

Colorado Department of Health

Review and Comment

Phase I RFI/RI Workplan, Draft Version, 3/91
Woman Creek Priority Drainage (OU 5)

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General Comments:

1) The Division is concerned that Table 5 within the Statement of Work (SOW) portion of the IAG is perceived by DOE as satisfying the sampling requirements necessary to define the nature and extent of contamination at the various IHSS's in OU 5. Quoting from the SOW, page 25, Section VI.B, the text reads "The FSP shall incorporate the sampling objectives of Table 5, and shall anticipate investigations beyond the work specified in the Attachment." The Division feels, therefore, that Table 5 provides initial guidance but leaves the meat of the FSP to be flexibly tailored to incorporate the latest data and characterization needs of each IHSS. Many of the following comments, particularly to Section 7, have been conveyed because the Division feels the proposed FSP cannot define the nature and extent of contamination, let alone it's fate and transport.

2) At several points in this document, the text refers to the possibility that additional phases of investigation may be necessary to completely characterize some of the IHSS's in this OU. This may be true, but only if, during the implementation of this workplan, a complex situation or development is discovered that goes beyond the original workplan scope. However, it is the responsibility of DOE to ensure that this workplan characterizes, to the greatest extent possible, each and every IHSS within this OU (see previous comment). Currently, not only is no additional phase of RFI/RI work scheduled in the IAG, but the Final ROD for OU 5 is to be submitted on March 8, 1996. Failure to meet this deadline for reasons other than stated above will be the liability of DOE alone.

3) The logistics and advantages of a "phased" approach could still be incorporated into this workplan by formulating a plan that would be implemented in stages (similar to what has been proposed in the Phase II RFI/RI Workplan for the bedrock in OU 2). However, in order for the regulatory agencies to approve a staged plan, all

stages of the investigation, and alternatives, must be outlined in the workplan.

Specific Comments:

Executive Summary: The first paragraph of this section states that the FSP presents the planned investigation that will evaluate the presence or absence of contamination at the IHSS's. The IHSS's have semi-arbitrary boundaries based upon sometimes incomplete or inaccurate historical data. Please revise the text to clarify that the RFI/RI investigation will not be confined to predetermined and possibly incorrect IHSS boundaries.

The fourth paragraph on page ES-2 describes the requirements of the FSP. Characterization of the IHSS's will not be complete nor adequate if the vadose zone is ignored. The importance of the vadose zone is discussed on page 2-8 of "Volume I, Interim Final RCRA Facility Investigation Guidance, Development of an RFI Work Plan and General Considerations for RCRA Facility Investigations," May 1989 (EPA 530/SW-89-031). The FSP should be amended to provide for vadose zone monitoring and sampling.

Section 1.0: The second paragraph of this section mentions that this investigation is part of a comprehensive, phased program of site characterization. Please clarify the term "phased" in light of the previous general comment on additional phases of RFI/RI work in OU 5.

Figure 1-4: This figure needs to be corrected to show the lenticularity of the Arapahoe Formation sands 1, 2, 3, 4, and 5.

Section 1.3.6.2: This section describes the Verdos, Slocum, and Louviers alluvial deposits as "terrace" alluvium. However, Figure 1-6 has labelled the Louviers, but not the Slocum or Verdos, as a terrace deposit. Please correct either the text or the figure.

Figure 1-5: The legend for this map includes a "Terrace Alluvium." Please make this consistent with the text and define which terrace it actually is.

Section 1.3.6.3: Please clarify the term "stream channel-shaped structures" that appears in the first paragraph of this section. The first paragraph also says that the upper Arapahoe Formation was deposited by a complex system of meandering streams. It is the Division's understanding that the upper portions of the Arapahoe Formation are not present at RFP having been eroded away prior to the deposition of the Rocky Flats Alluvium. In fact, the Division is still under the impression that it is a distinct possibility that all of the Arapahoe Formation was removed by erosion underneath RFP. Please clarify these apparent contradictions.

Also in the first paragraph, the text states that the lower Arapahoe sandstones were deposited by braided stream systems. This represents a significant departure from geologic discussions presented by DOE in previous documents. The Division concludes that the geologic conceptual model that was presented in the Phase II RFI/RI Workplan (Bedrock) for OU 2 has been changed. The text and model presented in the above referenced document clearly stated that the Arapahoe Formation (undifferentiated) was deposited in a meandering stream environment. Please clarify which model is now the currently accepted version and where this has been documented. If you cite EG&G 1990b (which is cited at this point in the Walnut Creek Ph I Workplan), the Division will want to see this report and will withhold approval of this plan until we have had a chance to review the site-wide geologic characterization.

Table 2-1: Please rename the last column of this table "Screened Interval" or an equivalent thereof.

Please plot the wells listed on this table on Figure 2-1.

Please generate a "Bedrock Surface Structure Map" for inclusion in this section of the document that uses the data presented on this table as well as any other pertinent well information from adjacent OU's.

Section 2.1: Please add text to this section that explains some of the construction details of the South Interceptor Ditch (SID). Please include the SID's depth, depth to bedrock under the SID, and whether or not the SID is lined in some fashion.

Figure 2-1: Please clarify which RAAMP stations are existing and which ones are planned as part of this RFI/RI.

Section 2.2.2: The last paragraph of this section has several items that need clarification. First, please clarify how it is known that the surface outfall pipe is not connected to a drainage pipe, as is stated in the fifth sentence of the paragraph. Second, please show exactly where the seepage emerged from the surface of the Original Landfill on a map. Next, please add text explaining where the SID was enlarged, how much it was enlarged, and why it was enlarged. In addition, please explain how water could be heard flowing within the eastern pipe but no outfall was observed emanating from the pipe. Additional explanation is also needed for an understanding of the "berm structure" that was added to the SID and the "containment embankment" that was constructed near the eastern-most outfall pipe. Where were these items constructed and are they still in place?

Section 2.2.4: The State and EPA have repeatedly been assured that a report on the results of the germanium gamma survey would be made available to us and incorporated into this RFI/RI Workplan. The Division finally received the report on June 17, 1991; only two

weeks before comments on this workplan were due and after most of the review had been completed. No effort was made to incorporate anything about the survey into this workplan. Please place in this section of the text a discussion and summary of the results from the germanium survey and add maps showing the survey grid locations and relative radioactivity picked up at each grid point in the Old Landfill. Please be sure that the areas and levels of contamination are clearly delineated. If data from the report is presented, clearly explain what the data means and which radionuclides show background and which show contamination.

Table 2-2: In light of previous text that states that disposal of multiple solvents occurred in the Old Landfill, please add the maximum concentrations of other suspected contaminants that may be present in the Old Landfill to this table, particularly the organic contaminants.

Section 2.3.1: Please add text to the second paragraph explaining possible reasons for the irregular hummocky surface at the Concrete Wash Pad.

Figure 2-5: Please make an effort to match the groundwater sampling points with the well bores on this figure. Also, along the southern border of the figure, there are several locations where the potentiometric contour lines of a particular elevation cross over the equal topographic elevation contour lines implying that the potentiometric surface is above the topographic surface. Please correct this problem on the figure.

Figure 2-6: After a review of several historical air photos, the Division is concerned that the ash pit IHSS's have been spotted incorrectly on this figure. For example, on Figure 2-6, IHSS 133.3 is spotted straddling and slightly to the north of a small east-west dirt road. According to the air photos, this pit was well to the south of the road and appears to be actually two trenches side by side. Also, there appears to be two older trenches located about mid-way between IHSS's 133.3 and 133.4. Several other areas show up on the photos as being disturbed and possibly containing ash. Please review the locations of the ash pit IHSS's as well as their extent so that the efforts of this workplan will not be expended in the wrong places.

Table 2-3: Please clarify whether the chemicals listed on this table are the only ones for which water from well 5686 is tested or if these represent only the elevated values.

Section 2.6: A discussion of conceptual models must include a description of the sources, release mechanisms, transport mechanisms, and affected populations. In addition, these discussions must include all known and anticipated pathways and describe both current and future use scenarios. The pathways should summarize what is known about rates of migration and the

receptor analysis should include types, sensitivities, time of exposure, concentrations, and numbers for the receptor populations. The descriptions of the conceptual models in the text do not present any of these completely. Please revise the conceptual models presented in this section so that they completely address these items.

Section 2.6.1: The air pathway must include off-site receptors as part of the exposed populations. Also, the first sentence of the surface water pathway needs clarification in light of the radioactive contamination that has already been found on the surface of the Old Landfill.

Sections 2.6.1, 2.6.2, 2.6.4, and 2.6.5: Please add a soil pathway to each of these sections under the future use scenario.

Section 3.0 - General Comment: The Division would like to suggest that Tables 3-1, 3-2, and 3-3 be made into a comprehensive site-wide list of potential chemical specific ARAR's. From such a list, the Division could ascertain the thought process that DOE and EG&G are using to screen the various standards and chemicals. We could also have a consistent list against which to compare future analytical suites and future sites.

Section 3.1: Colorado Water Quality Control Commission ground water standards for the Rocky Flats area became effective on April 30, 1991. The ground water standards are now potential ARARs and no longer TBCs. Please revise the text to reflect this change.

Section 3.2: This section, page 3-2, indicates that ARARs will be derived from federal and state regulations including "Colorado Department of Health (CDH) surface water standards for Woman Creek and Walnut Creek (5 CCR 1002-8, Section 3.8.29, Final Rule Effective March 30, 1990) - applied to surface water." The Division finds that the domestic water supply standards listed in TABLES I, II and III of "The Basic Standards and Methodologies for Surface Water 3.1.0 (5 CCR 1002-8)" must also be listed as potential ARARs. Section 3.8.29 ~~of the Basic Standards~~ specifically provides that "water supply standards are met at the point of discharge" and the action "will provide an extra layer of protection of downstream water supplies from the two reservoirs, each of which (Great Western and Standley) are already classified as domestic water supplies". For example, a standard for Fecal Coliform has been established for Domestic Water Supply where no such standard applies to warm water biota. Please amend Table 3-3 to include the Domestic Water Supply standards.

The last paragraph of Section 3.8.29 states that "For the organic pollutants contained in Tables A and B, the practical quantitation limits (PQL's) listed as "detection levels" are to be used as the "compliance thresholds." Therefore, even though the detection limits are more stringent than the standards, the detection limits

are the compliance thresholds. The Division finds, in Table 3-3, that the "Standard(s)" rather than the "Detection Levels" were listed as potential ARAR's. Please amend the appropriately affected constituents on Tables A and B.

Section 3.8.29 also states that "For any organic pollutants listed in Table A or B, the Commission intends that these standards be applied in accordance with PQLs determined appropriate by the Colorado Department of Health laboratory". Please determine the applicable PQLs.

Section 3.11.5.C.4 (5 CCR 1002-8), which is the "Basic Standards for Ground Water," states "Whenever the current detection level (PQL) for a pollutant is higher (less stringent) than a standard listed in Subsection 2 or 3 above [radioactive, Table A, and Table B constituents], the detection level shall be used as the performance standard in regulating specific activities. The detection levels (PQL's) identified in Tables A and B shall apply, unless and until they are modified as the result of a subsequent rulemaking hearing." Therefore, in contrast to the surface water regulations, the Division has identified several constituents in Table 3-1 (Groundwater Quality Standards) of the text that currently have the standard, instead of the less stringent detection limit, listed as the potential ARAR. This can be changed in the ARAR tables.

Table 3-1: The section of the CCR that became effective April 30, 1991 (Section 3.12.0; 5 CCR 1002-8) includes a "Table 6" that outlines the new radionuclide standards that will be applied to all ground water that is hydraulically connected to Walnut and Woman Creeks. Please replace the radionuclide standards that currently appear in Table 3-1 of the text with these new standards:

Gross Alpha	7 pCi/l
Gross Beta	5 pCi/l
Plutonium	.05 pCi/l
Americium	.05 pCi/l
Tritium	500 pCi/l
Uranium	5 pCi/l

Please add the following standards that are missing from the "Tables A and B - Statewide" column:

Benzene	5 ug/l
Chloroform	100 ug/l
2,4,6 Trichlorophenol	10 ug/l
Benzidine	50 ug/l
Dieldrin	10 ug/l
Pentachlorophenol	200 ug/l

Please replace the following standards with the detection limits in

the "Tables A and B - Statewide" column:

bis (2-Chloroethyl) ether	10 ug/l
Chlorodane	10 ug/l
DDT	10 ug/l
Dieldrin	10 ug/l
Dioxin	3 ug/l
Heptachlor	100 ng/l
Heptachlor Epoxide	100 ng/l
Hexachlorobenzene	10 ug/l
Nitrobenzene	10 ug/l
PCB's	500 ng/l

In addition, the values for Atrazine and Dichlorobenzidine presented in Table 3-1 could not be located in Tables A or B. Please remove them from the table.

A standard of 10 ug/l appears in Table 1 (Human Health), but was omitted from Table 3-1. Please add this value to Table 3-1. In addition, standards are promulgated in Table 1 for Lindane, 2,4-D, and 2,4,5-TP Silvex. Please include these chemicals and their standards in Table 3-1.

A standard of 0.2 ug/l for Endrin, 100 ug/l for Methoxychlor, and 5 ug/l for Toxaphene appear in RCRA subpart F regulations, but were omitted from Table 3-1. Please add these values to Table 3-1. In addition, standards are promulgated in RCRA Subpart F for Lindane, 2,4-D, and 2,4,5-TP Silvex. Please include these chemicals and their standards in Table 3-1.

Standards for Boron and Lithium appear in Table 3 (Agricultural Standards) but have been omitted from Table 3-1. Please include these chemicals and their standards in Table 3-1.

Standards for Diphenylhydrazine 1,2 and Ethylene Dibromide are promulgated in Table A (Carcinogenic Organic Chemicals) but have been omitted from Table 3-1. Please include these chemicals and their standards in Table 3-1.

Standards for Aldicarb, Carbofuran, 2,4-D, Ethylene Glycol, Pentachlorobenzene, 1,2,4,5 Tetrachlorobenzene, and 2,4,5-TP are promulgated in Table B (Non-carcinogenic Organic Chemicals) but have been omitted from Table 3-1. Please include these chemicals and their standards in Table 3-1.

Table 3-3: The following chemicals are identified in Tables A, B and C of "The Basic Standards and Methodologies for Surface Water 3.1.0 (5 CCR 1002-8)" but are absent from Table 3-3. If these were intentionally omitted, please provide the rationale. If inadvertently omitted, please include these chemicals and their regulatory standards in Table 3-3.

TABLE A:

1,2 Diphenylhydrazine

TABLE B:

Aldicarb
Carbofuran
Dichlorophenoxyacetic Acid (2,4-D)
Pentachlorobenzene
Tetrachlorobenzene 1;2,4,5
Trichlorophenoxypropionic Acid (2,4,5-TP)

TABLE C:

Benzene	Dinitrotoluene
BHC Hexachlorocyclohexane	Diphenylhydrazine 1,2
Chloro-4 Methyl-3 Phenol	Guthion
Chlorophenol 2	Malathion
Chlorpyrifos	Mirex
Demeton	Parathion
Dichloropropene	Phenol
Dimethylphenol 2,4	

The following additional errors and omissions have been found in the standards of Table 3-3. Typically the errors represent unit conversion errors. Some of the errors listed may be moot due to the application of the Section 3.8.29 requirements that "detection levels" be listed as possible ARARs. (See the comments to Section 3.2, second paragraph, above.)

Table 3-3 contains thirteen (13) columns in which numerical standards are identified beginning with the column for Tables A & B. To simplify these comments, errors and omissions will be identified in respect to a column number, page number and compound. For example, under the Statewide Standards, Table C, Acute column, page 3-24, Chlordane should be 2.4 ug/l not ng/l. The "Acute" column is the number 2 column. The 13th column is for Walnut Creek.

The standards for Fecal Coliform, Ammonia, Sulfur, Boron and Chlorine (not just Chloride) should be listed in columns 10 and 11, page 3-19, as derived from the Stream Segment Table.

A Chloroform standard, Tot THM, is listed in columns 1 and 7, page 3-21. This standard is not listed in either Table A or Table B. Please state where this standard is documented. Please explain the acronym THM in the footnotes to Table 3-3.

Trichlorophenol 2,4,6, 1.2 ug/l, was omitted from column 11 of page 3-21.

The standard for tetrachloroethane, 0.8 ug/l, was omitted from column 11 of page 3-22. Note that 1,1,2,2 Tetrachlorethane, 170 ng/l, was included in column 11 of page 3-21.

The standard for Acrylonitrile, page 3-23, column 11, should be 58 ng/l not 58 mg/l.

To repeat, the standard for Chlordane, column 2, page 3-24 should be 2.4 ug/l not ng/l.

The standard for Hexachlorobutadiene, column 11, page 3-25, should be 0.45 ug/l not 0.45 ng/l.

The standard for Hexachloroethane, column 2, page 3-25 should be 980 ug/l (or .98 mg/l) not 0.98 ug/l.

The standards for Toxaphene, columns 3 and 4, page 3-26, belong in columns 2 and 3 respectively.

Section 4.1.4: The last sentence of this section states "It is important to recognize that additional phases of investigation and risk assessment may be required at some IHSS's." The Division feels it is important for DOE to recognize that further phases are not scheduled in the IAG, but a submittal date of March 8, 1996 is scheduled for the Final ROD for OU 5. Failure to meet this delivery date will likely result in stipulated penalties being assessed against DOE.

Figure 4-1: This figure would be more effective and strategic if placed in Section 2.6.1.

Table 4-1: The only point at which pond water and sediment sampling appears on this table is the second bullet. Within this bullet, only analytical levels I and II are going to be used. The Division does not feel this is adequate and that analytical level IV should be used.

In addition, in light of preceding comments on conceptual models, the first bullet (Identify plumes, if present, at the Landfill) under "Characterize and Delineate Contaminant Sources" should be clarified. Contaminant plumes do not constitute a "source" in this context. The source is the improperly disposed solvent somewhere in the landfill that has created (sourced) the plume. While the Division recognizes the difficulty, unless and until the point sources within the landfill are found and removed, remediation is all but impossible.

Regarding the third bullet on the second page of the table, it is hard to picture how surface radiological surveys will characterize the horizontal and vertical extent of radionuclide contamination. Please explain how this will be accomplished. Also, unless the

types of radiological surveys are listed, the nature of the radionuclides cannot be addressed. This is particularly true when only analytical levels I and II are proposed. Please add text to explain how this will be resolved.

Section 4.2.4: Please remove this entire section as it is incorrect. Please see general comment 1 regarding the IAG and Table 5, and general comment 2 regarding the need for additional phases of investigation in OU 5.

Section 5.3: Regarding the last sentence of the first paragraph of this section, please see previous comments regarding additional phases of investigation at IHSS's in this OU.

Section 5.5.1: The first paragraph of this section says that geologic data will be used to detail the stratigraphy of the alluvium and colluvium at each site. The Division thinks that this is an admirable goal, but we are unclear about how this can be done at sites like the C-series ponds where only two wells are being drilled and no other subsurface work is planned. Even at the Old Landfill, the amount of drilling for soil borings and well installation cannot support a stratigraphic characterization that can detail the heterogeneities of the fill materials.

Section 5.7: With regard to the subsection entitled "Detailed Analysis of Remedial Alternatives," please see previous comments regarding additional phases of investigation.

Section 7 - General Comments: 1) At the scoping meeting for OU 5 held on January 10, 1991 at RFP, the Division was under the impression that some sort of a hand-held radiation survey would be done at the old landfill. It was mentioned that perhaps a FIDLER survey would not be the best choice, but that something should be used to more intimately measure radioactivity on the surface of the landfill. Please explain to the Division why this has been dropped from the plan and what, if anything, will take its place.

2) There are several obvious applications for non-intrusive geophysical techniques both in the Old Landfill and the Ash Pits. These techniques were also discussed at the scoping meetings. However, they have not been included in the workplan. Please explain to the Division why these technically effective and cost effective techniques have not been considered for the characterization of the OU 5 IHSS's.

Section 7.1.3: Item 4 listed under the "Phase I Sampling Program Modifications" does not agree with the Division's latest understanding of the relevant Standard Operation Procedure (SOP). Please revise this bullet to be consistent with the SOP.

Table 7-1: Please explain how the plume verification soil borings will be placed. Explain the placement of the transect (i.e. does

"downslope" mean down the hillside or down gradient?) and how far apart the soil borings will be placed. Is the strategy to place the third and last soil boring far enough from the second to get non-detect results?

It is mentioned that wells will be installed in soil borings where the highest concentrations of plume contaminants are found as well as at three locations down gradient from the landfill all to be completed in the alluvium. Please explain why no bedrock monitoring wells or even bedrock soil borings are being contemplated.

Table 7-2: The second item on this table is a radiation survey that is planned for the "entire site." Please define "entire." During the OU 5 walk-through, it was mentioned that this rad survey would link up with the rad survey from the Old Landfill. Please verify that this is, in fact, the plan and add text clarifying this issue. It would also be helpful to identify the type of radiation survey that is planned for the ash pits.

Section 7.2.1 - General Comment: This is, perhaps, the weakest section of this workplan. An over-dependence on Table 5 from the IAG has crippled complete three-dimensional characterization of the Old Landfill. The Division provides the following discussion as a summary of our concerns:

Soil gas surveys are best used as screening tools. Because of the number of complicating factors at most sites (soil heterogeneities, complex stratigraphy, fluctuating water table, etc.), the results of a soil gas survey are used in a very qualitative manner. The reason this is the case, and the reason for the main concern at the Old Landfill, is that a negative result cannot be interpreted as definitively "clean." However, the Division is concerned because this workplan indicates that if no plumes are found with the soil gas at the Old Landfill, then no plumes are present and the site has been completely characterized. The Division will never agree with that.

A further weakness in the proposed soil gas survey is the 100 foot grid spacing. Using the data provided in Section 2.2 and the conceptual cross-section 4-1, the average thickness of fill in the Old Landfill is slightly less than 8.5 feet. Considering the suspected nature of the mobile contaminants at the landfill (solvents, paint, paint thinners, pesticides, and cleaners), and the fact that these were probably disposed of in containers that are now point sources, there is a very high probability that a 100 foot soil gas grid spacing would miss the volatilizing contaminants from a source only 8.5 feet below the ground. An exception to this would occur if enough contamination was present to reach and spread on or in the ground water (a situation DOE must consider unlikely given the repeated phrase "if plumes are present").

The soil gas survey is supposed to guide the drilling of three soil borings for each "plume" identified by soil gas. Three points of data cannot possibly define the extent of a three-dimensional plume. The sources for these plumes are almost certainly located in the unsaturated (vadose) zone. Therefore, the plume may consist of residual free product zones, aqueous phase contamination in residual water, adsorbed contamination onto soil particles, and soil gas, all in the unsaturated zone. Or the plume could be aqueous phase (dissolved) contamination, DNAPL or LNAPL free product, or adsorbed contamination, all at or below the ground water level. Each of these possibilities has different remedial design contingencies and three borings (and one well) will not give enough data to characterize the plume, let alone aid future remediation decisions.

So far, all discussions in these comments and in the text have addressed mobile sources of contamination. A more important issue from the public's perspective is the immobile contamination, the most important constituent of which is radionuclide contamination. Other than the rads detectable on the surface, this workplan makes no effort to characterize and does not even mention radionuclide contamination in the subsurface. This must be addressed.

Section 7.2.1 - Specific Comments: Please provide a map of the soil gas survey locations.

One verification soil core collected for every 50 soil gas samples is inadequate for proper confirmation. In a "landfilled" substrate with extensive heterogeneities, soil gas can have a very confusing and ambiguous surface signature. This can lead to a long, expensive subsurface chase of the actual contamination unless the soil gas is more accurately confirmed. In addition, as the program is designed, only 2 confirmation soil cores will be collected. The Division does not consider this to be a very representative "random" sample. Therefore, the Division proposes that one random verification soil boring be collected for every 15 soil gas samples. This will allow 4 or 5 soil cores to be collected which will give a more representative cross-section of the soil gas variability.

Please verify that the new surface water collection point agreed upon during the OU 5 walk-through in the SID below the Old Landfill has been added to this workplan.

The Division feels that the addition of at least one monitoring well is necessary for this workplan. The Division suggests that this additional well be located midway between wells 5786 and 7086 but north of the SID and still down gradient from the landfill.

The last paragraph of this section says that the three monitoring wells downgradient of the Landfill will be sampled quarterly for one year. It is the Division's opinion that these wells should be

sampled quarterly until further notice. If no plumes are delineated by the soil gas survey and the soil borings, that does not mean that 1) there are definitely no plumes present or 2) that plumes may not originate in the future and begin to leave the site.

At several of the scoping meetings held for OU 5, the regulatory agencies repeatedly asked DOE to take some short term action to stabilize the soils in and around the areas delineated by the gamma radiation survey as having some amount of surface contamination. Not only has nothing been done to date on this matter, but nothing is proposed in this workplan. Please remedy this situation. This is an issue that must be addressed before approval will be granted to this workplan.

Figure 7-1: At the scoping meeting held on February 28, 1991, all parties agreed to install two new RAAMP stations (A and B) in the Woman Creek Drainage. Station A was to be located near the west access road in a background area. Station B was to be installed slightly southeast of the Old Landfill. These stations need to be included in the text and on the map. Please include appropriate text explaining the RAAMP stations and locate them on all appropriate figures including this figure, Figure 7-1.

Figure 7-2, parts 1 & 2: Please revise the title of this figure to include surface water sampling. Also, the map key needs to be revised in a similar manner.

On the second half of this figure (part 2), there is an error on the map scale. The description says 1" = 600' but the one inch bar scale only goes to 300'.

Section 7.2.2: As mentioned in a previous comment, the Division is concerned that the extent of ash burial is not well understood at this point. Therefore, we would like to emphasize the importance of the aerial photo review.

The radiation survey for the ash pits should tie all of the pits together on a 50' grid spacing and tie to the landfill rad survey on 100' grid spacing. Please provide a map of the planned sample grid. Also, describe the type of radiation survey that will be used.

There appears to be a contradiction in the second paragraph under Step 3. Figure 7-3 shows soil boring transects crossing both the long and short axes of each ash pit. However, the text does not mention the short axis transects. Please clarify if these short transects are still being planned, if they are going to be located at the mid-point of the trench, and how additional borings around hot-spots will be handled.

Please explain why no other types of geophysical surveys are being contemplated for the ash pits. Since the exact location and number

of pits is still in question, why not run an areal ground penetrating radar or other survey that would show the location and extent of all ground disturbances in the area.

The Division feels that the ground water monitoring wells installed down gradient from the ash pits should be sampled quarterly for at least two years. This will give the wells a longer stabilization period as well as allow for a more statistically significant sample set to be collected.

In the last paragraph of this section, please add the ground water analyte list that is delineated in Table 5 of the IAG.

Figure 7-3: The Division suggests moving the easternmost monitoring well for the ash pits to a location on the 6020' elevation contour line immediately to the south of the "S" in the words "South Interceptor Ditch."

Section 7.3.2: As commented on previously, the Division believes that reference to Phase I implies that a Phase II investigation will follow. This is not currently the case.

Table 7-5: The title of this table should not include "Phase I" for the same reason stated above.

This table needs to be consistent with the ARAR tables of Section 3. Therefore, if DOE is proposing ARAR's for certain chemicals, those chemicals obviously need to be on the analyte list. This means that Table 7-5 needs to include the following: Cesium 134, Cesium 137, Titanium, Tungsten, Radium 226, Radium 228, Fluoride, Nitrate + Nitrite as N, and Nitrite as N. Also, if chemicals show up on the analyte list, they should be there for a purpose and therefore need an ARAR analysis. Please add the following to the ARAR tables of Section 3: Lithium, 2,6-Dinitrotoluene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene, and the entire pesticide/PCB's target compound list.

Table 7-6: Please see the attached photo copies of this table for the Division's suggested additions.

Section 8.0: Additional risk assessment comments from Ms. Normie Morin, PhD, of the Rocky Flats Program Unit that are applicable to this workplan will be included in the comments to the RFI/RI Workplan for OU 6 (Walnut Creek). Please review these comments and incorporate them into both the revised version of this Workplan for OU 5 and the revised workplan for OU 6.

Section 8.0: For consistency and clarity, the Division suggests that the tasks of the Baseline Health Risk Assessment be identified numerically, similar to section 9.0.

Section 8.1: In the first sentence of the second paragraph of this section, please remove the phrase ". . confirm the presence or absence of contamination at OU 5 and . .". The Baseline Risk Assessment does not confirm contamination. It assesses the risk of contamination that has already been confirmed.

Section 8.2: On page 8-3, an additional bullet needs to be added to the list already presented that incorporates the following concept: The IAG, in Section VII.D.1.a states that when selecting indicator chemicals, "DOE shall also consider the additive or synergistic effect of risks, to the extent possible."

Section 8.3: Several items need to be added to either Section 8.3.1 or Section 8.3.2 based on Section VII.D.1.b of the IAG and should be included as part of any exposure assessment discussion. The items are: an estimate of the current number of people at the exposure point, a characterization of the sensitive and exposed populations, a consideration of present and future use, and a consideration of current and maximum reasonable use scenarios.

Section 8.3.2: The second sentence in the first paragraph of this section seems to contradict text on the previous page. One of the bullets on the previous page states that one of the criteria for choosing chemicals of concern is their concentrations relative to background levels. However, this sentence in Section 8.3.2 says that only sites where the chemicals of concern are significantly above background levels will be considered sources of chemical release. Please clarify this apparent contradiction.

Section 9.0: General Comments to the Revised EE (June, 1991):

1) The process of selecting a sampling plan for any site needs to take all questions and data needs into consideration. In selecting the aquatic sampling locations, physical, chemical (radionuclides included), and biological data needs should be considered concurrently.

2) The sampling stations selected and the data to be generated for OU 5 need to be evaluated further. Basic transport considerations would dictate some reconsideration or modifications as to where chemical and flow rate measurements can be located for better tracking of surface and sub-surface loads. The development of conceptual and more definitive models of the system as well as the identification of causal relationships depend on the ability to relate the data over time and space. Therefore, as was indicated in the June 25, 1991 meeting on Environmental Evaluations at RFP, Jeb Love of the Rocky Flats Program Unit will present the State's preferred approach, applying it to the Woman Creek basin at the next EE meeting. He will also give examples of interpretations and potential uses of the information in the decision making process.

3) A fundamental issue when examining data is the uncertainties in

the data and the interpretations along the way. The methodology for quantifying the uncertainties in the EE should be included in the Workplan. This effort should be integrated with the selection of the models to be used. The methodology for quantifying the uncertainties is not presently in the final version of this EE.

4) An Approach for Selecting and Using Indicator Species to Monitor Ecological Effects Resulting From Chemical Changes in Soil and Water, by Reagan, D.P. and C.L. is cited as the framework for examining the food web and other exercises that will be carried out during the implementation of this workplan. Please provide the State (specifically Jeb Love) a copy of this reference for our information and review.

5) The workplan should state DOE will be building a reference collection of benthic organisms as part of the EE work.

6) Part of an EE is a Use Attainment Assessment (UAA) of the aquatic uses in Woman Creek. The methodology for this assessment should be spelled out in an SOP (see CDH comments to the Ecology SOP's). The intent is to determine the limitations in the use and the factors contributing to the limitations. The factors can be tonics, flow, nutrients, etc.

7) Any aquatic station where biology and chemistry data are collected need to include flow measurements. Without flow measurement, evaluation of habitat suitability and loading to the system can not be determined. This is particularly critical for habitat and fate and transport assessments.

Section 9.1.2.1: Screening data against the EPA National Ambient Criteria Documents should be done for organics, inorganics, radionuclides, as well as heavy metals. Please revise this discussion in the text to indicate that this important task will be done for all of these classes of compounds.

Section 9.1.2.2: The screening process for selection of COC's should be done before the conclusions on page 13 and 60 (radionuclide examination of tissue) are drawn. Conclusions should be drawn from the data when presented. Until the review of existing data is complete, with attendant agreement on the conclusions and gaps in the information, conclusions are inappropriate.

Plutonium and Americium have such a significance to this site, obtaining body burden data in selected organisms is paramount.

Figure 9-6: In the revised EE submitted to the Division on June 7, 1991, please make sure that Figure 9-6 includes all of the sampling locations for aquatic biota that are included in OU 1, OU 2, and OU 5. The Division suggests that the sampling locations be color coded to match their association with the different OU's. A

comparison of the equivalent figures in the revised EE's for OU 1 and OU 2 showed that some of the sampling locations are duplicated and some of the locations overlap areas that are being covered in another OU. By presenting all of the sampling locations in different colors on all of the maps, confusion by reviewers and readers can be substantially reduced. In addition, it would give the reviewers more confidence that a comprehensive, but not duplicative, sampling plan is proposed for the entire Woman Creek drainage which includes portions of OU 1, OU 2, and OU 5.