ENGINEERING CHANGE NOTICE

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

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1a. ECN No: ECN-71484  Rev. 00  Tb. Project Number: T1P203

2. Title: ETF Brine Loadout System - Process P&ID Update

3. WA or Redline ECN: □ WA  □ REDLINE  ☑ N/A

4. Temporary Modification: ☑ Yes  □ No

5. Design Type: III

6. Design Verification Required: ☑ Yes  □ No

7. Safety Classification: ☑ SC  □ SS  ☑ GS  □ N/A

8. USQ Number: ☑ N/A  RPP-27195

9. PrHA Number  Rev.  □ N/A

10. Trend Codes

<table>
<thead>
<tr>
<th>Cause</th>
<th>Commodity</th>
<th>Discipline</th>
<th>Driver</th>
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<tbody>
<tr>
<td>Customer Initiated Changes</td>
<td>Mechanical Equipment</td>
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11. Design Authority Designator

ETF - WATER SYSTEMS - Cooling Water

12. Approvals

<table>
<thead>
<tr>
<th>Title</th>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td>Design Authority</td>
<td>Apablaza Lorca, Jimmy</td>
<td>Apablaza Lorca, Jimmy</td>
<td>09/03/2019</td>
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<tr>
<td>Checker</td>
<td>Allen, Paul R</td>
<td>Allen, Paul R</td>
<td>08/29/2019</td>
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<tr>
<td>Document Control Approval</td>
<td>Hood, Evan</td>
<td>Hood, Evan</td>
<td>09/04/2019</td>
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<td>Environmental Protection</td>
<td>Wall, Jeremy M</td>
<td>Wall, Jeremy M</td>
<td>09/03/2019</td>
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<tr>
<td>Originator</td>
<td>Olson, Donald S</td>
<td>Olson, Donald S</td>
<td>08/28/2019</td>
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<tr>
<td>Other Approver</td>
<td>Russell, Rose M</td>
<td>Russell, Rose M</td>
<td>08/31/2019</td>
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<td>Other Approver</td>
<td>McNamar, Edward A</td>
<td>McNamar, Edward A</td>
<td>09/03/2019</td>
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<tr>
<td>Responsible Engineering Manager</td>
<td>Rutherford, Wally</td>
<td>Rutherford, Wally</td>
<td>09/03/2019</td>
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13. Problem

Currently, the Effluent Treatment Facility (ETF) treats incoming waste streams, producing a bulk powder for disposal. It is expected that ETF's thin film dryer will not be capable of keeping up with the additional waste volume that will be produced once WTP starts up.

14. Solution

Provide capability for ETF to load concentrate (brine) from the concentrate tanks into Intermediate Bulk Container (IBC) totes for shipment to an offsite facility for treatment and disposal. This ECN updates the P&IDs for process systems that support the brine loadout system.

15. Analysis

Design checks were performed in accordance with ARES ESD (Sargent & Lundy) Quality Assurance Procedure (QAP) 3.2 and 3.6. Because of the simple nature of this change and the general service status of the equipment, a graded approach was applied and design verification was not performed as allowed by ARES ESD (Sargent & Lundy) QAP 3.5, Design Verification.

16. Description of Change

H-2-88998 SH 1 - Show new branch line connection from verification water to the brine loadout system P&ID.
- Show new branch line connections from concentrate tank 1A recirc loop to brine loadout system P&ID and heat exchanger P&ID.
- Show new branch line connections from concentrate tank 1B recirc loop to brine loadout system P&ID and heat exchanger P&ID.
- Remove valves 60J-062, 60J-063, 60J-067, and 60J-068 from P&ID.
- Move concentrate tank EINs and tank data to inside of tank depictions.
- Remove 3/4" nipples from vessel ventilation piping at both concentrate tanks. These connections are documented on H-2-88993.

H-2-88991 SH 1 - Show as-found condition for vessel ventilation system tie-in to Sump 1 drain header.
- Add new tie-in to Sump 1 drain header for Brine Loadout containment system drain line.

H-2-88993 SH 1 - Show new branch line connection from the brine loadout system P&ID to the vessel ventilation system P&ID.

H-2-89002 SH 1 - Show new cooling water branch line connections to and from heat exchanger P&ID.

H-2-89336 SH 2 - Show new cooling water branch for Concentrate Tank recirculation loop heat exchangers
- Update stream information table to reflect new Concentrate Tank recirculation loop heat exchangers
16. Description of Change
- Show air junction box branch line valves as ‘open’ and add AOV EINs that they supply air to.

H-2-89351 SH 1
- Add symbol for double-pipe heat exchanger.

17. Work Package Number(s)
TBD

18. TBDs or Holds
☒ N/A

19. Related Structures, Systems, and Components
a. Related Building/Facilities ☐ N/A
b. Related Systems ☐ N/A
c. Related Equipment ID Nos. (EIN) ☐ N/A

2025E
ETF-1D
ETF-45D
ETF-60H
ETF-60J
ETF-95C
60J-062
60J-063
60J-067
60J-068

20. Engineering Drawings to be Changed

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<tr>
<th>Drawing Number</th>
<th>Rev.</th>
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<tr>
<td>H-2-88988 SH 001</td>
<td>28</td>
<td>PIPING &amp; INSTRUMENTATION DIAGRAM CONCENTRATE RECEIVING SYSTEM</td>
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<td>H-2-88991 SH 001</td>
<td>26</td>
<td>PIPING &amp; INSTRUMENTATION DIAGRAM SUMP TANK SYSTEM</td>
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<td>H-2-88993 SH 001</td>
<td>13</td>
<td>PIPING &amp; INSTM DIAG VESSEL VENTILATION SYSTEM</td>
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<td>H-2-88998 SH 001</td>
<td>20</td>
<td>PIPING &amp; INSTRUMENTATION DIAGRAM COOLING WATER SYSTEM</td>
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<tr>
<td>H-2-89002 SH 001</td>
<td>03</td>
<td>UTILITY FLOW DIAGRAM COOLING WATER SYSTEM</td>
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<td>H-2-89336 SH 002</td>
<td>01</td>
<td>PIPING &amp; INSTRUMENTATION DIAGRAM COMPRESSED AIR SYSTEM (IA)</td>
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<td>H-2-89351 SH 001</td>
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<td>PIPING &amp; INSTRUMENTATION DIAGRAM - LEGEND</td>
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21. Related Modification Traveler
☐ N/A

MT-50388

22. Related Documents
☐ N/A

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<tr>
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<tr>
<td>ECN-714375</td>
<td>02</td>
<td>ETF Air Compressor and Dryer Replacement-Mechanical</td>
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<tr>
<td>ECN-714892</td>
<td>00</td>
<td>ETF Cooling Tower and Pump Upgrade</td>
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<tr>
<td>ECN-714977</td>
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<td>Cooling Tower Upgrade Project – Cooling Water Tie-In Stub Lines</td>
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23. Distribution

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<th>Name</th>
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<tbody>
<tr>
<td>Apablaza Lorca, Jimmy</td>
<td>ETF ENGINEERING</td>
</tr>
<tr>
<td>Avalos, Tiffany A</td>
<td>PROJECT MANAGEMENT OFFICE</td>
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<td>McNamar, Edward A</td>
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<td>Winkley, Teri M</td>
<td>MATERIAL PROCUREMENT</td>
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<td>Wood, R Robert H</td>
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WAS: (ZONE C-E/4-5)

IS: (ZONE C-E/4-5)
WAS: (ZONE C/7)

IS: (ZONE C/7)
**WAS:** (ZONE A/6–7)

**IS:** (ZONE A/6–7)
DRAFTING NOTE:
The as-found field condition is shown in clouded area.

WAS: (ZONE E-F/1-2)  

AS-FOUND: (ZONE E-F/1-2)

IS: (ZONE E-F/1-2)
WAS: (ZONE C/6-7)

IS: (ZONE C/6-7)
CONSTRUCTION NOTE: (DO NOT INCORPORATE)
THIS "WAS" CONDITION REFLECTS THE "IS" CONDITION OF WORK COMPLETE
ECN-714375 AND ECN-714892/ECN-714977 WHEN WORK COMPLETE.

WAS: (ZONE A-C/6-7)

IS: (ZONE A-C/6-7)
DRAFTING NOTE: (DO NOT INCORPORATE)
THIS "WAS" CONDITION REFLECTS THE "IS" CONDITION OF ECN-714892
WHEN WORK COMPLETE.

WAS: (ZONE C-D/2)

CONCENTRATE
TANK
VENT
COOLER

BOILER

DRIER
CONCENTRATE
COOLER

IS: (ZONE C-D/2)

CONCENTRATE
TANK
VENT
COOLER

BOILER

CONCENTRATE
TANK & R-B
REFRC COOLERS

DRIER
CONCENTRATE
COOLER

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WAS: (ZONE D-F/3-4)

IS: (ZONE D-F/3-4)
WAS: (ZONE D-F/1-2)

IS: (ZONE D-F/1-2)