

0022603

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 169791

Proj.
ECN

2. ECN Category (mark one)		Supplemental <input type="checkbox"/>	Change ECN <input type="checkbox"/>	Supersedure <input type="checkbox"/>
Cancel/Void <input type="checkbox"/>	Direct Revision <input checked="" type="checkbox"/>	Temporary <input type="checkbox"/>	Discovery <input type="checkbox"/>	
3. Originator's Name, Organization, MSIN, and Telephone No. J. D. Davis, Environmental Engineering, H4-55, 6-8919			4. Date July 8, 1992	
5. Project Title/No./Work Order No. Technical Program Plan for Project W-049H, 200 Areas Treated Effluent Disposal Basin		6. Bldg./Sys./Fac. No. 600 Area		7. Impact Level 3Q
8. Document Number Affected (include rev. and sheet no.) WHC-SD-W049H-SE-003, Rev. 0		9. Related ECN No(s). NA		10. Related PO No. NA
11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input checked="" type="checkbox"/> No (NA Blks. 11b, 11c, 11d)	11b. Work Package Doc. No. NA	11c. Complete Installation Work NA _____ Cog. Engineer Signature & Date	11d. Complete Restoration (Temp. ECN only) NA _____ Cog. Engineer Signature & Date	

12. Description of Change

Entire document has been revised to reflect changes in the functional design criteria for Project W-049H.



13a. Justification (mark one)		Criteria Change <input checked="" type="checkbox"/>	Environmental <input type="checkbox"/>	Facilitate Const. <input type="checkbox"/>
Design Error/Omission <input type="checkbox"/>	Design Improvement <input type="checkbox"/>	As-Found <input type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>	

13b. Justification Details

Changes were required due to revision of the Project W-049H functional design criteria for the design effluent discharge rate.

14. Distribution (include name, MSIN, and no. of copies)
See attached distribution list.

RELEASE STAMP

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Eta. 21

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15. Design Verification Required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	16. Cost Impact		17. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION	
	Additional	<input type="checkbox"/> \$	Additional	<input type="checkbox"/> \$
	Savings	<input type="checkbox"/> \$	Savings	<input type="checkbox"/> \$
			Improvement	<input type="checkbox"/>
			Delay	<input type="checkbox"/>

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

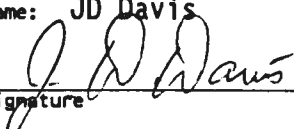

SDD/DD	<input type="checkbox"/>	Seismic/Stress Analysis	<input type="checkbox"/>	Tank Calibration Manual	<input type="checkbox"/>
Functional Design Criteria	<input type="checkbox"/>	Stress/Design Report	<input type="checkbox"/>	Health Physics Procedure	<input type="checkbox"/>
Operating Specification	<input type="checkbox"/>	Interface Control Drawing	<input type="checkbox"/>	Spares Multiple Unit Listing	<input type="checkbox"/>
Criticality Specification	<input type="checkbox"/>	Calibration Procedure	<input type="checkbox"/>	Test Procedures/Specification	<input type="checkbox"/>
Conceptual Design Report	<input type="checkbox"/>	Installation Procedure	<input type="checkbox"/>	Component Index	<input type="checkbox"/>
Equipment Spec.	<input type="checkbox"/>	Maintenance Procedure	<input type="checkbox"/>	ASME Coded Item	<input type="checkbox"/>
Const. Spec.	<input type="checkbox"/>	Engineering Procedure	<input type="checkbox"/>	Human Factor Consideration	<input type="checkbox"/>
Procurement Spec.	<input type="checkbox"/>	Operating Instruction	<input type="checkbox"/>	Computer Software	<input type="checkbox"/>
Vendor Information	<input type="checkbox"/>	Operating Procedure	<input type="checkbox"/>	Electric Circuit Schedule	<input type="checkbox"/>
OM Manual	<input type="checkbox"/>	Operational Safety Requirement	<input type="checkbox"/>	ICRS Procedure	<input type="checkbox"/>
FSAR/SAR	<input type="checkbox"/>	IEFD Drawing	<input type="checkbox"/>	Process Control Manual/Plan	<input type="checkbox"/>
Safety Equipment List	<input type="checkbox"/>	Cell Arrangement Drawing	<input type="checkbox"/>	Process Flow Chart	<input type="checkbox"/>
Radiation Work Permit	<input type="checkbox"/>	Essential Material Specification	<input type="checkbox"/>	Purchase Requisition	<input type="checkbox"/>
Environmental Impact Statement	<input type="checkbox"/>	Fac. Proc. Samp. Schedule	<input type="checkbox"/>		<input type="checkbox"/>
Environmental Report	<input type="checkbox"/>	Inspection Plan	<input type="checkbox"/>		<input type="checkbox"/>
Environmental Permit	<input type="checkbox"/>	Inventory Adjustment Request	<input type="checkbox"/>		<input type="checkbox"/>

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
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20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog./Project Engineer JD Davis <i>J.D. Davis</i>	<u>7/30/92</u>	PE	_____
Cog./Project Engr. Mgr. MJ Lauterbach <i>MJ Lauterbach</i>	<u>7/31/92</u>	QA	_____
QA LW Vance <i>L.W. Vance</i>	<u>7/13/92</u>	Safety	_____
Safety	_____	Design	_____
Security	_____	Other	_____
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Def. Wst. Mgmt. Div.	_____	DEPARTMENT OF ENERGY	_____
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Proj. Dept. MC Carrigan <i>McCarrigan</i>	<u>7/9/92</u>	ADDITIONAL	_____
Environ. Div.	_____		_____
IRM Dept.	_____		_____
Facility Rep. (Ops.)	_____		_____
Other	_____		_____
200/600 Area Env. Assurance, LP Diecker <i>LP Diecker</i>	<u>7/17/92</u>		_____

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7. Abstract <i>7/29/92 A. Sales</i> This report provides plans for evaluating potential sites and selecting a preferred site for the Project W-049H disposal facility for treated effluents from the 200 Areas of the Hanford Site.		
8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed. PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA. DISCLAIMER - This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.	10. RELEASE STAMP <div style="border: 1px solid black; padding: 5px; text-align: center;"> OFFICIAL RELEASE  BY WHC DATE JUL 30 1992 <i>Sta. 21</i> </div>	
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- Technical Program Plan -
Site Screening, Evaluation, and Selection
-- Project W-049H, 200 Areas Treated Effluent Disposal Basin --

SYNOPSIS

This report provides the plans for evaluating potential sites and selecting a preferred site for the Project W-049H disposal facility for treated effluents from the 200 East and 200 West Areas of the U. S. Department of Energy's Hanford Site.

First, the factors that determine whether a given location can be considered for candidacy are identified. Then, criteria for determining whether a site is a candidate and for evaluating the relative merits of environmentally acceptable candidate sites are described and their rationale explained. Finally, the site-selection procedure is explained. Reports that document the selection of a preferred site and the plans for characterizing that site to confirm its suitability will be issued later.

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- Technical Program Plan - Site Screening, Evaluation, and Selection

-- Project W-049H, 200 Areas Treated Effluent Disposal Basin --

1.0 INTRODUCTION

This report provides the plan for how potential sites will be evaluated and a preferred site selected for construction of an infiltration basin for disposal of treated effluent (hereafter referred to as the 200 Areas TEDB) for Project W-049H (Figure 1). The background, objectives, scope, and regulations considered in preparing the plan are discussed first, followed by discussions of the constraints on candidacy, screening and selection criteria, and the process that will be used to apply the criteria in selecting a preferred site.

1.1 Background

Past waste disposal practices at Hanford included discharge of untreated liquid effluents directly to ponds and trenches that infiltrated the effluents into thick, unconsolidated sediments overlying basalt bedrock. This practice was accepted at that time because of characteristics of the area such as isolation from major populations centers, low precipitation, a deep water table, and ion-exchange properties of the sediments underlying the site. However, in March 1987 the U. S. Department of Energy's (DOE) Richland Operations Office published a report that stated the DOE would cease the discharge of untreated liquid effluents (DOE 1987).

The Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) (Ecology, EPA and DOE 1989; as amended in 1990) established a schedule and milestones to either treat these effluents prior to their discharge or eliminate the discharge. Siting, construction, and operation of the 200 Areas TEDB is required to comply with the following milestones of the Tri-Party Agreement:

- Milestone M-17-00 -- Complete Liquid Effluent Treatment Facilities and/or Upgrades for All Phase I Streams by June 1995
- Milestone M-17-08 -- Complete 200 Area Treated Effluent System by June 1995

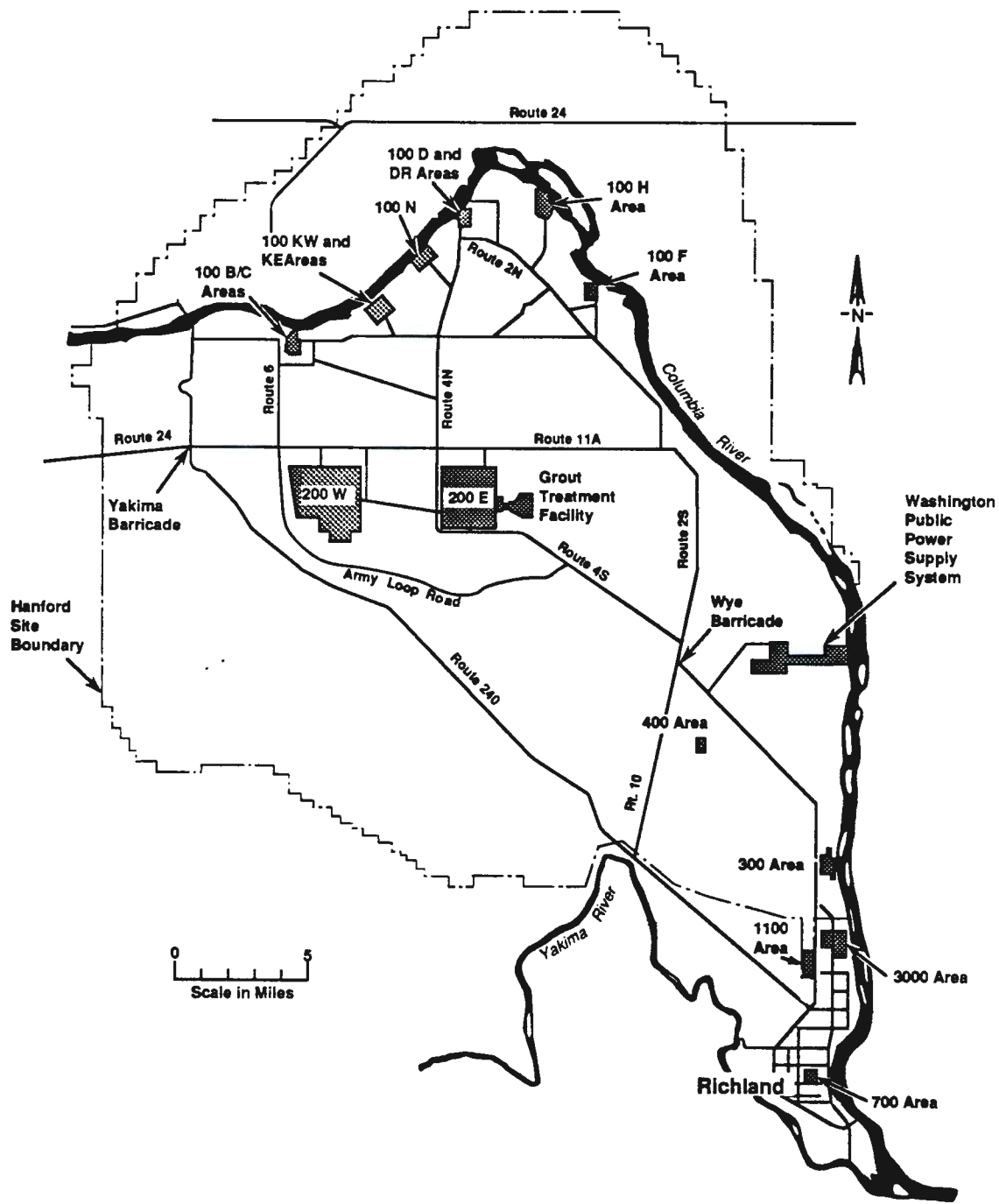


Figure 1. Location of Hanford Site 200 Areas.

The effluents will be sampled, analyzed, and verified as complying with WAC 173-216 discharge acceptance criteria (Ecology 1988) before being released for discharge to the 200 Areas TEDB. The acceptance criteria may include the most restrictive of Primary, Secondary, and proposed Maximum Contaminant Levels identified in the Federal Safe Drinking Water Act (SDWA) and Water Quality Standards for Groundwater, as stated in WAC 173-200. Practical Quantification Limits (lowest value, 40 CFR Part 264, Appendix IX) may be used as the concentration limits for substances not identified in the SDWA or in WAC 173-200. No dangerous waste as per WAC 173-303 will be discharged.

1.2 Objective

The objective of this report is to identify and explain the criteria and the process that will be used to: (a) identify candidate sites for the 200 Areas TEDB, (b) evaluate the relative merits of the candidate sites, and (c) document the choice of an environmentally acceptable site for disposal of the treated effluent.

1.3 Scope

This Technical Program Plan (TPP) addresses the criteria and the process that will be used to determine the location of the 200 Areas TEDB.

A Site Evaluation Report (SER) is required by DOE Order RL 4320.2C (DOE 1990) to ensure that facilities at Hanford comply with functional design requirements while considering human health, environmental protection, cost, and land-use planning factors. This TPP is being released prior to issuance of the SER. The scope of the TPP is limited to identifying the criteria that will be used to determine the preferred site for the 200 Areas TEDB, providing the rationale for using those criteria, and describing the process for applying them. After the TPP is finalized, a tentative site will be selected in accordance with the approved siting criteria and process; this selection will be documented in an SER.

Concurrent with submittal of the SER, plans to confirm the site's environmental acceptability will be issued for review and comment. The site characterization work plan (SCP) will identify the site characterization work, explain why it is needed, describe the methods that will be used to collect and analyze data, and offer a schedule and estimated cost of completion. The relationship of this TPP to the SER and the SCP is summarized in Figure 2. The information resulting from detailed characterization of the site will subsequently be issued in a Site Characterization Report (SCR) (see Fig. 2) that provides hydrologic and environmental assessment information required by

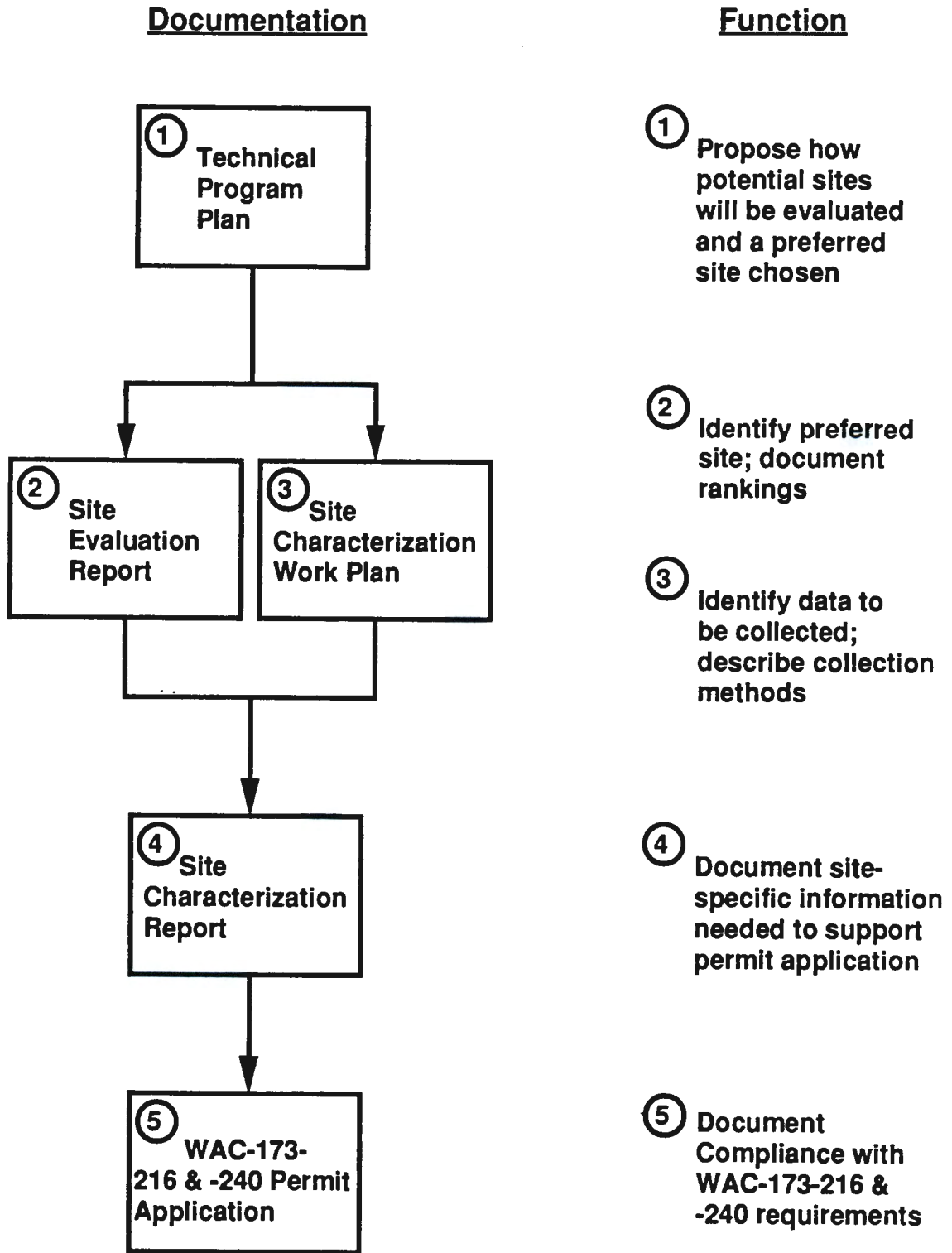


Figure 2. Relationships of the Technical Program Plan to the Site Evaluation Report, Site Characterization Work Plan, and Site Characterization Report.

WAC 173-216 and WAC 173-240.

1.4 Regulatory Considerations

The intent of this TPP is to ensure compliance with the applicable regulatory requirements of WAC 173-216 in identifying an environmentally acceptable site for the 200 Areas TEDB and confirming its suitability. Approval from Ecology will be sought for the 200 Areas TEDB through the Washington State Waste Discharge Permit Program. The purpose of permits issued under the auspices of the administrative code is to comply with Section 307 of the Federal Water Pollution Control Act (33 U.S.C., §1251).

2.0 FUNCTIONAL DESIGN CONSIDERATIONS

Several considerations based on functional design requirements (Crane, Rev. 1 1992) help constrain the areas from which candidate sites for the 200 Areas TEDB can be chosen. These considerations are as follow:

- 30-year design life
- Capacity to accommodate disposal of 2,100 gpm
- Slopes of retention berms that either allow escape of humans or animals, or are fenced to prohibit entry
- An inspection and maintenance road around the infiltration basin
- Underground effluent supply piping protected from freezing.

In addition, the TEDB will be located and designed to minimize the risk of spills, leaks or failure of the containment structures. These considerations require that the effluent disposal facility be located in reasonable proximity to the source of treated effluent, in suitable terrain. A land area is required that is sufficiently large to accommodate infiltration of effluent at the planned rate and duration.

2.1 Risk Factors

Proximity to the effluent source is a major consideration in siting the 200 Areas TEDB. Remoteness from the effluent treatment facility would require more excavation; hence, may increase the risk of disturbing contaminated areas during effluent supply pipeline

construction, and would likely increase the risk of pipeline rupture, leaks or spills during operation. Information is currently available that suggests environmentally acceptable candidate sites are likely available within 2 miles of the collection point near the northeast corner of the 200 East Area. Consequently, a maximum distance of 2 miles from this collection point is arbitrarily used to reduce risks likely to be associated with more distant candidate sites. Only if no environmentally acceptable sites can be identified within 2 miles of this point would a more distant site be selected.

The local relief and slope of the land surface are of principal regard in eliminating from further consideration those areas that are not suitable sites for the 200 Areas TEDB. Locations with elevations lower than that of the collection point would permit gravity flow to the TEDB. Areas with relatively steep slopes and high local relief require significantly more cut-and-fill for berm construction and could pose appreciably greater risk of containment structure failure than those with more gentle slopes and low relief.

For these reasons, gently sloping surfaces with relatively low topographic relief are preferred and a constraint of $\leq 2\%$ maximum slope of the land surface is used to screen unsuitable areas from further consideration. For the general area of interest within 2 miles of the collection point, a more gentle maximum slope is judged to be unnecessarily constraining; steeper allowable slopes are judged to pose unnecessary risks.

2.2 Effluent Capacity and Infiltration Rates

The current functional design criteria for the 200 Areas TEDB and related facilities (Crane 1992) specify that on the order of 2,100 gpm (3,024,000 gpd) will initially be discharged. However, the basin may eventually need to accommodate additional fluxes of effluent, depending on which facilities are operating and which treated waste streams are routed to the basin.

Rates of infiltration of liquid effluent at Hanford have been found to be highly dependent on both the hydrologic characteristics of the location and the chemistry of the effluent. Nevertheless, based on site-specific experience, higher equilibrium rates of infiltration can generally be expected for paired-basin facilities designed to operate in alternating cycles. The alternate wetting and drying cycles inhibit the growth of algae and permit periodic removal of fine-grained siltation or precipitation products that, within a relatively short time, can appreciably reduce the infiltration rate due to clogging of the pore space in the bottom of the pond. For such ponds, experience indicates that infiltration rates on the order of 20 gpd/ft² may in some locations be expected. For designs that do not permit cyclic operation, experience with effluent disposal cribs and the third lobe of the

216-B-3 Pond, immediately east of the 200 East Area, suggests that an infiltration rate of 10 gpd/ft² is generally appropriate for facility sizing.

For purposes of stipulating how much land is needed to construct the 200 Areas TEDB, either an infiltration rate of 20 gdf² can be assumed for a paired-basin design, or a rate of 10 gdf² can be assumed for a larger, single-basin facility that is not designed for cyclic operation; both designs require about the same amount of land. Assuming a rate of effluent discharge of 2,100 gpm and an infiltration rate of 20 gdf², the minimum area of land needed would be 151,200 ft² (3.47 ac). Consequently, a minimum of ~7 acres would be needed for the infiltration surface area of a 200 Areas TEDB that could be operated either with or without alternate wetting and drying cycles. Containment berms and a perimeter inspection road would require ~3 additional acres. Consequently, areas within 2 miles of the effluent collection point with slopes of $\leq 2\%$, but that are smaller than ~10 acres are not considered to be viable candidate sites for the facility.

3.0 CANDIDATE SELECTION CRITERIA

Screening criteria (Westinghouse 1989, 1991) derived from guidelines established in DOE-RL Order 4320.2C, *Site Selection* (1990) and DOE Order 6430.1A, *General Design Criteria*, Section 200-1 (1989) determine whether the areas constrained by the functional design considerations discussed in Section 2 are suitable candidate sites for the 200 Areas TEDB. These screening criteria are:

- (1) Conflict with Current Land Use
- (2) Negative Effect on RCRA, CERCLA or Effluent Disposal Sites
- (3) Negative Effect on Cultural Resources
- (4) Negative Effect on Threatened or Endangered Species.

These criteria provide the means for deciding whether areas with a slope of $\leq 2\%$ that are within 2 miles of the effluent collection point, and that contain a minimum of ~10 acres are worthy of further consideration. Areas that pass these screening criteria are subsequently ranked for relative merit; those that fail the criteria are dropped from further consideration.

3.1 Conflict with Current Land Use

This criterion is needed to ensure that use of a potential site for the 200 Areas TEDB will not conflict with any current use of that site. A conflict that cannot be resolved satisfactorily disqualifies a location from further consideration.

3.2 Negative Effect on RCRA, CERCLA or Effluent Disposal Sites

This criterion is used to ensure that parts of the vadose zone and the unconfined aquifer that are currently contaminated and other areas that are being considered for effluent disposal under the provisions of a WAC 173-216 permit will not adversely be affected by operation of the 200 Areas TEDB. Adverse effects from operation of the facility at a site are defined as follow:

- Effluent is likely to intrude on areas of existing contamination in the vadose zone or unconfined aquifer, causing significant reduction of the projected travel time or increase in the flux of contaminants to the Columbia River or other publicly accessible source of drinking water, or
- The operation of an existing RCRA site would be negatively affected or the remediation of an existing RCRA or CERCLA site would be made more difficult or less effective.

The potential for these adverse effects will be evaluated by computer simulations of the consequences of infiltrating 1,500 to 15,000 gpm of effluent in each candidate area. Conceptual models based on current geologic and hydrologic knowledge of the candidate sites will be used to numerically simulate the effects of the infiltration of effluent discharges. PORFLO-3[©] [Runchal and Sagar (1989), Sagar and Runchal (1989)] , VAM-2D[©], MODFLOW (McDonald and Harbaugh 1988), or equivalent software will be used for the simulations.

These consequences will be reflected by the elevation of the water table, head gradients, up- and down-gradient flow paths, and contaminant travel times during the life of the 200 Areas TEDB and during reversion to the pre-existing gradient of the unconfined aquifer after facility closure. If analysis of this information suggests that effluent disposal at a potential site is likely to remobilize contaminants known to be present in the vadose zone in the vicinity of the site, then that area will be removed from further consideration. Similarly, if the analysis indicates that operation of the facility would significantly shorten the travel time or increase the flux of contamination known to be present in the unconfined aquifer, then that area will be removed from further

consideration.

3.3 Negative Effect on Cultural Resources

This criterion is used to ensure that cultural, historic, or archeological resources are preserved. Information needed to apply this criterion will be provided from field surveys conducted and analyzed by qualified Hanford Site personnel in accordance with the Hanford Cultural Resources Management Plan (Chatters 1989). Sites in areas that adversely affect such resources will be removed from further consideration.

3.4 Negative Effect on Threatened or Endangered Species

This criterion is used to ensure the preservation of threatened or endangered plants or animals. These evaluations will be made by Hanford Site personnel that are qualified to conduct the requisite field surveys and analyze the resulting information. Sites in areas that are judged to be likely to reduce the populations of threatened or endangered species will be removed from further consideration.

4.0 CANDIDATE RANKING CRITERIA

These criteria provide the means to evaluate the relative merits of areas that comply with all of the functional design considerations (see Section 2) and all of the screening criteria (see Section 3). Each ranking criterion is assigned a numerical weighting that reflects its relative importance. Determination of relative importance of the ranking criteria and assignment of weighting are discussed in Section 5.

Because of the potential effects of construction and operation of the 200 Areas TEDB on worker safety and on the unconfined aquifer, two types of criteria were judged to be needed to evaluate the relative merits of candidate areas.

Two candidate ranking criteria relate directly to health and safety:

- (1) Occupational health and safety during construction and operation
- (2) Effect on the unconfined aquifer.

Three subordinate ranking criteria relate to design, construction, and operation of the 200 Areas TEDB:

- (1) Obstructions between the 200 Areas TEDB Candidate Site and the Effluent Treatment Facility
- (2) Interference with the Operation of Other Facilities
- (3) Availability of Adjacent Land for Expansion.

4.1 Safety and Environmental Protection Considerations

These ranking criteria are considered to be of overriding importance; they are used to evaluate the differences between candidate areas that relate to occupational health and safety of construction and operating personnel, to health and safety of the public, and to protection of the environment.

4.1.1 Human Health and Safety During Construction and Operation

This criterion is used to weigh the relative merits of candidate areas with respect to the health and safety of construction and operation personnel. The criterion is applied by using a philosophy of reducing the exposure of workers to hazards to as low as reasonably achievable (ALARA) (Westinghouse 1989).

For example, a candidate site judged to have less likelihood of incurring a risk to workers engaged in excavating and laying of the effluent supply pipeline because of the potential for intersecting an area of contamination would be ranked higher than a candidate site with a longer effluent supply line or one that would cross an area with known or suspected contamination.

Similarly, potential risk to operating personnel that would result from areas of known or suspected contamination in proximity to the facility or its access, if it were constructed at the location being considered, is evaluated by means of professional judgment relative to other candidate sites.

4.1.2 Effect on Potential Ground Water Contamination

Application of screening criterion 3.2, *Negative effect on RCRA, CERCLA or Effluent Disposal Sites*, will ensure that areas with a high risk of adversely affecting known contamination in the vadose zone or unconfined aquifer, or other WAC 173-216 Permit discharges of treated effluent, have been removed from consideration as sites for the 200 Areas TEDB. Hence, the purpose of this criterion of relative merit is to ensure that even a relatively small potential for adverse effects on existing ground water

contamination is accounted for in assessing the merits of alternative candidate sites.

This criterion is applied to ensure that candidate areas which are relatively distant or down-gradient from known or suspected contamination of the vadose zone or unconfined aquifer are ranked higher than those that are closer to, or are up-gradient from, contaminated areas. This criterion is also used to enhance the rankings of candidate areas at which a rise in the water table down-gradient of known contamination would likely reduce or reverse the existing gradient between the contamination and the Columbia River. In such cases, the contaminant travel time would increase and/or the current transport path of the contaminant to the river would lengthen -- both of which would be beneficial effects.

Information on these expectations will be provided by numerically simulating the effects of infiltrating 1,500 to 15,000 gpm of effluent (see Criterion 3.2). Information obtained from characterizing the site selected would be used in subsequent, confirmatory numerical simulations of the effects of operating the facility at that site.

4.2 Design, Construction, and Operational Considerations

These ranking criteria are subordinate to human health and safety criteria and are used to evaluate the differences between candidate areas that relate to the design, construction, and operation of the 200 Areas TEDB.

4.2.1 Obstructions between the 200 Areas Treated Effluent Disposal Basin and the Effluent Collection Point

This criterion is applied to rank the number and magnitude of features between the effluent collection point and the candidate areas that may obstruct construction of the 200 Areas TEDB. Such obstructions could consist of (1) effluent and power supply lines, (2) access roads and rail lines, and (3) areas of surface contamination. Locations that offer the fewest potential obstructions are preferred.

4.2.2 Interference with the Operation of Other Facilities

This criterion is used to evaluate the potential for interference to or from any current operations in the vicinity of the candidate area or between the effluent collection point and the candidate area, primarily during operation of the 200 Areas TEDB. For example, during operation of the TEDB nearby operations could be affected by the local rise in the water table. Similarly, construction or operation of other Hanford Site facilities could interrupt operation of the TEDB. Candidate areas with the least potential for

interfering with other operations are preferred.

4.2.3 Availability of Adjacent Land for Expansion

As indicated in Section 2.2, the capacity of the 200 Areas TEDB may need to be increased. Based on current discharges to various disposal facilities and projected disposal needs, an area sufficiently large to infiltrate on the order of 15,000 gpm (21,600,000 gpd) of effluent may eventually be needed. An area adjacent to the candidate site that is sufficiently large to accommodate a need for expansion of the facility is desirable because of the site characterization, and pipeline or other construction costs that would be required to service another facility at one or more widely separated locations.

Assuming either an infiltration rate of 20 gdf² for paired basins or 10 gdf² for a single-basin design, the infiltration surface needed to accommodate 15,000 gpm of additional effluent discharge would be ~3,160,000 ft², or nearly 50 acres; hence, candidate areas that have at least 50 acres of adjacent land available for facility expansion are preferred.

5.0 SITE SELECTION

As previously noted in Section 4.0, the 5 ranking criteria are not judged to be of equal importance -- environmental safety is judged to be the overriding concern. Consequently, different numerical weights are assigned to each criterion based on professional judgment. Selection of a preferred site for construction of the 200 Areas TEDB will be based on determination of which candidate site scores highest, overall.

5.1 Weighting of Ranking Criteria

Safety and environmental protection are considered to be essential in selecting a site suitable for the 200 Areas TEDB. Hence, 60% of the total candidate site evaluation score is assigned to the criteria described in Section 4.1. The remaining 40% is assigned to the design, construction and operational considerations described in Section 4.2.

Because protection of ground water beneath the Hanford Site and in the Columbia River is essential to public safety, Criterion 4.1.2, *Effect on Potential for Ground Water Contamination*, is assigned a weight of 70% of the criteria of Section 4.1. The remaining 30% is assigned to Criterion 4.1.1, *Human Health and Safety during Construction and Operation*.

Operation of the 200 Areas TEDB is central to plans to comply with environmental regulations for waste disposal and remediation in the 200 Areas. Because of the potentially large volume of treated effluent streams, as discussed in Section 4.2.3, the availability of adjacent land for expansion is judged to merit relatively heavy weighting. Consequently, Criterion 4.2.3, *Availability of Adjacent Land for Expansion*, is assigned a weight of 50% of the criteria of Section 4.2. Of the remaining 50%, half each is assigned to Criterion 4.2.1, *Obstructions between the 200 Areas Treated Effluent Disposal Basin and the Effluent Collection Point* and Criterion 4.2.2, *Interference with the Operation of Other Facilities*.

Figure 3 summarizes the weighting and scoring system that will be used to apply the 5 ranking criteria.

5.2 Selection Procedure

Candidate sites within the areas described in Section 2 will be ranked by persons with demonstrable expertise and experience in pertinent fields:

- Land use planning
- Regulatory permit applications
- Ground water hydrology
- Geological engineering and/or civil engineering
- Environmental science, wildlife biology, zoology, and/or botany
- Occupational health and safety, and
- Construction cost estimation.

Persons ranking the areas will be asked to (1) judge the suitability of an area as a candidate site and (2) rank the candidate sites by means of the criteria and weighting system summarized in Figure 3. Panelists will apply only those criteria that pertain to their fields of expertise. The raw and weighted scores will be computed for each criterion of relative merit. The scores will be summed and the candidate sites will be ranked accordingly.

Candidate Site	Safety and Environmental Protection Criteria (60%)					Design and Constructibility Criteria (40%)								Score Totals	
	Potential Effect on Ground Water and Existing Contamination (70%)			Potential Effect on Occupational Health and Safety (30%)		Availability of Adjacent Land for Expansion (50%)		Obstructions Between LERF and 200 Areas TEDB (25%)			Interference with Operations of Other Facilities (25%)			Raw	Weighted & Normalized to 100 %
	Negative	Neutral	Positive	Elevated Risk	Minor Risk	No	Yes	Substantial	Some	None	Substantial	Some	None		
	Ranking Score														
0	40	70	15	30	0	50	0	10	25	0	10	25			
A															
B															
C															
D															

Figure 3. Summary of Weighting and Scoring for Candidate Ranking Criteria.

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