April 22, 2022

Mr. Chris Sklaney 3SD21
Remedial Project Manager
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Subject: Submittal of Final Phase 2 Landfill Cover Repair Work Plan (WP)
Keystone Sanitation Landfill, Union Township, Adams County, Pennsylvania

Dear Mr. Sklaney:

HydroGeoLogic, Inc. (HGL) is pleased to submit the Phase 2 Landfill Cover Repair WP on behalf of Waste Management Disposal Services of Pennsylvania, Inc. (WMDSPI) for your review. This WP details the second phase of a two-phase approach to address the issue related to areas of ponding and subsidence. The issue was identified in the Fifth Five-Year Review (FYR) Report for the Keystone Sanitation Landfill Superfund Site (Site), signed on September 14, 2020. This document includes the technical approach, overall objectives, and scope of work for the performance of all associated earthwork activities required to fill depressions caused by subsidence and restore positive drainage on the south face of the landfill.

Should you have any questions or comments, please contact me via email at dsutton@hgl.com or via phone at (732) 233-1161.

Sincerely,

Douglas J. Sutton,
Principal Engineer

Enc.
cc: Glen Schultz, WMDSPI
Larry Smith, PADEP

PHASE II LANDFILL COVER REPAIR WORK PLAN
KEYSTONE SANITATION LANDFILL SUPERFUND SITE
UNION TOWNSHIP, ADAMS COUNTY, PENNSYLVANIA

Prepared for:

Waste Management Disposal Services of Pennsylvania, Inc.
100 Brandywine Blvd, Suite 300
Newtown, Pennsylvania 18940-4000

Prepared by:

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April 2022

HGL
HydroGeoLogic, Inc

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LIST OF ACRONYMS AND ABBREVIATIONS

EPA	U.S. Environmental Protection Agency
FYR	Five-Year Review
HAZWOPER	Hazardous Waste Operations and Emergency Response
HASP	Health and Safety Plan
HGL	HydroGeoLogic, Inc
WMDSPI	Waste Management Disposal Services of Pennsylvania, Inc
WP	work plan

1.0 INTRODUCTION

1.1 PURPOSE AND OBJECTIVES

This Work Plan (WP) details the overall objectives and associated methods, activities, and requirements for Phase II of the landfill cover repair at the Keystone Sanitation Landfill Superfund Site (Site) in Union Township, Adams County, Pennsylvania, including filling depressions caused by subsidence along the southern face of the landfill cover, restoring positive drainage in the depression areas, and reestablishing the vegetative cover. The work is being conducted after these issues were identified in the Fifth Five-Year Review (FYR) Report for the Keystone Sanitation Landfill Superfund Site (Site) (U.S. Environmental Protection Agency (EPA), 2020).

In accordance with Section VIII, Paragraph 75 of the Owner/Operator Consent Decree, on February 24, 2021, EPA requested Waste Management Disposal Services of Pennsylvania, Inc. (WMDSPI) to provide a WP outline to address these issues for review and approval. HydroGeoLogic, Inc. (HGL) submitted on behalf of WMDSPI a WP outline with accompanying schedule on April 14, 2021, and EPA approved the submittal on May 12, 2021. The WP outline included two phases to address the issues related with the landfill cover:

- Phase I: Tree removal and topographic survey.
- Phase II: Complete cover repairs based on the results from the topographic survey.

Phase I activities involved a topographical surface and a site inspection to identify areas of ponding. Based on a phone discussion with Chris Sklaney of EPA Region 3 on September 30, 2021, Phase I did not involve tree removal as originally planned due to the benefits afforded by the established stands of trees, including erosion control of the landfill cover and enhanced evapotranspiration during the growing season. Rather, EPA, WMDSPI, and EPA will arrange a time for a site visit to observe the trees identified in the Five-Year Review to confirm tree removal is not required.

The activities covered by this Phase II WP are as follows:

- Preparing the site for landfill cover repair work, including removing any ponded water and installation of erosion and sediment control measures.
- Importing, depositing, and grading clean fill to restore positive drainage in the water ponding and depressions areas on the landfill cover.
- Restoring landfill cover vegetation through seeding.
- Documenting the work conducted in a technical memorandum.
- Assess subsidence and assure minimal disruption to existing cap in the future by documenting any areas with depressions within landfill.

Background information on the Site, including regulatory status, previous investigations, physical setting, geology, hydrogeology, and contaminant distribution is provided in the Fifth FYR (EPA, 2020). The repairs will be conducted within the fenced area of the Site and over the engineered landfill cover.

1.2 WORK PLAN ORGANIZATION

This WP is organized as follows:

- Field Activities (Section 2): Provides a description of the cover repair work to be conducted
- Project Management and Contingency Plan (Section 3): This section describes the currently understood uncertainties and how these uncertainties will be addressed.
- Schedule (Section 4): This section provides the major steps in the timeline to complete the field activities.
- References (Section 5): Lists the documents referenced in this WP.

2.0 FIELD ACTIVITIES

2.1 SITE PREPARATION

Several depression areas have developed on the southern face of the landfill cover where leachate monitoring occurs as indicated in Figure 1. This portion of the southern face of the landfill is referred to as the "Repair Area" on Figure 1. The depression areas result in ponding, decreasing drainage of stormwater off from the landfill cover, and increasing the potential for infiltration. These areas within the Repair Area will be addressed as described in Section 2.2.

Prior to initiate any repair activities, water in ponded areas will be removed to a maximum depth of 2 inches. Drained water will be conveyed to one of two downchutes identified on Figure 2. The remaining water will be absorbed by the clean fill that is placed in the depression. The estimated areas of disturbance involve less than 1 acre of vegetated ground surface, therefore an erosion and sediment control plan or a National Pollutant Discharge Elimination System stormwater construction permit equivalency are not required. However, erosion and sediment measures will be installed around the water ponding or depression areas. Additional site preparation activities will include advanced notification of the property owner, mowing of the entire landfill cover, and approval of the source of clean fill to be used to address the Repair Area.

2.2 FILL IMPORTATION, PLACEMENT, AND GRADING

Work conducted to fill the depressions and restore positive drainage in these areas will not involve removal of existing soil cover or clay, and landfill waste will not be disturbed. Fill will only be added as required. As a result, the integrity of the landfill cover with respect to the 2000 Record of Decision (ROD) performance standards and the landfill gas extraction system will not be compromised. In addition, because no intrusive activities will be conducted that would encounter waste, site workers will not require HAZWOPER training.

Clean fill will be obtained from an approved source and will be deposited and graded as necessary within the water ponding and depression areas shown on Figure 2. The rest of the Repair Area has a positive drainage towards the south side or is flat near the top of the Repair Area, as shown from the topographical survey on Figures 1 and 2. The clean fill shall be capable of sustaining a vegetative cover (pH greater than 6.0 and minimum organic content of 2 percent by weight). The fill shall also be free of refuse, debris, rocks, and other deleterious material.

To fill the depressions and meet the specifications in Table 2.1, work will be completed in order from Zone 1 through Zone 4 to avoid equipment traffic disturbing areas that have already been repaired. Routes for equipment and other project traffic will be established to minimize disturbance of areas within the Repair Area that do not require soil addition and grading. Particular care will be taken around landfill gas extraction wells, gas monitoring points, and leachate monitoring points to avoid damage to these existing structures. The berms and associated drainage swales at the southern boundary of the landfill will also be inspected and rehabilitated as necessary to provide positive drainage to one of two downchutes.

Table 2.1: Repair Zone Plan

Repair Zone	Estimated volume of imported fill (cubic yards)	Planned Activities
Zone 1	129.95	• Remove ponded water from ponded areas identified on Figure 2 to a maximum depth of 2 inches. • Fill depressions with clean fill, placing fill in lifts. • Final longitudinal and lateral grades shall be uniform with existing grades surrounding the depression. • Rehabilitate berms to the south side of Repair Area to provide positive drainage.
Zone 2	501.16	
Zone 3	399.38	
Zone 4	255.55	

2.3 RESTORATION OF LANDFILL COVER

Upon completion of all fill placement and grading, the disturbed areas will be seeded and covered in straw mulch accordance with the following specifications, which are consistent with the seeding and mulching requirements of the original OU-1 Remedial Design and Extension Circular 391 for Turfgrass Seed and Seed Mixtures from PennState College of Agricultural Sciences. Seeding will occur between August 15th and September 30th unless approved otherwise by WMDSPI's representative. The straw mulch must be free of weeds and coarse matter.

The Repair Area will be inspected biweekly for three months following the initial seeding to document vegetation growth and identify areas that need to be reseeded or mulched. Seed and mulch will be reapplied during the inspection as needed. WMDSPI will visually inspect the landfill cover area conditions during routine maintenance visits to access if additional repairs, backfilling, or reseeding is needed.

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3.0 PROJECT MANAGEMENT AND CONTINGENCY PLAN

3.1 PROJECT MANAGEMENT PLAN

All field activities will be conducted within the fenced area of the landfill and no access agreements are needed to complete the field activities. Table B-1 of the Sampling and Analyses Plan/Quality Assurance Project Plan submitted with the 2019 Annual Performance Monitoring Report for Enhanced Landfill Gas Extraction System (HGL, 2020) provides the points of contact and contact information for the organizations involved in the work.

A daily report will log the field activities conducted at the Site and pertinent information, including but not necessarily limited to the spatial location on a map, thickness of added cover, delivery of off-Site materials, and volume of stored materials. Field photographs will be included.

Appendix A includes activity hazard analyses for the key work items associated with the project.

3.2 CONTINGENCY PLAN

There are several current uncertainties related to the planned field activities, ranging from critical to trivial. A list of the uncertainties identified during the development of this WP and the method for addressing these uncertainties is provided below, in descending order of importance:

1. Magnitude and extent of ponded water
   - Weather is the key uncertainty for the work. Although precipitation can help identify ponded areas that need to be addressed by the work, substantial precipitation and ponding will increase the amount of water that needs to be removed from ponded areas prior to fill placement. Additionally, a wet soil surface will increase the damage caused by the heavy equipment traversing areas that otherwise need little repair. To address this uncertainty, the work will be planned for the end of summer when less precipitation and more evapotranspiration is expected. Additionally, routes for heavy equipment will be established to minimize surface damage to areas that do not need to be repaired.

2. Precipitation after repairs
   - Weather poses another uncertainty after the work has been completed. Drought conditions could make it difficult to establish vegetation. Similarly, extensive rainfall in seeded and mulched areas could result in runoff, removing soil, seed, and mulch from certain areas. To address this uncertainty, the Repair Area will be inspected bimonthly for three months following the initial seeding to document ponding and vegetation growth and to reapply seed and mulch as appropriate. Seed and mulch will be reapplied as necessary during the inspection. Ponded areas will be documented and addressed within two weeks of the inspection.

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4.0 SCHEDULE

The proposed schedule for the work is provided below.

Activity	**Time Frame**
EPA Review	30 days after submittal
Submittal of Final Work Plan	15 days after receipt of comments
EPA Approval of Final Work Plan	30 days after submittal of final work plan
Procurement of Contractor	Within 60 days of EPA approval
Start of Repair Work	Within 30 days of Procurement
Completion of Repair Work and Start of Three-Month Monitoring Period	Approximately 60 days after start of repair work (target completion by end of September 2022)

5.0 REFERENCES

2019 Annual Performance Monitoring Report for Enhanced Landfill Gas Extraction System, Operable Unit (OU-1), Alternate Source Control Remedy, Keystone Sanitation Landfill, Union Township, Adams County, Pennsylvania, HydroGeoLogic Inc. February 2020

Fifth Five-Year Review Report for the Keystone Sanitation Landfill Superfund Site, Union Twp., Adams Co., PA. U.S. EPA, Region 3, September 2020

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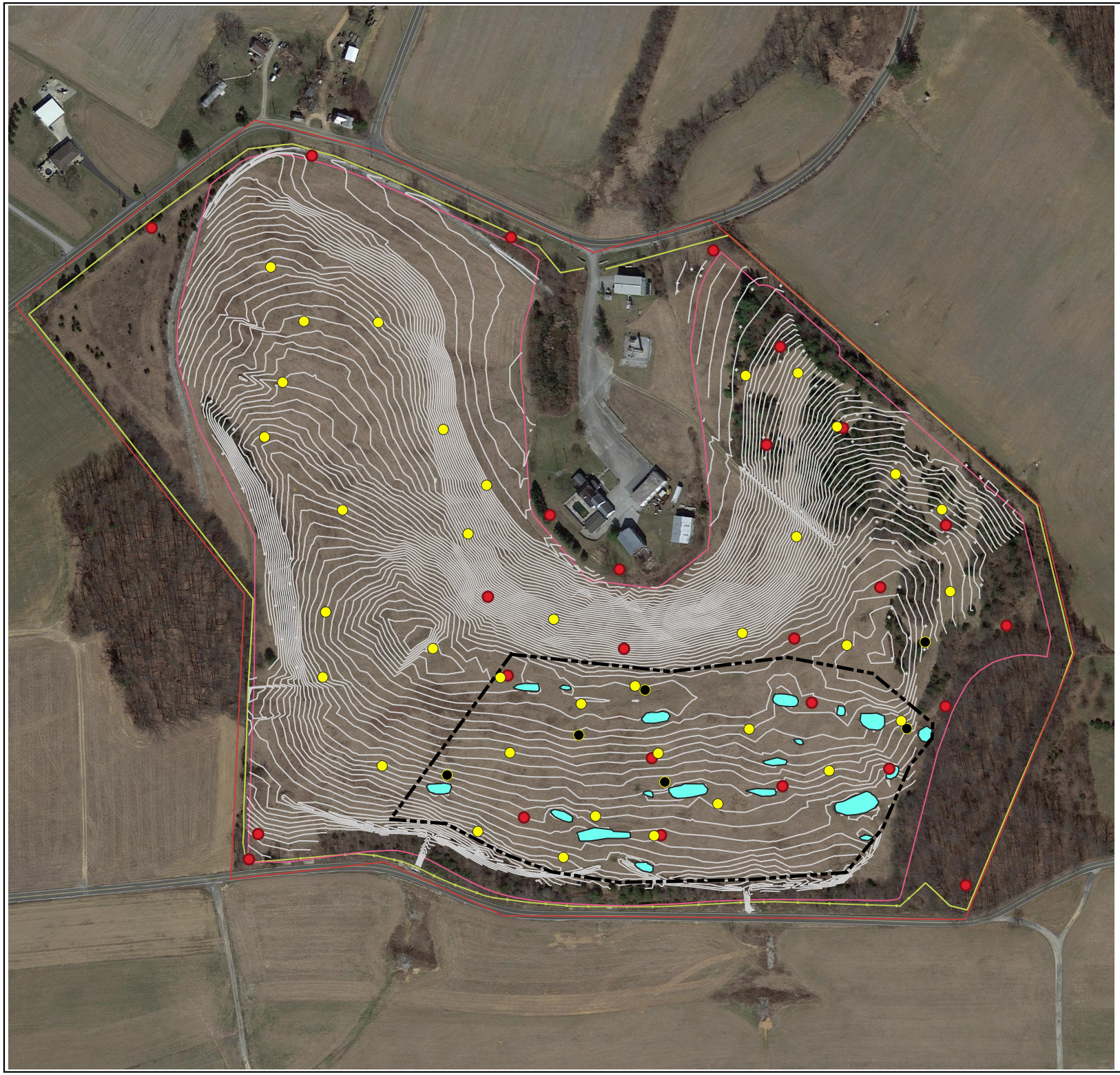
FIGURES



HGL - Phase II Landfill Cover Repair Work Plan
Keystone Sanitation Landfill, Union Township,
Adams County, Pennsylvania

Figure 1
Existing Conditions

Legend

- LFG wells
- LMP wells
- GMP wells
- Repair area
- Observed water ponding areas
- Topographic contour (1 ft)
- Keystone property
- Estimated limit of waste
- Fenceline

Notes:
ft = foot
LFG = landfill gas
LMP = leachate monitoring points
GMP = gas monitoring points

1. Water ponding areas were geolocated after a site visit conducted on September 24, 2021 after a rain event.

2. The 1-ft contour topographical survey was conducted the week of December 14, 2021.

N

0 100 200 ft

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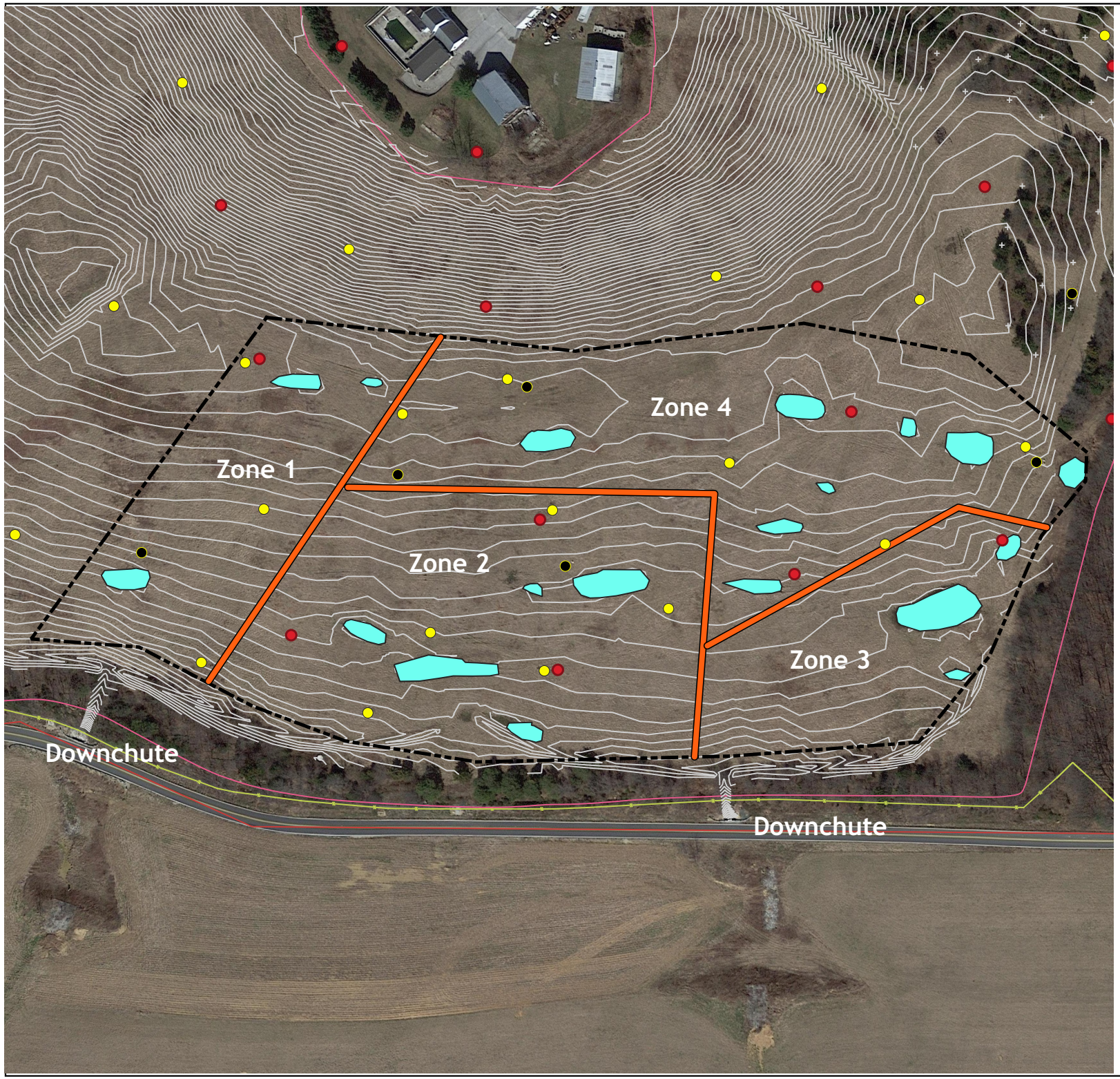

HGL - Phase II Landfill Cover Repair Work Plan
Keystone Sanitation Landfill, Union Township,
Adams County, Pennsylvania

Figure 2
Landfill Cover Repair Plan

Legend

- LFG wells
- LMP wells
- GMP wells
- Repair area
- Observed water ponding areas
- Topographic contour (1 ft)
- Keystone property
- Estimated limit of waste
- Fenceline
- Repair Zones

Notes:
ft = foot
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1. Water ponding areas were geolocated after a site visit conducted on September 24, 2021 after a rain event.

2. The 1-ft contour topographical survey was conducted the week of December 14, 2021.

N

0 50 100 ft

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APPENDIX A

Site-specific Activity Hazard Analysis

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ACTIVITY HAZARD ANALYSIS (AHA)

Activity/Work Task: Backfilling and Site Restoration

Project Name/Location:

Contract number:

Date Prepared:

Prepared by:

Corporate Health and Safety reviewer:

Notes: (Field Notes, review comments, etc.)

Overall Risk Assessment Code (RAC) (Use highest code) L

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
Use of earth moving equipment. Compact fill material. Test Compaction. Perform subsidence testing (rebar test). Establish access/egress for truck loads.	Unsafe mechanical equipment and operation	Ensure only qualified and authorized personnel are permitted to operate equipment. Inspect equipment daily. Deficiencies in equipment must be noted on the inspection form. Equipment found to be unsafe must be taken out of service. Do not allow trucks to raise beds on uneven surfaces or in soft areas where the tires will sink. Operate equipment at safe speeds Prohibit ground personnel near trucks when beds are raised. Stay away from pinch hazards. Lower dump beds before moving trucks.	L
	Dust	Control dust by applying water. Stay out of dust and work from upwind when possible. Perform dust monitoring, if necessary, to verify that dust control is effective.	

Job Steps	Hazards	Controls	RAC
	Crushing injuries	Wear safety belts when operating equipment. Instruct ground personnel to stay out of the swing radius of operating equipment. Do not assume equipment and vehicle operators have seen you unless operator has made eye contact with you and has signaled to you.	
	Overhead utilities	Complete a Site Layout Plan prior to mobilizing the equipment and identify overhead and underground hazards. Assume overhead power lines are energized unless verified to be de-energized and visibly grounded. Keep conductive equipment at least 20 feet from uninsulated overhead lines unless the voltage is known, and alternative distances have been calculated.	
Vehicle operation. Backing. Spotting trucks.	Stuck by/Crushing injuries Vehicle accidents	Ensure trucks and heavy equipment have functional backup alarms. Obey traffic control signage and flag persons. Do not position yourself between pieces of heavy equipment or between equipment and stationary objects. Wear high visibility vests. Approach equipment only after a signal from the operator is received. Wear safety restraints when vehicles are in motion. Do not use cell phones or other distracting devices when operating a vehicle.	**L**
Dumping materials from trucks. Spreading out common / structural fill (heavy equipment).	Dust inhalation Struck by injuries	Control dust by applying water. Stay out of dust and work from upwind when possible. See struck-by hazard controls, immediately above. Prohibit ground personnel near trucks when beds are raised. Stay away from pinch hazards. Lower dump beds before moving trucks.	**L**

Job Steps	Hazards	Controls	RAC
Excavating: Provide sloping, benching,or shoring. Perform direct loadout of excavated materials. Perform site restoration.	Excavation cave-in hazards	Use an excavation competent person to inspect and monitor all excavations (daily and more frequently if conditions change). Issue an excavation permit when personnel will be entering the excavation. Provide all protective systems as required by HGL H&S Procedure No. 21, “Excavation and Trenching,” and USACE EM-385-1-1, Section 25. All protective systems (sloping, benching, shoring, sheet piling, trench boxes, etc.) must be in place as necessary for safe personnel entry and work. Keep soils, equipment, and materials at least 2 feet from the edge of excavations. Perform air monitoring if there is a potential for hazardous atmospheres, prior to and during personnel entry, as deemed necessary by the SSHO. Provide stairs, ladders, or ramps every 25 feet when workers must enter excavations over 4 feet deep. Slope, bench, or shore excavations over 5 feet deep, if worker entry is required. Provide at least two means of exit for personnel working in excavations and trenches.	**L**
General Site Work (refer to General Site Work AHA)	General site hazards: Insect bites and stings. Contact dermatitis from poisonous and irritating plants (poison ivy, poison oak, and poison sumac). Vehicle traffic Severe weather Heat stress Cold stress Noise. Lifting Slips, trips, falls UV hazards, etc.	See General Site Work AHA	**L**

Job Steps	Hazards	Controls	RAC
Add Steps, Hazards, and Actions to Eliminate or Minimize Hazards based on conditions encountered in the field.			

Equipment	Training	Inspection
<u>Personal Protective Equipment</u>: Level D: Hard hat Safety Glasses Safety-Toed Boots Work Gloves Class 2 high visibility vests Hearing protection, as necessary Modified Level D: Refer to SSHP. <u>Other Equipment</u>: Fire Extinguishers Emergency eyewash bottles First Aid Kit Drinking water Water truck Dump trucks Excavator or front-end loader Smart phone apps for weather, heat, noise Insect repellant with DEET (Deep Woods Off™ or equivalent) Repel Permanone™	Competent Person (CP) / Qualified Person (QP): Excavation Competent Person_____ CP/SSHO _____ Alternate CP/SSHO _____ QP/First Aid and CPR _____ QP/First Aid and CPR _____ Training Requirements (as determined by the SSHO): Site safety orientation Emergency procedures Hazard communication Applicable AHAs Excavation competent person Spotter operations Qualified equipment operators Lifting/back safety Fire extinguisher use Biological hazard identification and control Tornado shelter location Lightning safety procedures	Daily site safety inspection (SSHO) _____ Daily excavation inspection Check Known Allergies Questionnaire, training, and medical certifications against personnel roster Mechanized equipment (U.S. Army Corps of Engineers form prior to use) Mechanized equipment (daily) Housekeeping (daily) Fire extinguisher (weekly) Vehicle inspection daily Equipment and tools inspection before use Survey areas for poisonous plants, insects, and animals Check body for ticks Verify tornado shelter is available

HGL HydroGeoLogic, Inc

ACTIVITY HAZARD ANALYSIS

Activity/Work Task: Clearing and Grubbing with Power Equipment

Project Location:

Contract number:

Date Prepared:

Prepared By:

Corporate Health and Safety Reviewer:

Notes: (Field Notes, Review Comments, etc.)

Overall Risk Assessment Code (RAC) (Use highest code)	**L**

Risk Assessment Code (RAC) Matrix

Severity	**Probability**				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	**E**	**E**	**H**	**H**	**M**
Critical	**E**	**H**	**H**	**M**	**L**
Marginal	**H**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom, or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	Hazards	Controls	RAC
Discuss the task, hazards, and hazard controls with HGL staff and subcontractors	No hazards directly related to this step. This step is intended to provide task-specific training.	Conduct this discussion in a safe area away from traffic or other hazards. Remind HGL personnel and subcontractors that they are to comply with this AHA and that it can be changed if needed. Subcontractors must also have their own safety programs and procedures specific to their tasks and equipment and are responsible to ensure the safety of their personnel.	**L**
Site access control	Unauthorized entry	Establish site access control prior to on-site operations using barricades, signs or other methods to prevent unauthorized access during tasks that could cause exposure to safety and health hazards.	**L**
	Explosion/fire	Require attendance of all HGL subcontractors at the site-specific hazards and health and safety training. Have a fire extinguisher readily available. Turn off all motorized equipment during fueling. Bond and ground components during fueling.	

Job Steps	Hazards	Controls	RAC
Inspection of work area before clearing	Traffic-Struck by hazards	Note all moving equipment in work areas. Wear Hi visibility vest. Make eye contact with equipment operators to confirm they see you. Use a spotter when visibility is poor (backing).	L
	Slip, trip and fall hazards - Walking over soft ground, uneven terrain	Determine best access route before transporting equipment or walking to avoid tripping hazards. Wear slip resistant footwear with ankle support. Look for rocks, brush, animal burrows and other hazards. Choose firm ground for walking, if possible.	
	Cuts, lacerations, flying debris from brush/vegetation (eye hazards)	Wear thick clothing fabrics and PPE such as leather gloves when there is a potential for cuts and lacerations. Wear safety glasses if there is a potential for dust and flying debris. Ensure eye wash bottle is available. Maintain adequate First Aid supplies.	
	Remote location	Institute buddy system. Establish a system of regular contact for lone workers.	
	General work hazards: Insect bites and stings. Contact dermatitis from poisonous and irritating plants (poison ivy, poison oak, and poison sumac). Vehicle traffic Severe weather Heat stress Cold stress Lifting Slips, trips, falls UV hazards, etc.	See General Work Hazards AHA actions.	
Vegetation removal. Brush cutting and clearing with hand tools	Cuts, slips.	Inspect all tools daily, prior to use. Defective tools must be tagged and removed from service immediately. Wear safety glasses, heavy duty work gloves, hard hat and safety toed boots. Wear abrasion resistant clothing (thick fabrics). Maintain 25-foot separation between personnel using machetes, sling blades, and similar tools. Attach tools to workers with lanyards if possible	L

Job Steps	Hazards	Controls	RAC
Vegetation Removal. Use of power equipment	Flying debris, dust, dirt, rocks, abrasions	Safety glasses, heavy duty work gloves, Stay clear of line of fire.	L
	Noise-hearing loss, fire, moving parts, struck-by	Wear hearing protection when noise levels are above 85 dBA (when you cannot be heard speaking in a normal voice at arm's length). Inspect and clean (as necessary) engine compartment regularly to prevent accumulation of flammable debris. Stage fire extinguisher on equipment. Turn engine off during fueling. Keep hands and feet away from rotating power-driven parts. Turn engine off for servicing. Wear high visibility vest. Stand clear of operating equipment. Operators must be authorized in writing.	

Job Steps	Hazards	Controls	RAC
Chain saw use	Cuts, noise, flying debris	Follow the procedures and safety precautions specified by the manufacturer to ensure safe operation of all hand and power tools. Inspect saw before use. Keep the chain clean, sharp, and properly lubricated. Require Chainsaw operators wear a specially designed helmet system (consisting of head, face, and hearing protection). Use heavy duty gloves and chaps at all times when using chainsaws. Secure loose fitting clothing. Do not use saws in which any safety feature is not functioning. Do not operate chainsaws above shoulder height. Do not overreach with chainsaw. Do not refuel a hot saw. Do not cut with the tip (nose) of the bar. Ensure that all chainsaws are equipped with automatic chain brake and other anti- kickback devices. Require chainsaw operators to hold the saw with both hands during cutting operations. Frequently check and adjust tension on chain (with engine off). Use only new chains or professionally sharpened chains. Do not use saws with dull cutters. Adjust the idle speed to prevent the chain from moving when the engine is idling. Keep bar groove clean. Use wedges to prevent binding of the chain. Let saw come to a complete stop before reaching for the chain or bar. Turn off the saw or activate the chain brake when carrying the saw. Carry the saw so the bar is pointing behind you. Keep the cutting area clear of co-workers and spectators.	**L**

Job Steps	Hazards	Controls	RAC
Using wood chipper or mulcher	Struck by injuries Hearing loss: Noise Cuts, scrapes Amputations caused by being caught in machine and contact with rotating high-speed blades.	Follow the procedures and safety precautions specified by the manufacturer to ensure safe operation of all hand and power tools. Inspect mechanical equipment before use. Wear hearing protection Never leave chippers or mulchers unattended while running. Never work alone. Review: • The machine's safety features and emergency stop controls, • Safety decals and their meanings, • Locations and purpose of machine guards, • Required PPE (safety glasses, HH, tight fitting clothing and gloves, safety toed shoes, hearing protection), and • The work area around the chipper to keep it free of hazards. Inspect materials to be chipped before they are feed into the chipper. Items to be chipped should be free of stones metal or hard objects. These objects can easily cause a machine jam or be discharged from the machine at a high rate of speed causing injury. Reduce sizes of wood to be chipped. Excessive size of wood and other material feed into the chipper/mulcher increases the risk of injury. Keep your hands and feet away from the wood chipper's/mulcher's feed chute area. Push materials into the wood chipper/mulcher's feed by using a long limb or long piece of wood to help keep hands at a safe distance. Clean excess debris from the area around the wood chipper regularly to prevent accidental falls near the machine. Make sure the knives have come to a complete stop before you open the hood.	**L**

Job Steps	Hazards	Controls	RAC
Add Steps, Hazards, and Actions to Eliminate or Minimize Hazards based on conditions encountered in the field.			

Equipment	Training	Inspection
PPE: Hard Hat Safety Glasses with side shields Safety-Toed Boots Work Gloves Class 2 high visibility vests Hearing protection, as necessary Face-shield, chaps, heavy duty gloves for chain saw use Other Equipment: Hand tools Fire Extinguishers First Aid Kit Drinking water Weather radio or Smart phone apps for temperature and noise measurement Insect repellant with DEET (Deep Woods Off™ or equivalent) Repel Permanone™	40-hr. HAZWOPER 8-hr. HAZWOPER refresher Supervisor course for SSHO OSHA 30 hour for SSHO Initial Site Safety /Task Hazard Training QP/First Aid and CPR QP/First Aid and CPR Training Requirements (as determined by the SSHO): Site safety orientation Emergency procedures Hazard communication Hearing conservation Qualified equipment operators Lifting/back safety Fire extinguisher use Biological hazard identification and control Tornado shelter location Lightning safety procedures Heat stress prevention and heat stroke treatment Cold stress prevention	Daily inspection of hand tools and power tools. Survey areas for poisonous plants, insects, and animals (each work area) Check body for ticks (each evening during tick season) Identify closest usable tornado shelter that is available (each work area)

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