

**SIXTH FIVE-YEAR REVIEW REPORT FOR
STRASBURG LANDFILL SUPERFUND SITE
CHESTER COUNTY, PENNSYLVANIA**



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Prepared by

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LIST OF ABBREVIATIONS AND ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIC	Community Involvement Coordinator
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DCA	Dichloroethane
DCE	Dichloroethene
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FYR	Five-Year Review
HI	Hazard Index
IC	Institutional Control
ICIAP	Institutional Control Implementation and Assessment Plan
J	Estimated Concentration
J+	Estimated and Biased High
MCL	Maximum Contaminant Level
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
NCP	National Contingency Plan
ND	Not Detected
NPL	National Priorities List
NS	No Standard
O&M	Operation and Maintenance
OU	Operable Unit
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Resources
PAH	Polycyclic Aromatic Hydrocarbon
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SDWA	Safe Drinking Water Act
SMCL	Secondary Maximum Contaminant Level
TCE	Trichloroethylene
THM	Trihalomethane
UAO	Unilateral Administrative Order
UU/UE	Unlimited Use and Unrestricted Exposure
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR Reports such as this one. In addition, FYR Reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the sixth FYR for the Strasburg Landfill Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of four operable units (OUs); this FYR addresses all four OUs. OU1 addresses the leachate releases into surface water and groundwater near the landfill and provided for point-of-use carbon treatment for contaminated residential wells. OU2 addresses Site access and security. OU3 addresses the need for a multi-layer cap over the landfill portion of the Site, a landfill subsurface leachate collection system, and a leachate treatment building. OU4 addressed groundwater contamination.

EPA remedial project manager (RPM) David Greaves led the FYR. Participants included EPA community involvement coordinator (CIC) Lavar Thomas, and Joshua Crooks from the Southeast Regional Office of the Pennsylvania Department of the Environment (PADEP). The review began on 4/10/2019. Appendix A provides additional resources. Appendix B provides a chronology of events for the Site.

Site Background

The Strasburg Landfill Superfund Site (the Site) includes a 24-acre inactive unlined landfill located on two parcels totaling approximately 209 acres of undeveloped land south and slightly east of Strasburg Road in Newlin Township, Chester County, Pennsylvania. In addition to the 209 acres, the Site also includes an access road on a 14.5-acre parcel that provides access from Strasburg Road to the Site (Appendix E, Figure 1). The access road is located in Newlin and West Bradford Townships.

Land use in the area is primarily suburban residential, with some residual agricultural areas. There are more than 300 single family residences within a one-mile radius of the Site. The drinking water to these residences is primarily supplied from groundwater. Most of the homes are served by private wells.

The Site began to accept municipal and industrial waste in 1978. The landfill operators were cited by the Pennsylvania Department of Environmental Resources (PADER, which later became PADEP) for numerous operational violations, and the landfill was closed in 1984. During its period of operation, the landfill accepted approximately three million cubic yards of waste. Following closure, the landfill began discharging leachate into the surrounding area, including the Briar Run Stream.

Initial sampling on and around the landfill that was conducted by PADEP and EPA in September of 1983 showed elevated levels of vinyl chloride and trichloroethylene both in leachate seeps emanating from the landfill, and in-home wells adjacent to the Site. Subsequent inspections and sampling showed that the existing landfill cap had failed in numerous locations and that contaminants were flowing both into the nearby surface water streams and into the groundwater.

PADEP required the landfill operators to collect the leachate and transport it offsite for treatment at a nearby municipal sewage treatment plant. The leachate was collected until July 1989 when the landfill operators gave notice that they would no longer operate the leachate collection system. PADEP operated the system on an interim basis until EPA took over operations of the temporary leachate collection system in September 1989. The Site was listed on the National Priorities List (NPL) on March 31, 1989.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Strasburg Landfill		
EPA ID: PAD000441337		
Region: 3	State: Pennsylvania	City/County: Newlin & West Bradford Townships / Chester County
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	Has the Site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: David Greaves		
Author affiliation: EPA Region 3		
Review period: 4/10/2019 – 4/27/2020		
Date of site inspection: 11/15/2019		
Type of review: Statutory		
Review number: 6		
Triggering action date: 4/27/2015		
Due date (five years after triggering action date): 4/27/2020		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The RI for the Site was performed by Ecology and Environment, Inc. (E&E) for EPA beginning in March 1989 to assess the nature and extent of contamination and document the potential for contaminant migration from the Site. Contaminants of concern (COCs) at the Site included volatile and base-neutral organics and selected inorganics. Volatile organic compounds (VOCs) were detected in ambient air, soil gas, soil, groundwater, surface water, sediment, and seep areas. The distribution of base-neutral and inorganic contamination was limited primarily to the sediment and water in the seep areas and in the sediment pond. The observed contaminant distribution reflects

the differing mobilities of the different compounds, with the widest distribution observed in the most mobile class of compounds, VOCs. Tetrachloroethene (PCE), vinyl chloride (VC), and 1,2-dichloroethene (1,2-DCE) were the most widespread contaminants identified at this Site.

Response Actions

The remedial action objectives of the Site remedy, as described in the Site decision documents, are to minimize migration of contaminants to ground and surface waters and to prevent direct contact with, or ingestion of, contaminants.

EPA divided the cleanup of the Site into four OUs. EPA issued a series of decision documents for the OUs which selected remedies necessary to protect human health and the environment from contaminants at the Site. The first record of decision (ROD) for OU1, dated June 29, 1989, addressed leachate releases into surface water and groundwater near the landfill. The selected remedy was to collect leachate and treat and dispose it offsite, as well as provide point-of-use carbon treatment for contaminated residential wells.

However, the potentially responsible parties (PRPs) ceased performing work at the Site in July of 1989. Because the PRPs ceased offsite disposal of collected leachate, the selected remedy outlined in the June 1989 ROD was no longer considered adequate. The first explanation of significant differences (ESD) was issued on January 3, 1990 to change the method of leachate treatment to onsite treatment via air-stripping and discharge to Briar Run.

The second ROD for OU2, dated June 28, 1991, addressed Site access and security and selected a security fence around the entire perimeter of the landfill.

The ROD for OU3, dated March 31, 1992, selected a multi-layer cap to address the existing landfill (the multiplayer cap was constructed and completed during the timeframe of August 1996 – September of 1999)

On September 27, 1999 EPA issued a “No Further Action” ROD for groundwater associated with the Site (OU4). This decision was based on groundwater data which demonstrated that Site-related contaminants were not migrating offsite from under the landfill cap.

A second ESD, dated September 4, 2012, required institutional controls (ICs) be implemented to achieve the following objectives:

- Prohibit activities on the Site within or near the existing security fencing that would in any manner disturb or interfere with remedial systems, including the landfill cap, gas vents, monitoring wells, leachate collection and conveyance system, and security measures that prevent access to the landfill. Such prohibited activities include, but are not limited to, digging in the landfill cap or tampering with the hardware associated with the gas vents, monitoring wells, leachate collection and conveyance systems, or the security fencing.
- Prohibit any use of landfill leachate unless approved by the EPA in consultation with PADEP to avoid exposure to contaminants in the leachate via ingestion, vapor inhalation or dermal contact.
- Prohibit installation of groundwater wells on the Site within the existing security fencing without notice and approval of the EPA in consultation with PADEP to avoid exposure to contaminants in groundwater via ingestion, inhalation, or dermal contact.
- Prohibit the installation and pumping of new groundwater wells within one-quarter of a mile of the identified plume¹ of the Site which may influence the Site hydrology without notice and approval of EPA in consultation with PADEP to avoid the migration of contaminants from under the cap and exposure to contaminants in groundwater via ingestion, inhalation, or dermal contact.

¹ All COCs are currently below maximum contaminant levels (MCLs) or are no longer detected. Therefore, there is no longer an “identified plume” at the Site.

Status of Implementation

In March of 1990 a limited leachate collection system for the eastern side of the landfill was completed.

In 1989, EPA installed whole-house carbon filtration systems in two private residences downgradient of the Site. EPA monitored and maintained the systems until PADEP took over responsibility for Operation and Maintenance (O&M) for the remedy in 2001. No Site-related contaminants have been detected at levels exceeding MCLs in any wells prior to treatment since 1995. PADEP maintained the carbon units and monitored groundwater from the residential wells pre-filter and post-filter until 2010 when maintenance and monitoring of the residential systems was discontinued based on the many years of sampling results not exceeding MCLs. No COCs have exceeded MCLs in monitoring wells since 1999 (as noted in the 9/27/1999 ROD) and no groundwater plume is currently present at the site.

EPA installed a security fence with warning signs around the entire perimeter of the landfill from October through December 1992.

EPA constructed a multi-layer cap over the landfill portion of the Site, a landfill subsurface leachate collection system, and a leachate treatment building, from August 1996 through September 1999. The landfill was re-graded creating fewer steep slopes, which conformed to the current landfill grading practices. All of the weeds, brush, and small trees, which had grown up on the landfill, were removed and an impermeable liner was placed over the landfill area. Approximately 600,00 cubic yards of earthen material was placed over the landfill as part of this reconstruction.

The leachate treatment system actively treated all leachate from the landfill until 2010. Because of significantly decreased flow and the low concentrations of contaminants present in the leachate, alternative treatment methodologies were evaluated for implementation at the Site. Following a successful pilot test in 2009-2010, an onsite constructed wetland now serves as a passive treatment system for leachate. The leachate, after being distributed via underground level spreaders in the up-gradient portions of the constructed wetland, eventually discharges to Briar Run. A gas flare system which collected and safely burned gases developed in the landfill operated starting in 1999. However, due to a decrease in the volume of gas generated by the landfill, operation of the flare became difficult over time. PADEP requested and EPA evaluated a change to passive gas venting for the Site. This request was approved by EPA in April 2016. The passive gas venting system was installed by PADEP in April 2016. Landfill gases were monitored quarterly for the first year after installation to confirm the newly installed system was operating effectively.

A Final Closeout Report (FCOR) was issued by EPA on March 18, 2019 demonstrating that construction of the Selected Remedy at the Site has been completed in accordance with the Site decision documents. All remedial action objectives, performance standards, and cleanup goals established in the decision documents have been achieved and the Selected Remedy is protective of human health and the environment. No further response actions, other than O&M, monitoring, and FYRs are necessary to protect human health and the environment.

A Notice of Intent to Delete (NOID) for the Site was published in the Federal Register for public comment on July 3, 2019. One written comment was received during the public comment period. However, the comment was not considered adverse to deletion, and a response to the comment was included in a Responsiveness Summary that is available to the public in the Site Repository. A Notice of Deletion was published in the Federal Register on September 5, 2019, finalizing the deletion of the Site from the NPL.

Institutional Control (IC) Review

IC Summary Table

Table 1: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Soil	Yes	Yes	Prohibit activity on the Property that could disturb or interfere with the selected remedial systems	Environmental Covenant (EC) recorded with the Chester County Recorder of Deeds on December 27, 2013
Leachate	Yes	Yes	<ul style="list-style-type: none">• Prohibit activity on the Property that could disturb or interfere with the selected remedial systems• Prohibit contact, handling, or use of landfill leachate without prior written approval	EC recorded with the Chester County Recorder of Deeds on December 27, 2013
Groundwater	Yes	Yes	<ul style="list-style-type: none">• Prohibit installation of groundwater wells on the property within the existing fencing without prior written approval• Prohibit installation and pumping of new groundwater wells on the Property within one-quarter mile of the identified plume² without prior written approval	EC recorded with the Chester County Recorder of Deeds on December 27, 2013 and Chester County Health Department (CCHD) regulations

The parcels subject to the EC are shown on Figure 1, and the extent of the well permit restriction area is shown on a map in Appendix E.

² All COCs are currently below MCLs or are no longer detected. Therefore, there is no longer an “identified plume” at the Site.

In addition, the Natural Lands Trust, Inc. (NLT), a non-profit conservancy, accepted a conservation easement from the property owner for portions of the property to permanently protect natural features of the property including deciduous woodlands, steep slopes, a cold-water stream and breeding bird habit, etc. in October 2014.

Systems Operations/Operation and Maintenance (O&M)

In accordance with the Superfund State Contract (SSC) and the updated Site Operation, Maintenance, and Sampling Plan (O&M Plan 2016), PADEP has been responsible for O&M of the remedy components at the Site since September 2011. As mentioned earlier in this document, the mechanical leachate treatment system has been deactivated and the onsite constructed wetland now serves as a passive treatment system for removal of the low concentrations of contaminants from the leachate.

The leachate, after being distributed via underground level spreaders in the up-gradient portions of the constructed wetland, eventually discharges to Briar Run. The National Pollution Discharged Elimination System (NPDES) equivalent discharge criteria were modified by PADEP's water program on August 2, 2013 for leachate discharge to Briar Run through passive wetlands treatment system modifications. All NPDES equivalent discharge criteria have been attained since 2013 and no problems or issues have been identified with the passive treatment system to date. The majority of the contaminants listed on the NPDES permit are monitor/report and not include any numerical limits.

In the fall of 2016, DEP's contractor performed a video inspection of the leachate conveyance line as part of the routine O&M tasks. Groundwater monitoring as a component of O&M will continue to be performed by PADEP no later than the fourth year of every FYR cycle. The landfill cap is routinely mowed and maintained by the property owner. The landfill vegetative cover has maintained its integrity, with no major erosion issues.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the previous FYR as well as the recommendations from the previous FYR and the status of those recommendations.

Table 3: Protectiveness Determinations/Statements from the 2015 FYR

OU #	Protectiveness Determination	Protectiveness Statement
Sitewide	Protective	The remedies have been implemented at this Site are protective of human health and the environment. Institutional controls were identified and selected in the September 4, 2012 ESD for the Site and are being implemented through an Environmental Covenant recorded December 27, 2013, and additionally, through Chester County Health Department regulations relating to well installation. These ICs will be used to prevent exposure to waste and contaminated groundwater and to preserve the integrity of the components of the remedies (cap, fence, leachate collection and treatment system, etc.). The Site operation and maintenance and sampling plans should be updated to reflect changes in site operations, maintenance and sampling that are not consistent with Site conditions.

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
	O&M Plan and sampling Plan outdated.	Update the O&M Plan and Sampling Plan to reflect current Site conditions.	Completed	Updated O&M and Sampling Plan submitted to EPA and approved.	10/5/2016

On April 26, 2017, members of EPA’s Biological Technical Assistance Group (BTAG) along with the Site RPM and CIC visited the Site for the purpose of assessing the suitability of the wetland habitat below the treatment facility for Bog Turtles. The survey was necessitated by the discovery of presence of Bog Turtles upstream in the watershed as well as a recommendation from the 2015 FYR. The findings of the survey indicated that suitable habitat for Bog Turtles was not present on or adjacent to the Site.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

A public notice was made available by a newspaper posting in the Daily Local News on December 18, 2019 (Appendix D). It stated that the FYR was underway and invited the public to submit any comments to EPA. The results of the review and the report will be made available at the Site’s information repository, Kennett Library 216 East State Street, Kennett Square, PA. 19348

During the FYR process, the Newlin and West Bradford Township offices were contacted in order to determine if any complaints or concerns were expressed by residents living near the landfill. Newlin Township responded to EPA’s request for information on possible complaints or concerns about the Site on February 19, 2020. The Township expressed that their overall impression of the Site’s management as positive and feel well informed about the status of the Site.

Data Review

In a letter dated December 12, 2013, PADEP requested that EPA consider removing groundwater monitoring from PADEP’s O&M obligations at the Site. EPA evaluated the request as a part of the 2015 FYR and determined that the frequency of sampling could be reduced from the biannual sampling requirement of the O&M sampling schedule (of that time) to a frequency of one sampling event per FYR cycle, to occur no later than the fourth year of the FYR cycle. Groundwater monitoring will continue to be performed by PADEP once every FYR cycle.

The most recent sampling events occurred on November 25, 2019 as a part of the 2020 FYR. Onsite and perimeter wells were sampled at this time. The 1999 OU4 ROD selected No Action for groundwater; therefore, no groundwater cleanup levels exist for the Site. However, for the purposes of evaluating the groundwater monitoring results, detected contaminant concentrations were compared to MCLs for contaminants with MCLs or to PADEP Land Recycling Program (Act 2) State-Wide Health Standard (SHS) Medium Specific Concentrations (MSCs) for a residential, used aquifer for contaminants without MCLs. Table 4 compares the maximum detected concentrations from this sampling event with the MCLs or MSCs.

As part of this sampling event, EPA sampled for 1,4-dioxane. Although 1,4-dioxane was detected at a concentration exceeding EPA's tap water Regional (RSL) (0.46 ug/L) in one monitoring well (MP-1) at a concentration of 13.2 ug/L, the Site toxicologist determined that that concentration is still within EPA's acceptable risk range. EPA will conduct 1,4-dioxane sampling during PADEP's sampling to support the next FYR.

In reviewing all the historic data, including this most recent sampling event, it was determined there were no exceedances of the MCLs or MSCs. This remains consistent with EPA's No Action determination for groundwater in the 1999 ROD and supports the determination that the other remedial actions are operating as intended.

Table 4: Maximum Detected Concentrations in Landfill Monitoring Wells, 2019

COC	MCL	Risk Based Standard*	Regional Screening Level (tapwater)	MSC	Maximum Detected Concentration 2019	Maximum Detected Concentration
			VOCs (µg/L)			
Acetone	-			33000	185	MP-1
Benzene**	5	1.2		-	-	Not Detected
2-Butanone	-			4000	74.1	MP-1
Carbon Disulfide	-			1500	15.5	MP-1
Chloroform**		5.7				
Chlorobenzene**	100	-		-	1.3B	MP-7-1
Chloroethane	-			250	-	Not Detected
1,1-Dichloroethane**	-	0.38		31	1.4	MP-1
1,2-Dichloroethane**	5	-		-	-	Not Detected
Cis-1,2-Dichloroethene**	70	-		-	-	Not Detected
1,2-Dichloropropane**	-	0.51				
1,1,2,2-tetrachloroethane**	-	0.18				
1,1,1-trichloroethane**	200					
Trichloroethene**	5	3.2				
1,4-Dioxane			0.46		13.2	MP-1
Ethylbenzene	700			-	-	Not Detected
2-Hexanone				63	-	Not Detected
Styrene	100			-	-	Not Detected
Toluene	1000			-	7	MP-1
Vinyl Chloride**	2	0.015		-	-	Not Detected
Xylene	10000			-	-	Not Detected
Notes: *- Site specific risk based goal from 1989 ROD **- 1989 ROD Drinking Water, Standards & Criteria Residential Wells ug/L – microgram per liter J- Indicates an estimated value, reported between Reported Limit (RL) and Minimum Detected Limit (MDL)		Notes: Wells at this site are constructed as multi-port wells and some monitored zones were observed to be dry during sampling events. Results are reported for zones where sufficient water was present to collect a sample.				

<p>B- This flag is used when the analyte is found in the associated blank as well as the sample. -All results reported in ug/L</p>	<p>Map in Appendix F details the monitoring well network at the Site</p>	
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Site Inspection

The site inspection took place on November 25, 2019. Participants include David Greaves from EPA, Joshua Crooks from PADEP, and Wayne Harris from PADEP. The purpose of the inspection was to assess the protectiveness of the remedy. Inspection checklist and photos are in Appendices E and F, respectively.

During the site visit, participants observed the wetland and the landfill cap. Some of the fencing around the cap had some plant overgrowth on it as well as a portion of the fence had a fallen tree on it blocking part of the access road. The part not accessible due to the fallen tree was inspected on foot.

Vegetation on the cap and around the groundwater treatment system building was overgrown. This was noted by the Site RPM and the PADEP project manager. PADEP's project manager contacted the Site owner the day following the inspection in order to address the lack of mowing, other vegetative maintenance, as well as to address the fallen tree. PADEP returned to the Site in February 2020 and in early March 2020 and these issues had not yet been addressed. PADEP has contacted the landowner again in late March of 2020 requesting that these issues be addressed as soon as possible, and that notification be sent to PADEP when the work is completed.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Yes, the assessment of this FYR found that the remedies were constructed in accordance with the decision documents and are functioning as designed. The threats have been addressed and the remedies are protective. Monitoring of the groundwater indicates that the concentration of contaminants of concern in all monitoring wells remains below MCLs and PADEP MSCs. The constructed remedies are functioning as intended. There are no current exposure pathways and contamination emanating from the Site has been eliminated. The Site was deleted from the NPL on September 5, 2019.

The remedial objectives for the Site, to minimize migration of contaminants to ground and surface waters and to prevent direct contact with, or ingestion of contaminants, have been achieved by the implementation of the landfill cap, leachate collection and treatment system, the landfill gas collection and flare system, and the landfill fencing and warning signs. Long-term protection has been ensured by the implementation of ICs for the Site. The ICs for the landfill property have been implemented through an Environmental Covenant recorded with the Chester County Recorder of Deeds on December 27, 2013, The ICs concerning installation of new groundwater wells beyond the landfill property are being implemented through Chester County Health Department regulations relating to installation of wells in the county.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Changes in Standards and TBCs

Have standards identified in the ROD been revised, and does this call into question the protectiveness of the remedy? Do newly promulgated standards call into question the protectiveness of the remedy? Have TBCs used in selecting cleanup levels at the site changed, and could this affect the protectiveness of the remedy?

No changes in standards or items to be considered (TBCs) that adversely affect the protectiveness of the remedy were identified during this FYR.

Changes in Exposure Pathways

Has land use or expected land use on or near the site changed?

No.

Have human health or ecological routes of exposure or receptors been newly identified or changed in a way that could affect the protectiveness of the remedy? Are there newly identified contaminants or contaminant sources? Are there unanticipated toxic byproducts of the remedy not previously addressed by the decision documents? Have physical site conditions or the understanding of these conditions changed in a way that could affect the protectiveness of the remedy?

No new routes of human exposure or receptors have been identified. There is no indication that physical Site conditions (such as hydrologic or hydrogeologic conditions) have changed in a way that could affect the protectiveness of the remedy.

A new road is proposed to run through the Site and an adjacent property to replace a portion of Laurel Road which was damaged by flash flooding on the West Branch of the Brandywine Creek. The proposed public road will connect Laurel Road to Strasburg Road.

Also, in conjunction with this proposed road through the Site, a common driveway or driveways will be proposed to connect existing houses and an existing lot to the proposed road.

The detailed design work and the required approvals for the proposed public road and associated driveways, through the Site and adjacent Michael Rosen Property will tentatively be completed in 2020 and construction will occur in 2021. A draft plan of the new road can be found in the Appendix E.

Expected Progress towards Meeting RAOs

Is the remedy progressing as expected?

The remedy has achieved the RAO's established to address waste, soil, sediment, groundwater and surface water through installation of the cap, leachate and gas collection systems, and implementation of the land use restrictions. The Site was deleted from the NPL on September 5, 2019.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light regarding the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
<i>OU1, OU2, OU3, OU4</i>

OTHER FINDINGS

Strasburg Landfill Road Construction - EPA will continue to work with the property owner to ensure that any future land use changes are compatible with the remedy and the ICs.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU1	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The OU1 remedy is protective of human health and the environment because the on-site wetland to treat landfill leachate is functioning and in good condition. Institutional controls are in place and effectively prevent disturbance of the remedy and groundwater use on site.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU2	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The OU2 remedy is protective of human health and the environment because the landfill portion of the Site is enclosed by a security fence and warning signs to prevent trespassing at the Site and any related exposure to site contamination.	

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU3	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The OU3 remedy is protective of human health and the environment because the landfill cap prevents direct contact with the site contamination and prevents migration of contaminants to groundwater.	

Sitewide Protectiveness Statement
<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The remedies have been implemented at this Site and are protective of human health and the environment. The landfill cap and fencing prevent direct contact with the site contamination, and the landfill cap and leachate collection and treatment system prevent migration of contaminants to groundwater. Institutional controls have been implemented through an Environmental Covenant recorded December 27, 2013, and additionally, through Chester County Health Department regulations. These ICs will be used to prevent exposure to waste and contaminated groundwater and to preserve the integrity of the components of the remedies (cap, fence, leachate collection and treatment system, etc.). The Site operation and maintenance and sampling plans have been updated to reflect changes in site operations, maintenance and sampling is consistent with current Site conditions.

VIII. NEXT REVIEW

The next FYR Report for the Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

First Five-Year Review Report for Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania. EPA Region 3, September 30, 1994

Second Five-Year Review Report for Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania. EPA Region 3, November 30, 1999

Third Five-Year Review Report for Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania. EPA Region 3, February 2, 2005

Fourth Five-Year Review Report for Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania. EPA Region 3, April 28, 2010

Explanation of Significant Differences, Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Pennsylvania. EPA Region 3, September 4, 2012

Record of Decision, Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania, EPA Region 3, June 29, 1989

Record of Decision, Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania, EPA Region 3, June 28, 1991

Record of Decision, Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania, EPA Region 3, March 31, 1992

Record of Decision, Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania, EPA Region 3, September 27, 1999

Final Closeout Report, Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania, EPA Region 3, March 18, 2019

Notice of Intent to Delete, Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania, EPA Region 3, June 24, 2019

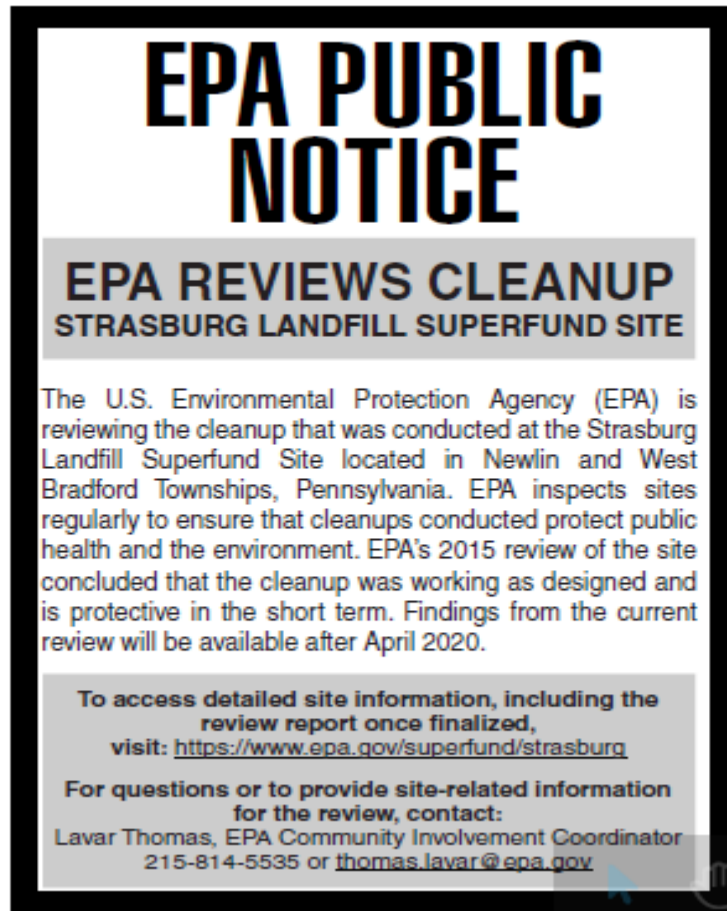
Notice of Deletion, Strasburg Landfill Superfund Site, Newlin and West Bradford Townships, Chester County, Pennsylvania, EPA Region 3, August 15, 2019

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
Strasburg Landfill Associates forms to operate landfill on former farm field.	1978
Landfill closed by State due to numerous operational problems	1984
Strasburg Landfill added to the National Priorities List (NPL)	March 1989
Record of Decision (ROD) issued selecting collection and treatment of landfill leachate.	June 29, 1989
PRPS begin operating limited (eastern slope only) leachate collection and treatment system.	June 30, 1990
First Explanation of Significant Differences (ESD) issued to change method of leachate treatment system.	January 3, 1990
ROD issued selecting access security to landfill portion of property	June 28, 1991
ROD signed calling for Landfill cap, active gas and leachate collection and treatment systems.	March 31, 1992
1 st Five-Year Review recommends completion of remediation and continued monitoring.	September 30, 1994
ROD issued selecting no further action relating to groundwater.	September 27, 1999
Preliminary Close Out Report issued by EPA.	September 27, 1999
2 ND Five-Year recommends continued monitoring	November 30, 1999
In accordance with State Superfund Contract (SSC), PADEP assumes O&M responsibilities for the Site.	September 30, 2001
EPA/PADEP joint Site Inspections.	May 16, 2003 and November 8, 2004
3 rd Five-Year Review recommends thorough review of Institutional Controls (ICs).	February 2, 2005
Parcels, including Strasburg Landfill and some adjacent parcels, transferred to new owners through Sheriff sale.	August 22, 2007
EPA, PADEP, Weston meet on Site to scope pilot of leachate treatment and discharge changes. Pilot initiated in Summer 2009.	April 30, 2009
4 th Five-Year recommends modify decision documents to provide for ICs and to implement the ICs.	April 28, 2010
Second ESD for ICs signed.	September 4, 2012
Following successful pilot study, Passive Leachate Treatment System adopted.	September 12, 2012
PADEP request to discontinue monitoring well sampling at the Site. Request evaluated by EPA as part of Five-Year Review	December 12, 2013
Uniform Environmental Covenant Act (UECA) agreement signed implementing ICs on parcels associated with the landfill portion of the Site.	December 27, 2013
PADEP requests to convert from active gas venting to passive gas venting. Request is currently being evaluated by EPA.	September 27, 2000
Natural Land Trust, Inc. accepts conservation easement from property owner.	October 2014
5 TH Five-Year Review issued	April 27, 2015
5 TH Five-Year recommended that the O&M and Sampling Plan be updated.	April 27, 2015
O&M and Sampling Plan submitted to EPA and approved	October 2016
Final Closeout Out Report (FCOR) signed by EPA Regional Administrator	March 18, 2019
State Concurrence letter for Site deletion signed by PADEP	April 18, 2019
NOID published in the Federal Register	July 3, 2019
NOD published in the Federal Register	September 5, 2019

APPENDIX C – PRESS NOTICE



EPA PUBLIC NOTICE

**EPA REVIEWS CLEANUP
STRASBURG LANDFILL SUPERFUND SITE**

The U.S. Environmental Protection Agency (EPA) is reviewing the cleanup that was conducted at the Strasburg Landfill Superfund Site located in Newlin and West Bradford Townships, Pennsylvania. EPA inspects sites regularly to ensure that cleanups conducted protect public health and the environment. EPA's 2015 review of the site concluded that the cleanup was working as designed and is protective in the short term. Findings from the current review will be available after April 2020.

To access detailed site information, including the review report once finalized, visit: <https://www.epa.gov/superfund/strasburg>

For questions or to provide site-related information for the review, contact:
Lavar Thomas, EPA Community Involvement Coordinator
215-814-5535 or thomas.lavar@epa.gov

APPENDIX D – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST					
I. SITE INFORMATION					
Site Name: Strasburg Landfill			Date of Inspection: 11-25-2019		
Location and Region: Newlin & West Bradford Townships, Pennsylvania 3			EPA ID: PAD000441337		
Agency, Office or Company Leading the Five-Year Review: EPA			Weather/Temperature: Sunny, 54 Degrees		
Remedy Includes: (Check all that apply) <div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other: _____ </div> <div> <input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls </div> </div>					
Attachments: <input type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached					
II. INTERVIEWS (check all that apply)					
1. O&M Site Manager <div style="display: flex; justify-content: space-between;"> Name _____ Title _____ Date _____ </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone: _____ Problems, suggestions <input type="checkbox"/> Report attached: _____					
2. O&M Staff <div style="display: flex; justify-content: space-between;"> Name _____ Title _____ Date _____ </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone: _____ Problems/suggestions <input type="checkbox"/> Report attached: _____					
3. Local Regulatory Authorities and Response Agencies (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply. <div style="margin-bottom: 20px;"> Agency PADEP Contact Joshua Crooks Environmental Protection Specialist 11-25-2019 484-250-5784 Name Title Date Phone No. Problems/suggestions <input type="checkbox"/> Report attached: _____ </div> <div style="margin-bottom: 20px;"> Agency _____ Contact _____ Name Title Date Phone No. Problems/suggestions <input type="checkbox"/> Report attached: _____ </div> <div style="margin-bottom: 20px;"> Agency _____ Contact _____ Name Title Date Phone No. Problems/suggestions <input type="checkbox"/> Report attached: _____ </div> <div> Agency _____ Contact _____ Name Title Date Phone No. Problems/suggestions <input type="checkbox"/> Report attached: _____ </div>					

Agency _____ Contact _____ <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Name _____ Title _____ Date _____ Phone No. _____ </div> Problems/suggestions <input type="checkbox"/> Report attached: _____			
4. Other Interviews (optional) <input type="checkbox"/> Report attached: _____			
III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)			
1. O&M Documents <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> O&M manual </div> <div style="width: 50%;"> <input type="checkbox"/> Readily available </div> <div style="width: 50%;"> <input type="checkbox"/> Up to date </div> <div style="width: 50%;"> <input checked="" type="checkbox"/> N/A </div> <div style="width: 50%;"> <input type="checkbox"/> As-built drawings </div> <div style="width: 50%;"> <input type="checkbox"/> Readily available </div> <div style="width: 50%;"> <input type="checkbox"/> Up to date </div> <div style="width: 50%;"> <input checked="" type="checkbox"/> N/A </div> <div style="width: 50%;"> <input type="checkbox"/> Maintenance logs </div> <div style="width: 50%;"> <input type="checkbox"/> Readily available </div> <div style="width: 50%;"> <input type="checkbox"/> Up to date </div> <div style="width: 50%;"> <input checked="" type="checkbox"/> N/A </div> </div> Remarks: <u>There are no documents on site.</u>			
2. Site-Specific Health and Safety Plan <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <input type="checkbox"/> Contingency plan/emergency response plan <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A </div> Remarks: _____			
3. O&M and OSHA Training Records <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A </div> Remarks: _____			
4. Permits and Service Agreements <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Air discharge permit </div> <div style="width: 50%;"> <input type="checkbox"/> Readily available </div> <div style="width: 50%;"> <input type="checkbox"/> Up to date </div> <div style="width: 50%;"> <input checked="" type="checkbox"/> N/A </div> <div style="width: 50%;"> <input type="checkbox"/> Effluent discharge </div> <div style="width: 50%;"> <input type="checkbox"/> Readily available </div> <div style="width: 50%;"> <input type="checkbox"/> Up to date </div> <div style="width: 50%;"> <input checked="" type="checkbox"/> N/A </div> <div style="width: 50%;"> <input type="checkbox"/> Waste disposal, POTW </div> <div style="width: 50%;"> <input type="checkbox"/> Readily available </div> <div style="width: 50%;"> <input type="checkbox"/> Up to date </div> <div style="width: 50%;"> <input checked="" type="checkbox"/> N/A </div> <div style="width: 50%;"> <input type="checkbox"/> Other permits: _____ </div> <div style="width: 50%;"> <input type="checkbox"/> Readily available </div> <div style="width: 50%;"> <input type="checkbox"/> Up to date </div> <div style="width: 50%;"> <input checked="" type="checkbox"/> N/A </div> </div> Remarks: _____			
5. Gas Generation Records <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A </div> Remarks: <u>Not onsite. Will be at Weston or PADEP</u>			
6. Settlement Monument Records <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A </div> Remarks: _____			
7. Groundwater Monitoring Records <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A </div> Remarks: <u>There are no documents on site.</u>			
8. Leachate Extraction Records <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A </div> Remarks: _____			
9. Discharge Compliance Records <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Air </div> <div style="width: 50%;"> <input type="checkbox"/> Readily available </div> <div style="width: 50%;"> <input type="checkbox"/> Up to date </div> <div style="width: 50%;"> <input checked="" type="checkbox"/> N/A </div> <div style="width: 50%;"> <input type="checkbox"/> Water (effluent) </div> <div style="width: 50%;"> <input type="checkbox"/> Readily available </div> <div style="width: 50%;"> <input type="checkbox"/> Up to date </div> <div style="width: 50%;"> <input checked="" type="checkbox"/> N/A </div> </div> Remarks: _____			

10.	Daily Access/Security Logs	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A																				
Remarks: _____																								
IV. O&M COSTS																								
1.	O&M Organization <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <input checked="" type="checkbox"/> State in-house <input type="checkbox"/> PRP in-house <input type="checkbox"/> Federal facility in-house <input type="checkbox"/> </div> <div style="width: 48%;"> <input type="checkbox"/> Contractor for state <input type="checkbox"/> Contractor for PRP <input type="checkbox"/> Contractor for Federal facility </div> </div>																							
2.	O&M Cost Records <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <input type="checkbox"/> Readily available <input type="checkbox"/> Funding mechanism/agreement in place Original O&M cost estimate: _____ </div> <div style="width: 48%;"> <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Unavailable <input type="checkbox"/> Breakdown attached </div> </div> <div style="margin-top: 10px;"> <p style="text-align: center;">Total annual cost by year for review period if available</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">From: _____ Date</td> <td style="width: 25%;">To: _____ Date</td> <td style="width: 25%;">_____ Total cost</td> <td style="width: 25%;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td>From: _____ Date</td> <td>To: _____ Date</td> <td>_____ Total cost</td> <td><input type="checkbox"/> Breakdown attached</td> </tr> </table> </div>				From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached	From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached	From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached	From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached	From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached
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From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached																					
From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached																					
From: _____ Date	To: _____ Date	_____ Total cost	<input type="checkbox"/> Breakdown attached																					
3.	Unanticipated or Unusually High O&M Costs during Review Period Describe costs and reasons: _____																							
V. ACCESS AND INSTITUTIONAL CONTROLS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A																								
A. Fencing																								
1.	Fencing Damaged <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Gates secured <input type="checkbox"/> N/A Remark: Fencing around the perimeter had a fallen tree on it. The Site owner has been contacted by PADEP to address the fencing repairs and tree removal.																							
B. Other Access Restrictions																								
1.	Signs and Other Security Measures <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A Remarks: <u>Signs located along fence and one sign located at one site entrance identify the Site.</u>																							
C. Institutional Controls (ICs)																								

1.	Implementation and Enforcement Site conditions imply ICs not properly implemented Site conditions imply ICs not being fully enforced Type of monitoring (e.g., self-reporting, drive by): <u>Self-reporting</u> Frequency: <u>Quarterly</u> Responsible party/agency: PADEP Contact _____ <div style="display: flex; justify-content: space-between; margin-top: 10px;"> Name Title Date Phone no. </div> Reporting is up to date Reports are verified by the lead agency Specific requirements in deed or decision documents have been met Violations have been reported Other problems or suggestions: <input type="checkbox"/> Report attached	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
2.	Adequacy <input checked="" type="checkbox"/> ICs are adequate <input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A Remarks: _____	
D. General		
1.	Vandalism/Trespassing <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No vandalism evident Remarks: While conducting sampling for VOCs and 1,4-Dioxane there were some ATV tracks. However, these tracks did not occur on the Site or cap.	
2.	Land Use Changes On Site <input checked="" type="checkbox"/> N/A Remarks: _____	
3.	Land Use Changes Off Site <input checked="" type="checkbox"/> N/A Remarks: _____	
VI. GENERAL SITE CONDITIONS		
A. Roads <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	Roads Damaged <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Roads adequate <input type="checkbox"/> N/A Remarks: Roads around the landfill cap were overgrown with shrubbery and weeds. PADEP has contacted the Site owner to address the roads and mowing.	
B. Other Site Conditions		
Remarks: _____		
VII. LANDFILL COVERS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
A. Landfill Surface		
1.	Settlement (low spots) <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Settlement not evident Area extent: _____ Depth: _____ Remarks: _____	
2.	Cracks <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Cracking not evident Lengths: _____ Widths: _____ Depths: _____	

Remarks: _____			
3.	Erosion Area extent: _____ Remarks: _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident Depth: _____
4.	Holes Area extent: _____ Remarks: _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Holes not evident Depth: _____
5.	Vegetative Cover <input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established <input checked="" type="checkbox"/> No signs of stress <input type="checkbox"/> Trees/shrubs (indicate size and locations on a diagram) Remarks: Parts of the caps were mowed but other parts were not and were over grown. PADEP has contacted the Site owner to address.		
6.	Alternative Cover (e.g., armored rock, concrete)		<input checked="" type="checkbox"/> N/A
Remarks: _____			
7.	Bulges Area extent: _____ Remarks: _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Bulges not evident Height: _____
8.	Wet Areas/Water Damage <input checked="" type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Wet areas <input type="checkbox"/> Location shown on site map Area extent: _____ <input type="checkbox"/> Ponding <input type="checkbox"/> Location shown on site map Area extent: _____ <input type="checkbox"/> Seeps <input type="checkbox"/> Location shown on site map Area extent: _____ <input type="checkbox"/> Soft subgrade <input type="checkbox"/> Location shown on site map Area extent: _____ Remarks: _____		
9.	Slope Instability <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of slope instability Area extent: _____ Remarks: _____		
B. Benches <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	Flows Bypass Bench Remarks: _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
2.	Bench Breached Remarks: _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
3.	Bench Overtopped Remarks: _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
C. Letdown Channels <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			

(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	Settlement (Low spots)	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of settlement Depth: _____
	Area extent: _____		
	Remarks: _____		
2.	Material Degradation	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of degradation Area extent: _____
	Material type: _____		
	Remarks: _____		
3.	Erosion	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of erosion Depth: _____
	Area extent: _____		
	Remarks: _____		
4.	Undercutting	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting Depth: _____
	Area extent: _____		
	Remarks: _____		
5.	Obstructions	Type: _____	<input checked="" type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Area extent: _____	
	Size: _____		
	Remarks: _____		
6.	Excessive Vegetative Growth	Type: _____	
	<input checked="" type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Area extent: _____	
	Remarks: _____		
D. Cover Penetrations <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	Gas Vents	<input type="checkbox"/> Active	<input checked="" type="checkbox"/> Passive
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> N/A
	Remarks: _____		
2.	Gas Monitoring Probes	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input checked="" type="checkbox"/> N/A
	Remarks: _____		
3.	Monitoring Wells (within surface area of landfill)		
	<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> N/A
	Remarks: A few of the wells while being sampled were dry and did not produce any water. Other		

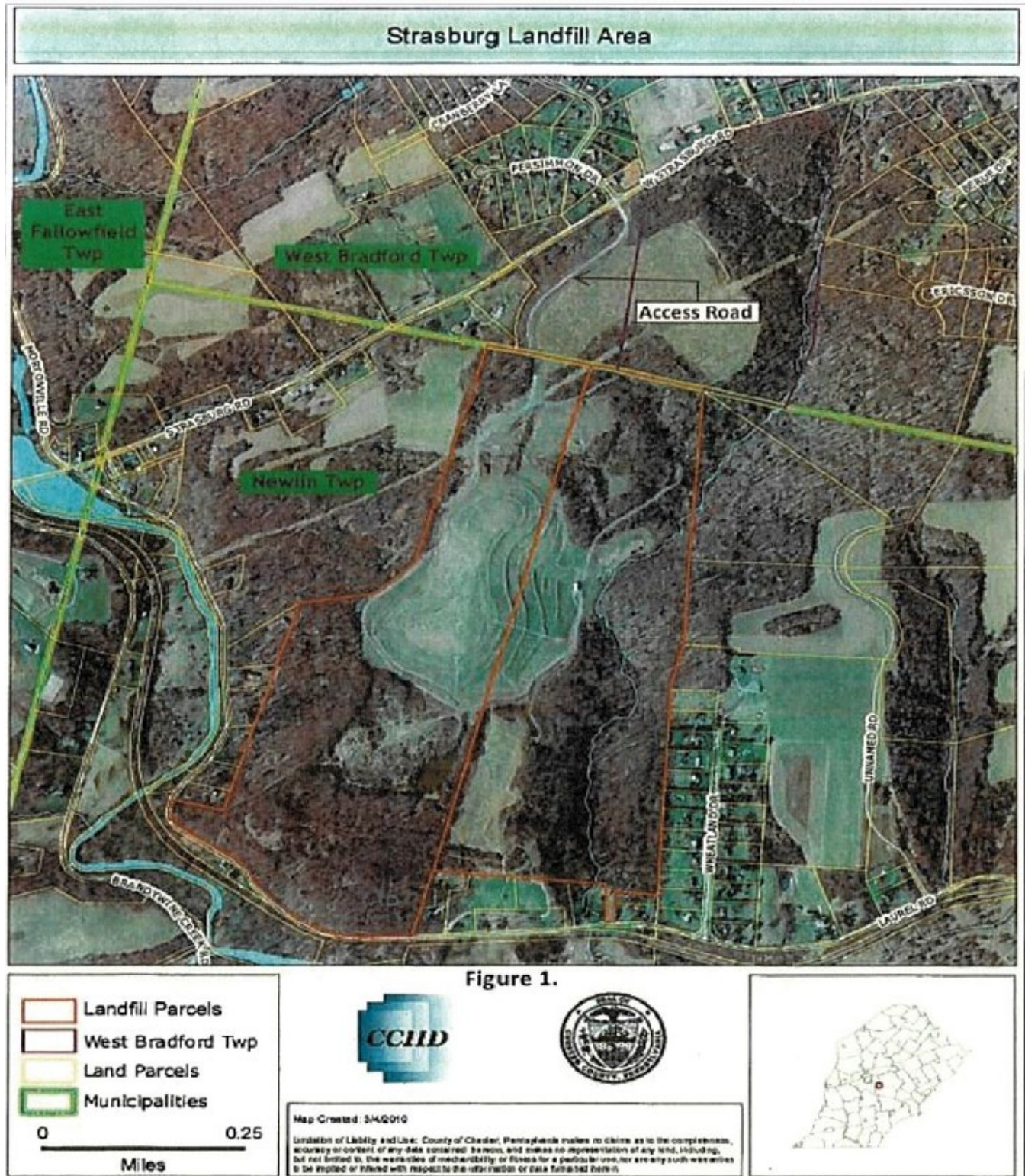
wells were able to be sampled with varying degrees of pumping rates.			
4.	Extraction Wells Leachate		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> Good condition
	Remarks: _____		
5.	Settlement Monuments		
	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed	<input checked="" type="checkbox"/> N/A
	Remarks: _____		
E. Gas Collection and Treatment			
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
1.	Gas Treatment Facilities		
	<input type="checkbox"/> Flaring	<input type="checkbox"/> Thermal destruction	<input type="checkbox"/> Collection for reuse
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs maintenance	
	Remarks: _____		
2.	Gas Collection Wells, Manifolds and Piping		
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs maintenance	
	Remarks: _____		
3.	Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)		
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> N/A
	Remarks: _____		
F. Cover Drainage Layer			
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
1.	Outlet Pipes Inspected		
	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
	Remarks: _____		
2.	Outlet Rock Inspected		
	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
	Remarks: _____		
G. Detention/Sedimentation Ponds			
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
1.	Siltation	Area extent: _____	Depth: _____
	<input type="checkbox"/> Siltation not evident	<input type="checkbox"/> N/A	
	Remarks: _____		
2.	Erosion	Area extent: _____	Depth: _____
	<input type="checkbox"/> Erosion not evident		
	Remarks: _____		
3.	Outlet Works		
	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
	Remarks: _____		
4.	Dam		
	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
	Remarks: _____		
H. Retaining Walls			
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
1.	Deformations		
	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident	

Horizontal displacement: _____ Vertical displacement: _____ Rotational displacement: _____ Remarks: _____	
2. Degradation Remarks: _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Degradation not evident
I. Perimeter Ditches/Off-Site Discharge <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1. Siltation Area extent: _____ Remarks: _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Siltation not evident Depth: _____
2. Vegetative Growth <input type="checkbox"/> Vegetation does not impede flow Area extent: _____ Remarks: _____	<input checked="" type="checkbox"/> N/A Type: _____
3. Erosion Area extent: _____ Remarks: _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Erosion not evident Depth: _____
4. Discharge Structure Remarks: _____	<input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A
VIII. VERTICAL BARRIER WALLS <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1. Settlement Area extent: _____ Remarks: _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident Depth: _____
2. Performance Monitoring Type of monitoring: _____ <input type="checkbox"/> Performance not monitored Frequency: _____ Head differential: _____ Remarks: _____	<input type="checkbox"/> Evidence of breaching
IX. GROUNDWATER/SURFACE WATER REMEDIES <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
A. Groundwater Extraction Wells, Pumps and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1. Pumps, Wellhead Plumbing and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A Remarks: <u>GWETS has been inoperable for many years. Passive leachate filtration via the wetland is the current remedy.</u>	
2. Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____	

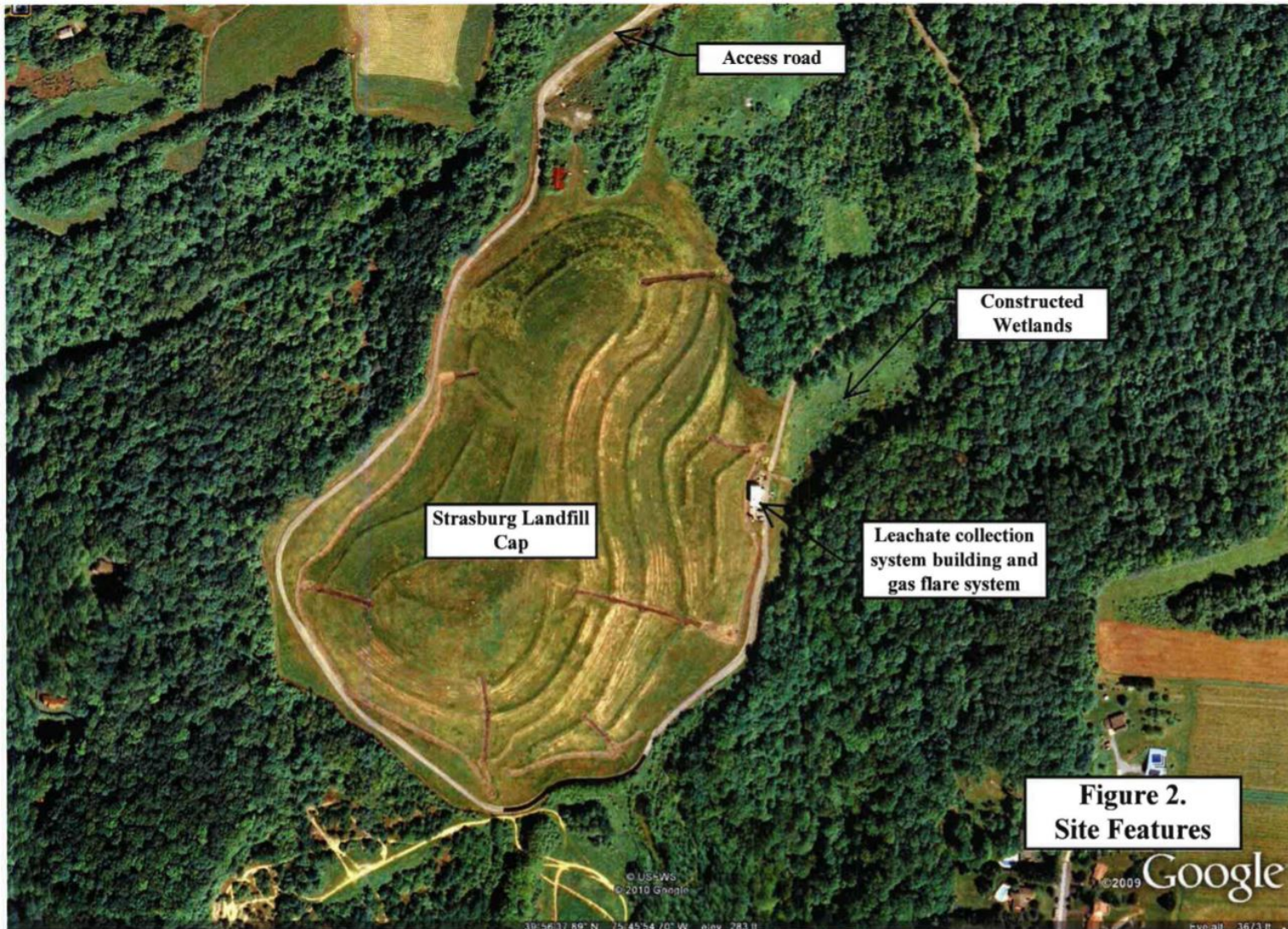
3. Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks: _____
B. Surface Water Collection Structures, Pumps and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A
1. Collection Structures, Pumps and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____
2. Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____
3. Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks: _____
C. Treatment System <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A
1. Treatment Train (check components that apply) <div style="display: flex; flex-wrap: wrap;"> <div style="width: 33%;"><input type="checkbox"/> Metals removal</div> <div style="width: 33%;"><input type="checkbox"/> Oil/water separation</div> <div style="width: 33%;"><input type="checkbox"/> Bioremediation</div> <div style="width: 33%;"><input type="checkbox"/> Air stripping</div> <div style="width: 33%;"><input type="checkbox"/> Carbon adsorbers</div> </div> <input type="checkbox"/> Filters: _____ <input type="checkbox"/> Additive (e.g., chelation agent, flocculent): _____ <input type="checkbox"/> Others: _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually: _____ <input type="checkbox"/> Quantity of surface water treated annually: _____ Remarks: _____
2. Electrical Enclosures and Panels (properly rated and functional) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____
3. Tanks, Vaults, Storage Vessels <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs maintenance Remarks: _____
4. Discharge Structure and Appurtenances <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: _____

5.	Treatment Building(s)	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks: Not
6.	Monitoring Wells (pump and treatment remedy)	<input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A Remarks: _____
D. Monitoring Data		
1.	Monitoring Data	<input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality
2.	Monitoring Data Suggests:	<input checked="" type="checkbox"/> Groundwater plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining
E. Monitored Natural Attenuation		
1.	Monitoring Wells (natural attenuation remedy)	<input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs maintenance <input checked="" type="checkbox"/> N/A Remarks: _____
X. OTHER REMEDIES		
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.		
XI. OVERALL OBSERVATIONS		
A. Implementation of the Remedy		
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). <u>The remedy includes a graded, capped landfill and passive leachate collection and treatment system. The landfill cover is well vegetated and however there needs to be more consistency with the mowing and ensuring that tree cover is removed around the fencing. The roads around the Site need to also be maintained on a more consistent basis and mowed. .</u>		
B. Adequacy of O&M		
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <u>O&M activities at the Site are adequate. No issues were noted.</u>		
C. Early Indicators of Potential Remedy Problems		
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. <u>There were no early indicators of potential remedy problems noted.</u>		
D. Opportunities for Optimization		
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>No optimization opportunities were noted.</u>		

APPENDIX E – Site Maps & New Road Figure



Site Features Map



New Proposed Road around Strasburg Landfill



APPENDIX F – Groundwater Monitoring Well Locations



[G:\pdr\Strasburg\pdr\strasburg.apr | layout 1 - sample for co ortho | g:\pdr\strasburg\pdr\strasburg_mon_well.apr | 2/28/96, 3:52:03]

