Appendix B

ICDF 30% Design Package—
Document Review, Comment, Resolution List – IDEQ

ICDF 30% DESIGN PACKAGE

DOCUMENT REVIEW, COMMENT, RESOLUTION LIST - IDEQ

DOCUMENT TITLE: General Comment

ITEM	SECTION/ FIGURE/ APPENDIX	PAGE	COMMENT	RESOLUTION
1	General	General	Information regarding design of the evaporation pond liner system is not included in this submittal, although it is referenced in Section 1.3 of the Master Table of Documents (Item # 8). However, based on a brief discussion during a May 9, 2001 conference call, it is our understanding that USDOE wants to propose modifications to the surface impoundment design requirements found in 40 CFR 264.221 (c), as applied to the ICDF evaporation pond. At this time, we do not know the nature of the proposed modifications. Further, we understand that USDOE will present an alternative design for our review in the ICDF 60 percent Selected Remedial Design, scheduled to be submitted to IDEQ August 31, 2001. We shall evaluate the proposed alternate design in accordance with 40 CFR 264.221 (d), and for consistency with the design and practices of other surface impoundments operating in the State of Idaho. However, it should be recognized that, unless each Agency agrees that the proposed alternate design is equally protective, the standard design requirements outlined in 40 CFR 264.221 (c) must be implemented. Therefore, to ensure that the aggressive schedule for the Group 3 ICDF remedy is maintained, we recommend that USDOE proceed now with a dual track design that includes both the standard design specified in 40 CFR 264.221 (c) and the proposed alternate design. Both	The evaporation pond design is included in the 30% design package (see drawing H-205), which includes the major components of the design. Since this is a modification to the requirements in 40 CFR 264.221(c), an equivalency determination will be provided as a 60% submittal that describes how the alternate design is equally or more protective of the 40 CFR 264.221(c) requirements. A conference call will be set up to determine key items for the equivalency determination.

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			designs should be included in the 60 percent submittal for review and comparison. The Agencies will determine during the review/comment resolution period which design will proceed and eventually be implemented. Additionally, to be pro-active, we specifically request that USDOE identify the major components of the proposed alternate design in response to this comment.	

DOCUMENT TITLE: Draft Title I Design, Volume 1, DOE-ID-10848 ICDF Remedial Design/Remedial Action Work Plan/Title II Design—Annotated Outline

ITEM	SECTION/ FIGURE/ APPENDIX	PAGE	COMMENT	RESOLUTION
2	Appendix C ARARs, *40 CFR 261.24 Toxicity Characteristi c*,	C-7	Please modify the second sentence in the "Operations, Design, or Administrative Requirement for ARAR" column to read: "Wastes from outside the AOC *and/or wastes from within the AOC that have triggered placement*, must meet LDRs.	Comment will be incorporated.
3	Appendix C ARARs, *40 CFR 261.92, .93, .95, .97, and .98*, "Compliance Document" Column	Pages C-8 through C-11	Please see Comment #53 regarding the proposed use of the Group 5 Monitoring System and Installation Plan.	A separate Groundwater Monitoring Plan for the ICDF will be developed and included in the RD/RA Work Plan. The approach for groundwater monitoring will be described in the 60% submittal to the Agencies.
4	Appendix C ARARs, , "Compliance Document" Column	Pages C-14 through C-18	The entry in this column for several of the ARARs states "ICDF Design (related documents to be listed). We assume that this means that the upcoming 60 percent RD and/or the 90 percent RD/RA Work plan will outline the compliance strategy for each of these ARARs, and that the "related documents" refer to as-yet-to be-numbered sections (e.g., EDFs) of those submittals. If these assumptions are incorrect (e.g., if "related documents" refers to documents other than those to be contained in the Design), please clarify.	The upcoming 90% deliverable will provide the related documents that demonstrate the compliance strategy.
5	Appendix C ARARs, 40 CFR 264.310 (a) (5),	Page C-19, Last Two Columns	a. We recommend that the Agencies discuss this requirement with respect to the proposed "Store and Release/Capillary Break" soil cover. b. Please clarify what "*Information Pending*" refers to in the last column.	a. Comment accepted. The design also includes a RCRA cap below the store and release/capillary break soil cover. b. Comment incorporated. Text has been added to indicate that 'information pending' refers to the associated compliance documents pertaining to the cited ARARs that have not yet been identified, are in development, or are to be

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				developed. As the information becomes available, 'information pending' will be modified to include the appropriate compliance document.
6	Appendix C ARARs, 40 CFR 264.552 (b) (2)	Page C-19, Last Two Columns	The entries in these two columns are not descriptive of the column headings. Please modify.	Comment clarified during the 6/12/01 conference call; will be incorporated.
7	Appendix C ARARs, 40 CFR 264.552 (c) and (d), "*Operations, Design, or Administrative Requirement for ARAR*" Column	Pages C-19 and C-20	It is unclear why the entry for this column commonly consists of "*OU 3-13 ROD*" rather than specifying the type of requirement. For example, we would consider the requirement that "*waste management activities associated with CAMU shall not create unacceptable risks to humans or the environment . . .*" to be met through both <u>remedial design</u> and <u>operational procedures</u>.	Comment clarified during the 6/12/01 conference call; will be incorporated.

Draft Title I Design, Volume 1, ICDF Construction QA Plan for the ICDF—Annotated Outline, DOE/ID-10851

ITEM	SECTION/ FIGURE/ APPENDIX	PAGE	COMMENT	RESOLUTION
8	Inspection Activities, Section 4	Page 4-1, First Bullet	We suggest that inspection activities also include a process to pre-approve each HDPE welding technician as well as the welder used. Also, a procedure should be included to inspect manufactured materials upon delivery for suitability and a proper storage area delineated to avoid damage.	Minimum qualifications for HDPE welding technicians will be provided in the 90% CQA Plan. Typically welding machines perform a test seam prior to any production welding to verify machine is working properly. This will be included in 90% deliverable. The procedures for inspecting materials and storage will be included in the 90% deliverable.

Draft Title I Design, Volume 1, ICDF Complex Landfill and Evaporation Pond O&M Plan—Annotated Outline, DOE/ID-10852

ITEM	SECTION/ FIGURE/ APPENDIX	PAGE	COMMENT	RESOLUTION
9	Site Layout, Section 3.1.3	Page 3-1	We suggest that the text address setbacks from landfill edges and interior (runoff control) drainage ditches. Also, methods and procedures should be included that cover dust control, traffic patterns, and equipment maintenance.	Setback requirements have been provided in the 30% deliverable, however, they will be specifically called out in the 90% deliverable. Procedures for dust control traffic patterns and equipment maintenance will be included in the 90% submittal.
10	Maintenance, Section 3.2	Page 3-1	Please add a subsection describing liner repair procedures.	Procedures for liner repair procedures will be included in the technical specifications for construction purposes. Liner repair procedures will also be included in the 90% submittal.
11	Evaporation Pond(s) Operation, Section 5.2	Page 5-1	Please include a discussion of the sediment/solids filtering process and the further management of the collected solids, including the dewatering process.	The 90% deliverable will include discussion of sediment/solids filtering and management. The SSSTF will also include filtering capability for decon water. The EP WAC will address specific TSS limitations.
12	Evaporation Pond(s) Maintenance, Section 5.3	Page 5-1	Please include sediment cleanout steps, and the equipment that will be available (shelf) for anticipated equipment failures.	Procedures for sediment control will be included in the 90% submittal. The SSSTF will also address filtering requirements for decon and purge water. Recommended spare equipment will also be provided in 90% deliverable.

Draft Title I Design, Volume 1, Technical Specifications, Other Specs Required to Complete Draft I Design, DOE ID SPC-1476

ITEM	SECTION/ FIGURE/ APPENDIX	PAGE	COMMENT	RESOLUTION
13	Section 02200, Site Preparation		Please include dust control descriptions.	Discussion of dust control will be provided in the 90% specifications.
14	Section Number 02319, Subgrade Preparation	Page 2, Part 3.2 A and B	Please explain how verification of compaction to a minimum of 95% relative compaction as determined in accordance with ASTM D698 will be accomplished. Will a nuclear density meter be used in this verification?	The verification of compaction will be described in the 90% CQA Plan. Allowable procedures for determining compaction will also be presented.
15	Section Number 02319, Subgrade Preparation,	Page 2, Part 3.3	Please add verbiage that requires the loaded dump truck or similar heavy-wheeled equipment to exert pressure on the soil that is equal to or greater than the anticipated pressure exerted by the overburden of the completed landfill.	The requirement to proof roll the subgrade is redundant in light of the 95% relative compaction (standard proctor) requirements specified in Part 3.2, but will be retained in the 90% deliverable. 95% relative compaction will provide more than adequate pressure on the subgrade as that exerted by the overburden of the completed landfill.
16	Section 02371, Geotextiles, Part 3.3 (A)	Page 4	We recommend that expected geotextile installation to be equivalent to methods employed by operators in Idaho. Geotextiles should be seamed. When overlapping (six (6) inches) is employed for edge of roll seams, the geotextiles should be sewn securely on a continuous basis using a color contrasting polymeric thread. When overlapping (twelve (12) inches) is employed for end of roll seams, the geotextiles should be thermally bonded on a continuous basis. Please provide additional procedures for the seaming of geotextiles for both flat sloped areas (less than 5H to 1V) and steep sloped areas (greater than 5H to 1V).	Design intent is to have no sewn seams as neither the separation or cushion geotextile is being relied on for tensile strength in the lining system design. Therefore there is no need to transfer tensile stresses (via sewn seams) at roll ends or edges. It should be noted that the specs will be written such that end of roll seams)or joints will not be allowed on sideslopes. Also procedures will be in place during construction to ensure that the overlapped joints are not displaced during placement of overlying materials.

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17	Section 02371, Geotextiles Supplement, Table 1		Footnote (c) states that "*Out-of-range values will be reviewed and can be approved by the BBWI Construction Manager on a case-by-case basis.*" Please identify the criteria that will be used to determine how many and to what degree out-of-range values may be deemed acceptable.	Footnote will be deleted. "Out-of range" values will not be allowed, but standard CQA practice will provide procedure if out of range values are encountered.
18	Section Number 02373, Composite Drainage Net (Geocomposite)	Page 1, Part 1.2 A, Sentence 2 and 3, and Page 2, Part 2.1A.2, sentence 1	Please specify if the geotextile bonded to the geonet will be woven or non-woven.	Geotextile will be non-woven, needle-punched, polypropylene as is currently specified in the GEOTEXTILES Specification, Article 2.1, Paragraph B.
19	Section Number 02373, Composite Drainage Net (Geocomposite)	Page 4, Part 3.2K	Please add the following sentence: "*Tearing of the geotextile away from the geonet in these locations shall be minimized to the extent necessary to perform required work.*"	Comment will be incorporated in the 90% specifications.
20	Section Number 02373, Composite Drainage Net (Geocomposite)	Page 4, Part 3.2L	Please provide documentation to show that the geocomposite will not be damaged by ultraviolet (UV) radiation for the specified period allowed before the geocomposite layer is covered (8 weeks). This period of time seems excessive.	This requirement in the specs will be deleted as it will be superceded by more stringent requirements for covering of the GCL and geomembrane (typically less than 10 days). These changes will be incorporated into the 90% design based on recommendation of geocomposite manufacturer.
21	Section Number 02661, Geomembranes	Page 3, Part 3.1B	This paragraph requires that the Construction Subcontractor <u>submit</u> a detailed plan describing geomembrane installation prior to placement. Please add verbiage that requires that this plan be <u>approved</u> prior to geomembrane installation. Also, please specify the party responsible for this approval.	Approval of this plan will be performed by third-party CQA certifying officer. Requirement for this approval will be included in the 90% CQA Plan and will require approval prior to use.

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22	Section Number 02661, Geomembranes	Page 4, Part 3.4B.1	This paragraph states that the geomembrane shall be installed per the Installer's layout plan, as approved or modified. Please add verbiage that specifies the party responsible for this modification approval.	The approval of this plan and any modification will be by the third-party certifying officer. Requirements for this approval will be included in the 90% CQA Plan.
23	Section 02661, Geomembranes	Subsectio n 3.5	Please provide the requirement for a field seaming technician to demonstrate proficiency with the welder.	Minimum qualifications for seaming technicians will be included in CQA Plan, submitted with the 90% deliverable.
24	Section Number 02661, Geomembranes	Page 9, Part 3.6A.2	Per this paragraph, peal and shear tests are to be performed every 4 hours during the operation of a particular seaming tool. In the event that the second trial seam from a particular seaming tool (that has been in operation for the previous four hours) fails the peel or shear test, please explain what testing shall be conducted to verify the integrity of the liner seams fabricated by the seaming tool in question since the last acceptable seam test. It should be noted that the nondestructive seam continuity testing described in Part 3.6B.1 does not provide assurance of seam strength.	The 90 Percent CQA Plan will describe seam testing required in the event that the 4 hour periodic seaming tool test is failed by a seaming tool that has been in operation for the previous 4 hours. The purpose of this testing is to verify the integrity of the liner seams fabricated by the seaming tool in question since the last acceptable seam test. Air wand testing was suggested by IDEQ as a possible method, pending further review of the adequacy of this procedure, to verify the integrity of the seam length in question. It should be noted that trial seams are also referred to as "start-up" seams and are intended to serve as a prequalifying experience for personnel equipment and procedures for making seams on the identical geomembrane material under the same climatic conditions as the actual field production seams will be made. Once the trial seams pass the welder can move directly to production seams, which will be tested thoroughly as described in Parts 3.6.B and 3.6.C of this specification.

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25	Section Number 02666, Soil Bentonite Liner	Page 6, Part 3.4C.2	Please specify that the minimum and maximum values referred to in this paragraph apply to the dry density. Also, please explain why the corner values of the acceptable trapezoidal field can be modified. Also, please explain how the data in this table was determined, and the design basis that it is based on.	a. Comment noted and will be incorporated into the 90% design. b. Values in the table were developed based on laboratory testing for the soil amendment study (see EDF-272). The most critical criteria for the soil-bentonite liner is to achieve the performance spec of hydraulic conductivity of $< 10^{-7}$ cm/sec. Based on the results of the test pad, adjustments to the required moisture and density may be justified. c. Data in this table was based on the results of the lab tests performed for the soil-amendment study. Details are presented in EDF-272 (Draft Soil Amendment Study), which is part of the 90% design package.
26	Section Number 02666, Soil Bentonite Liner	Page 7, Part 3.4E	Please specify that the material removed per the last sentence of this paragraph shall be replaced and re-compacted in a manner consistent with the placement of the original liner material that was removed.	Comment noted and will be incorporated into the 90% design.
27	Section Number 02666, Soil Bentonite Liner	Page 7, Part 3.4G	Please specify that the existing liner lift material shall be tested to ensure that it meets the required moisture content limits per Part 3.4F of this specification prior to resumption of liner placement.	Comment noted and will be incorporated into the 90% design.

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28	Section 3.1, Table 3-2	Pages 5-8	The table is comprehensive, but the recently released draft RI/FS for WAG 10, OU 10-04, includes as a potential option: shipping explosives-contaminated soils to this facility. These soils are contaminated with RDX and TNT which are not included in this list. Please verify with WAG 10 that there is an intent to consider shipping these soils to the facility and modify the list as needed.	At the time of the 30% submittal, no WAG 10 sites having RDX and TNT as contaminants were identified for disposal to the ICDF. Since it is possible that these contaminants may be disposed, the ICDF landfill waste acceptance criteria will address additional contaminants.
29	Section 3.1	Page 11, First Bullet	It is stated that the concentration of inorganic contaminants for a release site having no data was assumed to be the same as the inorganic contamination from a "similar site". Please provide additional detail regarding the approach utilized for this "comparison" process.	Additional detail and clarification of the approach will be provided in the revised 30% deliverable.

Draft Title I Design, Volume 2, Hydrologic Modeling of Final Cover EDF-ER-279

ITEM	SECTION/ FIGURE/ APPENDIX	PAGE	COMMENT	RESOLUTION
30	Section 1	Page 1-1, Paragraph 3, Third Sentence	The integrity of landfill caps or covers will degrade continuously (e.g., through wind erosion, biointrusion, etc.) despite the existence of an extensive management program conducted to maintain the cover of a closed landfill throughout time. Please offer a discussion on this probable effect.	EDF 281, Liner and Final Cover Long-term Performance Evaluation and Final Cover Life Cycle Expectation will address the details of this question in the 90% deliverable. The performance evaluation will demonstrate the cap will function for the required 1,000 years. Potential climate changes for the 1,000 years will also be evaluated based on similar analysis from other DOE landfills throughout the U.S.
31	Section 2.1, Modeling Approach		A rationale for the use of the SoilCover model, a proprietary code, to conduct the evaluation of the final cover, rather than public domain codes that have been used at the INEEL, should be presented. The information about the code provided in the report is minimal and includes no validation information. Some aspects of the code, such as the equations used to characterize the soil water characteristic curve and other soil hydraulic properties, are different from those historically used at the INEEL and are not used as extensively in the area of the modeling of water flow. Their acceptability should therefore be questioned. Conversely, an extensive body of work involving the modeling of infiltration and the effectiveness of various engineered barriers both at the INEEL and Hanford has been produced using the UNSAT-H code, thereby providing a significant body of validation information. A comparison run should be presented with a more familiar, and public domain code such as UNSATH which has been used at the site for previous modeling efforts.	SoilCover™ returned infiltration values similar to those modeled for the Engineered Barrier test plot located at INEEL by Magnuson using UNSAT-H (1993) using the same precipitation data that were used in the SoilCover analysis. SoilCover predictions corresponds well with the actual performance of the Engineered Barrier test plot reported by Indrek Porro (Porro, 2000). These references will be provided to the regulatory agencies.

ITEM	SECTION/ FIGURE/ APPENDIX	PAGE	COMMENT	RESOLUTION
32	Section 2.2.3, Soil Data		a) The soils data used in the modeling were selected from a proprietary soils database with the goal of being representative of the soil types proposed to be used during construction of the ICDF cover. The use of a proprietary database makes evaluation of the representative of the input data selected difficult. Please show, for the soil types proposed to be used (such as silt loam, fine sand, etc.), the ranges and distribution of the soil physical and hydraulic properties found in the soils database used.	Attached Excel file (Response_soil Data.xls) contains the soils data received from SoilVision. This file includes the soil water characteristic curves from which the modeled soils were selected and tables containing other soil parameters. The soils selected were average of the data set available and can be considered typical for the soil types. Further definition will be provided in the 90% deliverable regarding why the specific data sets were chosen.
			b) Also, please show where the parameter values used in the modeling study fit within these distributions, and how the values chosen are determined to be representative of conditions at the INTEC.	Soils selected are typical of the soil type and should be either available within the boundaries of the INEEL, or manufacturable from soils located at INTEC.
			c) A related issue is the impact of variability in soil physical and hydraulic properties (within soil types and between soil types in the various layers) on the amount of flux observed through the cover. Please address the uncertainty in flux estimates that results from variability in these properties both within and between layers. It is recommended that this uncertainty be addressed quantitatively through a sensitivity analysis involving additional simulations.	A complete sensitivity analysis of a capillary break cover similar to the one modeled in this report was conducted by Magnuson (1993). A review of these sensitivities will be added to the EDF.
33	Section 2.2.2, Weather Data		An attempt was made in this report to select input weather data that represented climatological extremes as measured at the INEEL (greater than 90th percentile precipitation, etc.). This data, given the limited period of record (50 years or so) would still appear to be	The approach presented in the 30% design is more conservative than the precipitation data used in the OU 3-13 RI/BRA and the HLW EIS. In addition to the current modeling, the potential for barrier defects will be analyzed in the 60% design. These runs will include burrowing animals, reduction in layer thicknesses, and

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			inadequate to evaluate the potential climatic conditions which could be encountered over the lifetime of this facility, that is about 10,000 years. Please discuss how this aspect of the uncertainty in the analysis is addressed at similar facilities, such as Yucca Mountain and WIPP, and how they will be addressed for this facility.	reduced drainage slopes. Based on the defects analysis, the greater of the infiltration rates between the defects and the conservative standard run will be used in the fate and transport analysis.
34	Section 3	Page 3-1, Paragraph 1, First Sentence	There are many possible water movements with complicating factors in a landfill cover. In the proposed hydrologic model evaluating the long-term infiltration rate through the landfill cover; if the ground is frozen, water in the frozen area will be unavailable for movement for a certain period of time. The storage of water in a frozen area should be taken into account in an analysis, and it is unclear whether the SoilCover model adequately addresses this concern. Please discuss this issue in the text.	The temperature equation used by SoilCover is given below. $$C_h \frac{\delta T}{\delta t} = \frac{\delta}{\delta y}\left(\lambda \frac{\delta T}{\delta y}\right) - L_v\left(\frac{P+P_v}{P}\right)\frac{\delta}{\delta y}\left(D_v \frac{\delta P_v}{\delta y}\right)$$ Where: T = Temperature (°C) C_h = Volumetric specific heat of the soil as a function of water content (J/m^3/°C) D_v = Diffusion coefficient of water vapor through the soil (kg*m/kn*s) λ = Thermal conductivity of the soil (W/m/°C) L_v = Latent heat of vaporization of water (J/kg) P = Total gas pressure in the air phase (kPa) P_v = Partial pressure due to water vapor (kPa) t = time (s) y = position (m) The adequacy of this equation to model soil freezing was verified by Newman (1995) by simulating results for 72 hour freezing tests that were carried out using silica flour. The results of the tests using a sample with an initial gravimetric water content of 10% are shown in the attached figure (freeze.bmp). This issue will be clarified in the text of the EDF.

ITEM	SECTION/ FIGURE/ APPENDIX	PAGE	COMMENT	RESOLUTION
35	Section 4.0, Summary and Conclusions		Several significant, cited references were not available at the time of this review. These include the results of engineered barrier research being conducted at the INEEL, that are cited (Magnuson, 1993, Porro, 2000 and Porro and Keck, 1998), the SoilCover user's manual, and two papers by Fredlund et. al (1994). Please provide these references.	References will be provided to the regulatory agencies.
36	Section 4	Page 4-1, Paragraph 2, Last Sentence	It is assumed that these materials will be engineered to meet the specifications. Please discuss hydraulic tolerances that will be established for geotechnical materials to ensure acceptable infiltration rates. Additionally, please explain the provisions (including pre-construction timeframes) to "plug-in" actual material specifications into the model.	Borrow source investigations are anticipated to be performed prior to closure of the ICDF Landfill cell 15 years in the future. Identifying borrow sources now would not guarantee their viability or availability 15 years from now. Future borrow sources for the various types of earthen materials anticipated in the cover system will be determined based on the physical soil descriptions and properties used in the Hydrologic Modeling. The volume of material needed for a particular cover layer will also be a consideration for borrow selection. Once candidate borrow sites are identified, a geotechnical investigation will be performed to determine the properties and variability that could impact infiltration. Once complete, the Hydrologic Model will be used to determine the hydraulic tolerance based on the actual data and the need for engineering (i.e., blending or mixing) of soils to achieve the desired properties. This work will be performed once soil cover borrow geotechnical investigations are complete prior to beginning construction of the cover. Any changes or modifications to the Agency-approved RD/RA Work Plan will require Agency review and approval.

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37	Section 4	Page 4-2, Paragraph 1, Second Sentence	Please state the conditions modeled for the following 2 years (after the breakthrough event) that allowed the capillary barrier to recover.	During the engineered barriers experiment at INEEL, test plots were intentionally wetted to the point of breakthrough. Following the time period (fall of 1997) of intentional wetting, the barriers were allowed to recover while receiving only natural precipitation. For the two spring seasons (spring 1998 and 1999) following the intentional wetting, both the thick soil covers and the capillary break covers showed infiltration as a result of the spring runoff. During the spring runoff season of 2000, only the thick soil cover showed infiltration (Porro, 2000).

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38	Section 2	Page 2-1, Paragraph 2, Fourth Sentence	In this report, it was defined that significantly leachable constituents have K_d values less than or equal to 20 for the waste soil. Please discuss the rationale for selecting the value of 20 in more detail.	Comment will be incorporated into the 30% design. Kd of 20 corresponds to 1% of leachate.
39	Section 2	Page 2-1, Paragraph 3	Please offer rationale and justification for the selection of ">1%" as the basis for organic species elimination and "0.01%" for the inorganic species.	Rationale is to select those contaminants that have a significant contribution to the chemistry of the leachate. Since there is a minimal amount of organic constituents in the design inventory, 1% was selected as the criteria to identify the major chemical species contributing to the leachate chemistry. Similar screening was used for the inorganic species with the intent to identify the species that contribute 99.99% of the constituents in the leachate. Text will be clarified in the revised 30% deliverable.
40	Appendix A, Tables A-1 and A-2	Pages A-1 through A-5	a) Because TNT and TDX are missing from EDF-ER-264, it is not clear if these potential contaminants will be screened from the process. Please comment #28 regarding the potential shipment of contaminated soils from WAG 10 and revise this table as needed. b) Many of the citations noted are reference #1, which is a personal communication from Marty Doornbos. Please provide a more thorough reference or citation for tracking the steps of this process.	a) The acceptance of TNT and RDX will be addressed in the ICDF landfill waste acceptance criteria. b) The appropriate references will be included.
41	Appendix A, Table A-4	Pages A-7 through A-9	Because TNT and TDX are missing from EDF-ER-264, it is not clear if these potential contaminants will be screened from the process. Please comment #28 regarding the potential shipment of contaminated soils from WAG 10 and revise this table as needed.	The acceptance of TNT and RDX will be addressed in the ICDF landfill waste acceptance criteria.

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42	Section 2.1	Page 2-1	This section describes the use of the National Council on Radiation Protection and Measurements (NCRP) ground water ingestion screening factor. The more appropriate references to use are EPA Region 9 screening criteria and/or the tables created by Jeff Fromm (IDEQ, January 1996). Screening in the past was based on the EPA risk assessment methodology and the typical screening value was less than the upper threshold value of 1E-4 for carcinogenic risk and often was less than 1E-6 for cumulative risk scenarios. Non-carcinogenic risks are evaluated using the hazard index and would be less than 1 for screening purposes. Please revise based on conventional EPA approaches for assessing risk.	This screening was not performed for conventional risk assessment purposes such as a Baseline Risk Assessment. The screening was conducted to identify the major contributors to groundwater impact. Using a conventional approach, such as the one recommended, would not necessarily identify groundwater impact constituents as the screening factors are based on multiple exposure pathways. The groundwater screening factors are based on groundwater consumption, and not contaminated soil in an engineered landfill prior to subsurface migration. The 60% and 90% deliverables will use the attached flow chart for developing maximum concentrations for the WAC (see attached flowchart).
43	Section 2.2	Page 2-3	a) The basis for using 1,000 kg as a cut off for retaining contaminants for further fate and transport assessment is not clear. Please provide the rational behind this cut off value. b) The risk posed by non-carcinogens has been evaluated by using the hazard index as described by EPA; screening tables developed by EPA Region 9 have been the accepted standard used by the three agencies for the INEEL. Please revise this section per EPA standard methods. An appropriate screening level would be less than 1 using the EPA approach.	a) The 1,000 Kg identifies the contaminants that are not a carcinogen, but have significant quantities (i.e., calcium). This screening step allows the important contaminants to be identified and evaluated. If the >1,000 Kg contaminants are toxic, they are then further assessed. b) See response to comment #42.

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44	Section 3.1.2	Page 3-3	The depth of the aquifer from the water table to the specified depth where simulated concentrations occur is not presented. For instance, is the MULTIMED output for a zone starting 50 m below the water table and extending for 5 m further into the aquifer or is the zone from the water table to a depth of 5 m below the water table? The dilution factor created by a large mixing zone should be avoided but it is not clear from the text just what the mixing zone depth is with respect to the water table. Please provide a clearer description of this modeling feature.	The mixing depth input for MULTIMED was specified at 5 m starting at the water table surface. Figure 3-1 illustrates this by showing a 5 m screen interval starting at the water table in the hypothetical monitoring well. This is the same mixing zone interval that Martian (2000) used. A clearer description will be included in the text.
45	Section 3.1.2	Page 3-5	A variable, 8_b is described as a "first-order lumped biodegradation rate in the saturated zone" but it is not clear if this variable is used in any of these simulations. Please state that this variable is not active for simulations included in this document.	The variable λ_b, the first-order lumped biodegradation rate in the saturated zone, was not utilized during the saturated zone MULTIMED simulations. This will be revised in the text.
46	Section 3.2.1, Figure 3-1	Page 3-6	It is unclear whether this diagram represents the minimum or average interbed thickness. Based upon previous Tri-agency discussions, the minimum thickness was to be utilized in all modeling efforts. Please clarify and/or adjust this figure to reflect the minimum.	*The current model utilized the Martian (2000) conceptual model. According to Martian (2000):* *"The WAG-3 RI/BRA model grouped the 15-20 interbeds into four effective interbeds, which with the alluvium comprised 23% of the subsurface. The ICDF model used an <u>average</u> interbed representation from the southwest corner of the RI/BRA model because the proposed location of the ICDF is immediately southwest of the INTEC and no wells are currently located at the site."* *However, Martian (2000) did perform a sensitivity analysis on the minimum interbed thickness which resulted in decreased vadose zone travel times and increased peak aquifer concentrations.* *If the current model were modified to reflect the minimum interbed thickness, the results would be similar as Martian's sensitivity analysis*

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47	Section 3.2.2, Table 3-3	Page 3-9	This table presents input values for key variables describing longitudinal, transverse, and vertical dispersivity. Please state the approximate numerical dispersion present in the use of the model for these simulations. Also, please state whether the values for dispersion are inclusive of the numerical dispersion.	One can really only truly show the amounts of numerical dispersion by comparing numerical to analytical results. However, we don't have an analytical solution for this problem. However, HYDRUS-1D automatically minimizes numerical dispersion. The model also utilized the standard Galerkin finite element method to solve the problem (no upward weighting, method of characteristics, or anything that would result into increased numerical dispersion). Also the overall maximum Peclet number is very small, only about 0.4, and thus there should be no numerical dispersion in this case. It can be shown (on problems for which an analytical solution exists) that problems with such small Peclet numbers do not suffer from almost any numerical dispersion. The text will be modified to clarify these points.
48	Section 4.1	Page 4-1	Please verify and state in this section the positions and lengths of the mixing zones used in current modeling and the Martian 2000 results to verify their similarity. This issue was discussed in a previous comment.	Please see response to Comment 44.
49	Section 4.1	Page 4-2	This page states that "Only I-129 exceeded the 10^{-6} risk level for the 0.001 m/yr infiltration rate." The MCL for I-129 must be considered and should be stated in this context. Please include the MCL for I-129. Please clarify whether this risk level is consistent with EPA's approach or whether this value is based on the NCRP. The EPA approach should be used.	The MCL for I-129 is 1 pCi/L as reported in Note C in Table 4.1. The text will be revised as requested to compare I-129 results to both the MCL and risk level. The EPA risk approach will be utilized during the results discussion. The calculated risk is based on EPA slope factor methodology. The 10^{-6} number for I-129 is less than the MCL.
50	Section 5	Page 5-1	This section states "*Results from the current modeling study were compared to results of previous modeling efforts (Martian 2000) and analytical calculations. Both the current model and the previous model (Martian 2000) reported that I-129 and Np-237 presented greater than a 10^{-6} risk to the aquifer for the 0.01 m/yr simulation*	Note that the Hydrologic Cover modeling and Fate and Transport modeling were run independently to develop models which could be combined to evaluate a range of potential site conditions and sensitivities. Ranges of infiltration rates were chosen for the Fate and Transport modeling to cover anticipated ranges of cover infiltration, and to correspond with existing modeling efforts. This

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			(based on the base ICDF inventory presented to Martian 2000). However, the previous model reported that Tc-99 was below the risk level for this infiltration rate, while the current model predicted that the RBL would be exceeded. Both models predicted that I-129 would be the only contaminant exceeding RBLs at the 0.001 m/yr infiltration rate. The previous model efforts did not use an infiltration rate comparable to the current model infiltration rate of 0.0001 m/yr." The 0.0001 m/yr infiltration rate noted in the previous paragraph is not consistent with the results of the modeling using SoilCover™ that predicts an infiltration rate of 0.37 mm/year for the "Base Case Simulation" and 0.049 mm/yr for the "Extreme Climatic Scenario". The infiltration rates predicted using SoilCover™ are 4 to 5 times the lowest rate used to predict contaminant transport to and in the aquifer. Table 4-1 (Page 4-1) summarizes the results of the current modeling effort and Martian (2000). It should be noted that the variability in modeling results in different answers even though the same conceptual model is used. The I-129 peak aquifer concentration is 48% higher in the current model and the difference in travel time results in an increase of 96% to reach peak concentration with an infiltration rate of 0.001 m/yr. The variability in predictions are expected when different models are used for the same problem and it demonstrates the uncertainties associated with modeling. It also should be kept in mind that this 10,000 year extrapolation is based on a10 year (wetter than average) weather data base from near the site.	range was selected prior to the results of the cover modeling. The Fate and Transport modeling does not state that any cover can achieve this 0.0001 m/yr infiltration rate. The Soil Cover predicted infiltration rates fall in between the 0.001 m/yr and 0.0001 m/yr modeling rates. Both of these simulations predict I-129 will be greater than the risk-level and that Np-237 and Tc-99 will be below risk-levels. Therefore, the use of a infiltration rate that is 4 to 5 times the Soil Cover rates should not effect the general conclusions of the Fate and Transport Modeling. It was agreed during the June 18-20 Agency meetings that variations in the precipitation rate would be performed as part of a sensitivity analysis for the modeling. The DEQ suggested using 3X of the average precipitation as an upper bound. USDOE will evaluate the approach used at other DOE facilities and recommend a precipitation rate for modeling. This sensitivity analysis will be included with the 60% submittal of the Fate and Transport modeling.

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			A serious concern exists with the modeling scenario described above wherein an infiltration rate of 0.0001 m/yr is used in the current effort. This infiltration rate was not used by Martian (2000). This low infiltration rate requires acceptance of some key assumptions given the predicted peak arrival time of the I-129 in the aquifer in excess of 50,000 years. It requires acceptance of the ability of the cap to reduce infiltration to 0.0001 m/yr, a continuous functioning cap over the ICDF at 0.0001 m/yr for over 50,000 years, and a precipitation rate that is not expected to increase significantly over the next 50,000 years. It is not unreasonable to assume that precipitation could increase significantly in the intervening years and if the cap has degraded, allow a much higher infiltration rate through the ICDF. The variability and inconsistencies between the modeling efforts and the predicted effects on the Snake River Plain Aquifer require further discussion between the Agencies during the comment resolution period.	
51	Appendix A, Table A-7	Page A-17	Per previous comments, please revise this table to reflect the EPA risk assessment process and appropriate MCLs.	See response to comments #42 and #43.
52	Appendix A, Table A-10	Page A-25	Per previous comments, please revise this table to reflect the EPA risk assessment process and appropriate MCLs.	See response to comments #42 and #43.