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BENEDETTI, R L	X	
BENJAMIN A.		
BERMAN H S.		
BRANCH, D. B.		
CARNIVAL, G. J.		
COPP R. D.		
DAVIS, J. G.		
FERRERA, D W		
HANNI, B. J.		
HARMAN L. K.		
HEALY T J.		
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HILBIG, J. G.		
KIRBY W A.		
KUESTER, A. W		
MANN H P	X	
MARX, G. E.		
MCDONALD M. M		
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MORGAN, R. V		
POTTER, G. L.		
PIZZUTO, V M.		
RILEY J. H.		
RISING T L.		
SANDLIN, N B.		
SETLOCK, G. H.		
STEWART D. L.		
SULLIVAN, M. T		
SWANSON, E. R.		
WILKINSON, R. B.	X	
WILLIAMS, S. (ORC)		
WILSON, J. M.		
WYANT R. B.		
N. M. HUTCHINS	✓	
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ADMIN RECORD	✓	
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TR APPROVALS:

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EG&G ROCKY FLATS

EG&G ROCKY FLATS INC
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October 20 1993 — 93 RF 12825

James K. Hartman
Assistant Manager
Transition and Environmental Management
DOE RFO

Attn S P Singh

TRANSMITTAL OF THE DRAFT SCOPE FOR OPTIMIZATION TESTING/PERFORMANCE EVALUATION ON THE OPERABLE UNIT NO 1 INTERIM MEASURE/INTERIM REMEDIAL ACTION GROUND WATER TREATMENT SYSTEM NMH 545-93

Per your request a draft scope for optimization testing/performance evaluation of the Operable Unit No 1 (OU1) Interim Remedial Action treatment system is attached Please review this scope to ensure th it meets your requirements

If you have any questions please contact C D Cowdery of Environmental Engineering and Technology X6953

A R Keith

N M Hutchins
Acting Associate General Manager
Environmental Restoration Management

CDC cb

Orig and 1 cc J K Hartman

Attachment
As Stated

cc
R J Schassburger DOE, RFO
M N Silverman DOE, RFO

Proposed Scope For

Optimization Testing/Performance Evaluation
On The Operable Unit No 1
Interim Measure/Interim Remedial Action
Ground Water Treatment System

I Introduction

The Operable Unit No 1 (OU 1) Interim Measure/Interim Remedial Action (IM/IRA) Ground Water Treatment System intercepts alluvial groundwater from the 881 Hillside routing it to a water treatment system treating the groundwater and then discharging it to the Rocky Flats Plant (RFP) South Interceptor Ditch The OU 1 IM/IRA groundwater treatment system consists of an ultraviolet/hydrogen peroxide (UV/H_2O_2) process and an ion exchange process The UV/H_2O_2 process is designed to reduce concentration of organics through destruction of organic constituents the ion exchange process is designed to remove inorganics and radionuclides

The treatment facility has been in operation for approximately a year and a half During startup and operation of the facility a series of tests were conducted to test the system performance and to optimize the system for the ground water in the 881 Hillside area These tests were hampered to some extent by contaminant concentrations that were significantly lower than those originally estimated in design documents In some cases these differences were two or three orders of magnitude

II Objectives

The following objectives have been identified as integral parts of any test/evaluation

- **Characterization/Evaluation of Ground Water Sources Currently Being Recovered** This would require collecting existing data in a form that would be amenable to data analysis and evaluation The three sources that are currently being treated are the french drain a recovery well to the north of the french drain and the footing sump of Building 881 Once in that form the sources could be evaluated in terms of whether IM/IRA operations are effectively remediating the sources and evaluating whether further remediation is required at a given source This objective would also require collecting any additional data that is needed

- **Characterization/Evaluation of Treatment System Influent Water** As above this also would require data collection and evaluation

- **Optimization Testing and Performance Evaluation of the UV/H_2O_2 Treatment Unit** This would require evaluating the system performance with water containing higher volatile concentrations than the groundwater already being treated at the facility so that should the system be utilized to handle different water sources or should concentrations at existing sources increase the operating characteristics of the UV/H_2O_2 system would be known a priori It would also include identifying and correcting deficiencies in the operation of the UV/H_2O_2 system

- **Optimization Testing and Performance Evaluation of the Ion Exchange Treatment Unit** This would require reevaluating the system performance since startup It would also require identifying and correcting problems and deficiencies in the operation of the ion exchange system These problems include elevated iron concentrations in the effluent problems with the pH of the effluent frequently measured at levels outside of the control range and problems associated with regeneration including cations being flushed back into the clean water tank

- **Development and Implementation of a Computer Based Data Management System** This would include developing a system to support other characterization and evaluation objectives current reporting requirements and real time data analysis

- **Reevaluation of the Sampling Requirements** This objective requires the evaluation of operational sampling requirements relative to reporting requirements process evaluation and regulatory requirements

- **Development of Test Plans for Other Sources of Water** This would include water from various part of the plant including other operable units that could potential have contaminants or characteristics different from the design basis of the treatment system

III Scope Definition

It is proposed that the initial approach to meeting the objectives be broken into three main activities development of a data management system development of test plans and reevaluation of sampling requirements

A) Development of a Data Management System

Scope The data management system would consist of a dedicated IBM model computer utilizing a relational database The database would be capable of managing all data generated by the treatment process What data would go into the database would need to be determined during the

developmental process It is also desired that the database have the following features

- The ability to directly transfer data from the Rocky Flats Environmental Database System
- The ability to handle data from real time analytical monitoring equipment
- The ability to create customized graphs tables and reports In particular the ability to generate tables for the quarterly reports on the IM/IRA
- The ability to support other characterization and evaluation objectives
- The ability to perform statistical analysis on the data
- The ability to utilize data entry forms so that chemical operators can input the data
- A user friendly format for routine operations

The following activities are expected to be undertaken as part of the development of this database

- Selection of the database system
- Design of the database system
- Setup of the database system including form report and data table development
- Data entry of historical data

Funding It is proposed that this work be performed by the Los Alamos Technology Office (LATO) in Fiscal Year 1994 (FY 94) with funding available for support from LATO It is proposed that LATO provide turnkey development of the database system Funding for the computer and the required software come out of the OU 1 IM/IRA Operation and Maintenance Work Package It is possible that this will need to come out of change control An estimate of the cost and labor hours to achieve each objective is attached

Schedule It is proposed that this task be completed in FY 94 A more detailed schedule will be needed to finalize commitment dates

B) **Preparation of Test Plans**

Scope The scope of test plan preparation would cover three areas requiring evaluation source/influent characterization and evaluation performance evaluation/optimization of the treatment system (UV/Hydrogen peroxide unit and the ion exchange unit) and a test plan for the treatment of water from new sources Each of the test plans would be independent to allow some flexibility in their implementation

Source/Influent Characterization Test Plan Test plan would consist of identifying objectives identifying sampling requirements and developing a sampling plan It is assumed that any form of data analysis or risk assessment would be outside the scope of this activity Objectives of the test plan would support any assessment work to add or remove sources and characterization work to better define treatment requirements

Estimated length 3 to 5 pages

Performance Evaluation/Optimization of the Treatment System Test plan would consist of identifying objectives developing an approach to meeting test goals identifying sampling requirements and developing sampling testing and reporting plans

The following areas would be addressed in this plan

- Performance evaluation of treatment system since start up
- Evaluation of reconfiguring UV/Hydrogen peroxide unit
- Investigation of iron problems
- Evaluation of acid usage to meet new Federal Requirements
- Investigation of pH problems of ion exchange
- Investigation of rinse/clean water tank problems
- Evaluation of resin selection/replacement including waste issues associated with resin use and disposal
- Evaluation of process changes to accommodate other water sources i e prefiltration recycle piping modifications

- o Splitting streams on the ion exchange unit
- o Determining whether to evaluate treatment for plutonium and americium
- o Evaluating the effect of contaminant loading outside of the design parameters road salt high suspended solids loadings and other problems

As part of the preparation of this test plan some ongoing process problems will need to be evaluated prior to preparation of certain test plans in particular pH problems in the ion exchange system problems with high iron in the effluent and problems with the rinse cycle of ion exchange columns 2 and 3 If during this evaluation solutions to these problems which are easily implemented shall proceed irrespective of the individual test plans More costly or involved solutions shall be incorporated into the appropriate test plan

It is suggested that the following actions be taken now prior to test plan preparation

- o Supply vendors with previous analytical results and get input on changes in process operations such as modifying regeneration cycle
- o Perform additional sampling for iron (see reevaluation of sampling requirements)
- o Perform water analysis on clean water tank and tap water
- o Treat water from an outside source that is high in volatiles

Estimated length 10 20 pages

Test (Contingency) Plan for the Treatment Of Water from New Sources
This test plan would describe the strategy for handling water from new sources including acceptance criteria modifications to the system operating parameters and modifications to any standard operating procedures It is suggested that this eventually lead to a computer based expert system that would determine what waters could be accepted what steps should be taken to adjust the system to handle those waters and any additional safety requirements

Estimated length 2 5 pages

Funding It is assumed that the bulk of this work would be performed by EG&G Environmental Engineering and Technology (EE&T) Funding within the OU 2 Operation and Maintenance Work Package will have to be examine to determine whether these activities are within the original scope schedule and budget If not Change Control will be petitioned An estimate of the cost and labor hours to achieve each objective is attached

Schedule If all relevant parties agree upon the scope and a budget is in place then this work is tentatively planned to be completed in Fiscal Year 1995

C) **Reevaluation Of Sampling Requirements**

Scope This activity consists of evaluating current routine sampling requirements to determine whether the needs of the system are being met and whether cost savings can be made by eliminating nonessential sampling A draft sampling table currently exists The remainder of this activity consists of reviewing the existing table and finalizing it

Funding The scope of the remainder of this activity falls within the FY 94 work package for operation and maintenance and no additional funding is needed This activity would be completed by EG&G Facility Operations Management who also prepared the draft routine sampling schedule An estimate of the cost and labor hours to achieve each objective is attached

Schedule This activity is tentatively scheduled for completion in early FY 94

Rough Cost Estimate for Meeting Objectives of

Optimization Testing/Performance Evaluation
On The Operable Unit No 1
Interim Measure/Interim Remedial Action

A more refined budget and schedule will need to be developed once the scope for FY 94 is determined and the test plans have been prepared This estimate is just a preliminary evaluation of some of the costs for the purposes of planning and scope development Also some of the preliminary actions defined in the scope could be instrumental in refining a cost estimate

General Assumptions

- o This estimate is rough and not intended for actual budgeting purposes
- o Assume that any sampling labor is included under existing subcontract and work package
- o Assume a labor rate of $85 00/hr for engineering activities
- o Assume that each objective is met separately It should be noted that in some instances there would be a significant cost savings to group activities together
- o Estimate only includes test plan preparation for activities associated with treatment system optimization and evaluation

1) Characterization/Evaluation of Ground Water Sources Currently Being Recovered

	Hours	Cost
Test Plan Preparation	10	$ 850
Samples (Assume 6 full suites + 3 QA at a cost $5500 each EPA 524 2 Total & Diss Metals WQP and Total & Diss Radionuclides)		$40 500
Data Evaluation	10	$ 850
Total		$42 200

2) **Characterization/Evaluation of Treatment System Influent Water**

	Hours	Cost
Test Plan Preparation	8	$ 680
Samples (Assume 3 full suites + 2 QA at a cost of $5500 each EPA 524 2 Total & Diss Metals WQP and Total & Diss Radionuclides)		$27 500
Data Evaluation	10	$ 850
Total		$29 030

3) **Optimization Testing and Performance Evaluation of the UV/H_2O_2 Treatment Unit**

	Hours	Cost
Test Plan Preparation	40	$3 400

4) **Optimization Testing and Performance Evaluation of the Ion Exchange Treatment Unit** Note this objective would include evaluating problems with iron

	Hours	Cost
Test Plan Preparation	70	$5 950

5) **Development and Implementation of a Computer Based Data Management System**

	Hours	Cost
Time Requirements	500 (1/3 FTE)	$42 500
Computer with sufficient storage capacity		$ 8 000
Software		$ 600
Total		$ 51 100

6) **Reevaluation of the Sampling Requirements**

	Hours	Cost
Time Requirements	20	$ 1 700

7) **Development of Test Plans for Other Sources of Water**

	Hours	Cost
Test Plan Preparation	60	$5 100

Suggested Approach to Funding

1) Use 1/3 FTE of LATO funding for database

2) Use remaining 1/6 FTE for technical input on work plan development and data evaluation

3) Use hours for Environmental Engineering & Technology (EE&T) Support to do the test plans It should be noted that the 500 hours in the Work Package for EE&T also includes activities outside this scope These activities include R T Reiman s time for characterizing the in line gamma spectrometer and C D Cowdery s time for process engineering support and for finishing a test report

4) Upon completion of test plans evaluate the cost for implementing each portion so that a determination can be made for what activities to perform in FY 94

5) If the existing work package can cover funding proceed to

   - o Perform evaluation of iron problem
   - o Take water samples from clean water tank and clean water tap
   - o Perform some limited testing on water from other sources and
   - o Obtain vender input on system operation