



**U.S. Department of Energy**  
**Office of River Protection**

P.O. Box 450  
Richland, Washington 99352

02-OSR-0231

Mr. Ron F. Naventi, Project Manager  
Bechtel National, Inc.  
3000 George Washington Way  
Richland, Washington 99352

Dear Mr. Naventi:

CONTRACT NO. DE-AC27-01RV14136 – INSPECTION REPORT IR-02-005 – ON-  
LOCATION INSPECTION REPORT FOR THE PERIOD APRIL 12 THROUGH MAY 23, 2002

This letter forwards the results of the Office of Safety Regulation (OSR) inspection of the Bechtel National, Inc. (BNI) waste treatment plant construction performance for the period April 12, 2002, through May 23, 2002. No Findings were identified.

During this inspection period, BNI construction was limited to the work authorized under the ORP Limited Construction Authorization Agreement that included the authorization to install forms, rebar, and embedments for the High Level Waste and Low Activity Waste building foundation basemats. The inspection identified continuing improvement in control of important-to-safety (ITS) soil testing and compaction activities and good readiness and implementation efforts associated with installation of ITS reinforcing steel. Industrial Health and Safety oversight performance continued to be good; however, based on the number of minor issues being identified during inspections, increased field oversight in this area may be warranted.

Details of the inspection are documented in the enclosed inspection report. If you have any questions regarding this inspection, please contact me or Pat Carrier of my staff, (509) 376-3574.

Nothing in this letter should be construed as changing the Contract, DE-AC27-01RV14136. If in my capacity as the Safety Regulation Official, I provide any direction that your company believes exceeds my authority or constitutes a change to the Contract; you will immediately notify the Contracting Officer and request clarification prior to complying with the direction.

Sincerely,

Robert C. Barr  
Safety Regulation Official  
Office of Safety Regulation

OSR:JWM

Enclosure

cc w/encl:  
W. R. Spezialetti, BNI

U.S. DEPARTMENT OF ENERGY  
Office of River Protection  
Office of Safety Regulation

INSPECTION: On-location Inspection Report for the Period April 12 through May 23, 2002

REPORT NO: IR-02-005

FACILITY: Bechtel National, Inc.

LOCATION: 3000 George Washington Way  
Richland, Washington 99352

DATES: April 12 through May 23, 2002

INSPECTORS: J. McCormick-Barger, Sr. Regulatory Technical Advisor, Inspection Lead  
D. Kirsch, Consultant  
M. Evarts, Fluor Hanford Acceptance Inspector  
H. Doan, Fluor Hanford Acceptance Inspector  
J. Mohatt, Consultant

APPROVED BY: P. Carrier, Verification and Confirmation Official  
Office of Safety Regulation

This page intentionally left blank

## EXECUTIVE SUMMARY

On-location Inspection Report for Period of April 12 through May 23, 2002  
Inspection Report Number IR-02-005

## INTRODUCTION

This inspection of Bechtel National, Inc. (the Contractor) construction activities covered the following specific areas:

- Observations of Firewater Piping Installation and Testing (Section 1.2)
- Adequacy of Reinforcing Steel Construction (Section 1.3)
- Adequacy of Concrete Mix Design (Section 1.4)
- Adequacy of Concrete Batch Plant (Section 1.5)
- Adequacy of Offsite Reinforcing Steel Fabrication (Section 1.6)
- Observation of Soil Compaction and Testing Activities (Section 1.7)
- Observations of Industrial Health and Safety Construction Activities (Section 1.8)
- Adequacy of Closure of Inspection Items. (Section 1.9)

## Significant Observations and Conclusions

- The Contractor accomplished hydrostatic testing of the firewater piping in accordance with the Contractor's established requirements and National Fire Protection Association (NFPA) 24. (Section 1.2)
- The Contractor provided adequate records of reinforcing steel fabrication and inspection activities; adequate initial inspections to assure the readiness and acceptance of the reinforcing steel fabrication facility and equipment; adequate reinforcing steel storage at the fabrication facility; adequate spacing and lap splice length for reinforcing steel installed on the bottom layer of the Low Activity Waste (LAW) basemat; and adequate provisions to assure design changes would be evaluated for impact on completed work or work in progress. (Section 1.3)
- The LAW reinforcing steel work packages contained appropriate requirements, installation drawings used in the field were appropriately controlled, and in process reinforcement installation were being conducted in an acceptable manner, in accordance with established procedures, specifications, and drawings. Qualified inspectors were performing in process Quality Control (QC) surveillance activities of this work in a thorough manner, and the surveillance activities were adequately documented. (Section 1.3)
- Performance weaknesses regarding reinforcing steel construction were identified in the following areas: (1) not transmitting completed work and training records to Project Document Control within an appropriate period of time following the completion of final records; (2) weak QC inspector knowledge and performance of reinforcing steel bend diameter verifications; and (3) poor reinforcing steel storage conditions on the banks of the LAW building basemat excavation site. (Section 1.3)

- The Contractor satisfactorily accomplished the formulation of concrete mixes in accordance with adequate quality and technical specification requirements. In addition, the concrete subcontractor had properly assured the materials testing laboratory and technicians had been certified as required by industry standards and Contractor requirements. (Section 1.4)
- The concrete subcontractor acceptably accomplished the requirements of ASTM C 94, ACI 349, and the National Ready-Mixed Concrete Association (NRMCA) certification checklist for one of two concrete batch plants. Two exceptions to the above requirements were identified by the certifying professional engineer and will be corrected before important-to-safety (ITS) concrete production. (Section 1.5)
- The Contractor established an acceptable purchase order for the offsite fabrication of reinforcing steel, specifying appropriate work and quality requirements, and performed a comprehensive evaluation for dedication of commercial grade mechanical rebar couplers for ITS applications. (Section 1.6)
- Soil sub-grade compaction, testing, and oversight activities were managed and implemented properly by a knowledgeable staff, resulting in a compacted subsurface conforming to applicable requirements. (Section 1.7)
- With the exception of a few minor instances, the Contractor acceptably implemented the program for industrial health and safety. Identified discrepant conditions were corrected promptly. Management's decision to implement a construction site-wide safety meeting was noted as a good practice. (Section 1.8)
- Contractor Occurrence Report Numbers RP--BNRP-RPPWTP-2002-0003 and -0004, and Inspection Follow-up Item IR-01-005-01-IFI were closed. (Section 1.9)

## Table of Contents

1.0	REPORT DETAILS.....	1
1.1	Introduction.....	1
1.2	Firewater Piping System Installation and Testing (ITP-I-137 and 138).....	1
	1.2.1 Inspection Scope.....	1
	1.2.2 Observations and Assessments.....	1
	1.2.3 Conclusions.....	2
1.3	Adequacy of Reinforcing Steel Construction (ITP-I-113).....	2
	1.3.1 Inspection Scope.....	2
	1.3.2 Observations and Assessments.....	2
	1.3.3 Conclusions.....	6
1.4	Adequacy of Concrete Mix Designs (ITP-I-113).....	6
	1.4.1 Inspection Scope.....	6
	1.4.2 Observations and Assessments.....	7
	1.4.3 Conclusions.....	7
1.5	Adequacy of the Concrete Batch Plant (ITP-I-113).....	8
	1.5.1 Inspection Scope.....	8
	1.5.2 Observations and Assessments.....	8
	1.5.3 Conclusions.....	10
1.6	Adequacy of Offsite Reinforcing Steel Fabrication Activities (ITP-I-113).....	10
	1.6.1 Inspection Scope.....	10
	1.6.2 Observations and Assessments.....	10
	1.6.3 Conclusions.....	11
1.7	Observation of Soil Compaction and Testing Activities (ITP-I-112).....	11
	1.7.1 Inspection Scope.....	11
	1.7.2 Observations and Assessments.....	11
	1.7.3 Conclusions.....	12
1.8	Industrial Health and Safety (IH&S) Oversight (ITP-I-161).....	12
	1.8.1 Inspection Scope.....	12
	1.8.2 Observations and Assessments.....	12
	1.8.3 Conclusions.....	16
1.9	Adequacy of Closure of Inspection Items (Inspection Administrative Procedures (IAP) A-105 and A-106).....	16
2.0	Exit MEETING SUMMARY.....	18
3.0	REPORT BACKGROUND INFORMATION.....	18
3.1	Partial List of Persons Contacted.....	18
3.2	List of Inspection Procedures Used.....	19
3.3	List of Items Opened, Closed, and Discussed.....	20
3.4	List of Acronyms.....	20

This page intentionally left blank.

## ON-LOCATION INSPECTION REPORT FOR PERIOD OF APRIL 12 THROUGH MAY 23, 2002

### 1.0 REPORT DETAILS

#### 1.1 Introduction

This inspection assessed the Contractor's performance of important-to-safety (ITS) and firewater construction activities in accordance with regulatory requirements, such as the Quality Assurance Manual (QAM), Safety Requirements Document (SRD), design documents, approved work procedures, and committed codes and standards. The inspectors also reviewed the Contractor's implementation of certain aspects of its Industrial Health and Safety program, including observing Contractor and subcontractor worker safety practices.

Details and conclusions regarding this inspection are described below.

#### 1.2 Firewater Piping System Installation and Testing (ITP-I-137 and 138)

##### 1.2.1 Inspection Scope

The inspectors examined the conduct of hydrostatic testing activities on selected portions of the firewater protection piping systems for conformance with established procedure requirements.

##### 1.2.2. Observations and Assessments

The inspectors examined the Contractor's test packages for three firewater piping hydrostatic tests. They verified tests boundaries were specified, valve line-ups were thorough and appropriate to the test boundary, and required test parameters had been specified. The inspectors verified the calibrations of the pressure gauges were current, the appropriate calibration stickers were properly affixed, and the gauge range conformed to requirements established by National Fire Protection Association (NFPA) 24, *Standard for the Installation of Private Fire Service Mains and their Appurtenance*.

The inspectors observed the conduct of hydrostatic testing on portions of the firewater piping in Areas 15, 18, 19, 23, 27, 29, 30, and 31 and verified the hydrostatic testing had been conducted in accordance with the Contractor's established requirements and NFPA 24, and the system tests conformed to established requirements regarding leakage and time at pressure.

During the performance of one hydrostatic test (test 24590-WTP-PTR-P-02-0007) on a section of firewater piping, the test technicians observed that a joint in a previously tested and accepted portion of piping failed to hold test pressure. The Contractor documented the nonconforming condition by nonconformance report number 24590-WTP-NCR-CON-02-049, dated May 13, 2002, and was in process of resolving the nonconformance.

### 1.2.3 Conclusions

The observed firewater piping system hydrostatic testing had been accomplished in accordance with the Contractor's established requirements and NFPA 24. The cause of a failed test was properly documented as a non-conformance and was entered into the Contractor's corrective action program for resolution.

## 1.3 Adequacy of Reinforcing Steel Construction (ITP-I-113)

### 1.3.1 Inspection Scope

The inspectors examined the Contractor's drawings, procedures, and construction activities in the areas of fabrication, placement, and inspection of reinforcing steel.

### 1.3.2 Observations and Assessments

The inspectors examined the following documents governing the installation and inspection of reinforcing steel:

- 24590-WTP-3PS-D000-T0001, *Engineering Specification for Concrete Work*, Revision 0, dated December 3, 2001
- 24590-WTP-GPP-CON-3203A, *Concrete Operations (Including Supply)*, Revision 0, dated January 23, 2002
- Drawing 24590-WTP-DD-S13T-00004, *Standard Embedded Anchor Bolt Details*, Revision 0, dated November 15, 2001
- 24590-WTP-GPP-CON-7107, *Field Project Document Control*, Revision 0, dated April 15, 2002.

The *Concrete Operations (Including Supply)* procedure specified, in Section 3.9.5, site fabrication of reinforcing steel shall meet the requirements of Appendix 7 of the procedure and the design specification (*Engineering Specification for Concrete Work*). The inspectors selected several requirements of this appendix and the design specification to assess the degree of conformance with the requirements.

The inspectors examined the activities of reinforcing steel shearing, bending, and QC inspection in the field and reviewed the documentation of on-site fabrication and QC inspection of reinforcing steel. The inspectors interviewed craft-persons and their supervision, examined completed work (bent bars), examined documentation of the work activities, and examined the bending machines and bending dies for conformance with requirements established in procedures, specifications, drawings, and industry standards. The inspectors verified Daily Rebar Fabrication Logs and QC Inspection Records were being maintained as required and reviewed those records for April 11, 12, and 15, 2002. The work activities, in progress at the reinforcing steel fabrication location, were being monitored by field engineering and

QC (as required by the *Concrete Operations (Including Supply)* procedure, Appendix 7, Section 4.1). The inspectors were informed no reinforcing steel had, as yet, been identified as unacceptable and, from discussions with responsible personnel, the inspectors verified the staff knew the procedure requirements regarding the disposition of any unacceptable reinforcing steel. The QC inspector, responsible for inspecting the bent reinforcing steel, stated 100% of the reinforcing steel fabrication conducted during the first three days (April 11, 12, and 15, 2002) had been inspected. On the day of the inspection, April 16, 2002, the inspectors observed, procedure specified, lot sampling inspection techniques being employed by the QC inspector.

Appendix 7, Section 3.5, of the *Concrete Operations (Including Supply)* procedure, required training for the use of the shearing and bending equipment be conducted to the manufacturer's recommended instructions and training records be forwarded to the training coordinator for processing. The inspectors were informed, through discussions with the Rebar Superintendent and a sample of the persons trained, the training consisted of having each equipment operator read the manufacturer's instructions. However, there were no formal records of the training identifying which personnel had been trained in equipment operation or what training had been provided. The Contractor documented this issue, on April 18, 2002, by Corrective Action Report 24590-WTP-CAR-QA-02-082. The Contractor subsequently provided records of the training to the Training Coordinator on April 17, 2002, the training was entered into the Training Database, and the record was transmitted to Project Document Control. Contractor management also discussed with construction staff the need to provide quality records to PDC in a timely manner. The Contractor's QAM Policy Q-05.1, "Instructions, Procedures and Drawings," Section 3.1.1, states activities affecting Quality shall be prescribed by and performed in accordance with documented instructions, procedures, and drawings. Although Appendix 7, Section 3.5, of the *Concrete Operations (Including Supply)* procedure, required training records for the use of shearing and bending equipment, these training records had not been forwarded to the training coordinator for processing. This would be considered a Finding; however, because this issue met the non-cited Finding criteria in Inspection Administrative Procedure A-105, "Inspection Performance," a Finding was not issued. Specifically, the issue was not programmatic, was entered into the Contractor's corrective action program, and the specific issue was corrected in a timely manner.

Appendix 7, Section 4.3.1, of the *Concrete Operations (Including Supply)* procedure required, prior to fabrication of quality level reinforcing steel, an initial inspection of the fabrication equipment and facilities be performed in accordance with a special instruction. By reviewing the signed and completed special instruction, the inspectors verified the initial inspections had been performed by field engineering, quality control, and the responsible superintendent in accordance with the special instruction.

During an inspection of the reinforcing steel bending and shearing work station on April 16, 2002, the inspectors observed the original Daily Rebar Fabrication Log and QC Inspection Records for April 11, 12, and 15, 2002, for machine 1, and the records for April 15, 2002, for machine 2, were still in the binder at the bending work station and had not been submitted to Project Document Control (PDC), as required by the *Concrete Operations (Including Supply)* procedure, Appendix 7, item 32, of the instructions for completing the Daily Rebar Fabrication and QC Inspection Record. The inspectors noted the Contractor had not prescribed a minimum time period for transmitting records to PDC; however, the inspectors concluded this was a poor practice because there was no reason for the records to be retained at the job site, unnecessarily increasing the risk of damage by the elements or loss. The inspectors observed, on April 17, 2002, these records had subsequently been submitted to the Facility

Document Control Station on site (an extension of the PDC). In response to these observations, the Contractor's Site Construction Manager stated additional training would be conducted for responsible personnel to emphasize the need for expeditious transfer of completed original records to PDC.

Appendix 7, Section 4.6.3, of the *Concrete Operations (Including Supply)* procedure required inspections be conducted to verify minimum bend diameter was in accordance with the dimensions provided on page 6-5 of Concrete Reinforcing Steel Institute Manual of Standard Practice (MSP)-1, 27<sup>th</sup> Edition. These requirements were repeated in the instructions for completing the Daily Rebar Fabrication Log and QC Inspection Record. The inspectors found, based upon discussions with the QC inspector, the required minimum bend diameter inspections had not been conducted on reinforcing steel bent prior to April 16, 2002. Reinforcing steel bending had occurred on April 11, 12, and 15, 2002. The Contractor's field engineer stated reinforcing steel bending had been conducted using the correct bend die, which had the proper radius, and this knowledge provided assurance the proper bend radius had been implemented. The inspectors examined several bundles of bent reinforcing steel and, based on uniformity of the bends, determined these had been bent using the correct die; accordingly, the inspectors identified no specific concern regarding bend radius conforming to applicable requirements. However, the Site Construction Manager acknowledged the issue and stated the dry run of the reinforcing steel fabrication process should have more clearly focused on the methods to be used to accomplish the required verifications and the methods should have been more clearly communicated to inspection personnel. The Contractor documented the discrepancy, that the process discussed in the dry run for measuring the bend dimension had not been implemented in the field, by Corrective Action Report 24590-WTP-CAR-QA-02-079, dated April 18, 2002. The inspectors examined about 100 reinforcing steel bends on number 11 bars and found the bends were free of cracks and verified the reinforcing steel was properly tagged and identified, as required by procedures.

The inspectors examined the storage of reinforcing steel in the field and at the reinforcing steel bending job site. The reinforcing steel at the bending job site was properly stored on cribbing and was not in contact with the ground. In the field, at the Low Activity Waste (LAW) building jobsite, the inspectors examined seventeen bundles of bent reinforcing steel stored on cribbing and located around the north end of the LAW foundation pit. The inspectors observed four of the bundles were in contact with the ground and did not provide for air circulation as required by Appendix 7, Section 3.8, of the *Concrete Operations (Including Supply)* procedure. The Contractor took immediate action to correct these discrepancies by digging the sand away from the area of bars touching the ground and providing for air circulation. The inspectors had confidence the bars had not been adversely affected by the short period of contact with the ground. The inspectors discussed the situation with several Contractor personnel at the scene and concluded they were aware of the requirements regarding need for air circulation.

The inspectors examined the process for installing basemat reinforcing steel on the LAW mudmat and discussed the process with responsible field engineers and QA representatives. Section 3.9.2 of the *Concrete Operations (Including Supply)* procedure prescribes reinforcing steel detail and placement drawings be prepared and submitted by the subcontractor to design engineering for review and approval in accordance with project procedures and, once approved, PDC will log-in and distribute the drawings to the field engineer for inclusion in the Construction Work Package. The inspectors observed the basemat bottom steel, lower layer, was being installed in accordance with subcontractor fabrication drawing LAW00S1006, Revision 1. The subcontractor drawing referenced Revision 0 of two design drawings (LAW-DG-S13T-00001, Revision 0 and -00008, Revision 0). The inspectors found the drawing had been submitted to, and approved for construction by, design engineering. The inspectors

subsequently found design drawing LAW-DG-S13T-00008 had been revised and Revision 1 was the current revision. The inspectors observed there was no evidence the subcontractor had reviewed the revised design drawing to establish whether the revision changed the installation configuration, or notified the Contractor's engineering staff of any conclusions regarding the impact Revision 1 of LAW-DG-S13T-00008 had on the fabrication drawing. Subsequent to identification of this issue, the Contractor issued the *Field Project Document Control* procedure. Section 3.3.5.1 of the *Field Project Document Control* procedure required, upon issue of a change document (Field Change Request, Field Change Notice, or Drawing Change Notice) or a revision greater than 0 to a design document, the responsible field engineering staff to review the document for impacts to previously ordered material or completed work in the field. Section 3.3.5.3 through 3.3.5.5 described the documentation of the impact review and the record filing and logging requirements of the impact review documentation. The inspectors concluded the Contractor's procedures provided adequate management controls necessary to ensure construction work, completed prior to a drawing change or revision, would be assessed in the field to ensure conformance with any new design requirements. Through a careful review of the two drawings, the inspectors verified the subcontractor drawing LAW00S1006, Revision 1, being used in the field to install the bottom layer of reinforcing steel on the LAW mudmat, continued to implement the requirements of engineering design drawing LAW-DG-S13T-00008, Revision 1. The inspectors examined several reinforcing steel strings, at the bottom layer of the LAW basemat, for proper lap length and spacing, and concluded the lap lengths and spacing conformed to design requirements.

The inspectors examined training profiles and records of training completion for the QC inspector, general foreman, foreman, two ironworkers, and the field engineer engaged in reinforcing steel fabrication operations and concluded the training had been adequately specified and these persons had completed their required training.

The inspectors examined Construction Work Package LAW/C/C/0001, *Pour #1 Base Mat Area*, and LAW/C/C/0007, *Pour #6 Base Mat Area*. The inspectors reviewed the contents of the work packages and concluded the required design media and in process inspection reports were contained within the work packages. The work package design drawing list was taken to the Field Document Control Station. The drawing list was cross-referenced to the controlled drawings maintained at the field station; the inspectors noted the control station was maintaining the needed referenced drawings. The inspectors concluded the process was acceptable, since the construction workers had readily available controlled drawings to perform work activities. The inspectors examined drawings the craft were working to in the field and concluded their drawings were also the current revisions.

The inspectors examined a Quality Control Surveillance Report, 24590-WTP-SV-QC-02-32, obtained from the Contractor's QC staff, detailing in-process monitoring of LAW reinforcement steel installation work. The inspectors reviewed the surveillance report for content, including determining if it contained correctly referenced procedures, specification, and drawings as well as inspection items, and concluded the requirements listed were the most current.

During walk down of installed reinforcement steel, the inspectors performed a general inspection of the items noted in the QC surveillance report that had been inspected and found to be acceptable. These items included bottom of the slab reinforcement steel size, spacing, clear cover, splice lengths, dowels on the "A line North Wall," dowels on the "15 line East Wall," dowels on the "1 line West Wall," and size, spacing, and 90 degree hook lengths. The inspectors

also identified no discrepancies with these items and concluded the in-process inspection performed by the Contractor's QC staff, were acceptable.

The inspectors witnessed an in-process inspection performed by a Contractor QC inspector on the LAW elevator pit, A to B line between 12 and 13 line. The inspectors concluded the Contractor's QC inspector was thorough in verifying applicable reinforcement steel attributes, such as those listed above.

The Contractor had developed a Construction Self Assessment Plan, as part of the program for performing management assessments, to assess the onsite fabrication and installation of reinforcing steel and embeds. The performance of the assessment had been scheduled during the period April 22-29, 2002. The inspectors examined the plan and concluded it would accomplish a substantial assessment of the reinforcing steel and embed activities. The inspectors attended the exit for the self-assessment on May 8, 2002, and concluded the assessment was well performed and identified several opportunities for improvement. The Construction Manager was receptive to the improvement items and assigned staff to take actions to address the items.

### **1.3.3 Conclusions**

The Contractor had provided adequate records of reinforcing steel fabrication and inspection activities; adequate initial inspections to assure the readiness and acceptance of the reinforcing steel fabrication facility and equipment; adequate reinforcing steel storage at the fabrication facility; adequate spacing and lap splice length for reinforcing steel installed on the bottom layer of the LAW basemat; and adequate provisions to assure design changes would be evaluated for impact on completed work or work in progress.

The LAW reinforcement steel work packages contained appropriate requirements, installation drawings used in the field were appropriately controlled, and in process reinforcement installation were being conducted in an acceptable manner, in accordance with established procedures, specifications, and drawings. Qualified inspectors were performing in process QC surveillance activities of this work in a thorough manner, and the surveillance activities were adequately documented.

Performance weaknesses included not transmitting completed work and training records to PDC within an appropriate period of time following the completion of final records; lack of QC inspector knowledge and performance of reinforcing steel bend diameter verifications; and poor reinforcing steel storage conditions on the banks of the excavation of the LAW building basemat.

## **1.4 Adequacy of Concrete Mix Designs (ITP-I-113)**

### **1.4.1 Inspection Scope**

The inspectors examined the Contractor's program and procedures for accomplishing concrete mix designs specified by the Contractor's engineering specifications. In addition, the inspectors examined the records documenting the designed concrete mixes. The inspectors examined the subcontractor's

activities to assure the testing laboratory and technicians providing testing services for the mix qualifications were qualified as required by ASTM C 94.

#### **1.4.2 Observations and Assessments**

The inspectors examined the quality assurance and engineering activities involved in the specification of concrete mix formulations. The Contractor had performed a review of the Central Pre-Mix (CPM), the subcontractor responsible for supplying important-to-safety (ITS) concrete, quality assurance manual (QAM), and placed the supplier on the Approved Suppliers List, in August 2001. The Contractor's QA auditor identified that although design was not an applicable QAM requirement of CPM, discussion needed to be held with the cognizant Contractor engineer regarding why design control was not applicable to CPM when the subcontractor was providing mix design. Engineering provided the requested justification, by e-mail on September 18, 2001, with the determination that mix design was not design in the strict sense of the term, but was a formulation of the concrete constituents in accordance with guidelines identified in the specification. The inspectors examined specification 24590-WTP-3PS-DB01-T0001, *Furnishing and Delivering Ready-Mixed Concrete*, Revision 1, dated December 4, 2001, and found the requirements of Section 3.1.1 through 3.1.17 provided adequate specification of the controls and requirements for the formulation of the required mixes.

The subcontractor provided the mix formulations, with the substantiating test data, to engineering on April 29, 2002. The subcontractor's submittal was reviewed by the responsible Contractor engineer. The cognizant engineer identified that work may proceed subject to the resolution of minor, non-technical comments. The inspectors discussed the scope and content of the review with the engineer. The engineer stated the technical requirements of the specification had been verified during the review of the subcontractor supplied data, providing the basis for allowing work to proceed. The inspectors found the Contractor's actions to specify controls over the mix design process and the verification of the subcontractor's results were acceptable and conformed to established industry requirements. The inspectors reviewed the concrete mix formulations and concluded the formulations conformed to specification requirements and applicable industry standards.

The subcontractor (CPM) had utilized a geotechnical engineering and materials testing company to perform the required testing of the concrete mix formulations. The inspectors examined documentation at the CPM facility and verified CPM had assured the testing company had conformed to the requirements of ASTM C 94, Sections 15.2, and 16.2, regarding laboratory qualification and testing technician certification. The inspectors examined the records of laboratory and testing technician certification and verified each had been certified as required by the ASTM C 94.

#### **1.4.3 Conclusions**

The Contractor had satisfactorily accomplished the formulation of the concrete mixes in accordance with adequate quality and technical specification requirements. In addition, the inspectors concluded CPM had properly assured the materials testing laboratory and technicians had been certified as required by industry standards and Contractor requirements.

## **1.5 Adequacy of the Concrete Batch Plant (ITP-I-113)**

### **1.5.1 Inspection Scope**

The inspectors examined the Contractor's certification of one of two concrete manufacturing batch plants at the WTP site by examining the documentation of plant certification and conducting verification inspections of several attributes specified in the National Ready Mixed Concrete Association (NRMCA) checklist for ready mixed concrete production facilities.

### **1.5.2 Observations and Assessments**

Safety Requirements Document (SRD), Safety Criteria (SC) 4.1-2, required conformance to American Concrete Institute (ACI) 349, *Code Requirements for Nuclear Safety Related Concrete Structures*, 2001 Edition. ACI 349, Section 3.8, required conformance to ASTM C 94, *Standard Specification for Ready-Mixed Concrete*, 1994 Edition.

The inspectors examined the Contractor's technical specification 24590-WTP-3PS-DB01-T0001, *Furnishing and Delivering Ready-Mix Concrete*, Revision 1, dated December 4, 2001, to determine whether the Contractor's requirements regarding the qualification of the concrete batch plant conformed to the requirements of ASTM C 94.

The Contractor had selected Central Pre-Mix (CPM) Concrete Company as the concrete supplier and batch plant operator but had not yet approved the operation of batch facilities and mixing and transportation units for producing important-to-safety (ITS) concrete. The Contractor was reviewing, but not yet approved, the CPM work implementing procedures for operation of the batching facilities. The second batching facility was still under construction.

Section 3.2 of the Contractor's technical specification provided several requirements regarding the manufacture of ITS concrete. Paragraph 3.2.3 of the specification required conformance with American Society of Testing and Materials (ASTM) C 94 for the batch plant and that the plant meet the National Ready-Mixed Concrete Association (NRMCA) checklist certification requirements for batching and mixing equipment. The required verifications and checklist had been completed by a registered professional engineer; although the checklist had not yet been submitted to the Contractor because it was being reviewed by the NRMCA Board. The certifying engineer had identified two checklist requirements that did not conform to established requirements and required correction before the batch plant could be certified. The subcontractor was working to correct the discrepancies and stated they would be corrected before production of ITS concrete.

Paragraph 3.2.4 of the Contractor's technical specification required all scales and meters be calibrated within six months prior to production by an independent agency and periodically, based on use and frequency thereafter. The inspectors examined batch plant scale calibration data and found the scales had been calibrated by an independent agency using certified weights within the tolerances of the NRMCA checklist requirements. The CPM QA program, Section 12, paragraph 2.0, required the scales to be rechecked for accuracy every six months. The inspectors found that records indicated each scale was accurate within the requirements of the NRMCA checklist (Section 2.1.2) and the test weights conformed to the checklist (Section 2.1.3) requirements. The CPM QA program, Section 12, paragraph

2.0, specified additional requirements regarding the calibration of sieves, laboratory balance scale, and batch plant water metering equipment. The inspectors examined this equipment and calibration data and found the data to be acceptable documentation of equipment calibration and found the equipment to be tagged as required, with the exception of two sieves whose calibration stickers had become dislodged and lost. The subcontractor took immediate action to replace the two lost sieve calibration stickers.

The NRMCA checklist (Sections 1.2.1 and 1.2.2) required the subcontractor to have procedures for unloading aggregate and building aggregate stockpiles so as to prevent harmful segregation and breakage. The inspectors found the CPM procedures addressed and accomplished these requirements.

The NRMCA checklist, Section 2.5.5, and the Contractor's technical specification, Section 3.2.6, required the subcontractor to provide compensation for free moisture on aggregates. During the current non-ITS batch plant trial runs, the inspectors found that the subcontractor tested the aggregates for moisture content daily before the production of the first batch of concrete and adjusted the amount of water added to the batch to account for the moisture contained in the aggregate. This requirement was specified in the subcontractor's procedures.

The NRMCA checklist (Section 2.2.4) required the subcontractor to establish an operating procedure used to assure compliance with requirements regarding the accuracy of batching when material was accidentally overweighed. The inspectors verified the subcontractor had established the required procedure and trained the batch plant operator in the procedure. The subcontractor only had one qualified batch plant operator (qualified by attending the batch plant computer and controls manufacturer's school) and the inspectors examined documentation of the individual's training and found the training records demonstrated the required training. The subcontractor planned to have additional qualified batch plant operators and stated each would be trained in batch plant operation by the already qualified individual (the Plant Superintendent). The subcontractor's QA manual provided appropriate requirements regarding the training of plant operating personnel. The inspectors examined the training records for the subcontractor's Plant Superintendent, two QC technicians, and the QA Manager and found these to conform to requirements established by the subcontractor's QA program.

ASTM C 94, Section 16.2, required technicians testing concrete to be certified ACI Concrete Field Testing Technician Grade 1, or equivalent. The inspectors examined the certification documentation of two QC test technicians and the Plant Superintendent and found they had been certified to the required standard and level.

The Contractor's specification (Section 3.2.5), the NRMCA checklist (Section 4), and ASTM C 94 (Section 13) provide requirements regarding the information content of batch plant delivery tickets. The inspectors examined the delivery tickets produced by the batch plant and found the delivery tickets provided the required information.

The subcontractor had established a mixing time of 45 seconds per batch, measured from the time all ingredients had been charged into the mixer. This mixing time was based upon the results of uniformity testing conducted in accordance with ASTM C 94, as required by the Contractor's technical specification, Section 3.2.2. Section 3.2.2 further required the mixer be maintained such that the results of the uniformity test and the minimum mixing duration (45 seconds) remained valid. The inspectors verified the NRMCA certification was required to be repeated every two years and the mixer uniformity testing would be accomplished during re-certification, providing a level of assurance that the mixing

duration would be re-established at least every two years. In addition, the cognizant engineer stated ACI 304, *Guide for Measuring, Mixing, Transporting, and Placing Concrete*, 2000 Edition, referenced by Section 3.4.1 of the specification, provided requirements for monitoring the performance of the mixer, for its continued ability to produce uniform mixes, through the testing for air content, slump, unit weight, and compressive strength on every 150 cubic yards of placed concrete. The inspectors verified the testing requirements and frequency were implemented in materials testing services technical specification (24590-BOF-3PS-C000-T0001, *Technical Specification for Material testing Services*, Revision 1, dated October 1, 2001). In addition, the Contractor stated that visual observations by Field Engineers and Quality Control inspectors during truck discharge provided an additional level of assurance that concrete uniformity remained acceptable. Based upon the above assertions and verifications, the inspectors concluded that sufficient controls were in place to assure that concrete uniformity remained acceptable and the 45 seconds of mixing time specified remained valid.

### **1.5.3 Conclusions**

Central Pre-Mix had acceptably accomplished the examined requirements of ASTM C 94, ACI 349, and the NRMCA certification checklist for concrete production facilities, with the exception of two requirements identified by the certifying professional engineer and being corrected before ITS concrete production.

## **1.6 Adequacy of Offsite Reinforcing Steel Fabrication Activities (ITP-I-113)**

### **1.6.1 Inspection Scope**

The inspectors examined the purchase order specifying the contracting requirements for performing bending and cutting of reinforcing steel and installation of reinforcing steel mechanical couplers by an off site subcontractor and facility.

### **1.6.2 Observations and Assessments**

The Contractor determined the need to perform reinforcing steel fabrication activities at another location, in addition to the fabrication facility onsite. The Contractor developed purchase order 24590-QL-MRA-DG00-00002, *Offsite Rebar Fabricator*, Revision 2, dated April 22, 2002, to accomplish the additional fabrication activities. The purchase order was issued to Graham Steel Corporation for fabrication of reinforcing steel and splices (Quality Level QL-1 activities) at their Vancouver, Washington facility. Graham Steel was not a supplier qualified to perform QL-1 fabrication activities in accordance with the requirements of the Contractor's NQA-1 Quality Program Requirements for the River Protection Project Waste Treatment Plant (RPP-WTP). Accordingly, the purchase order required the Contractor's quality representatives to be resident at the manufacturing facility to continuously monitor and provide acceptance inspection of the work in progress and perform surveillance of witness and hold points specified in the purchase order. At the time of this inspection, Graham Steel had not yet begun reinforcing steel fabrication.

The inspectors examined the purchase order and found it contained adequate and appropriate provisions and controls for reinforcing steel supplied from the RPP-WTP storage site, material shipped to the fabricator's facility from the reinforcing steel supplier, and Contractor supplied mechanical couplers.

The inspectors examined the purchase order to assess the adequacy of controls specified regarding the applicable quality program requirements, material receiving inspection and segregation requirements, and final product inspection requirements. The inspectors concluded the Contractor had contained provisions to ensure appropriate quality requirements had been specified, including requirements for material receiving inspection with specific inspection and acceptance criteria, identifying acceptable items and segregation of nonconforming items, storage of acceptable items, final product inspection attributes and acceptance criteria, and mechanical coupler material control.

The Contractor had performed a Commercial Grade Item Evaluation (24590-WTP-CGD-C-02-002, *Commercial Grade Item Evaluation for Mechanical Coupler (for Reinforcing Steel)*, Revision 0, dated January 17, 2002) for the reinforcement steel mechanical coupler. The inspectors examined the commercial grade evaluation; specifically, the Contractor's evaluation of identification characteristics, application and credible failure mechanism descriptions, critical characteristics of design, critical characteristics for acceptance of the couplers, manufacturer/supplier evaluation information, and storage instructions. The inspectors concluded the Contractor's commercial grade item evaluation conformed to the requirements of the Contractor's Quality Assurance Manual (24590-WTP-QAM-QA-01-001, *Quality Assurance Manual*, Revision A, dated July 11, 2001), Policy Q-07.1, Section 3.15.

### **1.6.3 Conclusions**

The Contractor had established an acceptable purchase order for the offsite fabrication of reinforcing steel, specifying appropriate work and quality requirements, and performed a comprehensive evaluation for dedication of commercial grade reinforcement steel mechanical couplers to important-to-safety applications.

## **1.7 Observation of Soil Compaction and Testing Activities (ITP-I-112)**

### **1.7.1 Inspection Scope**

The inspectors observed the conduct of sub-grade compaction activities and soil density testing on the floor of a pit in the HLW building foundation.

### **1.7.2 Observations and Assessments**

The inspectors examined work package HLW-C-E-1000, *Proof-rolling Subgrade at Bottom of HLW Pit*, observed the compaction activities, interviewed the Contractor's field engineer and QC inspector providing oversight of the activity, interviewed the GN Northern soil testing technician, observed the conduct of two soil density tests using a nuclear gauge, and observed the recording of density test data. Two soil density measurements were required because the total area was slightly in excess of 5000

square feet and technical requirements specify one test be conducted for each 5000 square feet, or fraction thereof.

The inspectors found the Field Engineer, QC Inspector, and the GN Northern testing technician were knowledgeable and implemented their responsibilities and requirements. The sub-grade area had been properly cleaned to assure thorough compaction of good soil and the level and elevation measurements were conducted by surveying staff to verify conformance with elevation and leveling acceptance criteria. The inspectors observed the conduct of two soils density measurements using a nuclear density gauge and concluded the technician properly performed the tests and recorded the data. The tests demonstrated the density of the compacted subsurface was greater than 95%, the minimum acceptance criteria. The soil density instrument had a current calibration sticker affixed.

### **1.7.3 Conclusions**

Soil sub-grade compaction, testing, and oversight activities were properly managed and implemented by a knowledgeable staff, resulting in a compacted subsurface conforming to applicable requirements.

## **1.8 Industrial Health and Safety (IH&S) Oversight (ITP-I-161)**

### **1.8.1 Inspection Scope**

The inspection in this area focused on the Contractor's implementation of the Contract industrial health and safety requirements described in the Office of River Protection Manual (ORPM) M 440.1-2, *Industrial Hygiene and Safety Regulatory Plan for the Waste Treatment Plant Contractor*. Specifically, the inspectors assessed compliance to the requirements of the Contractor's *Non-Radiological Worker Safety and Health Plan*, PL-W375-IS00001, Revision 1, dated March 12, 2001, for the River Protection Project-Waste Treatment Plant, which had been reviewed and approved by the Office of Safety Regulation (OSR), along with applicable requirements specified in ORP M 440.1-2. Areas reviewed included the safety and health operations associated with the installation of various building basemat forms, reinforcing steel, and embedments, and the construction fire protection/prevention program implementation.

### **1.8.2 Observations and Assessments**

#### **1.8.2.1 Preparation of Forms, Rebar, and Embedments (FRE) and Concrete Production**

The inspectors evaluated the IH&S safety aspects of the sequential steps associated with the installation of FRE. The sequential process included such jobs as off-loading and detailing the reinforcing steel to specifications, transport and placement of the formed reinforcing steel, and the fit-up and tie-in of FRE. The inspectors also examined drilling operations (both air track type and mud rotary) used to provide anchors and supports for shoring associated with HLW and PT foundations.

The job safety plans and Safety Task Analysis Risk Reduction Talk (STARRT) cards were examined and the inspectors attended pre-job meetings.

During a site tour with a safety and health representative on May 1, 2002, the inspectors noted the ironworkers were moving under the suspended load of reinforcing steel bundles when spotting them on the dunnage. The Contractor safety and health representative promptly notified the general foreman of the unsafe practice and the next load was picked and spotted with the use of a tag line. However, the inspectors noted when using the tag line, the ironworker still went under the terminal end of the suspended load with a portion of his body. The general foreman was notified and promptly corrected the activities. The inspectors later observed the reinforcing steel-detailing site on two separate occasions and noted the poor work practices had been corrected.

The inspectors observed all ironworkers were wearing necessary protective equipment, including hearing protection, in the detail area. The detail area was cordoned off and danger signs had been posted to keep unauthorized personnel away from the area. The layout of the hydraulic reinforcing steel shearing and bending equipment were staged in a manner to optimize the safety of the ironworkers in the area in the event reinforcing steel shattering occurred.

The inspectors attended a STARRT card meeting for ironworkers at the Low Activity Waste (LAW) building construction site. The foreman discussed the necessary personnel protective equipment issues and emphasized the importance of the workers staying clear of suspended loads when placing basemat FRE.

The inspectors witnessed a tag out process for the hydraulic reinforcing steel bending unit in the reinforcing steel detail area. A single reinforcing steel element damaged the control console and the system required tagging-out. The tags were promptly applied on the console unit and removed only after the mechanic applied his tag. The process was accomplished in a safe and controlled fashion.

The batch plant was making final preparations for full-scale production. The inspectors were informed the plant would fill trucks and haul the concrete to the mats. The housekeeping was good and proper fire protection was being provided for welding and cutting operations. Welding was being accomplished to upgrade fall protection railings. One tower ladder-way required some safety-related repairs (bent members/cage and climbing aid) to be performed prior to used. The subcontractor had scheduled that work prior to operational access. The inspectors requested the Contractor's safety and health representative provide copies of the required industrial hygiene baseline exposure for employees. Employee baseline sampling was required for materials being used within the plant, i.e. fly ash, cement, etc. The subcontractor committed to provide employee exposure data during start-up operations.

The inspector observed hoisting, rigging, and spotting of formed reinforcing steel. The crane swing radius was being kept free of personnel at all times. The crane oiler was constantly observing the load picks and placements. Plywood walkways were being installed to provide a safe access when working on top of the basemat.

The inspectors examined construction sites, including the pad for the tower crane, and observed exposed reinforcing steel impalement points were properly capped.

The inspectors observed the drill rig's air and high-pressure mud lines were properly whip-checked. The Contractor safety and health representative was requested to provide copies of required industrial hygiene baseline data for the operator of the air-track type of drill rig, which was being used in the

anchoring operation. The required baseline dust sampling data for the track anchor drilling operation was needed in order to assess whether the subcontractor had provided proper employee protection. The Contractor formally requested industrial hygiene data from the subcontractor.

### 1.8.2.2 Construction Fire Prevention and Protection

The inspectors evaluated the Contractor's construction Fire Protection and Prevention program specifically against the requirements specified within ORP M 440.1-2. This included on-site requirements for the ready and timely access to fire control equipment, properly located equipment, equipment inspection and maintenance, and the proper storage of combustible materials. The inspectors also evaluated the Contractor's implementation of the following procedures:

24590-WTP-GPP-SIND-026A, *Housekeeping and Fire Prevention*, Revision 0, dated September 28, 2001

24590-WTP-GPP-SIND-009, *Safety Watches*, Revision 0, dated September 28, 2001

24590-WTP-GPP-SIND-035A, *Welding and Cutting Safety*, Revision 0, dated August 16, 2001

The inspectors observed vent plugs had not been removed on a new flammable storage cabinet, located on the Low Activity Waste building construction site, as required. After the inspectors brought this condition to the Contractor's attention, the vent plugs were removed.

The inspectors determined no readily accessible or visible fire extinguisher was available within the welding area. The inspectors brought this condition to the Contractor's attention and the inspectors were shown that the fire extinguisher was located within the covered "job box." The Contractor then removed the fire extinguisher from the job box and hung it in an accessible and visible area.

The inspectors noted the Contractor did not have any trained and designated fire watch persons, as required by 24590-WTP-GPP-SIND-009, *Safety Watches*, Revision 0, dated September 28, 2001. However, the Contractor had previously scheduled a vendor to train twenty site individuals on May 20, 2002, to become designated fire watches throughout the site. The inspectors verified, later in the inspection period, the training was completed as planned for approximately thirty individuals.

The inspectors observed no accessible fire extinguisher was located in the combo shop construction site. The inspectors brought this condition to the attention of the Contractor. The Contractor committed to placing a fire extinguisher in the combo shop area. The inspectors subsequently verified that an appropriate fire extinguisher was provided in this area.

The inspectors observed poor general housekeeping in the T-1 construction facility, which could contribute to potential fires and injuries. The Contractor had previously formally notified the subcontractor that a systematic improvement was needed in this construction area. The inspectors were later informed, by the Contractor's Industrial Field Safety Manager, that the subcontractor had invested additional effort and manpower in improving the general housekeeping of this site and the Contractor had subsequently determined the housekeeping was satisfactory. The inspectors toured the T-1 facility

and noted some improved housekeeping; however, continued Contractor attention to housekeeping was warranted.

### **1.8.2.3 Other Industrial Safety and Health Observations**

The inspectors observed a subcontractor using a forklift to lift and move a large fabricated steel component to the facility by wrapping slings around the forks and suspending the load under the forks. Although the use of a forklift for moving items within its safe operating load range was not prohibited, the improper use of rigging, which could be damaged and compromised by cutting on steel edges of the forks, was not an acceptable rigging practice. The inspectors discussed this observation with the Contractor's safety and health representative and were informed the subcontractor's rigging practices would be changed to meet the Contractor's rigging requirements. Subsequently, the Contractor informed the inspectors the subcontractor's rigging practices were re-evaluated and necessary improvements were implemented.

The inspectors examined the sanitary sewer line construction trench at the toe of the slope just below the out-fall from the septic tank. The working trench was less than 4 feet in depth and was benched approximately two feet back on both sides. However, the main slope just above the working trench, which represented the cut from the main construction site ground level and the drain-field level, was much steeper than the excavation permitted slope of 1.75:1. The inspectors brought this condition to the attention of the Contractor, and the Contractor's safety and health representative requested the subcontractor remove personnel from that specific area until the subcontractor had trimmed the slope above the work area to the required angle. The subcontractor promptly corrected the discrepancy.

On May 2, 2002, the inspectors observed a construction wide enhanced safety meeting. This meeting was conducted to afford Contractor and subcontractor construction management an opportunity to discuss recent minor injuries, the need to improve performance, and the project expectations regarding working safely. Construction managers invited craft foremen and workers to provide input and many emphasized their commitment to safety. The inspectors viewed this effort to have been worthwhile, demonstrating management commitment to industrial health and safety. Positive responses during subsequent interviews with manual and non-manual personnel also indicated that the site wide safety meeting time was well spent.

The inspectors reviewed a series of STARRT cards. Out of approximately 25 cards, four had comments from employees written for submittal to construction management for consideration. The comments were behavior based and relevant. The Contractor's enhanced safety meeting emphasized feedback from employees, so it was expected that written employee suggestions would increase.

The inspectors reviewed approximately two months of entries from the Contractor's safety inspection logbook. The notations indicated safety inspectors had captured many relevant and timely issues and recommendations during the current phase of construction. Further, the inspectors noted the Industrial Field Safety Manager initialed off on every entry.

The inspectors reviewed the Contractor's program to address fugitive dust control at the work site. The inspector evaluated the scope of spoil piles and open cuts throughout the area, talked with the Contractor's lead safety and health representative and the excavation general superintendent. The

Contractor acknowledged problems associated with excessive fugitive dust during high winds and stated the following tasks would be initiated to address the problem:

- Increased watering roadways
- Water the cut faces and spoil piles
- Spray fixatives on cuts
- Refill and tamp trenches and ditches as conditions allow
- Introduce crushed rock on as many roads as possible
- Provide total particulate sampling for personnel at risk in order to evaluate exposure.

Based on the inspectors' experience with dust control, the inspectors doubted fugitive dust total particulate levels would reach or exceed the American Conference of Governmental Industrial Hygienists (ACGIH) Time Weighted Average (TWA) limit; however, documentation of personnel exposure was deemed essential. The inspectors will review this documentation and dust control efforts in a future inspection.

### 1.8.3 Conclusions

The inspectors concluded, with the exception of a few minor instances, the Contractor had acceptably implemented the program for industrial health and safety. Identified discrepant conditions were promptly and acceptably corrected. Management's decision to implement a construction site-wide safety meeting was a noteworthy good practice. The inspectors determined the Contractor had met the applicable requirements of ORP M 440.1-2.

## 1.9 Adequacy of Closure of Inspection Items (Inspection Administrative Procedures (IAP) A-105 and A-106)

The following occurrence reports and inspection follow-up item were reviewed to determine if they could be closed. The inspectors reviewed the Contractor's description of the occurrences, the corrective actions documented in the occurrence reports, and other information provided. The inspectors verified by records review the corrective actions stated in the occurrence reports were appropriately completed.

**1.9.1 (Closed 02-003-INR)** Occurrence Report No. RP--BNRP-RPPWTP-2002-0003, *Excursion of Sand and Gravel Permit*. On April 3, 2002, the Contractor notified the OSR of a reportable occurrence regarding the failure to collect a required monthly pH water sample from the discharge ponds at Pit 30, resulting in a permit excursion of the Washington State Department of Ecology *Sand and Gravel Permit*, No. WAG 50-5181. The Contractor entered this occurrence report in the DOE Occurrence Report Processing System (ORPS) at 17:45 (PTZ), April 3, 2002.

On April 3, 2002, during a review of the Process Water sampling log, the Contractor discovered the required monthly pH water sample had not been collected from the discharge ponds at Pit 30 during the month of February 2002. The Washington State Department of Ecology was notified of the event on April 3, 2002, at approximately 1610 hours. No other immediate actions were required because mining activities at Pit 30 were inactive at the time of discovery.

The Contractor performed a root cause evaluation of the event and established corrective actions to preclude recurrence. The inspectors verified that a new checklist had been developed identifying the frequency of sampling for the Process and Storm water and other requirements contained in the subcontractor's Environmental Compliance Plan. In addition, the checklist was required to be signed by the subcontractor's representative and the Contractor's environmental engineer. As an additional corrective action, a report was sent to the Washington State Department of Ecology discussing the event and corrective actions to prevent recurrence. The inspectors reviewed the report and verified the transmittal letter.

Based upon the above, this occurrence report is closed.

**1.9.2 (Closed 02-004-INTR)** Occurrence Report No. RP--BNRP-RPPWTP-2002-0004, *Employee Terminated for Being Under the Influence Of Alcohol*. On April 4, 2002, a direct hire electrician, working at the WTP construction site, was tested positive for alcohol consumption and subsequently terminated. The Contractor reported this occurrence on April 4, 2002, and provided to the Department of Energy via the DOE Occurrence Report Processing System (ORPS) a Final Report on April 29, 2002.

On April 4, 2002, an employee had reported to the construction site nurse because he was not feeling well. During the examination and treatment, the site nurse noticed the employee smelled like alcohol. The site nurse administered a breath alcohol test. The test proved positive and exceeded project limits. A subsequent search of the employee's vehicle, parked at the WTP, revealed containers of alcohol. The employee was terminated for cause, his badge was confiscated, and he was escorted offsite.

The Contractor had concluded the cause for this occurrence was human error. The Contractor stated the employee had attended the New Employee Orientation on April 1, 2002, which described the Contractor's drug and alcohol policy, had received a copy of the policy, and had signed forms acknowledging this policy. The employee had also passed an initial drug screening prior to being hired. The Contractor concluded the employee failed to adhere to the conditions for employment regarding the use or possession of alcohol. Other than terminating the employee's employment, the Contractor took no further corrective actions. At the time of the occurrence, the employee had been assisting other electricians in pulling wire to provide temporary power, a non important-to-safety activity.

The inspectors verified the employee had attended New Employee Orientation training by reviewing training records, verified the employee signed the acknowledgement statement regarding the alcohol and drug policy, and verified through records review he had passed the initial drug screening. The inspectors also reviewed 24590-WTP-G63-CON-1101A\_0, *Drug and Alcohol Screening for the WTP Construction Site*, dated October 22, 2001, and the *Jobsite Work Rules*, provided to the employee. These documents clearly described the Contractor's policy and rules regarding prohibition of alcohol onsite or being under the influence of alcohol while onsite.

Based on the above, the inspectors determined the Contractor adequately addressed this Occurrence Report and this item is closed.

**1.9.3 (Close IR-01-005-01-IFI)** Perform a review of the fire protection program for the Contractor's material receipt and storage Marshaling facility to determine compliance with 29 CFR 1926.151.

During the OSR's initial review of the Contractor's IH&S program in September 2001, the OSR determined the location of the Contractor's material receipt and storage facility had not been finalized and, therefore, a fire protection program for the facility, compliant with 29 CFR 1926.151, had not been put in place. The Contractor eventually settled on a location within the City of Richland, WA, which falls within the jurisdiction of the Richland Fire Department. The inspectors reviewed the Marshaling facility fire protection program to determine compliance with 29 CFR 1926.151. The Contractor's Industrial Safety Manager informed the inspectors, the City of Richland Fire Department inspected all premises within the Contractor's Marshaling area prior to issuance of a formal occupancy permit. The inspectors were also informed the sprinkler system was active and being maintained within the structures.

The facility owner, Port of Benton, hired a licensed fire protection service contractor to ensure that alarms, signals, and suppression systems are maintained functional as designed and required. The inspectors verified with the facility owner that the fire protection maintenance contract was in place and the City of Richland Fire Department performed an inspection of the facility.

Based on the above this item is closed.

## **2.0 EXIT MEETING SUMMARY**

The inspectors presented preliminary inspection results to members of Contractor management at an exit meeting on May 28, 2002. The Contractor acknowledged the observations and conclusions. The inspectors asked the Contractor whether any materials examined during the inspection should be considered limited rights data. The Contractor stated no limited rights data were examined during the inspection.

## **3.0 REPORT BACKGROUND INFORMATION**

### **3.1 Partial List of Persons Contacted**

J. Betts, Deputy Project Manager  
 W. Clements, Site Manager  
 G Shell QA Manager  
 D. Kline, Nuclear Safety Manager  
 B. Spezialetti, Regulatory Safety Manager  
 N, Brosee, C&T Manager  
 M. Platt, Safety Programs Lead  
 M. Ensminger, QC Manager  
 J. Minor, Construction Site Manager  
 E. Smith, Safety Programs Engineer  
 C. Herbert, Construction Training Coordinator  
 B. Niemi, Safety Program Engineer  
 R. Amos, Project Field Engineering Manager  
 S. Horn, CS&A BOF Supervisor  
 F. Boozer, Quality Control Engineer

D. Neal, QA Engineer  
 G. Nickolaus, QA Engineer  
 C. Edwards, QC Supervisor  
 G. Warner, Acting QA Manager  
 T. Worley, Ironworker General Forman  
 T. Davies, Ironworker Forman  
 R. Birley, Rebar Superintendent  
 J. Drake, Ironworker  
 T. Conter, Ironworker  
 C. Youngs, Ironworker  
 D. Lowery, QC Inspector  
 S. Ferrol, Field Engineer  
 J. Kalish, Field Engineer.  
 J. McKenney, Subcontract Coordinator  
 E. Ziegler, Central Pre-Mix (CPM) Safety and Environmental Officer  
 M. Farquharson, CPM Plant Superintendent  
 J. Holt, CPM QC Technician  
 J. Smith, Supplier QA Supervisor  
 W. Klinger, Supplier QA Manager  
 C. Allen, CPM QC Manager  
 W. Thomas, CS&A Engineer  
 W. Perry, Supplier Quality Manager  
 C. Cerda, Field Engineer  
 F. Blanks, QC Inspector  
 J. Lewis, Field Engineer  
 B. Pound, GN Northern Assistant Project Manager

### **3.2 List of Inspection Procedures Used**

Inspection Administrative Procedure A-105, "Inspection Performance"

Inspection Administrative Procedure A-106, "Verification of Corrective Actions"

Inspection Technical Procedure I-112, "Geotechnical/Foundations Inspection"

Inspection Technical Procedure I-113, "Structural Concrete Inspection"

Inspection Technical Procedure I-135, "Readiness for Construction Inspection"

Inspection Technical Procedure I-137, "Inspection of Fire Protection System Construction"

Inspection Technical Procedure I-138, "Inspection of Fire Protection System Inspection, Testing, and Maintenance"

Inspection Technical Procedure I-161, "Industrial Health and Safety Inspection"

### 3.3 List of Items Opened, Closed, and Discussed

#### Opened

None

#### Closed

02-003-INR	Incident Notification Report	Occurrence Report No. RP--BNRP-RPPWTP-2002-0003, <i>Excursion of Sand and Gravel Permit</i> . (Section 1.9.1)
02-004-INR	Incident Notification Report	Occurrence Report No. RP--BNRP-RPPWTP-2002-0004, <i>Employee Terminated for Being Under the Influence Of Alcohol</i> . (Section 1.9.2)
IR-01-005-01-IFI	Inspection Follow-up Item	Perform a review of the Contractor's material receipt and storage Marshaling facility fire protection program to determine compliance with 29 CFR 1926.151. (Section 1.9.3)

#### Discussed

None

### 3.4 List of Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
ASTM	American Society for Testing and Materials
ACI	American Concrete Institute
BNI	Bechtel National, Inc.
CAR	Corrective Action Request
CPM	Central Pre-mix
DOE	U.S. Department of Energy
HLW	High Level Waste
IAP	Inspection Administrative Procedure
IFI	Inspection Follow-up Item
IH&S	Industrial Health and Safety
INR	incident notification report
IR	Inspection Report
ITP	Inspection Technical Procedure
ITS	important-to-safety
LAW	Low Activity Waste
NFPA	National Fire Protection Association

NRMCA	National Ready-Mixed Concrete Association
ORP	Office of River Protection
ORPS	Occurrence Report Processing System
OSR	Office of Safety Regulation
PDC	Project Document Control
QA	Quality Assurance
QAM	Quality Assurance Manual
QAP	Quality Assurance Plan
QC	Quality Control
RPP-WTP	River Protection Project – Waste Treatment Plant
SRD	Safety Requirements Document
STARRT	Safety Task Analysis Risk Reduction Talk
TWA	Time Weighted Average

This page intentionally left blank.