

Memo



To: Ms. Sally Rubin
Great Swamp Watershed Association, Community Advisory Group

Bob Blauvelt, GEI, Consultants, Inc. (GEI)

c: Fran Schultz, GEI

Date: September 1, 2020

Re: Review of Rolling Knolls Landfill Superfund Site Documents
Chatham Township, Morris County, New Jersey
GEI Project 2002081

The following summarizes the findings of a review of 10 technical documents related to the referenced site. The purpose of this review is to identify site-specific issues that must be considered by the United States Environmental Protection Agency (EPA) and the potentially responsible parties as the feasibility study is developed and the final remedy selected and designed.

1. NPL Site Narrative for Rolling Knolls Landfill (2003)

This confirms that the Great Swamp National Refuge (Refuge) borders the Rolling Knolls landfill on three sides and that the landfill is the only source of contamination present at the site. It identifies metals, phthalates, and PCBs as the contaminants of concern and states that the landfill is affecting a terrestrially sensitive environment and that there are potential contaminant exposure pathways to nearby residents. The landfill is not covered and is fully accessible to trespassers (unfenced).

2. ATSDR Public Health Assessment (2006)

This report states that because there is an incomplete human exposure pathway, there is no apparent public health hazard from the landfill. There are exposure risks to construction workers and trespassers which need to be addressed. Signage and fencing are recommended to reduce the likelihood of exposure and additional sampling is needed to better characterize the distribution and movement of contaminants.

3. Screening Level Eco Risk Assessment (April 2013)

This report was prepared by consultants for the potentially responsible party group. It evaluated risks for 23 ecological assessment endpoints. These are explicit expressions of the environmental value to be protected, defined as an ecological entity and its attributes. An example of an ecological entity is an important fish species, such as coho salmon, with its attributes being fecundity and recruitment (i.e., addition of new individuals to a population).

Report findings are summarized on Table 1 with 11 of the 23 assessment endpoints identified as ecologically threatened by the soil, water, and sediment contamination present at the site. Additional work (sampling and evaluation) was recommended at each of the affected endpoints.

4. Revised Baseline Human Health Risk Assessment (June 2014)

This report was prepared by consultants for the potentially responsible party group. It updates a March 2014 Baseline Human Health Risk Assessment (HHRA, not reviewed by GEI) prepared by the same consultants that had developed the Screening Level Ecological Risk Assessment (Item 3 above). The revised HHRA incorporates data collected between June 2006 and January 2010, and lays out two land use scenarios: recreational (current) and residential (future). Its findings are summarized on Table 2, and concludes that non cancer risks for three exposure scenarios (landscaper, adolescent trespasser, and adult trespasser) and above EPA acceptable ranges for both land use scenarios.

Cancer hazards are within EPA acceptable ranges ($1E-4$ to $1E-6$)¹ for four of the six potential receptor exposures, with child resident and adult resident hazards an order of magnitude greater than allowed by EPA guidelines. New Jersey Department of Environmental Protection (NJDEP) has based its regulatory standards solely on a cancer hazard risk of $1E-6$, which the site does not meet for any potential receptors under either of the land use scenarios evaluated.

5. Data Gap Sampling Results, Human Health Risk Assessment (November 2016)

This report was prepared by consultants for the potentially responsible party group. It describes additional soil, surface water, ground water, and sediment collected at the site to provide the technical basis for a re-evaluation of the risks described in the June HHRA (Item 4, above). Sadly, for the potentially responsible party group, the additional data did not change the cancer or non-cancer related risk calculations for adult and adolescent trespassers. Results of ground water sampling actually increased risks for adult and child residents in the potentially re-developable area of the site. The report concluded, in effect, that the new data could not be used to change (i.e., reduce) risks described in the 2014 BHHRA.

6. Baseline Ecological Risk Assessment (December 2017)

This report was prepared by consultants for the potentially responsible party group. It presents an updated, revised baseline ecological risk assessment (BERA) relying on biological and tissue samples from survey, trap, and sacrifice studies conducted at the site. Eight types of ecological receptors were evaluated (Table 3) and found, with numerous exceptions and caveats, that the Rolling Knolls Landfill Superfund Site does not pose unacceptable ecological risks to most receptors. The report did not specify species or habitats where the risks were unacceptable.

7. Remedial Investigation Report (January 2018)

This report was prepared by consultants for the potentially responsible party group. It presents the results of all the soil, ground water, surface water, soil gas, and sediment sampling conducted at the site. The report also summarizes (verbatim) the findings of the HHRA and BERA. The Remedial Investigation Report (RIR) concludes that delineation (horizontal and vertical extent of the contamination) is complete and that data gaps will be addressed during the development of the feasibility study. The RIR was formally approved by EPA in 2018. GEI did not conduct an in depth review of the RIR given its acceptance by EPA as complete. The status of the review and approval of the RIR by NJDEP is not available.

¹ A statistically significant chance of an extra cancer developing in one person in 10,000 ($1E-4$) to one person in one million ($1E-6$).

8 Baseline Human Health Risk Assessment – Updated (July 2018)

This document was prepared by EPA. It modified the revised BHHRA (July 2014) by reducing (making less conservative) the number of potential trespasser exposure days from 143 to 84. It also updated 2014 toxicity information for several site specific contaminants to more recent (2017) values. The findings did not change. Non cancer hazard indices for the trespassing adult (HI = 2) and trespassing adolescent (HI = 3) child remained above EPA's acceptable level (HI = 1). The document also re-evaluated lead levels in soil and found that remedial action still was required to address this contaminant. It concluded by saying that the findings of the 2014 BHHRA remained valid and that actionable risk is present at the Rolling Knolls Landfill Superfund Site.

9. Presentation to Community Advisory Group (April 2019)

This presentation was prepared and delivered by EPA in cooperation with the potentially responsible party group. It described the overall Superfund remedial process and the results of the remedial investigation. Risks to human health were described as being driven by the presence of PCBs and that high concentrations of lead in site environmental media needed to be addressed. Data supporting low levels of ecological risks were less than compelling, primarily relying on indirect lines of evidence that often rendered conflicting conclusions. EPA ultimately focused on the finding of the BERA prepared by the potentially responsible party group that addressing risk to vermivorous birds or mammals **should** [emphasis added] address risk to other receptors.

10. Feasibility Study Assessment (September 2019)

This presentation was prepared by the U.S. Department of the Interior. It described the five remedial alternatives being considered for the site: no action, institutional controls, limited capping, excavation and limited capping, and full capping. The presentation concluded that the Refuge has been significantly impacted by landfill wastes and that the remedial alternatives under consideration do not adequately address those impacts. It urged that other remedial or removal alternatives be considered.

Recommendations

1. Determine the status of NJDEP review and approval of the RIR and supporting reports (BERA and HHRA).
2. Typically, ecological receptors are much more sensitive to contamination than human receptors. Yet the BERA and HHRA conclude the opposite: the site poses more risk to people than to insects, birds, etc. How does EPA explain this dichotomy?
3. The BERA concludes that risks are acceptable for most receptors. How does the potentially responsible party group plan to address risks for the remaining ecological receptors?

Table 1

**Summary of EPA Screening Level Ecological Risk Assessment - April 2013
Rolling Knolls Landfill Superfund Site**

Assessment Endpoint	Habitat	Finding	Risk Drivers	Recommendation
1 & 2	Lower trophic levels terrestrial receptors	Potential for ecological effects	Inorganic constituents and pesticides	Further evaluation of constituents and receptors
3	Amphibian & reptile communities	Not evaluated. Toxicity benchmarks not available		
4	Upper trophic level herbivorous mammals	Negligible potential for ecological effects	Metals (copper, lead, nickel, zinc), PCBs and pesticides	Further evaluation of constituents and receptors
4, 5, 6, 7, & 8	Upper trophic level insectivorous or vermivorous upper trophic level receptors	Potential for ecological effects	Metals (copper, lead, nickel, zinc), PCBs and pesticides	Further evaluation of constituents and receptors
AE-7 & 8	Carnivorous mammals and birds	Low potential risk of ecological effects	---	---
9	Terrestrial and wetland plants	Potential for ecological effects	Metals (copper, lead, nickel, zinc), PCBs and pesticides	Further evaluation of constituents and receptors
10	Soil invertebrates	Potential for ecological effects	Risk estimates likely influenced by background concentrations	Further evaluation of constituents and receptors
11	Benthic invertebrates	Potential for ecological effects	Metals (copper, lead, nickel, zinc), PCBs and pesticides	Further evaluation of constituents and receptors
12	Amphibians and reptiles	Potential for ecological effects	Metals (copper, lead, nickel, zinc), PCBs and pesticides	Further evaluation of constituents and receptors
13	Herbivorous mammals	Low potential for ecological effects	---	---
14	Insectivorous or vermivorous mammals	Low potential for ecological effects	---	---
15	Insectivorous or vermivorous birds	Potential for ecological effects	Metals (copper, lead, nickel, zinc), PCBs and pesticides	Further evaluation of constituents and receptors

Table 1

**Summary of EPA Screening Level Ecological Risk Assessment - April 2013
Rolling Knolls Landfill Superfund Site**

Assessment Endpoint	Habitat	Finding	Risk Drivers	Recommendation
16	Carnivorous mammals	Low potential for ecological effects	---	---
17	Carnivorous birds	Low potential for ecological effects	---	---
18	Benthic invertebrates ¹	Potential for ecological effects.	Metals (copper, lead, nickel, zinc), PCBs and pesticides	Further evaluation of constituents and receptors
19	Pelagic fish	Potential for ecological effects.	Metals (copper, lead, nickel, zinc), PCBs and pesticides	Further evaluation of constituents and receptors
20	Insectivorous or vermivorous mammals	Potential for ecological effects.	Metals (copper, lead, nickel, zinc), PCBs and pesticides	Further evaluation of constituents and receptors
21	Insectivorous or vermivorous birds	Low potential for ecological effects	---	---
22	Piscivorous mammals	Low potential for ecological effects	---	---
23	Piscivorous birds	Negligible potential for ecological effects	---	---

¹ Low potential for ecological effects for benthic invertebrates in Loantaka Brook and pelagic fish in on-site pond and Loantaka Brook. Risk estimates likely influenced by background concentrations.

Table 2

Summary of 2014 Baseline Human Health Risk Assessment

Rolling Knolls Landfill Superfund Site

No.	Receptors	Non-Cancer Hazard	Cancer Hazard
Current & Reasonably Anticipated Future Exposure Scenarios			
1	Landscaper (Area 1)	Yes (HI>1)	6E-5
2	Adolescent Trespasser	Yes (HI>1)	1E-5
3	Adult Trespasser	Yes (HI>1)	1E-4
Future On-site Residential Development Exposure Scenario			
1	Child Resident	Yes (HI>1)	2E-3
2	Adult Resident	Yes (HI>1)	1E-3
3	Construction Worker	Yes (HI>1)	3E-5

Table 3

Summary of 2017 Baseline Ecological Risk Assessment

Rolling Knolls Landfill Superfund Site

No.	Receptor	Finding	Basis
1	Terrestrial Vegetation	No unacceptable risk to terrestrial vegetation from site related contaminants	Plant toxicity based soil benchmarks exceeded Risks not associated with site specific contaminants
2	Benthic Invertebrates	No unacceptable risks to these receptors	Prior BERA (2013) results were too variable and overestimated risk
3	Amphibians and Reptiles	Risks to amphibians and reptiles related to exposures in the water column are unlikely, except for barium	Surface water data below NJDEP criteria, except for barium. Only some sediment samples could elicit toxicity. PCBs do not pose a risk because concentrations are too low.
4	Vermivorous Birds and Mammals	Total PCBs in Site media may not be causing significant risks to these receptors	Other sites showed that much higher PCB concentrations were needed before ecological effects noticed. Used conservative assumptions to minimize potential for risk under estimation
5	Piscivorous Birds	No unacceptable risk to piscivorous birds and potential minimal risk to piscivorous mammals	Used field collected prey items to avoid overestimating risks and conservative assumptions to avoid underestimating risk
6	Herbivorous Birds and Mammals	No unacceptable risk to herbivorous birds and minimal risk to herbivorous mammals	Used field collected prey items to avoid overestimating risks and conservative assumptions to avoid underestimating risk
7	Insectivorous Birds and Mammals	No unacceptable risk to insectivorous birds and potential minimal risk to insectivorous mammals	The evaluation of these receptors is mostly uncertain because of a lack of empirical data and over conservative use of bioaccumulation model.
8	Carnivorous Birds and Mammals	There is no unacceptable risk to carnivorous birds and carnivorous mammals	Exposure was assessed using tissue level measurements from small mammals.