44484

CORRES CONTROL
INCOMING LTR NO
03673 RF 94

DUE
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ACTION

DIST	LTR	ENC
BURLINGAME, A H		
BUSBY, W S		
CARNIVAL, G J		
CORDOVA, R C		
DAVIS, J G		
FERRERA, D W		
FRAY, R E		
GEIS, J A		
GLOVER, W S		
GOLAN, P M		
HANNI, B J		
HEALY, T J		
HEDAHL, T G		
HILBIG, J G		
HUTCHINS, N M		
JACKSON, D T		
KELL, R E		
KUESTER, A W		
MARX, G E		
McDONALD, M M		
McKENNA, F G		
MORGAN, R V		
PIZZUTO, V M		
POTTER, G.L.		
SANDLIN, N B		
SATTERWHITE, D.G.		
SCHUBERT, A L		
SCHWARTZ, J K		
SETLOCK, G H		
STIGER, S G.		
TOBIN, P M.		
VOORHEIS, G.M.		
WILSON, J.M.		
ERLICH, O	X	
[redacted]		
HOLLOWELL L	X	

RCVD W/O ENC

CORRES CONTROL	X	X
ADMN RECORD/080	X	X
PATS/T130G		

Reviewed for Addressee
Corres Control RFP

9-26-94 (DATE) MDH (BY)

Ref Ltr #

DOE ORDER # 5400.1

RF-46522 (Rev 6/94)

Department of Energy

ROCKY FLATS FIELD OFFICE
P O BOX 928
GOLDEN COLORADO 80402 0928

SEP 26 1 53 PM '94

EG&G
ROCKY FLATS PLANT
CORRESPONDENCE CONTROL SEP 2 1 1994

94-DOE-09880

Mr Martin Hestmark
U S Environmental Protection Agency, Region VIII
ATTN Rocky Flats Project Manager, 8HWM-FF
999 18th Street, Suite 500
Denver, Colorado 80202-2405

Mr. Joe Schieffelin
Hazardous Waste Facilities Unit Leader
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

Gentlemen·

Enclosed, you will find comment resolution forms on the Solvent Extraction Treatability Study draft work plan from both the Colorado Department of Public Health and Environment (CDPHE) and the U.S Environmental Protection Agency, Region VIII (EPA) Included also is correspondence from Resources Conservation Company (RCC), the subcontractor performing the treatability study, to Arturo Duran of the EPA A copy of this letter, which verifies the telephone conversation that he had with RCC representatives, was requested by Mr Duran.

With the resolution of these combined comments the work plan should qualify for final approval by both CDPHE and EPA. Please also initial each comment resolution form to verify acceptance and forward your final approval to the Department of Energy by October 10, 1994. If you have any questions please contact Norma Castañeda at extension 4226

Sincerely,

Steven W. Slaten
IAG Project Coordinator
Environmental Restoration

Enclosures

ADMIN RECORD

SW-SW-A-02992

cc w/Enclosures.
D Norbury, CDPHE
A Duran, EPA

cc w/o Enclosures.
A. Rampertaap, EM-453, HQ
M Silverman, OOM, RFFO
L Smith, OOM, RFFO
N Castañeda, ER, RFFO
R Schassburger, ER, RFFO
M Harris, SAIC
O. Erlich, EG&G
W Roushey, EG&G

1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) has completed a technical review of the Draft Solvent Extraction Bench-Scale Treatability Study Work Plan. This report was prepared for the U S. Department of Energy (DOE) by EG&G Rocky Flats (EG&G) in June 1994, and submitted for U.S. Environmental Protection Agency (EPA) review under terms of the Interagency Agreement (IAG). EPA requested this technical review under contract number 68-W9-0009, Technical Enforcement Support (TES 12) work assignment number C08061.

PRC's review focused on conformance with EPA guidance, internal consistency, and overall approach in evaluating the solvent extraction process.

This work plan describes bench-scale tests to be conducted on plutonium-, americium-, and uranium-contaminated soils from the Rocky Flats Plant (RFP). The test will evaluate the ability of triethylamine, in combination with various pretreatment steps, to remove these radioactive contaminants from RFP soil.

The following technical review comments are organized into Section 2.0, general comments pertaining to the document as a whole, and Section 3.0, specific comments that address individual deficiencies within the document.

2.0 GENERAL COMMENTS

1 In general, the treatability study work plan follows the suggested organization provided in EPA guidance (EPA 1992). However, most of the sections provide only the most basic information and do not adequately describe how the treatability test is to be conducted or results evaluated.

2. The treatability study has a number of objectives but does not provide a test matrix to show how they will be achieved. For example, in Phase I five tests are planned for each of two soil and one vegetation samples. The first test will use only the triethylamine, while the other four will evaluate several chemical pretreatments and several process operating parameters. Without a test matrix, these four tests will attempt to evaluate too many variables. Therefore, a test matrix and rationale for each test should be provided with the work plan

3. The treatability study work plan discusses the evaluation of several pretreatment compound as part of the treatability study. However, several oxidizing, reducing, and chelating compounds are already being evaluated in the Chemically Enhanced Steam Stripping of Radionuclides from RFP Soils treatability study. The rationale should be provided for repeating these experiments in this treatability study.

3.0 SPECIFIC COMMENTS

1. Section 4.1.1, Page 9, Second Paragraph. This paragraph discusses physical preparation o soil samples prior to testing and states that the less than one-quarter inch diameter material will be crushed and blended Previous treatability studies on RFP soils have determined tt x radionuclide contamination is concentrated in the less than 4 millimeter diameter soils (Hic s and Blakeslee 1981). Therefore, the rationale for not concentrating the soil washing experiments on this size fraction should be included in this section.

2. Section 4.3, Page 10, Third Paragraph. This paragraph begins the section on experimental design and procedures. No standard operating procedures (SOPs) to conduct the treatabilit study are discussed. EPA guidance (EPA 1992) suggests that SOPs, with sufficient detail t be used by the laboratory technician, be provided in the work plan. These SOPs should be included in this section.

3 Section 5.0, Page 15, First Paragraph. This paragraph begins a section which lists equipm nt and materials for the treatability study. This section does not contain any description of th process to be used during the treatability study. EPA guidance (EPA 1992) suggests that illustrations of major pieces of equipment and some description of system operation be provided in this section. Therefore, this section should include additional information on t e operation of equipment during the treatability study.

4 Section 7.0, Page 22, First Paragraph. This paragraph discusses data management. However, it does not provide any specific information on methods that will be used to evaluate the data. More specific information concerning methods to evaluate data should b included in this section.

REFERENCES

U S. Environmental Protection Agency (EPA). 1992. Guide for Conducting Treatability Studies under CERCLA. Office of Solid Waste and Emergency Response. Washington, DC. 20460 EPA/540/R-92/071a. October 1992.

Hicks, J.E., and J. J. Blakeslee. 1981. Soil Decontamination Process Development Closeout Report. AR05-15-20-1 AL. Rockwell International, Rocky Flats Plant, Golden, CO September 1981.

Colorado Department of Public Health and Environment
Comments
Draft Solvent Extraction Treatability Study Work Plan

1) Section 1.2: The Division questions the need for two separate soil samples - no justification is given to support the need. The treatability study seeks to answer the question "will solvent extraction be effective in remediating radionuclide-contaminated soil?" It seems this question can be adequately answered with one well chosen sample. If a good reason exists to run more than one soil matrix through the tests, it needs to be provided in the Workplan.

2) Figure 2-1: Are nine sample locations required? The key measurement points are at the input (sample location 1, feed) and output (locations 5, 7, 8, and 9) stages of the flow schematic. The test objectives listed in Section 3.0 can still be met at lower costs without the extensive intermediary sample locations proposed in the Figure.

3) Table 3-1: Where did the TSBs for gross alpha, gross beta, and total uranium come from? The Division is not aware of any soil standards outside of the draft PRG effort referenced for the plutonium and americium values.

4) Section 4.2: Each unique feed matrix is to be subject to five test runs - one with the "standard" conditions, and four with modifications to the standard conditions. The text suggests evaluating plutonium removal as a function of as many as seven variables. This will be impossible to do in four test runs.

DOE has to make a choice between keeping the experimental design simple, with only one or two key input parameters varying over four runs, or committing the resources necessary to adequately characterize the effects of multiple process variables. Previous experimental designs under the DOE Treatability Study Program have suffered from the same flaw of trying to examine too many variables in a study of limited scope (and budget). As described, the Phase I tests will not be able to provide the information necessary to select the "apparent optimized process" proposed for Phase II tests.

5) Section 4.3.2: What is the justification for (and advantages of) the 150°F extraction stage? The treatment technology description (Section 2.0) suggests that triethylamine is immiscible with water above 140°F.

6) Table 4-2: See comment 2.

7) Table 6-1: Since the detection limits are not provided, the Division can only assume the analytical methods will be sufficient to meet the TSBs presented in Table 3-1.

8) Table 6-2. Of all the possible measurement endpoints, the dried treated solids are one of the most important. However, no analysis is proposed for dried treated solids in this Table's analytical requirements.

9) Section 12.0: Can the tests for different sample types be run concurrently? The schedule suggests needing 30 days for Phase I tests, when each sample type requires only 10 days.

The Division did not review Appendices A and B (Health and Safety Plan, Quality Assurance Addendum).

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To Bill Rowsey	From Harris
Co.	Co.
Dept.	Phone # 4189
Fax # 8663 [redacted]	Fax # 4871

P25

TELEFAX COVER SHEET

Bill L. 966-8663

TO: NAME: Mike Herrs · 966-4871 MAIL CODE: ___

AGENCY/FIRM: _____ PHONE: 966-1187

CITY: _____ STATE: _____

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FROM: NAME: Arthur MAIL CODE: ___

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TELEFAX: 303-294-7559 CONFIRMATION: 303-294-1987

U.S. EPA REGION VIII
999 18TH STREET
DENVER, CO 80202-2466

****

DESCRIPTION: Comments on Solvent Extract TSW
#0

LOGGED _____ SENT _____ TIME _____

Analytical Technologies, Inc. 225 Commerce Drive Fort Collins, Colorado 80524 (303) 490-1511

Fax (303) 490-1522

Message

Bill,

Attached are my responses to the CDH comments. Please call if there are further questions.

Bill H

To Bill Roushey Company EG&G

Fax No. 303-966-8663 Date 7/27/94

From Bill Heins Number of pages including this sheet 2

If you do not receive all the pages please call us back as soon as possible.

RCC responses to CDH comments

7/27/94
WH

Comment 2

All nine sample locations are not used for all test runs. The majority of samples analyzed will be feed samples, treated solids, concentrated contaminant, and recovered solvent. The remaining in-process streams are sampled occasionally to allow for evaluation of key process parameters. These in-process samples are taken based on observations recorded during testing and, in some cases, may not need [redacted] to be taken at all. The frequency of the in-process samples will be determined on a test-by-test basis.

Comment 4

Even though only four modified test runs will be conducted, all key process parameters can be evaluated. Each of the four test runs will consist of several "extraction stages" each stage utilizing a given set of process parameters. Plutonium removal will be evaluated after each extraction stage. [redacted] Therefore, several process parameters can be evaluated during each test run, one variable per extraction stage.

Comment 5

Above 140°F, triethylamine is only partially miscible with water (i.e, about 2% water is miscible with triethylamine at 140°F) If there is insufficient water in the system to saturate the triethylamine solution, a second (i.e water) phase will not form. [redacted] the cold extractions will remove enough water so that, when hot extractions are performed, only a single liquid phase will exist. The advantage of [redacted] using elevated temperatures is to increase the extraction efficiency of the solvent through improved kinetics and contaminant mobility.

ROCKY FLATS PLANT
SOLVENT EXTRACTION TREATABILITY STUDY
PHASE 1 - TEST MATRIX

	Oxidant Addition	Chelant Addition	Cmplex Addition	Solvent Ratio	Solvent Temp	Sample pH	Contact Time
Test #1	no	no	no	med	cold/hot	high	med
Test #2	yes	no	yes	high	cold	low	med
Test #3	yes	no	yes	high	cold	med	med
Test #4	yes	no	yes	high	cold	low	long
Test #5	yes	yes	no	high	cold	low	long

Each of the above tests will consist of several "extraction stages", each stage utilizing a given set process parameters. Plutonium removal will be evaluated after each extraction stage. Several process parameters can be evaluated during each test run, one variable per extraction stage.

As the solvent extraction testing proceeds, deviation from the test matrix may occur if the test data indicates that certain parameters have a major impact on process performance.