PHASE II APPLICATION
CAMP HOPE RUN LANDFILL
BOGGS TOWNSHIP, CLEARFIELD COUNTY, PENNSYLVANIA

FORM 14
ATTACHMENT 14-1
Narrative Responses

REVISED JUNE 2019

FORM 14 – OPERATION PLAN – PHASE II

NARRATIVE

This Operation Plan has been prepared by Smith Gardner, Inc. (S+G) on behalf of PA Waste, LLC (PA Waste) in support of a Phase II permit application to site a proposed Municipal Solid Waste (MSW) landfill facility referred to as the Camp Hope Run Landfill. PA Waste proposes to construct and operate the landfill in Boggs Township, Clearfield County, Pennsylvania. The proposed facility is situated on a 2,071-acre parcel of property located approximately 6.5 miles southeast of Clearfield, Pennsylvania along the west side of SR 0153.

This plan has been prepared to address the requirements of the Pennsylvania Municipal Waste Management Regulations regarding the operation of municipal waste landfills (i.e., 25 PA Code 273 Subchapter C).

The organization of this Operation Plan is generally consistent with the Pennsylvania Department of the Environment (PADEP) Form 14, Operation Plan - Phase II.

SECTION C. GENERAL OPERATING DESCRIPTION

C.1 Landfilling Method and Procedures

Form 14, Section C.1. requires descriptions of the proposed landfill method and procedures that are to be established and followed for the life of the proposed site. Include daily procedures, inspection and monitoring of incoming waste, and daily closing procedures.

Proposed landfill method: The area landfilling method will be utilized for the Camp Hope Run Landfill.

Daily operating methods and procedures for collection vehicle receipt and unloading, waste and daily cover placement, inspection and monitoring, intermediate cover placement, and stormwater management and permanent marker placement are generally described as follows:

Collection vehicle receipt and unloading: Collection vehicles entering the site with refuse for disposal will be weighed in on the facility's scale at the site entrance. Vehicles will proceed to the working face and unload their refuse. After unloading, and as necessary, vehicles will proceed through the truck wash prior to weighing out and departing the site. If the facility does not have a stored tare weight for the vehicle, the vehicle will return to the entrance area where they are weighed a second time on the facility's scale. Disposal fees will generally be charged according to the weight of refuse disposed. For loads weighing less than a minimal set value, a fee (not based on weight) will be charged.

Small loads may be deposited into roll-off containers located adjacent to the facility's scale. On a daily basis, the roll-off containers will be transported to the working face by the landfill personnel and properly disposed. Prior to returning the roll-off container to its location the concrete pad will be observed for leaks or spills. If leaks are identified, the roll-off container will be repaired or replaced to prevent future leakage. Any spills will be cleaned up and mitigated prior to returning the roll-off container.

Waste and daily cover placement: At the working face, the refuse will be spread and compacted in approximate 2-foot thick layers. The working face will be advanced, in an approximate 8-foot thick lift. At the end of each working day or at the end of each 24-hour period, whichever is less, the exposed refuse

will be covered with daily cover soil or an approved alternate daily cover (ADC) At the time of this application no ADC materials are proposed. If ADC materials are proposed in the future, PA Waste will obtain approval from the department prior to implementation. The cover soil will be obtained from on-site stockpiles and/or borrow areas. More specific details regarding daily cover requirements are provided under **Section Q**.

Special handled material within the former Kauffman surface mine areas ("pods") is planned to be disposed as a waste within lined areas of the proposed landfill operation and will not be used as operational cover. Pods will be covered at the end of each operating day with suitable daily cover, along with the other MSW.

Inspection and Monitoring: Incoming waste will be inspected and monitored to prevent disposal of non-approved waste and hazardous wastes. Landfill personnel will receive training in waste inspection and monitoring according to the plans identified in **Section E**.

Intermediate cover: Intermediate cover, consisting of a 12-inch thickness of compacted soil, will be placed over the following areas: (i) areas that have been filled to final grades; (ii) the tops of completed lifts; and (iii) areas where no additional waste will be placed for 6 months or longer. More specific details regarding intermediate cover requirements are provided under **Section R.**

Stormwater Management: Throughout the filling of the landfill, measures will be taken to facilitate drainage, thus reducing infiltration, and to reduce the amount of stormwater that contacts waste, thus becoming leachate. The surface of the refuse will be maintained at a slope to drain surface water which has contacted waste away from the outside slopes and will be managed as leachate. In cells where waste has not yet been placed over the entire cell floor, berms will be used to separate clean stormwater from leachate. Geosynthetic rain cover (GRC) may also be used to manage stormwater and segregate rainfall from leachate. After waste has been filled above the level of the perimeter berm, stormwater runoff will be directed from the landfill slopes having adequately revegetated intermediate cover into the perimeter drainage channel, which will convey the runoff to sedimentation basins. Runoff from intermediate cover may only be diverted as stormwater if there are no leachate break-outs and the cover is adequately revegetated. Access roads will be constructed progressively to maintain all-weather access to the working face.

Permanent markers: Permanent markers will be installed at selected locations around the perimeter of the waste disposal cells. These markers will be used to eventually control the daily operations of the landfill as well as serving a function of secondary references for the construction activities.

C.2 Filling Sequence and Schedule

The sequence of landfilling and the proposed filling schedule are described as follows:

Filling sequence: The proposed filling sequence is illustrated on the design in phases on Drawings S5 through S14.

Filling operations with respect to stormwater management, access roads, and filling schedule are described as follows:

Stormwater Management: While waste in a particular cell is below the top of the perimeter berm, to the extent possible, stormwater will be prevented from contacting protective cover which has not yet received waste through the use of GRC's or similar, approved methods. Stormwater collected on the GRC's will be directed (through gravity or pumping) from the cell into the perimeter drainage channel or other ditches

leading to the on-site sedimentation basins. Once the waste in a cell is higher than the top of the perimeter berm, stormwater will be diverted from the slopes at final grade having final intermediate cover using surface water channels/ditches and/or culverts as depicted on the design drawings. Stormwater conveyance structures will be continually added as the elevation of the fill progresses upward.

Access Roads: Initially, the existing access road will be utilized. The access road will be rerouted as filling progresses. The details of access road progression, as well as its cross-section, are illustrated on the design drawings.

Filling Schedule: It is estimated that proposed cells will be filled over a period of years. The estimated filling time and closure capping for each cell is presented in **EXHIBIT 14-1.3**.

C.3 Type of Landfill Activity

Camp Hope Run Landfill is proposing to accept MSW, construction and demolition waste, and select residual waste streams. PA Waste may apply to PADEP for approval to accept other materials including, but not limited to, sewage sludge, ash, generic residual waste, and special handling waste streams.

In addition, PA Waste proposes operating a recycling drop off center. The recycling drop off center will accept certain recyclables as determined by Boggs Township and the recycling market which may, at different times, include, but not be limited to aluminum cans, bimetal cans, HDPE and PET plastic containers, clear glass, and colored glass. In addition, scrap metal including copper, white goods, and steel will be recycled.

C.4 Proposed Engineering Techniques

The following engineering controls will be used during filling of the Camp Hope Run Landfill to provide close correspondence between the design drawings and the actual constructed configuration of the cell and associated waste areas:

- annual topographic aerial or ground surveys; and
- periodic topographic ground survey updates.

C.5 Equipment

The following equipment is anticipated for use at the facility. The actual equipment list may vary from this.

Quantity	Equipment Type	Example Make/Model
1 (minimum)	Trash Compactor	Caterpillar 836 Compactor
2	Bull Dozer	Caterpillar D6H-LGP Dozer or Caterpillar D8 Dozer
1	Front End Loader	Caterpillar 973 Tracked Loader
2	Off Road Dump Truck	Caterpillar 730 Articulated Truck
1 (minimum)	Excavator	Caterpillar 318C Excavator
1	Water Truck	Varies
1	Crusher	Telsmith Hydra - Jaw Crusher

Off-road trucks will be used to transport soil from borrow areas to the working face and/or stockpile areas. Compactors and dozers will be used to spread and compact waste. The dozers will also be used to place cover material at the working face or the stockpile area. The dozer is used to perform clearing, grubbing and road grading.

Daily operations require the full-time use of a compactor, dozers, tracked loader, off road trucks, excavator, and water truck. Operations will be staffed with operators, administrative, and support personnel at a level adequate to operate the facility. It is anticipated that about 20 personnel will be required. Temporary and part-time personnel will be used as needed.

Additional compactors and bulldozers will be added to the site's equipment as a function of waste types/daily tonnage received and hours of operation to adequately place, compact, and cover the waste in accordance with 25 PA Code § 273.216 (unloading and compaction), § 273.232 (daily cover), and § 273.233 (intermediate cover). At the site's currently requested maximum daily tonnage (5,000 TPD) this would result in three (3) compactors and three (3) dozers being required.

SECTION D. SPECIFIC FEATURES

D.1 Dams, Embankments, Ditches, and Impoundments

A general description of the dams, embankments, and impoundments are presented below. The methods and schedules for construction will be detailed in construction specifications. Operation, modification, use, maintenance and removal are discussed where appropriate.

D.1.1 Dams

There are no existing or proposed dams associated with the Camp Hope Run Landfill. Embankments will be constructed to create impoundments used for storm water management detention basins. Embankments are discussed in **Section D.1.2.**

D.1.2 Embankments

The proposed embankments are referred to as berms. Intermediate and inter-cell berms will be used within and between landfill cells primarily to contain waste. A perimeter berm is proposed around the landfill boundary. The perimeter berm provides a physical location/platform for landfill operations and will include the liner system limits/waste boundary, the liner system anchor trench, perimeter access roads, drainage channels, leachate collection/conveyance systems, gas collection and control system, and other infrastructure.

D.1.3 Ditches

Ditches and channels, will be provided as shown on the design drawings for stormwater management and erosion and sediment control. Ditches and channels constructed on areas not yet at final grade will be temporary and will be eventually removed or filled over during operations. Channels constructed on areas at final grade will remain in place permanently.

D.1.4 Impoundments

There are seven (7) proposed detention and/or retention basins for erosion/sediment and stormwater control around the landfill and stockpile areas. These detention/retention basins will be constructed,

operated, and maintained throughout the life of the landfill development. The sequence of detention/retention basin development is indicated in the design drawings, along with the inclusion of major temporary sedimentation and stormwater features. Permanent features are indicated on the final cover plans. Provisions for long term operations and maintenance are provided in the closure plans.

D.2 Borrow Areas, Soil Storage, Handling Areas and Structures

D.2.1 Borrow Areas

Borrow soil will be obtained by excavating to proposed subbase grades within proposed disposal cells. The borrow areas will eventually become lined disposal cells. The erosion and sedimentation control plan reflects the handling of sediments from these disturbed areas.

D.2.2 Soil Storage and Handling Areas

Soil handling areas will be at the stockpile area, the active borrow (excavation) area(s) and the active landfill face. Any soil taken from a borrow areas, that is not taken straight to the active face, will be taken to the stockpile areas, which will be designated by the landfill manager for each stage of construction consistent with the design drawings. Separate stockpile areas may be established for the topsoil, daily and intermediate cover, and unusable components of the excavated material. Two (2) permanent stockpiles will remain after the closure and post-closure periods (Stockpiles S1 and S2). Stockpiles will be graded and restored with vegetation according to the design drawings, specifications, and closure plans.

D.2.3 Structures

No soil-related structures are planned for this site other than perimeter berms supporting the landfill, basin features, and stockpiles.

D.3 Scales and Weigh Stations, Scale House, Maintenance Building, Office Building and Sanitary Sewer Holding Tank

D.3.1 Scales and Scale House

The facility as proposed will include a scale house and two (2) scales, located as shown on the plan sheets. The scale house and at least one (1) scale will be constructed prior to the start of operations, the second scale will be added as necessary. The scale house will be either stick built or a pre-manufactured structure. Scales will be 70 feet long by 10 feet (minimum) wide platform scales. Scales, and supporting components, will be constructed and installed per manufacturer specifications. Trucks will be weighed upon entering and, if needed, again when they leave. Incoming waste will be monitored and inspected in conjunction with weighing in. Computer software will be utilized for documentation and record keeping. The scales will be maintained and operated, and weigh masters will be licensed in accordance with applicable rules and regulations. The scale house and scales will be removed upon landfill closure.

D.3.2 Office and Maintenance Building

The facility as proposed will include an office and maintenance building located as shown on the plan sheets. The office building will be a constructed prior to the start of operations, and will include space for administrative, management and other facility support staff as required. The office space, will generally include a conference/ training room, a break room and a changing/locker room. The office building will be removed upon landfill closure.

The maintenance building will be located adjacent to or in combination with the office building as shown on the plan sheets and will include space to provide storage and routine maintenance to facility equipment. The maintenance building will be removed upon landfill closure.

D.3.2 Sanitary Sewer Holding Tank

The sanitary sewer holding tank will be located as shown on the plans and will be adequately sized for the anticipated staff. The sanitary sewer holding tank will be decontaminated and removed upon landfill closure.

D.4 Water and Air Pollution Control Facilities

D.4.1 Water Pollution Control

The water pollution control facilities at the Camp Hope Run Landfill will consist of a leachate collection and conveyance system, and leachate storage tanks. An industrial (leachate) wastewater treatment plant (IWTP), permitted, designed and constructed by PA Waste, will be located on the northern portion of the PA Waste property. The collected leachate will be discharged by pumping from constructed landfill cells to a series of manholes and piping that extend around the perimeter of the disposal area. Leachate collected from the perimeter system will be directed to and stored in enclosed tanks for treatment. The leachate will be pumped to the on-site IWTP for treatment and subsequent discharge.

It is anticipated that the on-site IWTP will discharge treated effluent to Clearfield Creek under a National Pollutant Discharge Elimination System (NPDES) Permit under a separate application. The treatment process and plant design are described generally in **Form 25** of this application.

The leachate collection system will be constructed sequentially through the phases of landfill development. Leachate storage tanks and the leachate treatment facility will be constructed prior to beginning operations. The leachate collection system will be operated and maintained throughout the operational and final closure periods and into the post-closure period.

Surface water controls will also include sedimentation basins that concurrently serve as stormwater control basins, to prevent and reduce siltation and erosion of receiving streams.

D.4.2 Air Pollution Control

The air pollution control facilities will consist of an active gas collection and control system. The system will consist of numerous gas extraction wells, gas collection/conveyance piping, condensate management system, blowers, and at least one (1) flare. PA Waste may decide to contract gas collection and control with a separate firm to collect the landfill gas for reuse by an industrial user.

The gas collection and control system will be constructed, operated, and maintained incrementally throughout the progression of landfill development in accordance with applicable regulations.

Details of the proposed gas management system are presented in **Form K** and related attachments, and on the design drawings.

D.5 Erosion Control Facilities

The erosion and sediment control plan for the proposed landfill development is presented in **Form I** and related attachments and on the design drawings. Temporary erosion and sedimentation controls, such as sediment traps, silt fence, mulching, and diversions, will be installed at the beginning of each construction

phase and throughout phased landfill development. Permanent erosion control facilities, such as detention/sedimentation basins, ditches, and other conveyances will be developed throughout landfill construction and operated and maintained throughout the operational, final closure, and post-closure periods.

D.6 Equipment Storage, Maintenance, and Other Buildings

The following storage areas will be provided and/or buildings constructed in conjunction with or prior to starting landfill operations. Storage areas and buildings will be operated, maintained, and modified as needed during the lifetime of the proposed facility. Locations of the buildings and scales are indicated on the design drawings. The proposed storage areas and buildings include:

- Landfill Office and Equipment Maintenance Building - A single structure is planned to serve as the landfill offices and equipment maintenance building;
- Equipment Storage – Outdoor equipment storage areas will be provided as needed throughout landfill operations and will typically be located near or within the active cell, the borrow area, stockpile area, or maintenance building;
- Scale House; and
- Guard Shack/Gate House;

All buildings will be removed upon completion of landfill activities.

D.7 Access Roads

The proposed major access roads are shown on the design drawings. The proposed access roads will be built in a phased manner to provide ingress and egress to and from the particular cell that is being filled. Once the landfilling activities have been completed, the main access roads will remain in place for post-closure monitoring needs.

SECTION E. PERSONNEL TRAINING

PA Waste personnel will be trained in the inspection and monitoring of incoming waste and in the handling and disposal of special handling waste. Training for inspection and monitoring of incoming waste will include instruction in the identification of unacceptable wastes and will be conducted in accordance with the Waste Acceptance Plan provided in **EXHIBIT 14-1.1**. Training for handling of disposal of special handling waste will be conducted in accordance with the Handling Procedures for Special Handling Wastes and Residual Wastes presented in **EXHIBIT 14-1.2**.

SECTION F. CONSTRUCTION SCHEDULE

The following topics are addressed in this section: (i) survey control, markers, and signs; and (ii) construction schedule and sequence of operations.

Survey Control, Markers, and Signs

There will be a minimum of three (3) permanent physical survey control monuments (benchmarks) located on the landfill property within close proximity to the waste disposal. Permanent survey control monuments will consist of a standard surveyor's monument disc cast in concrete. During the construction phase of each particular cell, a survey crew will go to the work site as needed to stake out the various construction perimeters and control points. The survey crew will return to the site as needed to re-establish the control points if/when they are damaged or lost. Once construction of a cell has been completed, temporary markers will be placed every 200 feet along the perimeter berm. Temporary markers will be 1-inch square, wooden, stakes or equivalent. The stakes will be generally visible to equipment operators at the active face to provide location reference points. The temporary markers, in addition to the perimeter berm itself, will serve to distinguish the disposal area perimeter from the property line. Maintenance of permanent survey control markers and temporary markers will be performed by the site engineer The survey control monuments planned to be located at the Camp Hope Run Landfill are tabulated below.

SURVEY CONTROL MONUMENT SUMMARY

BENCHMARK ID	DESCRIPTION	COORDINATE DATA		
		NORTHING	EASTING	ELEVATION
BM-1	CONCRETE MONUMENT – TO BE ESTABLISHED	277972.14	1793521.81	1768.45
BM-2	CONCRETE MONUMENT – TO BE ESTABLISHED	281698.55	1786161.24	1717.10
BM-3	CONCRETE MONUMENT – TO BE ESTABLISHED	278270.18	1788945.24	1628.00
BM-4	CONCRETE MONUMENT – TO BE ESTABLISHED	1790180.22	1790180.22	1662.00

Signs identifying the site name, address, phone number, operating hours, and permit number will be placed at the site entrance. The signs will be constructed of a durable, weather-resistant material.

Construction Schedule and Sequence of Operations

The general construction schedule and sequence of operations will be as follows.

- In each year that construction will occur, the construction will begin as early in the year as weather permits (usually April).
- Construct Cells S2-1 through S2-6 followed by S3-1 through S3-4 in sequence, as each cell is needed to provide additional disposal capacity.
- Construct final cover in stages as sufficient areas of inactive disposal areas reach final grades.

At the time that this application is being submitted (February 2018 (Revised March 2019)), the following sequence and timing of landfill operations is anticipated. The actual timing of the various stages of development will vary depending on waste tonnage and operational considerations.

1. Construction will begin in the westernmost limits of the S2 area starting in Cell S2-1 and proceed in sequence as shown on the Drawings. As these areas are constructed, operational cover material will be obtained from both the S2 and S3 areas. Potentially acid-forming materials, encountered during the excavation will be handled as waste in accordance with the Materials

Handling Plan (**Attachment 14-2**). Surplus material that is permanently stored in on-site stockpiles will have alkaline addition in accordance with the Materials Handling Plan.

2. Concurrently with the start of construction, existing AMD treatment in the southwest portion of the site will be upgraded, as they are currently not functioning as designed.
3. Use of the re-excavated mine spoil from the S3 area will progressively expose the base of the mining operation (i.e. floor of the Lower Kittanning Coal), which approximates "subgrade" in this area of the site. This subgrade will receive a structural (engineered) fill overlay such that the liner subbase elevations are above previously "special handled materials", and the "pods" within the mine spoil will be treated as a waste and disposed within lined landfill areas. Non-pod overburden mine spoil that is not considered potentially acid-forming will be used for construction, landfill operations, or stockpiled in S1 Stockpile Area in accordance with the Materials Handling Plan (**Attachment 14-2**).
4. As S3 Area overburden materials are excavated (to be completed by the end of the 7th year of site operations), and the existing South Highwall is exposed, the proposed AMD Highwall Intercept Drain (AMDHID) will be installed in phases to direct any discharge through the South Highwall to the on-site AMD Treatment Area. Similarly, direct runoff and discharge from the S3 Area excavation will be contained through earthen berms within the exposed S3 Area and directed toward the AMD Treatment Area in the Southwest portion of the site.
5. It is anticipated that by the time the S2 Area is completely developed, cell construction will begin in the S3 Area. Non-pod overburden mine spoil from S3 that is not considered acid-forming will be used for construction, landfill operations, or stockpiled in the S1 Stockpile Area in accordance with the Materials Handling Plan (**Attachment 14-2**).
6. As cell development proceeds, soil/rock that is not be used for either construction or landfill operation will be permanently stockpiled on site, with excess soil/rock from S2 stockpiled in Stockpile S2 and excess soil/rock from S3 stockpiled in Stockpile S1.
7. The proposed landfill cell sequence and lifetime summary are provided in a table and a corresponding construction schedule, which is included in **EXHIBIT 14-1.3.** It is noted that the estimated lifetimes shown are based on assumed average daily weights of waste received and in-place waste densities. Actual site life may vary if the actual daily unit weights and waste densities are different from those assumed.

SECTION G. SITE PREPARATION

The site preparation plan and schedule for solid waste disposal are illustrated in the "Cell Sequence and Site Life Summary" table and "Construction and Operations Schedule" provided in **EXHIBIT 14-1.3**.

G.1 Waste Acceptance Rates

The anticipated maximum and average daily waste acceptance rates are:

- Maximum Daily Weight: 5,000 tons; and
- Average Daily Weight: 5,000 tons.

G.2/G.3 Waste Measurement Compliance

The site will have scales, which will be in compliance with the Measures Act of 1965. There will be licensed weigh masters at the site and back up licensed weigh masters on call. The scale will be inspected once per year, as required.

SECTION H. WATER QUALITY PROTECTION

H.1/H.2 A groundwater monitoring system for the site was previously approved by the DEP and included as part of the surface mine permit issued for the Site in 1993, which was renewed in 1998, and remained active until about 2003. This monitoring system included an extensive groundwater monitoring well system installed in multiple aquifers at the site. These monitoring wells, as installed, meet monitoring well installation requirements contained in the municipal waste regulations Section 273.283. This existing, approved groundwater monitoring well system was expanded in 2005, with the redevelopment of the existing well system and the addition of approximately 15 new wells. Background groundwater monitoring of the system started in March of 2005. During the installation of the new monitoring wells the DEP Waste Management geologist visited the site on June 1, 2006 to review the groundwater monitoring system plan and well locations. Groundwater samples from this monitoring well system have been collected quarterly and are submitted in **Form 8** of this application. The groundwater monitoring system will be described in **Form 18** as part of this permit application following review and approval by the Department.

H.3/H.4 Waste Acceptance

Unapproved special handling wastes and/or residual wastes will be prevented from being accepted by conducting operations consistent with the Waste Acceptance Plan provided in **EXHIBIT 14-1.1** and the Handling Procedures for Special Handling Wastes and Residual Wastes presented in **EXHIBIT 14-1.2**. Approved special handling waste will be handled in accordance with the procedures defined in the Handling Procedures for Special Handling Wastes and Residual Wastes. Landfill personnel, haulers, and others will be protected from approved special handling wastes by following the proposed special handling procedures. The operator will prevent hazardous and explosive wastes, and liquids from being accepted and disposed of at the site by following the procedures outlined in the Waste Acceptance Plan provided in **EXHIBIT 14-1.1**.

H.5 Leachate Recirculation

The Camp Hope Run Landfill plans to recirculate leachate within the active areas of the landfill. Refer to **Form 25, ATTACHMENT 25-1** for a description of the proposed leachate recirculation plan.

SECTION I. OPERATING HOURS

Under normal operating conditions the site proposed site will receive waste and be open to the public during the following times:

6:00 a.m. to 4:00 p.m.	**Monday through Friday**
7:00 a.m. to 3:00 p.m.	**Saturday**
Closed	**Sunday**

However, the Site may operate 24 hours per day, 7 days a week to include waste disposal support activities, construction, maintenance, monitoring, operation of landfill environmental management and control systems, and other associated support activities.

SECTION J. ACCESS PLAN

Locations and construction details of proposed access roads are provided on the design drawings. The access roads will be designed to accommodate 80,000 pound loaded refuse transfer trailers as well as a maximum anticipated loading of approximately 125,000 pounds for fully assembled compaction equipment. Calculations demonstrating that the site roads can accommodate the anticipated loads from construction and operational equipment are provided in **Exhibit 14-1.8** (**March 2019**). Details regarding access plans are described as follows.

Access roads, parking areas, and maneuvering areas will be designed with erosion and sediment control measures (i.e. channels, check dams, sediment basins, silt fences, etc.) in accordance with Pennsylvania erosion and sediment control design standards to minimize erosion and sedimentation.

1. There are no stream crossings anticipated.

2. Drainage systems for temporary and permanent roads, parking areas, and maneuvering areas will include, but not be limited to, temporary drainage ditches, permanent drainage ditches, check dams, silt traps, silt fence, and detention/sedimentation basins. Detailed design of the drainage system at each phase in the sequence of landfill development is provided in **Form I** and the design drawings.

3. Permanent access roads and parking areas around the offices will be paved (asphalt). Temporary roads may be either paved asphalt or gravel. There will be no grades greater than 8%.

4. Access roads providing two-way travel will have a minimum width of 22 ft. The method of maintenance for access roads will be periodic repairs using on-site equipment and materials as needed to maintain safe and reliable operating conditions.

5. Utility companies (PA Electric and Columbia Gas Transmission) will continue to have full access to their respective rights-of-way while on PA Waste property, per existing utility easements/agreements.

SECTION K. ACCESS CONTROL PLAN

The access control plan is described as follows.

1. Due to the location of this facility, it is not necessary to completely encompass the site with a fence. Site access will be controlled by a combination of chain link fencing, locked gates, and inaccessible terrain/topography barriers. Six-foot chain-link fence and gates with barbed wire will be installed at the entrance.

2. There is only one gated entrance to the site.

3. Site security will be provided during operations hours by controlled access through the guard shack and/or scale house. Site security will be provided after operations hours by security personnel and/or surveillance cameras, as needed.

4. Signs identifying the site name, address, phone number, operating hours, and permit number will be placed at the site entrance. The signs will be constructed of a durable, weather-resistant materials.

Refer to **Exhibit 14-1.4** for a plan location of these controls.

SECTION L. NUISANCE MINIMIZATION AND CONTROL PLAN

1. **An inventory and map of areas at the facility that have the potential to cause nuisances**

   Areas/site features that have the potential to cause nuisances include the following:

   1. LFG from uncontrolled sources within the waste limits;
   2. Uncontrolled leachate from within the waste limits;
   3. Unstabilized soil stockpiles; and
   4. Access roads.

   Refer to **Exhibit 14-1.5** for a plan location of these areas of the site.

- **Dominant wind direction:** The dominant wind direction at the site is from the West - Southwest Refer to **Exhibit 14-1.5**.
- **Hauling, truck staging, and radiation staging areas:** Refer to **Exhibit 14-1.5**.
- **Leachate and gas management components:** Refer to **Exhibit 14-1.5.**
- **Disposal areas, intermediate covered areas, anchor trenches, and trash relocation activities:** Refer to **Exhibit 14-1.5**. No waste relocation activities are planned or anticipated.
- **Landfill cell construction, fill and capping sequences:** Refer to **Exhibit 14-1.5**.
- **Landfill siting and position to nearby residences:** Refer to **Exhibit 14-1.5**.

2. **Description of nuisance related monitoring or response activities**

- **Organization flow chart with each person's duties and responsibilities with regard to this plan:** Refer to **Exhibit 14-1.6**. General duties and responsibilities with regard to the Nuisance Minimization and Control Plan (NMACP) for the site management personnel is summarized below.

  Site (Landfill) Manager – The site manager will be notified of all nuisance reports and is ultimately responsible for all monitoring, operational, and prevention/countermeasure implementation at the facility. The landfill manager will encourage all landfill personnel to report any safety hazards, public nuisances, or anything that may pose a threat to public health and environment. He will maintain a log of all reports and any complaints from residents and/or the DEP relative to nuisances. It is the landfill manager's responsibility to take measures to eliminate the nuisance.

  Operations Manager – The Operations Manager will be the primary contact for all nuisance monitoring and preventative/countermeasure implementation. Preventative and countermeasure activities associated with the landfill's active face and other operational areas will be directly managed by the Operations Manager and will be performed by site labor/operators/staff as directed by the Operations Manager. All information will be reported directly to the Site Manager.

  Compliance Coordinator – The site Compliance Coordinator will be responsible for directly supervising all nuisance monitoring and reporting to the Site Manager.

  Maintenance Supervisor – The Maintenance Supervisor will be responsible for nuisance preventative/countermeasure implementation outside of the landfill operational areas and will report directly to the Compliance Coordinator and Operations Manager.

- **Notification list for the facility and respective agencies:**

Landfill Administrative Office:	To Be Determined
Landfill Scalehouse:	To Be Determined
Clearfield Police Department (Local)	814-765-7819
Clearfield Fire Department (Local)	814-765-4861
PA DEP	717-783-2300
PA DEP (North-Central Emergency Number)	570-327-3636

- **A description of how the facility will be operated to eliminate off-site nuisances**

In general, the landfill facility will be operated to prevent conditions that may be harmful to the public health or the environment. The conditions to be controlled include: litter, vectors, odors, dust, noise, landfill gas detections, and unsightliness. The litter control plan calls for the policing of the landfill areas and access roads for litter and debris and the use of litter control fencing. The Landfill Manager will implement the nuisance control plan and follow the guidelines as stated herein. Employee's training will include all aspects of the litter and nuisance control plan. Proper operational procedures and placement of daily or alternate (ADC), intermediate, and final cover according to approved Department thickness will minimize the attraction and breeding of vectors. Inspections by the landfill manager and observations by landfill personnel will determine if additional corrective action is required to control vectors. If deemed necessary, a licensed extermination services will be contracted to curb any vector problem.

A. Monitoring frequency and locations

Refer to **Exhibit 14-1.7, Table 14.1** which summarizes monitoring frequency and locations.

B. Inspections for odorous loads

Refer to **Exhibit 14-1.7, Table 14.1** which summarizes inspections.

C. Monitoring and inspections of the landfill's gas/odors controls:

Monitoring of the site's LFG collection and control system is described in **Form K** of this application.

D. Dust suppression

Dust suppressants will only be used if all other methods are ineffective.
Refer to **Exhibit 14-1.7, Table 14.1.**

E. A description of internal and external communication and alarms

Internal communications at the site will consist of two-way radios or cell phones. External communication will include land-based telephone systems and cell phones.

3. Describe the facilities meteorological monitoring program:

Meteorological weather station location

The weather station is located atop an approximately 30-foot high, approved weather station tower. The weather station tower is located at a latitude of 40 55' 47" North (N40.9298) and a

longitude of 78 23' 07" West (W78.3852). Refer to **Exhibit 14-1.6**. This location was selected to provide weather data that is relevant to site operating conditions and representative of the entire site. The location also minimizes the interference between weather station and future site operations.

Data to be collected

The Camp Hope Run weather station measures and records wind speed and direction. The station is equipped with a RS-232 bi-directional interface port that allows for onsite data retrieval via a direct connection to a laptop computer (PC). The weather station operates on eight (8) D-Cell alkaline batteries, capable of powering the station up to 2-3 months. The eight (8) D-cell battery pack will be changed every two (2) months, or as necessary. Data is retrieved by a PC equipped with appropriate weather data software corresponding the weather station requirements (Microsoft Access format). Data will be stored daily and will be retrieved and processed on a monthly basis. The weather station device, data logger and power supply is housed in a fabricated enclosure that provides protection from dust, water, sunlight, extreme temperature, and other environmental hazards that may adversely affect the weather station performance or accuracy. Hourly data observations will be used to develop daily and monthly statistics such as average and standard deviation for wind speed and wind direction using methods suggested in the EPA Meteorological Monitoring Guidance for Regulatory Modeling Applications or equivalent meteorological calculation methods. Statistics and raw hourly data will be maintained for use in additional modeling that may be necessary.

Activities limited by the weather and the facilities threshold:

Landfilling operations could potentially be temporarily suspended due to inclement weather. The particular weather conditions thresholds will vary depending on the activities taking place at the site.

4. **Detailed plan for preventative maintenance and nuisance controls:**

Refer to **Exhibit 14-1.7, Table 14.1** which summarizes preventative maintenance and nuisance controls.

- **Description and location of portable/temporary odor controls**

Refer to **Exhibit 14-1.7, Table 14.1** which summarizes odor controls.

- **Preventative nuisance measures used during the facilities construction:**

Some examples of preventative nuisance measures used during construction are road watering, stockpile and slope revegetation, equipment mufflers, on-site speed limits, and increased control devices. Refer to **Exhibit 14-1.7, Table 14.1**.

- **Description of the nuisance suppression program and the location of any fixed odor controls**

Refer to **Exhibit 14-1.7, Table 14.1** which the NMACP. There are currently no plans for fixed odor controls other than the active LFG Collection & Control System.

- **Procedures for handling nuisance prone waste**

Nuisance-prone waste will be managed according to its specific characteristics. Tarps will be used as needed to minimize litter and blowing debris. Immediate cover soil placement will be implemented for malodorous waste loads or an area will be prepared in the active workface prior to delivery of the waste to the active area. Waste that does not meet the site solids criteria will be rejected. Refer to **Form R** for additional details.

- **Dust minimization Plan:**

  The Operational Plan calls for daily control of mud and dust on the access and landfill roads. The paved portions of the access roads will be routinely cleaned during the day with a sweeper vehicle. A water tank truck will apply water and, if required, Department-approved dust suppressants to the landfill roads to minimize fugitive dust generation. A section of the access road will be large size aggregate and will be used by trucks discharging at the facility, thus reducing the tracking of mud and other debris from the landfill. A speed limit will be imposed on all vehicles on the site. The revegetation of the landfill slopes will minimize dust generation during windy weather. Refer to **Form G(A)** for additional information related to fugitive dust expectations. Refer to **Exhibit 14-1.7, Table 14.1** which summarizes dust minimization and controls.

- **Employee and contractor training**

  Employee and contractor training will include all aspects of the nuisance control plan.

- **Inspection frequency for odor management equipment**

  Refer to **Exhibit 14-1.7, Table 14.1** which summarizes odor minimization and controls.

- Emergency Equipment

  Refer to **Form L** for a list of emergency equipment to be provided at the site.

5. **Provide specific countermeasures that will be undertaken by the facility in the event of a nuisance for:**

   Dust suppression from hauling, waste placement, or processing activities
   Water truck, sweeper, road washing, and dust suppressants are all countermeasures that will be used to prevent dust suppression. Refer to **Exhibit 14-1.7, Table 14.1**.

   Odors
   Countermeasures that will be used by the facility to prevent odor are cover placement, LFG flares, and odor neutralizers. Refer to **Exhibit 14-1.7, Table 14.1**.

   Vectors
   Countermeasures to reduce the potential presence of birds and vectors, the landfill will contract with the USDA's Animal Damage Control to conduct periodic surveys of the birds and other similar vectors in the vicinity of the landfill in order to make recommendations for the control of wildlife. By using the USDA'S Survey as a guideline, the site will implement the following steps to further control the birds listed in the survey. Refer to **Exhibit 14-1.7, Table 14.1**.

   Landfill gas detection

Areas with LFG detection exceeding the prescribed minimums will immediately follow the steps identified in **Form K**. Refer to **Exhibit 14-1.7, Table 14.1**.

Litter
Refer to Section M below. Also, refer to **Exhibit 14-1.7, Table 14.1**.

Litter during windy conditions
Refer to Section M below. Also, refer to **Exhibit 14-1.7, Table 14.1**.

SECTION M. LITTER CONTROL PLAN

Barriers sufficient to control blowing litter will be positioned downwind from the working face. Barriers will be constructed of mesh, snow fencing or other material. Fixed or mobile litter fencing for these areas will consist of poles surrounding the active cells (generally placed along the downwind side(s) of the working face(s)) to a height of about 15 to 20 feet above grade. Adjustments to this plan (i.e. operational changes, fencing materials and dimensions) will be made based on actual site conditions at the time of the operations to prevent blowing litter from leaving the site. At least weekly, litter will be collected from the fences and other areas in accordance with 25 Pa. Code §273.220. Litter will be collected from the site boundary, roadways, tree lined barriers and other site areas as needed.

The working face will be kept to the smallest size practical to assist in minimizing litter. A compacted waste lift thickness of 8 feet at an initial in-place waste density of 0.5 tons per cubic yard would result in a single active face of about 1 acre in area (about 200' square or other combinations of length and width that result in a 1-acre area). Multiple working faces would be smaller than this, but would have a combined total area of about 1 acre.

SECTION N. SALVAGING

Salvaging of materials will not be allowed or conducted unless controlled by the operator to prevent interference with prompt and sanitary operations and is conducted so as to prevent a health hazard or nuisance in accordance with 25 PA Code § 273.331.

1. Salvaging operations will occur at the working face as the waste is unloaded. Only site personnel or other properly trained subcontractors will be allowed to work in this area. Materials will be pulled out after they are discharged from the hauling vehicles and initially spread, prior to compaction.

2. Materials planned to be salvaged may include, but are not limited to, wood, tires, concrete, wallboard, metals, and other materials which can be otherwise recycled or reused.

3. Salvaging operations will be conducted at the operator's sole discretion and may not occur routinely.

4. Salvaged materials will be stored either on the lined area in contained, discrete areas or will be transported and placed into on-site storage containers/boxes located within the facility. Salvaged materials will be prevented from blowing or otherwise moving out of the storage area. Containers will be such that they can be easily handled, will prevent insects and rodents from infesting the contents, will not leak and will effectively contain the materials between collections. Containers will be appropriately labeled as to the general name of the contents ("METAL WASTE", "WOOD WASTE", etc.).

5. Unless approved otherwise by the Department, materials will be stored up to one year on site before being removed.

6. As materials accumulate, they will be transported off-site, as markets allow and are practical.

7. Equipment to be used will include a tracked loader, backhoe, and off-road truck, as needed.

8. As needed, measures will be taken to prevent and minimize vectors. If vectors become present, they will be promptly exterminated.

SECTION O. AIR QUALITY CONTROL

Air quality will be controlled by an active gas management system, which is described in **Form K** and its attachments, and by dust control measures. Dust will be controlled by applying water to access road surfaces and by periodically sweeping paved access routes using site equipment. Burning will be prevented by not accepting any hot loads, by keeping all wastes covered and by inspection to monitor for and prevent fires.

SECTION P. WASTE PLACEMENT

Procedures and explanations for initial waste placement, waste unloading, waste compaction, surface water management, and working face management are described as follows.

Initial lift: Initial placement of waste on the liner system for the first 8-foot lift will incorporate “Select Waste”; that is, waste not containing any items which could penetrate or puncture the protective cover/underlying geotextile and primary liner and will include primarily bagged, household waste. Any potentially damaging waste will be removed by spotters during this phase of the operation. The compactor will not be run until at least an 8-foot thickness of waste has been spread and inspected. These practices have been demonstrated to adequately protect the liner system during waste placement operations. Prior to waste placement, no pedestrians or vehicles will be permitted on the liner system or protective cover material following certification and department approval of the cell. Weather is not expected to impact the liner due to the free-draining nature and hydraulic capacity of the protective cover material.

Stormwater Management: Prior to the entire cell floor being covered with the first lift of waste, the upgradient portion of the cell, including sideslopes which have not yet received (incremental) protective cover material, may be covered with geosynthetic rain cover (GRC). Stormwater collected on top of the GRC will be directed (by gravity or pumped) from the cell into the perimeter channel or other appropriate site stormwater structures for proper management. At the discretion of landfill personnel, GRCs will be placed over areas of intermediate cover soils (except on final or intermediate areas that slope to the outer, final slopes) and on exposed protective cover/leachate collection material. The expected maximum duration of use at a particular location is approximately three (3) years.

Waste Unloading: The unloading area will be at the toe or crest of the working face in the particular cell area being filled. Signs or attendants will direct vehicles to the unloading area.

Waste Placement and Compaction: Lifts of approximately 8-ft in thickness will be constructed by spreading refuse in approximate 2-ft thick layers. Multiple passes by the landfill compactor will provide compaction.

Working Face: The size of the working face will be limited to no less than the minimum width necessary to accommodate the incoming vehicular loads. Generally speaking, a daily 8-ft thick cell would be no less than 200 ft wide. Water that comes into direct contact with the working face will flow into the refuse and then through the leachate collection system, from where it will be removed and treated. A schematic detail of a typical cell and work face is presented in the Phase II Design Drawings.

Cover Soil Placement: Daily cover will be placed as generally described in **Section Q**. Intermediate cover will consist of a compact and uniform cover of at least 1-foot of soil on the working face and on the top and side slopes of the cells and will be placed as described in **Section R**.

SECTION Q. DAILY COVER

A uniform cover of the approved daily cover material will be placed on exposed solid waste at the end of every working day, or at the end of every 24 hours, whichever interval is less. The daily cover will come from the borrow areas on site and will meet the following performance standards:

- Prevent vectors, odors, blowing litter, and other nuisances;
- Cover solid waste after it is placed without change in its properties and without regard to weather;
- Be capable of allowing loaded vehicles to successfully maneuver over it after placement;
- Be capable of controlling fires; and
- Be consistent with the waste acceptance plan for the facility.

A 5-day supply of cover material will be maintained in close proximity to the work area at all times.

Intermediate slopes constructed during daily landfill operations will not exceed 50% (2H:IV).

Erosion and sedimentation control for disturbed areas will be accomplished via the sedimentation basins, perimeter channel, drainage channels, and other temporary erosion and sediment control measures incorporated in the design.

Daily cover material will have maximum particle size less than 6 inches. This will be achieved on site through the selective use of weathered and/or processed material to limit the amount of over-sized material. As needed, additional processing (crushing, screening) will be employed.

At the time of this application we anticipate seeking PADEP approval for alternative daily cover materials including tarps, foundry sand, and POSI-SHELL, or similar cementatious materials. Additional alternate cover materials may be proposed for Department review and approval.

Quality assurance will be conducted in accordance with requirements of the Quality Assurance Plan for soil materials described in **Form J**.

SECTION R. INTERMEDIATE COVER

Intermediate cover will be placed within seven (7) days of waste disposal on any partial lifts where the operator intends to not place any additional waste for the next six (6) months, any partial or completed lifts that have attained final permitted elevations for that particular portion of the facility, or any completed lifts. Intermediate cover soil must satisfy the following performance standards:

- Prevent vectors, odors, blowing litter, and other nuisances;
- Cover solid waste after it is placed without change in its properties and without regard to weather;
- Be capable of allowing loaded vehicles to successfully maneuver over it after placement;
- Be capable of controlling fires;
- Control infiltration and erosion and sedimentation;
- Support vegetative cover; and
- Be consistent with the waste acceptance plan for the facility.

If soil or soil-like material is used as intermediate cover, it shall be at least 12 inches in thickness and uniformly graded.

A 5-day supply of intermediate cover material will be maintained on the site. Intermediate cover will be alkaline treated material taken from S2 excavation or the S3 mine spoil excavation; or material from Stockpile Area S1 or S2 and/or stockpiled within the waste limits for use as needed. The erosion and sedimentation controls for these areas will be provided by the detention/sedimentation basins and drainage ditches established for Phased development, mine spoil operations and/or stockpiles as defined/presented in the drawings, Sheets S5 through S14). Intermediate slopes will not have slopes greater than 50% (2H:1V).

GRC's will be used on top of intermediate soil cover where it is necessary to further minimize infiltration and more effectively manage stormwater.

Intermediate cover material will have maximum particle size less than 6 inches. This will be achieved on site through the selective use of only weathered and/or processed material to limit the potential for over-sized material. As needed, additional processing (screening, crushing, etc.) may need to be employed, in the event that current methods (rake) prove ineffective in limiting over-sized material.

Quality assurance will be conducted in accordance with requirements of the Quality Assurance Plan for soils provided in **Form J**.

SECTION S. FINAL COVER SCHEDULE

The schedule for placement of final cover and capping of the site is summarized in **EXHIBIT 14-1.3**. In general, areas will be capped as final grades are achieved to limit the maximum open area at any one time.

- A (minimum) 40-mil thick textured LLDPE geomembrane cap will be incorporated into the final cover design. Capping will be performed in phases as presented on the sequence (phasing) plans.

- A drainage layer capable of transmitting flow and preventing erosion of the soil layer will be placed over the top of the geomembrane. A geocomposite drainage layer consisting of an HDPE geonet with a nonwoven geotextile heat-bonded to each side will be used.

- A uniform soil layer, two (2) feet in thickness will be placed over the drainage layer. Compaction will be slight to promote the establishment of vegetation.

The design requirements for the 2-foot-thick soil portion of the final cover shall be as follows:

- It will fall within the USDA, Soil Conservation Service textural classes of sandy loam, loam, sandy clay loam, silty clay loam, loamy sand and silt loam.

- At least 40% by weight of the fragments in the soil will be capable of passing through a 2 mm, No. 10 mesh sieve.

The final cover soil will not include rock fragments that are greater than 6 inches in diameter.

The final landfill slopes have been designed to be stable and to shed water without developing erosion and sedimentation problems. The final slopes will have an inclination of 3 horizontal to 1 vertical (3H: 1V) and will have terraces every 25 vertical feet. Terraces will be 15-feet wide, have a minimum slope of 3 percent along the flow line and a back slope of between 5 and 7% perpendicular to the flow line. Each terrace will convey runoff to down-chute drainage channels leading to sedimentation basins.

DEMONSTRATION OF EQUIVALENCY TO INCLUDE BACKSLOPES OF 6.7% AS COMPARED TO 5%

Per §273.234(f): The grade of final slopes shall be designed, installed, and maintained to:

1. Ensure permanent slope stability;
2. Control erosion due to rapid water velocity and other factors;
3. Allow Compaction, seeding and revegetation of cover material placed on the slopes; and
4. Ensure minimal percolation of precipitation and surface runoff into the disposal areas.

Each of these is addressed separately below:

1. Ensure permanent slope stability.
   The stability analyses performed for the site design (**Exhibit 24-8.1)**, included bench backslopes and determined that the final slopes are stable under the conditions and assumptions included in the analysis. Additionally, as presented in calculations, the final cover slopes on 3H:1V are stable and therefore the 7% backslopes on the benches, being substantially flatter than 3H:1V final slopes, particularly over a 15-foot width, are stable. Therefore, it is concluded that the backslopes between 5% and 7% are stable.

2. Control erosion due to rapid water velocity and other factors
   The difference between a 15H:1V (6.7%) and 20H:1V (5%) slope over a bench width of 15 feet is, by inspection, insufficient to create additional surfacewater acceleration to cause any additional erosion due to surface water velocity. Therefore the slightly steeper bench backslopes will equally control erosion as compared to the regulatory 5% bench slope.

3. Allow Compaction, seeding and revegetation of cover material placed on the slopes:
   The difference between a 15H:1V and 20H:1V slope over a bench width of 15 feet (a slope change of less than 2%) is, by inspection, insufficient to create difficulties in compaction, seeding and revegetation as compared to the regulatory 5% back slope. Therefore the slightly steeper benches can be equally compacted and revegetated as compared to the regulatory 5% bench slope.

4. Ensure minimal percolation of precipitation and surface runoff into the disposal areas.
   The increased backslope of 7% (about 2% more than the regulatory 5%) will be slightly better at minimizing percolation of precipitation and will provide improved surface runoff due to the slightly increased slope as compared to the regulatory 5% backslope. Therefore the increased slope will ensure minimal percolation of precipitation and surface runoff into the disposal areas.

SECTION T. FINAL COVER CHARACTERIZATION

Characteristics of the final cover are described in **Section S** above. Land surveying will be used to establish final elevations.

SECTION U. FINAL CONFIGURATION

The final landfill configuration including terraces and drainage ditches is described in **Section S** above.

PHASE II APPLICATION
CAMP HOPE RUN LANDFILL
BOGGS TOWNSHIP, CLEARFIELD COUNTY, PENNSYLVANIA

FORM 14
ATTACHMENT 14-2
Material Handling Plan

REVISED JUNE 2019

MATERIAL HANDLING PLAN

1.0 INTRODUCTION

The following is the Material Handling Plan for managing excavated materials from within the S2 and S3 areas of the Camp Hope Run Landfill. A description of the soil and rock materials to be encountered in these areas is described in detail in **Form F** and **Form J.** Some of this information is repeated below for use in developing this proposed plan.

S2 and S3 Area – Intact Rock

The base grade (i.e. liner subbase) elevations in the S2 area were developed to minimize contact with potential acid producing material (S_{total} > 0.5%) as determined through continuous overburden analyses (sampled every foot of drill depth) conducted by Meiser & Earl, Inc. (M&E) on five (5) wells installed in the S2 Area, in concert with overburden analyses conducted during the previous Kauffman mining operation (at 10 drill locations). These results were then used to define geologic "interval" depths where S_{total} > 0.5%. A DEP-recommended method (Theissen Polygon method) was then used to establish the 2-dimensional areas of influence of these vertical intervals and from those depths/areas, the S2 base grades were established.

More specifically, the Theissen Polygon method is used in strip mine settings where the bottom of the excavation is one continuous planar surface, such as the underclay beneath the mined coal. In the case of the S2 Area, the **bottom** of the excavation is the subbase elevation (i.e. bottom of the 6-inch-thick subbase layer within the liner system) for the landfill and may have several intersecting planes in one polygon.

Based upon M&E's analysis, which included 15 holes with overburden analyses over the (approximate) 130-acre S2 area, three (3) material categories were identified within the S2 footprint based on total sulfur (S_{total}):

(1) non-acid producing material (S_{total} < 0.5%);
(2) potential acid producing material (S_{total} < 1.0%); and
(3) high potential acid producing material ($S_{total} \geq$ 1.0%).

For the S2 excavation and for the intact bedrock within the S3 excavation, these materials will be categorized and handled based on whether total sulfur (S_{total}) is less than 1% or greater than or equal to 1%.

S2 excavated materials, where S_{total} < 1.0%, which includes non-acid and potential acid producing materials, will be used for operational cover, structural fill, and/or stockpiled within the S2 Stockpile (typically non-processed, oversized material). Specific material use and placement location shall be based on material suitability as determined by the Technical Specifications (**Attachment 24-2 (Rev. March 2019)**), and alkaline addition as specified in **Table 14-2.1**. In general, untreated excavated material (S_{total} < 1.0%) may be placed as operational daily cover or as structural fill under lined areas. However; structural fill within 5 feet of the Lower Kittanning Structure Contours or within 5 feet above the Lower Kittanning Potentiometric Surface Contours of the ponded water against the north highwall as

shown on **Figure 14-2.1** shall be treated with alkaline material at a rate of 6 Tons alkaline/1,000 Tons material[1].

Excavated material treated with alkaline at a rate of 6 Tons alkaline/1,000 Tons material may be placed as structural fill (exposed); landfill operational cover (intermediate cover); or stockpiled material within the S2 Stockpile. Although alkaline addition is not necessary, alkaline added material could also be used as structural fill beneath the liner and as daily cover material. The excavated bedrock for S3 will be handled in the same manner as S2, except Stockpile S1 will be used when necessary.

Excavated high potential acid producing materials, which are typically associated with the Lower Kittanning rider, as identified in **Figure 14-2.2** ($S_{total} \geq 1.0\%$), will be disposed of within the constructed landfill footprint as waste. Although not identified in M&E's investigation, the Lower Kittanning rider may be encountered in other areas not shown as high potential acid producing zones on **Figure 14-2.2**. Based on data collected during field investigations and the borehole logs provided by M&E, when present, the Lower Kittanning rider is generally between 20 and 40 feet above the Lower Kittanning Coal and is visually identifiable as a thin coal with carbonaceous shale intermixed with black shale. As an additional conservative approach, **Figure 14-2.2** highlights areas of excavation that encounter the zone that is 20 to 40 feet above the bottom of the Lower Kittanning Coal where the Lower Kittanning rider could be encountered. Not all cells will encounter this zone. However; if a coal with carbonaceous shale intermixed with black shale is encountered in this 20 to 40 foot zone, then the coal along with the black shale above and below the coal that could be up to 2 feet thick will be handled as waste material.

S3 Area – Mine Spoil
The subbase grades within S3 (previously mined/reclaimed area) are to be:

1.) Located entirely above the base of the Lower Kittanning (LK) Coal strip mine floor **(Form 6, Exhibit 6-1.10**; and
2.) Located entirely above the LK highest composite potentiometric groundwater surface contours, as presented in **Form 7, Exhibit 7-1.1**.

The S3 (subgrade) excavation will re-excavate and remove all of the reclaimed mine spoil from the former Kauffman mine pit between the North and South highwalls. The plan is to begin removing overburden from S3-1 and proceed sequentially to S3-4 so that the South Highwall Intercept system can be installed from low-to-high and directly feed the proposed AMD treatment system planned to be located just south/west of Cell S3-1. The S3 material consists of: A.) Pods: All material with a total sulfur analysis equal to or greater than 1% that was previously special handled involved encapsulating the high sulfur strata within "pods" comprised of layered special handled material, clay and alkaline material; and B.) Overburden (non-pod material): consisting of the weathered rock and rock materials that were removed from above the (Lower Kittanning) coal in order to mine it, which were then placed back into the mine "pit" to achieve the approximate original contours that currently exist within the mine area at the site.

Based on recent discussions with Kenneth Maney, Environmental Compliance Manager for the former Kauffman mining operation, during the previous mining the pit floor was "cleaned" and the material was handled like pod material. For the S3 Area, any spoil or loose material will be removed down to intact bedrock. If loose (not intact) black or carbonaceous material, however, still exists on top of the intact

[1] 6 Tons/1,000 Tons means 6 tons of CaCO3 equivalent of alkaline material per 1,000 tons of excavated S2 material.

bedrock it will be placed in the active disposal area as a "waste". The S3 Area excavated floor will drain toward the North and West and be contained by earthen berms. These temporary diversion berms will be constructed and maintained to prevent any runoff from leaving the excavation area and direct the collected runoff to the on-site AMD treatment area. The overlying structural fill (subgrade) material will be placed on the intact bedrock where there is exposed carbonaceous material in an expeditious manner to minimize the exposure of this material. Only an area that can be recovered at the end of the workday will be exposed.

A. All previously special handled "pod" material encountered within S3 will be disposed within the lined landfill cells as a "waste", and will not be used as operational cover, although it will not be weighed or counted toward the site's daily tonnage. When the pod material is placed, it will be covered daily along with the MSW waste.

B.1. Untreated overburden material re-excavated from S3 will be used in two (2) different areas of the development: operational cover as daily cover within lined areas; and structural fill beneath lined (i.e. non-exposed) areas.

B.2. Treated overburden (non-pod material treated with alkaline at a rate of 6 Tons alkaline/1,000 Tons material) re-excavated from S3 may be placed as structural fill (exposed); landfill operational cover (intermediate cover); or stockpiled material within the S1 Stockpile. Although alkaline addition is not necessary, alkaline added material could also be used as structural fill beneath the liner and as daily cover material.

A summary of the proposed plan for managing the excavated materials from S2 and S3 is provided in **Table 14-2.1.**

2.0 IDENTIFICATION OF POD MATERIAL – S3 AREA

Upon achieving base grades in S2 and construction of the first lined landfill cell – (S2-1), excavation in S3 will be initiated. During excavation of S3, previously special handled material placed in S3 will be encountered. Sulfur-bearing material in S3 includes the constructed pods as well as the LK bottom split and underlying binders/shales corresponding to the old strip mine pit floor.

Within S3, materials previously placed within the pods should be easily identifiable in the field given the high contrast in color, layered construction features of the pods, and their linear nature. They have been described as dark gray or black material placed into 74 pods measuring about 200'x75'x6' each comprised of alternating layers (bottom to top) of dark gray to black shaley materials (these are expected to be primarily finer materials), alkaline material (again, fine-grained and white to light gray) and a layer of clay (fine-grained, red to brown). Each pod was constructed in two (2) to three (3) cycles of these layers. Therefore, it is expected that these "pods" will stand-out in contrast to the surrounding overburden materials which were randomly placed and will be a more heterogeneous mixture of various colored and sized material.

The remaining (not previously mined) sulfur-bearing strata in S3 include the LK coal bottom split and underlying binders/shale. These sulfur-bearing strata represent the former surface mine's pit floor, which will be easily identifiable during excavation activities. Alkaline material was also placed on top of the surface mine pit floor prior to backfilling. These combined features and the contrast in disturbed versus in intact rock will provide an easily identifiable marker horizon during excavation of the mine spoil.

3.0 EXCAVATION – S2 AND S3 AREAS

Encountering potentially acid-forming strata within S2 will be intermittent. These strata will be excavated using standard rock excavation techniques and equipment.

Upon the completion of the landfill's initial cell (S2-1), excavation of the pod-containing area of S3 will commence in successive north-south strips (or block cuts), beginning at the West side and progressing to the East and proceeding to the mine pit floor, with the exception of the intact rock area within S3-1. Any spoil or loose material within S3 will be removed down to intact bedrock. Based on discussions with Kenneth Maney, Environmental Compliance Manager for the former Kauffman mining operation, during the previous mining the pit floor was "cleaned" and the material was handled like pod material. For the S3 Area, any spoil or loose material will be removed down to intact bedrock. If loose (non intact) black or carbonaceous material, however, still exists on top of the intact bedrock it will be placed in the active disposal area as waste material.

The overlying structural fill (subgrade) material will be placed on the intact bedrock where there is exposed carbonaceous material in an expeditious manner to minimize the exposure of the material. Only an area that can be recovered at the end of the workday will be excavated. The S3 Area excavation floor will drain toward the North and West and be contained by earthen berms. These temporary diversion berms will be constructed and maintained to prevent any runoff from leaving the excavation area and direct the collected runoff to the on-site AMD Treatment Facility.

In general, the pod material within a given block cut will be excavated from south to north. Then pod removal will continue with the next block cut to the East.

The visually identified sulfur-bearing material contained in the constructed pods will be selectively excavated and loaded directly into trucks, keeping it segregated from the non-pod mine spoil. The pod material will be hauled to and disposed in the active, lined landfill cell and covered at the end of each day's work. When appropriate grades are achieved, the proposed AMD Highwall Interceptor Drain (AMDHID) will be constructed along the South Highwall. All pods and non-pod/ materials will be excavated from S3 within the first seven years of landfill operations (refer to Timing/Schedule section).

In general, when previously mentioned preparations have been completed, the pods will be excavated to their full extent and hauled to the active lined landfill areas in such a manner that partial pods will not be left exposed at the end of each day's work. However, as a contingency, and in the event that site conditions and sequencing of landfill construction may not allow for the complete excavation of a pod, protective procedures will be employed, including but not limited to placing compacted soil overburden or geosynthetic rain cover on the exposed face(s) of the unexcavated pod to limit exposure of the pod until the next days' operation.

4.0 HAULING AND PLACEMENT

4.1 HAULING/PLACEMENT OF POD MATERIAL

Pod materials encountered during S3 construction will be loaded and transported to the active landfill cell for subsequent disposal within the cell. The material will be loaded onto rock trucks using standard rock excavation/loading equipment and immediately transported to the active cell and placed within the cell either directly or in a controlled stockpile area within the lined, active cell area.

4.2 HAULING/PLACEMENT OF NON-POD MATERIAL

Non-Pod materials encountered during both S2 and S3 construction will be loaded and transported to the either the active landfill cell for use as operational cover, to stockpile areas, or for use as structural fill in constructing cell areas. The material will be loaded onto rock trucks using standard rock excavation/loading equipment. As presented in **Table 14-2.1**, when non-pod materials are to have alkaline addition, the alkaline materials will be added into the haul trucks at the rates shown above (4 Tons Alkaline per 1,000 Tons material) and transported to their final destination. In stockpile or structural fill areas, alkaline material will also be added to the surface beneath these areas at a rate of 2 Tons Alkaline material to 1,000 Tons material. **Table 14-2.2** provides calculations showing how much alkaline should be added to each haul truck. **Table 14-2.3** provides calculations showing how much alkaline material should be placed beneath material that is placed in a stockpile or beneath exposed structural fill. **Table 14-2.4** provides calculations showing how much total alkaline is required to treat all material excavation quantities and how much alkaline is needed for storage, on a periodic basis (e.g. one month) to meet construction and operational needs.

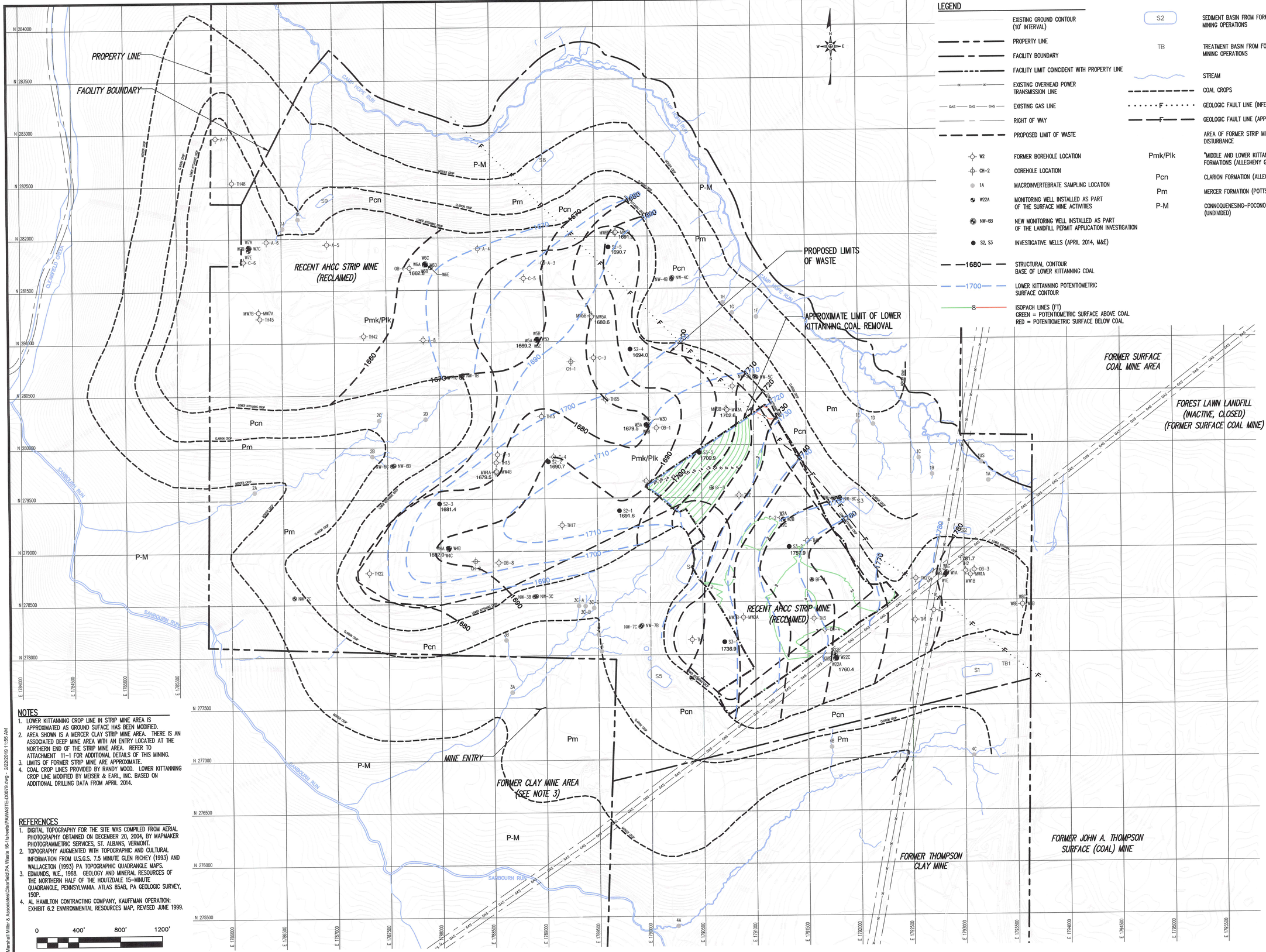
5.0 CONTACT WATER MANAGEMENT

Stormwater within excavations containing pod material will be considered contact water. Contact water will be directed to the on-site AMD Treatment facility. Where needed, soil berms and portable pump stations will be constructed to contain contact water within excavated areas.

Groundwater/ponded water and direct rainfall within the mine spoil in S3 will be treated as contact water and will also be controlled and diverted to proposed containment areas and treatment areas.

6.0 TIMING/SCHEDULE FOR POD/OVERBURDEN RELOCATION

As evaluated by the DEP during their Environmental Assessment Analysis (Redevelopment of Impacted Mine Lands), the proposed elimination (collection/treatment) of historic Acid Mine Drainage (AMD) and resultant elimination of the ongoing AMD discharges collectively minimize impacts from historic mining activities on the property. These environmental benefits were acknowledged as long as the impacts could be minimized within the initial landfill operations. Consequently, the S3 pod materials and overburden will be removed from the S3 area by the end of the 7th year of operations.



LEGEND

- EXISTING GROUND CONTOUR (10' INTERVAL)
- PROPERTY LINE
- FACILITY BOUNDARY
- FACILITY LIMIT COINCIDENT WITH PROPERTY LINE
- EXISTING OVERHEAD POWER TRANSMISSION LINE
- EXISTING GAS LINE
- RIGHT OF WAY
- PROPOSED LIMIT OF WASTE
- W2 — FORMER BOREHOLE LOCATION
- CH-2 — COREHOLE LOCATION
- 1A — MACROINVERTEBRATE SAMPLING LOCATION
- W22A — MONITORING WELL INSTALLED AS PART OF THE SURFACE MINE ACTIVITIES
- NW-6B — NEW MONITORING WELL INSTALLED AS PART OF THE LANDFILL PERMIT APPLICATION INVESTIGATION
- S2, S3 — INVESTIGATIVE WELLS (APRIL 2014, M&E)
- 1680 — STRUCTURAL CONTOUR BASE OF LOWER KITTANNING COAL
- 1700 — LOWER KITTANNING POTENTIOMETRIC SURFACE CONTOUR
- 8 — ISOPACH LINES (FT) GREEN = POTENTIOMETRIC SURFACE ABOVE COAL RED = POTENTIOMETRIC SURFACE BELOW COAL
- S2 — SEDIMENT BASIN FROM FORMER MINING OPERATIONS
- TB — TREATMENT BASIN FROM FORMER MINING OPERATIONS
- STREAM
- COAL CROPS
- GEOLOGIC FAULT LINE (INFERRED)
- GEOLOGIC FAULT LINE (APPROXIMATE)
- AREA OF FORMER STRIP MINE DISTURBANCE
- Pmk/Plk — "MIDDLE AND LOWER KITTANNING" FORMATIONS (ALLEGHENY GROUP)
- Pcn — CLARION FORMATION (ALLEGHANY GROUP)
- Pm — MERCER FORMATION (POTTSVILLE GROUP)
- P-M — CONNOQUENESING–POCONO FORMATIONS (UNDIVIDED)

NOTES

1. LOWER KITTANNING CROP LINE IN STRIP MINE AREA IS APPROXIMATED AS GROUND SUFACE HAS BEEN MODIFIED.
2. AREA SHOWN IS A MERCER CLAY STRIP MINE AREA. THERE IS AN ASSOCIATED DEEP MINE AREA WITH AN ENTRY LOCATED AT THE NORTHERN END OF THE STRIP MINE AREA. REFER TO ATTACHMENT 11-1 FOR ADDITIONAL DETAILS OF THIS MINING.
3. LIMITS OF FORMER STRIP MINE ARE APPROXIMATE.
4. COAL CROP LINES PROVIDED BY RANDY WOOD. LOWER KITTANNING CROP LINE MODIFIED BY MEISER & EARL, INC. BASED ON ADDITIONAL DRILLING DATA FROM APRIL 2014.

REFERENCES

1. DIGITAL TOPOGRAPHY FOR THE SITE WAS COMPILED FROM AERIAL PHOTOGRAPHY OBTAINED ON DECEMBER 20, 2004, BY MAPMAKER PHOTOGRAMMETRIC SERVICES, ST. ALBANS, VERMONT.
2. TOPOGRAPHY AUGMENTED WITH TOPOGRAPHIC AND CULTURAL INFORMATION FROM U.S.G.S. 7.5 MINUTE GLEN RICHEY (1993) AND WALLACETON (1993) PA TOPOGRAPHIC QUADRANGLE MAPS.
3. EDMUNDS, W.E., 1968. GEOLOGY AND MINERAL RESOURCES OF THE NORTHERN HALF OF THE HOUTZDALE 15-MINUTE QUADRANGLE, PENNSYLVANIA. ATLAS 85AB, PA GEOLOGIC SURVEY, 150P.
4. AL HAMILTON CONTRACTING COMPANY, KAUFFMAN OPERATION: EXHIBIT 6.2 ENVIRONMENTAL RESOURCES MAP, REVISED JUNE 1999.

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Hydrogeologists

Meiser & Earl, Inc.
1512 W. College Avenue
State College, PA 16801
(814) 234-0813

PREPARED BY:

SMITH+ GARDNER
ENGINEERS
14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

SEAL — COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — ROBERT M. HERSHEY — GEOLOGIST 0377-G — 4/1/19

SEAL — COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — JOHN M. GARDNER — ENGINEER No. 038615-E — 4/1/19

REV.	DATE	DESCRIPTION

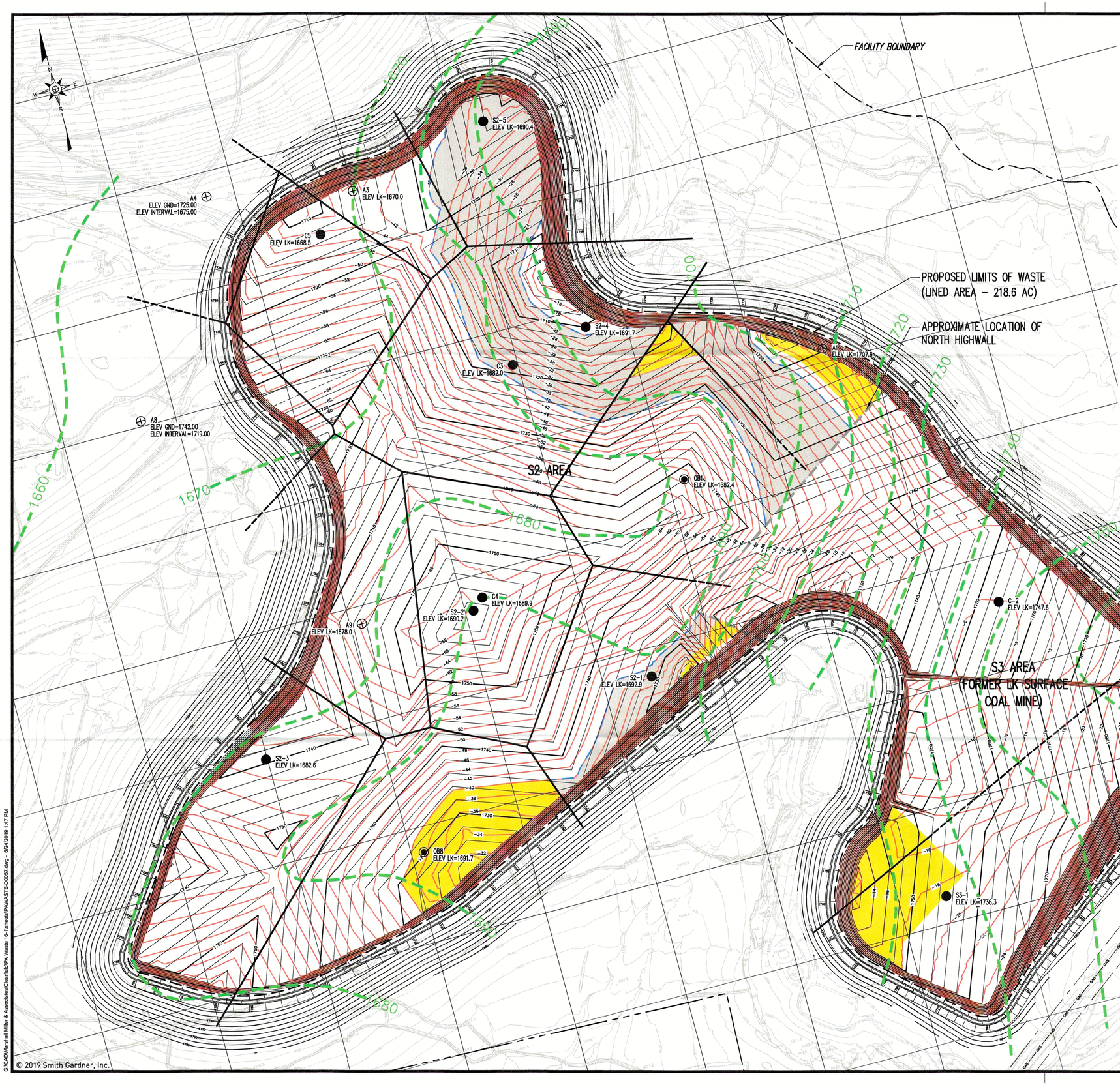
PROJECT TITLE:

PA WASTE, LLC
CAMP HOPE RUN LANDFILL
CLEARFIELD COUNTY, PA
PHASE I APPLICATION

DRAWING TITLE:

EXHIBIT 14-2.1
LOWER KITTANNING STRUCTURE CONTOURS AND POTENTIOMETRIC SURFACE CONTOURS

DESIGNED:	PROJECT NO: PAWASTE 16-1
DRAWN: C.T.J.	SCALE: AS SHOWN
APPROVED:	DATE: MAR. 2019
FILENAME: PAWASTE-D0079	
SHEET NUMBER: 14-2.1	DRAWING NUMBER:



OVERBURDEN ANALYSIS SUMMARY

Hole No.	Total Depth (feet)	Depth to Bottom of LK (feet)	LK Rider Depth (feet)	Interval >0.5% Sulfur Depth (feet)	Total Sulfur (>0.5%)	Height Above Bottom of LK (feet)	LK Rider Height Above Bottom of LK (feet)	Description
A-1	76.7	71.0		54.0 - 56.0	2.28	17.0 - 15.0		Dark gray shale
A-3	65.0	59.0		30.0 - 33.0	0.74	29.0 - 26.0		Dark gray , coarse-grained sandstone, many binders
				33.0 - 35.0	0.56	26.0 - 24.0		Dark gray , coarse-grained sandstone, many binders
				43.0 - 45.0	1.34	16.0 - 14.0		Dark gray shale
A-4*	61.5	53.0		50.0 - 50.9	1.20	9.0 - 8.1		Coal and dark gray shale
A-8*	85.0	77.0		23.0 - 24.6	0.70	54.0 - 52.4		Dark gray sandy shale
A-9	56.0	49.0		31.0 - 32.1	1.53	18.0 - 16.9		Dark sandstone with coal
				32.1 - 34.0	0.61	16.9 - 15.0		Dark gray shale with black layers
C-3	76.9	71.0		58.5 - 60.5	0.58	12.5 - 10.5		Light gray sandstone laminae
				60.5 - 63.5	0.64	10.5 - 7.5		Medium-dark to medium-light gray siltstone
				63.5 - 64.6	0.55	7.5 - 6.4		Light gray, very fine-grained sandstone
				64.6 - 67.0	0.84	6.4 - 4.0		Medium gray, very fine-grained sandstone to claystone
				67.0 - 68.0	0.85	4.0 - 3.0		Dark gray claystone (or coal)
C-4	99.7	92.0		77.5 - 80.5	0.58	14.5 - 11.5		Grayish black siltstone, decreasing organic with depth
				80.5 - 82.8	0.52	11.5 - 9.2		Grayish black siltstone, decreasing organic with depth
				82.8 - 84.8	0.58	9.2 - 7.2		Grayish black siltstone, decreasing organic with depth
				87.5 - 87.9	2.90	4.5 - 4.1		Medium black to dark gray siltstone (on coal)
C-5	84.8	79.0		54.1 - 54.6	1.10	24.9 - 24.4		Fine sandstone 50%-70% coal stringers
				75.5 - 76.2	0.65	3.5 - 2.8		Medium gray, fine sandstone (on coal)
OB-1	111.8	104.3		51.9 - 52.3	0.82	52.4 - 52.0		Black carbonaceous shale intermixed with coal
				72.2 - 74.2	0.51	32.1 - 30.1		Dark gray carbonaceous sandstone, black carbonaceous shale, intermixed with coal
			74.2 - 75.2	74.2 - 75.2	4.09	30.1 - 29.1	30.1 - 29.1	Coal **LK rider**
				75.2 - 76.2	1.20	29.1 - 28.1		Dark gray carbonaceous shale intermixed with coal
				76.2 - 79.2	0.70	28.1 - 25.1		Dark gray shale
				79.2 - 81.9	0.56	25.1 - 22.4		Dark gray shale
				85.9 - 88.9	0.92	18.4 - 15.4		Dark gray shale
				99.9 - 100.4	0.66	4.4 - 3.9		Dark gray shale and coal
OB-8	100.3	99.2		58.7 - 59.7	1.78	40.5 - 39.5		Gray-black shale
			59.7 - 60.7	59.7 - 60.7	4.38	39.5 - 38.5	39.5 - 38.5	**LK rider coal** and black shale
				60.7 - 63.7	1.55	38.5 - 35.5		Dark gray clay shale
				63.7 - 66.7	1.11	35.5 - 32.5		Dark gray shale
				66.7 - 69.7	0.66	32.5 - 29.5		Dark gray shale
				78.0 - 81.5	0.65	21.2 - 17.7		Dark gray clay shale
S2-1	91.7	89.5	57.0 - 57.4	57.0 - 57.4	0.80	32.5 - 32.1	32.5 - 32.1	Coal and black shale, **LK rider**
			57.4 - 58.0	57.4 - 58.0	3.63	32.1 - 31.5	32.1 - 31.5	Coal and siltstone, **LK rider**
				58.0 - 60.0	0.98	31.5 - 29.5		Gray and yellowish brown, fine-grained to very fine-grained sandstone
				60.0 - 62.0	0.71	29.5 - 27.5		Gray very fine-grained sandstone
				67.0 - 69.0	0.71	22.5 - 20.5		Gray very fine-grained sandstone
				71.0 - 73.0	1.65	18.5 - 16.5		Gray silty shale
S2-2	92.0	90.0		41.0 - 42.0	0.88	49.0 - 48.0		Gray claystone, thin coal
				76.0 - 79.0	0.50	33.1 - 30.1		Medium-dark gray very fine-grained sandstone
S2-3	84.0	82.0		31.0 - 32.0	0.52	53.0 - 50.0		Black shale and gray siltstone
				47.0 - 49.0	1.11	35.0 - 33.0		Gray siltstone
				49.0 - 50.0	1.38	33.0 - 32.0		Medium-dark gray shale
				50.0 - 51.0	0.80	32.0 - 31.0		Medium-dark gray shale
				51.0 - 52.0	1.03	31.0 - 30.0		Medium-dark gray shale
				52.0 - 53.0	2.12	30.0 - 29.0		Medium-dark gray shale
				53.0 - 54.0	1.41	29.0 - 28.0		Gray siltstone very fine-grained sandstone
				54.0 - 56.0	0.78	28.0 - 26.0		Gray siltstone
				56.0 - 57.0	0.54	26.0 - 25.0		Gray siltstone
				63.0 - 65.0	1.48	19.0 - 17.0		Gray shale
S2-4	17.5	16.0		13.0 - 13.5	0.53	3.0 - 2.5		Yellow clay on coal
S2-5	62.0	59.3		40.0 - 42.0	0.61	19.3 - 17.3		Gray very fine-grained sandstone
				43.0 - 45.0	0.51	16.3 - 14.3		Gray very fine-grained sandstone, shale siltstone interbed
				47.0 - 49.0	2.14	12.3 - 10.3		Gray shale
S3-1	114.0	51.0		49.0 - 50.0	0.67	1.0 - 2.0		Medium brown shale
			34.5 - 34.8	34.5 - 34.8	6.15	28.3 - 28.0	28.3 - 28.0	LK Rider - coal
				34.8 - 38.2	1.25	28.0 - 24.6	-	Medium gray shale
OB4	63.2	62.8		38.2 - 41.2	0.90	24.6 - 21.6	-	Medium gray sandy shale
				49.2 - 50.2	4.40	13.6 - 12.6	-	Dark gray/black shale
				59.2 - 59.5	1.25	3.6 - 3.3	-	Dark gray shale and coal
C2	59.5	51		21.1 - 23.3	0.88	29.9 - 27.7	-	Light gray sandstone
				40.8 - 43.7	1.37	10.2 - 7.3	-	Dark gray siltstone - lingula

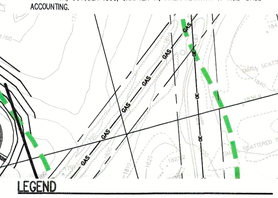
*Holes A-4 and A-8 are 230 and 430 feet, respectively, outside disposal boundary.
LK = Lower Kittanning Coal.
Samples collected by Meiser & Earl, Inc. personnel.
Samples analyzed by Geochemical Testing.

NOTES

1. HOLES A–4 AND A–8 ARE (APPROXIMATELY) 230 AND 430 FEET, RESPECTIVELY OUTSIDE THE WASTE DISPOSAL BOUNDARY.
2. LK: LOWER KITTANNING COAL.
3. THE ISOPACH LINES REPRESENT THE DISTANCE BETWEEN THE SUBBASE CONTOURS AND THE STRUCTURAL CONTOUR BASE OF THE LOWER KITTANNING COAL. A NEGATIVE VALUE REPRESENTS DEPTH BELOW SUBBASE.
4. THE LOWER KITTANNING RIDER COAL (LKr) NOT PREVIOUSLY IDENTIFIED TO BE > 1.0% TOTAL SULFUR MAY BE INCIDENTALLY ENCOUNTERED DURING SUBGRADE EXCAVATION WITHIN THE HORIZONTAL LIMITS IDENTIFIED FROM 20 TO 40 FEET ABOVE THE BASE OF THE LOWER KITTANNING COAL AS A COAL WITH CARBONACEOUS SHALE INTERMIXED WITH BLACK SHALE. THIS COAL ALONG WITH BLACK SHALE COULD BE UP TO 2 FEET ABOVE AND BELOW THE COAL WILL BE DISPOSED WHTIN THE LANDFILL AS A "WASTE".

REFERENCES

1. DIGITAL TOPOGRAPHY FOR THE SITE WAS COMPILED FROM AERIAL PHOTOGRAPHY OBTAINED ON DECEMBER 20, 2004, BY MAPMAKER PHOTOGRAMMETRIC SERVICES, ST. ALBANS, VERMONT.
2. TOPOGRAPHY AUGMENTED WITH TOPOGRAPHIC AND CULTURAL INFORMATION FROM U.S.G.S. 7.5 MINUTE GLEN RICHEY (1993) AND WALLACETON (1993) PA TOPOGRAPHIC QUADRANGLE MAPS.
3. PUBLICATION TITLED, "COAL MINE DRAINAGE PREDICTION AND POLLUTION PREVENTION IN PENNSYLVANIA", PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OCTOBER 1998, CHAPTER 11, INTERPRETATION OF ACID–BASE ACCOUNTING.



LEGEND

- EXISTING GROUND CONTOUR (10' INTERVAL)
- 1832 — SUBBASE CONTOUR (10' INTERVAL)
- SUBBASE CONTOUR (2' INTERVAL)
- 30 — ISOPACH LINES (2' INTERVAL) (SEE NOTE 3)
- PROPERTY LINE
- FACILITY BOUNDARY
- FACILITY LIMIT COINCIDENT WITH PROPERTY LINE
- OE — OE — EXISTING OVERHEAD POWER TRANSMISSION LINE
- GAS — GAS — GAS — EXISTING GAS LINE
- RIGHT OF WAY
- PROPOSED LIMIT OF WASTE (LINED AREA)
- A4, TH–1 — GEOLOGIC WELL
- C1, CH–1 — COREHOLE
- OB3 — OVERBURDEN ANALYSIS BOREHOLE
- S2, S3 — INVESTIGATIVE WELLS (2014 MEISER & EARL)
- THIESSON POLYGON CONSTRUCTION LINE (SEE REFERENCE 3)
- 1680 — STRUCTURAL CONTOUR BASE OF LOWER KITTANNING COAL
- TOTAL SULFUR >1.0%
- POTENTIAL LKr LIMITS (SEE NOTE 4)

0 200' 400' 600'

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PREPARED FOR:

PA WASTE, LLC
CLEARFIELD COUNTY, PA

PREPARED BY:

SMITH+ GARDNER
ENGINEERS
14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577
1526 Richland St., Columbia SC 29201

SEAL

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — JOHN M. GARDNER — ENGINEER No. 039015-E — PENNSYLVANIA — 7/1/19

SEAL

REV.	DATE	DESCRIPTION
1	3/19	RESPONSE TO 11/26/18
		PADEP COMMENTS
2	6/19	RESPONSE TO 6/4/19
		PADEP COMMENTS

PROJECT TITLE:

PA WASTE, LLC
CAMP HOPE RUN LANDFILL
CLEARFIELD COUNTY, PA

DRAWING TITLE:

MATERIAL HANDLING PLAN
POTENTIAL ACID
PRODUCING MATERIAL

DESIGNED: J.M.G.	PROJECT NO: PAWASTE 16-1
DRAWN: C.T.J.	SCALE: AS SHOWN
APPROVED:	DATE: FEB. 2018
FILENAME: PAWASTE-D0057	
SHEET NUMBER: **FIGURE**	DRAWING NUMBER: **14-2.2**

TABLE 14-2.1
SUMMARY HANDLING PLAN FOR EXCAVATED MATERIAL

Source Area	Excavated Material	Material Uses and Placement Location							
		Operational Soils		Structural Fill			Stockpile		Waste
		Daily Cover	Intermediate Cover	Exposed	Under Lined Areas	Under Lined Areas w/n 5' of LK or GW	S1	S2	
S2	Intact Bedrock (<1.0% Total Sulfur)	YES	NO	NO	YES	NO	NO	NO	NO
	Intact Bedrock (< 1.0% Total Sulfur w/ (Excess Alkaline Added)	YES	YES	YES	YES	YES	NO	YES	NO
	Intact Bedrock (>1.0% Total Sulfur	NO	NO	NO	NO	NO	NO	NO	YES
	Intact Bedrock (Incidentally Encountered LK Rider)	NO	NO	NO	NO	NO	NO	NO	YES
S3	Intact Bedrock (<1.0% Total Sulfur)	YES	NO	NO	YES	NO	NO	NO	NO
	Intact Bedrock (< 1.0% Total Sulfur w/ (Excess Alkaline Added)	YES	YES	YES	YES	YES	YES	NO	NO
	Intact Bedrock (>1.0% Total Sulfur	NO	NO	NO	NO	NO	NO	NO	YES
	Non-Pod Spoil Material	YES	NO	NO	YES	NO	NO	NO	NO
	Non-Pod Spoil Material (Excess Alkaline Added)	YES	YES	YES	YES	YES	YES	NO	NO
	Pod Material	NO	NO	NO	NO	NO	NO	NO	YES

LEGEND

1. NO - specified material may not be used or placed in the indicated location.
2. YES - specified material may be used or placed in the indicated location.
3. Excess alkaline is material that has:

   2 Tons $CaCO_3$ Per 1,000 Tons Material placed beneath the material
   4 Tons $CaCO_3$ Per 1,000 Tons Material mixed in the haul truck
   6 Tons $CaCO_3$ Per 1,000 Tons Material Total

TABLE 14-2-2
PA Waste, LLC
Camp Hope Run Landfill
Alkaline Addition for Haul Trucks

Assume:

1. 50-Ton Haul Trucks [(1)]
2. Graymont High Calcium Baghouse Lime
   a. 103.5% Calcium Carbonate Equivalent (Technical Data Attached). Use 100%. [(2)]
3. 4 Tons CCE/1000 Tons of Rock or Spoil Material (Excavated)
4. Baghouse Lime Density From Graymont 85 lbs/ft^3

$$\frac{4 \text{ Tons CCE}}{1000 \text{ Tons Rock Excavated}} \text{X} \frac{2000 \text{ lbs CCE}}{1 \text{ Ton CCE}} = \frac{8000 \text{ lbs of CCE (Baghouse Lime)}}{1000 \text{ Tons Excavated}}$$

$$\frac{1000 \text{ Tons}}{50 \text{ Tons/Truck}} = 20 \text{ Trucks}$$

$$\frac{8000 \text{ lbs Baghouse Lime}}{20 \text{ Trucks}} = \frac{400 \text{ lbs Baghouse Lime}}{\text{truck}} \text{ x } \frac{ft^3}{85 \text{ lbs}} = 4.7 \text{ } ft^3 \text{ Baghouse Lime/Truck} \quad (3)$$

NOTES:

(1) Different truck capacities will change the calculated CCE required per truck.

(2) Other sources of alkaline material could be utilized, with the appropriate CCE and density used in the calculations. For example, if 80% CCE alkaline material were used, then 4 tons of 100% CCE / 0.8 = 5 tons of alkaline material would be required per 1000 tons of material, or 500 lbs per truck. If the density of 80% CCE alkaline material were 110 lbs/ft^3, then 4.6 ft^3/truck would be required.

(3) There are excavator buckets that are approximately 4.7 ft^3, so one excavator bucket of baghouse lime per truck would be placed on top of the loaded truck.

TABLE 14-2-3
PA Waste, LLC
Camp Hope Run Landfill
Alkaline Addition
Beneath Excavated Material

Assume:

1. Graymont High Calcium Baghouse Lime
   a. 103.5% Calcium Carbonate Equivalent (Technical Data Attached - Figure 14-2-?) Use 100%(1)
2. 2 Tons CCE/1000 Tons of Rock or Spoil Material (Excavated)
3. Baghouse Lime Density from Graymont 85 lbs/ft^3
4. Lift is 10-feet high(2)
5. Spoil or excavated rock density is 3670 tons/acre-foot

$$\frac{3670\ \text{Tons}}{\text{Acre}-\text{Foot}}\text{X}\ \frac{10\ \text{Foot}}{\text{Lift}}\ =\ \frac{36700\ \text{Tons}}{\text{Lift}-\text{acre}}\text{X}\ \frac{2\ \text{Tons CCE}}{1000\ \text{Tons Excavated}}=$$

$$\frac{73.4\ \text{tons Alkaline}}{\text{Lift}-\text{acre}}\text{X}\ \frac{2000\ \text{lbs}}{\text{Ton}}=\ \frac{146800\ \text{lbs}}{\text{Lift}-\text{acre}}\ \text{X}\ \frac{1\text{ft}^3}{85\ \text{lbs}}=17271\ \text{ft}^3\ \text{X}\ \frac{1\ \text{acre}}{43560\ \text{ft}^2}=$$

$$0.04\ \text{ft}\ \text{X}\frac{12\ \text{inches}}{1\ \text{ft}}\ =\ \frac{0.5\ \text{inches}}{\text{Lift}}$$

NOTES:

(1) Other sources of alkaline material could be utilized, with the appropriate CCE and density used in the calculations. For example, if 80% CCE material were used, then 2 tons of 100% CCE / 0.8 = 2.5 tons of alkaline material would be required per 1000 tons of material. If the density were 110 lbs/ft^3, then 0.5 inches per lift would still be required.

(2) In general we recommend that a minimum of 0.5 inch of alkaline material be used even if less than a 10 feet of excavated material is place above it. The amount of alkaline material can be proportioned by the height of the lift. The appropriate alkaline material can be placed under each lift of at the bottom of all the material. For example, if 50 feet of excavated material were going to placed, then 2½ inches of alkaline material could be placed beneath all of the material, or ½ inch of alkaline material could be placed under each of 10 foot high lifts, or any combination that accounts for the height of the overlying material.

TABLE 14-2.4
PA Waste, LLC
Camp Hope Run Landfill
Alkaline Treatment and Storage

Objective:

1. Determine the quantity of Graymont Waste Lime required to treat the following:

    - Total Material Required for Construction (Structural Fill) and Operations (Daily and Intermediate Cover).
    - Total Material Required for S2-1 Construction (Structural Fill).
    - Total S3 Mine Spoil Material (Non-Pod) Excavation.

2. And estimate the stockpile size required to maintain a one-month supply of alkaline during construction and S3 overburden relocation.

Assumptions:

1. Operating Days 5.5 days/wk = 286 days/yr
2. Density(ρ) of mine spoil material = 2 ton/CY
3. Density(ρ) of Graymont Waste Lime (Alkaline as $CaCO_3$) = 85 lbs./ft^3 = 1.1 ton/CY

Determine the total quantity of Graymont Waste Lime required for construction, and operations.

Given (Reference Table F-5.1 for all values):

Volume S2 Excavation ($V_{S2\ (EXC)}$) = 4,600,146 CY
Volume S2 Structural Fill Under Liner ($V_{S2(UL)}$) = 670,053 CY
Volume S2 Daily Cover ($V_{S2(DC)}$) = 1,069,623 CY
Volume S2 Intact Rock (Sulfur $\geq$ 1%) ($V_{S2\ (S)}$) = 41,207 CY

Volume S3 Excavation ($V_{S3\ (EXC)}$) = 7,694,226 CY
Volume S3 Structural Fill Under Liner ($V_{S3(UL)}$) = 1,809,698 CY
Volume S3 Daily Cover ($V_{S3(DC)}$) = 738,029 CY
Volume S3 Pod ($V_{S3(POD)}$) = 490,990 CY
Volume S3 Intact Rock (Sulfur > 1%) ($V_{S3\ (S)}$) = 20,993 CY

Assumptions:

1. Material will be handled in accordance with the material handling plan.

Calculation:

Calculate the Total Material Requiring Treatment:

$$V_{Total} = V_{S2(EXC)} + V_{S3(EXC)} - V_{S2(UL)} - V_{S2\,(DC)} - V_{S2(S)} - V_{S3(UL)} - V_{S3(DC)} - V_{S3\,(POD)} - V_{S3(S)}$$

$$V_{Total} = 4{,}600{,}146\ CY + 7{,}694{,}226\ CY - 670{,}053\ CY - 1{,}069{,}623\ CY - 41{,}207\ CY - 1{,}809{,}698\ CY - 738{,}029\ CY - 490{,}990\ CY - 20{,}993\ CY$$

$$V_{Total} = 7{,}453{,}779\ CY^{*}$$

*Total excludes all material not requiring alkaline addition, including Structural Fill below liner, Daily Cover, and waste materials (Intact S2 and S3 Rock (Sulfur ≥ 1%) and S3 Pod Material).

Calculate Total Alkaline Required for V_{Total}:

$$7{,}453{,}779\ CY \times \frac{2\ TN}{CY} \times \frac{6\ TN\ CaCO_3}{1{,}000\ TN\ excavation} = 89{,}450\ TN\ CaCO_3$$

$$89{,}450\ TN\ CaCO_3 \times \frac{1\ CY}{1.1\ TN} \cong 81{,}300\ CY CaCO_3$$

Conclusion:

Approximately 81,300 CY of Graymont Waste Lime will be required to treat all material used for S-2 landfill construction and operations and S3 Mine Spoil Material (non-pod) excavation.

Determine the total and monthly quantity of Graymont Waste Lime required for S2-1 Construction.

Given:

Volume S2-1 Structural Fill ($V_{S2\text{-}1(EMB)}$) = 2,505,287 CY (Reference Attached S2-1 Isopach)
S2-1 Structural fill includes material inside and outside of liner

Assumptions:

1. Phase S2-1 structural fill is used for this calculation since S2-1 has the largest structural fill of all phases due to construction of the perimeter access road. As a result, the largest quantity of alkaline will be needed during this construction phase.
2. Alkaline treatment of all structural fill is used for this calculation, which is conservative, because untreated excavated rock material and/or non-pod Mine Spoil Material, may be used below liner systems.

Calculation:

Calculate the Total Alkaline Required for S2-1 for Treatment:

$$V_{S2-1(EMB)} = 2{,}505{,}287\ CY$$

$$2{,}505{,}287\ CY \times \frac{2\ TN}{CY} \times \frac{6\ TN\ CaCO_3}{1{,}000\ TN\ excavation} = 30{,}100\ TN\ CaCO_3$$

$$30{,}100\ TN\ CaCO_3 \times \frac{1\ CY}{1.1\ TN} \cong 27{,}400\ CY\ CaCO_3$$

Calculate an Approximate One-Month Supply of Alkaline:

Assume six (6) months required for construction of S2-1 and access roads.

$$\frac{27{,}400\ CY\ CaCO_3}{6\ months} \cong 4{,}600\ \frac{CY}{month}$$

Conclusion:

Approximately 27,400 CY of Graymont Waste Lime ($CaCO_3$) will be required to treat all the S2-1 Structural Fill, which is approximately 4,600 CY per month assuming a 6 month construction schedule. Since S2-1 construction requires the largest amount of structural fill, this monthly approximation would be considered most conservative in determining the amount of Alkaline needed during any one month of construction.

Determine the total and monthly quantity of Graymont Waste Lime required to treat all S3 Non-Pod Mine Spoil Material.

Given:

Volume S3 Non-Pod ($V_{S3\ (NON)}$) = 5,716,663 CY (Reference Table F-5.1)

Assumptions:

1. S3 Mine Spoil Material will be excavated and treated within the first seven (7) years of operation.
2. Treatment of all S3 (non-Pod) Mine Spoil Material is conservative, because untreated S3 (non-Pod) material may be used in daily cover operations or below liner systems.

Calculation:

Calculate the Total Alkaline Required for Treatment of the S3 Non-Pod Materials:

$$5{,}716{,}663 \times \frac{2\ TN}{CY} \times \frac{6\ TN\ CaCO_3}{1{,}000\ TN\ excavation} = 68{,}600\ TN\ CaCO_3$$

$$68{,}600\ TN\ CaCO_3 \times \frac{CY}{1.1\ TN} \cong 62{,}400\ CY\ CaCO_3$$

Calculate an Approximate One-Month Supply of Alkaline:

$$\frac{62{,}400\ CY\ CaCO_3}{7\ years} \times \frac{1\ year}{12\ months} \cong 740\ \frac{CY\ CaCO_3}{month}$$

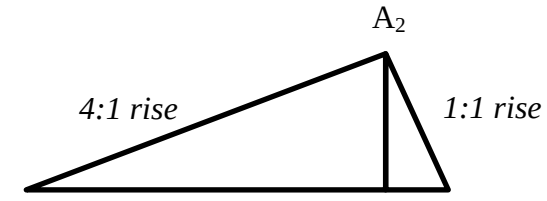
Conclusion:

Approximately 62,400 CY of Graymont Waste Lime ($CaCO_3$) will be required to treat all S3 Non-Pod Mine Spoil Material, which is approximately 740 CY per month assuming a 7-year operation. Since S3 Non-Pod Mine Spoil Material may be used below the liner system or as daily cover, this monthly approximation is conservative in determining the amount of Alkaline needed during any one month of operation.

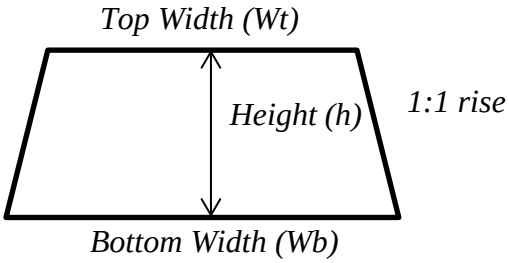
Determine the approximate stockpile size required to store Graymont Waste Lime during S2-1 Construction and S3 Mine Spoil Operations

Calculation:

- Calculate a stockpile volume based on the following assumed stockpile shape with 4:1 rise on long side (not to scale) and length (l), which is twice the width (w):



Typical Stockpile Section



Section $A_2 - A_2'$

$$Height\ (h) = \frac{Length\ (l)}{5}$$

$$Top\ Width\ (W_t) = \frac{l}{2}$$

$$Bottom\ Width\ (W_b) = Wt + 2H$$

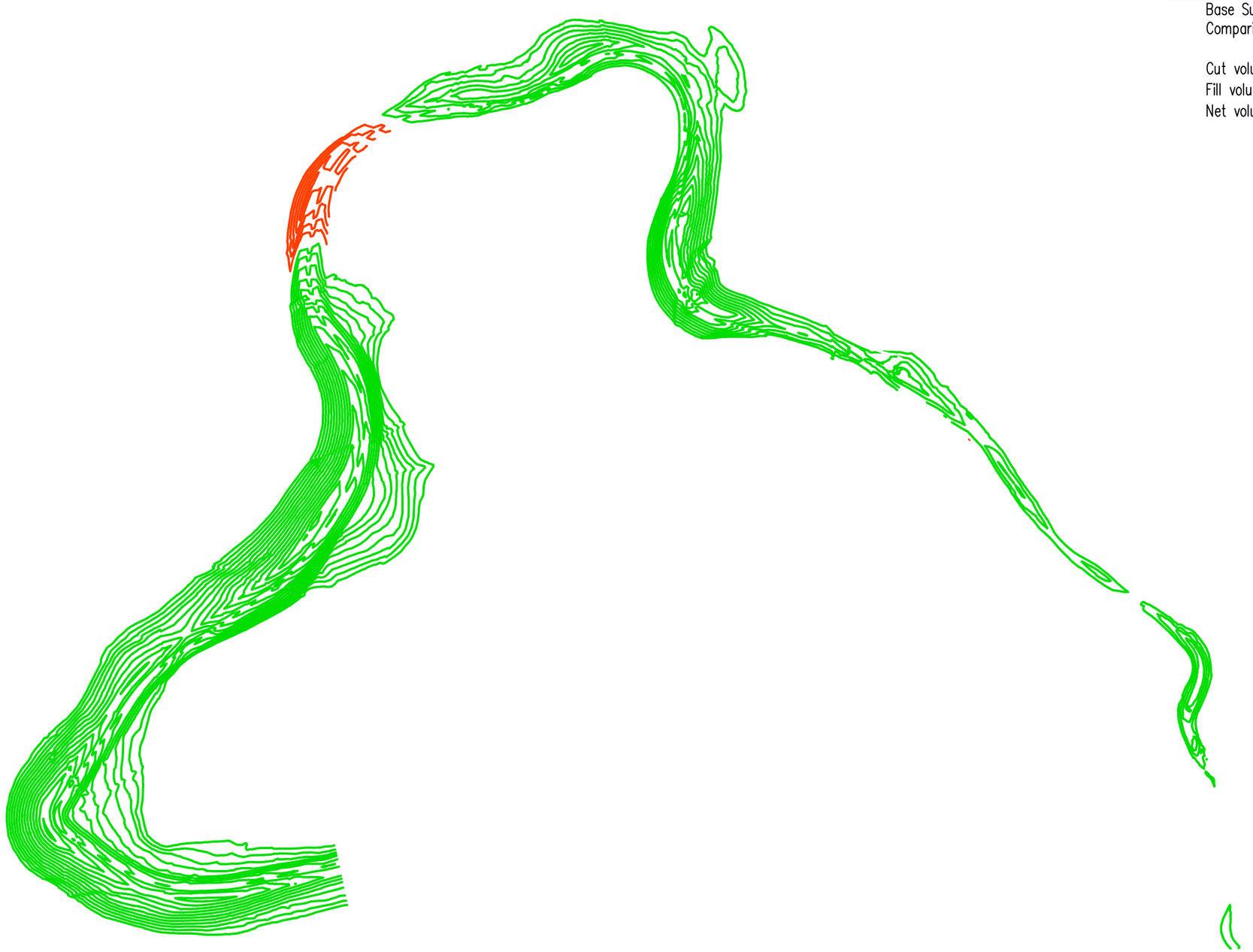
$$Cross - Sectional\ Area\ (A_{2,2'}) = \frac{Wt + Wb}{2} \times H$$

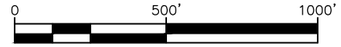
$$V_{stockpile} = \frac{1}{2} A_{2,2'} \times l \times \frac{1\ CY}{27\ cubic\ feet}$$

Stockpile	Volume Required (CY)	Stockpile Length (*l*) FT	Stockpile Height (*h*) (FT)	Top Width (*Wt*) (FT)	Bottom Width (*Wb*) (FT)	Volume Actual (CY)
S2-1 Construction	4,600	125	25	62.5	113	5,100
Mine Spoil Operation	740	70	14	35	63	900

Volume

Base Surface	TOPO 122004
Comparison Surface	SBASE_BERM
Cut volume (unadjusted)	49,302.87 Cu. Yd.
Fill volume (unadjusted)	2,505,287.16 Cu. Yd.
Net volume (unadjusted)	2,455,984.29 Cu. Yd.<Fill>





PHASE II APPLICATION
CAMP HOPE RUN LANDFILL
BOGGS TOWNSHIP, CLEARFIELD COUNTY, PENNSYLVANIA

FORM 14
EXHIBIT 14-2.1
Greymont Lime Analysis

REVISED MARCH 2019

GRAYMONT

HIGH CALCIUM *BAGHOUSE LIME*

Graymont (PA) Inc. BAGHOUSE LIME is an industrial co-product used for various neutralization and reclamation applications.

Technical Data

TYPICAL ANALYSIS

GRAYMONT (PA), INC.

965 E. College Ave.
Pleasant Gap, PA 16823
Tel.' (814) 355-4761
Fax: {814) 359·2175

		(% by weight, dry)
Calcium Oxide	(CaO)	57.8 %
Magnesium Oxide	(MgO)	0.66
Silica	(Si02)	4.02
Iron Oxide	(Fe203)	0.85
Aluminum Oxide	(Al203)	1.47
Sulfur	(S)	0.87
Available Cao		19.1
Loss-On-Ignition	(LOI)	34.73
Moisture (as rc'd)		20.9

Appearance: Off-white to dark gray powder with some consolidated clusters up to one-foot diameter.

Calcium Carbonate Equivalent (CCE) – Calculated 103.5

10/10/16