SECTION 7.0 – QUALITY ASSURANCE AND QUALITY CONTROL PLAN, SECTION 8.0 – CONTINGENCY PLAN, AND APPENDIX A – WETLAND MITIGATION PLAN FOR THE CLOSURE ACTION OF THE BROOME COUNTY COLESVILLE LANDFILL REMEDIAL DESIGN

Prepared for

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☐ Approved ☒ Approved As Noted ☐ Resubmit With Revisions ☐ Disapproved

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7.0 QUALITY ASSURANCE AND QUALITY CONTROL PLAN

7.0 QUALITY ASSURANCE AND QUALITY CONTROL PLAN

The Quality Assurance and Quality Control (QA/QC) Plan for the Colesville Landfill addresses the requirements for construction of the landfill. The Plan has been prepared to meet the requirements of 6 NYCRR Part 360, Section 2.8, effective December 31, 1988, last revised May 28, 1991.

Quality Assurance and Quality Control have been defined in 6 NYCRR Part 360, as follows:

- Quality assurance means the application of standards and procedures to ensure that a product or facility meets or exceeds desired performance criteria and documentation to verify the results obtained. Quality assurance includes quality control, and refers to actions taken to assure conformity of the construction with the department-approved quality assurance plan, engineering plans, reports, and specifications.
- Quality control means those actions which provide a means to measure and regulate the characteristics of an item or service to contractual and regulatory requirements. Quality control includes those actions taken before construction to ensure that the materials chosen and workmanship comply with the department-approved quality control plan, engineering plans, reports, and specifications.

The purpose of the Quality Assurance/Quality Control Plan is to develop systematic procedures to assure and document that design and permit requirements are properly implemented during construction. The QA/QC Plan presents procedures that will be used during the construction of the following elements:

- Landfill final cover
- Landfill gas venting layer
- Groundwater collection system
- Borrow area
- Final cover stormwater control

- Sediment basin
- Access roads
- Culverts
- Maintenance facilities

The QA/QC Plan presents the management organization, personnel and laboratory requirements, testing protocols, and requirements for documentation and recordkeeping to demonstrate that construction of the landfill will be completed in conformance with 6 NYCRR, Part 360 Section 360-2.13 of the Solid Waste Management Facilities Regulations.

During construction of the Landfill, a number of quality control measures will be employed by the Construction Contractor and any subcontractors to provide self-monitoring of construction activities. These self-monitoring activities are not addressed in this Plan. The QA/QC Plan for construction of the Landfill addresses the procedures that will be employed by the Project Engineer and other parties independent of the Contractor and subcontractors to assure and document that the design and permit requirements are properly implemented. The Quality Control measures for the construction of the above-listed items will be outlined and described in the Technical Specifications for construction, submitted under separate cover.

QA/QC procedures related to environmental monitoring activities are outlined in the Environmental Monitoring Plan, submitted under separate cover.

7.1 MANAGEMENT ORGANIZATION

The Owner will retain a licensed professional engineering firm knowledgeable in landfill design and construction to serve as the Project Engineer for the construction. In accordance with Section 360-1.2(b)(111) of 6 NYCRR Part 360, the Project Engineer shall be licensed to practice engineering in the State of New York and will be responsible for observing, documenting, and certifying that activities related to the quality assurance of the construction of the landfill and related facilities conform to approved construction plans and specifications, and conditions of the permit to construct.

Representatives of the Project Engineer will be responsible for implementing the requirements of the QA/QC Plan. The Project Engineer will also be responsible for supervising the activities of the QA/QC laboratories.

The Quality Assurance and Quality Control management organization to be used for construction at the Landfill is shown in Figure 7-1 and described below.

The party responsible for implementing the QA/QC Plan will be the Project Engineer.

7.1.1 Project Engineer

The Project Engineer will provide qualified personnel to serve in the following capacities:

- The ***Project Principal*** will serve as the official representative of the Project Engineer, and will have overall responsibility for the implementation of the QA/QC Plan.
- The ***Project Manager*** will report directly to the Project Principal, and will be responsible for overall coordination of construction and QA/QC activities with the Owner, the Contractor, any subcontractors, QA/QC Laboratories, and the other representatives of the Project Engineer.
- The ***Construction Coordinator*** will report directly to the Project Manager, and will be responsible for coordination of the activities of the Geotechnical and Geosynthetic Construction Observers, and the QA/QC laboratories.
- The ***Geosynthetic and Geotechnical Construction Observers*** will report to the Construction Coordinator, and will be responsible for observing, testing, and documenting construction activities on a daily basis.

The responsibilities of these personnel are described in further detail in Section 8.2.

7.1.2 Quality Assurance and Quality Control Laboratories

The services of Quality Assurance and Quality Control Laboratories will be secured by the Project Engineer to complete the testing requirements presented in the Technical Specifications. The QA/QC laboratories may be affiliated with the Project Engineer or subcontracted by the Project Engineer. If the services of the Geotechnical QA/QC laboratory are subcontracted, the laboratory must be independent of the Contractor, subcontractors, or material suppliers. If the services of the Geosynthetic QA/QC laboratory are

subcontracted, the laboratory must be independent of the manufacturer, fabricator, or installer of geosynthetics at the site.

The Geotechnical QA/QC laboratory will complete the required geotechnical testing as directed by the Project Engineer.

The Geosynthetic QA/QC laboratory will complete the required geosynthetic testing as directed by the Project Engineer.

7.2 QUALITY ASSURANCE AND QUALITY CONTROL PERSONNEL

The Project Engineer will have responsibility for implementation of the QA/QC Plan for construction at the Landfill. The qualifications and experience requirements and responsibilities of each representative of the Project Engineer, are presented below.

The project personnel will have construction-related responsibilities in addition to the QA/QC responsibilities listed below. Additional responsibilities, and qualifications and experience requirements have not been included for work activities to be performed in addition to the implementation of the QA/QC Plan.

7.2.1 Project Principal

Qualifications and Experience

The Project Principal must be a Professional Engineer registered in New York State. The Project Principal must demonstrate past experience in a position of significant responsibility for landfill construction projects of similar magnitude and complexity to this landfill project and must be knowledgeable of the project requirements and objectives, and must be familiar with the Construction Plans and Technical Specifications.

Responsibilities

The Project Principal will have the following responsibilities in the implementation of the QA/QC Plan:

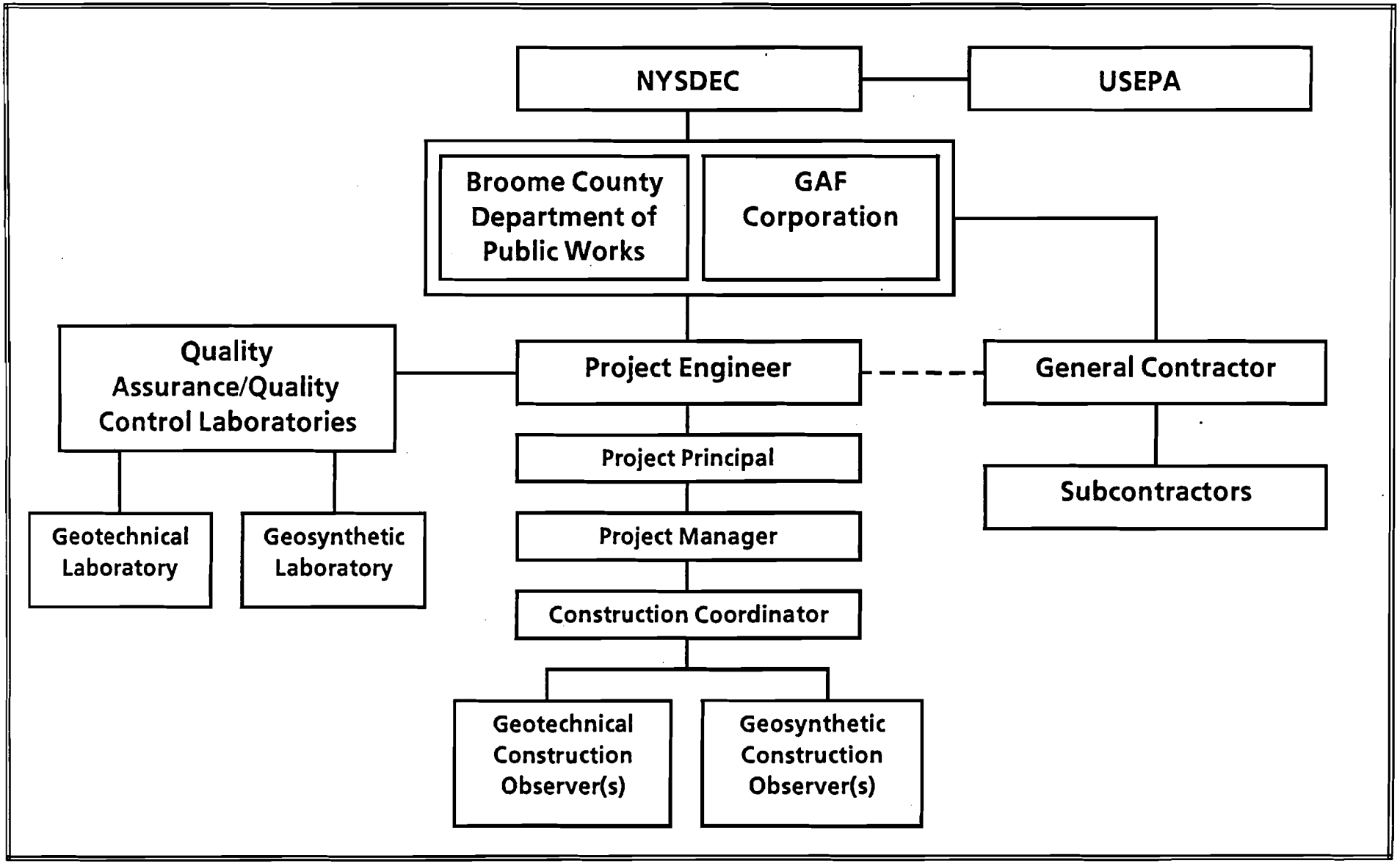
- Serve as the official representative of the Project Engineer.
- Has ultimate responsibility for the implementation of the QA/QC Plan.
- Ensure that appropriate technical review is completed by qualified representatives of the Project Engineer for Construction Plans, Technical

Figure 7-1

COLESVILLE LANDFILL

QUALITY ASSURANCE AND QUALITY CONTROL

MANAGEMENT ORGANIZATION



Specifications, any modifications to the Plans and Specifications and the Construction Certification Report.

- Review and approve all design documentation, including the Construction Plans and Technical Specifications.
- Review and approve modifications to the Construction Plans and Technical Specifications during construction.
- Review and endorse the Construction Certification Report.

7.2.2 Project Manager

Qualifications and Experience

The Project Manager must be a registered Professional Engineer. The Project Manager must have extensive experience with construction projects of similar magnitude and complexity to this Landfill project. The Project Manager must have a thorough familiarity with the project, and be familiar with the Construction Plans and Technical Specifications.

Responsibilities

The Project Manager will have the following responsibilities in the implementation of the QA/QC Plan:

- Serve as the primary contact person for the Project Engineer. Maintain contact with the Owner, Contractor and subcontractors regarding conformance with the requirements of this Plan.
- Provide overall coordination of the activities of the Geotechnical and Geosynthetic Construction Observers and the Construction Coordinator.
- Provide assistance to the Construction Coordinator in the review and interpretation of field and QA/QC laboratory quality control testing results.
- Provide assistance to the Construction Coordinator in the review of shop drawings and other submittals from Contractors and subcontractors.
- Perform periodic site visits to review progress and QA/QC procedures.
- Determine acceptance of installed portion of work to permit further construction

- Ensure that the Construction Coordinator and Construction Observers are notified of any noted deficiencies in quality control testing results or procedures so that corrective actions can be taken.
- Review the Weekly Construction Summary Reports.
- Compile the Construction Certification Report with the Construction Coordinator, and the Geotechnical and Geosynthetic Construction Observers.

7.2.3 Construction Coordinator

Qualifications and Experience

The Construction Coordinator must have a Bachelor of Science Degree in Engineering or an Associates Degree in Engineering Technology. The Construction Coordinator must have previous experience with landfill construction activities of similar magnitude and complexity to this Landfill project. The Construction Coordinator must have a thorough familiarity with the project, and have a thorough familiarity with the Construction Plans and Technical Specifications. The Construction Coordinator must also have a working knowledge of the quality control testing procedures included in the Technical Specifications.

Responsibilities

The Construction Coordinator will have the following responsibilities in the implementation of the QA/QC Plan:

- Serve as the daily contact person for the Project Engineer. Maintain routine contact with the Owner, Contractor, and subcontractors regarding conformance with quality control testing requirements.
- Coordinate the daily activities of the Geotechnical and Geosynthetic Construction Observer.
- Review all shop drawings and other submittals from the Contractors and subcontractors for conformance with the Technical Specifications.
- Review all field and QA/QC laboratory quality control testing results for conformance with the Technical Specifications and provide interpretation of data to determine areas to be reworked or repaired.

- Organize all field quality control testing data to facilitate preparation of weekly Construction Summary Reports, and the Construction Certification Report.
- Review all Daily Construction Reports prepared by the Construction Observers.
- Prepare the Weekly Construction Summary reports.
- Monitor delivery of appropriate samples to the QA/QC laboratory for quality control testing.
- Coordinate with Project Manager and Construction Observers to establish proper sampling procedures including proper sample location, sample size, sample collection protocol, and sample numbering system.
- Receive and organize all quality control testing results from the QA/QC laboratories and check for compliance with specifications. Notify Project Manager and Construction Observers of results and review test results with Project Manager to make determination of areas to be reworked or repaired.
- Perform routine site visits to review progress and QA/QC procedures.
- Notify Construction Observers, Contractors and subcontractors of acceptance of installed portion of work to permit further construction.
- Prepare Construction Certification Report

7.2.4 Geotechnical Construction Observer

Qualifications and Experience

Through a combination of formal education, training and experience, the Geotechnical Construction Observer must have a demonstrated knowledge of landfill construction including earthwork, installation of granular fills, aggregates, low permeability soil liners, and applicable testing methods. The Geotechnical Construction Observer must also have a demonstrated knowledge of installation of manholes, pumping and piping systems.

The Geotechnical Construction Observer must be familiar with and trained in the use of nuclear moisture-density meters.

Responsibilities

The Geotechnical Construction Observer will have the following responsibilities in the implementation of the QA/QC Plan:

- Visually observe construction materials such as soils and piping delivered to the site to determine general conformance with material specifications.
- Observe and record procedures used for site preparation clearing and grubbing.
- Observe and record procedures used for excavation and filling of subgrade to required elevations.
- Observe and record procedures for placement of fill, groundwater collection system drainage soil, barrier protection soil and top soil, including:
  - Compacted lift thickness
  - Method of moisture addition
  - Proofrolling
  - Fine grading
- Perform moisture and density testing, as established in the Technical Specifications.
- Assign locations and collect samples of other soils for quality control testing.
- Provide for delivery of samples to the QA/QC laboratory or the Construction Coordinator.
- Record any on-site activities that could result in damage to any earthwork or site improvements, such as compacted subgrade, and report these activities to the Contractor, Subcontractor and the Construction Coordinator.
- Prepare daily construction report as described in Section 7.5.

7.2.5 Geosynthetic Construction Observer

Qualifications and Experience

Through a combination of formal education and experience, the Geosynthetic Construction Observer must have a demonstrated knowledge of landfill construction including manufacturing, installation, and testing of geosynthetics.

Responsibilities

The Geosynthetic Construction Observer will have the following responsibilities in the implementation of the QA/QC Plan:

- Visually observe construction materials such as geomembranes, geotextiles, geonet, and geocomposite drain delivered to the site to determine general conformance with the material specifications.
- Observe and record condition of subgrade prior to placement of all geomembranes.
- Observe and record procedures for stockpiling, storage and handling.
- Observe and record procedures used for installation of geosynthetics.
- Visually observe all geosynthetics after installation for failure to comply with the Technical Specifications.
- Observe and record procedures used for installation of all liner penetrations.
- Conduct final inspection of membranes prior to drainage layer placement.
- Observe that panel placement is in accordance with the approved panel plan.
- Observe that permanent and temporary anchoring procedures are followed.
- Observe and record procedures used for seaming. Observe and record that the area of seam is clean, supported, and overlap and seam width are in accordance with the Technical Specifications.
- Observe and record that all required field seaming tests are performed. Observe and record that all areas with deficient seams are marked for repair.
- Observe and record procedures used for all repairs.
- Assign locations for collection of all samples for quality control testing.
- Observe and record procedures used to repair areas where samples are taken.
- Provide for delivery of samples to the QA/QC laboratory or the Construction Coordinator.
- Record any on-site activities that could result in damage to the various geosynthetics and report these activities to the Contractor, Subcontractor, and the Construction Coordinator.
- Prepare daily construction report.

7.3 QUALITY ASSURANCE AND QUALITY CONTROL LABORATORIES

7.3.1 Geotechnical Quality Assurance and Quality Control Laboratory

Experience and Qualifications

The Geotechnical QA/QC Laboratory shall have experience in testing granular fills and aggregates, and shall be familiar with ASTM test standards and Army Corps of Engineers test procedures as required in the Technical Specifications. The Geotechnical QA/QC Laboratory shall be capable of providing permeability test results within 48 hours of receipt of sample. The laboratory shall be capable of providing all other test results within four days of receipt of samples.

The Geotechnical QA/QC Laboratory must submit an acceptable QA/QC Plan to the Project Manager to demonstrate that the laboratory has the capability to complete the quality control testing required in the Technical Specifications.

Responsibilities

The Geotechnical Quality Assurance Laboratory is responsible for performing all tests and formally submitting results to the Project Engineer as required in the Technical Specifications.

7.3.2 Geosynthetic Quality Assurance and Quality Control Laboratory

Experience and Qualifications

The Geosynthetic QA/QC Laboratory shall have experience in testing geosynthetics, and must conform with ASTM, NSF, GRI, and other applicable test standards. The Geosynthetic QA/QC Laboratory shall be capable of providing test results within 48 hours of receipt of samples.

The Geotechnical QA/QC Laboratory must submit an acceptable QA/QC Plan to the Project Manager to demonstrate that the laboratory has the capability to complete the quality control testing required in the Technical Specifications.

Responsibilities

The Geosynthetic Quality Assurance Laboratory is responsible for performing all test procedures in accordance with the Technical Specifications and formally submitting results to the Project Engineer.

7.4 QUALITY ASSURANCE AND QUALITY CONTROL TESTING PROTOCOLS

The Quality Assurance and Quality Control Testing Protocols to be used during construction of this Landfill will be presented in the Technical Specifications. The Specifications will address the following elements of construction:

- Earthwork and related soil materials
- Geosynthetics
- Piping and appurtenances
- Mechanical equipment
- Electrical requirements

Where applicable, the Specifications describe the following testing requirements for each of the elements of construction:

- Field testing procedures to be used
- Field testing equipment to be used
- Frequency of field testing
- Sampling procedures to be used
- Sampling equipment to be used
- Frequency of sampling for laboratory testing
- Procedures to be used for laboratory testing
- Acceptable limits for field and laboratory testing

7.5 DOCUMENTATION AND RECORDKEEPING

Records of construction progress and quality control activities will be maintained throughout the construction at the Landfill. The following reports will be prepared by the Project Engineer retained to oversee these activities:

- Daily Construction Report
- Weekly Construction Summary Report
- Construction Certification Report

7.5.1 Daily Construction Report

Daily construction reports will be prepared by the Geotechnical Construction Observers and the Geosynthetic Construction Observers at the conclusion of every day construction activities occur at the site.

The daily construction reports will include the following:

- Date.
- Weather conditions, including daily high and low temperature, wind conditions, and precipitation, if any.
- General description of work activities at the site.
- List of personnel and equipment operating on site, number of hours worked, number of hours on standby, and work activities completed. Include names of key QA/QC and construction personnel.
- Description of work completed for the day, referencing stationing and grid coordinates.
- Identification of areas worked including lift number, panel number, and seam number.
- Drawings, sketches, and maps showing work completed.
- Summary of QA/QC procedures used for the day.
- Results of all quality control testing.
- Drawings, sketches and maps showing all quality control testing areas. Passing and failing areas of the geomembrane panels and seams will be recorded.
- Reworked and repair areas will be recorded with all quality control testing results.
- Identification of all samples collected for quality control testing at the QA/QC laboratories, including sample number, location, and testing to be performed.
- Identify any in-field modifications.
- Documentation of discussions, decisions or recommendations involving the Contractor, Subcontractor, the Owner, NYSDEC, and representatives of the Project Engineer.

The Daily Construction Report will be submitted to the Construction Coordinator for review and inclusion in the project file.

7.5.2 Weekly Construction Summary Report

Weekly construction summary reports will be prepared by the Construction Coordinator at the end of every working week. The weekly reports will summarize construction progress and quality control testing based on the following:

- Daily construction reports for the work.
- Results from the geotechnical and geosynthetic QA/QC laboratories.
- Shop drawings and other submittals from the Contractor and subcontractors.

The weekly construction summary reports will include the following:

- General description of work activities completed at the site for the week.
- Specific description of work completed for the week, referencing stationing and grid coordinates.
- Identification of areas worked for the week, lift thickness, panel number, and seam number.
- Drawings, sketches, and maps showing work completed for the week.
- Summary of QA/QC procedures used for the week.
- Summary of quality control testing results for the week.
- Summary of reworked areas and repairs completed for the week.
- Summary of shop drawings and submittals received from the Contractor and subcontractors during the week, and disposition of same.
- Summary of results received from the geotechnical and geosynthetic QA/QC laboratories during the week.
- Summary of in-field modifications.
- Summary of decisions and recommendations as a result of discussions with the Contractor, subcontractors, the Owner, NYSDEC, and representatives of the Project Engineer.

The Weekly Construction Summary Report will be included in the project file.

7.5.3 Construction Certification Report

Upon completion of construction activities, the Project Engineer will prepare a construction certification report. The report will be prepared under the direction of, and endorsed by, the Project Principal.

The certification report will document construction in accordance with construction plans and specifications, with any exceptions noted. The certification report will include the following:

- Narrative description of the construction completed at the site.
- Description of deviations from construction plans and specifications and reasons for such changes.
- Description of quality control testing procedures.
- Summary of quality control test data.
- Drawings showing quality control test locations.
- Descriptions of procedures used to rework or repair areas with failing quality control test results.
- As appropriate, raw data sheets and worksheets related to quality control testing.
- QA/QC Plans submitted to the Project Engineer by the Geotechnical and Geosynthetic QA/QC laboratories.
- A series of color photographs of major project features.
- Record drawings of the completed construction.
- Certification statement of completion of construction in accordance with the Construction Plans and Technical Specifications.

8.0 CONTINGENCY PLAN

8.0 CONTINGENCY PLAN

8.1 GENERAL

The purpose of this Contingency Plan is to present an organized, planned, coordinated, as well as technically and financially feasible course of action to be taken in responding to contingencies during the closure of the landfill. This plan should be carried out whenever emergency situations develop which endanger human health and safety or the environment.

8.2 PERSONNEL AND USER SAFETY

An emergency response program will be established for the Colesville Landfill to address safety in the event of the occurrence of emergency situations. The program will include:

- Identification of Emergency Coordinators
- Identification of Duties and Responsibilities of the Emergency Coordinator
- Identification of Communication Systems
- Development of Evacuation Plan
- Summary of First Aid Available for Selected Medical Emergencies
- Summary of Available Emergency Services

8.2.1 Emergency Coordinators and Chain-of-Command

Prior to commencement of closure at the landfill, the Owner, Engineer, and Contractor will appoint emergency coordinators to direct an organized response to emergency situations. If an emergency situation occurs at the landfill, field personnel must contact the designated Emergency Coordinators.

At all times during hours of site construction, there will be at least one Emergency Coordinator on site or on call, with the authority to commit the necessary resources of to carry out the provisions of this Contingency Plan.

8.2.2 Duties and Responsibilities of the Emergency Coordinator

Contingency Plan Implementation

The decision to implement the Contingency Plan at the landfill will depend upon whether or not a fire, explosion, or other emergency incident could potentially endanger human health and safety, or the environment. The following information provides the Emergency Coordinator with criteria to assist in making this decision.

The Contingency Plan should be implemented in the following situations:

Fire or Explosion

- The fire spreads and could possibly ignite materials at other locations on site or could cause heat-induced explosions.
- The fire could possibly spread to off-site areas.
- Use of water and/or chemical fire suppressant could result in contaminated runoff.
- An imminent danger exists that an explosion could occur, causing a safety hazard.
- An imminent danger exists that an explosion could ignite other materials at the facility.
- An explosion has occurred.

Material Release or Spill

- The material release spill could result in release of flammable, ignitable, or combustible liquids or vapors, thus causing fire or gas explosion hazard.
- The material release spill can be contained on site, but the potential exists for groundwater contamination.
- The material release spill cannot be contained on site, resulting in off-site soil contamination and/or ground or surface water pollution.

Emergency Response Procedures

Whenever there is any type of incident at the landfill, the Emergency Coordinator must immediately notify field personnel, identify and assess the source and extent of the emergency, and take action to control the situation.

Notification

In the event of an imminent or actual emergency occurrence, the first person on the scene should notify the Emergency Coordinator, who, in turn will initiate a proper response to the situation in question. Notification of the Emergency Coordinator may be performed second only to notification of on-site personnel and/or site evacuation, depending on the emergency situation.

Having been apprised of the situation, the Emergency Coordinator will proceed to notify all facility personnel by initiating the internal communications system, (if not previously initiated), and aid in evacuation, if necessary. Progression of notification will continue to any local, State, and Federal response agencies deemed appropriate by the Emergency Coordinator.

A list of the Designated Emergency Coordinators will be posted in a conspicuous location at the site office. In addition, a list of the Emergency Response Agencies and Contacts is included in Appendix F and will be posted conspicuously at the same location.

Identification

Whenever there is a fire and/or explosion, spill or release, or other incident presenting a potential threat to the human health and safety or the environment, the Emergency Coordinator must immediately identify the source and extent of the emergency.

Assessment

In case of an emergency situation, an assessment of the possible hazard must be made. If the Emergency Coordinator determines that the facility has had a fire and/or explosion, spill or release, or other incident that presents a possible hazard to public health and safety, and/or the environment, and initiates the Contingency Plan, contact with local authorities must be made informing them of situations when an evacuation of the surrounding area is necessary. The New York State Department of Environmental Conservation (NYSDEC) should also be advised of all the pertinent facts regarding the incident.

When making a report to the NYSDEC, the following information must be provided:

- Name and telephone number of person making the report
- Name of the facility
- Type and time of incident occurrence
- Name and quantity of material(s) involved, to the extent known

- Extent of any injuries
- Possible hazards to public health and safety, and/or the environment surrounding the facility

Control Procedures

The nature of work carried out during landfill closure makes the occurrence of emergency situations a possibility, no matter how infrequently they may actually happen. Emergencies can happen quickly and unexpectedly, requiring immediate response.

In the event of any emergency situation, the Emergency Coordinator must take all reasonable measures to prevent the occurrence, recurrence, or spread of a fire or explosion or unplanned releases to other portions of the facility.

A broad-based emergency response network will be established to respond to any incidents at the facility. If an emergency occurs, fully trained response personnel should be contacted as soon as possible.

Requests for assistance should always include:

- Name, address, and telephone number of the facility
- Type and time of incident occurrence
- Extent of any injuries
- Possible hazard to public health and safety, and/or the environment surrounding the facility
- Type and quantities of materials involved, if known

Immediate action by on-site personnel should concentrate on preventing any fire/explosion, or spill/leak situation that occurs from spreading to other areas of the facility, and immediate emergency medical attention should be given to injured personnel, if possible. Any possible sources of ignition should be removed from the incident area, if this can be done without risk, and vehicular traffic should be suspended and work ceased until the fire or incident can be safely contained or controlled.

Storage and Disposal of Released Materials

Immediately after an emergency situation, the Emergency Coordinator must make arrangements for the storage, or disposal of any recovered wastes, water, or any contaminated materials resulting from the incident.

Post-Emergency Equipment Maintenance

Following an emergency incident, all emergency response equipment used must be cleaned and made fit for reuse, or replaced as necessary, so that the equipment will be available when construction operations resume. An inspection of all equipment must take place before operations resume to ensure that each item is in proper working condition. Remedial activities as a result of this inspection may include recharging of fire extinguishers, restocking first aid kits, replacement of personal protective gear, and restocking of disposable items.

8.2.3 Internal Communication/Warning System

An internal communication system consisting of telephones and two-way radios will be available at the landfill for notifying field personnel in the event of an emergency episode. Units are located in readily accessible areas at the site office, in vehicles, and in the equipment. In addition, units may be carried by field personnel. This system provides facility personnel with immediate emergency notification and necessary instructions in the event of an incident.

8.2.4 External Communication/Warning System

A network of emergency response agencies are available and field personnel that can be contacted in the event of an incident at the landfill. Designated Emergency Coordinators and Emergency Response Agencies and Contacts will be notified by telephone for assistance in an emergency.

Lists including these names and telephone numbers will be displayed prominently at site office for easy employee accessibility in the event of an emergency.

8.2.5 Evacuation Plan for Facility Personnel

In an emergency situation, and when time permits, the Emergency Coordinator will be the individual responsible for determining when evacuation of the facility is required. Imminent or actual dangers that constitute a situation requiring evacuation include:

- A generalized fire or threat of generalized fire that cannot be avoided.
- An explosion or the threat of explosion that cannot be averted.
- A major spill or leak that cannot be contained and constitutes a threat to human health.

When time permits and evacuation is required, the following procedures should be followed:

- Alert all field personnel and support personnel using the telephone and/or two-way radio system.
- Alert and request assistance from local emergency response agencies.
- Shut down all facility equipment.
- All field personnel should proceed to a designated meeting point. Once assembled at this designated meeting point, a determination and identification of any missing persons should be made. In the event that any personnel cannot be accounted for, assembled personnel should not reenter the facility. Instead, all personnel should await the arrival of local emergency response agencies and standby to afford assistance, if and as needed.

8.2.6 Emergency Equipment

Various emergency equipment is available at the landfill facility as described below.

Firefighting Equipment

The landfill facility will maintain several types of equipment on site that may be used in firefighting efforts. Earth-moving equipment that is utilized on a regular basis for landfill closure may be used to move and apply material for fire control. A tank truck will be available for use in controlling fires.

The facility will also maintain a supply of fire extinguishers that may be used in the event of an emergency incident. These extinguishers will be located at strategic points at the site. Fire extinguishers will also be located on the construction equipment for use in cases of field emergencies. Extinguishers will be maintained in conformance with State and local fire codes and regulations.

First Aid/Safety Equipment

First aid and safety equipment will also be located in strategic locations on the site, and some items may be kept in construction equipment. First aid kits will be located in the landfill site office and will contain a full range of items necessary to care for minor injuries needing prompt attention. First aid kits will be easily and immediately accessible to personnel.

8.2.7 Medical Emergencies/First Aid

In cases of medical emergency, trained medical response personnel should be contacted immediately. First aid administered by on-site facility personnel should continue until professional assistance arrives.

First aid is the immediate care of a person who has been injured or has suddenly taken ill. It is intended to prevent death or further illness and injury, and to relieve pain until additional, professional medical aid can be obtained. The objectives of first-aid are:

- To control conditions that might endanger life.
- To prevent further injury.
- To relieve pain, prevent contamination, and treat for shock.
- To make the patient as comfortable as possible.

The initial responsibility for first-aid rests with the first person at the scene who must react quickly, but in a calm and reassuring manner. The person assuming responsibility should immediately summon medical assistance, being as explicit as possible in reporting suspected types of injury or illness. The injured person should not be moved, except where necessary, to prevent further injury.

8.2.8 Available Emergency Services

In the event of an emergency at the landfill, the agencies listed in Appendix F – Emergency Contact Listing, are available.

8.3 POTENTIAL REMEDIAL ACTIONS DURING CLOSURE OPERATIONS

Conditions may be encountered at the site during normal landfilling activities that will require response actions that are not included as part of typical daily site operations.

8.3.1 Fires

The possibility of a fire, whether in the landfilled waste or within a piece of equipment, is a potential hazard associated with the closure operation of the landfill.

The earth-moving equipment to be used in the closure activity will be capable of moving and applying the amount of material needed.

Water can be used to supplement the use of cover soil or serve as an alternative means of controlling fires. The Contractor will have a water truck available for use during emergency situations. Water can be obtained from the sediment basin or on-site water

supply. For larger or more serious outbreaks, the local fire department would be contacted. Additionally, portable fire extinguishers will be kept in all vehicles and buildings as a precautionary measure.

The contingency programs described below should be followed when encountering a ground fire and below cover fire:

- The application of cover soil by landfill earth-moving equipment, or the application of water by the on-site water tank truck to extinguish the blaze, can be carried out.
- Any vehicles and any equipment in the fire zone should be sprayed with water, while working to quench the fire.
- Precaution should be taken throughout the entire firefighting operation.
- If, at any time, additional assistance is required, local firefighting units should be contacted as soon as possible.

8.3.2 Landfill Gas

Decomposition of organic waste is generally accompanied by the production of landfill gas. Landfill gas produced at municipal solid waste disposal sites is generally composed of approximately 50 percent methane and 50 percent carbon dioxide and when mixed with oxygen at the proper proportion and exposed to an ignition source can present a fire and/or explosion hazard. Recognizing the potential explosive hazard, a plan will be developed to identify the source, extent of impact, and outline remedial actions to protect landfill personnel and the environment. In the event of combustible gas detection in any enclosed structures, the structure will be immediately evacuated, the emergency coordinator notified, and a plan developed to identify the source of the combustible gas, and outline remedial actions.

8.3.3 Dust Control

During dry periods, fugitive dust may be a nuisance resulting from the landfill closure operation. The access roads and working areas of the site are generally removed from residential areas. Under these conditions, dust problems are typically localized and can generally be managed with on-site equipment. The following measures may be employed wherever a potential problem exists:

- Applying water on haul roads.
- Wetting equipment and excavation faces.
- Spraying water on buckets during excavation and dumping.
- Hauling materials in properly tarped or watertight containers.
- Restricting vehicle speeds to 10 mph.
- Covering excavated areas and material after excavation activity ceases.
- Reducing the excavation size and/or number of excavations.

8.3.4 Litter Control

The tasks of excavation for the gas collection trenches or cover regrading may expose the waste to wind and potentially produce litter. Every practicable measure will be taken to contain litter as close to the working area as possible. Activities which have the potential to expose waste will be restricted to as small an area as possible. The Contractor's employees will manually pick up litter as required. If activities begin to distrub waste, the work will be evaluated and modified, if possible, to avoid further waste disturbance.

8.3.5 Odor Control

Odors from closed landfills generally result from the generation of landfill gas and upon exposure of waste. Due to the limited quantity and age of the waste, the amount of landfill gas expected to be generated is minimal. If odors become an off-site problem, the source must be determined and proper mitigative actions taken. The following contingency steps can be taken:

- Application of additional cover soils
- Use of odor masking agents
- Modification of landfill gas control system

Waste disturbance is anticipated only during gas vent installation. Therefore, any odor associated with this activity will be of limited and controlled time duration.

8.3.6 Noise Control

The major source of noise in the area of the landfill during closure will be the construction equipment. Since the construction will occur during daylight hours and will be generally removed from local residences, the noise generated from landfill operations are

not expected to be an off-site problem. All landfill equipment working at the site will have muffler systems to further diminish any potential nuisance from noise.

If noise conditions present a problem, mufflers on all landfill vehicles should be inspected and replaced if inadequate. If unsatisfactory conditions persist and noise levels are detected in violation of the effective solid waste management or local regulations, operational procedures will be modified or appropriate noise barriers should be constructed.

8.3.7 Vector Control

As in the case of litter control, the amount of waste exposed during any time will be kept to the smallest area practical. Prompt covering of the waste should eliminate problems with insect, bird, and animal pests. Vectors are greatly discouraged when waste materials are not easily available.

If vector control presents a problem at the site, waste exposure will be more closely controlled and monitored. However, if a problem persists with vectors such as insects or rodents, an extermination program can be initiated. This program would be in strict accordance with requirements of the New York State Departments of Health and Environmental Conservation.

APPENDICES

APPENDIX A
WETLAND MITIGATION PLAN

COLESVILLE LANDFILL WETLAND MITIGATION

COMPENSATION WETLANDS PLAN

Prepared For

BROOME COUNTY

DIVISION OF SOLID WASTE MANAGEMENT

Broome County, New York

and

GAF CORPORATION

Wayne, New Jersey

March 1994

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Middletown, New York

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Newark, Delaware

Environmental Engineers • Scientists • Constructors

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Appendix A – Data Sheets and Photographs
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Appendix C – Water Budget for Colesville, New York

1.0 INTRODUCTION

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to provide a conceptual plan for the creation of compensation wetlands as part of permit requirements for remedial actions at the Colesville Landfill, Broome County, New York.

These plans have been based on wetlands information provided in Remedial Design – Conceptual Design Report (June 1992), Pre-Final Engineering Design Report – Remedial Design of Final Cover and Groundwater Collection Systems (February 1993), correspondence documents with USEPA, and a brief site reconnaissance (November 1993).

It is the goal of Broome County and GAF Corporation to maintain the integrity of the compensation site and the environmental benefits provided by this site. Therefore, the County will not allow farming, silviculture or ranching activities to occur on the compensation site. However, the compensation site may be used in the future for educational purposes and non-intrusive features. Roads and structures will not be constructed in the compensation sites, unless a permit under Section 404 of the Clean Water Act is first obtained.

2.0 EXISTING CONDITIONS

2.0 EXISTING CONDITIONS

2.1 SITE CONDITIONS

The Colesville Landfill site is located 1,400 feet from the eastern bank of the Susquehanna River, 18 miles east of Binghamton, in eastern Broome County (Figure 1). Elevations on the landfill vary from 1,150 to 960 feet above sea level, while the river elevation is 930 feet above sea level. Two streams, on the east and west sides of the landfill, drain directly into the river. Soils in the landfill area are predominantly Braceville, Chenango and Howard, and Mardin channery series (Figure 2). Unadilla and Wayland series are the dominant soils of the floodplain along the river.

Vegetation on the landfill is a mixture of herbaceous weed and grass species. Some areas are sparsely vegetated with barren soil and rock fragments visible. Species included asters (Aster spp.), goldenrods (Solidago spp.), sweet fern (Comptonia peregrina), ragweed (Abrosia artemisiifolia), foxtail (Alopecurus spp.), broomsedge (Andropogon virginicus), and various grasses.

Upland forest occurs along the eastern and southern sides of the site. Species encountered in the forested areas include oaks (Quercus spp.), shagbark hickory (Carya ovata), beech (Fagus grandifolia), sugar maple (Acer saccharum), white pine (Pinus strobus), and black cherry (Prunus serotina). Areas along streams and seeps (i.e., wetlands) were dominated by hemlock (Tsuga canadensis), red maple (Acer rubrum), and hornbeam (Carpinus caroliniana). Agricultural fields are located along the northern landfill boundary (hayfield) and approximately 200 feet southeast of the landfill (plowed field adjacent to East Windsor Road).

2.2 SITE WETLANDS

Landfill and Vicinity Wetlands

The following description of site wetlands is from the Remedial Design – Conceptual Design Report (June 1992).

The March 1991 Record of Decision for the site required that a wetlands survey, based on the "three-parameter method", be conducted during the remedial design phase. Wehran conducted a wetland delineation to identify and map wetland areas occurring on

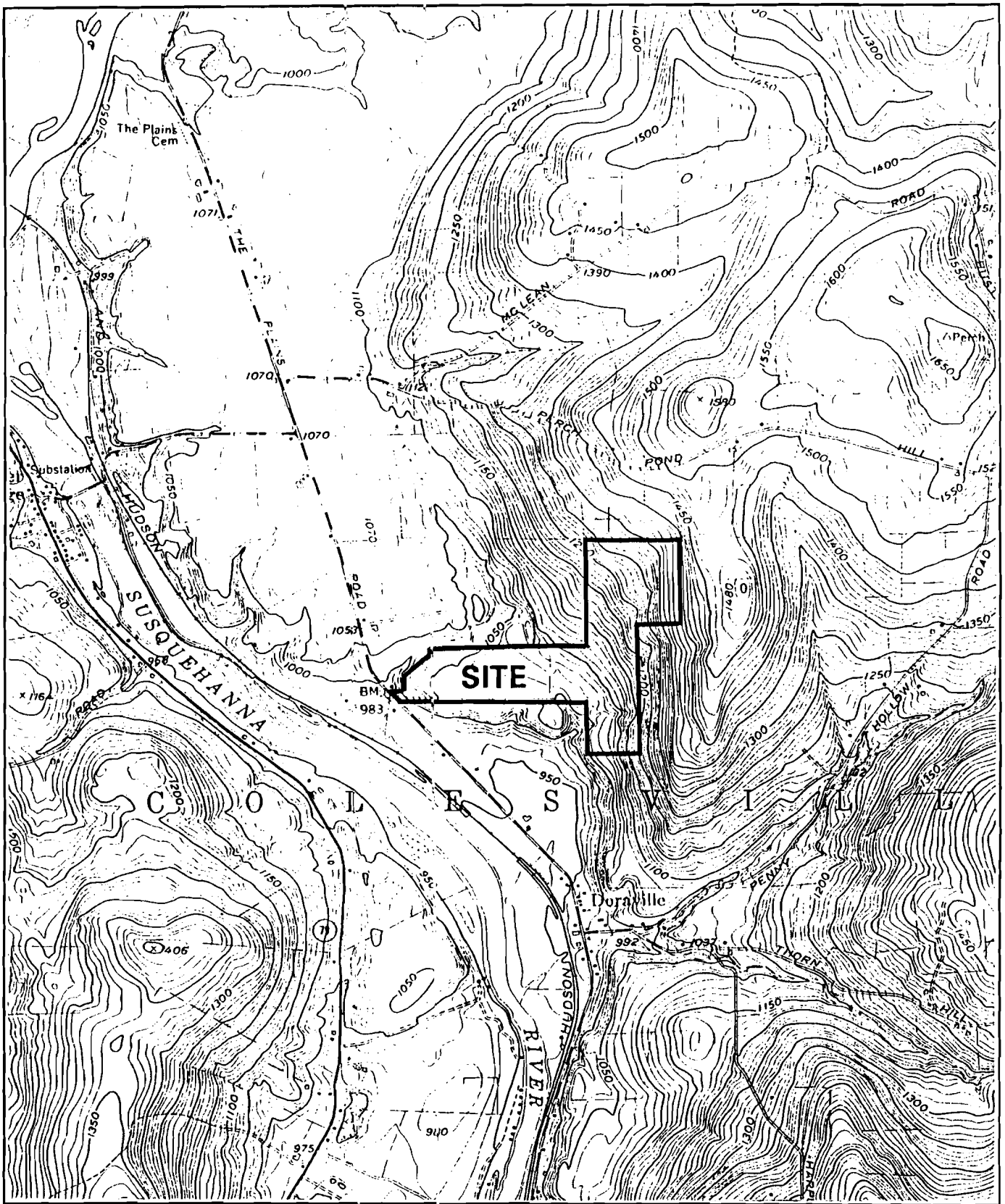

Figure 1. Site Location Map
Afton, NY, USGS
Scale: 1" = 2000'

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the site, and in the immediate vicinity of the site, which could potentially receive impact by remedial construction activities.

On April 6 and 7, 1992 and December 14, 1993, biologists from Wehran flagged the wetland boundaries in the field using the three-parameter approach described in the Wetland Delineation Manual (Corps of Engineers, January 1987). Surveying of the wetland boundaries was performed by Wehran on April 9 and 10, 1992, and in December 1993.

Review of NYSDEC00 Freshwater Wetland Maps for the Colesville area indicate that there are no State-regulated wetlands on or near the site (see Figure 3). A review of National Wetland Inventory Maps indicates that three wetlands occur within the study area (Figure 4). These include two palustrine, unconsolidated bottom excavations (PUBH; i.e., ponds), and one palustrine forested wetland (PFO1).

Wetland Descriptions

Several wetlands were flagged within the study area (see Sheet 1 of 1). These wetlands range in size from 0.04 to 0.84 acres. Wetland A is a small depression. Wetlands B and H are associated with the streams previously described. Others originate as groundwater or leachate seeps (Wetlands C, D, E, F, G). All of the wetlands along the southern side of the study area are part of a larger wetland located further south. Only the upper portions of these areas, which originate as seeps and which may be impacted by remedial activities, were flagged as part of this study.

Several small wetland microhabitats were also noted on the landfilled section of the site. These microhabitats are all isolated depressions less than 0.1 acre in size and were not included in the mapping presented on Sheet 1 of 1. Although hydrophytic vegetation was present in these areas, standing water and saturated soil conditions are believed to be present only after storm events.

Following is a description of each wetland area flagged as part of this study. Data sheets and photographs of each wetland are included in Appendix B.

Wetland A

This wetland is located on adjacent property near the north central landfill border. The wetland is a small depressional area which receives drainage from the east, south, and west. A small outlet is located to the north. The wetland consists of an open water area,

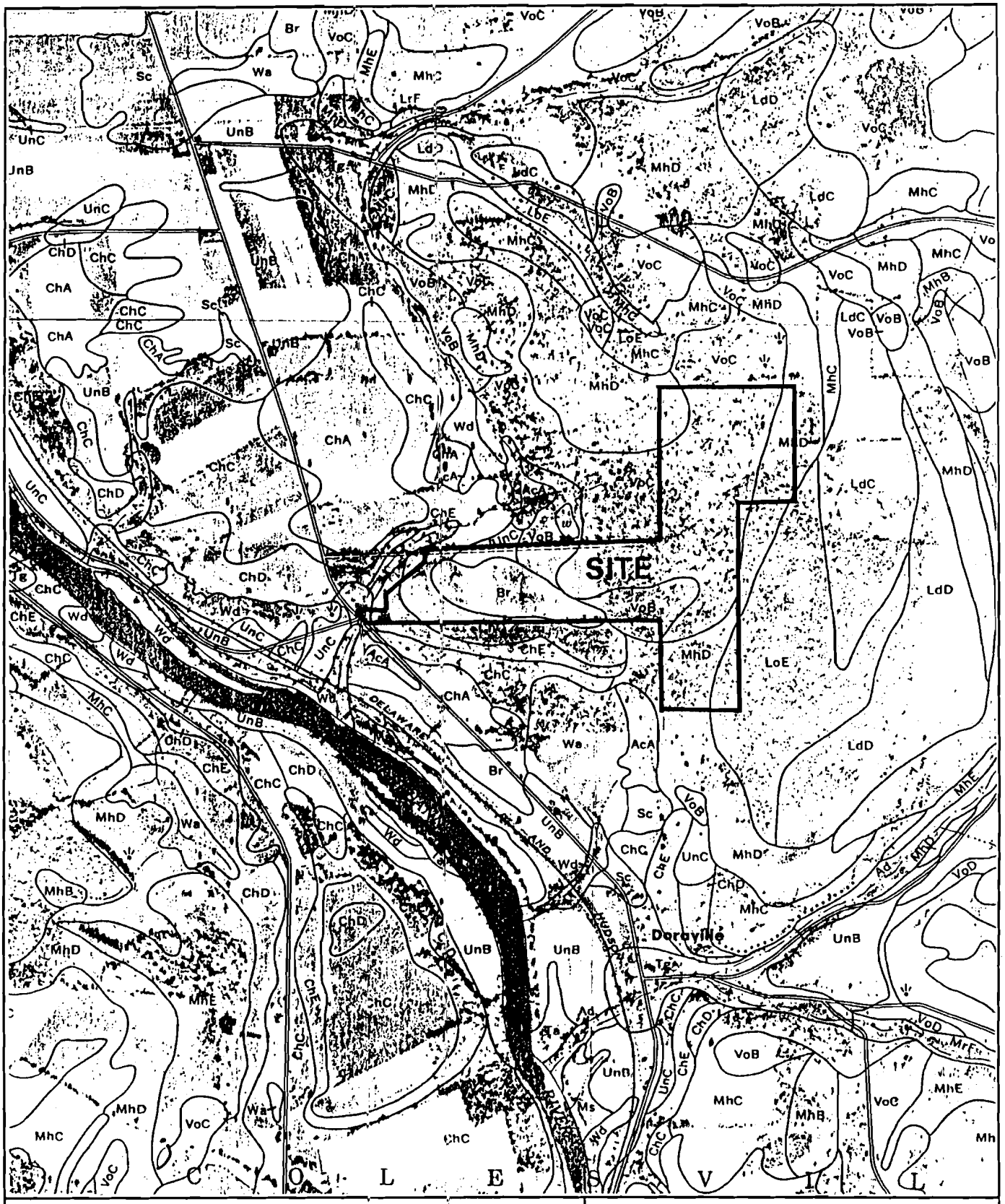

Figure 2. Site Soils Map
Soil Survey of Broome County, New York
USDA, SCS, 1971, pp.46,36 Scale: 1" = 1320'

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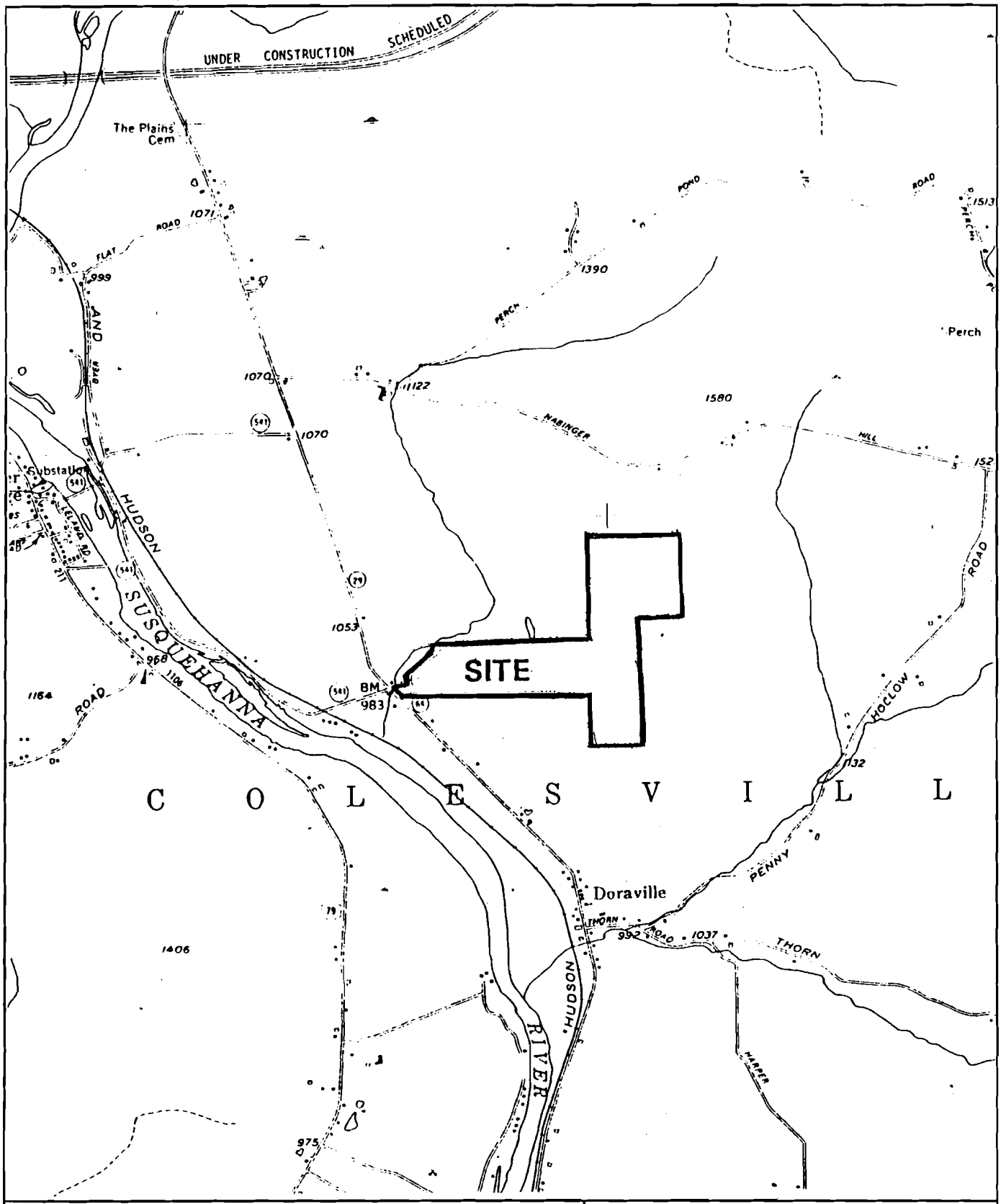

Figure 3. NYSDEC Freshwater Wetlands Map

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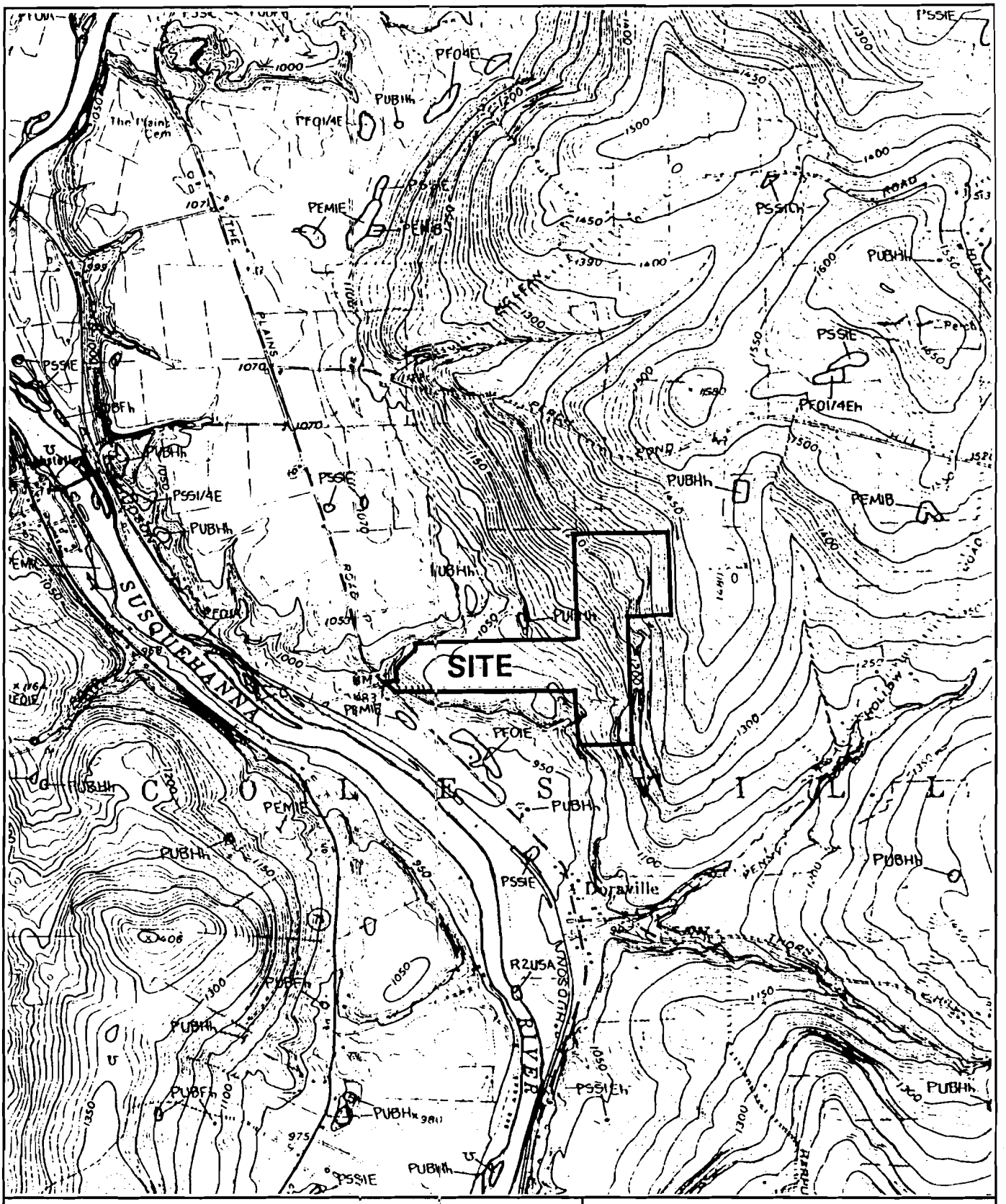

Figure 4. National Wetlands Inventory Map
Afton, NY, USFWS
Scale: 1" = 2000'

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1 to 2 feet deep; surrounded by a concentric ring of emergent vegetation 5 to 20 feet wide. Some hydrophytic shrubs and trees are located adjacent to the emergent zone. These shrub species include witch-hazel (Hamamelis virginiana, FAC-), speckled alder (Alnus rugosa, FACW+), hornbeam (FAC), buttonbush (Cephalanthus occidentalis, OBL) and red maple (FAC). Herbaceous species noted in the emergent zone consist of wool grass (Scirpus cyperinus, FACW+), soft rush (Juncus effusus, FACW+), tearthumb (Polygonum sagittatum, OBL), and sensitive fern (Onoclea sensibilis, FACW).

Soils in the vicinity of Wetland A are mapped by the Soil Conservation Service (SCS) as Volusia channery silt loams. These soils consist of deep, poorly drained, loamy soils formed in dense till. Soil samples retrieved within the wetland boundary from depths up to 12 inches were both mottled and gleyed. Mottle colors were generally found to range from orange to red (2.5 YR 4/8 to 2.5 YR 5/8). Gley colors were typically 5GY 7/1. Soils within the wetland boundary were inundated or saturated to the surface. This wetland is 0.76 acres in size.

Wetland B

This wetland is a small (0.2169 acres) linear wetland associated with a ditched tributary on the east side of the landfill. The wetland ranges from approximately 2 to 10 feet wide in certain areas. Characteristic plants include willow, rush, and sedge along the stream channel. Flowing water (2 to 3 inches deep) was present in the drainage channel.

Wetlands C, D, E, F, and G

Wetlands C through G originate as groundwater seeps on the south facing slope, approximately 400 to 500 feet south (below) of the landfill. Several of these wetlands have visible leachate discharges in the upper sections of the wetlands. All of these areas start out as small linear rivulets or seeps, and drain south into a larger wetland complex. The areas flagged represent fingers of the same wetland which extend up the hillside. All wetland flagging was terminated at an access road which runs along the base of the hill. No physical wetland impacts are expected below this road; subsequently, these areas will not be disturbed.

Dominant overstory vegetation within the wetland areas includes red maple and hemlock, with occasional green ash and yellow birch (Betula alleghaniensis, FAC). Understory tree and shrub species include spicebush (Lindera benzoin, FACW-), hornbeam, and which-hazel, with occasional red-oiser dogwood (Cornus stolonifera, FACW+), winterbery (Ilex opaca, FACW+), and green ash (Fraxinus pennsylvanica, FACW). Herbaceous plants within the wetland areas were skunk cabbage (Symplocarpus foetidus, OBL), Christmas fern (Polystrichum acrostichoides, FACU-), unknown sedge, violets, and goldthread (Coptis groenlandica, FACW).

Surface water in these wetlands varied from small channels of flowing water to small depressions containing 1 to 3 inches of water. In all cases, the ground surface was saturated.

Soils on the south facing slope below the landfill are classified by the SCS as Chenango and Howard gravelly loams. Chenango soils consist of deep, medium textured soils formed in glacial outwash. Howard soils are similar but typically have more clay in the subsoil. Soil samples collected throughout the wetlands on the south facing slope ranged from sandy silts to sandy clays. Black muck was common on the surface, and all samples were mottled (2.5 YR 4/8 to 2.5 YR 6/8) at depths between 3 to 8 inches.

The acreage of each of these wetlands is presented on Sheet 1 of 1. All of these areas are considered palustrine forested wetlands.

Upland areas adjacent to these wetlands contain overstory tree species of red maple (FAC), red oak (Quercus rubra, FACU-), white ash (Fraxinus americana, FACU), and shagbark hickory (FACU-). Understory species include hornbeam, beech (FACU), and white pine (FACU). Ground layer plants were running pine (Lycopodium clavatum, FAC), teaberry (Gaultheria procumbens, FACU), and partridge-berry (Mitchella repens, FACU). Soils in the upland areas consist of a 1 to 3-inch organic layer over silt or clay loams. Mottling and gleying were absent in the top 12 inches of soil.

Wetland H

Wetland H is associated with the stream located to the north of the landfill. Conditions and appearance of the wetland vary considerably as the stream flows to the west. The stream originates in a wooded area west of Wetland A, and as it flows through the agricultural fields, scrub/shrub habitat prevails. The upper sections of Wetland H were

not flagged because no impacts are anticipated in this area. As the stream proceeds west, steep hemlock covered banks are encountered. The wetland area in this section is limited to the rock covered stream bottom. Further along the stream, deciduous trees become dominant in more of a floodplain type environment.

Soil samples were only obtained in the upper sections of Wetland H due to the prevalence of rock in the stream bed. Also, the wetland was typically defined as the stream channel in the lower reaches.

Borrow Area Wetlands Y, Z, and BWA

The wetlands occurring in the borrow area are predominantly streamside corridor wetlands. They are generally linear and narrow, sometimes only 3 to 4 feet wide. Near the streams, dominant woody vegetation consists of red maple (Acer rubrum, FAC), hornbeam (Carpinus caroliniana, FAC), yellow birch (Betula alleghaniensis, FAC), and witch hazel (Hamamelis virginiana, FAC-). Areas of more moderate elevation change where the stream corridor and wetland widened included hawthorn (Crataegus spp.), red-osier dogwood (Cornus stolonifera, FACW+), and elderberry (Sambucus canadensis, FACW).

While no formal evaluation of wetland functions and values has been conducted, the value of much of the delineated wetlands is restricted to stormwater conveyance and microhabitat for amphibians.

Other wetland functions typically identified as occurring in wetlands are of unknown, or at least minimal, value for the wetlands in the borrow area. Characteristics of the subject wetlands which contribute to the lesser importance of their functions include the following:

- Small aerial extent of wetland acreage. (The larger the wetland, the greater the potential to store stormwater and reduce flooding.)
- Linear shape, with some cross-sections 3 to 4 feet. (Wide wetlands allow greater dissipation of storm flow and increased frictional resistance of vegetation to filter sediments.)
- Position in the landscape. (Wetlands high in the watershed have limited opportunity for many of the documented wetland functions.)
- No receptors of function. (No downstream development.)

3.0 WETLANDS IMPACTS

3.0 WETLANDS IMPACTS

3.1 IMPACTS

Remedial construction activities at the Colesville Landfill which will potentially affect on-site and nearby wetlands will include: capping of the waste areas, groundwater withdrawal and treatment, disturbance of borrow areas, discharge of treated effluent, and discharge of non-contact stormwater from the capped areas.

Precise conclusions concerning the impacts of drawdown are difficult given the complexity of wetland/groundwater interactions. However, impacts to wetland environments around the landfill will be offset by the enhanced protection of water resources and by remediation of the site.

Wetlands found on the landfill and in the surrounding area are identified on the Wetland Delineation Map (see Sheet 1 of 1). Presented below is a description of potential impacts to each wetland.

Wetland H (North Stream)

Wetland H consists of small fringe wetlands located along the North Stream. This stream and associated wetlands are currently fed by surface water flowing from higher topographic areas and from discharging groundwater. Current remedial design plans call for the placement of several pumping wells and an impermeable cap along the western end of the landfill, which will reduce the amount of discharging groundwater to the stream. The result of this loss to the stream hydrology may decrease the flow rates in the lower section of the stream. Drawdown in that same area also raises the potential for the water way to become a losing stream (i.e., contributing to groundwater).

Leachate Seeps 1 and 3, located adjacent to the North Stream, will be intercepted by a collection system. The collection system, consisting of geosynthetic clay, composite, subangular stone, slotted polyethylene pipe, and a pump station will be located in those positions currently occupied by the seeps. Construction of the seep collection system is expected to physically impact the stream bank. However, backfilling of the collection system excavation upon completion will mean that the physical disturbance will be temporary. Further, Leachate Seeps 1 and 3 should dry up over a period of time resulting in an overall improvement in water quality for the North Stream.

The stream's losing water balance may be compensated by the addition of treated effluent and non-contact stormwater runoff that will be directed to it from the landfill cap. Runoff will enter the stream via a step downchute located off the western end of the landfill. The step downchute can reduce the velocity of the flow by approximately 25 percent and allow some suspended particles associated with the stormwater to settle out.

Based on the pre-final design for the groundwater treatment system, treated effluent will be discharged to the North Stream. The effluent will enter DC-1-3 (diversion swale) from the treatment plant and enter the stream via the energy dissapating downchute. This discharge will be at a maximum rate of 80 gpm (gallons per minute), and an average temperature of 50 to 55°F. A hydrological evaluation of the waterway utilizing the Soil Conservation Service's Technical Release No. 55 method, indicates that the peak discharge rate is far greater than the treated effluent discharge rate of 80 gpm (0.18 cfs) and will therefore not impact the existing drainage capacity of the North Stream.

Wetland A

Wetland A is an isolated wetland on the north side of the landfill. This wetland receives surface flow and groundwater discharge from higher topographic areas. Drainage from the wetland flows to the west into the North Stream. This wetland is not expected to be impacted by capping and borrow activities because it is essentially upgradient or cross-gradient of all operations. Drawdown should also have little affect since the wetland is underlain by a highly impermeable till and receives overland flow from an upslope origin that will not be affected by remedial construction activities. Accordingly, the vertical leakage from Wetland A has been calculated at 0.07 gallons/day per square foot (22,194 gallons/day) based upon a 20-year model of groundwater drawdown of 4 feet in the vicinity of Wetland A. This vertical leakage will be an increase of 7.8 percent from the present day vertical leakage of 20,583 gallons/day (see Appendix B). These numbers equate to a loss of approximately 1,611 gallons/day to the surface water flow leaving the wetland and entering the North Stream.

Wetland B

Wetland B is comprised of a small narrow ditch corridor on the eastern (uphill) side of the site. In order to protect the integrity of the cap in that area, the stream corridor (Wetland B) will be rip-rapped along its length on the eastern end of the landfill and pass through a culvert near the southeast corner of the landfill.

Drainage from the sediment basin will be discharged to this drainage corridor following the removal of sediment.

Wetlands C, D, E, F, and G

Wetland Areas C, D, E, F, and G will likely be affected by drawdown along the southerly portion of the landfill. These wetlands occur as seeps which are driven by the hydraulic head from that area. Drawdown is necessary in the southern portion of the landfill to help control flow from Leachate Seep 2 located immediately upslope of Wetlands C, D, E, F, and G. It is anticipated that these wetland areas will be lost as a result of remedial activities.

Wetlands I, J, K, L, M, N, O, P

Capping activities will also require the filling of several small wetlands located directly on top of the landfill. Wetlands I, J, K, L, M, N, O, P, and Q currently exist as small, depressional, emergent wetlands, of which some originate as leachate seeps. The loss of these areas is unavoidable as capping is required to reduce the infiltration of precipitation into underlying waste strata.

Remedial construction activities, including capping and borrow operations, discharge of treated effluent, stormwater discharge, and groundwater withdrawal, will affect the wetlands on and around the Colesville Landfill. Those wetlands expected to be impacted minimally include Wetland Areas A and H. These wetlands comprise 1.60 acres. Wetland B comprising 0.22 acres, will receive impacts by construction activities that include placing rip-rap in the stream channel and passing the stream through a culvert. Wetland Areas C, D, E, F, and G, totaling 0.39 acres, are expected to be eliminated as a result of drawdown. Wetland Areas I, J, K, L, M, N, O, P, and Q, on top of the existing landfill and comprising 0.48 acres, will be lost because of capping operations.

Borrow Area Wetlands Y, Z, and BWA

Wetlands within the borrow area will be removed during material excavation (Figures 5 and 6). Stream corridors will be re-established according to the mitigation plan, and may have wetland characteristics. All wetland impacts are addressed in the following compensation plan.

EPA has required that wetland impacts be compensated as follows:

TABLE 1
IMPACT AND COMPENSATION SUMMARY

Wetland Impact Areas	***Acres***	***Replacement Ratio***	***Compensation Acres***
Landfill Surface and Southern Slope	1.1	1.0	1.1
Borrow Area	0.992	2.0	1.98
Total	***2.092***		***3.08***

Compensation Wetland Community Types	***Acres***
Open Water and Emergents	0.55
Emergents	0.85
Scrub/Shrub	0.6
Forested	1.1
Total	***3.08***

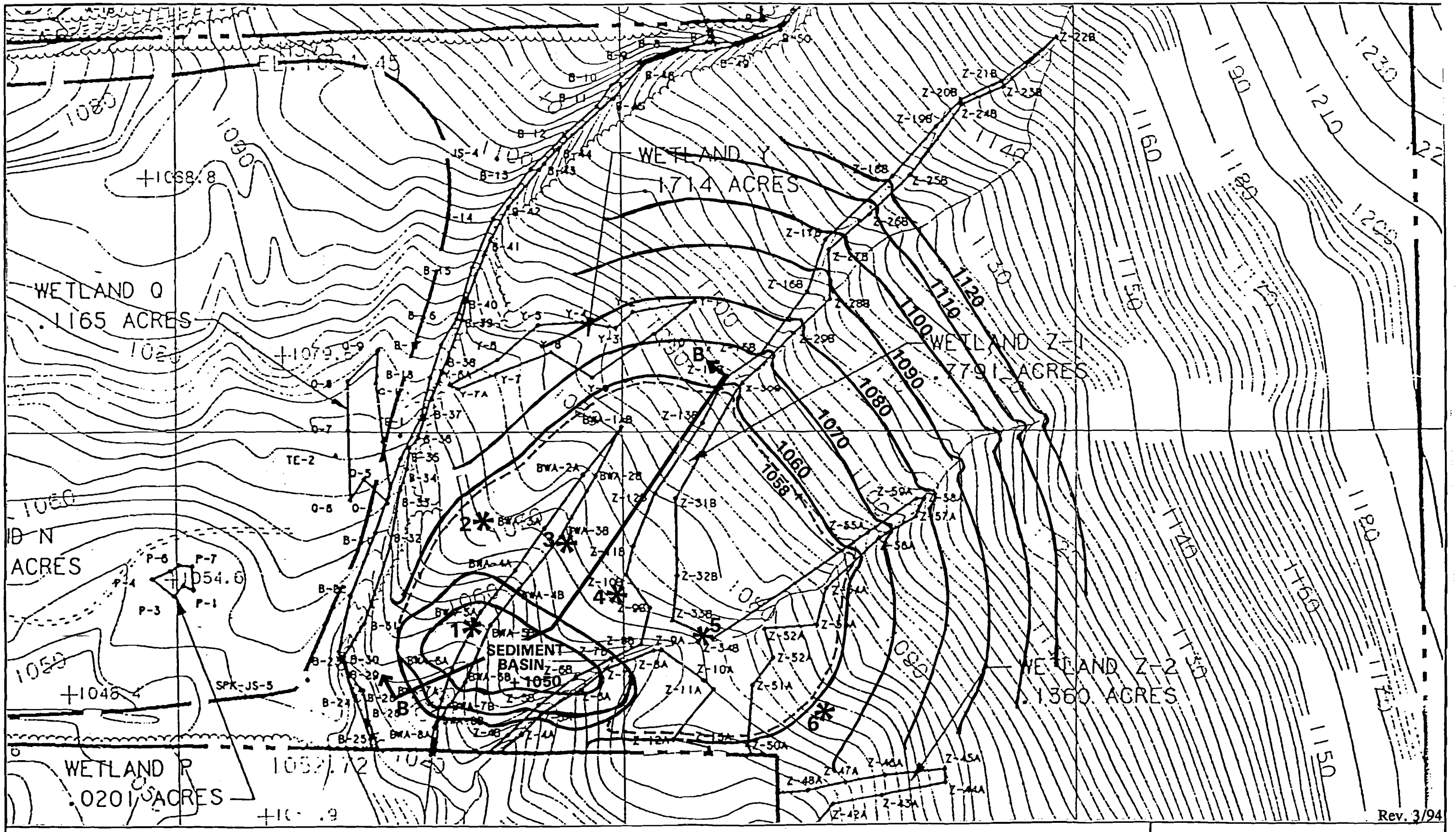

Figure 5. Grading Plan and Soil Boring Locations
Scale: 1" = 100'

0 100'

LEGEND
SOIL BORING LOCATION 1*

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Rev. 3/94

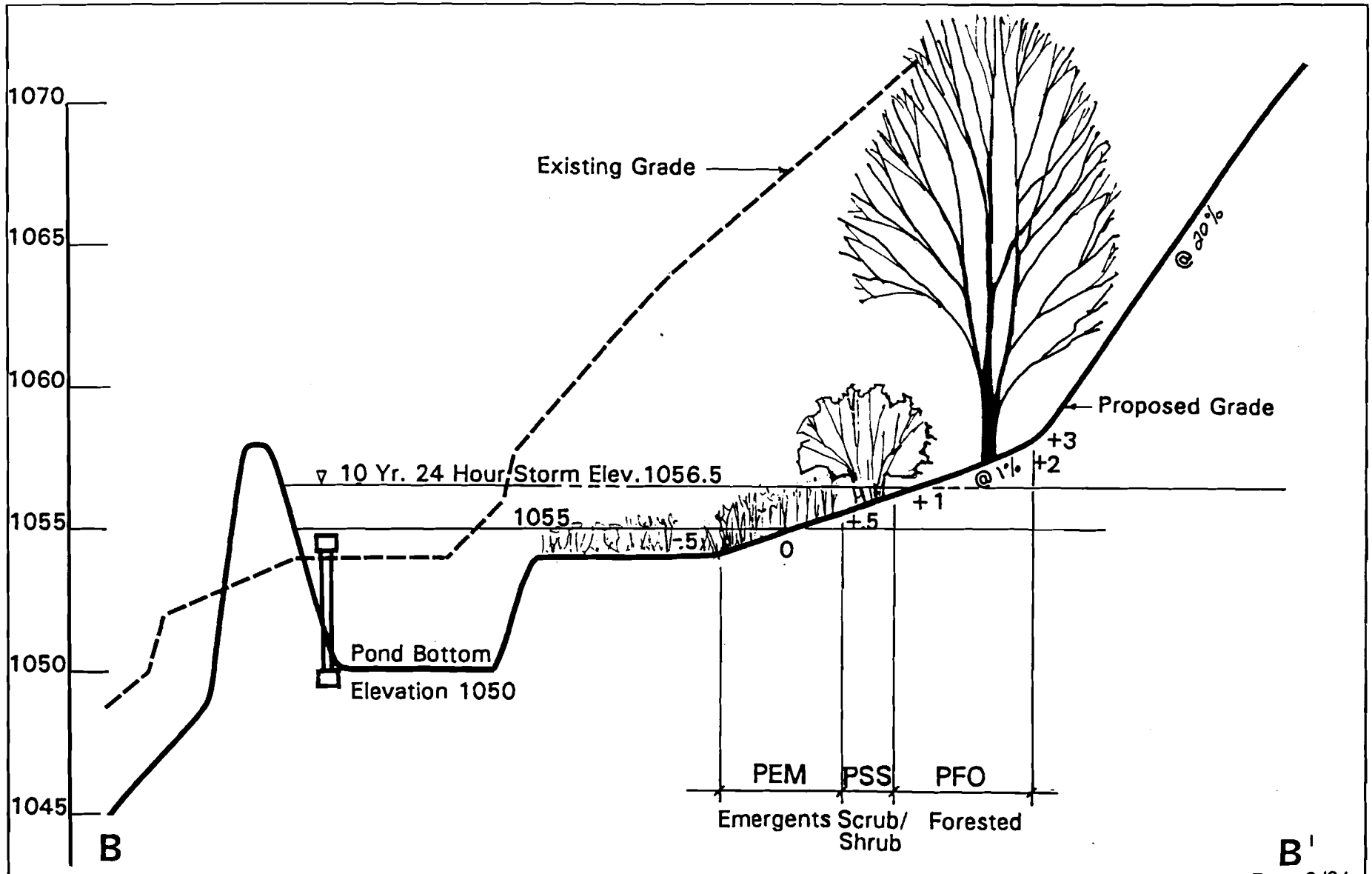

Figure 6. Sediment Basin Cross-Section B-B'
Not to Scale

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4.0 PROPOSED CONCEPTUAL PLAN

4.0 PROPOSED CONCEPTUAL PLAN

The restoration plan for the mitigation site includes the following elements:

1. Topographic map of existing conditions and proposed contours for grading/excavation.
2. Revegetation plan describing species to be planted, density, and distribution throughout the mitigation area.
3. Monitoring as necessary to determine the success of the grading and revegetation plan.

4.1 RESTORATION PLAN OBJECTIVES

The restoration plan seeks to replace wetland habitat lost as a result of the remedial actions on the landfill site. Wetlands receiving impacts from the remedial actions consist of emergent wetlands located on the existing landfill surface and forested wetlands on the slope woodland, south of the landfill and in the borrow area. These wetlands serve to improve water quality, desynchronize flood flows, moderate base flows, and provide wildlife habitat. The proposed compensation program seeks to mitigate for these losses by restoring a greater acreage of wetland habitat on the site within the borrow area.

Specifically, the restoration plan will:

1. Create emergent, scrub shrub and forested wetlands in the lower area of the borrow area, adjacent to the sediment basin.
2. Revegetate the upper borrow area with an assemblage of forest tree species.
3. Increase wildlife habitat in the restored borrow area through increasing habitat diversity to include open water, emergent marsh, scrub shrub, forested wetlands, and restored upland forest.
4. Permanently preserve and protect wetlands through site ownership and maintenance.

The success of the restoration effort will be measured against these objectives.

4.2 CONCEPTUAL DESIGN

The current wetland design is based upon a pond for dependable hydrology in the margin wetland and a mixture of emergent, scrub/shrub, and forested wetland community types as commensurate in-kind replacement for the wetland impact areas on site.

The creation of wetland hydrology on site may be achieved immediately adjacent to the proposed sediment basin in the borrow area on the eastern edge of the landfill (Figure 5). Specifically, wetland hydrology may be created on a expanded shoreline margin on the north and eastern borders of the sediment basin. It is anticipated that approximately up to 30 feet of soils and glacial till will be removed throughout the borrow area in order to provide sufficient material for the new landfill cap. Approximately 0.5 acre of pond margin will be created by excavation into the hillside in addition to the sediment basin area. The compensation wetland area will be comprised of the 0.55 acre permanent pond (initial sediment basin), 0.85 acre emergent wetland, 0.6 acre scrub/shrub wetland, and 1.1 acre palustrine forested wetland.

The primary source of water will be the stream within the borrow area and the surface runoff from the southern portion of the new landfill cap area. Groundwater elevations within the borrow area have not been determined, but may be assumed from boring data to be at streambed elevations in the stream between the landfill and borrow area or about 20 feet below the existing land surface. Water elevation within the basin and wetland margin will be set by a riser or weir and discharge structure.

The final construction specifications will describe the over-excavation (1 foot deeper) of the wetland margin area. This will allow for the addition of ½-foot depth of hydric soils from the stream and swale corridors of the borrow area, to bring the surface of the wetland up to the desired elevations. Hydric soils in the created wetland will enhance the growth of wetland plants through their associated soil moisture capacity, nutrients, and seed bank.

It is anticipated that the elevation of saturation in the margin wetland will be higher than the pond water elevation due to both capillary rise within the soil and the downgradient subsurface flow of water from the upper borrow area. Capillary rise even in pure sands may constitute 6 inches and the site till should exhibit greater capillary rise. These factors are expected to bring about saturated soil conditions (at least seasonally) within the root zone of the forested wetland area. Forested wetland community soils characteristically display a significant drawdown over the growing season. Four channels

(two intermittent stream channels and two ditches) will cross the wetland area. In the event that sufficient wetland hydrology is not achieved during the monitoring period, check dams may be placed in these channels to back up flow and increase soil saturation in adjacent areas.

The wetland margin will include shallow water habitat, emergent marsh, scrub/shrub and forested wetland areas. Wetland communities within the area are: shallow water and emergent marsh (-0.5 to +0.5 feet above pond water elevation), scrub shrub (+0.5 to 1.0 feet), and wetland forest (1.0 to 2.0 feet). Figure 7 presents a diagrammatic layout of the planting area. The actual borders between communities will be blended and irregular as in natural communities. Calculations for the 10-year, 24-hour storm event indicate that basin elevations will extend to the mid elevations of the forested wetlands (1056.5 feet). The basin/pond discharge structure will be developed to allow for the adjustment of basin water elevation. The proposed water control structure is not active in nature. A dam or weir is proposed with a wooden plank face. Adjustment to the pond water level could be made as warranted by removing, adding, or changing the size of planks. At the end of the monitoring period the overflow level would be permanently set by either rip rap or fill. The permanent basin elevation will be set to achieve the desired hydrology within the margin wetland communities.

Plant species suggested for the wetland area are given in Table 1. All species are native plants either commonly found on-site or within the region. All plant material may be purchased from regional wetland nurseries.

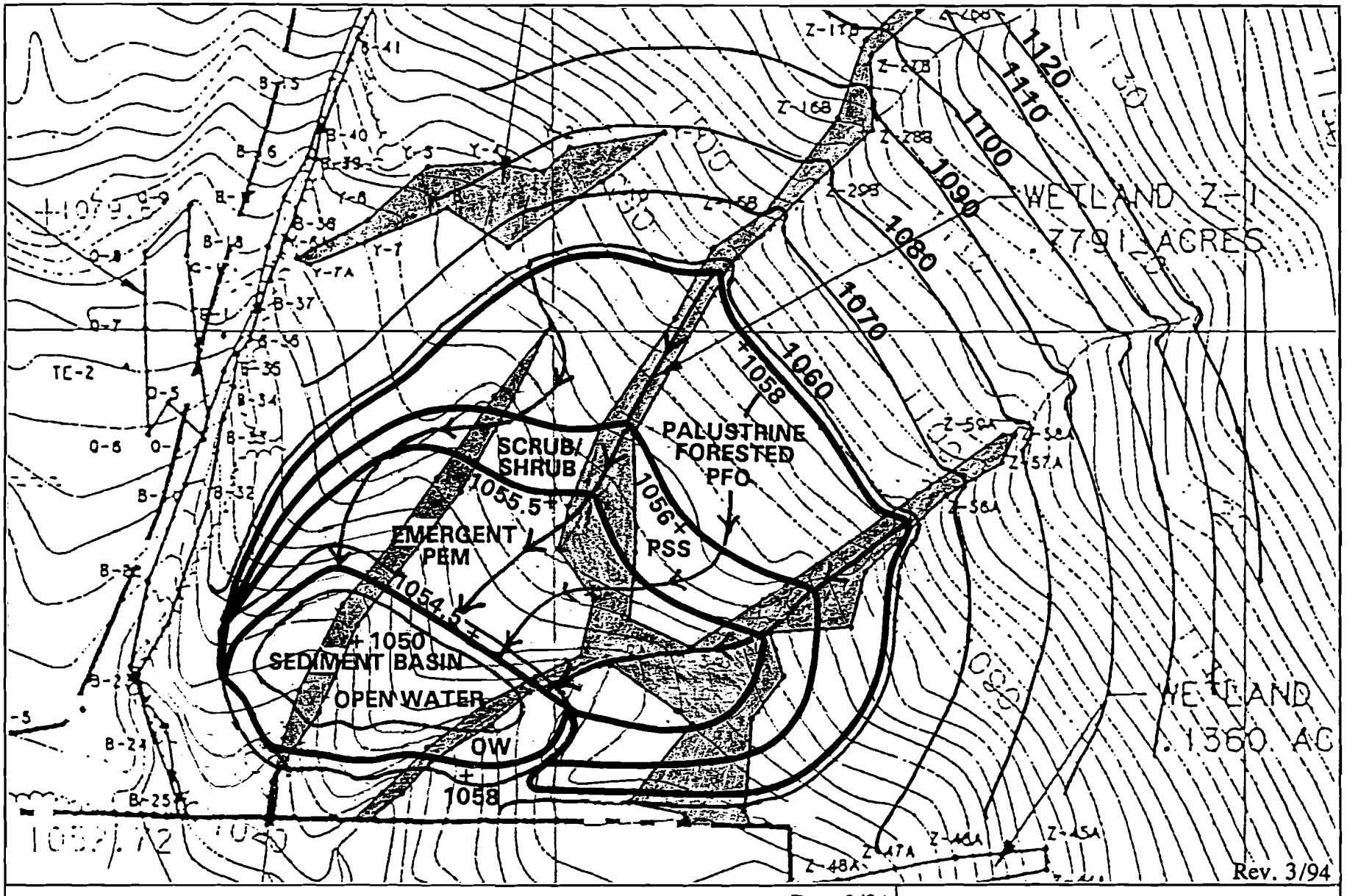

Figure 7. Wetland Compensation Planting Plan
Scale: 1" = 100'

0 100'

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LEGEND

EXISTING WETLANDS

Wetlands Research Associates, Inc.

5.0 COMPENSATION SITE FEASIBILITY

5.0 COMPENSATION SITE FEASIBILITY

5.1 TOPOGRAPHY AND DRAINAGE

The sediment basin, compensation wetland, and borrow area is located adjacent to the east end of the landfill. The site lies on a hillside that slopes moderately to the southwest, and is heavily wooded. The area is drained by a swale and two streams that eventually drain into the Susquehanna River, approximately one-half mile to the west. The elevation at the upper end of the proposed borrow area is 1,150 feet above sea level, and the lower elevation (near the proposed sediment basin) is 1,040 feet.

5.2 SOILS

The soil mapped in the borrow/compensation wetland area is Volusia channery silt loam, a deep, somewhat poorly drained, loamy soil. The Volusia series is listed as a soil with potential hydric inclusions. Hydric soil types in the vicinity that may occur as inclusions in Volusia soil at the site include Alden-Chippewa complex and Wayland soils.

AcA	Alden and Chippewa	Hydric	Deep, very poorly drained in depressions and along drainage ways
Wd	Wayland	Hydric	Deep, poorly to somewhat poorly drained
Unc	Unadilla silt loam	Non-Hydric	
Chc	Chenango and Howard	Non-Hydric	
Wa	Wallington silt loam	Hydric Inclusions	Deep, acid, somewhat poorly drained in slight depressions, sometimes ponded
MhD	Mardin	Non-Hydric	
Sc	Scio silt loam	Non-Hydric	
Vo	Volusia	Hydric Inclusions	

Soil data collected in the area of the sediment basin are presented below with auger locations given in Figure 5.

Auger	Depth	Description (Value/Chroma)
1	0-5" 5-10" 10-15" 15-20"	5/1, 4/1 10YR, Fe Ox roots 5/1, 4/1, 6/2 10YR 5/1, 6/1 5Y, Fe Ox Ag. 6/1 5Y, 6/8 10YR, Fe Ox Ag.
2	0-5" 5-20"	3/1 10YR 3/1, 5/3 10YR, 6/1 5Y, Fe Ox Ag.
3	0-5" 5-10" 10-20"	5/5, 4/2 10YR 5/4 2.5Y 5/4, 6/4 2.5Y
4	0-5" 5-10" 10-20"	5/5, 4/2 10YR 5/4 2.5Y 5/4, 6/4 2.5Y
5	0-5" 5-20"	3/1 10YR 3/1, 5/3 10YR, 6/1 5Y, Fe Ox Ag.
6	0-5" 5-10" 10-20"	5/5, 4/2 10YR 5/4 2.5Y 5/4, 6/4 2.5Y

5.3 HYDROLOGY

The area of the proposed sediment basin and compensation wetland is heavily influenced by surface flow from the upper watersheds to the north and east. Stream B, which flows in a channelized ditch west of and adjacent to the proposed basin and wetland, does not presently contribute directly to the surface flow. There are two swales and a small stream that converge in the southwest corner of the area, then join Stream B and flow south. Although the drainage area is moderately steeply sloped, the entire area is forested with adequate cover to stabilize surface flows.

Limited information is available on groundwater in the borrow area. Groundwater elevations as shown in drawing details are based on one boring log and the assumption that groundwater elevations are near the streambed of Stream B or about 1,050 feet in elevation, between the landfill and the borrow area. The boring log record from the borrow area indicates groundwater at about 20 feet below the surface. One may assume that in the vicinity of the proposed sediment basin, groundwater may seasonally reach the bottom of the basin at an elevation of 1,050 feet. Water budget calculations suggest wetland hydrology will usually be achieved (Appendix C).

5.4 VEGETATION

The proposed sediment basin and compensation wetland area is now predominantly second growth, mixed hardwood and pine forest. The upper elevations are dominated by white oak (Quercus alba), shagbark hickory, (Carya ovata), and white pine (Pinus strobus) with a sparse understory including black cherry (Serotina Prunus). The lower elevations are dominated by red oak (Quercus rubra), white pine (Pinus strobus), and red maple (Acer rubrum). Throughout the study area in lesser amounts were American beech (Fagus grandifolia), poplar (Populus sp.), birch (Betula sp.), hornbeam (Carpinus carolinianus), and red osier dogwood (Cornus stolonifera).

5.5 WILDLIFE

As second growth deciduous forest, the study area presumably supports diverse wildlife populations. During the November site visit, tracks and signs were observed for white-tailed deer, wild turkey, eastern cottontail, and canids. Red-tailed hawks and many passerine birds including, nuthatch, chickadee, fox sparrow, white throated sparrow, cardinals, and crow were observed on the site.

5.6 SITE FEASIBILITY

The sediment basin in the borrow area will be designed as a permanent wet basin or pond with a 5-foot water depth overall. This open water area, with associated water control structure, can provide a stable hydrology for the establishment of a wetland margin along the water's edge.

Grading of the margin around the north and east of the basin can easily be achieved assuming the representation of the Boring Log 9 data to this location. Slightly steeper slopes will be required immediately upslope of the wetland border to achieve the original borrow area contours and cut volumes. Grading in the margin wetland will require a 1 percent slope, from 0.5 below to 2.0 above, the design water elevation.

The source of water for the margin wetland will be the surface water stream through the borrow area, subsurface soil moisture flow in the borrow area, and runoff from the southeastern portion of the new cap landfill surface. Diversion of the adjacent stream (Wetland B) could be considered. The relocation of hydric topsoil from the borrow area to the margin wetland will ensure greater and enhanced growth of wetland plants.

6.0 PLANTING DESIGN AND SPECIFICATIONS

6.0 PLANTING DESIGN AND SPECIFICATIONS

The objective of the re-vegetation plan is to introduce species that can initiate the re-establishment of a diverse wetland and surrounding upland ecosystem. This will be achieved through:

1. Use of hydric soils from the impact areas to provide a seed source for "volunteer" wetland plant colonizers.
2. Planting with emergent and woody plants.

6.1 PALUSTRINE FORESTED WETLANDS

The dominant tree species of the area forested wetlands are red maple, green ash and hemlock, with an understory of spice bush and ironwood. The compensation site plan will emphasize these dominants and add select species found elsewhere to enhance diversity. Site diversity will also increase as the dominants mature providing greater shade and protection. Dominant species, such as red maple tend to be hardier, have wider moisture tolerances, and may survive better than less common species during the initial stages of the restoration. Additional wetland species will be selected both for being fast growing or otherwise less susceptible to grazing. A relatively rapidly formed canopy will allow for colonization by the shade tolerant wetland species not easily established in the open early stages of the compensation wetland development.

6.2 SCRUB-SHRUB WETLANDS

Shrub species will be planted within the forested areas at a equal density to tree species (Planting Specifications). The scrub/shrub wetland has been included in anticipation of the formation of a natural scrub/shrub community in this zone as a transition between the forested and emergent wetland communities. Shrub species will be planted in clumps on the border of the forested wetland areas; therefore, preference will be for shade intolerant species. Willow cuttings and clumps of alder will be located along banks or the waters edge wherever possible.

6.3 EMERGENT WETLANDS

A portion of the compensation wetland area will be planted with emergent species. The wettest of these areas may remain in solely emergent species, but in most areas there will probably be an invasion of tree and shrub species. In time these areas may develop into forest communities.

Emergent wetland species will be located in areas where soils are probably saturated throughout the growing season. Although selected species will be planted from bare root stocks and seeding, many species of sedges, rushes and broadleaved plants will invade and colonize these areas. It is expected that seeds and rootstocks in the hydric soils used as backfill will also provide a source of plant propagules.

Many emergent wetland plant species can tolerate considerably dry, as well as wet conditions. These more hardy and facultative species will be located on berm slopes of the lower elevations, which will experience greater extremes in conditions.

6.4 BERM AREAS

Facultative grass species available in seed stock for basin berm areas include: Agrostis alba (redtop), Agrostis tenuis, Agrostis palustris (bentgrasses), Poa trivalis (rough bluegrass), and Alopecus pratensis (meadow foxtail). All exposed soil will be seeded with this mixture.

6.5 UPLAND FOREST

Well drained, higher elevations of the sites will be planted with trees to establish an upland buffer to the wetland. Trees planted will be representative of adjacent uplands with an added emphasis on mast crops for enhanced wildlife value.

6.6 PLANTING SPECIFICATIONS

Plant species to be used are shown in Table 1. Planting details for trees and shrubs are discussed below. Trees to be used will be purchased at a height of 1 to 2 feet, and planted in density equivalent to 10 feet on center; although planting location will be on a random basis. Species will be chosen randomly in each community group. Shrubs will be purchased at 1 to 2 feet in height and planted in groups of 3, 5, and 7, of the same species.

In the case of a scrub-shrub community, these groupings will be in a density equivalent to 10 feet on center.

The plan is based on the use of native "wet-cultured" plants grown especially for wetland conditions. Nurseries that specialize in native wetland species should be contacted. Other nurseries tend to grow trees and shrubs for landscaping in upland conditions and the plants from these companies will not have been adapted to wetland conditions. If suitable plants are not available, it may be necessary to have them grown by nurseries under contract. All trees should be at least one year old prior to planting.

The location for the installation of various plant species will be shown on a detailed planting plan to accompany the final engineering drawings and specifications. These habitat and wetland types are shown in Figure 7. Emergent wetland species will be planted at the lowest elevation, where ponding is expected to occur the longest or soil saturation the longest throughout the year. Forested wetland species will be planted in the area having a seasonally wet hydroperiod, generally from December to late May. FACW species will be distributed in wetter areas than FAC species. Upland species will be planted in areas that have a water table generally below 24 inches or, when higher, it only saturates the upper soil profile for brief periods of time.

Assuming that the cap construction is completed in 1994, emergent species will be planted in the spring of 1995. Although seeding with facultative grasses is most needed to stabilize erodible surfaces, seeding may be carried out over the entire compensation site to hasten ground cover development with wetland species. A rapid natural colonization of the areas of hydric soils should be expected from the transported seed bed and wind born seeds. No additional watering is anticipated.

TABLE 1
WETLAND SPECIES FOR PLANTING

Species Name	***Common Name***	***Number***[1]	***Indicator Status***
EMERGENTS			
Carex stricta	tussock sedge	415 b.r.	OBL
Juncus effusus	soft rush	415 b.r.	FACW+
Onoclea sensibilis	sensitive fern	200 qt.	FACW

TABLE 1 WETLAND SPECIES FOR PLANTING			
Species Name	**Common Name**	**Number[1]**	**Indicator Status**
Sagittaria latifolia	duck potato	200 qt.	OBL
Scirpus cyperinus	wool grass	415 b.r.	FACW+
Sparganium americanum	eastern bur-reed	200 qt.	OBL
SHRUBS			
Alnus rugosa	speckled alder	6	FACW+
Cephalanthus occidentalis	button bush	6	OBL
Cornus stolonifera	red-osier dogwood	6	FACW+
Salix purpurea	streamco willow	6	-
Sambucus canadensis	elderberry	6	FACW+
TREES			
Acer rubrum	red maple	40	FAC
Fraxinus pennsylvanicus	green ash	20	FACW
Salix nigra	black willow	10	FACW+

[1] Plant material type: b.r. = bare root, qt. = quart container

7.0 PROPOSED SCHEDULE

7.0 PROPOSED SCHEDULE

7.1 PLANTING SCHEDULE

General Schedule

Planting of aquatic or emergent wetland species will occur between April 1 and June 1, preferably during April. Fall planting of trees and shrubs will occur between September 1 and October 30. Planting will not occur when the ground is frozen, snow-covered, or in an otherwise unsuitable condition for planting. Propagules will be planted in the proportions determined above in this plan. All balled, burlapped, and container grown plants will be handled and moved only by the ball or container.

Holes for planting will be dug to produce vertical sides and flat bottoms. When pits are dug with an auger and the sides of the pits become glazed and smooth, the glazed surfaces will be scarified. The depth of the holes will be 6 inches deeper than the root ball. The width of the holes will allow a minimum distance between the ball, and the sides of the hole of 6 inches for shrubs and 12 inches for trees. Loosen the bottom 4 inches of the hole with a shovel prior to planting. One part peat moss with four parts soil should be mixed to use as a soil amendment to support the root ball in the hole.

Plants will be set plumb and manually held in position until sufficient soil has been firmly placed around roots or ball. Plants are to be set at the same depth at which they were grown in the nursery or container.

Balled and burlapped stock will be backfilled with soil to approximately half the depth of the ball, then tamped and watered. Burlap and tying materials will be carefully removed or opened and folded back. Plastic wrap will be completely removed before the placement of backfill. The remainder of backfill will be tamped and watered.

Willow and alder cuttings may be made in winter to early spring and transplanted along the water's edge of the compensation wetland before leaf out. Willow cuttings can be planted on 2-foot centers. Emergent plant species rhizomes can be planted in early spring as available from the supplier.

7.2 WATERING

All plants will be watered by flooding the backfilled hole within the same working day upon which they were planted. During and immediately after watering, all plants will

be adjusted as necessary to insure correct depth of planting, vertical alignment and/or natural profile. Additional soil will be added around each plant as required to compensate for settling.

7.3 MAINTENANCE

The landscape contractor will be required to guarantee 85 percent survival of all planted materials over a two year period following installation. A 85 percent survival of trees and shrubs, allowing for the inclusion of those species established through natural colonization, will be required after the first 5 years of monitoring. A maintenance plan will be prepared by the contractor and approved by the supervisory wetland biologist for the permittee.

8.0 MONITORING

8.0 MONITORING

8.1 GOALS OF THE MONITORING PROGRAM

The monitoring program will be conducted to document the Permit Special Conditions. These permit conditions will be documented over a period of 2 years, starting from the completion of the first planting within the compensation wetlands.

Monitoring will be conducted during each year of the monitoring period. Progress and formal reports will document the status of wetland site conditions using the following monitoring methodology. The final monitoring report will provide a summary of monitoring data trends and compare current wetland status with compensatory wetland goals.

8.2 MONITORING PROGRAM COMPONENTS

8.2.1 Photographs

The compensatory wetland will be documented through fixed point photos with range poles or objects for scaling and reference. Location and number of photographs will be sufficient to cover the entire compensation site. Photographs will be taken from the same point and in the same direction each sampling period. Significant changes in the wetland structure, including events such as storm damage, will be documented by these photos.

8.2.2 Precipitation Gauge

Local recording precipitation gauges will be located near the mitigation area to provide better estimates of watershed precipitation than distant weather station records. Daily records of precipitation will be maintained during the period of monitoring and these data will be included in the annual monitoring reports.

8.2.3 Surface and Groundwater Monitoring

Shallow groundwater piezometers will be maintained in the compensatory wetland. Reference will be made to other groundwater elevation records. Groundwater and surface water records will be continued for the duration of the monitoring program and data summaries provided in the annual reports.

8.2.4 Base Map

A base map or plan view will be provided illustrating the location of photo points, piezometers, and sampling areas.

8.2.5 Vegetation Assessment

Vegetation is generally indicative of the structure of wetlands and a quantitative assessment of vegetative cover and survival is required by the permit conditions. The composition of each wetland vegetation community will be adequately characterized. The following general methods will be followed with an allowance for site or minor modifications. Sampling will be conducted during late spring and early fall periods of each monitoring year to best identify dominant plant species and assess seasonal biomass.

Forested Wetlands – A belt transect or line intercept method will be employed for sampling areas where tree species (with a secondary shrub layer) are to be dominant. Transects will be positioned so that each vegetation zone or category is sampled. Transects will also be located along wetland basin moisture gradients, extend into forest buffer vegetation and into undisturbed upland vegetation adjacent to the compensatory wetland.

Scrub/Shrub Wetlands – Replicate quadrat sampling will be used in areas to be dominated by shrub species. The number and average height of woody individuals within quadrats and the DBH of the largest individuals of each taxa recorded. Paired 3-meter by 3-meter quadrats are recommended.

Emergent Wetlands – Emergent vegetation areas to be dominated by herbaceous plant species are to sampled using replicate quadrats. The percent cover and average height of individuals of each taxa within the major height strata will be recorded. Each major herbaceous plant zone will be sampled. Seven replicate 1-meter by 1-meter quadrats are recommended.

8.2.6 Habitat Enhancement

Observational data will be collected on wildlife observed during seasonal vegetation assessments in the compensatory wetland area. Notes will also be kept on the grazing or predation of wetland vegetation.

8.3 IDENTIFICATION OF PROBLEMS AND RECOMMENDATIONS

As indicated through the monitoring program or otherwise noted by monitoring and facility staff, problems arising during the monitoring period will be communicated by the applicant to the District Corps of Engineers. Recommendations will be developed to compensate for problems or otherwise direct site management toward the goals of the wetland compensation program.

8.4 MAINTENANCE OF DOMINANT WETLAND VEGETATION

Wetland compensation program goals are the establishment and limited maintenance of forested and emergent wetland plant communities. Compensatory Wetland Plan specifications have been developed to enhance the establishment of such communities as quickly as possible. The persistence of these wetland communities may not depend upon a consistency of wetland community species composition as initially established on the site. Rather, wetlands are among the most dynamic of landscape features and their plant community assemblages reflect such temporal change. The influence of climatic variation, the natural colonization by native plants, and the natural development of site wetland hydrology and nutrient regimes may likely lead to a wetland that differs in community structure, but adequately meets program goals. Maintenance and management of the site will be directed towards establishing a natural wetland community over time.

APPENDICES

APPENDIX A
DATA SHEETS AND PHOTOGRAPHS

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: NY County: Broome Legal Description: Township: ____ Range: ____

Date: 4/6/92 Plot No.: A-1 wetland Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1.		7. Polygonum sagittatum	OBL
2.		8. Scirpus cyperinus	FACW+
3.		9. Juncus effusus	FACW+
Saplings/shrubs		**Woody vines**	
4. Salix discolor	FACW	10. Rubus hispidus	FACW
5. Cephalanthus occidentalis	OBL	11.	
6. Spirea latifolia	FAC+	12.	

% of species that are OBL, FACW, and/or FAC: >50%. Other indicators: _____.

Hydrophytic vegetation: Yes X No ___. Basis: >50% FAC or wetter.

Soil

Series and phase: Volusia On hydric soils list? Yes ____; No X.

Mottled: Yes X; No ____. Mottle color: 2.5YR 5/8; Matrix color: _____

Gleyed: Yes X No ____ Other indicators: 5 GY 7/1.

Hydric soils: Yes X No ____; Basis: Mottling and saturated condition.

Hydrology

Inundated: Yes X; No ____. Depth of standing water: at surface.

Saturated soils: Yes X; No ____. Depth to saturated soil: At surface.

Other indicators: _____.

Wetland hydrology: Yes X; No ____. Basis: _____.

Atypical situation: Yes ____; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland Yes; Nonwetland _____.

Comments:

Determined by: Dave TompKins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: N.Y. County: Broome Legal Description: Township: ____ Range: ____

Date: 4/6/92 Plot No.: TA1 Upland Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Quercus alba	FACU-	7. Lycopodium clavatum	FAC
2. Carya ovata	FACU-	8.	
3. Pinus Strobus	FACU	9.	
Saplings/shrubs		**Woody vines**	
4. Ostrya virginiana	FACU	10.	
5. Pinus strobus	FACU	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: <50% Other indicators: _____.

Hydrophytic vegetation: Yes ___ No X. Basis: <50% of Plants FAC or wetter on Indicator List.

Soil

Series and phase: Volusia Channery silt loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: _____; Matrix color: ____

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes ____ No X; Basis: No hydric soil indicators.

Hydrology

Inundated: Yes ____; No X Depth of standing water: none observed.

Saturated soils: Yes ____; No X. Depth to saturated soil: none observed

Other indicators: _____.

Wetland hydrology: Yes ____; No X. Basis: No saturated soil evidance.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes ____ No X.

Wetland Determination: Wetland _____; Nonwetland Yes.

Comments: Transect point located in upland north of wetland A on a 10% slope.

Determined by: Dave Tompkins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: N.Y. County: Broome Legal Description: Township: ____ Range: ____

Date: 4/6/92 Plot No.: TA2 Wetland Transect Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	FAC	7. Juncus effusus	FACW+
2. Betula lenta	FAC V	8. Sphagnum spp.	NA
3.		9. Onoclea sensibilis	FACW
Saplings/shrubs		**Woody vines**	
4. Alnus rugosa	FACW+	10.	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: >50% Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: Greater than 50% FAC or wetter species.

Soil

Series and phase: Volusia channery silt loam On hydric soils list? Yes ____; No X.

Mottled: Yes X; No ____. Mottle color: 2.5YR 5/6; Matrix color: ____.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottling and saturated soil.

Hydrology

Inundated: Yes X; No ____. Depth of standing water: at surface

Saturated soils: Yes X; No ____. Depth to saturated soil: Surface.

Other indicators: _____.

Wetland hydrology: Yes X; No ____. Basis: _____.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland YES; Nonwetland _____.

Comments: Part of transect for wetland A

Determined by: Dave Tompkins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: NY County: Broome Legal Description: Township: ____ Range: ____

Date: 4/6/92 Plot No.: TA3 (wetland) Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. [Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1.		7. Polygonum sagittatum	OBL
2.		8. Oroclea sensibilis	FACW
3.		9. Scirpus cyperinus	FACW+
Saplings/shrubs		**Woody vines**	
4. Hamamelis virginiana	FAC-	10. Rubus hispidus	FACW
5. Alnus rugosa	FACW+	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: >50%. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: Greater than 50% FAC species or wetter.

Soil

Series and phase: Volusia channery silt loam On hydric soils list? Yes ____; No X.

Mottled: Yes X; No ____. Mottle color: 2.5YR 4/8; Matrix color: _____.

Gleyed: Yes X No ____ Other indicators: Gley Color 5GY 6/1 _____.

Hydric soils: Yes X No ____; Basis: Mottled soil _____.

Hydrology

Inundated: Yes X; No ____. Depth of standing water: at surface.

Saturated soils: Yes X; No ____. Depth to saturated soil: at surface

Other indicators: _____.

Wetland hydrology: Yes X; No ____. Basis: Soil Saturated _____.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland YES; Nonwetland _____.

Comments: Transect point in wetland A.

Determined by: Dave Tompkins / Joe Kopalek

TA4 - upland area west of wetland H

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: N.Y. County: Broome Legal Description: Township: ____ Range: ____

Date: 4/6/92 Plot No.: TA4 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Pinus strobus	FACU	7. Lycopodium clavatum	
2. Acer rubrum	FAC U-	8.	
3. Quercus rubra	FAC U-	9.	
Saplings/shrubs		**Woody vines**	
4. Hamamelis virginiana	FAC-	10.	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: <50%. Other indicators: _____.

Hydrophytic vegetation: Yes ___ No X. Basis: Less than 50% of species FAC or wetter on Plant list.

Soil

Series and phase: Volusia, silt loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: None; Matrix color: 10YR 4/4.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes ____ No X; Basis: No indicators of hydric soils.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes ____; No X. Depth to saturated soil: None observed

Other indicators: _____.

Wetland hydrology: Yes ____; No X. Basis: _____.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes ____ No X.

Wetland Determination: Wetland _____; Nonwetland Yes.

Comments:

Determined by: Dave TompKins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: NY County: Broome Legal Description: Township: ____ Range: ____

Date: 4/6/92 Plot No.: A-6 Wetland Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Carpinus caroliniana	FAC	7. Sphagnum spp	____
2.		8. Scirpus cyperinus	FACW+
3.		9. Pteridium aquilinum	FACU
Saplings/shrubs		**Woody vines**	
4. Tsuga canadensis	FACU	10. Rubus hispidus	FACW
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: >50% Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: >50% species FAC or wetter on plant list.

Soil

Series and phase: Volusia Channery silt loam hydric soils list? Yes ____; No X.

Mottled: Yes X; No ____. Mottle color: 2.5YR/5/8; Matrix color: _____

Gleyed: Yes X No ____ Other indicators: 5GR 7/1 _____.

Hydric soils: Yes X No ____; Basis: Mottled and gleyed soil conditions.

Hydrology

Inundated: Yes X; No ____. Depth of standing water: At surface.

Saturated soils: Yes X; No ____. Depth to saturated soil: At surface.

Other indicators: _____.

Wetland hydrology: Yes X; No ____. Basis: Standing water present.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland Yes; Nonwetland _____.

Comments: — area may represent an abandoned farm pond.

Determined by: Dave TompKins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: NY County: Broome Legal Description: Township: ____ Range: ____

Date: 4/16/92 Plot No.: C-7B wetland. Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	FAC	7. Symplocarpus foetidus	OBL
2.		8. Polystichum acrostichoides	FACU-
3.		9.	
Saplings/shrubs		**Woody vines**	
4. Carpinus caroliniana	FAC	10.	
5. Hamamelis virginiana	FAC-	11.	
6. Lindera benzoin	FACW-	12.	

% of species that are OBL, FACW, and/or FAC: >50%. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: >50% of Plants listed or FAC or wetter.

Soil

Series and phase: Chenango On hydric soils list? Yes ____; No X.

Mottled: Yes X; No ____. Mottle color: 2.5YR 4/8; Matrix color: 2.5Y 4/2.

Gleyed: Yes X No ____ Other indicators: Gley color 5Y 4/1.

Hydric soils: Yes X No ____; Basis: Sample is mottled and gleyed.

Hydrology

Inundated: Yes X; No ____. Depth of standing water: 1 to 3 inches.

Saturated soils: Yes X; No ____. Depth to saturated soil: Surface.

Other indicators: Stream channel present.

Wetland hydrology: Yes X; No ____. Basis: Standing water / Saturated soils.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland Yes; Nonwetland _____.

Comments:

Determined by: Dave TompKins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: NY County: Broome Legal Description: Township: ____ Range: ____

Date: 4/6/92 Plot No.: Upland between C and D Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Quercus rubra	FACU-	7. Lycopodium clavatum	FAC
2. Acer rubrum	FAC	8.	
3. Carya ovata	FACU-	9.	
Saplings/shrubs		**Woody vines**	
4. Carpinus Caroliniana	FAC	10.	
5. Pinus Strobus	FACU	11.	
6. Fagus grandifolia	FACU	12.	

% of species that are OBL, FACW, and/or FAC: <50% Other indicators: _____.

Hydrophytic vegetation: Yes X No X. Basis: <50% of plant species listed as FAC or wetter.

Soil

Series and phase: Chenango - Silty Clay loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: None; Matrix color: _____.

Gleyed: Yes ____ No X Other indicators: No

Hydric soils: Yes ____ No X; Basis: No hydric soil indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: None.

Saturated soils: Yes ____; No X. Depth to saturated soil: None observed

Other indicators: No.

Wetland hydrology: Yes ____; No X. Basis: _____.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes ____ No X.

Wetland Determination: Wetland _____; Nonwetland Yes.

Comments:

Determined by: Dave Tompkins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: N.Y. County: Broome Legal Description: Township: ____ Range: ____

Date: 4/6/92 Plot No.: D2A Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

	Species	Indicator Status		Species	Indicator Status
Trees			Herbs		
1.	Acer rubrum	FAC	7.	Symplocarpus foetidus	OBL
2.	Betula alleghaniensis	FAC	8.		
3.	Tsuga canadensis	FACU	9.		
Saplings/shrubs			Woody vines		
4.	Lindera benzoin	FACW-	10.		
5.	Carpinus caroliniana	FAC	11.		
6.	Hamamelis virginiana	FAC-	12.		

% of species that are OBL, FACW, and/or FAC: >50% Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: _____.

Soil

Series and phase: Chenango On hydric soils list? Yes ____; No X.

Mottled: Yes X; No ____. Mottle color: 2.5Y 4/2 Matrix color: 5YR 6/8

Gleyed: Yes X No ____ Other indicators: _____.

Hydric soils: Yes X No ____; Basis: Mottled and gleyed soil indicators

Hydrology

Inundated: Yes ____; No X. Depth of standing water: Some in depressions.

Saturated soils: Yes X; No ____. Depth to saturated soil: _____.

Other indicators: None.

Wetland hydrology: Yes X; No ____. Basis: Standing water and saturated soil.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland Yes; Nonwetland _____.

Comments:

Determined by: Dave TompKins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: NY County: Broome Legal Description: Township: ____ Range: ____

Date: 4/6/92 Plot No.: E 7 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Fraxinus americana	FACU	7. Symplocarpus foetidus	OBL
2. *Acer rubrum	FAC	8. Viola spp.	
3. Tsuga canadensis	FACU	9.	
Saplings/shrubs		**Woody vines**	
4. Carpinus caroliniana	FAC	10.	
5. Lindera benzoin	FACW-	11.	
6. Hamamelis virginiana	FAC-	12.	

% of species that are OBL, FACW, and/or FAC: >50% Other indicators: _____.

Hydrophytic vegetation: Yes X No ___. Basis: >50% of plant species are FAC or wetter.

Soil

Series and phase: Chenango Silty Sand On hydric soils list? Yes ____; No X.

Mottled: Yes X; No ____. Mottle color: 2.5YR 4/8 red-brown; Matrix color: 7.5YR 5/3

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: Mottled soil condition

Hydrology

Inundated: Yes X; No ____. Depth of standing water: 0-1" .

Saturated soils: Yes X; No ____. Depth to saturated soil: Surface .

Other indicators: Flowing water (slow) .

Wetland hydrology: Yes X; No ____. Basis: _____.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes ____ No ____.

Wetland Determination: Wetland Yes ; Nonwetland _____.

Comments:

Determined by: Dave TompKins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: NY County: Broome Legal Description: Township: ____ Range: ____

Date: 4/6/92 Plot No.: Upland between E and F wetlands Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	FAC	7.	
2. Quercus rubra	FACU-	8.	
3. Fraxinus americana	FACU	9.	
Saplings/shrubs		**Woody vines**	
4. Carpinus caroliniana	FAC	10. Gaultheria procumbens	FACU
5. Fagus grandifolia	FACU	11.	
6. Pinus strobus	FACU	12.	

% of species that are OBL, FACW, and/or FAC: <50% Other indicators: None.

Hydrophytic vegetation: Yes ___ No X. Basis: <50% of plant species are FAC or wetter.

Soil

Series and phase: Chenango - Sandy loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: _____; Matrix color: Yellow-Brown

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes ____ No X; Basis: No mottling or gleyed condition.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: None observed.

Saturated soils: Yes ____; No X. Depth to saturated soil: None observed

Other indicators: _____.

Wetland hydrology: Yes ____; No X. Basis: _____.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes ____ No X.

Wetland Determination: Wetland _____; Nonwetland Yes ____.

Comments: Area is a southern slope.

Determined by: Dave TompKins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: NY County: Broome Legal Description: Township: ____ Range: ____

Date: 4/1/92 Plot No.: G9A Wetland Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Carpinus caroliniana	FAC	7. Symplocarpus foetidus	OBL
2. Acer rubrum	FAC	8. Juncus effusas	FACW+
3. Sassafras albidum.	FACU-	9. Carex spp.	
Saplings/shrubs		**Woody vines**	
4. Carpinus caroliniana	FAC	10.	
5. Ilex verticula	FACW+	11.	
6. Cornus stolinifera	FACW+	12.	

% of species that are OBL, FACW, and/or FAC: >50% Other indicators: Hummock vegetation

Hydrophytic vegetation: Yes X No ____. Basis: > 50% of vegetation is listed as FAC or wetter.

Soil

Series and phase: Braceville On hydric soils list? Yes ____; No X.

Mottled: Yes X; No ____. Mottle color: Red; Matrix color: _____.

Gleyed: Yes X No ____ Other indicators: Gray gleying.

Hydric soils: Yes X No ____; Basis: Soil mottled & Gleyed.

Hydrology

Inundated: Yes X; No ____. Depth of standing water: 1-2".

Saturated soils: Yes X; No ____. Depth to saturated soil: Surface.

Other indicators: _____.

Wetland hydrology: Yes X; No ____. Basis: Saturated soil and Standing water

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland Yes; Nonwetland _____.

Comments:

Determined by: Dave TompKins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Colesville Landfill

State: NY County: Broome Legal Description: Township: ____ Range: ____

Date: 4/7/92 Plot No.: H-2 (wetland) Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1.		7. Solidago spp.	
2.		8.	
3.		9.	
Saplings/shrubs		**Woody vines**	
4. Salix discolor	FACW	10.	
5. Cornus stolonifera	FACWt	11.	
6. Spirea alba	FACWt	12.	

% of species that are OBL, FACW, and/or FAC: >50% Other indicators: edge of stream

Hydrophytic vegetation: Yes X No ___. Basis: >50% plant species listed as FAC or wetter.

Soil

Series and phase: Alden and Chippewa (AcA) On hydric soils list? Yes X; No ___.

Mottled: Yes X; No ___. Mottle color: Red; Matrix color: _____.

Gleyed: Yes ___ No X Other indicators: _____.

Hydric soils: Yes X No ___; Basis: Hydric soils list and mottling.

Hydrology

Inundated: Yes ___; No X. Depth of standing water: None.

Saturated soils: Yes X; No ___. Depth to saturated soil: 6 inches.

Other indicators: area adjacent to flowing stream.

Wetland hydrology: Yes X; No ___. Basis: Saturated soils.

Atypical situation: Yes ___; No X.

Normal Circumstances? Yes X No ___.

Wetland Determination: Wetland X; Nonwetland _____.

Comments:

Determined by: Dave Tompkins / Joe Kopalek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: Coeksville Landfill

State: NY County: Broome Legal Description: Township: ____ Range: ____

Date: 4/7/92 Plot No.: East of H-2 Upland Section: _____

Vegetation [list the three cominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	FAC	7. Solidago spp.	
2. Betula lenta	FACU	8. Asters spp.	
3.		9.	
Saplings/shrubs		**Woody vines**	
4. Quercus alba	FACU-	10.	
5. Cornus stolonifera	FACW+	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: <50% Other indicators: None.

Hydrophytic vegetation: Yes ___ No X. Basis: <50% of species are FAC or wetter.

Soil

Series and phase: Chenango On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: _____; Matrix color: _____.

Gleyed: Yes ____ No X Other indicators: None.

Hydric soils: Yes ____ No X; Basis: No hydric indicators present.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: None.

Saturated soils: Yes ____; No X. Depth to saturated soil: None observed.

Other indicators: None.

Wetland hydrology: Yes ____; No X. Basis: No standing water or saturated soil conditions.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes ____ No X.

Wetland Determination: Wetland _____; Nonwetland Yes.

Comments:

Determined by: Dave TompKins / Joe Kopalek

Figure 1: North-facing view of Wetland A shows open water area, emergent zone, and scrub/shrub area (left).

Figure 2: East-facing view of Wetland A. Dominant herbaceous plants in the emergent zone include wool grass, sensitive fern, and soft rush.

Figure 3: Close-up of small tributary comprising Wetland B. Shrubs are pussy willow and red-osier dogwood. This wetland ranges from two to several feet wide.

Figure 4: Photograph shows Wetland B descending down the Landfill along tree line.

Figure 5: Part of Wetland E. This area is similar to photo described below. Shade in foreground is caused by dense hemlocks which prevail further down the slope.

Figure 6: Part of Wetland F located on south-facing slope below the Landfill. Surface soils are black muck. The most common herbaceous plant is skunk cabbage. Dominant trees are red maple and hornbeam.

Figure 7: Soil sample showing commonly encountered gleyed and mottled colors. This soil sample was retrieved from Wetland A.

BORROW AREA WETLANDS

PHOTOGRAPH DESCRIPTION

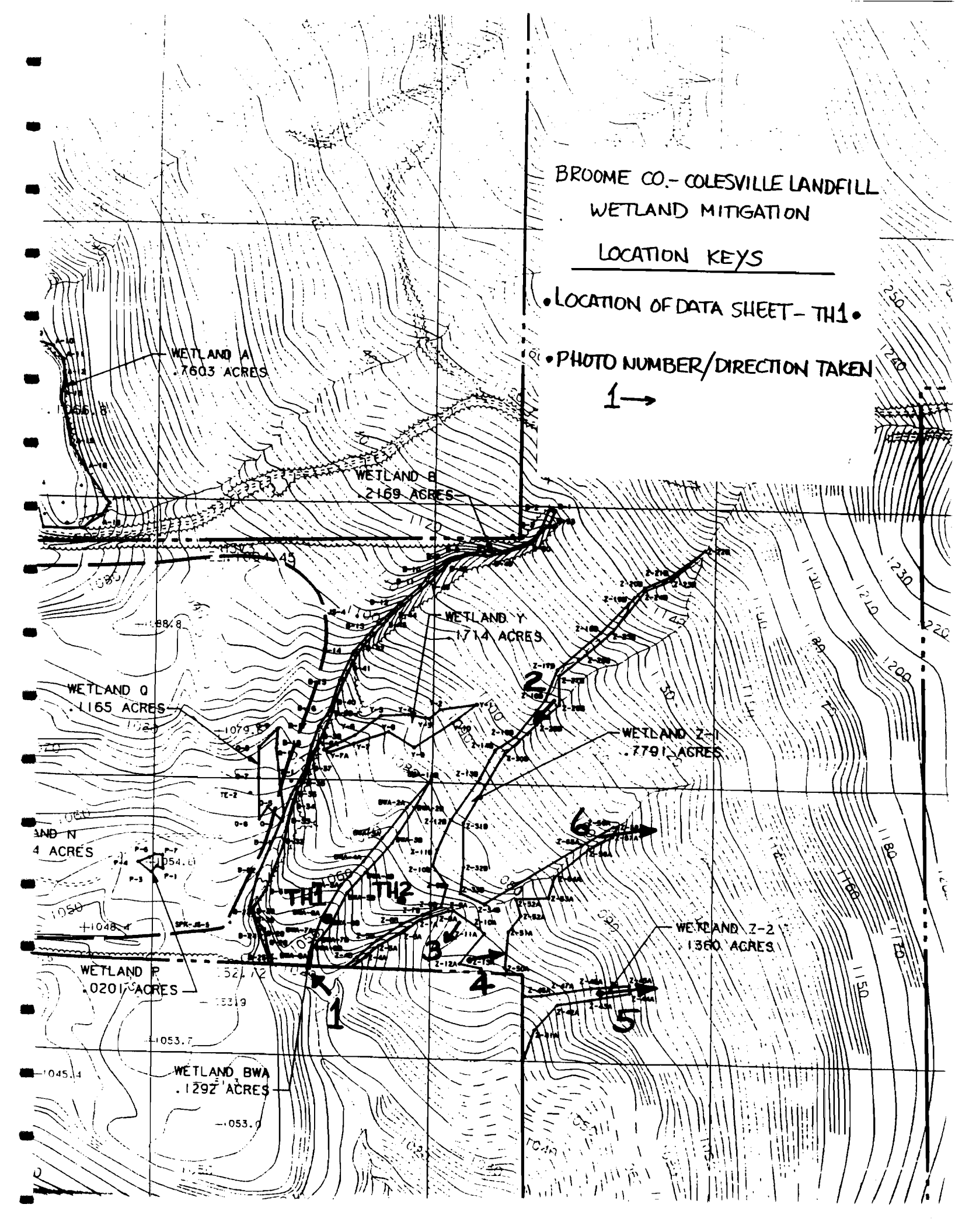
#1. Continuation of stream corridor (facing north) from wetland B. Location of outlet from wetlands BWA and Z on right.

#2. Photo taken near flag Z6B (east). Wetland in this area is restricted to just stream channel. Shrub area in background is a larger wetland area.

#3. Upland area facing south from flag Z9A.

#4. Larger flat wetland area near flag Z12A. This is the only area where significant herbaceous vegetation is present. Some disturbance (test pits) is visibly nearby.

#5. Upgradient section of wetland Z-2.


BROOME CO.- COLESVILLE LANDFILL
WETLAND MITIGATION
LOCATION KEYS
• LOCATION OF DATA SHEET - TH1 •
• PHOTO NUMBER/DIRECTION TAKEN
1→
WETLAND A
.7603 ACRES
WETLAND B
.2169 ACRES
WETLAND Y
.1714 ACRES
WETLAND Q
.1165 ACRES
WETLAND Z-1
.7791 ACRES
WETLAND Z-2
.1360 ACRES
WETLAND P
.0201 ACRES
WETLAND BWA
.1292 ACRES
TH1
TH2
1
2
3
4
5
6


upland
Photo #3


UP
WET
FLAG 212A


Photo #4


wet
Photo 5

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Cedesville - Borrow Area
Applicant/Owner:
Investigator: D. Tompkins

Date: 12/14/93
County: Broome
State: NY

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on reverse.)

Community ID:
Transect ID:
Plot ID: TH 1

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	OS	FAC
2. Pinus strobus	US	FACU
3. Hamamelis virginiana	Shr	FAC-
4. Betula lenta	shr	FACU
5. Cornus stolonifera	GL	FACW+
6. Onoclea sensibilis	GL	FACW
7. Solidago spp.	GL	—
8. unidentified grass	GL	—
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 4/6 = 67%

Remarks: No woody vegetation within 3-5 meters. Goldenrod and grass (clear dominant species) not identifiable in present condition, but only seem to be in wetland.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
Y No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)
Depth to Free Water in Pit: 1-2 (in.)
Depth to Saturated Soil: at Surface (in.)

Wetland Hydrology Indicators:
Primary Indicators:
X Inundated
X Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
X Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Ice present on ground surface

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8	A	10YR 3/1	na	na	silty clay
8-19	B	10YR 4/2	7.5YR 5/8	Common throughout	Sandy clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: difficult to accurately assign Munsell Color, too cloudy roots present to approx 8" depth

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No (Circle)	(Circle)
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	Is this Sampling Point Within a Wetland? (Yes) No

Remarks: Wetland represents a thin corridor occurring on a sloping landscape.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Colesville - Borrow Area	Date: 12/14/93
Applicant/Owner:	County: Broome
Investigator: D. Tompkins	State: NY
Do Normal Circumstances exist on the site? (Yes) No	Community ID:
Is the site significantly disturbed (Atypical Situation)? Yes (No)	Transect ID:
Is the area a potential Problem Area? Yes (No)	Plot ID: TH2
(If needed, explain on reverse.)	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Acer rubrum	OS	FAC	9.		
2. Pinus strobus	US	FACU	10.		
3. Fraxinus americana	Shr	FACU	11.		
4. Fagus grandifolia	Shr	FACU	12.		
5. Rubus flagellaris	GL	NI	13.		
6. Lycopodium clavatum	GL	FAC	14.		
7. Lycopodium obscurum	GL	FACU	15.		
8. Dryopteris spinulosa	GL	FAC+	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 3/8 = 38%

Remarks: Higher elevations (ie: upland) are dominated by Acer saccharum (FACU). Fairly developed woody groundlayer, herb. groundlayer nonexistent.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	____ (in.)
Depth to Free Water in Pit:	>21 (in.)
Depth to Saturated Soil:	>21 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- None ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- None ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
O	0-2"	10YR 2/1			organic
A	2-5	10YR 4/2			clayey silt
B	6-19	" 5/4			silty clay
B	19>21	" 5/4	5YR 5/8	slight	clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No) (Circle)	(Circle)
Wetland Hydrology Present?	Yes (No)	
Hydric Soils Present?	Yes (No)	Is this Sampling Point Within a Wetland? Yes (No)

Remarks:

Approved by HQUSACE 3/92

APPENDIX B
WETLAND A VERTICAL LEAKAGE ESTIMATE

By GHM Date 1/26
Chkd. by [illegible] Date 1/29
Subject Colesville - Pre Final Engineering Report

WEHRAN ENGINEERING Engineers & Scientists

Job No. 02260 EC
Sheet No. 1 of 2

Appendix I, Vertical Leakage in Wetland A

An estimate of the vertical leakage in Wetland A can be determined based on Darcy's Law and information obtained from on-site monitoring wells W-2 and W-10 as follows,

$$Q = K \frac{H_2 - H_1}{L} A$$

where:

Q = vertical leakage through upper glacial till

K = average permeability of upper glacial till measured in on-site monitoring wells W-2 and W-10
= 3.5×10^{-5} ft/min

H_2 = present day water table elevation in on-site monitoring well W-10
= 1015.71 ft

H_1 = water surface elevation in Wetland A
= 1066.80 ft

L = thickness of glacial till layer underlying Wetland A as determined from boring log of monitoring well W-10
= 31 ft

A = surface area of Wetland A
= 33,119 Sq. Ft.

Accordingly:

$$Q_{present\ day} = 3.5 \times 10^{-5}\ ft/min\ (1015.71 - 1066.80\ ft)\left(\frac{33,119}{31}\right)$$

$$= 20,583\ gallons/day$$

$$= 0.62\ gallons/day/ft^2$$

II An estimate of the leakage rate in 20-years based upon an average model predicted drawdown of 4-ft in Wetland H is given by:

$$Q = K\left(\frac{(H_2 - d) - H_1}{L}\right) A$$

Where:

d = drawdown
= 4 ft

Accordingly:

$$Q_{20\text{-year}} = 4.5 \times 10^{-5}\ \text{ft/min}\left(\frac{(1015.71 - 4) - 1066.80\text{ft})(33{,}110)}{3\text{ft}}\right)$$

= 22,154 gallons/day
= 0.67 gallons/day/ft²

III Therefore the total effect that the pumping of the groundwater recovery system for 20-years will have on the leakage rate from Wetland H is given by,

$$Q_{20\text{-year}} - Q_{\text{present day}} = \Delta$$

where: Δ = change in leakage rate

Accordingly: $\Delta = 22{,}154 - 20.83$

= 1611 gallons/day
= 0.049 gallons/day/ft²
= 7.8% increase in leakage rate

APPENDIX C
WATER BUDGET FOR COLESVILLE, NEW YORK

Water Budget Estimate
Colesville Landfill Compensation Wetlands Site

Water budget estimates were developed for the proposed Compensation Wetlands adjacent to the Colesville Landfill, Broome County, NY. Monthly water budget values were calculated based on temperature and precipitation data from Binghamton, NY. Estimates of potential evapotranspiration used in the budget were calculated by the Thornthwaite and Mather method (Thornthwaite and Mather, 1957). The budget form calculates monthly output values for: soil moisture storage, surplus, actual evapotranspiration and soil moisture deficit.

Water budget calculations require assumptions on the amount of water in the soil available for loss to the atmosphere (soil moisture capacity) and the ease with which this water may be withdrawn from the soil (soil moisture depletion function). The estimate of soil moisture capacity was based on data on typical bulk density and porosity data for hydric soils. Generally hydric soils have about 45% of their volume available for water storage at saturation. Rooting depth in wetland soils is typically limited to within the upper 15 inches of soil and this therefore corresponds to 6.85 inches of soil moisture storage from saturation. This corresponds to the available soil moisture capacity of 36 inches of Volusia soils (data from the Broome County Soil Survey) for unsaturated conditions. The soil moisture depletion function for heavy silty soils was used as an approximation of the Volusia soils.

Water budgets were run for average weather conditions of the last 20 years and the wettest (1976) and driest year (1964) within this period. Under average conditions there is a surplus of water (for runoff) through April. Then there is a drawdown of soil moisture reaching a maximum of 10 inches in soil depth in August. Recharge begins in September and is completed by October, when there is again a surplus of water. Under the wettest year conditions, the maximum soil moisture drawdown was to a depth of 1.5 inches. In contrast the driest year brought a drawdown of 11.8 inches in August. The estimated drawdown from this range of climatic extremes can be seen to be within an acceptable rooting depth range for wetland forest and shrub species.

The water budget estimates above **do not account** for an input of surface water from the watershed above the proposed wetland compensation area. The compensation wetland plan calls for the input of surface water to the wetland basin, whose elevation is set by the basin outfall elevation. Monthly estimates were made of stream flow for the project area watershed (borrow area and a portion of the landfill) from stream flow data for Newtown Creek at Elmira, NY (provided by USGS). These data suggest that under average conditions, 13.1, 7.1, and 6.0 ft. of water (for a 1 acre wetland/pond basin) is available each month during June, July and August respectively. During the driest year (1964) these months were estimated to have corresponding values of 4.2, 2.9, and 1.8 ft. for the months June July and August.

It can be seen from these estimates of soil moisture drawdown from the water budget and stream flow input additions, that sufficient hydrology should be available for wetland conditions. This is also based on the assumption that infiltration rates for the wetland/pond basin will be sufficiently low.

WATER BUDGET CALCULATIONS

Colesville, NY

YEAR IS AVERAGE

MO	TEMP	UPE	APE	PREC	DIFF	ST	DST	AE	DEF	SURP
1	-3.6	0	0	65	65	174	0	0	0	65
2	1.3	2	2	59	57	174	0	2	0	57
3	4.8	14	14	75	61	174	0	14	0	61
4	11.9	46	52	78	26	174	0	52	0	26
5	20.2	94	118	81	-37	141	-33	114	4	0
6	20.6	96	122	91	-31	118	-23	114	8	0
7	21.8	104	133	88	-45	91	-27	115	18	0
8	22.1	106	126	85	-41	72	-19	104	22	0
9	20.1	93	96	84	-12	67	-5	89	7	0
10	12.1	47	45	76	31	98	31	45	0	0
11	4.7	13	11	77	66	164	66	11	0	0
12	1.2	2	2	74	72	174	10	2	0	63
YEARLY TOTALS			720	933				661	59	272

TERMS

UPE = UNADJUSTED POT. EVAPO

APE = POTENTIAL EVAPOTRANSPIRATION

AE = ACTUAL EVAPOTRANSPIRATION

DST = CHANGE IN SOIL STORAGE

ST = SOIL MOISTURE STORAGE

PREC = PRECIPITATION

SURP = SURPLUS (RUNOFF)

TEMP = TEMPERATURE

DIFF = PREC-APE

DEF = DEFICIT (APE-AE)

WATER BUDGET CALCULATIONS

Colesville, NY

YEAR IS 1976

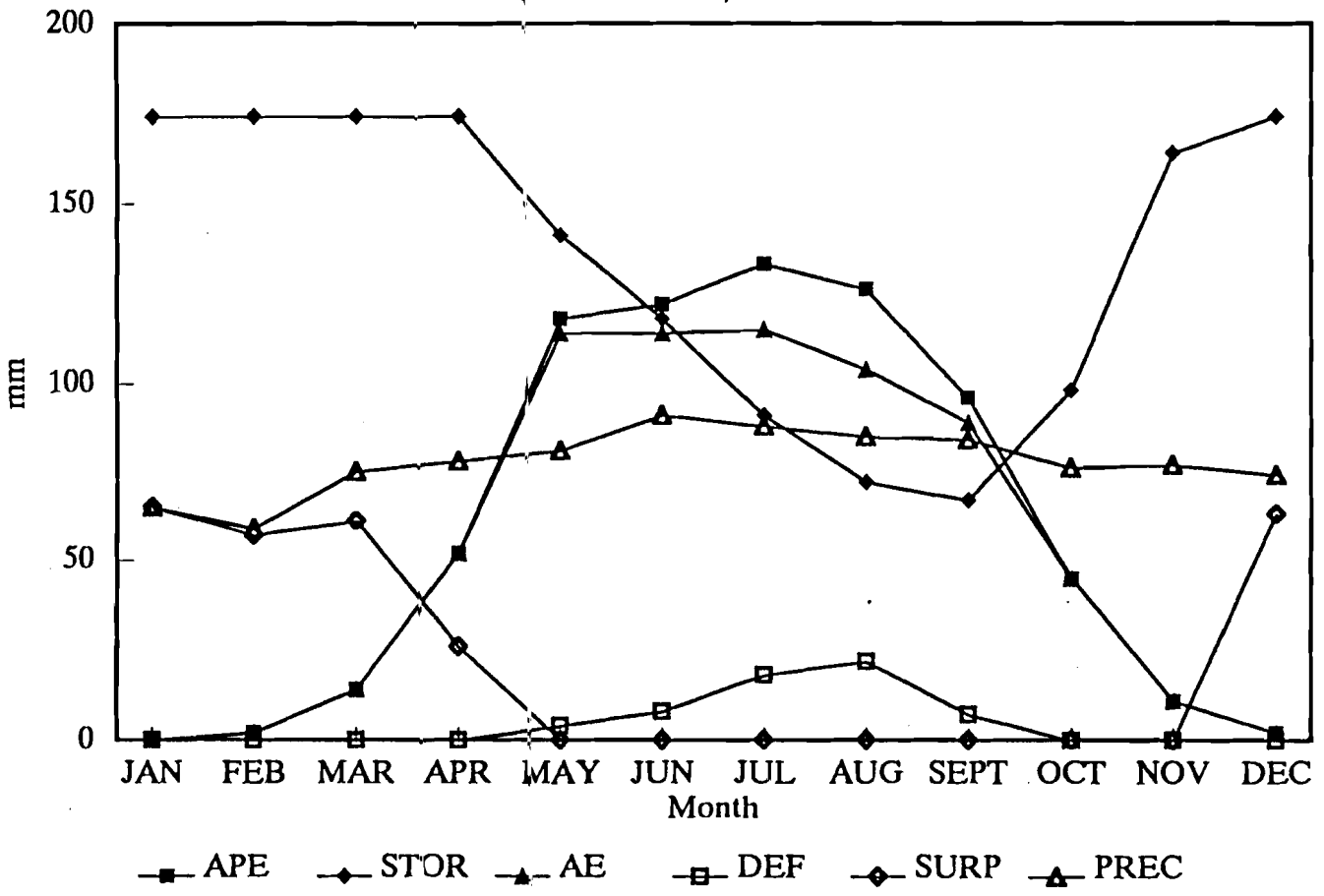
MO	TEMP	UPE	APE	PREC	DIFF	ST	DST	AE	DEF	SURP
1	-8.4	0	0	94	94	174	0	0	0	94
2	-.9	0	0	73	73	174	0	0	0	73
3	1.9	9	9	71	62	174	0	9	0	62
4	8.3	40	44	68	24	174	0	44	0	24
5	11.6	57	71	64	-7	167	-7	71	0	0
6	19.4	97	123	112	-11	157	-10	122	1	0
7	18.7	93	120	163	43	174	17	120	0	26
8	18.6	93	110	172	62	174	0	110	0	62
9	14.1	69	72	98	26	174	0	72	0	26
10	6.5	31	29	160	131	174	0	29	0	131
11	-.5	0	0	28	28	174	0	0	0	28
12	-6.5	0	0	43	43	174	0	0	0	43
YEARLY TOTALS			578	1146				577	1	569

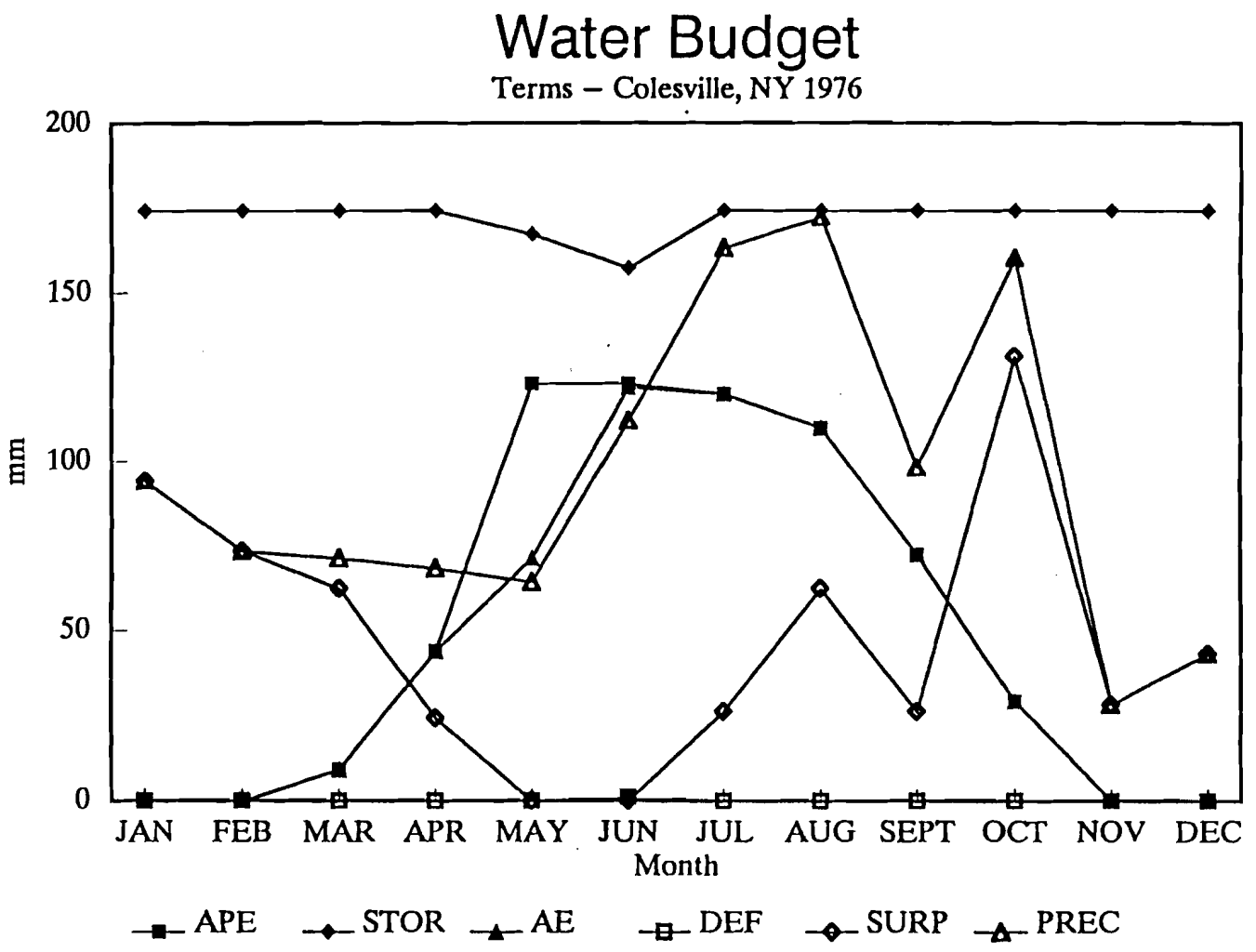
YEAR IS 1964

MO	TEMP	UPE	APE	PREC	DIFF	ST	DST	AE	DEF	SURP
1	-4.4	0	0	76	76	174	27	0	0	49
2	-7.3	0	0	51	51	174	0	0	0	51
3	-.1	0	0	116	116	174	0	0	0	116
4	6.1	27	30	129	99	174	0	30	0	99
5	14.7	70	88	51	-37	141	-33	84	4	0
6	16.7	81	102	31	-71	93	-48	79	24	0
7	21.3	106	136	122	-14	86	-7	129	7	0
8	18.4	90	107	47	-60	61	-25	72	35	0
9	16.2	78	80	17	-63	42	-19	36	45	0
10	9.1	41	39	27	-12	39	-3	30	9	0
11	6.1	27	21	48	27	66	27	21	0	0
12	-2.2	0	0	81	81	147	81	0	0	0
YEARLY TOTALS			603	796				481	123	315

Water Budget

Terms – Colesville, NY AVERAGE




Water Budget
Terms – Colesville, NY 1976
200
150
100
50
0
mm
JAN
FEB
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MAY
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AUG
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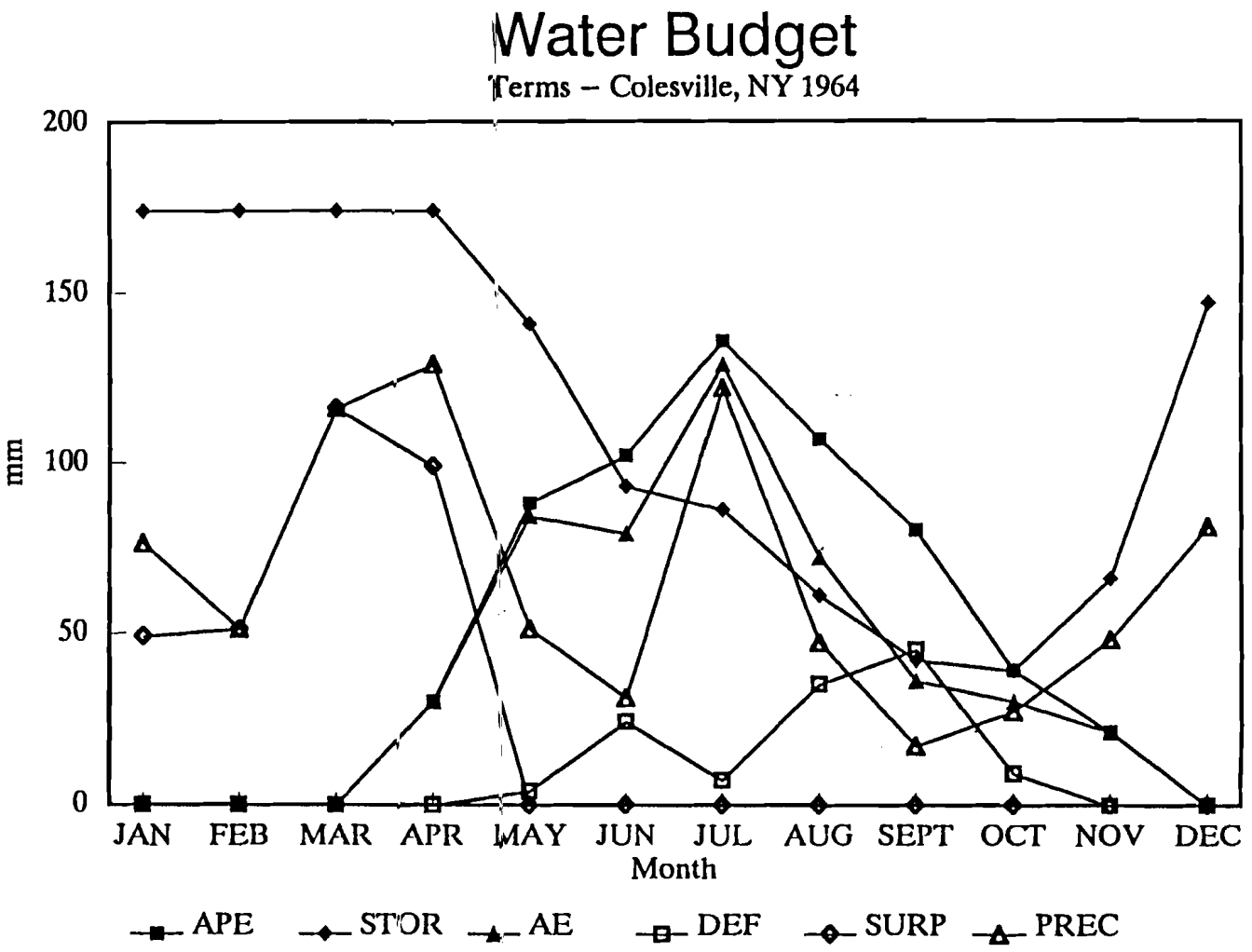
DEC
Month
APE
STOR
AE
DEF
SURP
PREC


Water Budget
Terms – Colesville, NY 1964
200
150
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JAN
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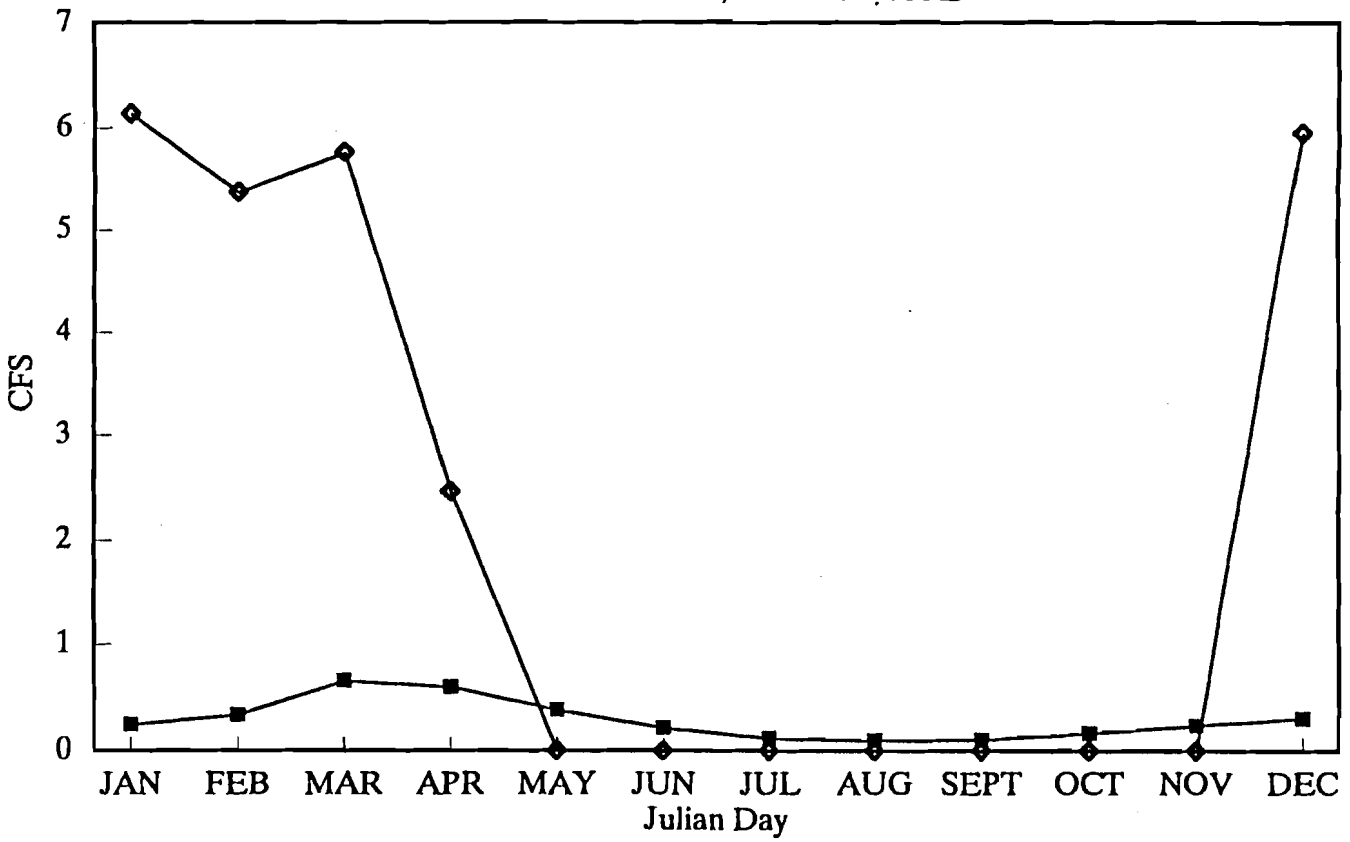
PREC

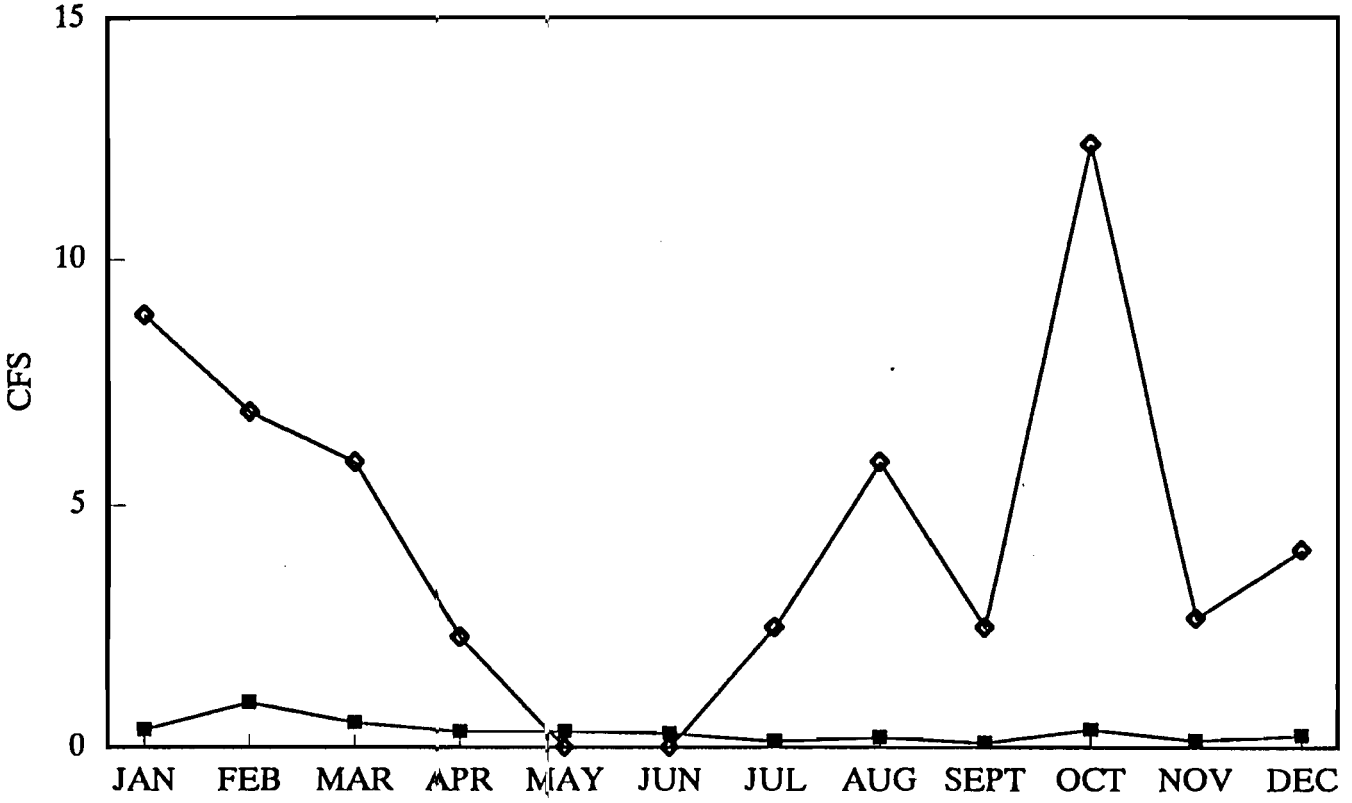
Water Budget

Terms – Colesville, NY AVERAGE



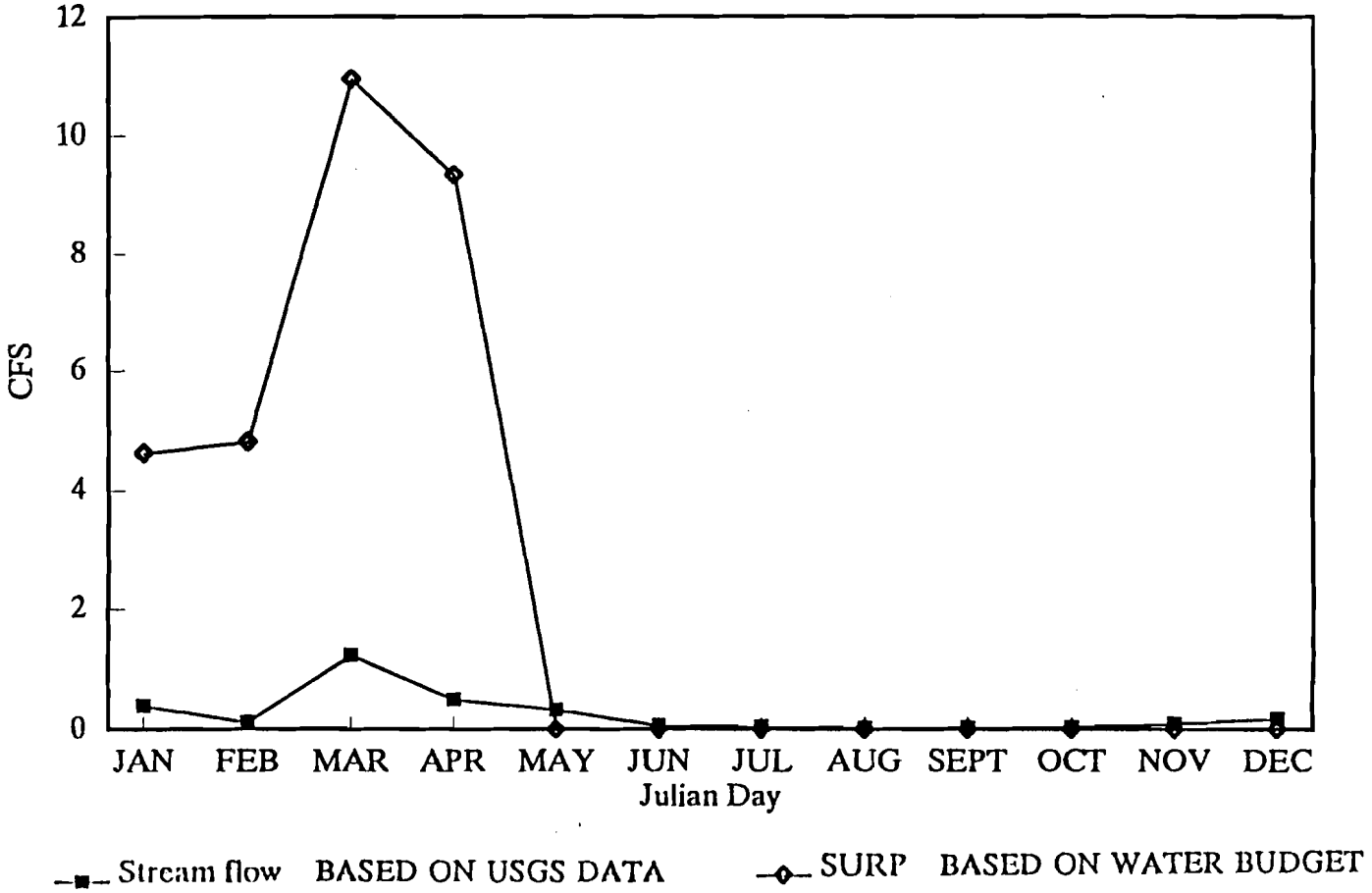
Water Budget

Terms – Colesville, NY 1976



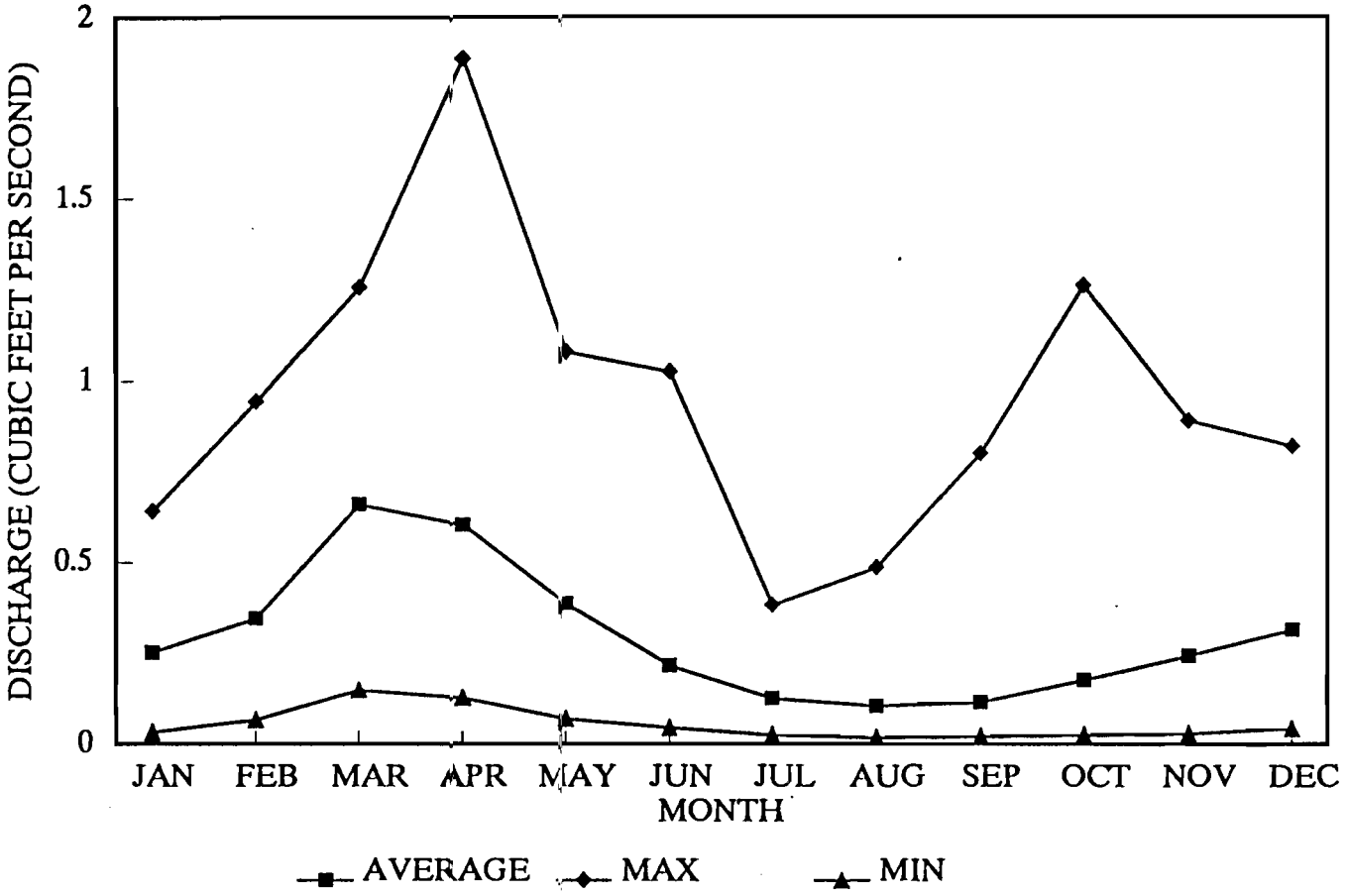
Water Budget

Terms – Colesville, NY 1964



STREAM FLOW

Colesville Borrow Area, NY



COLESVILLE LANDFILL

REMEDIAL DESIGN PROJECT

Wetland Survey Coordinates

Location	Northing	Easting
Z27B	788697.2720	771226.6785
Z17B	788707.8619	771222.8570
Z26B	788735.1807	771271.7693
Z18B	788775.6505	771297.8734
Z19B	788829.5800	771346.7255
Z24B	788852.5495	771375.6420
Z20B	788858.0126	771374.5358
Z21B	788872.0310	771422.4086
Z21B	788926.0068	771480.7839
Z23B	788872.4279	771422.4881
Z25B	788777.3791	771318.3158
SPKJC	788773.6623	771140.8853
T\W	788742.4969	771155.0083
Y1	788642.9432	771079.5897
Y2	788632.0721	771012.5161
Y3	788614.9089	770993.0040
TPPK8	788607.2083	770998.1730
Y10	788608.5638	771034.7033
Y9	788561.7428	770966.4230
Y8	788589.4258	770920.1916
Y7	788566.2290	770859.3101
Y7A	788550.5900	770816.8879
Y6A	788554.7737	770807.0686
Y6	788581.5962	770860.9848
Y5	788618.3780	770906.2643
Y4	788620.9374	770955.8878
P-1	788992.9323	771216.9462
P-2	788992.7925	771204.9661
P-53	788966.5759	771215.5280
P-52	788962.6878	771216.3855
P-54	788966.4190	771205.9183
P-51	788962.0628	771200.2625
P-3	788961.3400	771192.6956
P-4	788953.2300	771188.1027
P-5	788937.0096	771173.1735
P-50	788932.5036	771175.3975
P-49	788915.2811	771127.6853
P-6	788918.3110	771125.8609
P-7	788918.1292	771096.1902
P-48	788908.8537	771093.4828

NOTE: Location with P designation corresponds to Wetland B locations shown on the Wetland Delineation Map

COLESVILLE LANDFILL

REMEDIAL DESIGN PROJECT

Wetland Survey Coordinates

Location	Northing	Easting
P-47	788911.3039	771067.2462
P-8	788912.3267	771056.9424
P-9	788899.0547	771022.2258
P-46	788896.3326	771025.8280
P-10	788874.0610	770990.5684
P-45	788859.5648	770991.7980
P-11	788850.7973	770973.4876
P-12	788819.3616	770936.4771
P-44	788805.8310	770930.2823
P-43	788789.7016	770914.1590
P-13	788784.2731	770899.2714
P-42	788743.6460	770873.4670
P-14	788732.3860	770857.2007
P-41	788708.2185	770853.4793
P-15	788680.0596	770833.1042
P-40	788644.3280	770825.9919
P-39	788623.3379	770820.8942
P-16	788625.3124	770815.2067
P-17	788597.6059	770797.6080
P-18	788562.3295	770785.1546
P-38	788569.4720	770798.7770
P-37	788535.7885	770785.2855
P-19	788518.2380	770775.2852
P-36	788494.0447	770771.6455
P-35	788483.1380	770760.9295
P-34	788461.3044	770757.9936
P-20	788471.8354	770750.5726
P-33	788438.8686	770749.8306
P-21	788392.3107	770720.6886
P-32	788378.8648	770737.6713
P-22	788324.4647	770692.5633
P-31	788296.1777	770707.8103
P-23	788265.4221	770679.2749
P-30	788260.7530	770685.0857
P-29	788241.8895	770689.3702
P-28	788225.1700	770705.5158
P-24	788219.8391	770695.5805
P-28	788192.7565	770710.9973
P-25	788173.1403	770712.8768

NOTE: Location with P designation corresponds to Wetland B locations shown on the Wetland Delineation Map

COLESVILLE LANDFILL

REMEDIAL DESIGN PROJECT

Wetland Survey Coordinates

Location	Northing	Easting
Z49A	788113.1723	771160.7974
Z50A	788164.8692	771135.0989
Z51A	788229.7370	771140.4222
Z52A	788259.7418	771163.0827
Z53A	788293.8852	771212.2412
Z54A	788332.6990	771222.6832
Z55A	788391.6227	771269.5053
Z56A	788385.9821	771282.1589
Z57A	788408.6676	771322.9941
Z58A	788428.7123	771331.9578
Z59A	788427.6400	771323.2036
Z52A	788290.6447	771153.8355
Z34B	788279.8007	771096.5845
Z33B	788298.5817	771053.9602
Z9B	788312.1600	771028.8600
TPPK5	788391.0528	770994.4595
Z32B	788346.8163	771058.8375
Z31B	788428.9124	771057.5064
Z30B	788554.6964	771129.8973
Z14B	788561.8676	771113.8063
Z13B	788509.3933	771086.7602
Z12B	788434.6293	771035.1426
Z11B	788378.5254	771011.2799
Z10B	788348.2218	771003.3478
BWA3B	788387.6414	770929.8443
BWA4B	788332.4938	770883.8282
BWA5A	788308.5431	770840.5705
BWA4A	788352.6429	770879.4976
BWA3A	788396.9745	770912.1005
BWA2A	788454.3665	770955.5700
BWA2B	788454.1029	770969.6375
BWA1AB	788504.9583	770998.5367
TPPK6	788640.8562	771172.7430
TPPK7	788690.9086	771204.7614
Z15B	788579.6598	771154.2251
Z29B	788609.1210	771187.8261
Z28B	788644.8206	771227.6745
Z16B	788653.2364	771202.4554
Z27B	788697.2720	771226.6785

NOTE: Location with P designation corresponds to Wetland B locations shown on the Wetland Delineation Map

COLESVILLE LANDFILL

REMEDIAL DESIGN PROJECT

Wetland Survey Coordinates

Location	Northing	Easting
BWA8B	788193.3181	770791.5978
BWA7B	788208.8139	770803.7244
BWA7A	788216.8646	770796.2558
BWATH1	788240.6462	770814.5802
BWA6B	788234.1729	770822.6612
BWA6A	788248.6808	770807.7144
BWA5B	788294.3576	770851.7477
TPTJ1	788164.0645	770892.8449
BWA9A	788133.2057	770776.7330
BWA8A	788185.7365	770786.4822
Z2B	788137.0169	770828.0312
Z2A	788141.1484	770841.2602
Z3A	788150.3856	770848.5149
Z3B	788155.9508	770843.3578
Z4B	788178.0139	770870.1902
Z4A	788178.3451	770885.5214
Z5B	788209.3830	770904.3965
Z5A	788199.9401	770907.1175
Z6B	788238.9912	770946.3911
Z6A	788224.1403	770950.6684
Z7A	788247.5727	770980.6479
Z7B	788258.0401	770985.5309
Z8B	788272.7570	771019.1868
Z8A	788265.8564	771033.0281
TPTJ2	788177.0662	771087.0290
Z9A	788266.4353	771041.7466
Z10A	788234.8925	771087.3906
Z11A	788225.5664	771097.7529
Z12A	788169.9858	771053.1700
Z13A	788162.0899	771092.1788
Z14A	788100.3500	771127.7697
Z40A	787985.8933	771165.3752
Z41A	788055.8294	771189.6080
Z42A	788101.0392	771229.6728
Z45A	788139.5868	771354.6973
Z44A	788124.8956	771354.9728
Z46A	788132.4825	771288.6653
Z43A	788110.6034	771284.8364
Z47A	788124.4617	771243.5911
Z48A	788116.3483	771200.6375

NOTE: Location with P designation corresponds to Wetland B locations shown on the Wetland Delineation Map

COLESVILLE LANDFILL

REMEDIAL DESIGN PROJECT

Wetland Survey Coordinates

Location	Northing	Easting
P-27	788158.7475	770722.8278
P-26	788155.8519	770714.0058

NOTE: Location with P designation corresponds to Wetland B locations shown on the Wetland Delineation Map

APPENDIX F
EMERGENCY CONTACT LISTING

EMERGENCY RESPONSE AGENCIES AND CONTACTS

Regulatory Agencies – (Mandatory Within 2 Hours After Spill)

New York State Department of Environmental Conservation	(800) 457-7362

Oil and Hazardous Material Clean-up Contractors (if required)

IT Corporation, Stratford, CT	(203) 386-0100
Hitchcock, Bridgeport, CT	(203) 334-2161
Clean Harbors, Albany, NY	(518) 434-0149

Local Agencies (if required)

Broome County Sheriff, Binghamton, NY	(607) 778-1911
New York State Police, Binghamton, NY	(607) 775-1241
Local Police, Harpursville, NY	(607) 772-1010
Fire Department, Harpursville, NY	(607) 772-1010
Lourdes Hospital, Binghamton, NY	(607) 798-5231
Ambulance/Rescue Squad, Harpursville, NY	(607) 772-1010

Broome County (within 24 hours) Deputy for Engineering Services (Mike McElhare, Director)	(607) 778-2482