

Rolling Knolls Landfill Superfund Site - EPA Comments to December 2017 Draft Feasibility Study

General Comments

1. Comments from the Fish and Wildlife Service, through the Department of the Interior, were provided to you on February 8, 2018 and are attached again, for ease of reference. Responses to these comments should be provided along with responses to comments provided by EPA.
2. The future use of the Site is not yet certain and, as such, all language related to future use must be appropriately qualified. Language used throughout the FS, and in the screening and evaluation of alternatives, focuses on the assumption that there will be no residential, commercial, industrial, recreational, or any other future use of the landfill portion of the site other than trespassing. However, as has been discussed, a contingent active soil remedy must be included in the document in case institutional controls to restrict future are not implemented and a residential cleanup is required. Several specific comments relate to this general concept, but please review the document in its entirety to confirm that mention of future use is consistently qualified throughout.
3. Upon review, RAO 2 should be revised to remove reference to surface water and sediment. There is no basis for taking remedial action on these media, and thus they should not be included in the RAOs. However, please note that monitoring of surface water and sediment may be required during implementation of the remedial action to assure that no adverse impacts are occurring. In addition, overall, the descriptions of both the soil and groundwater alternatives should more clearly reflect how they will meet RAOs.
4. A more detailed description of each active soil alternative is needed. The details of how the soil remedies will be implemented are included, for the most part, in tables. The text of the report itself must clearly describe each alternative and include the key assumptions made, such as the volume of soil to be excavated, the depth of excavation, components of the capping system and the restoration details.
5. EPA has the following general comments related to the groundwater alternatives presented in the draft FS report:
 - a. On 11/15/2017, EPA provided the group with specific suggested language for both the soil and groundwater alternatives, and on 11/16/2018 we discussed these alternatives with the group. The groundwater alternatives presented in the draft FS do not include the contingent active remedy that we had presented.

Please include the following alternative for groundwater in the FS:

Source Control and Monitoring, with a Contingent Active Remedy; Institutional Controls

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- A. *Completion of source control and monitoring, as outlined in groundwater Alternative 2, to determine if restoration is occurring.*
- B. *If the data indicates restoration is not occurring, or if migration of contamination outside the landfill boundary is occurring, an active remedy will be implemented to accelerate restoration. Active remedies may include in-situ treatment or additional soil excavation.*

Metrics for determining whether restoration is occurring will be developed during the remedial design process. At a minimum, restoration progress will be assessed formally during the five-year review process. In addition, for costing purposes, the in-situ remedy was assumed to be a combination of biological and chemical treatment.

- C. *Institutional controls, including implementation of the CEA and deed notices, to restrict use of the groundwater until RAOs are achieved.*
- b. As we have discussed, if an active remedy is needed, neither chemical nor biological in-situ treatment can be used exclusively to address all COCs in groundwater that are currently known to be present at elevated concentrations at the site. Therefore, EPA suggests that Alternatives 3 and 4 be combined to represent a single “in-situ” treatment alternative.
 - c. Whichever approach is ultimately selected, the groundwater alternative will apply to the entire site, not just that portion around MW-3. The discussion in the report needs to make this clear.

Additional specific comments are provided in the attached. Please revise Section 7 of the report in its entirety to address these concerns.

- 6. A comparative evaluation of alternatives is presented in tables displayed in both the Executive Summary and Section 8 of the report. This evaluation must be consistent with the text, and the descriptions need to clearly explain the basis for the categorization. As they are, EPA finds the tables confusing and inconsistent. For example, the implementability rating for each active soil alternative is listed as “excellent,” but it seems that Alternative 3 would be much easier to implement than, say, Alternative 5. Please clarify and revise, as necessary.

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Specific Comments

	Page	Section	Paragraph	Comment
1	xi	Executive Summary	1st	In addition to conducting a detailed evaluation, the purpose of an FS is to develop and screen potential alternatives. The second sentence of this paragraph should be revised to reflect this.
2	xi	Executive Summary	3rd	Add that a small portion of the Surface Debris Area, approximately 80 feet by 40 feet, extends on to an adjacent property currently owned by David M. Bakunas, Trustee. The wording concerning property owned by Green Village Fire Department was revised in the RI; use that revised language here.
3	xi	ES		Paragraph starting with “Approximately 130 acres.” States that 35 acres are owned by F&W, it should be owned by the United States and operated by F&W. Footnote 1 – the last sentence should be removed.
4	xii	ES		“There is a low potential risk for short-tailed shrews and American robins through exposure to certain constituents in soil.” The “certain constituents” should be specified in the text so that how the remedial alternatives will protect the ecological receptors can be clearly evaluated, and, in the previous paragraph, the primary human health contaminants of concern should similarly be listed.
5	xii	ES		2 nd to last paragraph, 2 nd sentence starting with “The human health” “reasonably anticipated future exposure” should be deleted and revised. The deed restriction is not currently in place. Exposures to trespassers should be discussed.
6	xii	ES	3	Clarify if contaminant exceedances were being compared to residential or non-residential SRS in the sentence that begins “Analytical results indicate that..”. <ul style="list-style-type: none"> • Additionally, VOCs (at least chloroform, xylenes, and carbon tetrachloride) also exceeded both the residential and non-residential SRS and were omitted from the list of exceedances. • In the sentence that begins, “Volatile organic compounds are present in groundwater in limited areas..”, please add that SVOCs, pesticides, and PCBs were also present at concentrations exceeding the NJGWQS.

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7	xiii	ES		The start of the first paragraph on this page should say “proposed agreement” or “possible agreement,” and the rest of the paragraph should be changed to reflect that anticipated future use has not been determined since the deed restriction is not in place. In the 2nd paragraph, sentence starting with “First,” “only results...” should be changed for the reason stated above.
8	xiii	ES	2	In the first sentence, add the word "overall" between "lower the" and "risk levels." Please delete the 2nd sentence, "The risk levels in the soil outside of Selected Area are within USEPA's acceptable risk range."
9	xiii	ES		As discussed in the general comments, unless a deed restriction is put in place, a contingent soil remedy assuming future residential use must be included.
10	xiv	ES		As discussed in the general comments, the table on this page and the next page, and associated text, need to be modified for consistency with the Detailed Evaluation of Alternatives presented in Section 7 of the report.
11	3	2.2.		This section states that the Miele Trust may allow a portion of the site to be used as a laydown area. There is no discussion of what this means, and it is unclear if the exposure scenarios used to develop the ARS would be consistent with activities associated with this use.
12	3	2.2		The last two sentences of the 2nd paragraph of this section state, "The small portion of the landfill on the GVFD property is not eligible for development. As a result, there will be no residential, commercial, industrial, recreational, or any other use of the landfill portion of the Site." Assuming the Baseball Field and Shooting Range, which are located on the GVFD, will continue to be used as recreational areas, as is stated in the next paragraph, isn't that small portion of the landfill accessible to people using other portions of the GVFD? Can people on the GVFD property easily access the landfill area? Also, how was the determination made that the property will not be developed in the future?

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13	4	2.3		The statement “A small area at the northern end of the Surface Debris Area, approximately 4,000 square feet but not surveyed, extends onto a private/residential property” is of concern to the New Jersey Department of Environmental Protection (NJDEP or “the Department”). The existence of this privately-owned residential property is new information to NJDEP and this area needs to be addressed separately and remediated to unrestricted-use soil remediation standards according to N.J.A.C. 7:26E.
14	6			The reuse reports were prepared for self-interest reasons, and notably, not required by the order or the RI/FS process. Therefore, please remove the sentence "in connection with...".
15	7	2.7		RI Results should provide more details on occurrence and concentrations of COCs. There should be a focus on areas that are driving the remediation at the site (e.g., PCBs, test pits, POIs, etc...). More details should also be provided on specific references already in the text such as PCBs in one subsurface soil sample, dibenz(a,h) anthracene in downgradient surface water and sediment, and any constituents found in on-site ponds.
16	7	2.7		Section 2.7 should provide a brief description of the conceptual site model including site geology, hydrogeology, and contaminant fate and transport.
17	7	2.7.1		Per the RI, soil samples were collected between 1-2 feet if insufficient volume of soil was collected from the first foot. Revise text to state: “The depths of these (soil) samples were generally 0.0 to 1.0 feet below ground surface (bgs), but some were as deep as 1.0-2.0 bgs if the shallower intervals did not contain enough soil to sample”. Additionally, clarify that soil samples were also collected from deeper intervals to characterize subsurface soils.
18	7	2.7.1	2	Surface and subsurface soil impacts also include VOCs, which were omitted from this list.
19	7	2.7.1	3	Replace “residential soil remediation standards” with NJRSRS.
20	7	2.7.2		Please change "confirming" to "suggesting" in the sentence starting with "With the exception of a low level..." as consistent with the final RIR.
21	8	2.7.3		In the first bullet, 2-methylphenol, bis(2-chloroethyl)ether and pentachlorophenol are listed as PAHs, which is incorrect. Please revise the text to identify these chemicals as SVOCs, not PAHs.
22	8	2.7.3		Class 2A should be Class IIA.
23	8	2.7.3	1	Typo – “The groundwater zone of interest at the Site is the shallow water-bearing zone comprising silt...” Change ‘comprising’ to ‘comprised of.’

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24	8	2.7.3	1st Bullet	Typo – “These constituents were found in well MW-3 and certain of the nearby temporary well points.” Missing a word?
25	8	2.7.3	2nd Bullet	This bullet is misleading. Although 1,4-dioxane SIM analysis was performed during the most recent round of sampling, it was only used at 6 monitoring well locations. As USEPA has clarified before, future 1,4-dioxane analysis will be required at all monitoring well locations using a low-MDL method (Method 8270 as an SVOC). Additionally, the last statement that wells X-1 and X-2 did not contain detectable concentrations of 1,4-dioxane is misleading because of the high detection limit (~100 ug/L), but NJGWQS is 0.4 ug/L.
26	9	2.7.3	1st	Please state why MW-6 could not be sampled.
27	9	2.7.3	1st bullet	The sample collected in 2016 (not included in the RI Report) at MW-10 and MW-18 exceeded the GWQS for 1,4-dioxane. Include this fact here.
28	10	2.7.3	1st	Section 2.7.3 pg. 10 par. 1: “The concentration of metals in the aquifer underneath the landfill decreases as groundwater flows to downgradient areas.” Please add more specific evidence to support this. Where do concentrations begin to decrease? The concentrations overall increase underneath the landfill. Additional clarification is needed to substantiate this statement.
29	10	2.7.3		Please explain the statement that “elevated metal results do not appear to be consistently related to colloids.” Cite the specific metals and their concentrations.
30	10	2.7.3	1st	Please remove “Depending on the selected remedial alternative for groundwater, additional monitoring wells may be installed to verify these conditions are widespread across the site.”
31	10	2.7.3	2nd	Please remove the second paragraph on page 10. The data summary already provided in the section is adequate and information supporting contaminant attenuation should be discussed later in the document.
32	10	2.7.4		Please revise heading to "Subslab Gas and Indoor Air."
33	12	3.1.1		Please remove the last paragraph in this section. EPA has not received any new information regarding the "negotiations/agreement" on the future use of the site. Please note that if mentioning an "agreement" regarding future use, supporting documents or information are necessary.
34	12-16	3.1.2 and 3.1.3		These sections will require revisions once the BHHRA is updated.
35	14	3.1.2		PCBs are listed as the primary COCs. Other risk drivers should also be mentioned.

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36	16	3.1.3		Please include a summary of the lead results in this section.
37	19	3.2.2		It is noted that risks to amphibians are unlikely, since tadpoles were abundant at many of the sampling locations. Abundance of one receptor may not necessarily indicate that risks are unlikely. This language should be revised.
38		4		<p>Determination of areas requiring remediation:</p> <p>a. A map should be provided to show all the sample points exceeded the PRGs.</p> <p>b. On page 26, Section 4.3 Calculation of Risk-Based Remediation Area for Soil. It stated that dioxin-like PCBs were determined to be the primary risk driver at the Site. An evaluation of the PCB data was performed to identify which area(s) of the Site would require remediation to reduce the overall risk at the Site to acceptable levels. The analysis identified that a “Selected Area”, an approximately 25-acre area on the northern portion of the site as shown on Figure 6-2, would require remediation. However, there is no discussion on how the boundary of the selected area was defined in the text nor in Appendix B. A statement in Appendix B (page 4) stated that “This approach included removing the highest PCB concentrations from the data set in a step-wise manner, calculating the 95% upper confidence limit of the mean as the EPC for PCBs...”. However, as shown in the markup of locations with PCBs exceeding the ARS of 5 mg/kg (Attachment 1), high concentrations of PCBs (higher than those inside the 25 acres) exist outside the 25 acres. The following information should be provided in Appendix B or in the text:</p> <p>i. What sample points were removed from the data set and the location of those sample points</p> <p>ii. How the boundary of the 25-acre area was defined? Was it based on the outermost contaminated location, midway between contaminated and clean sample locations, the nearest clean sample locations, or something else? This information is necessary and will affect the area to be remediation during the design.</p> <p>c. There is no description or map showing to what extent the remediation of APCs will be performed. There is also no information on how to determine the extent of the remediation area at each APC.</p> <p>d. The targeted treatment areas, the depth, the volumes, and the COCs in each area under the groundwater alternatives are not provided. The methodology to define the</p>

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				target treatment areas for groundwater remedy are also not provided. e. Descriptions of the long-term monitoring and maintenance program for the cap and vegetated areas to ensure continued protection should be provided for Alternatives 3, 4 and 5.
39	23	4.1		Please replace the language "neither of which are appropriate for the future use of the site" with "neither of which reflects the anticipated future use of the site, assuming planned institutional controls are implemented." In the 3rd sentence of this paragraph, replace "actual" with "anticipated."
40	23	4.2.1	Table	Footnote #2 incorrectly classifies acetophenone as a PAH, but it is an SVOC. Please update the table to include SVOCs as COCs, not just PAHs.
41	24	4.2.1	4	Please rephrase sentence starting with "Because future use at the Site..." since it is premature to confirm that no residential development will take place. The previous paragraph also requires modification.
42	25	4.2.2	Table	Footnote #1 incorrectly classifies 2-methylphenol, bis(2-chloroethyl)ether, and pentachlorophenol as PAHs. They are SVOCs. Please update table to include SVOCs as COCs, not just PAHs.
43	25	4.2.2	2nd	2: Typo – "Certain of the COCs are present..."
44	26	4.2.2	2nd	"The concentration of metals in the aquifer underneath the landfill decreases as groundwater flows to downgradient areas." Please add more specific evidence to support this. Where do concentrations begin to decrease? The concentrations overall increase underneath the landfill. Additional clarification is needed to substantiate this statement.
45	27	4.5		RAO 1 should be revised to read, "Prevent or minimize current and potential future..."
46	27	4.5		RAO 4 does not include NJ MCLs. Please revise, as some NJ MCLs are more stringent than federal MCLs and should be used.

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47	27	4.5		<p>(1) Please revise RAO #1 to: "Prevent or minimize current and potential future unacceptable risks to current and potential future human and ecological receptors through direct contact or ingestion of contaminated soil." Please reflect this revision in the remainder of the document as well.</p> <p>(2) Please revise RAO #2 to: "Control or remove source areas to prevent, to the extent practicable, impacts to groundwater." Please note that if impacts to groundwater are not mitigated through excavation 2 ft bgs of impacted soils, additional soil excavation may be needed. Please reflect this revision in the remainder of the document as well. Also note that surface water and sediment may need to be monitored during remedial design to insure construction or changes at the site are not adversely affecting the two media.</p>
48		4.6		<p>Tables 4-2 through 4-4 appear to list each contaminant on the New Jersey NRDCSRS list with its associated default NRDCSRS. A site-specific ARS was calculated for a subset of these contaminants. As indicated in the ARS memo, these alternative standards were "calculated for those constituents identified at concentrations above the NJDEP NRDCSRS in the shallow soil (0 to 2 ft bgs)" As such, please re-name Tables 4-2 to 4-4 "Potential Preliminary Remediation Goals" and add new tables called Preliminary Remediation Goal which list just the COCs that will be addressed by this action. More explanation is needed on Page 28 of the report as well.</p> <p>Similarly for GW, confirm that only those contaminants that exceed NJGWQS are listed on Table 4-5.</p>
49	29	5.1	2	<p>Please remove the following language: "but its rural character will likely be adversely impacted if development of the site occurs (Chatham Township Planning Board, 2011)."</p>
50	30	5.2	1st Bullet	<p>Please revise to: "As discussed in Section 2.2, the evaluation and screening presented herein focuses on the assumption that there will be no residential, commercial, industrial, recreational, or any other future use of the landfill portion of the site other than trespassing. However, a contingent remedy is included in case institutional controls to restrict future are not implemented and a residential cleanup is required."</p>

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51	30	5.2	3rd bullet	Define what is meant by "minor" risks and revise the sentence to read" to vermivorous birds and mammals exist in ... " Risks are present for a variety of birds and mammals within this feeding guild, not just shrews and robins.
52	31	5.2	4th Bullet	Since groundwater is classified as a 2A aquifer, it must be protected for this use, as presented in N.J.A.C 7:9C-1.2, which states, “[i]t is the policy of this State to restore, enhance and maintain the chemical, physical, and biological integrity of its waters, to protect public health...and to enhance the domestic, municipal, recreational, industrial and other uses of water.” Therefore, the fourth bullet on Page 31 should be deleted. The fact that the Site groundwater is not reasonably anticipated to be used as a potable source does not obviate the requirement to protect it for this purpose.
53	32	5.2		What is “Monitoring of containment technologies/cover integrity”? Is this an inspection? This seems like a component of all remedies rather than a stand-alone technology.
54	34	5.2.2	11th Bullet	Why was enhanced reductive dechlorination retained? It doesn’t seem to be an ideal treatment technology for the site since it exclusively targets chlorinated compounds.
55	35	5.3	1st Bullet	Note that the FS is very prescriptive on the amount and locations of APCs on the site. Please add language stating that the APCs are approximate and need further delineation in future studies, pending approval of the ARS memo.
56	35	5.3	1st Bullet	Please provide a table that lists the Areas of Particular Concerns (APCs), and summarizes what COCs exceeded three times ARSs at the respective APCs. The table should also include any other reasons (such as a source for groundwater contamination) that the respective area is listed as an APC.
57	35	5.3	1	Please revise the third sentence in the first paragraph to read: "Based on the results of the BHHRA and BERA, and assuming institutional controls restricting future use are implemented, exposure to soil at the site poses unacceptable risks to trespassers." Also, delete the second to last sentence of this paragraph, and remove the word "Therefore" from the start of the next sentence.

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58	35			Please add a sentence after the two bullets on this page indicated that the extent of both the APCs and the non-vegetated areas will need to be refined during a pre-design investigation.
59	36	5.3.1		As discussed in the general comments, if necessary, a contingent soil remedy for potential future residential use will need to be added and carried through the rest of the document.
60	36	5.3.2		As discussed in the general comments, the groundwater alternatives presented are inappropriate and inconsistent with prior discussions. The descriptions and analyses will need to be revised throughout the rest of the document.
61	38	6		Item (4) under Primary Balancing Criteria: Please note that this criterion is “reduction of toxicity, mobility or volume through treatment.” Please revise.
62	39	6.1		Remove the second half of the paragraph starting with “There would be no additional risks...” The description for the soil and groundwater alternatives should be restricted the description of the alternatives, all comments regarding the effectiveness, implementability, protectiveness, and cost should be performed under the evaluation criteria. This comment should be incorporated into all alternative description.
63	39 - 41	6.1		Since the threshold criteria of Overall Protection of Human Health and the Environment is not met, evaluation of the remaining criteria is not required. As such, the entire section can be consolidated into 3 or 4 paragraphs (the intro, not protective of human health, not protective of ecological receptors and conclusion).
64	41 - 45	6.2		As currently described, Alternative 2 does not meet the threshold criteria of being protective of human health and the environment or compliance with ARARs. At a minimum, the engineering controls would need to include vegetative cover, as needed, to prevent exposure by ecological receptors. Additional specific comments about this alternative are provided below, and after re-evaluation a determination will need to be made about whether this alternative should be carried through.
65	41	6.2	1st (and Figure 6-1)	The proposed fence boundary doesn’t prevent access to the surface debris area or ponds. Please clarify how access will be restricted in this area.
66	42	6.2	1	Delete sentence describing this alternative as a sustainable approach.

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67	42	6.2.1		The current evaluation only focuses on risk reduction for human and ecological receptors. The evaluation must include protection of the environment, i.e., removal and/or containment of the contaminated soil to prevent it from becoming a source of groundwater contamination as stipulated in RAO #2. Please revise this section to include protection of the environment. This comment applies to subsequent sections of the report as well, as appropriate.
68	42	6.2.1	1st bullet	Since fence boundary doesn't prevent access to the surface debris area or ponds, this alternative doesn't eliminate exposure to all site risks. Revise accordingly.
69	43	6.2.3		The FS stated that Alternative 2 "will pose significantly lower residual risk than the magnitude that is evaluated in the BHHRA." The statement is incorrect. Alternative 2 only restricts access and would not change the residual risks on site. Correct the statement. Additionally, the long-term effectiveness of fencing and signage is moderate at best for human access, it is not effective for ecological receptors, especially for small burrowing mammals. This alternative is also not effective as source control. Please revise accordingly.
70	44	6.2.5	1st bullet	Remove the language on construction.
71	44	6.2.5	3rd bullet	States that with site controls, RAOs will be achieved upon completion of construction [of the fence] and filing of ICs, however, this action only achieves some of the RAOs.
72	45-57	6.3 and 6.4		State whether all excavated areas will be brought back to grade with clean fill or what will be done to the excavated areas?
73	45	6.3		Explain how existing vegetation would prevent or minimize direct contact risks for areas outside the Selected Area and APCs but contain contamination above the PRGs.
74	45	6.3		The FS states "Used in conjunction with Site controls, capping of the Selected Area would further reduce exposure to contaminated soil." This statement implies that fencing is the main protection of risk on site. This is incorrect as commented above. Re-phrase this sentence. Capping and remediation of the APCs would reduce the bulk of risks on site and achieve the RAOs.
75	45	6.3	2nd	All of the assumptions used in developing Alternative 3 are included in Table 6-3. A reference to this table should be added to this section, and, for ease of reading, maybe some key assumptions should be listed.

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76	45	6.3	2nd	Alternatives 3a and 3c each include excavation of APCs down to a maximum of 2 feet bgs. Please note that institutional controls should address disturbance of the soil in APCs below two feet. Also note that, as mentioned earlier, if impacts to groundwater are not mitigated once the soil remedy is in place, there may need to be additional soil excavation.
77	45	6.3	2nd	The text should explain why non-vegetated areas require attention (direct contact risk reduction).
78	45 - 46	6.3	2nd	The sentence at the end of the page starts, "Unlike in the Selected Area and APC cap(s), the seed mix used...." However, the restoration/seed mix to be used in the Selected Area and APC cap(s) is not previously described. Please add additional language for clarification.
79	46	6.3		Explain how the number of truck trips were derived. The text should include the estimated volume of excavation, both for the Selected Area and the APCs. Also, the alternative proposes capping of the Selected Area, not excavation of this area, but the text in this section suggests full excavation of the Selected Area will be conducted. Please clarify.
80	46	6.3		Remove the second half of the paragraph starting with "Cap construction and excavation..." to the appropriate evaluation section. Move the two sentences starting with "Cap construction and excavation..." to be under "Short-Term Effectiveness". Move the rest of the paragraph starting with "The relative cost of this alternative..." to be under "Cost".
81	46	6.3.1		Revise this section and subsequent sections related to alternative descriptions and evaluation. The current evaluation emphasizes fencing as the main risk reduction mechanism, which is not true. Capping of the selected areas, remediation of the APCs, and covering the non-vegetated areas are the main mechanisms in reducing direct contact risks and achieving source controls. Fencing is just a supplemental component of this alternative (and also under Alternatives 4-5). The evaluations (and description) should reflect this consideration.
82	46	6.3	2nd	Why would capped areas be revegetated with non-native grasses? Revegetation should use compatible species to the native plants.
83	47	6.3.2		The evaluation of compliance with ARARs are too vague under this alternative (and other alternatives). Discuss how (through what mechanism) this alternative would comply with the ARARs, including achieving the RAOs and PRGs.

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84	47	6.3.3		Revise the evaluation under “Adequacy and Reliability of Controls”. The main mechanism for protection under this alternative is capping and excavation. Site controls is a supplementary component of this alternative. Fencing and site access control alone is marginally effective at best.
85	48	6.3.4		Capping, even though not a treatment technology, will reduce the mobility of the contaminants, thus providing protection to the environment (achieving source control).
86	48	6.3.5		Provide calculations to justify the numbers of truck trips.
87	49	6.3.5	1st Bullet	Why would capped areas be revegetated with non-native grasses? Revegetation should use compatible species to the native plants.
88	49	6.3.5	2nd bullet	This action will achieve only some of the RAOs upon completion of construction. More detail is needed here.
89	51-57	6.4		See comments related to Alternative 3 on Section 6.3 and apply to Alternative 4, as appropriate.
90	52	6.4	1st	The number of truck trips estimated for the alternative is lower than that for Alternative 3. This does not make sense. Please review accordingly.
91	54	6.4.4		Excavation of Selected Area will reduce the volume and toxicity of contaminants on site. Capping of APCs, even though not a treatment technology, will reduce the mobility of the contaminants, thus providing protection to the environment (achieving source control).
92	54	6.4.5		Provide calculations to justify the numbers of truck trips.
93	55	6.4.5		Revegetation should use compatible species to the native plants. Also, in the same paragraph, provide the acreage of wetland to be disturbed, excluding the transition areas.
94	57-64	6.5		See comments on Sections 6.3 and 6.4 and apply, as appropriate.
95	60	6.5.5		The FS states “Minimal soil disturbance will help mitigate community and ecological impact, since no hauling of impacted materials from the Site is included in this alternative.” This statement is incorrect. To prepare for capping, the site will need to be cleared and grubbed, and regraded. All ecological habitat features will be removed except where it is designated to be protected. Revise accordingly.

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96	61	6.5.6		Under “Ease of Undertaking Additional Remedial Action, If Necessary”, please note that removing the capping system, even a small area, will be a major undertaking due to the multi-layer cap. Under “Ability to Monitor Effectiveness of Remedy”, monitoring of the effectiveness should also include discussion on whether the cap has achieved source reduction, rather than just contact risk.
97	62-64	6.6		Please incorporate any necessary changes based on comments on Sections 6.2 to 6.5.
98	63	6.6.2	Soil Tables	Text says Alternative 2 will not be meeting Chemical Specific ARARs, but the Soil Table (executive summary and Section 8) score Alternative 2 as “Good” in the compliance category. It seems it should be “poor.” Please clarify
99	64	6.6.4		Capping and excavation with off-site disposal under Alternatives 3, 4, and 5 would reduce the mobility and/or volume of the contaminants while Alternative 2 would not change TMV. Revise the evaluation accordingly.
100	64	6.6.6	Soil Tables	Implementability of Alternative 5 is expected, per the text, to be more difficult, yet on the Soil Table it still scored ‘excellent’ in this category. This seems to be a discrepancy. Revise accordingly.
101	65	6.6.8		Alternative 2 would not meet the chemical-specific ARAR and the PRGs, a threshold criterion. Alternative 2 would also not meet the RAO of preventing contaminated soil from continually contaminating groundwater and surface water. Alternatives 3 through 5 would comply with ARARs and achieve the RAOs. Revise the evaluation accordingly.
102	66-85	7		As explained in the general comments, Section 7, related to the Groundwater Remedial Alternatives, will need to be completely reworked. Overall this section should be set up as a contingent active groundwater remedy after a period of monitoring following any soil actions. Please keep in mind specific comments made to Section 6 when re-writing this section. Also, specific comments on existing portions of Section 7 are provided below to help guide your revision, but may need to be altered somewhat to be consistent with the revised remedy.
103	66-85	7		Throughout the remedial groundwater alternatives, develop and discuss a more quantitative description of the source area which relies on a contaminant level or other definable metric. The focus on the TP-09 area exclusively is not appropriate.
104	66			As mentioned before, “future use of the site will not include any development” is too definitive. Please revise accordingly.

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105	68	7.2	1st	Methods of source control should be described or discussed here (they are implied and mentioned later in the section as excavation or capping).
106	69	7.2		The document states, "After this potential source area has been remediated and the selected soil remedial actions are implemented, groundwater will be monitored to observe whether COC concentrations in groundwater are stable or decreasing. If COC concentrations increase or migration away from the landfill is observed, additional remedial actions could be employed." Approximately how long will the site be monitored before a determination on the effectiveness of the remediation is made?
107	69	7.2		The description of the alternative states that "Remediation of the test pit TP-09 area is anticipated to take place during the remedial action for soil (unless soil Remedial Alternative 1 – No Action, is selected)." This statement is incorrect. Soil Alternative 2 also has not included any source control measures. Currently, the document only discusses excavation down to 2 feet bgs. In addition, as mentioned in the general comments, source control measures may be needed at other areas of the site.
108	69	7.2		The last paragraph of this section should be moved to the appropriate evaluation sections.
109	69	7.2.1		The evaluation only focused on protection of human and ecological receptors. Protection of the environment, i.e., restoration of the groundwater (RAO #4) should also be evaluated under this criterion. The alternative must be evaluated to see if it meets the PRGs and achieve the RAOs. Revise accordingly.
110	69	7.2.1	1	As mentioned before, "future use of the site will not include any development" is too definitive. Please revise accordingly.
111	70	7.2.2		The FS states that "Concentrations of organic COCs (benzene and 1,4-dioxane) in groundwater are expected to decrease and meet the chemical Specific ARARs." However, this statement will be true only if Soil Alternatives 3, 4, or 5 is selected. Additionally, concentrations of metals would remain above the PRGs. Revise accordingly.
112	70	7.2.3		This alternative should not include source control evaluation. Source control would be selected and conducted under the soil remedies and this alternative has no control of the outcome. As such, source control evaluation should be performed under the soil remedies. This alternative would only prevent use of groundwater and would not contribute to the restoration of groundwater. Revise accordingly.
113	70	7.2.2	1st bullet	Is there an estimated timeframe until compliance with ARARs?

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114	70	7.2.3	1st bullet	If the method of source control includes capping, the cap will likely need to be impermeable to prevent infiltration and a continuing source of contamination to groundwater.
115	71	7.2.4		Remove the source control discussion under “Degree of Expected Reduction in TMV”. Source control may be performed under soil remedy, depending which soil alternative is selected. This alternative provides no source control. Revise accordingly.
116	71	7.2.5		Remove the source control discussion under this criterion. Source control may be performed under soil remedy, depending which soil alternative is selected. This alternative provides no source control. Revise accordingly.
117	72	7.2.6		Remove any reference to source control under this criterion. Source control may be performed under soil remedy, depending which soil alternative is selected. This alternative provides no source control. Revise accordingly
118	72	7.2.6	4th Bullet	“...to indicate how COC concentrations are decreasing.” Please replace ‘decreasing’ with ‘responding,’ as it’s not yet known if concentrations will decrease.

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119	73	7.3		<p>The treatment technologies proposed in this alternative need to be viable for site COCs, as well as more detailed descriptions of the enhanced bio and chemical treatments themselves. As part of this, there should be discussions about what treatment technology will target which COC, where, how and which chemicals will be used, and how successful it might be. There also needs to be some evidence that, if chosen, the remedial alternative will be functional in the site setting. The FS is going to be the basis of the proposed plan and ROD, and those documents cannot be based on unsupported conclusions. Timeframes for compliance with ARARs will also need to be developed. For instance:</p> <ul style="list-style-type: none"> • Enhanced reductive dechlorination is listed as a biological treatment option. The first issue with this technology is that it is most effective and most commonly used on chlorinated compounds (PCE, TCE), but this Site doesn't have prevalent chlorinated contamination. The second issue with this is that other lines of evidence would be needed to show that the aquifer could even support or sustain enhanced reductive dechlorination – i.e. are the right microorganisms present? How long will it take to meet GWQS with this approach? These arguments need to be presented for each technology and applied to the site COCs. • Aerobic bioremediation is another listed treatment option. What contaminants would this target? It was stated in the Supplemental Groundwater Investigation Report that benzene appears to be degrading anaerobically. Assuming the aerobic bioremediation is meant to target benzene, is the necessary geochemical change implementable? Why was aerobic selected over anaerobic? <ul style="list-style-type: none"> o If the aerobic bioremediation was intended to target 1,4-dioxane, that is contradictory to the Supplemental Groundwater Investigation Report which states that anaerobic degradation of 1,4-dioxane may be occurring. • Phytoremediation is the third listed treatment option. What contaminants would be treated with this? Is phytoremediation a viable technology for this site, with depth to groundwater approximately 6 ft bgs? Other than one cost estimate including 40 trees for phytoremediation, no specific assumptions for bioremediation or chemical remediation are discussed.
120	73	7.3.1	1	As mentioned before, “future use of the site will not include any development” is too definitive. Please revise accordingly.
121	73	7.3	1st	Typo in parenthetical note – amend from reductive chlorination to reductive dechlorination

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122	73	7.3	1st	Remove parenthetical note about metals and PCBs since the preliminary RAO is groundwater restoration.
123	74	7.3.2		The FS states “It is anticipated that the majority of groundwater COCs will be treated through a selected biological treatment and some PCBs and metal COCs in groundwater by natural processes.” Provide case studies to justify the statement regarding biological treatment of VOCs and natural processes of PCBs and metals.
124	74	7.3.3		Provide case studies to demonstrate the treatment will be effective. There is no evidence that the statements “there is low residual risk for this alternative” and the technologies “are adequate and reliable” are true. These are very general and blanket statements. Provide justifications.
125	74	7.3.2	1st bullet	What natural processes will treat PCBs?
126	74	7.3.4	2nd bullet	Will treatment only be targeted at MW-3 as indicated here? There are other locations that will likely need to be addressed for groundwater concentrations to comply with ARARs.
127	75	7.3.4		The evaluation under “Type and Quantity of Residuals Remaining after Treatment” is very general and not supported. Provide evidence to justify the evaluation.
128	75	7.3.4	1st bullet	States that biological treatments will affect 1,4-dioxane concentrations. Please provide more detail to support this statement.
129	76	7.3.6		Under the “Reliability of the Technology” evaluation criterion, the FS states “Enhanced reductive dechlorination, aerobic bioremediation, and phytoremediation are widely used and reliable technologies to control contaminated groundwater.” The statement may be true in general, but the key question is “are the technologies effective for the site contaminants?” Both benzene and 1,4-dioxane are not amenable to reductive dechlorination (Note: both COCs have no chlorine in the molecular structure).
130	76	7.3.6	4th Bullet	This states that long-term monitoring will occur downgradient of MW-3. It should be clarified that this is not the only location that will be subject to monitoring.
131		7.4		Section 7.4 general: The treatment technologies proposed in this alternative (in-situ chemical reduction or oxidation) need to be viable for site COCs. As part of this, there should be discussions about what treatment technology will target which COC, where, and how successful it might be. There also needs to be some evidence that, if chosen, the remedial alternative will be functional in the site setting. The FS is going to be the basis of the proposed plan and ROD, and those documents cannot be based on unsupported conclusions.

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132	78	7.4		Provide case studies to demonstrate the effectiveness and implementability of the proposed technologies. Additionally, in-situ chemical reduction was not part of the retained technology but is included in here. Provide justifications (why it is effective) of its inclusion. Remove the second paragraph to the appropriate evaluation section.
133	78	7.4.1	1	As mentioned before, “future use of the site will not include any development” is too definitive. Please revise accordingly.
134	78	7.4.2		The evaluation of compliance with ARARs are too vague under this alternative (and other alternatives). Discuss how (through what mechanism) this alternative would comply with the ARARs, including achieving the RAOs and PRGs.
135	79	7.4.3		Under “Adequacy and Reliability of Controls”, the FS states that “Site-specific factors, such as the presence of organic material in the landfill waste, may hinder the effectiveness of chemical reactants, potentially rendering this approach ineffective.” Provide case studies to demonstrate the effectiveness of this alternatives.
136	79	7.4.4		The FS states that the degree of expected reductions in TMV through this treatment alternative is moderate to high, and the chemical treatment is anticipated to be effective in reducing concentrations in the groundwater and the residual concentrations is anticipated to be below target levels. These statements are contradictory to the evaluation under Section 7.4.3 and there are no justifications for these statements. Provide supporting justifications (such as case studies) to demonstrate the effectiveness of the treatment technology and its ability to achieve the PRGs and RAOs.
137	79	7.4.4		The FS states “The anticipated quantity of residuals after treatment is marginal.” It is unclear the meaning of this statement. Please clarify.
138	79	7.4.4	2nd bullet	Will treatment only be targeted at MW-3 as indicated here? There are other locations that will likely need to be addressed for groundwater concentrations to comply with ARARs.
139	81	7.4.6	3rd bullet	This states that long-term monitoring will occur downgradient of MW-3. It should be clarified that this is not the only location that will be subject to monitoring.

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140	82	7.5.1	1	As mentioned before, “future use of the site will not include any development” is too definitive. Please revise accordingly.
141	83	7.5.2		Alternatives 2, 3, and 4 ‘include measures to reduce COC concentrations in groundwater,’ but the alternatives are not designed to target all COCs and exceedances of ARARs, and no estimated time until compliance has been calculated. Please justify.
142	84	7.5.8		Remove the statement regarding source control under alternative 2.
143	84	7.5.5		In the text, the short-term effectiveness of Alternatives 3 and 4 are nearly identical, but the conclusions in the Groundwater Summary Table are different. Please correct the discrepancy.
144	85	7.5.6		In the text, the implementability of Alternatives 3 and 4 are nearly identical, but the conclusions in the Groundwater Summary Table are different. Please correct the discrepancy.
145	86-89	8		Section 8 will need to be revised to reflect previous comments.
146	86	8		Please revise to "subslab gas and indoor air."
147	87	8	Table on page	“Overall protection” for Alternative 2 should be moderate at best as it has no source control. Also, “Compliance with ARARs” for Alternative 2 should be moderate at best as it will not comply with chemical-specific ARARs. Also, remove the phrase in the first full paragraph “good overall protection and compliance with ARARs” for Alternative 2. Alternative 2 has no source control and does not comply with chemical-specific ARARs.
148	88	8	Table on page	“Overall protection” for Alternative 2 should be moderate at best as it has no source control or treatment of contaminated groundwater. Also, “Compliance with ARARs” for Alternative 2 should be poor as it will not provide treatment of groundwater and will not comply with chemical-specific ARARs. “Reduction of TMV” for Alternative 2 should be poor as it has no treatment of groundwater. Also, remove the phrase in the first full paragraph “good overall protection and excellent compliance with ARARs” for Alternative 2. Alternative 2 has no source control, not treatment of groundwater, and does not comply with chemical-specific ARARs.
149	46-47	6.3.1		Under this evaluation criterion, the FS should also evaluate protection of the environment such as control or removal of the contaminated soil serving as a source of groundwater contamination (RAO #2 source control). This is part of the RAOs that must be met.

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150	55-56	6.4.6		The evaluation of Alternative 4 under several subcomponents of Implementability is not reflective of Alternative 4, which is excavation and offsite disposal, not capping, of the selected area. It appears that the text is copied from Alternative 3 without corrections. Please revise.
151	57-58	6.5		Remove all evaluations to the appropriate sections from the alternative description section.
152	62-63	6.6.1		The comparison of the alternatives should include if the alternatives achieve source control, not just direct contact risks. As is, Alternative 2 would not achieve source control. The contaminants in the impacted soil and wastes would continue to migrate to groundwater and surface water off-site.
153	78-79	7.4.3		Under “Magnitude of Residual Risk” evaluation, provide sufficient evaluation of treatment to justify the statement. Define “moderate residual risk” and provide justifications.
154	80-81	7.4.6		Provide justification of the reliability of the technology in view of the comments made under Section 7.4.3.
155		Figure 1-2 & other figures		Clarify if Note 1 should be applied to Hunt Club area as it was shown on figure 6-1 but not on the other figures.
156		Figure 2-1		The tan highlight for the south end of the landfill as part of the GNSWR should also include the dashed circle area. That area is part of the GNSWR.
157		Figure 6-2		How the boundary for the selected area was defined need to be provided? This information should be provided in Appendix B or in Section 4.3 on page 26. Also, the yellow highlight for the non-vegetated areas is hard to read in this figure. Select a different color for easier reading.
158		Figure 7-1		This figure shows the potential source area to be removed. However, source control is not under the groundwater alternatives. Rather, source control is under soil Alternatives 3 through 5. As a result, show the source removal under the soil alternative figures instead.
159		Tables for Construction Cost Estimate for Alternatives		Include assumptions as to what and how much amendment will be used and how they will be installed.

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		3(a,b) and 4(a,b)		
160		Table 4-1 and 6-1		Two important applicable chemical-specific ARARs are missing from the ARAR table (Table 4-1 & 6-1): i. RCRA Groundwater Protection Standards and Maximum Concentration Limits, 40 CFR 264, subpart F, which regulates release from the solid waste management unit (i.e., the landfill) and specifies the groundwater protection standards ii. NJDEP Groundwater Quality Standards NJAC 7:9C. All groundwater in NJ must comply with this regulation.
161		Table 4-1		The following NJAC requirements should be considered Applicable ARARs: NJ Technical Requirements for Site Remediation (NJAC 7:26C), Administrative Requirements for the Remediation of Contaminated Sites (NJAC 7:26E), Additional Specific Disposal Regulation for Sanitary landfills NJAC 7:26-2A), NJ solid Waste Rules (NJAC 7:26), NJ Storm Water Management Rules (NJAC 7:8), NJ Pollution Discharge Elimination System Rules (NJAC 7:14A), and NJ Remediation Standards (NJAC 7:26D). Additionally, the following applicable chemical-specific ARARs should be added: RCRA Groundwater Protection Standards and Maximum Concentration Limits (MCLs) (40 CFR 264, Subpart F) and NJ Groundwater Quality Standards (NJAC 7:9C).
162		Table 4-2		There is a Federal lead remediation guideline of 800 mg/kg for non-residential use. This number should be considered in the PRG development.
163		Table 4-2		the PRG for PCBs is 5 mg/kg in Table 4-2. However, the RBC for PCBs is 10 mg/kg in Appendix B and the Selected Area was established based on the RBC of 10 mg/kg. Explain the discrepancy.
164		Table 4-2		The use of "NA" for compounds that alternative remediation standards were developed in the column NJDEP Non-Residential Direct Contact Soil Remediation Standards (NRDCRS) can easily be misunderstood as if those compounds do not have NRDCRS. Include the NRDCRS for those compounds in the table.
165		Table 4-3 & 4-4		Please note that there is a Federal lead remediation guideline of 200 mg/kg for residential use. This number should be considered in the PRG development.

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166		Table 6-1		Revise the status column to be consistent with Table 4-1. Also include the two additional chemical-specific ARARs in this table.
167		Table 6-1		Alternative 2 must comply with NJ Technical Requirements for Site Remediation and Administrative Requirements for the Remediation of Contaminated Sites as these two are applicable ARARs.
168		Table 6-3		Revise the term “final Closure Cap” in this table. This term was not use in the FS report.
169		Table 6-8		Revise this table per the comments in the report, in particular: a. there should be a third sub-criterion “protection of the environment” under the overall protection criterion; b. Alternatives 3, 4, and 5 all provided reduction of the mobility or volume through capping or excavation and offsite disposal; c. The rating for alternative 2 should be lower as it does not provide protection to the environment, not comply with chemical-specific ARARs, and will not achieve RAOs; d. There should not be any ranking of the cost. The estimated costs should be included in this table instead
170		Table 7-1		The “Status” column should be revised to reflect the comments on Table 4-1. Also include the two additional chemical-specific ARARs in this table.
171		Table 7-3		Revise the title of this table to indicate the table is for the groundwater alternatives.
172		Table 7-6		Revise this table per the comments in the report, in particular: a. there should be a third sub-criterion “protection of the environment” under the overall protection criterion; b. The rating for alternative 2 should be much lower as it does not provide protection to the environment (no source control), not comply with chemical-specific ARARs, and will not achieve RAOs; c. There should not be any ranking of the cost. The estimated costs should be included in this table instead.
173		Appendix B, Page 2	2	A statement and figure should be added to verify that any areas exceeding the ecological-risk based standards are co-located with areas that will be addressed by either the extent of the cap indicated by the human-health based calculations described in this appendix, and/or through the remediation of other Areas of Particular Concern. In other words, add a statement and figure making clear that the approach described will be protective of ecological receptors as well.

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174		Appendix B, Page 2	3	Replace "will not continue" with "are assumed to not continue" in the first sentence of this paragraph.
175		Appendix B, Page 4	3	Please add a sentence to the conclusion section stating that the extent of the Selected Area may be modified based on pre-design investigation sampling conducted during the remedial design.