Portland General Electric Company
Trojan Nuclear Plant
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January 6, 2005

VPN-004-2005

Trojan Nuclear Plant
Docket 50-344
License NPF-1

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Revision 20 of PGE-1061, "Trojan Nuclear Plant Defueled Safety Analysis Report and License Termination Plan (PGE-1078)" (a.k.a., TNP Decommissioning Plan)

The enclosure to this letter provides Revision 20 to Portland General Electric Company's PGE-1061, "Trojan Nuclear Plant Defueled Safety Analysis Report and License Termination Plan (PGE-1078)" (a.k.a., TNP Decommissioning Plan). The attachment to this letter provides a description of the changes incorporated into Revision 20. Revised portions of the TNP Decommissioning Plan are denoted by sidebars.

If you have any questions concerning this submittal, please contact Mr. Jerry D. Reid, of my staff, at (503) 556-6474.

Sincerely,

Stephen M. Quennoz
Vice President, Generation

Attachment

Enclosure

c: Director, NRC, Region IV, DNMS
J. T. Buckley, NRC, NMSS, DWM
D. Stewart-Smith, ODOE
A. Bless, ODOE

NMSS01

Description of Changes

The following provides a description of the changes incorporated into PGE-1061, "Trojan Nuclear Plant Defueled Safety Analysis Report and License Termination Plan (PGE-1078)" (a.k.a., TNP Decommissioning Plan), Revision 20. The changes were evaluated and determined to not require prior NRC approval pursuant to 10 CFR 50.59. The changes are listed under their corresponding Licensing Document Change Request (LDCR) number.

LDCR 2004-015

Sections 1.3.3 and 4.1.2 are changed to clarity that the Trojan Nuclear Plant Industrial Area is the "Restricted Area" as defined in 10 CFR 20.1003.

Section 1.4.1.2.7 is added to reflect NRC issuance of of a partial exemption from recordkeeping requirements of 10 CFR 50.71(c); 10 CFR 50, Appendix A; and 10 CFR 50, Appendix B (reference NRC letter dated August 27, 2003, D. M. Gillen to S. M. Quennoz, and PGE letter VPN-033-2003, dated July 9, 2003).

Section 3.3.2.1, Gaseous Radioactivity, is revised to clarify the use of HEPA filtration in (and) building ventilation systems in support of decontamination and dismantlement activities.

All of the above changes are administrative or editorial in nature.

LDCR 2004-021

Figure 2-1a is revised to reflect that the area immediately surrounding the Cooling Tower is not considered a radiologically impacted area. The area had previously been considered for possible temporary storage of low-level radioactive waste shipping packages while awaiting shipment to an off-site disposal facility. However, the area was not used in such a manner and its original classification as a non-impacted area remains applicable. This change is administrative in nature.

Controlled Copy No. 24

PGE-1061, "TNP Decommissioning Plan"

Revision 20

Pages to your Controlled Copy of PGE-1061, "TNP Decommissioning Plan," are to be replaced as indicated below:

Remove	Insert
Volume 1 of 2:	
Table of Contents	
Pages xiv and xv	Pages xiv and xv
Section 1	
Page 1-4	Page 1-4
Pages 1-11 through 1-13	Pages 1-11 through 1-13
Section 2	
Figure 2-1a	Figure 2-1a
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Pages 4-1 and 4-2	Pages 4-1 and 4-2

LIST OF EFFECTIVE PAGES

Section/Page	Revised Date	Revision Number
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Section 1		
Page 1-1	March 2004	Revision 19
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Appendix 3-1, Pages 1 through 5	September 2003	Revision 18
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Table 3-7	September 2003	Revision 18
Figure 3-1	March 2004	Revision 19
Figures 3-2 through 3-5	September 2003	Revision 18
Figure 3-6	March 2004	Revision 19
Section 4		
Pages 4-1 and 4-2	January 2005	Revision 20
Pages 4-3 through 4-59	September 2003	Revision 18
Appendix 4-1, Pages 1 through 3	September 2003	Revision 18
Appendix 4-2, Pages 1 through 6	September 2003	Revision 18
Appendix 4-3, Pages 1 and 2	September 2003	Revision 18
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1.3 GENERAL PLANT DESCRIPTION

1.3.1 SITE LOCATION

The TNP site consists of approximately 623 acres located in Columbia County in NW Oregon on the Columbia River at River Mile 72.5 from the mouth. Major structures on the site include the Containment Building, Turbine Building, Auxiliary Building, Fuel Building, Control Building, and a single natural draft cooling tower. The town of St. Helens, Oregon, the county seat of Columbia County, is located approximately 12 miles SSE of the site. The town of Rainier, Oregon, is located approximately 4 miles NNW and the town of Kalama, Washington, is approximately 3 miles SE of the site. There are three small unincorporated communities within a 5-mile radius of the site: Prescott, Oregon, located approximately 1/2 mile N of the site; Goble, Oregon, located approximately 1-1/2 miles SSE of the site; and Carrolls, Washington, located approximately 2-1/2 miles NNE of the site.

1.3.2 CLASSIFICATION OF STRUCTURES, SYSTEMS, AND COMPONENTS

The classification of structures, systems, and components (SSCs) remaining on the TNP site reflects the current advanced stage of decommissioning and the absence of spent nuclear fuel on the TNP site. Specifically, there are no longer any SSCs located on the TNP site that are classified Seismic Category I (safety-related) or II/I. The quality-related SSCs remaining at the TNP site are those associated with the remaining operational design basis functions – radioactive effluent release control and monitoring. The classification of SSCs at TNP will continue to be controlled consistent with the definition of quality-related in PGE-8010, "Nuclear Quality Assurance Program."

1.3.3 EXCLUSION AREA AUTHORITY AND CONTROL

10 CFR 100 requires that each site of a commercial power reactor must have an Exclusion Area and surrounding low population zone as defined in 10 CFR 100.3. As discussed previously, the TNP is no longer licensed for commercial power operations, the reactor vessel has been transported to an offsite disposal facility, and the spent nuclear fuel has been moved from the TNP site to the Trojan ISFSI. The completion of the spent nuclear fuel transfer to the Trojan ISFSI eliminated the available radiological source term remaining on the TNP site for reasonably conceivable radiological accident scenarios that could pose an undue risk to the health and safety of plant workers or members of the public. Therefore, the 10 CFR 100 requirements for an Exclusion Area and low population zone no longer directly apply to the TNP. Notwithstanding, the TNP Exclusion Area Boundary is maintained for the purpose of calculating radioactivity release limits and consequences due to normal effluents and accident and off-normal events (specifically, the north sector site and exclusion area boundary at 662 meters is the location for which doses are calculated), and to allow for precautionary evacuations related to any remaining credible decommissioning events bounded by the non-mechanistic event described in Section 3.4 that could result in radiological release having a significant effect within unrestricted portions of the Exclusion Area. The TNP Industrial Area, depicted in Section 2, Figure 2-1, has been and continues to be the "Restricted Area" as defined in 10 CFR 20.1003.

authorized the discontinuation of security requirements for the Trojan facility licensed under 10 CFR 50 upon completion of the transfer of spent nuclear fuel from the Spent Fuel Pool to the ISFSI.

1.4.1.2.4 10 CFR 50.54(w), Decontamination Insurance Coverage for Radiological Accidents

10 CFR 50.54(w) requires licensees to obtain and maintain a minimum of $1.06 billion of decontamination insurance coverage for radiological accidents at a reactor site. By letter dated November 17, 1993, from M. T. Masnik (NRC) to J. E. Cross (PGE), the NRC granted an exemption to PGE from this requirement, provided that PGE continues to maintain a minimum of $5 million in decontamination insurance coverage or to demonstrate self-insurance in this amount.

1.4.1.2.5 10 CFR 140.11(a)(4), Amounts of Financial Protection for Certain Reactors

By letter dated November 2, 1995, from M. T. Masnik (NRC) to S. M. Quennoz (PGE), the NRC authorized for the Trojan facility a reduction in the primary financial protection required by 10 CFR 140.11(a)(4) from $200 million to $100 million, and exempted (effective November 9, 1995) PGE from participation in the industry retrospective rating plan (secondary level financial protection).

1.4.1.2.6 10 CFR 50.120, Training and Qualification of Nuclear Power Plant Personnel

By letter dated November 19, 1993, from M. T. Masnik (NRC) to J. E. Cross (PGE), the NRC authorized an exemption from the training program requirements of 10 CFR 50.120.

1.4.1.2.7 10 CFR 50.71(c); 10 CFR 50, Appendix A; and 10 CFR 50, Appendix B, Recordkeeping Requirments

By letter dated August 27, 2003, from D. M. Gillen (NRC) to S. M. Quennoz (PGE), the NRC granted a partial exemption from the recordkeeping requirements of 10 CFR 50.71(c); 10 CFR 50, Appendix A; and 10 CFR 50, Appendix B. This partial exemption is applicable to specific records as described in PGE letter VPN-033-2003, dated July 9, 2003, and in the NRC's August 27, 2003, exemption approval.

1.4.2 CONFORMANCE WITH NRC GENERAL DESIGN CRITERIA

Considering the advanced stage of decommissioning of the permanently defueled TNP, and the completion of the transfer of spent nuclear fuel from the TNP Spent Fuel Pool to the Trojan ISFSI, the applicable criteria have been reduced to a subset of the original design criteria. Specifically, the following design criteria remain applicable to TNP:

> Criterion 60 - Control of Releases of Radioactive Materials to the Environment. **The nuclear power unit design shall include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation, including anticipated operational occurrences. Sufficient holdup capacity shall be provided for retention of gaseous and liquid effluents containing radioactive materials, particularly where unfavorable site environmental conditions can be expected to impose unusual operational limitations upon the release of such effluents to the environment.**

Liquid, gaseous, and solid radioactive waste processing equipment is provided using the principles of filtration, demineralization, solidification and storage for decay as described in Sections 2.3.2.16, 2.3.2.17, 2.3.2.18, 3.3.2, and 3.3.3. Administrative controls are used to ensure offsite doses meet the requirements of 10 CFR 20. Therefore, Criterion 60 is satisfied.

> Criterion 61 - Fuel Storage and Handling and Radioactivity Control. **The fuel storage and handling, radioactive waste and other systems which may contain radioactivity shall be designed to assure adequate safety under normal and postulated accident conditions. These systems shall be designed (1) with a capability to permit appropriate periodic inspection and testing of components important to safety, (2) with suitable shielding for radiation protection, (3) with appropriate containment, confinement and filtering systems, (4) with a residual heat removal capability having reliability and testability that reflects the importance to safety of decay heat and other residual heat removal, and (5) to prevent significant reduction in fuel storage coolant inventory under accident conditions.**

With the completion of the transfer of spent nuclear fuel from the TNP site to the Trojan ISFSI, there are no longer active fuel storage and handling systems or SSCs considered important to safety at TNP. Radioactive waste treatment systems located in the Auxiliary and Fuel Buildings are used for the remaining decommissioning activities to contain or confine leakage under normal and accident conditions. The associated ventilation equipment includes filtration which minimizes the consequences of potential radioactive material releases associated with the remaining decommissioning activities. Therefore, Criterion 61 is satisfied.

> Criterion 63 - Monitoring Fuel and Waste Storage. **Appropriate systems shall be provided in fuel storage and radioactive waste systems and associated handling areas (1) to detect conditions that may result in loss of residual heat removal capability and excessive radiation levels and (2) to initiate appropriate safety actions.**

With the completion of the transfer of spent nuclear fuel from the TNP site to the Trojan ISFSI, there are no longer fuel storage and handling areas on the TNP site, and the minimal amounts of radioactivity that remain do not require the installation and operation of permanent monitoring systems. Surveys are conducted as necessary for radioactive waste systems and handling areas

to detect excessive radiation levels and to initiate appropriate safety actions, as described in Section 3.2.6. Therefore, Criterion 63 is satisfied.

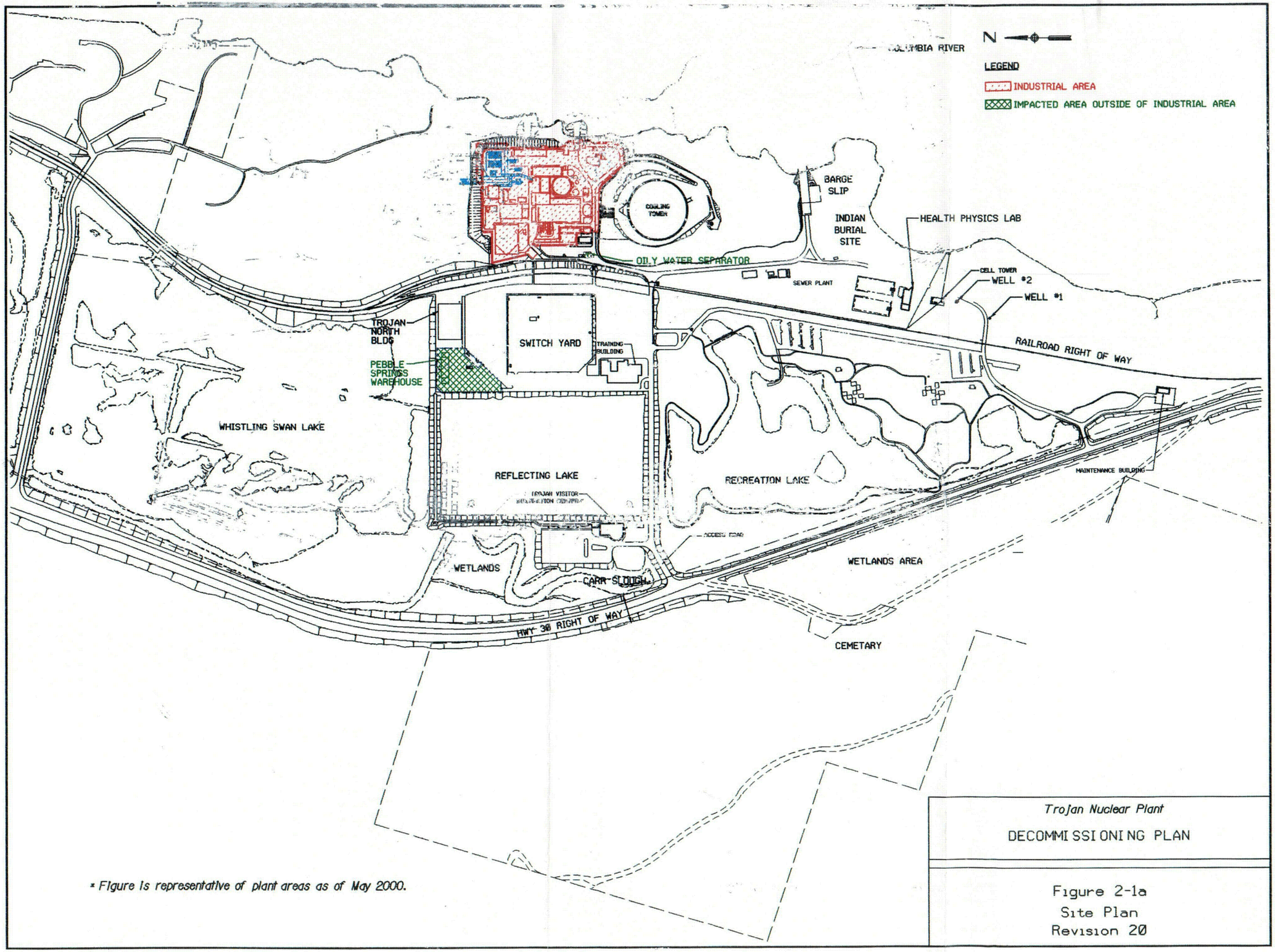
> Criterion 64 - Monitoring Radioactivity Releases. **Means shall be provided for monitoring the reactor containment atmosphere, spaces containing components for recirculation of loss-of-coolant accident fluids, effluent discharge paths, and the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents.**

With the completion of the transfer of spent nuclear fuel from the TNP site to the Trojan ISFSI, and of final survey activities in the Containment Building, monitoring of the Containment atmosphere is not required. Furthermore, there no longer remain any components associated with operating nuclear plant or reactor fuel accident mitigation. Effluent discharge paths and plant environs are sampled and/or monitored as described in Sections 3.2.6.3 and 3.3.2. Measurement capability and reporting of radioactive effluents meet the requirements of Regulatory Guides 1.21 and 4.1. Therefore, Criterion 64 is satisfied.

1.4.3 PERTINENT REGULATORY GUIDES

Regulatory Guides are developed and issued by the NRC for the purpose of describing acceptable ways of implementing regulatory requirements. Compliance with the Regulatory Guides is not mandatory as exceptions or alternative methods can be used. However, such exceptions or alternative methods, and their justifications, must provide comparable implementation acceptable to the NRC.

Table 1-1 lists the pertinent Regulatory Guides for the TNP in the final stages of decommissioning and with no spent nuclear fuel remaining on the site. A summary of PGE's compliance commitment or position is given for each Regulatory Guide. Commitment to a Regulatory Guide means that PGE is committed to complying with the requirements (shall) in the Regulatory Guide unless noted otherwise. Compliance with the recommendations (should) in these documents is not required and will be at the discretion of the Plant management. Any changes in commitments to the Regulatory Guides listed in Table 1-1 will be presented in updates to this TNP Decommissioning Plan.



* Figure is representative of plant areas as of May 2000.

Trojan Nuclear Plant

DECOMMISSIONING PLAN

Figure 2-1a
Site Plan
Revision 20

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3.3 RADIOACTIVE WASTE MANAGEMENT

With spent nuclear fuel no longer located on the TNP site, radioactive waste management activities during the remaining TNP decommissioning period include activities related to gaseous, liquid, and solid radioactive waste processing and disposal. The processing and disposal of gaseous, liquid, and solid radioactive waste will be managed in accordance with the Radiation Protection Program, Process Control Program, ODCM, Radioactive Effluent Controls Program, Radiological Environmental Monitoring Program, and Storage Tank Radioactivity Monitoring Program.

TNP policy for control of radioactive wastes is to minimize the amount of waste material generated, and to maintain the discharge of radioactive material below the design objectives provided in the ODCM. To ensure waste minimization goals are achieved during decommissioning, radiation workers will receive training in waste minimization procedures and practices. The TNP radioactive waste control program defines responsibilities and provides guidance for the minimization of radioactive wastes.

3.3.1 DELETED

3.3.2 RADIOACTIVE WASTE PROCESSING

3.3.2.1 Gaseous Radioactivity

Gaseous radioactivity is expected to be limited primarily to airborne radioactive particulates generated during decontamination and dismantlement activities. Airborne radioactive particulates are filtered through HEPA filters in the portions of building ventilation system(s) that are required to be maintained in operation to support decontamination and dismantlement activities in those buildings (see Sections 2.2.3.3, 2.3.2.12, 2.3.2.13, and 2.3.2.14). With decontamination and dismantlement activities still required in the Fuel, Auxiliary, and Condensate Demineralizer Buildings, the ventilation systems for these buildings are depicted in Figures 3-3, 3-4, and 3-5.

Local temporary ventilation systems with HEPA filtration, or other approved alternate systems, may be used in lieu of or to supplement building ventilation for activities expected to result in the generation of airborne radioactive particulates. Radioactive gaseous effluents will be monitored and release limits adhered to in accordance with the methodology and parameters in the ODCM.

3.3.2.2 Liquid Radioactive Waste

Liquid radioactive waste will be generated as a result of draining, decontamination, and cutting processes during plant decommissioning. Liquid radioactive waste treatment systems (plant effluent system, clean radioactive waste system, and dirty radioactive waste system) will be maintained as needed during decommissioning to process liquid radioactive wastes by filtering, demineralizing, and providing for holdup or decay of the radioactive wastes for the purpose of reducing the total radioactivity prior to release to the environment (see

demineralizing, and providing for holdup or decay of the radioactive wastes for the purpose of reducing the total radioactivity prior to release to the environment (see Sections 2.3.2.11, 2.3.2.17, and 2.3.2.18). Temporary liquid waste processing systems may also be used to process liquid radioactive waste. Radioactive liquid effluents will be processed in accordance with the ODCM.

3.3.2.3 Solid Radioactive Waste

Solid radioactive waste generated during decommissioning will include neutron-activated materials, contaminated materials, and radioactive wastes. Neutron-activated materials include the reactor pressure vessel, reactor vessel internals components, and the concrete biological shield. Contaminated material and radioactive wastes include pipe sections, valves, tanks, other plant equipment, concrete surfaces, contaminated air filters, wet solid wastes from the processing of contaminated water volumes (ion exchange resins, cartridge filters), and dry solid wastes (rags and wipes, plastic sheeting, contaminated tools, disposable protective clothing).

The solid radioactive waste system spent resin transfer system, filter handling vehicle, solid waste compactor, and spent resin compactor will be maintained in operation as necessary during decommissioning to process solid waste (see Section 2.3.2.17). Temporary solid waste processing systems may also be used.
Solid radioactive waste will be processed in accordance with the TNP Radiation Protection Program, Process Control Program, and plant procedures. The Process Control Program provides requirements for processing radioactive wastes requiring solidification, radioactive wastes requiring high-integrity containers, and low activity dewatered resins and other wet wastes to ensure that shipping and burial ground requirements are met with respect to solidification and dewatering. To the maximum extent practicable, solid radioactive waste will be decontaminated and compacted to reduce the volume to be packaged for shipment to an offsite disposal facility.

Waste container selection will be determined by the type, size, weight, classification, and activity level of the material to be packaged. Examples of containers used at TNP include drums, metal boxes, C-vans (container vans), and high-integrity containers. Other special containers may be used as required.

3.3.2.4 Mixed Wastes

Mixed wastes are wastes that contain both a hazardous waste component regulated under Subtitle C of the Resource Conservation and Recovery Act and a radioactive component consisting of source, special nuclear, or byproduct material regulated under the Atomic Energy Act. Plant procedures provide guidance for the minimization, control, and storage of mixed waste in accordance with the Environmental Protection Agency (EPA) and NRC regulations. The use of potentially hazardous materials in radiologically controlled areas will be reviewed to minimize the generation of mixed waste. TNP currently has no known mixed waste stored onsite. In the unlikely event that mixed waste is generated or discovered, it may be stored onsite until a permanent storage or disposal facility becomes available.

4. FINAL SURVEY PLAN

4.1 INTRODUCTION

4.1.1 PURPOSE

In accordance with 10 CFR 50.82(a)(9)(ii)(D) (Reference 4-1) and Regulatory Guide 1.179 (Reference 4-2), this TNP Final Survey Plan describes the final survey process that will be used to demonstrate that the TNP facility and site meet the radiological criteria for license termination. This plan incorporates the site release criteria of 10 CFR 20.1402 (Reference 4-3) for unrestricted use of the TNP site.

4.1.2 SCOPE

As detailed in Section 4.2.4, the final survey encompasses structures, land areas, and plant systems which, as a result of licensed activities, are identified as contaminated or potentially contaminated. The majority of these are located within the Trojan Industrial Area, which is illustrated in Section 2, Figure 2-1 has been and continues to be the TNP "Restricted Area" as defined in 10 CFR 20.1003. At the time of final survey, the structures will be largely intact. The majority of the contaminated systems and components will have been removed prior to the initiation of the survey data collection in those areas.

The final survey does not include the ISFSI. The ISFSI site has been previously surveyed and the results of that survey are documented in PGE-1074, "Trojan Final Survey Report for the ISFSI Site" (Reference 4-4). The final survey also does not include monitored gaseous and liquid plant effluent discharge pathways. As confirmed by characterization results summarized in Section 3.1, the Trojan Radiological Environmental and Effluent Monitoring Program (REMP) (Reference 4-5) documents compliance with the ALARA criterion of 10 CFR 50, Appendix I (Reference 4-6), associated with monitored releases.

4.1.3 SUMMARY

This final survey plan describes the final survey process, as well as the methodology used to develop guideline values against which residual radioactivity levels remaining at TNP at the time of final survey will be compared. The final survey process is described as a series of sequential steps—survey preparation, survey design, data collection, data assessment activities, and final survey report preparation. However, in practice, this process is iterative since the results from one step may prompt repeating one or more previous steps.

Survey preparation activities begin once dismantlement activities are complete in a given area. An ALARA evaluation is performed to determine, from a cost-benefit perspective, which remediation actions should be taken in addition to those already planned or completed. The area meets the site release ALARA criterion once any additional remediation actions are completed. The area is divided into survey units that are classified according to their potential for residual radioactivity. Survey data are collected from the survey unit according to data collection patterns and frequencies established for each classification. Where residual radioactivity is

measured above pre-set levels, an investigation is performed. Based on the results of the investigation, the survey unit may be remediated, reclassified, resurveyed, or determined to be acceptable with the elevated measurement(s).

Three principal types of survey data are collected. They are: 1) scan measurements, 2) static surface contamination measurements, and 3) laboratory analysis of soil and bulk material samples. Data are verified to be of adequate quantity and quality and to support underlying assumptions necessary for a statistical test to be applied. Where necessary, previous survey steps are re-evaluated and additional data are collected prior to statistical analysis. The survey unit meets the site release dose criterion once the survey data pass the statistical test. Where the data fail the statistical test, the survey unit does not meet the site release dose criterion. The data are analyzed and additional data are collected or the survey unit is remediated and resurveyed.

Upon completion of final survey activities, a final survey report will be prepared which summarizes the data and documents the conclusion that the TNP facility and site meet the 10 CFR 20.1402 release criteria and can be released for unrestricted use.

4.1.4 DATA QUALITY OBJECTIVES

Data quality objectives (DQOs), described in Section 2.3.1 of NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)" (Reference 4-11), are established as part of the survey design. The minimum information required from the DQO process to proceed with the methods described in MARSSIM is as follows:

1. Impacted areas are classified by contamination potential as Class 1, Class 2, or Class 3 areas, as described in Section 4.2.4. Survey unit boundaries are specified based on common history or other characteristics, as described in Section 4.4.1.1.

2. Statistical testing is based on the null hypothesis, which as defined in MARSSIM states that the residual radioactivity in the survey unit exceeds the site release dose criterion. This is described in Section 4.6.4.

3. The upper bound of the gray region is defined as the derived concentration guideline level (DCGL), and the lower bound of the gray region (LBGR) is 0.4 x DCGL. This is detailed in Appendix 4-2.

4. The Type I decision error is defined as the probability of passing a survey unit that should fail. The Type II decision error is defined as the probability of failing a survey that should pass. Probability limits of 0.05 are assigned for both decision errors, as described in Appendix 4-2.

5. The standard deviation is estimated at 0.2 x DCGL, as described in Appendix 4-2.

6. The relative shift is at least 1.5, and normally ranges between 1.5 and 3, as specified in Appendix 4-2.