9513347.0036

START

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004437

MEETING MINUTES

Type	Meeting No.	Date
Comment Discussion/Agreement Meeting	NA	6/22/94

Project or Work Order No. and Title
200-ZP-1 OU

References
Treatability Test Plan for the 200-ZP-1 Operable Unit (DOE/RL-94-12)/NPL Agreement Form

Attendees
R. A. Carlson
D. A. Faulk
P. M. Pak
D. L. Parker
Jeff Ross
Jim Consort
K. R. Simpson
Ross Potter

Distribution
Attendees
H. D. Downey
D. Goswami
G. C. Henckel
ZP-1 Project File

FEB 1995
RECEIVED
EDMC

The meeting was held at 2440 Stevens Center. Dan Parker stated that the subject of the meeting had changed in the rescheduling process and verified that everyone understood that the subjects of this meeting are (1) the selection of two wells to support the 200-ZP-1 treatability test, and (2) to finalize responses to EPA's comments on the Treatability Test Plan for the 200-ZP-1 Operable Unit (DOE/RL-94-12).

Mr. Parker distributed an NPL agreement form (Attachment 1) identifying the chosen wells and stating that groundwater will be reintroduced at carbon tetrachloride concentrations above MCLs. Discussion followed as to the efficiency of the system and it was agreed that the system might in fact treat groundwater to levels below MCLs. It was proposed that the text of the NPL Agreement Form be changed to say the groundwater will be reintroduced at carbon tetrachloride concentrations that may be above MCLs. Discussion switched to the IRM Proposed Plan for 200-ZP-1 and Dennis Faulk stated that he would like to add verbiage to the proposed plan to say that ARARs may need to be waived. Mr. Faulk went on to say that his schedule is to try to issue the Proposed Plan for public comment on July 27.

Reed Simpson of WHC Geosciences gave a presentation on the well selection process. Copies of the handout he had distributed at the May unit managers meeting were distributed (Attachment 2). Mr. Simpson noted that although the handout was distributed at the May meeting, the presentation was not given. The two wells are 299-W18-1 for withdrawal and 299-W18-4 for reinjection. Well 299-W18-3 may be tested later as a possible back-up reinjection well to be used in the event that 299-W18-4 becomes plugged during the course of the treatability test. Mr. Pak questioned the need for a back-up reinjection well. Mr. Simpson explained the possibility of fowling the reinjection well during the treatability test. In response to a question, Mr. Parker stated that the treatability test is planned for 5-months to provide 90-days worth of operating data, and that without an alternate reinjection well, the test may need to be stopped while an alternate is found. Mr. Pak indicated that discussions with Bechtel Hanford Incorporated (BHI) have indicated that treatability testing may be of little value and will probably be a much shorter effort than the 5-months currently envisioned.

Mr. Pak said that the treatability testing will not give us all the answers to scale-up to a 150 gpm unit. Mr. Pak went on to say that BHI is evaluating where the project is going

Prepared By	Approved By
D. L. Parker 7/25/94	R.A. Carlson 7/25/94
Title 200-ZP-1 OU Coordinator	Title 200 Area Groundwater Group Manager

and questions the usefulness of producing an IRM proposed plan at this time rather than waiting for the results of the treatability test. Mr. Faulk said that we have to make the assumption that pump and treat is going to work, and that an amendment to the interim action record of decision (IROD) will be prepared if it is found the pump and treat is not effective. When asked what DOE would propose, Mr. Parker responded that DOE/WHC had proposed an alternate approach in the February 1994 UMM, but that approach had been rejected by EPA. In response to Mr. Pak's assertion that the treatability test will not give us all the answers to scale-up to 150 gpm, Mr. Parker stated that it was never intended to. The treatability testing was only a part of the IRM which was to consist of additional studies such as the DNAPL Investigation and a groundwater sampling and analysis program. Mr. Parker said that he is concerned that the latest draft of the IRM Proposed Plan no longer mentions the DNAPL Investigation. Discussion followed concerning the DNAPL Investigation and the possibility of DNAPL being present. Mr. Faulk indicated that Ecology is very interested in learning what is being planned for the DNAPL Investigation. Mr. Parker responded that the presentation at the upcoming unit managers meeting should address some of the issues. Messrs Pak and Faulk agreed to meet to discuss the 200-ZP-1 approach further. At this point, Messrs Pak and Consort left to attend another meeting.

The subject of the treatability test plan comments (Attachment 3) were discussed. EPA asked for clarification of the disposition of comment number 12. It was explained that the text of the test plan is based on the actual contracts that are in place, and that the response is appropriate as written. After further discussion it was agreed that the response is acceptable. All other responses were acceptable and the treatability test plan will be finalized. At this point, Mr. Ross Potter left the meeting.

At this point Mr. Simpson completed his presentation on the well selection process. Mr. Faulk agreed to sign the NPL Agreement Form with the modification mentioned above. At this point Mr. Simpson left the meeting.

Mr. Faulk then asked that the ARAR letter be finalized and transmitted to the Administrative Record. Mr. Faulk was told that the request should be made to Mr. Pak. Discussion followed as to the ARARs that would be applicable to the 200-ZP-1 and substantive requirements of RCRA for the treatment system design. Dennis Faulk briefly described the letter received from DOE on the listed waste issue. Mr. Parker said that he had not seen a copy of the letter and was not sure of it's content, but that he didn't think it discussed substantive requirements of RCRA for treatment units such as secondary containment. Mr. Faulk questioned why secondary containment would be needed as the groundwater is already contaminated and if there were a leak it would have no effect. Mr. Parker said that a statement should be added to the ARAR letter stating that the treatment system is considered an RD&D unit under RCRA, and that no secondary containment would be required. Mr. Faulk questioned whether that much detail would be required in the ARAR letter.

Prepared By	Approved By
D. L. Parker 7/25/94	R.A. Carlson RACarlson 7/25/94
Title 200-ZP-1 OU Coordinator	Title 200 Area Groundwater Group Manager

ATTACHMENT 1
(NPL AGREEMENT FORM)

Prepared By	Approved By
D. L. Parker 7/25/94	R.A. Carlson 7/25/94
Title 200-ZP-1 OU Coordinator	Title 200 Area Groundwater Group Manager

9513347.0039

Control Number:	**200 NPL Agreement/Change Control Form** __ Change _X Agreement __ Information Operable Unit(s): 200-ZP-1	Date Submitted: June 14, 1994 Date Approved:

Document Number/Title: Treatability Test Plan for the 200-ZP-1 Operable Unit.	Date Document Last Issued: N/A
Originator: D. L. Parker	Phone: 372-1031

Summary Description: Ecology, EPA and DOE Unit Managers for Groundwater Operable Unit 200-UP-1 agree to initiate the 200-ZP-1 pilot-scale treatment test using well 299-W18-1 as an extraction well and 299-W18-4 as a return well. Both wells are located north of the 216-Z-18 Crib and south of 234-5Z Building. Treated groundwater will be returned via well 299-W18-4 at carbon tetrachloride concentrations above maximum contaminant levels (MCLs). Returning treated groundwater via down gradient well 299-W18-4 is expected to minimize the potential for establishing a recirculation cell between the extraction and return wells. A site plan showing the location of these two wells with respect to adjacent facilities and the treatment test site is attached.

Justification and Impact of Change:

WHC Operable Unit Coordinator	Date
DOE Unit Manager	Date
Ecology Unit Manager	Date
Env. Protection Agency Unit Manager	Date

Per Action Plan for Implementation of the Hanford Consent Order and Compliance Agreement Section 9.3.

9513347.0040

ATTACHMENT 2
(WELL SELECTION HANDOUT)

Prepared By	Approved By
D. L. Parker 7/25/94	R.A. Carlson RA Carlson 7/25/94
Title 200-ZP-1 OU Coordinator	Title 200 Area Groundwater Group Manager

200-ZP-1 PILOT SCALE PUMP AND TREAT OPERATIONAL TESTING

PROPOSED EXTRACTION AND INJECTION WELLS

Reed Simpson

Water Resources Engineering Group
Westinghouse Hanford Company

May 26, 1994

9513347.0041

WELL SELECTION CRITERIA

GENERAL CRITERIA:

- EXISTING WELL
- ACCESSIBILITY
- HIGH CONCENTRATION AREAS OF CARBON TETRACHLORIDE GROUNDWATER PLUME
- MINIMAL IMPACT ON EXISTING PROGRAMS
- EXISTING HYDROLOGIC AND HYDROCHEMICAL DATA
- AVAILABILITY OF MONITORING WELLS
- MINIMAL IMPACT ON OTHER GROUNDWATER PLUMES
- MINIMAL RECIRCULATION POTENTIAL WITHIN SCOPE AND TIME FRAME OF TEST

9513347.0042

WELL SELECTION CRITERIA

EXTRACTION WELL DESIGN CRITERIA:

- UPPER UNCONFINED AQUIFER (10 m)
- CONCENTRATIONS OF CARBON TETRACHLORIDE >1000 PPB
- CONCENTRATION OF OTHER VOC CONTAMINANTS
- MINIMUM PRODUCTION CAPACITY OF 17 GPM
- SCREENED WELLS GIVEN PREFERENCE OVER PERFORATED WELLS

INJECTION WELL DESIGN CRITERIA:

- UPPER UNCONFINED AQUIFER (10 m) AND/OR VADOSE ZONE BELOW PLIO-PLEISTOCENE UNIT
- GROUNDWATER CONCENTRATIONS OF CARBON TETRACHLORIDE ABOVE PREDICTED EFFLUENT CONCENTRATIONS
- NO CO-CONTAMINANTS IN VADOSE ZONE (I.E., RADS)
- MINIMUM INJECTION CAPACITY OF 17 GPM (30-40 GPM PREFERRED)
- SCREENED WELLS GIVEN PREFERENCE OVER PERFORATED WELLS

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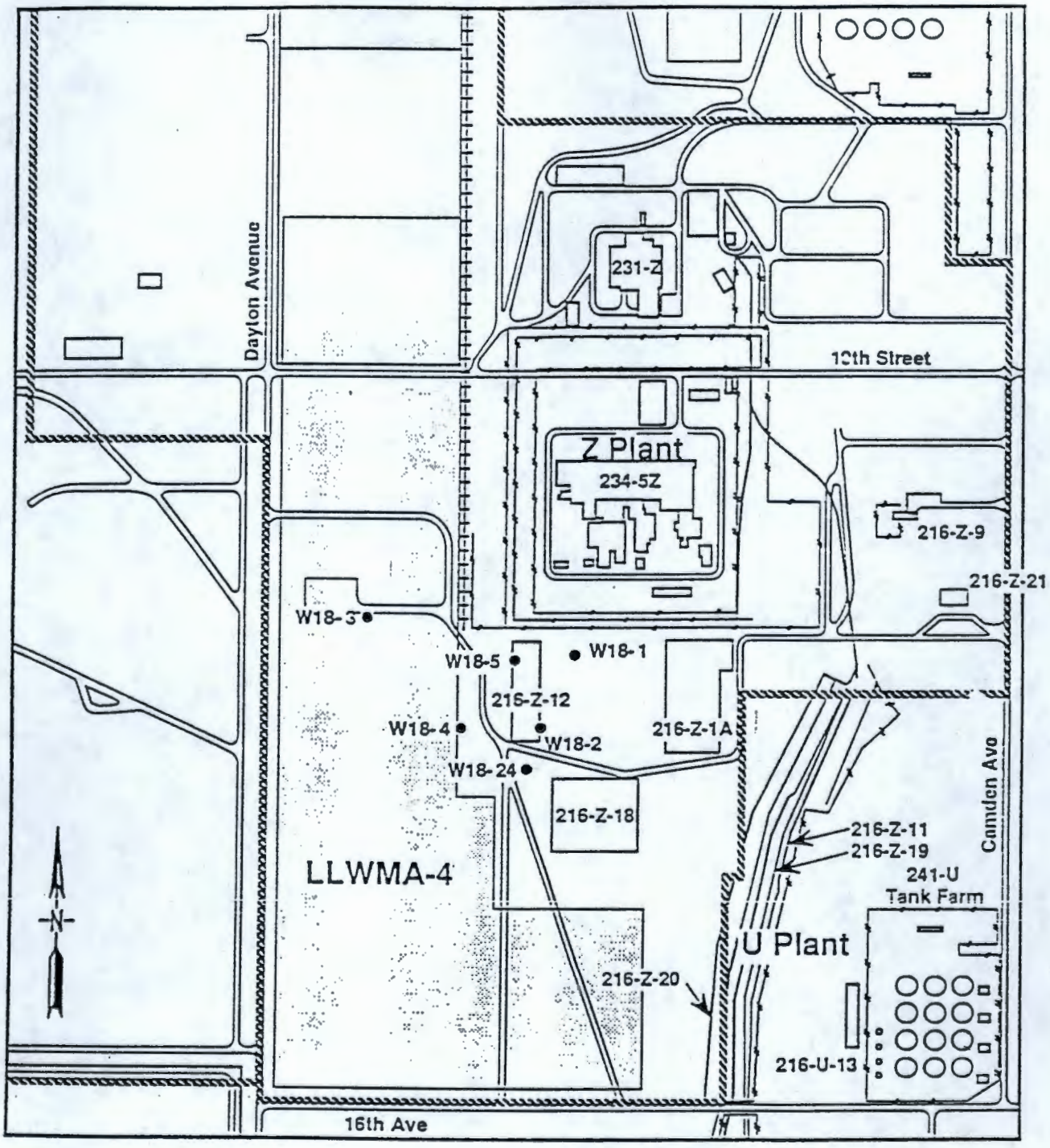
9513347.0044



RESULTS OF WELL SELECTION SCREENING

WELLS TARGETED FOR EXTRACTION OR INJECTION:

299-W18-1
299-W18-2
299-W18-3
299-W18-4
299-W18-5
299-W18-24

DESIGN CRITERIA ASSESSED BY:

REVIEW OF EXISTING DATA

FIELD SURVEYS

HYDRAULIC TESTING (Step drawdown or constant head injection)

GROUNDWATER SAMPLING

9513347.0045

RESULTS OF WELL SELECTION SCREENING

RECOMMENDED EXTRACTION WELL:

299-W18-1

DESIGN CHARACTERISTICS -

VOC CONCENTRATIONS

Carbon Tetrachloride = 2242 ppb; TCE < 5 ppb; Chloroform = 25 ppb

SATURATED INTERVAL = 154 ft. (perforated); Packed off to isolate upper 10 m of aquifer

PRODUCTION CAPACITY = 9.5 gpm/ft. or 114 gpm over 1/2 the packed off saturated interval

9513347.0046

RESULTS OF WELL SELECTION SCREENING

RECOMMENDED INJECTION WELL:

299-W18-4

DESIGN CHARACTERISTICS -

VOC CONCENTRATIONS

Carbon Tetrachloride = 1954 ppb (increased during purging)
Vapor sampling w/ SeaMist system detected no vapors*

PRESENCE OF CO-CONTAMINANTS IN VADOSE ZONE -

No man-made gamma-emitting rads identified by RLS

SATURATED INTERVAL = 21 ft. (perforated w/ screen liner) 22 ft. of open interval above static water level

INJECTION CAPACITY = 40 gpm w/ 25 ft. of head above static water level*

DISTANCE FROM EXTRACTION WELL = 433 ft.

WELL 299-W18-3 TENTATIVELY IDENTIFIED AS ALTERNATE INJECTION WELL

9513347.0047

9513347.0048

ATTACHMENT 3
(TREATABILITY TEST PLAN COMMENTS)

Prepared By D. L. Parker 7/25/94 Title 200-ZP-1 OU Coordinator	Approved By R.A. Carlson RA Carlson 7/25/94 Title 200 Area Groundwater Group Manager

9513347.0049

[106] From: Danny L Parker at ~WHC304 6/21/94 3:00PM (36542 bytes: 5 ln, 1 fl)
To: Dennis A Faulk at ~TPA1
cc: Paul M Pak at ~DOE6, Danny L Parker, Richard A Carlson at ~WHC249,
George C III Henckel at ~WHC300, Harold D (Hal) Downey at ~WHC57
Subject: Revised Draft Responses to EPA Comments on the 200-ZP-1 TTP
---------- Message Contents ----------

Text item 1:

Paul Pak asked that I cc:mail the attached file to you. The attached file contains the revised responses to your comments on the ZP-1 TTP. Responses that were modified will print-out in redline so that you may see the changes. We will be discussing these responses at tomorrow's meeting.

9513347.0050

File item 2: ZEPA.CRF 6/20/94 7:32PM

9513347.0051

ENVIRONMENTAL RESTORATION ENGINEERING
COMMENT RECORD FORM

1. Date May 11, 1994 2. Page 1 of 11

3. Document Title/Number DOE/RL-94-12, Pilot-Scale Treatability Test Plan for the 200-ZP-1 Groundwater Operable Unit, Draft A

4. Lead Engineer/Scientist D. L. Parker 5. Organization WHC/RR/ENV

6. Location/Phone/MSIN 2440 Stevens/2-1031/H6-03

7. Reviewer Dennis Faulk 8. Organization EPA/REG
Sign and Print Name Date

9. Location/Phone/MSIN 712 Swift/6-8631/B5-01

10. The document was reviewed, and the reviewer had no comments.

Reviewer _____ 11. Date _____

12. I have reviewed the disposition of comments with the Lead Engineer/Scientist.

Reviewer _____ 13. Date _____

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
	SPECIFIC COMMENTS:	
1.	Executive Summary, page ES-1, 3rd paragraph. In line 11 remove the word potential.	Accept. The words "a potential" on lines 30 - 31 will be replaced with the word "an".
2.	Executive Summary, page ES-1, 2nd bullet, line 39. EPA is not aware of any laboratory tests to be run in conjunction with this treatability test. Please provide rational and justification for the paragraph.	Accept. Laboratory treatability testing is not a component of this test plan, and the reference to laboratory testing will be removed.
3.	Section 1.0, page 1-2, first full paragraph. The text states that any residual contamination not addressed in the interim action record of decision should be addressed in the final remedy selection process. The text should clarify that this residual contamination refers to the aquifer and not process residuals. All process-related residual contamination should be addressed during implementation of this interim action.	Accept. The following text will be inserted between "contamination" and "not" on line 23; "remaining in the 200-ZP-1 Operable Unit groundwater and".

ENVIRONMENTAL RESTORATION ENGINEERING
COMMENT RECORD FORM (cont.)

Reviewer EPA/Ecology

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
4.	**Section 1.0, page 1-2 2nd paragraph, lines 10-25.** This paragraph discusses the IRM proposed plan, many of the statements in this paragraph are outdated and of little relevance. EPA recommends this paragraph be re-written to focus on the relationship and purpose of the treatability test in gaining information on the appropriate stream treatment option and information that will be gained to optimize the IRM.	Accept in part. The dates will be ~~updated in~~removed from the text~~ to reflect the latest schedule~~. However, the paragraph as written provides a general overview of the IRM process and will be retained.~~ Expected dates of issuance for the IRM Proposed Plan and the Interim Action ROD must be based upon information provided by EPA.~~ The schedule presented in Section 7.0 will also be updated.
5.	**Section 1.0, page 1-2, 4th paragraph, line 39-47.** In regards to this paragraph, EPA recommends that it be removed or rewritten to be consistent with the IRM proposed plan. It appears that this paragraph presupposes failure for the pump and treat operation. Whereas EPA believes that this action has a high probability of success in meeting the intention of the IRM of mass reduction.	Accept. While WHC disagrees that the paragraph implies a presumption that pump and treat will fail, the paragraph will be modified to delete the first sentence and the word "Nevertheless". The remainder of the text will be retained.
6.	**Section 1.1.2, page 1-4 and 1-5, bullets 1 and 4.** As stated in the general comments above, field investigations for the purposes of enhancing the remedial action and any additional risk assessment will be initiated after the IRM is initiated. The text should be changed to reflect this.	~~Reject.~~Accept. The text ~~only~~ discusses additional activities that are expected to be undertaken at the 200-ZP-1 Operable Unit~~. There is no indication of~~without indicating when these may occur relative to initiation of the IRM~~ because, pending final issuance of the IRM Proposed Plan and Interim Action ROD and concurrence on an IRM schedule, it would be premature to do so~~. The text has been clarified in accordance with the commenter's recommendation.
7.	**Section 1.3, page 1-7, line 33-35.** The number given for the amount of carbon tetrachloride of 19,300 and 19,800 lbs appear to be inconsistent. The numbers should be checked for inaccuracies.	Accept. The numbers were checked and no inaccuracies exist. Plume mass estimates reflect calculations made by different studies, which are included in the test plan text as references. To clarify that there may be differences between estimates, the following sentence will be added at page 1-7, line 32, at the beginning of the paragraph: "Estimates of carbon tetrachloride mass contained within the plume vary."

ENVIRONMENTAL RESTORATION ENGINEERING
COMMENT RECORD FORM (cont.)

Reviewer EPA/Ecology

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
8.	Section 1.3, page 1-7, line 50-53. This section discusses current receptors for the plume. The first part of this section refers to no existing human or ecological receptors associated with direct exposure. However the next sentence states that carbon tetrachloride is being released by well venting and passive venting. Human and ecological receptors are present in the 200 area. This section should be clarified.	Accept. While venting of carbon tetrachloride vapor is primarily from the vadose zone, there is a possibility of human exposure by passive venting from wells screened in the aquifer, as well as through drilling activities and well purging (both of which are monitored by H&S personnel to limit exposure). There are no known current users of the aquifer. The sentence "There are no...exposure to the IRM plume" (at page 1-7, lines 50-51) will be removed, and the next sentence will have the word "however" deleted.
9.	Section 3.0, page 3.1, 3rd paragraph, line 27-30. This section discusses the removal efficiency(90%) and mass of contaminate removal (.3 lbs/day). An explanation of how these goals where derived should be provided in this plan.	Accept in part. The text reflects the goals specified in Revision 0 of the 200-ZP-1 IRM Proposed Plan (DOE/RL-93-68, Revision 0). The goal of 90% removal efficiency is based upon EPA guidance for treatability testing. The basis for the 90% removal efficiency will be explained in the treatability test plan. The 0.3 lb/day was based upon treating groundwater with a concentration of 1000 ppb at 100 gpm with a 90% removal efficiency. Latest negotiations between EPA and DOE have resulted in the 0.3 lb/day goal being removed from the IRM Proposed Plan, and it, therefore, will also be deleted from this treatability test plan. The text will also be clarified to reference the source of the 90% removal efficiency back to the EPA guidance.

ENVIRONMENTAL RESTORATION ENGINEERING
COMMENT RECORD FORM (cont.)

Reviewer EPA/Ecology

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
10.	Section 3.1, page 3-2, 2nd bullet. Assessments of operating parameters(eg, flow rates, chemical doses, residence time, pH, oxidation/reduction potential) is proposed to optimize treatment efficiency. The text should explain the way these operating parameters will be verified during the test to optimize treatment efficiency. A range of values for these operating parameters should be specified.	~~Reject.~~Accept in part. Tables 3-1 and 3-2 address how operating parameters will be measured and verified (as does the quality assurance plan). The ranges of operating parameters are only generally known at this time. The operating parameters will be determined and described in the operating procedures for the system(s). Generally, the flow rates will be based on the maximum sustained capacity available from the groundwater extraction well(s) (as long as an empty bed contact time of greater than approximately 15 minutes is maintained for the GAC vessels and 10 minutes for the UV/oxidation reaction chamber). The UV/oxidation system can vary the pH and oxidation/reduction chemical addition doses; however, the chemical addition rates cannot be finalized until the system is operating, the commercial chemicals to be used are determined, and the flow rates capable of being sustained through the UV/oxidation unit are established. These operating parameters will be described in the operating procedures for the system(s), but the full range that may be available cannot be determined until the system(s) are operational. Text similar to the above will be incorporated into Section 4.2.1 for clarity.
11.	Section 3.2, page 3-3, bullets 1-2. Remedial project managers and unit managers are the same people therefore delete one of the bullets.	Accept. The term "remedial project manager" will be changed to "project manager".

ENVIRONMENTAL RESTORATION ENGINEERING
COMMENT RECORD FORM (cont.)

Reviewer EPA/Ecology

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
12.	**Table 3-1, page 3T-1a.** As described in Section 2.0 of the test plan, an indicator parameter such as total organic carbon (TOC) will be used to monitor for breakthrough of the carbon columns. TOC is not listed as a parameter to be monitored. TOC or another suitable parameter for monitoring breakthrough should be included in this table.	Accept. TOC has been added to the list of process chemistry parameters under "Parameters to be Obtained, Operating Parameters" in Table 3-1. However, the engineering assumption that TOC will be an appropriate indicator for breakthrough in the proposed treatability test is based on reported operating experience in treatment systems that are similar, but not identical, to the proposed treatment system. If test operations show that TOC is not a practical indicator for the proposed system, other indicators will be considered.
	In addition, the contract required detection or quantitation limit for carbon tetrachloride and trichloroethylene (TCE) should meet the maximum contaminant limit of 5 micrograms per liter. This comment also applies to Table 3-2.	Reject. The treatability test objective is to remove at least 90 percent of each of the primary contaminants, not to treat groundwater to achieve Maximum Contaminant Levels. The CRDL/CRQL values included in Tables 3-1 and 3-2 for carbon tetrachloride and trichloroethylene are derived from contract laboratory guaranteed detection and quantitation limits. Typically, the laboratory is reporting detection limits of less than 1 µg/L. Given the initial starting concentration for carbon tetrachloride, and the likely treatment efficiencies, the detection limits are anticipated to be more than adequate to support the degree of precision required to measure test performance.

ENVIRONMENTAL RESTORATION ENGINEERING
COMMENT RECORD FORM (cont.)

Reviewer EPA/Ecology

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
13.	Section 4.1, page 4-2, first paragraph. Well 299-W18-1 is recommended for the groundwater extraction well. There are a few concerns about the proposed extraction well. No carbon tetrachloride, chloroform, or TCE contaminant concentration data are presented for this well. If the contaminant plume is concentrated in the upper portion of the aquifer, the withdrawal of water from well 299-W18-1 (screened interval approximately 210 feet) may result in significant dilution. Therefore, this well may not supply water with an influent concentration of 1,000 parts per billion of carbon tetrachloride as stated in the test performance objectives (Section 3.0). Additionally, groundwater flow directions in the vicinity of the test site should be demonstrated with a potentiometric surface map. The 200-ZP-1 IRM proposed plan contains contradictory information with respect to the groundwater flow direction. The test wells should be selected to prevent establishing a groundwater recirculation system. Based on the available contaminant data, wells 299-W18-2 and 299-W18-5 should be reconsidered as potential extraction wells. Well 299-W18-5 may be adequate at 13,500 gallons per day, or yield may be improved if it is redeveloped. If these wells are not suitable for extraction, the test plan should propose a new well meeting the evaluation criteria for the extraction well.	Accept in part. Well 299-W18-1 was identified as the extraction well based on data collected during well usability testing activities conducted over the last several months. Groundwater sampling conducted as part of the well usability testing indicates that Well 299-W18-1 exhibits concentrations greater than 2000 ppb for carbon tetrachloride and 25 ppb for chloroform (no TCE was detected). Hydraulic testing in Well 299-W18-1 indicates the well is capable of producing over 100 gpm from the upper 10 meters of the unconfined aquifer. To limit dilution effects, the well has been sealed with an inflatable packer at a depth of approximately 10 meters below the static water level in the well. The potentiometric surface of the unconfined aquifer in the test area is essentially flat, although there appears to be a slight gradient to the west on a larger scale. Inclusion of a potentiometric surface map specific to the test area would not be feasible given the lack of any significant gradient. ~~The larger scale potentiometric surface map for the 200 West Area~~A groundwater flow direction map for the vicinity of the test site will be included to give the reader a better understanding of general flow directions in the general vicinity of the treatability test site. Criteria used to identify extraction and injection well sites included the need to minimize the potential for recirculation. We believe that the current configuration of Well 299-W18-1 as the extraction point and Well 299-W18-4 as the injection point accomplishes this. A

ENVIRONMENTAL RESTORATION ENGINEERING
COMMENT RECORD FORM (cont.)

Reviewer EPA/Ecology

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
		numerical simulation of this test configuration is being developed to provide a better understanding of how the groundwater flow system will likely respond under the anticipated extraction and injection flow rates. It should be noted that these two wells are separated by approximately 430 feet with Well 299-W18-4 situated west-southwest (down gradient) of Well 299-W18-1. Well 299-W18-5 and 299-W18-2 were tested during the well usability testing program; good flow rates and adequate concentration levels were achieved from Well 299-W18-5 while 299-W18-2 did not exhibit adequate extraction capacity; probably the result of poor construction characteristics. We believe well 299-W18-1 provides the best extraction well since it is located away from the nearby Z-Cribs and exhibits good extraction capacity and concentration levels. 299-W18-5 could be used as an alternate extraction well if needed, however. Text similar to the above explanation will be incorporated into Section 4.1 to provide clarity. In addition, the text will be revised to indicate that 299-W18-4, rather than 299-W18-5, will be used as the injection well. A brief listing of concentrations of primary contaminants expected in the ~~treated~~ groundwater ~~to be reinjected~~at the extraction and injection wells will be included.

ENVIRONMENTAL RESTORATION ENGINEERING
COMMENT RECORD FORM (cont.)

Reviewer EPA/Ecology

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
14.	Section 4.1, page 4-2, third paragraph. The text states that groundwater monitoring wells are identified in Appendix D and that well construction details are given in Table 4-1. The text in Appendix D does not specify monitoring wells. The reviewer assumed that wells 299-W18-2, 299-W18-3, 299-W18-6, and 299-W18-8 identified in Figure D-1 are monitoring wells. Monitoring well 299-W18-6 has a screened water thickness of 1 foot. The water level in well 299-W18-6 may drop below the 1-foot screened interval, making it nonusable. The screened interval and screened water thickness are not reported for well 299-W18-8 in Table 4-1. The IRM proposed plan should identify additional wells or propose new wells for groundwater quality and water level monitoring during the treatability testing, as appropriate based on the location of the selected extraction well.	Reject. A groundwater monitoring program to support the treatability test is detailed in a groundwater sampling and analysis plan (SAP) soon to be released for regulatory review. The groundwater SAP identifies Wells 299-W18-2, -5, and -24 for groundwater monitoring during the treatability test. Identification of these wells in the treatability test plan would be beyond its scope and premature until the groundwater monitoring program and SAP have been reviewed and concurred with. However, for clarity, reference to the soon to be released SAP (Ford 1994) will be included in the text.

9513347.0059

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
15.	Section 4.2.1, page 4-3, first paragraph. A range of design flows for the activated carbon and ultraviolet/oxidation systems are presented. The text does not provide a basis for selecting these design flow rates. The source of these values including appropriate references should be included in the text.	~~Reject. Too much detail for the treatability test plan. However, for the commenter's information, t~~Accept. The range of design flows is based on the combined consideration of the following criteria/guidelines: · The sustained capacity expected from the groundwater extraction well(s). · The maximum hydraulic treatment capacity available for the GAC system and the UV/oxidation system. The GAC system capacity is based on the empty bed contact time resulting from using the vessels supplied by EPA for the project (between approximately 15 and 40 minutes depending on the flow rate and installed carbon bed depth in each vessel). The UV/oxidation system is based on the detention time available in the UV/oxidation reaction chamber (approximately 15 minutes at a flow rate of 10 gpm). · Implementation of a pilot-scale treatment system having sufficient capacity amenable to scale-up to a full size treatment system. Text similar to the above information will be added as a new second paragraph to Section 4.2.1.

9513347.0060

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
16.	Section 4.3.2, page 4-8, fourth paragraph. The text states that the carbon usage rate will be estimated by varying the system flow rate. The way this rate will be estimated is not defined. An experimental design matrix should be provided. The two objectives of this study are as follows: (1) determine whether 90 percent of the three contaminants of concern can be removed and (2) determine whether a target mass reduction for carbon tetrachloride can be achieved. Therefore, this treatability test should determine the optimum flow rate through granular activated carbon (GAC) contactor with a fixed volume that achieves the desired removal rate or mass reduction. If either of the two objectives cannot be met, the test should determine the flow rate that achieves the highest removal rate and mass reduction. Once the design flow rate for optimum performance is found, the GAC contactors can be operated to determine the carbon usage rate for the optimum flow rate. If this is the method that will be used to determine the carbon usage rate, an appropriate discussion should be included. If this method will not be used, the planned method for determining carbon usage rate should be identified.	~~Reject.~~Accept in part. The text only states that "the system flow rate is the only operating parameter that can be varied" for the GAC treatment system. The method planned for determining the carbon usage rate is to maintain as high a constant, steady-state flow rate through the system as is possible given the sustained capacity available from the groundwater extraction well(s). The flow rate is limited based on a minimum and maximum empty bed contact time of greater than approximately 15 minutes and less than 40 minutes in the GAC vessels, respectively. The flow rate will be determined by the system operating procedures, the demonstrated groundwater yield, and the depth of the carbon bed installed in each vessel. The treatability test will be performed based on a selected flow rate (and corresponding empty bed contact time) and the GAC contactors operated until a predetermined percent breakthrough of the primary contaminants. The contaminant breakthrough curves recorded by the test data may be used to calibrate computer models that could then be used to assess the impacts of different flow rates, empty bed contact times, or other design parameters on the corresponding carbon usage rates and contaminant removal rates. Text similar to the above will be incorporated in Section 4.3.2 to provide clarity.

ENVIRONMENTAL RESTORATION ENGINEERING
COMMENT RECORD FORM (cont.)

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Reviewer EPA/Ecology

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
17.	Section 4.3.4, page 4-9, 1st paragraph. This section discusses the level of analysis that will be performed during the test for process monitoring including level V analysis. However section 3.2 on DQO's has no mention of level V analysis. This discrepancy should be corrected.	Accept. The commenter is correct. Level V data analyses will not be required except in the Waste Control Plan for purposes of waste acceptance and disposal. Thus, Table 3-2 under "Appropriate Analytical Level or Implementation Guidelines", and the text in Section 4.3.4.1, lines 29 and 43, will be changed to delete reference to Level V and include only Level III.
18.	Appendix B, page B-1, 2nd paragraph. This section discusses approval of the waste control plan. The language in this section states that EPA is required to approve this waste control plan. However, per EII 4.3 instead of EPA being required to approve the waste control plan, it should be submitted for our approval. Also, usually an agreement form is initiated with a signature area for all three agencies to concur with waste handling practices. Also EPA would like to discuss options other than disposal as hazardous waste for the spent carbon.	Accept. The WCP is currently in the process of being submitted ~~for approval~~to and approved by DOE, EPA, and Ecology. The final WCP, once approved, will be ~~incorporated into the test plan~~a standalone document. It was originally included in the test plan to facilitate review of expected waste control procedures. Due to issues still being resolved, the WCP will be removed from this test plan and referenced instead. Outstanding questions, such as options other than disposal as hazardous waste, will be resolved during the approval process.
19.	Appendix B, page B-1, last paragraph. The text states that the GAC will be sampled and analyzed for volatile organic compounds (VOC). If the system is operating correctly, the GAC will be loaded with VOCs. The purpose of this testing should be explained in the text.	Accept. ~~No change to document pending resolution during the WCP approval process.~~See response to Specific Comment 18. For the commenter's information, VOC analyses are required by WHC's internal waste acceptance criteria.