:ORRES. CONTROL 0000126087
OUTGOING LTR NO.

110893-15

E ORDER#
93RF 13667

DIST.	LTR	ENC
AMARAL, M.E.		
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.		
HEDAHL, T.		
HILBIG, J.G.		
HUTCHINS, N.M.	X	
KIRBY, W.A.		
KUESTER, A.W.		
MAHAFFEY, J.W.		
MANN, H.P.		
MARX, G.E.		
McDONALD, M.M.		
McKENNA, F.G.		
MONTROSE, J.K.		
MORGAN, R.V.		
POTTER, G.L.		
PIZZUTO, V.M.		
RISING, T.L.		
SANDLIN, N.B.		
SETLOCK, G.H.		
STEWART, D.L.		
SULLIVAN, M.T.		
SWANSON, E.R.		
WILKINSON, R.B.		
WILLIAMS, S.(ORC)		
WILSON, J.M.		
WYANT, R.D.		
Stagg	X	
GM	X	
Wilson	X	
Broussard	X	
Bushy	X	
Smith	X	
CORRES. CONTROL	X	X
ADMN RECORD/080	X	
TS/T130G		
TRAFFIC		

CLASSIFICATION:

UCNI		
UNCLASSIFIED		
CONFIDENTIAL		
SECRET		

AUTHORIZED CLASSIFIER SIGNATURE
DOCUMENT CLASSIFICATION REVIEW WAIVER PER CLASSIFICATION OFFICE
DATE

IN REPLY TO RFP CC NO:

ACTION ITEM STATUS
PARTIAL/OPEN
CLOSED
LTR APPROVALS:

ORIG & TYPIST INITIALS
EHW/mp

(Rev. 9/93)

EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC.
ROCKY FLATS PLANT, P.O. BOX 464, GOLDEN, COLORADO 80402-0464 • (303) 966-7000

November 8, 1993

93-RF-13667

Richard J. Schassburger
Acting Director
Environmental Restoration Division
DOE, RFO

POSITION PAPER ON ENVIRONMENTAL RESTORATION FIELD SCREENING LABORATORY - NMH-073-93

The attached Field Screening report describes the reasoning and the basis for proposing a new temporary onsite Environmental Restoration managed rapid screening field laboratory and SMO shipping facility. This field laboratory facility represents the quickest way to fulfill the Environmental Restoration program that manages the schedule driven and data quality compliance issues mandated by the Interagency Agreement.

If you have any questions please contact E. H. Wilson of Environmental Engineering & Technology at X6952.

N. M. Hutchins
Director
Environmental Science & Engineering

EHW:mp

Attachment:
As Stated

Orig. and 1 cc - R. J. Schassburger

cc:
A. H. Pauole
M. N. Silverman

DOCUMENT CLASSIFICATION
REVIEW WAIVER PER
CLASSIFICATION OFFICE

NOV 1993
RECEIVED

GROUP	ACT	INFO
11000 ERM		
11010 PIR		
11100		
11200 ES&E		
11300		
11400 FOA		
11500		
11600 SM		
11700		

POSITION PAPER ON ENVIRONMENTAL RESTORATION FIELD SCREENING LABORATORY

1.0 INTRODUCTION AND PURPOSE

This position paper describes the reasoning and the basis for proposing a new temporary onsite ER managed rapid screening field laboratory and SMO shipping facility. This field laboratory facility represents the quickest way to fulfill the ER program that manages the schedule driven and data quality compliance issues mandated by the Interagency Agreement.

1.1 Goal

The goal of this proposed field screening laboratory is to perform onsite, rapid turnaround gross radiological screening for ER samples safer, quicker, better, and faster, e.g., within 12 hours. This field laboratory facility will enable operable unit managers to make timely field decisions on their sampling programs that are in progress. This radiological screening laboratory will enable the ER Sample Manager to decide which offsite laboratory can test a specific sample, determine test protocols, and which samples need to be expedited. All of this requires a capability for rapid screening at the site. These screened samples will then be shipped to offsite facilities. This effort will be accomplished by subcontractor services furnished to equip and operate the ER Field Screening laboratory and Shipping Facility.

1.2 Project Needs

This screening laboratory and shipping facility will be dedicated to serving Environmental Restoration Programs-remedial investigations, feasibility studies, treatability studies, research and development projects, and remedial actions. This facility will be designed and built to satisfy an estimated annual sample screening throughput capacity of 10,000 water and soil samples. The screening laboratory and shipping facility operations will be managed by the ER Sample Management Office under a separate work package. Specific needs that have been divided into two phases include;

Phase One -Design and Construct ER Screening Laboratory and Shipping Facility

- Support the OU Remedial Investigations and Remedial Actions programmatic needs for making rapid field decisions using field laboratory screening services.
- Offer onsite radiological screening for shipment of ER samples with low (2 nCi) to moderate radiological contamination
- Conduct study for future needs and for "market survey" to operate a field screening laboratory on plant site by independent contractor.
- Fulfill CPAF requirements.

Phase Two- Laboratory Operations

- Begin field Screening Laboratory operations
- Ramp up to a complete field screening laboratory as part of Phase Two to include screening for VOA, SVOA, metals, and radioisotopes.
- Minimize the need for 100% offsite laboratory support.

This proposed field laboratory will resolve an immediate need- the radiological screening for ER samples prior to shipment. Ultimately, this field screening laboratory will help to streamline the RI/FS processes. The analytical information and data that is generated by this proposed facility will reduce turnaround times minimize the lengthy chain of custody and greatly reduce costs.

Examples of how these potential improvements could be accomplished include:

- Streamline the screening and analytical testing process for environmental samples(CP/I).
- Offer greater flexibility for managing assessment field investigations and remediation operations. Provide a standardized facility and support organization for all ER projects
- Cost productivity Improvements- This is estimated to be $5K to $30 K per month in cost savings by transferring screening testing to this proposed ER RFP field laboratory. (see attached Tables One and Two).

DOE is the primary client. The Environmental Restoration Sample Manager is the immediate ER customer for this design engineering package. The deliverable to these customers is a gross radiological screening laboratory and shipping facility, that enables RFP to safely ship all ER samples to either onsite or offsite analytical laboratories, EPA, CDH and the public are end point customers where the work product is a reliable data set and information.

2.0. OPERATIONAL REQUIREMENTS

The ER field laboratory operational requirements are established to support the Environmental Restoration programs which currently generate up to 10,000 soil and water samples per year. Each sample must be screened for radiological material prior to shipment to an offsite laboratory. This screening includes gross alpha, beta and gamma activity. The screening is used to address sample disposition and management concerns as follows.

- To determine how to manage each sample according to established procedures.
- To make the decision to send the sample to a qualified laboratory with proper licensing for handling low level radiological materials.
- To follow the correct shipping instructions including labeling.
- To ensure that laboratory safety is maintained.

This laboratory will be operated on a year round basis for one to one and half shifts. The laboratory systems must be capable of functioning in all weather conditions. This includes freeze protection for tanks and piping.

2.1 Performance Requirements

Performance requirements include the following. The following parameters will be field screened and/or analytically tested for water and soil media samples. Water samples will be equivalent to the soil sample loads:

- Rapid screening parameters - Gross radioactivity (alpha, alpha/beta, and gamma)
- Sample turn around time from delivery to laboratory to getting test results - 12 to 24 hours
- Gross screening instrument detection limits for activity
  - 400 dpm gross alpha,
  - 400 dpm gross alpha and gross beta
- Lower detection limits for activity screening laboratory instrument (Gross proportional counter) assume soil density 1.5 g/cc.
  - 2nCi/g gross alpha,
  - 2nCi/g gross alpha and gross beta

- Upper detection limits for activity screening laboratory instrument (Gross proportional counter) assume soil density 1.5 g/cc.
  - 0.01uCi/g gross alpha,
  - 0.1 uCi/g gross alpha and gross beta
- Sample throughput capacities- peak daily 100 samples; annually 10,000 samples
- Radioactivity (gross alpha and beta) background conditions for bench laboratory instruments
  average - <1 cpm
  maximum - 2 cpm.
- Compliance with EG&G ER QA/QC plans.
- Compliance with Environmental Restoration Standard Operating Procedures Field Operations 18.0 and ER Radiological Guidance Manual.

3.0 EXISTING RFP LABORATORY FACILITIES

RFP laboratories possess the fundamental capability and staff support to provide screening and analytical for water and soil sample using the required analytical services to the ER programs in accordance with GRAASP; 123 Laboratory, 371 Laboratory, and 881 Laboratory. The remaining laboratories 559 and 771 are so specialized to meet production facility needs by analyzing moderate to high level radioactive materials that they can't easily accommodate environmental media such as water and soil samples and perform the associated analytical protocol (procedures).

ER is currently and has historically used offsite laboratories to screen and to test all water and soil samples for several reasons. The following information on the three existing laboratories (123, 371, 881) and is based on ER experience, the EG&G Environmental & Waste Management Analytical Strategic Plan (ASP 3/19/93) and on current (10/93) anecdotal sources.

3.1 General Circumstances

- Existing onsite laboratories are at capacity for both staff and analytical laboratory facilities (EG&G ASP 3/93).
- The 881 Laboratory is under capacity and thus represents the best resource available to ER for onsite laboratory services.
- Existing onsite laboratories have production facility priorities that currently conflict with the ER Programs Existing onsite laboratory capacities were inadequate to fulfill the average and peak sample loads generated as part of the ER programs. This can typically exceed 60 samples per day and 10,000 samples per year.
- Existing onsite laboratories use procedures that do not satisfy rapid turnaround screening requirements.
- Existing onsite laboratories all have had continual RCRA out of compliance operations problems. Several attempts have been made to get these issues solved. All laboratories currently are operational, but not at full capacity.
- Existing RFP Laboratory Procedures do not include rapid methods for screening soil and water samples. The ER laboratory will be operated using state of art technology to expedite sample preparation, minimize secondary waste generation and actual measurement of counts per minute.

3.2 Building 123 Environmental and Bioassay Laboratory

The Bldg. 123 laboratory performs screening services are primarily dedicated to the medical bioassay programs and to a portion of the EP surface water sampling programs. This laboratory is

currently at capacity in terms of both space and services offered. Additional space for accommodating the increased ER sample loads for sample preparation and radiological screening is insufficient (per 123 Laboratory Manager 10/28/93).

Typical turnaround time that begins when the sample is delivered to the laboratory to when the test results are made available to the customer typically vary from a minimum of 72 to 240 hours.

The increased hazardous and low level radiological waste streams from the ER samples loads (60 per day) could complicate the existing RCRA waste problems.

3.3 Building 371 Radioassay Laboratory

The Bldg. 371 Laboratory is in the Protected Area. This tight security area severely limits access to a rapid screening laboratory on a routine basis. The increased hazardous and low level radiological waste streams from the ER samples loads (60 per day) could complicate the existing RCRA waste problems.

Existing onsite laboratory capacities are inadequate to completely fulfill the average and peak sample loads generated as part of the ER programs. This can typically exceed 60 samples per day and 10,000 samples per year.

3.4 Building 881 General Laboratory

Existing onsite 881 laboratories have relatively high background beta and gamma count per minute sufficient to cause each routine screening test to be extended from 10 to 20 minutes. Sample preparation times are lengthy (8 hr.) for the type of screening for DOT shipping that is required.

Improvements to existing laboratories involves a cumbersome and lengthy design engineering and construction process. Improvements to Bldg. 881 are limited by severe power restrictions that will be in effect well into FY 95.

The increased hazardous and low level radiological waste streams from the ER samples loads (60 per day) could complicate the existing RCRA waste problems at 881.

Typical turnaround time that begins when the sample is delivered to the laboratory to when the test results are made available to the customer typically vary from a minimum of 72 to 240 hours. The Bldg. 881 Laboratory is in a secured area. This tight security area limits access to a rapid screening laboratory on a routine basis.

Improvements to 881 general laboratory are scheduled for completion in FY 95. These include upgrades to secondary containerization of process waste drains; and satellite storage issues (per 881 Bldg Mgr. 11/1/93). Electrical supply is tentatively scheduled to be installed late FY95. Increased electric power must be available.

3.5 Undeveloped Laboratory Space

This option is available to ER as a long term FY 95/96 solution that involves reallocation of existing facilities to ER as each building comes off-line. Bldg. B439 and B440 modification buildings could be such opportunities. The introduction of a commercial industrial to RFP is a possible alternative. This alternative, however won't mature until well into FY 96. This is a long range alternative that must be planned and included in future planning agendas at RFP.

4.0 WORK PACKAGE

4.1 Objectives

The objectives of this engineering workplan are:

- To design the ER Yard infrastructure (Site work) to support a field screening laboratory and shipping facility.
- To specify and procure two laboratory trailers with supporting environmental control equipment and waste disposal systems. One trailer is a sample receiving and preparations trailer. The second trailer is the radiological. screening laboratory and laboratory data processing area.
- To specify and procure radiological screening laboratory equipment and supporting equipment and computer control systems.
- To install and test the lab. equipment and data systems.

4.2 Project Elements

The Phase One portion of the proposed field laboratory is included in work package 12974. This work package has the following two project design elements:

- ER Yard with Infrastructure
- ER Field Radiological Screening Laboratory and Shipping Facility

The proposed ER Support Yard with infrastructure includes a level graded gravel and asphalt covered pad, drainage structures, independent power, water supply, and other independent utilities; cargo container storage areas, plant power and a short access road. Connections to plant utility services is to be designed, but not constructed as a part of this work package, e.g., power, telecommunications and water. Design of RFP utilities extensions to the ER Yard is part of this work package, however the installation of these utilities is not a part of this work package.

The second design element of this work package includes specifying and procuring two single wide trailers and the equipment internal to these trailers. The project (this work package 12974) will initially include only two 70 ft x14 ft trailers. Trailer One includes the sample receiving and storage and shipping areas; initial radiological screening area, sample preparation area and an isolated laboratory office, data system station area. Trailer Two includes an alpha screening room, a second alpha/beta screening room, a gamma screening area and a sample preparation holding area . Radiological screening laboratory equipment includes 3 alpha counters (each with 16 detectors), three alpha/ beta counters (each with 16 detectors), one high purity germanium detector. Associated instrument data control systems include computers, software, and instrumentation and other equipment needed to support this capability. Subcontractor furnished services are included as required to support EG&G activities. This includes design, construction management, procurement, interim field laboratory services, and document preparation support.

5.0 FUTURE EXPANSION REQUIREMENTS

The Phase Two portion of this proposed screening laboratory and facility should be designed for future expansion to support additional field screening laboratories. Task Two of this work package will evaluate similar existing facilities. These laboratory. must be capable of handling, preparing samples, and performing analytical tests that yields data that fulfills level III data quality objectives (DQO) for the above analytical parameters. This will be ramped up as a future analytical service as needed. The final configuration of the proposed screening laboratory will be limited to accommodate the 5 proposed laboratory trailers.

6.0 CONCLUSIONS

The screening of ER soil and water samples by onsite laboratories is possible for limited sample quantities. Rapid screening can be performed if existing procedures are modified and if the additional secondary RCRA waste streams can be accommodated by the 881 laboratory Substantial facility improvements are required to upgrade this facility to meet the flexibility demanded by the IAG driven programs.
The proposed ER field screening laboratory and shipping facility is the best option for accommodating the near term FY 95 ER needs for a rapid screening laboratory. It is a dedicated laboratory that will be designed and equipped to operate as a screening laboratory within a realistic time frame.

This field laboratory is in the process of being designed based on two successful analogs; a field screening laboratory currently being brought on-line at Hanford and an operating mobile laboratory at Los Alamos National Laboratories.

TABLE One
Cost Savings Gross Alpha, Beta Screening
Unit Costs

Item	Laboratory	Qty Samples per Year	Sample Handling	Packaging shipping transfer	Sample Prep., Testing, & Reports	Sample Prep and Count Times	Daily Sample Throughput	Yearly Sample Through Put (200 day/yr)	Turnaround Time	Annual Costs Estimated
1	Screening by IT Hanford	10000	$20	$20	$100	4 hrs/0.2 hr	50 per day	10000	24 to 48 hr	$1400K
2	Screening by 881 Lab	1600	$10	$10	$231	8 hrs/24 hrs	8 per day	1600	72 to 240 hrs	$402K
3	Screening by ER Field Laboratory	10000	$10	$0	$100	1 hr/0.2 hr	60 per day	10000	12 to 24 hr	$1100K

TABLE TWO
Productivity Factors

LABORATORY	S	C	T	1/S x C x T = CF	CPI Results	Conclusions
IT Richland	10000/10000 = 1	$140/$140 = 1	24 hr /24 hr = 1	1 x 1 x 1 = 1	(0) x $1400K = $0 K	no savings
881 RFP Standard Rad screen Procedure	10000/1600 = 6.25	$251/$140 = 1.8	72 hr/24 hr = 3	6.25 x 1.8 x 3 = 33.75	(32.8) x $1400K = $ 45920K	no savings
881 Commercial Standard Rad screen Procedure w/two GPC instruments	10000/5000 =2 ??	$251/$140 = 1.8	24 hr/24 hr = 1	2 x 1.8 x 1 = 3.6	(2.6) x $1400 K = - $ 3640K	no savings
ER Laboratory w/3 GPC Instruments	10000/10000 =1	$110/$140 = 0.78	24hr/24hr = 1	1 x 0.78 x 1 = 0.78	(1-0.78) x $1400K = + $ 308K	savings

Productivity Factor

S = Sample Throughput = Offsite IT Laboratory Richland /Laboratory X ;

C = Unit Cost = Laboratory X/Offsite IT Richland

T = Turnaround Time = LAboratory X/Offsite IT Richland

Combined Factors = S x C x T

Potential Savings or Cost overruns Equation.

One minus PF x total annual offsite laboratory services costs = CPI Results.

If CPI Results are less than offsite costs, then savings occur. (+)

If CPI Results are greater than offsite costs, then potential for cost overruns occur. (-)