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June 9 1994

Mr Richard J Schassburger
U S Department of Energy
Rocky Flats Office Bldg 116
P O Box 928
Golden Colorado 80402 0928

**RE Development and Screening of Remedial Action Alternatives 881 Hillside Area (OU 1)
Technical Memorandum #11 Draft Final April 1994**

Dear Mr Schassburger

The Colorado Department of Health Hazardous Materials and Waste Management Division (the Division) has reviewed the above referenced document submitted by DOE and prime operating contractor EG&G. The Division's comments are attached. The Division is currently evaluating the potential action specific ARARs presented in this technical memorandum. Comments on ARARs will be sent under separate cover.

The Division is generally pleased with the scope of alternatives developed for remediation of contaminated groundwater at IHSS 119 1. However the Division is concerned that the current scope of the development and screening of alternatives may not be adequate to fully support a corrective action decision for contaminated subsurface soils at IHSS 119 1 or the other ten IHSSs at OU 1.

The Division does not consider the entire operable unit to be the only appropriate level for evaluation of remedial action alternatives since it is not realistic to assume the entire operable unit will require remediation. The Division will make a corrective action decision for each of the eleven IHSSs comprising OU 1 and any release from these IHSSs. Because of this information on the effectiveness, implementability and cost of remedial alternatives considered from an OU wide level will be of limited usefulness in making corrective action decisions for individual IHSSs unless the OU wide alternatives are capable of addressing each type of release from any IHSS in OU 1. Therefore the Division believes that remedial action alternatives must be developed and screened considering each IHSS and contamination source area within OU 1 in combination with OU wide and site wide considerations.

If you have any questions regarding these matters please call Jeff Swanson of my staff at 692 3416.

Sincerely

Gary W Baughman Chief
Facilities Section
Hazardous Waste Control Program

cc Martin Hestmark EPA
Scott Grace DOE
Tim Reeves DOE
Zeke Hauk EG&G
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ADMIN RECORD

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GENERAL COMMENTS

Information Necessary to Support a Corrective Action Decision The CMS/FS must contain sufficient information to fully support a corrective action decision by the Division for each IHSS and source area in OU 1. The Division is concerned that the current scope of the development of remedial alternatives may not meet our needs in making these decisions.

The development of remedial action alternatives must address all contamination from the IHSS and source level. Corrective measures must be selected for each IHSS and source area that are fully protective and meet the appropriate RAOs. The number and range of alternatives evaluated for each IHSS may be limited by the scope and complexity of contamination and availability of treatment options. Alternatives selected for each IHSS should then be combined to form a range of remedial action alternatives for the operable unit. When appropriate, IHSSs with similar effective alternatives can be combined to achieve economies of scale. Alternatives developed at the operable unit level should provide the range of alternatives prescribed in EPA guidance.

The combining of technology options into alternatives for each IHSS and the integration of IHSS alternatives into remedial action alternative for the OU should not be distinct steps. Rather, the final range of alternatives developed for the operable unit should be the product of an iterative process of integrating and optimizing technology options, considering screening criteria at the IHSS, operable unit, and facility scale simultaneously. It is not necessary to evaluate or screen every potential combination of alternatives at the IHSS or OU level.

The no action alternative should be presumed in areas where no contamination was determined to be present. If an IHSS with contamination is determined to be currently protective and meets all applicable RAOs, a presumptive remedy of no action may be proposed. IHSSs where no action is proposed on the basis of protectiveness must include sufficient justification to support the finding. The Division considers an excess cancer risk of 1×10^{-6} and hazard index of unity to be protective of human health. Remedies must also be protective of ecological receptors and environmental resources such as groundwater.

Effectiveness of Remedial Action to protect Ecological Environment The general assumption that remedial actions that are protective of human health will adequately protect ecological receptors at OU 1 is not always appropriate. Not all remedial actions that meet human health RAOs will necessarily be protective of the environment. For example, institutional actions such as site access and use restrictions will not reduce access and exposure of small animals. The effectiveness of an alternative to protect ecological receptors must be considered in the development and screening of alternatives.

Evaluation of Existing IM/IRA The existing IM/IRA is not fully or accurately characterized or evaluated in this TM. Evaluation of the IM/IRA is based on dated material and does not accurately characterize the effectiveness of either the french drain collection well or treatment facility.

The conclusion that the french drain would not provide an effectiveness in protecting human health or the environment much greater than institutional controls is not accurate. The concentration of contaminants in the influent water can not be directly correlated to the effectiveness of the french drain. Footing drain water, which DOE has determined is not contaminated, contributes a significant percentage of the influent water, effectively diluting the contaminants collected.

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by the french drain and collection well Discontinuation of the collection and treatment of footing drain water was recently proposed by DOE The dilution of influent water was not considered in concluding that the french drain would not increase protectiveness over institutional actions Also the potential for contamination to migrate into the french drain in the future was not considered

The building 891 treatment facility has recently been shown to be ineffective in treating carbon tetrachloride and would subsequently require modification to treat extracted groundwater This fact should be considered in evaluation of this treatment option

Transfer of Remediation of Surficial Radionuclide Contamination with OU 2 The Division recognizes the utility of conducting remediation of surficial soil radioactive contamination in OU 1 under OU 2 However this transfer has yet to be formally proposed by DOE or approved by EPA and CDH This proposal must include detailed documentation of the contaminants and media for which remediation are to be transferred to OU 2 In addition responsibility for the remediation of radionuclide hot spots and non radionuclide (PAH and PCB) contaminated surficial soils must be clearly documented

Remediation of OU 1 Surface Water and Sediments The Division requests a formal proposal from DOE documenting DOE s intent to investigate and remediate surface water and sediments at OU 1 under OU 5 This proposal must include details on the areas media and contamination to be transferred

Remediation of Radionuclide Hot Spots at OU 1 The Division is unclear how the DOE plans to conduct radionuclide hot spot remediation at OU 1 The remediation of radionuclide contamination at OU 1 must be fully considered in the development and selection of remedial alternatives This technical memorandum states on page 2 2

It is assumed that implementation of any groundwater GRA presented below would include removal and temporary storage of this [radionuclide hot spot] contaminated soils This statement is not accurate several groundwater GRA are listed that would not necessarily require the removal of radionuclide hot spots The Division requires that DOE include alternatives for surface soil hot spot remediation in the OU 1 remedy selection process

Management Options for Treatment Residuals The development and screening of alternatives must include options for the management and ultimate disposition of any treatment or removal residuals Many of the alternatives developed in this technical memorandum could generate significant volumes of treatment residuals that may need to be managed as hazardous radioactive or mixed waste

Interface of CMS/FS with Sitewide Treatability Studies and IM/IRAs Several of the process options and alternatives discussed in this technical memorandum have been or are currently being evaluated by DOE at Rocky Flats through the sitewide treatability study program and IM/IRAs Based on the review of this document it appears to the Division that technical staff conducting studies directly applicable to remediation of OU 1 have not been utilized in the development and screening of alternatives Many of the statements and assumptions presented in this technical memorandum regarding these projects and related alternatives are outdated or inaccurate It is critical to the development of remedial action alternatives that DOE utilize all available resources The Division recommends that DOE confer with personnel conducting these studies and update this technical memorandum to include the most current and accurate information available

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SPECIFIC COMMENTS

Section 2 1 General Response Actions

Media of Concern for General Response Actions The Division does not agree with the statement on page 2 2 that groundwater is the only medium of concern at OU 1 that requires general response actions. In order to fully address the remedial action objectives for OU 1 medium specific general response actions must be fully developed for all media impacted by OU 1 contamination. This should include all contamination sources contaminated surface and subsurface soils and contaminated groundwater.

Complete Documentation of General Response Actions Several general response actions are currently assumed by this technical memorandum to be part of groundwater remediation alternatives but are not formally documented as such. For example the text states (page 2 2 paragraph 3) that groundwater GRA assume the removal of radionuclide hot spots though removal of the hot spots is not covered elsewhere in the TM. It is critical to the development and screening of remedial action alternatives that the complete list of all GRA for each alternative be considered. The description of each GRA must include a complete description of all actions singularly or in combination that would be taken to satisfy the remedial action objectives for an area.

Listing and Description of General Response Actions The list and brief description of groundwater GRA on page 2 3 is incomplete and confusing. The list of GRA is the foundation on which remedial alternatives are developed and evaluated. It is imperative that GRA and associated process options be clearly presented and described in this TM. Each general response action must clearly specify the action(s) media and as appropriate contamination to be targeted. For example in situ treatment of chlorinated solvents in subsurface soils and in situ removal of chlorinated solvents from subsurface soils with ex situ treatment are different general response actions for subsurface soils.

Additionally it is not clear to the Division why removal ex situ treatment of chlorinated solvents and some options for in situ treatment of chlorinated solvents are considered separate GRA for groundwater. It is the Division's understanding that under most of the process options being considered under these GRA groundwater is to be removed and treated at the building 891 treatment facility.

Volume and Area Estimates This section should be expanded to include area and volume estimates for all media for each IHSS or source area at OU 1 to which general response actions might be applied. This must include estimates of the probable location of solvents at IHSS 119 1 including potential NAPL residual in soils and/or NAPL pools at the top of bedrock. To aid in the presentation and understanding of areas and volumes being considered for remediation maps of each area should be included in the CMS/FS report.

Section 2 2 Identification and Screening of Technologies and Process Options

Initial Screening of Technologies and Process Options The Division offers the following comments regarding the screening of technology options and process options presented in Figure 2 3.

- The no action alternative should not include references to institutional controls as part of long term monitoring. Institutional controls are an action. No

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further action would include no institutional controls

- The Division recommends that the Institutional Control GRA be renamed to Institutional Actions Monitoring should be included as a remedial technology option under institutional actions
- The Removal GRA should be a combination of actions including removal and treatment and/or release of groundwater The potential for residual or free phase DNAPL at IHSS 119 1 must be considered in the screening of process options for that source area In addition removals must consider storage issues
- Several process options listed under physical remedial technology for in situ treatment of chlorinated solvents are not treatment technology and are more appropriately classified as in situ removal of solvents from groundwater
- The fact that bioremediation is currently undergoing treatability studies at RFP should be included in screening comments The objectives of the bioremediation treatability study and the studies usefulness in evaluating bioremediation alternatives at OU 1 must be addressed

Section 2 3 Evaluation and Selection of Representative Process Options

Selection of Process Options for Alternative Development The Division requests that additional information be included in this section documenting how and why specific process options were selected for inclusion and others excluded in the selection of process options for developing alternatives

Page 2 20, First Paragraph The statement that bioremediation and soil flushing were not viewed favorably in the selection of process options is confusing and inconsistent with other sections of this technical memorandum While soil flushing is not identified as a process option in either Figure 2 3 or 2 4 it is selected in alternative 3 groundwater removal by pumping Alternative 3 is the injection of water up gradient and extraction down gradient of the source areas Use of a similar treatment train for bioremediation would not increase the potential for further migration of contaminants into bedrock and would have the additional benefit of treating contamination in the bedrock Soil flushing should be included in the development and screening of process options Soil flushing as well as bioremediation and other in situ treatment alternatives should be considered in the selection of representative process options equally without undue bias

Minimize potential for Contaminant Migration The elimination of soil flushing and bioremediation from consideration because of concerns about forcing contamination further into the bedrock system appears to be inconsistent with alternative 3 in section 3 3 4 This alternative is called groundwater removal by pumping and includes the injection of clean water up gradient to flush contaminated groundwater from the soils The evaluation of the effectiveness of this alternative does not include concerns about contaminant migration

Section 3 4 Existing IM/IRA Treatment System

Effectiveness of Existing IM/IRA Treatment Facility The selection of process options for alternative development was biased towards selection of the existing IM/IRA treatment system for treating extracted groundwater This section incorrectly states that the existing IM/IRA treatment system is proven to be effective in treating the contaminants present at OU 1 This document must state

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that the existing system may require modification to provide adequate treatment of extracted groundwater Discussions regarding the existing IM/IRA treatment system should be reviewed and most recent accurate information regarding the IM/IRA treatment system included in this technical memorandum and the CMS/FS report

Section 3 Development and Screening of Alternatives

Scope of Development and Screening of Alternatives This section should be expanded to include the development and screening of remedial action alternatives for each IHSS at OU 1 The process by which technology options were assembled into alternatives is not clear from this document The Division requests that additional information be added to this report documenting how process options developed in section 2 were combined into the alternatives presented in section 3 The Division recommends that the range of alternatives developed for each site include some intermediate actions

Section 3 1 Development of Remedial Action Alternatives

Development of Alternatives on a Medium Specific Basis The Division does not believe that it is appropriate to develop remedial action alternatives on a medium specific basis EPA guidance recommends assembling alternatives by combining GRA and process options selected for each medium to form alternatives for the site In the case of IHSS 119 1 alternatives must be developed that include the remediation of subsurface soils as well as groundwater The Division recommends that the alternatives assembled in this section be reviewed to ensure that they address all media of concern at each site within OU 1

Description of process options represented by alternatives The Division requests that additional information on those process options that were not screened out and that are represented by those described in the alternatives be included in the description of each alternative in this section

Section 3 2 Screening of Alternatives

Refinement of Alternatives prior to Screening The process options selected for the remediation of groundwater should be combined with process options selected for the remediation of other media at each site during the development of alternatives At this point in the process such aspects as interaction among media and sitewide protectiveness requirements have usually not been fully developed Therefore refinements to each alternative should be considered to ensure the alternative is protective of human health and the environment The process of refining alternatives is described in section 4 3 1 of EPA s Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA The Division recommends that information of the refinement of remedial alternatives be included in the screening of alternatives presented in this technical memorandum

Section 3 3 Groundwater Remedial Action Alternatives

Page 3 10, last sentence The Division disagrees with DOE s the conclusion that the french drain would not provide much greater protectiveness than institutional controls with no active treatment applied The operation of the french drain during the time frame specified in this section included the collection and treatment of building 881 footing drain water as well as french drain and collection well sump

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water causes substantial dilution of french drain contaminants The fact that any contamination was detected in the influent water is strong evidence to suggest that the french drain and collection well are effective in reducing the toxicity mobility and volume of contaminants

Page 3 11, first sentence The statement Particularly in light of the fact that the effluent storage tanks used for the treatment system may be contributing to the contaminant concentrations in the treated water is neither accurate or relevant and should be deleted

Page 3 11, Implementability Evaluation While existing fencing and site check points provide physical barriers to access to the Rocky Flats Plant the Division does not believe that the current physical barriers would be effective in limiting worker access to OU 1

Alternative 4b and 5b The Division does not believe that the implementation of RF/Ohmic Heating with SVE or Stream Injection/Mechanical Mixing over the entire operable unit is practical or appropriate for consideration as alternatives

Section 3 4 Summary of Alternative Screening

Removal of Alternatives 2 and 3 The removal of both alternatives 2 and 3 from further consideration are based on inaccurate information regarding the performance of the french drain and collection well The removal of these alternatives from further consideration must be reassessed using current and accurate information Solid rationale must be clearly stated before these alternatives are removed

Section 4 0 Potential Action Specific ARARs and TBCs

Potential ARARs The Division is currently reviewing the potential ARARs and TBCs proposed in this section Comments of the selection of potential ARARs will be sent under separate cover The early identification of ARARs is critical to the efficient development and selection of appropriate remedial action for OU 1 The Division is disappointed that DOE has failed to specify representatives for the ARARs working group proposed by CDH in January 1994