

**FIVE-YEAR REVIEW REPORT
UPPER DEERFIELD TOWNSHIP SANITARY LANDFILL
SUPERFUND SITE
CUMBERLAND COUNTY, NEW JERSEY**



Prepared by

**U.S. Environmental Protection Agency
Region 2
New York, New York**

September 2015

Approved by:

A handwritten signature in blue ink, which appears to read "Walter E. Mugdan", is written over a horizontal dashed line.

**Walter E. Mugdan, Director
Emergency and Remedial Response Division**

Date:

A handwritten date "Sept. 30, 2015" in blue ink is written over a horizontal dashed line.

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Table of Contents

Executive Summary	iii
Five-Year Review Summary Form	iv
Introduction	1
Site Chronology	1
Background	1
<i>Physical Characteristics</i>	<i>1</i>
<i>Land and Resource Use</i>	<i>1</i>
<i>Site Geology/Hydrogeology</i>	<i>1</i>
<i>History of Contamination</i>	<i>2</i>
<i>Initial Response</i>	<i>2</i>
<i>Basis for Taking Action</i>	<i>3</i>
Remedial Actions	3
<i>Remedy Selection</i>	<i>3</i>
Progress Since Last Five-Year Review	4
Five-Year Review Process	5
<i>Administrative Components</i>	<i>5</i>
<i>Community Involvement</i>	<i>5</i>
<i>Document Review</i>	<i>5</i>
<i>Data Review</i>	<i>6</i>
<i>Site Inspection</i>	<i>6</i>
<i>Interviews</i>	<i>6</i>
Technical Assessment	6
<i>Question A: Is the remedy functioning as intended by the decision documents?</i>	<i>6</i>
<i>Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?</i>	<i>6</i>
<i>Question C: Has any other information come to light that could call into question the protectiveness of the remedy?</i>	<i>7</i>
Issues, Recommendations and Follow-Up Actions	7
Protectiveness Statement	8
Next Review	8
Attachments	9
<i>Attachment 1: Figure</i>	<i>9</i>
<i>Attachment 2: Tables</i>	<i>9</i>

Executive Summary

This is the fourth five-year review for the Upper Deerfield Township Sanitary Landfill Superfund site (Site) located in Upper Deerfield Township, Cumberland County, New Jersey. The purpose of this five-year review is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this five-year review was the completion of the third five-year review in September 2009.

The remedy for the Site in Upper Deerfield Township, New Jersey called for no further remedial action with a monitoring program of the air and groundwater.

A protectiveness determination of the remedy at the Site cannot be made at this time until groundwater data is obtained. In order for groundwater data to be collected, the following actions must be taken: 1) identify all monitoring wells and piezometers on and off the landfill and mark each location with identification numbers; 2) perform testing of all monitoring wells and piezometers to determine if they are suitable for sampling and take water level measurements; 3) prepare figure(s) depicting the locations and well construction details of all usable and non-usable monitoring wells and piezometers; 4) identify monitoring wells and piezometers not being used for monitoring the Site groundwater so they can be considered for abandonment; 5) inspect, and replace if broken, locks on monitoring wells and piezometers designated for further use; 6) conduct groundwater sampling and take water level measurements from useable monitoring wells and piezometers; 7) prepare figure(s) depicting the direction of groundwater flow from the useable monitoring wells and piezometers after groundwater sampling and water level measurements have been taken.

Additionally, the following actions are necessary for site maintenance: 1) repair or replace fencing along southwest side of the Site; 2) place no trespassing signs on the southwest side of the Site fencing once it has been repaired or replaced; 3) perform annual inspections of the Site to ensure that the remedial action chosen in the September 30, 1991, Record of Decision (ROD) remains protective of human health and the environment.

It is expected that these actions will take approximately two years to complete, at which time a protectiveness determination will be made.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Upper Deerfield Township Sanitary Landfill Site		
EPA ID: NJD980761399		
Region: 2	State: NJ	City/County: Upper Deerfield Township, Cumberland County
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA <i>[If "Other Federal Agency", enter Agency name]:</i> Click here to enter text.		
Author name (Federal or State Project Manager): Diego Garcia		
Author affiliation: Remedial Project Manager		
Review period: 9/30/2009 to 9/30/2015		
Date of site inspection: 12/12/2013		
Type of review: Policy		
Review number: 4		
Triggering action date: 9/18/2009		
Due date (five years after triggering action date): 9/18/2014		

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:

None

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1	Issue Category: Remedy Performance			
	Issue: No groundwater data has been collected in the last five years.			
	Recommendation: Perform necessary well improvements and collect groundwater analytical parameters and water level measurements.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	EPA	9/30/2017

Protectiveness Statement(s)

<i>Operable Unit:</i> OU1	<i>Protectiveness Determination:</i> Protectiveness Deferred	<i>Addendum Due Date (if applicable):</i> 9/30/2017
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Protectiveness Statement:

A protectiveness determination of the remedy at the Upper Deerfield Sanitary Landfill site cannot be made at this time until groundwater data is obtained. It is expected that these actions will take approximately two years to complete, at which time a protectiveness determination will be made.

Sitewide Protectiveness Statement

<i>Protectiveness Determination:</i> Protectiveness Deferred	<i>Addendum Due Date (if applicable):</i> 9/30/2017
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Protectiveness Statement:

A protectiveness determination of the remedy at the Upper Deerfield Sanitary Landfill site cannot be made at this time until groundwater data is obtained. It is expected that these actions will take approximately two years to complete, at which time a protectiveness determination will be made.

Introduction

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

This is the fourth FYR for the Upper Deerfield Township Sanitary Landfill Superfund site (Site), located in Upper Deerfield Township, Cumberland County, New Jersey. This FYR was conducted by the United States Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Diego Garcia. The review was conducted in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). This report will become part of the Site file.

The triggering action for this statutory review is the completion date of the third FYR for the Site in September 2009. A five-year review is required at this Site due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of one operable unit, which is addressed in this five-year review.

Site Chronology

See Table 1 for the site chronology.

Background

Physical Characteristics

The Site is an inactive, 14-acre landfill located on a 22.72-acre tract of land in the rural farming community of Upper Deerfield Township, Cumberland County, New Jersey. The Site is located approximately two and one-half miles, east-southeast of Seabrook, New Jersey and lies between Woodruff Husted Station Road (County Route 687) to the east and Centerton Road (County Route 553) to the west (see Figure 1).

Land and Resource Use

The Site is protected by zoning and deed restrictions which prohibit any construction on the landfill as well as any use of groundwater beneath the property. These restrictions, established in September 1991 by Upper Deerfield Township, have allowed native plant species to flourish. The soil cover, placed on the Site by Upper Deerfield Township is intact and well vegetated. The Site is secured by a fence and gated at all times.

Site Geology/Hydrogeology

The closest stream downgradient of the Site is an unnamed tributary of the Thundergust Brook located approximately three-quarters of a mile southeast of the Site. This tributary flows from Route 658 northeast for about one-half mile before entering Thundergust Brook. Thundergust Brook is located approximately one-half mile northeast of the landfill. Thundergust Brook flows

eastward into Muddy Run, a tributary of the Maurice River which in turn flows into Union Lake.

The topography in the general area of the Site is flat, to gently sloping, with an average slope of less than one percent. The landfill is at an elevation level approximately equal to the surrounding land and has an average elevation of approximately 130 feet above mean sea level. The Site is located in the Atlantic Coastal Plain physiographic province. This area is comprised of south and east" dipping layers of sand, silt, and gravel. Generally these sediments are unconsolidated and not continuous. The sands and gravels form confined aquifers at various levels separated by the clays.

The principal aquifers in the vicinity of the Site are the Cohansey-Kirkwood and the Lower Kirkwood. The Cohansey-Kirkwood aquifer is generally considered to be a water table aquifer (top of the groundwater.) throughout most of Cumberland County. The water table in the Cohansey-Kirkwood in the vicinity of the Site is approximately 40 feet below ground surface. This aquifer serves as the major source of water for this part of southern New Jersey. Groundwater at the Site flows to the south and southeast under a slight horizontal gradient.

Because it is highly permeable and relatively thick, the Cohansey-Kirkwood aquifer is capable of yielding abundant quantities of water. Large quantities of water can generally be obtained from wells that are less than 180 feet deep. The Township maintains two potable water production wells approximately one-half mile north (upgradient) of the Site. The wells are approximately 165 feet deep and are capable of pumping 150 gallons per minute each. A second important source of groundwater in Cumberland County is the Lower-Kirkwood aquifer. Most of the wells installed in this aquifer are located in the eastern half of the county and along the near shore area of Delaware Bay. Depth of the wells range from about 200 to 370 feet.

History of Contamination

The Site originally was used as a gravel pit from 1938 to 1960, when the Township purchased 12 acres; the remaining acreage was purchased by the Township in 1977. The property was operated as a municipal landfill licensed to accept household waste until it closed in 1983.

Initial Response

In response to complaints about water quality from residents using private groundwater wells, the Township installed three monitoring wells at the landfill in January 1980. In February 1980, the three monitoring wells and 26 residential wells were sampled by the Cumberland County Health Department. The results of the sampling indicated the presence of volatile organic compounds (VOCs) and mercury in area wells. In 1983, the New Jersey Department of Environmental Protection (NJDEP) and the County advised residents to discontinue using their wells, and Upper Deerfield Township began supplying the affected residents with bottled water.

In response to the groundwater contamination, homes were connected to a public water supply in 1986, thus removing any immediate health risk posed by the groundwater. That action was funded by the State of New Jersey.

Basis for Taking Action

EPA placed the Site on the National Priorities List of Superfund sites in 1983. EPA conducted a remedial investigation and feasibility study (RI/FS) at the Site from 1987 to 1990. The RI results showed only low levels of contaminants in landfill soils. A soil-gas survey indicated that while VOCs and mercury were present in on-site soil gas, little migration of the soil gas contaminants on-site was occurring. VOCs and inorganic compounds were found at relatively low levels in the groundwater. The RI did not identify a contaminant plume migrating from the landfill.

The results of the investigation showed that groundwater and soil contamination associated with the Site no longer posed a health threat under then-current or likely future land-use conditions. More details on the investigation can be found in the July 1991, final RI/FS reports.

The human health risk assessment for the Site concluded that under current and likely future land use conditions, the total carcinogenic risk was estimated to be 1×10^{-6} to on-site trespassers and 2×10^{-5} risk to off-site residents. The hazard indices for all current and future scenarios are less than or equal to one. Therefore, under current and likely future land use scenarios, total carcinogenic and noncarcinogenic risks are within EPA's acceptable risk range for the Site.

The ecological risk assessment for the Site concluded that the environmental hazards are limited to possible impacts on aquatic life from exposure to low levels of metals in groundwater which can potentially enter surface water. The amphibian populations of the study area as a whole are not expected to be affected. Adverse impacts on plant and other terrestrial wildlife are unlikely.

Remedial Actions

Remedy Selection

Remedy Selection and Implementation

Based on the results of the RI/FS, EPA signed a Record of Decision (ROD), for the Site on September 30, 1991. The ROD called for:

- No further remedial action with a monitoring program of the air and groundwater.

Since the RI found that the groundwater and soil contamination associated with the Site did not pose a health threat, and area homes had been connected to a public water supply, EPA determined that no additional action was required for the Site pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act. However, because groundwater contamination did exist in the vicinity of the Site, and low-levels of hazardous substances were believed to remain on the Site, EPA determined that continued air and groundwater monitoring was necessary.

In September 1994, EPA and Upper Deerfield Township signed an Administrative Consent Order which required the Township to monitor the groundwater for 30 years. EPA initiated an air monitoring program in December 1994 to determine if any off-site migration of VOCs and methane had occurred. During December 1994 and June 1995, EPA conducted two phases of air sampling from six locations on the southern, eastern and northern edges of the landfill. These locations were chosen by EPA to mirror previous investigations. The results obtained during

both investigations did not detect any airborne contaminants of concern. Since airborne contaminants were never detected, the air monitoring program was discontinued.

In December 1995, the Township initiated a groundwater monitoring program at the landfill. The monitoring program consists of the sampling and analyses of seven off-site monitoring wells surrounding the landfill. The sampling frequency was set at quarterly during the first year, semi-annually during years two through four, and annually thereafter. Since the program began, fourteen rounds of groundwater samples have been taken. During the 1997 sampling event, EPA requested that the Township incorporate low-stress (low-flow) purging and sampling procedures for the collection of groundwater samples from monitoring wells. This method is used by EPA to minimize stress on the geological formation and minimize the disturbance of sediment that has collected in the wells.

Groundwater sampling was last performed in three on Site monitoring wells on June 17, 2009. The sampling results were generally below their respective National Primary Drinking Water Standard Maximum Contaminant Levels (MCLs) and EPA's Regional Screening Levels for Tap Water.

Progress Since Last Five-Year Review

This is the fourth five-year review for the Site. The third five-year review, completed by EPA in 2009, concluded that the remedial action for the Site was protective. Since the last FYR was completed in 2009, the Upper Deerfield Township has not collected any groundwater samples. To clarify the monitoring activities required in the AOC, Upper Deerfield Township was notified on January 23, 2014, that the following activities should be conducted at the Site:

- Identify all monitoring wells and piezometers on and off the landfill and mark each location with identification numbers.
- Perform testing of all monitoring wells and piezometers to determine if they are suitable for sampling and take water level measurements.
- Prepare and submit to EPA figure(s) depicting the locations and well construction details of all usable and non-usable monitoring wells and piezometers.
- Identify monitoring wells and piezometers not being used for monitoring the Site groundwater so they can be considered for abandonment.
- Inspect, and replace if broken, locks on monitoring wells and piezometers designated for further use.
- Conduct groundwater sampling and take water level measurements from useable monitoring wells and piezometers.
- Prepare and submit to EPA figure(s) depicting the direction of groundwater flow from the useable monitoring wells and piezometers after groundwater sampling and water level measurements have been taken.

- Repair or replace fencing along southwest side of the Site.
- Place no trespassing signs on the southwest side of the Site fencing once it has been repaired or replaced.
- Perform annual inspections of the Site to ensure that the remedial action chosen in the September 30, 1991, ROD remains protective of human health and the environment.

The following discussion summarizes activities performed to address the monitoring issues discussed above:

Groundwater

In July 2015, Upper Deerfield Township informed EPA that they had identified the locations of seventeen monitoring wells in and around the landfill area. EPA and Upper Deerfield Township are currently in discussions to determine the size of monitoring wells and if they are usable. EPA also requested that they identify which wells could be used for gathering a comprehensive round of groundwater samples and which ones could be abandoned and sealed.

Overall Site Activities

In June 2015, Upper Deerfield Township repaired the damaged fencing on the southwest side of the Site and "no trespassing signs" are planned in fall 2015. The remaining work suggested in January 23, 2014, is currently being discussed with Upper Deerfield Township to ensure that the work will be addressed.

Potential Site impacts to climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change.

Five-Year Review Process

Administrative Components

The five-year review team consisted of Mr. Diego Garcia, RPM, Mr. Robert Alvey, hydrogeologist, Ms. Julie McPherson, risk assessor and Ms. Natalie Loney, community involvement coordinator. This is a potentially responsible party (PRP) lead site.

Community Involvement

Once the five-year review is completed, the results will be made available at the local Site repository, which is at the Upper Deerfield Township Municipal Building located at Upper Deerfield Township, New Jersey. In addition, efforts will be made to reach out to local public officials to inform them of the results.

Document Review

The documents, data and information which were reviewed in completing this five-year review are summarized in Table 3.

Data Review

No data has been collected since 2009.

Site Inspection

The inspection of the Site was conducted on December 12, 2013. In attendance were Diego Garcia, Robert Alvey, Julie McPherson and the Township Engineer, Brian Murphy. The purpose of the inspection was to assess the protectiveness of the remedy.

The inspection revealed that the fencing and no trespassing signs along the southwest side of the Site needed repair or replacement, and that locks on monitoring wells and piezometers designated for further use should be replaced if broken. The gates preventing access to the Site were locked and the soil cover, placed on the Site by Upper Deerfield Township is intact and well vegetated.

Interviews

There is regular contact between the Township Engineer and EPA.

Institutional Controls Verification

Although not selected in a decision document, institutional controls that include zoning and deed restrictions were placed on the landfill in September 1991, by Upper Deerfield Township that prohibit any construction on the landfill as well as any use whatsoever of groundwater beneath the property.

Technical Assessment

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

Without recent groundwater data, it is not possible to fully assess the protectiveness of the remedy. Although there are no analytical groundwater data for this reporting period, exposure to groundwater has been eliminated since the area residents are connected to the public water supply. EPA will continue to work with the Township to redevelop, replace or abandon, and sample monitoring wells that may have been lost or damaged since the last time they were last sampled.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

Although, groundwater use is not expected to change in the next five years, a protectiveness determination of the remedy at the Site cannot be made at this time until further information on groundwater quality is obtained.

There have been no changes to toxicity data or groundwater cleanup levels that impact the remedial action performance at the Site. The land and groundwater use at the Site is not expected to change in the next five years and the objectives for the remedy are still valid.

Although data has not been collected in the last five years, exposure to ecological receptors has not changed and the ecological risk assessment is still valid.

Furthermore, due to localized groundwater contamination since the remedy was selected and the current use of the landfill property, vapor intrusion is not a concern at this Site.

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

No.

Technical Assessment Summary

Without new data, the performance of the remedy could not be assessed. Since residents are connected to a public water supply, the groundwater exposure pathway has been eliminated. Additionally, ecological exposure pathways are not considered complete.

Issues, Recommendations and Follow-Up Actions

OU(s): 1	Issue Category: Remedy Performance			
	Issue: No groundwater data has been collected in the last five years.			
	Recommendation: Perform necessary well improvements and collect groundwater analytical parameters and water level measurements.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	EPA	9/30/2017

To further expand on the recommendation above, in order for groundwater data to be collected, the following actions must be taken:

- Identify all monitoring wells and piezometers on and off the landfill and mark each location with identification numbers.
- Perform testing of all monitoring wells and piezometers to determine if they are suitable for sampling and take water level measurements.
- Prepare figure(s) depicting the locations and well construction details of all usable and non-usable monitoring wells and piezometers.
- Identify monitoring wells and piezometers not being used for monitoring the Site groundwater so they can be considered for abandonment.
- Inspect, and replaced if broken, locks on monitoring wells and piezometers designated for further use.

- Conduct groundwater sampling and take water level measurements from useable monitoring wells and piezometers.
- Prepare figure(s) depicting the direction of groundwater flow from the useable monitoring wells and piezometers after groundwater sampling and water level measurements have been taken.
- Repair or replace fencing along southwest side of the Site.
- Place no trespassing signs on the southwest side of the Site fencing.
- Perform annual inspections of the Site to ensure that the remedial action chosen in the September 30, 1991, ROD remains protective of human health and the environment.

Protectiveness Statement

Protectiveness Statement(s)		
<i>Operable Unit:</i> OU1	<i>Protectiveness Determination:</i> Protectiveness Deferred	<i>Addendum Due Date (if applicable):</i> 9/30/2017
<i>Protectiveness Statement:</i> A protectiveness determination of the remedy at the Upper Deerfield Sanitary Landfill site cannot be made at this time until groundwater data is obtained. It is expected that these actions will take approximately two years to complete, at which time a protectiveness determination will be made.		

Sitewide Protectiveness Statement	
<i>Protectiveness Determination:</i> Protectiveness Deferred	<i>Addendum Due Date (if applicable):</i> 9/30/2017
<i>Protectiveness Statement:</i> A protectiveness determination of the remedy at the Upper Deerfield Sanitary Landfill site cannot be made at this time until groundwater data is obtained. It is expected that these actions will take approximately two years to complete, at which time a protectiveness determination will be made.	

Next Review

The next FYR for the Upper Deerfield Sanitary Landfill Superfund Site is required five years from the signature date of this review.

Attachments

Attachment 1: Figure

Attachment 2: Tables

UPPER DEERFIELD TOWNSHIP SANITARY LANDFILL

EST. POP. WITHIN A 1 MILE SITE BUFFER: 673
(based on Census 2000 Block-level data)

SITE AREA IN ACRES 22.43



SITE ID: NJD980761399

CITY: UPPER DEERFIELD TOWNSHIP 0.02

SITE NAME: **UPPER DEERFIELD TOWNSHIP SANITARY LANDFILL** STATE: NY ZIP: 12801

DATE OF MAP: Feb 26, 2007

CONG. DIST.: NJ02

RPM: GARCIA, DIEGO

Contamination Polygon Source Document:
Original Polygon good



Table 1 - Chronology of Site Events	
Event	Date(s)
The property is owned by Seabrook Farms, Inc. which operates the property as a gravel pit and alleged waste disposal facility.	1938 to February 29, 1960
Upper Deerfield Township purchases the property that makes up the Upper Deerfield Township Sanitary Landfill.	February 29, 1960 to January 13, 1977
The Cumberland County Health Department samples three monitoring wells and 26 local residential wells in the vicinity of the landfill. Nine of the residential wells have levels of mercury greater than the drinking water standards.	February 1980
NJDEP issues Administrative Orders to Upper Deerfield Township for the Landfill.	September 4, 1981 October 13, 1981 July 19, 1983
NJDEP notifies Upper Deerfield Township of the inclusion of the Upper Deerfield Township Sanitary Landfill on the National Priorities List.	October 18, 1983
The landfill is closed by Upper Deerfield Township and covered with one foot of material suitable for vegetative growth.	December 31, 1983
NJDEP develops an Administrative Consent Order (ACO) which they propose to enter with Upper Deerfield Township to conduct a RI/FS for the landfill.	June 25, 1985
Upper Deerfield Township refuses to sign the ACO by the deadline establish by the State. On this date, the Site becomes an EPA fund lead Site.	April 15, 1986
A Superfund State contract between NJDEP and EPA is drawn up for remedial activities relating to the Site.	August 11, 1986
The Final RI/FS is completed.	July 1991
The Record of Decision is signed.	September 1991
Upper Deerfield Township agrees to sign an ACO with EPA to monitor the groundwater under the landfill for 30 years.	September 1994
Upper Deerfield Township initiates a groundwater sampling program at the site.	December 1995
Second five-year review report.	September 2004
Third five-year review report.	September 2009

Table 2: Documents, Data and Information Reviewed in Completing the Five-Year Review	
Document Title, Author	Submittal Date
Final RI/FS Report	July 1991
Air Sampling Report	December 1995
Mercury in groundwater, soils and sediments of the kirkwood-cohansey aquifer system in the New Jersey Coastal Plain, U.S. Geological Survey	July 1997
Groundwater Data Review Memo	April 1998
First five-year review	September 1999
Environmental Response Team review of historical groundwater data	July 2004
Second five-year review	September 2004
Third five-year review	September 2009