

INEL-95/0625

Revision 1

July 1997



**Stationary Low-Power Reactor-1 and
Boiling Water Reactor Experiment-I
Burial Grounds Engineered Barriers
Project Operation and Maintenance
Plan, Operable Units 5-05 and 6-01**

A. Cram

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The Lockheed Martin logo consists of the words "LOCKHEED MARTIN" in a bold, uppercase, sans-serif font. To the right of the text is a stylized graphic element: a horizontal line that ends in a sharp, upward-pointing arrowhead, with a diagonal line intersecting it from the bottom right.

**Stationary Low-Power Reactor-1 and Boiling Water
Reactor Experiment-I Burial Grounds Engineered
Barriers Project Operations and Maintenance Plan,
Operable Units 5-05 and 6-01**

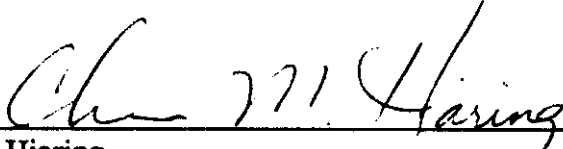
A. Cram

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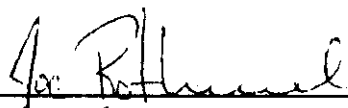
**Stationary Low-Power Reactor-1 & Boiling Water Reactor
Experiment-I
Burial Grounds Engineered Barriers
Project Operation and Maintenance Plan
Operable Unit 5-05/6-01**

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6-30-97
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6/30/97
Date

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ACRONYMS AND ABBREVIATIONS

BORAX-I	Boiling Water Reactor Experiment-I
DOE-ID	U.S. Department of Energy-Idaho Operations
INEEL	Idaho National Engineering and Environmental Laboratory
M&O	Maintenance and Operating
O&M	Operation & Maintenance Plan
SL-1	Stationary Low-Power Reactor-1

Stationary Low-Power Reactor-1 and Boiling Water Reactor Experiment-I Burial Grounds Engineered Barriers Project Operations and Maintenance Plan, Operable Units 5-05 and 6-01

1. GENERAL

This site-specific Operation and Maintenance (O&M) Plan describes the activities and procedures required to maintain the long-term engineered barriers at Stationary Low-Power Reactor-1 (SL-1) and Boiling Water Reactor Experiment-I (BORAX-I) burial grounds. As operations at the sites will cease upon completion of the construction, inspection and maintenance comprise the scope of anticipated activities.

Basic elements of this O&M Plan present:

- A description of inspection procedures,
- Maintenance and repair procedures for the barriers, adjacent revegetated areas, and institutional controls,
- Reporting policies and practices.

Photographs will be used to enhance the informative quality of the comprehensive documentation whenever possible, particularly when scheduled maintenance activities result in comments by the inspector. A record of these photographs, preserved in a site inspection photo log, will be maintained by the Idaho National Engineering and Environmental Laboratory (INEEL) Maintenance and Operating (M&O) Contractor SL-1/BORAX-I Remediation Project Manager and made available for agency review.

2. RIP RAP BARRIERS AND BIOTIC BARRIER

The engineered barriers will be inspected semi-annually for the first year and annually thereafter, with particular attention being paid to settling of the barrier. Visual inspection will identify areas affected by erosion and/or subsidence. Areas on the top of the barriers showing signs of localized subsidence more than 12 inches deep will be repaired by the addition of rip rap in the subsided area. Subsidence in depths of less than 12 inches would be difficult to measure, as the rip rap layer will be constructed of rock which is 1 to 2 foot in diameter.

Inspection information will be recorded on inspection forms, as shown in Attachment 1 of this document.

Animal intrusions into the biotic barrier at SL-1 will be identified during semi-annual inspections during the first year following construction and annually thereafter. Information will be recorded on the SL-1 Inspection Report Form in Attachment 1 of this document.

3. REVEGETATED AREAS AND EROSION

Revegetated areas will not be placed on the barriers, but on adjacent areas which have been disturbed by either the removal of contaminated soils or activities associated with the building of the caps. The revegetated areas will be monitored qualitatively during annual inspections in late summer for three years following seeding to ensure proper growth. Qualitative determinations of non-growth areas or of sparse growth areas will be made by a qualified inspector, through comparative evaluations of the growth in undisturbed areas near the burial grounds, with consideration of the length of time since planting. Information will be recorded on Inspection Report Forms shown in Attachment 1 of this document.

Areas experiencing seeding failure, as evidenced by lack of perennial grass establishment, invasion by weeds (primarily Russian thistle, wheatgrass, and tumble mustard), or encroachment of shrubs (sagebrush and rabbitbrush), will be documented and photographed. Reseeding and fertilization procedures will be in accordance with the requirements of Specifications Section 02930 (Appendix D of the RD/RA WP). Reseeded areas will require follow-up inspections to verify successful reseeding.

At the time of the inspections of the revegetated cover, qualitative information on surface erosion will be collected in the revegetated zones. Observations of soil movement, as evidenced by the accumulation of soil on the up-slope side of plants, pedestalling of plants or rocks, or the formation of rills or gullies, will be recorded on Inspection Report Forms in Attachment 1 of this document, with the extent of erosion noted. Photographs will be used as needed.

4. INSTITUTIONAL CONTROLS

The purpose of the institutional controls is to restrict access to the SL-1 and BORAX-I long term engineered barriers. Controls will be inspected semi-annually for the first year and annually thereafter. Institutional controls include:

- Site signs
- Permanent markers
- Fences
- Postings

The controls will be inspected and their status registered on the Inspection Report Form, shown in Attachment 1. The institutional controls to be inspected are indicated on the figures accompanying the Inspection Report Forms. The institutional controls found to be damaged or missing will be repaired or replaced.

Written notification of the remedial action will be included in the facility master plan. The notification will prohibit any activities that would interfere with the remedial activity. A copy of the notifications will be given to the Bureau of Land Management (BLM) along with a request that such notification be placed in their property management records. DOE will provide written verifications to EPA and IDHW/DEQ that notification, including BLM notification, have been fully implemented, per the ROD.

5. ORGANIZATION AND RESPONSIBILITIES

This section outlines the organizational practices that will drive the operation and maintenance activities and specifies the individuals responsible for the inspections, repairs, and reporting required at the SL-1 and BORAX-I burial sites.

5.1 Organization

5.1.1 DOE Project Manager

The U.S. Department of Energy, Idaho Operations Office (DOE-ID) Lockheed Martin Idaho Technologies Company SL-1/BORAX-I Remediation Project Manager is responsible for:

- Ensuring the operations and maintenance activities are performed in accordance with the approved plan;
- Coordinating the activities of the INEEL Operating Contractor at SL-1 and at BORAX-I.

5.1.2 Lockheed Idaho Technologies Company SL-1/BORAX-I Remediation Project Manager

As the point of contact for operation and maintenance activities, the INEEL M&O SL-1/BORAX-I Remediation Project Manager will be accountable for:

- Document control of inspection reports, including their placement in the project records file;
- Administration of subcontracts for performing required repairs;
- Reporting of activities to DOE-ID.

5.2 Responsibilities

5.2.1 Inspections

The INEEL M&O Contract SL-1/BORAX-I Remediation Project Manager will provide personnel to inspect the SL-1 and BORAX-I engineered barriers in accordance with the approved O&M Plan and will document inspections in accordance with Section 6.0 of this document. Table 5-1 summarizes the inspection schedules for SL-1 and BORAX-I engineered barriers. Personnel will be trained to the requirements of the approved plan prior to performing inspections. The INEEL M&O Contractor SL-1/BORAX-I Remediation Project Manager is responsible for the implementation and reporting of inspections.

After five years, the frequency of inspection and reporting will be reevaluated by the SL-1/BORAX-I Remediation Project Manager. Changes will require approval of the agencies.

5.2.2 Repair/Replacement of Material

The INEEL M&O Contractor SL-1/BORAX-I Remediation Project Manager will obtain the services of a Subcontractor, as necessary, to repair or replace any structures at or near the SL-1 and BORAX-I barriers which are identified by inspections as requiring corrective action in accordance with the approved Operations and Maintenance Plan. The Remediation Project Manager will provide construction management support for maintenance activities, and will document all repairs or replacements in accordance with existing INEEL procedures.

Table 5-1. Summary of inspection schedules for SL-1/BORAX-I engineered barriers.

Vegetative Cover		In late summer for three years following seeding.
Soil Erosion		In late summer for three years following seeding.
Biotic Barrier		
Intrusion:	Semi-annually for 1 year.	Annually after first year.
Erosion:	Semi-annually for 1 year.	Annually after first year.
Institutional Controls		
Fences:	Semi-annually for 1 year.	Annually after first year.
Signs and postings:	Semi-annually for 1 year.	Annually after first year.
Rip Rap Cover:		
Settling:	Semi-annually for 1 year.	Annually after first year.
Erosion:	Semi-annually for 1 year.	Annually after first year.
Rad Surveys	Semi-annually for 1 year.	Annually after first year.
	Semi-annually for 1 year.	Annually after first year.

6. REPORTING REQUIREMENTS

6.1 Inspection

Inspections of the SL-1 and BORAX-I engineered barriers will fall into three types:

- Semi-annual or annual scheduled inspections,
- Follow-up inspections,
- Contingency inspections.

Scheduled inspections are summarized in Table 5-1, page 5-3. Follow-up inspections for repair/replacement activities will occur as determined by the Remediation Project Manager. Contingency inspections are unscheduled inspections ordered by DOE; trigger events for these inspections may include severe rainstorms, floods, or highly unusual events such as tornadoes, earthquakes, or severe vandalism.

The SL-1/BORAX-I Remediation Project Manager will record inspection results on the attached Inspection Report Forms (Attachment A), which include figures of SL-1 and BORAX-I barriers to aid the inspector in identifying locations of required maintenance or repair. The forms will be completed, signed, dated, and submitted to the INEEL M&O Contractor SL-1/BORAX-I Remediation Project Manager on a semi-annual basis or as needed in the case of contingency inspections.

6.2 Maintenance

No routine maintenance is planned for the sites. Unscheduled custodial maintenance activities will be determined during inspections.

The INEEL M&O Contractor SL-1/BORAX-I Remediation Project Manager will develop the following documents to be submitted to the DOE-ID SL-1/BORAX-I Remediation Project Manager for required maintenance activities:

- A work plan citing required maintenance activities as identified by inspection reports. The work plan will include a technical work scope, cost estimate, schedule, a reference list of existing applicable technical specifications and drawings, and health and safety requirements.
- A completion report defining the maintenance work performed, including record drawings of any maintenance work which alters the design configuration of the SL-1 and BORAX-I barriers.

6.3 Reporting

The O&M Contractor's SL-1/BORAX-I Remediation Project Manager's will report semi-annually for the first year, and annually thereafter, to the DOE-ID SL-1/BORAX-I Remediation Project Manager. Reports will include:

- Documentation of scheduled inspections, follow-up inspections, contingency inspections, and maintenance activities,
- A summary of the inspection,
- A summary of maintenance activities to date,
- An estimate of maintenance activities required in the subsequent quarter,

The DOE-ID PM will send a copy of the report to EPA and IDHW/DEQ.

Appendix A
Inspection Report Forms

**INSPECTION REPORT FORM FOR BORAX-I ENGINEERED BARRIER
AS REQUIRED BY OU 6-01 OPERATING AND MAINTENANCE PLAN**

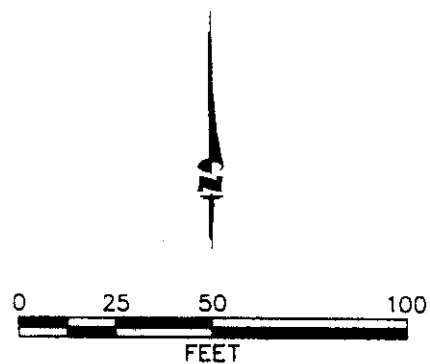
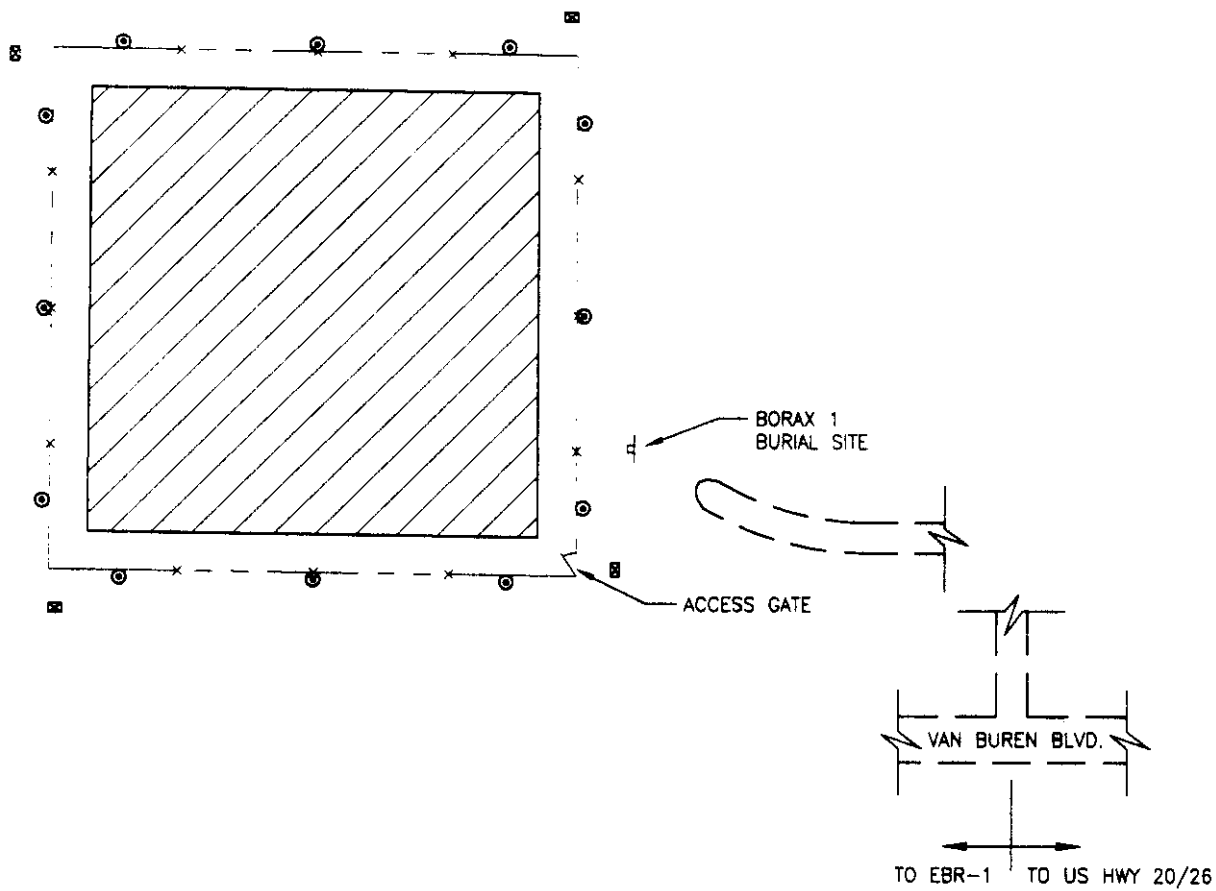
SEMI-ANNUAL ANNUAL Inspection of BORAX-I Barrier

INSPECTION ACTIVITY	INSPECTOR SIGNATURE	INSP. DATE	COMMENTS/RECOMMENDED REPAIR
<u>REVEGETATED AREAS</u>			
1. Inspect for non-growth areas.			
2. Inspect for sparse growth areas.			
3. Inspect for weed encroachment.			
<u>RIP RAP BARRIER</u>			
1. Inspect for erosion areas.			
2. Inspect for subsidence areas.			
3. Survey for slope movement (yearly).			
4. RAD survey.			
<u>INSTITUTIONAL CONTROLS</u>			
1. Document that fences restrict access.			
2. Document that signs/barriers are in place and in good condition.			


Name of Inspector _____

Photographs Taken Yes No

Qualifications/Title _____



LEGEND

- x — x — FENCE
- POSTINGS
- MARKERS
-  RIP RAP

ATTACHMENT 1

BORAX - I ENGINEERED BARRIER

Inspection Report Form
Operations and Maintenance Plan

**PARSONS
ENGINEERING SCIENCE, INC.**

Idaho Falls, Idaho

**INSPECTION REPORT FORM FOR BORAX-I ENGINEERED BARRIER
AS REQUIRED BY OU 6-01 OPERATING AND MAINTENANCE PLAN**

QUARTERLY BI-ANNUAL ANNUAL Inspection of BORAX-I Barrier

INSPECTION ACTIVITY	INSPECTOR SIGNATURE	INSP. DATE	COMMENTS/RECOMMENDED REPAIR
REVEGETATED AREAS			
1. Inspect for non-growth areas.	/		
2. Inspect for sparse growth areas.			
3. Inspect for weed encroachment.			
RIPRAP BARRIER			
1. Inspect for erosion areas.	/		
2. Inspect for subsidence areas.			
3. Survey for slope movement (yearly).			
INSTITUTIONAL CONTROLS			
1. Document fences restrict access.	/		
2. Document signs/barriers are in place and in good condition.			

Name of Inspector _____

Photographs Taken Yes No

Qualifications/Title _____

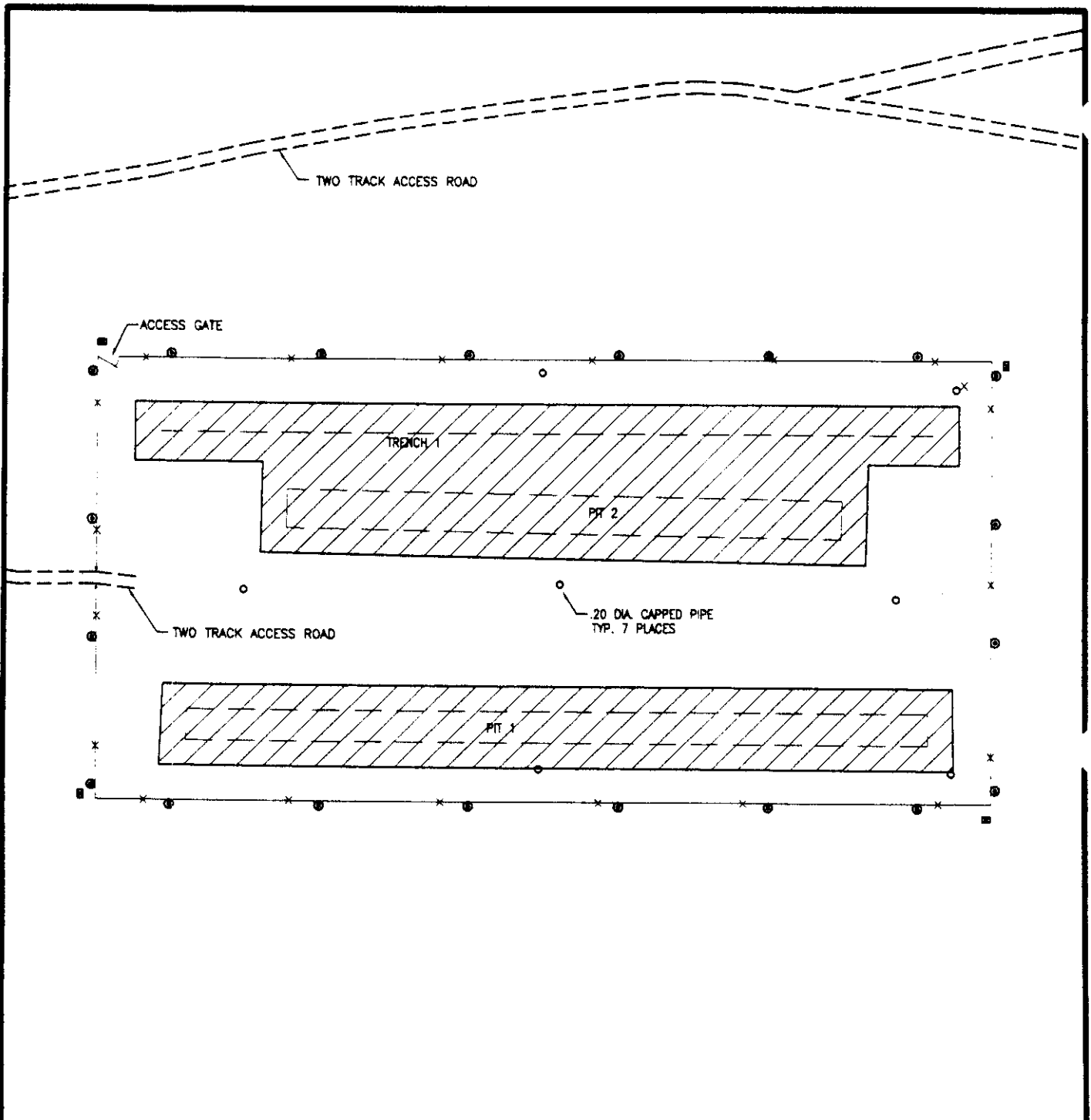
**INSPECTION REPORT FORM FOR SL-1 ENGINEERED BARRIER
AS REQUIRED BY OU 5-05 OPERATING AND MAINTENANCE PLAN**
 SEMI-ANNUAL ANNUAL Inspection of SL-1 Barrier

INSPECTION ACTIVITY	INSPECTOR SIGNATURE	INSP. DATE	COMMENTS/RECOMMENDED REPAIR
REVEGETATED AREAS			
1. Inspect for non-growth areas.			
2. Inspect for sparse growth areas.			
3. Inspect for weed encroachment.			
BIOTIC BARRIER			
1. Inspect for erosion areas.			
2. Inspect for animal intrusion.			
RIP RAP BARRIER			
1. Inspect for erosion areas.			
2. Inspect for subsidence areas.			
3. Survey for slope movement (yearly).			
4. RAD survey.			
INSTITUTIONAL CONTROLS			
1. Document that fences restrict access.			
2. Document that signs/barriers are in place and in good condition.			

Name of Inspector _____

Photographs Taken Yes No

Qualifications/Title _____



LEGEND



FENCE



POSTINGS



MARKERS



RIP RAP



ATTACHMENT 1

SL-1 ENGINEERED BARRIER

Inspection Report Form
Operations and Maintenance Plan

**PARSONS
ENGINEERING SCIENCE, INC.**

Idaho Falls, Idaho

**INSPECTION REPORT FORM FOR SL-1 ENGINEERED BARRIER
AS REQUIRED BY OU 5-05 OPERATING AND MAINTENANCE PLAN**
 QUARTERLY BI-ANNUAL ANNUAL Inspection of SL-1 Barrier

INSPECTION ACTIVITY	INSPECTOR SIGNATURE	INSP. DATE	COMMENTS/RECOMMENDED REPAIR
REVEGETATED AREAS			
1. Inspect for non-growth areas.			
2. Inspect for sparse growth areas.			
3. Inspect for weed encroachment.			
RIPRAP BARRIER			
1. Inspect for erosion areas.			
2. Inspect for subsidence areas.			
3. Survey for slope movement (yearly).			
BIOTIC BARRIER			
1. Inspect for erosion areas.			
2. Inspect for animal intrusion.			
INSTITUTIONAL CONTROLS			
1. Document fences restrict access.			
2. Document signs/barriers are in place and in good condition.			

Name of Inspector _____

Photographs Taken Yes No

Qualifications/Title _____