- Calibration Procedures:
    - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
    - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures.
- Data Reduction and Validation:
    - Data validation will be performed in accordance with the USEPA validation guidelines for organic and inorganic data review. Validation will include the following:
        - § Verification of 100% of all QC sample results (both qualitative and quantitative).
        - § Verification of the identification of 100% of all sample results (both positive hits and non-detects).
        - § A Data Usability Summary Report (DUSR) which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks.
- QA Performance and System Audits.
- Preventative Maintenance Procedures and Schedules.
- Corrective Action Measures.

3.8 Monitoring Reporting Requirements

Forms and any other information generated during regular monitoring events and inspections will be kept on file. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be: (1) subject to approval by NYSDEC and (2) submitted at the time of the Annual Site Management Report, as specified in the Reporting Plan of the SMP.

All monitoring results will be reported to NYSDEC on an Annual basis in the Site Management Report. Additionally, a quarterly report will be prepared that provides all logs and validated data collected during the subject quarterly report period. No data interpretation or evaluation will be included in the quarterly reports. If required by the NYSDEC for a specific sampling event, a report or letter will be prepared for submission. The report (or letter) will include, at a minimum:

- Date of event.
- Personnel conducting sampling.
- Description of the activities performed.
- Type of samples collected (e.g., groundwater, etc).
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.).
- Sampling results in comparison to appropriate standards/criteria.
- A figure illustrating sample type and sampling locations.
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (also to be submitted electronically in the NYSDEC-identified format).
- A copy of the laboratory certification.
- Any observations, conclusions, or recommendations.

- A determination as to whether groundwater quality conditions have changed since the last reporting event.

Reports and data will be provided in hard copy and digital format as requested by NYSDEC (See Section 5.4 of this SMP). A summary of the monitoring program deliverables are provided in Table 6.

3.9 Certifications

Site inspections and sampling activities will take place as outlined above. Frequency of inspection is subject to change by NYSDEC. Inspection certification for all ICs and ECs will be submitted to NYSDEC on a calendar year basis and must be submitted by March 31 of the following year. A qualified environmental professional, as determined by NYSDEC, will perform inspection and certification. Further information on the certification requirements are outlined in the Reporting Plan of the SMP (see Section 5.0 of this SMP).

4. Operation and Maintenance Plan

This section of the SMP provides the Operation and Maintenance Plan.

4.1 Introduction

This section provides a cursory overview of the OM&M Manual (1996 and 2005), which is provided in Appendix K of this SMP and will be kept at the Site along with the SMP. The OM&M Manual includes the basic measures necessary to operate and maintain the mechanical components of the selected Remedial Action for the Site, which consists of the following as outlined in Section 2.0 of this SMP:

- Landfill Cover System.
- Groundwater and Leachate Management System.
- Landfill Gas Management and Flare System.
- Stormwater Management System.
- Ancillary Systems (i.e., access roads, fencing, gates, locks, etc.).

This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the Site to operate and maintain the mechanical components of the Groundwater and Leachate Management System and the mechanical components of the Landfill Gas Management and Flare System.
- Includes an operation and maintenance contingency plan.
- Will be updated periodically to reflect changes in Site conditions. Any changes to this Section, due to changes in Site conditions or operation of these major components, will be reflected as addendums to the SMP.

Information on non-mechanical ECs can be found in Section 2 (EC/IC Plan) of this SMP.

As mentioned above, this Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the SMP. The Operation and Management Plan is subject to NYSDEC revision.

4.2 Engineering Control System Operation and Maintenance

This section describes the EC system operation and maintenance.

4.2.1 Landfill Cover System

The Landfill Cover System consists of the following design elements (from top to bottom):

- Vegetated topsoil layer.
- Loamy soil, barrier protection layer.
- Double-sided geocomposite, drainage layer.
- HDPE geomembrane.
- Single-sided geocomposite gas venting layer on the top portion of the landfill.
- Subbase layer. (Note: The subbase layer functions as the gas venting layer on the landfill side slopes.)

For monitoring, inspection, and maintenance purposes, the Landfill Cover System is divided into the following components:

- Grass cover/topsoil layer.
- Cover soil and cap components.

4.2.1.1. Scope

The O&M Contractor shall follow the monitoring, inspection, and maintenance procedures described, in detail, below, unless otherwise directed by the NYCDEP and NYSDEC. In cases where an O&M procedure could be modified to be more efficient, the O&M Contractor may propose a modification in writing to the NYCDEP and

NYSDEC. Any modifications to the procedures must be approved by the NYCDEP and NYSDEC prior to implementation.

- Inspect the grass cover, topsoil layer, cover soil and cap components on a monthly basis and after storms equal to or exceeding the two year 24-hour precipitation event (3.5 inches in 24 hours).

- Place readily visible markers on the landfill surface to delineate the 14 inspection zones, as shown on Figure 2-1 in Section 2 of Volume III of the OM&M Manual (1996 – provided in Appendix K of this SMP).

- Record all the observations at the time of inspection in Form FCS-1 (Appendix N of this SMP) and report all the deficiencies and problems observed in Form DP-1 (Appendix N of this SMP).

- Immediately repair the damage(s) observed to the Landfill Cover System with materials of construction specified in Contract No. HP-876.

4.2.1.2. Landfill Cover System Start-Up and Testing

System start-up and testing are not applicable to the Landfill Cover System.

4.2.1.3. Landfill Cover System Operation: Routine Operation Procedures

Routine operation procedures are not applicable to the Landfill Cover System.

4.2.1.4. Landfill Cover System Operation: Routine Inspection and Maintenance

The Landfill Cover System shall be inspected by the O&M Contractor on a monthly basis. The surface of the landfill shall be divided into zones as shown on Figure 2-1 of Volume III of the OM&M Manual (1996). Prior to the first inspection, readily visible markers shall be placed on the landfill surface to delineate the zones. The inspector shall perform the work in an orderly fashion completing all of the items in each zone prior to proceeding to the next zone. The inspector is required to walk up and down the sideslopes at least once in each zone to obtain close inspection of the slope conditions.

It is anticipated that the inspector will spend a minimum of 20 minutes inspecting each zone for the items listed on Form FCS-1 (provided in Appendix N of this SMP).

Additional time may be required if problems/deficiencies are observed. Observations shall be recorded at the time they are viewed. If no problems or deficiencies are observed in a given zone, the item shall be noted as satisfactory by inserting an "S" in the appropriate box on the Form. If adverse conditions are observed or if others conditions exist which deviate from the normal and could be deleterious to the landfill cover, in the opinion of the inspector, the appropriate checkbox should be marked as not satisfactory ("NS") and the location and problem noted on the form.

If the O&M Contractor cannot complete the required visual inspection due to overgrown vegetation, invasive species, or other obstructions, the O&M Contractor shall identify these conditions as a deficiency.

Surface Cracks

The O&M Contractor shall carefully check for surface cracks while walking up and down the slopes in each zone. Surface cracks may indicate serious problems, such as slope movement (slope stability below), or less serious conditions, such as desiccation cracking due to dry conditions. The O&M Contractor shall investigate observed cracks for depth and length, and note orientation with respect to the slope and record accurately on O&M Drawings. Cracks that are greater than about 20 feet long, 9 inches deep and 2 inches wide that are parallel to the slope should be noted on the checklist and immediately reported to the NYCDEP.

The O&M Contractor shall repair cracks deeper than 12 inches that are on mild slopes (i.e., slopes of 10% or less), and which appear to be the result of localized settlement or dry conditions. DO NOT fill cracks that are associated with general slope movement as this may aggravate situation. Refer to Section 2 of Volume III of the OM&M Manual (1996 – provided in Appendix K of this SMP) for detailed instructions.

The O&M Contractor shall repair minor cracks by filling with like material, compacting and reseeding area in accordance with the specifications for Contract No. HP-876.

Vegetative Growth

The O&M Contractor shall check for areas of vegetative stress on landfill surface, height of vegetative stand by zone, and the presence of any invasive species. Report areas of vegetative stress on appropriate checklist form and determine possible causes. Grasses should be of consistent quality without shrubs or trees with stem diameter greater than about 2 inches, except on vegetation islands (refer to record

drawings for Contract No. HP-876 for locations of vegetative islands). In general, vegetation shall be cut (mowed) to a height of 6 inches when general height of grasses exceeds 12 to 18 inches, or as directed by NYCDEP. Use tractor with mower attachment weighing less than 4000 pounds. Mow cross-slope rather than up or down slope, whenever possible. Mower shall mulch grass and grass clippings shall be left in place, unless it is determined that volume of clippings prevent proper inspection or present a possible fuel source/potential fire hazard; in this case, clippings shall be removed and properly disposed of off-site. As described in Section 3.2.1 of this SMP, a vegetation mowing schedule will be provided (subsequent to the issuance of this SMP) that is anticipated to include a rotating mowing schedule to minimize impacts to wildlife that use the Site.

Do not damage any wells, well heads, valves, fencing, lighting, culverts, structures, signage, manholes or other permanent features of the Landfill Cover System during mowing operations. The O&M Contractor shall repair, at his own expense, any items that may become damaged during the mowing operations.

Trim grasses along fence with suitable grass trimmers that will not damage fencing. Environmentally safe grass inhibitor may be used along fence lines with approval by NYCDEP.

Areas of vegetation stress shall be analyzed by the O&M Contractor for the cause. Note any gas odors and check for insect infestation or other parasites that could be the cause. Take sample of topsoil in affected areas and test for organic content, phosphorous, nitrogen, potassium, and pH.

If grasses are stressed due to lack of fertilization, apply fertilizer, as needed. If stressed due to lack of water and stand does not reestablish itself within 2 months, reseed affected area after dry period ends. Repairs shall be completed in accordance with the specifications of Contract No. HP-876.

In accordance with Section 2 of Volume III of the OM&M Manual (1996), the visual inspection shall include, but not be limited to, erosion, sinkholes, bare spots, wet spots, signs of ponding, dead spots of vegetation, the presence of undesirable species of vegetation (Phragmites is a wetland invasive species which, if found on the sideslope cover areas other than ditches, may indicate areas of ponding, settlement, or clogging of the surface drainage geocomposite). Furthermore, the O&M Contractor shall investigate and try to determine the cause and if the landfill cover is being negatively impacted. The use of herbicides to control the growth of invasive plant species may be

necessary, but will only be conducted (including product to use and method of application) as directed by the NYCDEP and approved by the NYSDEC.

Vector Penetration

Any evidence of burrowing animals observed by the inspector shall be recorded on the appropriate form. Check area for damage to geosynthetics by carefully hand excavating test pit near burrow holes. Note and repair any damage to geosynthetics in accordance with specifications for Contract No. HP-876. Replace original soil materials and hand compact, and reseed, if necessary. If significant damage is observed, notify NYCDEP and contract with an animal/wildlife control/management contractor to remove and relocate the burrowing animals, subject to NYCDEP approval.

Settlement

The O&M Contractor shall record, by zone, areas of localized differential settlement. These are areas that begin to pond water on the landfill surface. Mark locations on the O&M record drawings and repair according to the repair protocol in Section 2.4 of Volume III of the OM&M Manual (1996 – provided in Appendix K of this SMP).

Large depressions may require regrading of subsoils beneath the geomembrane and replacement of geosynthetics.

Erosion

The O&M Contractor shall record erosion by zone as not satisfactory ("NS") whenever rills or gullies exceed 4 inches deep. Inspect closely at top and base of sideslopes, around vegetation islands, around structures and at the outlets of all piping. Repair erosion immediately to match the surrounding grades. Use like materials for each layer of the cover eroded or damaged. For erosion approaching the depth of the top of the geocomposite drainage layer (approximately 30 inches), inspect geosynthetics for damage.

Erosion may indicate that some portion of the Stormwater Management System is not functioning correctly. Examples of this could be sediment impeding water flow through culverts, debris clogging water inflow through the openings of grates or trashracks, or differential settlement along drainage ditches contributing to stormwater overtopping the drainage systems. When erosion is identified, investigate these, or other possible

causes. Repair with like materials and reseed or replace topsoil, crushed base course or rip rap in accordance with the specifications for Contract No. HP-876. Record areas of erosion on the O&M record drawings (Refer to Section 5.0 of Volume I of the OM&M Manual [2005 – provided in Appendix K of this SMP]).

Slope Stability

The O&M Contractor shall check for indications of slope movement in each zone. Slope movement may be identified by large displacements or cracks in the soil mass. Early signs of slope movement can also appear as bulging of the soil materials near the base of the potential failure. Mark the checkbox "NS" when any of the conditions described are observed.

For cracks oriented parallel to the slope with a minimum length of 20 feet, depth of 9 inches and width of 2 inches, the O&M Contractor shall install 1- foot-long steel bars into soil on either side of cracks for future reference measurements. Check and record distance between steel bars with a tape measure initially and on a frequent basis for the next 2 weeks (i.e., possibly daily, depending on the extent of the cracking) or as instructed by NYCDEP.

Any observable slope movement is serious in nature. The area in question should be noted on the checklist as "NS" and recorded on the O&M record drawings. Notify the NYCDEP immediately. Refer to the Contingency Plan in Section 6.0 of Volume I of the OM&M Manual (2005 – provided in Appendix K of this SMP) for further instructions.

Seepage

The O&M Contractor shall check the sideslopes in each zone carefully for seepage. Mark the checkbox not satisfactory ("NS") for each zone where seepage is observed. Note the location on the slope. Note if there is odor or other indications that the seepage could be leachate. Provide this information in the description of the deficiency/problem.

Clean seepage water may indicate that there is a problem with the cover drainage system. The drainage system may be clogged in an area or is not functioning correctly for some other reason. Seepage near the alignment of the 24-inch diameter corrugated HDPE stormwater piping may indicate a broken collection pipe or subdrain lateral (6-inch diameter HDPE corrugated slotted pipe). Notify NYCDEP of the condition. Check baffled outlet weepholes for clogging and clean, if necessary.

Seepage of leachate may indicate that the geomembrane liner has ruptured and that liquids may have accumulated beneath the landfill geomembrane. Hand excavate materials to the level of the geosynthetics by following the seepage path and check integrity of the membrane liner at the point of seepage origin. DO NOT damage geosynthetics during uncovering operations. Any accumulation of leachate behind the geomembrane could indicate a serious condition. Notify the NYCDEP and refer to the Contingency Plan in Section 6.0 of Volume I of the OM&M Manual (2005 – provided in Appendix K of this SMP) for further instructions.

Vandalism

The O&M Contractor shall check for indications of vandalism, illegal dumping, or other damage to the Landfill Cover System from sources not related to the elements (i.e., high winds, heavy rainfall, etc.). Report any such damage or dumping to the NYCDEP and, if directed, to the local police authorities immediately. Concurrently, inform on-site security personnel of each occurrence. Repair damage from vandals to original condition.

Sediments and Debris Removal and Disposal

All sediments removed as part of the maintenance work described herein shall be properly disposed of by the O&M Contractor in accordance with the SoMP (see Section 2.3.2 of this SMP). The O&M Contractor shall determine if sediments are contaminated prior to disposal or on-site stockpiling. Sediments may be assumed to be uncontaminated if there are no breaches of the HDPE geomembrane liner. The O&M Contractor shall notify the NYCDEP as to the location and disposal of any contaminated sediment. Any debris or refuse removed from the Stormwater Management System shall be properly disposed of off-site.

Small quantities of uncontaminated sediments (less than 20 cubic yards), may be disposed by spreading thinly over a large area of the site. Larger quantities (up to 500 cubic yards) may be stockpiled on-site, allowed to drain, and reused as fill in other Landfill Cover System repair operations.

4.2.1.5. Landfill Cover System Operation: Non-Routine Inspection and Maintenance

All the monthly inspections described above should also be performed after storms equal to or exceeding any two-year 24-hour precipitation event (3.5 inches in 24

hours). All the forms and reports required for the monthly inspection shall also be completed.

4.2.2 Groundwater and Leachate Management System

In 1991, to mitigate landfill leachate that was entering Eastchester Bay from the Site, the City of New York designed and installed an IRM. IRM construction activities began in January 1992. The IRM system, called the "150 Day System", consisted of five 20,000-gallon storage tanks, five interceptor wells, a force main that conveyed the discharge from the interceptor wells and a nearby sump to the storage tanks, and expansion of the existing French drain system. Leachate was conveyed to the five storage tanks and then transported to the Hunts Point WPCP. The IRM system is no longer in use, and leachate collected by the present day Groundwater and Leachate Management System is transferred to the Hunts Point WPCP for treatment. During heavy rain events, the leachate is stored on site in the five IRM 20,000-gallon tanks. The leachate is temporarily stored in the tanks until normal sewer flow rates resume, at which time the leachate is transferred to the Hunts Point WPCP for treatment.

The current Groundwater and Leachate Management System was designed to prevent groundwater from entering the Site and remove leachate from the landfill to protect groundwater from contamination and limit discharges into the surrounding environment, including Pelham Bay Park and Eastchester Bay.

The groundwater component of the Groundwater and Leachate Management System consists of the following:

- A cut-off wall installed between the Site and Pelham Bay Park.
- An upgradient groundwater collection drain that was constructed on the Pelham Bay Park side of the cut-off wall.
- Fourteen groundwater monitoring wells and six piezometers used to measure groundwater elevations.

The leachate component of the Groundwater and Leachate Management System consists of the following:

- Downgradient collector drains, collection manholes, and collection sumps.

- Curtain drain that collects leachate from the west side of the Site.
- Lift Stations Nos. 1 and 2.
- Force main that discharges leachate to the Hunts Point WPCP.
- Leachate storage tanks (five 20,000-gallon) that are only used to store leachate during heavy rain events when direct discharge to the NYCSS is not permitted. Collected leachate stored in storage tanks is drained to Collection Sump D-1, which then discharges the leachate through a force main to the Hunts Point WPCP.
- The pump in Collection Sump D-1 is equipped with automated valves and shut-offs to prevent pumping to the force main during a CSO event. A remote telemetry unit receives signals from an on-site rain gauge and the CSO event signal and is integrated with the NYCDEP's central monitoring system (DYNAC system). The DYNAC system is also connected to the storage tanks which are filled during a CSO event. If Lift Station No. 1 fails to shutoff when the storage tanks are filled or if the Collection Sump D-1 pump fails to stop pumping, the DYNAC system sets alarms off in the main control panel at the Site.

The Groundwater and Leachate Management System design information is included in Volume III of the OM&M Manual (1996) provided in Appendix K of this SMP.

4.2.2.1. Groundwater and Leachate Management System Start-Up and Testing

Section 4.2 of Volume III of the OM&M Manual (1996) (see Appendix K herein) lists major subsystems and components, normal operation, automatic operation procedures, manual operation procedures, alarms and interlocks, and emergency operation procedures for each component of the Groundwater and Leachate Management System.

4.2.2.2. Groundwater and Leachate Management System Operation: Routine Operation Procedures

The Groundwater and Leachate Management System is comprised of 15 components (see Figures 2-4 through 2-9 in Volume I of the OM&M Manual [2005] provided in Appendix K herein), as listed below; Sections 4.2.1 through 4.2.15 in Volume III of the

OM&M Manual (1996) (see Appendix K) provide operational procedures for each of these components:

- Downgradient Collection Drains and Manholes:
    - The collector drain to the north of Manhole D-5, which drains northward to Manhole D-1. This manhole is equipped with two submersible pumps and is called Collection Sump D-1.
    - The collector drain to the south of Manhole D-6, which drains southward to Manhole D-8. This manhole is equipped with two submersible pumps and is called Collection Sump D-8.
    - The collector drain to the east of Manhole D-9, which drains eastward to Manhole D-10. This manhole is equipped with two submersible pumps and is called Collection Sump D-10.
    - Automatic or manual controls are not required for operation of the downgradient collector drain because it is a gravity system.
- Leachate Collection Sumps D-1, D-8, and D-10: Collection Sumps D-1, D-8, and D-10 are equipped with two submersible pumps each. Collection Sump D-1 discharges to a sewer manhole at Burr Avenue under normal conditions. During a storm event, leachate discharge to the sewer will stop to prevent overload of the NYCSS. A storm event is detected by a high level in the Burr Avenue sewer manhole. Upon detection of a storm event, discharge from Collection Sump D-1 is automatically directed (via Lift Station No. 1) to the leachate storage tanks, where it is held until surcharging of the sewer dissipates (i.e., end of storm event). At the end of the storm event, the leachate tanks automatically drain back to Collection Sump D-1 and the discharge from Collection Sump D-1 is automatically redirected to the Burr Avenue manhole.
- Curtain (or French) Drain: The Curtain Drain consists of a perforated HDPE pipe that is located at the bottom of a gravel-filled collection trench and gravity drains to Lift Station No. 1.
- Lift Station Nos. 1 and 2: Lift Station No. 1 diverts flow from Collection Sump D-1 to the leachate storage tanks under storm conditions; Lift Station No. 2 discharges directly to Collection Sump D-1.

- Each lift station operates with a pair of Ebara submersible pumps in a duty/standby configuration, which are alternated for operation in 8-hour intervals when they are in the "AUTO" position (under normal conditions) on the sump control panel.

- For each pump there is also a three position switch (AUTO-OFF-HAND) which controls operation of the pump. With this switch in the AUTO position, the operation of the pump is controlled by the level switches located in the collection sump. In the HAND position, the pump will run without reference to the level switches. Under normal operating conditions this switch should be in the AUTO position.

- Force Mains Heat Tracing: Two heat tracing systems that are in place on the aboveground force mains to protect from freezing; these systems include: a primary system, which is controlled by an ambient temperature sensing thermostat at 40° F, and a secondary system, which is controlled by a pipe temperature sensing thermostat set at 30° F. There is no heat tracing on the below grade force mains.

- Decon Trailer Sump: The Decon Trailer referenced in the OM&M Manual has been removed from the Site and the Decon Trailer Sump is no longer in use. There is no O&M associated with the Decon Trailer Sump.

- Gravel Decon Pad/Area Sump: The Gravel Decon Pad/Area Sump with pumps is present at the Site and only pumps rain water that collects in the sump to the Tanks. There is minimal O&M associated with the Gravel Decon Pad/Area Sump. Inspection of the pumps and equipment are performed routinely.

- Leachate Storage Tanks: Five tanks comprise the leachate storage tank system. These tanks are used only in an emergency or during major storm events, where the leachate cannot be conveyed to the sewer system due to capacity. Leachate in the five tanks is equalized; however, individual tanks can be isolated to drain into tankers so that the leachate can be transported to the treatment plant; however, under normal conditions, leachate received by the tanks is discharged continuously by gravity drainage to Collection Sump D-1 for discharge to the NYCSS. During major storm events, the discharge line from the storage tanks will close automatically (Valve V-3) and the tanks will be used to hold leachate until the end of the storm event.

- Leachate Storage Tank Containment Sump: Two pumps (duty/stand-by configuration) that transfer any leachate that may have leaked from the leachate storage tanks, accumulated rainwater and leachate that is gravity discharged to the sump through the leachate storage tank drain, back into the storage tanks. The pumps are automatically controlled by an adjustable conductance-actuated level switch that stops the pumps at a low level, starts the lead pump at a high level, and starts the stand-by pump at a high-high level.

- Carbon Adsorption System for Storage Tank Off-Gas: The Carbon Adsorption System is normally not operated. Prior to the construction of the force main system, this system was continuously operated for off-site leachate disposal. Compressed air was forced through the tanks and out through a pair of carbon vessels where the volatile organic compounds were removed. Currently, the system is a passive vent system, and when in use during CSO events, vapor or air discharged from the tanks is treated.

- Force Main Discharge to POTW: Under normal conditions, the force main discharges leachate below ground to the NYCSS. Section 4.2.2 (Control System after Completion) of Contract No. HP-877 found in Volume III of the OM&M Manual (1996) (see Appendix K) details the changes.

- Storage Tank Off-loading and Tanker Loading: The Storage Tank Off-loading and Tanker Loading area is present at the Site, but is inactive. Under normal operating conditions, the tanker loading pumps operate in the automatic mode. Both pumps are used to load a tanker to minimize the transfer time. A butterfly valve (normally closed) on the discharge side of the pumps can be opened to re-circulate leachate back to the storage tanks. This was the typical manner for disposing of leachate off-site prior to completion of Contract No. HP-877. The primary method for leachate disposal off-site is now through the use of the force main. The system remains in place in case the force main becomes temporarily unavailable or if trucking of leachate is required to free up capacity within the POTW pipe network.

- Central Control Alarm Panel: The Central Control Alarm Panel is located in the security trailer. During normal operations, the Central Control Alarm Panel informs the O&M Contractor or security personnel of any high sump level conditions and the status of each pump located in the Groundwater and Leachate Management System, with the exception of pumps located in Sumps D-1, D-8, and D-10.

- Motor Control Center: The Motor Control Center consists of a 480 V, AC 3 phase, 3 wire 400A bus feed with a voltmeter, kilowatt-hour meter, a kilowatt meter, and ammeter. The meters are used to monitor the performance of the Motor Control Center. Under normal conditions, the draw out disconnect devices are left to the "On" position and all are active circuits.

- Cut-off Wall and Collector Drain: The primary purpose of the cut-off wall and collector drain is to minimize or eliminate groundwater from migrating onto the Site. The cut-off wall will also help to control the migration of landfill leachate from entering the Pelham Bay Park. Through use of the cut-off wall, groundwater levels in Pelham Bay Park are maintained 1 foot higher than on the Landfill side. The collector drains (i.e., upgradient [for groundwater] and downgradient [for leachate]) and manholes are a gravity-feed system.

4.2.2.3. Groundwater and Leachate Management System Operation: Routine Equipment Maintenance

Section 4 of Volume III of the OM&M Manual (1996) (see Appendix K herein) describes the operation and management procedures for the Groundwater and Leachate Management System. Section 4 of Volume III of the OM&M Manual (1996) is divided into five subsections, as follows: Section 4.1 provides a general overview of the system. Section 4.2 lists and describes (in detail) the major subsystems and components. Section 4.3 outlines the monitoring requirements and maintenance procedures for each component. Section 4.4 provides detailed procedures for troubleshooting all components; and Section 4.5 identifies spare parts required for the system. Appendix N of this SMP provides the Inspection Checklist Forms so that the O&M Contractor can manage, operate, and repair the Groundwater and Leachate Management System. These Inspection Checklist Forms have been developed to aid the O&M Contractor with determining if the system is operating correctly. The major monitoring requirements for the Groundwater and Leachate Management System are presented below:

- Daily recording of the Collection Sump D-1 to the force main flow totalizer reading.

- Twice weekly inspection of the Collection Sumps (D-1, D-8 and D-10), curtain drain, lift stations, force main discharge to the Hunts Point WPCP, and the cut-off wall and collector drain.

- Monthly inspection of the manholes and sumps.

- Semi-annual inspection of monitoring wells.

- Semi-annual sampling of groundwater and leachate.

Routine inspection and preventative maintenance information for the subsystems that comprise the Groundwater and Leachate Management System are discussed below. Detailed information for each component is available in Section 4.3 of Volume III of the OM&M Manual (1996) (see Appendix K herein). Additional maintenance procedures for each component are included in Appendix B1 of Volume III of the OM&M Manual (1996). The O&M Contractor should use this information as a guideline.

The O&M Contractor shall record all the observations at the time of inspection on Inspection Checklist Forms GWL-1, GWL-2, and GWL-3 and report all the deficiencies and problems observed on Inspection Checklist Form DP-1 (Appendix N of this SMP). In general, routine monitoring includes the following:

Downgradient Collection Drains

Drains should be inspected regularly for sediment accumulation and possible obstructions that may restrict flow.

Collection Sumps (D-1, D-8 and D-10)

Sumps should be inspected on a regular basis to ensure proper operation of all components within the sumps (fittings, wiring, pump, etc.).

Curtain (French) Drain

The curtain drain should be inspected on a 6 month frequency, or more frequently if warranted, for obstructions within the pipe.

Lift Station Nos. 1 and 2

The lift stations should be inspected on a regular basis to ensure proper operation of all components (sensors, pumps, fittings, etc.).

Decontamination Trailer Sump

The Decontamination Trailer referenced in the OM&M Manual has been removed from the Site. There is no O&M required.

Gravel Decon Pad/Area Sump

The Gravel Decon Pad/Area Sump with pumps is present at the Site, and only pumps rain water that collects in the sump to the Tanks. There is minimal O&M associated with the Gravel Decon Pad/Area Sump. Inspection of the pumps and equipment are performed routinely.

Storage Tank Containment Area Sump

The storage tank containment area sump should be inspected on a regular basis to ensure proper operation of all components (sensors, valves, pump, etc.).

Force Main Discharge to POTW

The force main discharge to POTW should be inspected on a regular basis to ensure proper operation of all components (flow, valves, build up in the lines, etc.). Collection Sump D-1 will discharge directly to the sewer manhole at Burr Avenue under normal conditions.

Storage Tank Off-loading and Tanker Loading

The Storage Tank Off-loading and Tanker Loading area is present at the Site, but is inactive. Under normal operating conditions, the tanker loading pumps operate in the automatic mode. Both pumps are used to load a tanker to minimize the transfer time. A butterfly valve (normally closed) on the discharge side of the pumps can be opened to re-circulate leachate back to the storage tanks. This was the typical manner for disposing of leachate off-site prior to completion of Contract No. HP-877. The primary method for leachate disposal off-site is now through the use of the force main. The system remains in place in case the force main becomes temporarily unavailable or if trucking of leachate is required to free up capacity within the POTW pipe network. The storage tank-off loading and tanker loading system will be inspected prior to the loading of tankers to ensure proper operation of all components (maintaining proper oil flow and temperature, pump seal, packing, switches, flow, etc.) in case the force main is temporarily out of commission.

Motor Control Center

On a monthly basis, the O&M Contractor shall check operation of all circuit breakers; check operation of all electrical controls; check indicator lamps and switches on the Central Control Alarm Panel and all local control centers (and replace as needed); check the operation of the following: all motor starters, all overload relays and auxiliary contacts, all motor circuit protectors, all control relays, and all other electrical controls; and check and replace fuses, indicator lamps and switches, as needed.

Groundwater System

The groundwater system should be inspected on a regular basis to ensure proper operation of all components. Most importantly, the cut-off wall should be examined for settling and the collector drains and manholes should be inspected to ensure that adequate flow is being achieved and no blockages exist.

4.2.2.4. Groundwater and Leachate Management System Operation: Non-Routine Equipment Maintenance

Section 4 of Volume III of the OM&M Manual (1996) (see Appendix K herein) describes the operation and management for the Groundwater and Leachate Management System. Section 4.2 of Volume III of the OM&M Manual lists major subsystems and components, normal operation, automatic operation procedures, manual operation procedures, alarms and interlocks, and emergency operation procedures for each component of the Groundwater and Leachate Management System. Section 4.4 of Volume III of the OM&M Manual provides detailed procedures for troubleshooting all components.

Warning devices and alarms have been installed at the pumps and the Central Control Alarm Panel is located in the security trailer. During normal operations, the Central Control Alarm Panel informs the O&M Contractor or security personnel of any high sump level conditions and the status of each pump located in the Groundwater and Leachate Management System, with the exception of pumps located in Sumps D-1, D-8, and D-10, which have their own alarm panel. In general, non-routine maintenance may be required for any of the following components:

Downgradient Collection Drains

Drains may need to have sediment accumulation and possible obstructions that may restrict flow removed. Non-routine inspection or sediment removal would be triggered by a decrease of available water.

Collection Sumps (D-1, D-8 and D-10)

Non-routine maintenance would be triggered in the event of a pump failure or an alarm event. If required, sumps should be inspected to ensure proper operation of all components within the sumps (fittings, wiring, pump, etc.). Sump pumps may be operated manually. Each sump houses a pair of Flyght submersible pumps. The pumps in all three sumps are identical and therefore the backup pump can be utilized at any of the sumps. The pumps have been sized so that under normal operation, only one pump is required to operate the system. In the event of serious emergency, the O&M Contractor shall consult the Correction Action Process in Section 6.2 of Volume I of the OM&M Manual (2005) (see Appendix K herein).

Curtain (French) Drain

The curtain drain should be inspected for obstructions within the pipe if restricted flows are observed. Obstructions that may restrict flow must be removed.

Lift Station Nos. 1 and 2

Non-routine maintenance would be triggered in the event of a pump failure or an alarm event. In addition to the normal water level alarms monitored at the Central Control Alarm Panel, three additional alarm conditions are monitored. They are "P Fault" (Pump is inoperable), "P Seal Failed" (Oil level is low indicating seal has failed), and "P Temp High" (which is activated when the temperature in the pump is high). The pumps in all three lift stations are identical and therefore the backup pump can be utilized at any of the lift stations. The pumps have been sized so that under normal operation, only one pump is required to operate the system. The lift stations should be inspected to ensure proper operation of all components (sensors, pumps, fittings, etc). Each lift station houses a pair of Ebara pumps operating in duty/standby configuration. In the event of serious emergency, the O&M Contractor shall consult the Correction Action Process in Section 6.0 of Volume I of the OM&M Manual (2005) (see Appendix K herein).

Force Main Heat Tracing

In the event of serious emergency, the O&M Contractor shall consult the Correction Action Process in Section 6.0 of Volume I of the OM&M Manual (2005) (see Appendix K herein).

Decontamination Trailer Sump

The Decontamination Trailer referenced in the OM&M Manual has been removed from the Site. There is no non-routine O&M required.

Gravel Decon Pad/Area Sump

Non-routine maintenance would be triggered in the event of a pump failure or an alarm event indicating high water level. The Gravel Decon Pad/Area Sump currently pumps rain water that collects in the sump to the Tanks. Inspection of the pumps, sensors, and equipment will be performed and damaged components replaced.

Leachate Storage Tanks

Non-routine maintenance would be triggered in the event of a pump failure, an alarm event indicating high water level, or the failure of the tanks to stop discharging when called upon by the main control panel. Five tanks comprise the leachate storage tank system, which are used only in an emergency or during major storm events, where the leachate cannot be conveyed to the sewer system due to capacity. Leachate in the five tanks is equalized. In the case of an emergency or if a tank begins to leak, individual tanks can be isolated to drain into the Leachate Storage Tank Sump and pumped back into the tanks with the leaking tank isolated. In the event of serious emergency, the O&M Contractor shall consult the Correction Action Process in Section 6.0 of Volume I of the OM&M Manual (2005) (see Appendix K herein).

Leachate Storage Tank Containment Sump

Non-routine maintenance would be triggered in the event of a pump failure or an alarm event indicating high water level or other problem. Two pumps (duty/stand-by configuration) transfer leachate that may have leaked from the leachate storage tanks, accumulated rainwater, and leachate that is gravity discharged to the sump through the leachate storage tank drain, back into the storage tanks. The pumps are automatically controlled by an adjustable conductance-actuated level switch which stops the pumps at a low level, starts the lead pump at a high level, and starts the stand-by pump at a high-high level. The pumps have been sized so that under normal operation, only one pump is required to operate the system. In the event that an alarm is signaled due to high water level alarm, the submersible pump can easily be changed. In the event of serious emergency, the O&M Contractor shall consult the Correction Action Process in Section 6.0 of Volume I of the OM&M Manual (2005) (see Appendix K herein).

Force Main Discharge to POTW

Non-routine maintenance would be triggered in the event that Collection Sump D-1 is working properly; however, the force main will not accept the discharge. The force main discharge to POTW should be inspected to ensure proper operation of all components (flow, valves, build up in the lines, etc.). Collection Sump D-1 will discharge directly to the sewer manhole at Burr Avenue under normal conditions. During a storm event, leachate discharge to sewer will stop to prevent overload of the NYCSS. An ultrasonic level device installed at CSO 22 is set to transmit a signal when the water level reaches critical levels. At these levels, a signal is sent to the valve control system and the valve to allow leachate to be discharged to the force main is either opened or closed as appropriate. In the event of serious emergency, the O&M Contractor shall consult the Correction Action Process in Section 6.2 of Volume I of the OM&M Manual (2005) (see Appendix K herein).

Storage Tank Off-loading and Tanker Loading

There is no non-routine maintenance of this system. Currently, this system is not operational.

Central Control Alarm Panel

The Central Control Alarm Panel is located in the security trailer. In the event of an emergency with the Central Control Alarm Panel, a general site walk-through shall be undertaken to inspect the Groundwater and Leachate Management System and the problem determined. For other serious conditions, the O&M Contractor shall consult Section 6.0 Correction Action Process in Volume I of the OM&M Manual (2005) (see Appendix K herein).

Motor Control Center

In the event of a failure of the Motor Control Center, the O&M Contractor shall check operation of all circuit breakers, check operation of all electrical controls, check indicator lamps and switches on the Central Control Alarm Panel and all local control centers and replace as needed, check the operation of the following: all motor starters, all overload relays and auxiliary contacts, all motor circuit protectors, all control relays, all other electrical controls, check and replace fuses, indicator lamps and switches as needed. In the event of an emergency with the Motor Control Center, the O&M Contractor shall notify an authorized electrical technician immediately. For other

serious conditions, the O&M Contractor shall consult Section 6.0 Correction Action Process in Volume I of the OM&M Manual (2005) (see Appendix K herein).

4.2.3 Landfill Gas Management and Flare System

The Site Landfill Gas Management and Flare System includes the following elements: landfill gas extraction wells, lateral well connections, header pipe, condensate systems, transfer systems and a treatment system. The Landfill Gas Management and Flare System has two main components for this Site: the Landfill Gas Collection System and the Blower/Gas Flare System. These combined systems work together to collect, monitor and control gas emissions associated with the landfill. Figure G-1 of the CCR (2002) (see Appendix J herein) shows the layout of the Landfill Gas Collection System and the location of the Gas Flare System.

The Landfill Gas Collection System component consists of the following elements:

- Twenty-two landfill gas extraction wells.
- A gas venting layer at the surface of the landfill.
- A perimeter gas collection pipe around the base of the landfill.

The Blower/Gas Flare System component consists of the following elements:

- Condensate separator.
- The blowers.
- The enclosed flare.
- A 10-inch control valve immediately upstream of the blowers and a 10-inch flow meter downstream of the blowers.

The Landfill Gas Management and Flare System design information and as built drawings are included in Volume III of the OM&M Manual (1996), which is provided in Appendix K of this SMP.

4.2.3.1. Scope

The operation and management for the Landfill Gas Management and Flare System is described in sufficient detail to allow the O&M Contractor to operate, maintain, and service the system in Section 5 of Volume III of the OM&M Manual (1996) (see Appendix K herein). Section 5 of Volume III of the OM&M Manual (1996) is divided into six subsections, as follows:

- Section 5.1 General – This is an overview of the system and the organization of the OM&M Manual.
- Section 5.2 Equipment And Components – This details the major component and discusses operating procedures, start-up procedures, normal operation, controls, alarms, and emergency operation.
- Section 5.3 Monitoring, Inspection, and Maintenance – This section includes monitoring, inspection, and maintenance procedures that the O&M Contractor must follow to successfully operate the system.
- Section 5.4 Sampling and Analysis – This section instructs the O&M Contractor on how to sample, details what constituents must be analyzed, and specifies the instrumentation and documentation required to complete sampling.
- Section 5.5 Troubleshooting Procedures – This section provides corrective actions which may be helpful to the O&M Contractor when problems with the Landfill Gas Management and Flare System arise.
- Section 5.6 Spare Parts – This last section describes the spare parts that must be readily available and details the major parts of the gas blower and gas flare.

The major components covered (in detail) in the OM&M Manual (1996) (see Appendix K herein) and briefly discussed in this SMP are:

- Gas Collection System and Blower.
- Condensate System.
- Enclosed Flare System.

- Electrical System.

The gas blowers, gas blowers control panel, piping, enclosed flare system, gas flare control panel, well heads, gas monitoring wells, and electrical system need to be maintained periodically.

4.2.3.2. Landfill Gas Management and Flare System Start-Up and Testing

Detailed steps for pre-start-up and start-up of the gas collection system and blowers, the enclosed flare system, and the electrical system are included in Section 5 of Volume III of the OM&M Manual (1996) (see Appendix K herein). Presented below is a summary of the system start-up procedures:

- Pre-start-up physical inspection and verification of all piping, valving, equipment functionality, wiring, and controls.
- The initial start-up of the flare will take place under the supervision of a John Zink Company representative and will be completed by operating the system in manual mode.
- Start-up procedures assuming the initial start-up of the blowers and flare system is capable of running and while running the O&M Contractor will be performing initial adjustments to equalize flow, balance vacuum pressure and extraction rates for each well head, and maintain methane at approximately 50 percent by volume.
- Increase the flow rate from the initial rate of 750 standard cubic feet per minute (SCFM) to 1500 SCFM over an 8-week period.

The objective of the system start-up is to confirm the system is fully operational, no short circuiting exists, and reach steady state operation.

The system testing described in Volume III of the OM&M Manual (1996) will be conducted if, in the course of the Landfill Gas Management and Flare System lifetime, significant changes are made to the system, and the system is restarted. Section 5.2.1 and 5.2.2 of Volume III of the OM&M Manual (1996) (see Appendix K herein) describes the step by step procedures and requirements for both the blower system and the enclosed flare component.

4.2.3.3. Landfill Gas Management and Flare System Operation: Routine Operation Procedures

The Landfill Gas Management and Flare System consists of four (4) components: Gas Collection System and Blower, Condensate System, Enclosed Flare System and Electrical System. Detailed routine operation procedures for these four components are presented below and in Section 5.2 of Volume III of the OM&M Manual (1996) (see Appendix K herein) in conjunction with the procedures outlined in the John Zink and the Lamson Corporation Operation and Maintenance Manuals.

For general description and location of various subsystems, the O&M Contractor's attention is directed to Volume I of the OM&M Manual (2005) (see Appendix K herein). Figure 5-1 of Volume III of the OM&M Manual (1996) (see Appendix K herein) is a schematic flow and instrumentation diagram for the waste gas blowers and the enclosed flare. Figure 5-2 of Volume III of the OM&M Manual (1996) is a layout of the blower control panel. Figure 5-3 of Volume III of the OM&M Manual (1996) documents instruments identification for the blower control panel. Figures 5-4 and 5-5 of Volume III of the OM&M Manual (1996) are a layout of the enclosed flare control panel. Figure 5-6 of Volume III of the OM&M Manual (1996) shows the digital temperature controller for the flare. Figure 5-7 of Volume III of the OM&M Manual (1996) is a complete layout of the gas collection and flaring system. Photograph No. 5-1 of Volume III of the OM&M Manual (1996) shows the waste gas blowers and piping. Photograph No. 5-2 of Volume III of the OM&M Manual (1996) shows the enclosed flare. Photographs Nos. 5-3 and 5-4 of Volume III of the OM&M Manual (1996) show the blower control panel, the flare control panel and the purge blower panel. Photograph No. 5-5 of Volume III of the OM&M Manual (1996) shows the blower/flare main breakers.

During normal operation of the system, it is expected that the O&M Contractor will have to perform routine monitoring, periodic adjustments to compensate for fluctuations in methane production, and alternate blowers and other equipment that was designed and built with redundant components. The rate of gas extraction will reduce over time due to the future decline in methane generation. Individual wells or gas sources will need to be monitored and proportioned accordingly.

4.2.3.3.1. Gas Collection System and Blower

The blowers for the gas collection system operate in automatic mode under normal conditions.

- The O&M Contractor shall make periodic adjustments to the gas flow rate to decrease system vacuum and allow wellhead valves to be opened more.

- Once per month, the centrifugal blowers shall be alternated (i.e., the duty blower shall be alternated from duty to stand-by). The procedure for alternating blowers is provided in Appendix B, Section B21 in Volume III of the OM&M Manual (1996).

The rate of gas extraction will reduce over time due to the future decline in gas production. A significant decrease in the methane content with an accompanying increase in oxygen of gas drawn from an individual gas source will indicate a need to reduce the extraction flow rate at that source. If subsequent sampling events at the flare indicate an increase in methane content, the O&M Contractor may increase the flow rate until a steady-state is reached where the methane concentration is consistently maintained above 45 percent. If methane content cannot be maintained above 45 percent after adjusting the flow rates, this should be noted on the Site Inspection Checklist forms, and the NYCDEP should be notified. The practical minimum methane percentage needed to operate the flare system is 25 percent. With methane concentrations between 45 and 25 percent; intermittent operation, timer operation, lowering the thermal coupler height, or decreasing the damper size, thus allowing less combustion oxygen into the system, are all possible solutions to continued operation. The O&M Contractor should contact the John Zink Company and determine what modifications can be made to continue operation of the system. NYCDEP shall review the operating permit and determine if modifications to the operating permit are necessary.

4.2.3.3.2. Condensate System

The condensate system operates or functions on its own. Automatic or manual controls are not required for its operation since condensate generated at the separator will flow by gravity to the leachate manholes.

4.2.3.3.3. Enclosed Flare System

The enclosed flare system shall always be started in manual mode to verify gas flows and mechanical systems prior to the initial automatic start-up. A John Zink factory representative shall be present for initial start-up. The following procedures shall be implemented to automatically start up the gas flaring system in conjunction with the John Zink Operation and Maintenance Manual:

- Verify that the pre-start checklist has been satisfactorily completed and that all valves are operative and in the proper position.

- Place the Start-up Sequence Switch in the Auto position.

- Place the Local Unit Control Switch in the Start/Run position (if starting from a remote location, or when using a timer to run the system, the remote circuit must be in the stop position).

- The purge blower will start and run for five minutes. During this time, the blue "Purging" light will illuminate to let the operator know the unit's status. Once the purge cycle is completed, the Purge Complete Light will illuminate.

- The pilot solenoid valve will open.

- The ignition transformer will spark and the pilot will light.

- The flame proved relay will verify that the pilot is lit.

- After the Flame Proved light illuminates, the PLC will open the inlet waste gas valve and activate the blower(s).

- The pilot solenoid valve will close approximately 1 minute after the valve open limit is met.

- As the unit comes up to operating temperature the Controller will send a signal to the Temperature Control Valve and the Controller will make adjustments to achieve the specified continuous combustion temperature (1600° F).

- Once the flare reaches operating temperature, slowly close the manual damper(s) to the same percentage open as the automatic damper(s).

4.2.3.3.4. Gas Flare Control Panel

The O&M Contractor shall (1) initially confirm PLC programming and make modifications, as required; (2) weekly, monitor the alarm functions and acknowledge, investigate and record any alarm present; (3) monthly, check operation of all circuit breakers, check operation of all electrical controls and check indicator lamps and

switches on panel and replace, as needed. The enclosed flare and its support systems are controlled at Panels 101, 102, and 103. Panel 101 is the main display panel and controls both the flare and the blower. This control panel controls the pilot ignition for the flare. Section 5.2.3 of Volume III of the OM&M Manual (1996) (see Appendix K herein) lists the displays and the controls of Panel 101. Panel 102 contains fuses, motor starter and the motor overload circuitry. If there is no display, the O&M Contractor will open this panel and replace fuses. Control panel 103 is located on the shell of the flare.

4.2.3.3.5. Electrical System

Electrical power to the equipment and components of the Landfill Gas Management and Flare System is supplied through two (2) explosion-proof, dust-tight, weatherproof electrical control panels, one high voltage power Panel "G" and one low voltage power "Panel G-I". There are two other critical components, which are the 15KVA transformer and the main disconnect switches. The O&M Contractor shall follow the operating procedures described in Section 5.2.4 of Volume III of the OM&M Manual (1996) (see Appendix K herein).

4.2.3.3.6. Routine Monitoring

Routine monitoring is required as part of normal operation. Summarized below is the required monitoring and testing:

- Daily recording of the landfill gas flare flow totalizer reading.
- Twice weekly inspection of the blowers, blower control panel, flare control panel, and flare piping.
- Monthly inspection of the 22 landfill gas extraction wells and wellheads.
- Quarterly inspection of below ground landfill gas piping.
- Semi-annual monitoring of the ten landfill surface gas locations and sampling of the four gas monitoring wells (GMW-1, GMW-2, GMW-3 and GMW-4).

4.2.3.4. Landfill Gas Management and Flare System Operation: Routine Equipment Maintenance

Inspection and preventative maintenance information for the subsystems that comprise the Landfill Gas Management and Flare System are discussed below and in the following subsections. The O&M Contractor should use this information as a guideline and should refer to the John Zink and Lamson Corporation O&M Manuals and other vendor O&M Manuals (Section 12, Volume IIc of the OM&M Manual [1996]) for detailed information.

The O&M Contractor shall record all the observations at the time of inspection on Inspection Checklist Forms LFG-1, LFG-2, and LFG-3 and report all the deficiencies and problems observed on Inspection Checklist Form DP-1 (Appendix N of this SMP).

4.2.3.4.1. Gas Blowers

On a monthly basis, the O&M Contractor shall observe blower and motor alignment; monitor machine bearings (by taking vibration and bearing temperature readings); observe all valves for proper operation; observe blower foundation and site condition; lubricate motor bearings; clean grease inlet area and replace the pipe along with grease fitting; and run motor for two hours.

The flare station blowers shall be alternated on a monthly basis to keep them working properly. The recommended procedure for alternating the blowers is as follows:

- Take flare station readings to verify the existing system operation. Verify that there is propane available for relighting the flare.
- Turn the flare off by using the "stop - start/run" control switch on O.K. panel (Section 5 and Figure 5-5 of Volume III of the OM&M Manual [1996]).
- Close the inlet and outlet manual valves to the operating blower and open the inlet and outlet manual valves to the stand-by blower or remove drain plugs provided.
- Drain water from the stand-by blower
- Turn the blower selector switch to change the stand-by blower to the operating blower.

- Restart the flare by turning the control switch to Start/Run (Section 5 and Figure 5-5 of Volume III of the OM&M Manual [1996]). The flare should be through its normal pre-purge cycle, ignite and come up to temperature.

- Take flare station readings and verify that the system is operating normally. Check the blower operation for unusual noise or vibration.

4.2.3.4.2. Gas Blower Control Panel

On a monthly basis, the O&M Contractor shall monitor the motor control center and insure that all applicable breakers are in the ON position; check the operation of motor starters, overload relays and auxiliary contact, motor circuit protectors and control relays; check and replace fuses, indicators lamps, and switches, as needed.

4.2.3.4.3. Piping

On a quarterly basis, the O&M Contractor shall walk along piping alignment and check for settlement and any LFG detection, check header valve and valve enclosure, and check above ground piping for leak and vibration.

4.2.3.4.4. Enclosed Flare System

On a monthly basis, the O&M Contractor shall lubricate purge air blower, stroke inlet landfill gas valves, and check pressure in propane cylinders. Quarterly, the O&M Contractor shall inspect the pilot assembly for damaged or loose wires; inspect the ignition rod, flame detector, spark plug and insulator for damage; test and verify all safety shutdown devices; check calibration and operation of all instruments; inspect flare tips for blockage or corrosion (and clean if necessary); inspect internal insulation for overall integrity (and repair if necessary); inspect external surface for signs of heat corrosion; check all flanges and connections for signs of leakage (and remove and replace if necessary); test control panel logic to insure that all shutdowns, inputs and outputs are operating correctly; and inspect all auxiliary flare equipment for signs of deterioration. Every six (6) months, the O&M Contractor shall check blower and motor alignment, bump blower to verify that wiring is correct, clean flame arrestor, clean demister pad in knock out, visually inspect internal surfaces of knock out drum; and on an annual basis, the O&M Contractor shall replace the thermocouple assemblies.

4.2.3.4.5. Gas Flare Control Panel

Initially, the O&M Contractor shall confirm PLC programming and make modifications, as required. On a weekly basis the O&M Contractor shall monitor the alarm functions and acknowledge, investigate and record any alarm present. On a monthly basis the O&M Contractor shall check operation of all circuit breakers, check operation of all electrical controls and check indicator lamps and switches on panel and replace, as needed.

4.2.3.4.6. Landfill Gas Extraction Wells and Wellheads

On a monthly basis, the O&M Contractor shall monitor, observe and repair the wells or wellheads, as necessary. On a quarterly basis, the O&M Contractor shall observe each well head and observe alignment and look for settlement, make sure in-line ball valve and gauges are operating properly, check for gas leak from well head fitting and flexible hose connection, and also inspect each well head and observe alignment and look for settlement, inspect probe monitoring and observe alignment and look for settlement.

4.2.3.4.7. Main Service Equipment

Every six (6) months, the O&M Contractor shall inspect Property line manhole, handhole, and grounding system. Annually, the O&M Contractor shall service the transformer, current transformer and meter.

4.2.3.4.8. Main Distribution

Quarterly, the O&M Contractor shall inspect manholes and handholes, check for debris and water accumulation, and check that the splices are not damaged. Every six months, the O&M Contractor shall inspect Main 600A Service Switch, Motor Control Center, Panels, Transformers, and Disconnect Switches and Starters. For the Main 600A service switch, verify lugs are tight; fuses are running cool and for indication of phases balance. The O&M Contractor shall verify the amperage meter is indicating a balance load on each phase, all fuses are running cool, and grounding for Gas Flare Control Panel is intact. The O&M Contractor shall inspect all circuit breakers, pull boxes, junction points, site lighting system (luminaries and poles) yearly.

Quarterly, the O&M Contractor shall check all contractors, relays, timers, panel heaters and thermostats for operating conditions.

4.2.3.5. Landfill Gas Management and Flare System: Non-Routine Equipment Maintenance

Warning devices and alarms have been installed at the control panels of the blowers and the enclosed flare system. If warning devices are signaled, the O&M Contractor shall troubleshoot in accordance with Section 5.5 of Volume III of the OM&M Manual (1996). This SMP briefly discusses the non-routine maintenance for the major components as an overview. The O&M Contractor shall perform all work in accordance with Volume III of the OM&M Manual.

4.2.3.5.1. Gas Blower Control Panel

In the event of system shutdown or alarm, the O&M Contractor shall check the motor control center and insure that all applicable breakers are in the ON position; check the operation of motor starters, overload relays and auxiliary contact, motor circuit protectors and control relays; and check and replace fuses, indicators lamps, and switches (as needed). The blowers are controlled by the blower control panel with an interlock with the flare control panel. The blowers receive a permissive run signal via the flare panel. If the blower control panel indicates that the blower is not working, the O&M Contractor must determine if the problem was initiated due to the blower itself or the flare. In the event of an emergency with the Motor Control Center, the O&M Contractor shall notify an authorized electrical technician immediately. For other serious conditions, the O&M Contractor shall consult Section 6.0 Correction Action Process in Volume I of the OM&M Manual (2005) (see Appendix K herein).

4.2.3.5.2. Piping

In the event of a system shutdown caused by excessive water or oxygen levels, the O&M Contractor shall walk along piping alignment and check for settlement, check header valve and valve enclosure, and check above ground piping for leak and vibration. If a leak in the system piping is detected, excessive settlement is noted along the piping, or if any other damage in the system is detected; the O&M Contractor will isolate the section in question if possible and if that is not possible, shut the system down until repairs have been made. Section 5.5.1 Gas Collection and Extraction Well System of Volume III of the OM&M Manual (1996) (see Appendix K herein) lists the troubleshooting procedures to be followed if any problems are identified.

4.2.3.5.3. Enclosed Flare System

Automatic system shutdown will be initiated by the PLC in the event of high temperature of the flare shell and/or a blower surge. Any shutdown of the system will initiate automatic communications to the O&M Contractor. Section 5.5.3 Gas Flaring System of Volume III of the OM&M Manual (1996) (see Appendix K herein) lists the troubleshooting procedures to be followed.

4.2.3.5.4. Gas Flare Control Panel

In the event of system shutdown or alarm situation, the O&M Contractor shall check the alarm functions and acknowledge any alarms, investigate and record any alarm present; check operation of all circuit breakers, check operation of all electrical controls and check indicator lamps and switches on panel and replace, as needed. In the event of an emergency with the Motor Control Center, the O&M Contractor shall notify an authorized electrical technician immediately. For other serious conditions, the O&M Contractor shall consult Section 6.0 Correction Action Process in Volume I of the OM&M Manual (2005) (see Appendix K herein).

4.2.3.5.5. Landfill Gas Extraction Wells and Wellheads

In the event of a system shutdown or alarm due to excessive oxygen, water, or loss of vacuum, the O&M Contractor shall inspect each well head and observe alignment and look for settlement, make sure in-line ball valve and gauges are operating properly, check for gas leak from well head fitting and flexible hose connection, and inspect probe monitoring and observe alignment and look for settlement. If any defect is noted, the O&M contractor shall investigate and correct the problem, if possible. If not possible, the O&M Contractor shall notify NYCDEP.

4.2.3.5.6. Main Service Equipment and Main Distribution

In the event of an emergency with the Main Service Equipment, the Motor Control Center, or other electrical component other than fuses and resetting breakers, the O&M Contractor shall notify an authorized electrical technician immediately. In the event of a system failure involving the Main Service Equipment or Main Distribution System, the O&M Contractor shall inspect Property line manhole, handhole, and grounding system, service the transformer, current transformer and meter if necessary, inspect manholes and handholes, check for debris and water accumulation, check that the splices are not damaged, and inspect Main 600A Service Switch, Motor Control Center, Panels, Transformers, and Disconnect Switches and Starters. For the Main 600A service switch, verify lugs are tight; fuses are running cool and for indication of

phases balance. The O&M Contractor shall verify the amperage meter is indicating a balance load on each phase, all fuses are running cool, and grounding for Gas Flare Control Panel is intact. The O&M Contractor shall inspect circuit breakers; pull boxes, junction points, site lighting system (luminaries and poles) yearly. For other serious conditions, the O&M Contractor shall consult Section 6.0 Correction Action Process in Volume I of the OM&M Manual (2005) (see Appendix K herein).

4.2.4 Stormwater Management System

The operation and management for the Stormwater Management System is described in sufficient detail to allow the O&M Contractor to operate, maintain, and service the system, in Section 3 of Volume III of the OM&M Manual (1996) (see Appendix K herein). Section 3 of Volume III of the OM&M Manual (1996) is divided into three subsections, as follows:

- Section 3.1 General System Overview.
- Section 3.2 Major Subsystems and Components.
- Section 3.3 Inspection and Maintenance Procedures.

The major Stormwater Management System components at the Site, which require inspection and periodic maintenance include, but are not limited to, the following:

- Stormwater drainage ditches.
- Buried 6-inch diameter corrugated HDPE infiltration pipe and flap gate.
- Riprap.
- Stormwater collection manholes and buried 24-inch diameter corrugated HDPE pipe.
- Concrete baffled outlets.
- Sedimentation ponds.
- Concrete inlet/outlet structures.

- Sedimentation pond connection manholes and 30-inch diameter HDPE sedimentation pond connection pipes.

- 24-inch diameter RCP pipe and flap gate.

- Drainage culverts (30-inch diameter).

The Stormwater Management System location is shown on Figure 2-1 in Volume I of the OM&M Manual (2005), and is a gravity controlled system.

4.2.4.1. Scope

The O&M Contractor shall follow the monitoring, inspection, and maintenance procedures described in detail below, unless otherwise directed by the NYCDEP and NYSDEC. In cases where an O&M procedure could be modified to be more efficient, the O&M Contractor may propose a modification in writing to the NYCDEP and NYSDEC. Any modifications to the procedures must be approved by the NYCDEP and the NYSDEC prior to implementation.

- Visual inspection of the components of the stormwater management system on a monthly basis and after major storm events (3.5 inches in 24 hours or larger).

- Maintenance of the original slopes and grades shown in the record drawings and specifications for Contract No. HP-876, unless otherwise directed by the NYCDEP and NYSDEC.

- Proper containment and disposal of sediments removed as part of the maintenance work per the SoMP contained in this SMP (Section 2.3.2); and notifying the NYCDEP as to the location and disposal of any contaminated sediment.

- Recording all the observations at the time of inspection on Inspection Checklist Forms SMS-1, SMS-2, SMS-3, and DP-1 (Appendix N of this SMP).

- Immediately repair observed damage to the Stormwater Management System with materials that meet construction specifications in Contract No. HP-876. The materials of construction, site grades, or construction methodology shall not be modified without the approval of the NYCDEP and NYSDEC, unless otherwise directed in the O&M Manuals.

4.2.4.2. Stormwater Management System Start-Up and Testing

System start-up and testing are not applicable to the Stormwater Management System.

4.2.4.3. Stormwater Management System Operation: Routine Operation Procedures

Routine operation procedures are not applicable to the Stormwater Management System.

4.2.4.4. Stormwater Management System Operation: Routine Inspection and Maintenance

The Stormwater Management System shall be inspected by the O&M Contractor on a monthly basis, as instructed in Volume III of the OM&M Manual (1996) (see Appendix K herein). The inspector shall perform the work in an orderly fashion, completing all of the items in each zone prior to proceeding to the next zone. Inspection shall be performed for each of the three major components of the Stormwater Management System, as follows: stormwater drainage ditches, manholes and baffled outlets, and sedimentation ponds.

The O&M Contractor shall record all the observations at the time of inspection on Inspection Checklist Forms SMS-1, SMS-2, and SMS-3 and report all the deficiencies and problems observed on Inspection Checklist Form DP-1 (Appendix N of this SMP). Maintenance shall be performed following the instructions below. If no problems or deficiencies are observed in a given zone, the item shall be noted as satisfactory by inserting an "S" in the appropriate box. If adverse conditions are observed or if other conditions exist that deviate from the normal and could be deleterious to the Stormwater Management System, in the opinion of the inspector, the appropriate checkbox should be marked as not satisfactory ("NS") and the location and problem should be noted on the form.

Stormwater Drainage Ditches

The stormwater drainage ditches are located along Roads A, B and C of the Site. The location of roads is shown on Figures 2-2 and 2-3 of Volume I of the OM&M Manual (2005). The ditches shall be visually examined by the O&M Contractor along their entire length. It is anticipated that the inspector will observe the condition of the ditches as he/she drives a vehicle slowly along each roadway. The inspector shall exit the vehicle to closely observe any problems or deficiencies detected.

It is anticipated that the inspector will spend a minimum of 1 hour inspecting all of the drainage ditches. Additional time may be required if problems/deficiencies are observed. Inspection Checklist Form SMS-1 (Appendix N of this SMP) shall be completed.

Overgrown Vegetation

Drainage ditches shall be inspected by the O&M Contractor for overgrown vegetation. Mow or trim vegetation greater than 12 inches in height; vegetation should be cut as close to the ground surface as possible. Grass clippings should be removed from drainage ditches. Vegetation greater than 2 inches in diameter should be grubbed by the O&M Contractor.

Standing Water

Standing water may indicate settlement has occurred, which impedes flow in the ditch, or that there is a blockage in the drainage ditch system. O&M Contractor shall remove blockage if present. The O&M Contractor shall repair ditches with standing water greater than 6 inches deep or 50 feet in length by re-grading ditches to drain using like materials. Add additional crushed rock base or fill, as appropriate.

Sediments and Debris

Blockages may cause the ditches to overtop during a storm, resulting in slope erosion and potential cover failures. The O&M Contractor shall inspect ditches for sediments and debris that ponds water or impedes potential flow in drainage ditches, checking particularly in front of baffled outlets, and remove any blockages to the level of crushed stone base, riprap or vegetation and grade to drain.

Erosion/Washout

The O&M Contractor shall inspect ditches for erosion or washouts. If located, the O&M Contractor shall inspect for cause of erosion such as overtopped manhole or baffled outlet, settlement depressions, roadway not sloped toward landfill, etc. Additionally, the O&M Contractor shall check local rainfall data for recent rainfall events and record dates of rainfall and significant amounts in inches. If riprap is washed out, the O&M Contractor shall inspect geotextile and underlying materials for damage, and replace if necessary. Use like materials and repair erosion or washout to the relative grades described in the record drawings.

Sink Holes

Sink holes may indicate damage in the underlying infiltration drainage trench and 6-inch diameter HDPE corrugated slotted pipe. The O&M Contractor shall investigate sink holes for their origin by excavating to the subdrain pipe system, taking extreme care not to damage geosynthetics during the operation. Damaged items shall be repaired/replaced and the area shall be backfilled and the surface graded in accordance with the record drawings and specifications, as required by Contract No. HP-876.

Culverts

The O&M Contractor shall inspect culverts for rusting, crushing or blockage. The culverts are located near the intersections of Roads A and B and the intersection of Roads B and C in Zone 8 and south of the inlet to Sedimentation Pond C. The O&M Contractor shall remove any blockages and repair, as necessary.

Flapgate (6") Debris/Silt Blockage

The O&M Contractor shall inspect flapgate at the outfall of the infiltration drainage trench piping to Eastchester Bay, located near the intersection of Roads A and B. The inspector shall manually lift the gate and check hinges and seating in the closed position; wipe contact area with cloth, and lubricate hinges with good quality, high grade grease, and repair or replace if damaged.

4.2.4.4.1. Manholes and Baffled Outlets

The inspector is required to open each manhole and use a flashlight, and appropriate hand tools to conduct the inspection. DO NOT enter manholes during the inspection. Note any problems on Form DP-1 (see Appendix N of this SMP) and perform maintenance separately following appropriate Health and Safety guidelines for Confined Space Entry, when applicable.

It is anticipated that the inspector will spend a minimum of 15 minutes inspecting each manhole and about 5 minutes for each baffled outlet. Additional time may be required if problems/deficiencies are observed. Inspection Checklist Form SMS-2 (Appendix N of this SMP) shall be completed.

Inspection for the CP-series manholes and baffled outlets B03 and B04 are to be completed in conjunction with the sedimentation pond inspection. Inspection Checklist Form SMS-3 (Appendix N of this SMP) shall be completed.

4.2.4.4.2. Stormwater Collection Manholes (SP Series) Trashracks

The O&M Contractor shall unfasten trashrack and remove any debris or blockage and inspect the rack and bolts for rusting. Repaint trash racks if excessive rust is present. Spray taps and bolts with rust inhibitors and replace trash rack when inspection is completed.

Silt Accumulation

The O&M Contractor shall inspect base of manholes for silt accumulation or other debris and remove silt or other debris, if present, using suitable Health and Safety precautions. Silt can be removed by hand or by washing through pipe to the baffled outlets.

Pipe Connections to Manhole

Using a flashlight, the O&M Contractor shall inspect pipe connections for 6-inch diameter corrugated infiltration pipe and 24-inch diameter corrugated HDPE pipe. Any cracking or leakage at connection point must be noted. Notify NYCDEP immediately of any breakage or leakage in the 24-inch diameter pipe. Repair connections in accordance with the specifications for Contract No. HP-876. If the pipe connection appears to be damaged, examine weepholes at baffled outlet adjacent to 24-inch pipe. This is to check if water has accumulated in pipe trench behind structures.

Flow from 8" HDPE Inlets

The O&M Contractor shall check flow of water from 8" HDPE inlets. Flow is expected during all but very dry seasons or during long periods of freezing weather. Check inlet for ice build up and remove if present. Non-flow conditions during typical seasonal conditions may indicate blockage in the subdrainage system. If the condition persists over two consecutive inspection periods, inspect pipes using video camera apparatus. Clean any blockage with high pressure pipe cleaning equipment.

Debris/Silt Blockage in 24" Pipes

The O&M Contractor shall inspect 24-inch pipe for blockage by placing a 12-inch diameter rubber ball in pipe and check that it travels through pipe and exits at manhole or baffled outlet below. If ball does not exit, visibly inspect pipe using video camera device. Use appropriate Health and Safety Precautions. If blockage is present, remove using high pressure pipe cleaning equipment. If pipe is compressed or contorted due to settlement or surcharge, notify NYCDEP immediately.

Settlement along 24" Pipe

The O&M Contractor shall inspect alignment between SP-series manholes downslope for settlement, depressions or blow holes. Conditions of this type could indicate a potential pipe failure. Check baffled outlet for gravel deposits in silt trap. Gravel could indicate pipe breakage. Notify NYCDEP immediately and repair in accordance with the record drawings.

Settlement around Manhole

The O&M Contractor shall inspect for settlement around manhole. Re-grade drainage ditch to match top of manhole so that water does not pond around manhole. If persistent settlement continues, inspect 24-inch pipe connection closely following similar instructions for settlement along 24" pipe above.

Baffles inside Manhole

The O&M Contractor shall inspect baffles for connection to HDPE manhole. Gently push on baffles with a shovel handle or similar item from above and note any deflection near the HDPE weld connections. Note any problems with the baffle and repair.

4.2.4.4.2.1. Pond Collection Manholes (CP Series) Grates

The O&M Contractor shall inspect manhole grates and note any debris or blockage and remove if present. Remove grate from manhole and replace after inspection of manhole is completed. Inspect manhole grate for damage, and repair if necessary.

Silt Accumulation

The O&M Contractor shall inspect base of manhole for silt accumulation and other debris and note if any blockages are present. DO NOT enter manhole alone during

inspection. Remove silt or other debris using appropriate Health and Safety precautions. A vacuum truck may be used to clean manholes.

Flow through Manhole

The O&M Contractor shall check manholes for water flow-through. Stagnant water should only be present if all ponds have similar water levels. If ponds do not have similar water levels, a blockage of the connection pipe may be indicated. Note the conditions on the form (provided in Appendix N of this SMP) and contact NYCDEP. Refer to Sections 3.3.3 and 3.3.6 of Volume III of the OM&M Manual (1996) for instruction on inspection and cleaning the 30-inch connection piping.

Settlement above 30" Pipe

The O&M Contractor shall inspect the alignment between the CP-series manholes for any settlement. Noticeable settlement could indicate a breakage in the 30-inch connection piping. Report the location of the observed settlement on the form and schedule an inspection of the pond collection manholes during the next significant rainstorm to establish flow-through at the manhole. If settlement continues over the pipe, or a hole develops, uncover the affected section of pipe and repair it to its original condition in accordance with the record drawings and specifications for Contract No. HP-876.

4.2.4.4.2.2. Baffled Outlets (BO Series)

Silt Accumulation

The O&M Contractor shall inspect the baffled outlets for silt accumulation in the silt trap. Remove silt from silt trap when the thickness reaches two inches. Gravel present in the silt trap could indicate damage to the 24-inch corrugated HDPE pipe. See description above for stormwater collection manholes - pipe connections to manhole, if gravel is observed.

Connections to 24" Pipe

Using a flashlight, if necessary, the O&M Contractor shall inspect the connection of baffled outlet to 24-inch diameter corrugated HDPE pipe. Record any indication of pipe slippage at the connection, cracking of the concrete or leakage at the connection. Notify NYCDEP immediately of any problem or deficiency. Check weepholes in the

baffled outlet below this connection for indications of drainage. This is to check if water has accumulated in the 24-inch pipe trench behind the structure. Repair any damage to the connection.

The O&M Contractor shall inspect pipe for visible damage or blockages. If blockage is visible, refer to instruction for debris/silt blockage in 24" pipes for stormwater collection manholes above (Section 4.2.4.4.2.1 of this SMP). If breakage or crushing of pipe is noted, contact NYCDEP immediately.

Erosion around Structures

The O&M Contractor shall inspect the materials surrounding the baffled outlets for erosion rills or gullies. If erosion has occurred in vegetation around structure, replace with like material and reseed. Attempt to determine the cause of the erosion and follow instructions for erosion of the Landfill Cover System (see Form FCS-1 – Appendix N of this SMP).

If erosion has occurred in the rip rap, the O&M Contractor shall repair with rip rap one class larger than that originally placed. Refer to Section 3.3.3 of Volume III of the OM&M Manual (1996) (see Appendix K of this SMP).

If erosion has damaged the geomembrane, the inspector shall check integrity of surrounding geosynthetics and replace. Use like materials and repair in accordance with record drawings and specifications from Contract No. HP-876.

Spalling Cracking

The O&M Contractor shall inspect structures for spalling and cracking. Repair using waterproof sealant cement.

Weepholes

The O&M Contractor shall inspect weepholes in structure for free drainage. The weepholes are located in the structure back wall above and below the 24-inch HDPE pipe inlet. These weepholes are ½-inch in diameter spaced at 12-inch centers. Clean with compressed air or water. DO NOT push material back into the weephole using a rod as this will tend to plug the weephole at the back of the wall.

There are two 4-inch diameter blockouts on the front lip of the silt trap that allow water to drain from the floor of the structure. The O&M Contractor shall inspect these blockouts for clogging and clean. Check that water can drain freely from the front of the baffled outlet to the drainage ditch. Refer to instruction for stormwater drainage ditches for further information if ditch does not drain freely.

Guardrails

The O&M Contractor shall inspect guardrails for damage or rusting. If significantly damaged or rusted, repair to the original condition in accordance with the record drawings and specifications for Contract No. HP-876.

4.2.4.4.3. Sedimentation Ponds

The inspector is required to walk from Pond A to Pond C and closely inspect each pond, inlet/outlet structures, and manholes. The pond connection manholes (CP-1 through CP-5) and baffled outlets (B03 and B04) shall be examined during the sedimentation pond inspection. Inspection Checklist Form SMS-2 (Appendix N of this SMP) shall be completed.

It is anticipated that the inspector will spend a minimum of 1 hour inspecting the ponds and the associated items listed on the forms. Additional time may be required if problems/deficiencies are observed. Inspection Checklist Form SMS-3 and partial Form SMS-2 (Appendix N of this SMP) shall be completed.

4.2.4.4.3.1. Minimum 2-Feet Freeboard

The O&M Contractor shall initially place a marker at elevation 12 in a convenient location on the sideslope at each pond (see Section 3.3 of Volume III of the OM&M Manual [1996] [provided in Appendix K of this SMP]). The marker should NOT be embedded more than 6 inches in the sideslope. Water levels exceeding this elevation may indicate that there is blockage in the sedimentation pond connection pipe. If this is the case, the inspector shall check for flow through the CP manholes (see Form SMS-2 [provided in Appendix N of this SMP]). If blockage is apparent, drain the ponds using pumps and remove the blockage from the pipes, manholes or inlet/outlet structures. Refer to Sections 3.3.3 and 3.3.7 of Volume III of the OM&M Manual (1996) for instructions on cleaning blockages in the system.

Normally the elevation in the ponds should be at or below the invert elevation of the outlet pipe for Ponds A and B and below the bottom weep holes in the outlet structure for Pond C. Water is likely to be present above this level after a recent snowmelt or heavy rainfall.

Silt Accumulation

The O&M Contractor shall check the bottom of the ponds for silt accumulation when the water level is at or below the outlet invert elevations. When silt is generally 4 to 6 inches above the invert elevation over at least one third the pond area, have silt removed. Refer to Section 3.3.6 of Volume III of the O&M Manual (1996 – provided in Appendix K of this SMP) for procedures to be used for silt removal.

Slope Erosion/Stability

The O&M Contractor shall inspect the Pond sideslopes for erosion and stability. The inlets to the ponds are protected by rip rap. Erosion in these areas should be repaired using the next larger class rip rap (see Section 3.3.3 of Volume III of the OM&M Manual [1996]) to prevent continued erosion. Repair in accordance with the methods provided in the specifications for Contract No. HP-876.

Erosion on the sideslopes indicates overtopping of the stormwater drainage ditch system. Refer to Form SMS-1 (provided in Appendix N of this SMP). Cracks longer than about 20 feet and greater than 2 inches wide running parallel to the Pond slopes may indicate a serious stability condition. Notify the NYCDEP immediately. Repair any minor crack (less than that described above) using like materials placed in accordance with the record drawings and specifications for Contract No. HP-876.

4.2.4.4.3.2. Inlet/Outlet Structures

Debris/Silt Blockage

The O&M Contractor shall inspect the inlet and outlet structures in each pond for debris and silt accumulation that might inhibit free water flow. Remove and properly dispose of materials off-site.

Connection to Pipe

The O&M Contractor shall inspect connections of pipe to structure when water level is at or below invert. Use flashlight to examine the outside of the pipe at the structure interface and inside for the integrity of pipe to visual limits. Check for pipe deflection or gaps between the structure and pipe. Notify the NYCDEP immediately of this condition and repair.

Erosion around Structure

The O&M Contractor shall inspect the materials surrounding the structures for erosion rills or gullies, checking areas downstream of outlet structures in particular. Observe if erosion has moved or cut through rip rap.

If erosion has occurred, replace with rip rap one class larger than that originally placed (Refer to Section 3.3.3 of Volume III of the OM&M Manual [1996]). If erosion has cut through to geomembrane, check integrity of surrounding geosynthetic material, replace as necessary, and notify the NYCDEP. Use like materials and repair in accordance with record drawings and specifications from Contract No. HP-876.

Spalling and Cracking

The O&M Contractor shall inspect structures for spalling and cracking. Repair using waterproof sealant cement.

Weepholes

The O&M Contractor shall inspect weepholes in the Pond C pipe outlet for blockage. Remove any blockage by hand.

Trash Rack

The O&M Contractor shall inspect all trash racks for debris/blockages. Mark the checkbox "NS" when observed and remove debris/blockage by hand.

RC Pipe

The O&M Contractor shall inspect entire length of RC pipe from the Pond C pipe outlet using a flashlight or other suitable like source. Look for cracks, spalling, and other damage to the pipe or blockages. Remove any blockage using cable tools. Do not

enter pipe unless suitable Health and Safety precautions are taken. Report any damage of the pipe to NYCDEP.

Flapgate

The O&M Contractor shall exercise flapgate by lifting gently away from the RC pipe and releasing. Lubricate flapgate hinges in accordance with manufacturer's recommendations. Check for rusting. If water is flowing through RC pipe, check that flapgate is permitting flow through with little resistance. If tidewaters are above the water level in Pond C, check that flapgate remains sealed against pipe outlet. Repair or replace flapgate when damaged. Flapgate shop drawing and supplier information are provided in Section 8 of Volume II of the OM&M Manual (1996 – provided in Appendix K of this SMP).

4.2.4.4.4. Sediments and Debris Removal and Disposal

All sediments removed as part of the maintenance work described herein shall be properly disposed of by the O&M Contractor. The O&M Contractor shall determine if sediments are contaminated prior to disposal or on-site stockpiling (refer to the SoMP in this SMP, Section 2.3.2). Sediments may be assumed to be uncontaminated if there are no breaches of the HDPE geomembrane liner. The O&M Contractor shall notify the NYCDEP as to the location and disposal of any contaminated sediment. Any debris or refuse removed from the stormwater system shall be properly disposed of off-site.

Small quantities of uncontaminated sediments (less than 20 cubic yards), may be disposed by spreading thinly over a large area of the site. Larger quantities (up to 500 cubic yards) may be stockpiled on-site, allowed to drain, and reused as fill in other cover system repair operations.

4.2.4.5. Stormwater Management System Operation: Non-Routine Inspection and Maintenance

Inspections shall be performed by the O&M Contractor after storms equal to or exceeding any two-year 24-hour precipitation event (3.5 inches in 24 hours). All the forms and reports required for the monthly inspection shall be completed.

4.2.5 Ancillary Systems

Ancillary Systems consists of access roads over the cut-off wall and elsewhere throughout the Site, fences, gates, and locks existing in various areas throughout the Site that provide a barrier and prevent exposure to Site contaminants.

4.2.5.1. Scope

The O&M Contractor shall follow the monitoring, inspection, and maintenance procedures described below or in Section 7.3 of Volume III of the OM&M Manual (1996 – provided in Appendix K of this SMP), unless otherwise approved by the NYCDEP and NYSDEC. In cases where an SOP is not identified, the O&M Contractor shall develop a procedure that is acceptable to the NYCDEP and NYSDEC. The access roads, all fences, gates, and locks should be visually inspected regularly, and any damage to these systems should be repaired routinely.

4.2.5.2. Ancillary Systems Start-Up and Testing

System start-up and testing are not applicable to the Ancillary Systems.

4.2.5.3. Ancillary Systems Operation: Routine Operation Procedures

Routine operation procedures are not applicable to the Ancillary Systems.

4.2.5.4. Ancillary Systems Operation: Routine Equipment Maintenance

The O&M Contractor shall visually inspect the access roads for the following:

- Overall condition of the road surface, including grading.
- Potholes or burrow holes.
- Erosion gullies.
- Loss of crushed stone cover.
- Evidence of debris and/or obstructions.
- Evidence of uneven settlement.

- Ponding of water.

The visual inspection of roads shall be performed on a quarterly basis.

The O&M Contractor shall routinely repair any damage to the road surface. Maintenance of the access roads shall include, but not be limited to, the following:

- Repair ruts deeper than 6 inches with like material in accordance with the technical specifications.
- Repair shoulders, slopes and drainage areas.

The O&M Contractor shall visually inspect all fences (including the perimeter fence), gates, and locks on a weekly basis for the following:

- Condition of gates and locks.
- Condition of the fence and signs for forced entry or damage.
- Excessive vegetative growth which could damage the fence.

The O&M Contractor shall view or walk all portions of the fence line. The O&M Contractor shall repair damage to or replace all fences, gates, and locks with like material and remove excessive vegetative growth, as directed by the NYCDEP. Additionally, the O&M contractor shall record all observations at the time of inspection on Form AS-1 and report all the deficiencies and problems observed in Form DP-1 (see Appendix N of this SMP).

4.2.5.5. Ancillary Systems Operation: Non-Routine Equipment Maintenance

No warning devices and alarms have been installed for the Ancillary Systems. The inspection should also be performed after storms equal to or exceeding any two-year 24-hour precipitation event (3.5 inches in 24 hours), and repaired if any damage has occurred.

4.3 Maintenance Reporting Requirements

Maintenance reports and any other information generated during regular operations at the Site will be kept on-file on-Site. All reports, forms, and other relevant information