



ICD 01 – Interface Control Document for Raw Water

Document title:

Document number: 24590-WTP-ICD-MG-01-001, Rev 5

Contract: DE-AC27-01RV14136 **Contract deliverable:** C.9.1

Department: Project Management

NOTE: Obtain concurrence and approval signatures on the following page prior to approval of this ICD.

Approved by: Scott Monson

Scott Monson 1/28/2019
Signature Date

BNI Area Project Manager

Issue Status: Approved

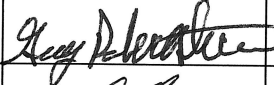


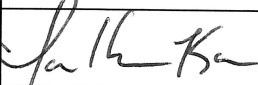
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NOTE: This document defines current service needs, future needs, and service gaps. The identified service levels do not represent contractual obligations between service recipient and providers. Future contractual and funding actions to close service gaps will be accomplished by integration between the federal offices as part of the budget planning process.


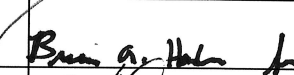

Interface Signature Page

Interface organizations, as appropriate, sign this sheet indicating concurrence and approval with the ICD contents. These signatures signify that the ICD accurately reflects the current baselines of interface organization's contracts, except as indicated in Appendix A, ICD 01 Issues and Open Items. The BNI APM does not approve this ICD until all required signatures on this page have been obtained.

Contractor Concurrence

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WTP Contractor	ICD 01 Interface Owner	Dave Reinemann		12-21-18
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DOE Approval

Position	Name	Signature	Date
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ORP Assistant Manager for Tank Farms	Rob Hastings		1/22/19
RL Assistant Manager for Mission Support	Jeff Frey		1/24/19

History Sheet

Rev	Date	Reason for revision	Revised by
A	16 Jul 2001	Issued for ORP concurrence	O Stuenkel
0	14 Mar 2002	Provided for ORP Contracting Officer to issue as Operative ICD. Upon issuance this document will supersede BNFL-5193-ID-01, Rev 6	K Cleveland
1	15 Nov 2002	Provided for ORP Contracting Officer to issue as Operative ICD as part of the required ICD update. Included ICFs: 24590-WTP-ICF-M-01-001, Rev 2, 24590-WTP-ICF-M-02-002, Rev 0, and 24590-WTP-ICF-M-02-001, Rev 0.	R Ciolli
2	15 Nov 2003	Provided for ORP Contracting Officer to issue as Operative ICD as part of the required ICD update. Incorporated ICF 24590-BOF-ICF-ENG-03-005.	R Ciolli
3	26 Jun 2012	Periodic update. There are no open Issues or Actions associated with this ICD at this time. Incorporated responsibility for testing and maintaining Backflow Preventer Valves.	M Miller
4	29 Jan 2014	Periodic update. There are no open ICFs associated with this ICD at this time. This revision created new ICD Issue I01-15, 24590-WTP-ATS-MGT-13-0557, Produce RWW Integrated Hydrostatic Test Procedure.	M Miller
5	28 Jan 2019	Revised per scope document CCN 306000. Added Sections 3, 4 and 5 based on revised ICD template. This is a major revision, and change bars are not shown. Incorporated ICF 24590-WTP-ICF-MGT-15-0001; schedule activities were deleted. Incorporated ICFs 24590-WTP-ICF-MGT-18-0006 except for section 3.1.3.3 which was updated this ICD revision and 24590-WTP-ICF-MGT-18-0007.	G Robertshaw

Revision Description

ICD Section	Description
All	The ICD has been reformatted in accordance with the requirements of <i>Interface Control Documents</i> (24590-WTP-GPP-RAOS-OS-0001, Rev 3).
Acronyms	Updated list.
1.1	Renamed section to “Interface Scope” and added new content.
1.2	Renamed section to “System Overview”, added new content and a block diagram.
Figure 1	New block diagram that aids in understanding the WTP and MSC interfaces for raw water provided to WTP.
1.3	Renamed section to “Interface Functions”.
Table 1	Renamed table to “Functions of the Raw Water Interface” and revised content to consider aspects that need to be in place for a complete interface.
1.4	Renamed section, “Special Interface Roles,”. Added section 1.4.1 to list the general responsibilities of the Water Purveyor and interactions with WTP. Added Section 1.4.2 to describe the role of the WTP Contractor AHJ.
1.5	Deleted.
1.6	Deleted.
Table 2	Deleted. Configuration Management documents are listed in Section 3.
2	Moved references to new Section 5 and renamed section, “Interface Background Information,” with expanded subsection discussions.
2.1	New subsection, “Physical Information,” with discussion to address consideration of construction and commissioning activities.
2.2	New subsection, “Administrative Information”.
2.2.1	New subsection, “Safety Information,” with discussion to address potential safety-related issues associated with the interface.
2.2.2	New subsection, “Regulatory Information,” with discussion to provide background regulatory information related to the interface.
2.2.3	New subsection, “Post-Commissioning/Maintenance,” with discussion to provide background information associated with the operation and maintenance aspects of the interface.
2.2.4	New subsection, “Interface Schedule,” to reference the One System DFLAW Integrated Program Schedule.
2.3	New subsection, “Acceptance Criteria.”
101	New section, “Requirements,” and subsections to address technical, activity level flow down, and programmatic requirements for ICD 01.
3.1	New section to address Technical Requirements (Design Criteria). Content is from 24590-WTP-ICF-MGT-18-0006. Section 3.1.3.3 of this ICF was revised.
3.2	New section to address Activity Level Requirements. Content is from 24590-WTP-ICF-MGT-18-0007.
3.3	New section to address Programmatic Requirements. Content is from 24590-WTP-ICF-MGT-18-0007.
4	New section, “Requisite Interface Items,” and subsections to address WTP Contractor, TOC and MSC interface items.

Revision Description

ICD Section	Description
4.1	New section to address WTP Contractor Requisite Interface Items. Content is from 24590-WTP-ICF-MGT-18-0007.
4.2	New section to address TOC Interface Items as a placeholder.
4.3	New section to address MSC Contractor Requisite Interface Items. Content is from 24590-WTP-ICF-MGT-18-0007.
5	New section to address References. Various references were deleted and added to support this revision of ICD 01.
Appendix A	Re-labeled as Issues and Open Items. Changed table format to align with ICD Action Item List.
Appendix B	Re-labeled as Interface Control Drawing Mark-up. Closed ICD issues to be identified in Appendix A.
Appendix C	Deleted. New open items to be listed in Appendix A.

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Acronyms

AHJ	Authority Having Jurisdiction
BOF	Balance of Facilities
DFLAW	direct feed low-activity waste
DOE	US Department of Energy
FSW	fire service water
ICD	interface control document
MSC	Mission Support Contractor
ORP	US Department of Energy, Office of River Protection
P&ID	pipng and instrumentation diagram
RL	US Department of Energy, Richland Operations Office
RAMI	reliability, availability, maintainability, and inspectability
RPBA	reduced pressure backflow assembly
TOC	Tank Operations Contractor
TWRS	Tank Waste Remediation System
WAC	Washington Administrative Code
WDOH	Washington State Department of Health
WTP	Hanford Tank Waste Treatment and Immobilization Plant

1 Interface Description

1.1 Interface Scope

This Interface Control Document (ICD) describes the physical and administrative interactions for managing the transfer of raw water from the Hanford 200 East Area Raw Water System to the Hanford Tank Waste Treatment and Immobilization Plant (WTP). The WTP Contractor interfaces with the Tank Operations Contractor (TOC) and the Mission Support Contractor (MSC) for this transfer. TOC has contractual responsibility for providing Hanford services to the WTP Site. MSC operates the 200 East Area Raw Water System for the Hanford Site.

The Hanford Site 200 East Area Raw Water System provides raw makeup water for use during WTP construction, startup testing, commissioning, and operations. Raw water is used to support construction and startup activities such as dust control and pipe flushing. Raw water is used within the WTP for fire water makeup and may be used for cooling tower makeup, especially during seasonal peak demands.

This ICD focuses on the WTP direct-feed low-activity waste (DFLAW) operating configuration.

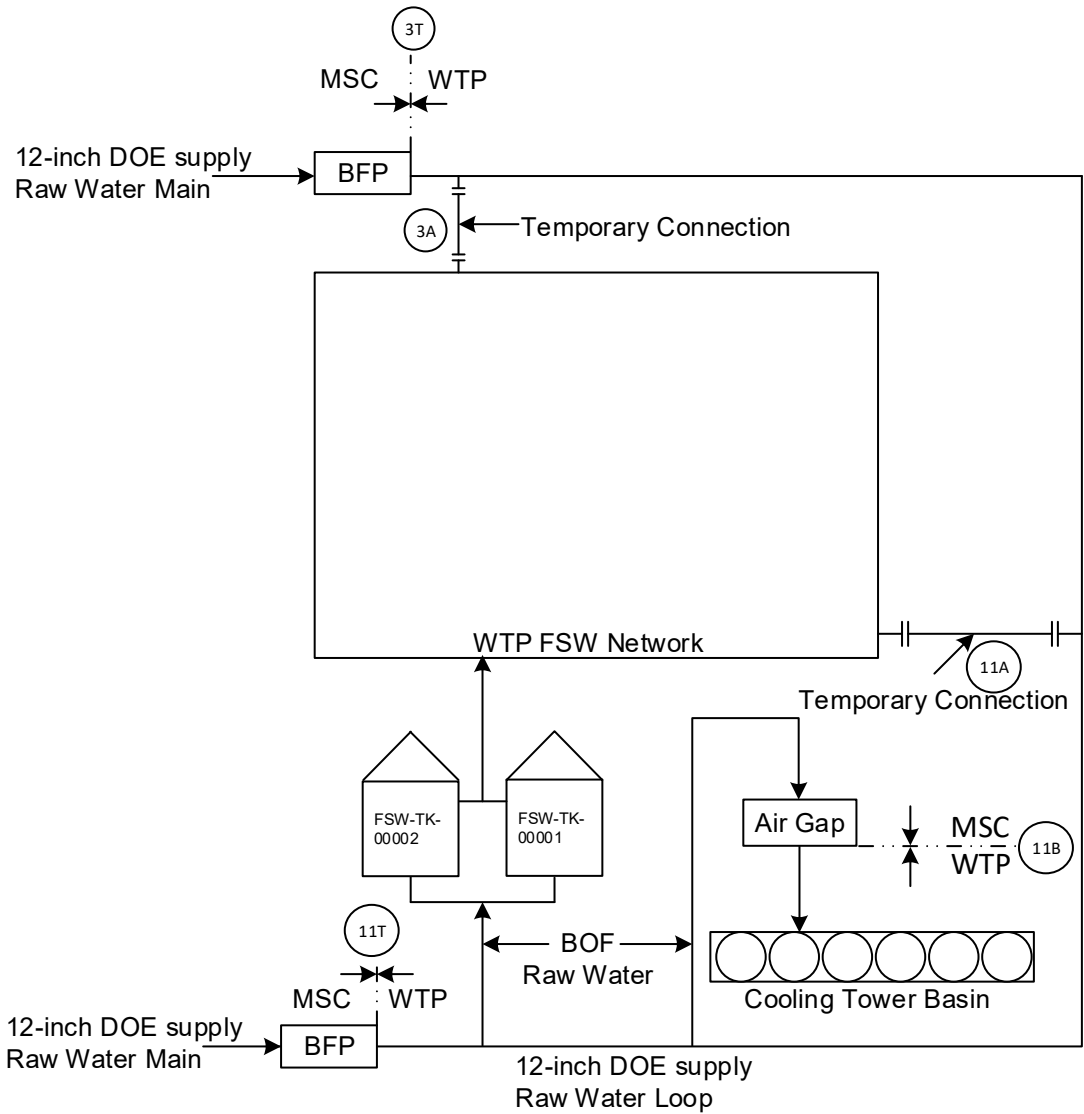
1.2 System Overview

The interface for the raw water provided to WTP by MSC during construction and startup prior to DFLAW operation is illustrated in Figure 1 Interface Block Diagram.

The 200 East Area Raw Water System provides raw makeup water for process use and fire water. The raw water supply is unfiltered, untreated Columbia River water subject to seasonal changes in temperature and composition. Raw water is received into two three million-gallon reservoirs at the 200 Area plateau from water lines coming from the Columbia River. The water is then pumped from the 200 East Area reservoir to the WTP Site through a 12-inch raw water line loop that provides raw water for construction, startup, commissioning, and operations. The raw water loop feeds the two-fire service water (FSW) storage tanks and the Balance of Facilities (BOF) cooling tower.

Two raw water pipe lines supply the WTP systems from the 12-inch loop. One line feeds the FSW-TK-00001 and FSW-TK-00002 providing water for the FSW system, and the second connection supplies the BOF cooling tower with a secondary source of make-up water. From the FSW tanks, a WTP FSW network supplies the fire protection system in the facilities and fire hydrants throughout the site. During construction and startup, the two temporary connections shown in Figure 1 are used to supply the FSW network.

Figure 1 Interface Block Diagram



1.3 Interface Functions

Table 1 presents the general interface functions and corresponding responsibilities for each interfacing contractor. Requirements derived from these functions are listed in Section 3 for each contractor.

Table 1 Functions of the Raw Water Interface

Interface Function	WTP Responsibility	TOC Responsibility	MSC/PRC Responsibility
Provide raw water for WTP Construction, Startup, Commissioning, and Operations.	Connect to the FSW tanks and BOF cooling tower.	Provide administrative coordination between MSC and the WTP Contractor.	Provide connection for long term raw water use.
Establish parameters for raw water demand and supply pressure.	Establish maximum demand and supply pressure range.	None	Ensure supply meets demand and operates within supply pressure range.
Define operation and maintenance responsibilities.	Operate and maintain piping and components downstream of interface points.	None	Operate and maintain piping and components upstream of interface points.
Coordinate installation, maintenance, and inspection activities with the Water Purveyor.	Notify Water Purveyor of activities affecting transition pipes prior to the WTP air gaps and allow access to site.	None	Water Purveyor provides oversight to WTP Contractor activities affecting all supply piping up to the air gap.
Provide contamination control.	Design and install features to prevent contamination of raw water supply.	None	Water Purveyor reviews, inspects, and approves features to prevent contamination.
Communicate changes to the raw water supply and demand.	Notify MSC of changes in demand.	Evaluate changes for impacts.	Notify WTP Contractor of changes in supply, and review changes in demand.
Implement regulatory requirements	Design, install, and operate per appropriate sections of the Washington Administrative Code.	None	Water Purveyor provides oversight to WTP Contractor.

1.4 Special Interface Roles

1.4.1 Water Purveyor

The Washington Administrative Code (WAC) 246-290-490, *Cross-connection Control*, establishes a Water Purveyor who has the responsibility to protect the potable water system from contamination. The Water Purveyor's jurisdiction begins at the water source and ends at the premise isolations to the WTP Raw Water Systems. Each premise isolation is a contamination control consisting of an air gap or a reduced pressure backflow prevention assembly (RPBA), as shown in Figure 1 Interface Block Diagram. The raw water pipelines from the WTP Site boundary up to the isolations at the FSW tanks and cooling tower, including the backflow prevention assemblies and air gaps are referred to as the "transmission piping."

The Water Purveyor is responsible for the WTP raw water transmission piping for the following activities within the WTP, in accordance with the MSC Contract Section J.3.

- Design review and approval of the raw water transmission piping.
- Review and approval of any design changes associated with piping that affects cross-connection control within 30 calendar days of final submittal.
- Oversight of any maintenance activities performed on the transmission piping.
- Performance of inspections of the backflow prevention provisions within the WTP boundary, up to and including the air gaps
- Performance of any other work within the WTP boundary that is required to be performed by the Water Purveyor as identified in the MSC Contract Section J.3.
- Performance of notification and reporting requirements pursuant to WAC 246-290, *Group A Public Water Supplies*, and complementary notification communications with the WTP water system users.

1.4.2 WTP Contractor Authority Having Jurisdiction

The Authority Having Jurisdiction (AHJ) for plumbing is the WTP Contractor designee who is authorized to administer and enforce the Uniform Plumbing Code. The AHJ has responsibility for the cross-connection controls within the WTP Site. The AHJ coordinates with the Water Purveyor in all matters concerning cross-connection control.

2 Interface Background Information

This section only contains background information pertinent to the interface. For requirements, along with their basis, implementation, and configuration management, see Section 3. Other actions needed to complete the interface are listed in Section 4.

2.1 Physical Information

The physical interface points for the connection of raw water during construction and startup are shown on the *Interface Control Drawing*, 24590-WTP-B2-C12T-00001, (BNI 2018a) and the sketch shown in Appendix B for the new connection points:

- Node 3T at the backflow preventer on the 12-inch raw water pipeline on the north side of the WTP site.

- Node 3A is the temporary connection for raw water to the FSW network on the north side.
- Node 11A is the temporary connection for raw water to the FSW network on the south side.
- Node 11 B is new and located at the air gap at the BOF cooling tower.
- Node 11C is the proposed air gap at the inlet of FSW-TK-00001.
- Node 11D is the proposed air gap at the inlet of FSW-TK-00002.
- Node 11T at the backflow preventer on the 12-inch raw water pipeline on the south side of the WTP site.

Interface nodes 3T and 11T are at the 12-inch discharge flange on the backflow preventers.

Project W-519 provided a 12-inch pipeline for raw water within the WTP site boundary to the physical interface point(s). Design requirements can be found in *Design Requirements Document for TWRS Privatization Phase I Raw and Potable Water Supply Systems*, HNF-SD-WM-DRD-015 (NHC 1999b). Construction and material specifications for the water systems are contained in *Construction Specification, W-519 TWRS Privatization Phase I Site/Utility Systems*, W-519-C1 (NHC 1999a).

The Water Purveyor has reviewed and approved the WTP Raw Water System piping design upstream of the isolations and air gap (*Document Review Request – Interface for the Water Purveyor’s Approval of Raw Water Specification and Drawings*, CCN 063409 [BNI 2003a]).

The 12-inch raw water pipeline was hydrostatically tested in 2007. The results of this hydrostatic test were recorded on *Pressure Test Data Sheet Raw Water Distribution*, 24590-BOF-PPTR-CON-06-0033 (BNI 2007) and *Pressure Test Data Sheet Raw Water Distribution*, 24590-BOF-PPTR-CON-06-0034 (BNI 2008b).

2.2 Administrative Information

2.2.1 Safety Information

The respective organizations’ design requirements include integrated safety management principles and are communicated through the interface in the configuration management documents identified in Section 3.

No new hazards or accident scenarios are expected to be introduced through this interface that are not adequately controlled by the interface contractors and through controls placed across this interface. The physical and administrative controls to mitigate these risks using a graded approach have been or will be adequately addressed through requirements on each contractor’s authorization basis, and no additional physical and administrative controls are necessary.

2.2.2 Regulatory Information

As long as the potential exists for the Hanford Raw Water System to cross-contaminate the Hanford potable water system, the WTP Raw Water System is subject to appropriate sections of the WAC 246-290, *Group A Public Water Supplies*.

2.2.3 Post-Commissioning/Maintenance

The ICD team has not identified any deactivation or reliability, availability, maintainability, and inspectability (RAMI) considerations that require management across the interface. Systemic RAMI assessments of this interface have not been conducted.

The WTP Contractor has not created dedicated operating manuals for the Raw Water System. Use of raw water for filling the FSW tanks is covered under *Filling Fire Water Tanks*, 24590-BOF-FSW-SOM-0003-02-008 (WTCC 2017). Use of raw water for the BOF plant cooling water system is covered in the set of operating manuals listed in *BOF Plant Cooling Water System Operating Manual*, 24590-BOF-PCW-SOM-0001 (WTCC 2015).

2.2.4 Interface Schedule

Refer to the One System DFLAW Integrated Program Schedule for monitoring appropriate interface schedule milestones.

2.3 Acceptance Criteria

No acceptance criteria are defined for the transfer of raw water.

3 Requirements

This section identifies all Technical (Design Criteria), Activity Level, and Programmatic requirements associated with the interfaces defined by the ICD. Specific requirements for implementation by the appropriate contractors are listed in this section only. In addition to the requirement statement, each requirement includes a basis for that requirement, the requirement source document(s), and the implementing document(s) (if known at the time of revision). Source and implementing documents are listed as configuration management items for each requirement.

3.1 Technical Requirements (Design Criteria)

Technical requirements are requirements managed by engineering organizations according to engineering procedures and work processes.

3.1.1 WTP Contractor Technical Requirements

For the WTP Contractor, technical requirements are managed in accordance with *Technical Requirements Management*, 24590-WTP-3DP-G04B-00004 (BNI 2016f). Any changes to the requirements in this subsection are reviewed with the WTP Manager of Engineering.

- 3.1.1.1 The WTP Contractor shall provide approved backflow prevention measures compliant with WAC 246-290 for premise isolation of all WTP service connections receiving a direct raw water feed from the US Department of Energy (DOE) Raw Water System as follows:
- a) The raw water feeds to the WTP during construction through cold commissioning shall be isolated from the Raw Water System utilizing either approved RPBA's or approved air gaps, unless an exception is made by the Water Purveyor. Per WAC 246-290-010(10), *Definitions, Abbreviations, and Acronyms*, only assemblies that appear on the current approved backflow prevention assemblies list developed by the University of Southern

California Foundation for Cross-Connection Control and Hydraulic Research or other entity acceptable to the Washington State Department of Health (WDOH) are considered approved by the WDOH. An approved air gap is defined in WAC 246-290-010(7).

- b) By the start of hot commissioning at the LAW Facility, all raw water feeds to the operating areas of the WTP shall be isolated from the Raw Water System utilizing approved air gaps, unless an exception is made by the Water Purveyor. An approved air gap is defined in WAC 246-290-010(7).

Requirement Basis: WAC 246-290-490 details the minimum acceptable cross-connection control requirements for potable water. The Raw Water System is currently connected to, and is the source for, the DOE 200W Sanitary Water System; therefore, WAC 246-290-490 cross-connection control requirements are also applicable to the Raw Water System. Consequently, all WTP service connections/piping that receive a raw water feed from the Raw Water System (existing and new) necessitate approved backflow prevention measures to protect and isolate the 200W system from potential back-contamination from WTP. These premise isolation backflow prevention measures are under the Water Purveyor's jurisdictional control.

When the DFLAW portions of the WTP begin hot commissioning, the hazards associated with the operational WTP facilities will increase, and those operational facilities will be considered a severe health cross-connection hazard per WAC 246-290-490(4) (i.e., a radioactive material processing plant). Therefore, premise isolation for all raw water feeds from the 12-inch raw water main to the operating facilities shall consist of approved air gaps beginning with hot commissioning of the LAW Facility.

The WTP currently has two (2) locations for raw water premise isolation using RPBA's (at Node 3T and 11T on *Interface Control Drawing* [BNI 2018a]). The RPBA's at these locations (as follows) are an acceptable means of premise isolation for construction activities through cold commissioning (prior to hot commissioning):

- The pair of backflow prevention assemblies (RWW-BFP-00005 and RWW-BFP-00006) at the southern site perimeter (Node 11T).
- The pair of backflow prevention assemblies (RWW-BFP-00007 and RWW-BFP-00008) at the northwestern site perimeter (Node 3T).

The WTP has three (3) locations planned for approved air gaps for raw water premise isolation during WTP Operations as follows. These air gaps will be required by the start of hot commissioning of the LAW Facility.

- An approved air gap for raw water at the WTP/BOF Cooling Tower (Node 11B).
- An approved air gap for raw water at fire water storage tank FSW-TK-00001 (Proposed Node 11C).
- An approved air gap for raw water at fire water storage tank FSW-TK-00002 (Proposed Node 11D).

Configuration Management Document(s):

Requirement Source(s):

- *Group A Public Water Supplies*, WAC 246-290
- *Cross-Connection Control Program for the Hanford Water Systems*, WSU-MP-CP-60404 (MSA 2017a)

- *Controlling Cross Connections*, MSC-RD-FM-10361 (MSA 2017b)

Implementation:

- *P&ID - BOF Raw Water System Raw Water Distribution Piping*, 24590-BOF-M6-RWW-00001 (BNI 2008a)
- *P&ID – Fire Protection System Fire Water Main Loop, System FSW*, 24590-BOF-M6-FSW-00001 (BNI 2018b)
- *P&ID – 84A Fire Water Pump House, System FSW*, 24590-BOF-M6-FSW-00002 (BNI 2016a)
- *P&ID – 84B Fire Water Pump House, System FSW*, 24590-BOF-M6-FSW-00003 (BNI 2016b)
- *P&ID – Fire Water Storage Tanks, System FSW*, 24590-BOF-M6-FSW-00004 (BNI 2016c)
- *P&ID – BOF Plant Cooling Water System, Cooling Tower Flow Channel*, 24590-BOF-M6-PCW-00003001 (BNI 2018d)
- *Cooling Tower General Arrangement Plan & Sections*, 24590-BOF-P1-83-00001 (BNI 2013d)
- *Potable Water and Raw Water Air Gap Approval for the BOF Cooling Tower*, CCN 293006 (BNI 2017a)

- 3.1.1.2 By the start of hot commissioning at the LAW Facility, the WTP Contractor shall remove the temporary connections between the 12-inch raw water main and the WTP fire water system main loop (at Nodes 3A and 11A), unless an exception is made by the Water Purveyor.

Requirement Basis: Early in the WTP Project, temporary connections from the 12-inch raw water main were installed at Node 3A and at Node 11A on *Interface Control Drawing* (BNI 2018a) to allow WTP to construct the inner WTP fire service water system. These temporary connections from the 12-inch raw water main to the WTP fire water system main loop at Node 3A and at Node 11A are currently only protected by the RPBA's at Nodes 3T and 11T and are not protected by air gaps. Therefore, by the start of hot commissioning when the hazards associated with the operating facilities increases, these connections will need to be removed to comply with WAC 246-290-490(4)(b)(ii).

Configuration Management Document(s):

Requirement Source(s):

- *Group A Public Water Supplies*, WAC 246-290

Implementation:

- *P&ID - BOF Raw Water System Raw Water Distribution Piping, Note 7* (BNI 2008a)
- *P&ID – Fire Protection System Fire Water Main Loop, System FSW, Note 4* (BNI 2018b)

3.1.2 TOC Technical Requirements

No technical requirements have been identified for the TOC.

3.1.3 MSC Technical Requirements

- 3.1.3.1 MSC shall provide capacity to supply raw water for WTP Operations at a peak rate of 1200 gpm at operating pressures between 90 and 150 psig.

Requirement Basis: WTP calculation *BOF Raw Water System (RWW) Line, Distribution, and Orifice Sizing Calculation*, 24590-BOF-M6C-RWW-00003 (BNI 2016d), establishes that a raw water supply of 1200 gpm will meet WTP raw water needs for WTP baseline operations (i.e., BOF Cooling Tower @ 550 gpm, Pretreatment Cooling Tower @ 275 gpm, and FSW tank refill during normal operations @ 375 gpm). This peak supply volume will also satisfy a National Fire Protection Association (NFPA) 22 requirement to have capability to fill one empty 350,000-gallon tank in 8 hours (minimum flow rate of 730 gpm). WTP calculation *Design Pressure and Temperature Calculation for Raw Water (RWW) System*, 24590-BOF-M6C-RWW-00001 (BNI 2016g), establishes that a maximum pressure of 150 psig is acceptable and within the allowable limits of the pipe material classes used. A minimum pressure of 90 psig is necessary to maintain proper flow rates to the fire water storage tanks and cooling tower with existing WTP valve settings and restriction orifice plates (*Maximum and Minimum Allowable Raw Water Pressures at WTP*, CCN 260803 [BNI 2013c]).

Configuration Management Documents:

Requirement Source(s):

- *Design Pressure and Temperature Calculation for Raw Water (RWW) System* (BNI 2016g)
- *Maximum and Minimum Allowable Raw Water Pressures at WTP* (BNI 2013c)
- *BOF Raw Water System (RWW) Line, Distribution, and Orifice Sizing Calculation* (BNI 2016d)

Implementation:

- *Hanford Site Water System Master Plan*, HNF-5828, (MSA 2018) Section 1.4.5.3

- 3.1.3.2 MSC shall provide capacity to supply raw water for WTP Construction activities at operating pressures between 90 and 150 psig at the following peak volumes:

- a) 1200 gpm for construction use while the 242A evaporator is operating.
- b) 2600 gpm for construction use when the 242A evaporator is not operating.
- c) 3650 gpm for construction use for pipe flushing - only when administratively coordinated between MSC Water Utilities and WTP.

Requirement Basis: Raw water volumes for WTP construction use were determined in ICD-01 Issue 1-12 that was closed by the ICD team on April 30, 2002. The volumes were evaluated in a water modeling study completed by Fluor Federal Services in early 2002 (*200 Area Raw Water System Network Analysis in Support of WTP Project*, RPP-6672 [FFS 2002]) that confirmed flow availability to WTP while keeping ongoing demands for other facilities satisfied. Based on this 2002 evaluation and the ICD team recommendation, the DOE issued technical direction to incorporate these volumes for construction use into ICD-01 (*Approval of Interface Control Document (ICD) 01, Table 1 Changes*, CCN 032123 [BNI 2002]). Because raw water for WTP construction will come from the same DOE pipeline feeding WTP operations, the pressure requirement basis provided above in Section 3.1.3.1 is unchanged.

Configuration Management Documents:

Requirement Source(s):

- *200 Area Raw Water System Network Analysis in Support of WTP Project* (FFS 2002)
- *Contract No. DE-AC27-01RV14136 – Approval of Interface Control Document (ICD) 01, Table 1 Changes* (BNI 2002)
- *Maximum and Minimum Allowable Raw Water Pressures at WTP* (BNI 2013c)

Implementation:

- *Hanford Site Water System Master Plan*, Section 1.4.5.3 (MSA 2018)

3.1.3.3 MSC shall provide capacity to supply raw water for fire suppression at 2500 gpm at 20 psig during both Construction and Operations.

Requirement Basis: The historical basis for this requirement was to provide fire suppression water while WTP was constructed. As such, a raw water flow rate of 2500 gpm for fire suppression was established early in the Tank Waste Remediation System (TWRS) Privatization Phase 1 Project and was documented in *Design Requirements Document for TWRS Privatization Phase 1 Raw and Potable Water Supply Systems* (NHC 1999b). The 2500 gpm flow rate was also evaluated in a water modeling study completed by Fluor Federal Services in early 2002 (*200 Area Raw Water System Network Analysis in Support of WTP Project* [FFS 2002]) that confirmed fire water flow availability to WTP (in addition to normal maximum daily demand), while keeping ongoing demands for other facilities satisfied. Based on this 2002 evaluation and the ICD team recommendation at the time, the DOE issued technical direction to incorporate a flow rate of 2500 gpm at 20 psig for fire water use into ICD-01 (*Approval of Interface Control Document (ICD) 01, Table 1 Changes* [BNI 2002]), noting that raw water pressure can drop to as low as 20 psig during a fire event in the 200 Area.

DOE-STD-1066-97, *Fire Protection Design Criteria*, requires that the supply system be capable of meeting the highest water flow demand for a period of not less than 2 hours as stated in *BOF Fire Water Storage Tank Sizing*, 24590-BOF-MTC-FSW-00001, (BNI 2005). The *Fire Hazards Analysis for the General/Balance of Facilities* (BNI 2018g) identifies that the largest single fire flow demand of the WTP for a 2-hour period is a bounding demand of 2367 gpm. Therefore, the historical basis of 2500 gpm supply capacity bounds the largest anticipated demand and should be maintained for support of permanent plant operations, existing temporary facilities, and potential continued construction at High-Level Waste and /or Pretreatment facilities.

Configuration Management Documents:

Requirement Source(s):

- *Design Requirements Document for TWRS Privatization Phase 1 Raw and Potable Water Supply Systems* (NHC 1999b)
- *200 Area Raw Water System Network Analysis in Support of WTP Project* (FFS 2002)
- *Contract No. DE-AC27-01RV14136 – Approval of Interface Control Document (ICD) 01, Table 1 Changes* (BNI 2002)

Implementation:

- *Hanford Site Water System Master Plan*, Section 1.4.5.3 (MSA 2018)

3.2 Activity Level Requirements

Activity level requirements are facility and functional requirements that require incorporation into the work planning process. These include repetitive use requirements that are typically implemented in an operating technical procedure or preventative maintenance work package. They may also include task specific requirements that must be complied with when completing a specific scope of work, such as a repair or replacement of a component. These are typically performed within a maintenance work control document.

3.2.1 WTP Contractor Activity Level Requirements

There are no activity level requirements for the WTP Contractor.

3.2.2 TOC Activity Level Requirements

There are no activity level requirements for the TOC.

3.2.3 MSC Activity Level Requirements

There are no activity level requirements for the MSC.

3.3 Programmatic Requirements

Programmatic requirements include those specified through the contract; federal, state, and local laws and regulations; DOE directives; and negotiated agreements such as memorandums of agreement, commitments and permits.

3.3.1 WTP Contractor Programmatic Requirements

For the WTP Contractor, programmatic requirements are managed per *Requirements Management*, 24590-WTP-GPP-RARM-RM-00001 (BNI 2018e).

- 3.3.1.1 Submit design documentation for all transmission piping and premise isolation backflow prevention measures, including temporary changes, to the Water Purveyor for review and approval before the release of designs for construction or modification.

Requirement Basis: All WTP transmission piping receiving a direct raw water feed from the Raw Water System, along with all associated air gaps and/or backflow prevention assemblies used for premise isolation, are under Water Purveyor jurisdictional control for compliance with the WAC. The Water Purveyor maintains this jurisdictional control of the transmission piping and air gaps for protection of the Raw Water System from potential back-contamination from WTP. The basis/source of this requirement for Water Purveyor review/approval is the WAC for *Cross Connection Control* (WAC 246-290-490) and the *MSC Cross-Connection Control Program for the Hanford Water Systems* (MSA 2017a).

Configuration Management Document(s):

Requirement Source(s):

- *Cross-Connection Control*, WAC 246-290-490
- *Cross-Connection Control Program for the Hanford Water Systems* (MSA 2017a)

Implementation:

- *Interface for the Water Purveyor's Approval of Raw Water Specification and Drawings* (BNI 2003a)
- *Potable Water and Raw Water Air Gap Approval for the BOF Cooling Tower* (BNI 2017a)

3.3.1.2 Conduct backflow preventer assembly inspections and tests on 24590-BOF-RWW-BFP-00005, -00006, -00007, and -00008. All testing is to be conducted in compliance with the Water Purveyor's *Cross-Connection Control Program for the Hanford Water Systems* (MSA 2017a) as stated below:

- Obtain and maintain certification of backflow preventer testers per WAC regulation.
- Submit a copy of the current backflow assembly tester certification validation card to the Water Purveyor.
- Test backflow prevention assemblies in accordance with Water Purveyor approved maintenance instructions.
- Ensure the completeness and accuracy of the backflow prevention assembly test reports.
- Upon completion of testing transmit test reports to the Water Purveyor.
- Remove from service, if backflow prevention assembly fails an operability test.
- Notify the Water Purveyor when an assembly is removed from service.
- Ensure out of service backflow assemblies may be readily identified by visual observation (e.g., sign, out of service tag).
- Immediately report any suspected backflow incidents to the Water Purveyor.

The backflow preventer assemblies are to be inspected and tested:

- At the time of installation.
- Annually (+/- 10 days) after installation (minimum frequency) or more frequently.
- After a backflow incident.
- After an assembly is repaired, replaced, reinstalled, or relocated.
- After upstream mechanical isolation, causing loss of pressure to the assembly.

Requirement Basis: The four backflow preventers separate the DOE 12-inch supply line for raw water from the WTP site. These backflow preventers are under the jurisdictional control of the Water Purveyor. The requirements for annual testing are defined in *Cross-Connection Control Program for the Hanford Water Systems* (MSA 2017a) which tailors the WAC *Cross-Connection Control* (WAC 246-290-490) to the Hanford site.

Configuration Management Document(s):

Requirement Source(s):

- *Cross-Connection Control*, WAC 246-290-490

- *Cross-Connection Control Program for the Hanford Water Systems* (MSA 2017a)

Implementation:

- This requirement has been partially implemented to-date via Commissioning Maintenance work orders. See *CM Work Order Backflow Preventer*, 24590-WTP-TWO-CMNT-14-0298 (BNI 2015). The implementing mechanism(s) shall be issued by the WTP. The current implementation status can be obtained from the WTP One System RAM as identified in *Designation of Requirement Area Managers and Subject Matter Experts* (BNI 2018f).

- 3.3.1.3 Provide updates by February 25 of every year to MSC’s normal annual data call on the estimate for raw water usage for construction, startup, DFLAW operations, and full WTP operations. The average annual and peak flow demand forecast will be a rough order of magnitude, non-binding estimate for the next 10 years.

Requirement Basis: The Hanford Site Water System Master Plan provides the roadmap to optimize the Water Utilities infrastructure capability to serve the Hanford Site needs. This master plan includes a 10-year forecast of future water demands by all water system users.

Configuration Management Document(s):

Requirement Source(s):

- *HNF-5828, Hanford Site Water System Master Plan*, (MSA 2018)

Implementation:

- The implementing mechanism(s) shall be issued by the WTP. The current implementation status can be obtained from the WTCC Plant Management RAM as identified in *Designation of Requirement Area Managers and Subject Matter Experts* (BNI 2018f)
- Previous updates are provided below:
 - *Informal Engineering Study – Forecast of the WTP Potable and Raw Water Annual Usage During DFLAW and Full WTP Operations*, 24590-WTP-RPT-M-16-001 (BNI 2016e)
 - *WTP 2017 Raw and Potable Water Usage 10-Year Forecast*, CCN 293405 (BNI 2017b)
 - *WTP 2018 Raw and Potable Water Usage 10-Year Forecast*, CCN 303473 (BNI 2018c)

- 3.3.1.4 WTP drawings associated with the transmission piping shall include a note to indicate that the drawings are subject to approval by the Water Purveyor. The note shall include wording similar to: “any modifications or changes made to the length of pipe from the site interface to the air gaps must be approved by the Water Purveyor”.

Requirement Basis: This note readily identifies the WTP transmission piping drawings within the WTP boundary that are under the jurisdiction of the Water Purveyor. This drawing note has been determined to be a mutually agreed upon requirement for the transmission piping drawings.

Configuration Management Document(s):

Requirement Source(s):

- None.

Implementation:

- This requirement has been broadly implemented but is not included in an Engineering procedure. Implementing mechanisms and traceability shall be established within the WTP Requirements Management Program (i.e. DOORS).

3.3.1.5 The Filter Plant Operator shall be notified in the event of any upset conditions that impact the Raw Water System.

- Filter Plant Operator (509) 373-2748
- Shift Manager (509) 373-5824 during normal working hours OR (509) 276-2900 during off shift hours and request Emergency Operations Center (EOC) to provide number for on call manager/Building Emergency Director (BED) or request EOC to make the contact.

Requirement Basis: The Water Purveyor has been granted the authority to operate the Raw Water System and must be kept informed of actions at WTP that may impact the operation of this water system.

Configuration Management Document(s):

Requirement Source(s):

- *Reliability and Emergency Response*, WAC 246-290-420(9)

Implementation:

- The implementing mechanism(s) shall be issued by the WTP. The current implementation status can be obtained from the WTCC Plant Management RAM as identified in *Designation of Requirement Area Managers and Subject Matter Experts* (BNI 2018f)

3.3.1.6 The Water Purveyor shall be contacted to coordinate any planned maintenance actions on the transmission piping within the WTP boundary.

Requirement Basis: The Water Purveyor has been granted the authority to operate the Raw Water System and must be kept informed of actions at WTP that may impact the operation of this water system.

Configuration Management Document(s):

Requirement Source(s):

- *Operations and Maintenance*, WAC 246-290-415

Implementation:

- The implementing mechanism(s) shall be issued by the WTP. The current implementation status can be obtained from the WTCC Plant Management RAM as identified in *Designation of Requirement Area Managers and Subject Matter Experts* (BNI 2018f).

- 3.3.1.7 For planned raw water usage above 1200 gpm, contact MSC Water Utilities to coordinate the needed high-water flow rates. A written notice shall be provided at least 48 hours in advance of the high raw water flow rate needs.

Requirement Basis: Certain non-emergency circumstances such as construction pipe flushing, refilling of FSW tanks following maintenance, or other testing activities may require high raw water flow rates above 1200 gpm. Coordination is required in advance to allow balancing of WTP high water demand periods with ongoing demands from other Hanford facilities.

A network analysis determined that a maximum peak flow of 1200 gpm could be achieved without impact to other water users. Flowrates above 1200 gpm will require coordination of other water users and operation of multiple pumps.

Configuration Management Document(s):

Requirement Source(s):

- *200 Area Raw Water System Network Analysis in Support of WTP Project* (FFS 2002)

Implementation:

- The implementing mechanism(s) shall be issued by the WTP. The current implementation status can be obtained from the WTCC Plant Management RAM as identified in *Designation of Requirement Area Managers and Subject Matter Experts* (BNI 2018f)

3.3.2 **TOC Programmatic Requirements**

No programmatic requirements have been identified for the TOC.

3.3.3 **MSC Programmatic Requirements**

- 3.3.3.1 Conduct periodic surveys of the transmission piping within the WTP boundary for cross-connection hazards. Coordinate with the WTP Contractor regarding site access and support.

Requirement Basis: The Water Purveyor has jurisdictional control over the transmission piping within the WTP boundary and is required by the WAC to periodically survey for cross-connection hazards.

Configuration Management Document(s):

Requirement Source(s):

- *Group A Public Water System* (WAC 246-290)
- *Controlling Cross Connections* (MSA 2017b)

Implementation:

- *Facility Cross-Connection Control Inspection*, WSU-PRO-CP-60372 (MSA 2016)

- 3.3.3.2 The WTP Contractor (Shift Duty Manager (509) 420-3597) shall be called in the event of:

- any upset conditions that impact raw water supply to WTP
- any planned interruptions to the raw water supply to WTP

Requirement Basis: Prompt communication regarding impacts to the raw water supply to WTP is needed to mitigate restrictions to or loss of service.

Configuration Management Document(s):

Requirement Source(s):

- None

Implementation:

- The implementing mechanism(s) shall be issued by the MSC. The current implementation status can be obtained from the One System RAM as identified in *Designation of Requirement Area Managers and Subject Matter Experts* (BNI 2018f)

4 Requisite Interface Items

Some interfaces may have additional actions to be performed to establish a complete interface. Any of these actions that do not fall into the above requirements categories are listed as requisite interface items. These items are typically single actions to be performed prior to commissioning. A requisite interface item is considered completed when objective evidence is provided to verify the action was performed. The requisite interface items are excluded from the WTP Requirements Management Program and associated procedures. The One System Requirements Area Manager may use the requirements management tool to track requisite interface items.

4.1 WTP Contractor Requisite Interface Items

- 4.1.1 Upon completion of all WTP construction activities, provide the MSC with as-built drawings of all modifications made to the 12-inch raw water main within the WTP site boundary to allow recovery of affected Hanford drawings. Reference the “Transfer of Drawing Responsibility” note on *Civil Water Lines Miscellaneous Details*, H-2-829676 (FFS 2002b).

4.2 TOC Requisite Interface Items

Not Applicable

4.3 MSC Requisite Interface Items

- 4.3.1 Upon the receipt of the final WTP as-built drawings of the 12-inch raw water main within the WTP site boundary, update affected Hanford drawings and remove the associated “Transfer of Drawing Responsibility” markings as necessary. Reference paragraph 4.1.1 and the “Transfer of Drawing Responsibility” note on drawing H-2-829676 (FFS 2002b).

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Appendix A - ICD 01 Issues and Open Items

NOTE: This appendix lists open ICD issues, ICD issues that have been closed since the last revision, and new ICD open items. New open items are added to each ICD revision with a tracking number or schedule activity to track their completion outside the ICD. Open items are removed from the ICD in the next revision following their introduction.

Issue/Action/ Open Item No.	Description	Tracking No	Responsible Org.	Responsible Actionee	Originator	Status/ Due Date	Support Information / Basis for Closure	Comments
ICD 01 has no open issues. No new open items have been identified.								

Appendix B – Interface Control Drawing Mark-up

