



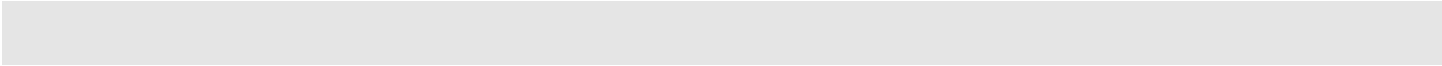
Nuclear Projects 1 & 4

SITE RESTORATION PLAN

June 1999

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SITE RESTORATION PLAN

Executive Summary

Energy Northwest submitted a site restoration plan for its terminated nuclear power plant projects in March 1995 to the Washington State Energy Facility Site Evaluation Council (EFSEC). EFSEC conditioned its approval of the plan on conducting more detailed reviews as additional information became available and Energy Northwest finalized its plans. Since 1995, information on the costs of various restoration options has been improved. More recently, there has also been interest in redevelopment of the Projects 1 and 4 site for the benefit of the local economy.

This revised Restoration Plan for the Projects 1 and 4 site provides a discussion of the economic factors regarding the costs and benefits of various restoration options versus the relative public risk. Nine levels of restoration ranging from the minimum – securing and protecting the site from public access, to complete restoration are given. To evaluate the restoration alternatives, this Plan assesses safety and health, environmental and regulatory factors in light of the estimated cost of each alternative. Other factors that affect the selection are also discussed.

This Plan provides a recommended long-term level of restoration contingent on the site not being used for economic redevelopment. Energy Northwest plans to follow a parallel path until a decision is made on the site's reuse. This decision is expected within the next 12 to 18 months. To avoid any further delay, pending the necessary approvals, Energy Northwest is preparing to begin restoration activities this year.

In the absence of redevelopment, this Plan recommends that the remaining major concrete structures be permanently sealed or removed. At Project 4 all remaining structures would be reduced to 25 feet above grade. At Project 1 the turbine generator building would be removed but the containment dome remains. Other Project 1 concrete structures would be permanently sealed. The turbine pedestals at both sites would remain.

Energy Northwest's approach is to commence with restoration activities at both sites that need to be addressed regardless of the redevelopment decision. The specific tasks planned for 18 months beginning in July 1999 are given in this Plan. Once the economic development potential is known remaining restoration activities will begin in earnest.

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Introduction

In May 1994, the Washington Public Power Supply System's (now Energy Northwest) Board of Directors adopted a resolution terminating Project 1 and requested the Project 3 Owner's Committee declare the termination of Project 3. The Project 3 Owner's Committee voted unanimously to stop Project 3 in June 1994. Since that time, Energy Northwest has been planning and executing the disposition of its Projects. Projects 4 and 5, the respective twin plants of Projects 1 and 3 were terminated in 1982. Energy Northwest has considered that Projects 4 and 5 would be consolidated into their net-billed twins for purposes of site restoration and disposal.

As result of its termination decisions, and in accordance with its Site Certification Agreements, Energy Northwest submitted its initial Site Restoration Plan to the Washington State Energy Facility Site Evaluation Council (EFSEC or Council) in March 1995 for approval. In this Site Restoration Plan (1995 Plan), Energy Northwest pursued complete restoration, but stated that if demolition to grade is much more difficult than expected, it would seek EFSEC approval of a lesser degree of restoration. The 1995 Plan goes on to indicate that efforts to restore Projects 1 and 4 would be deferred to benefit from the experience gained from first addressing Projects 3 and 5.

Since Project 3 was terminated in 1994, Energy Northwest has worked with representatives from the Grays Harbor County area to consider potential redevelopment and transfer of ownership of the Projects 3 and 5 (Satsop) site. In 1996, the Washington State Legislature passed amendments to the RCW's that allowed the successful transfer of ownership of the site for conversion to industrial, business or other uses. The agreement for the transfer of the Projects 3 and 5 site to the Satsop Redevelopment Project was approved in February 1999.

In 1998, as it became apparent that there would be a successful transfer of ownership of the Satsop site, Energy Northwest's and EFSEC's focus returned to the disposition of the Projects 1 and 4. In May 1998, EFSEC proposed that Energy Northwest amend its Site Certification Agreement to update its 1995 Plan and address the Projects 1 and 4 site. In the same timeframe, a local group expressed an interest in the potential redevelopment of the Projects 1 and 4 site.

This revision to the 1995 Plan provides a discussion of the factors regarding the costs and benefits of various restoration options. It establishes a preferred restoration level subject to possible reuse of the site for local economic development. It is Energy Northwest's objective to assure that the public health and safety is protected in advance of determining the best and highest possible future use of the site.

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Background

In August 1975, Energy Northwest entered into a Site Certification Agreement with the State of Washington for its Projects Nos. 1 and 4 (WNP-1 and WNP-4). Following the termination of WNP-1 in 1994, in accord with WAC 463-42-665, Energy Northwest submitted a detailed Site Restoration Plan to EFSEC in March 1995.

In its 1995 Plan, Energy Northwest indicated that although the Project sites had a high potential for economic development, there were few proposals to reuse the WNP-1 and 4 site. However, as a result of the transfer of the Satsop Projects, a group including Benton County, the City of Richland, the Port of Benton and Benton County PUD together with Energy Northwest are now considering the potential redevelopment of the WNP-1 and 4 property. This group also believes the site may have a high potential for reuse and may afford the local region similar benefits on the transfer of the Satsop site. Discussions on the feasibility of redevelopment are at the early stages.

Concurrent with these discussions, Energy Northwest has addressed its need of the site in supporting its long-term objectives. We have concluded that one of our principal interests in the site may be to retain our rights and options to pursue our business development initiatives. Another is to continue to use some of the facilities to support Washington Nuclear Project No. 2 (WNP-2) operations. Since submitting the 1995 Plan, Energy Northwest has been considering the tradeoffs of different site ownership alternatives including transfer of the site. Energy Northwest's preliminary determination indicated that there is not an immediate economic basis to retain the entire WNP-1 and WNP-4 site for the development of new electrical energy generation projects. Should Energy Northwest foresee the potential future need for additional power plant construction, it will retain an interest as a participant in the reuse of the site.

The 1995 Plan was approved by the Council in EFSEC Resolution No. 280. In its approval, the Council noted that the Plan contained a number of uncertainties that would need to be addressed when Energy Northwest finalized its plans. Accordingly, Resolution No. 280 states:

"...The Supply System shall submit specific details of the restoration, consistent with the conceptional plan, as soon as those details are determined, for Council review, and that changes in scope, timing and/or level of restoration effort shall be treated as an amendment to the restoration plan and be subject to full review and approval by the Council"

The partially completed WNP-1 and WNP-4 nuclear plants are liabilities to Energy Northwest. It has been determined that the full restoration costs for these plants could be as high as one hundred million dollars. As indicated in the 1995 Plan, due to the limited industry experience in demolishing such structures, Energy Northwest was uncertain whether these structures could reasonably and economically be removed. Since that time, there have been no similar demolition projects to reduce that uncertainty.

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Although the 1995 Plan proposes a complete restoration, it states that if demolition to grade is much more difficult than expected, Energy Northwest would seek EFSEC approval of a lesser degree of restoration. To obtain such an amendment, Energy Northwest must address the elements identified in WAC 463-42-655 which include a discussion of the economic factors regarding the costs and benefits of various restoration options versus the relative public risk.

A secondary purpose of this Plan is to address the terms of Energy Northwest's lease agreement with the U.S. Department of Energy (DOE). The partially complete nuclear power plants are located on land leased by Energy Northwest from the U.S. Department of Energy (DOE). In 1975 the Energy Research and Development Administration, the predecessor to DOE, signed a lease agreement with Energy Northwest for land at the Hanford Site to be used for construction of WNP-1 and WNP-4. The lease provides that following expiration or termination and if requested by the Administration, the leased premises are to be returned in a condition as nearly as possible to original condition. Energy Northwest is conducting ongoing discussions to address DOE expectations regarding the restoration of the site.

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Approach

Underlying all considerations for site restoration is the need to ensure that future public health and safety can be managed appropriately. However, given the significant potential cost of a full restoration, the technical risk, and the limited availability of funding to meet these costs, Energy Northwest has elected to perform a simple cost-benefit analysis to evaluate the various restoration alternatives compared to the relative public risk. The results of this analysis are used to recommend a long-term condition for the site that provides for the public's health and safety.

As indicated in the Background discussion, a local group is addressing the potential of the site to be used in support of the local area's economic development. For the near term, we will identify restoration tasks that are consistent with both the long term recommended alternative yet will not delimit or reduce the site's reuse potential in advance of such decision.

Cost – Benefit

A formal selection process is required by WAC 463-42-655 to select a preferred level of restoration. Cost-benefit analysis is one framework that has been developed for evaluating alternative courses of action. It provides a consistent means to make comparisons. In its most rigorous application all attribute performances are translated into dollar quantities. The difficulties of using cost-benefit analysis for public decisions are well known, particularly to make decisions which affect human health and safety or the environment. Energy Northwest has well-developed cost estimates for alternative levels of restoration of the WNP-1 and 4 site. Our selection process does not make any attempt to derive monetary value for the factors that affect the decision beyond the restoration costs.

Here, we use a simple structured process to consider alternative levels of restoration. The key elements of the approach of this analysis are: (1) Establishing and defining the objective, (2) Defining the alternatives to be considered for meeting the objective, (3) Identifying the important decision factors or criteria relevant to making the decision, (4) Assessing each alternative's performance and (5) Comparing costs and benefits (and associated risks) of alternatives and ranking the alternatives.

Objective

From a regulatory perspective, the restoration option that is selected must be evaluated in terms of economic and public risk factors. WAC 463-42-655 references three areas of concern to be addressed in the restoration plan – public health and safety, major environmental issues and economic factors (in terms of cost-benefit). Our objective is to select a recommended course of action that accounts for all of the factors affecting the decision with public health, safety, and the environment as paramount.

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Restoration Alternatives

Nine levels of restoration are defined as alternatives for consideration. The activities associated with each level are summarized in Table 1 and given in more detail in Attachment A. The alternatives are given as four general levels ranging from Securing the Site (Level 1), Blocking Access (Level 2), Entombment (Level 3) or to Demolish to Grade (Level 4). Several sub levels of Entombment (Levels 3B-3E) are considered to provide a broad range of alternatives and an Economic Development alternative (Level 2B) is also provided.

Table 1. Restoration Alternatives

Levels of Restoration	Brief Description
Level 1 – Secure Site	This is the most limited restoration alternative. Involves providing security to the site and removing certain environmental and safety hazards.
Level 2 – Block Building Access	Secures and seals certain buildings and provides more extensive removal of environmental and safety hazards than Level 1. Increases security features such as fences.
Level 2B – Economic Development	Same as Level 2, except it leaves certain buildings that could potentially be reused. Leaves railroad and infrastructure intact.
Level 3 – Entombment	Provides more extensive entombment of containment and general services buildings.
Level 3B – Remove Buildings	Removes several buildings including turbine generator building and air intake and chemical waste treatment buildings. Backfills pump sump and spray pond.
Level 3C – Remove Turbine Foundation	Same as 3B, except includes removal of turbine generator pedestal.
Level 3D – Demolish and Seal	Same as 3C, except demolishes WNP-4 containment building and general services building to 25 ft. above grade & WNP-1 general services building to 47 ft. above grade.
Level 3E – Mound and Backfill	Similar to 3C, except fills voids within remaining structures, backfills to cover structures.
Level 4 – Demolish to Grade	Demolishes all buildings and structures to grade. Removes infrastructure of the site.

Decision Factors

Energy Northwest has sought to address all relevant factors in establishing a recommended restoration approach. To validate to this effort, the support of several consultants was drawn upon. The specific list of the firms and the area of expertise they provided are listed in Attachment B. Based on their input, the following factors were determined to be relevant to the site restoration selection process:

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Cost

Energy Northwest and its consultants have developed a number of cost estimates for alternative levels of restoration of the Projects 1 and 4 site. These estimates were recently updated in 1999 for this Plan.

Public Health and Safety

The public health and safety criterion captures potential health risks to the workers and the public during the site restoration process and indefinite period following completion of site restoration activities. This criterion also includes the secondary considerations of security risks and exposure for consequences resulting from losses that may occur.

Environmental

Environmental impacts associated with site restoration are addressed in the Site Certification Agreement (SCA) and in Section 4.2 and Appendix A of the 1995 Plan. Commitments made by Energy Northwest that relate to the environmental impacts will be met by each alternative considered. Other considerations are aesthetics and indirect socio-economic impacts.

Stakeholder and Tribal Perspectives

The Indian treaty rights relating to the Hanford Site and the expressed views of the public related to land use at Hanford are important factors. The Tribal Government perspective is a key aspect of the DOE's consideration regarding the disposition of its site. Local communities and regional residents are interested in Energy Northwest meeting its responsibilities and in the area's economic development.

Compatibility with Legal Agreements and Land Use Plans

The principal agreements, requirements and plans are the (1) Site Certification Agreement and EFSEC regulations (2) lease with DOE (3) Hanford Remedial Action Environmental Impact Statement and Comprehensive Land-Use Plan (4) Hanford Reach Act and Wild and Scenic Rivers Act and (5) Local comprehensive and economic development plans that would affect economic reutilization.

Other factors including assumptions that were made to support the assessment are included in the discussion of the results.

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Performance Assessment

To evaluate the restoration alternatives, this Plan assesses safety and health, environmental, and regulatory factors in light of the estimated costs of carrying out particular levels of restoration. The socioeconomic, stakeholder and tribal perspectives are also discussed. The assessment results are given as Chapter 4 of this Plan.

Results and Recommendations

Following the evaluation in Chapter 4, the relative performance of each alternative is compared. The performance comparisons and recommendations are given in Chapter 5.

Plans

The approach of this Plan is to follow a parallel path until a decision is made on the site's reuse. The feasibility of the reuse of the site is now being assessed. Those considerations are not specifically addressed in this plan. It is not expected that this determination will be finalized before mid-year 2000. To avoid any further delay, Energy Northwest is preparing to begin restoration activities this year.

The restoration alternatives as defined are mainly serial, that is, each level includes the remedial steps and tasks of lower levels. As such, it is possible to proceed with some of the site's restoration in advance of the decision whether or not to reuse the site.

In Table 1, the alternative to reuse the site's infrastructure and buildings is shown as Level 2B-Economic Development. This means that many of the Level 1 and Level 2 restoration tasks can be conducted without jeopardizing the site's reutilization.

This Plan also recommends initial restoration activities to be conducted over the next 18 months. These are given in Chapter 6.

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Assessment

The following criteria are relevant to the site restoration selection process: 1) cost, 2) public health and safety, 3) environmental impact, 4) stakeholders' and tribal perspectives, and 5) compatibility with legal agreements and land use plans.

Cost

Energy Northwest and its consultants have estimated costs to meet the various levels of site restoration. Costs have been separately estimated for WNP-1 and WNP-4. The costs are summarized in Table 2.

Table 2. Estimated Site Restoration Costs (in millions of dollars)*

Restoration Options	WNP-1	WNP-4
Level 1 – Secure Site	\$5.5	\$5.6
Level 2 – Block Building Access	\$6.7	\$6.7
Level 3 – Entombment	\$9.5	\$9.9
Level 3B – Remove Buildings	\$16.5	\$12.5
Level 3C – Remove Turbine Foundation	\$20.0	\$16.0
Level 3D – Demolish and Seal	\$24.9	\$23.4
Level 3E – Mound and Backfill	\$53.2	\$31.7
Level 4 – Demolish to Grade	\$59.8	\$38.9

*Includes only initial costs (does not include annual costs, e.g. to guard or maintain site)

The costs are based on labor, construction, and maintenance expenses required at each level of restoration. Cost estimates were made for each of the general tasks of activities associated with each restoration level as described in Attachment A. To analyze the costs of restoring the site, it is helpful to observe how costs change from one restoration level to another. Both of the lowest levels of restoration (Levels 1 & 2) are the least expensive initially; however, both of these levels would require ongoing maintenance and labor expenses including, for example, security guards and maintenance of operable sump pumps. Including these ongoing expenses significantly changes the incremental costs of moving from one level to another.

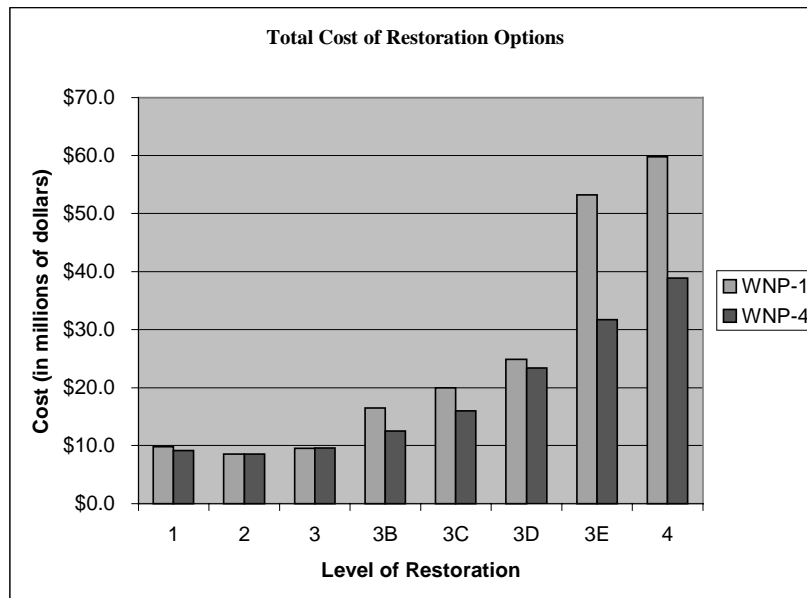
To appropriately evaluate the future stream of costs, the ongoing expensesⁱ are assumed for thirty yearsⁱⁱ and are discountedⁱⁱⁱ at a rate of 5.6% to the present. The total costs of moving to higher levels of restoration, including ongoing expense for Levels 1 and 2, are found in Table 3 and illustrated graphically in Figure 1.

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Table 3. Costs of Restoring Sites, Including On-going Costs

Level of Restoration	WNP-1	WNP-4
	Total Cost	Total Cost
Level 1 – Secure Site	\$9.8	\$9.2
Level 2 – Block Building Access	8.5	8.5
Level 3 – Entombment	9.5	9.6
Level 3B – Remove Buildings	16.5	12.5
Level 3C – Remove Turbine Foundation	20.0	16.0
Level 3D – Demolish and Seal	24.9	23.4
Level 3E – Mound and Backfill	53.2	31.7
Level 4 – Demolish to Grade	59.8	38.9

Figure 1. Total Cost of Restoration Options for WNP-1 and WNP-4



Including both initial and ongoing costs reveals that the present value of total restoration costs decreases when moving from the Level 1 to the Level 2 because the security is reduced from 24-hour guards to random guards, thus reducing the future stream of expenses. Figure 1 shows that total costs increase substantially for WNP-1 restoration when moving from Level 3 (entombment) to Level 3B (removal of buildings) and again from 3D to 3E. Figure 2 shows that the total costs for WNP-4 restoration options increase significantly between 3C to 3D. The costs of restoring the plant sites vary between WNP-1 and WNP-4 due to the degree of completion of the structures and buildings. To demolish completed buildings to grade, for example, will cost more than the demolition of partially completed buildings.

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These costs do not reflect any potential cost savings associated with reuse possibilities. Reuse options may play a role in selecting restoration alternatives for WNP-1, which has several completed structures that may potentially be made productive by other industrial or business uses. This could impact costs, for example, for a Level 2 restoration effort by eliminating or reducing ongoing security and maintenance expenses.

Public Health and Safety

The public health and safety criterion captures potential health risk to workers and the public during the site restoration process and the indefinite period following completion of site restoration activities. During the site restoration process, the principal human health risks will be risks to workers. The magnitude and likelihood of health incidents will increase as the level of restoration increases. For example, there will be greater health risks to workers under the Level 4 restoration alternative (demolish to grade) than under Level 1 (securing the site). Conversely, long-term health risks to the public after site restoration will be greater under Level 1 than under Level 4. These risks result from individuals being attracted to the structures left in place for various reasons including adventure, shelter, and a place to search for recreation.

In Section 5.1 of the 1995 Plan, Energy Northwest stated that a worker safety program would be required of restoration contractors. Energy Northwest also committed in Appendix A of the 1995 Plan to maintain;

- a safe and healthy work environment during site restoration activities,
- an appropriate level of security to protect members of the public from potential hazards of the site,
- an appropriate level of vector control.

Contractors performing site restoration activities will be required to meet the worker safety requirements established under the Washington Industrial Safety and Health Act (WISHA). The Division of WISHA Services of the Washington State Department of Labor and Industries administers WISHA. General safety and health standards and general occupational health standards are codified at Chapters 296-24, 296-62, and 296-155 of the Washington Administrative Code.

Each level of restoration presents unique combinations of risks and benefits based on the potential for events related to the activities, hazards, and the short and long-term outcomes associated with each restoration level.

The assessment to follow characterizes the relative severity of each hazard and the extent to which each restoration alternative addresses each hazard. The hazard severity is evaluated as "high", "moderate", or "low" for each alternative, and the extent to which each hazard is addressed is evaluated as "Severe Risk", "Protected" (implies potential long-term risk), or "Eliminated". The matrix for each site is presented in Tables 4 and 5.

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Table 4 WNP 1 - Public Health and Safety Hazards

Restoration Level No. Restoration Level	Public Health & Safety Hazards														Marginal Increased Risk to Workers
	Fall hazards		Falling debris/ structures		Hazardous materials						Promotion of animal pests		Minor industrial hazards (e.g. trip)		
	Severity	Extent Addressed	Severity	Extent Addressed	asbestos		"trash"		other		Severity	Extent Addressed	Severity	Extent Addressed	
					Severity	Extent Addressed	Severity	Extent Addressed	Severity	Extent Addressed	Severity	Extent Addressed	Severity	Extent Addressed	
1 Fence & Patrol	low	Prot	low	Prot	high	Risk	low	Prot	low	Prot	low	Prot	low	Prot	low
2 Block Public Access	low	Prot	low	Prot	low	Elim	low	Prot	low	Prot	low	Prot	low	Prot	low
2B Econ. Dev.	low	Prot	low	Prot	low	Elim	low	Prot	low	Prot	low	Prot	low	Prot	low
3 Entombment	mod	Prot	mod	Prot	low	Elim	low	Prot	mod	Prot	mod	Prot	mod	Prot	mod
3B plus rmv Cooling Twr.	mod	Prot	mod	Prot	low	Elim	low	Elim	low	Elim	mod	Prot	mod	Prot	high
3C plus rmv TGF	mod	Prot	mod	Prot	low	Elim	low	Elim	low	Elim	mod	Prot	mod	Prot	high
3D plus rmv walls	low	Elim	low	Prot	low	Elim	low	Elim	low	Elim	low	Prot	low	Prot	high
3E Mound	low	Elim	low	Prot	low	Elim	low	Elim	low	Elim	low	Elim	low	Elim	high
4 Down	low	Elim	low	Elim	low	Elim	low	Elim	low	Elim	low	Elim	low	Elim	high

Legend

Hazard Severity	
low	
mod	
high	
Extent Addressed	
Risk	Severe Risk
Prot	Protected (short term)
Elim	Eliminated

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Table 5. WNP- 4 – Public Health and Safety Hazards

Restoration Level No. Restoration Level	Public Health & Safety Hazards														Marginal Increased Risk to Workers
	Fall hazards		Falling debris/ structures		Hazardous materials						Promotion of animal pests		Minor industrial hazards (e.g. trip)		
					asbestos		"trash"		other						
	Severity	Extent Addressed	Severity	Extent Addressed	Severity	Extent Addressed	Severity	Extent Addressed	Severity	Extent Addressed	Severity	Extent Addressed	Severity	Extent Addressed	
1 Fence & Patrol	high	Risk	high	Risk	high	Risk	high	Risk	low	Prot	high	Risk	high	Risk	low
2 Block Public Access	high	Risk	high	Risk	low	Elim	high	Risk	low	Prot	high	Risk	high	Risk	low
2B Econ. Dev.	high	Risk	high	Risk	low	Elim	high	Risk	low	Prot	high	Risk	high	Risk	low
3 Entombment	mod	Prot	mod	Prot	low	Elim	low	Prot	low	Prot	mod	Prot	mod	Prot	high
3B plus rmv Cooling Twr.	mod	Prot	mod	Prot	low	Elim	low	Elim	low	Elim	mod	Prot	mod	Prot	high
3C plus rmv TGF	mod	Prot	mod	Prot	low	Elim	low	Elim	low	Elim	mod	Prot	mod	Prot	high
3D plus rmv walls	low	Elim	low	Prot	low	Elim	low	Elim	low	Elim	low	Prot	low	Prot	high
3E Mound	low	Elim	low	Prot	low	Elim	low	Elim	low	Elim	low	Elim	low	Elim	high
4 Down	low	Elim	low	Elim	low	Elim	low	Elim	low	Elim	low	Elim	low	Elim	high

Hazard Severity	
low	
mod	
high	
Extent Addressed	
Risk	Severe Risk
Prot	Protected (short term)
Elim	Eliminated

Legend

To facilitate a comparison, numbers were assigned to each category of severity and the extent to which restoration alternative addresses the hazards. Those numbers are a 1 to 3 scale with 1 being the least desired ("high" severity or "Risk" as the extent addressed), and 3 being the most safe ("low" severity or "Eliminated" as the extent addressed). Weighting factors are also assigned to each hazard as indicated below:

- 6 - Fall Hazards
- 5 - Falling debris/structures
- 4 – Asbestos
- 3 - Demolition worker safety and health
- 2 - Promotion of animal pests
- 1 - "Trash" and other hazards, and minor industrial hazards

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The rating numbers and weighting factors were used in an algorithm as follows:

$$\text{Safety Quality Rating} = \text{Sum}_{\text{for all hazards}} (\text{Severity} \times \text{Extent Addressed} \times \text{Weighting Factor})$$

This algorithm provides a "safety quality rating" for each restoration level. Lower numbers are the least safe (or most hazardous) in terms of public health and safety making the options associated with these scores a higher priority to complete in the short-term. The ratings were then sorted and used to guide the following recommendations:

Table 6. Prioritized Restoration Level /Rating

WNP-4 – Level 1 Fence & Patrol	46
WNP-4 – Level 2, Block Public Access	66
WNP-4—Level 3, Entombment	107
WNP-1—Level 3, Entombment	108*
WNP-1—Level 3B, plus remove cooling tower	113*
WNP-4—Level 3B, plus remove cooling tower	113
WNP-1—Level 3C, plus remove TGF	113*
WNP-4—Level 3C, plus remove TGF	113
WNP-1—Level 1, Fence & Patrol	117
WNP-1—Level 2, Block Public Access	141
WNP-1—Level 2B, Economic Development	141
WNP-1—Level 3D, plus remove walls	159
WNP-4—Level 3D, plus remove walls	159
WNP-1—Level 3E, Mound	168
WNP-4—Level 3E, Mound	168
WNP-1—Level 4, Down	183
WNP-4—Level 4, Down	183

*rating may depend on other factors such as potential reuse options

Based on the ratings shown in Table 6, some general observations can be made in terms of safety and health:

On the safety quality rating alone, executing restoration at Level 1 or 2 for WNP-4 does not gain a level of safety equivalent with the same actions at WNP-1. Entombment (Level 3 or above) of WNP-4 would be required at WNP-4 to achieve the same general performance as fencing and patrol (Level 2) at WNP-1.

The higher levels of safety quality rating performance provide more permanent protection to the public health and safety. There are little significant differences in the public health and safety between restoration taken to a 3E or 4 level of restoration –“Mound” or “Down”.

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Environmental Impact

Physical Environment

The mitigation of environmental impacts associated with site restoration is addressed by the Site Certification Agreement (SCA) conditions for construction. In Attachment F, the applicable SCA conditions and other requirements have been compiled into a single performance standard to guide the restoration activities at WNP-1 and WNP-4. The performance standard is applicable to all restoration activities and is independent of the restoration level selected.

Aesthetic Environment

After completion of restoration activities, the principal environmental impact associated with the various levels of restoration will be aesthetic impact. Aesthetic impacts are important to Native American tribes and to the general public. The buildings and structures at the WNP-1 and WNP-4 construction sites are visible from Route 4 South on the Hanford Site; they are not visible from the Columbia River. The water intake structure on the Columbia River is visible from the river, but is not visible from Route 4 South. The extent of aesthetic impact will vary with the extent to which existing buildings/structures on the WNP-1 and WNP-4 construction sites are removed. Site restoration alternative levels 1, 2, and 3 will have the greatest aesthetic impact because existing buildings and structures at the construction sites as well as the water intake structure will be left in place. Levels 3B through level 4 will reduce aesthetic impact with increasing removal of buildings and structures.

Socioeconomic Environment

Three major sectors have been the principal driving forces of the economy in the Tri-Cities since the early 1970s: 1) the DOE and its contractors who operate the Hanford Site; 2) Energy Northwest in its construction and operation of nuclear power plants; 3) an export-oriented agricultural community, including a substantial food-processing component. Any major changes in activity at Energy Northwest would most likely affect the Tri-Cities and other areas of Benton and Franklin counties. In addition to the direct employment and payrolls, these major sectors also support a sizable number of jobs in the local economy through their procurement of equipment, supplies, and business services.

Final termination of activity at WNP-1 and WNP-4 will reduce the number of employees necessary to maintain these facilities. Any of the levels of planned restoration activity, however, would potentially have a positive short-term impact on the economy of the community by bringing in additional jobs for restoration planning and construction. All levels of restoration will involve the procurement of construction subcontractors and additional equipment. The type of restoration alternative Energy Northwest selects may also impact the economy of the community through its potential for reuse. If a business is able to make

SITE RESTORATION PLAN

productive use the existing structures and infrastructure at the site, the community could potentially reap long-term economic benefits.

Stakeholder and Tribal Perspectives

Benton County, the Port of Benton, Benton County Public Utility District, the City of Richland with Energy Northwest have joined together to consider the possible redevelopment of the WNP-1 and WNP-4 sites. There is believed to be a general community and regional support of initiatives that will diversify and improve the area's economy. These agencies together with Energy Northwest believe that the reuse of the site may provide potential net benefits to the area's economy. This group is currently studying the feasibility of such an initiative. Attachment D provides some further background on the potential for the site's economic redevelopment.

Native American treaty rights relating to the Hanford Site are summarized as Attachment C. The expressed views related to land use at Hanford of the three Tribal Governments affected by Hanford operations are summarized below:

Nez Perce Tribe

The Nez Perce Tribe appears to accept industrial development at the WNP-1 and WNP-4 sites and thus may not object to the aesthetic impact of the building and structures located there, even if the buildings and structures are left in place for an extended period. The Tribe wrote alternative two in the recently issued *Revised Draft Hanford Remedial Action Environmental Impact Statement and Comprehensive Land-Use Plan*^{iv} (HRA-DEIS). The area occupied by WNP-1 and WNP-4 was designated as industrial use by the Tribe under alternative two. The term "industrial" is defined at p. 3-5 of the HRA-DEIS as allowing the opportunity for expanded economic growth including leases for industrial facilities on the land leased by Energy Northwest from DOE.

The land adjacent to the Columbia River is designated for "preservation" by the Tribe. This preservation area includes the land occupied by the water intake structure and pump house for WNP-1 and WNP-4. The term "preservation" is defined at p. 3-6 of the HRA-DEIS as protecting the natural resources to include active management practices. The definition does not state that existing structures would need to be removed.

Confederated Tribes of the Umatilla Indian Reservation

The Confederated Tribes of the Umatilla Indian Reservation also appear to accept industrial development at the WNP-1 and WNP-4 sites and thus may not object to the aesthetic impact of the building and structures located there, even if the buildings and structures are left in place for an extended period. The Tribes wrote alternative four in the HRA-DEIS. The area occupied by WNP-1 and WNP-4 is designated by the Tribes as industrial use under alternative four.^v The land adjacent to the Columbia River is designated for preservation by the Tribes.

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Confederated Tribes and Bands of the Yakama Indian Nation

The Confederated Tribes and Bands of the Yakama Indian Nation did not prepare an alternative for the HRA-DEIS. However, the Nation recently submitted language to DOE-RL for inclusion in the draft environmental impact statement currently being prepared by DOE-RL on the Hanford solid waste program. The language submitted by the Yakama Nation included the following statement:

"...The entire viewshed that is visible from the top of Gable Mountain is considered a cultural resource by tribal members. Because this Hanford viewshed plays a large role in the tribal religious context, this type of landscape has also been called a sacred geography. It also has an educational context because tribal elders teach younger generations about their history and heritage, using the unique place names of their native language."

This language suggests that the Yakama Indian Nation would prefer that the buildings and structures at WNP-1 and WNP-4 be removed from the Gable Mountain viewshed.

Compatibility with Legal Agreements and Land Use Plans

This section discusses compatibility of restoration options with various legal agreements and land use plans. The agreements and plans that are discussed are 1) the Site Certification Agreement and the EFSEC regulations, 2) the lease with DOE, 3) the HRA-DEIS, and 4) the Hanford Reach Act and the Wild and Scenic Rivers Act.

Site Certification Agreement and the EFSEC Regulations

The WNP-1 and WNP-4 SCA discusses certain environmental issues applicable to construction in that would be relevant to site restoration, but does not specifically address the restoration of the site.

EFSEC requirements for site restoration were first adopted in 1987 and are included in the regulations addressing applications for site certificates (WAC 463-42-655, WAC 463-42-675 and WAC 463-42-680). Compliance with an approved plan is addressed in WAC 463-54-080.

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DOE-Energy Northwest Lease

The Energy Research and Development Administration signed a lease agreement with Energy Northwest (Washington Public Power Supply System) in 1975 for land on the Hanford Site to be used for construction of WNP-1 and WNP-4. Section 11(a)(1) of the lease allows DOE to terminate the lease if Energy Northwest discontinues its use of the lease premises for the purposes stated in the lease. The purposes of the lease are stated in Section 2 of the lease to be the construction, operation, maintenance, and use of two nuclear generating plants. Section 12(b) of the lease provides that following expiration or termination of the lease, the leased premises are to be returned in a condition as nearly as possible to original condition if requested by the Administration (DOE).

Draft Hanford Remedial Action Environmental Impact Statement and Comprehensive Land-Use Plan

DOE's preferred alternative in the HRA-DEIS shows the land occupied by WNP-1 and WNP-4 as industrial and the land adjacent to the Columbia River as preservation.^{vi} Under these designations, the continued existence of buildings and structures at the WNP-1 and WNP-4 sites may not be objectionable. The compatibility of the water intake structure and the pump house with the preservation designation is less certain.

Hanford Reach Act and the Wild and Scenic Rivers Act

The Hanford Reach Act (PL 100-605), as amended by section 404 of the Omnibus Parks and Public Lands Management Act of 1996 (PL 104-333), required the Secretary of the Interior, in consultation with the Secretary of Energy, to conduct a study of the Hanford Reach of the Columbia River that included identification and evaluation of geologic, scenic, historic, cultural, recreational, fish, wildlife, and natural features of the Hanford Reach. The Secretary of the Interior was also directed by Congress to examine alternatives for the preservation of these features. In addition, the amended Act establishes protections for the Reach by requiring parties planning new projects within one-quarter mile of the river to consult and coordinate with the Secretary of the Interior to minimize and provide mitigation for any direct and adverse effects on the values for which the river is under study. In addition, all existing projects that affect the study area are to be operated and maintained to minimize any direct and adverse effects on the values for which the river is under study, taking into account any existing and relevant license, permit, or agreement affecting the project.

A final study report was published in June 1994: *Hanford Reach of the Columbia River, Comprehensive River Conservation Study and Environmental Impact Statement*.^{vii} The Record of Decision for this EIS, signed on July 16, 1996 by the Secretary of the Interior, recommended that Congress designate the Hanford Reach of the Columbia River and public land within ¼ mile of the river and all land in the Saddle Mountain National Wildlife Refuge and Wahluke State Wildlife Recreation Area as a new National Wildlife Refuge and National Wild and Scenic River.

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The proposed action in the EIS states that new structures within ¼ mile of the river would be prohibited if deemed by the U.S. Fish and Wildlife Service to be incompatible with the purpose of the Wild and Scenic River designation. The study report specifically states, however, that DOE would be allowed to construct new water intake and outfall structures and the access and utilities necessary to use and service them.^{viii}

The Hanford Reach Act, as amended, does not appear to preclude the operation or require the dismantling of the WNP-1 and WNP-4 water intake structure and pump house. Any such operation, however, would need to minimize any direct and adverse effects on the values for which the river is under study.

An act of Congress would be required for the Hanford Reach to become part of the Wild and Scenic River System.

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CONCLUSIONS AND RECOMMENDATION

Summary Results

Table 7 below provides a summary of the assessments for each of the alternative restoration levels for each of the categories. For comparison, the Economic Development alternative (Level 2B) is shown for WNP-1. For this alternative, no annual costs are included as part of the restoration estimate which are equivalent to the Level 2 costs shown in Table 2 for WNP-1. An Economic Development alternative is not shown for WNP-4 since no potential reuse of the facility has been identified. The results for the aesthetics, regulatory, socioeconomic factors are subjectively based from the assessment. The final determination of the acceptability of a specific recommended level of restoration, for example, by the DOE also remains to be established.

Table 7. Summary of Findings

Alternative Number	Description	Environment, Safety, and Health Score	Cost(\$ millions)	Meets Visual Aesthetic Goals	Meets Regulatory Goals	Potential Socioeconomic Benefits (reuse)
	WNP 1					
WNP1-1	Fence and Patrol	117	\$9.8	No	Yes*	Yes
WNP1-2	Block Public Access	141	\$8.5	No	Yes*	Yes
WNP1-2B	Economic Development	141	≈\$6.7	No	Yes*	Yes
WNP1-3	Entombment	108	\$9.5	Partial	Yes	No
WNP1-3B	Plus rmv Cooling Twr.	113	\$16.5	Partial	Yes	No
WNP1-3C	Plus rmv TGF	113	\$20.0	Partial	Yes	No
WNP1-3D	Plus rmv Walls	159	\$24.9	Partial	Yes	No
WNP1-3E	Mound	168	\$53.2	Yes	Yes	No
WNP1-4	Down	183	\$59.8	Yes	Yes	No
	WNP-4					
WNP 4-1	Fence and Patrol	42	\$9.2	No	Yes*	No
WNP4-2	Block Public Access	66	\$8.5	No	Yes*	No
WNP4-3	Entombment	107	\$9.6	Partial	Yes	No
WNP4-3B	Plus rmv Cooling Twr.	113	\$12.5	Partial	Yes	No
WNP4-3C	Plus rmv TGF	113	\$16.0	Partial	Yes	No
WNP4-3D	Plus rmv Walls	159	\$23.4	Partial	Yes	No
WNP4-3E	Mound	168	\$31.7	Yes	Yes	No
WNP4-4	Down	183	\$38.9	Yes	Yes	No

*may not meet specifications of lease with DOE

The relative results for WNP-1 and WNP-4 are discussed next.

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WNP-1

From a regulatory perspective, it does not appear that any of the levels of restoration proposed for WNP-1 would be in conflict with either the draft Comprehensive Land Use Plan for the Hanford Site or the Hanford Reach Act and the Wild and Scenic River Act.

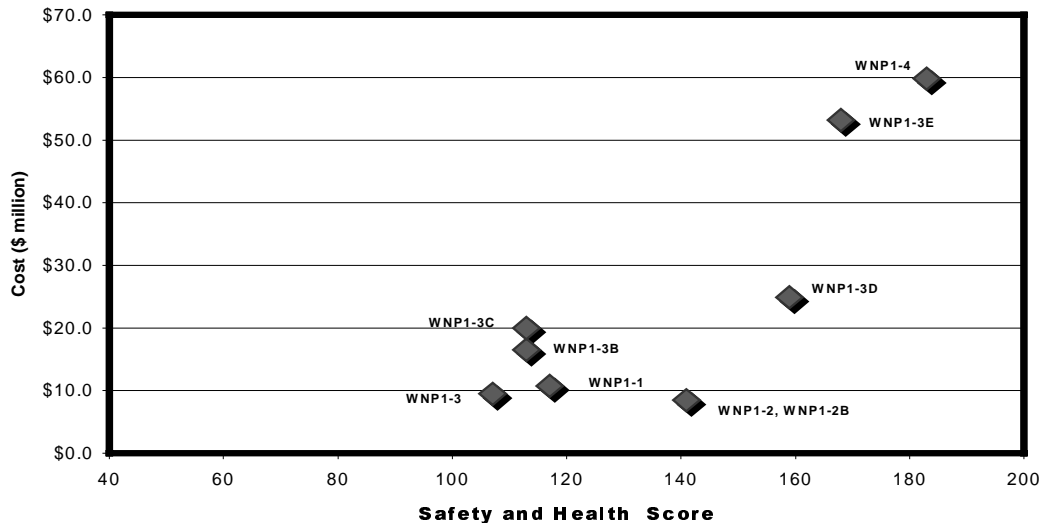
From an environmental perspective, all levels of restoration could potentially improve the environment in terms of reducing disruption to wildlife habitat and disposal of hazardous substances. From the Yakama Indian Nation perspective, however, Levels 3 and 4 (removal of buildings), would be preferable to lower levels of restoration. Lower levels of restoration for WNP-1 could be favored from the socioeconomic perspective if they were to lead to redevelopment of the site providing additional long-term employment opportunities and thus economic gains for the community.

From the safety and health perspective, the “safety quality ratings” indicate that in the near term WNP-1 should be taken, to at least a 2B level of restoration which would reduce or eliminate certain safety hazards while keeping the option of reuse open. This assumes that the structures can remain adequately protected by Energy Northwest to prevent hazardous access. For the long term, the greatest public health and safety is afforded by mounding and filling (Level 3E) or demolition to grade (Level 4). Level 3D, Demolish and Seal to 25 ft. above grade; provides a similar level of protection except that the building void spaces are not filled.

From an economic perspective, it is logical to move from Level 1 to at least the Level 2 alternative restoration because, in terms of the present value of total costs, this option is less costly than Level 1. A visual representation of the costs of each level of restoration compared with each marginal safety and health score is found in Figure 2. As seen in Figure 2, the marginal cost of moving to higher levels of restoration is generally increasing with a relatively dramatic jump in costs of over \$28 million at the 3E Level. The WNP-1 3E Level of restoration involves the costly demolition of completed buildings (containment and general services) which are generally plumbed and set up with equipment with reutilization potential.

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Figure 2 - WNP-1 Safety and Health vs. Cost



Note that while total costs significantly increase as restoration efforts move to the 3E level, the relative increases in safety and health scores begin to diminish.

WNP-4

From a regulatory perspective, the analysis of WNP-4 is the same as WNP-1. As with WNP-1, it does not appear that any of the levels of restoration proposed for WNP-4 would be in conflict with either the draft Comprehensive Land Use Plan for the Hanford Site or the Hanford Reach Act and the Wild and Scenic River Act.

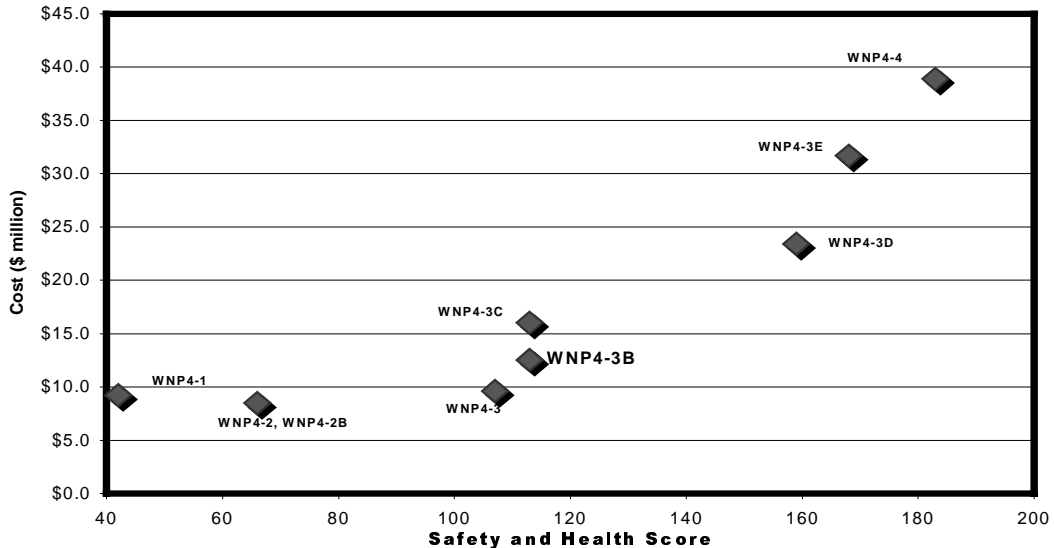
From an environmental perspective, all levels of restoration could potentially improve the environment in terms of reducing disruption to wildlife habitat and disposal of hazardous substances. Again, from the Yakama Indian Nation perspective, Levels 3 and 4 (removal of buildings), would be preferable to lower levels of restoration; however, WNP-4 buildings are less noticeable from distances (such as Gable Mountain) than the completed dome and other structures of WNP-1. Unlike WNP-1, lower levels of restoration for WNP-4 would not necessarily be favored from the socioeconomic perspective because there is little potential of reuse and redevelopment of these incomplete structures.

From the safety and health perspective, WNP-4 represents a greater immediate hazard than WNP-1 due to its condition. However, since it is unlikely that reuse alternatives will be determined for WNP-4 it may be appropriate to pursue long term restoration alternatives provided by demolishing and sealing (Level 3D), mounding (Level 3E) or ground level demolition (Level 4).

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From an economic perspective, it is logical to move at least from the Level 1 to the Level 2 restoration alternative because, in terms of the present value of total costs, this option is less costly than Level 1. For WNP-4, while the total costs significantly increase for each restoration level above 3C, there is relative improvement in the score of the safety and health benefits from Level 3C to Level 3D. Comparison of these two factors (cost and safety and health) may indicate that the significant increases in costs of Level 3E or Level 4 may not provide proportionate additional safety and health benefits.

Figure 3 - WNP- 4 Safety and Health vs. Cost



Recommendation

Energy Northwest's objective is to adequately address its responsibility for the public health and safety not only now but for the long term.

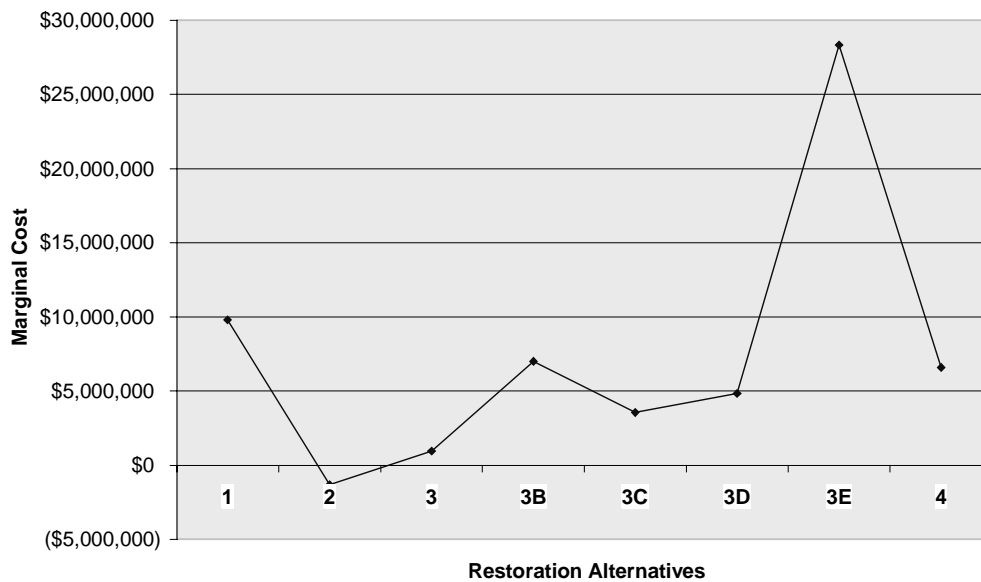
Given the extremely long potential life of the civil structures associated with WNP-1 and WNP-4 it is necessary, at a minimum to provide a restoration that adequately protects future occupants or visitors to the site. As indicated, our studies have shown that the highest level of long term public health and safety is provided by restoration alternatives; Mound and Fill – Level 3E and Demolish to Grade-Level 4. Our assessment also found little significant difference in the relative public health and safety between these two levels.

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The principal difference between the Level 3D-Demolish and Seal restoration alternative and Level 3E for both WNP-1 and WNP-4 is the backfilling of the facilities before sealing. (See Attachment A for the description of the alternative restoration levels.) The backfilling of the void spaces provides permanent protection from future subsidence or the ultimate hazards of structural failure. Considering the robust construction of these facilities, it does not seem reasonable to predict the likelihood for such structural failure.

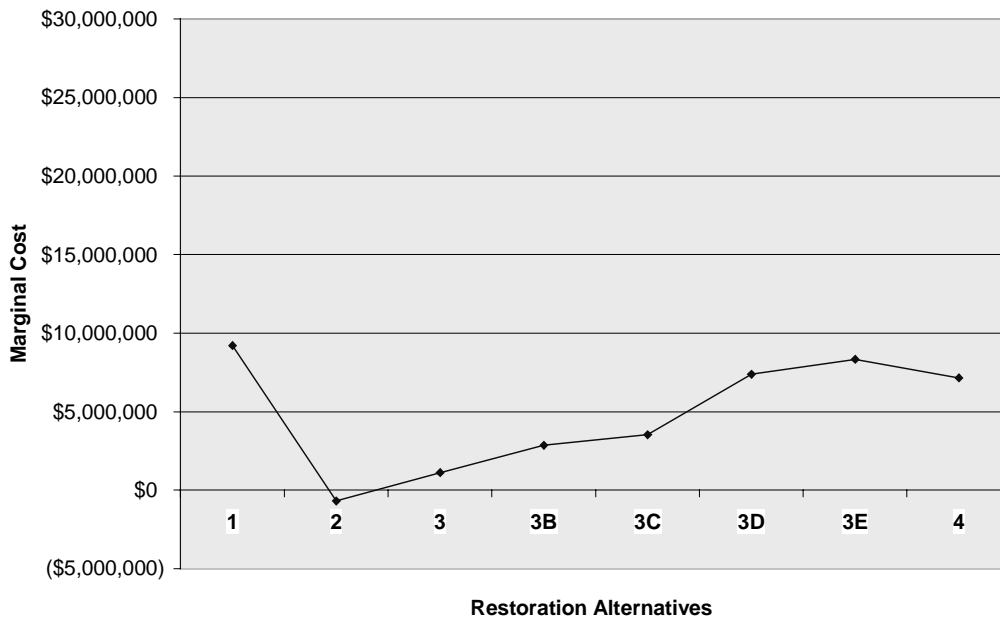
Going to Level 3E-Mounding and Backfilling has the greatest increase in marginal cost of moving to higher levels of restoration for WNP-1. The changes marginal costs of each subsequent level are shown in Figures 4 and 5 for WNP-1 and WNP-4 respectively.

Figure 4. WNP-1 Marginal Costs



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Figure 5. WNP-4 Marginal Costs



From the analysis, the long-term protection of the public health and safety is most cost-effectively provided by Level 3D-Demolish and Seal.

A comparison of Level 3B-Remove Buildings to Level 3C-Remove Turbine Foundation alternatives shows no marginal improvement in the public health and safety. The analysis however indicates that the environmental aesthetic perspective favors a Level 3C or higher level of restoration. The estimated cost of removing the turbine foundation is approximately \$3.5 million.

WNP-1's potential for economic development will likely be affected if the restoration is begun in the immediate future. Although the issues regarding reuse of facilities and redevelopment are not thoroughly considered in this plan, these considerations should play a role in the final selection of restoration alternatives. Fortunately much of the immediate public risks are from hazards at WNP-4 which appears to have little or no economic development potential.

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It is recommended that WNP-4 be taken to a long-term level of restoration; perform all of the activities of Level 3D-Demolish and Seal, with the exception of removing the turbine pedestal.

In the absence of economic redevelopment opportunities, Energy Northwest's recommended long-term level of restoration for WNP-1 is also a Level 3D restoration with the exception of removing the turbine pedestal. However, for the intermediate term, the actions described in this study for Level-2B affords significant public health and safety benefit while retaining the opportunity to reuse the WNP-1 facility.

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Plans

The assessment of the feasibility of reuse of WNP-1 and WNP-4 for economic development is expected to take upwards of 12 to 18 months. Energy Northwest's approach is to commence with restoration activities at both sites that need to be addressed regardless of the redevelopment decision. This Chapter presents a workscope and plans for an 18 month period.

Energy Northwest has recommended a long-term restoration alternative for the WNP-4 construction site. To date, no reuse potential has been identified for this facility. Therefore, the planned restoration tasks are consistent with our recommendation. For the WNP-1 facility, economic redevelopment may be a feasible alternative. To possibly realize the potential benefits of WNP-1's reuse, the economic redevelopment options and associated institutional questions need to be fully considered. Our plan is to preserve the option for reusing the site while pursuing required work irrespective of economic development until these questions are answered and a redevelopment decision is made.

Plans and budgets have been established to begin initial site restoration activities in July 1999. Figure 5 gives a general schedule for the planned activities. As shown, initial activities will address the removal of the cooling tower asbestos fill at both of the sites. Initial activities at WNP-4 and WNP-1 will focus on further reduction of personnel safety hazards and possible environmental concerns in preparation for further restoration.

The conceptual schedule shown in Figure 5 displays 18 months beginning in July 1999. This 18-month period is thought to be sufficient time for the local governmental agencies to explore the feasibility of assuming ownership of the site for economic redevelopment (Attachment D). The agencies plan to explore and resolve questions about the site's potential including the acquisition of water rights, possible changes to RCW 80.50.300, land ownership issues, and the marketability of this type of industrial land. At the end of this feasibility study, a decision point has been designated to determine if the site should be transferred to a third party or retained by Energy Northwest for the completion of restoration under this Plan.

The initial restoration activities that are identified in Figure 5 are also listed in Table 8 and explained in Attachment E. These are the activities that have been determined to be necessary regardless of the restoration option selected. The primary activities identified in this category are the disposal of the cooling tower fill, the demolition demonstrations at WNP-4, and the beginning of equipment removal at WNP-1. These activities have been scheduled to begin immediately.

The remaining "WNP-1" and "WNP-4" categories on Figure 5 depict the timing of the major actions at these projects. Other than general cleanup and the removal of equipment, the first major restoration work is planned for WNP-4. This work is scheduled to begin following the completion of the demolition demonstration projects. Other work on WNP-1 will not begin until after the economic development decision point.

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Figure 6. WNP-1/4 Restoration Schedule

Activity	FY 2000						FY 2001					
	J	A	S	O	N	D	J	A	S	O	N	D
Initial Restoration Activities												
Establish Site Landfill For Cooling Tower Fill	█											
Remove WNP1/4 Cooling Tower Asbestos				█								
Perform Concrete Demolition Demonstrations				█								
Equipment Removal & Disposition	█											
WNP-4												
Begin General Cleanup	█											
Remove Remaining Equipment				█								
Begin Level 3D Restoration							█					
WNP-1												
Begin General Cleanup	█			█			█					
Begin Sealing Building Openings				█			█					
Pursue Economic Development Options												
Assess Redevelopment Feasibility	█						█					
Economic Development Decision Point							█					

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Specific tasks to be conducted over the next 12 to 18 months are shown in Table 8. Table 8 lists planned tasks in priority order. Attachment E provides summary descriptions of these initial tasks.

Table 8 - WNP-1/4 Initial Demolition and Restoration Tasks

Activity	WNP-1	WNP-4
1. Establish Site Landfill	X	X
2. Remove Trash, Scaffolding, & Form Work	X	X
3. Install Building Drains In Concrete Floor		X
4. Remove Cooling Tower Asbestos	X	X
5. Concrete Demolition Verification Testing	X	X
6. Remove Non Reusable Buildings	X	X
7. Eliminate Exterior Fall/Tripping Hazards		X
8. Demolish/Backfill Unused Pits and Vaults		X
9. General Exterior Cleanup and Grading		X
10. Identify Environmental Hazards	X	X
11. Implement Environmental Cleanup Tasks		X
12. Relocate Fencing & Install signs	X	X
13. Demolish/Fill Large Underground Piping		X
14. Install Fill Over Turbine Generator Slab		X
15. Demolish/Backfill Circulating Water Pump House		X
16. Demolish Air Intake Structures	X	X
17. Demolish Cooling Tower Superstructures	X	X
18. Seal Building Openings/Install Permanent Doors	X	X
19. Remove Exterior Components	X	
20. Remove Turbine Generator Building Components	X	

Once the economic development potential is known, restoration and demolition activities will begin in earnest. If economic development is chosen, it is anticipated that a period of eighteen to twenty four months (by December 2002) will be required to complete restoration activities. If economic development is not chosen and demolition to Level 3D is conducted at WNP-1, additional time totaling from 30 to 36 months may be required to conduct the work. In this case, all demolition/restoration obligations would be complete by December, 2003. The activity schedule will also be updated to begin restoration activities as the decision is made.

In parallel with the conduct of these initial restoration tasks, Energy Northwest expects to proceed in earnest with the disposition of remaining equipment and appurtenances not clearly required for economic development. This will include the removal of all unnecessary or unusable structures as part of the general cleanup. Our plans anticipate a period of up to 24 months for completion of equipment removal and sales of remaining assets.



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Restoration Alternatives

In 1995 Energy Northwest considered various restoration levels prior to committing in its 1995 Plan to a full restoration. A full restoration is now believed to not be in the best interests of the region due to the large cost involved and the potential for reuse of all or a portion of the facilities.

Although the WNP-1 and WNP-4 Projects are currently at different stages of completion, the restoration level descriptions are basically the same. For each Project it is assumed that all installed equipment is removed. This permits evaluation of each alternative without concern for the installed assets. Ultimately the installed equipment will be addressed based on current conditions and potential site uses, which may include utilization of some of the equipment.

The alternatives progress from easy, simple, and least costly to more complex and costly. The range of alternatives progress naturally from leaving the site as-is to removing more buildings as you progress through the options. The more expensive the option, the more protection that is provided for the health and safety of the general public.

The restoration alternatives range from simply securing the site to full restoration to ground level.

- The first level simply secures the site.
- The second level adds protection by reducing possible building access, cleaning up the grounds, and eliminating potential fall hazards at ground level. Some concrete walls and roofs are completed.
- The third level fully seals the Containment and General Services Building.
- Level 3B begins to remove major structures. The cooling towers, spray pond pump house, and circulating water pump house are removed and the spray pond is backfilled to grade.
- Level 3C removes the turbine pedestal and transformer concrete fire walls.
- Level 3D removes the containment walls to elevation 479 at WNP-4 but leaves the WNP-1 containment alone as it is a complete building. The WNP-4 General Services Building walls are removed to elevation 479 and the WNP-1 General Services Building walls are removed to elevation 501. Concrete roofs are then poured at the top elevations to seal the building.
- Level 3E takes a different approach by removing the site infrastructure and all buildings except the General Services Building and the Containment. The General Services Building and the Containment are then demolished to elevation 479, backfilled and an earth mound is used to cover the buildings.
- The fourth level is the complete restoration to ground level. All buildings are removed to below grade and backfilled. The site utility infrastructure is removed and vegetation is planted over the site.

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Another alternative is to pursue economic development. This alternative (Level 2B) looks like Level 2 except that buildings, roads, and utilities would be made available for development activities. In addition, the existing electrical power, telephone and water supplies would be maintained.

Level 1 (Secure Site)

- **Remove the asbestos-containing materials**
- **Secure the sites with additional fencing**
- **Eliminate exterior fall hazards**
- **Perform general site cleanup**
- **Post “No Trespassing” signs**
- **Conduct regular security patrols**

Level 1 establishes a secure perimeter around each site. It assumes that perimeter security will be sufficient to prevent and deter unauthorized entry by the public. The removal and/or salvage of remaining plant equipment of value removes theft as a motive for entry.

The exterior hazards would not be eliminated or protected to prevent falls. The buildings would be secured to prevent entry. Additional fencing would be provided to minimize unauthorized entry potential. Environmental hazards would be eliminated. Due to the potential as an attractive nuisance, it was deemed necessary to provide a 24 hour security presence. In perpetuity costs would include security and utility maintenance costs for lighting.

Level 2 (Block Building Access)

- **Conduct appropriate Level 1 restoration activities**
- **Remove temporary buildings**
- **Secure site with additional fencing**
- **Eliminate exterior fall hazards**
- **Perform general site cleanup**
- **Install additional exterior lighting**
- **Render plant island safe and secure**
- **Demolish/backfill exposed exterior piping and electrical vaults**
- **Seal or eliminate building access points**

Level 2 establishes a secure perimeter around each site. It assumes that perimeter and secondary security, and reducing site access will be sufficient to prevent and deter unauthorized entry by the public.

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Exterior

In addition to securing the site much the same as Level 1, this option adds the additional protection factors of eliminating exterior fall hazards. Outside piping and electrical vaults would be demolished and backfilled and the general outside areas would be graded clean. Some temporary buildings would be removed. Roads and rail lines would be removed and graded clear. All outside electrical substations would be fenced to minimize the entry potential. Due to the additional level of protection, random security patrols are deemed sufficient to minimize the entry potential. In perpetuity costs would again include security and utility maintenance costs for lighting.

Containment

The building would be sealed to provide highly secure access. The interior would be cleaned to remove trash, debris, scaffolding, and formwork. Note that at WNP-4 this condition still provides access to birds to all floor levels.

General Services Building

The building would be sealed to provide highly secure access. The interior would be cleaned to remove trash, debris, scaffolding, and formwork. Note that at WNP-4 this also includes construction of concrete walls to prevent access at ground level.

Turbine –Generator Building

The building would be sealed to provide highly secure access. The interior would be cleaned to remove trash, debris, scaffolding, and formwork. Note that at WNP-4 this would only include protection of fall hazards at the concrete slab level.

Cooling Towers

Provide permanent doors and walls to cooling tower stairwells.

Circulating Water Pump House

The building would be sealed to provide highly secure access. The interior would be cleaned to remove trash, debris, scaffolding, and formwork. At WNP-4 this also includes addition of a fence around the pump pit since the building has already been removed.

Spray Pond And Pump House

The building would be sealed to provide highly secure access and a separate fence would be installed around the spray pond. The interior would be cleaned to remove trash, debris, scaffolding, and formwork.

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Remote Air Intakes/Chemical Waste Treatment Building

The buildings would be sealed to provide highly secure access. The interior would be cleaned to remove trash, debris, and formwork. Note that the WNP-4 Chemical Waste Treatment Building does not exist.

River Intake Structure

Any openings to the building would be sealed. The interior would be cleaned to remove trash and debris.

Security Access Building

The building would be sealed to provide highly secure access. The interior would be cleaned to remove trash and debris.

Pipeline Corridor

The openings to the vent stations would be sealed.

Level 2B (Economic Development)

Economic development, while not specifically a restoration level, is a variation of Levels 1 and 2, where selected site infrastructure (i.e. power lines, roads, railroad tracks, and other site utilities and structures) will remain to support economic development on, and adjacent to, the site at some future time.

- **Adjusts Level 1 and Level 2 to allow for re-use**
- **Preserve selected site infrastructure**
- **Retain selected plant equipment**
- **Do no demolish/backfill necessary piping and electrical vaults**
- **Install permanent access doors (vs. seal access)**

Level 3 (Entombment)

- **Conduct Level 1 and Level 2 actions**
- **Entomb reactor and related buildings**
- **Demolish/Seal related plant structures**

Level 3 is more rigorous than Levels 1 and 2, emphasizes permanence, and relies less on establishing and maintaining perimeter security. It assumes points of building entry can be permanently sealed and secured to prevent unauthorized entry.

SITE RESTORATION PLAN

This is the first of five level three options which begin to address removing major plant structures and further sealing the buildings on a more permanent basis. Execution of any of these options permits elimination of security patrols. The need for the site infrastructure still may require some utility maintenance for the first four options, 3, 3B, 3C, and 3D. If the facility is mounded over there will be no need to retain utility services. Each option builds upon the previous option. For example, Levels Three, 3B, 3C, and 3D assume that all Level 2 work was completed, Level 3B assumes that all Level 2 and Level 3 work was completed, etc. Level 3E takes a different approach and selects the applicable parts from various levels.

Exterior

Additional temporary buildings would be removed. Fencing would be removed. Yard areas would be cleaned, contoured, graded, and seeded. The large underground circulating water lines would be backfilled.

Containment

A concrete floor would be poured at elevation 479 at WNP-4 only.

General Services Building

A concrete floor would be poured at elevation 479 for WNP-4. Roof areas at WNP-1 would be reworked to provide a long term seal.

The additional proposed variations on entombment listed below (Level 3B through 3E) provide increasing measures of safety by removing and/or securing a greater number of site structures and removing additional attractive nuisances.

Level 3B (Remove Buildings)

- **Conduct Level 1, Level 2, and Level 3 actions**
- **Remove cooling towers**
- **Remove turbine building, leave pedestal**
- **Remove circulating water pumphouse**
- **Backfill spray ponds**
- **Remove air intakes and fill**
- **Remove chemical waste treatment building**

Exterior

The turbine oil and condensate tanks would be removed.

SITE RESTORATION PLAN

Turbine-Generator Building

The WNP-1 structure would be removed leaving the pedestal.

Cooling Towers

The structures would be demolished to grade. The footprint areas would be cleaned, contoured, graded, and seeded.

Circulating Water Pump House

The surface slabs at both units and the building at WNP-1 would be removed and the pit would be backfilled. The footprint area would be cleaned, contoured, graded, and seeded.

Spray Pond And Pump House

The building would be removed and the pond backfilled. The footprint area would be cleaned, contoured, graded, and seeded.

Remote Air Intakes/Chemical Waste Treatment Building

The remote air intakes would be removed to grade and backfilled. The WNP-1 Chemical Waste Treatment Building concrete slab and treatment ponds would be removed and backfilled. The footprint area would be cleaned, contoured, graded, and seeded.

Level 3C (Remove Turbine Foundation)

- **Conduct the Level 1, Level 2, Level 3, and Level 3B actions**
- **Remove turbine-generator pedestal and slab**
- **Remove transformer footings, pads, and firewalls**

Turbine Generator Building

The turbine pedestal and building slab would be removed to grade. The transformer footings and firewalls would be removed. The footprint area would be cleaned, contoured, graded, and seeded.

SITE RESTORATION PLAN

Level 3D (Demolish and Seal)

- Conduct the Level 1, 2, 3, 3B, and 3C actions
- Demolish WNP-4 walls to 25 feet above grade
- Demolish WNP-1 General Services Building to 47 feet above grade
- Pour concrete floors to seal building

Containment

The WNP-4 containment walls would be removed down to elevation 479. The WNP-1 containment building would be sealed and would remain.

General Services Building

The walls would be demolished down to elevation 479 at WNP-4 and 501 at WNP-1. Concrete roofing would be poured at 479 and 501 elevations at WNP-1.

Level 3E (Mound and Backfill)

- Conduct Level 1, 2, 3, 3B, 3C, and 3D actions
- Fill voids in remaining buildings
- Backfill to cover structure
- Clean, contour, grade, and reseed

This alternative takes a basic approach that if you cover everything up you won't have any hazards remaining. The Containment and General Services Building would be demolished down to elevation 479 where a mound of earth would be put on top of the remaining structures. It assumes that to safely cover the structures with dirt the voids within the buildings would have to be filled for long term safety considerations.

Exterior

Fencing and no trespassing signs would not be required and would be removed. Environmental hazards would be removed. All other buildings would be removed. The site utility infrastructure would be removed.

Containment and General Services Building

The interior would be cleaned as required to remove trash, debris, scaffolding, and formwork. Environmental hazards would be removed. Voids would be filled to elevation 479. The structure would be mounded over with earth at a three to one slope. The resultant footprint area would be cleaned, contoured, graded, and seeded.

SITE RESTORATION PLAN

Major Plant Buildings

The remaining buildings would be demolished, backfilled to grade, cleaned, contoured, graded, and seeded as described in the following levels for each structure.

- Turbine Generator Building – Level 3C
- Cooling Towers – Level 3B
- Circulating Water Pump House – Level 3B
- Spray Pond and Pump House – Level 3B
- Remote Air Intakes/Chemical Waste Treatment Building – Level 3B

Remaining Plant Buildings

The Pipeline Corridor vent stations, River Intake Structure, and Security Access Building would be demolished, backfilled, cleaned, contoured, graded, and the footprint area would be seeded.

Level 4 (Demolish To Grade)

- **Demolish and bury reactor and related buildings**
- **Re-contour and re-vegetate site**

Level 4 is the “most permanent” of the proposed restoration levels and is intended to return the site to a “natural” condition. Level 4 removes from the public, in terms of sight and access all of the site’s attractive nuisances (structures, buildings, and ponds). At Level 4, the site presents the same health and safety hazards to the public as the surrounding landscape.

This alternative envisions the entire site will be returned to its original desert condition. The structures will be removed and underground structures may be left in place provided they are covered with three feet of earth. Underground voids will be backfilled.

Exterior

This is the same as Level 3E.

Containment And General Services Building

This is the same as Level 3E however the buildings will be demolished down to elevation 450.

SITE RESTORATION PLAN

Major Plant Buildings

This is the same as Level 3E.

Remaining Plant Buildings

This is the same as Level 3E.

SITE RESTORATION PLAN

Consultant Support

Pacific Northwest National Laboratories

Operated by Battelle Memorial Institute for the US Department of Energy
902 Battelle Boulevard
Richland, WA 99352

Battelle reviewed the cost estimates and provided the substance of the cost benefit analysis for the restoration alternatives. They also considered impacts concerning the Hanford site, environmental impacts, public interest and stakeholder concerns, potential future land use, and public health and safety concerns.

Burns & McDonnell

9400 Ward Parkway
Kansas City, Missouri 64114

Burns & McDonnell updated and validated previous cost estimates for demolition and restoration and adapt the previous estimates to the current restoration alternatives. In addition, they were asked to consider structural integrity, expected lifetime, and any ongoing maintenance issues.

Prezant Associates, Inc.

330 6th Avenue North, Suite#200
Seattle, WA 98109

Prezant characterized the public health and safety aspects of the restoration alternatives and included aspects related to other publicly owned facilities.

SITE RESTORATION PLAN

Foster Wheeler Environmental

3200 George Washington Way, Suite G
Richland, WA 99352

Foster Wheeler reviewed previous regulatory studies to identify any applicable regulatory requirements relative to the final long term site condition. In addition, they were asked to consider any similar restoration experience and applicable DOE site requirements.

J & H Marsh & McLennan, Inc.

1215 Fourth Avenue, Suite 2300
Seattle, WA 98161-1095

J&H Marsh & McLennan considered the overall insurance perspective related to owner obligations of the various restoration options, including potential risks and indemnity issues for Energy Northwest.



SITE RESTORATION PLAN

Treaties of the United States with American Indian Tribes of the Hanford Region

In June 1855 at Camp Stevens in the Walla Walla Valley, representatives of the United States negotiated treaties with leaders of various Columbia Plateau American Tribes and Bands. The negotiations resulted in three treaties, one with the fourteen tribes and bands of what would become the Confederated Tribes and Bands of the Yakama Indian Nation, one with the three tribes that would become the Confederated Tribes of the Umatilla Indian Reservation, and one with the Nez Perce Tribe. The U.S. Senate ratified the treaties in 1859. The negotiated treaties are as follows:

1. Treaty with the Walla Walla, Cayuse, etc. (June 9, 1855; 12 Stats. 945)
2. Treaty with the Yakama (June 9, 1855; 12 Stats. 951)
3. Treaty with the Nez Perce (June 11, 1855; 12 Stats. 957).^{ix}

The Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Umatilla Reservation, and the Nez Perce Tribe of Idaho are federally acknowledged tribes which have the immunities and privileges available to other federally acknowledged Indian tribes by virtue of their government-to-government relationship with the United States as well as the responsibilities, powers, limitations and obligations of such tribes.^x

The terms of the three preceding treaties are similar. Each of the three Tribal organizations agreed to cede large blocks of land to the United States.^{xi} The Hanford Site is within the ceded lands. The Tribes retained certain lands for their exclusive use (the three reservations) and also retained certain rights and privileges to continue traditional activities outside the reservations. These included 1) the right to fish (and erect temporary fish-curing facilities) at usual and accustomed places in common with citizens of the United States, and 2) the privileges of hunting, gathering roots and berries, and pasturing horses and cattle on open and unclaimed lands.

The Richland Operations Office of DOE (DOE-RL) interacts and consults on a direct basis with the three federally recognized tribes affected by Hanford operations, i.e., the Nez Perce, Umatilla, and Yakama tribes. In addition, the Wanapum people, who still live adjacent to the Hanford Site, are a non-federally recognized tribe who have strong cultural ties to the site. The Wanapum are also consulted on cultural resource issues in accordance with DOE-RL policy and relevant legislation.

SITE RESTORATION PLAN

Economic Redevelopment And Transfer

The U. S. Department of Energy (DOE) has been shrinking the portion of the Hanford Reservation on which they have active missions and projects. DOE's preferred alternative in the HRA-EIS shows the land occupied by WNP-1 and WNP-4 as industrial. However, DOE has indicated that they may want to retain title to the land until all potential environmental questions are addressed and resolved.

With the downsizing of a number of facilities at Hanford, the area's economic development climate has changed in recent years. Most notably, downsizing has moderated wage rates slightly, making the area more attractive to new and expanding industries. The TriCities area has retained a good workforce that is well educated and highly skilled. The area is locationally well situated with respect to primary markets in the Inland Empire, the Portland area, and Puget Sound.

The existing nuclear and other high tech industries in the TriCities area, coupled with the quality of the labor force, present many economic development opportunities. Keeping in mind that the preponderance of economic growth comes from the growth of existing industries and firms, one can expect that the high tech component of the regional economy will continue to be very important. Spin-offs from the nuclear industry can be expected as well as growth in services (such as specialized metal fabrication) that support it.

Because of the labor force and relatively high wage rates, it is unlikely that industries using routine assembly and mass production manufacturing would be interested in the area. By contrast, the area is well suited for locating one-of-a-kind and low volume, high value added industries. Specialized metal manufacturing, chemical production, instrument design and manufacture, and related research and development activities "fit" the TriCities and may be reasonable candidates for the WNP-1 and WNP-4 areas.

The WNP-1 and WNP-4 site has characteristics that may prove to be beneficial for attracting industry. The area is isolated and security is relatively easy to maintain. For industries engaged in defense-related research and development and manufacturing, or other activities where security is important, the area would be attractive.

Many of the existing buildings are of high value due to the durability of their construction and features such as ability to withstand seismic events, negative pressure enclosures, large traveling cranes, etc. They represent an economic development attraction to the area, but the opportunities to "match" the buildings with industries' requirements is likely to be infrequent. While very expensive to construct, these types of buildings are not in constant demand if considered only for their special design characteristics. Near-term economic development interests would be better served by making them available for a broad range of industrial activities.

SITE RESTORATION PLAN

As part of their economic development charters the Port of Benton and Benton County are seeking opportunities from the Department of Energy's initiatives to downsize and encourage privatization of Government funded activities. One such initiative is a long-range (by 2050) plan to use part of the Hanford Reservation for an "Energy Park". Over the past several years, Energy Northwest has had discussions with representatives from the Port of Benton and others including Benton County and the City of Richland to consider potential redevelopment of the WNP-1/4 Projects' site. Their commonly held view has been that the site represents an opportunity for economic development and the creation of new jobs in the region. The principal advantages of the site for commercial development are the existing elements of infrastructure and the potential availability of more than adequate water supplies for industrial purposes.

Concurrent with these discussions, Energy Northwest has addressed its need of the site in supporting its long-term objectives continued with ownership. We have concluded that one of our principal interests in the site may be to retain our rights and options to pursue our business development initiatives. Another is to continue to use some of the facilities to support Washington Nuclear Project No. 2 (WNP-2) operations.

The proximity of the WNP-1/4 site infrastructure to the WNP-2 operating plant provides unique capabilities for supporting WNP-2 operations in three areas; water, backup electrical power, and personnel. Although none of these considerations is paramount to this decision process, they are important factors to Energy Northwest.

The Energy Northwest security firing range receives water from the WNP-1 fire protection and potable water system. Occasionally water is also supplied to WNP-2 to support water system outages and to maximize megawatt production. The WNP-1 electrical infrastructure is interconnected to WNP-2 which allows feeding power to WNP-2 support areas. This capability to switch the power supply to the support areas is frequently applied during outages for maintenance of selected WNP-2 power distribution systems in plant support areas. Additionally, the WNP-1 electrical grid supplies power to the security firing range.

Since submitting the 1995 Plan, Energy Northwest has been considering the tradeoffs of continued site ownership alternatives including transfer of the site. Energy Northwest's preliminary analysis determined that there is not an immediate economic basis to continue to fully retain the WNP-1 and WNP-4 site for the development of new electrical energy generation projects. Should Energy Northwest foresee the potential future need for additional power plant construction, it will retain those interests as a participant in the reuse of the site.



SITE RESTORATION PLAN

Initial Restoration Task Descriptions

1. **Establish Site Landfill for Cooling Tower Fill** – This is an administrative task to determine whether to license a new landfill, assure the existing landfill can be utilized for disposal of the transite fill from the cooling towers, or ship this material to an approved site.
2. **Remove Trash, Scaffolding, and Form Work** – This activity will remove any concrete forms, scaffolding, and trash from the interior and exterior areas. This activity primarily applies to WNP-4.
3. **Install Building Drains in Concrete Floor** – Drain holes will be installed in the basement elevations of the Containment and the General Services Building to permit rain and snow to drain directly to the ground.
4. **Remove Cooling Tower Asbestos** – The fill in the six cooling towers is transite, which consists of concrete and asbestos and shall be removed.
5. **Concrete Demolition Demonstrations** – The feasibility of demolishing highly reinforced concrete walls is an unknown. Contractors will be invited to demonstrate their techniques at WNP-4 to validate the demolition estimates.
6. **Remove Non Reusable Buildings** – Remove any buildings that are not assets for potential economic development through sale or demolition.
7. **Eliminate Exterior Fall/Tripping Hazards** – Seal or fill any openings to pipes, vaults, pits, trenches, etc. that are to be left.
8. **Demolish/Backfill Unused Pits and Vaults** – Demolish minor underground concrete structures and backfill to grade.
9. **General Exterior Cleanup and Grading** – Scour the yard areas to remove debris and grade the general area.
10. **Identify the Environmental Hazards** – This is an administrative task to survey the remaining equipment and grounds to assure any hazardous materials are identified for cleanup. This survey may identify oil in equipment, light ballasts, lead paint, etc.
11. **Implement Environment Cleanup Tasks** – This task will perform the removal and cleanup of any identified environmental issues.
12. **Relocate Fencing** – A second fence will be installed around the WNP-4 Spray Pond, General Services Building, and Containment. Additional fencing and gate controls will be added to WNP-1 to prevent unauthorized access to the major buildings. Signage will be installed on fence lines and access corridors to minimize unauthorized access.

SITE RESTORATION PLAN

13. **Demolish/Fill Large Underground Piping** – The eight, nine, and twelve foot diameter buried piping will be filled, plugged, or removed.
14. **Install Fill Over Turbine Generator Slab** – The basement floor area of the structure will have portions removed, three feet of clean fill installed, and the area will be final graded and reseeded.
15. **Demolish/Backfill Circulating Water Pump House** – The WNP-4 underground structure will be demolished to three below grade, backfilled with clean fill, and the area final graded and reseeded.
16. **Demolish Air Intake Structures** – These structures, two per site, will be demolished to three feet below grade, backfilled to three feet below grade, and the area final graded and reseeded.
17. **Demolish Cooling Tower Superstructures** – The cooling towers, three per site, will be demolished to three feet below grade, covered with three feet of clean fill, and the area final graded and reseeded.
18. **Seal Building Openings/Install Permanent Doors** – All openings to the Containment and General Services Building will be permanently sealed at WNP-4 by installing concrete walls. Roof and sky openings will not be sealed until the final restoration level is established. The permanent doors will be installed at WNP-1.
19. **Remove Exterior Components** – Any exterior components will be removed. This primarily consists of tanks and piping.
20. **Remove Turbine Generator Building Components** – This task will remove the power plant process equipment from the building. Facility support equipment such as HVAC, fire protection, power, potable water, and sanitation facilities will remain.

SITE RESTORATION PLAN

Performance Standard for Site Restoration

This standard has been developed for the restoration of Energy Northwest Projects WNP-1 and WNP-4. Its terms define a final site condition and describe the conditions by which the restoration activities can be conducted in compliance with the requirements specified by the State of Washington.

REMOVAL OR DEMOLITION OF PLANT STRUCTURES

1. For those structures identified for demolition and backfilling, below grade exterior foundation walls and interior walls may be left in place.
2. Unless specified otherwise, subsurface structures (foundations) and cavities will be backfilled using methods that minimize void space in the backfill material.
3. Where appropriate, provisions for drainage will be made in structures to be abandoned by burial.
4. Debris conforming to the definitions of inert (WAC 173-304-100(40)) and demolition (WAC 173-304-100(19)) waste may be used as subsurface structure backfill material or may be placed in the onsite landfill. Other wastes may be disposed onsite with appropriate approvals.
5. Large diameter water pipelines connecting the turbine-generator building, cooling towers and circulating water pumps will either be removed, backfilled, or plugged.
6. Blasting shall be conducted under appropriate safety standards required by WAC 296-52.

EARTH

1. Reasonable means will be taken to avoid soil erosion.
2. Areas disturbed by restoration activities will be graded and sloped to blend with the adjacent land.
3. Areas prepared for reclamation will be stabilized with gravel, seeding of appropriate vegetation, mulch, or soil cement to prevent erosion.
4. To the extent practicable, site restoration activities should not disturb areas of the site which were previously stabilized or undisturbed.

SITE RESTORATION PLAN

AIR

1. Reasonable means will be taken to control dust from the restoration activities.
2. Any material that may be blown from a vehicle during off-site travel will be covered.
3. On-site burning may be conducted in compliance with EFSEC requirements and local air authority rules.

WATER

1. Discharges from the site must meet the water quality standards (WAC 173-201A) at their points of entry into the waters of the state. Proposed in-stream work must be described and waivers of the water quality standards obtained from EFSEC.
2. Deleterious effects from leachate will be avoided by controlling the disposal of materials on site.
3. The existing Oil and Hazardous Substance Spill Plan will be maintained and revised as necessary during the site restoration period.

WILDLIFE

1. Site restoration activities will be conducted in a manner that minimizes disruption of wildlife habitat.
2. Any in-stream work will be conducted during approved times with standard precautions to prevent dewaterings or disturbance of fish spawning, rearing and migration.

TRANSPORTATION

1. All vehicles hauling materials to or from the sites will operate within the gross weight limits for which each vehicle is licensed and in accordance with the any posted load restrictions.
2. Commercial haulers will obtain county road/hauling permits, if required.

SITE RESTORATION PLAN

HEALTH, SAFETY AND SECURITY

1. Efforts will be made to maintain a safe and healthy work environment during the site restoration activities.
2. An appropriate level of security will be maintained to protect members of the public from potential hazards of the site.
3. An appropriate level of vector control will be maintained at each site to prevent the deleterious effects of unwanted birds, pests, and rodents until the end of the site restoration activities.

CULTURAL RESOURCES

1. In the event that new ground is disturbed by excavation outside of the previously disturbed site areas, the services of a qualified archaeologist will be retained to inspect the site to determine whether archaeological or historical sites will be disturbed.

SITE RESTORATION PLAN

References

Washington Public Power Supply System, March 1995, Nuclear Projects 1,3,4 and 5, *Site Restoration Plan* (1995 Plan), Richland, Washington.

59 Fed. Reg. 44430, 1994, Federal Register, Vol. 59, p. 44430 (August 29).

63 Fed. Reg. 71941, 1998, Federal Register, Vol. 63, p. 71941 (December 30).

DOE, 1999. *Revised Draft Hanford Remedial Action Environmental Impact Statement and Comprehensive Land-Use Plan* (HRA-DEIS), DOE/EIS-0222D, U.S. Department of Energy, Washington, D.C. (April).

NPS, 1994, *Hanford Reach of the Columbia River, Comprehensive River Conservation Study and Environmental Impact Statement, Final -- June 1994*, National Park Service, Pacific Northwest Regional Office, Vol. I, Seattle, Washington (June).

Scott, M. J., D. B. Belzer, R. J. Nesse, R. W. Schultz, P. A. Stokowski, and D. C. Clark. 1987. *The Economic and Community Impacts of Closing Hanford's N Reactor and Nuclear Materials Production Facilities*. PNL-6295, Pacific Northwest National Laboratory, Richland, Washington.

WAC 463-42-665, 1998, Washington Administrative Code, Volume 463, Chapter 42, Section 665.

SITE RESTORATION PLAN

Endnotes

- i Ongoing costs are estimated for Level 1 as \$500,000 for guarding (4 shifts, two men/shift, split between both plants) and \$50,000/year labor, equipment and parts to maintain operable sump pumps. For Level 2, a random security patrol would be provided at an estimated \$250,000/year (4 shifts, one man/shift, split between both plants).
- ii All ongoing expenses would be incurred in perpetuity. Thirty years is used as an estimate.
- iii Using a 30 year bond rate.
- iv DOE, 1999, HRA-DEIS Section 3.3.4.3.4.
- v DOE, 1999, HRA-DEIS Figure 3-7.
- vi HRA-DEIS, Figure 3-3.
- vii 59 FR 44430, August 29, 1994.
- viii NPS, 1994, Vol I, p. 35.
- ix The text of the three treaties can be accessed at the following URL:
<http://www.rootsweb.com/~usgenweb/wa/indians/treaties.htm>.
- x 63 FR 71941; December 30, 1998.
- xi A map of the ceded lands is shown in Figure 1-3 of the Revised Draft Hanford Remedial Action Environmental Impact Statement and Comprehensive Land-Use Plan, DOE/EIS-0222D, April 1999.