including aluminum, antimony, cobalt, iron, manganese, vanadium, and zinc. With the exception of iron and manganese, none of these metals were found in the groundwater at significantly elevated concentrations and none were found in the landfill pond, so it is unlikely that their presence in the railroad pond is attributable to the landfill, but may be from the railroad tracks themselves.

Sediments

Ischua Creek sediment samples generally contained only a few organic compounds and none of the specific chlorinated compounds of concern related to the landfill. The concentrations of those organic compounds found were below levels of concern. The upstream sediment sample contained traces of bromomethane (0.5 ppb) and acetone (3 ppb), while the sample at the Farwell Road bridge adjacent to the landfill contained only a trace level of acetone (4 ppb). The downstream sediment sample contained 15 ppb of 2-butanone and a trace of toluene (2 ppb). No other VOCs were detected in the creek sediments. Sediments in the landfill and railroad ponds contained similarly low concentrations of 2-butanone and carbon disulfide.

The landfill and railroad pond sediments contained several metals at concentrations exceeding the "lowest effect level" of the NYSDEC sediment criteria, including: arsenic, chromium, copper, iron, lead, manganese, nickel and zinc. However, none of these elements were found at concentrations above the "severe effect level".

Ischua Creek sediment samples collected for metals analyses from the upstream location and adjacent to the landfill were damaged during shipment to the laboratory, so no direct comparison could be made with the downstream sediment location. However, it was noted that the downstream sediment sample contained only one metal, manganese, at a concentration above the "lowest effect level" of the NYSDEC sediment criteria; 490 ppm of manganese was found which is only slightly higher than the 460 ppm criterion. With little else found, it appeared that the landfill has had little or no impacts on the creek sediments.

Leachate

A sample of the landfill leachate was collected from one of the two holding tanks on site. It contained a number of the same VOCs that have historically been identified in site groundwater samples. These included: 1,2 DCE (160 ppb), TCE (18 ppb), vinyl chloride (17 ppb), and 1,1 DCA (28 ppb). The total VOC concentration in the leachate sample was 390 ppb.

Typical of many municipal solid waste leachates, the sample also contained significant levels of iron (10,500 ppb), magnesium (88,600 ppb), potassium (251,000 ppb) and sodium (233,000 ppb). It was also noted that the concentration of dissolved carbon dioxide was generally high (192 ppm) while the concentration of oxygen was low (1 ppm), suggesting the biological decay of organic material in the landfill waste.

4.2: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 6 of the RI report.

An exposure pathway is the manner by which an individual may come in contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Pathways which are known to or may exist at the site include:

- ingestion of contaminated groundwater should it be used for potable purposes (drinking or cooking),
- dermal contact with contaminated groundwater should it be used for bathing or showering,
- dermal contact with contaminants if the landfill cover is allowed to erode exposing wastes and contaminants; and
- inhalation of VOCs in the form of vapors from contaminated water should it be used for bathing or showering.

At the present time, the only well located in the area of impacted groundwater is the landfill water supply well. The water supply well is not used for drinking water and a sign is currently posted which prohibits such use. In the future, development of the area south of the landfill is possible. Development could be accompanied by the installation of other water supply wells. Exposure to contaminants in groundwater could then occur through ingestion, inhalation and dermal contact. However, this future scenario is considered unlikely given the rural, isolated nature of the area and the fact that the County owns much of the land south of the landfill and west of the creek.

4.3: Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures and ecological risks which may be presented by the site. The Fish and Wildlife Impact Assessment included in the RI report presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources. As noted earlier in this document, there were no landfill-related contaminants of concern identified in the any of the sediment or surface water samples from Ischua Creek. Remediation of the creek was deemed unnecessary. The RI found no evidence of adverse impacts to plants or wildlife. However, the RI noted that portions of the landfill cover have settled. If not properly maintained, the landfill cover might fail in the future to adequately contain the hazardous waste. Exposed hazardous waste and/or contaminated surface water runoff would create a complete environmental exposure pathway.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The NYSDEC and the Cattaraugus County Department of Public Works entered into a Consent Order on July 23, 1998. The Order also named the Alcas Corporation as a settling party. The Order obligates the responsible parties to implement a Remedial Investigation and Feasibility Study. Upon issuance of the Record of Decision, the NYSDEC will approach the PRPs to implement the selected remedy under a new Order on Consent.

The following is the chronological enforcement history of this site:

Date	File No.	Subject of Order
1984	84-106	Landfill closure
1989	89-71	Post-closure monitoring
1998	B9-0489-96-02	Remedial Investigation & Feasibility Study

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all Standards, Criteria and Guidance (SCGs) and be protective of human health and the environment. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Eliminate, to the extent practicable, ingestion of groundwater affected by the site which does not attain NYSDEC Class GA Ambient Water Quality Criteria;
- Eliminate, to the extent practicable, exposures to groundwater contaminants through inhalation or dermal contact;
- Eliminate, to the extent practicable, off-site migration of groundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost effective, comply with other laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Farwell Landfill site were identified, screened and evaluated in the report entitled Feasibility Study-Farwell Landfill (October 1999).

A summary of the detailed analysis follows. As presented below, the time to implement reflects only the time required to implement the remedy and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

7.1: Description of Remedial Alternatives

As noted earlier, groundwater was the only environmental media to show evidence of significant, adverse impact from landfill-related contaminants. The potential remedies described below are primarily intended to address the contaminated groundwater at the site.

Alternative 1, No Action

Capital Cost	*$0*
Annual O&M Cost	*$23,000*
Present Value[1]	*$350,000*
Time to implement	*none required*

[1] *Present value is based on an interest rate of 5% and project life of 30 years.*

The No Action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in its present condition. Although this alternative is termed no action, the existing operation and maintenance activities would continue. These practices include continuation of the quarterly groundwater monitoring required as part of the landfill's original closure plan, leachate collection and disposal (both current practices at the landfill), and monthly inspections. The current practice of mowing the cover once every two years would also continue. This alternative would otherwise leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2, Institutional Measures

Capital Cost	*$12,000*
Annual O&M Cost	*$23,000*
Present Value[1]	*$360,000*

Time to implement	*< 1 month*

[1]Present value is based on an interest rate of 5% and project life of 30 years.

Alternative 2 would rely upon natural attenuation processes to decrease the levels of dissolved organic contaminants in the groundwater. However, to help preserve the integrity of the low permeability soil cap, the existing fence along Farwell Road and the railroad right-of-way would be supplemented with a hedge consisting of thorny shrubs to limit access to the landfill. By providing access restrictions, the potential for trespassers to damage the existing cover on the landfill and cause potential erosion problems would be minimized.

Alternative 2 would also include the continued implementation of the ongoing post-closure operation and maintenance activities. These activities include the long-term quarterly groundwater monitoring program developed following closure of the landfill, continued leachate collection and off-site disposal and periodic cap inspections and mowing. Continued groundwater monitoring would enable verification that attenuation of the dissolved organic contaminants is occurring as anticipated.

Finally, signs would be posted on the landfill property advising that the water from the existing site well is not for potable purposes and that bottled water should be used for drinking. The County would also enact deed restrictions on the their property south of the landfill, preventing future installation of drinking water wells within the area of impacted groundwater.

Alternative 3A, Repaired Cap, Institutional Controls	
Capital Cost	*$380,000*
Annual O&M Cost	*$30,000*
Present Value[1]	*$800,000*
Time to implement	*6 months*
Alternative 3B, Repaired Cap, Institutional Controls and Natural Attenuation Monitoring	
Capital Cost	*$420,000*
Annual O&M Cost	*$60,000*
Present Value[1]	*$1,300,000*
Time to implement	*6 months*

[1]Present value is based on an interest rate of 5% and project life of 30 years.

Alternative 3 (i.e. both 3A and 3B) would contain all of the same components as Alternative 2. Alternative 3 would include access restrictions (thorny hedge to supplement the existing fence), continued groundwater monitoring, continued leachate collection and off-site disposal, cap inspections and mowing, and implementation of institutional controls for the site. However, additional actions in the form of regrading and revegetating portions of the landfill are included. Some areas of settlement have occurred since the site was closed and the soil cap installed. The low areas collect ponded storm water, resulting in localized areas with higher amounts of recharge. If repairs are not made and the condition of the landfill cap is allowed to deteriorate further, hazardous wastes might be exposed, resulting in an increased threat to the environment and public health. Alternative 3 would involve regrading and reseeding specific areas where settlement has occurred, followed by a periodic inspection and maintenance program. The repairs would reduce the amount of leachate generated by the landfill, mitigate the impacts to groundwater, and eliminate the potential for human or wildlife exposure to the

hazardous waste in the future if the landfill cover continues to deteriorate. It is estimated that a third of the landfill cap or approximately 5 acres would need to be repaired.

Cap repairs would be undertaken by scraping the existing topsoil layer from depressed areas and filling in the depressed area with compacted soils that match the low permeability characteristics of the original barrier layer.

Two separate monitoring options would be possible as part of this repaired cap alternative. Alternative 3A would include continued implementation of the existing post-closure quarterly groundwater monitoring plan consisting of three rounds per year of Part 360 routine parameters from nine wells and one sampling round per year of Part 360 baseline parameters from the same nine wells.

Alternative 3B would include an expanded quarterly monitoring plan designed to collect data required to monitor natural attenuation of the VOCs detected in the area of groundwater impacts. This monitoring plan would include three quarters per year of routine parameters and one quarter per year of baseline parameters from three monitoring wells. This would be supplemented by quarterly sampling from an additional 11 monitoring wells for baseline parameters and dissolved gases (carbon dioxide, oxygen, and methane).

Alternative 4, Upgrade to Latest Part 360 Cap Requirements

Capital Cost	*$1,500,000*
Annual O&M Cost	*$60,000*
Present Value[1]	*$3,000,000*
Time to implement	*9 months - 1 year*

[1] *Present value is based on an interest rate of 5% and project life of 30 years.*

Similar to Alternative 3B, this alternative would consist of implementation of a monitoring program designed to monitor the progress of natural attenuation, continued leachate collection and off-site disposal, and periodic cap inspections and mowing. However, the perimeter hedge would not be required, but might be added later if evidence of significant use of the site by trespassers occurs. This alternative would also include source containment in the form of a multi-media cap over the landfill consistent with current 6 NYCRR Part 360 regulations. Although a 12-inch gas venting layer is required over the soil covering the refuse, the adequacy of the existing gas venting trenches and vent system would be evaluated to determine if it needed to be upgraded to the current requirements. Overlying this gas venting layer is an 18-inch soil barrier layer, normally consisting of clay, or an equivalent geomembrane layer. Overlying the geomembrane would be a 24-inch barrier protection layer (two 12-inch layers separated by geotextile) with a final 6-inch topsoil layer. Construction of this cap might require some site grading. Similar to Alternative 3, the existing layers of the cap might be scraped from the landfill and stockpiled for use in construction of the Part 360 cap.

Alternative 5, Upgrade to Latest Part 360 Cap Requirements and Groundwater Collection and Disposal

Capital Cost	*$1,900,000*
Annual O&M Cost:	*$170,000*
Present Value[1]	*$5,000,000*
Time to implement	*1 - 1 ½ years*

[1]Present value is based on an interest rate of 5% and project life of 30 years.

Alternative 5 would consist of implementation of Alternative 4 with the addition of groundwater recovery using collection wells and/or a trench. The wells and/or trench would be placed downgradient of the landfill in the southern and eastern direction. Groundwater would be pumped to storage tanks located on County owned property and managed along with the collected leachate from the existing system. This alternative would also include implementation of a revised monitoring program designed to verify the capture efficiency of the groundwater collection system. For the purposes of this document, it was assumed that two recovery wells would be sufficient for groundwater collection and that each well would recover groundwater at the rate of 10 gallons per minute. It is noted, however, that the naturally low permeability of area till would probably minimize the influence of individual recovery wells to the point that adequate groundwater control could only be achieved by a large number of wells. Thus, it is highly probable that more than two wells would be needed. This would be determined during remedial design. Recovered water would be transported to a publicly owned treatment works for disposal with the leachate under the existing contract. During remedial design, the actual recovery system size would be determined. If the cost for disposal of combined leachate and groundwater should significantly increase in the future, the County could then evaluate options, such as air stripping, for treating both the leachate and groundwater together.

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided, followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is included in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards and guidance.

Five of the SCGs examined in the FS report refer to concentration limits for contaminants in groundwater. Only Alternative 5 would provide for active remedial options to address the current levels of groundwater contamination. However, because there is some evidence that the organic contaminants in the groundwater are degrading, it is likely that natural attenuation would eventually result in each of the alternatives achieving contaminant specific SCGs given enough time. Because Alternatives 3B, 4, and 5 each would include a monitoring program designed to collect the data required for monitoring the progress of natural attenuation processes, these three options can be considered the only alternatives that would verify over time that compliance with SCGs has been accomplished through natural attenuation.

Two of the SCGs identified in the FS report refer to closure requirements for landfills. Only Alternatives 4 and 5 address current NYCRR Part 360 requirements for landfill closure. However, the landfill was closed in accordance with requirements detailed in an Order on Consent and NYSDEC-

approved closure plan which incorporated the Part 360 requirements of the time. The closure and post-closure requirements in effect the day the landfill closure plan were approved are applicable SCGs for the site. Because of the degree of settlement in portions of the landfill, the current condition of the cap is not considered adequate, and therefore, Alternatives 1 and 2 do not meet all of the SCGs for landfill closure.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment. Because there is currently no exposure to contaminated groundwater, all the alternatives would be protective of human health. In the future, however, if the County-owned land in the vicinity of the groundwater plume is developed, it is likely that unacceptable risks would be associated with ingestion of the water or inhalation and dermal contact during showering and/or bathing. Therefore, alternatives 3B, 4 and 5, which include long-term monitoring of the groundwater, especially at the downgradient edge of the plume, would provide a greater degree of assurance that natural attenuation of the contaminants is occurring over time.

Alternatives 4 and 5 would be most protective of the environment, as both would provide for an upgraded cap over the entire landfill. The improved cap would result in reduced opportunities for storm water infiltration to the landfill which in turn would reduce the dissolution of waste-related contaminants and associated leachate production. Alternatives 3A and 3B would achieve almost the same level of environmental protection by eliminating or reducing the opportunity for storm water to pond on the surface of the landfill. The no action alternative (Alternative 1) would not provide any additional measures to protect the environment or the public health beyond what the existing cap provides. Alternative 2, institutional controls, would provide some additional protection from existing conditions by restricting the installation of water supply wells in the area of the landfill plume and reducing access to the site, thereby preventing damage to the existing cap. However, storm water ponding would not be reduced or eliminated.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives. Alternatives 1 and 2 could be implemented almost immediately; there would therefore be no adverse short-term effects associated with either of these options. Alternatives 3A and 3B would involve regrading portions of the landfill cap. If the topsoil is removed and stockpiled as part of this regrading, erosion could occur during storm events or excessive dust could be generated during dry weather. Construction of a Part 360 cap (Alternatives 4 and 5) could also result in erosion or dust. Storm water pollution prevention plans and dust suppression measures would be implemented during construction of these alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls. Because the source of the groundwater contaminants remains present in the landfill with each

of the alternatives, none of the alternatives are considered fully permanent solutions. Long-term monitoring would be part of all the alternatives.

Given the apparent lack of significant impact to the surface water of Ischua Creek and the limited extent of groundwater contamination, the risks to public health and the environment following implementation of all but the no action alternative is considered low. Deed restrictions on the impacted, County-owned property (alternatives 2, 3A/B, 4 and 5) would provide adequate protection against human exposure to contaminated groundwater. Repairs or improvements to the landfill cap (alternatives 3A/B, 4 and 5) would reduce the volume of leachate produced by the landfill and the resulting impacts on the groundwater. Alternatives 3B, 4 and 5, which include groundwater monitoring programs designed to monitor the progress of natural attenuation, would offer a greater degree of reliability. The multi-layered landfill cap of the latest Part 360 landfill regulations (alternatives 4 and 5) would be more resistant to erosion/cracking and therefore somewhat more reliable in the long term than the existing single layer cap.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site. None of the alternatives would reduce the toxicity of the wastes. Alternative 5, which would include groundwater recovery within the contaminant plume, provides for actions which would reduce both the volume and mobility of the contaminants. The mobility of the contaminants is influenced by the amount of continued infiltration of storm water through the refuse mass in the landfill. Alternatives 3A and 3B, 4 and 5 all include actions that would restore appropriate grades to the site and therefore reduce ponding of storm water by promoting runoff. Consequently, these alternatives would likely result in a reduction in the mobility of the contaminants, while Alternatives 1 and 2 would likely not impact the mobility of the contaminants. Since Alternatives 4 and 5 would include significant additions to the landfill cap barrier layer, these alternatives would likely result in a greater reduction in mobility of contaminants than Alternatives 3A and 3B.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc. The most easily implemented alternative is the no action alternative (Alternative 1). Similarly, Alternative 2, which would include only institutional controls, would also be easy to implement. Alternatives 3A, 3B, and 4 would require more time to implement, but would not require any specialized construction equipment. Alternative 5 would be the most difficult to implement, given the number of recovery wells required or the depth to which a recovery trench would be need to be excavated. However, it should be noted that since all alternatives could be implemented using standard equipment and simple construction practices, extensive pilot testing or other specialized pre-design and construction techniques would not be required. Therefore, all of the alternatives could be readily implemented.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. As noted previously, the capital cost for Alternative 5 might well be much

higher in the event that more groundwater recovery wells are needed to achieve hydraulic control. The costs for each alternative are presented in Table 3.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance. Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the manner in which the Department will address the concerns raised. In general the public comments received were supportive of the selected remedy.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is selecting **Alternative 3B, Repaired Cap, Institutional Controls and Natural Attenuation Monitoring**, as the remedy for this site.

This selection is based on the evaluation of the five alternatives developed for this site. Alternatives 1 and 2 were rejected because both inadequately addressed the remedial objectives, neither alternative would reduce the continued storm water recharge in the areas where the landfill cap has settled, or prevent the further deterioration of the cap. If the landfill cap were allowed to continue to deteriorate, the containment of the hazardous wastes would be compromised which would increase the potential for public exposure and/or impacts to the environment. Alternatives 4 and 5 might provide for more protection against further contaminant mobility and leachate production, but the additional costs associated with the upgraded landfill cap would not be justified in a rural setting where pressures to develop the adjacent property are negligible. The RI found that the landfill has had no significant impact on the nearby Ischua Creek. The investigation also found that the significant groundwater contamination was limited to the area immediately downgradient of the landfill. There was also evidence that the groundwater contamination was naturally attenuating. Alternatives 3A and 3B would reduce the amount of storm water infiltration and would be less costly than constructing a new cap over the entire landfill. Since it will include a monitoring plan designed to assess the progress of natural attenuation at the site, Alternative 3B will provide more assurance for long-term protection of human health and the environment than Alternative 3A. Alternative 3B has therefore been selected as the site remedy.

The estimated present worth cost to implement the remedy is $1,300,000. The cost to construct the remedy is estimated to be $420,000 and the estimated average annual operation and maintenance cost for 30 years is $60,000. After the first several years of groundwater monitoring, it is expected that the information gathered will make it easier to predict the progress of natural attenuation processes. It is also expected that groundwater quality will improve. The scope of the groundwater monitoring program could then be adjusted as appropriate, which would likely result in a reduction in the annual operation and maintenance costs.

The elements of the selected remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS will be resolved.

2. In those portions of the landfill where settlement of the cap has occurred, the existing top soil layer will be scraped away and the depressed area filled with compacted soils matching the low permeability characteristics of the original barrier layer. The topsoil will then be replaced and reseeded.

3. The current post-closure groundwater monitoring program will be expanded. Monitoring wells MW-19S and -20D, installed during the RI, will be added to the current list of wells sampled (MW-13D, -14S/I, -15S/I, 16S/D and 17S/I). So called "compliance monitoring wells" will also be installed farther downgradient (south) of the landfill at locations marking the point beyond which groundwater quality is expected to satisfy SCGs. The groundwater samples will be analyzed for the VOCs, TAL metals and various parameters required for evaluating the progress of natural attenuation. If adverse changes in the site conditions occur or if the progress of natural attenuation appears to no longer offer adequate protection to the public health or the environment, additional remedial action will be taken. Such action may include elements of the remedial alternatives previously considered. The community would be notified in the event that additional remedial action is deemed necessary.

4. To limit access to the site, a hedge of thorny shrubs will be planted along the perimeter of the site to supplement the existing fence.

5. The operation of the leachate collection system will be continued, with the leachate being disposed off site.

6. Property use restrictions will be placed by the County on the deed for the site to prevent future exposures to residual contamination.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- A repository for documents pertaining to the site was established.
- A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.
- A fact sheet was mailed to the public on July 21, 1998 describing the start of the Remedial Investigation. Another fact sheet was distributed on February 25, 2000 which

described the results of the site investigation and outlined the Proposed Remedial Action Plan.

- On March 16, 2000 a public meeting was held to discuss the Proposed Remedial Action Plan.

- In March 2000 a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the Proposed Remedial Action Plan.

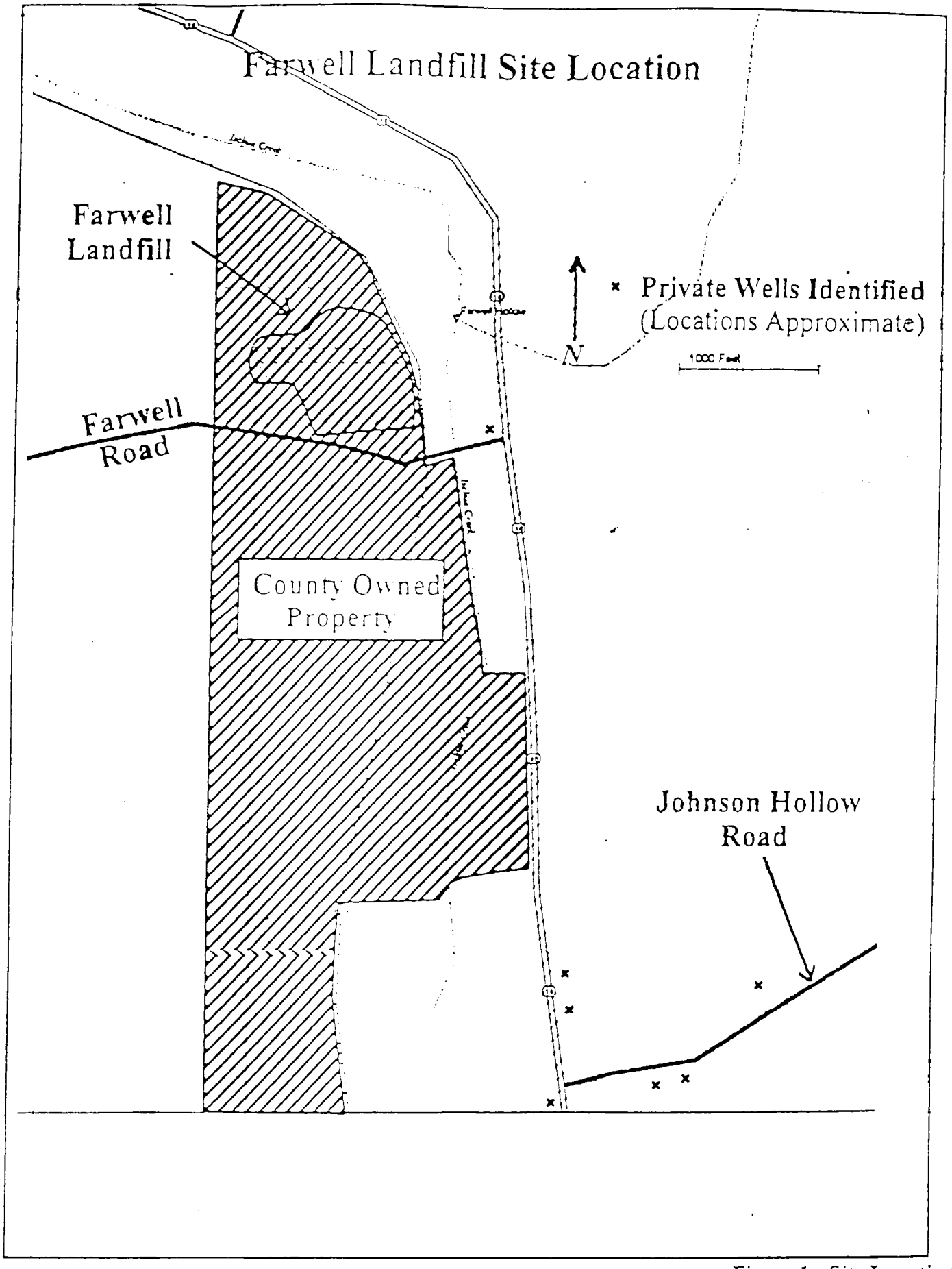


Figure 1 - Site Location

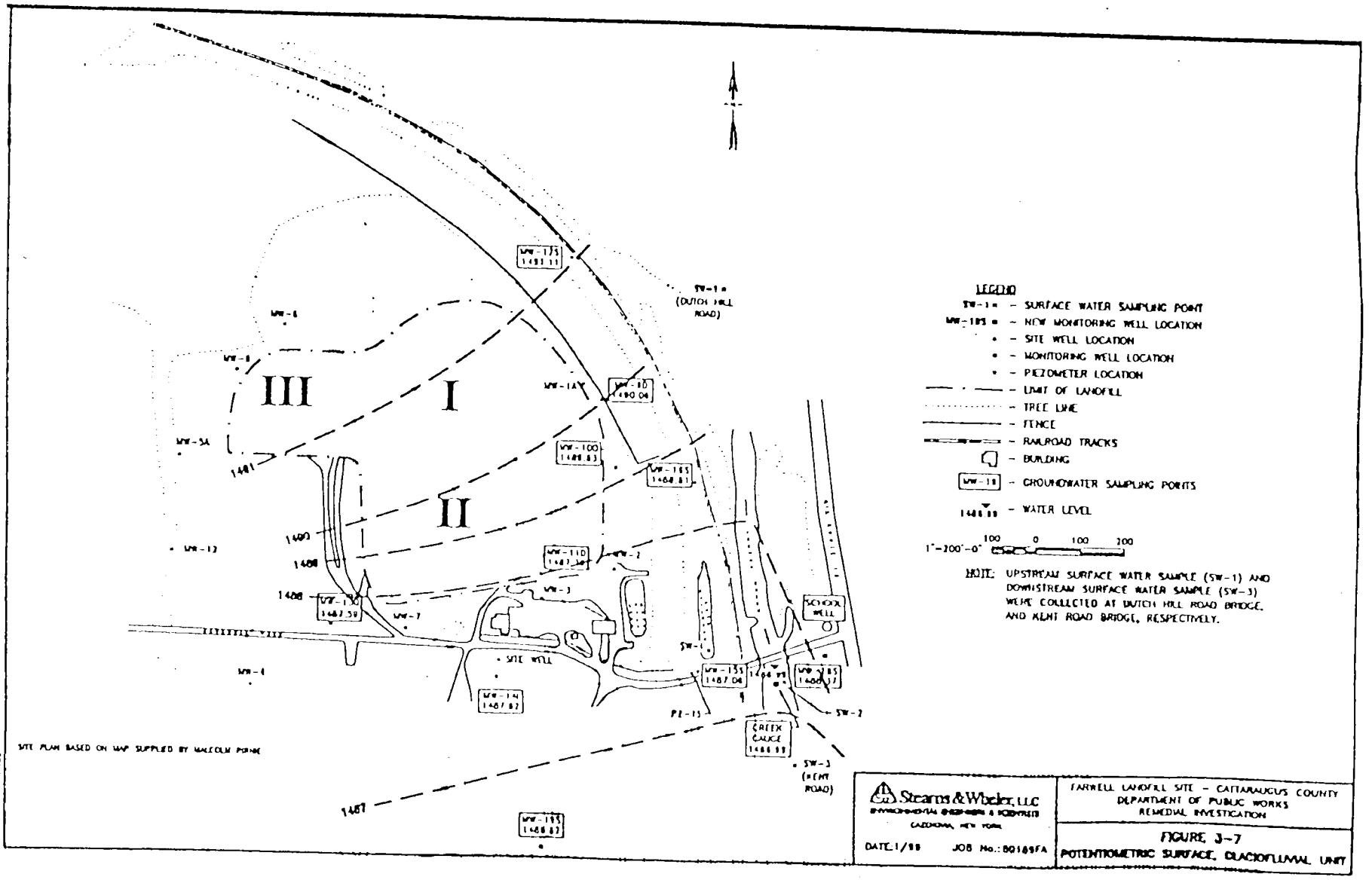


Figure 2 - Site Map

Table 1
Nature and Extent of Contamination
Groundwater

	CONTAMINANT OF CONCERN	CONCENTRATION RANGE * (ppb)	FREQUENCY of EXCEEDING SCGs	SCG (ppb)
Volatile Organic Compounds (VOCs)	Trichloroethene	ND - 45	1 of 20	5
	1,1 Dichloroethane	ND - 160	11 of 20	5
	Chloroethane	ND - 120	7 of 20	5
	1,2 Dichloroethene (total)	ND - 28	5 of 20	5
	1,1,1 Trichloroethane	ND - 27	5 of 20	5
	Vinyl chloride	ND - 9	6 of 20	2
	Benzene	ND - 2	1 of 20	1
TAL Inorganics	Antimony	ND - 6.7	3 of 20	3
	Arsenic	ND - 59.8	2 of 20	25
	Barium	53.4 - 8,490	3 of 20	1,000
	Iron	7.5 - 87,500	16 of 20	300
	Manganese	11.2 - 3,080	11 of 20	300
	Cadmium	ND - 12.8	1 of 20	10
	Sodium	ND - 39,400	8 of 20	20,000
	Zinc	9.7 - 307	1 of 20	300
	Magnesium	14,600 - 59,700	6 of 20	35,000
	Lead	ND - 55	4 of 20	25

ND - Not detected.

Table 2A
Historical Extent of Contamination
Groundwater
(parts per billion)

	TCE					1,1,1 TCA				
Monitoring Well	9D	11D	14I	15I	16S	9D	11D	14I	15I	16S
Sample Date Mo / Yr 9/88	<5	130				28	110			
4/89	<5	85				36	300			
12/89	15	70				96	100			
3/90	<3	50				140	120			
9/90	<30	46				110	95			
3/91	8	26	6	<5	10	67	55	49	1	90
9/91	8.2	39	7	<5	7.2	61	68	16	30	66
4/92	6.9	1.2	5.3	<3	11	<3	39	27	4	71
10/92			6.4	13	8.1			25	47	52
4/93			5	13	7			26	46	46
10/93			<3	6	8			<3	19	53
4/94			3	7.8	6.6			14	33	60
10/94	5.6	6.1	4.3	8.9	5.3	31	38	7.2	28	42
4/95			6.3	14	7			18.3	35	27
10/95			1.8	2.4	3.6			1.6	7.37	20.7
4/96	3.57	25.5	<1	5.98	1.98	20.2	40.6	6.49	28.7	20
10/96			1.83	2.45	3.01			6.01	11.6	27.6
4/97			4	15	7			16	33	23
10/97			43	<3	7			7	<3	25
4/98			5	16	7			11	30	16
10/98	5	61	4	10	7	14	36	<3	18	17

Table 2B
Historical Extent of Contamination
Groundwater
(parts per billion)

	1,2 DCE					Vinyl Chloride				
Monitoring Well	9D	11D	14I	15I	16S	9D	11D	14I	15I	16S
Sample Date Mo / Yr 9/88	<5	<5				<10	<10			
4/89	<5	<5				<10	<10			
12/89	<3	<3				3	<3			
3/90	<3	<3				<3	<3			
9/90	<30	<30				<30	<30			
3/91	30	18	6	<5	36	4	4	3	<10	<10
9/91	23	23	5.6	16	36	<10	<10	<10	<10	<10
4/92	20	15	5.3	<3	28	3.6	<3	4	<3	<3
10/92			6.2	19	21			<3	<3	<3
4/93			6	17	23			4	<3	<3
10/93			<3	<3	<3			4	<3	<3
4/94			4.1	9.2	18			<3	<3	<3
10/94	11	11	5.2	13	15	<3	<3	<3	<3	<3
4/95			9.4	19	14			<1	<1	<1
10/95			3.3	3.52	8.3			1.8	2.4	3.6
4/96	10.6	20.5	13.3	25.7	21.5	3.6	25.5	<1	6	2
10/96			8.5	7.9	18.4			1.83	2.45	3
4/97			9	16	12			4	15	7
10/97			7	<3	11			43	<3	7
4/98			6	19	9			5	16	7
10/98	16	31	<3	<3	8	5	61	4	10	7

Note: 1,2 DCE and vinyl chloride are possible degradation products of both TCE and 1,1,1 TCA.

Table 2C
Historical Extent of Contamination
Groundwater
(parts per billion)

	1,1 DCA					Chloroethane				
Monitoring Well	9D	11D	14I	15I	16S	9D	11D	14I	15I	16S
Sample Date Mo / Yr 9/88	85	170				<10	<10			
4/89	550	960				<10	200			
12/89	<3	250				80	75			
3/90	440	310				<3	35			
9/90	440	450				<30	90			
3/91	270	200	59	10	210	38	69	28	<10	36
9/91	200	230	110	130	180	23	81	77	32	34
4/92	230	140	49	19	190	24	31	34	4.6	38
10/92			52	190	140			69	59	18
4/93			29	180	110			32	62	15
10/93			14	75	130			5	19	18
4/94			17	120	130			31	44	18
10/94	140	150	46	130	93	8.5	35	85	34	10
4/95			48.7	128	87.2			<1	<1	<1
10/95			<1	<1	<1			<1	<1	<1
4/96	69.3	89.6	55.3	104	81.7			<1	<1	<1
10/96			56	36.8	53.4			<1	<1	<1
4/97			47	140	60			57	88	6
10/97			77	6	60			160	<3	6
4/98			33	140	46			33	68	5
10/98	210	160	44	71	43	20	120	120	30	6

Note: 1,1 DCA and chloroethane are possible degradation products of 1,1,1 TCA.

Table 3
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth[1]
Alternative 1: No Action	$0	$23,000	$350,00
Alternative 2: Institutional Controls	$12,000	$23,000	$360,000
Alternative 3A: Repaired Cap, Institutional Controls	$380,000	$30,000	$800,000
Alternative 3B: Repaired Cap, Institutional Controls and Expanded Quarterly Monitoring	$420,000	$60,000	$1,300,000
Alternative 4: Upgrade to Latest Part 360 Cap Requirements	$1,500,000	$60,000	$3,000,000
Alternative 5: Upgrade to Latest Part 360 Cap Requirements & Groundwater Recovery/Disposal	$1,900,000	$170,000	$5,000,000

[1]Present Value is based on an interest rate of 5% and project life of 30 years.

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Farwell Landfill
Proposed Remedial Action Plan
Ischua (T), Cattaraugus County}
Site No. 9-05-024

The Proposed Remedial Action Plan (PRAP) for the Farwell Landfill, was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on February 25, 2000. This Plan outlined the preferred remedial measure proposed for the remediation of the contaminated soil and sediment at the Farwell Landfill. The selected remedy is to repair the existing landfill cap, conduct long-term groundwater monitoring and implement institutional controls.

The release of the PRAP was announced via a notice to the mailing list, informing the public of the PRAP's availability.

A public meeting was held on March 16, 2000 which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. Written comments were received from Mr. Eric Meyer, a Cattaraugus County resident. The public comment period for the PRAP ended on March 29, 2000.

This Responsiveness Summary responds to the written comments received and to the questions and comments raised at the March 16 public meeting that could not be addressed by reference to the site reports or PRAP.

The following are the comments received at the public meeting, with the NYSDEC's responses:

COMMENT 1: Does chloride and metals break down in groundwater?
RESPONSE 1: No, chloride and metals do not break down in groundwater.

COMMENT 2: When chemical compounds (e.g. trichloroethene) break down, are the breakdown chemicals dangerous?
RESPONSE 2: Intermediate breakdown products of some contaminants found in the landfill have been identified in groundwater on site. These intermediate breakdown products (e.g. 1,2-dichloroethene, 1,1-dichloroethane and vinyl chloride) do have maximum contaminant levels (MCLs) allowable for public water supplies and do have adverse health effects if individuals are exposed at high concentrations. It is important to note that levels of these intermediate breakdown products decrease significantly in groundwater several hundred feet downgradient from the landfill. It is not expected that levels will exceed MCLs in sentinel monitoring wells to be located between the landfill and the nearest private

wells, let alone in the private wells. No dangers from these compounds will exist since no exposures to the compounds are expected to occur.

COMMENT 3: Why are you not going to test private wells? I want assurances that my well is not impacted.

RESPONSE 3: Private well monitoring is not planned as part of the regular operation and maintenance activities for the site. Several private drinking water wells have been identified within one mile down gradient of the site. These wells have been sampled in the past and no site-related contamination was ever found. The need for sampling these wells located immediately downgradient will be assessed by the New York State Department of Health (NYSDOH) and the Cattaraugus County Health Department (CCHD) as monitoring well data is collected as part of the site operation and maintenance activities. Should monitoring well data indicate a possible threat to the private wells, the NYSDOH and CCHD will sample those wells deemed to be at risk. The NYSDOH and CCHD are also planning to re-sample private wells previously identified as being downgradient of the site when construction work begins at the site.

COMMENT 4: How much of the existing landfill cap needs to be repaired? How will the repairs be made? How long will it take?

RESPONSE 4: For the purpose of providing a rough cost estimate, it was assumed in the Feasibility Study that one third of the landfill cap or approximately 5 acres would need some repair. A more accurate estimate will be determined during the design phase of the remedy. To make the repairs, it is expected that the cover of topsoil will first be removed to expose the underlying layer of compacted clay. Low spots and damaged portions of the clay layer will be filled with clay, matching the permeability of the existing material. The topsoil would then be replaced and reseeded. It has been estimated that repairs would take approximately six months to complete.

COMMENT 5: Is it possible that a drought or groundwater pumping could change groundwater flow patterns, pulling contamination from the landfill side of Ischua Creek to the residential wells on the opposite side?

RESPONSE 5: As part of the selected remedy, groundwater elevations will be carefully monitored for any changes in groundwater flow patterns. However, it is considered very unlikely that conditions could exist that would allow groundwater contamination to cross beneath the creek. The water level in the creek approximates the lowest groundwater elevation in the creek valley. Groundwater from both sides of the valley converge and discharge at the creek. There is no historical evidence that Ischua Creek has ever been dry, suggesting that the convergence of groundwater has always been maintained. Furthermore, sampling of the site monitoring wells has found most of them to be moderately slow in producing water, some were nearly pumped dry. This indicates that influence on the groundwater elevation or the "cone of depression" from pumping these wells extends over relatively short distances. Normal usage of the residential wells and pumping of site monitoring wells during sampling activities is unlikely to have a profound effect on the groundwater flow patterns.

COMMENT 6: Why was there no liner beneath the landfill?

RESPONSE 6: The earliest portions of the landfill were built without a bottom liner, following the common construction practices of the time. New York State regulations now require a bottom liner in all newly constructed landfills.

COMMENT 7: Is the Alcas Corporation also going to have to pay for the cleanup?
RESPONSE 7: Alcas was named as a settling party in the Order on Consent which obligated Cattaraugus County to complete the RI/FS. Alcas paid for some of the costs of the RI/FS. With the release of the Record of Decision, the NYSDEC will approach both the County and Alcas to implement the remedy under a new Order on Consent.

A letter was received on March 24, 2000 from Mr. Eric Meyer, a Cattaraugus County resident, which included the following comments:

COMMENT 1: During the March 16, 2000 public meeting, NYSDEC described Alternative 3B as the chosen remedy. The public was not given an opportunity to participate in the remedy selection process, NYSDEC had already decided on the remedy.
RESPONSE 1: The March public meeting was designed to present the information gathered over the 18 month period of the site Remedial Investigation and Feasibility Study, and to reflect the NYSDEC's preferred remedial alternative. During the meeting it was stated that a remedy would not be decided upon until all public comments received were addressed.

The goal of New York's hazardous waste site remedial program is to ensure the development of timely, effective site remedial programs that protect people and the environment, and that the public understands and supports. Citizen participation creates opportunities for the public to express preferences and provide input that New York State Department of Environmental Conservation (NYSDEC) staff need to know and which is factored into decision making. However, citizen participation does not substitute for decision making. Ultimate decision making responsibility resides with NYSDEC and other agencies charged by the people through their government with identifying, investigating, and remediating hazardous waste sites.

Under the New York State's Inactive Hazardous Waste Site Remedial Program, the NYSDEC follows a path of thorough site investigation, enforcement, remedial action selection, design and construction. Along that path, we try to keep the affected community informed and involved. Before the Farwell Landfill remedial investigation began in 1998, the NYSDEC and County distributed a fact sheet to the residents living within a mile south of the site.

The fact sheet was also provided to Town and County officials as well as the news media. At least four news articles appeared in various newspapers over the course of the investigation A second fact sheet, noting the completion of the remedial investigation/feasibility study and the availability of the Proposed Remedial Action Plan, was distributed in the same manner as the first. The NYSDEC received no inquiries from the public following the first fact sheet. Four individuals contacted the NYSDEC after the second mailing, two before the public meeting and two afterwards. You were not included on the direct mailing list for either fact sheet, but evidently learned of the project through the news media or some indirect means. While this may have left you with the impression that attempts were not made to include the community in the remedy selection process, such was not the case. Actually, your attendance at the meeting and your written comments were examples of precisely what the NYSDEC had been trying to obtain.

COMMENT 2: Alternative 5 is the only alternative that can be implemented that will have any chance of eliminating or mitigating the significant threat to public health and the environment that the hazardous

wastes pose. Alternative 5 provides for actions which would reduce both the volume and mobility of the contaminants. Alternative 3B (the proposed remedy) offers very little remedial or corrective action.
RESPONSE 2: While preference is given to alternatives which reduce contaminant mobility, toxicity or volumes, this is only one of the several criteria considered. It is important to note that Alternative 5 would be the most difficult to implement given the number of recovery wells required or the depth to which a recovery trench would need to be excavated. As stated in the PRAP (Section 7.2, item 4 Long-term Effectiveness) the risks posed to the public health and the environment following implementation of all but the no action alternative are low. When viewed against the limited current risk (with the existing cap) to the public health and the environment, the degree of added protection provided by Alternative 5 over Alternative 3B is marginal and does not outweigh the disadvantages of low cost-effectiveness and difficulties with implementability.

APPENDIX B

Administrative Record

ADMINISTRATIVE RECORD

Farwell Landfill
Ischua (T), Cattaraugus County
Site No. 9-05-024

Preliminary Hydrogeological Investigation for Farwell Landfill Site, Malcolm Pirnie, July 1986

Phase I Hydrogeological Investigation at the Farwell Landfill, Malcolm Pirnie, September 1989

Phase II Hydrogeological Investigation at the Farwell Landfill, Malcolm Pirnie, November 1989

Phase III Hydrogeological Investigation at the Farwell Landfill, Malcolm Pirnie, April 1990

Preliminary Evaluation of Remediation Scenarios-Farwell Landfill, Stearns & Wheler, September 1997

Groundwater Quality Monitoring Reports (Quarterly and Annual): Malcolm Pirnie; Hayden Wegman; Science, Engineering & Technology Int'l.; and A/E Group Inc.; September 1988 to May 1999

Remedial Investigation / Feasibility Study - Work Plan, Stearns & Wheler, June 1998

Remedial Investigation Report - Farwell Landfill, Stearns & Wheler, revised October 1999 (amended February 2000)

Feasibility Study Report - Farwell Landfill, Stearns & Wheler, October 1999 (amended February 2000)

Proposed Remedial Action Plan, NYSDEC, February 2000

Correspondence from Mr. Eric Meyer to Mr. David Locey (NYSDEC), received March 24, 2000

APPENDIX B

CITIZEN PARTICIPATION PLAN

Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS

Citizen Participation Plan
Farwell Road Landfill
Remediation

Cattaraugus County, New York

January 2002

APPENDIX B

CITIZEN PARTICIPATION PLAN

SECTION 1- INTRODUCTION

This Citizen Participation Plan outlines the community relations' activities for the remedial action being conducted by the Cattaraugus County at the Farwell Road Landfill site in Cattaraugus County, NY in cooperation with the New York State Department of Environmental Conservation (NYSDEC). The purpose of this plan is to aid Cattaraugus County in developing a community relations program tailored to the needs of the community. Cattaraugus County and the NYSDEC are conducting community relations' activities to ensure that the local public is well informed about the remedial process and that the local public's concerns about the site remedial activities are addressed. The NYSDEC publication "New York State Inactive Hazardous Waste Site Citizen Participation Plan" dated August 30, 1998 was used in the preparation of this plan.

The plan is divided into the following sections:

Section 1 Introduces a purpose and organization of the Community Relations Program and contains a summary of the NYSDEC's remedial program.

Section 2 Provides a description of the site and its history.

Section 3 Provides a description of the site remedial program

Section 4 Identifies affected and interested parties.

Section 5 Identifies involved government personnel.

Section 6 Identifies document repositories (places where documents related to the site remedial program are available for public review).

Section 7 Describes specific citizen participation activities planned for the remedial action elements of the remedial program for the site.

Section 8 Provides a glossary of commonly used terms.

1.1 NYSDEC Remedial Program

The New York State remedial program for inactive hazardous waste sites is managed by the Division of Hazardous Waste Remediation of the NYSDEC. The state's remedial program consists of eight

major elements. The elements, providing for the management of hazardous waste sites from identification to final cleanup, are:

1. Site Listed in State Registry of Inactive Hazardous Waste Sites
2. Screening Phase I Investigation
3. Post-Screening Phase II Investigation
4. Remedial Investigation (RI)
5. Feasibility Study (FS)
6. Remedial Design
7. Remedial Construction
8. Long-Term Monitoring, Operation, and Maintenance.

Sites involved in Element 1 are listed on the State Registry of Inactive Hazardous Waste sites based on the known or suspected presence of hazardous waste. Elements 2 and 3 involve site investigations intended to determine whether hazardous wastes are present at suspected sites, and whether the sites pose a threat to public health or the environment. Phase I investigations generally involve record searches and surface (i.e., aboveground) investigations, such as visual inspections and surface environmental sampling. The Phase I investigations may provide insufficient data for determination of presence of a hazardous waste or threat. Phase II investigations, involving subsurface information provided by soil borings, monitoring wells, and geophysical surveys, are more thorough and may be required to obtain sufficient data.

Elements 4 through 8 apply to sites where hazardous wastes are known to be present and cleanup is required.

1.2 Overall Objectives of the Remedial Program

Following the completion of the RI/FS for the site (October 1999), the NYSDEC issued a Record of Decision (ROD) which identifies the remedial measures that will be taken by Cattaraugus County to address the groundwater contamination impacts Farwell Road Landfill site. The remedial action selected to achieve the remedial objectives includes repair of damaged and settled areas of the existing cap, long-term groundwater monitoring, and use of institutional controls. The repair of the settled areas of the landfill cap will consist of removal of the topsoil layer, backfill depressed areas with fill similar to original barrier layer and a replacement of the vegetative topsoil layer to match the existing grade of the area. The ongoing leachate collection with off-site disposal will be continued at the Farwell site. The current post-closure groundwater monitoring program will be expanded to include two additional monitoring wells that were installed during the Remedial Investigation (RI). A total of seven wells will be monitored on the site and three "compliance monitoring wells" will also be installed farther downgradient of the site at an area where groundwater is expected to meet all Standards, Criteria and Guidance values (SCGs). A vegetative barrier hedge will be constructed along the perimeter of the site to supplement the existing fence to prevent trespassing. Finally, property use restrictions will be placed on the Farwell property deed by Cattaraugus County to prevent future exposure to residual contamination.

SECTION 2 - SITE BACKGROUND

2.1 Site Location

The Farwell Landfill is located on Farwell Road, off of Route 16, in the Town of Ischua, Cattaraugus County, NY. The landfill occupies approximately 16-acres of the northern portion of property owned by the County, located along the western wall of the Ischua Creek valley. Farwell Road passes along the southern side of the site, while the western side is bounded by a narrow strip of trees and fields. The northern and eastern sides are bounded by a bend in Ischua Creek and an active Norfolk and Southern railroad line. At its closest point, the creek is approximately 400 feet from the landfill.

The scarcely populated area surrounding the landfill is primarily rural and agricultural. The closest off site structure to the landfill is a former schoolhouse located 600 feet from the landfill on the northwest corner of Route 16 and Farwell Road. There are nine residences located with one-mile downgradient of the landfill. All drinking water for the residences in the area is supplied by private wells or springs.

2.2 Site History

The landfill was constructed in phases to form three contiguous areas. Phase I and II areas of the landfill are unlined. Active disposal of municipal solid wastes, resource recovery ash, and New York State Department of Environmental Conservation (NYSDEC) approved non-hazardous industrial wastes took place in these areas until 1984, when these areas reached capacity. The Phase III area of the landfill was constructed with a compacted soil liner and leachate collection system. This particular area accepted only commercial, permitted industrial, C&D waste, and incinerator ash. The ash was used primarily as daily cover material. The Phase III portion of the landfill was utilized until 1989.

In 1989 the landfill was closed and capped with a minimum of 18-inches of compacted soil and 6-inches of topsoil following NYSDEC guidelines. Since closure, the cap has an established vegetative cover consisting of mixed grasses and shrubbery. Portions of this cap have settled and ponding has been observed in the depressions. During closure, leachate collection piping was added to the southeastern, eastern, and western sides of the landfill in areas where leachate outbreaks had been observed. Currently, leachate is collected in two 10,000-gallon storage tanks located on the eastern portion of the site, near the garage and transfer station. Leachate is pumped from the tanks as needed and transported off site to a permitted wastewater treatment facility.

South of the landfill, two buildings are present on the site. One building has been utilized as a transfer station since closure of the landfill. The other building is used by the Cattaraugus County Department of Public Works for vehicle storage. The water supply well at this site has been deemed non-potable and is accordingly posted.

A number of investigations have been completed over the years at the landfill in order to determine the extent of groundwater contamination. Water quality data from the monitoring wells and Ischua

Creek is available from the 1970s to the present. Groundwater monitoring undertaken prior to the remedial investigation indicated the principal contaminants of concern at the Farwell Landfill are chlorinated volatile organic compounds (VOCs). These include trichloroethene (TCE), vinyl chloride (VC), chloroethane, 1,1-Dichloroethene (1,1-DCE), 1,1-Dichloroethane (1,1-DCA), 1,1,1-Trichloroethane (TCA), and the two isomeric forms of 1,2-Dichloroethene (1,2-DCE) (RI, Stearns & Wheler, 1999). The origin of these compounds is believed to be hazardous waste that was dumped into the landfill.

The following is a historic summary of actions to date.

- In 1975 the former farmland was developed and disposal operations on the Phase I and II areas begin. The landfill received residential, commercial and industrial wastes along with incinerator ash, sewage treatment sludge, and construction debris until capacity is reached in 1985 and the Phase III area is opened.

- Between 1975 and 1980, according to Community Right to Know records, 8.5 tons of hazardous waste consisting of trichloroethene (TCE) sludge and sawdust were disposed of in the landfill, apparently in the Phase I and II areas.

- In October 1984, an Order on Consent (File # 84-106) is issued to the County to bring the landfill into compliance with New York State regulations (6NYCRR Part 360) for solid waste facilities. The order requires the County to begin hydrogeologic studies, install a groundwater monitoring system and close the landfill.

- In 1987 monitoring for USEPA pollutants is added to the groundwater monitoring program. Results show that groundwater downgradient of the landfill is polluted with chlorinated volatile organic compounds (VOCs), including trichloroethene.

- In 1988, the landfill stops accepting waste, a closure plan and a quarterly groundwater monitoring plan is established.

- In 1989, closure of the landfill is completed in agreement with the consent order and closure plan. The landfill is capped with 18-inches of low permeability soil, 6-inches of topsoil and seeded. Two former leachate collection ponds are dredged and the debris disposed of in the landfill. One pond is permanently backfilled with clean soils and the other is lined with low permeability compacted soil in order to receive surface runoff from the landfill. The 1990 construction monitoring report certified that the landfill was closed in accordance to the closure plan.

- In 1989, an Order on Consent (File # 89-71) was issued to the County to uphold a 30-year post closure maintenance and monitoring program under New York State solid waste regulations.

- In 1996, the NYSDEC classified the landfill as a Class 2 inactive hazardous waste site following results from the post-closure monitoring data and documentation of hazardous

waste disposal in Phase I and II areas of the landfill. Such a classification suggested that the site might represent a significant threat to the public health or environment, and that action might be required.

- An Order on Consent (File # B0489-96-02) was issued to the County in 1998 to complete a Remediation Investigation (RI) to supplement past site investigations and a Feasibility Study (FS) to examine remedial alternatives.

- In February 1999, the Remedial Investigation/Feasibility Study (RI/FS) was completed for Cattaraugus County by Stearns & Wheler, LLC.

- In March 2000, the NYSDEC issued a Record of Decision (ROD) which identified **Alternative 3B, Repaired Cap, Institutional Controls and Natural Attenuation** as the remedy for this site.

- In July 2001, Stearns & Wheler, Environmental Engineers and Scientists, was hired by Cattaraugus County to complete this remedial design and oversee the implementation of the remedial action.

SECTION 3 - PROJECT DESCRIPTION

3.1 Project Objectives

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR 375-1.10. These goals are established under the overall goal of meeting all standards, criteria, and guidance (SCGs) and protecting human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected as detailed in Section 8 of the Cattaraugus County Cattaraugus County/NYSDEC ROD are:

1. Establish a remedial design program to verify the components of the conceptual design and provide the detail necessary for the construction, operation and maintenance, and monitoring of the remedial program.

2. Repair settled or damaged areas of the existing landfill cap with compacted soils matching the low permeability characteristics of the original barrier layer. The topsoil will then be replaced and reseeded..

3. Expand the current post-closure ground monitoring program. Monitoring wells MW-19S, -20D will be added to the current list of wells sampled. Three compliance monitoring wells MW-21S,

-22S, and -23S will be added downgradient of the landfill at locations marking where groundwater is expected to satisfy SCGs.

4. A vegetative barrier hedge of thorny shrubs will be planted along the perimeter of the site to supplement the existing fence.

5. The current leachate collection system will continue, with leachate being disposed of off-site.

6. Property use restrictions will be placed on the property deed by Cattaraugus County to prevent future exposures to residual contamination.

SECTION 4 - AFFECTED AND INTERESTED PARTIES

4.1 Introduction

The names and addresses of known affected and interested parties were compiled by Cattaraugus County and Stearns & Wheler, LLC. When contacted, the NYDSEC shall maintain the confidentiality of names and addresses where requested and appropriate. The contact list will be used by the NYSDEC to inform and involve the interested and affected public. The list will be updated periodically based on public interest in the site, stage of remediation, and other factors. A site hotline may be created during the construction phase of the project. The hotline message will be updated weekly to allow residents to call and be informed of the current work.

4.2 CONTACT LIST

Cattaraugus County	Mr. David Rivet Commissioner Department of Public Works	Cattaraugus County Department of Public Works 8810 Route 242 Little Valley, NY 14755
Stearns & Wheler, LLC	Paul McGarvey, P.E. Project Manager Brad Smith, P.E. Project Engineer	University Center Suite 100 415 North French Road Amherst, NY 14228 (716) 691-8503 (716) 691-8506 (fax)

SECTION 5 - REGULATORY CONTACTS

5.1 Introduction

Regulatory oversight of the Farwell Road site remedial program will be the responsibility of the NYSDEC and the New York State Department of Health (NYSDOH). Key contacts within these

agencies are presented in this section.

5.2 Contact List

NYSDEC	Mr. David Locey NYSDEC Region 9 270 Michigan Avenue Buffalo, NY 14203 (716) 851-7220
Additional NYSDEC Contacts	Hazardous Waste Toll Free Information Number (800) 342-9296
	Mr. Gerald Rider Div of Environmental Remediation NYSDEC 625 Broadway Albany, NY 12233
	Mr. Michael Podd NYSDEC Region 9 270 Michigan Avenue Buffalo, NY 14203 (716) 851-7220
NYSDOH	Mr. Gary Litwin Bureau of Environmental Exposure New York State Department of Health Flanigan Square 547 River Street Troy, NY 12180
	Mr. Cameron O'Connor NYSDOH 584 Delaware Avenue Buffalo, NY 14202 (716) 847-4385
	Toll Free Information Number (800) 458-1158

SECTION 6 - DOCUMENT REPOSITORY

6.1 Introduction

Three repositories will be established for project documents. The repositories will also include the following documents as they become available:

- Remedial Investigation (RI) Report(s)
- Feasibility Study (FS) Report
- Plans and specifications for remedial construction
- Quality assurance/quality control plans
- Health and safety plans
- Remediation progress reports
- Construction completion reports
- Responsiveness summaries
- This site-specific Citizen Participation Plan
- Any fact sheets and newsletters

6.2 Document Repositories

The document repositories are:

NYSDEC Region 9
270 Michigan Avenue
Buffalo, NY 14203

Cattaraugus County
Dept of Public Works
8810 Route 242
Little Valley, NY 14755

Ischua Town Hall
1850 Mill Street, Unit 36
Hinsdale, New York 14743

Olean Public Library
134 North 2nd Street
Olean, NY 14760

SECTION 7 - CITIZEN PARTICIPATION ACTIVITIES

7.1 Introduction

Cattaraugus County will implement specific citizen participation activities described in this section during the remedial action. The community relations program is designed to allow the community to learn about and participate in the remedial process. The community relations program has been developed in conformance with the following NYSDEC regulations and guidance:

- 6 NYCRR Part 375.7 - State regulations establishing citizen participation requirements for inactive hazardous waste disposal areas.
- NYSDEC Policy - Citizen participation activities required by the NYSDEC in addition to Part 375.7 requirements.

Activities to be conducted as part of the community relations program are described below.

A. **Place Copies of Project Documents in Designated Document Repositories.** The primary document repository for the remedial design documents is the NYSDEC Region 9 office in Buffalo, NY. This office possesses copies of all final documents pertaining to this project which have been approved by the NYSDEC. Additional local document repositories are the Cattaraugus County Department of Public Works, and Olean Public Library. Copies of required remedial design documents will be placed in these repositories.

B. **Meet Periodically with the Citizen Advisory Committee Previously Formed During the RI/FS Phase of this Project.** This committee, comprised of interested citizens and local officials,

will provide feedback to Cattaraugus County and NYSDEC regarding community concerns associated with this project.

C. **Hold Public Meetings.** Public meetings will be held prior to and during commencement of the remedial construction to inform the public of the scope of activities at the site.

D. **Fact Sheets.** Fact sheets will be issued periodically by Cattaraugus County (after review by NYSDEC) to the contact list in order to keep the public informed of the progress of the remedial action. The following fact sheets will be issued:

- A Fact sheet/mailing to the public and news media announcing that the Remedial Design is complete and the project will go out to Bid,
- A Fact sheet/mailing and a public availability session prior to the start of construction,
- A Fact sheet/mailing announcing the completion of remedial construction.

SECTION 8 - GLOSSARY OF KEY TERMS

8.1 Definitions of Commonly Used Citizen Participation Terms

A. **Availability Session.** A scheduled gathering of program staff and members of the public casual setting, without a formal presentation or agenda but usually focusing on a specific aspect of a site's remedial process.

B. **Citizen Participation.** A program of planning and activities to encourage communication among people affected by or interested in hazardous waste sites and government agencies responsible for investigating and remediating them.

C. **Citizen Participation Plan.** A document which must be developed at a site's **Remedial Investigation** stage. A CP Plan describes the citizen participation that will be conducted during a site's remedial process.

D. **Citizen Participation Specialist.** A staff member from an NYSDEC central office of regional office who has specialized training and experience to assist a **project manager** and other staff to plan, conduct and evaluate a site-specific citizen participation program.

E. **Consent Order.** A legal and enforceable agreement negotiated between the NYSDEC and a **responsible party.** The order and the Responsible Party sets forth agreed upon terms by which a responsible party will undertake site investigation and/or cleanup, or pay for the costs of those activities. The order includes a description of remedial actions to be taken by the responsible party with NYSDEC oversight, and a schedule for implementation.

F. **Contact List.** Names, addresses, and/or telephone numbers of individuals, groups, organizations, and government officials and media affected by or interested in a particular hazardous waste site. The size of a contact list and the categories included are influenced by population density, degree of interest in a site, the stage of the remedial process and other factors. It is an important tool needed to conduct outreach activities.

G. **Document Repository.** A file of documents pertaining to a site's remedial and citizen participation programs which is made available for public review. The file generally is maintained in

a public building near the hazardous waste site to provide access at times and a location convenient to the public.

H. **Fact Sheet.** A written discussion about part or all of a site's remedial process, prepared and provided by DER to the public. A fact sheet may focus on: a particular element of the site's remedial program; opportunities for public involvement; availability of a report or other information, or announcement of a **public meeting** or **comment period**. A fact sheet may be mailed to all or part of a site's **contact list**, distributed at meetings, placed in a **document repository** and/or sent on an "as requested" basis.

I. **List of Inactive Hazardous Waste Disposal Sites in New York State**. This is a compilation by the NYSDEC of all known and suspected hazardous waste sites in New York State.

J. **Monitoring Well**. A hole drilled into the soil or bedrock which has a screen pipe and riser pipe installed in the borehole. The well enables the sampling of groundwater for chemical analysis.

K. **Project Manager**. A NYSDEC staff member within the **Division of Hazardous Waste Remediation** (usually an engineer, geologist, or hydro geologist) responsible for the day-to-day administration of remedial activities at, and ultimate disposition of, a hazardous waste site. The Project Manager works with legal, health, **citizen participation** and other staff to accomplish site-related goals and objectives.

L. **Proposed Remedial Action Plan (PRAP).** An analysis by DER of each alternative considered for the remediation of a hazardous waste site and a rationale for selection of the alternative it recommends. PRAP is created based on information developed during the site's Remedial Investigation and Feasibility Study. The PRAP is reviewed by the public and other state agencies.

M. **Public.** Individuals, groups, and organizations affected (or potentially affected) by an inactive hazardous waste site and its remedial program, interested in the site and its remediation, or having information about the site and its history.

N. **Public Meeting**. A scheduled gathering of the NYSDEC staff and the public to exchange information, ask questions, and discuss concerns. May take one of the following forms: large-group meeting called by the NYSDEC; participation by the NYSDEC at a meeting sponsored by another organization such as a town board or Department of Health; working group or workshop; or tour of a hazardous waste site.

O. **Record of Decision (ROD).** An administrative record detailing the selected remedy for a hazardous waste site and documenting the information and rationale used to select the remedy.

P. **Remedial Investigation/Feasibility Study (RI/FS).** A Remedial Investigation gathers new data to fully define the nature and extent of contamination at and/or emanating from the site, and it evaluates the need for remedial action. The Feasibility Study proposes an environmentally sound, comprehensive remedy. The results of the RI/FS set the stage for the next steps in the remediation process, design and construction.

Q. **Responsible Parties**. Individuals or companies (e.g. site owners, operators, transporters or generators of hazardous waste) responsible for or contributing to the contamination problems at a hazardous waste site. A PRP is a Potentially Responsible Party.

R. **Responsiveness Summary**. The responsiveness summary is included as part of the ROD. It summarizes questions and concerns brought up during the public comment period and replies to these questions and concerns.

S. **Toll-Free "800" Telephone Information Number**. Provides cost-free access to the NYSDEC by members of the public who have questions, concerns or information about a particular hazardous waste site. Calls are taken and recorded 24 hours a day and a NYSDEC staff member contacts the caller as soon as possible (usually the same day).

8.2 Definitions of Elements Remedial Program and Other Remediation Terms

The first eight definitions describe major elements of the remedial process. They are presented in the order in which they occur, rather than in alphabetical order.

1. **Site Placed on Registry of Inactive Hazardous Waste Sites**. Inactive sites known or suspected to contain hazardous waste are listed in the Registry. Whenever possible, the NYSDEC carries out an initial evaluation at the site before listing.

2. **Screening Site Investigation**. A preliminary investigation of the presence of hazardous substances present at a site. Screening investigations include estimates of pathways by which pollutants might be migrating away from the original site of disposal, identification of population or resources which might be affected by pollutants from a site, and information regarding who might be responsible for wastes at a site. Involves a search of records from all agencies known to be familiar with a site, interviews with site owners, employees, and local residents to gather pertinent information about a site. After the investigation, NYSDEC may chose to initiate an emergency response such as nominating the site for the National Priorities List, or, where additional information is needed to determine site significance, conduct further investigation.

3. **Post-Screening Site Investigation**. An investigation intended to obtain information to properly classify a site and determine a final hazard ranking score. A post-screening investigation is more extensive than a screening investigation, but not sufficiently detailed to determine the full extent of the contamination, to evaluate remedial alternatives, or to prepare a conceptual design for construction.

4. **Remedial Investigation (RI)**. An investigation to determine the nature and extent of contamination at a site. The RI includes sampling and monitoring, if necessary, and includes the gathering of sufficient information to determine the necessity for, and proposed extent of, a remedial program for the site.

5. **Feasibility Study (FS).** A process for developing, evaluating, and selecting remedial actions for a site based on the RI. The FS includes defining the objectives of the remedial program, developing remedial action alternatives, performing an initial screening of these alternatives, and performing a detailed analysis of a limited number of alternatives.

6. **Remedial Design**. Development of technical drawings and specifications for construction of the selected remedial alternative at a site based on the final RI/FS report. Design documents are used to bid and construct the chosen remedial actions. The remedial design is prepared by consulting engineers with experience in inactive hazardous waste disposal site remedial actions.

7. **Construction**. Supervision and construction of the designed remedial alternative. Construction costs may vary from several thousand dollars to many millions of dollars, depending on the size of the site, the soil, and groundwater conditions on site, and the nature of the wastes present.

8. **Monitoring/Maintenance.** Post-closure activities intended to ensure continued effectiveness of the remedial actions. Typical monitoring/maintenance activities include quarterly inspection by an engineering technician, measurement of water levels in monitoring wells, and collection of groundwater and surface water samples. Monitoring/maintenance may be required indefinitely at many sites.

A. **Consent Order**. A legal and enforceable negotiated agreement between the Department and responsible parties under which responsible parties agree to investigate and clean-up, or pay for the costs of investigation and clean-up at a site. The order includes a description of the remedial actions to be undertaken at the site and a schedule for implementation.

B. **Contract**. A legal document signed by a contractor and the Owner to carry out specific site remediation activities.

C. **Contractor**. A person or firm hired by the Owner to furnish materials or perform services.

D. **Delisting**. Removal of a site from the state Registry based on a finding that the site does not contain hazardous wastes.

E. **Potentially Responsible Party-Lead Site**. An inactive hazardous waste site at which those legally liable for the site have accepted responsibility for investigating hazardous wastes at the site, and for developing and implementing a remedial program. PRP's include past and present owners and operators of the site, and those who generated the wastes placed at the site. Remedial programs developed and implemented by PRP's generally result from an enforcement action taken by the State and the costs of the remedial program are generally borne by the PRP.

F. **Ranking System**. A system to assign numerical scores representing the relative risk or danger from a site. NYSDEC uses the Hazard Ranking System (HRS) developed by the U.S. Environmental Protection Agency.

G. **Responsible Parties**. Individuals or companies responsible for or contributing to the contamination problems at a hazardous waste site (e.g., site owners, operators, and transporters of hazardous waste to or from a site, or generators of hazardous waste disposed at a site).

H. **Site Classification**. The NYSDEC assigns sites to classifications established by state laws to sites listed in the State Registry:

Classification 1. A site causing or posing an imminent danger of causing irreversible or irreparable damage to the public health or environment -- immediate action required.

Classification 2. A site posing a significant threat to the public health or environment - action required.

Classification 2a. A temporary classification for a site known or suspected to contain hazardous waste. Frequently, a Phase I or Phase II investigation is required at these sites to reclassify or remove the site from the state Registry.

Classification 3. A site with confirmed presence of hazardous waste, but not a significant threat to the public health or environment -- action may be deferred.

Classification 4. A site which has been properly closed -- requires continued management.

Classification 5. A site which has been properly closed with no evidence of present or potential adverse impact -- no further action required.

I. **State-Lead Site.** An inactive hazardous waste site which the NYSDEC has responsibility for investigating, and developing and implementing the site's remedial program. The NYSDEC uses money available from the State Superfund and the Environmental Quality Bond Act of 1986 to pay for these activities.

APPENDIX C

CONTINGENCY PLAN

Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS

Contingency Plan
Farwell Road Landfill
Remediation

Cattaraugus County, New York

January 2002

APPENDIX C

CONTINGENCY PLAN

SECTION 1 - GENERAL

The function of the Contingency Plan is to set procedures for organizing, planning, and coordinating various groups and services in the event of an emergency during the site remediation. The plan discusses protocol for notifying key participants, taking remedial actions, and ensuring worker and community safety. The Contingency Plan is divided into the following sections:

1. Listing of telephone numbers, addresses, and contact persons that provide emergency services (Section 2).

2. Listing of emergency equipment to be stored on site (Section 3).

3. Evacuation Plan (Section 4).

4. Site-specific emergency procedures and remedial options (Section 5).

SECTION 2 - EMERGENCY SERVICES

Emergency situations may require decisions to be made by individuals not present at the site, assistance from outside trained help, or notification of employers or regulatory agencies. A listing of personnel and phone numbers will be posted at the site in the site trailers.

The following is a list of telephone numbers and addresses for agencies and organizations to be contacted for emergency services:

ORGANIZATION	ADDRESS/CONTACT PERSON
Owner	Cattaraugus County David J. Rivet Commissioner Department of Public Works 8810 Route 242 Little Valley, NY 14755

ORGANIZATION	ADDRESS/CONTACT PERSON
Engineer	Stearns & Wheler, LLC Paul McGarvey, Project Manager University Center, Suite 100 415 North French Road Amherst, NY 14228 (716) 691-8503
Contractor	To be determined
Site Facilities	To be determined
NYSDEC	NYSDEC Region 9 Mr. David Locey, Project Engineer 270 Michigan Avenue Buffalo, New York 14203 (716) 851-7220
NYSDOH	NYSDOH Mr. Gary Litwin Bureau of Environmental Exposure New York State Department of Health Flanigan Square 547 River Street Troy, NY 12180
NYDEC Spill Hotline	1-800-457-7362
National Spill Response	1-800-424-8802
UFPO	1-800-962-7962
Local Police Department	911
County Police Department	911
State Police Department	911
Fire Department	911
Hospital	911
Equipment suppliers	To be determined

The above list may be added to or revised as needed

2.1 Coordination of Emergency Services

Prior to start of construction activities, the above list of emergency service personnel will be familiarized with the following:

1. The site layout (refer to Sheet 2, Existing Conditions).

2. **Associated Hazards of the Groundwater Contaminants.** The following additional hazards may be encountered on site: noise, heavy equipment, and steep slopes.

3. Facility Evacuation Plan (refer to Section 4 of this report).

SECTION 3 - EMERGENCY EQUIPMENT

The following is a general list of emergency equipment, equipment capabilities, and equipment storage locations.

EQUIPMENT	LOCATIONS	CAPABILITIES
Hand-held fire extinguishers	Support area on machinery	Extinguish small fires
First aid kits	Support area	Perform first aid for minor injuries
Spill kit	Support area	To clean small incident spills
Extra silt fence	Excavation area	To contain areas of erosion
Ring buoy	Near shore	Water safety
Air horn	Support area	Alarm notification

SECTION 4 - EVACUATION PLAN

The site engineer will have primary responsibility for establishing whether evacuation of the site is necessary. Evacuation of specific areas due to immediate health or safety dangers will be established by personnel present. The following standard hand signals will be used in case of inability for voice communication:

Hand gripping throat .....Out of air; can't breathe
Grip partner's wrist or both hands around waist.....Leave area immediately
Hands on top of head .....Need assistance
Thumbs up .....OK; I am all right; I understand
Thumbs down.....No; negative

If an emergency situation poses significant danger to personal safety, the following evacuation plan should be initiated as time permits.

1. Site personnel shall be alerted of potential problems. An alarm system, such as three long blasts from an air horn, should be established, documented, and reviewed with site personnel by the site engineer.

2. Site equipment should be shut down.

3. Appropriate emergency response agencies should be notified (Section 2).

SECTION 5 - SITE-SPECIFIC EMERGENCY PROCEDURES AND OPTIONS

5.1 Personnel and Equipment Safety

A. Procedures.

1. Set safety practices and standards for each operation at the site.
2. Train site personnel.
3. Inform site engineer of non-conformance.

B. Possible Remedial Options.

OPTIONS	FUNCTION
Follow OSHA safety requirements	Provide a safe working environment
Follow equipment and safety suggestions on Table CP-1	Provide a safe working environment

5.2 On-Site Personal Injury

A. Procedures.

1. Provide first aid for minor injury.
2. Notify ambulance.
3. Notify hospital.
4. Notify Owner.
5. Document accident.

B. Possible Remedial Options.

OPTIONS	FUNCTION
Identify unsafe conditions and revise	Provide a safe working environment
Follow OSHA safety requirements	Provide a safe working environment
Follow site operation requirements	Provide a safe working environment

5.3 Fires

A. Procedures.

1. Extinguish immediately (if small fire)
2. Isolate area and remove personnel
3. Notify Fire Department
4. Notify Owner
5. Record incident

B. Possible Remedial Options.

OPTIONS	FUNCTION
Extinguish fire	Smothers fire

5.4 Equipment Breakdown

A. Procedures.

1. Notify mechanic
2. Notify Owner
3. Notify equipment supplier
4. Evaluate repair or replacement alternatives
5. Implement best remedial option(s)

B. Possible Remedial Options

OPTIONS	FUNCTION
Establish and implement proper equipment maintenance program	Reduce equipment downtime
Replace or repair equipment	Reduce equipment downtime
Identify cause of repeated problem and remediate	Reduce equipment downtime

5.5 Spill (NMPC Environmental Guidance Handbook, which will be posted at the Engineer's trailer in addition to the following).

A. Procedures.

1. Cease filling operations in the spill area
2. Isolate the spill area
3. Evacuate the area where the spill has occurred
4. Notify Owner
5. Notify NYSDEC
6. Begin spill cleanup procedures

TABLE CP-1

SAFETY SUGGESTIONS FOR EQUIPMENT OPERATORS

1. Check equipment before starting
2. Use steps and handholds
3. Keep steps clean
4. Inspect area before moving
5. Operate from driver's seat
6. Wear seat belts
7. Never mount moving equipment
8. Authorized passengers only
9. Keep bucket or blade low
10. Check blind areas
11. Keep enough clearance
12. Avoid sidehill travel
13. Avoid excessive speed
14. Do not crush sealed containers
15. Go carefully over bulky items
16. Check work area
17. Park on level ground
18. Lower attachments to ground when parked
19. Never jump from equipment
20. Avoid leaving equipment unattended
21. Always have adequate lighting
22. Clean equipment before repairing
23. Remain in seat during equipment adjustments
24. Wear hearing protectors
25. Wear steel-toed boots
26. Wear protective eyewear

Source: 40 Code of Federal Regulations §271.7

APPENDIX D

QA/QC PLAN

Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS

QA/QC Plan
Farwell Road Landfill
Remediation

Cattaraugus County, New York

January 2002

APPENDIX D

QUALITY ASSURANCE/QUALITY CONTROL PLAN

INTRODUCTION

This plan describes the guidelines to be followed for quality assurance (QA) and quality control (QC) to be used during the remediation of the Farwell Landfill site. Included in this plan are the roles and responsibilities of each individual or organization which will be involved in construction activities, as well as the minimum level of experience and training required for each individual or organization. In addition, an outline of the protocol for testing is included.

All aspects of this QA/QC Plan will be included in the contract specifications for the remediation of this site.

DEFINITIONS OF QUALITY ASSURANCE AND QUALITY CONTROL

Definitions

Definitions of QA and QC have been adapted from the Canadian Standards Association. For this project, definitions are as follows.

1. **Quality assurance** consists of a planned and systematic pattern of all means and actions designed to provide adequate confidence that items or services meet contractual requirements and will perform as designed. Quality assurance includes the review of work performed in the field and the testing of installed materials to verify compliance with the drawings and specifications. Overall quality assurance means and actions also include quality control.

2. **Quality control** consists of those actions which provide a means to measure and regulate the characteristics of an item or service to contractual and regulatory requirements. These actions are comprised both of the specification of testing methods and frequencies as well as specifying minimum levels of experience and training for the individuals and organizations performing the work. In general, quality control is performed prior to allowing individuals and organizations to perform the work and prior to accepting materials for delivery to the work site as a means for prequalification of services and materials and continues throughout construction to evaluate the consistency of products and services.

Purpose of Quality Assurance And Quality Control

Careful quality assurance and quality control testing of the materials and services used in the construction of the remedial action is an important aspect of the construction process. The QA/QC requirements are intended to provide a level of confidence to the Owner, Engineer, and the public

that the completed project was constructed in accordance with the approved specifications. The programs proposed in this plan provide added control over the quality of the completed project and greater confidence in the cleanup of the Farwell Landfill site.

LINES OF COMMUNICATION AND RESPONSIBILITIES

Each individual and organization associated with the design, construction and testing of the proposed project have defined roles and responsibilities during the progress of the work. Timely communication among the parties can reduce problems and changes encountered in the field, increase the efficiency of the work and improve the quality of the finished project.

This section describes the proper lines of communication between the Contractor, QA/QC personnel, the Engineer, the Owner, and the Regulator. This chapter also describes the roles and responsibilities of each party.

Lines of Communication

By delineating lines of communication, questions, concerns and problems can be more effectively and efficiently addressed and resolved. For this project, the number of parties which communicate directly to the Owner have been limited to isolate overall responsibilities for QA/QC. All items which arise in the field should be directed to the Contractor, who in turn can resolve the situation or bring it to the attention of the Owner's representative (Engineer) or the regulators. By developing efficient and direct lines of communication, the reporting and resolution of problems and changes should be efficiently handled, thereby reducing work stoppages and delays.

Meetings

To assist in the proper communication of problems and their resolutions, a schedule of meetings will be defined and included in Section 01039, Coordination and Meetings, in Division 1 of the specifications. Prior to the commencement of construction, a preconstruction meeting will be held. This meeting should be attended by a representative of the NYSDEC, the Engineer, Owner, and Contractor. During this meeting, the lines of communication will be reviewed and specific procedures for QA/QC testing will be established.

Additional progress meetings will be conducted at two-week intervals during construction. Attendees at progress meetings include the Owner, the Contractor, the Engineer, and the NYSDEC. The purpose of these meetings is to review work progress, identify problems affecting progress and schedules, review delivery schedules, discuss any corrective measures, and maintain quality standards throughout the project. Once all equipment is installed and has been tested, a treatment system startup conference will be conducted.

Roles and Responsibilities

This section summarizes roles and responsibilities of key personnel or organizations involved in the construction of the remedial systems.

1. **Regulator.** The primary role of the regulatory agency is to verify compliance with the ROD and discharge requirements. Additional roles and responsibilities of the Regulator are as follows: (a) promptly review design modifications, changes and variance requests and work with the Owner and Engineer to efficiently reach decisions and provide approvals; and (b) promptly review QA/QC testing results and work with Owner and Engineer to resolve required remediation of unacceptable areas, if encountered.

2. **Owner.** The general roles and responsibilities of the Owner are as follows: (a) communicate with the Engineer regarding proposed modifications and changes; and (b) promptly submit required and requested information to the regulator.

3. **Engineer.** The general roles and responsibilities of the Engineer are to: (a) consult with the Contractor and Owner in consideration and selection of products, suppliers, and installers, and to consult with the regulator; (b) select products in consultation with the Owner and transmit decisions to Contractor; (c) prepare change orders; (d) inspect and check results of field engineering services for conformance with Contract Documents; and (e) hold progress meetings.

4. **Contractor.** The Contractor will assist the Construction Manager and Engineer in the selection of products and suppliers, obtain supplier proposals, execute purchase agreements, arrange for the process shop drawings, arrange for product and equipment delivery, inspect product and equipment, install product equipment, oversee work of subcontractors, and prepare schedules. Unless specifically stated otherwise, the term "Contractor" throughout the drawings and specifications refers to the Contractor.

TESTING PROTOCOL

As with most projects, actual testing serves as the main form of material quality assurance and quality control. The following is an overview of testing requirements for this project.

Quality Control Testing - Backfill Materials

Quality control testing of backfill materials is to be performed at the source of the material prior to the excavation and/or loading of that material for transportation to the project site. The timing of the sampling and testing of materials is designed so that testing can be performed in advance of the use of the materials such that unacceptable volumes of materials are not transported to the site. The material characteristics for each fill material specified for this project are contained in the notes for the construction drawings or in the specifications.

Quality Assurance – Testing – Backfill Materials

Quality Assurance Testing of backfill materials is to be performed after installation of the materials. Testing is designed to verify the materials were installed in accordance with the Contract Documents. Testing criteria is specified in the technical specifications.

APPENDIX E

HEALTH AND SAFETY PLAN

Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS

Health and Safety Plan
Farwell Road Landfill
Remediation

Cattaraugus County, New York

January 2002

Woodward Miller & Associates

5806 Innsbruck Road
East Syracuse, New York 13057

Phone/Fax: (315) 656-8247
Email: cmiller@twcny.rr.com

January 30, 2002

Mr. Paul J. McGarvey, P.E.
Stearns & Wheler, LLC
University Centre, Suite 100
415 North French Road
Amherst, NY 14228

Dear Mr. McGarvey:

As per your request, I have reviewed the site health and safety plan for the field work for the Farwell Road Landfill, Town of Ischua, Cattaraugus County, NY prepared by Stearns & Wheler, LLC. The site health and safety plan meets Occupational Safety and Health Administration regulations found in 29 Code of Federal Regulations Part 1910.120 (b)(4)(ii) (General Industry) and Part 1926.65(b)(4)(ii) (Construction Industry) for required elements of a site –specific safety and health plan for hazardous waste operations.

If you have any questions, please feel free to contact me at (315) 656-8247.

Sincerely,

Caroline W. Miller

Caroline W. Miller, CIH, CSP

PLAN ACCEPTANCE FORM

PROJECT HEALTH AND SAFETY PLAN

I have read and agree to abide by the contents of the Health and Safety Plan for the following project Farwell Landfill Remediation Project, Town of Ischua, Cattaraugus County, New York.

_____

Name (print)

_____

Signature

_____

Date

Return to Office Health and Safety Representative before starting to work on subject project work site.

1001030.1

HEALTH AND SAFETY PLAN
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APPENDIX E

HEALTH AND SAFETY PLAN

Prepared for Field Work
to be Performed at
Farwell Road Landfill
Farwell Road, Town of Ischua, Cattaraugus County, NY

EMERGENCY CONTACTS

In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below (numbers verified November 2001). For emergency situations, contact should first be made with the site coordinator, who will notify emergency personnel, who will then contact the appropriate response teams. This emergency contacts list and map with directions to the local hospital must be posted at the site.

	Phone Number
Contingency Contacts	
Ambulance	911
Fire Department	911
Police	911 or operator
Poison Control Center - Western New York	1 (800) 888-7655
Utility Emergencies (gas)	1 (800) 847-2345
Utility Emergencies (other)	1 (800) 932-0301
Medical Emergency	
Hospital name:	Olean General Hospital
Hospital address:	515 Main Street, Olean, NY 14760
Hospital phone number:	(716) 373-2600

Directions to Hospital (see Figure HSP-1 Route to Olean General Hospital)

1. East on Farwell Road to Route 16
2. Turn right (South) on Route 16, take to City of Olean
3. Turn left at light on Front Street
4. Turn left next light on Main Street
5. Parking Lot/Emergency Entrance located just off Main Street

Stearns & Wheler Contacts

Project Manager, Paul McGarvey	(716) 691-8503

Cattaraugus County Contacts

Commissioner, David Rivet	(716) 938-9121

RISK ANALYSIS

Chemical Hazards

Volatile Organic Carbon (VOCs) are known to be present in groundwater at the Farwell Landfill site. However the work being performed at the site will not require contact with the contaminated waste. The landfill cap will not be penetrated during the work process.

Substance	Primary Exposure Routes	Source
Volatile Organic Carbon (VOCs)	Inhalation of vapors from contaminated water, ingestion and/or dermal contact of contaminated water, dermal contact of contaminated waste.	Industrial Wastes

Physical Hazards

Physical hazards include contact with overhead power lines when excavating, and drowning in the Ischua Creek (life preservers will be posted on the shore which may be thrown into the water to assist a person in trouble). Other physical hazards include heat stress or hypothermia.

Pressure Wash Cleaning of Equipment

Employees shall avoid contact with pressure wash and wear protective equipment (face shield, gloves, Tyvek) while near pressure wash operations.

Heavy Equipment

Employees shall be cognitive of heavy equipment. The following hazard controls shall be followed:

- Minimize number of workers and equipment in same area.
- Respond to backup alarms on equipment.
- Maintain clear vision for drivers.

Personal Protective Requirements

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks:

Location	Job Function	Level Of Protection*
Exclusion Zone	Soil Excavation	C or D C or D

Engineering Controls and Work Practices

Exposure of site workers to chemical and physical hazards will be limited through application of engineering controls. This project consists primarily of excavation activities; therefore, the following engineering controls will be applied where necessary: water spray to control dust; site preparation, such as road construction and removal of obvious physical hazards; warning alarms; and personal protective equipment specified in HSP Table 1.

Action Levels

Due to the VOCs in wastes disposed of in the landfill, there exists a potential for the exposure to the VOCs if contact is made with the contaminated waste below the landfill cap. However the work being performed at the site will not require contact with the contaminated waste. The landfill cap will not be penetrated during the work progress. However, air monitoring for fugitive dust is required during construction activities. Air monitoring must meet the requirements of the NYSDEC TAGM #4031 dated October 27, 1989.

Hearing Protection

Per OSHA regulation 29 CFR 1926.101, hearing protective devices will be provided to personnel working in areas of high decibel noise. Hearing protective devices will be worn during periods of high decibel noise exposure, as per 29 CFR 1926.52, Table D-2, Permissible Noise Exposures, which includes personnel working near large equipment.

The "Buddy" System

The "buddy" system will be employed by site personnel when working under all circumstances. Under the "buddy" system, each site worker is responsible for monitoring the well-being of another worker. No one works alone when the "buddy" system is implemented. At no time will fewer than two employees be present at the site if activities are underway. This is particularly critical near the shoreline.

GENERAL HEALTH AND SAFETY POLICY

HEALTH AND SAFETY PLAN PURPOSE AND POLICY

The purpose of this safety plan is to establish personal protection standards and mandatory safety practices and procedures for the Farwell Landfill site. This plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies which may arise during remediation activities. The anticipated duration of remedial activities is two (2) months.

The requirements and provisions of this plan are mandatory for all phases of the proposed site work, and all Stearns & Wheler personnel shall abide by it. All safety plans used by subcontractors shall meet the requirements of the Stearns & Wheler safety plan as a minimum. This plan must be reviewed and understood by all personnel who participate in the field installation and monitoring activities. All personnel will have received 40 hours of initial training in hazardous waste operations in compliance with 29 CFR 1910.120. The 40-hour training or eight hours of refresher training will have taken place within the 12 months prior to the completion of site activities. Copies of all necessary certifications should be kept on site.

PROJECT OUTLINE

The Farwell Landfill is located on Farwell Road, off of Route 16, in the Town of Ischua, Cattaraugus County, NY. The landfill occupies approximately 16-acres of the northern portion of property owned by the County, located along the western wall of the Ischua Creek valley. Farwell Road passes along the southern side of the site, while the western side is bounded by a narrow strip of trees and fields. The northern and eastern sides are bounded by a bend in Ischua Creek and an active Norfolk and Southern railroad line. At its closest point, the creek is approximately 400 feet from the landfill. Approximately 8.5 tons of hazardous waste consisting of trichloroethene (TCE) sludge and sawdust from industrial sources were disposed of in the landfill, apparently in the Phase I and II areas.

Hazardous Substance Identification

Hazardous substances encountered at this site below the landfill cap are the volatile organic carbons trichloroethene (TCE), 1,1,1 trichloroethane (1,1,1 TCA) and benzene. Other VOCs may have been produced from the chemical and/or biological degradation of TCE and 1,1,1 TCA such as 1,2 dichloroethene (1,2 DCE), 1,1 dichloroethene (1,1 DCE), vinyl chloride, 1,1 dichloroethane (1,1 DCA) and chloroethane. However the work being performed at the site will not require contact with the contaminated waste. The landfill cap will not be penetrated during the work progress.

Scope of Work

Tasks to be performed at the Farwell site include the following:

- Excavation and load-out of settled areas of landfill cap
- Backfill of settled areas of landfill cap
- Restoration of site

Project Team Organization

Table 2 describes the responsibilities of all on-site personnel. The names of principal on-site personnel associated with this project are delineated below:

Project Manager:	Paul McGarvey
Field Team Leader:	To be determined
Site Safety Officer:	To be determined
Office Health and Safety Representative:	To be determined

Individuals have been trained in first aid and hazardous waste safety procedures, and are experienced with the types of field work to be employed at the site (Table 2).

SITE SECURITY PLAN

Purpose

The purpose of a site security plan is: (1) to establish procedures and define responsibilities for controlling access to the Farwell Road Landfill site during remediation activities; and (2) to prevent unauthorized access to the area. Site security will be conducted through appropriate Cattaraugus County personnel.

Site Security Organization Responsible Personnel

The individual primarily responsible for day-to-day site security will be the on-site Project Manager. The Project Manager will be responsible for the enforcement of site security and maintaining physical site security controls. The Project Manager will delegate responsibilities, providing support as needed, to implement and enforce the site security plan. All authorized personnel are responsible for assisting the project manager and implementing and enforcing the site security. All site security will be coordinated through appropriate personnel of Cattaraugus County.

Lines of Communication

The Project Manager will be responsible for ensuring that all individuals present at the site are familiar with all aspects and requirements of the site security plan. All concerns of on-site personnel regarding site security shall be brought to the attention of the Project Manager for resolution.

Authorized Personnel

The Project Manager is responsible for designating authorized personnel relative to site access. In general, authorized access will be limited to those individuals whose presence on the site is required in order to conduct work activities.

Non-Authorized Personnel

Non-authorized personnel seeking access to the site will be directed to the Project Manager for access consideration. Access permission will be granted on a case-by-case basis, taking into account safety and the need for access. All safety considerations, such as access, may be restricted to limited areas within the site. All non-authorized personnel must be accompanied by the Project Manager or designee of the Project Manager.

Enforcement of Site Security

All violations of site security shall be brought to the attention of the Project Manager by authorized personnel. The Project Manager will be responsible for stopping the violation and taking measures to prevent reoccurrence. The Project Manager will document all violations.

PREVENTIVE HEALTH MEASURES

Stearns & Wheler will utilize the services of a licensed occupational health physician with knowledge and/or experience in the hazards associated with the project to provide the medical examinations and surveillance specified herein. During field activities, the Site Safety Officer of each respective company will be responsible for monitoring temperature-related stress and exposure to potentially hazardous substances.

Medical Examination

Personnel involved in this operation will be provided with medical surveillance prior to participation in on-site operations and at 12-month intervals. The initial medical examination will include a complete medical and work history and a standard occupational physical; examination of all major organ systems; complete blood count with differential (CBC); and a SMAC/23 blood chemistry screen which includes calcium, phosphorus, glucose, uric acid, BUN, creatinine, albumin, SGPT, SGOT, LDH, globulin, A/G ratio, alkaline phosphatase, total protein, total bilirubin, triglyceride, cholesterol, and a creatinine/BUN ratio. Additionally, a pulmonary function test will be performed by trained personnel to record Forced Vital Capacity (FVC) and Forced Expiratory Volume in one second (FEV 1.0). An audiogram and visual acuity measurement, including color perception, will be provided. The medical exam will be performed under the direction of a licensed occupational health physician. A medical certification as to fitness or unfitness for employment on this job, or any restrictions on his/her utilization that may be indicated, will be provided by the physician. This evaluation will be repeated as indicated by substandard performance, by evidence of particular stress

that is evident by injury or time loss illness on the part of an worker, or by evidence of symptoms of exposure to hazardous substances, and in the event of termination of employment.

Site-Specific Training

The Site Safety Officer will be responsible for developing a site-specific occupational hazard training program and providing initial training to all Stearns & Wheler personnel that are to work at the site. Responsibilities of project personnel are outlined on Table 2. This training will include the following topics:

- First aid training
- Names of personnel responsible for site safety and health
- Safety, health, and other hazards at the site
- Proper use of personal protective equipment
- Work practices by which the employee can minimize risk from hazards
- Safe use of engineering controls and equipment on the site
- Acute effects of compounds at the site
- Decontamination procedures
- Review of this Health and Safety Plan

All Stearns & Wheler personnel working at the site involved in operations with the potential for employee exposure to safety or health hazards have successfully completed 40 hours of initial instruction off the site, and annual 8-hour refresher training covering the following subjects:

- Hazardous Communication and Identification
- Medical Surveillance
- Personal Protective Equipment
- Confined Spaces
- Emergency Response
- Respiratory Protection
- Comprehensive Health and Safety Programs
- Toxicology
- Site Characterization and Control
- Safety

Site-Specific Safety Rules

The following site-specific rules and regulations will be enforced during the Farwell Road remediation project and will also be posted in the project field office.

- No smoking, drinking, eating, or applying cosmetics within restricted zones.

- Proper respiratory protection is required to be worn at all times within zones where particulate concentration levels have been determined to be above recommended safety limits.

- All rest, refreshment, and sanitary facility use will take place in "clean areas" outside of restricted zones and decontamination zones.

- Those in contact with contaminated soils or other materials that are thought to be contaminated must go through decontamination upon egress from the restricted area (based on the level of contamination) and before they may enter "clean" areas or non-restricted areas.

Protective Equipment

This section describes personal protective level classifications. Table 1 shows minimum equipment requirements necessary for the specified protection levels.

Regardless of level of protection, every field team should be equipped with a first aid kit including, but not limited to, bandages, compresses, tape, scissors, disinfectant and eyewash.

Level A

Level A protection should be worn when the highest available level of both respiratory, skin and eye contact protection is needed. While Level A provides the maximum available protection, it does not protect against all possible airborne or splash hazards. For example, suit materials may be rapidly permeable to certain chemicals in high air concentrations or heavy splashes.

Level B

Level B protection should be selected when the highest level of respiratory protection is needed, but cutaneous or percutaneous exposure to the small unprotected areas of the body (i.e., neck and back of head) is unlikely or where concentrations are known within acceptable exposure standards.

Level C

Level C protection should be selected when the type(s) and concentration(s) of respirable material and/or VOCs is known or reasonably assumed to be not greater than the protection factors associated with air-purifying respirators; and if exposure to the few unprotected areas of the body (i.e., neck and back of head) is unlikely to cause harm. Continuous monitoring of site and/or individuals should be established to ensure this minimum protection level is still acceptable throughout the exposure.

Level C respiratory protection consists of wearing a full-face air purifying respirator with HEPA/Class 100 filterS and/or organic vapor cartridges. Both the respirator and filter/cartridges must be approved by NIOSH and MSHA.

Air purifying respirators cannot be used under the following conditions:

- Oxygen deficiency
- IDLH concentration
- High relative humidity
- Contaminant levels exceed designated maximum use concentrations
- Poor warning properties

Individuals who use air purifying respirators must wear a respirator which has been successfully fitted to their faces. An improperly-fitted respirator provides little respiratory protection.

Level D

Level D is the basic work uniform and should be worn for all site operations and includes eye, face, head, foot and hearing protection. Level D protection should only be selected when sites are positively identified as having no toxic hazards.

All personal protective equipment used during the course of this field investigation must meet the following applicable OSHA standards:

TYPE OF PROTECTION	REGULATION	SOURCE
Eye and face	29 CFR 1910.133	ANSI Z87.1-1989
Respiratory	29 CFR 1910.134	ANSI Z88.2-1969
Head	29 CFR 1910.135	ANSI Z89.1-1986
Foot	29 CFR 1910.136	ANSI Z41-1991
Hearing	29 CFR 1910.95	

ANSI = American National Standards Institute

Heat Stress

The use of protective equipment may create heat stress. Monitoring of personnel wearing impermeable clothing will commence when the ambient temperature is 70°F or above. Table 3 presents the required frequency for such monitoring and establishing work/rest regimes. Monitoring frequency will increase as the ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring will be performed by a person with a current first aid certification who is trained to recognize heat stress symptoms. For monitoring the body's recuperative abilities to excess heat, one or more of the following techniques will be used. Other methods for determining heat stress monitoring, such as the wet bulb globe temperature (WBGT) index from American Conference of Governmental Industrial Hygienist (ACGIH) TLV Booklet can be used.

To monitor the worker, measure:

1. **Heart Rate.** Count the radial pulse during a 30-second period as early as possible in the rest period.

   - If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one third and keep the rest period the same.

   - If the heart rate exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one third.

2. **Oral Temperature.** Use a clinical thermometer (three minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

   - If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one third without changing the rest period.

   - If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one third.

   - Do not permit a worker to wear a semi-permeable or impermeable garment when oral temperature exceeds 100.6°F (38.1°C).

Prevention of Heat Stress

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat-related illness. To avoid heat stress, the following steps should be taken:

1. Adjust work schedules.

   - Modify work/rest schedules according to monitoring requirements.

   - Mandate work slowdowns as needed.

   - Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.

2. Provide shelter (air conditioned, if possible) or shaded areas to protect personnel during rest periods.

3. Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e., eight fluid ounces (0.23 liters) of water must be ingested for

approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:

- Maintain water temperature at 50° to 60°F (10° to 16.6°C).
- Provide small disposable cups that hold about 4 ounces (0.1 liter).
- Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.
- Urge workers to drink a cup or two every 15 to 20 minutes or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight. Urge workers to salt their food appropriately.

4. Train workers to recognize the symptoms of heat-related illnesses.

5. Avoid alcohol consumption.

Cold-Related Illness

If work on this project begins in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally labeled frostbite.

1. **Hypothermia.** Hypothermia is defined as a decrease in the patient core temperature below 96°F. The body temperature is normally maintained by a combination of central (brain and spinal cord) and peripheral (skin and muscle) activity. Interferences with any of these mechanisms can result in hypothermia, even in the absence of what normally is considered a "cold" ambient temperature. Symptoms of hypothermia include shivering, apathy, listlessness, sleepiness and unconsciousness.

2. **Frostbite.** Frostbite is both a general and medical term given to areas of local cold injury. Unlike systemic hypothermia, frostbite rarely occurs unless the ambient temperatures are less than freezing and usually less than 20°F. Symptoms of frostbite are a sudden blanching or whitening of the skin; the skin has a waxy or white appearance and is firm to the touch; tissues are cold, pale and solid.

Prevention of Cold-Related Illnesses

1. Educate worker to recognize the symptoms of frostbite and hypothermia.

2. Identify and limit known risk factors: (a) prohibit phenothiazine use; and (b) identify/warn/limit beta blocker use.

3. Assure the availability of enclosed, heated environment on or adjacent to the site.

4. Assure the availability of dry changes of clothes.

5. Develop capability for temperature recording at the site.

6. Assure the availability of warm drinks.

Monitoring

Start (oral) temperature recording at job site:

1. At the Field Team Leader's discretion when suspicion is based on changes in worker's performance or mental status.

2. At worker's request.

3. As a screening measure, two times per shift, under unusually hazardous conditions (e.g., windchill less than 20°F or windchill less than 30°F with precipitation).

4. As a screening measure whenever any one worker on the site develops hypothermia.

Any person developing moderate hypothermia (a core temperature of 91°F) cannot return to work for 48 hours.

Action Levels

Due to the VOCs in wastes disposed of in the landfill, there exists a potential for the exposure to the VOCs if contact is made with the contaminated waste below the landfill cap. However the work being performed at the site will not require contact with the contaminated waste. The landfill cap will not be penetrated during the work progress. However, air monitoring for fugitive dust emission is required during construction activities. Air monitoring must meet the requirements of the NYSDEC TAGM #4031 dated October 27, 1989.

ACCIDENT PREVENTION

All field personnel will receive health and safety training prior to the initiation of any site activities. On a day-to-day basis, individual personnel should be constantly alert for indicators of potentially-hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency.

Before daily work assignments, regular meetings shall be held. Discussion should include:

1. Tasks to be performed

2. Time constraints (e.g. rest breaks, cartridge changes)

3. Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals

4. Emergency procedures

Each phase (remedial activities) presents unique hazards of which the field team should be vigilant.

CONTINGENCY PLAN

Emergency Equipment

First aid kits will be kept on-site and will consist of a weather-proof container with individually sealed packages for each type of item. Portable fire extinguishers having a rating of 20 ABC, emergency eyewash, and emergency air horns will be conspicuously and centrally located.

Emergency Procedures

In the event that an emergency develops on site, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

1. Any member of the field crew is involved in an accident or experiences any adverse effects of symptoms of exposure while on site.

2. A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

Emergency decontamination of personnel, if required, will involve the following procedures:

- Immediate removal and containment of contaminated protective outerwear
- Use of emergency eyewash or first aid
- Contact hospital and ambulance, if required

General emergency procedures and specific procedures for personal injury and chemical exposures are described below.

Chemical Exposure

If a member of the field crew demonstrates symptoms of chemical exposure, the procedures outlined below should be followed:

1. Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate to the Field Team Leader (via two-way radio or hand signals) of the chemical exposure. The Field Team Leader should contact the appropriate emergency response agency. This Health and Safety Plan will be provided to any emergency response agency as necessary.

2. Precautions should be taken to avoid exposure of other individuals to the chemical.

3. If the chemical is on the individual's clothing, the chemical should be neutralized or removed if it is safe to do so.

4. If the chemical has contacted the skin, the skin should be washed with copious amounts of water.

5. In case of eye contact, an emergency eyewash should be used. Eyes should be washed for at least 15 minutes.

6. All chemical exposure incidents must be reported in writing to the Office Health and Safety Representative. The Site Safety Officer or Field Team Leader is responsible for completing the accident report.

Personal Injury

In case of personal injury at the site, the following procedure should be followed:

1. Another team member (buddy) should signal the Field Team Leader (via two-way radio or hand signals) that an injury has occurred.

2. A field team member trained in first aid can administer treatment of an injured worker.

3. The victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim. A copy of this Health and Safety Plan should accompany the victim.

4. For less severe cases, the individual can be taken to the site dispensary (i.e., engineer's trailer office, plant infirmary, or field worker's vehicle equipped with first aid kit).

5. The Field Team Leader or Site Safety Officer is responsible for making certain that an accident report form is completed. This form is to be submitted to the Office Health and Safety

Representative. Follow-up action should be taken to correct the situation that caused the accident.

Spills or Material Release

Any of the following scenarios involving spills or material releases, whether imminent or having already occurred, will cause implementation of a contingency plan (Appendix C):

1. A spill or material release that could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard.

2. A spill or material release that could cause the release of toxic vapors or fumes into the atmosphere in concentrations higher than the Threshold Limit Values recommended by the American Conference of Governmental and Industrial Hygienists.

3. A spill or material release that can be contained on site, but a potential exists for groundwater or surface water contamination.

4. A spill or material release that cannot be contained on-site, resulting in a potential for off-site contamination and/or groundwater or surface water pollution.

If a hazardous waste spill or material release or process upset resulting in probable vapor release is identified, the Field Team Leader will immediately assess the magnitude and potential seriousness of the spill or release based on:

1. MSDSs for the material spilled or released.

2. Source of the release or spillage of hazardous materials.

3. An estimate of the quantity released and the rate at which it is being released.

4. The direction in which the spill or air release is moving.

5. Personnel who may be or may have been in contact with material, or air release, and possible injury or sickness as a result.

6. Potential for fire and/or explosion resulting from the situation.

7. Estimates of area under influence of release.

If the spill or release is determined to be within the on-site emergency response capabilities, the Field Team Leader will ensure implementation of the necessary remedial action. If the accident is beyond the capabilities of the operating crew, all personnel not involved with emergency response activity will be evacuated from the immediate area. The spill or release area will be roped or otherwise blocked off.

The contractor's Emergency Coordinator will immediately identify the character, exact source, amount, and extent of any release. This information should be reported immediately to the Field Team Leader. Initial identification will be based on visual analysis of the material and location of the release. If the release material cannot be identified, samples will be taken for analysis.

Fire or Explosion

1. Notify paramedics and/or fire department as necessary.

2. Signal the evacuation procedure previously outlined and implement the entire procedure. Evacuation procedure follows.

3. Isolate the area.

4. Stay upwind of any fire.

5. Keep area surrounding the problem source clear after the incident occurs.

6. Complete accident report form and distribute to appropriate personnel.

Evacuation

1. The Field Team Leader will initiate evacuation procedures by signaling (via two-way radio or whistle) to leave the site.

2. All personnel in the work area should evacuate the area and meet in the common designated area (field trailer). The common designated area will be communicated to all employees prior to beginning work on site.

3. All personnel suspected to be in or near the contract work area should be accounted for and the whereabouts of missing persons determined immediately.

4. Further instruction will then be given by the Field Team Leader.

PPE and Emergency Equipment

Personnel will be prohibited from entering the area where a spill or material release has occurred without appropriate PPE and/or emergency equipment. An emergency spill cleanup kit will be provided on site.

DECONTAMINATION PROCEDURES

Contact with contaminated waste at this site is not anticipated.

Chemical Exposure

If a member of the field crew demonstrates symptoms of chemical exposure, the procedures outlined below should be followed:

1. Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate to the Field Team Leader (via two-way radio or hand signals) of the chemical exposure. The Field Team Leader should contact the appropriate emergency response agency. This Health and Safety Plan will be provided to any emergency response agency as necessary.

2. Precautions should be taken to avoid exposure of other individuals to the chemical.

3. If the chemical is on the individual's clothing, the chemical should be neutralized or removed if it is safe to do so.

4. If the chemical has contacted the skin, the skin should be washed with copious amounts of water.

5. In case of eye contact, an emergency eyewash should be used. Eyes should be washed for at least 15 minutes.

6. All chemical exposure incidents must be reported in writing to the Office Health and Safety Representative. The Site Safety Officer or Field Team Leader is responsible for completing the accident report.

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In case of personal injury at the site, the following procedure should be followed:

1. Another team member (buddy) should signal the Field Team Leader (via two-way radio or hand signals) that an injury has occurred.

2. A field team member trained in first aid can administer treatment of an injured worker.

3. The victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim. A copy of this Health and Safety Plan should accompany the victim.

4. For less severe cases, the individual can be taken to the site dispensary (i.e., engineer's trailer office, plant infirmary, or field worker's vehicle equipped with first aid kit).

5. The Field Team Leader or Site Safety Officer is responsible for making certain that an accident report form is completed. This form is to be submitted to the Office Health and Safety

FIGURE HSP-1 ROUTE TO OLEAN GENERAL HOSPITAL

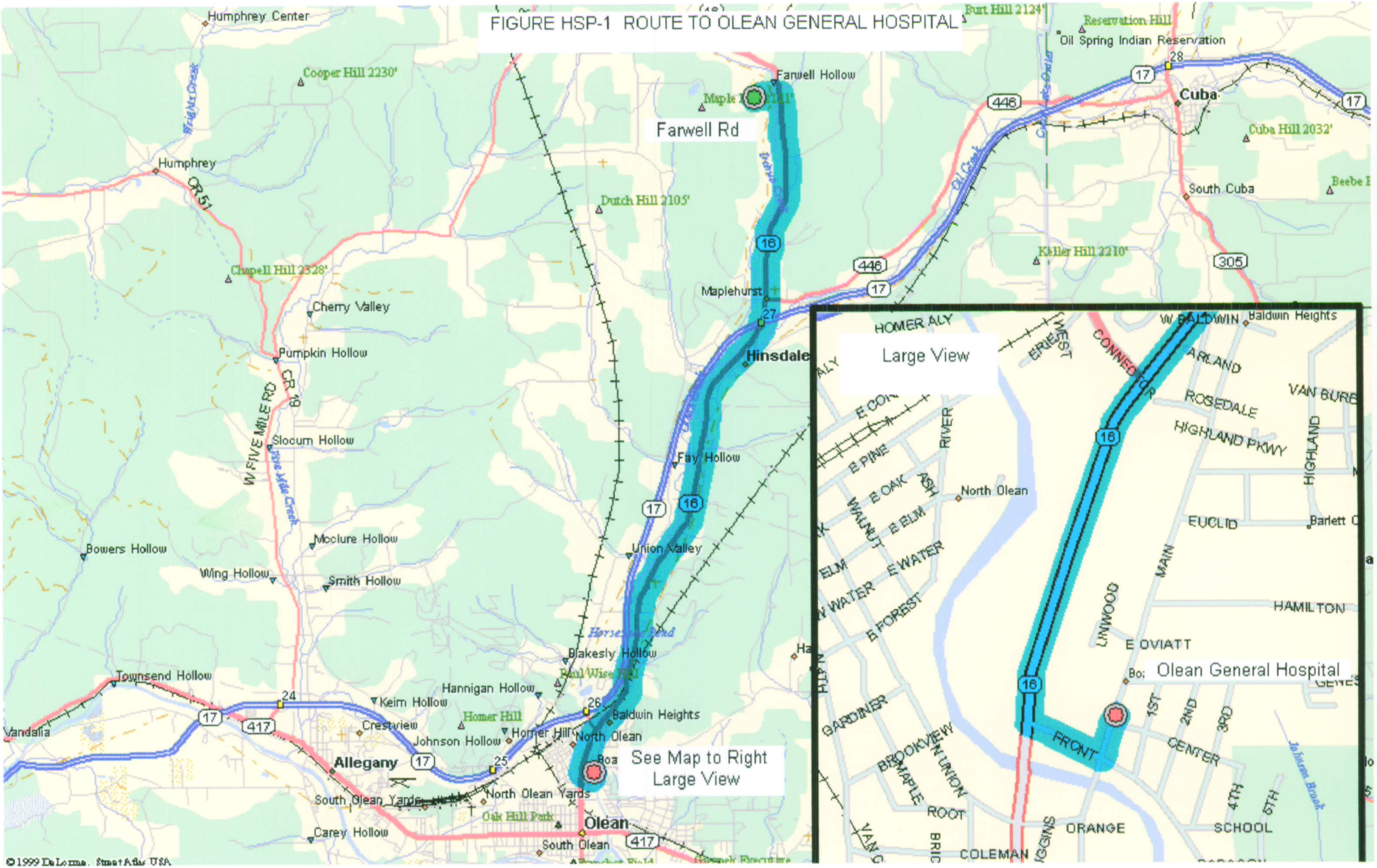

TABLE 1

HAZARD LEVEL VS. EQUIPMENT

	LEVEL OF PROTECTION			
	A	B	C	D
Hard hat	√	√	√	√
Face shield/safety glasses			√	√
Boots (steel toe, steel shank)	√	√	√	√
Inner gloves (latex)	√	√	√	(1)
Outer gloves (nitrile)	√	√	√	(1)
Work coveralls				√
Chemical-resistant coveralls (Tyvek)			√	(1)
Chemical-resistant suit (Tyvek)		√		
Fully encapsulating suit	√			
Air purifying respirator - MSA Full Face (HEPA filter)(2)			√	
SCBA/air-line respirator	√	√		
Two-way radio	√			
Hearing protection	√	√	√	√

(1) Modified Level D gloves shall be worn if worker is to have direct contact with soils (soil sampling, decontamination).

(2) APR cartridge shall be a combination organic vapor, acid gas canister with a high efficiency particulate filter/Class 100.

Table 2
On-Site Personnel

TITLE	GENERAL DESCRIPTION	RESPONSIBILITIES
Project Manager	Reports to upper-level management. Has authority to direct response operations	·Prepares and organizes the background review of the situation, the work plan, the site safety plan, and the field team. ·Obtains permission for site access and coordinates activities with appropriate officials. ·Ensures that the work plan is completed and on schedule. ·Briefs the field teams on their specific assignments. ·Uses the Site Safety and Health Officer to ensure that safety and health requirements are met. ·Prepares the final report and support files on the response activities. ·Serves as the liaison with public officials.
Site Safety Officer		·Periodically inspects protective clothing and equipment. ·Ensures that protective clothing and equipment are properly stored and maintained. ·Controls entry and exit at the access control points. ·Coordinates safety and health program activities with the Office Health and Safety Representative. ·Confirms each team member's suitability for work based on a physician's recommendation. ·Monitors the work parties for signs of stress, such as cold exposure, heat stress and fatigue. ·Implements the Site Safety Plan. ·Verifies compliance with the site safety plan. ·Conducts periodic inspections to determine if the site safety plan is being followed. ·Enforces the "buddy system". ·Knows emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department and police department.
Site Safety Officer		·Trains on-site employees on site-specific health and safety plan.

Table 2
On-Site Personnel

TITLE	GENERAL DESCRIPTION	RESPONSIBILITIES
(continued)		·Notifies, when necessary, local public emergency officials. ·Coordinates emergency medical care. ·Sets up decontamination of all equipment, personnel and samples from the decontaminated areas. ·Controls the decontamination of all equipment, personnel, and samples from the contaminated areas. ·Assures proper disposal of contaminated clothing and materials. ·Ensures that all required equipment is available. ·Advises medical personnel of potential exposures and consequences. ·Notifies emergency response by telephone or radio in the event of an emergency.
Field Team Leader	Responsible for field team operations and safety.	·Manages field operations. ·Executes the work plan and schedule. ·Enforces safety procedures. ·Coordinates with the Site Safety Officer in determining protection level. ·Enforces site control. ·Documents field activities and sample collection. ·Serves as a liaison with public officials.
Work Team	Remediation contractor.	·Safely completes the on-site tasks required to fulfill the work plan. ·Complies with Site Safety Plan. ·Notifies the Site Safety Officer or supervisor of suspected unsafe conditions.

TABLE 3

SUGGESTED FREQUENCY OF PHYSIOLOGICAL MONITORING
AND WORK/REST SCHEDULE
FOR FIT AND ACCLIMATIZED WORKERS[1]

ADJUSTED TEMPERATURE[2]	NORMAL WORK ENSEMBLE[3]	IMPERMEABLE ENSEMBLE[4]
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°-90°F (30.8°- 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5°-87.5°F (28.1°-30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5°-82.5°C (25.3°-28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5°-77.5°C (22.5°C-25.3°C)	After each 150 minutes of work	After each 120 minutes of work

(1) For work levels of 250 kilocalories/hour (light to moderate type of work).

(2) Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows).

(3) A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

(4) Impermeable ensembles include Tyvek® or chemical-resistant coveralls.

APPENDIX F

FIELD SAMPLING PLAN

Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS

Field Sampling Plan
Farwell Road Landfill
Remediation

Cattaraugus County, New York

January 2002

FIELD SAMPLING PLAN

SITE BACKGROUND

Site Location

The Cattaraugus County Department of Public Works is responsible for maintaining the County's closed Farwell Landfill in the Town of Ischua, NY. Monitoring programs have been established to enable the County to implement a long-term post-closure monitoring and maintenance strategy. This monitoring plan is included in the 2001 Farwell Landfill Comprehensive Document was approved on August 8, 2001 by the New York State Department of Environmental Conservation.