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**RESPONSE TO USEPA AND OEPA COMMENTS FOR OPERABLE UNIT 1
FEASIBILITY STUDY REPORT JULY 1994**

06/30/94

**DOE-FN EPA
135
RESPONSES**

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**RESPONSE TO
USEPA AND OEPA COMMENTS
FOR OPERABLE UNIT 1
FEASIBILITY STUDY REPORT**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO**

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY



JULY 1994

**U.S. DEPARTMENT OF ENERGY
FERNALD FIELD OFFICE**

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FOREWORD

This document provides responses to U.S. Environmental Protection Agency (EPA) and Proposed Plan (PP) and Ohio EPA (OEPA) comments on the March 1994 Draft Feasibility Study (FS) Report for Operable Unit 1 at the U.S. Department of Energy (DOE) Fernald Environmental Management Project (FEMP). In total, 197 comments were received. Of these, 130 were made by the EPA, and 67 were made by the OEPA. The following is a "user's guide" of the rationale used to develop this comment response document and an overview of how the responses to the comments from both agencies are presented in the July 1994 Draft Final FS and PP. The comment response document is submitted along with the Draft Final FS and PP.

Comment Response Document Organization. Responses are provided to OEPA comments (1-67), followed by responses to EPA comments (68-197). All comments have been re-numbered, sequentially, in the order of receipt. Within each group of OEPA and EPA comments, the comments are organized by section of the Draft Final FS and then by section of the Draft Final PP. This format is designed to facilitate simultaneous review of the comment response document and the Draft Final FS and PP.

A comment number cross-reference list is provided at the end of this introduction. OEPA comments 1-67 retain their original numbering. For EPA comments 68-197, this cross-reference also identifies each original EPA comment number and its corresponding page number of the EPA comment package. The list also identifies the commentor, section and page number where the subject of the comment appeared in the March 1994 Draft FS and/or PP, the code identifying the weight of the comment (M = major comment; C = clarification needed; and E = editorial), and a brief description of the subject.

Each comment and response has four components:

- The comment "header" (commenting organization, commentor, section number, page number, line number, code, and original comment number in parentheses). The reference location in the comment header refers to the appropriate text, table, and/or figure, and the corresponding section/page/line of the March 1994 Draft FS and/or PP.
- The agency comment, unedited.

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- The narrative response, beginning with the DOE disposition on the comment (agree, partially agree, disagree, comment acknowledged).
- The action statement that identifies the substantive revisions made as a result of the comment. The specific change(s) made to the corresponding text in the Draft Final FS and/or PP are identified, to the extent practical. Each action statement identifies the new location of the changes in the text, table, or figure in the July 1994 Draft Final FS and/or the PP. It is important to note that revisions and insertion of figures and tables into the text have caused the page numbers to shift.

FS Revisions. To the extent appropriate, EPA and OEPA comments, EPA and OEPA recommendations to other FEMP operable units, and internal quality checks have been considered in the development of this comment response document and the July 1994 Draft Final FS and PP. In keeping with the precedent set in the Operable Unit 1 Remedial Investigation Report, all substantial (non-editorial) revisions or additions to the March 1994 Draft FS and PP have been shaded in the accompanying July 1994 Draft Final FS and PP submittal. Shaded areas indicate revisions or additions to text and tables that resulted from EPA and OEPA comments, are ancillary text corrections, or provide further clarification of major conclusions. An Executive Summary has been added to the Draft Final PP; for the reader's convenience it has not been shaded. Accompanying each shaded area is the number of the comment that the shaded text addresses, if applicable. The designation "DOE" is used to identify DOE-initiated revisions such as error corrections in the costs and changes resulting from the RI change pages. Some text deletions have been made either in response to specific comments, to fix editorial or format errors, or to clarify central issues. To avoid confusion and retain the overall readability of the FS and PP documents, deletions are not shown.

Revisions to tables are shaded; however, no comment numbers are provided on tables in order to preserve clarity of the data provided. This represents a change from the procedure followed during the RI revision. Revisions to figures are not shaded in the revised FS and PP, in order to preserve the clarity of the information presented.

Revisions Resulting from Internal Quality Check: Internal quality control checks of both the FS and PP were made, prompted by internal quality control procedures and by several comments. For example, in response to a comment, all references to figures, tables, and previously cited data were thoroughly cross-checked. Following is a list of revisions to the July 1994 Draft Final FS and PP that were not identified or referenced in specific comments:

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- Revisions necessitated by the Draft Final Operable Unit 1 Remedial Investigation Report change pages that were submitted on May 4, 1994.
 - Minor editorial revisions (grammar, punctuation, etc.)
 - Some cost figures have been revised in response to the identification of incorrect quantities and rates used in the March 1994 Draft Feasibility Study Report. In response to specific comments, all cost figures have been checked to ensure consistency between the basis for all remedial action costs (Tables E.2-1 and E.4-1) and FS and PP text references to cost. Changes to total capital and present worth costs for Remedial Alternatives 4A, 4B, and 5B are summarized in the following table:

**SUMMARY OF CHANGES
TO THE OPERABLE UNIT 1 FEASIBILITY STUDY COST ESTIMATE**

Remedial Alternative	Previous Costs ^a		Current Costs ^b		Reason for Change
	Total Capital	Present Worth	Total Capital	Present Worth	
4A	\$639,094,175	\$446,690,000	\$654,852,965	\$457,740,000	Incorrect quantities of vitrification additives identified in previous version of the FS. The quantities for both silica sand and sodium carbonate flux have increased from 90,000 to 114,500 tons each.
4B	\$504,195,700	\$388,609,000	\$525,063,363	\$404,903,000	Incorrect quantities of cementation additives identified in previous version of the FS. The quantity of cement has increased from 500,000 to 687,000 tons, while the quantity of fly ash has increased from 250,000 to 344,000 tons.
5B	\$457,773,376	\$348,202,000	\$513,050,560	\$389,509,000	Incorrect transportation rate used in previous version of the FS. The rate for transporting a single 75-ton gondola car loaded with waste from the FEMP to Envirocare increased from \$1,650 per rail car to \$4,850 per rail car.

^aDraft Final Feasibility Study Report for Operable Unit 1, March 1994

^bDraft Final Feasibility Study Report for Operable Unit 1, July 1994

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Comment*	Org.	Commentor	March FS Revision		Code	Description
			Section	Page		
1	O	OFFO	General		C	Figures & Tables
2	O	GeoTrans	ES	ES-4	C	Cost & Schedule
3	O	OFFO	ES	ES-5	C	Soil
4	O	DDAGW	1.2.1	1-16	C	Groundwater
5	O	DDAGW	1.2.3.4	1-39	C	Editorial
6	O	GeoTrans	1.2.3.4	1-36	C	QC
7	O	GeoTrans	1.2.3.4	1-40	E	Editorial
8	O	GeoTrans	1.2.4	1-42	G	Groundwater
9	O	OFFO	1.2.5.2	1-52	C	Risk Assessment
10	O	OFFO	2.2.2.4	2-13	C	Risk Assessment/PRGs
11	O	OFFO	2.2.2.4	2-14	C	ARARs
12	O	OFFO	2.2.2.5	2-16	C	Risk Assessment
13	O	OFFO	2.2.2.6	2-18	C	Risk Assessment
14	O	OFFO	2.2.3.1	2-20	C	Risk Assessment
15	O	OFFO	2.2.4	2-22, 2-23	C	Risk Assessment
16	O	GeoTrans	2.3	2-24	C	Admin. Controls & Monitoring
17	O	DDAGW	2.4.4.1	2-29	C	Groundwater
18	O	GeoTrans	2	2-31	C	Vegetative Cover
19	O	GeoTrans	2	2-31	C	Groundwater
20	O	OFFO	2.4.6.4	2-37	C	Editorial
21	O	GeoTrans	2.5.4.2	2-49	E	Groundwater
22	O	GeoTrans	2.5.4.2	2-51	C	Cost
23	O	GeoTrans	2.5.6.3	2-59	E	Cost
24	O	GeoTrans	2.5.7.1	2-61	C	Administrative Feasibility
25	O	GeoTrans	2.5.7.1	2-61	C	Cost
26	O	OFFO	Table 2-13	2-86	C	Consistency of COC lists
27	O	OFFO	Table 2-17	2-96	E	Editorial
28	O	OFFO	Table 2-19	2-99	E	Editorial
29	O	OFFO	Figure 2-2	2-102	E	Figure
30	O	GeoTrans	2	2-99	C	Technical Feasibility
31	O	GeoTrans	2	2-100	E	Figure
32	O	GeoTrans	3.1	3-2	E	Editorial
33	O	OFFO	3.2.3.3	3-10	C	Soil
34	O	GeoTrans	3.3	3-11	C	Editorial
35	O	GeoTrans	3.3.1	3-12	E	Editorial
36	O	OFFO	3.3.3.1	3-22	E	Editorial
37	O	OFFO	3.3.4.1	3-28	C	VIT
38	O	GeoTrans	3.3.4	3-29	C	On-site Disposal - Tech. Feasibility
39	O	OFFO	3.3.5.1	3-35	C	Solidification - Tech. Feasibility
40	O	GeoTrans	3.3.5	3-38	C	Solidification - Tech. Feasibility
41	O	GeoTrans	4.1.2.4	4-6	C	Residuals - Treatment
42	O	OFFO	4.1.2.4	4-6	C	Drying - Treatment
43	O	GeoTrans	4.1.2.5	4-7	C	Treatment
44	O	GeoTrans	4.3.1	4-12	C	Drying Treatment
45	O	GeoTrans	4.3.1	4-12	C	Excavation
46	O	OFFO	4.3.1	4-13	C	Rubble & Decontamination
47	O	OFFO	4.3.1	4-14	C	Paved Ramp Decontamination

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Comment*	Org.	Commentor	Section	Page	Code	Description
48	O	OFFO	4.3.1	4-14, 4-15	C	Excavation
49	O	OFFO	4.3.1	4-20	C	Excavation
50	O	DDAGW	4.3.2.2	4-25	C	Groundwater - Point of Compliance
51	O	DDAGW	4.3.2.2	4-25	C	Groundwater
52	O	OFFO	4.3.2.2	4-25	C	Groundwater - Point of Compliance
53	O	DDAGW	4.3.2.2	4-27	C	On-site Disposal
54	O	OFFO	4.3.2.3	4-32	C	VIT - Technical Feasibility
55	O	OFFO	4.4.1	4-57	C	Solidification - Technical Feasibility
56	O	OFFO	4.6.1	4-88	C	Off-site Disposal
57	O	OFFO	Table 4-3	4-109	C	Cost
58	O	OFFO	Table 4-4	4-110	C	Cost
59	O	OFFO	Table 4-5	4-111	C	Cost
60	O	GeoTrans	4	4-2	C	Solidification - Technical Feasibility
61	O	OFFO	PP	P-1-3	E	Editorial
62	O	OFFO	PP	P-1-3	C	FS/PP Cross-reference
63	O	OFFO	PP	P-4-2	C	Groundwater Contamination
64	O	OFFO	PP	P-5-2	C	Soils
65	O	OFFO	PP	P-6-7	C	Heterogeneity - Treatment
66	O	OFFO	PP	P-6-12	C	Off-site Disposal
67	O	OFFO	PP	P-7-1	C	Editorial
68 (1; pg. 2-1)	US	Saric	All	NA	M	Regulatory Format
69 (2; pg. 2-1)	US	Saric	All	NA	C	Off-site Disposal
70 (4; pg. 1-1)	US	Saric	All	NA		On-site Disposal
71 (5; pg. 1-2)	US	Saric	All	NA	E	Editorial
72 (6; pg. 1-2)	US	Saric	All	NA	E	Editorial
73 (1; pg. 1-2)	US	Saric	1.2.1	1-15	C	Groundwater
74 (2; pg. 1-2)	US	Saric	1.2.3.4	1-36 to 1-39	C	Groundwater
75 (3; pg. 1-3)	US	Saric	1.2.3.4	1-37	E	Editorial
76 (4; pg. 1-3)	US	Saric	1.2.4.3	1-45	E	Units of measure
77 (5; pg. 1-3)	US	Saric	1.2.5.2	1-53	C	Contaminants
78 (6; pg. 1-3)	US	Saric	2.2.2.1	2-10	E	Editorial
79 (1)	US	v. Leeuwen	2	2-20	M	R. A. Methodology
80 (2)	US	v. Leeuwen	2	2-21	M	Contaminants R. I.
81 (3)	US	v. Leeuwen	2	2-21	M	Contaminants R. I.
82 (4)	US	v. Leeuwen	2		M	R.A. Methodology
83 (7; pg. 1-3)	US	Saric	2.2.3.2	2-22	C	Contaminants R. I.
84 (8; pg. 1-4)	US	Saric	2.2.4	2-23	C	Cleanup levels
85 (9; pg. 1-4)	US	Saric	2.2.4	2-24	C	Contaminants
86 (10; pg. 1-4)	US	Saric	2.4.3.5	2-33	C	Excavation Technology
87 (11; pg. 1-4)	US	Saric	2.4.6.1	2-34	C	In situ VIT Technical Feasibility
88 (12; pg. 1-4)	US	Saric	2.5.3.1	2-46	E	Cost
89 (13; pg. 1-5)	US	Saric	2.5.4.3	2-50	C	Runoff Control
90 (14; pg. 1-5)	US	Saric	2.5.4.3	2-50	E	Cost
91 (15; pg. 1-5)	US	Saric	2.5.5.1	2-53	C	Conveyor Technical Feasibility
92 (16; pg. 1-5)	US	Saric	2.5.6.2	2-59	C	Solidification - Implementability
93 (17; pg. 1-5)	US	Saric	NA	2-70 to 2-72	C	ARARs
94 (18; pg. 1-6)	US	Saric	NA	2-82	C	ARARs

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Comment*	Org.	Commentor	Section	Page	Code	Description
95 (19; pg. 1-6)	US	Saric	3.2.1	3-3	E	Technology Screening
96 (20; pg. 1-6)	US	Saric	3.2.3.1	3-7	C	Physical Barriers
97 (21; pg. 1-6)	US	Saric	3.3.4.1 - 6.1	3-31 to 3-44	C	Remediation Time Frame
98 (22; pg. 1-7)	US	Saric	3.3.4.2	3-34	C	VIT Technical Feasibility
99 (23; pg. 1-7)	US	Saric	3.3.7.1	3-49	C	Transportation Container
100 (24; pg. 1-7)	US	Saric	NA	3-55 to 3-56	E	Technology Screening
101 (25; pg. 1-7)	US	Saric	NA	3-62	E	Graphics
102 (1; pg. 1-1)	US	Saric	3.0 and 4.0	NA	C	Off-Site Disposal
103 (2; pg. 1-1)	US	Saric	3.0 and 4.0	NA	C	Cost
104 (3; pg. 1-1)	US	Saric	4.0	NA	C	Graphics
105 (26; pg. 1-7)	US	Saric	4.3.1	4-16	C	Dryers/Graphics
106 (27; pg. 1-7)	US	Saric	4.3.2.2	4-27	C	On-Site Disp. Cell/Cultural Res.
107 (28; pg. 1-8)	US	Saric	4.3.2.5	4-42	C	Excavation/Dust Control
108 (29; pg. 1-8)	US	Saric	4.3.2.6	4-50	C	VIT/Technical Feasibility
109 (30; pg. 1-8)	US	Saric	4.4.2.3	4-60	C	Cement Stabilization/Treatability
110 (31; pg. 1-8)	US	Saric	4.4.2.4	4-62	C	Cement Stabilization/Treatability
111 (32; pg. 1-8)	US	Saric	4.4.2.6	4-65	C	Cement Stabilization/Feasibility
112 (33; pg. 1-9)	US	Saric	4.5.1	4-71	C	Temporary Storage
113 (34; pg. 1-9)	US	Saric	4.5.2.3	4-76	C	Borrow Area/Wetlands
114 (35; pg. 1-9)	US	Saric	4.6.1	4-89	C	Dust Collection Hood
115 (36; pg. 1-9)	US	Saric	4.8	4-105	C	Irreversible Commitmt. of Resources
116 (37; pg. 1-9)	US	Saric	4.8	4-105	C	Irreversible Commitmt. of Resources
117 (38; pg. 1-10)	US	Saric	NA	4-108 to -111	C	Cost/Operation & Maintenance
118 (39; pg. 1-10)	US	Saric	NA	4-115	E	Table
119 (40; pg. 1-10)	US	Saric	NA	4-116	C	Comparative Analysis/Variance
120 (41; pg. 1-10)	US	Saric	NA	4-119	C	Cost
121 (42; pg. 1-11)	US	Saric	NA	5-19	C	Environmental Impacts Table
122 (43; pg. 1-11)	US	Saric	NA	5-20	C	Environmental Impacts Table
123 (2; pg. E-1)	US	Saric	NA	NA	C	Caps Longevity
124 (5; pg. E-2)	US	Saric	NA	NA	E	Risk Assessment/References
125 (6; pg. E-2)	US	Saric	NA	NA	C	Risk Assessment/PRGs
126 (1; pg. E-2)	US	Saric	D.1.0	D-1-2	E	Risk Assessment/Tables & Figures
127 (2; pg. E-3)	US	Saric	D.2.2.1	D-2-2	C	Risk Assessment/CPCs
128 (3; pg. E-3)	US	Saric	D.2.2.2.2	D-2-3	E	Risk Assessment
129 (4; pg. E-1)	US	Saric	D.2.4	D-2-5, D-2-6	E	Risk Assessment/Tables
130 (4; pg. E-3)	US	Saric	D.2.2.4.1	D-2-6	E	Risk Assessment
131 (5; pg. E-3)	US	Saric	D.2.2.4.2	D-2-6	C	Risk Assessment & methodology
132 (6; pg. E-3)	US	Saric	D.2.2.4.2	D-2-6	C	Risk Assessment & methodology
133 (7; pg. E-4)	US	Saric	D.2.5.1	D-2-12	C	Exposure Scenario/R. A.
134 (3; pg. E-1)	US	Saric	D.2.6.1	D-2-15	C	Conceptual Model/R. A.
135 (8; pg. E-4)	US	Saric	D.2.6.1	D-2-16	C	Assumptions/R. A.
136 (9; pg. E-4)	US	Saric	D.2.6.2	D-2-18	M	Assumptions/R. A.
137 (10; pg. E-4)	US	Saric	D.2.6.2	D-2-16	M	CPC Selection/R. A.
138 (15; pg. E-6)	US	Saric	D.3.3.1	D-3-8	C	PRGs/R. A.
139 (16; pg. E-6)	US	Saric	D.3.3.1	D-3-8	C	Soil Concentrations/R. A.
140 (17; pg. E-6)	US	Saric	D.3.3.1	D-3-9	C	Parameters/R. A.
141 (18; pg. E-6)	US	Saric	D.3.3.1	D-3-12	C	D & D Risks/R. A.

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142 (19; pg. E-6)	US	Saric	D.3.3.1	D-3-13	C	Assumptions/R. A.
143 (20; pg. E-7)	US	Saric	D.3.3.1	D-3-13	C	D & D Risks/R. A.
144 (21; pg. E-7)	US	Saric	D.3.4.1	D-3-17	C	Risk Factor/R. A.
145 (22; pg. E-7)	US	Saric	D.3.4.2	D-3-18	C	Residual Exposures/R. A.
146 (23; pg. E-7)	US	Saric	Table D.3-2	D-3-20	C	Parameters/R. A.
147 (24; pg. E-8)	US	Saric	Table D.3-8	D-3-28	C	Parameter X/R. A.
148 (25; pg. E-8)	US	Saric	Table D.3-9	D-3-29	C	Soil Concentrations/R. A.
149 (26; pg. E-8)	US	Saric	Table D.3-13	D-3-34	E	Table/R. A.
150 (27; pg. E-8)	US	Saric	Table D.3-15	D-3-36	E	Table/R. A.
151 (28; pg. E-8)	US	Saric	D.4.1	D-4-1	E	Table/Text/R. A.
152 (30; pg. E-9)	US	Saric	Table D.4-1	D-4-6	C	Slope and Toxicity Factors/R. A.
153 (29; pg. E-9)	US	Saric	D.4.2	D-4-3	M	TEF/PAHs/R. A.
154 (5)	US	v. Leeuwen	D	D-4-3	M	Dermal Exposure PAH/R. A.
155 (31; pg. E-9)	US	Saric	D.5.1.1	D-5-1	C	Exposures/R. A.
156 (32; pg. E-9)	US	Saric	D.5.2.1	D-5-2	C	Groundwater Models/R. A.
157 (33; pg. E-10)	US	Saric	D.5.2.1	D-5-8	C	Table/Text/R. A.
158 (8; pg. E-2)	US	Saric	D.6.0	NA	C	Total Risk/Tables/R. A.
159 (36; pg. E-10)	US	Saric	D.6.1	D-6-1	C	Mechanical Hazard Comparison
160 (37; pg. E-10)	US	Saric	D.7.0	D-7-1	E	Table/Text/R. A.
161 (38; pg. E-10)	US	Saric	D.7.0	D-7-2	C	Exposure Routes/R. A.
162 (39; pg. E-11)	US	Saric	D.7.2	D-7-4	C	HIS/R. A.
163 (40; pg. E-11)	US	Saric	D.7.2	D-7-4	C	Expanded Trespasser Scenario
164 (41; pg. E-11)	US	Saric	D.8.2.1	D-8-4	C	Distance from Source/R. A.
165 (42; pg. E-11)	US	Saric	D.8.2.1	D-8-5	C	Assumptions/R. A.
166 (43; pg. E-11)	US	Saric	D.9.5	D-9-5	C	Summary Table/R. A.
167 (1; pg. E-1)	US	Saric	D.9.5	D-9-5	M	Total Risks/R. A.
168 (11; pg. E-5)	US	Saric	Table D.2-3	D-2-22	C	Text/Tables/R. A.
169 (12; pg. E-5)	US	Saric	Table D.2-9	D-2-28	C	Risk Criteria/CPCs/R. A.
170 (13; pg. E-5)	US	Saric	Table D.2-10	D-2-30	E	Table/R. A.
171 (34; pg. E-10)	US	Saric	Tables D.5-5, -6	D-5-14, D-5-1	E	Tables/R. A.
172 (35; pg. E-10)	US	Saric	Table D.5-7	D-5-16	C	Tables/R. A.
173 (14; pg. E-5)	US	Saric	Figure D.2-9	D-2-40	C	Figure/Text/R. A.
174 (7; pg. E-2)	US	Saric	Attachment I	NA	C	Attachment I Tables
175 (44; pg. E-12)	US	Saric	Attachment I	D-I-1 to D-I-3	C	PRG Development/R. A.
176 (45; pg. E-12)	US	Saric	Attachment I	D-I-4 to D-I-9	C	Tables/ R. A.
177 (46; pg. E-12)	US	Saric	Attachment I	D-I-28 to I-29	E	Attachment I/R. A.
178 (45; pg. 1-11)	US	Saric	Appendix E	NA	C	Cost
179 (46; pg. 1-12)	US	Saric	Appendix E	NA	C	Cost
180 (44; pg. 1-11)	US	Saric	Appendix E	NA	C	Cost
181 (47; pg. 1-12)	US	Saric	Appendix E	E-I-34	C	Cost
182 (48; pg. 1-12)	US	Saric	E-4.0	E-4-1, E-4-2	C	Cost
183 (49; pg. 1-13)	US	Saric	Table F.2-2	F-2-11 to 2-12	C	ARARs
184 (50; pg. 1-13)	US	Saric	Table F.2-2	F-2-13	C	ARARs
185 (51; pg. 1-14)	US	Saric	Table F.2-2	F-2-16	C	ARARs
186 (52; pg. 1-14)	US	Saric	NA	F-I-1 to F-I-3	C	ARARs
187 (1; pg. 2-1)	US	Saric	PP 2.2	P-2-2	E	Graphics
188 (1; pg. 1)	US	Saric	PP 3.2.1	P-3-2 to P-3-4	E	Glossary

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: General Comment Page #: Line #: Code: C
Original Comment #: 1

Comment: The document would be more user friendly if figures and tables were included within the text. DOE should revise the document to incorporate these into the text.

Response: Agree. The low number of figures and tables would enhance readability by incorporating figures and tables into the text of each section.

Action: Each figure and table has been relocated to follow its initial text reference within each section of both the Feasibility Study and the Proposed Plan. In addition, the following text was added to page ES-3, line 26, of the Proposed Plan: "Along with the clarification of technical and other information, this revised Proposed Plan incorporates figures and tables within the text of each section (rather than placing them at the end of each section).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: ES Page #: ES-4 Line #: 10 Code: C
Original Comment #: 2

Comment: This paragraph should indicate that the FS also presents information on remedial alternative costs and schedules.

Response: Agree. This summary paragraph should include remedial alternative costs and schedules.

Action: Page ES-4, line 12. The following text has been added: "...; and (6) remedial alternative costs and schedules."

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: ES Page #: ES-5 Line #: 1-6 Code: C
Original Comment #: 3

Comment: It is likely that soil in contact with and close proximity to the waste will be contaminated to a level more representative of waste than soil. These soils should be managed with the pit wastes rather than as soils under Operable Unit 5. It is unclear from the text whether the treatability studies under Operable Unit 5 will address the range of contaminants found within the waste pits and associated soils.

Response: Comment Acknowledged. Soil in close proximity to the pit waste, whether in the covers or beneath the pits, may be contaminated to levels representative of pit waste. If this is the case, the soil would be processed and disposed of as pit waste, either on site or off site, according to the alternative under discussion. However, less contaminated soils, specifically those amenable to waste management methodologies undertaken by Operable Unit 5, would be sent to Operable Unit 5.

Operable Unit 5 has taken the lead in evaluating remedial alternatives most appropriate for managing contaminated process area soils. The less contaminated soils from Operable Unit 1 are similar to the process area soils, and will be sent to Operable Unit 5 only if they are determined to be amenable to the Operable Unit 5 treatment and disposal methods identified for the process area soils. Ultimately, it is possible that all the soils associated with Operable Unit 1 pit waste could be processed as pit waste and shipped off site or disposed of on site in an engineered facility (depending on the alternative under discussion).

Action: **Page ES-4, line 35.** The text in the Executive Summary has been modified to clarify the flexibility of this approach. Specifically, language has been added to clarify that any surface and subsurface soils not amenable to Operable Unit 5 treatment and disposal methods will be disposed of as pit materials. The last bullet has been revised to read:

- "• Contaminated surface soil and soils beneath the waste pits. Proposed remediation levels will be established for the surface soils outside the pit covers and the soils beneath the waste pits; those soils contaminated above these levels will be excavated. Of the excavated soils, those soils contaminated to levels representative of pit waste would be processed and disposed of as pit waste, either on site or off site according to the alternative under discussion. However, less contaminated soils, and specifically those amenable to waste management methodologies undertaken at Operable Unit 5, would be forwarded to Operable Unit 5 for management, including disposal. Any soils not amenable to such management methodologies will be disposed of as pit waste.

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Operable Unit 5 has taken the lead in evaluating remedial alternatives most appropriate for managing the process area soils. The less contaminated soils from Operable Unit 1 are sufficiently similar to process area soils. Only soils determined to be amenable to Operable Unit 5 treatment and disposal methods will be forwarded and these soils will be handled in the same way as the process area soils. Ultimately, it is possible that all the soils associated with the pit waste at Operable Unit 1 could be processed as pit waste and shipped off site or disposed of on site in an engineered facility (depending on the alternative under consideration)."

Page ES-11 of the Proposed Plan. The following text was added: "as amenable" after "contaminated soils."

Page P-5-13, line 13. The following text has been added: ". . .if amenable to treatment methods being used by Operable Unit 5."

Page P-6-4. The following text was added: "as amenable" after "contaminated soils."

Commenting Organization: Ohio EPA Commentor: DDAGW
Section #: 1.2.1 Page #: 1-16 Line #: 19-26 Code: C
Original Comment #: 4

Comment: This paragraph does not directly identify the glacial till as an aquifer. It should emphasize that although there are zones of higher permeability within the till, the till itself is a saturated aquifer system.

Response: Partially Agree. While the glacial till does exhibit significant saturation in a localized area, it is not necessarily an aquifer on that basis alone. There are portions of the till that yield groundwater more readily than other portions. It is all saturated beginning at approximately three to five feet beneath the ground surface. It is the responsibility of Operable Unit 5 to investigate site-wide media (which includes the glacial till); related information is currently being evaluated in support of Operable Unit 5's RI/FS.

Action: **Page 1-23, line 19.** The following sentence has been added: "Operable Unit 5 has site-wide responsibility for investigation of groundwater, including perched groundwater."

Page P-4-4, line 28. The following sentence has been added: "It should be noted that Operable Unit 5 has sitewide responsibility for investigation of groundwater, including perched groundwater."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: DDAGW
Section #: 1.2.3.4 Page #: 1-39 Line #: 13 Code: C
Original Comment #: 5
Comment: Change "elements" to radionuclides.
Response: Agree.
Action: **Page 1-61, line 2.** The word "elements" has been changed to "radionuclides."

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 1.2.3.4 Page #: 1-36 Line #: 8 Code: C
Original Comment #: 6
Comment: Note that 2-butanone is also listed as a common lab contaminant by EPA in their functional guidance document on laboratory data validation.
Response: Agree. The comment is correct; 2-butanone is a common laboratory contaminant. The text should be revised to indicate that laboratory chemicals were disposed of in the Burn Pit. Elevated levels of the common laboratory chemicals--2-butanone, acetone, and carbon disulfide--may be the result of migration of waste pit leachate or the result of laboratory cross-contamination.
Action: **Page 1-56, line 17.** The text starting at the second sentence of paragraph 2 has been revised to read: "Elevated levels of 2-butanone, acetone, and carbon disulfide may be due to laboratory cross-contamination as these chemicals are considered common laboratory contaminants by the EPA; however, the levels may also be attributed to migration of waste pit leachate, as laboratory chemicals, including 2-butanone, acetone, and carbon disulfide, were disposed of in the Burn Pit."

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 1.2.3.4 Page #: 1-40 Line #: 4 Code: E
Original Comment #: 7
Comment: Change "uranium" to "Uranium".
Response: Agree.
Action: **Page 1-61, line 25.** The word "uranium" has been changed to "Uranium."

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RESPONSE TO OHIO EPA COMMENTS

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Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 1.2.4 Page #: 1-42 Line #: 27 Code: G
Original Comment #: 8

Comment: Was the groundwater modeling conservative as noted? The significance of recent revisions to the conceptual model of radionuclide transport through the glacial overburden should be addressed in this report.

Response: Comment Acknowledged. The groundwater modeling assumed no future maintenance and all waste units released contaminants to the environment, thus producing a higher (i.e., conservative) contaminant load to the aquifer. The modeling also assumed total contact between the waste and the leaching fluid, thus producing a higher concentration than would actually be encountered. See the Operable Unit 1 Draft Final Remedial Investigation Report, page 5-30, for additional clarification of this issue. Operable Unit 5 will more quantitatively evaluate emerging land use issues using the most up-to-date groundwater modeling parameters.

Action: **Page 1-64, line 19.** The following text was added between the existing sentences: "The groundwater modeling assumed no future maintenance and all waste units released contaminants to the environment, thus producing a higher (i.e., conservative) contaminant load to the aquifer. The modeling also assumed total contact between the waste and the leaching fluid, thus producing a higher concentration than would actually be encountered. See the Operable Unit 1 Draft Final Remedial Investigation Report, page 5-30, for additional clarification of this issue. Operable Unit 5 will more quantitatively evaluate emerging land use issues using the most up-to-date groundwater modeling parameters."

Page P-4-23, line 9. The following text has been added: ". . . particularly with respect to groundwater modeling."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.2.5.2 Page #: 1-52 Line #: 9 Code: C
Original Comment #: 9

Comment: This section should be revised to be consistent with revisions to the Operable Unit 1 Remedial Investigation Report.

Response: Agree. The section on CPCs should be revised to be consistent with the RI.

Action: **Page 1-75, line 1.** The text has been revised as follows: "The CPCs were selected for inclusion in the quantitative risk assessment based on a two-step process. The first step is comparison to background levels (applicable to inorganic and radionuclide constituents only). Statistical analyses were used to compare measured on-property concentrations of CPCs to background concentrations of that constituent in the same media. Then, toxicological screening is performed. After statistical comparisons were made, detected compounds which were shown to exceed background were subjected to toxicological screening to exclude constituents that are unlikely to have a human health risk at the detected levels."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2.2.4 Page #: 2-13 Line #: 21 Code: C
Original Comment #: 10

Comment: Tables 2-5, 2-6, & 2-7 will need to be revised consistent with revisions to the Operable Unit 1 RI Report.

Response: Partially Agree. These FS tables represent the latest information in the development of Preliminary Remediation Goals (PRGs). This is an iterative process. New air modeling has since been performed specifically for the FS risk evaluation. In this light, the PRGs have been checked to ensure accuracy.

Action: The PRGs in the referenced tables were revised as required.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2.2.4 Page #: 2-14 Line #: 7-13 Code: C
Original Comment #: 11

Comment: The intent of this paragraph is unclear, especially with regard to the last sentence. The paragraph should be rewritten. If the ARAR was selected and it exceed both background and the 10^{-6} risk-based PRG, then an incremental risk would exist for the difference between background and the ARAR. If multiple contaminants exist the ARAR should only be selected when it is more protective than the risk based concentration.

Response: Agree. This paragraph should be made clearer. The intent of this paragraph is to discuss the relative relationship of the PRGs to the ARAR values and the background values. At this point, there is no attempt to select the risk-based PRG, the ARAR PRG, or background; rather, the intent is to merely present the values. The specific point made by this paragraph is that the risk-based PRGs are much lower than either the respective ARAR or background concentrations.

Action: **Page 2-29, line 10.** The paragraph has been rewritten as follows: "The 10^{-6} PRG for Radium-228 under the residential farmer scenario was less than the ARAR-based PRG by several orders of magnitude and also less than the background concentrations of Radium-228. This means that an increase in soil concentrations due to residual wastes is not distinguishable from background. However, it does mean that the ARAR PRG would not be protective at the 10^{-6} risk level. Similarly, the Uranium-238 and Radium-226 are 2.6 and 38 times less than background and are also distinguishable from background. Since these values are less than the ARARs for Uranium-238 and Radium-226, the ARARs are not protective at the 10^{-6} level."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2.2.5 Page #: 2-16 Line #: 14-15 Code: C
Original Comment #: 12
Comment: Risk-based values aren't derived for noncarcinogens. Revise the sentence to delete reference to risk-based values.
Response: Agree.
Action: Page 2-31, line 19. "Risk" has been replaced with "toxicity."

Page P-4-11, line 3, and Page P-4-11, line 23, and P-4-22, line 3. The word "risk" has been replaced by "impact."

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Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2.2.6 Page #: 2-18 Line #: 12-17 Code: C
Original Comment #: 13

Comment: DOE must revise the soil and leachate PRGs to be protective of groundwater at the waste management unit boundary for both residual soil and disposal facility design. The remedial action must protect groundwater at the waste unit boundary for an on-property farmer.

Response: Comment Acknowledged. The central issue in this comment is future land use of the FEMP. Final decisions concerning such future land use have not yet been made as additional input from the Fernald Citizens Advisory Task Force is required. In the absence of a final future land use decision, an assumption was made to facilitate completion of the Operable Unit 1 Feasibility Study. The approach taken within the Operable Unit 1 Feasibility Study is similar to that taken for the miscellaneous soils in the Operable Unit 4 Feasibility Study. Specifically, proposed remediation levels were developed for a future land use/exposure scenario involving an on-site expanded trespasser and an off-site residential farmer. These levels are considered interim, pending decisions on future land use, and will be revisited by the Operable Unit 5 Feasibility Study.

The Operable Unit 5 Feasibility Study will consider, quantitatively, a range of future land use/exposure scenarios from a site-wide basis (including the Operable Unit 1 areas) in the process of developing final remediation levels. If found to be necessary, the Operable Unit 5 Record of Decision will modify the current Operable Unit 1 proposed remediation levels downward to ensure protectiveness of human health and the environment. The Operable Unit 5 Record of Decision, and remediation levels therein, will be consistent with the final decision(s) concerning future land use. Language should be added to the text clarifying the above and emphasizing that the PRGs and proposed remediation levels in the Operable Unit 1 Feasibility Study are interim, based on an assumed future land use, and would require modification if an alternate future land use is selected.

DOE does recognize the critical importance of the ability of an on-site waste disposal facility to be protective of the Great Miami Aquifer. Alternatives involving an on-site waste disposal facility would include an ongoing leachate and groundwater monitoring program at the waste management unit itself designed to detect unacceptable releases from the unit. In particular, the groundwater monitoring program would be designed to help ensure that releases from the waste management unit did not increase contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs. Corrective action would be initiated as appropriate based on this program. Related text will be added to the document.

Action: **Page 2-35, line 17.** The following text has been inserted: "Final decisions concerning future land use have not yet been made as additional input from the Fernald Citizens Advisory Task Force is required. In the absence of a final future land use decision, an assumption was made to facilitate completion of the Operable Unit 1 Feasibility Study. The approach taken within the Operable Unit 1 Feasibility Study is similar to that taken

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in the Operable Unit 4 Feasibility Study. Specifically, proposed remediation levels were developed for a future land use/exposure scenario involving an on-site expanded trespasser and an off-site residential farmer. These levels are considered interim, pending decisions on future land use, and will be revisited by the Operable Unit 5 Feasibility Study.

The Operable Unit 5 Feasibility Study will consider, quantitatively, a range of future land use/exposure scenarios from a site-wide basis (including the Operable Unit 1 areas) in the process of developing final remediation levels. If found to be necessary, the Operable Unit 5 Record of Decision will modify the current Operable Unit 1 proposed remediation levels downward to ensure protectiveness of human health and the environment. The Operable Unit 5 Record of Decision, and remediation levels therein, will be consistent with the final decision(s) concerning future land use. It is emphasized that the PRGs and proposed remediation levels presented herein are interim, based on an assumed future land use, and may require modification depending on the final approved future land use scenario. In particular, the groundwater monitoring program would be designed to help ensure that releases from the waste management unit (disposal cell and/or restored pit area) did not increase on-property contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs."

Page 2-19, line 8. The following text has been inserted: "The groundwater monitoring program for an on-property disposal cell would also be developed to ensure releases from the unit did not increase on-property contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs."

Commenting Organization:	Ohio EPA	Commentor:	OFFO
Section #:	2.2.3.1	Page #:	2-20
		Line #:	12-13
		Code:	C
Original Comment #:	14		
Comment:	Risk-based values aren't derived for noncarcinogens. Revise the sentence to delete reference to risk-based values.		
Response:	Agree.		
Action:	Page 2-42, line 13. "Risk-based" has been changed to "toxicity-based."		

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2.4 Page #: 2-22, 2-23 Line #: 30 Code: C
Original Comment #: 15

Comment: DOE must revise the soil and leachate PRLs to be protective of groundwater at the waste management unit boundary for both residual soil and disposal facility design. The remedial action must protect groundwater at the waste unit boundary for a resident farmer. It is unacceptable for DOE to select a remedy costing in excess of a quarter million dollars which is not protective of groundwater.

Response: Comment Acknowledged. The central issue in this comment is future land use of the FEMP. Final decisions concerning such future land use have not yet been made as additional input from the Fernald Citizens Advisory Task Force is required. In the absence of a final future land use decision, an assumption was made to facilitate completion of the Operable Unit 1 Feasibility Study. The approach taken within the Operable Unit 1 Feasibility Study is similar to that taken for the miscellaneous soils in the Operable Unit 4 Feasibility Study. Specifically, proposed remediation levels were developed for a future land use/exposure scenario involving an on-site expanded trespasser and an off-site residential farmer. These levels are considered interim, pending decisions on future land use, and will be revisited by the Operable Unit 5 Feasibility Study.

The Operable Unit 5 Feasibility Study will consider, quantitatively, a range of future land use/exposure scenarios from a site-wide basis (including the Operable Unit 1 areas) in the process of developing final remediation levels. If found to be necessary, the Operable Unit 5 Record of Decision will modify the current Operable Unit 1 proposed remediation levels downward to ensure protectiveness of human health and the environment. The Operable Unit 5 Record of Decision, and remediation levels therein, will be consistent with the final decision(s) concerning future land use. Language should be added to the text clarifying the above and emphasizing that the PRGs and proposed remediation levels in the Operable Unit 1 Feasibility Study are interim, based on an assumed future land use, and would require modification if an alternate future land use is selected.

DOE does recognize the critical importance of the ability of an on-site waste disposal facility to be protective of the Great Miami Aquifer. Alternatives involving an on-site waste disposal facility would include an ongoing leachate and groundwater monitoring program at the waste management unit itself designed to detect unacceptable releases from the unit. In particular, the groundwater monitoring program would be designed to help ensure that releases from the waste management unit did not increase contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs. Corrective action would be initiated as appropriate based on this program. Related text will be added to the document.

Action: Page 2-48, line 11. The following text has been inserted between sentences: "Final decisions concerning future land use have not yet been made as additional input from the Fernald Citizens Advisory Task Force is required. In the absence of a final future land use decision, an assumption was made to facilitate completion of the Operable Unit 1

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Feasibility Study. The approach taken within the Operable Unit 1 Feasibility Study is similar to that taken in the Operable Unit 4 Feasibility Study. Specifically, proposed remediation levels were developed for a future land use/exposure scenario involving an on-site expanded trespasser and an off-site residential farmer. These levels are considered interim, pending decisions on future land use, and will be revisited by the Operable Unit 5 Feasibility Study.

The Operable Unit 5 Feasibility Study will consider, quantitatively, a range of future land use/exposure scenarios from a site-wide basis (including the Operable Unit 1 areas) in the process of developing final remediation levels. If found to be necessary, the Operable Unit 5 Record of Decision will modify the current Operable Unit 1 proposed remediation levels downward to ensure protectiveness of human health and the environment. The Operable Unit 5 Record of Decision, and remediation levels therein, will be consistent with the final decision(s) concerning future land use. It is emphasized that the PRGs and proposed remediation levels presented herein are interim, based on an assumed future land use, and may require modification depending on the final approved future land use scenario. In particular, the groundwater monitoring program would be designed to help ensure that releases from the waste management unit (disposal cell and/or restored pit area) did not increase contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs."

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 2.3 Page #: 2-24 Line #: 30-31 Code: C
Original Comment #: 16

Comment: The statement should be revised to indicate that the existing multi-media monitoring system and access controls would remain in place if the no-action alternative is selected.

Response: Comment Acknowledged. It is recognized that, in reality, DOE would not abandon the site under the No-Action Alternative. However, the No-Action Alternative is meant to truly be no action and, thus, no cost as required by the NCP to allow a baseline for comparison among alternatives. In reality, DOE would maintain existing access controls and continue multimedia monitoring. The text has been revised to clarify this point.

Action: Page 2-55, line 16. The following text has been added to the end of the last bullet: "For the purposes of this analysis, the No-Action Alternative is truly no action and, thus, no cost as required by the NCP to allow a baseline for comparison among alternatives. However, in reality, DOE would not abandon the site. Existing access controls would be maintained and current multimedia monitoring would be continued."

Page P-5-2, line 6. The following text has been added: "However, in reality, DOE would not abandon the site. Existing access controls would be maintained and current multi-media monitoring would be continued."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: DDAGW
Section #: 2.4.4.1 Page #: 2-29 Line #: 5 Code: C
Original Comment #: 17

Comment: Since waste removal activities may increase contaminant loading to the GMA, pumping wells should not be limited to perched ground water.

Response: Agree. Pumping wells may be required during remedial activity for water other than perched groundwater.

Action: **Page 2-63, line 5.** The text was revised as follows: "This process option is retained for further evaluation in the Operable Unit 1 strategy because they could be effective in preventing groundwater from coming into contact with pit waste."

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 2 Page #: 2-31 Line #: 21 Code: C
Original Comment #: 18

Comment: One of the main functions of the vegetative cover is to promote evapotranspiration. This advantage should be noted.

Response: Agree. The promotion of evapotranspiration should be noted.

Action: **Page 2-66, line 1.** The following text was added: "It also promotes evapotranspiration and reduces the amount of infiltration into the subsurface."

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 2 Page #: 2-31 Line #: 21 Code: C
Original Comment #: 19

Comment: Surcharge is normally used as a slow process to consolidate underlying materials by reducing void pockets. A disadvantage of this process option is that it would force contaminated water to flow horizontally and downward. Thus, it would increase the potential for contaminating new areas and/or increase the level of contamination in the underlying aquifer. This process option should only be considered in conjunction with another technology, such as hydraulic containment, to intercept and remove contaminated water before it reaches new areas.

Response: Agree. However, the intent of this section of the FS was only to introduce the technologies. Further discussion of the surcharging technology is found on pages 2-56 and 2-57 and 3-23 through 3-25. It is the impacts of potentially uncontrollable contaminant movement to the Great Miami Aquifer, as discussed above, that ultimately eliminates this technology from further consideration.

Action: **Page 2-68, line 17.** The following text has been modified: "This process option, when implemented in conjunction with groundwater flow control technologies, is retained for further evaluation because it could potentially be used for in situ alternatives to stabilize the wastes to allow construction of a cap."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
 Section #: 2.4.6.4 Page #: 2-37 Line #: 7 Code: C
 Original Comment #: 20
 Comment: Revise "cheating" to "chelating".
 Response: Agree.
 Action: **Page 2-71, line 16.** "Cheating" has been changed to "chelating."

Commenting Organization: Ohio EPA Commentor: GeoTrans
 Section #: 2.5.4.2 Page #: 2-49 Line #: 17 Code: E
 Original Comment #: 21
 Comment: The statement indicating that the multi-media cap would prevent further contaminant migration needs to be corrected. This type of cap (by itself) would only reduce (not eliminate) the potential for infiltration and contaminant migration.
 Response: Agree.
 Action: **Page 2-87, line 3.** The following text has been modified: "A multimedia cap is a highly effective method of reducing further contaminant migration; however, it does not address past contaminant migration."

Commenting Organization: Ohio EPA Commentor: GeoTrans
 Section #: 2.5.4.2 Page #: 2-51 Line #: 10 Code: C
 Original Comment #: 22
 Comment: The relative cost of grading should be considered low in comparison to the cost of other process options considered in this FS.
 Response: Agree. The overall cost of grading has been changed from "moderate" to "low" as suggested.
 Action: **Page 2-88, line 33.** The last word "moderate" has been changed to "low."

Commenting Organization: Ohio EPA Commentor: GeoTrans
 Section #: 2.5.6.3 Page #: 2-59 Line #: 1 Code: E
 Original Comment #: 23
 Comment: The present worth O&M cost of this process option should be considered moderate because of the low maintenance cost expected over the life of the project.
 Response: Agree. The present worth O&M cost for vitrification has been revised from high to moderate as suggested. The overall cost has been left at high.
 Action: **Page 2-100, line 2.** The first bullet (second sentence) has been changed to read "The O&M costs would be moderate..."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 2.5.7.1 Page #: 2-61 Line #: 24 Code: C
Original Comment #: 24

Comment: This paragraph should indicate that the truck transport of radiologically contaminated materials, outside the boundary of the FEMP facility, would require rigorous approval from and coordination with the jurisdictions located along the transport route (DOT approval, evacuation plan, etc.).

Response: Partially Agree. It should be noted in the text that DOE would comply with all applicable transportation regulations including those requiring advance notification and coordination with jurisdictions located along the transportation route. For consistency, similar language should be added in the discussion of the implementability of rail transportation.

Action: **Page 2-102, line 19, and Page 2-104, line 1.** The following sentence has been added to the discussions of rail and truck transportation implementability: "This technology would require full compliance with all applicable transportation regulations, including those requiring advance notification and coordination with jurisdictions located along the transportation route."

Page P-6-11, line 23. The following sentence has been added: "Nevertheless, logistics issues associated with transporting large volumes of material would make implementation moderately difficult for both Alternatives 5A and 5B."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 2.5.7.1 Page #: 2-61 Line #: 25 Code: C
Original Comment #: 25

Comment: The capital cost for constructing a truck road should be moderate, since the existing on-site roadway network can be upgraded and/or expanded to accommodate trucking traffic. The off-site highway network, to transport contaminated materials, should be fairly adequate to handle anticipated truck loads.

Response: DOE agrees that capital cost for constructing a truck road is moderate. However, overall costs for this technology include trucking fees and waste handling. Trucking fees for the off-site disposal option would be high if all wastes were shipped by truck and moderate if trucking fees were charged for only part of the journey. The cost of trucking has not been revised although the cost of trucking would be lower if trucking was only performed on site for the on-site disposal option and not for the off-site disposal option.

The text has been revised to show trucking fees as part of the operations costs, not capital costs. The overall costs of off-site waste transportation by truck are still considered high. The bullet addressing cost under rail transport has been revised as well to clarify the fact that fees are part of operating costs, not capital costs.

Action: **Page 2-102, line 23.** The following new text has been inserted in the third bullet under "Rail Transport:"

- "• Cost. The rail transport option is of moderate capital cost because of the following requirements: upgrading of the on-site rail spur and the need to build or upgrade loading and unloading waste handling facilities. Operation costs include rail fees and are expected to be moderate. Maintenance costs are expected to be low because rail components have a relatively long life span and require little maintenance. Overall, costs are considered moderate."

Page 2-104, line 7. The following new text has been inserted in the third bullet under "Truck Transport:"

- "• Cost. The capital costs include the construction of access roads. The overall capital cost would be moderate. Operation costs would include trucking fees and waste handling. Operation costs would be high because trucking fees for the off-site disposal option would be high if all wastes were shipped by truck and moderate if trucking fees were charged for only part of the journey. Maintenance costs are considered low and include the maintenance of the access road and the loading terminal. Overall, costs are considered high."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Table 2-13 Page #: 2-86 Line #: Code: C
Original Comment #: 26
Comment: All contaminants listed on Table 2-6 are not included within this table (e.g., Ra-226, Th-228, dioxins). DOE should revise Table 2-13 to include contaminants from Table 2-6.
Response: Disagree. The contaminants on Table 2-13 are a subset of those on Table 2-6. No change is needed for Table 2-13. The contaminants on Table 2-13 are only those for soil, while those on Table 2-6 are the COCs for all media.
Action: None.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Table 2-17 Page #: 2-96 Line #: Code: E
Original Comment #: 27
Comment: Hydraulic Mining Pump should have an asterisk associated with it.
Response: Agree.
Action: **Page 2-90, Table 2-17.** An asterisk has been added in column 2 to change "Hydraulic Mining Pump" to "Hydraulic Mining Pump*."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Table 2-19 Page #: 2-99 Line #: Code: E
Original Comment #: 28
Comment: Above Grade Concrete should have an asterisk associated with it.
Response: Agree.
Action: **Page 2-103, Table 2-19.** An asterisk has been added in column 2 to change "Above-Grade Concrete" to "Above-Grade Concrete*."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
 RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
 Section #: Figure 2-2 Page #: 2-102 Line #: Code: E
 Original Comment #: 29

Comment: The figure should be revised to reflect all screened technologies. A number of screened technologies are not so designated in the figure.

Response: Agree. The figure has been compared to the Section 2 text that discusses all technologies that have been screened. All technologies discussed in the text were included in Figure 2-2 as submitted to the U.S. and Ohio EPA. However, chemical extraction should have been designated as "not retained" in the figure. Additional text to support the consideration and screening out of airlift dredging was needed.

Action: **Page 2-102, Figure 2-1.** The figure (formerly Figure 2-2) has been revised to shade "Chemical Extraction" indicating that it has been screened out from consideration for Operable Unit 1 remediation.

Page 2-67, line 10. The following text on airlift dredging has been added:

"Airlift Dredging

Airlift dredging works on the principle that air injected into the bottom of a pipe partially submerged in water will produce a density differential in the pipe. The air-water mixture in the pipe will then flow upward under the influence of the hydraulic head. This flow will cause a suction at the bottom end of the pipe. Efficiency of this system increases with depth of pipe submergence. Due to the shallow depths of the waste pits (20 to 30 feet), this process option was not retained."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 2 Page #: 2-99 Line #: Table 2-19 Code: C
Original Comment #: 30

Comment: It was stated earlier in this document that off-site disposal of contaminated materials at the Nevada Test Site (NTS) is readily implementable as a result of existing similar practice. This fact should be reflected in the table.

Response: Agree. The text on page 2-63 states that the option of shipping waste to the Nevada Test Site would be moderately difficult to implement from a logistics/material control and scheduling standpoint. This is due to the long distance between Operable Unit 1 and the Nevada Test Site and to the large volume of waste to be shipped. The text goes on to state that administratively, this process option would be relatively easy to implement because the FEMP site has an approved NTS waste shipment and certification program already in place and has shipped similar waste to NTS. It is true that the appropriate procedural mechanisms are in place for shipping waste to the NTS. However, the large volume of material (over 600,000 cubic yards) being considered for shipment makes the option moderately difficult to implement overall.

Action: **Page 2-104, line 1.** "Easily implemented" was changed to "moderately difficult to implement due to the long distance from Operable Unit 1 to the NTS, and due to the large volume of material to be shipped."

Page 2-103, Table 2-19. The wording in the "Implementability" column, fifth entry, across from the Nevada Test Site, has been changed from "Difficult to Implement" to "Moderately Difficult to Implement."

Page ES-11, line 18. The following statement has been added after the first sentence in paragraph 2: "However, what is readily implementable in general may be made more difficult because of the large volume of waste to be processed and transported from Operable Unit 1 (more than 600,000 cubic yards). Volume alone may increase the difficulty of implementing these technologies due to logistical issues."

Page 3-60, line 5. The following text was revised: "However, what is readily implementable in general may be made more difficult because of the large volume of waste to be processed and transported from Operable Unit 1 (more than 600,000 cubic yards). Volume alone may increase the difficulty of implementing these technologies due to logistical issues."

Page 3-63, line 3. The following text was revised: "However, what is readily implementable in general may be made more difficult because of the large volume of waste to be processed and transported from Operable Unit 1 (more than 600,000 yards). Volume alone may increase the difficulty of implementing these technologies due to logistical issues."

Page 3-65, Table 3-2. The entry in the "Implementability" column for Alternative 5A has been changed from "Reliable technology, but administrative feasibility is moderately difficult" to "Reliable technology, but implementability is moderately difficult."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Page 3-65, Table 3-2. The entry in the "Implementability" column for Alternative 5B has been changed from "Reliable technology, but administrative feasibility is moderately difficult" to "Reliable technology, but implementability is moderately difficult."

Page 4-100, line 11. The following statement has been inserted on the last line: "Although transporting mixed and low-level radioactive waste across the country is a straightforward technology and generally readily implementable, it is made more difficult because of the large volume of waste to be processed and transported from Operable Unit 1. Volume alone may increase the difficulty of implementing the alternative due to logistical issues."

Page 4-100: The text concerning administrative feasibility is consistent as it stands.

Page 4-119, line 25. The following statement has been inserted: "Although transporting mixed and low-level radioactive waste across the country by rail is a straightforward technology and generally readily implementable, it is made more difficult because of the large volume of waste to be processed and transported from Operable Unit 1. Volume alone may increase the difficulty of implementing the alternative due to logistical issues."

Page 4-127, Table 4-7. The following statement has been added to the end of the fourth entry in the "Alternative 5A" column: "Large volumes of material would make implementation moderately difficult due to logistical issues."

Page 4-127, Table 4-7. The following statement has been added to the end of the fourth entry in the "Alternative 5B" column: "Large volumes of material would make implementation moderately difficult due to logistical issues."

Page 5-18: Table 5-1 is consistent as it stands.

Page P-6-11, line 23. The following sentence has been added: "Nevertheless, logistics issues associated with transporting large volumes of material would make implementation moderately difficult for both Alternatives 5A and 5B."

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 2 Page #: 2-100 Line #: Figure 2-1 Code: E
Original Comment #: 31

Comment: Figure 2-1 should be moved to become a part of Section 1.
Response: Disagree. Figure 2-1 is identical to Figure 1-5.
Action: Figure 2-1 has been deleted and all subsequent Section 2 figures have been renumbered accordingly.

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 3.1 Page #: 3-1 Line #: Code: E
Original Comment #: 32

Comment: Two additional bullets should be added to the identified items. These are (1) Health & Safety and (2) Cost.

Response: Disagree. 40 CFR 300.430 (a) (1) (iii) identifies a list of EPA criteria for developing and screening remedial action alternatives. These are reflected in the bulleted items on pages 3-1 and 3-2. Health & Safety and Cost are not identified in the above citation; it would be inappropriate to add them to this section.

However, for those alternatives that are carried through detailed analysis, cost is one of five primary balancing criteria used to evaluate each alternative and is addressed throughout the detailed analysis discussion. Health & Safety is not evaluated as a decision factor. Worker protection requirements are standards established by OSHA and DOE that must be complied with regardless of the alternative.

Action: **Page 3-1, line 22.** The appropriate citation (40 CFR 300.430 [a] [1] [iii]) has been added to the text. The citation clarifies that the bulleted items are EPA preferences for developing and screening remedial action alternatives as defined under CERCLA.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 3.2.3.3 Page #: 3-10 Line #: 1-13 Code: C
Original Comment #: 33

Comment: As stated previously, DOE should dispose of grossly contaminated soils with the pit wastes. Additionally, the text should discuss the ability of Operable Unit 5 to treat the types of contaminants found within Operable Unit 1 soils (e.g., dioxins, PAHs).

Response: Comment Acknowledged. Soil in close proximity to the pit waste, whether in the covers or beneath the pits, may be contaminated to levels representative of pit waste. If this is the case, the soil would be processed and disposed of as pit waste, either on site or off site, according to the alternative under discussion. However, less contaminated soils, specifically those amenable to waste management methodologies undertaken at Operable Unit 5, would be sent to Operable Unit 5.

Operable Unit 5 has taken the lead in evaluating remedial alternatives most appropriate for managing the process area soils. The less contaminated soils from Operable Unit 1 are similar to the process area soils. Only soils determined to be amenable to Operable Unit 5 treatment and disposal methods will be sent to Operable Unit 5 and these soils will be handled in the same way as Operable Unit 5 soils. Ultimately, it is possible that all the soils associated with the pit waste at Operable Unit 1 could be processed as pit waste and shipped off site or disposed of on site in an engineered facility (depending on the alternative under discussion).

Action: The text in the Executive Summary and Section 3 has been modified to clarify the flexibility of this approach. Specifically, language has been added to clarify that any surface and subsurface soils not amenable to Operable Unit 5 treatment and disposal methods will be disposed of as pit materials.

Page 3-10, line 23. The following statement was inserted before the last sentence: "Only soils determined to be amenable to Operable Unit 5 treatment and disposal methods would be sent to Operable Unit 5 and these soils would be handled in the same way as soils from the process area. Ultimately, it is possible (depending upon the alternative under discussion) that all the soils associated with the pit waste at Operable Unit 1 would be processed as pit waste and shipped off site or disposed of on site in an engineered facility."

Page P-5-12, line 21. The following text has been added: ". . .if amenable to treatment methods being used by Operable Unit 5."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 3.3 Page #: 3-11 Line #: 3 Code: C
Original Comment #: 34

Comment: Only seven of the nine evaluation criteria should be discussed in this phase of the FS. The other two modifying criteria should be addressed following the initiation of the Proposed Plan (PP) and receiving the state comments and community concerns.

Response: Agree. The comment is correct. Only seven of the nine CERCLA evaluation criteria were evaluated in the FS. The other two modifying criteria, State Acceptance and Community Acceptance, will be addressed following the initiation of the Proposed Plan and public comment periods. The text on page 3-11 has been revised to correct that point.

Action: **Page 3-12, line 18.** The following text replaced the third and fourth sentences in paragraph 1: "The detailed analysis in this FS will subject the remaining alternatives to seven specific criteria and their individual factors rather than the three general criteria used in the alternative screening process. The relationship between the three screening criteria and the seven specific evaluation criteria is illustrated in Figure 3-1. The last two criteria, State Acceptance and Community Acceptance, will be addressed following issuance of the Proposed Plan and subsequent comment period."

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 3.3.1 Page #: 3-12 Line #: 22 Code: E
Original Comment #: 35

Comment: The existing monitoring system should be retained as part of the no-action alternative.

Response: Comment acknowledged. As discussed in the response for Comment 16, the "no action" alternative is meant to truly be no action as required by the NCP to allow a baseline for comparison among alternatives. It is recognized that in reality, DOE would maintain existing access controls and continue multimedia monitoring. The text has been revised to clarify this point.

Action: **Page 3-16, line 20.** The following text has been added: "For the purposes of this analysis, the no action alternative is truly no action and thus no cost as required by the NCP to allow a baseline comparison among alternatives. However, in reality, DOE would not abandon the site. Existing access controls will be maintained and current multimedia monitoring would be continued."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 3.3.3.1 Page #: 3-22 Line #: 17 Code: E
Original Comment #: 36

Comment: Replace "contaminant" with "containment."

Response: Agree.

Action: **Page 3-28, line 13.** "Contaminant" has been changed to "containment."

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 3.3.4.1 Page #: 3-28 Line #: 14-16 Code: C
Original Comment #: 37

Comment: DOE fails to provide a justification for fritting the vitrified material versus pouring into a container. DOE should justify fritting over containerizing as was proposed in the Operable Unit 4 FS. It seems a larger monolith of glass in a container will be easier to handle/manage and less likely to be dispersed than fritted material.

Response: Comment acknowledged. The reasons that fritting the vitrified material were used in the development of the conceptual engineering design are: shorter cooling time and, thus, less downtime prior to handling (which is important considering the waste volume); handling and packaging are easier and more efficient; and placement during disposal is easier and more efficient without rigid containers. Detailed engineering design would evaluate and select the final form of the vitrified material if this alternative was selected.

Action: **Page 3-35, line 16.** The following text was added: "Fritting (versus pouring into a container) the vitrified material was used in the cost estimate because it allows for shorter cooling time and less downtime prior to handling (which is important considering the waste volume), handling and packaging are easier and more efficient, and placement during disposal is easier and more efficient without rigid containers."

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 3.3.4 Page #: 3-29 Line #: 23 Code: C
Original Comment #: 38

Comment: A structural geotextile should be included as part of the liner. The structural geogrid would provide a structurally stable base, and minimize the potential for localized settlement.

Response: Agree. While not specifically listed in the text at this location, the conceptual design of the liner system (and the cap system also) does contain geotextile membranes (see Appendix B, Section B.2.5.2, page B-2-25). In the conceptual liner system, these geotextile membranes are placed on the upper surface of each drainage layer to prevent the migration of fines from overlying material, in addition to adding structural support and minimizing potential for settlement. If this is the selected alternative, the liner system would be engineered and verified against protectiveness standards during detailed design.

Action: **Page 3-37, line 1.** The following text was added: "Additional materials such as structural geotextiles may be incorporated into the facility during remedial design."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 3.3.5.1 Page #: 3-35 Line #: 16-18 Code: C
Original Comment #: 39

Comment: The text should discuss the vehicle for cement solidification. Will molds be used or permanent containers? Size of each monolith should also be discussed.

Response: Comment Acknowledged. For the conceptual phase, the cement-solidified material is handled in bulk as a relatively small solid material. The reason that handling the mixed material in bulk is used in the development of the conceptual engineering is handling and placement during disposal are easier and more efficient without rigid containers. Detailed engineering design will make the decision of the final form of the cement-solidified material.

Action: **Page 3-43, line 8.** The following text was added: "The mixed material would be left in bulk instead of being molded or poured into permanent containers. This method was used in the cost estimate because handling and placement during disposal are easier and more efficient without rigid containers or monoliths."

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 3.3.5 Page #: 3-38 Line #: 16 Code: C
Original Comment #: 40

Comment: The technical feasibility for implementing the cement solidification option should be characterized as moderate (or less difficult) compared to the proposed vitrification option.

Response: Partially Agree. The technical feasibility of cement solidification can be characterized as less difficult than the technical feasibility of vitrification primarily because there is more uncertainty associated with the feasibility of vitrification. Although vitrification has been done before, it has not been done on as large a scale as that contemplated for Operable Unit 1. There would be start-up issues for a state-of-the-art facility associated with vitrification that are not associated with cementation.

Action: No change has been made to the text on page 3-38. The text on page 3-34 has been revised to emphasize the uncertainties associated with vitrification, and the last statement in the first paragraph has been revised so that the alternative is characterized as "very difficult" rather than "difficult." Table 3-2, page 3-57, has been revised to reflect this change as well.

Page 3-41, line 19. After "...disposal industry," the last line has been replaced with the following: "Nevertheless, the vitrification performed at these facilities has not been done on as large a scale as that contemplated for Operable Unit 1. There are likely to be many start-up issues associated with vitrification. Thus, overall this alternative will be very difficult to implement based on these technical issues."

Page 3-65, Table 3-2. The fourth entry in the "Implementability" column has been changed to reflect the change from "difficult" to "very difficult." The entry for 4A now reads: "Very difficult to implement due to start-up issues and uncertainties associated with full-scale operation of an innovative treatment system and administrative requirements associated with sitting a disposal cell over a sole-source aquifer"

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 4.1.2.4 Page #: 4-6 Line #: Code: C
Original Comment #: 41

Comment: In addition to expected reduction in TMV and irreversibility of treatment, this evaluation criterion should address the type and quantity of residuals expected to result from the application of each of the remedial alternatives.

Response: Agree. The text should be modified to include evaluation of the type and quantity of residuals expected to result from the allocation of each of the remedial alternatives. For Alternatives 4A, 4B, 5A, and 5B, residuals expected to result from treatment are discussed under "Reduction of Toxicity, Mobility, or Volume Through Treatment."

Action: **Page 4-6, line 25.** The text was modified as follows: "The evaluation considers the extent to which remedial action process technologies can effectively and irreversibly fix, transform, immobilize, reduce, or detoxify the volume of waste materials and contaminated media and the type and quantity of residuals expected to result from application of each remedial technology."

Page 4-49, line 11. No change is required since discussion of type and quantity of residuals is present.

Page 4-75, line 5. The following text has been inserted at the end of the paragraph: "The cement solidification process itself results in no residuals; all contaminants are incorporated into the solidified cement matrix."

Page 4-93, line 1. The following statement has been added: "Residuals from drying include any particulates found on the HEPA filters in the off-gas system."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.1.2.4 Page #: 4-6 Line #: 15-20 Code: C
Original Comment #: 42

Comment: The document fails to discuss the ability of drying to "effectively and irreversibly" treat the waste. Drying neither permanently or significantly reduces the volume, toxicity or mobility of hazardous substances. DOE should discuss the fact that drying is reversible and the only irreversible "treatment" would be size reduction.

Response: Agree. The comment is correct. Drying is assessed primarily for its ability to treat the waste to parameters that meet the waste acceptance criteria of the off-site disposal facilities under consideration. The drying technology has limited ability to irreversibly treat waste. However, volatile organic chemicals are removed from the waste through thermal desorption during drying and do not return. In addition, drying has some limited ability to reduce the volume and weight of waste. Volume and weight reduction resulting from drying is equal to whatever volume is associated with the moisture content of the original waste. The text should be modified to include drying as a treatment technology in paragraph 4 and to discuss its limited ability to irreversibly treat the waste and to reduce the volume and weight of the waste.

Action: **Page 4-7, line 1.** The following text has been deleted: "Two treatment technologies are principal components of the alternatives selected for this detailed analysis that involve on-site disposal." It has been replaced with "Three treatment technologies are principal components of the alternatives selected for this detailed analysis. These include drying, vitrification, and cement solidification. Drying is assessed primarily for its ability to treat the waste to parameters that meet the waste acceptance criteria of the off-site disposal facilities under consideration. The drying technology has limited ability to irreversibly treat waste. However, VOCs are removed from the waste through thermal desorption during drying and do not return. In addition, drying has some limited ability to reduce the volume and weight of waste. Volume and weight reduction resulting from drying is equal to whatever volume and weight is associated with the moisture content of the original waste."

Page 5-14, line 8. The following text was added between sentences: "The drying technology has limited the ability to irreversibly treat waste. However, volatile organic contaminants are removed from the waste through dermal desorption during drying and do not return."

Page P-6-7, line 12. The following text has been added: "The drying technology has limited the ability to irreversibly treat waste. However, the volatile organic compounds (VOCs) are removed from the waste through thermal desorption during drying and do not return. . . ."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 4.1.2.5 Page #: 4-7 Line #: Code: C
Original Comment #: 43

Comment: One sub-criterion, "the time required until RAOs are achieved" is missing.
Response: Agree. The time until remedial action objectives (RAOs) are achieved was not included as an analysis factor.
Action: Page 4-7, line 23. The following text was added: "The time until remedial action objectives are achieved (i.e., the point in the schedule where protectiveness, in this case disposal, is achieved) is also part of the evaluation."

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 4.3.1 Page #: 4-12 Line #: 21 Code: C
Original Comment #: 44

Comment: The reason for setting the moisture content of the dryer output at 15% should be clarified.
Response: Comment Acknowledged. The reasons for setting the moisture content at 15 percent are: reduce the uncertainty associated with the proper ratio of additives and process temperature control because of varying degrees of moisture content in the waste, and reduce the size and costs associated with the vitrification off-gas treatment system. The Standard Proctor optimum moisture content (assumed to be 15 percent) has been judged to be the most appropriate moisture content to accomplish these objectives.
Action: Page 4-19, line 23. The following text was added: "Drying is required to achieve two objectives. First, it would reduce uncertainty associated with the proper ratio of additives and process temperature control because of varying degrees of moisture content in the waste. Secondly, it would reduce the size, cost, and uncertainty associated with the vitrification off-gas treatment system. The Standard Proctor optimum moisture content (assumed to be 15 percent) has been judged to be the most appropriate moisture content to accomplish these objectives."

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 4.3.1 Page #: 4-12 Line #: Code: C
Original Comment #: 45

Comment: The FS should set, conceptually, the horizontal and vertical extent of excavation beyond that of the original pit limit.

Response: Agree. Both vertically and horizontally, the extent of excavation would be limited to surface soils around the pits and soils beneath the pits that are contaminated above remediation levels. Should all of these soils be determined to be contaminated in concentrations above remediation levels, the vertical extent of excavation would be to the top of the Great Miami Aquifer and the horizontal extent of excavation would be to the Operable Unit 1 boundary.

Action: The text has been modified for this alternative and by reference for all the alternatives to reflect this clarification.

Page 4-12, line 22. The following text has been inserted after the second sentence of the first paragraph: "Surface soils within the Operable Unit 1 boundary, outside the capped areas, would also be excavated to health-based levels.

Both vertically and horizontally, the extent of excavation would be those surface soils around the pits and soils beneath the pits that are contaminated above remediation levels. Should all of these soils be determined to be contaminated in concentrations above remediation levels, the vertical extent of excavation would be to the top of the Great Miami Aquifer and the horizontal extent of excavation would be to the Operable Unit 1 boundary."

Page 4-65, line 8. The text for Alternative 4B refers to 4A, so this is consistent. No change is needed here.

Page 4-79, line 14. The text for Alternative 5A refers to 4A, so this is consistent. No change is needed here.

Page 4-104, line 8. The text for Alternative 5B refers to 5A, which refers to 4A, on the extent of excavation point, so this is consistent and the text is carried through by reference to all alternatives. No change is required in this section.

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RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.3.1 Page #: 4-13 Line #: 24-26 Code: C
Original Comment #: 46

Comment: Additional discussion of the criteria for sending rubble to Operable Unit 3 should be included in the section. Rubble removed from the pits will likely contain significant contamination and be more representative of pit waste than of Operable Unit 3 material, as such it should be disposed with the pit waste. The Operable Unit 4 FS discussed decontamination of rubble prior to transfer to Operable Unit 3 this would be necessary at a minimum.

Response: Agree. Rubble should be decontaminated prior to transfer to Operable Unit 3.

Action: **Page 4-15, line 23.** The following text has been modified: "Oversized material not suitable for shredding and amenable for treatment under the selected alternative for Operable Unit 3 would be segregated from Operable Unit 1 waste, decontaminated by pressure washing prior to transfer, and forwarded to Operable Unit 3 to be managed as construction rubble."

Page ES-11 of the Proposed Plan, line 21, and Page P-6-4, line 2. The following revision has been made: ". . .disposition of oversized material that is amenable to the selected alternative for Operable Unit 3 would be segregated from Operable Unit 1 wastes, decontaminated, and forwarded to Operable Unit 3 to be managed as construction rubble."

Page P-5-2, line 19. The following text was added: "Such material that is not readily amenable to size reduction in the Operable Unit 1 remedial process but that is amenable to the selected alternative for Operable Unit 3 would be segregated from Operable Unit 1 waste, decontaminated by pressure washing prior to transfer and forwarded to Operable Unit 3 to be managed as construction rubble."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.3.1 Page #: 4-14 Line #: 22-23 Code: C
Original Comment #: 47

Comment: DOE should provide additional justification for the creation of paved ramps into the pits. Paving of the ramps will generate additional waste to be disposed/treated. If DOE finds it necessary to create paved ramps, then a paving material that allows for easiest decontamination should be used.

Response: Partially Agree. During the detailed engineering design phase, the necessity of paving the access ramps will be considered. Paved access roads were used as a conservative approach during this phase. Paved access ramps may be required to meet structural load requirements for heavy earth-moving equipment. If it is determined that structural support is required, criteria for material selection and ramp design will include waste minimization considerations.

Action: **Page 4-16, line 23.** Justification has been added to the text as follows: "Access ramps may need to be paved to meet structural load requirements for heavy earth-moving equipment. Waste minimization considerations would be factored into the design of the ramps."

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.3.1 Page #: 4-14 & 15 Line #: 28 Code: C
Original Comment #: 48

Comment: It seems unlikely that DOE will be able to maintain a clean side of the excavation and pit and backfill as excavation occurs. How will confirmation sampling be coordinated with this? DOE should provide more discussion on the excavation.

Response: Disagree. However, more discussion has been added for clarification. (a) It is in the best interest of the remediation to minimize the amount of excavation open at any one time. Because the area to be excavated is so large, managing runoff and drainage engineering controls will be a significant portion of the detailed engineering design effort. (b) Confirmation sampling of contaminants for which a final action level has been established will precede placement of backfill material.

Action: (a) **Page 4-17, line 2.** The text has been modified and expanded as follows: "Waste pits would be backfilled and regraded more or less concurrently with waste excavation to minimize the amount of open excavation at any one period of time. Additional engineering controls, such as berms in the bottom of the excavation separating the clean side of the excavation from the open cut, can be utilized to control cross-contamination. These measures are desirable because of the large surface area of the waste pits which would be excavated. The major advantage to minimizing the open excavation area is to prevent possible recontamination in the event of pit flooding during severe rains."

(b) **Page 4-17, line 9.** Text has been added as follows: "Confirmation sampling on a grid pattern to determine "clean" areas (i.e., contaminant concentrations at levels below final action levels) will precede placement of backfill into the excavation."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.3.1 Page #: 4-20 Line #: 18-20 Code: C
Original Comment #: 49

Comment: How does the previous discussion of waste removal with concurrent backfilling relate to the first sentence of the paragraph suggesting liners will not be removed until all of the waste pit area has been excavated? DOE should clarify the excavation and restoration activities.

Response: Agree. More clarification is required. As discussed in the response to Comment 48, it is in the best interest of the remediation to minimize the amount of excavation open at any one time. Liners will be removed in sections as areas of excavation are opened.

Action: **Page 4-27, line 6.** The following text has been revised: "After a portion of the waste in the waste pit area has been excavated, the pit liners in that area would be carefully removed and confirmation sampling would be initiated."

Page 4-27, line 14. The following text has been revised: "The exposed area would then be backfilled with clean soil."

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: DDAGW
Section #: 4.3.2.2 Page #: 4-25 Line #: 10-12 Code: C
Original Comment #: 50

Comment: Why is the point of compliance set as the limit of the FEMP site boundary? The proposed waste disposal units at the FEMP site are located above the Great Miami River Aquifer system, an aquifer which has received sole source aquifer classification by EPA. The Ohio EPA has only entertained the construction of these units because they serve to improve the overall condition of the FEMP site, not based upon site suitability. As such, extra measures must be taken by DOE to protect the quality of the GMA. It is expected by Ohio EPA that if any waste disposal unit at the site should be breached, DOE will remediate ground water at the unit itself, not at the property boundary.

Response: Comment Acknowledged. DOE believes that there are two issues associated with responding to this comment. The first issue relates to the future land use/exposure scenario for which remediation will be protective. As discussed in the responses to Comments 13 and 15, proposed soil remediation levels were developed to be protective of an off-site residential farmer (i.e., potential groundwater user). These levels are considered interim, pending decisions on future land use, and will be revisited by the Operable Unit 5 Feasibility Study. The Operable Unit 5 Feasibility Study will consider, quantitatively, a range of future land use/exposure scenarios from a site-wide basis (including the Operable Unit 1 areas) in the process of developing final remediation levels. If found to be necessary, the Operable Unit 5 Record of Decision will modify the current Operable Unit 1 proposed remediation levels downward to ensure protectiveness of human health and the environment. The Operable Unit 5 Record of Decision, and remediation levels therein, will be consistent with the final decision(s) concerning future land use. DOE does not believe that any change to this approach is necessary for the Operable Unit 1 Feasibility Study. DOE does recognize the critical importance of the ability of an on-site waste disposal facility to be protective of the Great Miami Aquifer. Alternatives involving an on-site waste disposal facility would include an ongoing leachate and groundwater monitoring program at the waste management unit itself designed to detect unacceptable releases from the unit. In particular, the groundwater monitoring program would be designed to help ensure that releases from the waste management unit did not increase contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs. Corrective action would be initiated as appropriate based on this program. Related text will be added to the document.

Action: **Page 4-31, line 28.** The original text has been deleted and replaced with: "All action alternatives would include an ongoing leachate and groundwater monitoring program at the facility boundary itself designed to detect unacceptable releases from the unit. In particular, the groundwater monitoring program would be designed to help ensure that releases from the waste management unit (disposal cell and/or restored pit area) did not increase contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs. Corrective action would be initiated as appropriate based on this program."

Page P-5-4, line 17. The following text has been added: ". . . water. Most notable of the chemical-specific ARARs are MCLs, with compliance measured at the waste unit boundary (disposal cell and/or restored pit area)."

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: DDAGW
Section #: 4.3.2.2 Page #: 4-25 Line #: 16-18 Code: C
Original Comment #: 51

Comment: This paragraph is misleading. It portrays the glacial overburden as an unsaturated unit which only contains ground water in special "zones of saturation." This is untrue; the glacial overburden at the FEMP site has consistently proven to be saturated, thus acting as an aquifer system. This aquifer system does indeed have a low permeability but it is an aquifer system.

Response: Partially Agree. While the glacial overburden does exhibit characteristics similar to an aquifer system, it is not necessarily an aquifer. It is the responsibility of Operable Unit 5 to investigate site-wide media (which includes glacial overburden) and related information is currently being evaluated in support of Operable Unit 5's RI/FS. Operable Unit 5 will make the final determination as to the most appropriate designation for the saturated glacial overburden. This has important ramifications relative to on-site disposal facility siting issues.

Action: Page 4-32, line 9. The following text was added: "Operable Unit 5 has site-wide responsibility for investigation of groundwater including perched groundwater. The Operable Unit 5 Remedial Investigation will specifically evaluate if this perched water is simply a zone of saturation or part of an aquifer system."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

5723

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.3.2.2 Page #: 4-25 Line #: 22-24 Code: C
Original Comment #: 52

Comment: The point of compliance is not defined within this section and should be. DOE should be using the edge of the waste management unit boundary as the point of compliance for groundwater protection.

Response: Comment Acknowledged. DOE believes that there are two issues associated with responding to this comment. The first issue relates to the future land use/exposure scenario for which remediation will be protective. As discussed in the responses to Comments 13 and 15, proposed soil remediation levels were developed to be protective of an off-site residential farmer (i.e., potential groundwater user). These levels are considered interim, pending decisions on future land use, and will be revisited by the Operable Unit 5 Feasibility Study. The Operable Unit 5 Feasibility Study will consider, quantitatively, a range of future land use/exposure scenarios from a site-wide basis (including the Operable Unit 1 areas) in the process of developing final remediation levels (including the Operable Unit 1 areas). If found to be necessary, the Operable Unit 5 Record of Decision will modify the current Operable Unit 1 proposed remediation levels downward to ensure protectiveness of human health and the environment. The Operable Unit 5 Record of Decision, and remediation levels therein, will be consistent with the final decision(s) concerning future land use. DOE does not believe that any change to this approach is necessary for the Operable Unit 1 Feasibility Study. DOE does recognize the critical importance of the ability of an on-site waste disposal facility to be protective of the Great Miami Aquifer. Alternatives involving an on-site waste disposal facility would include an ongoing leachate and groundwater monitoring program at the waste management unit itself designed to detect unacceptable releases from the unit. In particular, the groundwater monitoring program would be designed to help ensure that releases from the waste management unit did not increase contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs. Corrective action would be initiated as appropriate based on this program. Related text will be added to the document.

Action: **Page 4-31, line 28.** The following text has been deleted and replaced with: "All action alternatives would include an ongoing leachate and groundwater monitoring program at the facility boundary itself designed to detect unacceptable releases from the unit. In particular, the groundwater monitoring program would be designed to help ensure that releases from the waste management unit (disposal cell and/or restored pit area) did not increase contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs. Corrective action would be initiated as appropriate based on this program."

Page P-5-4, line 17. The following text has been added: ". . . water. Most notable of the chemical-specific ARARs are MCLs, with compliance measured at the waste unit boundary (disposal cell and/or restored pit area)."

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: DDAGW
Section #: 4.3.2.2 Page #: 4-27 Line #: 17-22 Code: C
Original Comment #: 53

Comment: The three bullets indicate that the exemption will be granted based upon the suitability of the siting location. This is not founded. The locations was based upon the MOST suitable location available at the site. The DOE has committed to making up for the lack of a suitable siting location by "over engineering" the disposal facilities. By doing this, DOE will be as protective of the GMA as technically possible.

Response: Agree. The text currently indicates that an exemption will be granted based upon the technical considerations listed. DOE, EPA, and OEPA have not agreed upon this issue to date. The text will be revised to discuss the options available in addition to gaining an exemption based on certain technical criteria.

Action: All references to obtaining an exemption from this requirement (from the State of Ohio) have been deleted from the revised FS and PP.

Page 4-34, line 10. The text has been deleted. The following language has been included:

"OAC 3745-27-07 (B) (5) specifically prohibits solid waste disposal facilities from being constructed over sole-source aquifers. Because Operable Unit 1 and the FEMP lie above the Great Miami Aquifer which is designated as a sole-source aquifer under the Safe Drinking Water Act, Alternative 4A would not be able to comply with this ARAR. A waiver from this requirement under CERCLA Section 121 (d) (4) is discussed in Appendix F.

DOE, EPA, and OEPA are evaluating the possibility of obtaining a waiver from the requirement. The location of the on-property disposal facility will be based upon the most suitable location available at the site. The disposal facility will also be engineered to compensate for the lack of a suitable siting location and to be as protective of the Great Miami Aquifer as technically possible."

Page P-5-13, line 21, and P-5-14, line 16. The following text has been added: "DOE, EPA, and OEPA are evaluating the possibility of obtaining a waiver from the requirement. The location of the on-property disposal facility will be based upon the most suitable location available at the site. The disposal facility will also be engineered to compensate for the lack of a suitable siting location and to be as protective of the Great Miami Aquifer as technically possible."

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.3.2.3 Page #: 4-32 Line #: 26-27 Code: C
Original Comment #: 54

Comment: DOE should discuss how much soil will be needed for the vitrification process and why soil would be forwarded to Operable Unit 5 if it is need for vitrification. Also see previous comments concerning treatment of the soil with pit wastes.

Response: Agree. Clarification should be provided. As discussed on page 4-17, lines 18-21, the conceptual basis for the cost estimate used a mixture of 20 percent soil and 60 percent waste for vitrification feed. If this alternative is selected for implementation, this ratio would be refined during the remedial design process based on additional treatability study input. Under this alternative, the first priority for contaminated soil would be to satisfy vitrification requirements. If more contaminated soil is encountered than is required in the vitrification process, the excess would go to Operable Unit 5.

Action: **Page 4-39, line 27.** The text has been modified as follows: "After the pit waste and liner material have been excavated, contaminated residual soil would be removed to established remediation levels. For this alternative, the soils would be used to satisfy the soil mixture requirements of vitrification. If more contaminated soil is encountered than is required in the vitrification process, the excess would be forwarded to Operable Unit 5 for management."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.4.1 Page #: 4-57 Line #: 21-24 Code: C
Original Comment #: 55

Comment: It is unclear from the text whether the cement-solidified waste is being disposed of in the cell as cured solid or as a wet mix. DOE should clarify this within the text.

Response: Agree. Clarification should be provided to establish that the cement-solidified mixture is a semi-solid prior to disposal with final curing in place.

Action: **Page 3-43, line 12.** The text has been modified as follows: "Semi-solid, cement-solidified material would be placed in the cell through a distributor conveyor, spread, and compacted in 30-centimeter (12-inch) lifts. The material would be allowed to cure in place."

Page 4-68, line 6. The text was modified as follows: "A conventional material handling system would be installed to receive the cement-solidified mixture in a slurried state from the pugmill mixers and to transfer and place the slurried cement-solidified waste into the disposal cell to be spread and compacted with final curing in place. The transfer system will be selected during further engineering studies. The cement-solidified waste will be spread and compacted in 30-centimeter (12-inch) lifts within the disposal cell."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.6.1 Page #: 4-88 Line #: 9-11 Code: C
Original Comment #: 56

Comment: The waste processing section should include a discussion of the Envirocare acceptance criteria with regard to % moisture as this is the only treatment being conducted. Including the criteria within the text will support the use of drying if indeed it is necessary.

Response: Agree. A discussion of the percent moisture should be included in the text.

Action: **Page 4-104, line 29.** The following text has been expanded: "Some type of water removal treatment for the waste is required for the waste to meet the acceptance criteria of the commercial disposal facility (see Appendix J). To facilitate effective waste compaction in the disposal cell, the representative commercial waste disposal facility requires wastes to be at or below the Standard Proctor optimum moisture content. This is assumed to be, on average, approximately 15 percent for the waste pits."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Table 4-3 Page #: 4-109 Line #: Code: C
Original Comment #: 57

Comment: The table should include cost for Borrow Pit Restoration as shown in Table 4-2.

Response: Agree. Table 4-3 should have included the cost for Borrow Pit Restoration in the total capital cost for Alternative 4B. It was included in the cost estimate calculations located in Appendix E.

Action: **Page 4-80, Table 4-4.** Table 4-4, formerly identified as Table 4-3, was revised to include the cost of the Borrow Pit Restoration.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Table 4-4 Page #: 4-110 Line #: Code: C
Original Comment #: 58

Comment: The table should include cost for Borrow Pit Restoration as shown in Table 4-2. Additionally, the table should clarify the difference between "Off-site Disposal" and "Shipping and Disposal (NTS)".

Response: (a) Disagree. There is no work and, therefore, no cost associated with the borrow pit restoration in Alternative 5A - Off-Site Disposal at NTS. In this alternative, backfill material for the waste pit restoration would be obtained from off-site sources. (b) Agree. Table 4-4 should be clarified.

Action: (a) None.

Page 4-103, Table 4-5 (formerly identified as Table 4-4). (b) The table was clarified to show that Off-Site Disposal refers to Decontamination, Dismantling, and Off-Site Disposal of Remedial Facilities, and Shipping and Disposal (NTS) refers to Shipping and Disposal (of Waste Material to NTS).

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Table 4-5 Page #: 4-111 Line #: Code: C
Original Comment #: 59

Comment: The table should include cost for Borrow Pit Restoration as shown in Table 4-2. Additionally, the table should clarify the difference between "D&D Off-site Disposal" and "Shipping and Disposal (Commercial)".

Response: (a) Disagree. There is no work and, therefore, no cost associated with the borrow pit restoration in Alternative 5B - Off-Site Disposal at a Representative Commercial Disposal Facility. In this alternative, backfill material for the waste pit restoration would be obtained from off-site sources. (b) Agree. Table 4-5 should be clarified.

Action: (a) None.

Page 4-123, Table 4-6. (b) Table 4-6, formerly identified as Table 4-5, was clarified to show that D&D Off-Site Disposal refers to Decontamination, Dismantling, and Off-Site Disposal of Remedial Facilities, and Shipping and Disposal (Commercial) refers to Shipping and Disposal (of Waste Material to a Commercial Disposal Facility).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 4 Page #: Figure 4-2 Line #: Code: C
Original Comment #: 60

Comment: A structure geotextile layer should be placed on top of the waste.

Response: Partially Agree. Figure 4-2 is a conceptual drawing of the general features of an on-site waste disposal facility. This figure details components of the conceptual waste disposal facility such that the cover and liner system are not presented showing specific engineered components, such as a geotextile layer. Figure 4-3 shows the layers of the cap system (and the liner system) as conceived for the conceptual design phase in greater detail. In the conceptual cap system on this figure, a geotextile membrane is included among the components located above the wastes. Immediately above the waste will be a layer of contour-leveling fill. Such a layer is required to provide a consistent, stable foundation for the remainder of the cover system. This would be particularly important for an irregular waste form such as a cement-solidified material. A geotextile layer placed on such an irregular surface could, in fact, promote differential cover settlement. It is emphasized that the features presented in Figure 4-3 are conceptual at this stage and would be refined during the remedial design phase to produce the most appropriate design. Language will be added to the text to emphasize the conceptual nature of this and other drawings and that the specific components of the facility would be refined in the remedial design to produce the most appropriate design. This conceptual design was completed to provide enough information to complete the cost estimate. If this becomes the selected alternative, the cap system would be engineered and verified against protectiveness standards during detailed design.

Action: **Page 4-22, line 2.** The following text was added: "This is a conceptual drawing of the general features of an on-site waste disposal facility."

Page 4-22, line 21. The following text was added: "This drawing is conceptual in nature and the specific components of the facility will be defined during remedial design."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: PP Page #: P-1-3 Line #: 2 Code: E
Original Comment #: 61

Comment: Reverse the order of the second and third bullets to reflect the order in which they are presented at the end of the Proposed Plan.

Response: Agree.

Action: Page P-1-3, line 4. The bulleted text has been revised as follows:

- "● A reference list serving as a bibliography.
- A glossary defining key terms and acronyms.
- A cross-reference matrix identifying other Operable Unit 1 documents that provided topics discussed in this Proposed Plan."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: PP Page #: P-1-3 Line #: 4 Code: C
Original Comment #: 62

Comment: Where in the text of the Proposed Plan does the cross-reference matrix appear? Maybe my copy is defective, but I was unable to locate the referenced information.

Response: Agree. The cross-reference matrix should have been provided.

Action: The cross-reference matrix (copy follows on next page) has been included in the revised Proposed Plan.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
 RESPONSE TO OHIO EPA COMMENTS

OPERABLE UNIT 1 PROPOSED PLAN REMEDIAL INVESTIGATION AND
 FEASIBILITY STUDY CROSS-REFERENCE MATRIX

PROPOSED PLAN SECTION	OTHER FEMP OPERABLE UNIT 1 DOCUMENTS
2.1 Site History	RI Section 1.1, 1.2.2 FS Section 1.2.2
2.2 Site Description	RI Section 1.1, 1.2.1 FS Section 1.2.1
3.1 The Operable Unit Concept	RI Section 1.0 FS Section 1.1.1.1
3.2 Scope and Role of Operable Unit 1	RI Section 1.2 FS Section 1.2.1.1
4.1 Overview of the Nature and Extent of Contamination	RI Section 4.0, 7.3
4.2 Overview of the Baseline Risk Assessment	RI Section 6.0, Appendix E FS Section 1.2.5
5.1.1 No-Action Alternative	FS Section 4.2
5.1.2 Alternative 4A - Removal, Treatment (Vitrification), and On-Property Disposal	FS Section 4.3
5.1.3 Alternative 4B - Removal, Treatment (Cement Solidification), and On-Property Disposal	FS Section 4.4
5.1.4 Alternative 5A - Removal, Treatment (Thermal Drying), and Off-Site Disposal at NTS	FS Section 4.5
5.1.5 Alternative 5B - Removal, Treatment (Thermal Drying), and Off-Site Disposal at Permitted Commercial Facility	FS Section 4.6
6.1 Preferred Remedial Alternative	FS Section 4.1.2, 4.6.2
6.1.1 Summary of the Comparative Analysis of Alternatives	FS Section 5.0, FS Table 5-1
6.2 Summary of Preferred Alternative Impacts	FS Section 5.0, Appendix I
6.3 Summary of Basis for Preference	FS Section 5.0
7.0 Community Participation	NA

NA = Not Applicable

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: PP Page #: P-4-2 Line #: 20 Code: C
Original Comment #: 63

Comment: Is it true that uranium contaminations in perched groundwater are concentrated in the vicinity of Waste Pits 1 and 4? Most of the text suggests that most contamination is near Waste Pit 4 and the Burn Pit.

Response: Agree. On pages 4-116 through 4-117, the Operable Unit 1 Draft Final Remedial Investigation Report discusses the uranium concentrations in the perched groundwater, in addition to that near Waste Pit 4, as "an elevated area at Well 1073, located near or within the border of Waste Pit 1." However, this well may have intersected the waste pit material and this may have caused the high concentration.

Action: **Page P-4-2, line 21.** The following text has been modified: "An elevated area of uranium concentrations was noted at Well 1073, located near or within the border of Waste Pit 1. It is noted that Well 1073 may intersect waste pit material, thereby affecting groundwater sample contaminant concentrations."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: PP Page #: P-5-2 Line #: 17 Code: C
Original Comment #: 64

Comment: The Proposed Plan states that Operable Unit 5 will "document the method of management for these soils." Does 'management' include temporary storage of these soils as they await final management under the RD/RA plan? If not include discussion of temporary storage in this section of the text.

Response: Comment Acknowledged. Management is intended to include disposition of soils. Current schedules indicate that Operable Unit 5 will be ready to accept soils from Operable Unit 1 so that no long-term storage will be necessary.

Action: **Page P-5-2, line 25.** The following text has been revised: "... will be forwarded to Operable Unit 5 for management, including final disposition."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: PP Page #: P-6-7 Line #: 21 Code: C
Original Comment #: 65

Comment: This line touches on an important point. Please expand on this in the text.

Response: Agree. However, the impacts of waste heterogeneity are further discussed in the Administrative Feasibility text in Section 6.

Action: **Page P-6-9, line 23.** The following text was added: "The impacts of waste heterogeneity are discussed further in the technical feasibility discussion." Note that the Technical Feasibility subheading and the Technical Feasibility discussion have been placed under the Implementability heading.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO OHIO EPA COMMENTS

5723

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 6.3 Page #: P-6-12 Line #: Code: C
Original Comment #: 66

Comment: It would be interesting to read a paragraph in this section that addresses specifically why the preferred disposal site is a commercial facility rather than the NTS. Please add this discussion to the text.

Response: Agree.

Action: Page P-6-16, line 14. The following text was added at the end of the third bullet: "Cost is the major difference between the off-site disposal alternatives. It is this cost advantage of disposal at a permitted commercial facility which led to the selection of the preferred alternative over use of NTS."

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: PP Page #: P-7-1 Line #: 10 Code: C
Original Comment #: 67

Comment: Change to "Mr. Gary Stegner".

Response: Agree.

Action: Page P-7-1, line 10. "Mr. Ken Morgan" has been changed to "Mr. Gary Stegner."

Page ES-13, line 26 of the Proposed Plan. "Mr. Gary Stegner" has been added.

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: All Page #: NA Line #: NA Code:
Original General Comment #: 68 (1; Pg 2-1)

Comment: The Proposed Plan (PP) is not in the format recommended by U.S. Environmental Protection Agency (U. S. EPA) guidance and is too long for its intended purpose. Because this document will be used by the public to understand the proposed remedial action, formatting changes such as deleting unnecessary information and summarizing and shortening the existing information are recommended. At a minimum, the PP should include an executive summary that condenses the information presented.

Response: Partially Agree. The Operable Unit 1 Proposed Plan format is consistent with the outline provided in U.S. EPA's Guidance on Preparing Superfund Decision Documents (Directive 9355.3-02), January 1992. Section 2.4.2 of the guidance indicates the lead agency may develop a more detailed proposed plan as appropriate, particularly if the site is more complex, involves several operable units, or is the subject of greater public concern. An Executive Summary should be added to summarize the information in the document and to provide the general public with precise and condensed facts regarding Operable Unit 1.

Action: An Executive Summary has been added to the Proposed Plan.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: All Page #: NA Line #: NA Code:
Original General Comment #: 69 (2; Pg 2-1)

Comment: As noted for the Feasibility Study (FS), when describing Alternative 5B - Removal, Treatment (Thermal Drying), and Off-Site Disposal at a Permitted Commercial Disposal Facility, the PP does not refer to a specific off-site disposal facility. However, when discussing the evaluation of this alternative, the PP considers many apparent disposal facility-specific parameters (such as distance from OU1, geology, and climate). For clarity, the description of Alternative 5B presented in the PP should clearly describe all the assumptions associated with the proposed disposal site.

Response: Comment Acknowledged. Page P-5-7 states that the characteristics and waste acceptance criteria of a representative facility in Clive, Utah, would be used for the purposes of analysis. However, additional information has been added to the description of Alternative 5B in the Proposed Plan to clarify the source of assumptions and parameters relating to the representative commercial facility.

Action: Page P-5-10, line 16. After "...Clive, Utah, were considered," the following insert has been added: "The representative facility is located on the eastern side of the Great Salt Lake Desert, 4.8 kilometers (3 miles) west of the Cedar Mountains. The facility's license and waste acceptance criteria are discussed in Appendix J of the Draft Final FS. The facility is fully licensed to accept low-level radioactive waste and most mixed wastes for disposal. As implied, this facility is considered to be representative of any such facility that would be licensed to accept similar wastes. As stated above, Alternative 5B was developed and evaluated assuming that the Operable Unit 1 wastes would go to this representative facility."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: ALL Page #: NA Line #: NA Code:
Original General Comment #: 70 (4; Pg 1-1)

Comment: When discussing the long-term effectiveness of on-site disposal alternatives, the FS frequently refers to a "1,000-year" criterion. However, the FS inconsistently uses terminology regarding this criteria. The report should be revised to use consistent terminology for the 1,000-year criterion.

Response: Agree. The basis of the 1,000-year criterion relative to long-term effectiveness should be explained and discussed consistently throughout the Feasibility Study. Language will be added to Section 3 and Section 4 where the evaluation criteria are explained which clarifies the basis of the 1,000-year criterion. All discussions of long-term effectiveness in Section 3 and 4 will be reviewed to ensure that they are consistent with the specified basis of the 1,000-year criterion.

Action: **Page 3-11, line 21.** The following text has been added at the end of the existing sentence: "For evaluation of the first factor above, long-term effectiveness and permanence, the time-frame considered is 1,000 years following implementation of the remedial action. The basis of using 1,000 years is found in DOE Order 5820.2A and 40 CFR 192. These require that facilities managing radioactive wastes similar to those found in Operable Unit 1 maintain integrity for up to 1,000 years."

Page 4-6, line 1. The following text has been added between the existing sentences: "For evaluation of long-term effectiveness and permanence, the time-frame considered is 1,000 years following implementation of the remedial action. The basis of using 1,000 years is found in DOE Order 5820.2A and 40 CFR 192. These require that facilities managing radioactive wastes similar to those found in Operable Unit 1 maintain integrity for up to 1,000 years."

Page 5-7, line 8. The text was revised as follows: "...with the wastes for a design life of 1,000 years."

All discussions of long-term effectiveness in Section 3 and 4 were reviewed for consistency with the text above and revisions were made as required.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: ALL Page #: NA Line #: NA Code:
Original General Comment #: 71 (5; Pg 1-2)

Comment: Many of the specific comments regarding one section of the FS affect other sections of the FS. U.S. EPA has tried to note when this occurs by cross-referencing such comments. However, DOE should ensure that any changes made in response to U.S. EPA comments in one section are also incorporated into other sections as appropriate.

Response: Agree.

Action: Efforts have been made to cross-reference responses that affect text in more than one location in the Feasibility Study/Proposed Plan. Multiple locations where text revisions were required are noted in each individual action statement in this comment response document.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: ALL Page #: NA Line #: NA Code:
Original General Comment #: 72 (6; Pg 1-2)

Comment: During the review, several instances of incorrect references, inconsistent terminology, inconsistencies between text and tables or figures, misspelling, and other typographical errors were noted. The FS should be thoroughly proofread for these types of errors before it is resubmitted to U.S. EPA.

Response: Agree. A high standard of accuracy and consistency should be maintained.

Action: Both the revised Feasibility Study/Proposed Plan and this Comment Response document have been carefully edited.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.2.1 Page #: 1-15 Line #: 10 to 12 Code:
Original Specific Comment #: 73 (1; Pg 1-2)

Comment: This section of the FS discusses the site-wide hydrogeology and points out that the Great Miami Aquifer is a sole source aquifer. A sentence should be added explaining that because the Great Miami Aquifer is a sole source aquifer, it is categorized as a Class I aquifer according to the U.S. EPA groundwater protection strategy. This designation significantly affects the cleanup level of the aquifer required by the Superfund program. Also, the designation potentially affects cleanup levels for contaminated soil that may leach to the groundwater.

Response: Agree. The suggested sentence emphasizing the significance of the sole-source aquifer designation with regard to cleanup standards applied to the Great Miami Aquifer has been added to the text on page 1-21.

Action: Page 1-21, line 1. The following insert has been added: "Because the Great Miami Aquifer is a sole-source aquifer, it is categorized as a Class I aquifer according to the EPA groundwater protection strategy. This designation significantly affects the cleanup level of the aquifer required by the Superfund program. The designation also potentially affects cleanup levels for impacted soil that may leach contaminants to the groundwater."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.2.3.4 Page #: 1-36 to 1-39 Line #: ALL Code:
Original Specific Comment #: 74 (2; Pg 1-2)

Comment: This section discusses groundwater contamination at OU1, and organizes this discussion based on the 1000-, 2000-, 3000-, and 4000-series of monitoring wells. However, the differences in the depths of the four well series is not explained. This section should briefly explain the difference between each of the four monitoring well series.

Response: Agree. The difference relative to the zones monitored between the four well series should be explained.

Action: **Page 1-58, line 5.** The following text has been modified: "Groundwater includes perched water in the 1000-series wells outside of the waste pits and the 2000-, 3000-, and 4000-series wells that monitor various depths of the Great Miami Aquifer. Twenty-two of the 1000-series wells monitor groundwater in the glacial overburden (12 to 52 feet below the surface) under both sampling programs. Fourteen different 2000-series wells monitor the upper aquifer, or regional water table (43 to 130 feet below the surface). Only eleven 3000-series wells monitor the middle region of the aquifer (95 to 150 feet below the surface). Both series are located 100 to 125 feet below the surface in the sand-and-gravel layer above the clay interbed. Six wells (4000-series) monitor the bottom region of the aquifer (lower sand-and-gravel above the bedrock and below the clay interbed). The 4000-series wells are 193 to 210 feet below the ground surface."

Page 1-36, line 20. New text has been added to the end of the paragraph as follows: "Figure 2-18 of the Operable Unit 1 Draft Remedial Investigation depicts the relative depths of the monitoring well series."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.2.3.4 Page #: 1-37 Line #: 24 and 25 Code:
Original Specific Comment #: 75 (3; Pg 1-3)

Comment: This sentence states "Well 1073 was not sampled for technicium-99 during the RCRA," and is therefore apparently incomplete or incorrect. This sentence should be corrected to refer to some specific RCRA activity or possibly the Remedial Investigation (RI), as applicable.

Response: Agree. It should be clarified that the well was not sampled during the RCRA groundwater sampling program.

Action: **Page 1-59, line 13.** The text has been modified as follows: "Well 1073 was not sampled for technetium-99 during the RCRA groundwater sampling program."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.2.4.3 Page #: 1-45 Line #: 19 Code:
Original Specific Comment #: 76 (4; Pg 1-3)

Comment: This sentence refers to a concentration in units of "micrograms per cubic liter," which is apparently not a standard measure. The sentence should be changed to reflect the proper units.

Response: Agree.

Action: Page 1-45, line 15. The text has been modified as follows: "The highest organic constituent modeled to be present was aroclor-1254 at a concentration of 9.9×10^{-15} micrograms per cubic meter."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.2.5.2 Page #: 1-53 Line #: 1 to 7 Code:
Original Specific Comment #: 77 (5; Pg 1-3)

Comment: This paragraph refers to a "three-step process" for selecting constituents of potential concern (CPC); however, only an initial step and a second step are discussed. The text should be reworded or the appropriate missing information should be included to resolve this discrepancy.

Response: Agree.

Action: Page 1-75, line 1. The text has been revised as follows: "The CPCs were selected for inclusion in the quantitative risk assessment, based on a two-step process. The first step is comparison to background levels (applicable to inorganic and radionuclide constituents only). Statistical analyses were used to compare measured on-property concentrations of CPCs to background concentrations of that constituent in the same media. Then, toxicological screening is performed. After statistical comparisons were made, detected compounds which were shown to exceed background were subjected to toxicological screening to exclude constituents that are unlikely to have a human health risk at the detected levels."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.2.1 Page #: 2-10 Line #: 13 Code: G
Original Specific Comment #: 78 (6; Pg 1-3)

Comment: The first sentence in this paragraph refers to a "review" that resulted in the revision of the proposed remedial goals (PRG) originally appearing in the site-wide characterization report (SWRC). However, the subject of the review is unclear. The text should be revised to clarify the subject of the review.

Response: Agree.

Action: Page 2-15, line 11. The text has been modified as follows: "As a result of the refinement of future land use scenarios used in the Operable Unit 1 Baseline Risk Assessment, the PRGs originally appearing in the SWCR have been revised to more appropriately reflect Operable Unit 1 conditions."

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Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2 Page #: 2-20 Line #: 14-18 Code: M
Original Comment #: 79 (1)

Comment: This is an incorrect statement. In general, PRGs are not incremental above background concentrations; this process is only applicable for radionuclides. It is incorrect to calculate risks, PRGs, PRLs, or any management value for organic/inorganic contaminants using this methodology. All calculations for chemical contaminants are incorrect and must be recalculated. Tables 2-5, 2-6, 2-7, 2-7, 2-8, 2-13 and any other tables in which incremental risks or PRGs above background are presented must be revised.

For radionuclides, I have continuously commented that the most appropriate method of calculating risk is to subtract natural background levels and calculate the risk for the residual. This will avoid problems with the risk management values for the radionuclides as well.

Response: Partially Agree. DOE agrees that PRGs should not be developed such that they represent an incremental risk above that posed by background. In fact, the PRGs presented in Tables 2-5, 2-6, 2-7, and 2-8 were not calculated as being incremental above background. DOE recognizes that the text referenced in the comment, (partially on line 14 of Page 2-20) implies that they were. This text is incorrect and will be revised per the action statement below. DOE also recognizes that Tables 2-5, 2-6, 2-7 and 2-8 state that the PRGs presented therein are incremental above background as organic background levels are assumed to be zero. That statement is incorrect and will also be revised per the action statement below. Further, DOE agrees that at the FEMP it would not be relevant to develop a PRL for organics that is incremental above background as organic background levels are assumed to be zero. Again, establishment of the PRLs for organics in the Operable Unit 1 did not use such a methodology.

At this time, however, DOE does not agree in principal that it is inappropriate to establish inorganic PRLs as representing an incremental risk above that posed by background. Although there is no specific reference to "background" in RAGS Part B it is clear from RAGS Part A and from the Guidance for Conducting Remedial Investigation/Feasibility Studies that background concentrations of chemicals is to be considered. There are two types of background considered (anthropogenic and natural). The concept put forward in all of the applicable guidance documents that DOE is aware of is that contamination is produced by activities at a site that result in uncontrolled release and distribution of hazardous substances. The definition of contaminant clearly means concentrations of hazardous materials in media and areas where they are not expected. The indication presented in RAGS Part A is that the level of background risk is not specifically addressed as a part of the guidance for evaluating the need for remedial action.

To consider that a particular cleanup level must be background when the 10^{-6} , 10^{-5} , or 10^{-4} PRG is less than background is in effect saying the excess risk range is actually 0.0.

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For a site to be required to "clean" to background is not supported by the NCP. The NCP states that the cleanup levels are set to limit the excess cancer risk. The term excess implies greater than some threshold value which is nominally background. Additionally, there are several other factors to be considered as part of the process of establishing final remedial levels. These are, as identified in the NCP, factors related to technical limitations, uncertainty, and other pertinent information. Each of these additional factors can be made to take into account background (anthropogenic or natural) concentrations.

DOE believes, and EPA has agreed, that it is appropriate to establish PRLs for radionuclides that represent an incremental risk above that posed by naturally occurring background concentrations. DOE does not understand, nor is it aware of any written guidance which clarifies why there would be a distinction between the approach taken for radionuclides versus that taken for inorganics. From a chemical standpoint there is no apparent difference between radionuclides and inorganic metals. The only difference is that radionuclides present an additional exposure pathway, which is direct exposure. Once inside the body there is a difference of how damage occurs and potential cancer causing mechanisms, but there is no apparent technical basis for being able to have incremental above background levels for radionuclides and not for naturally occurring inorganic metals.

While disagreeing in principal with the EPA on this matter, DOE believes that the substantive impact of this issue on the development of PRLs for Operable Unit 1 inorganic contaminants is inconsequential. There may be an issue for only one metal, which is beryllium, where the background value was reported as 0.6 and the calculated PRG was 0.025 which would result in a final incremental risk PRL of 0.63. The issue is moot since there is no ability, on a technical level, to discriminate between 0.6 and 0.63. Since these two levels are essentially indistinguishable, DOE will set the PRL for beryllium at the background level. A footnote will be added to the table that clarifies establishment of this level. The text will be reviewed and language which indicates that inorganic PRLs will be established as incremental above background will be removed in favor of language that states background concentrations are a factor to be considered in the establishment of such PRLs.

Action: Page 2-20, Table 2-5, Page 2-23, Table 2-6, and Page 2-26, Table 2-7. The tables were revised by removing the label "Incremental Above Background Concentration" and replacing with the title "Risk-Based Concentrations."

Page 2-32, Table 2-8. The following was deleted in the first heading: "..., Background Above."

Page 2-41, line 10. The text was modified as follows: "PRLs are established considering the PRG concentrations and background concentrations."

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Page 2-42, line 14. The text was modified as follows: "Since PRGs are developed to address the excess cancer risk after remediation is complete a number of factors including technical limitations, uncertainty, and other significant factors such as background would be important in determining final remedial levels (referred to as proposed remedial levels [PRLs] in Operable Unit 1 since the final decisions concerning land use and cleanup levels will be revisited in the Operable Unit 5 FS)."

Page 2-47, line 27. The text was modified as follows: "However, the beryllium PRL of 0.60 milligram per kilogram is within the limits of analytical precision for soil sampling (+/- 40 percent) for the existing soil concentrations (0.77 milligram per kilogram) and may be indistinguishable from these surface soil concentrations."

Page 2-19, line 8. The following text was added: "The groundwater monitoring program for an on-property disposal cell would also be developed to ensure releases from the unit did not increase on-property contaminant concentrations in the Great Miami Aquifer to levels in excess of MCLs."

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Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2 Page #: 2-21 Line #: 22 Code: M
Original Comment #: 80 (2)

Comment: It is not clear what is meant by "infrequently detected" as it is used here. What is the basis for applying this criterion? Has it been used with the approval of the U.S. EPA RPM/toxicologist as suggested in RAGS? I have commented on the potential misuse of this criterion before.

Response: Comment Acknowledged. The term "infrequently detected" simply means that after comparison of the PRGs, which are calculated without regard to site concentrations, the development process for the PRL does take into account the detection frequency of a contaminant in a particular media and evaluates the frequency in light of cleanup considerations. Once a contaminant is identified as a COC in the baseline risk assessment, that constituent is evaluated for determining whether a PRL (modified PRG) needs to be established. The detection frequency is only one such consideration. If it is determined that the remedial action will address, for example, all of the surface soil and a particular constituent was infrequently detected in the surface soil then the development of a PRL may not be required since assumption is that the media which contained the constituent of concern will be addressed by removing the "hot spots".

The term infrequently detected is also considered in terms of the technical limitations related to detection in a specific media. In a number of cases, beryllium being just one example, there is no technical ability to both detect and distinguish between the site related concentrations and background. In cases such as these the number of times a particular constituent is detected in the characterization phase and in background can be used to determine whether a PRL is to be developed (PRGs are developed for all COCs and the preferred remedial alternative is designed to address all COCs). The NCP indicates in 40[CFR]300.430 (e) (2) (A), that there are 5 factors to be considered in development of the final cleanup concentrations; these are 1) ARARs, 2) risk range, 3) technical limitations, 4) uncertainty, and 5) other pertinent information. The term Infrequently detected is simply a means to take into account the factors identified in the NCP.

Action: Page 2-46, line 27. The following text was added: "The NCP indicates in 40 CFR 300.430 (e) (2) (A), that there are 5 factors to be considered in development of the final cleanup concentrations; these are 1) ARARs, 2) risk range, 3) technical limitations, 4) uncertainty, and 5) other pertinent information. The term infrequently detected is simply a means to take into account the factors identified in the NCP."

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Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2 Page #: 2-21 Line #: old line 5 Code: M
Original Comment #: 81 (3)

Comment: The example here has changed from aroclor-1254 to PAHs (one sample of how many?).
Does that mean that the aroclor reference was incorrect?

Response: Comment Acknowledged. The original Feasibility Study text contained an inconsistent
discussion of aroclor-1254 and polycyclic aromatic hydrocarbons. The change pages to
the Draft Feasibility Study submitted pursuant to DOE's March 16, 1994 letter to U.S.
EPA and Ohio EPA corrected this error. Those change pages are incorporated into the
revised document.

Action: None.

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Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: 2 Page #: Line #: Code: M
Original Comment #: 82 (4)

Comment: As per RAGS, Part B, "PRGs" are derived using generic equations to enable a preliminary evaluation of the remediation strategy. PRGs are modified to produce clean-up goals for risk management, based on the site-specific risk assessment. I/the reader cannot be certain whether the "PRGs" referred to in this report are the generic or site-specific values. The issue is further confused by the generation of "PRLs", which appear to be an incremental value, rather than clean-up/remediation goals based on site-specific information from the Baseline Risk Assessment. The methods used in this report must be further explained.

Response: Comment Acknowledged. The DOE agrees that the terminology can be confusing, however the DOE has met with representatives of the EPA on this subject and has submitted, for review and approval, documents outlining both the methodology and the supporting rationale for developing the terms as they are used in the OU1 FS report. The EPA guidance, RAGS Part B, refers to PRGs only. The guidance provides for the development of pure (default value) PRGs or site-specific values without specific reference to which is preferred or approved. In fact the guidance actually suggests that the default values be modified as soon as site-specific information is available.

The DOE's interpretation of this guidance suggests that there is no technical reason to support the differentiation between default and site-specific parameter usage, since all of the parameters are required to be defined. For this reason the tables and text, which refer to PRGs, do not typically delineate when the default values or site-specific values are used. In terms of the development of "cleanup levels" known as Proposed Remedial Levels (PRLs) for individual operable units, the distinction between generic or site-specific parameters does not play an important role.

There are many factors which contribute to the manner in which PRGs are modified to support the final remedial strategy at a site and the baseline risk assessment is merely one such consideration. In fact the baseline risk assessment for OU1 was used in modifying the PRGs for the development of the OU1 PRLs. It is also important to note that the PRLs development considers both the future land use scenario and the preferred remedial action alternative. In this way the "cleanup levels" are developed to be protective at the appropriate risk range, which is 10^{-6} for OU1 since there are multiple pathways and multiple contaminants. The preferred remedial action alternative also takes into account source containment or in the case of OU1 source removal.

Action: None.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.3.2 Page #: 2-22 Line #: 3 to 5 Code: G
Original Specific Comment #: 83 (7; Pg 1-3)

Comment: This paragraph specifies the constituents of concern (COC) for which surface soil remediation is required. As stated in the FS, the COCs requiring remediation are apparently cesium-137, uranium-235, uranium-238, beryllium, total uranium, and araclor-1254. However, because the thorium-230 concentration in surface soil is above the PRG, remediation would also be required for this COC. The text should be reworded to clarify that remediation for thorium-230 will also be required.

Response: Agree.

Action: Page 2-47, line 11. Thorium-230 has been added.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.4 Page #: 2-23 Line #: 21 to 29 Code:
Original Specific Comment #: 84 (8; Pg 1-4)

Comment: This paragraph provides examples of how to determine preliminary remedial levels (PRL) and how to interpret the information presented in Table 2-14. However, the data presented for the uranium-234 and uranium-238 examples does not coincide with the data presented for these contaminants in Table 2-14. This discrepancy should be resolved. Additionally, the other data presented in Table 2-14 should be checked for accuracy and, if necessary, revised.

Response: Agree.

Action: Page 2-49, line 17. "2 x" has been changed to "1.2 x."

Page 2-49, line 20. "Less than" has been changed to "greater than."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2.4 Page #: 2-24 Line #: 10 Code:
Original Specific Comment #: 85 (9; Pg 1-4)

Comment: This paragraph presents the components that drive the remediation levels at the different areas of OU1, and specifies uranium-238 as a secondary driver in Waste Pits 4 and 5. However, according to the data presented in Table 2-14, uranium-238 is apparently the secondary driver at Waste Pits 1 and 4, and neptunium-237 is apparently the secondary driver at Waste Pit 5. These discrepancies should be resolved.

Response: Agree.

Action: The numbers and examples in this section and Table 2-14 were reviewed and Table 2-14 was revised as necessary.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4.3.5 Page #: 2-33 Line #: 1 to 4 Code:
Original Specific Comment #: 86 (10; Pg 1-4)

Comment: This section discusses pneuma/oozer dredging as the only pneumatic removal technology identified and screened in the FS. However, Figure 2-2 also identifies airlift dredging as another pneumatic removal technology. Although airlift dredging was apparently not retained for further evaluation in the FS, a discussion of this technology should be included in Section 2.4.3.5 so that the reader will understand the justification for its deletion.

Response: Agree.

Action: Page 2-67, line 10. The following text was added:

"Airlift Dredging

An airlift dredge uses compressed air to dislodge and transport sediment. This process option is not retained for further evaluation because a minimum depth of 6 to 9 meters (20 to 30 feet) is required to develop enough air pressure to overcome the hydrostatic pressure. Accordingly, it would not be an effective technology for the majority of the waste pit volume."

Page 2-96, Table 2-17. A new row has been added to the table under Pneumatic Removal. The following text has been added under the current table headings:

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Remedial Technology	Process Option	Effectiveness	Implementability	Cost
	Pneuma/Oozer Dredge Airlift Dredge	Not effective for the majority of the waste pit material because technology requires a minimum depth of 6 to 9 meters to develop sufficient air pressure to overcome hydrostatic pressure.	Difficult to implement	Moderate

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4.6.1 Page #: 2-34 Line #: 2 to 4 Code:
Original Specific Comment #: 87 (11; Pg 1-4)

Comment: This section provides three reasons why in situ vitrification was not retained for further evaluation in the FS. As it is phrased, the third reason provided is unclear and appears incomplete. The text should be rephrased to clarify this third reason.

Response: Agree.

Action: **Page 2-68, line 10.** The following text has been modified: "This process option is not retained for further evaluation due to: (1) its difficulty in implementation for heterogenous wastes, (2) saturated wastes (i.e., in situ) require special design considerations because of the large amount of water that will be vaporized during the process (Shelley 1990), and (3) wastes in Operable Unit 1 are present at levels deeper than those tested to date, specifically; this process option has not been shown to be implementable in full-scale tests at depths exceeding 17 to 20 feet (Bowlds 1992 and Levi 1992)."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.3.1 Page #: 2-46 Line #: 13 to 15 Code:
Original Specific Comment #: 88 (12; Pg 1-4)

Comment: This section discusses the cost of surface water/sediment monitoring as one of three monitoring technologies that could potentially be used as an institutional control for OU1. This section identifies the cost of this technology as "low to moderate," but Table 2-15 identifies the costs of this technology as "low." This discrepancy should be resolved.

Response: Agree. The overall cost of surface water and sediment monitoring would be low relative to the other monitoring technologies. This is because less equipment is involved and this type of monitoring is less labor intensive. This determination is made consistent in the text on page 2-46 and on Table 2-15 on page 2-93.

Action: **Page 2-88, line 23.** In the third bullet under Surface Water/Sediment Monitoring, the words "to moderate" have been deleted so the sentence reads, "Overall, costs would be low."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.4.3 Page #: 2-50 Line #: 8 to 12 Code:
Original Specific Comment #: 89 (13; Pg 1-5)

Comment: This section discusses how to implement a sedimentation basin/sediment trap as a potential run-on/run-off control technology. However, it does not discuss the implementability of this technology specific to conditions at OU1, as required. The text should be modified to include this information.

Response: Agree.

Action: **Page 2-87, line 89.** The following text has been modified: "Flow characteristics across the site are generally acceptable for sedimentation basin/trap construction. However, a large sedimentation basin will be required to service runoff from the large surface area of Operable Unit 1. The fill material must be properly prepared and the emergency spillway of the sedimentation basin should be stabilized with temporary vegetation."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.4.3 Page #: 2-50 Line #: 27 to 30 Code:
Original Specific Comment #: 90 (14; Pg 1-5)

Comment: This section discusses the cost of diversion/collection as one of four run-on/run-off control technologies that could potentially be used at OU1. This section identifies the cost of this technology as "low," but Table 2-16 identifies the cost of this technology as "moderate." This discrepancy should be resolved.

Response: Agree. The text on page 2-50 is correct; the overall cost of the Diversion/Collection technology is low. Table 2-16 should be revised to be consistent with the text on page 2-16.

Action: No change to page 2-50.

Page 2-95, Table 2-16, second entry in the Effectiveness column. The words "water runoff" have been added after the word "surface." (The words were left out.) In the Cost column, second entry, "Moderate" has been changed to "Low."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.5.1 Page #: 2-53 Line #: 10 to 11 Code:
Original Specific Comment #: 91 (15; Pg 1-5)

Comment: This sentence states that due to its moderate effectiveness and implementability, the belt-type conveyor system was not carried forward as a mechanical removal technology for further evaluation in the FS. However, several of the remedial action alternatives presented later in the FS include the use of conveyor systems for transferring waste during remediation. This discrepancy should be resolved.

Response: Agree. However, the use of conveyor systems is retained for further evaluation as a remedial component only after treatment and, thus, after a change in waste characteristics has taken place.

Action: Page 2-92, line 1. The following text has been modified: "Due to its moderate effectiveness and implementability, the belt-type conveyor system is carried forward for alternative development only as a means for moving treated waste materials."

Page 2-90, Table 2-17. In the "Effectiveness" column for the conveyor system, the third entry under Mechanical Removal Remedial Technologies, insert the following statement: "The technology was carried forward as a means of moving treated waste material." The rest of the entry remains unchanged.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.6.2 Page #: 2-59 Line #: 10 to 12 Code:
Original Specific Comment #: 92 (16; Pg 1-5)

Comment: This section discusses the implementability of lime/fly ash solidification as a potential waste solidification technology to be used at OU1. However, this section does not consider the disadvantages posed by the increased volume and weight of the waste for disposal after the waste is solidified, as mentioned in Table 2-18. The text should be revised to include this information.

Response: Agree. Lime/flyash solidification will increase the volume and weight of the waste after treatment. More waste volume would need to be disposed of. This disadvantage has been added to the text on page 2-59 to make it consistent with Table 2-18.

Action: Page 2-100, line 9. The last line of the first bullet under Lime/Flyash Solidification has been replaced with the following sentence: "Additionally, there is concern over the long-term stability of the final material, the potential for dust emissions, and the increased volume and weight of the waste for disposal after solidification."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: 2-70 to 2-72 Line #: NA Code:
Original Specific Comment #: 93 (17; Pg 1-5)

Comment: Tables 2-5, 2-6, and 2-7 each include a column apparently intended to provide applicable or relevant and appropriate requirements (ARAR)/to-be-considered (TBC) requirements associated with contaminants at OU1. However, no information is included in these columns. The tables should be revised to include the intended information.

Response: Agree. The information originally intended for this column was not included. During development of alternatives, preliminary remediation goals are established based on available information including health-based criteria and ARARs. Examples of such ARARs include MCLs, water quality criteria, and state drinking water and air emission standards. In the specific instance of the Operable Unit 1 soil PRGs, all were developed using health-based criteria. There were no ARAR levels more stringent than the health-based levels. Accordingly, the column in the referenced tables for ARAR/TBC levels adds no value and should be deleted.

Action: Page 2-70, Table 2-5, Page 2-71, Table 2-6, and Page 2-72, Table 2-7. The column headed "ARAR/TBC" has been deleted.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: 2-82 Line #: NA Code:
Original Specific Comment #: 94 (18; Pg 1-6)

Comment: Table 2-9 presents a summary of maximum contaminant levels (MCL), maximum contaminant level goals (MCLG), and secondary MCLs for contaminants at OU1. The MCL for polychlorinated biphenyls (PCB) is listed, but the MCLG of zero for PCBs is not listed. The table should be revised accordingly.

Response: Agree. The MCLG for PCBs, which is zero, has been added to Table 2-9 in response to the comment. However, it is important to note that, according to the EPA, MCLGs set at zero are not considered when cleanup goals are established.

Action: Page 2-82, under the column "40 CFR 141.50 and 141.51 SDWA-NPDWS MCLG (mg/L)," a "0" has been inserted across from Polychlorinated Biphenyls.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.1 Page #: 3-3 Line #: 6 to 17 Code:
Original Specific Comment #: 95 (19; Pg 1-6)

Comment: This section compares the remedial action alternatives presented in the Initial Screening of Alternatives (ISA) report with those identified in the FS. Because the ISA alternatives are not specifically numbered, the text comparing the ISA alternatives to the FS alternatives is unclear and inconsistent. This section should be revised for clarity; in particular, the ISA alternatives should be assigned specific numbers on Page 3-3.

Response: Agree. Adding alternative numbers to the alternatives of the ISA would clarify the discussion comparing the alternatives of the ISA to the FS alternatives. Text corrections have been made in response to this comment on pages 3-3, 3-4, and 3-5.

Action: Page 3-3. The alternatives included in the Initial Screening of Alternatives have been numbered in parentheses after the alternative title, as follows:

- "-No action (ISA Alternative 1)
- Nonremoval; Slurry Wall & Cap (ISA Alternative 2)
- Nonremoval; Physical Stabilization Slurry Wall & Cap (ISA Alternative 3)
- Removal, Waste Treatment, & On-Property Disposal (ISA Alternative 4)
- Removal, Waste Treatment, & Off-Property Disposal (ISA Alternative 5)
- Removal, Waste Treatment, & On-Property Disposal (ISA Alternative 6)
- Removal, Waste Treatment, On-Property Disposal, Soil Treatment, & Cap (ISA Alternative 7)." No changes were made to the numbering of the FS alternatives.

Page 3-3, line 22. "The ISA's first alternative nonremoval action and the FS's" in the first line has been replaced with "ISA Alternative 2 and the FS's...."

Page 3-4, line 6. "FS" has been added before the words "Alternative 2 and 3."

Page 3-4, line 9. "Approach within" has been moved to before "ISA" so the sentence begins, "In general, the approach within ISA Alternative 4...."

Page 3-4, line 13. The word "alternative" has been capitalized and "4A" has been added before the same word so the sentence begins, "The FS Alternative 4A also includes...."

Page 3-4, line 15. "Of the fifth" has been deleted and "5" has been added after the word "alternative;" the second "alternative" in the sentence has been capitalized so the sentence reads, "This alternative is similar to part of ISA Alternative 5."

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Page 3-4, line 18. The sentence begins with "ISA" and "from the" has been deleted so the sentence begins, "ISA Alternative 5 is generic...."

Page 3-4, line 23. "In ISA Alternative 5" has been added after "...but the difference is that."

Page 3-4, line 24. "As in ISA Alternative 6" has been added after "...the above-grade structure."

Page 3-5, line 1. "ISA" has been moved to the beginning of the sentence and "presented in the" has been deleted so the sentence begins "ISA Alternative 7 consisted of...."

Page 3-5, line 6. "FS" has been added before "Alternative 4A and 4B."

Page 3-5, line 8. The word "final" has been replaced with "ISA" and "6" added after "alternative." "Alternative" was capitalized. "Presented in the ISA" has been deleted and the acronym "ISA" has been added before the reference to Alternative 6, in line 8, so the sentence begins, "ISA Alternative 7 is identical to the previous ISA Alternative 6 with the exception of...."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.2.3.1 Page #: 3-7 Line #: 14 to 16 Code:
Original Specific Comment #: 96 (20; Pg 1-6)
Comment: This section states that all remedial action alternatives would include access control of OU1 during the alternative implementation or as part of the final remediation. However, Table 3-1 does not indicate physical barriers being used for action Alternatives 5A and 5B. This discrepancy should be resolved.
Response: The text on page 3-7 is correct. Physical barriers will be used during the implementation of all remedial action alternatives. Table 3-1 should be revised to indicate that physical barriers will be used during implementation of Alternatives 5A and 5B.
Action: **Page 3-57, Table 3-1.** An "X" has been added to alternative columns 5A and 5B in the sixth row under both of these columns.

Page P-5-2, line 12. The following sentence was inserted: "Each alternative incorporated institutional controls, monitoring measures and forwarding of all water to the FEMP's Advanced Wastewater Treatment Facility."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.4.1 -6.1 Page #: 3-31 to 3-44 Line #: NA Code:
Original Specific Comment #: 97 (21; Pg 1-6)

Comment: This section discusses the remediation time frame for Alternative 4A. Although the total remediation time frame is mentioned, the discussion does not provide an estimate of the time required to construct the on-site, above-grade disposal cell. Because no provisions are apparently available for temporary storage after treatment, the disposal cell would need to be constructed before full-scale remediation could begin. The estimated time required to complete construction of the above-grade disposal cell and a brief description of provisions for temporary storage of treated waste before on-site disposal should be included in this section.

Response: Agree. Initiation of disposal cell construction would be among the first activities undertaken in implementation of the Operable Unit 1 remedial action. Disposal cell construction would proceed to a point where wastes could be accepted before waste excavation and treatment activities were initiated. This would preclude the need for significant interim storage. Disposal cell construction is accommodated by the estimated two-year period for construction of waste processing and handling facilities. It is emphasized that waste excavation and processing would not begin until the waste disposal facility was ready to receive wastes.

An explanation should be added to page 3-31 regarding scheduled construction of the disposal facility. Text should also be added to pages 3-36, 3-44, 3-49, 3-52, 4-64, 4-84, and 4-102 to clarify that construction of the disposal facilities and transportation of waste would coincide with the schedules for excavation of waste and treatment so that significant interim storage is not required for any of the alternatives being considered for detailed analysis.

Action: Text changes have been made in Sections 3 and 4 as described below:

Page 3-38, line 15. The following paragraphs have replaced the original paragraphs:

"Remediation Time Frame
Site preparation, material processing facility construction, processing equipment installation, and construction of the first quadrant of the disposal cell would take approximately two years. Waste removal, processing, and disposal with construction of additional phases of the disposal cell as needed would take place over the next 10 years. Waste excavation and treatment would not be initiated until the waste disposal facility was ready to receive wastes. Decontamination and decommissioning of the pretreatment and treatment facilities following remedial activities would take an additional two years. Remedial activities are expected to require a total of 14 years. Waste excavation activities would be scheduled to coincide with the rate of treatment and the readiness of the disposal cell so that no significant interim disposal facilities would be required prior to treatment or prior to disposal following treatment."

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Page 3-44, line 2. This statement clarifies the interim storage question, accounts for D&D of facilities, and makes the time frame consistent with Appendix E.

"Remediation Time Frame

Site preparation, material processing facility construction, processing equipment installation and construction of the first quadrant of the disposal cell would take approximately two years. Waste removal, processing, and disposal with construction of additional phases of the disposal cell as needed would take place over the next five years. Waste excavation and treatment would not be initiated until the waste disposal facility was ready to receive wastes. Decontamination and decommissioning of the pretreatment and treatment facilities following remedial activities would take an additional two years. Remedial activities are expected to require a total of nine years. Waste excavation activities would be scheduled to coincide with the rate of treatment and the readiness of the disposal cell so that no significant interim disposal facilities would be required prior to treatment or prior to disposal following treatment."

Page 3-52, line 18, and Page 3-53, line 1.

"Remediation Time Frame

Site preparation, material processing facility construction, processing equipment installation, and construction of the disposal vault would take approximately two years. Waste removal, processing, and disposal with construction of additional phases of the disposal cell as needed would take place over the next five years. Waste excavation and treatment would not be initiated until the waste disposal facility was ready to receive wastes. Decontamination and decommissioning of the pretreatment and treatment facilities following remedial activities would take an additional two years. Remedial activities are expected to require a total of nine years. Waste excavation activities would be scheduled to coincide with the rate of treatment and the readiness of the disposal vault so that no significant interim disposal facilities would be required prior to treatment or prior to disposal following treatment."

Page 3-58, line 11. The following text replaces original text to make it consistent with Appendix E and Section 4, and responsive to the question on interim storage requirements:

"Remediation Time Frame

Site preparation, material processing facility construction, and processing equipment installation would take approximately one year. Waste removal, processing, and shipment would take place over the next five years. Decontamination and decommissioning of the pretreatment facilities following remedial activities would take an additional two years. Remedial activities are expected to require a total of eight years. Waste excavation activities would be scheduled to coincide with the rate of treatment and the rate of shipment so that no significant interim disposal facilities would be required prior to drying or prior to shipment following waste drying."

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Page 3-62, line 2. The following text has been inserted between the second paragraph and the beginning of Section 3.3.8.2:

"Remediation Time Frame

Site preparation, material processing facility construction, and processing equipment installation would take approximately one year. Waste removal, processing, and shipment would take place over the next five years. Decontamination and decommissioning of the pretreatment facilities following remedial activities would take an additional two years. Remedial activities are expected to require a total of eight years. Waste excavation activities would be scheduled to coincide with the rate of treatment and the rate of shipment so that no significant interim disposal facilities would be required prior to drying or prior to shipment following waste drying."

Page 4-56, line 20. "Duration of Remedial Activities" - no change needed.

Page 4-76, line 7. The text has been modified as follows (which is substantially the same as was said in Section 3):

"Duration of Remedial Activities

Site preparation, material processing facility construction, processing equipment installation and construction of the first quadrant of the disposal cell would take approximately two years. Waste removal, processing, and disposal with construction of additional phases of the disposal cell as needed would take place over the next five years. Decontamination and decommissioning of the pretreatment and treatment facilities following remedial activities would take an additional two years. Remedial activities are expected to require a total of nine years. Waste excavation activities would be scheduled to coincide with the rate of treatment and the readiness of the disposal cell so that no significant interim disposal facilities would be required prior to treatment or prior to disposal following treatment. Physical, substantial, and continuous on-property activities could be initiated within 15 months after the ROD is approved by EPA."

Page 4-99, line 9. The text has been modified as follows (which is substantially the same as was said in Section 3):

"Duration of Remedial Activities

Site preparation, material processing facility construction, and processing equipment installation would take approximately one year. Waste removal, processing, and shipment would take place over the next five years. Decontamination and decommissioning of the pretreatment facilities following remedial activities would take an additional two years. Remedial activities are expected to require a total of eight years.

There is some uncertainty involved with the remedial activity schedule estimate for this alternative since transportation or waste acceptance criteria problems could cause delays

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in the shipping schedule. Section 4.5.2.6 discusses these uncertainties in more detail. However, waste excavation activities would be scheduled to coincide with the rate of treatment and the rate of shipment so that no significant interim disposal facilities would be required prior to drying or prior to shipment following waste drying. Physical, substantial, and continuous on-property activities could be initiated within 15 months after the ROD is approved by EPA."

Page 4-119, line 1. The text has been modified as follows (which is substantially the same as was said in Section 3):

"Duration of Remedial Activities

Site preparation, material processing facility construction, and processing equipment installation would take approximately one year. Waste removal, processing, and shipment would take place over the next five years. Decontamination and decommissioning of the pretreatment facilities following remedial activities would take an additional two years. Remedial activities are expected to require a total of eight years.

There is some uncertainty involved with the remedial activity schedule estimate for this alternative since transportation or waste acceptance criteria problems could cause delays in the shipping schedule. However, waste excavation activities would be scheduled to coincide with the rate of treatment and the rate of shipment so that no significant interim disposal facilities would be required prior to drying or prior to shipment following waste drying. Physical, substantial, and continuous on-property activities could be initiated within 15 months after the ROD is approved by EPA."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.4.2 Page #: 3-34 Line #: 2 to 3 Code:
Original Specific Comment #: 98 (22; Pg 1-7)

Comment: This section states that effluent characteristics and off-gas monitoring would present difficulties in the waste processing, but does not explain why these difficulties would be present. This section should include a brief explanation of the reasons for these difficulties.

Response: Agree. The off-gas treatment system would use standard components, but the selected devices and their configuration will have to be explicitly defined, tested, and optimized through bench-scale and pilot-scale testing. Difficulties could arise due to the complex linkage of treatment devices and treatment monitors. This means that if one fails, those downstream will be affected by the failure, potentially causing treatment and detection problems throughout the system. This section was intended to summarize only the implementability of the alternative briefly; difficulties posed by implementing this alternative are discussed in detail in Section 4.3.2.6."

Action: The text on page 3-34 should be reworded for clarification, but the detailed discussion can remain in Section 4.3.2.6.
Page 3-35, line 14. The text has been modified as follows: "Difficulties with the off-gas treatment and monitoring device system could arise due to the complex configuration alone. If even one treatment or monitoring device fails, those downstream will be affected by the failure, potentially causing treatment and detection problems throughout the system. Difficulties posed by implementing this alternative are discussed in detail in Section 4.3.2.6."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.3.7.1 Page #: 3-49 Line #: 23 to 25 Code:
Original Specific Comment #: 99 (23; Pg 1-7)

Comment: This section states that for Alternative 5A, treated material would be placed into "disposal containers." This section should include a brief description of the type of disposal containers proposed.

Response: Agree. This alternative would use metal shipping and disposal containers. The current conceptual design calls for use of containers with a capacity of 11.5 cubic meters (15 cubic yards). Each container could hold approximately 20 tons of waste material and have a total loaded weight of 21 tons. The waste would be buried at NTS in the containers. The text on pages 3-49 and 4-70 has been revised to clarify this point.

Action: Page 3-52, line 22. The text was modified as follows: "The treated material would be placed into metal shipping and disposal containers and transported by rail/truck combination to NTS. The disposal containers have a capacity of 11.5 cubic meters (15 cubic yards). Each container could hold approximately 20 tons of waste material and have a total loaded weight of 21 tons. The material would be held in an on-site staging area until proper tests confirming suitability for disposal have been performed and results analyzed and interpreted. The waste and containers would be buried at NTS."

Page 4-85, line 5. "metal shipping" was added before "disposal containers."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: 3-55 to 3-56 Line #: NA Code:
Original Specific Comment #: 100 (24; Pg 1-7)

Comment: Table 3-1 summarizes the process options retained and assembled for OU1. However, the table does not include Alternative 4C - Removal, Treatment (Thermal Drying), and On-Property Disposal. Table 3-1 should be revised to include Alternative 4C.

Response: Agree. Alternative 4C was overlooked when this table was prepared. The table should be modified to include information on Alternative 4C.

Action: Page 3-7, Table 3-1. A column was added to Table 3-1 for Alternative 4C, including the information attached.

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Process Option	4C Removal, Treatment (Thermal Drying), and On-Property Disposal
Groundwater Monitoring	X
Air Quality Monitoring	X
Surface Water/Sediment Monitoring	X
Leachate Collection/Disposal System	X
Administrative Controls/Deed Restrictions	X
Physical Barriers	X
Slurry Walls	
Subsurface Drains	
Run-On/Run-Off Controls	X
Groundwater Extraction	X
Multimedia Cap	X
Loader/Dozer/Backhoe	X
Dredge	X
Shallow Soil Mixing	
Surcharging	
Vitrification	
Cement Stabilization	
Solid/Liquid Separation	X
Drying/Calcination	X
Rail Transport	
Truck Transport	
Disposal Cell	X
NTS	
Representative Permitted Commercial Disposal Facility	

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: 3-62 Line #: NA Code:
Original Specific Comment #: 101 (25; Pg 1-7)

Comment: Figure 3-1 presents a schematic showing the removal, treatment, and disposal alternatives (Alternatives 4A, 4B, 4C, 5A, and 5B) for OU1. However, the figure does not differentiate between Alternatives 5A and 5B. This figure should be revised to reflect the differences between Alternatives 5A and 5B.

Response: Agree. Figure 3-1 is titled "Relationship of Screening Criteria to the Nine Evaluation Criteria." Figure 3-4, page 3-62, presents the schematic with the information referenced above. Alternatives 5A and 5B are both presented in the Off-Site Disposal box on this schematic. This has been revised per the comment. The one box is now two boxes, one for each alternative.

Action: Page 3-62, Figure 3-4, the Off-Site Disposal Box. Two equal boxes replace this one box in the schematic. The left-hand box contains the following text: "Off-Site Disposal at NTS, Alt. 5A." The right-hand box contains the following text: "Off-Site Disposal at Commercial Facility, Alt. 5B."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.0 and 4.0 Page #: NA Line #: NA Code:
Original General Comment #: 102 (1; Pg 1-1)

Comment: These sections present screening and analysis of remedial action alternatives for Operable Unit 1 (OU1). When describing Alternative 5B - Removal, Treatment (Thermal Drying), and Off-Site Disposal at a Permitted Commercial Disposal Facility, the Feasibility Study (FS) does not refer to a specific off-site location. However, when evaluating this alternative, the FS considers many apparent disposal facility-specific parameters (such as distance from OU1, geology, and climate). For clarity, the descriptions of Alternative 5B presented in the FS should clearly state all assumptions regarding the proposed disposal site.

Response: Comment Acknowledged. The description of Alternative 5B has been revised to contain information about the representative commercial facility so that the source of assumptions made and parameters for the representative commercial facility used in evaluating Alternative 5B are more clearly understood. The text on page 3-51 and 4-87 has been revised to include more information on the commercial disposal facility in response to this comment.

Action: **Page 3-51, line 9.** The following text has been added after "...located in the arid west": "The representative facility is located on the eastern side of the Great Salt Lake Desert, 4.8 kilometers (3 miles) west of the Cedar Mountains. The facility's license and waste acceptance criteria are discussed in Appendix J. The facility is fully licensed to accept low-level radioactive waste and most mixed wastes for disposal. As implied, this facility is considered to be representative of any such facility that would be licensed to accept similar wastes. As stated above, this remedial alternative was developed and evaluated assuming that the Operable Unit 1 wastes would go to this representative facility."

Page 4-87, line 14. The following text has been added after "...Alternative 5A" and before "The representative permitted commercial disposal facility is accessible directly by...": "The representative facility is located on the eastern side of the Great Salt Lake Desert, 4.8 kilometers (3 miles) west of the Cedar Mountains. The facility's license and waste acceptance criteria are discussed in Appendix J. The facility is fully licensed to accept low-level radioactive waste and most mixed wastes for disposal. As implied, this facility is considered to be representative of any such facility that would be licensed to accept similar wastes. As stated above, this remedial alternative was developed and evaluated assuming that the Operable Unit 1 wastes would go to this representative facility."

(New paragraph) "The representative permitted commercial disposal facility is accessible directly by...."

Page P-5-16, line 10. After "...Clive, Utah, were considered," the following text has been added: "The representative facility is located on the eastern side of the Great Salt Lake Desert, 4.8 kilometers (3 miles) west of the Cedar Mountains. The facility's license and waste acceptance criteria are discussed in Appendix J of the Draft Final FS."

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The facility is fully licensed to accept low-level radioactive waste and most mixed wastes for disposal. As implied, this facility is considered to be representative of any such facility that would be licensed to accept similar wastes. As stated above, Alternative 5B was developed and evaluated assuming that the Operable Unit 1 wastes would go to this representative facility."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.0 and 4.0 Page #: NA Line #: NA Code:
Original General Comment #: 103 (2; Pg 1-1)

Comment: These sections present screening and analysis of remedial action alternatives for OU1. For each of these alternatives, the FS provides a brief description of the relative cost involved for each alternative (for example, low, moderate, or high). In addition to providing this relative information, these narratives should also discuss the primary factor(s) that drive the cost of each alternative. This will provide additional information so that alternatives can be compared.

Response: Agree. Additional information on the factors which drive the cost for each alternative should be provided.

Action: **Page 3-31, line 1.** The following text has been added: "Capital Cost. The major components of capital cost include cap installation, slurry wall and groundwater well installation, and placement of monitoring systems. O&M Cost. The O&M costs associated with this alternative include maintaining institutional controls and conducting a review every five years to ensure that the remedy continues to provide adequate protection. Cap maintenance is assumed to be minimal (e.g., patching and mowing, etc.)."

Page 3-42, line 8. The following text has been added: "Capital Cost. The major components of capital cost for this alternative include waste excavation, waste processing (drying and vitrification), and construction of the on-site disposal cell. O&M Cost. The O&M costs associated with this alternative include maintaining access controls, monitoring the performance of the disposal cell, and maintenance of the disposal cell and waste pit area caps. Cap maintenance is assumed to be minimal (e.g., patching and mowing, etc.)."

Page 3-47, line 3. The following text has been added: "Capital Cost. The major components of capital cost for this alternative include waste excavation, waste processing (drying and cementation), and construction of the on-site disposal cell. O&M Cost. The O&M costs associated with this alternative include maintaining access controls, monitoring the performance of the disposal cell, and maintenance of the disposal cell and waste pit area caps. Cap maintenance is assumed to be minimal (e.g., patching and mowing, etc.)."

Page 3-55, line 13. The following text has been added: "Capital Cost. The major components of capital cost for this alternative include waste excavation, waste processing (drying), and construction of the on-site disposal cell. O&M Cost. The O&M costs

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associated with this alternative include maintaining access controls, monitoring the performance of the disposal cell, and maintenance of the disposal cell and waste pit area caps. Cap maintenance is assumed to be minimal (e.g., patching and mowing, etc.)."

Page 3-60, line 20. The following text has been added: "Capital Cost. The major components of capital cost for this alternative include waste excavation, processing (drying), and transport and disposal. More than 75 percent of the total capital cost associated with this alternative is identified with waste transport and disposal. O&M Cost. The O&M costs associated with this alternative include inspection and custodial maintenance of the cap installed over the waste pit area."

Page 3-63, line 14. The following text has been added: "Capital Cost. The major components of capital cost for this alternative include waste excavation, processing (drying), and transport and disposal. Approximately 50 percent of the total capital cost associated with this alternative is identified with waste transport and disposal. O&M Cost. The O&M costs associated with this alternative include inspection and custodial maintenance of the cap installed over the waste pit area."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.0 Page #: NA Line #: NA Code:
Original General Comment #: 104 (3; Pg 1-1)

Comment: This section presents a detailed analysis of those remedial action alternatives that passed the screening process. As part of the detailed analysis, the FS presents a description of each alternative. To clarify the information presented in these descriptions, a figure that shows the location of proposed on-site structures associated with each alternative (for example, above-grade disposal cells, interim waste storage areas, and additional railroad switches and sidings), should be included.

Response: Agree. Two figures have been developed to present the location of proposed on-site structures associated with each on-site (Figure 4-1) and each off-site (Figure 4-8) alternative carried through detailed analysis. Information presented in the figures include proposed treatment facility location, interim waste storage areas, conveyor systems, and disposal facilities.

Action: New Figure 4-1, Vitrification/Cementation Facility, On-Site Disposal, has been added to Section 4. The following text has been added to page 4-13, line 9: "Figure 4-1 provides a conceptual drawing of on-site facilities required for Alternative 4A." In addition, the following text was added to page 4-65, line 12: "Refer to Figure 4-1 for a conceptual drawing of on-site facilities required for Alternative 4B."

New Figure 4-8, Dryer Facility, Off-Site Disposal, has been added to Section 4. The following text has been added to page 4-79, line 27: "... is provided in Figure 4-7; a conceptual drawing of the dryer facility and related on-site facilities is provided in Figure 4-8." In addition, the following text was added to page 4-104, line 10: "Refer to Figure 4-8 for a conceptual drawing of on-site facilities needed for Alternative 5B."

All subsequent figures in Section 4 have been renumbered sequentially.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.1 Page #: 4-16 Line #: 6 to 8 Code:
Original Specific Comment #: 105 (26; Pg 1-7)

Comment: This sentence states that for Alternative 4A, waste would be handled by two indirect rotary dryers. However, Figure 4-1 apparently shows only one indirect rotary dryer. This discrepancy should be resolved.

Response: Agree. The current conceptual design calls for two indirect rotary directs operated in parallel. Figure 4-1 should be revised such that it is consistent with the text in Section 4.3.1.

Action: Figure 4-1 was renumbered as Figure 4-2 in response to another comment and was revised to show two indirect rotary dryers operating in parallel.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.2.2 Page #: 4-27 Line #: 2 to 3 Code:
Original Specific Comment #: 106 (27; Pg 1-7)

Comment: This sentence states that for Alternative 4A, no cultural resources are expected to be found within the boundaries of OU1. However, Alternative 4A includes disposal at an on-property, above-grade disposal cell and it is unclear whether the disposal cell would be within these boundaries. The location of the disposal cell should be identified and if the disposal cell is located outside of the OU1 boundaries, any additional location-specific ARARs should be considered.

Response: Agree. While the precise location of such a disposal cell is uncertain, it would most likely not be located within the current boundaries of Operable Unit 1. If cultural resources are identified, they would be avoided or managed appropriately regardless of the location. The referenced sentence will be revised to discuss areas impacted by the Operable Unit 1 remedial action rather than the boundaries of the operable unit itself. It will also emphasize compliance with the ARARs regardless of on-site location.

Action: Page 4-33, line 25. The text has been revised to read: "It is noted that no such cultural resources are expected to be found in the on-site areas that would be impacted by Operable Unit 1 remedial activities. It is emphasized that there will be compliance with the ARAR provisions regardless of the location of activity."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.2.5 Page #: 4-42 Line #: 15 to 16 Code:
Original Specific Comment #: 107 (28; Pg 1-8)

Comment: This section explains additional risks associated with dust released as part of excavation activities during the implementation of Alternative 4A. The text further states that these risks would be significantly reduced by dust control. However, it is not clear that dust control will be included as part of the alternative. The text should be revised to include clarification stating such dust control methods will be implemented as part of this alternative.

Response: Agree. Dust control methods to reduce risk to nonremediation workers would be used during remedial activities. Dust would be controlled on active excavation faces and spoil piles by wetting, fogging, or misting. Dust from inactive excavation faces would be controlled with plastic, applied foam, shotcrete, or paving. Crushing and drying activities would take place in an enclosed building with emission control systems. The text on page 4-42 should be revised to clarify this point.

Action: Page 4-50, line 17. The text has been modified as follows: "Dust control methods to reduce risk to nonremediation workers would be used during remedial activities. Dust would be controlled on active excavation faces and spoil piles by wetting, fogging, or misting. Dust from inactive excavation faces would be controlled with plastic, applied foam, shotcrete, or paving. Crushing and drying activities would take place in an enclosed building with emission control systems."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.3.2.6 Page #: 4-50 Line #: 3 to 10 Code:
Original Specific Comment #: 108 (29; Pg 1-8)

Comment: This paragraph introduces the three basic circuits of the vitrification system. Each circuit is discussed in subsequent paragraphs. However, operational problems associated with the feed preparation circuit are not discussed. The text should be revised to include potential operational problems associated with the feed preparation circuit.

Response: Agree. Potential operational problems in the feed preparation circuit include inadequate segregation of foreign materials (such as ferrous material, organic material, plastic, etc.) from the waste stream and unexpected variations in the metered quantities of waste and additives delivered to the melters. Text has been revised to incorporate this information.

Action: **Page 4-59, line 1.** The following text was added: "Potential operational problems in the feed preparation circuit include inadequate segregation of foreign materials (such as ferrous and organic materials, plastic, etc.) from the waste stream and unexpected fluctuations in the metered quantities of waste and additives delivered to the melters."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.2.3 Page #: 4-60 Line #: 24 to 27 Code:
Original Comment #: 109 (30; Pg 1-8)

Comment: This section refers to treatability results for cement stabilization. As provided for vitrification, a table summarizing the results of the treatability study for cement stabilization should be included in the FS.

Response: Agree. A table summarizing the treatability results for cement stabilization has been incorporated into the Feasibility Study Report.

Action: Table 4-2, Operable Unit 1, Summary of Cement Stabilization Treatability Study Results, has been incorporated into the feasibility study report text.

Page 4-72, line 14. The following text was added: "A summary of the cement stabilization treatability results is provided in Table 4-3." Table 4-3 was formerly identified as Table 4-2. Subsequent tables contained within the Feasibility Study Report have been renumbered.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.2.4 Page #: 4-62 Line #: 12-13 Code:
Original Specific Comment #: 110 (31; Pg 1-8)

Comment: This section states that according to treatability study results, cement formulations were not as effective in reducing the leaching of uranium from Waste Pit 4. The text should clarify to what effectiveness these cement formulations are being compared.

Response: Agreed. Text has been clarified to reflect that each developed formulation was evaluated using samples of waste collected from each waste pit.

Action: **Page 4-72, line 23.** The following text was added: "Each developed formulation was evaluated on samples of waste collected from each waste pit. In this way the effectiveness of each formulation could be comparatively made between the wastes contained within the waste pits."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.4.2.6 Page #: 4-65 Line #: 4 to 9 Code:
Original Specific Comment #: 111 (32; Pg 1-8)

Comment: This paragraph discusses the detrimental effects that the organic content in a waste material can have on the hydration of cement used for stabilization. This information is too general because it does not directly relate to conditions at OU1. The text should be revised to discuss specifically how the waste at OU1 will affect the cement stabilization process proposed in Alternative 4B.

Response: The above-referenced information was provided as a generic statement on how organic constituents contained within the pit wastes could interfere with the cement stabilization processes. The Operable Unit 1 Remedial Investigation Report documents the localized occurrence of these organic constituents at varying levels within the pit wastes. However, it is not known to what extent these constituents will be present in the waste following thermal drying. Additionally, it is not known to what degree residual concentrations of these constituents will have on the cement stabilization processes, placing some uncertainty in the effectiveness of this technology on stabilizing the pit wastes. This information has been provided within the Feasibility Study Report.

Action: Page 4-77, line 6. The following text was added: "The Operable Unit 1 Remedial Investigation Report documents the localized occurrence of these organic constituents at varying levels within the waste pits. Residual concentrations of these constituents remaining in the waste following thermal drying may potentially affect the cement stabilization processes and generated waste form."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.1 Page #: 4-71 Line #: 4 to 6 Code:
Original Specific Comment #: 112 (33; Pg 1-9)

Comment: This sentence states that treated material may be placed into temporary storage in response to temporary interruptions in the available transportation rate or disposal capacity. However, the text does not specify where this interim storage would take place. The text should be modified to include additional information regarding the interim storage.

Response: Agree. If an interruption slows down the rate of shipment of waste temporarily, treated waste can be held in newly constructed storage silos along the rail or stacked temporarily in their shipping containers in the paved loading dock area or along the rail siding. For longer transportation interruptions or slow downs, excavation activities would be scheduled to coincide with the rate of treatment and shipment so that no significant interim disposal facilities would be required prior to treatment or prior to disposal following treatment. The text on page 4-71 should be modified to emphasize this point.

Action: **Page 4-86, line 7.** The sentence that begins with "Treated material may be staged..." has been replaced with the following text: "If an interruption slows down the rate of shipment of waste temporarily, treated waste can be held in the silos along the rail or stacked temporarily in their shipping containers in the paved loading dock area or along the rail siding. For longer transportation interruptions or slow downs, excavation activities would be scheduled to coincide with the rate of treatment and shipment so that no significant interim disposal facilities would be required prior to treatment or prior to disposal following treatment."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.5.2.3 Page #: 4-76 Line #: 21 to 22 Code:
Original Specific Comment #: 113 (34; Pg 1-9)

Comment: This sentence specifies the acreage of wetlands that would be lost due to the borrow area associated with Alternative 5A. The text should also specify whether wetlands would be lost due to construction of additional structures (for example, railroad sidings and waste storage silos) during the implementation of Alternative 5A.

Response: Agree. A sentence should be added to specify wetland impacts from other activities.

Action: **Page 4-91, line 28.** The following text has been added: "Based on the current conceptual design, no wetland areas would be expected to be lost as a result of constructing additional structures (e.g., railroad sidings and waste storage silos) during the implementation of Alternative 5A."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.6.1 Page #: 4-89 Line #: 19 to 20 Code:
Original Specific Comment #: 114 (35; Pg 1-9)

Comment: This sentence states that for Alternative 5B, a dust collection hood would be incorporated to "eliminate" air emissions during railcar loading. By using such a device, it is unlikely that air emissions would be eliminated; therefore, the text should be modified to reflect that air emissions would more likely be "reduced."

Response: Agree. The railcar dust collection hood is more likely to significantly reduce dust emissions, rather than eliminate them. The word "eliminate" in line 19 should be changed to "reduce" as suggested.

Action: Page 4-106, line 19. "eliminate" has been replaced with "reduce."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.8 Page #: 4-105 Line #: 13 to 15 Code:
Original Specific Comment #: 115 (36; Pg 1-9)

Comment: This sentence compares the area of off-property land permanently disrupted by Alternative 5A (3 acres) with the area disrupted by Alternative 5B (2 acres). Because the amount of dried waste material would be approximately the same for each of these alternatives, it is unclear why the total off-site area that is disrupted would be different.

Response: Comment Acknowledged. Off-property disposal at the Nevada Test Site (Alternative 5A) requires placement and burial of waste in 11.5 cubic-meters (15 cubic-yards) metal containers. Off-property disposal at the representative commercial disposal facility (Alternative 5B) requires placement of waste into disposable reinforced polyethylene liners. The liners would be placed in the empty and clean rail cars prior to waste material loadout at the FEMP, and would incorporate a lap-over top that is laced shut after the railcar is filled with waste material. Upon arrival at the disposal facility, the liner would be cut open at the top and the waste emptied and transported to the disposal cell. The spent liner will be disposed of along with the waste. This requires less disposal space than is required to accommodate disposal of waste in metal containers. Therefore, Alternative 5A is more land intensive than Alternative 5B, requiring additional acreage.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 4.8 Page #: 4-105 Line #: 22 to 24 Code:
Original Specific Comment #: 116 (37; Pg 1-9)

Comment: This sentence refers to "mitigative measures discussed in Section 4.8." However, the measures being referred to are not apparent in the text of this section. The text should be revised to refer to the appropriate section, or these mitigative measures should be discussed in Section 4.8.

Response: Agree. This sentence should be revised to reflect Section 4.3.

Action: Page 4-133, line 12. The sentence was revised to replace "4.8" with "4.3."

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RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: 4-108 to 4-111 Line #: NA Code:
Original Specific Comment #: 117 (38; Pg 1-10)

Comment: Tables 4-2, 4-3, 4-4, and 4-5 present the cost estimate for Alternatives 4A, 4B, 5A, and 5B, respectively. Included in the tables is a sum of the total capital cost for the alternative; however, the O&M cost for the alternative appears to be incorrectly listed as one of the items included in capital costs. The tables should be modified to present O&M cost as a separate cost. Additionally, because the O&M cost is presented as an annual cost, a footnote should be included in the tables that estimates the number of years over which this annual cost will be incurred.

Response: Agree. Although the O&M cost appears above the "Total Capital Cost" line, the O&M cost was not included in the total capital cost number. The line for O&M cost should be moved to a position below the total capital cost line and renamed "post-remediation O&M cost" for clarity. The total Post-Remediation O&M Cost should be revised to reflect the fact that for cost estimation purposes post-remediation operations and maintenance will continue for 30 years. Footnote "a" should be revised to present the annual cost. The total cost of the alternative should contain the approximate cost of O&M for 30 years instead of 1 year. The O&M costs should be calculated in the present worth cost.

Action: **Page 4-64, Table 4-2.** The line for O&M cost has been moved to a position below the total capital cost line and renamed as "Post-Remediation O&M Cost." The total Post-Remediation O&M Cost has been revised to reflect the fact that post-remediation operations and maintenance will continue for 30 years (\$9 million). Footnote "a" has been revised so that it presents the annual cost (\$.3 million). The total cost of the alternative has been revised so that it now includes the approximate cost of O&M for 30 years instead of 1 year.

Page 4-80, Table 4-4 (formerly identified as Table 4-3). The line for O&M cost has been moved to a position below the total capital cost line and renamed as "Post-Remediation O&M Cost." The total Post-Remediation O&M Cost has been revised to reflect the fact that post-remediation operations and maintenance will continue for 30 years (\$9 million). Footnote "a" has been revised so that it presents the annual cost (\$.3 million). The total cost of the alternative has been revised so that it now includes the approximate cost of O&M for 30 years instead of 1 year.

Page 4-103, Table 4-5 (formerly identified as Table 4-4). The line for O&M cost has been moved to a position below the total capital cost line and renamed as "Post-Remediation O&M Cost." The total Post-Remediation O&M Cost has been revised to reflect the fact that post-remediation operations and maintenance will continue for 30 years (\$2 million). Footnote "a" has been revised so that it presents the annual cost (\$.06 million). The total cost of the alternative has been revised so that it now includes the approximate cost of O&M for 30 years instead of 1 year.

Page 4-123, Table 4-6 (formerly identified as Table 4-5). The line for O&M cost has been moved to a position below the total capital cost line and renamed as "Post-

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Remediation O&M Cost." The total Post-Remediation O&M Cost has been revised to reflect the fact that post-remediation operations and maintenance will continue for 30 years (\$2 million). Footnote "a" has been revised so that it presents the annual cost (\$.06 million). The total cost of the alternative has been revised so that it now includes the approximate cost of O&M for 30 years instead of 1 year.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: 4-115 Line #: NA Code:
Original Specific Comment #: 118 (39; Pg 1-10)

Comment: Table 4-6 presents a summary of the comparative analysis of remedial action alternatives for OU1. When comparing protection of workers during remedial action, the table considers the "protectiveness" of Alternatives 4A and 4B, but refers to the "effectiveness" of Alternatives 5A and 5B. The table should be revised to use consistent terminology when comparing alternatives for the same criterion.

Response: Agree. In Table 4-6, "effective" in the Alternative 5A and 5B columns for "Protection of Workers During Remedial Actions," on page 4-115, should be "protective" to be consistent with the entries in Columns 4A and 4B.

Action: Page 4-127, Table 4-7 (formerly identified as Table 4-6). The first entry in the first row of the Alternative 5A column for "Protection of Workers During Remedial Actions," was revised to be "Moderately Protective" instead of "Moderately Effective."

Page 4-127, Table 4-7 (formerly identified as Table 4-6). The first entry in the first row of the Alternative 5B column for Protection of Workers During Remedial Actions was revised to be "Moderately Protective" instead of "Moderately Effective."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: 4-116 Line #: Code:
Original Specific Comment #: 119 (40; Pg 1-10)

Comment: Table 4-6 presents a summary of the comparative analysis of remedial action alternatives for OU1. When evaluating the Administrative Feasibility of Alternatives 4A and 4B, the table does not consider the variance that would be required from restrictions to construct a land disposal unit above a sole-source aquifer. The table should be revised to include this information.

Response: Agree. Table 4-6 has been revised to include reference to the variance that must be obtained for Alternatives 4A and 4B from restrictions to construct a land disposal unit above a sole-source aquifer.

Action: Page 4-128, Table 4-7 (formerly identified as Table 4-6). The following text was added at the beginning of the entry for "administrative feasibility" in Column 4A: "A waiver from restrictions placed on construction of land disposal units above a sole-source aquifer would be required."

Page 4-128, Table 4-7 (formerly identified as Table 4-6). The following text was added at the beginning of the entry for "administrative feasibility" in Column 4B: "A waiver from restrictions placed on construction of land disposal units above a sole-source aquifer would be required."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: 4-119 Line #: NA Code:
Original Specific Comment #: 120 (41; Pg 1-10)

Comment: Table 4-7 summarizes the unavoidable impacts of OU1 on resources and states that the total cost of each alternative ranges from \$0 to \$1 trillion dollars. However, the costs presented earlier in the section do not exceed \$856 million. This discrepancy should be clarified.

Response: Agree. This table should be revised to reflect the high end of alternative costs at \$856 million.

Action: Page 4-131, Table 4-8 (formerly identified as Table 4-7). "\$1 trillion" was replaced with "\$856 million."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: 5-19 Line #: NA Code:
Original Specific Comment #: 121 (42; Pg 1-11)

Comment: Table 5-2 summarizes the environmental impacts for remedial alternatives at OU1. When considering the impacts of Alternative 4A on socioeconomics and land use, the table identifies "restricted land use" as an impact. However, this impact is not identified for Alternative 4B, even though a similar impact would be expected because both of these alternatives involve the construction of an on-property, above-grade disposal cell.

Response: Agree. "restricted land use" should be included for Alternative 4B.

Action: Page 5-15, Table 5-2. "Restricted land use" was added under the heading "Socioeconomics and Land Use" for Alternative 4B.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: 5-20 Line #: NA Code:
Original Specific Comment #: 122 (43; Pg 1-11)

Comment: Table 5-2 summarizes the environmental impacts for remedial alternatives at OU1. When considering the impacts of Alternative 5B on transport, the table identifies an ILCR of 4×10^{-6} along the route to "FERMCO." This destination was not specifically mentioned in the earlier discussions of this alternative and therefore should be explained.

Response: Agree. This portion of the table should be revised to reflect the ILCR along the route of the representative commercial disposal facility.

Action: Page 5-6, Table 5-2. "FERMCO" was replaced with "representative."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment #: 123 (2; Pg E-1)

Comment: The appendix assumes that the caps over the on-site disposal cell and the excavated pit areas will remain intact for 1,000 years. This seems unreasonable, especially under the future land use scenarios without access controls. Cap failure could result from any number of natural and man-made activities. The appendix should be revised to consider the risks associated with the potential failure of these caps.

Response: Partially Agree. It is recognized that over the course of 1,000 years, there is potential for the caps over an on-site disposal cell and the restored pit area to fail for a variety of reasons. DOE agrees that the impacts, relative to risk evaluation, of such potential failure should be discussed in the Feasibility Study. In completing detailed analysis of remedial alternatives, one of the evaluation criteria is long-term effectiveness and permanence. According to the NCP [40 CFR 300.430], among the factors to be considered in evaluating this criterion is the following:

"Adequacy and reliability of controls such as containment systems and institutional controls that are necessary to manage treatment residuals and untreated waste. This factor addresses in particular the uncertainties associated with land disposal for providing long-term protection from residuals;..."

The NCP also directs that this analysis support evaluation of an alternative's ability to be protective of human health and the environment in the long term. DOE believes that it is most appropriate to evaluate the potential impacts of cap failure over the 1,000-year timeframe within the context of the NCP remedial alternative evaluation criterion. DOE recognizes that if the cap over an on-site disposal cell or restored pit area failed in the future, potentially unacceptable risks to human health and the environment could result. DOE does not believe that it would add value to the Feasibility Study to quantitatively assess the risks associated with potential cap failure. As stated above, DOE acknowledges the potential for unacceptable risks to be associated with cap (or other portion of the disposal facility) failure. This introduces an uncertainty concerning long-term protectiveness that should be recognized in the remedial alternative evaluation process and considered in remedy selection. Quantification of potential risk associated with cap failure would not substantively impact how this uncertainty would be considered in the remedy selection process. For Alternatives 4A and 4B undergoing detailed evaluation in Section 4, a discussion should be added to the evaluation of protection of human health and the environment and long-term effectiveness and permanence of the potential impacts and uncertainties associated with a cap failure. A similar discussion should be added to Appendix D.

Action: Page 4-37, line 29. The following text was added: "As designed, and under normal conditions, the disposal cell would be a reliable system for managing the treated wastes over the long term. It is possible, however, that cap failure is possible over the long term due to factors such as human intrusion or atypical natural events such as seismic

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activity. If such failure occurred without corrective action, potentially unacceptable risks to human health could result."

No revisions are required for Alternative 4B because it refers directly to the long-term effectiveness discussion for Alternative 4A (see page 4-59, lines 3 and 4).

Page D-2-15, line 5. The following text has been added: "It is recognized that over the long term, there could be failure of one or more components of the waste disposal facility. Depending on the degree of severity of failure, potentially unacceptable risks to human health could result."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment #: 124 (5; Pg E-2)

Comment: The appendix contains numerous referencing inconsistencies. For example, Section D.3.3.1 includes a reference to DOE, 1988. However, the reference section presents DOE, 1988a and 1988b. Other references listed in Section D.10, such as EPA, 1991a, 1991b, and 1992a, do not appear to be referenced in the text. The entire appendix should be closely reviewed and all incorrect references corrected.

Response: Agree. A detailed review of the entire Feasibility Study Report will be undertaken to identify and correct editorial errors and referencing inconsistencies. This includes a review of table-to-table consistencies which resulted in changes in the PRG/PRL tables.

Action: Corrections as necessitated by the above-referenced review were incorporated into the Feasibility Study Report.

Page 2-47, line 3. The text was modified as follows: "It should be noted that technetium-99, thorium-232, manganese, mercury, nickel, silver, thallium, and vanadium were not carried forward from Tables 2-5, 2-6, and 2-7. This is because it was determined that the surface and subsurface soil concentrations were all below the respective PRGs."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment #: 125 (6; Pg E-2)

Comment: The appendix contains several references to both soil action levels and preliminary remediation goals (PRG). The two terms apparently refer to the same set of values. The appendix should be revised to use only one of these terms consistently to minimize confusion. Also, the text should make clear that the PRGs used were based on carcinogenic risks of 10⁻⁴ for the "most conservative scenario." This scenario should be identified.

Response: Comment Acknowledged. PRGs and PRLs are both used in this appendix as appropriate. However, the context is confusing at times.

Action: The references and context of PRGs and PRLs have been reviewed and corrected to clarify the context.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.1.0 Page #: D-1-2 Line #: 23 and 24 Code:
Original Specific Comment #: 126 (1; Pg E-2)

Comment: The last sentence in this paragraph states that tables, figures, and risk calculations are provided at the end of the appendix. However, the tables and figures specific to each section are provided at the end of each section. Only the risk calculations are provided at the end of the entire appendix. The sentence should be revised to accurately describe the locations of tables, figures, and risk calculations.

Response: Agree. The tables in Attachment 1 are neither numbered nor individually referenced in the text.

Action: Numbers have been added to tables in Attachment I. Once the table numbers were added, references to tables were added to the text as appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.2.1 Page #: D-2-2 Line #: 25 Code:
Original Specific Comment #: 127 (2; Pg E-3)

Comment: The first paragraph of this section explains that statistical analyses of "each remaining [constituent of potential concern] CPC" are conducted as part of a two-part screening process. The phrase "each remaining CPC" seems inappropriate. If the screening has not yet taken place, it is unclear what the CPCs remain from. The statistical analyses should be conducted on each CPC detected in OU1. The paragraph should be revised to correct this error.

Response: Agree. The description of CPC selection in this section refers to the process undertaken in the baseline risk assessment in the Remedial Investigation report. Section D.2.2.1 should be revised to make the process clearer.

Action: **Page D-2-2, line 23.** The following sentence was added to the beginning of the first paragraph of D.2.2.1: "The first step of the baseline risk assessment was to select CPCs for Operable Unit 1," and the word "remaining" was removed from line 26 on page D-2-2.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.2.2.2 Page #: D-2-3 Line #: 16 Code:
Original Specific Comment #: 128 (3; Pg E-3)

Comment: The last sentence in the first paragraph of this section uses the phrase "the Waste Storage Area." This phrase is not defined in the appendix. The appendix should be revised to define "the Waste Storage Area" when it is first used.

Response: Agree.

Action: Page D-2-3, line 25. The following text has been added: "(which includes all of Operable Unit 1, all of Operable Unit 4, and portions of Operable Unit 2)," has been inserted after "...Waste Storage Area..."

Page ES-4, line 9 of the Proposed Plan. The following text has been added: "The Waste Storage Area (which includes all of Operable Units 1 and 4 and portions of Operable Unit 2)," has been inserted after "...Waste Storage Area..."

Page P-2-2, line 14. The following text has been added: "The Waste Storage Area (which includes all of Operable Units 1 and 4 and portions of Operable Unit 2)," has been inserted after "...Waste Storage Area..."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.4 Page #: D-2-5 to D-2-6 Line #: NA Code:
Original General Comment #: 129 (4; Pg E-1)

Comment: This section includes numerous incorrect references to tables. For example, Table D.2-9 is incorrectly referred to as Table D.2.2-9. The table references in this section should be reviewed and corrected as necessary.

Response: Agree. Tables were incorrectly referenced in text.

Action: The Feasibility Study has been edited to ensure correct table references in Appendix D.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.2.4.1 Page #: D-2-6 Line #: 14 Code:
Original Specific Comment #: 130 (4; Pg E-3)

Comment: This line states that "impacts to the Great Miami River user were minimal." The term "minimal" is subjective. The line should present the actual risks for the Great Miami River user or else define the term "minimal."

Response: Agree.

Action: Page D-2-6, line 14. The text has been revised to read: "HI of 2. The Great Miami River user incurs an ILCR of less than 10^{-6} ."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.2.4.2 Page #: D-2-6 Line #: 18 to 21 Code:
Original Specific Comment #: 131 (5; Pg E-3)

Comment: The summary of risks under future land use with access controls omits the risks associated with the expanded trespasser scenario. The paragraph should be revised to include these risks.

Response: Agree. The projected risks to the expanded trespasser as presented on Table D.2-6 should be added to the paragraph.

Action: **Page D.2-10, line 29.** The following statement was added: "The expanded trespasser was projected to incur cancer risks in the order of 10^{-4} ."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.2.4.2 Page #: D-2-6 Line #: 26 Code:
Original Specific Comment #: 132 (6; Pg E-3)

Comment: The second sentence in this paragraph includes the phrase "... incur risks in excess of 10^{-4} ." The risks referred to are carcinogenic risks. Therefore, the phrase should be revised to read "... incur carcinogenic risks in excess of 10^{-4} ."

Response: Agree.

Action: **Page D-2-17, line 22.** The word "carcinogenic" was added after the word "incur."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.5.1 Page #: D-2-12 Line #: 1 Code:
Original Specific Comment #: 133 (7; Pg E-4)

Comment: In the discussion of the direct radiation exposure scenario, the fixed source in the case of excavation is described as surface soil contamination. In fact, workers would be subject to exposure to direct radiation from the waste material and soil being excavated, and from direct radiation from contaminated underlying soils that become exposed. The section should be revised to more completely describe the fixed source for excavation.

Response: Agree. The text should describe the fixed source for excavation.

Action: **Page D-2-26, line 15.** The phrase and punctuation, ", waste materials and underlying soils" was added after the phrase "surface soils."

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Commenting Organization: U.S. EPA Commentor: Saric
 Section #: D.2.6.1 Page #: D-2-15 Line #: 37 and 38 Code:
 Original General Comment #: 134 (3; Pg E-1)

Comment: These lines discuss the assumed use of personal protective equipment (PPE) by remediation workers. This discussion should appear earlier in the appendix. Otherwise, the conceptual model for remediation workers (see Figure D.2-3) does not make sense. The appendix should be revised to discuss the proposed use of PPE prior to the presentation and discussion of the conceptual site model.

Response: Agree. The text should describe assumptions made regarding workers' personal protection equipment.

Action: **Page D-2-26, line 16.** The following sentence was added: "However, the inhalation exposure mode is precluded for remediation workers, since it is assumed that they are in supplied air cabs in heavy equipment or in other forms of full personnel protection equipment."

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: D.2.6.1 Page #: D-2-16 Line #: 20 and 26 Code:
 Original Specific Comment #: 135 (8; Pg E-4)

Comment: In items 7 and 9, operators of drying and vitrification/solidification processes are assumed to not be exposed to off-gas plumes. It is not apparent why this assumption is made. Items 7 and 9 should be revised to include a description of where the operators will be working and provide more justification for the assumption that operators will not be exposed to off-gas plumes.

Response: Agree. The text should describe assumptions made regarding workers' personal protection equipment.

Action: **Page D-2-38, line 13 (item 7) and line 20 (item 9).** The following sentence was added to both items: "The operators are located in control areas within the facility and breathe uncontaminated air."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.6.2 Page #: D-2-18 Line #: 15 to 17 Code:
Original Specific Comment #: 136 (9; Pg E-4)

Comment: The last two sentences of item 9 assume that caps over the disposal cell and the excavated pit areas will remain intact for 1,000 years. This assumption does not appear justified, especially under the future land use scenarios without access controls. In this case, no cap maintenance is assumed. Without maintenance, it seems possible that the caps could fail before 1,000 years for a variety of reasons, both natural and man-made. Item 9 should be revised to provide a better justification for the assumption that the caps will last 1,000 years; such justification could refer to sections in the FS that document this assumption.

Response: Partially Agree. It is recognized that over the course of 1,000 years, there is potential for the caps over an on-site disposal cell and the restored pit area to fail for a variety of reasons. DOE agrees that the impacts, relative to risk evaluation, of such potential failure should be discussed in the Feasibility Study. In completing detailed analysis of remedial alternatives, one of the evaluation criteria is long-term effectiveness and permanence. According to the NCP [40 CFR 300.430], among the factors to be considered in evaluating this criterion is the following:

"Adequacy and reliability of controls such as containment systems and institutional controls that are necessary to manage treatment residuals and untreated waste. This factor addresses in particular the uncertainties associated with land disposal for providing long-term protection from residuals;..."

The NCP also directs that this analysis support evaluation of an alternative's ability to be protective of human health and the environment in the long term. DOE believes that it is most appropriate to evaluate the potential impacts of cap failure over the 1,000-year timeframe within the context of the NCP remedial alternative evaluation criterion. DOE recognizes that if the cap over an on-site disposal cell or restored pit area failed in the future, potentially unacceptable risks to human health and the environment could result. DOE does not believe that it would add value to the Feasibility Study to quantitatively assess the risks associated with potential cap failure. As stated above, DOE acknowledges the potential for unacceptable risks to be associated with cap (or other portion of the disposal facility) failure. This introduces an uncertainty concerning long-term protectiveness that should be recognized in the remedial alternative evaluation process and considered in remedy selection. Quantification of potential risk associated with cap failure would not substantively impact how this uncertainty would be considered in the remedy selection process. For Alternatives 4A and 4B undergoing detailed evaluation in Section 4, a discussion should be added to the evaluation of protection of human health and the environment and long-term effectiveness and permanence of the potential impacts and uncertainties associated with a cap failure. A similar discussion should be added to Appendix D.

Action: Page 4-37, line 29. The following text was added: "As designed, and under normal conditions, the disposal cell would be a reliable system for managing the treated wastes

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over the long term. It is possible, however, that cap failure is possible over the long term due to factors such as human intrusion or atypical natural events such as seismic activity. If such failure occurred without corrective action, potentially unacceptable risks to human health could result."

No revisions are required for Alternative 4B because it refers directly to the long-term effectiveness discussion for Alternative 4A (see page 4-59, lines 3 and 4).

Page D-2-36, line 30. The following text has been added: "It is recognized that over the long term, there could be failure of one or more components of the waste disposal facility. Depending on the degree of severity of failure, potentially unacceptable risks to human health could result."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.6.2 Page #: D-2-16 Line #: 19 to 22 Code:
Original Specific Comment #: 137 (10; Pg E-4)

Comment: Item 10 states that CPCs were selected based on an incremental lifetime cancer risk (ILCR) of greater than 10^{-7} or a hazard quotient (HQ) of greater than 0.1. However, Section D.2.2.4 states that CPCs were identified as those constituents with ILCRs of greater than 10^{-6} or HQs of greater than 0.2. The entire appendix should be revised to consistently describe the risk criteria used to select CPCs.

Response: Agree. Risk calculations included individual CPCs with ILCRs greater than 10^{-7} or HIs greater than 0.1 to protect against screening out CPCs with ILCRs summing to greater than 10^{-6} or HQs greater than 1. The text should be modified to explain this point more clearly.

Action: **Page D-2-38, line 22-27.** Step 6 under the Preliminary Remedial Goals was revised as follows: "From data developed in the Baseline Risk Assessment, select the CPCs that contributed greater than 10^{-7} cancer risk or an HI greater than 0.2 to a receptor's total risk estimates. These are now identified as COCs."

Page D-2-38, line 22-27 and page D-2-40, lines 16-21.. Item 10 was revised to read as follows: "COCs were chosen based on Operable Unit 1 Baseline Risk Assessment results. Residual risk calculations included constituents with Incremental Lifetime Cancer Risk (ILCR) greater than 10^{-7} or Hazard Quotient (HQ) greater than 0.1 by all combined exposure pathways. The use of risk levels more conservative than the target values of 10^{-6} and 1 protects against screening out those COCs with potential additive risk summing to greater than 10^{-6} or 1."

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.3.1 Page #: D-3-8 Line #: 6 to 8 Code:
Original Specific Comment #: 138 (15; Pg E-6)

Comment: These lines discuss the use of PRGs. The discussion should be revised to refer to the tables in Attachment I on pages D-I-1 to D-I-3, which present PRGs.

Response: Agree. The text should include a reference to Attachment I.

Action: **Page D-3-9, line 12.** The sentence at line 10 that introduces the radionuclide PRGs has been revised to read: "The PRGs are taken from Table D.I-1 in Attachment I to this appendix and are listed below. They are based on the On-Property Resident Farmer, Adult Scenario, which provides the most limiting concentrations."

A new table, D.5-3, was added and the following tables were modified to address this comment:

Page D-6-2, Table D.6-1

Page D-6-4, Table D.6-3

Page D-6-5, Table D.6-4

Page D-6-8, Table D.6-6

Page D-6-9, Table D.6-7

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.3.1 Page #: D-3-8 Line #: 19 Code:
Original Specific Comment #: 139 (16; Pg E-6)

Comment: This line discusses the use of surface soil concentrations. However, the discussion does not clarify what representative surface soil concentrations will be used: maximum concentrations, mean concentrations, or 95-percent upper confidence limit concentrations. The line should be revised to clarify which representative surface soil concentrations were used.

Response: Agree. The text should clarify that the surface soil concentrations identified in Table D.3-9, Radionuclide Soil Concentrations, were used.

Action: **Page D-3-8, line 19.** The sentence was revised to read: "For those radionuclides without PRGs, RME surface soil concentrations as defined in Table D.3-9 will be used. The RME concentration is the 95 percent UCL or the maximum concentration, whichever is the least. Table D.3-9 and all the exposure parameters used in this analysis are presented in Section D.3.4."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.3.1 Page #: D-3-9 Line #: 34 Code:
Original Specific Comment #: 140 (17; Pg E-6)

Comment: This line presents an equation with the parameter $C_{s,i}$. The section should be revised to include the specific values used for this parameter and the process used to derive these values.

Response: Agree.

Action: Page D-3-11, line 17. The following text was added: " $C_{s,i}$ = soil concentration for radionuclides, i mrem."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.3.1 Page #: D-3-12 Line #: 23 Code:
Original Specific Comment #: 141 (18; Pg E-6)

Comment: This line discusses the estimated hours required to construct the drying facility and the resulting potential for mechanical hazard impacts. In addition to the risks associated with constructing such a facility, risks will also be associated with dismantling the facility. The section and the remainder of the appendix should be revised to consider the risks associated with dismantling the drying facility.

Response: Agree that the issue should be discussed.

Action: Page D-3-14, line 29. The following text was added after T_0 : "The total number of hours for dismantling all remedial structures is 63,000 which includes the drying facility. This is a small fraction of the total remedial hours of approximately 1,000,000 hours and is not considered a separate item. Therefore, the hours for dismantling the dryer facility qualitatively is considered to be an insignificant contribution to the physical risk and will not factor into alternative comparison."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.3.1 Page #: D-3-13 Line #: 3 to 14 Code:
Original Specific Comment #: 142 (19; Pg E-6)

Comment: These lines present the equation and parameters used to estimate airborne concentrations of constituents. The discussion of this equation, however, is incomplete. The discussion of this equation should at least be revised to explain where nonremediation worker and off-site individual receptors are assumed to be located and what percentage of time the wind is assumed to blow in the direction of these receptors.

Response: Agree. No change is needed to the text in Section D.3.1.1; however, the receptor distance should be added to Table D.3-1. Parameter values are provided in Section D.3.4.1. The maximum fraction of time the wind blows in a given direction is provided on page D-3-16, lines 32-33.

Action: Receptor distances have been added to Table D.3-1 found on page D-3-19.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.3.1 Page #: D-3-13 Line #: 26 to 28 Code:
Original Specific Comment #: 143 (20; Pg E-7)

Comment: These lines discuss the calculation of mechanical hazard impacts associated with constructing the vitrification/solidification facility. In addition to the risks associated with constructing the facility, there will be risks associated with dismantling such a facility. The section (and the remainder of the appendix) should be revised to address the risks associated with dismantling the vitrification/solidification facility.

Response: Agree that the issue should be discussed.

Action: **Page D-3-15, line 15.** After "...respectively" add: "The total number of hours for dismantling all remedial structures for the cementation alternative is 63,000 which includes the cementation facility. This is a small fraction of the total remedial hours of approximately 1,000,000 hours and is not considered a separate item. Therefore, the hours for dismantling the cementation facility will not be shown separately.

The total number of hours for dismantling all remedial structures for the vitrification alternative is 86,000 which includes the vitrification facility. This is a small fraction of the total remedial hours or approximately 1,600,000 hours and is not considered a separate item. Therefore, the hours for dismantling the vitrification facility qualitatively is considered to be an insignificant contribution to the physical risks and will not factor into alternative comparison."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.4.1 Page #: D-3-17 Line #: 13 to 17 Code:
Original Specific Comment #: 144 (21; Pg E-7)

Comment: These lines discuss the derivation of inhalation unit risk factors. The discussion should be revised to indicate that oral risk factors were multiplied by an inhalation rate of 20 cubic meters per day and divided by a body weight of 70 kilograms. In addition, the constituent 2,3,7,9-tetrachloro-p-debenzofuran (TCDF) is mistakenly identified as a polychlorinated biphenyl. The text should correctly identify this constituent.

Response: Agree with both parts of the comment: (a) The text should discuss the derivation of inhalation unit risk factors. (b) TCDF should not be identified as a polychlorinated biphenyl.

Action: (a) **Page D-3-23, line 17.** Following the word "microgram," the phrase "and divided by a body weight of 70 kilograms" was added. (b) **Page D-3-23, line 18.** The reference to TCDF and accompanying punctuation ", and 2,3,7,8-TCDF" was deleted from the parenthetical list.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.4.2 Page #: D-3-18 Line #: 13 to 15 Code:
Original Specific Comment #: 145 (22; Pg E-7)

Comment: These lines discuss the parameters used to estimate residual exposures. However, the discussion does not refer to the equations used to estimate the exposures. The text should be revised to either provide the equations used to estimate the exposures or to refer to specific sections in other reports that present these equations.

Response: Agree.

Action: **Page D-3-42, lines 15-17.** The following text was added at the end of Section D.3.4.2: "Risk calculations were performed using equations which are presented and explained in the Operable Unit 1 RI report (DOE, 1994). See Appendix E.III in the RI report."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table D.3-2 Page #: D-3-20 Line #: NA Code:
Original Specific Comment #: 146 (23; Pg E-7)

Comment: The reference provided for each of the parameters presented in this table is "see supporting text." This reference is insufficient. The table should be revised to refer to specific sections of the text for each of the parameters.

Response: Agree. The fourth column in Table D.3-2 should cite a specific text reference for supporting documentation of the parameters identified in this table.

Action: **Page D-3-20, Table D.3-2.** The phrase "Section 3.4.1" replaced "See supporting text" in each line of Table D.3-2, Column 4.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table D.3-8 Page #: D-3-28 Line #: NA Code:
Original Specific Comment #: 147 (24; Pg E-8)

Comment: This table presents the formulations used to calculate horizontal and vertical dispersion coefficients. However, this table is of little use without values for the parameter "x," which is defined as the downwind distance in meters. The table should be revised to include values for x for the nonremediation worker and the off-site individual.

Response: Agree.

Action: **Page D-3-29, Table D.3-8.** Parameter values for x have been added to Table D.3-1.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table D.3-9 Page #: D-3-29 Line #: NA Code:
Original Specific Comment #: 148 (25; Pg E-8)

Comment: This table presents radionuclide soil concentrations. However, it is not clear if these concentrations represent maximum, mean, or 95-percent upper confidence limits. Furthermore, these unit-specific values were used to derive volume-weighted soil concentrations to evaluate risks from direct exposures. The table should be revised to (1) clearly describe the type of concentrations presented in the table and (2) incorporate a column for volume-weighted concentrations for each radionuclide, that includes a description of the volume-weighted calculation.

Response: Comment Acknowledged. The values used in Table D.3-9 are the RME values, which were obtained from the Remedial Investigation Report, as stated in the tables "source" footnote.

Action: Page D-3-30, Table D.3-9. The following was added to the footnote: "The values above represent RME concentrations which is the 95 percent UCL or the maximum concentration, whichever is the least."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table D.3-13 Page #: D-3-34 Line #: NA Code:
Original Specific Comment #: 149 (26; Pg E-8)

Comment: Footnote "a" in this table is inconsistent with similar footnotes in Tables D.3-11 and D.3-12 (it does not include a specific percentage volume increase) and does not reflect information presented in Section D.3.4.1. The footnote should be revised to be consistent with these tables. A possible rewording is, "The values in the table were derived by increasing the unit volume in Table D.3-9 by 80 percent...."

Response: Agree.

Action: Page D-3-35, Table D.3-13. Footnote "a" on Table D.3-13 has been revised to read: "The values in this table are derived by increasing the unit volume in Table D.3-9 by an average value of 80 percent, based on bulking factors in DOE, 1993a."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table D.3-15 Page #: D-3-36 Line #: NA Code:
Original Specific Comment #: 150 (27; Pg E-8)

Comment: This table includes references to footnotes "b" through "g." However, these footnotes are not included in the table. The table should be revised to remove references to footnotes "b" through "g."

Response: Agree.

Action: Page D-3-35, Table D.3-15. Footnotes "b" through "g" have been deleted.

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OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.4.1 Page #: D-4-1 Line #: 32 Code:
Original Specific Comment #: 151 (28; Pg E-8)

Comment: This line indicates that chronic reference dose (RfD) values (presented in Table D.4-1) were used when available. However, footnote "a" in Table D.4-1 states that RfD values are for subchronic values unless otherwise noted. The text and Table D.4-1 should be revised to eliminate this inconsistency.

Response: Agree.

Action: Page D-4-1, Table D.4-1. The footnote has been changed from "chronic" to "subchronic."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table D.4-1 Page #: D-4-6 Line #: NA Code:
Original Specific Comment #: 152 (30; Pg E-9)

Comment: The units for all the cancer slope factors should be revised from "(mg/kg/day)" to read "(mg/kg/day)⁻¹." The cancer slope factors for inhalation are blank for polychlorinated biphenyls. These blanks should be filled in as appropriate. The table also should be revised to include a footnote describing how the dermal toxicity factors were calculated. Finally, footnote "a" states that RfD values represent subchronic values unless otherwise noted. Section D.4.1 states that chronic RfD values were used. This inconsistency should be eliminated.

Response: Agree.

Action: Page D-4-4, Table D.4-1. The units identified in all three Cancer Slope Factor columns have been changed from "(mg/kg/day)" to "(mg/kg/day)⁻¹." The blank values for PCBs have been designated as ND (Not Determined). Footnote "b" has been changed to read: "...of the Operable Unit 1 Draft Final RI Report."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.4.2 Page #: D-4-3 Line #: 1 to 8 Code:
Original Specific Comment #: 153 (29; Pg E-9)

Comment: These lines indicate that inhalation and dermal risks from four polyaromatic hydrocarbons (PAH) cannot be evaluated at this time. Toxicity equivalency factors (TEF) are available for PAHs. TEFs can be used to derive oral toxicity factors for PAHs that do not have their own toxicity factors. By using an estimate of oral absorption efficiency, these oral toxicity factors can be converted to dermal toxicity factors. DOE should contact the U.S. EPA Environmental Criteria and Assessment Office (ECAO) for guidance in addressing PAHs. The appendix should be revised to derive and use dermal toxicity factors for PAHs from TEFs or provide a better justification for why none are presented.

Response: Disagree. Change pages for the Operable Unit 1 RI and FS were submitted on March 16, 1994, correcting PRG derivation as per the EPA comments on the Operable Unit 4 FS. This comment is not consistent with the Operable Unit 4 comment and the submitted change pages. There has been no suggested guidance for inhalation slope factors. TEFs were used for the oral slope factors. In addition, all wastes and soils containing PAHs will be removed so that residual risk due to PAHs is not a factor.

Action: None.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: D Page #: D-4-3 Line #: Paragraph 1 Code: M
Original Comment #: 154 (5)

Comment: The dermal exposure from contact carcinogens, such as PAHs, cannot be ignored. The reduction of risks from the dermal pathway must be considered in developing remediation levels for such contaminants. I have commented on this issue in prior FS Study reports.

Response: Comment Acknowledged. The exposure to PAHs via the dermal pathway was not ignored in the OUI FS. In fact, this pathway is handled by means of assuming that the dermal pathway is at least as toxic as the oral pathway. Although this methodology does not support direct calculation, the final "cleanup levels" are adjusted to take this pathway equivalency into account. The page and text referred to in the comment was the section documenting the basis for toxicity. This section focused on the technical basis for determining carcinogenicity and, therefore, was factual in that it is not possible to state absolutely the impact that the lack of dermal slope factors has on the final risk characterization for PAHs. The method U.S. EPA Region V approved for use in Operable Unit 4 was used in Operable Unit 1 and was also documented in the document submitted for review and approval concerning the development of recreational scenarios for use in the Operable Unit 5 FS. This was reflected in the change pages submitted pursuant to DOE's March 16, 1994 letter to U.S. EPA and Ohio EPA. Specifically, it was reflected in revised PRGs (Tables 2-6 and 2-13). The Operable Unit 1 text should be reviewed to ensure that it accurately reflects that the dermal pathway was considered for PAHs.

Action: Page D-4-6, line 8. "Assessed" was inserted before "quantitatively." The following text was added:

"However, the current policy is to consider the impact due to dermal absorption to be equal to the risk estimated due to the oral pathway. In essence, the potential risk due to PAH exposure by both routes is the doubling of the estimated oral risks."

Page D-8-10, line 20. The following text was added: "Another toxicological uncertainty is the impact of dermal exposure to PAH compounds. It is recognized that PAHs are primarily dermal carcinogens, but quantitative estimates of risk due to dermal exposure are not possible at the time due to a lack of slope factors. The doubling of the oral exposure reduces the chances of underestimating risk, but does not cover the entire picture as the magnitude of skin exposure is related to oral exposure only through exposure times. The magnitude of exposure may be quite different. However, in the case of this FS risk assessment, this uncertainty is minimal as all known PAH contaminated materials (wastes and soils) are proposed to be removed with no residual PAH concentrations."

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.5.1.1 Page #: D-5-1 Line #: 16 Code:
Original Specific Comment #: 155 (31; Pg E-9)

Comment: This line states that all receptors are assumed to be exposed to the same contaminant concentrations. This statement appears to be true for radionuclides, but not for chemical contaminants (see Tables D.5-3 and D.5-4). The line should be revised to discuss how radionuclides and chemicals were evaluated differently.

Response: Agree. The text and tables should be revised to reflect that the nonremediation worker and off-site individual are exposed to different concentrations.

Action: Page D-5-1, line 15. These lines have been deleted.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.5.2.1 Page #: D-5-2 Line #: 26 Code:
Original Specific Comment #: 156 (32; Pg E-9)

Comment: This line introduces four groundwater models that are "normally" used. The section should be revised to discuss the groundwater models that were actually used and support their selection.

Response: Agree. The term "normally" used in the text is incorrect. The referenced models are the groundwater models actually used in the fate and transport for Operable Unit 1.

Action: Page D-5-2, line 23. The following text has been modified: "The four models used to determine residual fate and transport for Operable Unit 1 are:"

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.5.2.1 Page #: D-5-8 Line #: 6 and 7 Code:
Original Specific Comment #: 157 (33; Pg E-10)

Comment: These lines state that receptor point 3 is the off-site exposure point. However, Figure D.5-2 shows exposure point 2 as the off-site exposure point. The text and Figure D.5-2 should be revised to eliminate this inconsistency.

Response: Agree.

Action: Page D-5-10, line 6. The following sentence has been changed: "Receptor points 1 and 3 represent on-property exposure points and receptor 2, the off-property exposure point."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.6.0 Page #: NA Line #: NA Code:
Original General Comment #: 158 (8; Pg E-2)

Comment: The tables in this section would be more useful if they included total risks. In other words, the columns of alternative-specific risks should be totaled where appropriate. The totals should be broken down to present totals for radionuclides and chemicals separately. The tables should be revised accordingly.

Response: Disagree. The risks are summarized in Section 9 for each alternative. Please refer to Comments 166 and 167 as to how the risks are summed.

Action: None.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.6.1 Page #: D-6-1 Line #: 29 to 31 Code:
Original Specific Comment #: 159 (36; Pg E-10)

Comment: These lines discuss the mechanical hazard impacts associated with Alternatives 4A and 4B. Of greater importance for comparative purposes is the fact that Alternatives 4A and 4B have greater mechanical hazard impacts than Alternatives 5A and 5B. This paragraph should be revised to address the comparative risks of Alternatives 4A and 4B versus Alternatives 5A and 5B.

Response: Agree. The text should discuss the comparative risks of the mechanical hazard impacts associated with Alternatives 4A and 4B versus those associated with Alternatives 5A and 5B.

Action: Page D-6-1, line 31. The following text had been added: "Since on-property disposal is an element of Alternatives 4A and 4B, the mechanical hazard impacts for these two alternatives are greater than the mechanical hazard impacts for Alternatives 5A and 5B."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.7.0 Page #: D-7-1 Line #: 20 Code:
Original Specific Comment #: 160 (37; Pg E-10)

Comment: This line indicates that exposure point concentrations (EPC) for the residual risk evaluation are presented in Table D.5-4 for each remedial alternative and receptor. However, this table only presents EPCs for the off-site individual under the excavation scenario. The line should be revised to refer to the correct table or tables.

Response: Agree.

Action: Page D-7-1, line 20. Change "D.5-4" to "D.5-7."

Line 21. Delete "remedial alternative and..."

Line 21. Insert after "location" the following: "It was found that the receptor point air concentrations did not change from alternative to alternative so the values in Table D.5-7 were used for all alternatives."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.7.0 Page #: D-7-2 Line #: 23 and 24 Code:
Original Specific Comment #: 161 (38; Pg E-10)

Comment: These lines indicate that exposures to groundwater were evaluated for exposure via ingestion and dermal contact. However, Figure D.3-1 indicates that exposures were also evaluated for exposure via inhalation of volatile contaminants. The appendix should be revised to resolve this discrepancy.

Response: Partially agree. Figure D.3-1 is intended to show all potential pathways. Inhalation of volatiles is a potential pathway; however, volatiles in groundwater are not a factor, as indicated in Table D.3-5, so the pathway was not carried forward.

Action: None.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.7.2 Page #: D-7-4 Line #: 26 Code:
Original Specific Comment #: 162 (39; Pg E-11)

Comment: This line indicates that the total hazard index (HI) for one of the on-property receptors is 0.7. However, this value is the HI for the expanded trespasser. The line should be revised to correctly present and discuss HIs for the on-property farmer and the on-property child.

Response: Agree.

Action: **Page D-7-8, line 1.** Replace the remainder of the sentence after "to be..." with the following: "...7.0 and 30 for the adult and child respectively. The major contributors to the HI were antimony and cadmium."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.7.2 Page #: D-7-4 Line #: 29 to 33 Code:
Original Specific Comment #: 163 (40; Pg E-11)

Comment: This paragraph summarizes the risks associated with future land use assuming a government facility scenario. However, the discussion does not address risks associated with the expanded trespasser scenario. The paragraph should be revised to include risks associated with the expanded trespasser scenario.

Response: Agree.

Action: **Page D-7-8, line 10.** Insert the following paragraph: "The total radiological ILCR for the expanded trespasser was 5×10^{-6} with cesium—the uranium isotopes and thorium-230 risk estimates being the principal components. The chemical ILCR was 2×10^{-5} with beryllium being the principal component due to dermal exposure. This estimate due to beryllium exposure is an overestimate of risk by at least an order of magnitude (factor of 10) due to the conservative derivation of the dermal slope factor. The HI for the expanded trespasser was 0.7 with antimony and uranium toxicity being the principal components of the HI."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.8.2.1 Page #: D-8-4 Line #: 27 Code:
Original Specific Comment #: 164 (41; Pg E-11)

Comment: For the first time in the appendix, this line presents the distances from the source that were assumed for nonremediation workers and the off-site individual. The appendix should be revised to present this information much earlier, preferably as part of the discussion of the Gaussian dispersion modeling.

Response: Comment Acknowledged. No change is needed in Section D.8.2.1. Parameter values were already provided in Section D.3.4.1. The maximum fraction of time the wind blows in a given direction is provided on page D-3-16, lines 32-33. The receptor distances were not provided in Section D.3.4.1 but should be, as noted in the response to Comment 142.

Action: No change to Section D.8.2.1. Refer to revised Table D.3-1, which identifies receptor distances.

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RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.8.2.1 Page #: D-8-5 Line #: 4 and 5 Code:
Original Specific Comment #: 165 (42; Pg E-11)

Comment: These lines state that the assumed breathing rate of 3 cubic meters per hour (m³/hr) assumed for the nonremediation worker is based on the assumption of 8 hours of continuous, heavy labor. However, Table D.3-1 indicates (correctly) that this value is based on the assumption of 50 percent moderate labor (2.1 m³/hr) and 50 percent heavy labor (3.9 m³/hr). The appendix should be revised to eliminate this discrepancy.

Response: Agree. The text discussing the breathing rate should be consistent with the values presented in Table D.3-1.

Action: Page D-8-5, line 4. The paragraph has been deleted.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.9.5 Page #: D-9-5 Line #: NA Code:
Original Specific Comment #: 166 (43; Pg E-11)

Comment: This section compares the risks associated with each alternative. The discussion would be greatly enhanced if it was accompanied by a summary table that presented, for example, total risks for each receptor under each alternative. The appendix should be revised to include a summary table or figure that presents comparative total risks for each alternative.

Response: Agree. The text should be edited. A table summarizing total risks for each alternative, as well as a text reference, should be added.

Action: Page D-9-5, line 8. The following text was added at the end of Section D.9.5.1: "Table D.9-1 summarizes the risks associated with remedial actions. This table includes cancer risks from alternative operations and waste transport, mechanical risks from operations and waste transport, and the Hazard Index from operations." Table D.9-1 was added.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.9.5 Page #: D-9-5 Line #: NA Code:
Original General Comment #: 167 (1; Pg E-1)

Comment: The comparison of the risks associated with each of the alternatives is not well presented. The text is minimal and does not discuss specific quantitative risks. This section is very important and must be improved. The discussion would be greatly enhanced by including a summary table that presents total risks for each alternative. The appendix should be revised to improve the discussion of the risks associated with each alternative, preferably by including and referring to a summary table presenting total risks for each alternative.

Response: Agree. The text should be edited. A table summarizing total risks for each alternative, as well as a text reference, should be added.

Action: Page D-9-5, line 8. The following text was added at the end of Section D.9.5.1: "Table D.9-1 summarizes the risks associated with remedial actions. This table includes cancer risks from alternative operations and waste transport, mechanical risks from operations and waste transport, and the Hazard Index from operations." Table D.9-1 was added.

OPERABLE UNIT 1 DRAFT FEASIBILITY STUDY
RESPONSE TO EPA COMMENTS

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table D.2-3 Page #: D-2-22 Line #: NA Code:
Original Specific Comment #: 168 (11; Pg E-5)

Comment: According to its title, this table is supposed to present risk summaries for receptors under current land use, future source term. The receptors listed are trespassing youths and Great Miami River (GMR) users. However, Section D.2.2.2 states that the trespassing youth scenario is evaluated only under current source term and that receptors evaluated under current land use, future source term are the off-property farmer, off-property child, the GMR user, the user of meat and produce, and the groundskeeper. The text and tables (including Tables D.2-3 and D.2-4) should be revised to eliminate any inconsistencies.

Response: Agree.

Action: Page D.2-4, lines 16-17, Table D.2-3. Section D.2.2.2 has been revised to read "...current source term with current and future land uses..."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table D.2-9 Page #: D-2-28 Line #: NA Code:
Original Specific Comment #: 169 (12; Pg E-5)

Comment: This table presents CPCs for various media. The table would be more informative if a footnote was added explaining the risk criteria (both ILCR and HQ) used to select CPCs. The table should be revised to provide such a footnote.

Response: Agree.

Action: Page D-2-7, Table D.2-1. The following footnote "a" was added to the table: "The criteria for selection was 10^{-7} for ILCR and 0.1 for the HI." Table D.2-9 has been renumbered to Table D.2-1.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table D.2-10 Page #: D-2-30 Line #: NA Code:
Original Specific Comment #: 170 (13; Pg E-5)

Comment: This table presents various sources of uncertainty along with a partial estimation of the magnitude of uncertainty. However, the magnitude estimates do not line up correctly with the appropriate sources of uncertainty. The table should be revised to correctly line up each source of uncertainty with the correct magnitude estimate.

Response: Agree. The table is confusing as presented.

Action: Page D-2-18, Table D.2-10. The table has been revised so each row is aligned properly.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: Tables D.5-5/D.5-6 Page #: D-5-14 and D-5-15 Line #: NA Code:
Original Specific Comment #: 171 (34; Pg E-10)
Comment: Tables D.5-5 and D.5-6 are not referred to in the text. The text should be revised to refer to these tables or the tables should be eliminated.
Response: Agree. Tables D.5-6 and D.5-7 are not referred to in an appropriate location of the text.
Action: Page D-5-10, line 22,. The following text was added: "Tables D.5-6 (surface soil) and D.5-7 (air particulates) contain exposure point concentrations used in residual risk calculations." The tables were renumbered due to the addition of Table D.5-3.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table D.5-7 Page #: D-5-16 Line #: NA Code:
Original Specific Comment #: 172 (35; Pg E-10)
Comment: This table presents concentrations of radionuclides in the air at the fenceline to up to nine significant figures. Such accuracy is not possible with any model. The concentrations should be revised to show a number of significant figures consistent with other concentration estimates presented in the table.
Response: Agree. Consistency should be maintained.
Action: Page D-5-18, Table D.5-8. The first six values in Column 7 (for rows Np-237 through U-235) have been changed to incorporate to the following values:

- 0.018
- 6.4
- 1.2
- 14
- 0.25
- 0.57

The significant figures will be reduced.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: Figure D.2-9 Page #: D-2-40 Line #: NA Code:
Original Specific Comment #: 173 (14; Pg E-5)

Comment: This figure is intended to present a great deal of information regarding possible exposure scenarios. As a result, several attempts to summarize information were incorporated resulting in several points of confusion. For example, it is not clear which primary contaminant sources are associated with each primary release mechanism. According to the text, on site disposal of excavated soil and waste is not expected to result in entrainment in the air (the disposal cell cap is assumed to remain intact for 1,000 years). However, the figure suggests that such entrainment could occur. Further, the text makes clear the assumption that wastes will not be released to the groundwater. Rather, percolation of water through the disposal cell and the excavation pits will result in leachate reaching the groundwater. The figure does not clearly show that leachate and not actual waste is assumed to reach the groundwater. Finally, the figure indicates that contaminants in subsurface soils can be released via entrainment in the air. The figure should be revised to indicate that the entrainment of subsurface soils is assumed to occur after these soils are brought to the surface through farming or other activities. The figure should be revised to address the comments above and to clearly summarize information.

Response: Agree.

Action: Page D-2-35, Figure D.2-9. The figure has been revised to reflect this comment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Attachment I Page #: NA Line #: NA Code:
Original General Comment #: 174 (7; Pg E-2)

Comment: The tables in Attachment I are not numbered and as a result are hard to locate. Also, the text does not refer to these tables directly. The tables in Attachment I should all be numbered to allow for easy reference. Also, the text should be revised to reference specific tables as part of the discussion.

Response: Agree. The tables should be numbered and referenced in text.

Action: The tables were numbered sequentially and text references were inserted.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Att. I Page #: D-I-1 to 3 Line #: NA Code:
Original Specific Comment #: 175 (44; Pg E-12)

Comment: The first three tables of Attachment I present PRGs. However, neither the tables or the text discuss how the PRGs were developed. The appendix should be revised to summarize how the PRGs were developed or refer to another document that explains PRG development.

Response: Agree.

Action: Page D-I-1. A table of contents and brief introduction were added to Attachment I, stating that "the PRGs were developed as per Appendix E.III in the Draft Final Operable Unit 1 RI."

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Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Att. I Page #: D-I-4 to D-I-9 Line #: NA Code:
 Original Specific Comment #: 176 (45; Pg E-12)

Comment: These tables present EPCs for both adult and child receptors. However, for each type of receptor (on-property, off-property, and expanded trespasser), the EPCs presented for adults and children are the same. The tables should be combined and the titles changed to reflect these changes.

Response: Comment Acknowledged. Exposure Point Concentration (EPC) represents exposure to a specific concentration and is not dependent on the receptor. As such, these tables represent a standard printout of the spreadsheet program and represent the basis for these risk numbers.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Att. I Page #: D-I-28 to 29 Line #: NA Code:
 Original Specific Comment #: 177 (46; Pg E-12)

Comment: These two pages are identical. The attachment should be revised to eliminate page D-I-29.

Response: Agree. The two pages are the same.

Action: Page D-I-29 has been deleted.

Commenting Organization: U.S. EPA Commentor: Saric
 Section #: Appendix E Page #: NA Line #: NA Code:
 Original Specific Comment #: 178 (45; Pg 1-11)

Comment: Estimates state that the cost for "health physics" is assumed to be 20 percent of the direct and indirect field labor costs. However, in several cases, a much higher rate was used. For instance, on Page E-I-11, a health physics cost of 50 percent was used and on Page E-1-59 a health physics cost of 46 percent was used. The report should explain the rationale for the 20 percent health physics costs and for the higher rates used.

Response: Agree. A rate of 20 percent was used in determining health physics costs for all activities with the exception of waste pit excavation, rotary drying, and D&D efforts. Health physics labor costs associated with these activities are rolled into the direct field labor costs identified with the performance of these activities. A material cost for personal protective equipment required to implement these activities is determined explicitly in the cost estimate detailing sheets and provided under this indirect cost. The rate of 20 percent for this indirect cost element is believed to be appropriate based on the complexity of the activities against which it was applied based on routine experience at the site now. Higher rates were used for the waste pit excavation, rotary drying, and D&D efforts because these activities are expected to have more significant radiological monitoring requirements. The given rates were based on the estimator's professional judgement using site-specific historical rates. Text has been clarified to reflect this information.

Action: Page E-3-4, line 6. The text has been modified as follows: "Health Physics Includes the labor costs identified with lost time incurred by the contractor for monitoring delays,

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workers time for physicals, etc. For all activities, with the exception of waste pit excavation, rotary drying, and D&D, this cost is established as a percentage of the sum of total direct field labor costs and all indirect field labor cost identified above. For the purpose of the cost estimate, this percentage was established at 20 percent. This is consistent with the rates experienced for routine field activities at the site. For the remaining activities (i.e. waste pit excavation, rotary drying, and D&D), this labor cost is rolled into the direct field labor costs identified with the performance of the remedial effort. Higher rates were used for the waste pit excavation, rotary drying, and D&D efforts because these activities are expected to have more significant radiological monitoring requirements. The given rates were based on the estimators professional judgement using site-specific historical rates. A material cost for personal protective equipment required to implement these activities is determined explicitly in the cost estimate detailing sheets, and provided under this direct cost."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix E Page #: NA Line #: NA Code:
Original Specific Comment #: 179 (46; Pg 1-12)

Comment: The unit rate used in the cost estimates is consistent among alternatives. However, some of the unit rates appear to be inordinately high. For example, on Page E-I-4 the unit cost for the clear and grub areas is \$5,590 per acre, not including indirect costs. The Means building construction cost (1992) estimates this same activity to cost \$3,825 per acre. The Means rate includes labor, equipment, overhead, and profit. The report should provide rationale for the unit rates used in the estimates.

Response: Comment Acknowledged. Cost for labor, material, and equipment incorporated within Appendix E of the Feasibility Study Report are based on costing handbooks (historical costing data), existing contract labor rates, vendor quotations, and the estimator's professional experience. Rates obtained from costing handbooks, such as Means for example, were at times modified by the estimator to reflect site-specific conditions. DOE acknowledges that rates contained within the cost estimate are conservative, but believes that these rates are reflective of the costs associated with performing construction/remedial activities at DOE weapons complex facilities.

Action: None.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix E Page #: NA Line #: NA Code: C
Original Specific Comment #: 180 (44; Pg 1-11)

Comment: Appendix E presents the detailed cost estimates for Alternatives 4A, 4B, 5A, and 5B. The cost estimates used a production factor of 2.1 to convert Level D (health and safety protection) manhours to Level B manhours. The 2.1 production factor appears to be higher than normal. For instance, U.S. EPA Region 4, Appendix B of "A Methodology of Evaluating Closure and Post Closure Cost Estimates for RCRA Hazardous Waste Treatment, Storage, and Disposal Facilities," lists a production factor of 1.3 to convert Level D manhours to Level B manhours. The rationale for the 2.1 production factor should be presented in the report or the production factor should be lowered appropriately.

Response: Comment Acknowledged. The productivity factor incorporated within Appendix E of the Feasibility Study Report is based on the estimator's professional experience. DOE acknowledges that the productivity factor contained within the cost estimate is conservative, but believes that this factor is reflective of the costs associated with performing construction/remedial activities in Level B protection at DOE weapons complex facilities.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix E Page #: E-I-34 Line #: NA Code:
Original Specific Comment #: 181 (47; Pg 1-12)

Comment: This section presents the costs for construction of a 44,000 square foot building as \$13,633,100. The cost of construction per square foot (sq ft) is \$300. Although this cost includes cleaning and grubbing and working in Level B, the cost appear to be high compared to other cost references. For example, the Means (1992) reference lists the following building construction costs: (1) the bank at \$105 per sq ft, (2) the hospital at \$124 per sq ft, (3) the jail at \$134 per sq ft, and (4) the science laboratory at \$113 per sq ft. The report should provide the rationale for the higher than normal construction costs.

Response: Comment Acknowledged. Cost for labor, material, and equipment incorporated within Appendix E of the Feasibility Study Report are based on costing handbooks (historical costing data), existing contract labor rates, vendor quotations, and the estimator's professional experience. Rates obtained from costing handbooks, such as Means for example, were at times modified by the estimator to reflect site-specific conditions. DOE acknowledges that rates contained within the cost estimate are conservative, but believes that these rates are reflective of the costs associated with performing construction/remedial activities at DOE weapons complex facilities.

Action: None.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: E-4.0 Page #: E-4-1 and E-4-2 Line #: NA Code:
Original Specific Comment #: 182 (48; Pg 1-12)

Comment: Section E-4.0 presents the present worth analysis. The accuracy of the present worth values presented in Table E.4-1 for the four remedial action alternatives could not be determined. In particular, there was no direct correlation between total costs (including costs for O&M) presented in Table E.2-1 and the present worth values. Values derived by using the specified rate of 4.5 percent to discount for a period of 30 years the total capital costs identified in Table E.2.1 do not correspond to those present worth values. Therefore, it is reasonable to assume that the present worth values may have been derived by estimating the projected expenditures for each year of the 30-year period and discounting that value by 4.5 percent for the number of years which are expected to pass between May 1, 1995 and the date when the funds will be spent. The report, however, does not provided projected expenditures data. Without those missing data, the accuracy of the present worth values presented in Table E.4-1 cannot be determined. These data should be provided and the methodology for calculating present worth should be presented.

An incorrect discount rate may have been used to perform the present worth calculations. The Office of Management and Budget (OMB) revised Circular 94 which specifies the discount rate to be used by federal agencies to conduct benefit-cost, cost effectiveness, and lease purchase analysis. The previous OMB guidance, issued by OMB on October 29, 1992, directs federal agencies to use a 7 percent discount rate. Further, U.S. EPA, Office of Solid Waste and Emergency Response (OSWER) Directive No. 9355.3-20 specifically revises the discount rate to be used by federal agencies to estimate present worth values for Superfund activities, including remedial investigations and feasibility studies and for remedial actions, to 7 percent.

Response: Comment Acknowledged. Table E.2.1 presents the estimated unescalated 1994 costs for the respective project components that comprise each of the alternatives which underwent detailed analysis in the Feasibility Study. These unescalated costs were linearly spread, component by component, across the conceptual implementation schedules for each of the respective components and summed over all components comprising an alternative. (The schedules for each alternative and component are presented with this response). All cash flows were stated in present value constant dollars; hence, all dollars have the same purchasing power. Constant dollars are dollars of uniform purchasing power tied to a base year (FY 1994) and are exclusive of general price inflation or deflation. In accordance with OMB (revised) Circular A-94 dated October 29, 1992, in effect at the time the cost estimates were prepared, a real discount rate of 4.5 percent was applied to the cash flows and used to preform the present worth analysis. Real discount rates are used when discounting real constant dollar cash flows.

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The U.S. EPA OSWER Directive No. 9355.3-20 specifies a nominal discount rate of 7 percent. The directive leaves to the discretion of the preparer of the present worth analysis the selection of the escalation rate to apply to the future cash flows. The OMB Circular A-94 stipulates a nominal discount rate of 6.8 percent for a 30-year study period when cash flows are stated in current dollars. Current dollars are dollars of nonuniform purchasing power, including general price inflation or deflation, in which actual prices are stated. The discount rate stated in the U.S. EPA directive represents a nominal discount rate rather than a real discount rate. The approach taken in the present worth analysis presented in the Feasibility Study, wherein a real discount rate of 4.5 percent was used, is equivalent to escalating each of the estimated future cash flows by approximately 2.5 percent and then discounting the cash flows to the base year by applying a nominal discount rate of 7 percent. Either approach will provide the same net present value results if consistently followed.

Given the discretion availed to the preparer per the U.S. EPA Directive, the approach taken in the Feasibility Study and the present worth estimates presented herein are considered compliant with the U.S. EPA approach and are well within the envelope of intended accuracy for a cost estimate for a Feasibility Study.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table F.2-2 Page #: F-2-11 to 12 Line #: NA Code:
Original Specific Comment #: 183 (49; Pg 1-13)

Comment: Table F.2-2 lists the chemical-specific ARARs for water. The table identifies an MCL for lead of 0.05 mg/L as the ARAR. The MCL for lead should be the Safe Drinking Water Act action level of 0.015 mg/L. The Superfund program uses this action level as the groundwater cleanup standard for lead. The table should be revised accordingly. In addition, on page F-2-11 MCLs for the following chemicals of concern should also be listed: antimony - 6 µg/L, beryllium - 1 µg/L, copper - 1.3 µg/l action level, cyanide - 200 µg/L, mercury 2 mg/L, and nickel 10,000 µg/L. The MCL listed for silver should be deleted; there is no promulgated MCL for silver. On page F-2-12, the note in the comments section should be revised accordingly.

Response: Agree. The action level for lead should be the Safe Drinking Water Act action level for lead, 0.015 mg/L. In addition, the MCLs for antimony, beryllium, cyanide, mercury, and nickel should be added to the table, along with the action level for copper. However, in order to be consistent with units of measure in other parts of the document, the MCLs should be added in milligrams per liter instead of micrograms per liter. The MCL for silver should be deleted. The note on page F-2-12 should also be revised in response to this comment.

Action: Page F-2-11, Table F.2-2, Requirements Column. The following chemicals have been added in alphabetical order, after this introduction:

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"Pursuant to 40 CFR 141.62, MCLs for Inorganic Contaminants in community, non-transient non-community, and transient non-community drinking water systems, the following MCLs are relevant and appropriate to groundwater at Operable Unit 1:

<u>Chemical</u>	<u>MCL (mg/L)</u>
Antimony	.006
Beryllium	.004
Cyanide	.2
Mercury	.002
Nickel	.1

Pursuant to 40 CFR 141.80, Control of Copper and Lead, the action level is exceeded for copper at 1.3 mg/L and the action level for lead is exceeded at 0.015 mg/L. Thus, although the standards are not MCLs, the action levels for copper and lead have been added as a relevant and appropriate regulatory requirement for drinking water.

<u>Chemical</u>	<u>MCL (mg/L)</u>
Copper	1.3
Lead	0.015

Page F-2-11, Table F.2-2, Requirements Column. The MCL for lead has been deleted.

Page F-2-12, Table F.2-2, Comments/Rationale Column. Silver has been deleted from the "Note:" at the bottom of the page.

Page F-2-13, Table F.2-2, Silver. The first row in the table has been deleted.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table F.2-2 Page #: F-2-13 Line #: NA Code:
Original Specific Comment #: 184 (50; Pg 1-13)

Comment: The comments section states that 1,1,1-trichloroethane (1,1,1-TCA); methylene chloride; and perchloroethylene were disposed of in the waste pits. However, Table F.2-1, which lists the OU1 chemicals of concern, does not list 1,1,1-TCA or methylene chloride. This apparent discrepancy should be explained. This page should list the MCL for pentachlorophenol of 0.001 mg/L and the MCLs for the following PAHs: (1) benzo(a)anthracene at 0.1 µg/L; (2) benzo(a)pyrene at 0.2 µg/L; (3) benzo(b)fluoranthene at 0.2 µg/L; (4) chrysene at 0.2 µg/L; and (5) indeno(1,2,3-c,d)pyrene at 0.4 µg/L. In addition, tetrachloroethene is referred to in Appendix F three different ways, as tetrachloroethene (Page F-2-10), tetrachloroethylene (Page F-2-13), and perchloroethylene (Page F-2-13). This chemical should be referred to using consistent nomenclature, preferably tetrachloroethene.

Response: Agree. According to the results of the Remedial Investigation, inclusive of the Baseline Risk Assessment, 1,1,1-trichloroethane is not a contaminant of concern at the Operable Unit 1 site. The chemicals of concern at Operable Unit 1 include only the chemicals identified in Table 2-2 and Table F.2-1 in Appendix F. The reference to organic compounds historically involved in the waste stream is not relevant to this ARARs analysis. This ARARs analysis is based on chemicals identified as present in levels of concern after the completion of the Remedial Investigation and Baseline Risk Assessment. The reference has been removed from the comments/rationale column of Table F.2-2 on page F.2-13.

Regarding the second part of the comment about MCLs for PAHs, only the MCL for benzo(a)pyrene is an ARAR at this time. The rest of the MCLs are proposed and thus are to-be-considered guidance until the regulations containing them are finalized. The MCLs for pentachlorophenol and benzo(a)pyrene have been added to Table F.2-2 on page F-2-13. The MCLs for the other polyaromatic hydrocarbon compounds listed in the comment were added in a new row on Table F.2-2 on page F.2-13. Because the MCLs are proposed, their ARARs status is to-be-considered guidance. The MCLs may be used to set clean up goals for the site, but are not at this time legally applicable or relevant and appropriate requirements.

DOE agrees with the third part of the comment. Reference to Tetrachloroethene should be made consistent in Appendix F.

Action: Page F-2-13, Table F.2-2. In the Comments/Rationale column, the paragraph beginning "Historical records show that trichloroethylene..." has been deleted.

Page F-2-13, Table F.2-2. The MCL for pentachlorophenol, 0.001 mg/L, has been added as an MCL for Organic Contaminants in Drinking Water.

Page F-2-13, Table F.2-2. The MCL for Benzo(a)pyrene, 0.0002 mg/L, has been added as an MCL for Organic Contaminants in Drinking Water.

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Page F-2-13, Table F.2-2. The following proposed MCLs have been added to the table in a new row labeled "Proposed MCLs from 'Drinking Water Regulations and Health Advisories' by the Office of Water, U.S. EPA, Washington, D.C., May 1993.

Benzo(a)anthracene	0.0001
Benzo(b)fluoranthene	0.0002
Chrysene	0.0002
Indeno(1,2,3-c,d)pyrene	0.0004"

The "ARAR/TBC" column has been revised to read "TBC." The "Comments/Rationale" column has been revised as follows: "The proposed regulations are not ARARs for Operable Unit 1 because they are not promulgated at this time. However, the proposed limits can be used to establish cleanup levels for the site in the absence of promulgated federal and state regulations. The listed chemicals have been found to be present at Operable Unit 1 during the Remedial Investigation.

Page F-2-13, Table F.2-2, Requirements Column. Change tetrachloroethylene to tetrachloroethene, noting that in the regulations the limit is specified for the synonym tetrachloroethylene.

Page F-2-13, Table F.2-2, Comments/Rationale Column. Reference to perchloroethylene has been deleted.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Table F.2-2 Page #: F-2-16 Line #: NA Code:
Original Specific Comment #: 185 (51; Pg 1-14)
Comment: Table F.2-2 includes a list of MCLGs for inorganic chemicals. The MCLG for thallium of 0.5 µg/L should be added to the table because it is a chemical of concern and its MCLG is lower than its MCL. Selenium and asbestos should be removed from this page because neither are chemicals of concern at OU1.
Response: Agree. The MCL for thallium of .0005 mg/L from 40 CFR 141.51, U.S. EPA's Primary Drinking Water Rules, should be added to Table F.2-2 on page F-2-16. Selenium and asbestos should be removed from Table F.2-2 because neither are chemicals of concern for Operable Unit 1.
Action: **Page F-2-16, Table F.2-2.** The following text has been added to the table: "Thallium .0005." The limits specified for selenium and asbestos have been deleted from the table.

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Commenting Organization: U.S. EPA Commentor: Saric
 Section #: NA Page #: F-I-1 to F-I-3 Line #: NA Code:
 Original Specific Comment #: 186 (52; Pg 1-14)

Comment: Table I-1 and I-2 list federal and state MCLs for inorganic and organic chemicals, respectively. Both tables are missing inorganic and organic chemicals of concern for OU1. The tables should be checked and inorganic and organic chemicals with MCLs that are listed in Table F.2-1 should be added to the appropriate table.

Response: Agree. In Table I-1, federal and state MCLs for antimony, beryllium, mercury, and thallium should be added to and silver should be deleted from the table. In Table I-2, the MCLs for pentachlorophenol and benzo(a)pyrene should be added and the proposed MCLs for benzo(a)anthracene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene should be added.

Action: Page F-I-1, Table I-1. The following chemicals and their MCLs have been added:

<u>Chemical</u>	<u>Federal MCL</u>	<u>State of Ohio MCL</u>
Antimony	0.006 mg/L	0.006 mg/L
Beryllium	0.004 mg/L	0.004 mg/L
Cyanide	0.2 mg/L	0.2 mg/L
Mercury	0.002 mg/L	0.002 mg/L
Thallium	0.002 mg/L	0.002 mg/L"

The entry for "Silver" has been deleted.

Page F-I-3, Table I-2. The following chemicals and their MCLs have been added:

<u>Chemical</u>	<u>Federal MCL</u>	<u>State of Ohio MCL</u>
Benzo(a)anthracene	0.0001 mg/L Proposed MCL	
Benzo(a)pyrene	0.0002 mg/L	0.0002 mg/L
Benzo(b)fluoranthene	0.0002 mg/L Proposed MCL	
Chrysene	0.0002 mg/L Proposed MCL	
Indeno(1,2,3-cd)pyrene	0.0004 mg/L Proposed MCL"	

"'Drinking Water Regulations and Health Advisories' by the Office of Water, U.S. EPA, Washington, D.C., May 1993" has been added to the "Citation" column.

The Ohio MCL for PCBs (0.0005 mg/L) and the MCL for tetrachloroethene (tetrachloroethylene) (0.005 mg/L) have been added.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: PP 2.2 Page #: P-2-2 Line #: 10 to 11 Code:
Original Specific Comment #: 187 (1; Pg 2-1)
Comment: This sentence identifies the communities in the vicinity of the Fernald Environmental Management Project (FEMP) site, and refers to Figure 2-1. Figure 2-1 should be revised to show the location of Harrison in relation to the site.
Response: Agree.
Action: **Figure 2-1** has been modified to include Harrison.

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Commenting Organization: U.S. EPA Commentor: Radiation Section
Section #: PP 3.2.1 Page #: P-3-2 to P-3-4 Line #: Various Code: E
Original Comment #: 188 (1; Pg 1)

Comment: For the benefit of the reader who may not have process knowledge, please define the following terms in the glossary: *slurries, calcined, depleted, slag, trailer cake, clearwell, raffinate, settling basin, slag leach, pyrophoric, and supernatant.*

Response: Agree.

Action: The suggested words and the following definitions have been added to the glossary in alphabetical order:

Calcined - Heated to a high temperature, but below the melting or fusing point, causing loss of moisture, reduction or oxidation, and the decomposition of carbonates and other compound (The American Heritage College Dictionary, third Edition, Houghton Mifflin Company, Boston, Ma, 1993).

Clearwell - A basin, or pit, constructed as a holding area for surface water from another source (The Clearwell was constructed as a holding area for the Waste Pit Area), where heavier particles sink to the bottom and clean or clear water is released from the top of the basin.

Depleted - Used up or decreased, having something essential removed. For uranium, depleted uranium is uranium having less than 0.711 percent by weight of the isotope U-235 (OU1 RI, Appendix F, June, 1994, and The American Heritage College Dictionary, Third Edition, Houghton Mifflin Company, Boston, MA, 1993).

Pyrophoric - The quality of being liable to cause fires through friction. Pyrophoric material has retained heat from manufacturing or processing, or can be ignited readily and when ignited burns so vigorously and persistently as to create a serious transportation, handling, and disposal hazard (DOE 5820.2A, 09-26-88 and OU1 RI, Appendix F, 1994).

Raffinate - The portion of a liquid that remains after other components have been dissolved by a solvent (The American Heritage College Dictionary, Third Edition, Houghton Mifflin Company, Boston, Ma, 1993). In the refinery process at the FEMP, uranium-bearing feed materials were digested in nitric acid to solubilize the uranium. The uranium was extracted, leaving most of the nitric acid, impurities associated with the materials being processed and small quantities of insoluble, nonextractable uranium in the resulting "raffinate" (OU1 RI, Section 1, 1994).

Settling basin - A basin, or pit, constructed as a holding area for surface water from another source, where heavier particles sink to the bottom and clean or clear water is released from the top of the basin.

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Slag - Magnesium fluoride. A reaction product resulting from the uranium fluoride and magnesium ($UF_4 + 2Mg$) = uranium and magnesium fluoride ($U + 2MgF_2$) thermite reduction (OU1 RI, Appendix F, 1994).

Slag leach - A white to gray granular material that is the result of MgF_2 dissolved in nitric acid, uranium extraction, and denitration. The insoluble materials left over were mixed with lime (calcium oxide) to a pH of approximately 11, and pumped to the waste pits. The composition of slag leach is approximately 96.5 percent MgF_2 , 3 percent filter aid (diatomaceous earth), and 0.5 percent uranium, with some amount of calcium compounds from the neutralization step, as well as nitrates (OU1 RI, Section 1, 1994).

Slurry - (Plural: slurries) a thin mixture of liquid, usually water and insoluble matter (OU1 RI, Appendix F, June, 1994, and The American Heritage College Dictionary, Third Edition, Houghton Mifflin Company, Boston, MA, 1993).

Supernatant - The clear fluid above a sediment or precipitate (The American Heritage College Dictionary, Third Edition, Houghton Mifflin Company, Boston, Ma, 1993).

Trailer cake - The dry, white to gray granular material left after the reduction of magnesium fluoride and uranium fluoride. Trailer cake is approximately 96.5 percent MgF_2 , 3 percent filter aid diatomaceous earth), and 0.5 percent uranium, with some amount of nitrates (OU1 RI, Section 1, 1994).

Commenting Organization: U.S. EPA Commentor: Radiation Section
Section #: PP 4.2.4 Page #: P-4-11 Line #: 4 Code: C
Original Comment #: 189 (2; Pg 1)

Comment: This sentence erroneously states that a "Hazard Index equal to or greater than one" is generally acceptable under CERCLA; please review and revise.

Response: Agree. The sentence should be corrected to state "These results may be compared to the ranges of generally acceptable risk under CERCLA, which are an incremental lifetime cancer risk of one in one million (10^{-6}) to one in ten thousand (10^{-4}) or a Hazard Index equal to or less than one."

Action: Page P-4-11, line 23. "Greater than" in the second sentence of the first paragraph has been changed to "less than."

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: PP 5.1 Page #: NA Line #: NA Code:
Original General Comment #: 190 (3; Pg 2-1)

Comment: This section provides estimated costs for each remedial action alternative selected for detailed analysis. However, the costs presented in the PP differ from those presented in the FS. This discrepancy should be resolved.

Response: Comment Acknowledged.

Action: The figures that summarize the FS cost estimate have been verified during this revision. The cost figures summarized in the Proposed Plan reflect those cost estimates provided in the Feasibility Study. These figures are reported as follows:

Alternative 4A	Page P-5-12
Alternative 4B	Page P-5-13
Alternative 5A	Page P-5-14
Alternative 5B	Page P-5-16

In addition, cost figures in the Executive Summary of the Feasibility Study and the Proposed Plan have been verified.

Commenting Organization: U.S. EPA Commentor: Radiation Section
Section #: PP 5.1.4 Page #: P-5-6 Line #: 26 Code: C
Original Comment #: 191 (3; Pg 1)

Comment: It is stated that the FEMP site can support rail transport to the Nevada Test Site (as well as to Utah). Please state whether the existing FEMP rail line (with or without added improvements) can support the combined remedial activities of those operable units utilizing off-site disposal.

Response: Comment Acknowledged. Not all the operable units have determined which remedial alternative and technologies they will implement. At this time, the only operable unit other than Operable Unit 1 planning to use off-site shipment is Operable Unit 4. Currently, Operable Unit 4 is planning on waste shipment by truck rather than rail. It is recognized, however, that if other operable units were to utilize rail shipment to support off-site disposal it would place significant additional demands on the FEMP rail line. At this point, since additional requirements beyond those of Operable Unit 1 are uncertain, it can only be stated that DOE would undertake any improvements necessary to support site-wide remedial activities.

Action: Page P-5-15, line 15. The following sentence has been added: "Evaluation of the need for improvements will consider the requirements of all operable units utilizing rail to support off-site waste disposal."

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Commenting Organization: U.S. EPA Commentor: Radiation Section
Section #: PP 5.1.4 Page #: P-5-7 Line #: 4 Code: C

Original Comment #: 192 (4; Pg 1)

Comment: It is stated that "it is possible that isolated pockets of waste could be encountered that would meet NTS waste acceptance criteria." Since this alternative deals with off-site disposal at NTS, it is expected that most of the treated waste meets the NTS waste acceptance criteria.

Response: Agree. The referenced sentence was meant to discuss the possibility that isolated pockets of waste could be encountered that would not meet NTS waste acceptance criteria. The text on page P-5-7 should be revised to clarify this point.

Action: Page P-5-15, line 23. The word "not" has been inserted between "would" and "meet NTS..."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: PP 5.1.4 Page #: P-5-7 Line #: 4 Code:

Original Specific Comment #: 193 (2; Pg 2-2)

Comment: This sentence states that isolated pockets could be encountered that "would" meet Nevada Test Site (NTS) waste acceptance criteria. The sentence is apparently incorrect and should read that the waste "would not" meet NTS waste acceptance criteria.

Response: Agree. The text on page P-5-7 should be changed to say "would not" instead of "would."

Action: Page P-5-15, line 23. The word "not" has been inserted between "would" and "meet NTS"

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Commenting Organization: U.S. EPA Commentor: Radiation Section
Section #: PP 5.1.4 Page #: P-5-7 Line #: 6 Code: C
Original Comment #: 194 (5; Pg 2)

Comment: Please state for this alternative what will happen if more than 10% of the wastes do not meet the NTS waste acceptance criteria, or if there are wastes do not meet the acceptance criteria of neither NTS nor a permitted commercial waste disposal facility.

Response: Comment Acknowledged. The nature of potential concerns about meeting waste acceptance criteria (WAC) are different between NTS and the representative permitted commercial waste disposal facility. At the representative permitted commercial waste disposal facility, the principal WAC of potential concern to Operable Unit 1 focus on radionuclide-specific concentrations that cannot be exceeded, on average. At NTS, the principal WAC of potential concern to Operable Unit 1 focus on radiological designation, i.e., low-level waste, and designations (RCRA wastes are not acceptable for disposal).

As stated in the text, based on process knowledge and data presented in the Operable Unit 1 Remedial Investigation, it is anticipated that Operable Unit 1 waste as processed will meet the WAC for either disposal facility.

Based on data and information in the Operable Unit 1 Remedial Investigation, it is possible that localized areas of RCRA characteristic wastes for metals and/or volatile organics could be encountered during remediation. In the event RCRA characteristic wastes are encountered during WAC sampling, treatment options could be employed. Waste drying will be designed such that it will thermally desorb volatile organics in the waste. Simple modifications to the waste treatment process, such as lime addition during the crushing phase of the process, would immobilize any metals encountered. It is noted that if a waste is treated such that it no longer demonstrates a hazardous characteristic, then it is no longer a RCRA hazardous waste. Therefore, any RCRA characteristic wastes that are identified during WAC sampling could be treated such that they are no longer RCRA regulated, leaving only radiological concerns for the WAC. Since the wastes of Operable Unit 1 are considered low-level radiological wastes which are acceptable for disposal at NTS, and since they can be treated for RCRA characteristics as noted above, it is anticipated that all wastes could meet NTS WAC if necessary.

Action: Page P-6-11, line 7. The following text was added: "It is possible that localized areas of RCRA characteristic wastes for metals and/or volatile organics could be encountered during remediation and, therefore, not meet NTS waste acceptance criteria. In the event RCRA characteristic wastes are encountered during waste acceptance criteria sampling, treatment options could be employed. Waste drying will be designed such that it will thermally desorb volatile organics in the waste. Simple modifications to the waste treatment process, such as lime addition during the crushing phase of the process, would be undertaken to immobilize metals encountered. It should be noted that if a waste is treated such that it no longer demonstrates a hazardous characteristic, then it is no longer a RCRA hazardous waste. Therefore, any RCRA characteristic wastes that are identified during waste acceptance criteria sampling could be treated such that they are no longer RCRA regulated, leaving only radiological concerns for waste acceptance criteria. Since

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the wastes of Operable Unit 1 are considered low-level radiological wastes which are acceptable for disposal at NTS and since they can be treated for RCRA characteristics as noted above, it is anticipated that all wastes could meet NTS waste acceptance criteria, if necessary."

Commenting Organization: U.S. EPA Commentor: Radiation Section
Section #: PP 5.1.5 Page #: P-5-8 Line #: 2 Code: C
Original Comment #: 195 (6; Pg 2)

Comment: Please state for this alternative what will happen if more than 10% of the wastes do not meet the waste acceptance criteria of the Clive, Utah disposal facility, or if there are wastes do not meet the acceptance criteria of neither the Clive, Utah disposal facility nor NTS.

Response: Comment Acknowledged. Relative to the question concerning the possibility that there will be wastes that will not meet the waste acceptance criteria of either facility, the reviewer is directed to the response to Comment 194. Relative to the possibility that more than 10 percent of the wastes would not meet the representative permitted commercial waste disposal facility's waste acceptance criteria, DOE emphasizes that the data in the Operable Unit 1 Remedial Investigation indicates that this is a remote possibility. The only course of action in this unlikely event would be to dispose of the excess material at NTS.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: PP 6.3 Page #: P-6-13 Line #: 27 to 29 Code:
Original Specific Comment #: 196 (3; Pg 2-2)

Comment: This paragraph presents the cost advantage of Alternative 5B over Alternatives 4A and 4B; however, it does not mention the cost advantage of Alternative 5B over Alternative 5A. The text should be modified to discuss this cost advantage.

Response: Agree.

Action: Page P-6-16, line 30. The following text has been added: "There is also a large cost advantage to off-site disposal at a permitted commercial disposal facility compared to off-site disposal at the NTS."

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Commenting Organization: U.S. EPA Commentor: Van Leeuwen
Section #: Page #: Line #: Code: M
Original Comment #: 197 (6)

Comment: I believe that there is a problem with the risk calculations for beryllium, which have generated very high risks at background concentrations. This problem has been noted in other FEMP reports. Please review your methodology.

Response: Comment Acknowledged. The DOE submitted a document, for review and approval to the U.S. EPA Region V, outlining the problems with the methodology used in calculating the dermal pathway for beryllium. The policy document was disapproved in its entirety due to the interpretation, by U.S. EPA, that DOE was questioning the slope factors provided in the IRIS data base.

The essence of the policy paper was that the method that DOE was directed to use by U.S. EPA Region V, and reported to have come from ECAO, was flawed. The policy paper pointed out that the problem was most likely in the absorption coefficient for dermal contact. The DOE recommended to utilize a method similar to that of PAHs, which have no dermal slope factors either, and assume that the dermal pathway is at least as toxic as the oral. The U.S. EPA Region V rejected this approach in favor of waiting until ECAO Cincinnati could review the methodology. U.S. EPA Region V indicated that the ECAO should respond by the first week in May 1994. No additional information was ever provided to the DOE on this subject. The only course of action was to continue to use the original method as directed.

The DOE has reviewed the methodology and is continuing to await a response on the subject from U.S. EPA Region V.

Action: None at this time.