DOCUMENT RELEASE AND CHANGE FORM

Prepared For the U.S. Department of Energy,
Assistant Secretary for Environmental Management
By Washington River Protection Solutions, LLC., PO Box 850, Richland, WA 99352
Contractor For U.S. Department of Energy, Office of River Protection, under Contract DE-AC27-08RV14800

1a. **Doc No:** RPP-16604 **Rev.** 02

1b. **Project Number:** T1P97☐ N/A

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Release Stamp

DATE: Nov 05, 2014 HANFORD RELEASE

2. **Document Title**
PROCUREMENT SPECIFICATION FOR ANTIMONY-LEAD SHIELDING

3. **Design Verification Required**
☐ Yes ☒ No

4. **USQ Number** ☒ N/A
N/A-8

5. **PrHA Number** ☐ N/A
PRHA-02025 Rev. 00

6. **USQ Screening:**

a. Does the change introduce any new failure modes to the equipment? ☐ **Yes** ☒ **No**
Basis is required for Yes:_____

b. Does the change increase the probability of existing failure modes? ☐ **Yes** ☒ **No**
Basis is required for Yes:

c. For Safety Significant equipment, does the change require a modification to Chapter 4 of the DSA and/or FRED? ☐ **Yes** ☐ **No** ☒ **N/A**
Basis is required for Yes:

7. **Description of Change and Justification** (Use Continuation pages as needed)

Description: Update procurement specification for Antimony-Lead shielding as shown in attached revision to add version with 2-in wall thickness per H-14-110130, specify anti-skid finish on top exposed surface of these structures, and clarify attributes to be verified in first-article inspection.

Problem:
- The current procurement specification for Antimony-Lead shiedling, RPP-16604, Rev. 1, specifies structures with wall thickness of 1-in. Preliminary dose rate calculations for transfer of AY-102 waste through Hose-in-Hose Transfer Line (HIHTL) indicates a shiedling thickness of 2-in is required for the expected source term to ensure conditions in the field are ALARA over the course of planned transfer of AY-102 contents.
- When installed in the field, the gloss finish of Antimony-Lead shielding strucutres may pose a slipping hazards to field workers who have to walk over them.
- Attributes to be verified in first article inspection of Antimony-Lead shielding structures are not clearly specified in the current specification.

See continuation page 3 for additional information.

8. **Approvals**

Title	Name	Signature	Date
Clearance Review	WASHINGTON, MARGUERITE	WASHINGTON, MARGUERITE	11/05/2014
Design Authority	BUCHANAN, JOSEPH R	BUCHANAN, JOSEPH R	10/29/2014
Checker	DORSH, PAUL M	DORSH, PAUL M	10/28/2014
Document Control Approval	WASHINGTON, MARGUERITE	WASHINGTON, MARGUERITE	11/05/2014
Originator	BUCHANAN, JOSEPH R	BUCHANAN, JOSEPH R	10/29/2014
Other Approver	ULK, CHARLES R	ULK, CHARLES R	10/28/2014
PrHA Lead	SMITH, RYAN D	SMITH, RYAN D	10/29/2014
Radiological Control	WINSLOW, ROBERT C	WINSLOW, ROBERT C	10/28/2014
Responsible Engineering Manager	HANSON, CARL E	HANSON, CARL E	10/29/2014
USQ Evaluator	SMITH, RYAN D	SMITH, RYAN D	10/29/2014

9. **Clearance Review:**

Restriction Type:

☐ Public
☒ Undefined
☐ Unclassified Controlled Nuclear Information (UCNI)
☐ Export Control Information (ECI)
☐ Official Use Only Exemption 2-Circumvention of Statute (OUO-2)
☐ Official Use Only Exemption 3-Statutory Exemption (OUO-3)
☐ Official Use Only Exemption 4-Commercial/Proprietary (OUO-4)
☐ Official Use Only Exemption 5-Privileged Information (OUO-5)
☐ Official Use Only Exemption 6-Personal Privacy (OUO-6)
☐ Official Use Only Exemption 7-Law Enforcement (OUO-7)

DOCUMENT RELEASE AND CHANGE FORM

Doc No: RPP-16604 **Rev.** 02

10. **Distribution:**

Name	Organization
ANDREWS, JEFFREY E	MODIFIED SLUICING OPERATIONS
BUCHANAN, JOSEPH R	HANFORD TOC
FOSTER, JAMES	
HANSON, CARL E	AY-102 RETRIEVAL ENGRNG
HULKE, MARK W	RADCON ENGINEERING
ROBINSON, RANDALL S	AY-102 RETRIEVAL ENGRNG
WINSLOW, ROBERT C	SST R & C RADCON

11. **TBDs or Holds** ☒ N/A

12. **Impacted Documents – Engineering** ☐ N/A

Document Number	Rev.	Title
RPP-16604	01	SPECIFICATIONS FOR ANTIMONY-LEAD SHIELDING

13. **Other Related Documents** ☒ N/A

Document Number	Rev.	Title

14. **Related Systems, Structures, and Components:**

14a. **Related Building/Facilities** ☐ N/A	14b. **Related Systems** ☒ N/A	14c. **Related Equipment ID Nos. (EIN)** ☒ N/A
241-AP 241-AY		

DOCUMENT RELEASE AND CHANGE FORM CONTINUATION SHEET	**Document No:** RPP-16604 **Rev.** 02

Continued of Block 7:

Solution: Update specification to:
- define an Antimony-Lead shielding sturcure that has 2-in of thickness.
- Specify an anti-skid finish on top exterior surface of these structures
- Clarify attributes to be verified during first-article inspection

Analysis: Preliminary examination of expected AY-102 waste retrieval source term indicates 2-in of Antimony-Lead shiedling applied to slurry and supernatant transfer HIHTLs will ensure conditions are ALARA.

Justification: Project T1P97 objectives include transfer of waste currently stored in tank 241-AY-102 to compliant DST storage (ref. RPP-PLAN-55220). Project planning specifies that sludge in AY-102 will be transferred to receiver tank 241-AP-102 via HIHTL. Shielding of these waste transfer components is necessary to ensure ALARA conditions are maintained during transfer of AY-102 sludge.

Update RPP-16604, Rev. 1 as shown in attached revision.

Procurement Specification for Antimony-Lead Shielding

Author Name:
KW Dixon
ARES Corporation for Washington River Protection Solutions, LLC
Richland, WA 99352
U.S. Department of Energy Contract DE-AC27-08RV14800

EDT/ECN: DRCF MW 11/5/2014 UC:
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Key Words: Antimony, Hose Barn, Lead, Shielding,

Abstract: This Specification provides the requirements for shielding using an Antimony-Lead alloy used to reduce radiation levels at Tank Farms.

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APPROVED
By marguerite washington at 4:01 pm, Nov 05, 2014

Release Approval Date

DATE:
Nov 05, 2014
HANFORD RELEASE

Release Stamp

Approved For Public Release

Tank Operations Contractor (TOC) **RECORD OF REVISION**	(1) Document Number: **RPP-16604, Revision 2**	Page 1

(2) Title:

Procurement Specification for Antimony-Lead Shielding

Change Control Record

(3) Revision	(4) Description of Change – Replace, Add, and Delete Pages	Authorized for Release	
		(5) Author. (print/sign/date)	(6) Resp. Mgr. (print/sign/date)
0	Revision 0 released via EDT-636527	RL Brown 6/3/03	KW Gray 6/3/03
1	Replaced sketches in Attachment A with more legible sketches.	RL Brown 8/22/03	KW Gray 8/22/03
2 RS	Added 2" thick option for hose barn configuration. Removed incorrectly dimensioned sketches in back of document and added references to released drawings.	See DRCF	See DRCF

PROCUREMENT SPECIFICATION FOR ANTIMONY-LEAD SHIELDING

September 2014

prepared by

ARES Corporation
Energy Services Division
1100 Jadwin Avenue, Suite 400
Richland, Washington 99352
(509) 946-3300

for

Washington River Protection Solutions, LLC

1.0 SCOPE

This Specification defines the requirements for shielding using an antimony-lead alloy used to reduce radiation levels at Hanford Tank Farms.

2.0 APPLICABLE DOCUMENTS

The following documents form a part of the basis of design to the extent specified in the applicable sections of this Specification. In the event that the requirements of this Specification are more restrictive than the requirements of the documents referenced herein, the requirements of this Specification take precedence.

2.1 GOVERNMENT DOCUMENTS

Documents listed in Table 2-1 constitute a part of this Specification to the extent specified herein. Current version shall be used unless otherwise noted.

Table 2-1. Applicable Documents.

Document Number	Title
Industry Consensus Codes and Standards	
H-14-106306	*Hose Barn Shielding Assembly Drawing*
H-14-110130	*2"Hose Barn Shielding Assembly Drawing*

2.2 NON-GOVERNMENT DOCUMENTS

National codes and standards listed in Table 2-2 constitute a part of this Specification to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this Specification, the contents of this Specification shall be considered a superseding requirement.

Table 2-2. Applicable Documents.

Document Number	Title
Industry Consensus Codes and Standards	
ASTM A36/A36M-01	*Standard Specification for Carbon Structural Steel,* ASTM International (ASTM), West Conshohocken, Pennsylvania. *(Relative only to steel lifting eye insert.)*

3.0 TECHNICAL REQUIREMENTS

3.1 ITEM DEFINITION

The shielding materials in this Specification are a configuration of shielding material composed of an antimony-lead alloy to be used at Tank Farm facilities. For specific configuration, reference Hose Barn Shielding Assembly Drawing H-14-106306 and 2" Hose Barn Shielding Assembly Drawing H-14-110130.

3.2 CHARACTERISTICS AND PERFORMANCE CRITERIA

The material shall be cast material utilizing an alloy of 3% (+0.5/-0%) antimony with the remaining material being lead, with minor impurities no greater than 1.25% of the total constituents. The product shall meet the following performance criteria:

NOTE: First article inspection (per Section 4.0) as well as assessment of workmanship and appearance (described below) shall be performed prior to painting.

1. The antimony-lead alloy shall cast to have a thickness as shown on the drawings (H-14-106306 – 1" +1/16" -0"; H-14-110130 – 2" +1/16" -0").

2. Each item shall be painted yellow in color and have a gloss finish suitable for outdoor applications with a temperature range of -25 to 115° Fahrenheit.

3. The painted surface shall not peel, bubble, or leave any exposed lead.

4. Grit or sand shall be added to the top surface of the items during painting to create a non-skid type surface.

5. **Appearance** – Material surfaces must be clean and free of any foreign matter.

6. **Workmanship** – The item must be free of any cracking, pits, voids, or holes.

7. **Hole in Steel Angle** – The hole in the steel angle shall be clean cut or drilled with no loose or ragged edges and free from debris.

4.0 FIRST ARTICLE INSPECTION AND TESTING

The Supplier shall schedule a first article inspection for the Buyer at the Supplier's plant to demonstrate compliance with Purchase Order/Contract Order dimensional and workmanship requirements (before painting). The Supplier shall notify the Buyer at least five working days before the first article is available for inspection.

First article inspection shall include:

(a) Verification that the first article conforms to the drawing identified in purchase order (i.e. H-14-106306 and/or H-14-110130) for configuration and dimensional requirements.

(b) Verification that the first article meets characteristics listed in Section 3.2.

(c) Performance of a Lift Test of the first article via the hole in steel angle.

(d) Performance of a qualification fit up test of the first article to ensure configurations fit together as designed.

(e) Verification that the Certified Material Test Reports (CMTRs) show the material, as described above in Section 3.2, contains the prescribed Antimony-Lead alloy.

The performance of such tests and inspections does not limit the right of the Buyer to conduct other such tests and inspections as the Buyer deems necessary at the Supplier's facility, or otherwise, to assure that all items are in conformance with all requirements of this Specification or to assure validity of the Supplier's inspection.

5.0 DOCUMENTATION REQUIREMENTS

Required submittals are identified and listed on the procurement Master Submittal Register (MSR). The MSR identifies the minimum submittals required by this specification and identifies when the submittals are required to be submitted in the procurement process. The MSR included with the purchase order will constitute the governing MSR.

Submittals shall be provided using the TOC Incoming Letter of Transmittal (form A-6005-315). All transmittal subject headings shall contain, at a minimum, the subcontract number, submittal number identified by the MSR, and submittal description.

Submittals shall be provided in electronic format unless available only as a hard copy. Electronic submittals may be sent to TOCVND@rl.gov or delivered via a WRPS designated File Transfer Protocol (FTP) site. Electronic formats must be non-password protected in one of the following formats:

- Microsoft® Office Compatible
- Portable Document Format (PDF)
- Tagged Image File Format (TIFF)
- Graphics Interchange Format (GIF)
- Joint Photographic Experts Group (JPEG)
- Windows Media Video (WMV)
- Moving Picture Expert Group (MPEG)
- Extensible Markup Language (XML)
- HyperText Markup Language (HTML)
- Comma Separated Values (CSV)
- Text (TXT)

All deliverable documentation shall be complete, accurate, legible, and reproducible. Before delivery, design media and documents shall be reviewed by qualified Subcontractor personnel for technical adequacy and appropriate content in accordance with the Subcontractor's Quality Assurance procedures. The Subcontractor shall attest, in writing, to the accuracy and completeness of the information contained in the final deliverables.

Deliverables shall be subject to approval by the BTR. Deliverables shall comply with this specification and technical basis documents and other requirements identified herein.

5.1 APPROVAL OF SUBMITTALS

All Submittals transmitted shall include the designation in the Master Submittal Register (MSR) per TOC Vendor Processes stated in TFC-BSM-IRM_DC-C-07. Submittals are divided into two types: 1) those requiring "approval" (e.g., approval data or pre-purchase evaluation data); and 2) those "not requiring approval" (e.g., vendor information data). Submittals "not requiring approval" will be reviewed to verify completeness and adequacy for their intended purposes. A submittal requiring approval that is not approved is identified as: 1) "Not Approved Revise and Resubmit." The submittal is considered technically deficient, or incomplete, and therefore unacceptable. Resubmittal is required, hence the fabrication, procurement, or performance of procedures shall not proceed; or 2) "Approved with Exception." Fabrication, procurement, and performance may proceed, and resubmittal is required to verify incorporation of the exception. Submittals "not requiring approval" that are determined to be incomplete or inadequate will be marked "Resubmit." An explanation of the deficiencies will be included for corrective action by the Seller.

Approval by the Buyer does not relieve the Seller of responsibility for accuracy or adequacy of design under this specification.

If any revision has been made to previously submitted items, the Seller shall resubmit updated versions of said items for approval, in addition to the items listed above.

5.2 SUBMITTALS

The supplier shall provide submittals as discussed in this sub-section. One copy of the documentation, specified in the Master Submittal Register in the procurement documents, shall accompany the applicable item(s) shipped. For subsequent shipments on this Purchase Order/Contract Order, reference may be made to documentation provided with earlier shipments, instead of duplicating such documentation.

The Supplier/Manufacturer shall provide, as a submittal, a legible/reproducible Certification of Conformance (in accordance with Procurement Quality Clause B79). Supplier's/Manufacturer's authorized representative responsible for quality shall sign the Certification of Conformance.

This Certification of Conformance shall, as a minimum:

1. Identify the appropriate Purchase Order/Contract Order number under which the item is being supplied.

2. Supplier/Manufacturer shall warrant that all items furnished meet the requirements of the Purchase Order.

Additionally, the Supplier/Manufacturer shall provide, as a submittal, a chemical analysis report showing that the material contains the prescribed antimony-lead alloy.

6.0 PREPARATION FOR DELIVERY

6.1 PRESERVATION AND PACKAGING

The material shall be shipped in appropriately-labeled containers constructed in a manner that will ensure damage-free delivery.

6.2 MARKING

Each container shall be legibly and conspicuously marked with the purchase order number, specification number, name of supplier, name of component, and weight (gross and net).