SEQUOYAH FUELS
A GENERAL ATOMICS COMPANY

0933-N

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U.S. Nuclear Regulatory Commission
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Subject: License SUB-1010; Docket 40-8027
Demonstration Survey – Phase I Disposal Cell Footprint Soils

Dear Mr. Kalman:

Sequoyah Fuels Corporation (SFC) submits the attached demonstration survey for Phase I of the disposal cell. This survey demonstrates that the cleanup criteria described in the Reclamation Plan have been satisfied for soils within the Phase I footprint of the disposal cell

Should you have any questions concerning the demonstration survey, please contact me at (918) 489-5511, extension 226.

Sincerely,

John Ellis,
President

xc: Robert Evans, RGN-IV/DNMS
Alvin Gutterman, Morgan, Lewis & Bockius
Whitney Weingartner, Assistant Oklahoma Attorney General
Mike Broderick, ODEQ
Saba Tahmassebi, Land Protection Division, ODEQ
NRC Document Control

Enclosure: 1

HIGHWAY 10 & I-40 PO BOX 610, GORE, OKLAHOMA 74435 (918) 489-5511 FAX: (918) 489-2291

1.0 Purpose

The purpose of this report is to demonstrate that the cleanup criteria described in the Reclamation Plan (see Section 3.1 below) have been satisfied for soils within the Phase 1 footprint of the disposal cell.

2.0 Scope

This report applies to soils within the Phase 1 footprint of the disposal cell prior to placement of the cell base.

3.0 References

3.1 Sequoyah Fuels Corporation, Reclamation Plan, Section 3.2.1 Soils. [RP]

3.2 Sequoyah Fuels Corporation, Reclamation Plan, Appendix D Site Characterization Report. [SCR]

3.3 U.S. Nuclear Regulatory Commission, *Multi-Agency Radiation Survey and Site Investigation Manual*, Revision 1, NUREG-1575. [MARSSIM]

3.4 Oak Ridge Institute for Science and Education, *Computerization Of the MARSSIM for Planning and Assessing Site Surveys*, v1.1.0. [COMPASS]

4.0 Definitions

As provided by sections 3.3 and 3.4.

5.0 Responsibilities

As described below.

6.0 Results

The following section describes the data quality objectives associated with the subject demonstration survey. A subsequent section describes the survey design developed from the data quality objectives used to complete the subject demonstration survey.

6.1 Data Quality Objectives

Data Quality Objectives (DQOs) were developed as described in [MARSSIM].

The DQOs were completed before the demonstration survey design was developed (Section 6.2).

6.1.1 Statement of problem

A. Description of problem

A survey is performed to demonstrate that residual radioactivity in the soils within the Phase 1 footprint of the disposal cell satisfy the requirement of the [RP].

B. Team members and decision maker {DM}

Project Manager (President, Sequoyah Fuels),

Quality Assurance Manager (Director, Regulatory Affairs), and,

Manager, Health and Safety (Manager, Environmental {DM})

C. Summary of resources

Personnel and equipment currently available at SFC.

Analytical capabilities currently available from several commercial laboratories.

D. Summary of deadlines

Deadlines were developed from the schedule for construction of the disposal cell as it includes the subject area. The deadlines were self-imposed and included no regulatory compliance constraints.

6.1.2 Identification of decision

A. Principal study question

Is the level of residual radioactivity in the soil of the Phase 1 disposal cell footprint below the uranium Derived Concentration Guideline Level (DCGL) of the [RP]?

B. Alternative actions

Resurvey, decontaminate, do not release.

C. Decision statement

Determine whether or not the soils of the Phase 1 disposal cell footprint exceed the uranium DCGL.

6.1.3 Identification of inputs to the decision

A. Information inputs to resolve the decision statement.

Measurement of radioactive contaminant of concern in soil

The radioactive contaminant of concern is natural uranium [RP].

Assessment for potential for contamination

It is assumed that residual levels of radioactivity are present above the DCGL.

Identification of appropriate measurement techniques and detection limits

- ASTM D 5174, "Standard Test Method for Trace Uranium in Water by Pulsed-Laser Phosphorimetry", ASTM International.
  - detection limit $\leq$ 1 pCi/g.
- Gamma scan by NaI
  - detection limit ~ 80 pCi/g natural uranium [MARSSIM, Table 6.7].

Equivalent measurements from a background area

Measurements from a background area are described in the Site Characterization Report [SCR].

B. Environmental variables to be measured

The level of residual radioactivity in the soils within the footprint of the disposal cell; i.e. the concentration of total uranium in soil and semi-quantitative assessment of concrete pad by gamma scan.

6.1.4 Define the boundaries of the study

A. A description of the spatial and temporal boundaries

The physical and chemical form of the residual radioactivity is not important, only the total uranium activity concentration will be determined.

The spatial boundaries are depicted on Figure 1.

The temporal boundary is that the data are used to reflect the initial condition of radionuclides available to the environment for a period of 1000 years.

Practical constraints that may interfere with full implementation of the survey design are remediation and construction activities in the vicinity of the survey area and schedule for construction of the cell base.

6.1.5 Develop a decision rule

A. The parameter of interest that characterizes the level of residual radioactivity in soils;

The gross concentration of total uranium in soil is the parameter of interest used for making decisions based on the demonstration survey.

The gross count rate from the gamma walkover may also be a parameter of interest used for making decisions based on the demonstration survey.

B. The action level;

The action level (aka investigation level (IL)) will be:

- Sample result greater than DCGL [RP]or,
- scanning measurement greater than 3x detection sensitivity as gross counts (3 x Background value from [SCR]: 28000 cpm).

C. "if ... then ..." statements (decision rule);

If the parameter of interest is less than the IL, then the level of residual radioactivity is in compliance with the DCGL.

6.1.6 Specify limits on decision errors

A. Determine the possible range of the parameter of interest;

The range is bounded by the analytical detection limit and the IL. The range is based on professional judgment considering knowledge of operations and site characterization results.

B. Identifying the decision errors and choosing the null hypothesis;

Define both types of decision errors and establish the true condition of the survey unit for each decision error.

A Type I decision error occurs when the null hypothesis is rejected when it is true (false positive). A Type I decision error would result in the release of the survey unit with total uranium concentration above the DCGL. A Type II decision error occurs when the null hypothesis is accepted when it is false (false negative). A Type II decision error would result in not releasing the survey unit with total uranium concentration below the DCGL.

C. Specify and evaluate the potential consequences of each decision error.

A Type I decision error would improperly release the survey unit for construction of the cell base; the consequence would be a conceptual increased health risk or various degrees of deconstruction. A Type II decision error would improperly not release the survey unit for construction of the cell base; the consequence would be either unnecessary costs due to decontamination of an area that was actually below DCGL, or additional survey effort to demonstrate compliance.

D. Establish which decision error has more severe consequences near the release criteria.

Considering the cost of deconstruction or additional survey compared to the total cost of decommissioning, the Type I decision error may be significant with respect to both schedule and cost.

E. Define the null hypothesis and the alternative hypothesis.

H_o: Unit does not meet DCGL.

H_a: Unit does meet DCGL.

F. Specify a range of possible parameter values, a gray region, where the consequences of decision errors are relatively minor.

Lower Bound Gray Region = ½ DCGL.

Upper Bound Gray Region = DCGL.

G. Assign probability limits above and below the gray region that reflect the probability for the occurrence of decision errors.

Type I error at $\alpha = 0.05$.

Type II error at $\beta = 0.05$ (each arbitrary).

A graphic representation of decision rule as a prospective power curve is provided with Attachment 7 [COMPASS].

6.2 Design

This design was developed in consideration of guidance for characterization surveys [MARSSIM], and the DQOs of Section 6.1.

6.2.1 Project Management

Project management occurred within SFC's existing organizational structure. Project management was directly supported by contract workforce.

A. Project Organization

Project Manger had overall accountability for completion of the demonstration survey.

Manager, Health and Safety (Mgr H&S) had overall responsibility for coordination and completion of the demonstration survey. Mgr H&S was also the decision maker (DM) with respect to interpretation or revision of design requirements.

The DM, through contract workforce, was responsible for implementation of the data generation and acquisition requirements of design (Section 6.2.2).

Quality Assurance Manager was responsible for assessment / oversight requirements of the design (Section 6.2.3)

The DM was responsible for completion of the data validation and usability requirements of the design (Section 6.2.4).

B. Problem Statement

The problem to be solved (aka the decision to be made or outcome to be achieved) was provided from the data quality objectives (sections 6.1.1 and 6.1.2):

Determine whether or not the soils of the Phase 1 disposal cell footprint exceed the uranium DCGL.

C. Project Description

The work to be performed was measurement of total uranium radioactivity concentration in soils within the Phase 1 footprint of the disposal cell prior to placement of the cell base.

The products of the work are documentation of the results of the measurements and an assessment of the decision statement.

A relative sequence of implementation was

1. review historical data with Team (see 6.1.1.B.),
2. review the design with Team,
3. identify design soil sample and/or scanning locations,
4. perform and/or document sampling and/or scanning activities
5. review scanning to ID biased sample locations,
6. submit biased samples to laboratory
7. evaluate soil sample results,
8. draft report of decision statement.

A relative schedule of implementation was not developed.

D. Quality objectives and criteria for data

Description of the quality objectives for the design is included in Section 6.1.

Description of the performance criteria to achieve the quality objectives is provided here in terms of the data quality indicators precision, bias, accuracy, representativeness, completeness, comparability, and sensitivity.

- Precision was assessed by reference to [SCR].
- Bias was not assessed.
- Accuracy was assessed by reference to [SCR] and laboratory quality control (see Attachment 2).
- Representativeness was qualitatively evaluated as whether samples and measurements appropriately reflect the condition being measured.
- Comparability was evaluated by comparison of sample and measurement methods to respective procedural requirements.
- Completeness was evaluated by comparison of the number of valid samples and measurements completed to the number planned.
- Sensitivity requirement is described at Section 6.1.3.A.

E. Training

Specialized training or certifications of personnel are not necessary to successfully complete the survey. Training on implementing procedures and instructions was documented in accordance with SFC's existing document control and training programs.

F. Documents and Records

Document control and recordkeeping were conducted in accordance with existing SFC programs, procedures, and instructions.

This document serves as the data report package to document the survey.

6.2.2 Data Generation and Acquisition

The following elements describe the requirements related to the actual methods or methodology used for the survey.

A. Sampling design

This section describes the project's data collection design.

i. Identify contaminants

The potential contaminant is natural uranium.

The potentially contaminated areas are soils within the Phase 1 footprint of the disposal cell.

ii. Establish cleanup levels

The DCGL for soils is 570 pCi/g total uranium.

The DCGL was applied directly to the data to demonstrate compliance.

Surrogate measurements were not used.

Only one "radionuclide" (natural uranium) is a potential contaminant, therefore no consideration was given to adjusting the DCGL for multiple radionuclides.

iii. Classify areas by contamination potential

The area within the scope of this design is expected to contain residual radioactivity above background but on average substantially less than the DCGL. Site characterization surveys provide the basis for classification [SCR].

iv. Group/Separate areas into survey units

There is one unit in this classification. The unit corresponds to Phase 1 construction of the disposal cell. The demonstration survey was applied independently to this unit.

v. Select background reference area

The background reference area used for the conduct of the demonstration survey is as described in the [SCR].

vi. Prepare site for survey access.

The site was prepared and available for access by coordination with SFC personnel.

vii. Establish survey location reference system

Land area scanning surveys and soil sample locations are referenced to the Oklahoma State Plane (NAD 1983(93) horizontal, NGVD 29 vertical).

viii. Determine number of data points

Design

The design of the survey for the soils of the Phase 1 disposal cell footprint was equivalent to that of a [MARSSIM] Class 3 unit. No assumption of final status survey or contamination condition associated with [MARSSIM] Class 3 is intended; however the use of the statistical test is intentional to provide a quantitative assessment.

The design was established by the Surface Soil Survey Plan of [COMPASS] using the sample set of Table 1 and Figure 1.

Calculate relative shift

The design was established by [COMPASS]. The Surface Soil Survey Plan of [COMPASS] indicates the statistical design details and provides the prospective power curve. In summary:

- The shift (Δ) = DCGL - ½DCGL = 285 pCi/g.
    - The LBGR thus is 285 pCi/g.
- The Type I and Type II error are each 0.05.

The Surface Soil Survey Plan of [COMPASS] is included as Attachment 7.

Number of data points

The number of data points was obtained directly from the Surface Soil Survey Plan of [COMPASS] as N/2 = 9.

Determining Data Points for Small Areas of Elevated Activity

This item was not considered.

Sample and measurement locations

Soil samples were collected as described in Table 1 and Figure 1.

Scanning was completed for the entirety of the Phase 1 disposal cell footprint; i.e., the concrete pad.

ix. Select instrumentation

Measurement Methods

Scanning was conducted in accordance with G-117 "Gamma Walkover Survey".

Instrument selection

Scanning of Phase 1 disposal cell footprint was made with a NaI(Tl) radiation detector coupled to a handheld scaler/ratemeter.

Instrument calibration

Instruments were calibrated in accordance with HSDEPT-110 "Calibration of Health Physics Instruments".

Data conversion

No data conversion was applied to scanning results.

Detection sensitivity

Detection sensitivity was as described in Section 6.1.3.A.

Measurement uncertainty

The uncertainty of individual measurements was not determined.

x. Integrated survey design

A biased sample was collected of the concrete based on location of elevated scanning results. The location of the biased sample is shown in Figure 1.

xi. Evaluation of survey results

The Wilcoxen Rank Sum (WRS) statistical test was used to evaluate the soil sample results. Results from the survey unit were compared to equivalent results from the reference area. In general, the comparison was whether the unit exceeds the reference area by more than the DCGL for total uranium.

Individual scanning results were compared to 3 x Background value of the SCR; i.e., IL (Section 6.1.5.B.). The comparison was whether individual results from the unit exceed 3 x Background value of the [SCR]; i.e., 28000 cpm.

B. Sampling methods

Soil sampling was conducted in accordance with Sequoyah Fuels Corporation Facility instruction Environmental Department Instruction EDI-304 "Soil and Sediment Sampling" or as described in [SCR].

The soil samples were typically collected in six inch increments by hand auger, split spoon, or Shelby tube. A single soil plug was collected from known depth(s) at each sample location. The plug from a six inch layer was used to create one soil sample. The location was recorded with respect to the reference coordinate system described at Section 6.2.2.A.vii.

The concrete sample was collected by drilling 12 holes, each about 0.5 inch diameter and six inches deep. The cuttings from each hole were collected in one sample container to create a composite sample.

C. Analytical methods

The analytical method used, or equivalent, for analysis of soil and concrete samples was:

- Total uranium: ASTM D 5174, "Standard Test Method for Trace Uranium in Water by Pulsed-Laser Phosphorimetry", ASTM International.

D. Quality control requirements

Quality control requirements were as described in Section 6.2.1.D.

Also, analytical results must satisfy the quality control requirements of the laboratory.

E. Instrument, equipment, test, inspection, & maintenance

Inspection and maintenance was performed in accordance with HSDEPT-130, "Instrument Source Checking".

F. Instrument calibration frequency

(See Section 6.2.2.A.ix.)

The scanning instrument is calibrated on a semi-annual frequency.

G. Inspection/assessment of supplies and consumables

The demonstration survey did not require supplies or consumables considered critical to the project. Supplies and consumables were obtained from common vendors or supply routes. No specific acceptance criteria were established for this item.

H. Non-direct measurements

The Phase 1 demonstration survey did not use data for project implementation or decision making that was obtained from non-measurement sources such as computer data bases, programs, or literature files.

I. Data management

This section describes the project's data management design.

i. Data record

This report establishes the data record to document field observations, field sampling and measurements, and data evaluations. The data record includes the following information:

ii. Identification of sample type and location

All samples were identified by type and location in accordance with Sequoyah Fuels Corporation Facility Operating Procedure G-108 "Sample Collection and Submission".

Copies of G-108 are included in Attachment 5.

iii. Chain-of-custody (CoC)

All samples will be transferred in accordance with Sequoyah Fuels Corporation Facility Operating Procedure G-108 "Sample Collection and Submission".

Copy of the CoCs are included in Attachment 1.

iv. Field log book

Copy of the available field logs or related explanation are included in Attachment 3.

v. Maps and drawings

Figure 1 describing the sample locations and scanning results was prepared under the direction of the DM.

vi. Analytical results

Copies of the analytical results are included in attachments 1 and 2.

vii. Calculation worksheets

There are no calculation worksheets applicable to this survey.

viii. Files

Data associated with this survey is maintained in hardcopy. All data records and supporting information, and this report are available directly or by reference in the Decommission File.

6.2.3 Assessment and Oversight

Assessment and oversight activities were conducted in accordance with SFC's existing quality assurance program. There were no deficiencies or other non-conforming conditions identified for the sample set described in this report.

6.2.4 Data Validation and Usability

The following elements describe the requirements for data validation and usability.

A. Data review, verification, and validation requirements

Data review included checking that data entry, transcription, and calculations were completed without error. Data review was completed under the supervision of the DM.

Data verification included evaluating for completeness, correctness, and conformance of results against the requirements of sample collection, and the data quality indicators described at Section 6.1.2.D. Data verification was completed under the supervision of the DM.

Data validation included a qualitative evaluation of whether the quality of the data set is acceptable for the intended end use. Data validation was completed under the supervision of the DM.

B. Verification and validation methods

The data verification effort was qualitative and documented as described in [SCR] and within this report.

The data validation effort was semi-quantitative and is effectively described at Section 6.2.1 D.

C. Reconciliation with user requirements

Sample results were reconciled with design requirements by direct comparison.

There were no anomalies or departure from planning assumptions.

This report describes the design, sampling and measurements, assessment and oversight, verification and validation, and interpretation of final results.

Figure 1 and Attachment 6 provide that the concrete of the Phase 1 disposal cell footprint satisfy the DCGL for total uranium. The analysis of the concrete cuttings samples is expected to substantiate this conclusion.

Attachment 7 [COMPASS] provides that the soils of the Phase 1 disposal cell footprint satisfy the DCGL for total uranium.

7.0 Records

Table 1 Demonstration Survey, Phase 1 Disposal Cell Footprint, soil sample results

Table 2 Site Characterization, around Phase 1 Disposal Cell Footprint, soil sample results

Figure 1 Demonstration Survey, Phase 1 Disposal Cell Footprint, soil sample locations and scanning results

Attachment 1 Soil sample chains-of-custody

Attachment 2 Laboratory Analysis Reports

Attachment 3 Soil sample field log

Attachment 4 Scanning instrument calibration

Attachment 5 Implementing procedures and instructions

Attachment 6 Scanning assessment

Attachment 7 COMPASS: report, plan, & assessment

Approval

John H. Ellis — Project Manager — 9/30/09 — Date

Scott C. Munro — Manager, Health and Safety (Decision Maker) — 9/30/2009 — Date

Craig D. Pugh — Quality Assurance — 9/30/2009 — Date

Table 1
Demonstration Survey
Phase 1 Disposal Cell Footprint

Location	Sample Top feet	Sample Bottom feet	Total Uranium µg/g	Total Uranium pCi/g	Sample Date	CoC*
BH087	0.50	1.00	< 5.00	< 3	12/17/1990	E0021-91
	1.50	2.00	< 5.00	< 3		
	2.50	3.00	< 5.00	< 3		
	4.00	4.50	< 5.00	< 3		
	5.00	5.50	< 5.00	< 3		
	6.00	6.50	< 5.00	< 3		
	18.00	20.00	< 5.00	< 3	12/19/1990	E0153-91
	20.00	22.00	< 5.00	< 3		
	22.00	24.00	< 5.00	< 3		
	24.00	26.00	< 5.00	< 3		
	26.00	28.00	< 5.00	< 3		
	28.00	30.00	< 5.00	< 3		
	30.00	32.00	< 5.00	< 3		
	32.00	34.00	< 5.00	< 3		
	34.00	36.00	< 5.00	< 3		
	36.00	38.00	< 5.00	< 3		
	38.00	40.00	< 5.00	< 3		
	40.00	42.00	< 5.00	< 3		
	42.00	44.00	< 5.00	< 3		
	44.00	46.00	< 5.00	< 3		
BH088	0.50	1.00	7.80	5	12/18/1990	E0022-91
	1.50	2.00	< 5.00	< 3		
	2.00	2.50	< 5.00	< 3		
	4.00	4.60	< 5.00	< 3		
	9.00	9.50	< 5.00	< 3		
	10.00	10.50	< 5.00	< 3		
	14.00	14.50	< 5.00	< 3		
	22.00	24.00	< 5.00	< 3	12/19/1990	E0156-91
	24.00	26.00	< 5.00	< 3		
	26.00	28.00	< 5.00	< 3		
	28.00	30.00	< 5.00	< 3		
	30.00	32.00	< 5.00	< 3		
	32.00	34.00	< 5.00	< 3		
	34.00	36.00	< 5.00	< 3		
	36.00	38.00	< 5.00	< 3		
	38.00	40.00	< 5.00	< 3		
	40.00	42.00	< 5.00	< 3		
	42.00	44.00	< 5.00	< 3		
	44.00	45.00	< 5.00	< 3		
BH217	0.00	0.20	< 5.00	< 3	3/5/1991	E0287-91
	0.70	1.20	101.00	68	3/12/1991	E0354-91
	1.20	1.70	< 5.00	< 3		
	1.70	2.20	< 5.00	< 3		
	2.20	2.70	< 5.00	< 3		
	2.70	3.20	< 5.00	< 3		
	3.20	3.70	< 5.00	< 3		
	3.70	4.20	< 5.00	< 3		
	4.20	4.70	< 5.00	< 3		
	4.70	5.00	< 5.00	< 3		
BH218	0.00	0.20	19.00	13	3/5/1991	E0287-91
BH223	0.70	1.20	33.00	22	3/11/1991	E0353-91
	1.20	1.60	< 5.00	< 3		
	2.50	3.00	< 5.00	< 3		
	3.00	3.50	< 5.00	< 3		
BH224	0.00	0.20	< 5.00	< 3	3/5/1991	E0287-91
	0.70	1.20	< 5.00	< 3	3/11/1991	E0352-91
	2.50	3.00	< 5.00	< 3		
	3.00	3.50	< 5.00	< 3		
	3.50	3.90	< 5.00	< 3		
BH320	0.50	1.00	7.50	5	6/27/1991	E0973-91
	1.00	2.00	14.00	9		
	2.00	3.00	10.30	7		
HA646	0.00	0.50	24.50	17	1/14/2004	SF040007
	0.50	1.00	10.20	7		
HA651	0.00	0.25	76.10	52	2/9/2004	SF040038
HA652	0.00	0.50	13.90	9	2/9/2004	SF040038
	0.50	0.75	14.50	10		
HA834[+]	0.00	0.50	n/a	n/a	9/18/2009	SF09326

* CoC = Chain-of-Custody

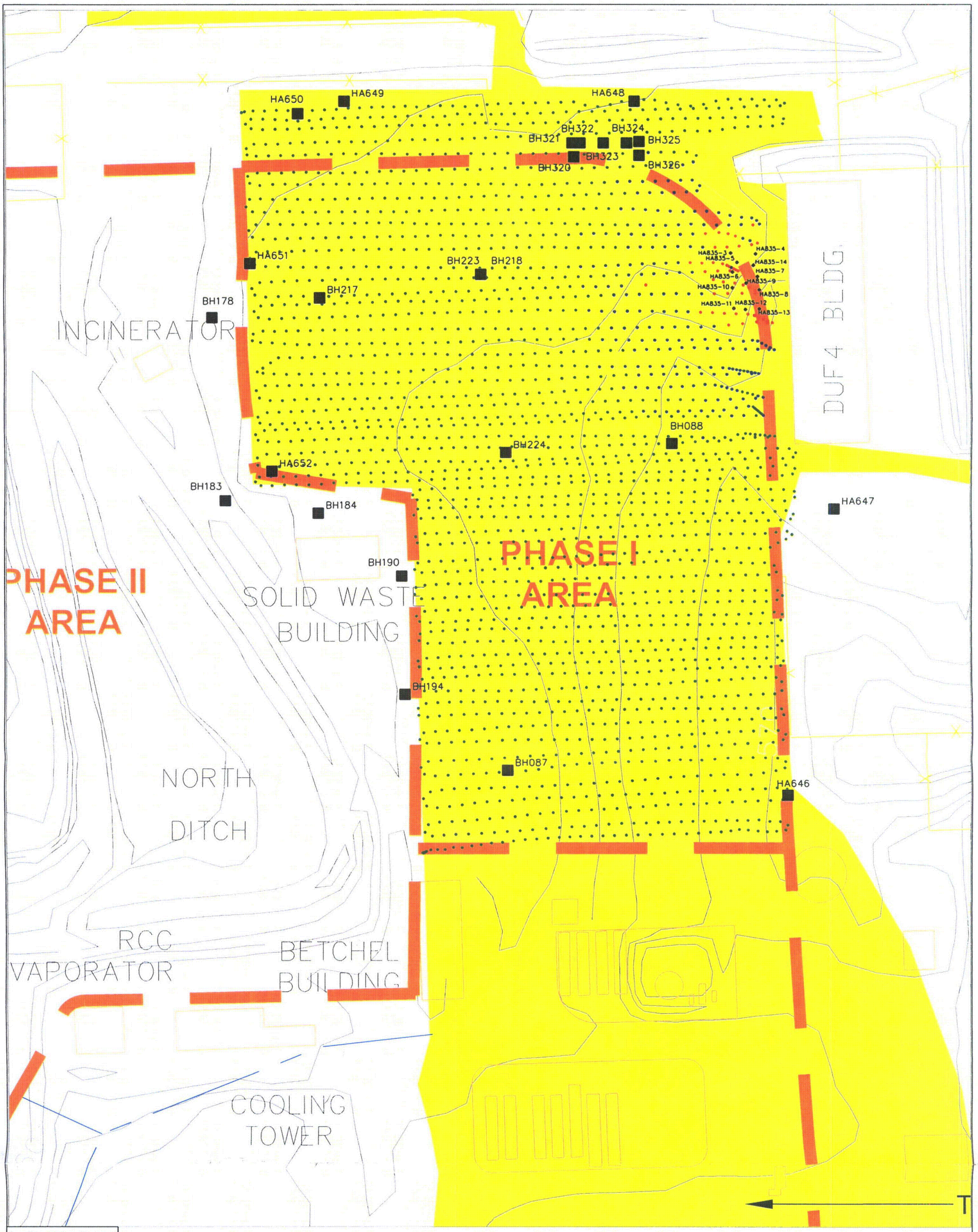
[+] A composite sample of 12 concrete corings.

n/a = not available (result expected 27Oct09)

Table 2
Site Characterization
around Phase 1 Disposal Cell Footprint

Location	Sample Top feet	Sample Bottom feet	Total Uranium µg/g	Total Uranium pCi/g	Sample Date	CoC*
BH178	0.00	0.50	322.00	218	3/27/1991	E0567-91
	1.00	1.50	7.70	5		
	2.00	2.50	< 5.00	< 3		
	3.00	3.50	< 5.00	< 3		
	4.00	4.50	< 5.00	< 3		
BH183	0.00	0.50	234.00	158	4/10/1991	E0610-91
	1.00	1.50	35.30	24		
	2.00	2.50	< 5.00	< 3		
	3.00	3.50	5.40	4		
	4.00	4.50	2.90	2		
BH184	0.00	0.50	136.00	92	3/28/1991	E0572-91
	1.00	1.50	6.80	5		
	2.00	2.50	< 5.00	< 3		
	3.00	3.50	< 5.00	< 3		
	4.00	4.50	< 5.00	< 3		
BH190	0.00	0.50	18.40	12	4/4/1991	E0608-91
	1.00	1.50	6.30	4		
	2.00	2.50	< 5.00	< 3		
	3.00	3.50	< 5.00	< 3		
BH194	0.00	0.50	16.40	11	4/3/1991	E0609-91
	1.00	1.50	31.60	21		
	2.00	2.50	17.00	12		
	3.00	3.50	< 5.00	< 3		
	4.00	4.50	< 5.00	< 3		
BH321	0.50	1.00	< 5.00	< 3	6/27/1991	E0973-91
	1.00	2.00	7.40	5		
	2.00	3.00	9.20	6		
BH322	0.50	1.00	< 5.00	< 3	6/27/1991	E0973-91
	1.00	2.00	14.00	9		
	2.00	3.00	14.20	10		
BH323	0.50	1.00	26.00	18	6/27/1991	E0973-91
	1.00	2.00	53.40	36		
	2.00	3.00	43.80	30		
BH324	0.50	1.00	15.10	10	6/27/1991	E0973-91
	1.00	2.00	17.10	12		
	2.00	3.00	17.30	12		
BH325	0.50	1.00	< 5.00	< 3	6/27/1991	E0973-91
	1.00	2.00	5.40	4		
	2.00	3.00	< 5.00	< 3		
BH326	0.50	1.00	10.50	7	6/27/1991	E0973-91
	1.00	2.00	16.80	11		
	2.00	3.00	21.10	14		
HA647	0.00	0.50	20.30	14	1/14/2004	SF040007
	0.50	0.75	11.10	8		
HA648	0.00	0.50	2.93	2	1/14/2004	SF040007
	0.50	1.00	7.19	5		
HA649	0.00	0.50	156.00	106	1/14/2004	SF040007
	0.50	1.00	348.00	236		
HA649	1.00	1.50	76.60	52	2/9/2004	SF040038
	1.50	2.00	70.10	47		
HA650	0.00	0.50	50.60	34	2/9/2004	SF040038

* CoC = Chain-of-Custody



SEQUOYAH FUELS CORPORATION
Phase I Demonstration Survey

TITLE: Survey and Sample Locations

PREPARED BY: SCM

REVIEWED BY: RHM

DATE: 22 Sep 2009

FILENAME: Phase I Demonstration Survey.dwg

FIGURE NO. 1

Attachment 1

Chains-of-Custody

Soil Samples

SPC-4000-1

90- 000828

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
Carol Couch	12-17-90	

Comments/Copies to: M Nichols, C Couch, L Lacey, L Parker RSA Wild 1/4/91 1130

Dispatched by (SIGNATURE)	Date	Time	Received by Lab(Signature)	Date	Time
James W. Johnson	12/17/90	3:15	Mont M.	12-17-90	15:45

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U- 40 µg/g Pu 1/4/91 HH

F- 350 µg/g

Run 1 sample for all analysis for every 1 foot. per Kenneth Schilz

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

SAMPLE: Effluent ☐ Ground Water ☐ Other ☐
Solid ☑ Surface Water ☐

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	F-ISE LAB	ANALYSIS REQUESTED			
			Comp	Grab	Mech	Man.						
BH-87 Soil								V HH2	U µg/g	F µg/g	NO3 N	% moist
S-1 .5-1.0'			✓				1	<5	<400	180	44	16.52
S-2 1.0'-1.5'							1					
S-3 1.5'-2.0'		S-1					1	<5	<400	292	2	16.34
S-4 2.0'-2.5'							1					
S-5 2.5-3.0'		F 5/6 180.0					1	<5	<400	777	29	22.82
S-6 4.0'-4.5'		NOT 160					1	<5	<400	804	30	23.19
S-7 4.5'-5.0'							1					
S-8 5.0'-5.5'		CK (F) DATA SHEET					1	<5	<400	681	42	21.45
S-9 5.5-6.0'							1					
S-10 6.0'-6.5'							1	<5	<400	699 R3/6/91	30	6.13

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above MCF

- ☐ Mail results to submitter(s) when complete. Date Notified _____ Phone ☐
- ☐ Notify submitter when analyses complete and arrange a hand transfer of report sheet. Time Notified _____ Mail ☐
- ☑ Notify submitter as soon as possible during normal working hours. Hand to Hand ☐
- ☐ Notify submitter or designee immediately. Signature _____
- ☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.

Sample Disposition: Discard___, Return___, Retain✓	Lab Approval	Date Reported	Lab Report Number
Note: Sample Bottles Must Be Flagged for Return or Retain.	Robert F. Bent	1-3-91	901971
Note: Samples sent to the Environmental Lab for Fluoride Analysis.	3-7-91		IF-0021-90

-4000-1

90- 000838

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
CAROL Couch	12-18-90	

Comments/Copies to: M. Nichols, L. Lacey, R. Parker, C. Couch, R.S.A. 1/4/91 1130

Dispatched by (SIGNATURE)	Date	Time	Received by Lab(Signature)	Date	Time
James W Johnston	12/18/90	10:45	[signature]	12-18-90	1100

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U 40.0 ug/g
F = 350.0 ug/g
NO3
% moist

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

SAMPLE: Effluent ☐ Ground Water ☐ Other ☐
Solid ☒ Surface Water ☐

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	ANALYSIS REQUESTED			
			Comp	Grab	Mech	Man.		ENV LAB U ug/g	U 40.0 ug/g	F=350.0 ug/g	NO3 % moist
BH-88 S-1 .5-1.0'	12/10/90		X				1	2.8	<400	268	44 18.59
S-2 1.0-1.5'											
S-3 1.5-2.0'								<5	<400	383	16 18.84
S-4 2.0'-2.5'								<5	<400	317	6 17.72
S-5 4.0-4.6'								<5	<400	343	10 22.13
S-6 9.0-9.5								<5	<400	274	1 17.81
S-7 9.5-10.0											
S-8 10.0-10.5'								<5	<400	438	1 18.69
S-9 10.5-11.0'											
S-10 14.0-14.5'								<5	<400	639	1 18.48
S-11 14.5-15.0'								not		3/1/91	

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

☐	Mail results to submitter(s) when complete.	Date Notified	Phone ☐
☐	Notify submitter when analyses complete and arrange a hand transfer of report sheet.	Time Notified	Mail ☐
☒	Notify submitter as soon as possible during normal working hours.		Hand to Hand ☒
☒	Notify submitter or designee immediately.	Signature	
☐	Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.		

Sample Disposition: Discard___, Return___, Retain ✓	Lab Approval	Date Reported	Lab Report Number
Note: Sample Bottles Must Be Flagged for Return or Retain.	[signature]	1-3-91	90 1990
Note: Samples sent to Environmental Lab for Fluoride Analysis.	[signature]	3-8-91	F-0022-91

SPC-4000-1

90-000876

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
C Couch	12-21-90	

Comments/Copies to: C. Couch, M. Nichols, L. Lacey, R Parker R.S.A.

Dispatched by (SIGNATURE)	Date	Time	Received by Lab (Signature)	Date	Time
James W Johnson	12/21/90	9:00 AM	[signature]	12/21/90	1035

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U = 40.0 ug/g
F = 350.0 ug/g

Env Lab Received 2-1-91

Note: Samples were sent to the Environmental Lab for analysis after the uranium analyses were completed.

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

SAMPLE: Effluent ☐ Ground Water ☐ Other ☐
Solid ☒ Surface Water ☐

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED			
			Comp	Grab	Mech	Man.			U=40.0 ug/g	F=350.0 ug/g	NO_3 mg/gm	ENV. LAB REPORT U. µg/g
MW 79-A												
S-1 18-20' ✓	12/19/90	9:00		X			1		<400	596	7.3	<5
S-2 20-22' ✓							1		<400	464	7.5	<5
S-3 22-24' ✓							1		<400	526	8.1	<5
S-11 24-26' ✓							1		<400	471	20.7	<5
S-5 26-28' ✓							1		<400	280	25.5	<5
S-6 28-30' ✓							1		<400	291	23.7	<5
S-7 30-32' ✓							1		<400	302	20.6	<5
S-8 32-34' ✓							1		<400	334	16.4	<5
S-9 34-36' ✓							1		<400	540	15.5	<5
S-10 36-38' ✓							1		<400	237	10.1	<5
S-11 38-40' ✓							1		<400	269	16.3	<5

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

- ☐ Mail results to submitter(s) when complete.
- ☐ Notify submitter when analyses complete and arrange a hand transfer of report sheet.
- ☒ Notify submitter as soon as possible during normal working hours.
- ☒ Notify submitter or designee immediately.
- ☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.

Date Notified _____ Phone ☐
Time Notified _____ Mail ☐
Hand to Hand ☒
Signature _____

Sample Disposition: Discard___, Return___, Retain☒ Note: Sample Bottles Must Be Flagged for Return or Retain.	Lab Approval	Date Reported	Lab Report Number
	[signature]	1-29-91	90 2022
	[signature]	3-22-91	E0153-91

SPC-4000-1

90- 000877

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
C. Couch	12/21/90	

Comments/Copies to: C. Couch, M. Nichols, L. Lacey, R. Parker, R.S.A.

Dispatched by (SIGNATURE)	Date	Time	Received by Lab (Signature)	Date	Time
James W. Johnson	12/21/90	9100 AM		12/21/90	1035

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U = 400 ug/g
F = 350.0 ug/g

Note: Samples were sent to the Environmental Lab for analysis after the Uranium analyses were completed.

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

SAMPLE: Effluent ☐ Ground Water ☐ Other ☐
Solid ☐ Surface Water ☒

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED			
			Comp	Grab	Mech	Man.			U=400.0 ug/g	F=350.0 ug/g	NO3 mg/g	ENV. LAB REPORT ug/g
MW-77-A												
S-12 40-42' ✓				X			1		<400	356	14.3	<5
S-13 42-44' ✓							1		<400	655	21.8	<5
S-14 ~~40~~ 44-46' ✓							1		<400	683	12.7	<5
												2-20-91 D
										3/15/91	3/21/91	

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

- ☐ Mail results to submitter(s) when complete.
- ☐ Notify submitter when analyses complete and arrange a hand transfer of report sheet.
- ☒ Notify submitter as soon as possible during normal working hours.
- ☒ Notify submitter or designee immediately.
- ☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.

Date Notified _____ Phone ☐
Time Notified _____ Mail ☐
Hand to Hand ☒
Signature _____

Sample Disposition: Discard___, Return___, Retain X Note: Sample Bottles Must Be Flagged for Return or Retain.	Lab Approval	Date Reported	Lab Report Number
	Robert F. Beck	1-29-91	90 2023

3-22-91 IE0153-91

SFC-4000-1

90- 000880

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
C. Couch	12-21-90	

Comments/Copies to: C. Couch, M. Nichols, L. Lucas, R. Parker, RSA

Dispatched by (SIGNATURE)	Date	Time	Received by Lab (Signature)	Date	Time
James W Johnston	12/21/90	9:00 AM		12/21/90	1020

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.
U = 40.0 ug/g
F = 350.0 ug/g

End Received Samples 2-1-91

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

Note: Samples were sent to the Environmental Lab for analysis after the Uranium analyses were completed.

SAMPLE: Effluent ☐ Ground Water ☐ Other ☐ Solid ☒ Surface Water ☐

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED			
			Comp	Grab	Mech	Man.			U = 40.0 ug/g	F = 350.0 ug/g	NO_3 mg/gm	ENV. LAB REPORT U. µg/g
NEW SOIL												
S-1 22-24 ✓	12/11/90	0700		X			1		<400	346	28.2	<5
S-2 24-26 ✓							1		<400	559	14.2	<5
S-3 26-28 ✓							1		<400	591	11.3	<5
S-4 28-30 ✓							1		<400	437	22.1	<5
S-5 30-32 ✓							1		<400	265	22.5	<5
S-6 32-34 ✓							1		<400	287	21.9	<5
S-7 34-36 ✓							1		<400	396	18.9	<5
S-8 36-38 ✓							1		<400	318	19.2	<5
S-9 38-40 ✓							1		<400	514	15.9	<5
S-10 40-42 ✓							1		<400	272	18.3	<5
S-11 42-44 ✓							1		<400	389	18.2	<5

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

☐	Mail results to submitter(s) when complete.	Date Notified	Phone ☐
☐	Notify submitter when analyses complete and arrange a hand transfer of report sheet.	Time Notified	Mail ☐
☒	Notify submitter as soon as possible during normal working hours.		Hand to Hand ☒
☒	Notify submitter or designee immediately.	Signature	
☐	Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.		

Sample Disposition: Discard___, Return___, Retain ✓ Note: Sample Bottles Must Be Flagged for Return or Retain.	Lab Approval	Date Reported	Lab Report Number
	Robert F. Bent	1-29-91	90 2014
	3-22-91		E0156-91

S[illegible]-4000-1

90- 000881

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
C. Couch	12-21-90	

Comments/Copies to: C. Couch, L. Lacey, M. Nichols, R. Parker, R.S.I.

Dispatched by (SIGNATURE)	Date	Time	Received by Lab (Signature)	Date	Time
James W Johnson	12/21/90	9:00 AM		12/21/90	1030

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U = 40.0 ug/g

F = 350.0 ug/g

Note: Samples were sent to the Environmental Lab for analysis after the Uranium Analyses were completed.

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

SAMPLE: Effluent ☐ Ground Water ☐ Other ☐ Solid ☒ Surface Water ☐

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED			
			Comp	Grab	Mech	Man.			U=40.0 ug/g	F=350.0 ug/g	NO_3 mg/g	ENV. LAB REPORT U. µg/g
MW-50A S-12 44-45 ✓	12/19/90	9:00		X			1		<400	462	13.6	<5
										3/19/91	3/21/91	2-20-91 (D)

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

- ☐ Mail results to submitter(s) when complete.
- ☐ Notify submitter when analyses complete and arrange a hand transfer of report sheet.
- ☒ Notify submitter as soon as possible during normal working hours.
- ☒ Notify submitter or designee immediately.
- ☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.

Date Notified _____ Phone ☐

Time Notified _____ Mail ☐

Hand to Hand ☑

Signature _____

Sample Disposition: Discard___, Return___, Retain ☒ Note: Sample Bottles Must Be Flagged for Return or Retain.	Lab Approval	Date Reported	Lab Report Number
	Robert D. Bell	1-29-91	90-2015
	[signature]	3-22-91	E0156-91

SFC-4000-2

91- 00490

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
Carol Couch	3-5-91	ASAP

Comments/Copies to: L. Lacy - R. Parker - C Couch M Nichols - RSA

Dispatched by (SIGNATURE)	Date	Time	Received by Lab(Signature)	Date	Time
	3-5-91	1706		3/5/91	17:10

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U 40.0 ug/g F 350 ug/g % Moist

NO_3 —

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

SAMPLE: ☐ Ground Water ☑ Solid ☐ Other ☐ Surface Water ☐ Effluent

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED				
			Comp	Grab	Mech	Man.			U ug/g	F ug/g	% moist	NO_3 ug/g	
Coring Soil													
C-1 BH096	3-5-91	08:00	✓				1		<5	130	6.8	(424)	— check
C-2 BH096A			✓				1		<5	92	9.3	150.5	
C-3 BH095			✓				1		42	78	10.0	315.8	
C-4 BH095A			✓				1		141.	172	18.8	577.7	
C-5 BH 236			✓				1		129.	732	17.7	225.8	
C-6 BH 237			✓				1		37.	64	1.5	372.1	
C-7 BH 245			✓				1		<5.	59	1.0	69.5	
C-8 BH250			✓				1		487.	136	16.7	226.4	
C-9 BH 224			✓				1		<5.	63	12.8	151.7	
C-10 BH 218			✓				1		<5.	58	14.7	308.4	
C-11 BH 219		1600	✓				1		19.	325	13.1	84.67	
First 2" of fill Sand below Concrete Coring -									4-2-91 (D)	4/17/91	4-3-91	4/17/91	

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

☒ Notify submitter as soon as possible during normal working hours.	Date Notified		Hand to Hand ☐
☐ Notify submitter or designee immediately.	Time Notified		Phone ☐
☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.	Signature		Mail ☐

Sample Disposition: Discard___, Return___, Retain X Note: Sample Bottles Must Be Flagged for Return or Retain.	Lab Approval	Date Reported	Lab Report Number
		4-18-91	E-0287-91

SFC-4000-2

91- 00401

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
Carol Couch	3-12-91	ASAP

Comments/Copies to: M. Nichols, R. Parker, C. Lacey, RSA

Dispatched by (SIGNATURE)	Date	Time	Received by Lab(Signature)	Date	Time
James A Johnson	3-13-91	0950	B. Cawhorn	3-13-91	0950

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U - 40 ug/g
F - 350 ug/g
NO_3 -

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

SAMPLE: ☐ Ground Water ☑ Solid ☐ Other ☐ Surface Water ☐ Effluent

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED				
			Comp	Grab	Mech	Man.			U ug/g	F ug/g	NO_3	%M	
SC-154	3-11-91												
S-1 (.7-1.2)			✓				1		<5	143	93.1	10.1	
S-2 (2.5-3)									<5	351	5.4	14.4	
S-3 (3-3.5)									<5	371	8.4	15.0	
S-4 (3.5-3.9)									<5	313	7.2	13.0	
									4-2-91	4/15/91	4/15/91	4-3-91	

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

- ✓ Notify submitter as soon as possible during normal working hours.
- ☐ Notify submitter or designee immediately.
- ☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.

Date Notified _____ Hand to Hand ☐
Time Notified _____ Phone ☐
Signature _____ Mail ☐

Sample Disposition: Discard___, Return___, Retain___
Note: Sample Bottles Must Be Flagged for Return or Retain.

Lab Approval

Date Reported 4/16/91

Lab Report Number E-0352-91

SFC-4000-2

91- 01071

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
Carol Couch	3-13-91	ASAP

Comments/Copies to: M. Nichols, R. Parker, L. Leary RSA

Dispatched by (SIGNATURE)	Date	Time	Received by Lab(Signature)	Date	Time
James W Johnson	3-13-91	0950	B. Cawhorn	3-13-91	0950

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U 40 mg/g
F - 350 mg/g
NO_3

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

BH223

SAMPLE: ☐ Ground Water ☑ Solid ☐ Other ☐ Surface Water ☐ Effluent

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED			
			Comp	Grab	Mech	Man.			U mg/g	F mg/g	NO_3	%M
SC-2	3-11-91		✓				1		33.	296	264.7	10.0
S-1 (.7-1.2)	↓		↓				↓		<5.	256	105.5	9.3
S-2 (1.2-1.6)									<5.	122	11.0	9.6
S-3 (2.5-3)									<5.	210	11.3	12.2
S-4 (3-3.5)												
									4-3-91	4/16/91	4/15/91	4-3-91
									D	R	R	

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

- ✓ Notify submitter as soon as possible during normal working hours.
- ☐ Notify submitter or designee immediately.
- ☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.

Date Notified _____ Hand to Hand ☐
Time Notified _____ Phone ☐
Signature _____ Mail ☐

Sample Disposition: Discard___, Return___, Retain___
Note: Sample Bottles Must Be Flagged for Return or Retain.

Lab Approval

Date Reported 4-17-91

Lab Report Number E-0353-91

SFC-4000-2

91- 00400

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
Carol Couch	3-12-91	ASAP

Comments/Copies to: M. Nichols, R. Parker, L. Lacey, RSA

Dispatched by (SIGNATURE)	Date	Time	Received by Lab(Signature)	Date	Time
James W Johnston	3-13-91	0950	B. Cawhorn	3-13-91	0950

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U - 40 mg/L
F - 350 mg/L
NO_3 -

STAMP SAMPLE TYPE HERE: ENVIRONMENTAL

BH21

SAMPLE: ☐ Ground Water ☑ Solid ☐ Other ☐ Surface Water ☐ Effluent

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD: Comp	Grab	Mech	Man.	NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED: U-mg/g	F-mg/g	NO_3 mg/g	Σ M
SC-3	3-12-91											
S-1 (.7-1.2)			✓				1		101	269	194.0	10.5
S-2 (1.2-1.7)									<5	136	49.3	8.4
S-3 (1.7-2.2)									<5	186	6.2	8.9
S-4 (2.2-2.7)									<5	235	8.1	10.7
S-5 (2.7-3.2)									<5	313	4.3	14.0
S-6 (3.2-3.7)									<5	216	4.6	11.1
S-7 (3.7-4.2)									<5	399	5.2	15.2
S-8 (4.2-4.7)									<5	393	7.4	16.4
S-9 (4.7-5.0)									<5	313	8.8	15.6
									4-3-91 (D)	4/16/91	4/5/91	4-3-91

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

- ✓ Notify submitter as soon as possible during normal working hours.
- ☐ Notify submitter or designee immediately.
- ☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.

Date Notified _____ Hand to Hand ☐
Time Notified _____ Phone ☐
Signature _____ Mail ☐

Sample Disposition: Discard___, Return___, Retain___
Note: Sample Bottles Must Be Flagged for Return or Retain.

Lab Approval

Date Reported: 4-17-91

Lab Report Number: E-0354-91

Hydrogen Tank Soils
NEAR DUF4

1/2

SFC-4000-2

91- 00331

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
K. Schlag	6-28-91	7-19-91

Comments/Copies to: C. Couch

Dispatched by (SIGNATURE)	Date	Time	Received by Lab (Signature)	Date	Time
Kenny Schlag	6-28-91	15:45		6/28/91	16:18

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U - ~~20~~ mg/g
F - 350 mg/g
N - 200 mg/g

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

OTO25 Thru OTO45

SAMPLE: ☐ Ground Water ☒ Solid ☐ Other ☐ Surface Water ☐ Effluent

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD: Comp	Grab	Mech.	Man.	NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED: U µg/g	F µg/g	NO3 µg/g	% Moist
	BH320											
Hole 1-A	6-27-91	BH=67 OTO25	0.5-1.0	X			1		7.5	209	86.7	22.4
Hole 1-B		OTO26	~~1.0-3.0~~	X			1		14.0	216	28.1	9.9
Hole 1-C		OTO27	~~2.0~~ 3.0	X			1		10.3	182	19.3	7.6
Hole 2-A	BH321	BH=65 OTO28		X			1		<5	178	22.6	6.6
-B		OTO29							7.4	268	13.2	18.2
-C		OTO30							9.2	202	20.1	19.3
Hole 3-A	BH322	BH=20 OTO31							<5	140	30.6	6.6
-B		OTO32							14.0	219	18.3	13.5
-C		OTO33							14.2	277	22.4	12.7
Hole 4-A	BH323	BH=60 OTO34							26.0	206	26.6	13.3
-B		OTO35							53.4	208	15.7	12.7
-C		OTO36							43.8	206	21.0	12.1
Hole 5-A	BH324	BH=61 OTO37							15.1	144	18.4	10.8
B		OTO38					1		17.1	226	52.6	9.9
C		OTO39					1		17.3	272	29.2	11.0
Hole 6-A	BH325	BH=62 OTO40					1		<5	210	35.7	10.3
-B		OTO41					1		5.4	231	28.2	10.6
-C		OTO42					1		<5	~~210~~	29.3	11.3

These are the Yellow Posts put in around the Hydrogen Tank West of DUF4.

2, 3, 4, 5, 6, 7 on one side
1, 7 on other side

3, 4, 5, 6

2, 7

1

ASK EMMA or LARRY to verify

NOTIFICATION LEVELS: Notify if parameter(s) ... ted above.

☒ Notify submitter as soon as possible during ...	Date Notified		Hand to Hand ☐
☐ Notify submitter or designee immediately.	Time Notified		Phone ☐
☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.	Signature		Mail ☐

Sample Disposition: Discard___, Return___, Retain ✗	Lab Approval	Date Reported	Lab Report Number
Note: Sample Bottles Must Be Flagged for Return or Retain.		7-17-91	E0973-91

SFC-4000-2

91- 00332

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed
K. SCHLAG	6-28-91	7-19-91

Comments/Copies to: C. Couch

Dispatched by (SIGNATURE)	Date	Time	Received by Lab (Signature)	Date	Time
Kenny Schlag	6-28-91	15:45		6/28/91	6:18

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

U - 90 mg/g
F - 350 mg/g
N - 200 mg/g

STAMP SAMPLE TYPE HERE

ENVIRONMENTAL

SAMPLE: ☐ Ground Water ☐ Surface Water ☐ Solid ☐ Effluent ☐ Other

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD: Comp	Grab	Mech	Man.	NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED: U	F µg/g	NO_3 µg/g		% Moist
	Bit 326												
HOLE 7-A	6-27-91	~~11:12~~		X				1	10.5	201	44.2		9.7
-B	"	~~11:14~~		X				1	16.8	181	207.4		9.1
-C	"	~~11:16~~		X				1	21.1	172	240.3		7.3
									7-17-91 TBC	7/18/91	7/15/91		7/22/91

A = 0.5 - 1.0 ~~0~~
B = 1.0 - 2.0
C = ~~20~~.0 - ~~30~~.0

SEQUOYAH FUELS CORPORATION
RADIATION RELEASE
Location 326 Bldg. Date 6/28/91
Released By [signature] Health Physics
SFC-3007

21 bags soil samples to E.L.

NOTIFICATION: Notify if parameter(s) are above the action levels listed above.

X Notify submitter as soon as possible during normal working hours.	Date Notified		Hand to Hand ☐
☐ Notify submitter or designee immediately.	Time Notified		Phone ☐
☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.	Signature		Mail ☐

Sample Disposition: Discard___, Return___, Retain X
Note: Sample Bottles Must Be Flagged for Return or Retain.

Lab Approval [signature]

Date Reported 7-17-91

Lab Report Number E0973-91

OUTREACH LABORATORY

311 North Aspen
Broken Arrow, OK 74012
Phone: (918) 251-2515
Fax: (918) 251-0008

CHAIN OF CUSTODY

Results To: Company Sequoyah Fuels Corp
Name
Address
City State Zip
Phone Fax #

Bill To:
Company
Name
Address
City State Zip

ANALYSIS REQUESTED

PO #
PROJECT # SF04-007
PROJECT NAME
REQUESTED TURNAROUND TIME (ADDITIONAL CHARGES MAY APPLY) 1/30/2004
SAMPLER Signature

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	# CONTAINERS	CONTAINER SIZE / PLASTIC OR GLASS	PRESERVATIVE # (1. HNO_3 pH<2; 2. Ice <4°C; 3. HCl pH<2; 4. H_2SO_4 pH<2; 5. NaOH pH>11)	U, Pu, Th								REMARKS (I.E. FILTERED, UNFILTERED, GRAB, COMPOSITE)
1	HA646 0-0.5'	~~1/14/04~~	1330	S	1	P		X								
2	HA646 0.5-1.0'	1/14/04	1334	S	1	P		X								
3	Q-HA646 0.5-1.0'	1/14/04	1334	S	1	P		X								Field Duplicate
4	HA647 0-0.5'	1/14/04	1341	S	1	P		X								
5	HA647 0.5-0.75'	1/14/04	1345	S	1	P		X								
6	HA648 0-0.5'	1/14/04	1352	S	1	P		X								
7	HA648 0.5-1.0'	1/14/04	1354	S	1	P		X								
8	HA649 0-0.5'	1/14/04	1400	S	1	P		X								
9	HA649 0.5-1.0'	1/14/04	1405	S	1	P		X								

RELINQUISHED BY: DATE 1/15/04 TIME 1115 RECEIVED BY: DATE 1/16 TIME 10:15

RELINQUISHED BY: DATE TIME RECEIVED BY: DATE TIME

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis. The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance carried over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/DISPOSAL: All non-hazardous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

FOR LABORATORY USE ONLY: 20040037

Sample Condition Upon Receipt good
Custody Seals Intact (Y) N
Cooler Temperature 8.5

OUTREACH LABORATORY

311 North Aspen
Broken Arrow, OK 74012
Phone: (918) 251-2515
Fax: (918) 251-0008

CHAIN OF CUSTODY

Results To:
Company SEQUOYAH FUELS CORP
Name
Address
City State Zip
Phone Fax #

Bill To:
Company
Name
Address
City State Zip

ANALYSIS REQUESTED

PO #
PROJECT # SF04-038
PROJECT NAME
REQUESTED TURNAROUND TIME (ADDITIONAL CHARGES MAY APPLY) 2/25/14
SAMPLER Signature

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	# CONTAINERS	CONTAINER SIZE / PLASTIC OR GLASS	PRESERVATIVE # (1. HNO_3 pH<2; 2. Ice <4°C; 3. HCl pH<2; 4. H_2SO_4 pH<2; 5. NaOH pH>11)	U-Nat								REMARKS (I.E. FILTERED, UNFILTERED, GRAB, COMPOSITE)
	HA649 1.0-1.5	2/9/14	1330	S	1	P		X								
	HA649 1.5-2.0	2/9/14	1335	S	1	P		X								
	HA650 0.0-0.5	2/9/14	1045	S	1	P		X								
	HA651 0.0-0.25	2/9/14	1100	S	1	P		X								
	HA652 0.0-0.5	2/9/14	1030	S	1	P		X								
	HA652 0.5-0.75	2/9/14	1035	S	1	P		X								

RELINQUISHED BY: Maxwell DATE 2/12/14 TIME 1320 RECEIVED BY: Jon Lewis DATE 2/13 TIME 8:45

RELINQUISHED BY: DATE TIME RECEIVED BY: DATE TIME

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis. The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance carried over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/DISPOSAL: All non-hazardous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

FOR LABORATORY USE ONLY: 20040102

Sample Condition Upon Receipt good
Custody Seals Intact Y N
Cooler Temperature 3c

Attachment 2

Laboratory Analysis Reports

Soil Samples

The laboratory analysis results for samples collected in 1991 are included on the respective chain-of-custody. Copy of the chains-of-custody is provided in Attachment 1 of this report.

Outreach Laboratory
311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client:	Sequoyah Fuels Corp.
Client Project:	SF04-007
Lab Number:	20040037
Date Reported:	1/29/2004
Date Received:	1/16/04
Page Number:	1 of 3

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20040037-01**						
Client ID:	**HA646 0-0.5'**						
Date Sampled:	**1/14/2004 1:30:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	24.5	ug/g	0.123	1/26/2004	1/29/2004	RE
Lab ID:	**20040037-02**						
Client ID:	**HA646 0.5-1.0'**						
Date Sampled:	**1/14/2004 1:34:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	10.2	ug/g	0.107	1/26/2004	1/29/2004	RE
Lab ID:	**20040037-03**						
Client ID:	**Q-HA646 0.5-1.0'**						
Date Sampled:	**1/14/2004 1:34:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	3.45	ug/g	0.106	1/26/2004	1/29/2004	RE
Lab ID:	**20040037-04**						
Client ID:	**HA647 0-0.5'**						
Date Sampled:	**1/14/2004 1:41:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	20.3	ug/g	0.114	1/26/2004	1/29/2004	RE
Lab ID:	**20040037-05**						
Client ID:	**HA647 0.5-0.75'**						
Date Sampled:	**1/14/2004 1:45:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	11.1	ug/g	0.125	1/26/2004	1/29/2004	RE

BDL = Below Detection Limit

Outreach Laboratory
311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client:	Sequoyah Fuels Corp.
Client Project:	SF04-007
Lab Number:	20040037
Date Reported:	1/29/2004
Date Received:	1/16/04
Page Number:	2 of 3

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20040037-06**						
Client ID:	**HA648 0-0.5'**						
Date Sampled:	**1/14/2004 1:52:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	2.93	ug/g	0.107	1/26/2004	1/29/2004	RE
Lab ID:	**20040037-07**						
Client ID:	**HA648 0.5-1.0'**						
Date Sampled:	**1/14/2004 1:54:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	7.19	ug/g	0.123	1/26/2004	1/29/2004	RE
Lab ID:	**20040037-08**						
Client ID:	**HA649 0-0.5'**						
Date Sampled:	**1/14/2004 2:00:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	156	ug/g	0.123	1/26/2004	1/29/2004	RE
Lab ID:	**20040037-09**						
Client ID:	**HA649 0.5-1.0'**						
Date Sampled:	**1/14/2004 2:05:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	348	ug/g	0.121	1/26/2004	1/29/2004	RE

BDL = Below Detection Limit

Outreach Laboratory
311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client:	Sequoyah Fuels Corp.
Client Project:	SF04-007
Lab Number:	20040037
Date Reported:	1/29/2004
Date Received:	1/16/04
Page Number:	3 of 3

QC Report

Parameter	Blank	LCS %REC	LCSD %REC	LCSD RPD	DUP RPD	MS %REC	MSD %REC	MSD RPD	Date
Uranium	0.574	91.0	80.0	12.7	4.0	91.0	96.0	4.8	1/29/2004

QA Approval:

Lab Approval:

BDL = Below Detection Limit

Outreach Laboratory
311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client:	Sequoyah Fuels Corp.
Client Project:	SF04-038
Lab Number:	20040102
Date Reported:	2/25/2004
Date Received:	2/13/04
Page Number:	1 of 2

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20040102-01**						
Client ID:	**HA649 1.0 - 1.5**						
Date Sampled:	**2/9/2004 1:30:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	76.6	ug/g	0.099	2/19/2004	2/25/2004	RE
Lab ID:	**20040102-02**						
Client ID:	**HA649 1.5 - 2.0**						
Date Sampled:	**2/9/2004 1:35:00 PM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	70.1	ug/g	0.098	2/19/2004	2/25/2004	RE
Lab ID:	**20040102-03**						
Client ID:	**HA650 0.0 - 0.5**						
Date Sampled:	**2/9/2004 10:45:00 AM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	50.6	ug/g	0.099	2/19/2004	2/25/2004	RE
Lab ID:	**20040102-04**						
Client ID:	**HA651 0.0 - 0.25**						
Date Sampled:	**2/9/2004 11:00:00 AM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	76.1	ug/g	0.099	2/19/2004	2/25/2004	RE
Lab ID:	**20040102-05**						
Client ID:	**HA652 0.0 - 0.5**						
Date Sampled:	**2/9/2004 10:30:00 AM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	13.9	ug/g	0.098	2/19/2004	2/25/2004	RE

BDL = Below Detection Limit

Outreach Laboratory
311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client:	Sequoyah Fuels Corp.
Client Project:	SF04-038
Lab Number:	20040102
Date Reported:	2/25/2004
Date Received:	2/13/04
Page Number:	2 of 2

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20040102-06**						
Client ID:	**HA652 0.5 - 0.75**						
Date Sampled:	**2/9/2004 10:35:00 AM**						
Matrix:	**Soil**						
	Radiochemical Analyses						
Uranium	ASTM D 5174M	14.5	ug/g	0.094	2/19/2004	2/25/2004	RE

QC Report

Parameter	Blank	LCS %REC	LCSD %REC	LCSD RPD	DUP RPD	MS %REC	MSD %REC	MSD RPD	Date
Uranium	BDL	83.3	88.9	6.5	0.2	98.9	96.9	2.0	2/25/2004

QA Approval:

Lab Approval:

BDL = Below Detection Limit

Attachment 3

Field Log

Soil Samples

The field logs for the following sample locations are not available:

- 1990
  - BH087
  - BH088
- 1991
  - BH217
  - BH223
  - BH224
  - BH320

A field log book entry was not completed in February 2004 for sample locations HA649 through HA652.

1/5/04 Maxwell
Charged combination Stream Samples
Composited, and made out COC

1/7/04 Maxwell
Charged Combination Stream Samples
Composited, and made out COC

1/9/04 Maxwell
Charged combination Stream Samples
Composited, and made out COC

1/12/04 Linenth
CHARGED COMBINATION STREAM SAMPLES
COMPOSITED, AND MADE OUT COC.
CHANGED TUBING IN THE PERISTALIC PUMP

1/14/04 Linenth
CHARGED COMBINATION STREAM SAMPLES
COMPOSITED, AND MADE OUT COC

COLLECTED RECOVERY AND DRAINAGE SAMPLES

1/14/04 Con't K. Sinnett / S. Manson
Checked MW118 to determine if enough water present to sample:
WL 9.60 TD 10.02
Purged ~ 200 mL @ 1305 water was cloudy w/ significant suspended solids.

Collected soil samples from the following locations. Started @ 1330 hours
Sunny, 41°F @ 1600 hrs

HA646	0-0.5'	1' East of Pad Surface Silt by 3" Clay below 3"
	0.5-1.0'	Muddy clay w/ some Gravel
Collected duplicate of HA646 from 0.5-1.0'		
HA647	0-0.5'	Muddy Gravel / some Sediment
	0.5-~~to~~ 0.75'	Muddy Gravel / Some Soil
Could not hand auger deeper than 0.75'		
HA648	0-0.5'	Top Soil w/ some Gravel 3' North of Curb
	0.5-1.0'	Clay / Gravel mix (Fill)
HA649	0-0.5'	2" Top Soil 4" Clay w/ some gravel. 6' North of Pad.
	0.5-1.0'	Clay / Gravel Mix

Completed Sampling at 1405.
All sample locations were on east and north edges of Rifle Pad.

Sept 18, 2009 1430

Temp 74°F WIND NE 4

Sky: Partly Cloudy

A Kahl and A. Webb obtained Sample HA 835 by drilling the Concrete on the west side of the DLF4 Bldg, by the

the concrete drilling fines were collected from 12 points randomly selected in a 50' Square centered at the vent outlet.

Drilling depth was 6" at 10 locations and 4" at refusal at 2 locations

Attachment 4

Instrument Calibration

Scanning

GENERAL ATOMICS

Certificate of Calibration

Location:	Description	Serial Number:
SEQUOYAH	LUD 2221	97315(GAMMA
Calibration Date: 05-26-2009	Assigned To: KEN SIMEROTH	Calibration Due Date : 11/24/2009

As Found Condition:

○ Operational Failure ○ Out-of-Tolerance ● Within Tolerance

Work Performed / Parts replaced:

CALIBRATED WITH; CS-137 S/N 551379 (EFF%:900,000 CPM/MR/H FOR CS-137) SETTINGS: HV@711 , TH@102

Calibration Points :

Range	Initial Reading	Calibration Point	Final Reading
X1	100CPM	100CPM	100CPM
X1	400CPM	400CPM	400CPM
X10	1KCPM	1KCPM	1KCPM
X10	4KCPM	4KCPM	4KCPM
X100	10KCPM	10KCPM	10KCPM
X100	40KCPM	40KCPM	40KCPM
X1K	100KCPM	100KCPM	100KCPM
X1K	400KCPM	400KCPM	400KCPM

Detector Information :

Detector Model: 44-10 Detector Serial Number RN014155

Background Reading: 19,916CPM

Gross Reading: 899818CPM

Net Reading: 879902CPM

% Efficiency: 97.76%

Calibration Factor: 1.02

Comments :

900,000CPM/MR/H

Calibration Standard Information :

Instrument Calibration Standard : 37512

Detector Calibration Standard : MP-2 S/N37512

Calibration Procedure / Revision: NCP222A

Calibrated By :

5-26-09

Response Check for Gamma Meter
File Name: zgamma response check

Calibration Date	5/26/2009	Calibrator	General Atomics
Calibration Due	11/24/2009		
Meter Model	Lud 2221	S/N	97315
Prode Model	44-10	S/N	RN014155
Source	Cs-137	S/N	SFC-29

Record values for 30, 0.1 minute counts below. Record average for the 30 readings and determine +/- value by multiplying average by 0.20. Example: avg. is 1,000 x 0.2 = 200. Acceptable response check range would then be 800-1,200 counts / 0.1 min.

	cp/.1 min		cp/.1 min
1	14328	16	14335
2	14226	17	14287
3	14309	18	14314
4	14298	19	14392
5	14268	20	14008
6	14263	21	14128
7	14456	22	14293
8	14313	23	14394
9	14324	24	14264
10	14269	25	14351
11	14314	26	14254
12	14206	27	14291
13	14490	28	14377
14	14146	29	14143
15	14343	30	14501

Average=	14296	+/- avg x.2=	2859
Upper Limit	17155	Lower Limit	11437

Performed by _____ Date 5/29/09

Reviewed by _____ Date 6/2/09

13,000 - 28,000

DATE	Source Check Sat/Unsat	INI
8/24	Sat/Unsat	
8/25	Sat/Unsat	
8/26	Sat/Unsat	
8/31	Sat/Unsat	
9/11	Sat/Unsat	
	Sat/Unsat	
	Sat/Unsat	

Attachment 5

Implementing Procedures and Instructions

TABLE OF CONTENTS

1.0 INTRODUCTION 2

2.0 REFERENCES 2

3.0 SAFETY PRECAUTIONS AND LIMITATIONS 2

4.0 PROCEDURE 2

ADDENDA

REVIEW AND APPROVAL 5

1.0 Introduction

This procedure describes the requirements for conduct of the gamma walkover survey.

2.0 References

2.1 Sequoyah Fuels Corporation, Health and Safety Department Instruction HSDEPT-130 "Instrument Source Checking".

3.0 Safety Precautions and Limitations

3.1 The Health and Safety Department has the responsibility for preparation and maintenance of the gamma walkover survey instruments.

3.2 Areas of standing water will not be surveyed.

3.3 No surveys will be performed during or immediately following rainfall events.

4.0 Procedure

4.1 Obtain the necessary equipment and instruments from the Health and Safety Department.

4.2 Prior to beginning the survey, source check the instrument and connect to GPS unit.

4.3 Confirm the GPS unit batteries are adequately charged

4.4 Complete a gamma walkover survey by foot or vehicle in accordance with sections 4.4.1 and 4.4.2, respectively.

4.4.1 Perform a survey on foot as follows:

A. Proceed to the area to be surveyed. Set the instrument up to capture data and create a new file.

B. Perform the survey by walking at a casual

pace (≈ 3 feet per second). The spacing between the survey paths should be approximately five feet. Keep the survey probe as close to the ground as practical. Identify the survey path with a temporary mark.

C. The GPS unit will provide an audible signal if satellite communication is interrupted. In this case, stop and wait for the audible signal that indicates communication has been reestablished or terminate the survey.

D. Upon completion of the survey, stop the survey data collection and end data capture on the GPS. Return the equipment and instrument to the Health and Safety Department.

4.4.2 Perform a survey by vehicle as follows:

A. Proceed to the area to be surveyed. Set the instrument up to capture data and create a new file.

B. Place the GPS unit in the vehicle and the radiation detector in the holder mounted on the vehicle.

C. Perform the survey with the vehicle at or near idle speed. The spacing between the survey paths should be about five feet. Identify the survey path with using a temporary mark.

D. The GPS unit will provide an audible signal if satellite communication is interrupted. In this case, stop and wait for the audible signal that indicates communication has been reestablished or terminate the survey.

E. Upon completion of the survey, stop the survey data collection and end data capture on the GPS. Return the equipment and instrument to the Health and Safety Department.

4.5 Record the following information in the field logbook maintained for the gamma walkover survey:

- Date the survey was performed,
- start time of the survey,
- name of the file containing the survey data,
- identification of the person performing the survey,
- description of the area surveyed, and
- description of any events or conditions that might influence the survey results.

REVIEWED BY:

Manager,
Health and Safety John W Ellis for C L HARLIN

Manager,
Environmental Scott C. Munson

APPROVED BY:

President John W Ellis 3-17-09
Date

Effective Date: 3-17-09

TRAINING/IMPLEMENTATION REQUIREMENTS

The following implementation action is required - check one:

Action Level				
0	1	2	3	4
✓				

SUBJECT: SOIL AND SEDIMENT SAMPLING

TABLE OF CONTENTS

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1.1 Purpose 2
1.2 Responsibilities 2

2.0 REFERENCES 2

3.0 SAFETY PRECAUTIONS AND LIMITATIONS 3

4.0 INSTRUCTION 3
4.1 Documentation of Sampling Activities 3
4.2 Equipment Decontamination 3
4.3 Soil Sampling - Scoop Method 4
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4.5 Sediment Sampling - Scoop, Dipper or Box Methods 6
4.6 Duplicate Sample Collection Schedule 7
4.7 Chain-of-Custody Control 8

5.0 APPROVAL 8

ADDENDA

Attachment 1 9
Field Log Book Information

Attachment 2 10
Soil and Sediment Sampling Equipment List

1.0 INTRODUCTION

1.1 Purpose

This instruction provides sampling requirements for the collection of soil, sediment or sludge samples. Samples are typically collected for site characterization, scoping survey or termination survey purposes in support of Facility decommissioning.

1.2 Responsibilities

The Manager, Environmental or designee is responsible for identifying soil and sediment sampling locations. The Manager, Environmental or designee is also responsible for identifying the parameters to be analyzed.

D&D or Health and Safety Technicians are responsible for the collection and submittal of non-routine soil and sediment samples to the appropriate laboratory for analysis. If a sample specified by the Manager, Environmental or designee is not collected at the designated location, the Technician is responsible for providing verbal and/or written notification to the Manager, Environmental, or designee. The Technician is also responsible for recording details regarding the collection of the samples in the field log book used for recording sampling activities.

2.0 REFERENCES

2.1 Sequoyah Facility Environmental Department Instruction, EDI-101, "Environmental Department Monitoring Schedule."

2.2 Sequoyah Facility Operating Procedure, G-108, "Sample Collection and Submission."

2.3 Byrnes, Mark E., "Field Sampling Methods for Remedial Investigations," Lewis Publishers, 1994.

3.0 SAFETY PRECAUTIONS AND LIMITATIONS

3.1 Obtain required permits, such as a Hazardous Work Permit, prior to proceeding with the sampling.

3.2 Locate underground utilities before digging.

4.0 INSTRUCTION

4.1 Documentation of Sampling Activities

4.1.1 Soil and/or sediment samples may be collected by several different methods depending upon the objective(s) for the sampling being performed. Details regarding the sampling method used and other appropriate information should be included in a field log book.

4.1.2 Field log book entries should be detailed enough to describe the sampling event to someone who was not present during the sampling activity. Any individuals assisting with the sampling should be recorded.

4.1.3 Black ink should be used for completion of records. Corrections shall be made with single line-out and initialed by the individual making the correction. Opaque substances such as "Liquid Paper" shall not be used for making corrections.

4.1.4 Attachment 1 contains a listing of typical information to be included in a field log book for each sampling event.

4.2 Equipment Decontamination

4.2.1 To prevent contamination of samples, all sampling equipment will be thoroughly cleaned before and between uses at different sampling locations in accordance with the following steps:

1. Clean with tap water and phosphate-free laboratory grade detergent (brush if necessary).

2. Rinse thoroughly with distilled or deionized water.

3. Equipment cleaned prior to field use shall be recleaned after transfer to the sampling site unless carefully wrapped for transport.

4.2.2 Laboratory supplied sample containers shall be cleaned and sealed by the laboratory before shipping.

4.2.3 In addition to the use of properly cleaned equipment, the following precautions shall also be taken:

1. A clean pair of new, disposable latex (or similar) gloves shall be worn each time a different sample is obtained.

2. Sample collection activities shall proceed progressively from background (clean) areas to the impacted areas or from areas of least impact to areas of progressively more impact.

3. Personnel handling the samples will be minimized and only pre-designated personnel will be involved in sample handling.

4.3 Soil Sampling - Scoop Method

4.3.1 Obtain equipment needed for sampling. Refer to Attachment 2 for a listing of typical sampling equipment needed.

4.3.2 Collect the sample by applying downward pressure on the scoop until the desired sampling depth is reached, then lift. If a grab sample is being collected, transfer the soil from the scoop directly into a sample container. If a composite sample is being collected, transfer the soil from each location to be composited into a stainless steel container and homogenize with a stainless steel spoon or stainless steel knife prior to placement into a sampling container. If soil conditions will not allow mixing, collect small portions of soil from different depths and/or areas of the soil contained in the scoop.

4.3.3 Label the container with sample information (sample identification, depth, date, time, sample collectors initials, etc.) and immediately place into a cooler. Samples analyzed for radionuclides only do not require cooling.

4.3.4 Soil remaining after sample collection should be appropriately dispositioned. This will be determined by the Manager, Environmental or designee for each sampling event. The disposition of soil will depend upon the sample location and historical analytical results in the area being sampled.

4.3.5 Determine the coordinates for the sample location using measurement methods such as land survey, GPS equipment, or measurement from a known coordinate. This should be done within a reasonable time frame either before or after sample collection (e.g. a month). If the sample location coordinates have not been determined before sampling, mark the location for identification purposes.

4.3.6 Decontaminate sampling equipment in accordance with Section 4.2 before proceeding to next sample location.

4.4 Soil Sampling - Hand Auger Method

4.4.1 Obtain equipment needed for sampling. Refer to Attachment 2 for a listing of typical sampling equipment needed.

4.4.2 Collect the soil sample by applying downward pressure while rotating the hand auger clockwise. Transfer all or portions of the soil retrieved in the auger either directly into a sample container or a stainless steel container for compositing. If one auger entry has collected an adequate sample move to step 4.4.5, otherwise continue sampling in this manner until the bottom of the sampling interval is reached or refusal is encountered.

4.4.3 Composite the soil in a stainless steel container by using a stainless steel spoon or stainless steel knife to break apart any large chunks of soil, then mix and stir the soil enough to thoroughly homogenize the sample. Transfer soil into a sample container using a stainless steel spoon or knife. If soil conditions will not allow mixing, collect small portions of soil from different depths and/or areas of the soil collected within the hand auger and transfer the soil directly into a sample container.

4.4.4 Label the container with sample information (sample identification, depth, date, time, sample collectors initials, etc.) and immediately place into a cooler. Samples to be analyzed for radionuclides only do not require cooling.

4.4.5 Soil remaining after sample collection should be appropriately dispositioned. This will be determined by the Manager, Environmental or designee for each sampling event. The disposition of soil will depend upon the sample location and historical analytical results in the area.

4.4.6 Determine the coordinates for the sample location using measurement methods such as land survey, GPS equipment, or by measurement from a known location. This should be done within a reasonable time frame either before or after sample collection (e.g. a month). If the sample location coordinates have not been determined before sampling, mark the location for identification purposes.

4.4.7 Decontaminate sampling equipment in accordance with Section 4.2 before proceeding to next sample location.

4.5 Sediment Sampling - Scoop, Dipper or Box Methods

4.5.1 Obtain equipment needed for sampling. Refer to Attachment 2 for a listing of typical soil sampling equipment needed.

4.5.2 If sampling is to be performed in a flowing stream, approach the sampling point from downstream, being careful not to disturb the underlying sediment. If sampling is to be performed in a basin or pond, samples shall be collected with the least disturbance to the sediment as possible.

4.5.3 Lower and/or push the sampling tool downward into the sediment, then gently lift upward. Raise the sampler out of the water in an effort to reduce the amount of sediment lost to the water current. If a grab sample is being collected, transfer the sediment directly into a sample container. If a composite sample is being collected, transfer the sediment from each composite interval or location into a stainless steel container and homogenize with a stainless steel spoon or knife prior to filling a sample container.

4.5.4 Label the container with sample information (sample identification, depth, date, time, sample collectors initials, etc.) and immediately place into a cooler. Samples to be analyzed for radionuclides only do not require cooling.

4.5.5 Sediment remaining after sample collection should be appropriately dispositioned. This will be determined by the Manager, Environmental or designee for each sampling event. The disposition of remaining sediment will depend upon the sample location and historical analytical results in the area.

4.5.6 Determine the coordinates for the sample location using measurement methods such as land survey, GPS equipment, or by measurement from a known location. This should be done within a reasonable time frame before or after sample collection (e.g. a month). If the sample location coordinates are not determined before sampling, mark the location for identification purposes.

4.5.7 Decontaminate sampling equipment in accordance with Section 4.2 before proceeding to next sample location.

4.6 Duplicate Sample Collection Schedule

4.6.1 One duplicate sample per day shall be collected during a soil/sediment/sludge sampling event. Each duplicate sample shall be analyzed for the same analytical parameters as the sample.

4.6.2 Duplicate samples should be collected by first compositing the sampling interval in a stainless steel container, mixing the contents and then alternately spooning the sample into two separate sample containers. If soil/sediment/sludge conditions will not allow mixing, carefully place small portions of the material to be sampled alternately into two separate containers.

4.6.3 Duplicate samples shall be submitted on a separate chain-of-custody to a laboratory specified by the Manger, Environmental or designee. Each sample designation (location identification) shall be preceded by a "Q-" to indicate that the sample is a quality assurance sample.

4.6.4 Routine samples shall be submitted following standard submittal procedures with no indication on the chain-of-custody that a duplicate sample has been collected. The laboratory should not be informed that quality assurance samples have been collected. Quality assurance sample results may be provided to the laboratory after both sample and quality assurance results have been reported to SFC.

4.7 Chain-of-Custody Control

After samples have been obtained, chain-of-custody procedures shall be followed to establish a written record concerning sample movement between the sampling site and the analytical laboratory. (See Procedure G-108)

5.0 APPROVAL

Approved: _____ Date: 5/30/97
Preparer

Approved: _____ Date: 5/30/97
Manager, Environmental

Approved: _____ Date: 05/30/97
Director, Regulatory Affairs

Attachment 1

Field Log Book Information

The following items should be included in the field log book for each soil or sediment sampling event:

- ☐ Sample Collector(s) Name(s)
- ☐ Date and Time of Sampling
- ☐ Weather Conditions
- ☐ Sample Identification (Sample LOC_ID)
- ☐ Sample Location Description
- ☐ Sample Depth
- ☐ Sample Collection Method Used
- ☐ Sample Location Map or Detailed Sketch
- ☐ Field Observations of Sample Appearance and/or Odor
- ☐ Any Deviation from the Procedure or Instruction
- ☐ Sample Analysis to be Performed (May refer to Instruction or Procedure)
- ☐ Cleaning of Equipment Before and Between Each Sample Collected
- ☐ Any Other Information Which is Significant

Note: Field log book entries should be detailed enough to describe the sampling event to someone who was not present during the sampling activity. Any individuals assisting with the sampling should be included. Black ink should be used for completion of records. Corrections shall be made with single line-out and initialed by the individual making the correction. Opaque substances shall not be used for making corrections.

Attachment 2

Sampling Equipment List

The following is a list of suggested equipment which should be considered during each sampling event:

- ☐ Health and Safety Equipment (Air Sampler) and Protective Clothing
- ☐ Access Keys
- ☐ Field Logbook
- ☐ Sample Location Map
- ☐ Chain-of Custody Forms
- ☐ Cooler with Ice and Bubble Wrap
- ☐ Disposable Vinyl or Rubber Gloves
- ☐ Potable Water (For Cleaning)
- ☐ Distilled or Deionized Water (For Rinsing)
- ☐ Alconox Detergent
- ☐ Brushes
- ☐ Equipment Cleaning Trays
- ☐ 5 Gallon Buckets
- ☐ Visqueen Plastic
- ☐ Glass Pint Jars
- ☐ Trash bags
- ☐ Ziplock Bags
- ☐ Paper Towels
- ☐ Black Ink Pens
- ☐ Marker for Labeling Containers
- ☐ Roll Duct Tape
- ☐ Garden Sprayers
- ☐ Tape Measure
- ☐ Laboratory Sample Containers
- ☐ Stainless Steel Containers
- ☐ Stainless Steel Spoons, Trowels, and/or Knifes
- ☐ Hand Auger Sampling Equipment
- ☐ Box Sampler

Subject: **ENVIRONMENTAL SUBMISSION AND REPORTING PROCEDURE**

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Rec Copy
11/1/90

1.0 INTRODUCTION

1.1 This procedure establishes the requirements and provides instructions for Sequoyah Facility employees in submission of environmental samples to appropriate laboratories and the reporting and notification of the resulting analysis.

1.2 Responsibilities

1.2.1 It is the responsibility of the sample submitter to collect the sample according to the procedure that applies to the particular sample. The submitter must complete all applicable items on the Chain of Custody form, including action levels, notifications, and priority of analysis.

1.2.2 It is the responsibility of the sample requestor to provide the submitter, if not the same person, all pertinent data to complete the Chain of Custody form.

1.2.3 It is the responsibility of the ~~Facility~~ Process Laboratory Manager to assure all environmental samples submitted to the Process Laboratory are handled and analyzed according to established laboratory procedures.

1.2.4 It is the responsibility of the ~~Chemist~~ Laboratory Supervisor to assure all environmental samples submitted to the Environmental Laboratory are handled and analyzed according to established laboratory procedures.

1.2.5 It is the responsibility of the Laboratory Technician to analyze and report results according to the guidelines set out in the following procedure. Pager telephone numbers for off-shift notification are listed in the Emergency Notification Manual (Tab L).

2.0 PROCEDURE

2.1 All environmental samples, except routine environmental samples from the process area, must be submitted with a Chain of Custody/Special Analysis Request Form (SFC-4000-1, see Attachment Number 1). Note: Environmental samples from the Process Area are listed on Attachment 2.

After the laboratory signs for receipt of sample, a copy of the Chain of Custody should be retained by the requestor ~~and filed according to Facility Record Retention Schedules~~.

2.2 Submitter must fill out all areas of Chain of Custody form that apply to the sample submission.

2.2.1 Requested by: (Authorization to collect sample, sample results will be reported to this person.)

2.2.2 Date of submission and date results needed. Note: Laboratory date and time stamp should be used.

2.2.3 Dispatched by: (Submitter's signature, date, and time submitted.)

2.2.4 Action Levels: (Action levels for each analysis requested.)

Reference action levels for various parameters.

2.2.5 Stamp sample type: (All environmental samples must be stamped by submitter with the word "Environmental" in appropriate space.)

2.2.6 Sample designation: (Location, equipment #, area, pond, etc. from which sample was taken.)

2.2.7 Date and time of collection.

2.2.8 Sample Type and Method: (Type: soil, effluent, surface water, ground water, etc. Method: composite, grab, mechanical, or manual.)

2.2.9 Number of containers: (Number of sample containers submitted for each sample designation.)

2.2.10 Depth to water: (Applies to ground water samples only. Mark N/A for other types of samples.)

2.2.11 Analysis requested: (Submitter should specify each parameter.)

2.2.12 Notification levels: (Submitter will mark appropriate notification for parameters exceeding action levels.)

2.2.13 Sample disposition: (Submitter will mark final disposition of sample on form and sample container.) Note: Samples marked for return or retain; the bottles must be flagged. ~~(Red tape.)~~

NOTE: PLACE A PIECE of RED TAPE ON THE SAMPLE BOTTLE

2.3 Submitter will designate the following on each sample container:

2.3.1 Sample designation.

2.3.2 Collection date and time.

2.3.3 Chain of Custody form number.

2.3.4 Final Disposition.

2.4 Laboratory Technician will sign, date, and enter time or initial date and time ~~started~~ STATED on the Chain of Custody form upon receipt of sample.

2.4.1 Laboratory Technician will assign a laboratory project number to the Chain of Custody/Special Analysis Form.

2.4.2 Laboratory Technician will analyze sample for requested parameters.

2.5 ~~Process~~ Laboratory Manager or ~~his~~ designee will approve results and make the notification indicated on the Chain of Custody form.

Date, time, and method of notification should be documented on Chain of Custody form. Hand-to-hand delivery of results requires requestor's (or designee's) signature of receipt of results.

2.6 ~~Process Facility~~ Laboratory Manager and the Environmental ~~Chemist~~ Lab Supervisor or their designees will make a daily environmental sample report to the Health, Safety and Environmental Manager.

The Daily Environmental Sample Report will include all samples analyzed since last report.

ATTACHMENT #1

SFC-4000-1

90-000501

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed

Comments/Copies to:

Dispatched by (SIGNATURE)	Date	Time	Received by Lab(Signature)	Date	Time

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

STAMP SAMPLE TYPE HERE

SAMPLE: Effluent ☐ Ground Water ☐ Other ☐
Solid ☐ Surface Water ☐

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED			
			Comp	Grab	Mech	Man.						

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

- ☐ Mail results to submitter(s) when complete.
- ☐ Notify submitter when analyses complete and arrange a hand transfer of report sheet.
- ☐ Notify submitter as soon as possible during normal working hours.
- ☐ Notify submitter or designee immediately.
- ☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.

Date Notified _____ Phone ☐
Time Notified _____ Mail ☐
Hand to Hand ☐
Signature _____

Sample Disposition: Discard___, Return___, Retain___ Note: Sample Bottles Must Be Flagged for Return or Retain.	Lab Approval	Date Reported	Lab Report Number

ATTACHMENT #2

Combination Stream
(Grab Sample Only)

Fluoride Stream

Fluoride Settling Pond

Fluoride Sludge Basin

Solvent Extraction Vault

North Ditch

~~EMERGENCY~~ **East Dump Basin**

Treated Raffinate

DENITRATION Sump

REVIEWED AND APPROVED BY:

Manager, Engineering _____

Manager, Laboratory _____

Manager, Maintenance _____

Manager, Operations _____

Manager, Health, Safety & Environment _____

PORC Chairman/ Manager, Procedures & Training _____ 11-1-90 Date

APPROVED BY:

Senior Vice President _____ 11-2-90 Date

This procedure is effective 11/09/90.

TRAINING/IMPLEMENTATION TABLE

The following implementation action is required:

Department	Action Level				
	0	1	2	3	4
Engineering		✓			
Laboratory		✓			
Maintenance	✓				
Operations		X			
Health & Safety		X			
Security	✓				
Administration	✓				
Other	✓				

Supervisors only use

92-[redacted]01 CHAIN OF CUSTODY/SPE[redacted]AL ANALYSIS REQUEST SFC-4000-[redacted]

Requested By:	Date:	Date Needed:

COPIES TO:

STAMP SAMPLE TYPE HERE

CHAIN OF CUSTODY TRANSFERS

RELINQUISHED BY(SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME

SAMPLE TYPE: ☐ Ground Water ☐ Soil ☐ Sediment ☐ Other ☐ Surface Water ☐ Effluent ☐ Vegetation

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD		NUMBER OF CON-TAINERS	DEPTH TO WATER	ANALYSIS REQUESTED					
			Comp	Grab								

Comments:

Person Notified: Date: Time:

Method Used:

☐ Hand to Hand (Initial)_____ ☐ Phone ☐ Mail

Sample Disposition: Discard___, Return___, Retain___

Note: Sample Bottles Must Be Flagged for Return or Retain.

Date Reported	Lab Approval	Lab Report Number

* Subject: **ENVIRONMENTAL SAMPLE SUBMISSION AND REPORTING PROCEDURE**

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PORC
4-11-91

* Revised

1.0 INTRODUCTION

1.1 This procedure establishes the requirements and provides instructions for Sequoyah Facility employees in submission of environmental samples to appropriate laboratories and the reporting and notification of the resulting analyses.

1.2 Responsibilities

1.2.1 It is the responsibility of the sample requestor to provide the submitter, if not the same person, all pertinent data to complete the Chain of Custody form.

1.2.2 It is the responsibility of the sample submitter to collect the sample according to the procedure that applies to the particular sample. The submitter must complete all applicable items on the Chain of Custody form, including action levels, notifications, and priority of analyses.

1.2.3 It is the responsibility of the Process Laboratory Manager to assure all environmental samples submitted to the Process Laboratory are handled and analyzed according to established laboratory procedures.

1.2.4 It is the responsibility of the Environmental Laboratory Supervisor to assure all environmental samples submitted to the Environmental Laboratory are handled and analyzed according to established laboratory procedures.

* 1.2.5 It is the responsibility of the Laboratory Technician to analyze and report results to the Process Laboratory Manager or the Environmental Laboratory Supervisor, as appropriate; according to the guidelines set out in the following procedure. Pager telephone numbers for off-shift notification are listed in the Emergency Notification Manual (Tab L).

* 1.3 An environmental sample is defined as any uncontained material sampled outside the process stream, process sump, or contained enclosure, or as specified in Section 4.1 of this procedure.

* Revised

* 2.0 SAFETY PRECAUTIONS

2.1 The health and safety precautions and requirements contained in Operating Procedure G-160, are to be followed.

3.0 REFERENCES

3.1 NRC License SUB 1010, Chapter 5
3.2 Operating Procedure G-160,"Health and Safety Precautions."

4.0 PROCEDURE

4.1 All environmental samples, except routine environmental samples from the process area, must be submitted with a Chain of Custody/Special Analysis Request Form * (SFC-4000-2, see Attachment Number 1). Note: Routine environmental samples from the Process Area are listed on Attachment 2.

After the laboratory signs for receipt of sample, a copy of the Chain of Custody should be retained by the requestor.

4.2 Submitter must fill out all areas of Chain of Custody form that apply to the sample submission.

4.2.1 Requested by: (Authorization to collect sample, sample results will be reported to this person.)

4.2.2 ~~Date of submission and date results needed.~~ Note: ~~Laboratory date and time stamp should be used.~~

4.2.3 Dispatched by: (Submitter's signature, date, and time submitted.) NOTE: LABORATORY DATE AND TIME STAMP SHOULD BE USED.

4.2.4 * Action Levels: (Environmental action levels for each analysis requested.)

==NOTE==

Environmental Action Levels for Water

Uranium	-	225.0 ug/l
Fluoride	-	1.6 mg/l
Nitrate	-	20.0 mg/l
pH	-	<6.0 / >9.0

AMMONIA 2.5 mg/l

4.2.2 A date must be specified. If analysis results are critical so specify in the comments.

==NOTE==

Environmental Level Guidelines for Soils

Uranium	**400.0 ug/g (RES)**	**40.0**	**ug/g (UNRES)**
Fluoride	**350.0 ug/g (RES)**	**350.0**	**ug/g (UNRES)**
Nitrate	**200.0 ug/g (RES)**	**200.0**	**ug/g (UNRES)**

Note: RES= Restricted Area
UNRES= Unrestricted Area

remove marker

Reference action levels for various parameters.

4.2.5 Stamp sample type: (All environmental samples must be ~~stamped~~ OR WRITE LABELED by submitter with the word "Environmental" in appropriate space.)

4.2.6 Sample designation: (Location, equipment #, area, pond, etc. from which sample was taken.)

4.2.7 Date and time of collection.

4.2.8 Sample Type and Method: (Type: soil, effluent, surface water, ground water, etc. Method: composite, grab, mechanical, or manual.)

4.2.9 Number of containers: (Number of sample containers submitted for each sample designation.)

4.2.10 Depth to water: (Applies to ground water samples only. Mark N/A for other types of samples.)

4.2.11 Analysis requested: (Submitter ~~should~~ will specify each parameter.)

4.2.12 Notification levels: (Submitter will mark appropriate notification for parameters exceeding action levels.)

==NOTE==

"Notification is Required"

If uranium contamination in uncontained liquid is >~~25.0 mg/l~~ .025 g/l it should be reported to the Manager, Environmental promptly. Any sample >1.0 g/l shall be reported to the Manager, Health & Safety, and the Manager, Environmental or the facility designees as soon as possible.

* Revised

* 4.2.13 Follow-up actions: It is essential for the protection of the health and safety of employees, and to insure the protection of the environment, that upon receipt of analyses that exceed environmental action levels for licensed material the following instructions be followed:

a) notification should be made to Health Mgr. & Safety Physics ~~and management personnel~~ Mgr. Env. and other appropriate personnel.

b) containment or clean-up of licensed material should be undertaken as appropriate; and

c) investigation and documentation of the condition (example: where sample was taken, remediation and clean-up efforts, probable cause of condition, etc.).

==NOTE==

For conditions that have already been investigated, reported, and documented previously, it is not necessary to repeat the above process (4.2.12 and 4.2.13) just because new sample results have been received.

* 4.2.14 Sample disposition: (Submitter will mark final disposition of sample on form and sample container.)

==NOTE==

Samples marked for return or retain; the bottles must be flagged. Place a piece of red tape on the sample bottle.

4.3 Submitter will designate the following on each sample container:

4.3.1 Sample designation.

4:3.2 Collection date and time.

4.3.3 Chain of Custody ~~Request~~ number.

4.3.4 Final Disposition.

* Revised

4.4 Laboratory Technician will sign, date, and enter time or initial date and time stated on the Chain of Custody form upon receipt of sample.

4.4.1 Laboratory Technician will assign a Laboratory * Report Number to the Chain of Custody/Special Analysis Form.

4.4.2 Laboratory Technician will analyze sample for requested parameters.

4.5 Process Laboratory Manager or the Environmental Laboratory Supervisor or their designee will approve results and make the notification indicated on the Chain of Custody form.

Date, time, and method of notification should be documented on Chain of Custody form. Hand-to-hand delivery of results requires requestor's (or designee's) signature of receipt of results.

4.6 Process Laboratory Manager and the Environmental Laboratory Supervisor or their designees will make ~~a daily environmental sample report~~ to the Health and Safety Manager, and the Manager, Environmental.

The ~~Daily~~ Environmental Sample Report will include all samples analyzed since last report.

an Environmental Sample report on regular work days.

* Revised

SEQUOYAH FACILITY OPERATING PROCEDURE

Subject: ENVIRONMENTAL SAMPLE SUBMISSION AND REPORTING PROCEDURE

ATTACHMENT #1

SFC-4000-2

91- 00821

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

Requested by	Date	Date Needed

Comments/Copies to:

Dispatched by (SIGNATURE)	Date	Time	Received by Lab(Signature)	Date	Time

ACTION LEVELS: Submitter must list action levels and notification levels for each parameter.

STAMP SAMPLE TYPE HERE

SAMPLE: ☐ Ground Water ☐ Surface Water ☐ Solid ☐ Effluent ☐ Other

SAMPLE DESIGNATION	DATE	TIME	SAMPLE TYPE AND METHOD				NUMBER OF CONTAINERS	DEPTH TO WATER	ANALYSIS REQUESTED				
			Comp	Grab	Mech	Man.							

NOTIFICATION LEVELS: Notify if parameter(s) are above the action levels listed above.

☐ Notify submitter as soon as possible during normal working hours.
☐ Notify submitter or designee immediately.
☐ Notify submitter, shift supervisor, Environmental, Health Physics, Regulatory Affairs.

Date Notified _____ Hand to Hand ☐
Time Notified _____ Phone ☐
Signature _____ Mail ☐

Sample Disposition. Discard___, Return___, Retain___ Note: Sample Bottles Must Be Flagged for Return or Retain.	Lab Approval	Date Reported	Lab Report Number

* Revised

ATTACHMENT #2

* **PROCESS AREA ENVIRONMENTAL SAMPLES**

The following environmental samples from the process area do not require a Chain of Custoday/Special Analysis Request Form (SFC-4000-2).

Combination Stream
(Grab Sample Only)

Fluoride Stream

Fluoride Settling Pond

Fluoride Sludge Basin

Solvent Extraction Vault

North Ditch

Emergency Dump Basin

Treated Raffinate

Denitration Sump

* **All other environmental samples from the process area must be submitted with a form SFC-4000-2.**

* Revised

Subject: SAMPLE COLLECTION AND SUBMISSION

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1.0 PURPOSE

1.1 This procedure establishes the requirements and provides instructions for the sampling, submission, and reporting requirements for environmental samples, restricted area uncontained samples, waste/by product management and non-routine samples.

1.2 Definitions

Composite Sample - A series or set of samples combined to make a single sample which are separated by space (solids) or time (liquids).

Depth to Water - The distance from the top of a well casing to the static water level.

Environmental Sample - Any uncontained material, whether solid, liquid, or air, sampled outside a restricted area or in a monitoring well within a restricted area or listed in license SUB-1010, Table 5.2. Both routine and non-routine samples are included. An environmental sample would not include a sample of material contained within a process stream, process sump, or confined enclosure such as a process holding pond, or a sample for the purpose of process control.

Grab Sample - A single discrete sample.

Non-Routine Samples - Samples that are not proceduralized or do not meet the criteria for waste/by product management, environmental or restricted area-uncontained samples.

Restricted Area - Uncontained material sample - A sample of liquid or soil taken from within a Restricted area and outside a building boundary, which is not contained within a facility structure (e.g. sump, pit, pond, etc.)

Transfer - A transfer occurs each time a sample and its Chain of Custody/Special Analysis Request form changes possession from one individual to another.

Waste/By Product Management Samples - Samples that are contained within a process stream, process sump, confined enclosure, from fertilizer program prior to application, and any solid, liquid, semi-solid or contained gaseous material that is to be discarded.

1.3 Responsibilities

1.3.1 Sample Collector:

A. Collecting a representative sample and following sampling procedure to ensure contamination of himself and the sample does not occur.

B. Completing all applicable sections of the Chain of Custody/Special Analysis Request form (Attachment 1).

C. Ensuring the sample is properly secured, stored, and delivered to the laboratory as soon as practical.

2.0 REFERENCES

2.1 NRC License SUB-1010, Chapter 2, Sections 2.2 and 2.9 and Chapter 5

2.2 Operating Procedure G-160, "Industrial Safety Precautions and Requirements".

3.0 SAFETY PRECAUTIONS AND LIMITATIONS

The health and safety precautions and requirements contained in Operating Procedure G-160, are to be followed.

4.0 PROCEDURE

4.1 Sample Collection

4.1.1 The sample collector will use proper sampling practices including the following:

CAUTION
=======

Make sure that the sample container used is compatible with the sample matrix being taken. If unsure, contact Environmental Department personnel to determine sample container to be used.

A. Use new and unused sample containers.

B. Use clean sampling equipment.

C. Wear clean impermeable gloves.

D. Do not allow the sample, the sampling equipment, or the sample container to contact contaminated areas, and

E. Prevent cross-contamination of samples by thoroughly cleaning the sampling equipment between samples.

4.1.2 The sample collector will record the following on each sample container:

A. Sample location name or identification.

B. Collection date and time.

C. Final disposition of the sample (only if the sample is to be held or saved.

D. Sample collectors initials.

E. Type of preservative (See Attachment A).

4.2 Chain of Custody/Special Analysis Request Form

==NOTE==

All environmental, restricted area-uncontained, waste/by product management, and non-routine samples must be submitted with a Chain of Custody/Special Analysis Request form (Attachment #1).

4.2.1 The Sample Collector shall fill out the applicable sections of the Outreach Laboratory Chain of Custody/ Special Analysis Request form according to the following instructions:

A. **Results to:** Sequoyah Fuels Corporation

B. **Requested Turnaround Time:** Enter date results are desired.

C. **Sampler:** Name of Sampler

D. **Chain of Custody Transfers:** Person collecting sample is the first signatory under the "relinquished by" column. Each time a sample container is transferred from one person to another person the signature of each person is required along with the date and time of transfer. The last "received by" signature will be the Laboratory personnel who receives the sample into the Laboratory.

E. **Client Sample ID:** SFC sample location code

F. **Date/Time:** Record Date and Time sample was collected.

H. **Matrix:** L - liquid or S - solid

I. **# of Containers:** Record the number of sample containers under the appropriate column.

J. **Container:** P - Plastic or G - glass

K. **Preservative:** Enter appropriate code identifying preservative from list on COC

form.

L. **Analysis requested:** Specify each analytical parameter (and reporting units) requested for each sample listed on the COC.

M. **Remarks:** List any significant instruction or guidance. Add notes as necessary.

4.3 Sample Submission

4.3.1 The sample collector shall transfer or arrange for transfer(s) of the sample and Chain of Custody/Special Analysis Request form to the assigned D&D technician.

4.3.2 Each sample transfer must be documented on the Chain of Custody/Special Analysis Request form by signature.

4.3.3 The D&D technician (or designee) will prepare the samples for shipment via a contract courier unless otherwise specified.

4.3.4 The D&D technician (or designee) will assign each Chain-of-Custody (COC) a unique COC number from the COC log book and write this COC number in the lower right hand corner of each COC.

4.3.5 The D&D technician (or designee) will retain a copy of each COC.

4.3.6 The D&D technician (or designee) will place all COC's which correspond to the appropriate transport containers in zip-lock type bags, seal each bag and place in the appropriate shipping container.

4.3.7 The D&D technician (or designee) will place sufficient ice packs in each shipping container prior to transport.

4.3.8 The shipping container(s) in which the samples are transported will be sealed either with glass filament tape or clear packing tape. A tamper seal will also be placed on each transport container.

4.3.9 All COC documentation shall be kept in the COC log book.

ATTACHMENT A SAMPLE PRESERVATION

If a sample to be analyzed for nitrate and/or ammonia cannot be transported to the contract laboratory within 48 hours, the sample should be preserved with sulfuric acid (H2SO4).

The amount of preservative to add to the sample is dependent on the size of the sample container. Therefore, the volumes of H2SO4 preservative required for typical sample containers are as follows:

Sample Container	Amount of Preservative
Bioassay Bottle	0.5 milliliters (ml)
One liter cubitainer	1 ml
One gallon cubitainer	3 ml

The sulfuric acid should be added to the sample using an Oxford Macro-Set automatic pipette or a calibrated disposable pipette.

CAUTION

Sulfuric acid can cause severe burns to the skin and mucuous membranes. Safety glasses and disposable gloves must be worn when adding H2SO4 to samples.

ATTACHMENT 1

CHAIN OF CUSTODY/SPECIAL ANALYSIS REQUEST

ATTACHMENT 2

ACTION LEVELS FOR ENVIRONMENTAL SAMPLES

SAMPLE TYPE	ANALYSIS	ACTION LEVEL
AIR	Gross Alpha	6.0 x 10-14 µCi/ml
	Fluoride	5.0 x 10-3 µg/l
	Uranium	1.5 x 10-14 µCi/ml
WATER	Gross Alpha	15 pCi/l
	Uranium	225 µg/l
	Fluoride	1.6 mg/l
	Nitrate (as N)	20 mg/l
	Radium 226	3 pCi/l
	Thorium 230	10 pCi/l
SOIL	Uranium	40 µg/g
	Fluoride	350 µg/g
	Nitrate (as N)	200 µg/g
VEGETATION	Uranium	2.5 µg/g Dry Weight
	Fluoride	40 µg/g

ACTION LEVEL FOR WASTEWATER DISCHARGE*

OUTFALL	ANALYSIS	ACTION LEVEL
001	pH	<6.5 or >8.5 s.u.
	Total Suspended Solids	20.0 mg/l
	Ammonia (as N)	1.0 mg/l
	Nitrate (as N)	6.0 mg/l
	Fluoride	1.1 mg/l
	Radium 226	10 pCi/l
	Uranium	225 µg/l
01A	Biochemical Oxygen Demand	35 mg/l
	Total Suspended Solids	35 mg/l
	Uranium	30 mg/l
008	pH	<6.5 or >8.5 s.u.
	Radium 226	10 pCi/l
	Fluoride	1.1 mg/l

* Based on G-180

REVIEWED BY:

Manager,
Health and Safety_____

Manager,
Environmental _____

APPROVED BY:

President _____
Date

Effective Date:_____

TRAINING/IMPLEMENTATION REQUIREMENTS

The following implementation action is required - check one:

Action Level				
0	1	2	3	4

Attachment 6

Scanning Assessment

Sequoyah Fuels Corporation

Internal Memorandum

To: File – Phase 1 Disposal Cell Footprint; Demonstration Survey

Date: September 18, 2009

From: Scott Munson

RE: Radiation Survey of Area West of dUF4 Building – September 15, 2009

Survey By: Ken Simeroth and Scott Munson Date of Survey: September 15, 2009

Instrument: Ludlum Model 2221 Serial Number 97315 Portable Scaler / Rate Meter

Detector: Ludlum Model 44-10 Serial Number RN014155 NaI Probe

Calibration Due: 11/24/2009

Shield: Schedule 40 stainless steel 3" ID Pipe When the detector was placed into the shield the bottom of the probe was 5.5" above the bottom of the shield.

A gamma walkover survey recently completed of the area west of the DUF4 Building detected elevated gamma levels near the building. An additional survey was conducted on September 15, 2009 by Ken Simeroth and Scott Munson to evaluate if the elevated radiation levels west of the building are originating from the building or from contamination on the concrete surface.

Prior to entering the restricted area to conduct the survey a background check of the instrument was conducted on a concrete surface approximated 20 feet east of the entrance to the Administration Building. The following results were obtained using one minute integrated counts:

Count rate without shield: 6577 c/m
Count rate with shield: 4395 c/m
Percent decrease with shield in place: 33 %

Upon entry of the restricted area, the first readings were obtained about 20 feet west of the building and 20 feet north of the vent on the west wall of the DUF4 Building. The following results were obtained using one minute integrated counts:

Count rate without shield: 44715 c/m
Count rate with shield: 30825 c/m
Percent decrease with shield in place: 31 %

The next set of readings was obtained about 20 feet west of the building directly in line with the vent on the west wall of the DUF4 Building. The following results were obtained using one minute integrated counts:

Count rate without shield: 49715 c/m
Count rate with shield: 34350 c/m
Percent decrease with shield in place: 31 %

Several readings were taken with no shield starting close to the west wall of the DUF4 Building (about 10 feet south of the vent) and moving to the west, away from the building, at about 10 foot intervals. The following results were obtained using one minute integrated counts:

Distance West of Building, feet	Count Rate, c/m (1 min. integrated count)
1	70578
10	58044
20	50045
30	43568
40	37458
50	33092

A walkover survey was conducted of the area west of the building to detect areas with elevated readings. The detector was placed into the shield for this survey. The surveyor slowly walked over the area with the bottom of the shield kept within about six inches of the concrete surface. When oriented with the surveyor's body between the detector and the building a 25% decrease in count rate was observed. Particular attention was given to stained areas, cracks and the areas where events had occurred that may have contaminated the concrete surface. The decrease in count rate as moving away from the building to the west appeared to be uniform. No elevated readings were observed that would indicate a contaminated spot was present on the concrete.

A final set of readings at the stained area where 55 gallon drums of material had been stored west of the concrete entrance ramp to the loading dock were collected. The following results were obtained using one minute integrated counts with the shield:

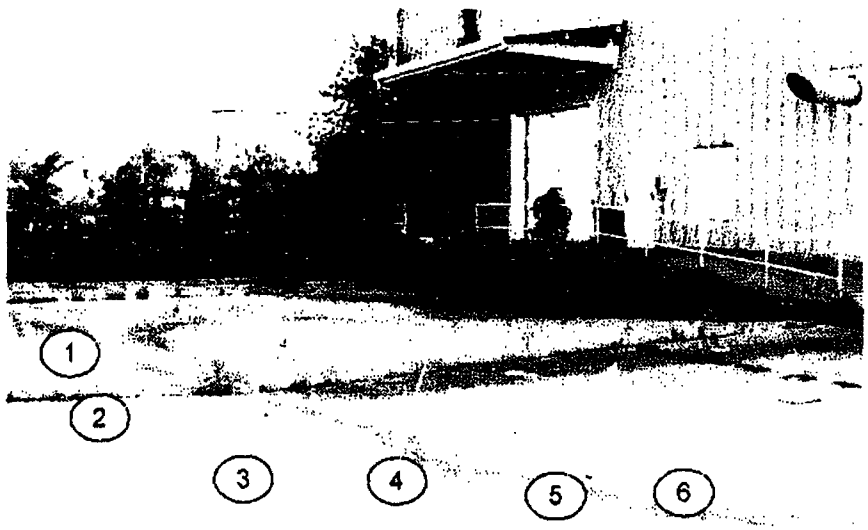
Count rate at rust spot: 31414 c/m
Count rate of concrete ramp west wall at the base[1]: 12682 c/m
Count rate at rust spot: 29683 c/m

Based on measurements taken and an evaluation of the results indicates that the elevated gamma radiation present west of the DUF4 Building appears to be originating from radioactive material present in the building.

[1] This reading was at the base of the ramp wall along the western edge of the ramp such that the ramp would act as a shield to radiation being emitted from within the DUF4 Building.

Radiological Contamination Survey Form

Phase 1 concrete pad west of DUF4 vent pipe



Survey Date: 9/21/9	Time: 1400	Location: Phase 1 concrete pad

Instruments and Counters Used

	Type (removable)	Serial Number	Cal. Due Date		Type (direct)	Serial Number	Cal. Due Date
1	TENN			3	L-2360 (43-89)	262540	1/14/2010
2	(same)			4	L-2221 (44-9)		

Radiological Survey Data - All Results in dpm/100 cm^2

No.	Alpha removable	Beta removable	Alpha direct**	Beta direct**	Location
1	N/A	N/A	128	N/A	concrete pad
2			320		"
3			108		"
4			600		"
5			168		"
6			492		"
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

Remarks:

Surveyor Signature	Reviewed By / Date: 9/22/09

Sequoyah Fuels Corporation

Attachment 7

Computerization Of the MARSSIM for Planning and Assessing Site Surveys (COMPASS)

Site Report

Surface Soil Survey Plan

Surface Soil Assessment Report

SITE REPORT

Site Summary

Site Name: Phase 1 Disposal Cell Footprint
Planner(s): Sequoyah Fuels Corporation

Contaminant Summary

NOTE: Surface soil DCGLw units are pCi/g.
Building surface DCGLw units are dpm/100 cm².

Contaminant	DCGLw Type	DCGLw	Screening Value Used?	Area (m²)	Area Factor
U-total	Surface Soil	570	No	N/A	N/A

Report Created 09/23/2009 1354 (*COMPASS v1.1.0*)

SURFACE SOIL SURVEY PLAN

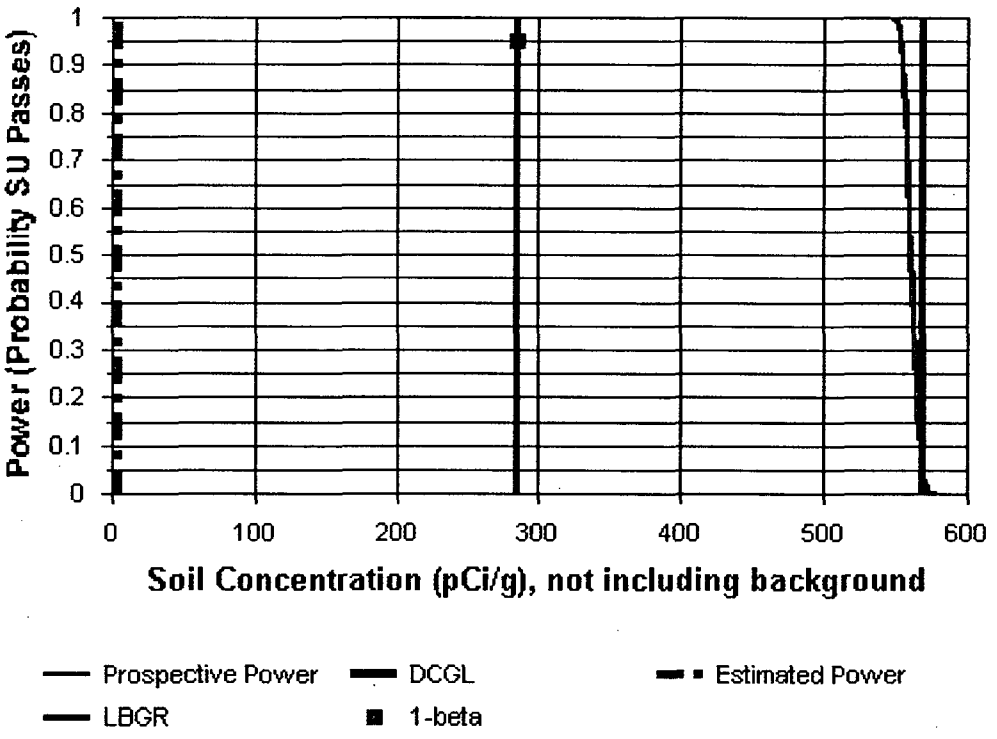
Survey Plan Summary

Site Name:	Phase 1 Disposal Cell Footprint
Planner(s):	Sequoyah Fuels Corporation
Survey Unit Name:	Phase 1 Demonstration Survey
Comments:	None.

Statistical Design Details

Area (m²):	11,400	Classification:	3
Selected Test:	WRS	Estimated Sigma (pCi/g):	10
DCGL (pCi/g):	570	Sample Size (N/2):	9
LBGR (pCi/g):	285	Estimated Conc. (pCi/g):	5.1
Alpha:	0.050	Estimated Power:	1.0
Beta:	0.050		

Prospective Power Curve



Measured Contaminant Details

Contaminant	DCGLw (pCi/g)	Modified DCGLw (pCi/g)	Survey Unit Estimate (Mean ± 1-Sigma) (pCi/g)	Reference Area Estimate (Mean ± 1-Sigma) (pCi/g)
U-total	570	N/A	6.1 ± 10	1.0 ± 0.26

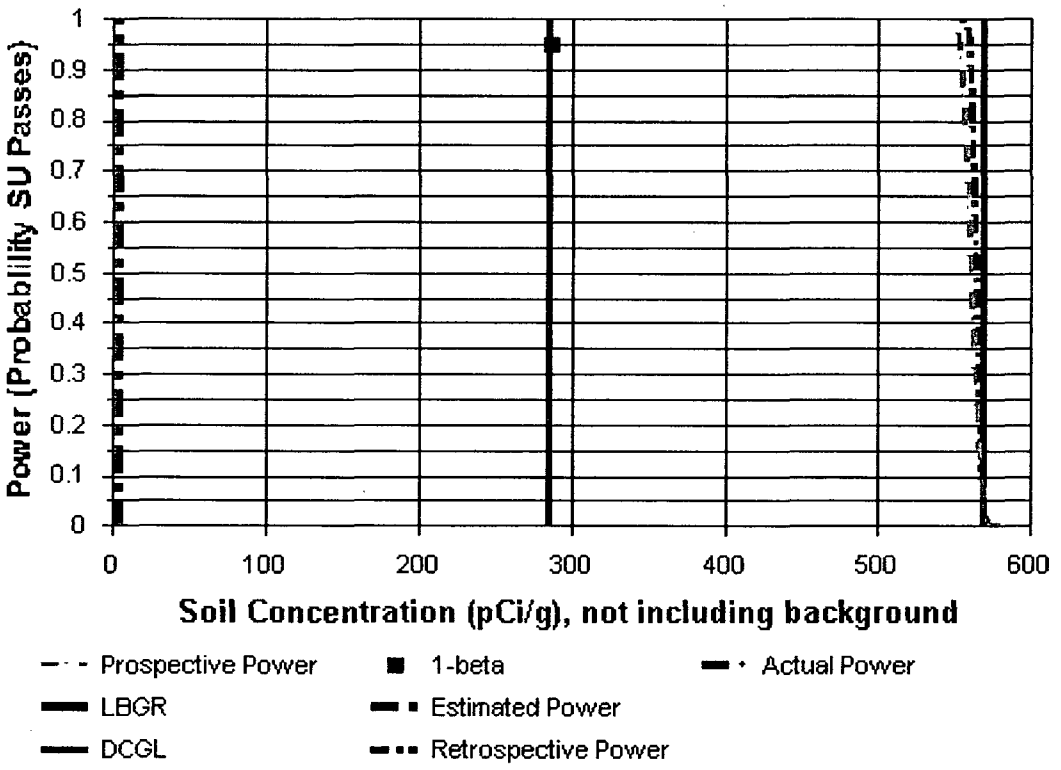
Report Created 09/23/2009 1356 (*COMPASS v1.1.0*)

SURFACE SOIL ASSESSMENT REPORT

Assessment Summary

Site Name:	Phase 1 Disposal Cell Footprint		
Planner(s):	Sequoyah Fuels Corporation		
Survey Unit Name:	Phase 1 Demonstration Survey		
Report Number:	1 *(DQAID: 1)*		
Survey Unit Samples:	67	Reference Area Samples:	15
Statistical Test Selected:	WRS	Test Result:	Not Performed
Judgmental Samples:	0	EMC Result:	Not Performed
Assessment Conclusion:	**Reject Null Hypothesis (Survey Unit PASSES)**		

Retrospective Power Curve



Analytical Survey Data

NOTE: Type = "SU" indicates survey unit sample.
Type = "RA" indicates reference area sample.
All analytical results are in units of pCi/g.

Sample Number	Type	U-total
BH087-1	SU	3.385
BH087-2	SU	3.385
BH087-3	SU	3.385
BH087-4	SU	3.385
BH087-5	SU	3.385
BH087-6	SU	3.385
BH087-7	SU	3.385
BH087-8	SU	3.385
BH087-9	SU	3.385
BH087-10	SU	3.385
BH087-11	SU	3.385
BH087-12	SU	3.385
BH087-13	SU	3.385
BH087-14	SU	3.385
BH087-15	SU	3.385
BH087-16	SU	3.385
BH087-17	SU	3.385
BH087-18	SU	3.385
BH087-19	SU	3.385
BH087-20	SU	3.385
BH088-1	SU	5.2806
BH088-2	SU	3.385
BH088-3	SU	3.385
BH088-4	SU	3.385
BH088-5	SU	3.385
BH088-6	SU	3.385
BH088-7	SU	3.385
BH088-8	SU	3.385
BH088-9	SU	3.385
BH088-10	SU	3.385
BH088-11	SU	3.385
BH088-12	SU	3.385
BH088-13	SU	3.385
BH088-14	SU	3.385
BH088-15	SU	3.385
BH088-16	SU	3.385
BH088-17	SU	3.385
BH088-18	SU	3.385
BH088-19	SU	3.385
BH217-1	SU	3.385
BH217-2	SU	68.377
BH217-3	SU	3.385
BH217-4	SU	3.385
BH217-5	SU	3.385
BH217-6	SU	3.385

Sample Number	Type	U-total
BH217-7	SU	3.385
BH217-8	SU	3.385
BH217-9	SU	3.385
BH217-10	SU	3.385
BH218	SU	12.863
BH223-1	SU	22.341
BH223-2	SU	3.385
BH223-3	SU	3.385
BH223-4	SU	3.385
BH224-1	SU	3.385
BH224-2	SU	3.385
BH224-3	SU	3.385
BH224-4	SU	3.385
BH224-5	SU	3.385
BH320-1	SU	5.0775
BH320-2	SU	9.478
BH320-3	SU	6.9731
HA646-1	SU	16.5865
HA646-2	SU	6.9054
HA651	SU	51.5197
HA652-1	SU	9.4103
HA652-2	SU	9.8165
HA288	RA	1.7
HA289	RA	0.7
HA290	RA	0.7
HA291	RA	0.9
HA292	RA	0.8
HA293	RA	1
HA294	RA	1
HA295	RA	1.1
HA296	RA	1.2
HA297	RA	0.8
HA298	RA	0.9
HA299	RA	0.9
HA300	RA	0.7
HA307	RA	1
HA308	RA	1.2

Basic Statistical Quantities Summary

Statistic	Survey Unit	Background	DQO Results
Sample Number	67	15	N/2=9
Mean (pCi/g)	6.13	0.97	5.1
Median (pCi/g)	3.39	0.90	N/A
Std Dev (pCi/g)	10.15	0.26	10
Max Value (pCi/g)	68.38	1.70	N/A
Min Value (pCi/g)	3.39	0.70	N/A

Report Created 09/23/2009 1356 (*COMPASS v1.1.0*)

SEQUOYAH FUELS CORPORATION

DEMONSTRATION SURVEY
Phase I Disposal Cell Footprint Soils