

PART 360 PERMIT RENEWAL APPLICATION

Lockwood Ash Disposal Site

Permit No. 8-5736-00005/00003-0

Prepared on behalf of:

Lockwood Hills LLC
590 Plant Road
P.O. Box 187
Dresden, New York 14441

Prepared by:



2620 Grand Island Blvd.
Grand Island, New York 14072-2131

March 2018

Revised May 2018

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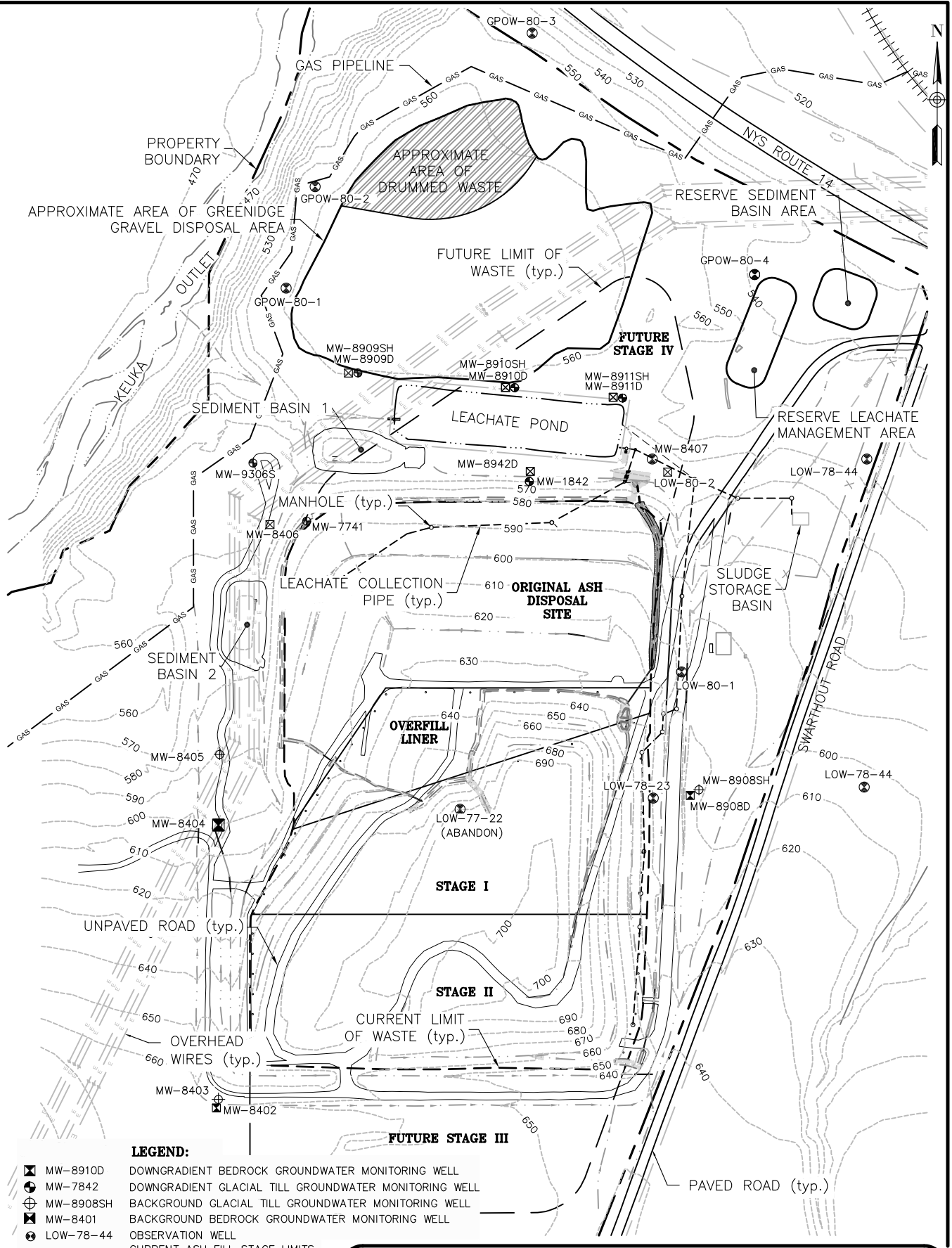
1 INTRODUCTION

Lockwood Hills LLC (Lockwood Hills) manages the Lockwood Ash Disposal Site (Lockwood or the Landfill), an ash monofill associated with the Greenidge Power Generating Station (Greenidge), an electric generating plant that formerly burned coal and was recently retrofitted to burn natural gas. The Station is on Seneca Lake in the Town of Torrey, Yates County, New York. Lockwood is located on Swarthout Road, across NYS Route 14 from the power plant. Lockwood Hills maintains a 6 NYCRR Part 360 Solid Waste Management Facility permit (Permit No. 8-5736-00005/00003).

Lockwood started accepting Coal Combustion By-Products (CCBP's) in approximately 1979. As shown in Figure 1-1, the currently permitted extent of the Landfill is 44.2 acres of which 29.8 acres has already been constructed to date. The current Landfill consists of a soil-lined Original Ash Disposal Site (OADS) and two of four stages of a membrane-lined expansion. Stage I includes a section of overfill liner over part of the OADS. Stage II extends the baseliner to the south. The remainder of overfill liner and the baseliner for Stages III and IV are permitted, but not yet constructed.

The Landfill was placed in protective layup in the spring of 2011 in general accordance with the Layup Plan prepared by Daigler Engineering, PC (DE) and submitted to the New York State Department of Environmental Conservation (NYSDEC or Department) in May 2011. With the exception of a minor volume of waste disposal associated with cleanup activity at the Station in 2015 and construction efforts associated with the Department approved Stormwater Separation Plan (revised June 2016) in 2016 and 2017, the Landfill has been inactive and largely under intermediate cover as described in Section 8.2 of the Operations and Maintenance Manual included as Attachment 4.

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- LEGEND:**
- ⊗ MW-8910D DOWNGRADIENT BEDROCK GROUNDWATER MONITORING WELL
 - ⊕ MW-7842 DOWNGRADIENT GLACIAL TILL GROUNDWATER MONITORING WELL
 - ⊕ MW-8908SH BACKGROUND GLACIAL TILL GROUNDWATER MONITORING WELL
 - ⊗ MW-8401 BACKGROUND BEDROCK GROUNDWATER MONITORING WELL
 - ⊕ LOW-78-44 OBSERVATION WELL
 - CURRENT ASH FILL STAGE LIMITS
 - PERMITTED LIMIT OF WASTE

SITE PLAN		
GREENIDGE GRAVEL DISPOSAL AREA AND LOCKWOOD HILLS ASH DISPOSAL SITE		
LOCKWOOD HILLS LLC		
TOWN OF LEWISTON	NIAGARA COUNTY	NEW YORK
May 2018	SCALE: NOT TO SCALE	REVISION # 0

DAIGLER ENGINEERING, P.C.
 CIVIL & GEO-ENVIRONMENTAL ENGINEERING
 2620 GRAND ISLAND BLVD. GRAND ISLAND, NEW YORK 14072
 (716) 773-6872 (716) 773-6873 FAX

FIGURE 1-1

1.1 PURPOSE

Lockwood Hills' current Part 360 permit was issued on September 5, 2008 and expires September 4, 2018. Pursuant with paragraph 360.16(g)(1) of the revised Part 360 regulations, an application for renewal must be filed at least 180 days prior to the expiration of the current permit. Therefore, Lockwood Hills submitted a Part 360 permit renewal application and associated documents by March 8, 2018 in order to be considered timely for the purposes of the State Administrative Procedure Act (SAPA). This document is a revised version of the Part 360 permit renewal application. Revisions address the comments received by the Department in a March 27, 2018 comment letter from Mr. Scott Sheeley, and addressed to Mr. Kenneth Scott.

1.2 CONSENT ORDER HISTORY

Effective February 18, 2015, Lockwood Hills agreed to execute a Consent Order (Case No. R8-20140710-47) with the NYSDEC to, in part, segregate stormwater from leachate and to treat and dispose of the leachate onsite or at an appropriate offsite facility. An amendment of the schedule contained in the Lockwood Hills Consent Order was issued by the NYSDEC on February 24, 2016. The amendment postponed the design of the leachate management system to allow for the collection of leachate flow measurements, while moving forward with the design and construction of a separate stormwater management system.

On January 29, 2016, DE provided the NYSDEC with the Leachate Flow Monitoring Plan to measure and record the volume and rate of leachate discharged to the Leachate Pond. This plan was revised on March 21, 2016 and received final approval on April 14, 2016 after satisfying all of the NYSDEC's comments. The modifications to the leachate sewer system and installation of the leachate flow metering equipment and appurtenances was completed in June 2016. The flow meter began recording instantaneous and totalized flow measurements on July 1, 2016.

As required by the February 24th Consent Order Amendment, Stormwater Separation Plan construction drawings and design calculations were submitted March 15, 2016, and after addressing comments received on March 31, 2016, the plan was revised and resubmitted on June 16, 2016. Plan approval was received on August 16, 2016 after correspondence dated July 26, 2016 satisfied the Department's final concerns.

It was agreed by the Department in correspondence dated October 13, 2016 that a portion of the approved Stormwater Separation Plan construction may be deferred and completed no later than November 1, 2017. This deferred portion included the work on the west side of the site including modifications to Sediment Basin 2 and associated drainage channels. In accordance with this agreement, work satisfying the primary purpose of the Consent Order; that is, to segregate stormwater from leachate by rerouting stormwater to Sediment Basin 1 rather than to the Leachate Pond, was completed on October 25, 2016, prior to the November 1, 2016 Consent Order deadline. Documentation of the work completed in 2016, including both the Stormwater Separation Plan and Leachate Flow Monitoring plan efforts, and the associated record drawings were submitted to the Department on January 23, 2017. The deferred portion of work, namely construction of Sediment Basin 2 and the associated drainage channels was completed in October 2017.

An Engineering Report proposing onsite treatment of landfill leachate and remediation of the existing Leachate Pond was submitted to the Department on May 15, 2018. The proposed leachate management system is currently under review by the Department, with design and Engineering Plans and Specifications to be completed following the approval of the Engineering Report. Construction of all elements of the Consent Order must be completed by November 1, 2019. Upon conclusion of this construction work, Lockwood Hills' Part 360 permit and State Pollutant Discharge Elimination System (SPDES) permit will require modification based on the significant changes to the facility's systems and operations.

1.3 CONTENTS

Prior to preparation of the permit renewal package, Lockwood Hills, DE, and NYSDEC Region 8 staff met on January 29, 2018 to discuss the implications of the Consent Order and the revised Part 360 regulations that were issued November 4, 2017, on this permit renewal application.

The contents of this Part 360 permit renewal application are consistent with the requirements outlined in 360.16(g) and address the Department's initial comments. The documentation includes:

- An updated Record of Compliance;

- Demonstration that the facility is capable of compliance with the Environmental Conservation Law, the Solid Waste Management Facility regulations, and the facility's permit conditions, and how compliance will be ensured;
- Demonstration that the facility is consistent with the state solid waste management policy, and the goals and objectives of NYS's solid waste management plan;
- Future leachate management system design considerations;
- Future Stage IV design considerations; and,
- An updated Operations and Maintenance Manual.

2 RECORD OF COMPLIANCE & COMPLIANCE DEMONSTRATION

A completed Record of Compliance form for the Lockwood Ash Disposal Site is provided in Attachment 1. As demonstrated, Lockwood has a longstanding established record of compliance. The facility was first constructed in 1979 with the Original Ash Disposal Site. The Stage I and Stage II extensions were added in 1989/1990 and 1992, respectively.

Quarterly and annual reporting has been completed every year for the current permit term, that is, from 2007 through 2016. The Annual Reports document the tonnage of waste received and their source, as well as, any environmental factors that have occurred for the reporting period such potential surface water or groundwater contamination based on the trending of analytical data. These Annual Reports provide documentation of the compliance at Lockwood and can be provided to the Department upon request.

Lockwood will continue to be compliant under the 6 NYCRR Part 360 regulations and the permit conditions. Lockwood will be compliant by following the associated and approved documents for the facility including the Environmental Monitoring Plan, Site Analytical Plan, Operations & Maintenance (O&M) Manual, and Contingency Plan. Updates to the O&M Manual have been completed to be consistent with current conditions onsite and a copy of the manual is included in Attachment 4 and discussed further in Section 6. Upon execution of the Consent Order, the O&M Manual will be further modified to reflect changes based on the changes to facility systems and to fully comply with the new requirements of the revised Part 360 regulations.

Compliance will be ensured through the required routine inspections, and the reporting and recordkeeping routinely completed at the facility as presented in the quarterly and annual reports submitted to the Department.

Additionally, the facility maintains a State Pollutant Discharge Elimination System (SPDES) permit (Permit No. NY0107069) with which compliance has been demonstrated through appropriate sampling and reporting of discharges. In addition to the monitoring of water quality at Outfall 001, SPDES compliance actions include a Mercury Minimization Program and Whole Effluent Toxicity (WET) Testing, all of which are completed by Lockwood Hills as required under their permit.

3 STATE SOLID WASTE MANAGEMENT POLICY & PLAN CONSISTENCY

3.1 STATE SOLID WASTE MANAGEMENT POLICY

Section 27-0106 of the Environmental Conservation Law (ECL) describes New York's solid waste management policy. The policy provides a listing of the preferred solid waste management methodologies for managing solid waste in a manner that will lessen dependency on land disposal. The solid waste management hierarchy, in descending order of preference includes:

1. Reduce the amount of waste generated;
2. Reuse material for the purpose of which it was originally intended, or to recycle material that cannot be reused;
3. Recover in an environmentally acceptable manner, energy from solid waste that cannot be economically and technically reused or recycled; and,
4. Dispose of solid waste that is not being reused, recycled or from which energy is not being recovered, by land burial or other methods approved by the NYSDEC.

Lockwood is consistent with the second highest preferred solid waste management method listed within Section 27-0106 of the ECL. When Greenidge Station was burning coal, a portion of the ash, specifically the bottom ash, was diverted from disposal at the Landfill. The bottom ash was reused as traction agent on rural roads by local and regional municipalities. This beneficial use represents a recycling-related reuse as the bottom ash replaces virgin salt and sand mixtures typically utilized on roads as is consistent with New York State's Solid Waste Management Policy.

In 2017, Greenidge Station converted from burning coal to natural gas, with the ability to co-fire up to 19% biomass (i.e., clean wood). Should Greenidge utilize the option to co-fire biomass, the quantity of ash produced, and therefore, the quantity requiring landfilling will be significantly less compared to the amount generated/landfilled when coal was the sole source of fuel. Therefore, when considered together, Greenidge and Lockwood have instituted changes over the current permit term that are helping the State meet its top solid waste management goal of reducing the amount of waste generated. Additionally, wood ash is considered more inert than coal ash,

providing the opportunity for additional potential beneficial uses. Similar to the reuse of bottom ash, Greenidge would seek potential future reuses for the ash produced as a result of co-firing biomass to avoid disposal at the Landfill.

3.2 STATE SOLID WASTE MANAGEMENT PLAN

The current New York State Solid Waste Management Plan is titled *Beyond Waste: A Sustainable Materials Management Strategy for New York State* dated December 2010. The overall strategy of the Plan is to focus on determining how materials that would otherwise become waste can be sustainably managed through New York State's economy.

Beyond Waste discusses Beneficial Use Determinations (BUDs) in Section 8.5. To develop a sustainable materials economy, the State plans to develop policies and programs to redirect items that still have value for uses other than their original intended purpose. Once an alternative avenue is established, a BUD can be issued by the NYSDEC designating that the waste stream in question ceases to be a waste when it is used for the established alternative purpose. CCBPs already have pre-determined BUDs for a number of uses. *Beyond Waste* states "it is common industry practice in the United States to manage bottom ash and fly ash together as combined ash. However, this serves to limit the development of potential higher-value uses of the bottom ash." As described in the previous section, Greenidge Station maintained separation between the bottom ash and fly ash produced while burning coal. As such, the bottom ash was able to be reused and removed from the waste stream destined for the Landfill. Further, the recycling of bottom ash for use as a roadway traction agent avoids the emissions related to energy consumption and manufacturing associated with the extraction, production, and transportation of virgin materials used in original production of salt and sand. EPA has scrutinized the beneficial use of coal fly ash, questioning whether potentially adverse impacts exist from their use. Despite the pre-determined BUD for this material, this scrutiny has limited the practical uses of fly ash. As such, landfilling coal fly ash is a generally accepted practice given the uncertainty associated with the characteristics of fly ash and its use. In the future, a portion of the ash resulting from the combustion of biomass at Greenidge, also could potentially be diverted from the landfill for use as a soil amendment under a pre-determined BUD for unadulterated wood combustion ash.

Landfilling is viewed as the least preferable waste management approach. However, it is recognized that landfills will continue to be necessary for management of waste that cannot be prevented, reused or recycled.” Additionally, Section 2 of *Beyond Waste* describes a Best Residual Management Strategy which involves advancing policies that ensure an adequate capacity exists for disposal of the waste that cannot be reduced, reused, recycled, composted or otherwise diverted.

Energy is recovered at Greenidge Station from burning of a fuel source through combustion, which can, depending on the fuel source, result in residual ash as a byproduct. After reuse and recycling of the residual ash are maximized, some residual waste will inevitably remain and require disposal at the Landfill. Consistent with *Beyond Wastes’* strategy, utilizing the existing site rather than constructing a new landfill for these inevitable residuals provides for more efficient use of the land resources already permitted for landfill disposal, and generally conserves more natural resources. Improvements in landfill design, construction, and quality assurance of the baseliner system, as regulated under the revised Part 360 regulations, would be incorporated into any future expansion of the Landfill should the permitted, but not yet constructed cells at Lockwood be necessary. This will provide for protection of human health and the environment, as is consistent with the State’s solid waste management strategy for land disposal.

4 FUTURE LEACHATE MANAGEMENT SYSTEM DESIGN CONSIDERATIONS

According to subparagraph 363-4.3(e)(1)(iii) for landfills undergoing subsequent development, an analysis of the anticipated leachate generation rate should be conducted using the actual leachate generation data from the existing Landfill to determine the design leachate generation rate. The Landfill is permitted for both vertical (overfill liner above the remaining 10.5 -acres of OADS not currently under an overfill liner) and horizontal expansion (new baseliner in Stages III and IV). Therefore, the design of the leachate management system must consider the addition of leachate generation rates from the subsequent development/landfill expansion. An analysis of potential leachate generation flow rates under future phases of Landfill construction per the Landfill's permitted Fill Progression Plan was conducted to establish a conservative-case scenario for leachate generation. Within each phase of construction, the leachate flow calculations consider the following conditions:

1. Open Liner – The critical factor of leachate generation for this condition is the contributing storm event. It is assumed that there is little waste over the baseliner. Therefore, stormwater runoff is assumed to be at the rate of the storm event for a 25-yr, 24-hr storm event as mandated by subparagraph 363-4.3(e)(1)(i). This storm event will release 4.15 inches of precipitation, which converts to a generation rate of 113,000 gallons per acre per day (GPAD). Landfill operations will include the use of temporary diversions of stormwater using geomembrane flaps. The geomembrane flaps will be placed to divert non-contact stormwater such that the maximum area of the open liner can be routed to the stormwater management system. Any contact stormwater is routed toward the leachate collection system. In addition to using geomembrane flaps and run-on diversion of stormwater, the probability of the 25-yr storm occurring on a day when the cell is open is very low. In any given year, the probability of a 25-yr storm is just 4%. The conditional probability of having an open liner and a 25-year storm is lower still. Therefore, the open liner condition was not considered during the design of the system.
2. Active Landfilling – The critical factors governing leachate generation during active landfilling are largely dependent upon the precipitation rates and the operation of the

Landfill. If temporary cover is not used over an active Landfill area, the permeability and pore water storage characteristics of the CCBP wastes, and infiltration at the edges of the fill play critical roles in the rate and amount of leachate generated in the cell. The historic leachate generation rates from Stages I and II, prior to application of intermediate cover in May 2011, provide insight into the leachate generation rates from active filling at this Landfill. Prior to May 2011 active landfilling was occurring in Stages I and II, and the entire area was under no more than daily cover. The OADS was already closed and under a soil-based final cover system. The mean leachate flow from Stages I and II during this time period was 500 GPAD. The 80th percentile or peak design flow rate was 822 GPAD. Given that the data was collected on a quarterly basis, the representativeness of the measurements is lower than desirable; accordingly, a factor of safety of 1.3 has been applied, resulting in a peak design flow rate of 1,070 GPAD for active landfilling.

3. Intermediate Cover – The flow monitoring of leachate as described in the Leachate Monitoring and Analysis Report (dated January 2018), occurred over a period of time where the entire Landfill was under intermediate cover. A peak design rate of 625 GPAD was chosen based on the 80th percentile daily flowrate in the leachate system over a 17-month monitoring period between July 1, 2016 through November 30, 2017. This rate is appropriate for all areas of intermediate cover. The facility's O&M Manual defines intermediate cover as a minimum six-inch thick layer of unclassified soil.
4. Final Cover – The critical factor governing leachate generation from a Landfill with final cover is a calculated rate of liquid migration through the final cover system, in this case a composite liner, due to geomembrane defects. Leachate generation for any Landfill drops significantly once the final cover system is placed. The rate of liquid migration through the composite liner within the Landfill's final cover system design due to geomembrane defects is conservatively calculated to be 7.6 GPAD.

Using the categories of leachate generation detailed above, six phases of future landfill development were considered using the Landfill's Fill Progression Plan. These phases are shown in Attachment 2. Leachate generation calculations corresponding to each phase are provided in Attachment 3. The highest calculated flow scenario of 24,651 gallons per day (GPD) is anticipated

to occur during Phase 1b. The approved sizing criteria from the Leachate Monitoring and Analysis Report is an average design rate of 470 GPAD and a peak design rate of 625 GPAD. Conservatively applying these unit leachate generation rates to the full build-out of the Landfill (44.2 acres) results in an average daily rate of 20,800 GPD and a peak daily rate of 28,000 GPD. This peak leachate generation rate of 28,000 GPD was used to size the leachate management facility as described in the recently submitted Revised Engineering Report. Since the approved unit rates result in a peak flowrate greater than the analysis considering future Landfill development, the proposed leachate management system will provide leachate treatment capacity for current and future conditions as permitted.

5 FUTURE STAGE IV DESIGN CONSIDERATIONS

As can be seen in Figure 1-1, Stage IV of the Landfill overlaps a portion of the Greenidge Gravel Disposal Area (GGDA), as well as, stormwater and leachate management features. This section provides a discussion of the GGDA and potential impacts of the future Stage IV Landfill on the GGDA and these other essential components of the operating facility.

5.1 GGDA

The GGDA is a former gravel pit established prior to 1952, based on our earliest available information. The GGDA was used by Transelco, Inc. for disposal of dry sweepings and a small amount of semi-wet slurry until 1973. The following year, NYSEG purchased the site inheriting approximately 500-700 metal and fibre drummed waste. The waste was identified in NYSEG's original application to begin using the site for ash disposal as mostly ceramic tailings; floor sweepings from Transelco Inc., zirconium oxide, cerium oxide, and barium titanate.

In 1975, permission was granted from the NYSDEC for NYSEG to compact the drummed waste in-place (in the northwest area of the disposal site) and cover them with fly ash. Fly ash disposal activities continued on site until 1979 when the GGDA was capped with two feet of soil and seeded. Later that year, the NYSDEC released a list of the state's 520 suspected hazardous waste sites. Initially, the Greenidge Gravel Site (under the site name Transelco, Inc.) was included on that list. Since none of the known wastes in the GGDA are considered hazardous, the site is an N-rated, non-registry site.

During installation of a natural gas pipeline to support the natural gas operation at Greenidge, waste was uncovered that appeared to fit the description of the disposed material at GGDA. This waste was separated from the backfill material and characterized as a mixture comprised of partially intact steel drums containing wet to moist white powder, dark brown, moist gravely-silt soil contaminated with pockets of the white paste/powder, wood, plastic, household waste, tires, and remnants of steel drums. Analytical testing on the white powdery substance confirmed the material to be non-hazardous and suitable for disposal at a municipal solid waste facility.

5.2 CONSTRUCTABILITY

Construction of Stage IV will encroach on the approximate limit of the GGDA. As a result, construction of Stage IV may unearth waste from the GGDA. Based on the site history and waste characterization during the installation of the nearby natural gas pipeline, there is no evidence that the GGDA includes any hazardous waste.

Prior to construction of Stage IV, Lockwood Hills will conduct an investigation of the GGDA in the vicinity of the new liner to characterize the limits, thickness, and content of the waste. Updated drawings and specifications will be submitted for review and approval by the Department before construction commences. The design shall include any special considerations for constructing the Stage IV baseliner deemed necessary by the investigation, as well as, reclamation of the GGDA soil liner.

In addition to the potential overlap with the GGDA, construction of Stage IV will disturb the Leachate Pond, Sediment Basin 1, and several groundwater monitoring wells. Reserve areas for leachate management and a sediment basin are shown in the Fill Progression Plans in Attachment 2. The design of the leachate management system, including its final size and location, are currently being determined through implementation of the Consent Order. These changes will be established well before the construction of Stage IV. Sediment Basin 1 is currently functioning appropriately for the existing landfill. Since the location of Sediment Basin 1 conflicts with the construction of Stage IV, a new stormwater design will be prepared to replace Sediment Basin 1 and to control the additional volume of stormwater expected after construction of Stage IV. This stormwater design will be included with the Stage IV drawings and specifications.

Several monitoring wells are located within the footprint of Stage IV. These monitoring wells will need to be properly decommissioned prior to construction. Specifications for decommissioning and replacement of groundwater wells necessary for the monitoring of the facility will be included in the Stage IV drawings and specifications.

Material excavated during construction of Stage IV baseliner will be sorted into three categories. The first category will include any drums, tires, or miscellaneous material that is not acceptable waste at the Landfill. If found, material in this category will be characterized and properly disposed. The second category is for fly ash and any material that is permitted for disposal at the

Landfill. Acceptable waste materials will be hauled to and disposed of in the active area of the Landfill. The remaining material is expected to be soil that is usable for backfill, subgrade, berms, etc.

The Stage IV construction contractor will use practices to minimize potential of waste material cross-contaminating backfill material and being tracked around the site. This may include broom cleaning equipment before leaving an excavation, covering stockpiles prior to rain events, and stockpiling waste in areas that minimize potential for cross-contamination with backfill. Additionally, efforts will be made to minimize the extent of disturbance to the two-foot soil cover over the GGDA. Any portion of the cap outside of the Stage IV footprint that is disturbed during construction will be repaired.

5.3 MONITORABILITY

A primary concern regarding the proximity of the Landfill to the GGDA is monitorability and isolation of the source of contamination, if contamination is detected. Five shallow wells, GPOW 80-1 through GPOW 80-5 were installed in 1980 to monitor groundwater up and downgradient of the GGDA. With the exception of GPOW 80-5, which has long been abandoned, the existing water quality in these wells is established with a rather extensive dataset consisting of quarterly sampling events from 1982 to 1992 and annual sampling events from 1993 to 2006 for select parameters. The Landfill has its own monitoring well array of five background and nine downgradient wells for the monitoring of groundwater quality in the bedrock and overburden water bearing zones. The locations of these wells are shown on Figure 1-1.

To continue the proper monitoring of the Landfill and GGDA, new monitoring wells will be installed during Stage IV construction. The new wells will be laid out in a way that allows the monitorability to continue as it is described in Section 5.3. New monitoring wells will also consider the leachate management practice that replaces the Leachate Pond.

In addition to the wells, the baseliner in the Landfill's newer Stages I and II is equipped with a leak detection system. The leak detection system is monitored for groundwater quality on a quarterly basis, while the flowrate is monitored monthly. Monitoring of the leak detection system can indicate whether the Landfill is a potential source of contamination to groundwater. If an

excessive flowrate is detected or a chemical signature similar to that found in the primary leachate collection system is also found in the leak detection system and in the groundwater, the landfill would be considered a likely source of groundwater contamination.

Groundwater underneath the Landfill is maintained at a level below the liner system through the effects of the liner itself (limits infiltration of precipitation into the groundwater system) and the use of groundwater depression drains installed below the liner system. When flowing, the groundwater depression systems from OADS, and Stages I and II will discharge into the surface water perimeter channels around the site. Similar systems are expected for future Stages III and IV.

GGDA does not have a similar groundwater drainage system. If contamination is found in the surrounding groundwater, discharge from the Landfill's groundwater drains can be studied to see if a similar chemical signature is present in the groundwater drains. If a similar chemical signature is not identified, then the Landfill is an unlikely source of the groundwater contamination.

Graphical methods, such as Stiff and Piper diagrams, can be used to visually represent water quality and aid in determining the source of contamination. A Stiff diagram is a graphical representation of the concentration of major cations and anions in a water sample. The resulting shape allows a visual comparison between samples to easily identify similarities in general chemistry. The stiff diagrams constructed using the water quality of downgradient monitoring wells can be compared to those from background water quality and Landfill leachate or other potential sources of contamination. If downgradient samples are influenced by Landfill leachate, their Stiff diagrams will display similar shapes. Piper diagrams are triaxial graphs that allows for the plotting of general chemistry parameters from multiple source onto one plot. Water quality that results from the mixing of different sources can be demonstrated graphically on a Piper diagram. For example, if a downgradient groundwater sample plots in between a upgradient groundwater sample and a Landfill leachate sample, then it supports the notion that the downgradient groundwater is a mixture of upgradient groundwater and leachate. If the samples do not line up in this manner, then any suspected contamination is likely from another source.

5.4 SUMMARY

Groundwater monitoring data from the GPOW wells shows no evidence of groundwater impact from the GGDA. The documented waste contained in the GGDA is not hazardous waste, which is supported by more recent evidence. Therefore, it is extremely unlikely that the GGDA would require remediation, and thus, future Stage IV of the Landfill is not anticipated to interfere with any potential, ongoing, or completed remedial program. Additional design and operational information necessary to construct Stage IV of the Landfill will be prepared under the appropriate regulations at the time of construction and will be submitted to the Department for review and approval. Such additional information includes, but may not be limited to, any special baseliner design considerations, minimizing disturbance to the GGDA soil cover, design and replacement of stormwater features, special design considerations for components of the leachate collection system and decommissioning and replacement of groundwater monitoring wells. Waste material that is encountered during the construction of Stage IV will be properly managed. Finally, as outlined in Section 5.3, there are methods already in place that will assist future groundwater monitorability.

6 UPDATED OPERATIONS & MAINTENANCE (O&M) MANUAL

The O&M Manual provided in Attachment 4 was updated to reflect current conditions onsite, especially those operations that will not change once construction of the leachate management system under the Consent Order is complete. Further modifications to the O&M Manual will be completed upon execution of the Consent Order. The changes include:

- Modification to the text to reflect the change in ownership from AES to Lockwood Hills LLC;
- Updated references from the former 6 NYCRR Part 360 regulations to the new Parts, Subparts, sections, subdivisions, etc., of the revised November 4, 2017 Part 360 regulations;
- A description of Greenidge Station's retrofit of the electric generation operations from coal as the primary fuel source to natural gas with the ability to co-fire biomass. As such, Lockwood's primary wastes to be disposed in the landfill will be wood fly ash and bottom ash rather than CCBPs;
- Modification of the proposed final cover system to be consistent with the Part 360 regulations;
- Description of the newly constructed stormwater management system which now manages stormwater in a completely separated system from landfill leachate via Sediment Basin 1 and Sediment Basin 2, rather than utilizing the Sedimentation Basin/Leachate Pond; and,
- Description of the newly construction leachate flow monitoring system which records instantaneous and totalized primary and secondary leachate flows into the Leachate Pond.

ATTACHMENT 1

Record of Compliance Form



DEPARTMENT USE ONLY
DEC APPLICATION NUMBER

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

RECORD OF COMPLIANCE—Permit Application Supplement

Please read all instructions on reverse side before completing this application—Please **TYPE** or **PRINT** clearly

1. FULL NAME OF APPLICANT Lockwood Hills LLC	
2. MAILING ADDRESS (Principal Place of Business) Street 590 Plant Road, PO Box 187	3. NEW YORK STATE MAILING ADDRESS (if different) Street
City/State/Zip Code Dresden, NY 14441	City/State/Zip Code
4. TYPE OF ORGANIZATION <input type="checkbox"/> Individual <input type="checkbox"/> Partnership <input type="checkbox"/> Company <input type="checkbox"/> Corporation <input checked="" type="checkbox"/> Other <u>LLC</u>	
If other than individual, provide Federal Taxpayer ID Number 80-0870495	
5. Does the applicant currently hold any permit issued under the Environmental Conservation Law? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No SPDES permit No. NY0107069; SWMF Permit No. 8-5736-0000/5/00003-0	
6. a Has the applicant been denied a permit or has the applicant had a permit revoked or suspended under the Environmental Conservation Law? b Is the applicant currently the subject of an enforcement action under the Environmental Conservation Law? a <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No b <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Consent Order Case No. R8-20140710-47)	
7. If any answer to questions 5, 6(a), or 6(b) is YES, provide details on a separate page and attach it to this form.	
8. Has the applicant, and if the applicant is a corporation, has any officer, director, or large stockholder (owner of 25 percent or more of not publicly-traded stock) of the corporation, within the last ten (10) years, been: a. found in an administrative, civil or criminal proceeding to have violated any provision of the Environmental Conservation Law (ECL), any related order or determination of the Commissioner, any regulation promulgated pursuant to the ECL, the condition of any permit issued thereunder, or any similar statute, regulation, order or permit condition of any other state or federal government agency? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
b. an officer, director or large stockholder (owner of 25% or more of not publicly-traded stock) of a corporation which—during the time such person was an officer, director or large stockholder—was determined in an administrative, civil or criminal proceeding to have violated any provision of the Environmental Conservation Law (ECL), any related order or determination of the Commissioner, any regulation promulgated pursuant to the ECL, the condition of any permit issued thereunder, or any similar statute, regulation, order or permit condition of any other state or federal government agency? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
c. convicted of a criminal offense under the laws of any state or federal government agency, which involves environmental statutes or regulations, or fraud, bribery, perjury, theft or an offense against public administration as that term is used in Article 195 of the Penal Law, or an offense involving false written statements as those terms are defined in Article 175 of the Penal Law? Out-of-state history may be limited to misdemeanors, felonies and civil penalties assessed at \$25,000 or more. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
d. an officer, director or large stockholder (owner of 25% or more of not publicly-traded stock) of a corporation which—during the time such person was an officer, director or large stockholder—was convicted of a criminal offense under the laws of any state or federal government agency, which involves environmental statutes or regulations or fraud, bribery, perjury, theft, or an offense against public administration as that term is used in Article 195 of the Penal Law, or an offense involving false written statements as those terms are defined in Article 175 of the Penal Law? Out-of-state history may be limited to misdemeanors, felonies and civil penalties assessed at \$25,000 or more. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
9. If any answer to question 8a through 8d is YES, provide details on a separate page and attach it to this form.	
10. Does the applicant currently owe any regulatory fees pursuant to Article 72 of the Environmental Conservation Law to the Department of Environmental Conservation? <input type="checkbox"/> Yes, Amount \$ _____ <input checked="" type="checkbox"/> No <input type="checkbox"/> Under dispute for year(s) _____, amount \$ _____	
11. CERTIFICATION (By Applicant who is an individual) I hereby affirm under penalty of perjury that information provided on this form and attached statements and exhibits is true to the best of my knowledge and belief. I am aware that any false statement made herein is punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law. <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="text-align: center;"> <u>3/7/2018</u> Date </div> <div style="text-align: center;"> Signature </div> <div style="text-align: center;"> <u>Dale Irwin</u> Print Name </div> </div>	
ITEMS 12 THROUGH 15 TO BE COMPLETED BY AN APPLICANT OTHER THAN AN INDIVIDUAL	
12. SPECIFY UNDER WHAT LAW APPLICANT WAS ORGANIZED <u>NEW YORK</u>	13. STATE 14. DATE OF ORGANIZATION <u>N.Y.</u> <u>MARCH 3, 2014</u>
15. CERTIFICATION (By An Applicant Other Than An Individual) I hereby affirm under penalty of perjury that I am _____ (title) of <u>Lockwood Hills LLC</u> (entity); that I am authorized by that entity to make this application; that this application was prepared by me or under my supervision and direction; and that information provided on this form and attached statements and exhibits is true to the best of my knowledge and belief. I am aware that any false statement made herein is punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law. <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="text-align: center;"> <u>3/7/2018</u> Date </div> <div style="text-align: center;"> Signature </div> <div style="text-align: center;"> <u>Dale Irwin</u> Print Name </div> </div>	

Supplemental Information

Date: March 8, 2018

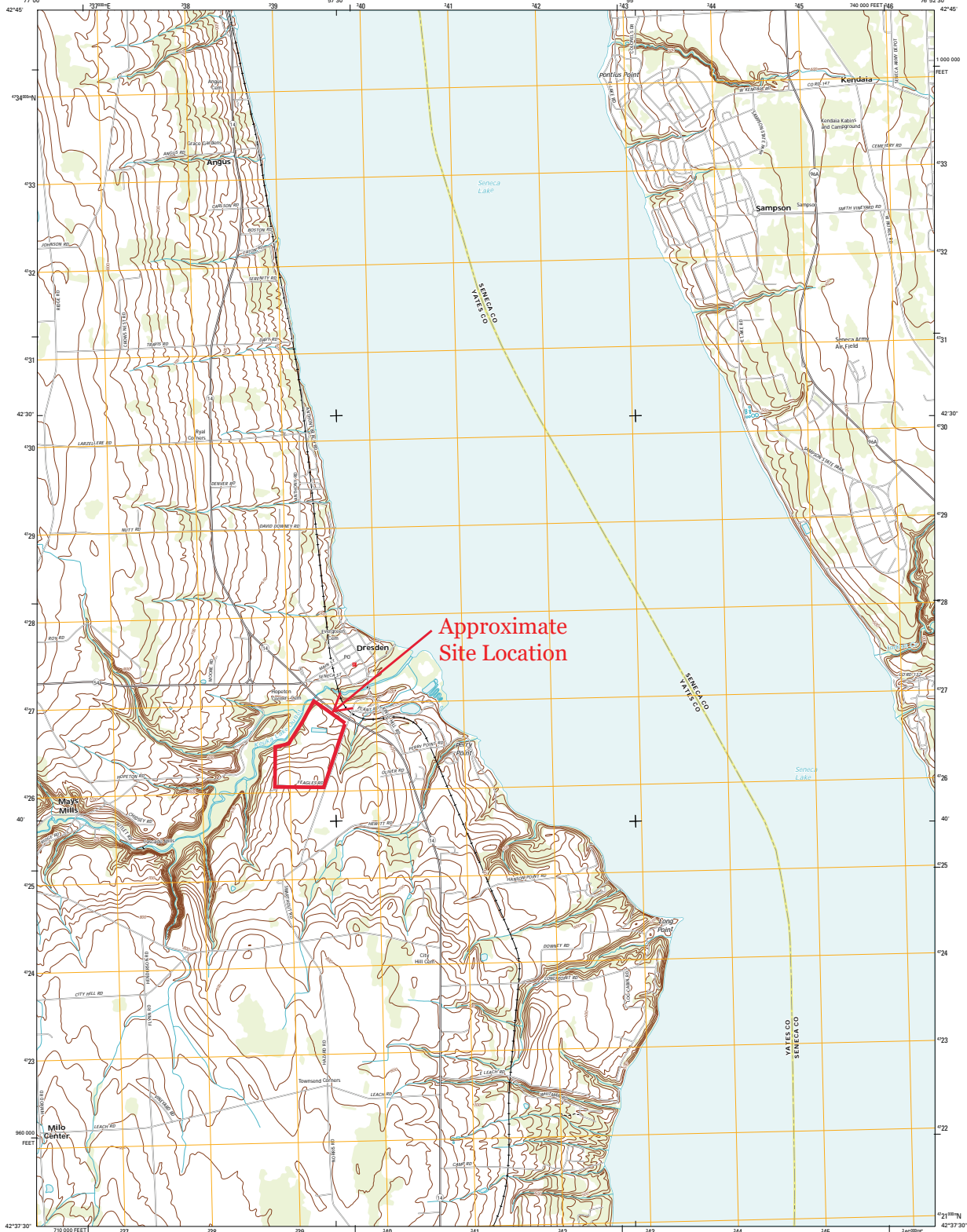
**RE: Record of Compliance – Permit Application Supplement
Supplemental Information to Form**

Question #7 on the Record of Compliance – Permit Application Supplement Form indicates that if any answer to questions 5, 6(a), or 6(b) is YES, additional details shall be provided. Question 5 was answered yes. Additional details follow:

Question 5: Does the applicant currently hold any permit issued under the Environmental Conservation?

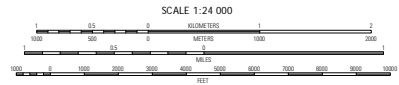
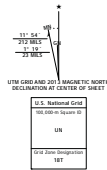
Response: Yes, Lockwood Hills LLC maintains a Part 360 Solid Waste Management Facility Permit (Permit No. 8-5736-00005/00003-0) which expires on September 4, 2018. This Record of Compliance is being submitted as a required component of the renewal package for this permit. Wastes authorized for disposal at the Lockwood Ash Disposal Site include fly ash, bottom ash, pulverizer mill rejects, and wastewater treatment plant sludge from Greenidge Station, as well as, a number of former electrical generating facilities that were all owned by AES Eastern Energy, L.P. of Arlington, Virginia. Coal bottom ash from Garlock, Inc. and coal fly ash from Eastman Kodak Company are also authorized wastes, although they have not been disposed of in the Landfill in recent years.

Lockwood Hills LLC also maintains a State Pollutant Discharge Elimination System (SPDES) permit (Permit No. NY0107069) to discharge a combination of leachate and contact stormwater from the Sedimentation/Neutralization Basin located north of the landfill. The current SPDES permit expired on 11/30/2015; however, the permit has been extended per the State Administrative Procedure Act (SAPA) to allow for the NYS Department of Environmental Conservation (NYSDEC) to undertake “a full technical review of the SPDES discharge” according to a letter from Lindy Sue Czuberant of NYSDEC to Dale Irwin of Lockwood Hills dated February 18, 2016.



Approximate
Site Location

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84) Projection and
1:250,000 meter grid (Universal Transverse Mercator, Zone 18E,
10 000-foot scale, New York Coordinate System of 1983 (central
zone))



ROAD CLASSIFICATION

Interstate Route	State Route
US Route	Local Road
Ramp	466D
Interstate Route	US Route
	State Route

Stanley	Green	Bambusa
Peen	Ten	Old
Kendia	Park	Loft

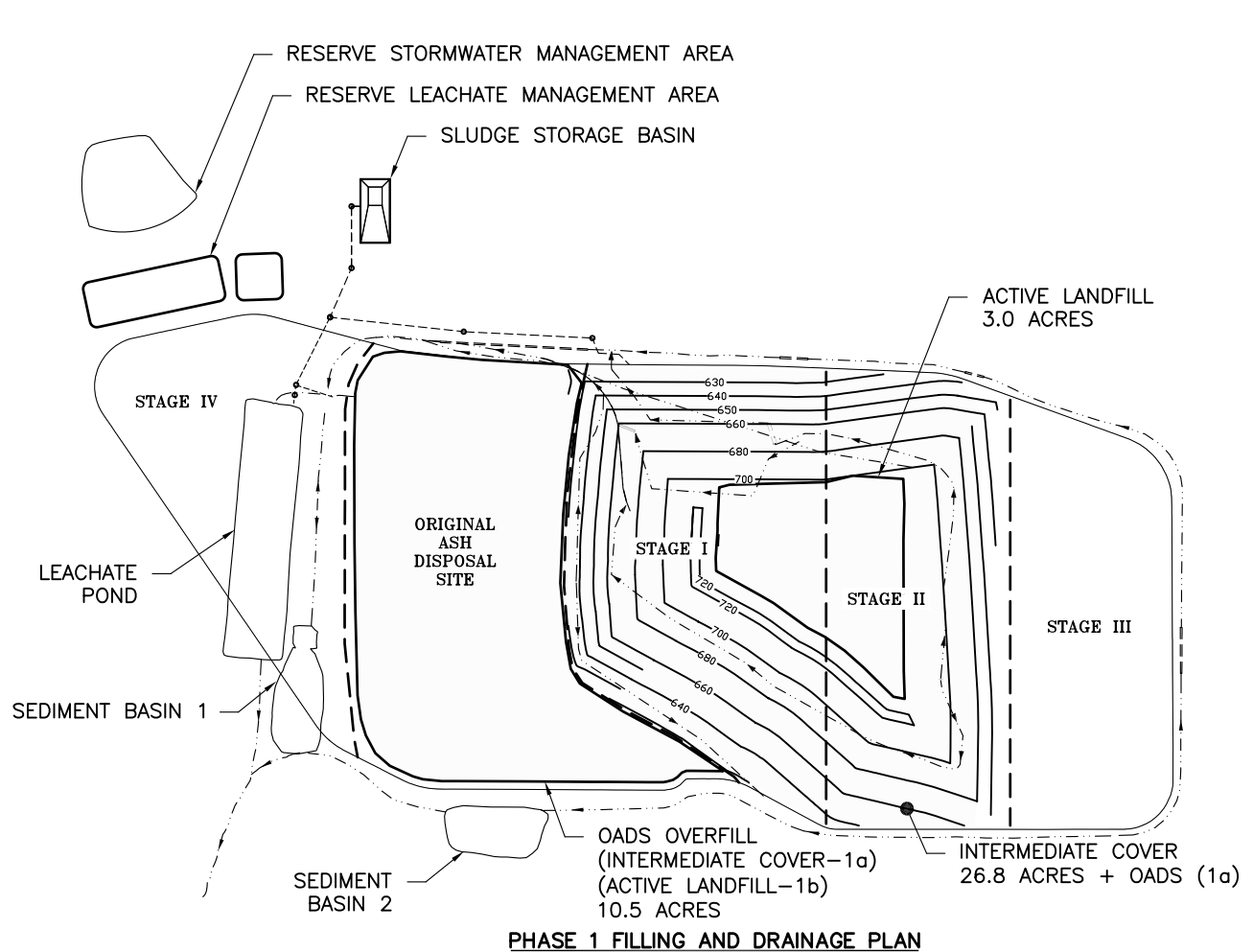
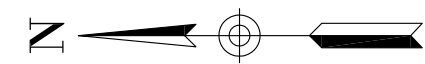
This map was produced to conform with the
National Geospatial Program US Topo Product Standards, 2011.
A metadata file associated with this product is available (see s.7)

DRESDEN, NY
2013

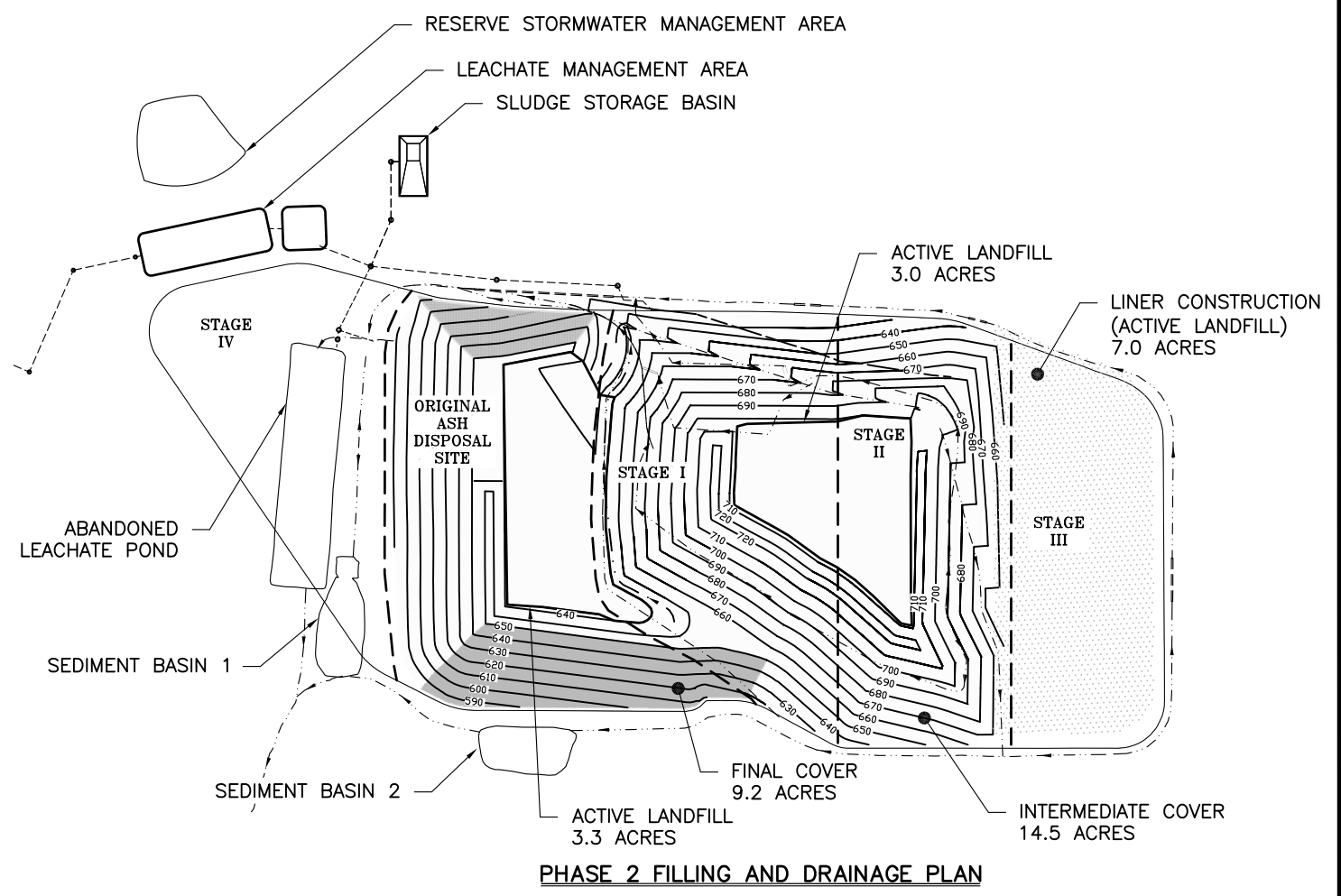
ADJOINING 7.5 QUADRANGLES

ATTACHMENT 2

**Fill Progression Plan
Phase 1 through Phase 6**



PHASE 1 FILLING AND DRAINAGE PLAN



PHASE 2 FILLING AND DRAINAGE PLAN

PHASE 1a (CURRENT LANDFILL, AS OPERATING)

ACTIVE LANDFILL	= 3.0 ACRES
INTERMEDIATE COVER	= 26.8 ACRES
TOTAL	= 29.8 ACRES

PHASE 1b (ACTIVE LANDFILL OF OADS OVERFILL)

ACTIVE LANDFILL	= 13.5 ACRES
INTERMEDIATE COVER	= 16.3 ACRES
TOTAL	= 29.8 ACRES

FINAL COVER

LEACHATE TRANSFER PIPE AND MANHOLE

STORMWATER CHANNEL

PHASE 2

ACTIVE LANDFILL	= 13.3 ACRES
INTERMEDIATE COVER	= 14.5 ACRES
FINAL COVER	= 9.2 ACRES
TOTAL	= 37.0 ACRES

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ALTERATION OF ANY SURVEY, DRAWING, DESIGN, SPECIFICATION OR REPORT MUST BE COMPLETED IN ACCORDANCE WITH SECTION 7209 PROVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

DAIGLER ENGINEERING, P.C.
 CIVIL & GEO-ENVIRONMENTAL ENGINEERING
 2620 GRAND ISLAND BLVD. GRAND ISLAND, NEW YORK 14072
 (716) 773-6872 (716) 773-6873 FAX

PRELIMINARY NOT FOR CONSTRUCTION



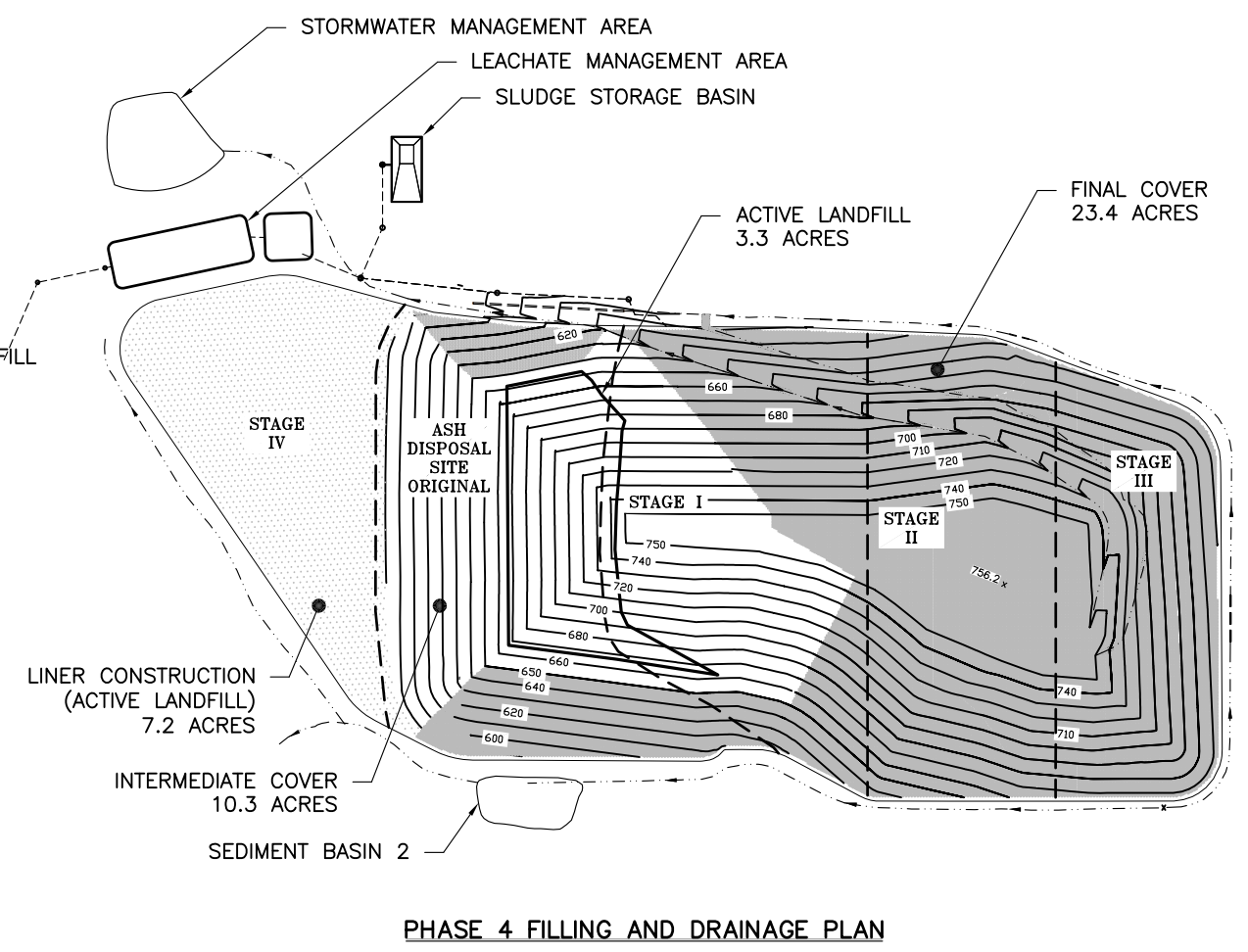
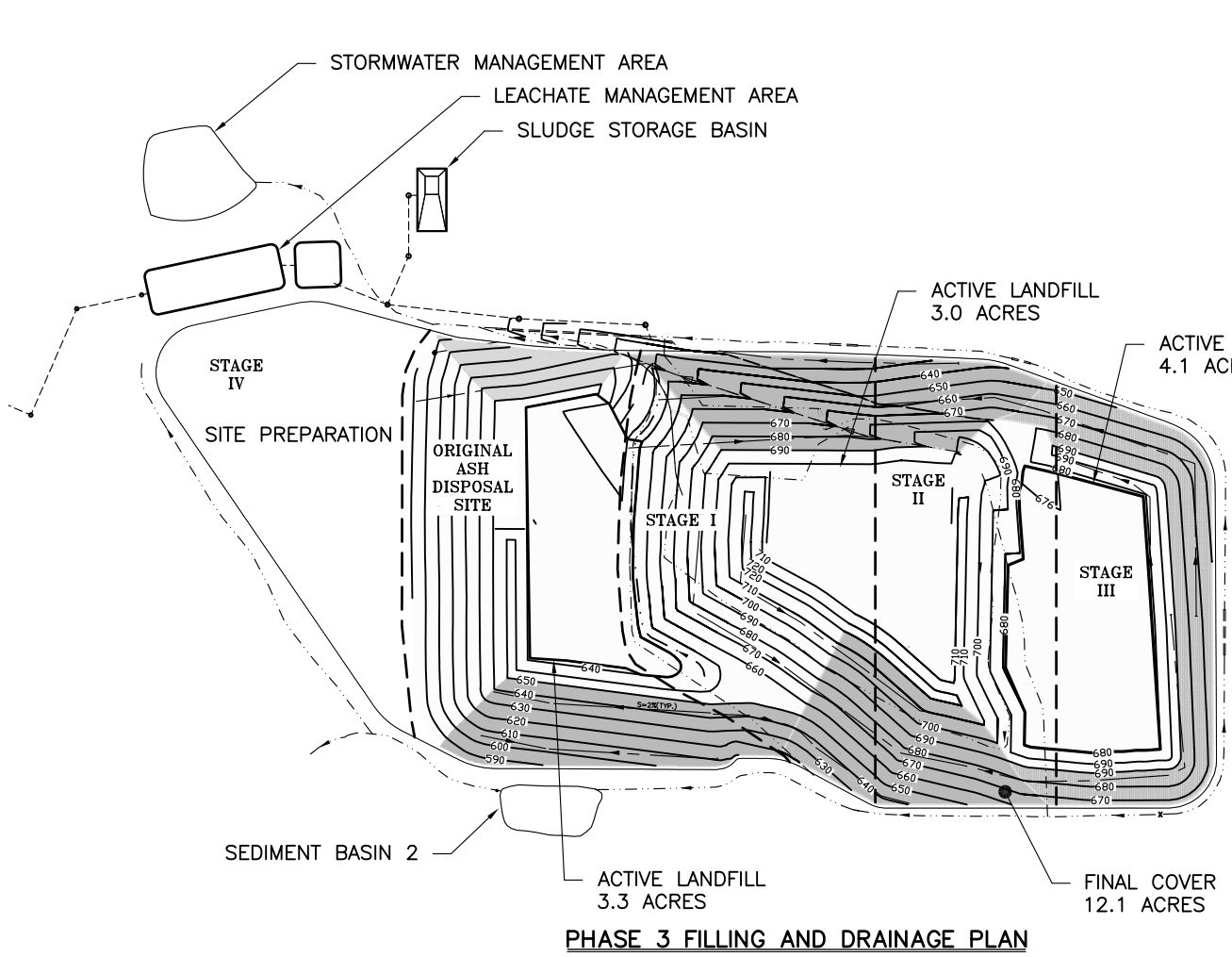
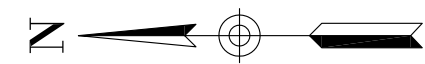
NO.	REVISION	BY	DATE

JAMES A. DAIGLER, P.E.
NYSPE NO. 061689

DATE: May 2018

SCALE: 1"=400'

PREPARED FOR: LOCKWOOD HILLS LLC	PHASE 1-2 FILL PROGRESSION PLAN LOCKWOOD ASH DISPOSAL SITE			SHEET 1
DES. BY: DRW. BY: CHK. BY:				
DWG: Phasing Plan 1-4.dwg	TOWN OF TORREY	YATES COUNTY	NEW YORK	

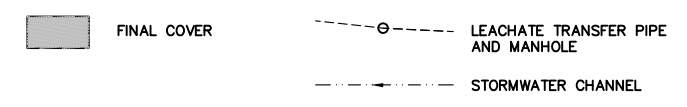


PHASE 3

ACTIVE LANDFILL	=	10.4 ACRES
INTERMEDIATE COVER	=	14.5 ACRES
FINAL COVER	=	12.1 ACRES
TOTAL	=	37.0 ACRES

PHASE 4

ACTIVE LANDFILL	=	10.5 ACRES
INTERMEDIATE COVER	=	10.3 ACRES
FINAL COVER	=	23.4 ACRES
TOTAL	=	44.2 ACRES



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 CIVIL & GEO-ENVIRONMENTAL ENGINEERING
 2620 GRAND ISLAND BLVD. GRAND ISLAND, NEW YORK 14072
 (716) 773-6872 (716) 773-6873 FAX

**PRELIMINARY
NOT FOR
CONSTRUCTION**



NO.	REVISION	BY	DATE

JAMES A. DAIGLER, P.E.
NYSPE NO. 061689

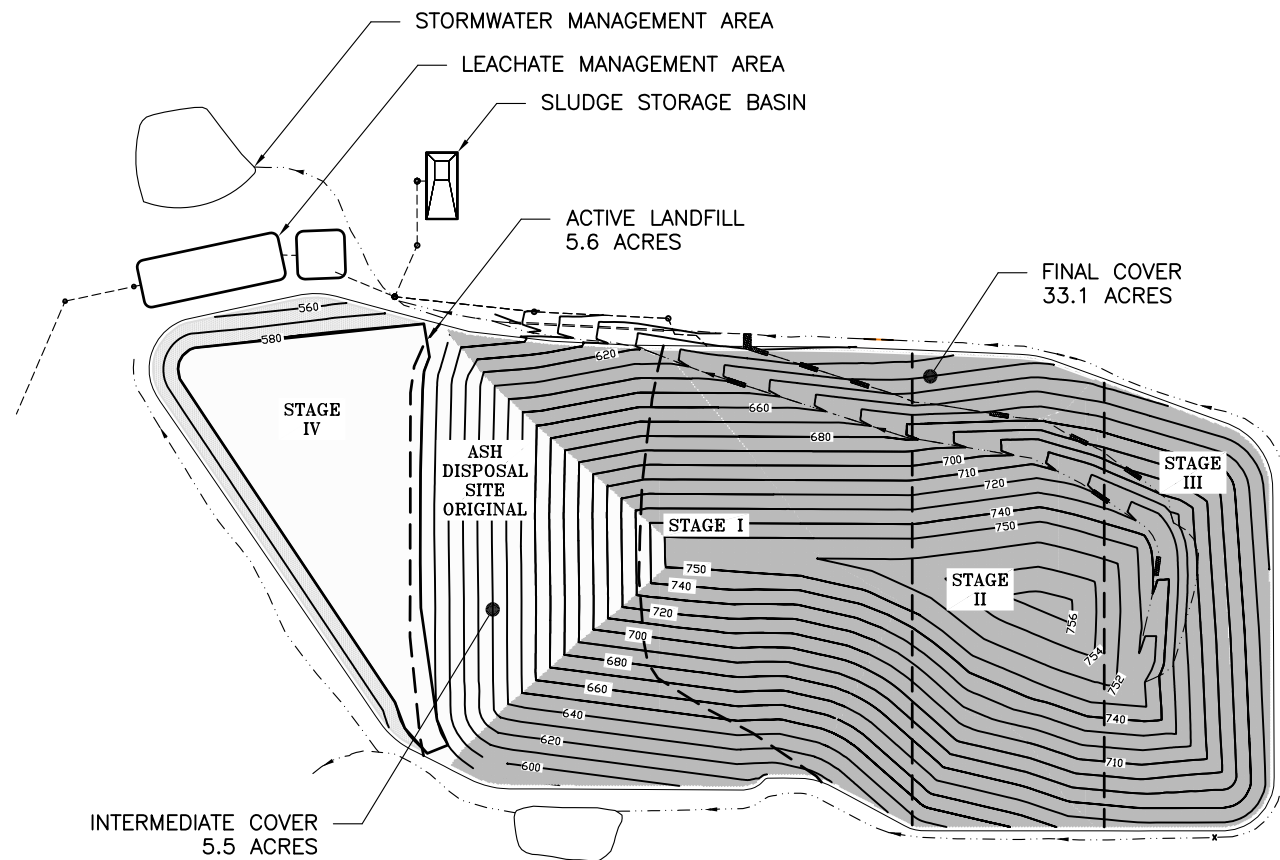
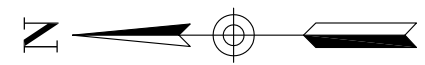
DATE: May 2018

SCALE: 1"=400'

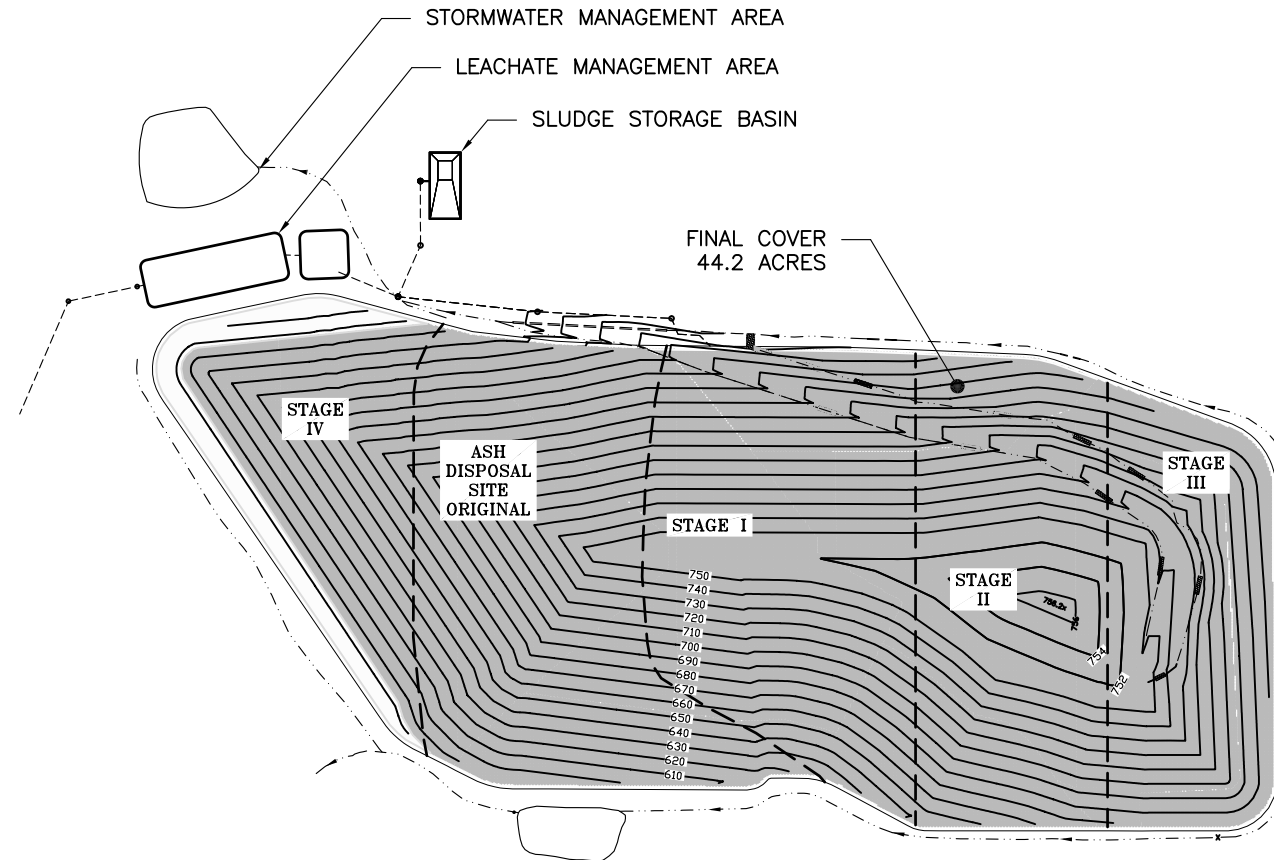
PREPARED FOR:	LOCKWOOD HILLS LLC
DES. BY:	DRW. BY:
CHK. BY:	DWG:
Phasing Plan 1-4.dwg	

PHASE 3 THROUGH 4 FILL PROGRESSION PLAN		
LOCKWOOD ASH DISPOSAL SITE		
TOWN OF TORREY	YATES COUNTY	NEW YORK

SHEET
2



PHASE 5 FILLING AND DRAINAGE PLAN



PHASE 6 FINAL GRADING PLAN

PHASE 5

ACTIVE LANDFILL	= 5.6 ACRES
INTERMEDIATE COVER	= 5.5 ACRES
FINAL COVER	= 33.1 ACRES
TOTAL	= 44.2 ACRES

PHASE 6

ACTIVE LANDFILL	= 0.0 ACRES
INTERMEDIATE COVER	= 0.0 ACRES
FINAL COVER	= 44.2 ACRES
TOTAL	= 44.2 ACRES

- FINAL COVER
- LEACHATE TRANSFER PIPE AND MANHOLE
- STORMWATER CHANNEL

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 2620 GRAND ISLAND BLVD. GRAND ISLAND, NEW YORK 14072
 (716) 773-6872 (716) 773-6873 FAX

**PRELIMINARY
NOT FOR
CONSTRUCTION**

JAMES A. DAIGLER, P.E.
NYSPE NO. 061689

DATE: May 2018

SCALE: 1"=400'



NO.	REVISION	BY	DATE

PREPARED FOR:	LOCKWOOD HILLS LLC	PHASE 5 THROUGH 6 FILL PROGRESSION PLAN			SHEET 3
DES. BY:	DRW. BY:	CHK. BY:	LOCKWOOD ASH DISPOSAL SITE		
DWG:	Phasing Plan 5-6.dwg	TOWN OF TORREY	YATES COUNTY	NEW YORK	

ATTACHMENT 3

**Leachate Generation Rate and
Quantity Calculations**

Lockwood Ash Disposal Site
Leachate Generation Rates

Conditions	GPAD	Method to determine flow rate
Landfilling	1,070	Measured peak flow x 1.3 factor of safety
Intermediate Cover	625	Measured peak flow
Final Cover	7.6	Calculated migration through composite liner

PHASE 1a (current landfill, operating condition)			
Phase Condition	Size (acre)	Generation Rate (gpad)	Flow (gpd)
Active Landfill Area	3.0	1,070	3,210
Intermediate Cover	26.8	625	16,769
Final Cover	0.0	7.6	0
TOTAL	29.8		19,979

PHASE 1b (active landfill of OADS overfill area)			
Phase Condition	Size (acre)	Generation Rate (gpad)	Flow (gpd)
Active Landfill Area	13.5	1,070	14,445
Intermediate Cover	16.3	625	10,206
Final Cover	0.0	7.6	0
TOTAL	29.8		24,651

PHASE 2			
Phase Condition	Size (acre)	Generation Rate (gpad)	Flow (gpd)
Active Landfill Area	13.3	1,070	14,231
Intermediate Cover	14.5	625	9,063
Final Cover	9.2	7.6	70
TOTAL	37.0		23,363

PHASE 3			
Phase Condition	Size (acre)	Generation Rate (gpad)	Flow (gpd)
Active Landfill Area	10.4	1,070	11,128
Intermediate Cover	14.5	625	9,063
Final Cover	12.1	7.6	92
TOTAL	37.0		20,282

PHASE 4			
Phase Condition	Size (acre)	Generation Rate (gpad)	Flow (gpd)
Active Landfill Area	10.5	1,070	11,235
Intermediate Cover	10.3	625	6,438
Final Cover	23.4	7.6	178
TOTAL	44.2		17,850

PHASE 5			
Phase Condition	Size (acre)	Generation Rate (gpad)	Flow (gpd)
Active Landfill Area	5.6	1,070	5,992
Intermediate Cover	5.5	625	3,438
Final Cover	33.1	7.6	252
TOTAL	44.2		9,681

PHASE 6			
Phase Condition	Size (acre)	Generation Rate (gpad)	Flow (gpd)
Active Landfill Area	0.0	1,070	0
Intermediate Cover	0.0	625	0
Final Cover	44.2	7.6	336
TOTAL	44.2		336

- * Intermediate cover is defined as minimum 6" thick layer of unclassified soil in the facility's O&M Manual
- * Active landfill areas measured in AutoCAD (Q:\F Drive\data\Projects\AES\Permit Renewal Application\dwg\....._active LF areas.dwg)
- * Final cover areas from "Operation Summary Chart" on Phase 1 through 3 Fill Progression Plan
- * Active Landfilling areas from Section 10 of the Revised O&M Manual (March 2018)
- * The Open Liner period is neglected for the sizing criteria of each phase. It is assumed that the rainwater collected is directed to stormwater

BY MKS DATE 5/2/18

CHKD. BY BAMA DATE 5/2/18

2620 Grand Island Blvd. - Grand Island, NY - 14072 Ph: (716) 773-6872 - Fax: (716) 773-6873

SUBJECT Lockwood - Leachate Generation Rates

FINAL COVER

Use Giroud, et al 1997 - Final Cover Infiltration Eqn.

Q = Cqo * n (1 + 0.1 (h/ts)^0.95) a^0.1 h^0.9 Ks^0.74

Q = Leakage rate through the Defect (m^3/s)

Cqo = Contact quality factor = 0.7 for Soil contact

n = # of defects in geomembrane -> Assume 4/Acre

h = Head on geomembrane = 18" = 0.4572m

ts = Thickness of soil below geomembrane = 6" = 0.152m

a = Area of circular defect = 3.1416 x 10^-6 m^2 for 2.0mm dia.

Ks = Soil Permeability = 1 x 10^-5 cm/s = 1 x 10^-7 m/s

- Neglect GCL (conservative)

Q = (0.7)(4) [1 + 0.1 ((0.4572m)/(0.152m))^0.95] (3.1416 x 10^-6 m^2)^0.1 (0.4572m)^0.9 (1 x 10^-7 m/s)^0.74

Q = (0.28)(1.284675)(0.281653)(0.494420)(6.6 x 10^-6)

Q = 3.31 x 10^-7 m^3/s -6 1m^3 = 264.17 gal

= 8.74 x 10^-5 g/s -> For 1 Acre

-> 8.74 x 10^-5 g/s (60s/1m) (60m/1hr) (24hr/1d) -> For 1 Acre

= 7.55 g/d -> For 1 Acre

-> Use 7.6 GPAD ✓

Intermediate Cover

From Leachate Monitoring and Analysis Report, Jan 2018

Avg Design = 470 GPAD, Peak Design = 625 GPAD

-> Use Peak Design = 625 GPAD For rate base design ✓

Active Landfill

From Historic Leachate generation rates prior to 5/2011 with a 1.3 factor of safety -> Use 1070 GPAD ✓

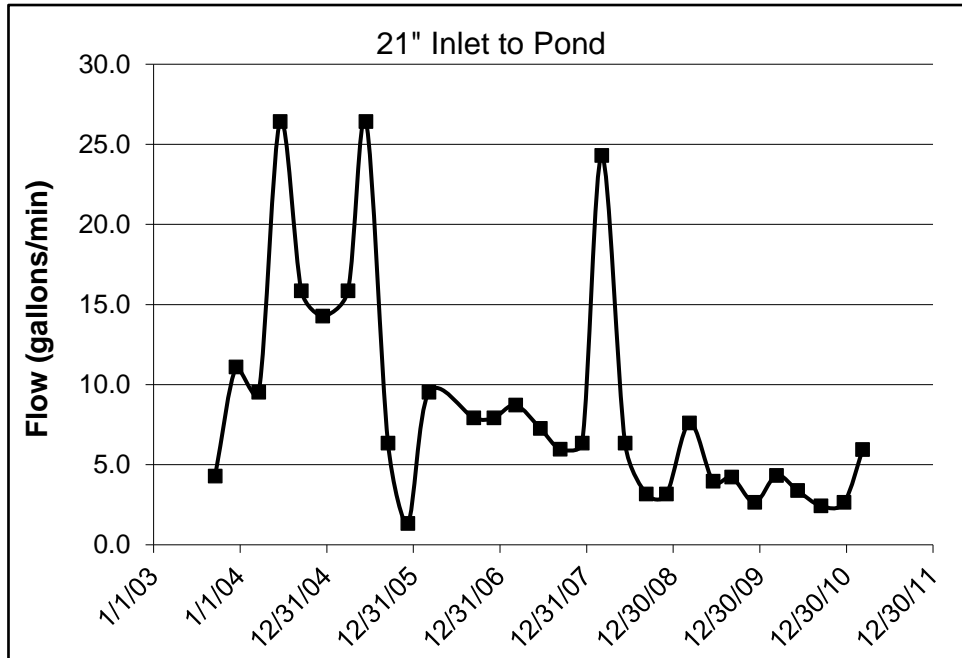
Active Landfill Leachate Generation Calculations

Flow, gallon/min
21" Inlet to

Date	Pond
3/12/03	7.1
6/4/03	9.5
9/17/03	4.3
12/15/03	11.1
03/19/04	9.5
6/17/04	26.4
9/15/04	15.9
12/14/04	14.3
3/30/05	15.9
6/14/05	26.4
9/15/05	6.3
12/7/05	1.3
3/6/06	9.5
9/12/06	7.9
12/5/06	7.9
3/7/07	8.7
6/19/07	7.3
9/11/07	6.0
12/12/07	6.3
3/4/2008	24.3
6/10/08	6.3
9/8/2008	3.2
12/2/2008	3.2
3/9/2009	7.6
6/16/2009	4.0
9/3/2009	4.2
12/8/2009	2.6
3/10/2010	4.3
6/7/2010	3.4
9/14/2010	2.4
12/20/2010	2.6
3/8/2011	5.9

21" Inlet to Pond = Influent to the Sediment Basin from Stage I and II, including the Leak detection system and the Stage I overflow liner

Stage I Area (including overflow area)	10.704	Acres
Stage II Area	8.567	Acres
Total tributary area to 21" Inlet to Pond	19.271	Acres



Data After May 2011 after using 21" Inlet only			
Point	Flow (GPM)	Rank	Percent
6	26.4	1	96.70%
10	26.4	1	96.70%
21	24.3	3	93.50%
7	15.9	4	87.00%
9	15.9	4	87.00%
8	14.3	6	83.80%
4	11.1	7	80.60%
	11.00		80.00%
2	9.5	8	70.90%
5	9.5	8	70.90%
13	9.5	8	70.90%
17	8.7	11	67.70%
15	7.9	12	61.20%
16	7.9	12	61.20%
25	7.6	14	58.00%
18	7.3	15	54.80%
1	7.1	16	51.60%
11	6.3	17	41.90%
20	6.3	17	41.90%
22	6.3	17	41.90%
19	6.0	20	38.70%
33	5.9	21	35.40%
29	4.3	22	32.20%
3	4.3	23	29.00%
27	4.2	24	25.80%
26	4.0	25	22.50%
30	3.4	26	19.30%
23	3.2	27	12.90%
24	3.2	27	12.90%
28	2.6	29	6.40%
32	2.6	29	6.40%
31	2.4	31	3.20%
12	1.3	32	0.00%

Average Leachate Flow Rates Before Layup (May 2011):

Geomean	6.7
Gal/Day	9,643.3
GPAD	500.4

~ 500 GPAD

80th Percentile Leachate Flow Rate Before Layup (May 2011):

gpm	11.00
Gal/day	15,840.0
GPAD	822.0
FS = 1.3	1068.55

~ 1070 GPAD

ATTACHMENT 4

**Operation & Maintenance
(O&M) Manual
Updated March 2018**



OPERATION & MAINTENANCE (O&M) MANUAL

LOCKWOOD ASH DISPOSAL SITE

Prepared on behalf of:

Lockwood Hills LLC
590 Plant Road
P.O. Box 187
Dresden, New York 14441

Prepared by:



2620 Grand Island Blvd.
Grand Island, New York 14072-2131

February 2007
Revised March 2018

OPERATION & MAINTENANCE (O&M) MANUAL

LOCKWOOD ASH DISPOSAL SITE

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Dresden, New York 14441

Prepared by:



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Grand Island, New York 14072-2131

February 2007
Revised March 2018

OPERATION & MAINTENANCE (O&M) MANUAL

Lockwood Ash Disposal Site

Lockwood Hills LLC

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OPERATION & MAINTENANCE (O&M) MANUAL

Lockwood Ash Disposal Site

Lockwood Hills LLC

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1 INTRODUCTION

1.1 GENERAL

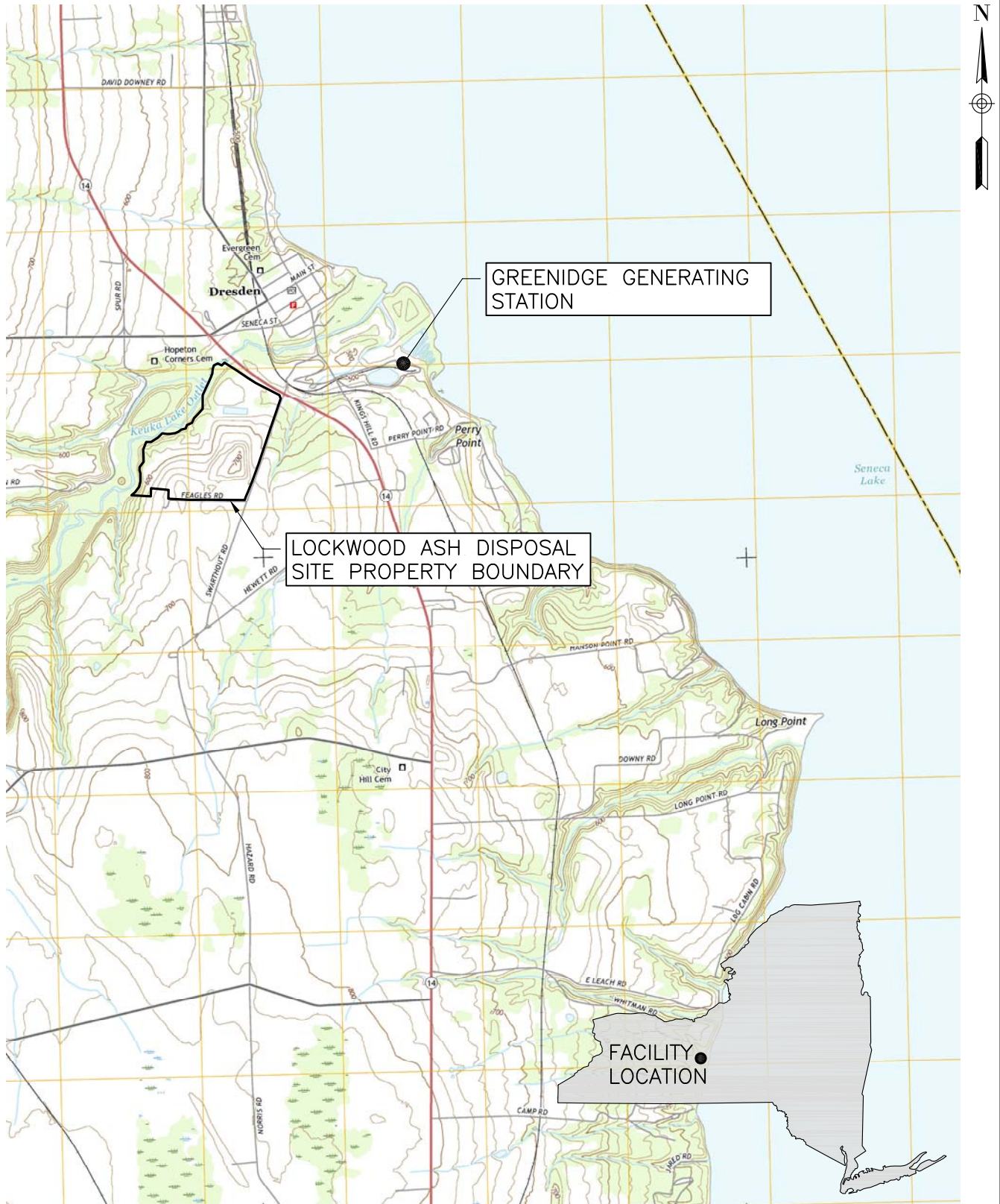
Greenidge Station is electric generating plant owned and operated by Greenidge Generation LLC. The station is located on the west shore of Seneca Lake near the Village of Dresden in the Town of Torrey, Yates County, New York. Up until 2011 the power plant operated on two, coal-fired generating units, Unit 3 and Unit 4, with a combined maximum generating capacity of about 160 megawatts. After a six-year layup, Greenidge Station revived operation of Unit 4 only in 2017, after converting the boiler to burn natural gas. The Station now has a maximum generating capacity of about 112 megawatts and uses natural gas as its primary fuel with up to 19% biomass co-firing permissible.

The Lockwood Ash Disposal Site (Lockwood or Landfill), managed by Lockwood Hills LLC (Lockwood Hills), is located about 0.75 miles west of the Greenidge Generating Station as shown in Figure 1-1. The currently permitted extent of this landfill is 44.2-acres of which 29.8 acres has already been constructed to date. The Lockwood Landfill has been accepting coal combustion byproducts (CCBP's) produced at the Greenidge Station and other facilities since approximately 1979. It is anticipated that Lockwood will continue to accept fly ash and bottom ash from the burning of 19% biomass at Greenidge Station in the future.

1.2 PURPOSE

This Operation and Maintenance (O&M) Manual describes the day-to-day facility operation throughout the active life of the Landfill as required by subparagraph 360.16(c)(4)(ii) and subdivision 360.19(d) of the 6 NYCRR Part 360 regulations.

Q:\Lockwood Hills LLC\ACAD\PDF\SITE LOCATION MAP.dwg 5/2/2018 1:25 PM



SITE LOCATION MAP

REVISED ENGINEERING REPORT

LOCKWOOD HILLS LLC

TOWN OF TORREY

YATES COUNTY

NEW YORK

May 2018

SCALE: NOT TO SCALE

REVISION # 0

FIGURE

1-1



CIVIL & GEO-ENVIRONMENTAL ENGINEERING
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2 AUTHORIZED WASTES, DISPOSAL RATE, & SERVICE AREA

2.1 WASTE TYPES

Wastes authorized for disposal at the Lockwood Ash Disposal Site include fly ash, bottom ash, pulverizer mill rejects, and wastewater treatment plant sludge from Greenidge Station, as well as, a number of former electrical generating facilities that were all owned by AES Eastern Energy, L.P. of Arlington, Virginia. Coal bottom ash from Garlock, Inc. and coal fly ash from Eastman Kodak Company are also authorized wastes, although they have not been disposed of in the Landfill in recent years.

Historically, coal combustion by-products (CCBPs) and their admixtures produced almost exclusively at Greenidge Station during its coal burning years were disposed at Lockwood. The principal constituents of CCBPs are oxides of silica, aluminum and iron. The material will also include unburned carbon, oxides of calcium, magnesium, phosphorous, potassium, sulfur sodium and small amounts of titanium. During the layup period, the wastes disposed consisted of authorized waste (primarily ash and mill rejects with occasional unprocessed coal) contaminated soil from routine cleaning and maintenance of the stormwater management system basins and channels onsite and cleanup activities at the Greenidge Station from the former coal pile storage area. In the future, the primary waste stream is anticipated to be fly ash and bottom ash from Greenidge associated with the up to 19% biomass that the Station is authorized to co-fire. Sludge or soils from the routine maintenance or remediation activity of retired or active ponds or other areas at the Greenidge Station which are found to contaminated with an authorized waste, also have the potential to be disposed at Lockwood.

The biomass can include untreated wood and resonated wood. Ash handling operations at Greenidge Station convey boiler fly ash associated with the use of biomass pneumatically to a fly ash storage silo. The ash is then processed for proper disposal. This wood ash waste primarily derives its chemical composition from the parent wood.

The wastewater treatment plant sludge is a mixture of calcium sulfate and metal hydroxides resulting from the lime precipitation of the former coal pile drainage, maintenance cleaning wastewaters and miscellaneous wastewater collected and treated at Greenidge Station's wastewater treatment facility.

In the event Lockwood Hills seeks to dispose of approved wastes from other facilities, Lockwood Hills must determine whether the candidate solid waste stream meets the definition of an authorized waste, subject to the requirements and procedures of the waste approval program. The waste approval program must establish and document the characteristics of the waste stream to:

- Confirm the material is authorized for disposal; and,
- Determine the waste is compatible with other wastes disposed at the site.

This process can be accomplished through the review and assessment of a completed Generator Waste Profile and supporting documentation, as included in a complete waste disposal application. Lockwood Hills must confirm the material properties and establish that the waste is not prohibited from disposal. Any such wastes will be subject to the approval of the NYSDEC prior to disposal. If the knowledge of the Generator is insufficient to support the characterization of the material, material sampling and laboratory analysis to quantify contaminant concentrations will be required, and the resulting information will be submitted to the NYSDEC for approval.

2.2 WASTE DISPOSAL RATE

Consistent with the previous permits for this site, the approved design capacity for this facility is 1,729 tons per day. As evidenced by the remaining site life for the permitted facility however, it is noted that the Landfill provides a significant amount of permitted airspace, and Lockwood may accept approved wastes from other combustion facilities should approval by the NYSDEC be granted as described in Section 2.1.

2.3 SERVICE AREA

Lockwood is by-in-large a captive landfill with a practical service area consisting only of property managed by Lockwood Hills LLC or Greenidge Generation LLC. However, the service area for other candidate solid waste streams, as discussed above, is New York State and the nearby northeastern states of Pennsylvania, New Jersey, Massachusetts, Connecticut, and Vermont.

3 LANDFILL DISPOSAL METHODS

3.1 WASTE TRANSPORTATION & LANDFILL ACCESS

The majority of the waste is generated at the Greenidge Generating Station; however, the Landfill may also accept authorized wastes from other facilities.

Ash materials shall be removed as required between the hours of 6:00 am and 6:00 pm seven days per week from Greenidge Station, unless the Contractor/Plant verifies, by visual inspections, that plant storage will be inadequate for continuous operation. Operational hours for wastes from other facilities will be limited to the hours of 6:00 am and 6:00 pm Monday through Saturday.

Authorized wastes are transported to the active area of the Landfill by truck. All transport vehicles shall be suitably equipped that they may be filled and transported to the disposal site in a manner that assures no spillage or blowing of ash. The trucks must be properly placarded, and truck transportation must be in accordance with the conditions of the effective permits and the requirements of the applicable regulations for transportation of waste in New York State.

All loads will be weighed on a truck scale at the plant or other location, and records of each load transported to the Landfill are to be kept on file at the plant. Trucks transporting ash and other acceptable authorized wastes must be covered by a canvas or other approved cover. Trucks destined for the site will use NYS Route 14 to Swarthout Road, then continuing on to the Landfill site entrance approximately 200 feet south of Route 14.

Trucks then travel south using the onsite haul road constructed along the eastern side of the Landfill and traveling towards the southwestern corner to enter the active fill area. The access road is cleaned as necessary to prevent ash from being tracked onto public roadways. The site entrance gate and driveway chains shall be locked at the end of each day's operation to prevent unauthorized access to site.

Lockwood maintains a generalized fill progression plan, intended to coordinate waste and cover placement in manner that efficiently utilizes the available airspace. Landfill progression planning is designed to help direct the landfill operator in the construction of access roadways and waste grades that will promote the use of protected areas (i.e., interior, bermed areas or those

lower on the slope) when the wind has the potential to blow ash offsite, and less protected areas (e.g., sideslopes) when ambient winds are not a significant operating factor. The fill progression plans illustrate the general direction and manner of filling and permanent access road locations. Working face size and geometry, filling procedures, lift thickness compaction, and cover usage are as per the NYSDEC regulations

3.2 WASTE PLACEMENT

The working face size must be controlled by the operator and will generally be a function of the rate of disposal and truck/equipment maneuvering requirements. The working face must consist of an area as small as is practicable to spot the trucks, dump the waste, spread the waste into manageable lifts, and compact the graded waste materials. The working face will be nominally a maximum of 10 feet high. Trucks delivering waste and cover material to the working face will position themselves either at the top or the bottom of the working face slope. The working face slope will typically be constructed at a grade between 3H:1V to 5H:1V. Waste hauling vehicles must be afforded stable and level ground on which to maneuver before depositing the material.

Fly ash shall be graded into a nominal one-foot thick lift, on the sloping portion of the working face by a tracked bulldozer. A steel drum vibratory compactor shall be used to compact the waste to enhance in-place density and shear strength and improve resistance to erosion.

The pulverized mill rejects (pyrites) and the sludges are not deposited in the fly ash fill until at least a seven-foot separation exists between the cell and bottom or top of the Landfill. Pyrites and sludges are placed/buried in a cellular manner in separate excavations in the ash not less than 50 feet from the boundaries of the Landfill, and the remainder of the excavation backfilled with fly ash and recompact. An effort will be made to blend fly ash with the sludge so that the subsequent fly ash backfill can be compacted. Pyrites and sludges shall be covered the same day they are received from the Plant. At no time shall any excavation remain unattended without placing enclosure barrier consisting, at minimum, pylons and yellow "Caution" tape.

During the daily landfilling operation, the exposed fly ash may be dampened during above freezing temperatures by lightly spraying water on the surface to help achieve effective dust control. At the end of each daily operation, the surface of the ash fill is "seal rolled" with the vibratory smooth drum compactor to help prevent erosion of the ash by wind and/or rainfall that

may occur before the next daily operation. Areas of the Landfill not being actively filled will be covered with an intermediate cover consisting of a six-inch thick (minimum) layer of unclassified soil placed in a single lift. This intermediate soil cover will be seeded to provide a protective vegetative cover.

3.3 ROUTINE LANDFILL SITE MAINTENANCE

The Operations Contractor will be required to perform routine as-needed maintenance on the storm water management and cover systems, within the boundary of the site. This will require, in general, the following:

- Maintain all drainage channels and culverts in a clean and unobstructed condition;
- Annual mowing to prevent deep-rooted vegetation to ensure continued viability of vegetative cover, and facilitate site inspections;
- Spot repairs to cover layers; and,
- Road grading, maintenance, and drainage.

3.4 ENVIRONMENTAL CONTROL

The Operations Contractor shall be responsible for the removal of ice and snow from the work areas and haul roads as may be necessary to execute the work. It will also be necessary to remove snow from the working face area prior to placing additional waste.

The Operations Contractor shall at all times (including Sundays and Holidays) prevent the wind or water erosion of ash or soil from the Landfill and all haul roads. Fugitive dust control is a major issue with respect to site operations. The Contractor must satisfy all conditions of the program designed to control dust emissions from the site.

The Operations Contractor is responsible for maintaining drainage and erosion control devices as required to prevent solids from being transported from the lined area of the site. The Contractor shall maintain, repair, and clean all drainage channels and dry well catch basins. The Contractor also shall perform any minor maintenance of these facilities such as removing or adding stop logs, cleaning culverts, removing ice or debris, etc.

During late spring or early summer of each year, or as directed by the Lockwood site representative, the Operations Contractor will be required to remove any ash fines from the peripheral drainage or roadway infrastructure. The Operations Contractor may use either hand tools or mechanical equipment to perform this work, but it must be done to the satisfaction of the Lockwood Project Manager.

3.5 GENERAL REQUIREMENTS

Cleanouts - The leachate collection pipe cleanouts that have been installed on the site are permanent structures and must be protected and extended as required. It is the Operations Contractor's responsibility to extend each of the cleanouts so that they are at all times exposed above the surrounding surface. Extensions shall be no more than 5 feet at any one time.

Grade Staking – Lockwood shall be responsible for supplying a New York State licensed land surveyor to provide horizontal and vertical control such that the Operations Contractor can perform grade staking and layout work.

Temporary Roads – The Operations Contractor must construct Lockwood-approved temporary roads or parking areas in addition to those designated on the drawings.

Permits – The Contractor must obtain a NYSDEC Waste Transporter Permit and all other necessary federal, state, and local permits, licenses, approvals, consents, etc. for his equipment and operators prior to the start of operations.

The Operations Contractor must supply adequate personnel to perform the necessary work and must have staff on-call and available as required to ensure the operational performance requirements (e.g., dust control, leachate containment, run-off control, etc.) are achieved. The Operations Contractor also must monitor site conditions on the weekends, as required, to prevent potential fugitive dust or run off, etc. from occurring. If site conditions indicate dusting potential, the Operations Contractor must take preventative measures to mitigate dusting potential as required.

4 PERSONNEL REQUIREMENTS

4.1 PROJECT MANAGER

Hauling and placement of approved wastes is conducted by the Operations Contractor under the supervision of the Project Manager, who will be designated by the Greenidge Station Plant Manager. The Project Manager's primary responsibilities include the following:

- Assuring proper performance by the Operations Contractor in accordance with the Contract and Part 360 permit conditions;
- Administration of the Contract;
- Monthly site inspections and leachate flow monitoring;
- Maintenance of records;
- Coordination and documentation of leachate collection pipe cleaning activities; and,
- Communication of pertinent information to other Lockwood personnel.

4.2 ENVIRONMENTAL SPECIALIST

An Environmental Specialist is responsible for matters associated with the sampling and monitoring activities related to environmental compliance requirements. The Environmental Specialist is responsible for the following:

- Leachate, groundwater, and surface water sampling;
- Management and documentation associated with sedimentation pond monitoring, treatment and SPDES Permit discharge events; and,
- Measurement of leachate and groundwater depression drain flow rates.

4.3 OPERATIONS CONTRACTOR

The Operations Contractor is responsible to furnish all equipment, labor, materials (unless designated by others) and supervision to operate the Landfill. In general, these duties include primarily:

- Load and transport Plant's fly ash to the disposal site;
- Spread and compact fly ash at the disposal site;

- Excavate bottom ash from C-Pond and temporarily stockpile;
- Load, haul, and place pyrites at the disposal site;
- Haul and place wastewater treatment sludge at the disposal site;
- General cleaning of work areas at the plant;
- General cleaning and maintenance at the disposal site;
- Load recovered fly ash and bottom ash onto purchaser's vehicles as required; and,
- Perform other plant and site work as directed by the Lockwood Project Manager.

In addition, the Operations Contractor will be responsible to complete the activities summarized in Section 2 of this O&M Manual that are not referenced above.

4.4 EMPLOYEE TRAINING PROGRAM

An Employee Training Program can provide personnel with a structured and organized instruction program for the performance of their assigned duties during routine and emergency operating conditions. This program includes instruction in various aspects of waste management procedures, as well as, inspection and maintenance procedures, emergency response procedures and the proper use of facility and personal protective and emergency equipment.

4.4.1 Training Program Outline

This training program provides basic on-the-job training instructions in the following areas:

- An introduction to the layout of the site and its waste handling methods;
- An overview of the contents of this O&M Manual;
- An overview of the proper handling procedures and safety concerns associated with the waste materials accepted and the equipment utilized onsite;
- Instruction in required inspection and maintenance procedures;
- Instruction on the use of safety and emergency equipment.
- An overview of the emergency response procedures, and the specific function of each employee during the implementation of this plan; and,

- A discussion on the importance placed on personnel safety and protection.

4.4.2 Technical Training Approaches

All new employees of the Operations Contractor will be trained on the job. As part of introductory training efforts, each new employee will be given a general tour. An explanation of the relationship between the employee's position and the operation of the Landfill will be provided. This will include a discussion of the waste disposal activities, and an overview of the nature of the overall site practices from solid waste handling and safety perspectives.

The importance of preventive and routine inspections and maintenance will be stressed, with particular emphasis placed on those duties the employee will perform in the job to which they are assigned. The employee will be informed about, and shown the location of, the emergency and safety equipment available at the site, and scheduled for subsequent instruction in the use of any equipment requiring special training or explanation. He/she will also be informed about the procedures for responding to emergency conditions, including a fire and/or explosion, spill incident, or medical emergency. A copy of the O&M Manual and, any other pertinent facility information will be made available to any employee on request.

The employee will be questioned on the information pertinent to him contained in the O&M Manual, and the other facility information provided. At the completion of this instruction session, the Operations Contractor's supervisor and the employee will document the training and maintain a copy of the records at the Station office.

The following sections provide specific details on the additional on-the-job training each employee will receive regarding the duties to which they are assigned.

4.4.3 Inspection & Maintenance Procedures

Each employee at the facility will be educated in the importance of both the preventive and routine maintenance inspections that are conducted at the facility.

As part of the training, each employee will be informed to be constantly aware of problems that could potentially occur with the equipment used on a daily basis, and the activities performed. The employee will receive training regarding any inspections required for the equipment to be

operated to ensure that if any problems are encountered, the employee will be able to easily recognize the problem and take immediate action.

Employees involved directly with the waste receiving and management aspects of the facility will learn the proper handling of each type of waste material along with the practical implementation of applicable regulatory guidelines. Emphasis will be continually placed on safe and proper waste handling. Employees will also be educated in proper fuel handling and equipment fueling procedures to prevent spills or other incidents.

Safety and first aid equipment inspections will be given special attention during the employee's instruction. Each individual will be impressed with the importance of keeping all site safety equipment in good working condition. Procedures will be outlined for reporting any deficiencies the employee detects with his own or company equipment or when first aid supplies are low.

4.4.4 Emergency Response Procedures

Each facility employee will be trained in the proper and effective response procedures to potential emergency situations that may occur at the site.

Individuals will be informed of correct notification procedures in the event of a fire, explosion and/or release incident, including:

- Initiating the internal notification system;
- Notifying the Lockwood Project Manager; and
- Evacuating the area, if required.

Employees will be advised of the steps taken by the Lockwood Project Manager to continue the notification process, including the notification of fire and police departments, medical assistance, and state and local emergency response teams. An explanation of the Evacuation Plan for the facility will be provided. Specific conditions will be described under which the site should be abandoned.

Control measures will be thoroughly explained for possible incident occurrences, detailing precautions to be taken and remedial techniques to be used for the various types of equipment

and materials at the facility. In conjunction with incident control measures, instructions for the use of all available fire-fighting, first aid, and safety equipment also will be given.

During these group and individual instruction sessions, employees will be given every opportunity to ask questions about the facility emergency response procedures. This will include the usage of available emergency and safety equipment, to ensure that each person has a clear understanding of the actions that should be taken in an emergency incident.

4.4.5 Record Keeping Practices

Documentation of the training that is provided to each facility employee will be maintained on file in the plant office. This documentation will include a description of the type of training or instruction, basic information regarding the employee receiving the instruction, the instructor, and the date of completion. This will serve as a record that the instruction was given and successfully completed by the employee.

4.4.6 Personnel Program Evaluation

The personnel training program will be evaluated periodically to determine the need for improvements or revisions.

5 MACHINERY & EQUIPMENT

5.1 GENERAL

By Contract with Lockwood Hills, the Operations Contractor must have the necessary machinery and equipment operational at all times with sufficient operators to fulfill the requirements of landfill operation. All equipment must be in place and in operation on the first day of the Contract. Any piece of equipment not available on the first day or that is removed from the site during the Contract duration will be replaced by the Operations Contractor.

All equipment will be properly equipped with safety devices, which meet OSHA and Lockwood's standards and will be properly equipped with exhaust mufflers to limit the noise associated with this work. For the purpose of landfill operation, the Operations Contractor will have as a minimum the following equipment:

- At plant site: Sufficient number of licensed and permitted (see 6 NYCRR Part 364) transport vehicles capable of handling the plant's maximum daily waste production.
- At disposal site: Bulldozer – track type adequately sized to handle maximum daily waste disposal rate (Cat D5 or approved equal)
- Compactor – vibratory, self-propelled, and smooth steel drum (minimum 66" wide drum)
- Licensed Water truck – equipped with a front mounted pressure spray distribution bar for washing fines off the asphalt road surface and applying water to fly ash area for dust control and compaction control.
- Snowplowing vehicle – as required for maintaining access to the active disposal area.
- Back-up equipment: The Contractor will have access to and shall provide equipment to replace any units which may be out of service within sufficient time to prevent any default in the performance of his Contract.

6 OPERATIONAL CONTROLS

6.1 HOURS OF OPERATION

The Landfill will generally be open for operation up to seven days per week for the disposal of ash and/or other authorized wastes from Greenidge Station, from 6:00 am to 6:00 pm, 365 days per year. In the event storage capacity for ash at the Greenidge plant is exceeded, it may be necessary to temporarily open the ash disposal site for a short time during other hours. In that case, the NYSDEC will be notified on the first business day after this emergency event occurs.

The landfill will be open for operation for wastes from other facilities up to six days per week, from 6:00 am to 6:00 pm, and will be closed for disposal of offsite wastes on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas.

6.2 ACCESS & TRAFFIC FLOW CONTROL

A chain link fence and/or perimeter drainage channels surround the site, which controls vehicle access to the facility. A chain link double gate at the entrance roadway is locked when the site is closed, preventing unauthorized vehicle access to the site via the main roadway. Personnel employed by the Operations Contractor or Lockwood staff will unlock the gate to begin disposal operations. At the end of the day, the last staff member leaving the site locks the gate.

The existing site access roadways provide a significant amount of space for the queuing of incoming and exiting vehicles. Traffic flow is not expected to pose problems at the site given the relatively low volume of traffic, the long access roads and the availability of staging areas within the site. Given these conditions, the possibility that site related vehicles will need to queue or stage on the public roads is extremely low.

Typical off-road dump trucks will be utilized to dispose of approved wastes at Lockwood. The maximum daily traffic flow to and from the facility is approximately 110 trucks per day based on the waste acceptance rate of 1,729 tons per day; however, based on current and expected future operations, this level of site associated traffic is unlikely.

6.3 LANDFILL USAGE RULES

The Landfill will be operated and maintained in conformance with the rules and regulations set forth by the NYSDEC, as well as other applicable Federal, State, and local rules and regulations. Operation of the Landfill will be in accordance with all specific requirements set in the permit.

Disposal of unauthorized wastes are prohibited. Access control, operations, maintenance, inspection, monitoring, record keeping and reporting shall be in conformance with the requirements of the NYSDEC.

6.4 FIRST LIFT PLACEMENT

To protect the constructed baseliner system, a policy will be adopted which will restrict uncontrolled access to unfilled areas of the baseliner and overfill liner coupled with a maintenance and inspection program. The maintenance and inspection program will include requirements that traffic shall not be allowed directly above the drainage soil portion of the liner system. All movement of construction or landfill equipment (including pickup trucks or smaller vehicles) on the exposed liner system shall be only as absolutely required, and in a most careful and restricted fashion.

Any work on the liner system should be carried out in a manner consistent with that required for initial construction activities, and this will include oversight by a spotter to reduce the potential for overstressing the liner system. Inspection of the liner system in the unfilled areas shall be a routine part of landfill operations. This will include visual inspections and observations during the placement of the initial five-foot lift to preclude objects that may damage the liner system.

The placement of the first lift over a newly constructed baseliner system will require that only fly ash be placed in the initial five-foot-thick layer. The Operations Contractor will ensure that only fly ash is utilized in this zone and will ensure that field personnel are observant for any materials that may affect the integrity of the liner system.

6.5 FIRES/EXPLOSIONS

The materials disposed at the site are non-combustible. Fires or explosions would most likely be limited to operating equipment.

Onsite and portable fire extinguishers are located in the onsite trucks and machines. Only incipient or small fires would be extinguished using appropriately rated fire extinguishers by personnel instructed in their safe use.

Personnel will be instructed to err on the side of safety when evaluating whether to contact professional and/or trained fire fighters. In the event a large fire or explosion occurs, personnel are will evacuate the area and contact the Dresden Fire Department.

7 FILL PROGRESSION

Fill progression is the planned general progression of solid waste disposal, bottom liner construction, and final cover placement at the site. The intent is to describe a direction and sequence of filling, including access, screening, and surface water drainage schemes, that will promote efficient landfill development and reduce fugitive dust emissions.

The planned fill progression incorporates the following important features of the operation:

- Access to the working face will be obtained by sequential construction of the final landfill access roadway;
- Wind breaks in the form of waste berms will be constructed during good weather days along the windward limits of the fill area in any stage of landfiling;
- Landfiling during windy or poor weather operating days will be completed in protected areas below the elevation of the windward berms and interior to the Landfill;
- All waste and cover materials will be graded and sloped to promote surface water drainage away from active landfiling areas and access ways, toward the drainage channel associated with the final access road;
- All surface water will be directed to sediment basins prior to discharge from the site;
- Filling operations are intended to achieve interim and final waste grades as soon as is practical in any given area;
- Final drainage swales and channels will be constructed as soon as practical after landfill areas achieve final grade; and,
- A minimum of six inches of intermediate cover will be placed on all slopes achieving final grade and all slopes where landfiling operations will not occur for extended periods.

An important feature of planned fill progression is to bring as much of the fill area to final grade as soon as is reasonable to do so. In this manner, the amount of leachate and fugitive dust from unprotected areas exposed to precipitation and wind will be minimized.

Another important feature of fill progression planning is to reduce the impacts of wind and poor weather conditions on the waste disposal operation. The prevailing winds are out of the west or southwest. Berming of the waste to final grade along the windward side during calm weather days will provide sheltered, interior areas of the Landfill that can be utilized during high wind periods.

In brief, Lockwood's fill progression plan is to bring wastes in the currently constructed and lined Stages I (including the Stage I overfill liner) and II to grade first. Once waste grades near elevation 710 or 720 feet above mean sea level (MSL), an overfill liner system above the Original Ash Disposal Site (OADS) will be constructed, and landfilling operations will continue. Once waste grades near elevation 620 feet MSL in the OADS overfill liner area, the baseliner system in Stage III will be constructed, and landfilling operations will continue above all three zones. The priority at this point in time will be to bring the waste to final grade above Stages I, II and III.

At a time when waste elevations in Stage III are approaching 720 to 730 feet MSL, access to the landfilling activities in the OADS would continue to be gained by ramping off the permanent access road along the eastern side of the Landfill to the point where waste in the OADS obtained approximate elevation 630 to 650 feet MSL. After that point in time, the grade change between the permanent access road and the waste in the OADS would exceed practical limits, and an alternate means of access will be required. As such, a second, northern access point can be constructed along with the Stage IV baseliner system to allow efficient access to the Landfill.

As subsequent landfilling operations advance, the protective soil cover will be stripped and used for intermediate and final cover on completed sections of the Landfill or stockpiled for later use. The working face will be restricted to the smallest practicable area. The working face slope shall be maintained at 3H:1V slope or less.

8 COVER MATERIAL MANAGEMENT PLAN

8.1 DAILY COVER

Since the landfilled materials are not putrescible and do not attract scavengers, the purpose of daily cover is primarily related to the control of blowing and dusting. To the extent that compaction and wetting do not adequately control dusting, daily cover will be placed as required to prevent offsite migration of blowing ash from the Landfill. When placed, daily cover will consist of a minimum of three to six inches of soil or alternate materials as approved by NYSDEC. Based on previous operational experience, daily cover will be required during periods of higher winds when the working face is located in an exposed position.

Daily cover soil material can consist of a wide range of soil textures including clayey and silty soils, sandy soils, or gravelly soils. In the event fine grained (clayey, silty) soils are used, the Operations Contractor must take notice of and remedy any potential for the fine grained soils themselves to create a dusting problem.

8.2 INTERMEDIATE COVER

Intermediate cover will be placed on all areas that are not expected to be covered with additional waste for a prolonged period of time. Intermediate cover will consist of a minimum of six to nine-inches of clayey/silty soils, sandy soils or gravelly soils, or other NYSDEC approved materials, overlain by three to four inches of soil suitable to sustain vegetative growth. Intermediate cover will be seeded and vegetated as appropriate to control fugitive dust and erosion by surface water runoff. Typical locations for placement of intermediate cover include interim or temporary slopes between stages.

8.3 FINAL COVER

Final cover will be placed in areas where final waste grades have been achieved, and no additional waste will be placed, in accordance with 6 NYCRR sections 360-6.16, 6.17, and 6.18.

Upon attaining final elevation and contours per the approved engineering design, the active area of the site will be covered with a minimum six-inch thick subgrade soil layer. On slopes less than 25%, a geosynthetic clay liner will be placed atop of the soil layer. A geomembrane liner of a minimum thickness of 40 mil will be placed above either the geosynthetic clay liner or the six-

inch thick subgrade soil layer. On slopes greater than 4%, a geocomposite drainage layer will be placed to control infiltration of surface water and promote stability. On slopes of 4% or flatter, a geotextile cushion will be placed above the geomembrane to protect the liner from damage by overlying soil cover. A barrier protection layer of soil at least 12 inches thick will then be placed over the geomembrane liner or geotextile cushion. A 6-inch thick layer of topsoil will be placed over the barrier protection layer and seeded with a cool season vegetation mix to provide a protective vegetative cover. All final cover construction shall be conducted in accordance with 6 NYCRR 363-6.19.

9 STORMWATER MANAGEMENT PLAN

9.1 GENERAL

The stormwater management system is designed to control surface water runoff from the Landfill prior to discharging offsite. Proper operation and maintenance of the system helps prevent erosion and ponding within the Landfill area, as well as, flooding downstream. Discharge from the site is via Keuka Outlet to Seneca Lake.

9.2 DESIGN

Recent modifications to the Landfill's stormwater management system were required to reroute stormwater from the Leachate Pond with the primary purpose of separating the stormwater and leachate management systems. The design of the stormwater management system is based on limiting peak stormwater discharges. The sediment basins were designed in general accordance with the NYS Stormwater Management Design Manual, January 2015. Each basin is equipped with a concrete square outlet structure, retrofitted with the appropriate openings to discharge accumulated stormwater into drainage channels conveying stormwater to Keuka Outlet.

Sediment Basin 1 is located north of the Landfill and manages stormwater originating in the north, east, and southeast portion of the Landfill in addition to the area north of the disposal site. Sediment Basin 2 is located west of the Landfill and collects stormwater originating beyond the limit of waste to the west in addition to the west and southwest portion of the disposal site. Swales, perimeter channels, and downchutes are utilized to convey stormwater away from active landfilling areas to one of the sediment basins. Modifications in 2016 and 2017 included increasing the size of Sediment Basin 1 and Sediment Basin 2, constructing Forebay 1 and Forebay 2, and widening the North Channel to accommodate the additional diverted flow. The Junction Area northeast of the Landfill was modified to divert stormwater away from the Leachate Pond to Sediment Basin 1.

Inspection of the stormwater management system is conducted monthly during Lockwood's routine site inspections and memorialized on monthly site inspection forms, copies of which are maintained at the Plant. Inspections includes visual observation that solid waste is not entering surface water, drainage ditches are sufficiently clear to allow freely flowing water, that the basins are free of damaging vegetation, and damage to basins is not occurring due to erosion or wildlife.

10 LEACHATE MANAGEMENT PLAN

10.1 GENERAL

Leachate is defined as liquid contained and collected by the basal liner systems. Leachate management at the site focuses on the conveyance of collected leachate to the Leachate Pond, also called the sedimentation basin, for treatment and subsequent discharge through a State Pollution Discharge Elimination System (SPDES) outfall. Leachate is piped into the pond along the east bank and discharges via the outfall along the west bank of the pond.

10.2 BASELINER SYSTEM

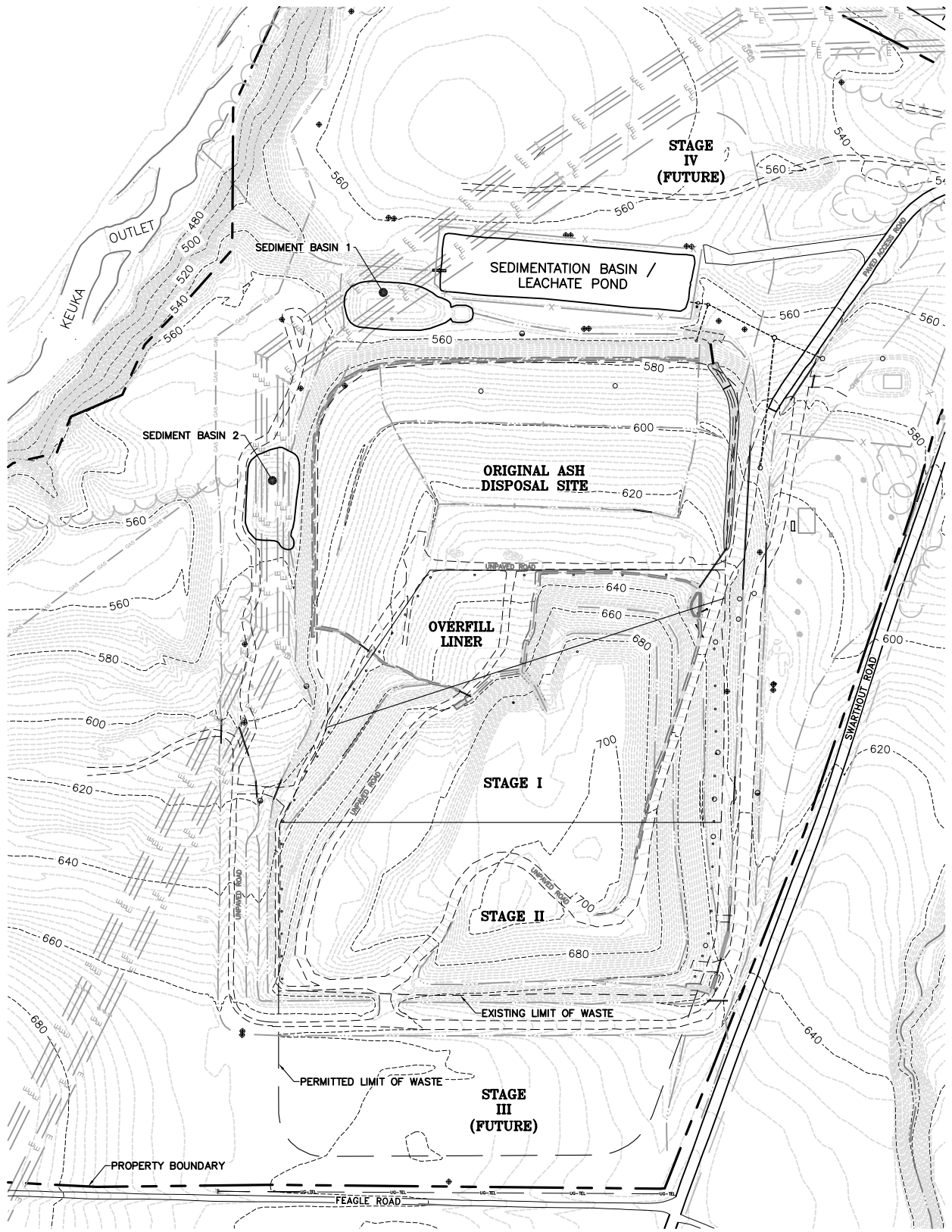
10.2.1 Design

To date, 29.8 acres of the permitted 44.2-acre landfill have been constructed, and waste has been disposed in those constructed areas. This landfill cell construction has involved the excavation of native soils, the installation of groundwater depression drains and the installation of basal liner and leachate collection systems. The individually constructed cells are identified in Figure 10-1, and are described as follows:

The “Original Ash Disposal Site” – an approximate 14.08-acre cell constructed in two phases, the first in 1979 and the second in 1981. The OADS basal liner is constructed above a series of groundwater drain trenches, and consists of a two-foot thick compacted soil barrier and overlying two-foot thick layer of bottom ash, which acts as the leachate drainage layer. A network of leachate collection pipe is installed in the drainage layer.

Stage I – a 10.7-acre liner system constructed in 1989 and 1990 including an approximate 7.2-acre double liner constructed above natural soil deposits and an approximate 3.5-acre single geomembrane overfill liner atop the wastes in the OADS. The basal liner and underlying groundwater drainage trenches are constructed within natural soil deposits. The geomembrane overfill liner atop the OADS consists of the following components, in ascending order:

- A geotextile cushion layer;
- A 50-mil polyvinyl chloride (PVC) geomembrane liner;



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SITE PLAN			FIGURE 10-1
OPERATION & MAINTENANCE (O&M) MANUAL			
LOCKWOOD HILLS LLC			
TOWN OF TORREY	YATES COUNTY	NEW YORK	
March 2018	SCALE: NOT TO SCALE	REVISION # 0	

- A geotextile cushion layer; and,
- A one-foot thick drainage layer including a leachate collection pipe network.

The basal liner in Stage I that is constructed on natural soil deposits above the underlying groundwater drainage trenches consists of the following components:

- A two-foot thick compacted soil liner;
- A secondary leachate collection and removal system composed of band drains (six-inch strips of geocomposite drainage material) within a four-inch thick sand layer;
- A geotextile cushion layer;
- A 50-mil polyvinyl chloride (PVC) geomembrane liner;
- A geotextile cushion layer; and,
- A two-foot thick drainage layer with an embedded leachate collection pipe network.

Stage II – an 8.6-acre area completed in 1992 as a double lined cell with a groundwater drainage trench system and basal liner consistent with that liner system in Stage I that is constructed on natural soil deposits.

Stage III – a 7.0-acre cell to be constructed to the south of Stage II at some time in the future.

Stage IV - a future 7.2-acre cell to be constructed in the area north of the OADS.

The planned landfill design also includes an approximate 10.5-acre extension of the Stage I overfill liner to be constructed above the northern soil covered slope of the OADS once Stage I/II achieves its interim capacity. This overfill liner is a single liner system, consisting of the following components:

- A minimum six-inch thick prepared subgrade soil layer;
- A geomembrane liner; and,
- A 12-inch thick bottom ash drainage layer with embedded leachate collection pipe.

10.2.2 Operation

The leachate collection system piping is equipped with cleanout risers consisting of PVC pipe that are vertically installed pipes connected to the leachate piping, extending through to the ground surface. These cleanouts allow for periodic flushing (annually as a minimum) of the leachate collection pipe to help assure leachate collection pipes are free and clear of any obstructions that may reduce liner system efficiency.

As detailed in the January 2017 Construction Report prepared by Daigler Engineering, P.C., modifications to the onsite leachate sewer system occurred in late spring/early summer of 2016. The leachate sewer system now routes leachate from both areas of the Landfill (i.e., the Original Ash Disposal Site and synthetic-lined Stages 1 and 2) to a meter pit prior to discharging to the Leachate Pond. A large, 60-degree, V-trapezoidal flume is positioned within the meter pit in-line with an eight-inch diameter, PVC, leachate sewer pipe. An ultrasonic level sensor functions by transmitting pulses of high frequency sound to the surface of leachate flow within the Flume's approach, and measures the time for an echo to reflect to the face of the sensor. The depth of leachate flow is effectively calculated by the system and applied to a pre-programmed discharge equation to compute a flowrate. The flowrate is displayed on a monitor and recorded by logging software. The instrument log file is downloaded monthly by Lockwood Hills personnel and processed.

The volume of leachate generated at the site is calculated using instantaneous and totalized flow recorded by the flow meter. The Stage I and Stage II liner systems include a secondary leachate collection and removal system to monitor the performance of the primary geomembrane liner in these areas. The flow rate from the leak detection system is measured on a monthly basis to compute a 30-day leakage rate in terms of gallons per acre per day. Primary and secondary leachate volumes are reported in the Annual Report.

Primary leachate is sampled at five separate locations, and leachate from the secondary system is sampled at the leak detection manhole as described in detail in the Environmental Monitoring Plan (EMP). Samples of leachate from the primary and secondary leachate collection systems are analyzed for the parameters identified for groundwater samples as described in the EMP. All

leachate quality data is presented and discussed in a report provided to the NYSDEC each calendar quarter.

10.3 SEDIMENTATION BASIN/LEACHATE POND OPERATION

The sedimentation pond collects primary and secondary leachate which is discharged through SPDES Permit No. NY-0107069 Outfall 001 as a controlled release, batch discharge to the Keuka Outlet. The SPDES Permit restricts the sedimentation basin discharge rate as a function of stream flow rate in the Outlet, as measured and recorded through a data logger at the USGS Gauging Station in the Village of Dresden. The permit requires that the Leachate Pond discharge be limited to no more than 140,000 gallons per day when the stream flow rate in the Outlet is less than 27 cubic feet per second (cfs). When the stream flow rate in the Outlet is greater than 27 cfs, the permit allows that the Leachate Pond discharge can be increased to no more than 250,000 gallons per day. The permit further requires that grab samples may be collected on a batch basis only if a minimum of 24-hour detention is provided and no additional runoff flows into the pond during discharge. Otherwise, a 24-hour composite sample must be obtained.

Prior to any discharge, the collected water is sampled and analyzed to determine whether the SPDES Permit discharge water quality requirements will be met. In the event the pre-discharge water quality sample analyses indicate that the water is not acceptable quality for discharge, the following activities are initiated:

- Additional samples of the collected water are obtained for laboratory determination of the treatment required; typically, this consists of an adjustment of pH;
- The pH is adjusted, or other treatment technologies are implemented as required;
- Water samples are obtained during the treatment process;
- The treated pond water is retained for a minimum of one day and is re-sampled to assure acceptable water quality prior to discharge; and,
- Composite samples are obtained from the discharge to ensure an adequate record of the quality of the water discharged is collected.

Discharge volumes are calculated for each batch release based on the depth/volume relationship for the pond geometry, and these volumes are used as an estimate of the quantity of leachate collected and treated as reported in the Annual Report.

10.4 LEACHATE MINIMIZATION

One objective of site operations is to minimize leachate production. To achieve this goal, Lockwood will, to the extent practicable, operate the Landfill to prevent ponding of water on the fill area and erosion of soil covers. In this manner, the site operation will promote a reduction in the infiltration of water into the solid waste.

Runoff control features are intended to minimize erosion and convey surface water to Sediment Basin 1 or Sediment Basin 2 in an efficient manner. These structures may include straw bales, silt fences, erosion control mats, and channel linings. Runon control structures will be used as required to help prevent surface water from entering the active landfill area, and direct surface water away from active landfilling. The perimeter berm serves to restrict runon to the active area. Other features include the perimeter channels outside the landfill perimeter berm, and may also include berms, channels and swales to direct surface water away from active areas.

In addition, good operational practices will be utilized to minimize leachate production. These good operational practices include maintaining a minimal working face area to reduce leachate production and erosion, and re-establishing soil cover material and vegetation in areas where cover soil may have eroded.

Groundwater underneath the facility is maintained at a level below the liner system through the effects of the liner itself (limits infiltration of precipitation into the groundwater system) and the use of groundwater depression drains installed below the liner system. When flowing, the groundwater depression systems from Stage I, II III and IV will discharge into the surface water perimeter channels around the site.

11 WINTER & INCLEMENT WEATHER OPERATION

11.1 GENERAL

Due to limited storage in the fly ash silo at Greenidge Station, the loading transporting, and disposal of waste may take place despite inclement weather. Various inclement weather conditions have the potential to affect the operation of the Landfill and must be addressed. Some of these possible climatic conditions and associated measures that can be taken are described below.

11.2 FREEZING CONDITIONS

If icy or freezing conditions create potentially dangerous operating conditions, the Operations Contractor will determine if it is necessary to either temporarily stop or modify operations. Icy roadways will be sanded as required to promote safe working conditions.

11.3 HEAVY RAINS

Control of surface water drainage through drainage channels, culverts and the like, along with the use of gravel for operational haul roads, will provide continued access to the site during heavy rains, by promoting runoff away from the trafficking and disposal areas.

In the case of excessively heavy rains, the Operations Contractor may determine that it is necessary to either modify operations or temporarily suspend work until improved weather conditions allow re-establishment of operations. During operating hours and an excessively heavy rainfall event, the Operations Contractor will regularly check drainage channels, containment berms and basins to ensure runoff from the Landfill is contained within the surface water management systems.

11.4 SNOWFALL

If snowfall occurs overnight, the first personnel to arrive at the site are responsible for snow removal. Snow removal activities will start immediately upon arrival. During operational hours, the available onsite equipment is adequate to remove accumulated snow from access roads and operational areas. In the event of extremely heavy snow, the Operations Contractor will decide if it is necessary to modify or temporarily suspend work until snow removal on access roads and the disposal areas permit continued operation.

If snowfall should become more severe, and it is determined by the Operations Contractor that operations cannot proceed in an acceptable manner, waste disposal activities would be temporarily suspended until an improvement in the weather conditions or site equipment can allow re-instatement of disposal activities. Following cessation of the severe storm event, appropriate site-based equipment would be utilized to remove accumulated snow from access roads and operational areas. Snow banks would be arranged in a manner to promote adequate drainage when melting occurs.

11.5 ELECTRIC STORMS

The open area of the Landfill is particularly susceptible to the hazards of an electric storm. If necessary, disposal activities will be temporarily suspended by the Operations Contractor to guard the safety of all field personnel. Refuge should be taken at Greenidge Station or in rubber-tired vehicles.