Response to the Colorado Department of Public Health and Environment
Hazardous Materials and Waste Management Division

comments on

Draft Solar Ponds Plume Decision Document
January 5, 1999

1. Sections 2.2 & 2.4.2 (pages 15 & 22); Tables 2-1, 2-2, 2-3 & 2-5 (pages 12,13, 14 & 25) These text and tables mention several metals in the plume which exceed surface water and groundwater action levels, plus some metals and organic chemicals which exceed soil action levels. The document does not explain if and how the proposed technology will remediate these chemicals in the groundwater to below the standards and action levels.

Although exceedances of surface water standards and action levels are noted in the text and specifically on Tables 2-3 and 2-5 for groundwater in the Solar Ponds Plume (SPP), an analysis of metals distribution and occurrence in the SPP was conducted as part of Sampling and Analysis Plan (SAP) development and it was concluded that there is no indication of a metals plume from the Solar Ponds. As a result of the evaluation in the SAP coupled with the fact that nitrate is the most prevalent contaminant of concern for the plume followed by uranium, treatment of metals in the SPP was not considered as part of the alternative analysis for remedy selection. Because of this, the Decision Document does not reflect metals as a contaminant of concern, which influenced remedy selection in the SPP.

However, it is recognized that for the system to be effective the reactive media must be capable of removing metals, whether they are naturally occurring or waste related, from contaminated groundwater. Concentrations of metals in the influent to the treatment system can be considered during treatment system design if there is a potential the metals could impact system effectiveness. Studies which evaluated metals removal by using iron (Cantrell et al. 1995) and organic (i.e., peat or sawdust) media (Morrison and Spangler, 1992, 1995) indicate that the metals reacted similarly to uranium (i.e., metals were effectively removed from solution primarily by sorption, reduction, and/or precipitation mechanisms.) Text will be added to the Section 3.3, Alternative Analysis, to indicate that treatment of the metals is an added benefit of selecting the reactive barrier as the preferred alternative.

The data presented in Tables 2-1 and 2-2 represent a compilation of all data from the RFI/RI performed for the former OU 4, Solar Evaporation Ponds. Soil contamination in the vicinity of the Soil Evaporation Ponds will be addressed as part of the Industrial Area OU. With respect to the surface soil data from the Phase I RFI/RI summarized in Tables 2-1, comparing maximum concentrations observed to RFCA Tier II surface soil action levels for the industrial area indicate that Am-241, beryllium, benzo(a)pyrene, and aroclor-1254 exceed action levels. Because these contaminants are not detected in the SPP, they are not considered contaminants of concern for the plume and are therefore not considered in the alternative analysis, selection, or treatment system design . None of the maximum subsurface soil concentrations (Table 2-2) exceed their respective RFCA Tier I subsurface soil action levels.

2. Table 2-3 (page 14) Programmatic Preliminary Remediation Goals (PPRGs) have recently been revised as part of an annual review process. It is currently proposed that those ground water action levels which are based on PPRGs reflect those revisions. The proposed Tier II ground water action levels for aluminum, manganese, and nickel are 36,500 ug/L, 1720 ug/L, and 140 ug/L respectively. Maximum manganese concentrations, therefore, do not exceed the new Tier II action level.

Table 2-3 has been updated to reflect the revised PPRGs for aluminum and manganese. Nickel has been revised to reflect 140 ug/L; however, please note that the concentration is based on the

MCL and not the PPRG. The PPRG for nickel is 730 ug/L. Additionally, text in Section 2.4.2 and Table 2-5 has been updated to indicate that manganese does not exceed Tier II groundwater concentrations.

3. Section 2.4.5 (page 26) The literature values used and the assumptions made to fill in the unavailable site-specific data should be stated so that they can be evaluated. The Eh and DO data listed as unavailable should be relatively easy and inexpensive to collect. These data are pertinent to the fate of both nitrate and uranium.

The literature values and/or assumptions have been incorporated into the Decision Document as requested. DO data in the SPP area were collected in the field during June 1998 for the purposes of estimating Eh. Eh was calculated using equations presented in Properties of Groundwater (Matthess, 1982). Based on the calculated values, the Eh in the wells where DO was measured indicates oxidizing conditions. The conclusion is also supported by the presence of nitrate.

The dissolved oxygen content of the influent has little impact on treatment because the strongly reducing environment within the treatment cell means oxygen is removed early on in the cell. Bacterial action also strips out the oxygen. Eh/pH in the source water also is not important as the treatment media within the cells create a strong reduction reaction, thereby creating a strong reducing environment.

Well	*DO (mg/L)*	*Eh (Calculated)*
3086	*4.52*	*0.82*
05093	*6.32*	*0.84*
2286	*1.03*	*0.83*
P210089	*10.7*	*0.78*
B208589	*3.88*	*0.82*

Nitrate concentration and uranium activity in North Walnut Creek are critical parameters which are necessary to assess impacts of the various alternatives on surface water and to bracket the stream reach intersected by the plume. Data presented in this decision document does not sufficiently support the premise that the proposed technology will meet surface water standards. CDPHE is currently developing a loading analysis to determine what levels the treatment system must achieve in order to meet surface water standards. In order to complete these analyses, in stream concentrations from sampling stations upgradient and downgradient of the plume's influence (particularly GS13 and SW118) are needed. If there are no nitrate or uranium data available from these stations, monitoring for these constituents should be initiated as soon as possible.

As requested, the available uranium and nitrate data for stations SW118 (upgradient), SW93 (up/side-gradient) and GS13 (downgradient) are attached. Nitrate samples were more recently collected on September 1, 1998 at these locations as well as some intermediate locations between SW93 and GS13 (i.e., SW93A and SW-93B). These data are summarized below.

Sample Location	*Nitrate (mg/L)*
SW95	*220*
SW118	*0.05*
SW93	*1.3*
SW93A	*1.7*
SW93B	*1.5*
GS13	*1.4*

These data are not included in the Decision Document because currently most of the groundwater in the SPP is intercepted by the Interceptor Trench System and therefore does not influence North Walnut Creek.

4. Section 3.1.2 (page 32) This text should explain that 100 mg/L is a temporary modification of the surface water standard, granted till 2009. For the Long-Term Site Condition, the Site must meet the 10 mg/L standard, both on-site and off-site, and remedial actions must have Long-Term Site Condition standards as a goal.

The text in Section 3.1.2 was expanded to explain that the 100 mg/L interim nitrate standard is only a temporary modification effective until 2009. For the Long-Term Site Condition, the 10 mg/L nitrate standard must be met.

5. Section 3.1.5 (Page 33); Sections 7.3.1 and 7.3.2 (Page 52) The text in these sections can be updated to state that the US Fish & Wildlife Service has been consulted and has concurred with the assumption that implementation of the proposed alternative would not adversely affect the Prebles meadow jumping mouse. Their letter could be referenced in Section 9.0.

The text of Sections 3.1.5, 7.3.1, and 7.3.2 has been updated to reflect consultation and concurrence from the Fish and Wildlife Service and the letter, under preparation, has been referenced in the appropriate section. Although DOE anticipates the receipt of the letter shortly, it can not be included in the References Section, Section 9.0.

6. Section 3.1.5 (page 34) The last sentence of the first paragraph in this section is incomplete.

The text has been corrected to state "..... to enhance flow to the perforated PVC pipe and subsequently to the treatment cells."

7. Pages 35-39 are missing from the copies supplied to CDPHE. According to the Table of Contents, these pages discuss remedial alternatives (which are also discussed in Appendix A and were explained to CDPHE in meetings with the Site).

The referenced pages were inadvertently omitted from the Draft supplied to CDPHE and are included as an attachment to this response document.

8. Section 5.0 (page 41) This section could explain the similarities between this project and the Mound Site Plume remedial project, and that this project will take advantage of the lessons learned at the previous project (e.g., techniques to prevent piping from separating during backfilling).

Text has been added to Section 5.0 to reflect the Mound Plume Project Lessons Learned, as suggested. Specifically, the text states:

> *"Because of the similarities in the SPP and the Mound Plume Project, the lessons learned will be incorporated into the project by design and executed during construction and backfilling. The major lessons learned from the Mound Plume Project include:*
>
> - *Safe work practices resulted in identification of hazards prior to these becoming problems.*
> - *Excavations should remain open for as brief a period as possible.*
> - *Equipment and materials utilized must be efficient and effective for the task (i.e., valves and piping).*
> - *Backfill operations must be conducted in a manner that protects equipment and materials remaining within the excavation."*

This section proposes an action to remediate the major portion of this plume affecting North Walnut Creek, but does not address the portions of both the nitrate and uranium plumes which flow towards the South Walnut Creek drainage. Reasons for not considering the southeast lobe of the plume should be covered in this document.

Text has been added to explain why plume migration towards South Walnut Creek is not considered in the remedial action. Essentially, monitoring of surface water station GS10 indicates that the portion of the SPP migrating toward South Walnut Creek has not impacted surface water quality of the drainage. Results from surface water monitoring station GS10 (attachment 2) indicate that nitrate has never exceeded 10 mg/L with a maximum concentration observed of 5.7 mg/L in 1994. As stated above, the uranium plume is limited to the plateau. The maximum uranium activity (all isotope activities combined) observed at GS-10 was 6.7 pCi/L in 1992.

9. Section 5.2 (page 42) There is no indication of how water from the breached ITS collected in Pond A-1 will be monitored and managed. A decision document which is concerned with this water should include this information. This section also does not explain why the water diverted to Pond A-1 could not be routed to the MSTs for continued treatment during installation of the barrier.

In response to the comment, an additional section, Section 5.3, Construction Water Management was added to explain the approach to water management and monitoring. Water which accumulates as a result of the action is also generally discussed in Section 5.0 and in Section 7.2.5, Construction Waters. The text states:

> *"Dewatering the construction site is essential for the safety of personnel and to facilitate timely construction. Alternatives considered for handling seepage during trench construction were:*
>
> *1) discharge directly to Pond A-1, A-2 or A-3*
> *2) discharge directly to Pond B-1 or B-2,*
> *3) transfer to the Sewage Treatment Plant for treatment,*
> *4) transfer to the existing MSTs for storage, followed by treatment or discharge*
> *5) transfer to Building 891 treatment system for treatment,*
> *6) transfer to Building 374 for treatment,*
> *7) transfer to the Solar Ponds Plume Treatment System after construction is completed for treatment.*
>
> *The approach for handling the construction water will utilize the existing and accepted water management system (i.e., MSTs). The construction water will be stored in the MSTs then either routed for treatment at Building 374, piped into the new Solar Ponds Plume treatment system, or discharged to the B-Series Ponds. In the unlikely event of an emergency situation, there is a possibility that water will be discharged directly to Pond A-1 or A-2. Any discharge to these ponds is expected to be short-term during emergency situations only.*
>
> *Construction of the barrier will intercept some of the existing transfer lines. When intercepted, these lines will be reestablished sufficiently so that the trench can continue to be dewatered and the construction water transferred to the MSTs."*

10. Section 5.4 (page 45) Performance monitoring wells in the alluvium of North Walnut Creek need to be designated to measure changes occurring there as a result of the remedy. This section also should describe the transfer of project monitoring authority to the Integrated Monitoring Plan.

Additional text has been added to Section 5.4 to include performance monitoring of alluvial groundwater in the North Walnut Creek drainage. Specifically, the text has been modified to state:

> *"Performance monitoring in alluvial groundwater in the North Walnut Creek Drainage will be implemented to monitor changes in groundwater quality as a result of the selected remedy. Groundwater monitoring will be performed after the remedial action has been completed and conducted under the IMP. Groundwater wells 1786 and 1386 currently monitor the drainage. The wells will be, at a minimum, monitored for nitrate and uranium. A well cluster to the north of the barrier will also be installed for performance monitoring purposes and will be classified as such in the IMP. The frequency of sampling and analytical suites will be consistent with the IMP."*

11. Section 7.2.8 (page 51) The "boilerplate" text in this section lacks some detail that is necessary to adequately assess the project's ability to monitor and control fugitive emissions. "Bounding assumptions", "conservative assumptions concerning soil-contaminant concentrations and project parameters", and "estimated potential emissions" are mentioned, but are not documented. The text refers to "project documentation" and "project operations" as the source of more detailed information. This section should at least commit to provide these sources to the regulatory agencies for review so that the agencies and the public can have some assurance that the estimates and assumptions referred are reasonable and protective. As a minimum, this text should also refer to the existing ambient air monitoring system and protocols. Depending on the type of project and its location, enhanced monitoring may be necessary (e.g., the T1 excavation project provided additional samplers and increased ambient air sampling frequency).

Project documentation supporting the calculations and conclusions presented in the Decision Document is placed in the Administrative Record for the project and is available to the regulators. Kaiser-Hill Interoffice Memorandum CAP-102-98, Air Quality Review of the Project to Construct a Collection/Treatment Trench for the Solar Pond Plume Project, To: S. Nesta; From: C. Patnoe September 8, 1998, is the source of information referred to in the text.

In response to the comment, an additional subsection (Section 5.5, Air Monitoring) has been added to the Decision Document to address the reviewers concern. The text is similar in content and detail as other, previously-approved, decision documents.

Specifically, the additional section states:

> *"The K-H Air Quality Management group maintains the RFETS Radioactive Ambient Air Monitoring Program (RAAMP) which monitors the perimeter of RFETS continuously with samples collected and analyzed on a monthly basis. The RAAMP sampling network also includes monitoring stations inside the perimeter of RFETS which are collected but not analyzed unless conditions warrant additional analysis.*
>
> *Wind speed and direction are monitored continuously at RFETS and these data are available through the shift superintendent. Dust suppression will be performed to minimize the potential for particulate dispersion."*

Additionally, text clarifications have been added to Section 7.2.8 as requested. Specifically, the volume of soil used in the estimates, source term concentrations, and quantitative results.

12. Appendix A Stakeholders should be provided with information to weigh the cost benefits of the project in context of long-term stewardship of the Site. This information cannot be provided without an estimate of how long this plume will continue to discharge to the North Walnut Creek drainage and without establishing performance requirements for the system. If the lifetime of the plume is modeled to exceed the period of active remediation at the Site, then this document should address the issue of continued funding for the maintenance and operation of the remedial system.

Based on discussions provided in the document Accelerating Cleanup Path to Closure (DOE, 1998), the scope, role, and responsibilities for future Site stewardship remain undetermined; however the Rocky Flats Future Site Use Working Group will be evaluating stewardship issues. As identified in the referenced report, some outstanding issues include identification of a future use management entity, long-term site monitoring requirements, long-term maintenance and surveillance costs, water management for the interim and long-term, and long-term institutional controls. The necessity for maintenance and operation of the reactive barrier will be incorporated into the resolution of these issues.

With respect to estimating how long the plume will continue to discharge to North Walnut Creek, it is noted that the reactive barrier system allows the groundwater flow to restore to its natural discharge point in the drainage system (i.e., under natural conditions, groundwater discharges to the North Walnut Creek drainage at the base of the hill slope), the "plume", treated or untreated, will continue to discharge to the creek consistent with natural conditions. Based on modeling conducted to support selection of a remedial alternative, it was generally concluded that, without treatment, the potential for exceedance of the nitrate standard (10 mg/L) in alluvial groundwater adjacent to North Walnut Creek exists for greater than 100 years from present. The model is considered conservative in that it did not account for denitrification or natural attenuation of the plume; however, if the simulated condition is realized, the passive treatment of the SPP could theoretically continue for a minimum of 100 years. The unescalated cost of operation and maintenance of $10,000 per year is included in Appendix A.

The actual timeframe for treatment will be re-evaluated, over time, and based on results of monitoring the influent to and effluent from the treatment system (i.e., are natural processes decreasing the contaminant concentrations to levels which meet the acceptable nitrate levels).

the effect of a carbon source on denitrification. Because the reactive barrier is a passive system and would not significantly alter the overall hydraulic conductivity.

The collection trench will be approximately 850 feet long (which is the required width to capture the Tier II nitrate plume), two to three feet wide, and approximately 20-30 feet deep. The width of the trench would be dictated by design considerations. It is anticipated that the trench would extend about ten feet into the weathered bedrock to capture both bedrock and alluvial flow. An impermeable barrier would be placed on the downgradient side so that flow is effectively diverted to the treatment cells. The collection trench would be filled with a highly permeable media such as gravel to enhance flow the perforated PVC pipe and subsequently to the treatment cells. A geotextile would be placed at the top of this media to prevent backfilled soils from settling into the reactive barrier.

3.2 Groundwater Flow and Transport Model to Evaluate Remedial Alternatives

Several groundwater-modeling tools were used to evaluate the retained remedial alternatives. These tools included the following:

- ***Plume flushing model:*** Developed to provide a preliminary estimate of plume cleanup time.

- ***Two-dimensional plan-view plume model:*** Developed to provide estimates of plume migration rates, assist in evaluating parameter values, and provide preliminary sensitivity analyses for key transport parameters.

- ***Two-dimensional numerical vertical plane flow and transport models:*** Developed for evaluation of three remedial alternatives (not phytoremediation).

Specifically, the numerical flow and transport models used were MODFLOW-SURFACT (HydroGeoLogic, 1996) and MODPATH (U.S. Geological Survey [USGS], 1994). MODFLOW-SURFACT is a three-dimensional numerical finite-difference model based on MODFLOW (USGS). MODFLOW-SURFACT was used to analyze groundwater flow within a two-dimensional vertical cross-section of the aquifer that extended along the axis of the SPP from the SEPs to North Walnut Creek. MODPATH (USGS, 1994) was used to calculate the flow path of particles within the groundwater flow field using the output from MODFLOW-SURFACT.

The alternatives evaluated by the models included no action, managed release, and treatment at Building 995. Effects of the phytoremediation alternative were not simulated based on discussions among the project team prior to conducting the modeling. Additionally, simulations did not specifically address the reactive barrier technology because the alternative was incorporated into the alternative analysis after the modeling had been performed. For the alternatives considered, the models were used to estimate:

- Water levels, hydraulic gradients, and groundwater flow rates within the UHSU;
- Dissolved chemical transport (plume migration rates);
- Groundwater fluxes in the unconsolidated deposits and weathered bedrock aquifer zones;
- Changes in water budget for each aquifer zone caused by SEP capping;
- Chemical concentrations in each aquifer zone;
- Fluxes of both groundwater and dissolved mass to North Walnut Creek.

For model purposes, the SPP groundwater flow system was conceptualized as a shallow hillside aquifer consisting of an upper layer of unconsolidated deposits underlain by a zone of weathered claystone bedrock. The unconsolidated deposits and the weathered bedrock together are referred to as the UHSU. The weathered bedrock zone grades into relatively impermeable competent claystone bedrock that forms the base of the flow system. Groundwater enters the SPP area as underflow from the IA of RFETS. Recharge to the aquifer comprises leakage through the SEPs and infiltration of precipitation on the hillside. Under natural conditions, groundwater discharges to the North Walnut Creek drainage at the base of the hill slope.

Currently, the majority of the groundwater flowing in the unconsolidated deposits of the hillside aquifer are collected by the ITS. Figure 3-1 shows a conceptual diagram of SPP groundwater flow system and model boundary conditions Figure 3-2 shows the location of the model cross-section.

The UHSU was modeled as two hydrostratigraphic units: an upper unconsolidated layer varying in thickness from approximately 5 to 20 feet; and an underlying weathered claystone layer varying in thickness from approximately 20 to 60 feet. The competent claystone beneath the weathered zone was considered the impermeable base of the flow system. The model consisted of 10 layers and 353 columns; layers 1 and 2 represented the unconsolidated deposits and layers 3 through 10 represented the weathered bedrock. The parameter values used in setting up the cross-section model were based on the results of previous investigations of the SPP and RFETS in general. The french drains which comprise the ITS were represented in the model as drain cells which extended to the base of the unconsolidated deposits and captured all of the flow in the alluvium in these areas.

Beginning with the 1998 plume conditions estimated from the low-flow event sampling data, model simulations were conducted to evaluate the remedial alternatives of no action, managed release, and treatment at Building 995. Modeling the continued use of the ITS or use of an enhanced ITS (french drains deepened into the weathered bedrock) corresponds to the effects of implementing the managed release or treatment at Building 995 remedial alternatives. Modeling of discontinued use of the ITS corresponds to the no action (i.e., baseline) condition. For all of these simulations, it was assumed that an impermeable cap was placed over the SEPs in 2005 and any surface run-off from the capped area was collected and diverted. The simulations evaluated the conditions for a period of approximately 100 years. Nitrate concentration versus time in the UHSU under the scenarios modeled indicated that the groundwater adjacent to North Walnut Creek would continue to exceed 100 mg/L beyond the modeled period (year 2100).

Nitrate mass flux to North Walnut Creek was also simulated for continued use of the ITS (i.e., managed release or treatment at Building 995) and closure of the ITS (i.e., no action). The results of the simulations support the following conclusions:

- The existing ITS significantly reduces the rate of nitrate mass flux to North Walnut Creek by reducing flow through the unconsolidated deposits.
- Nitrate mass flux is higher in the unconsolidated deposits than in the weathered bedrock.
- Approximately 90% of the total nitrate mass flux in the weathered bedrock is in the upper half of the unit.

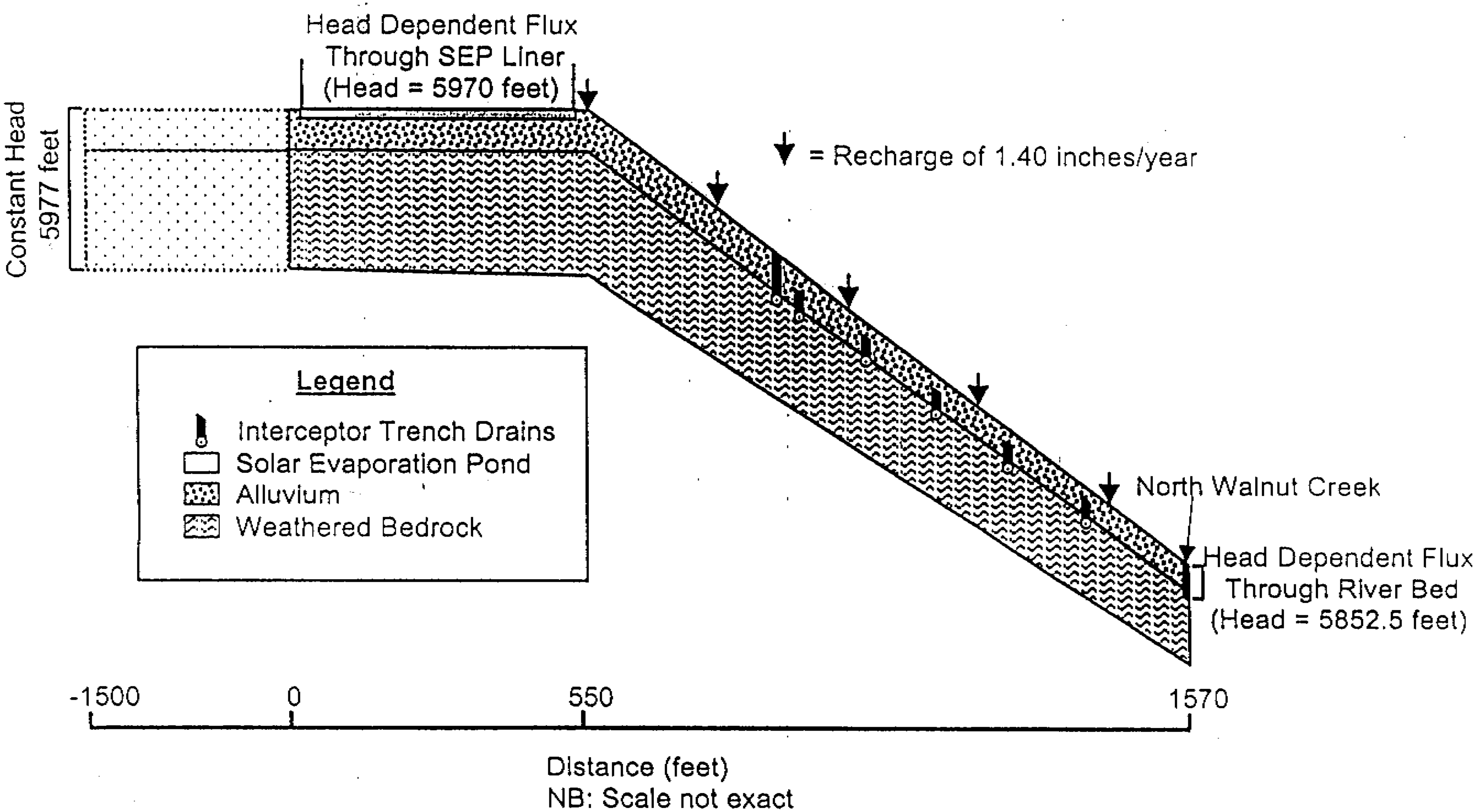

Figure 3-1: Conceptual diagram of SPP groundwater flow system and model boundary conditions.

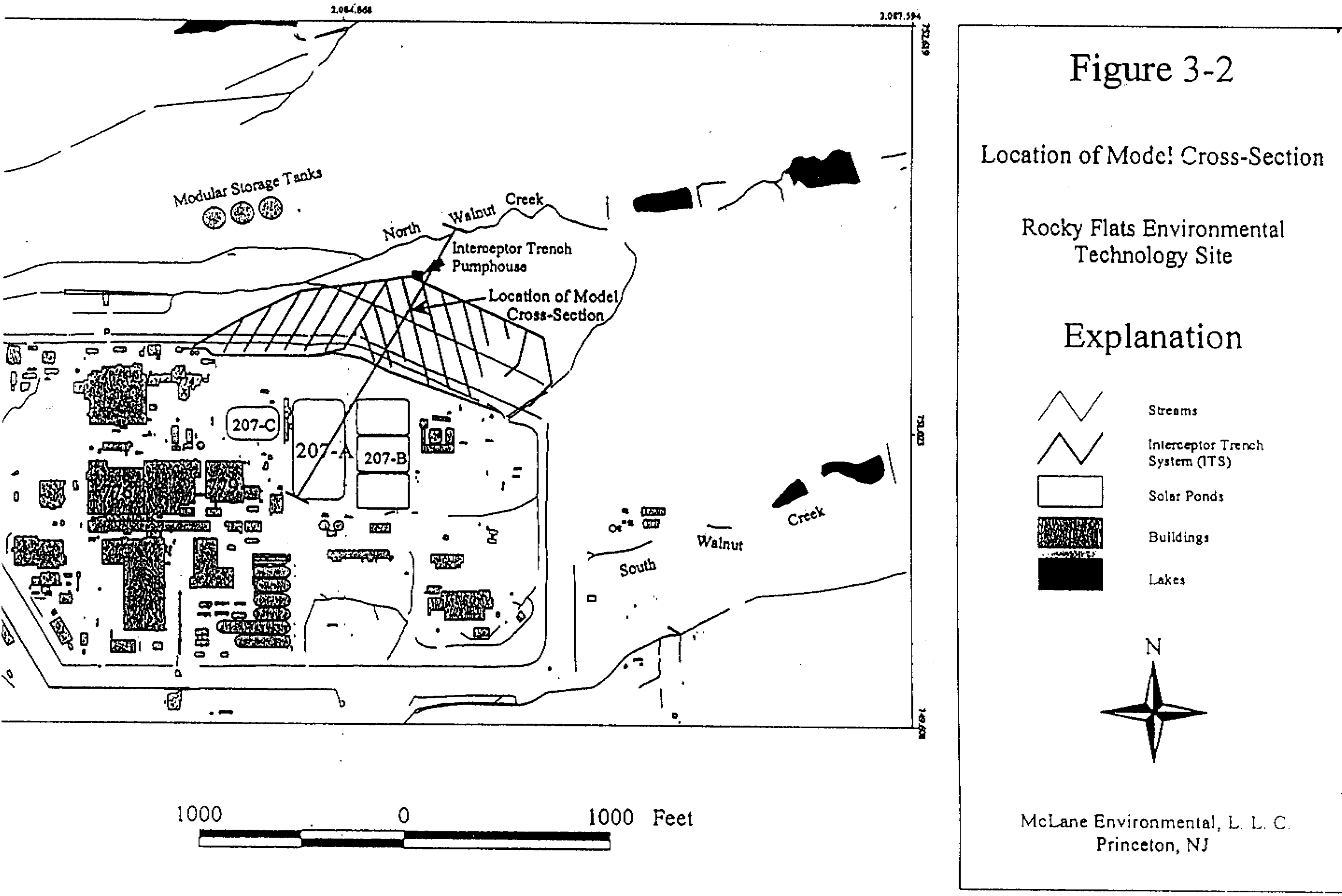

Figure 3-2

Location of Model Cross-Section

Rocky Flats Environmental Technology Site

McLane Environmental, L. L. C.
Princeton, NJ

The results from the groundwater fate and transport model indicate treatment for removal of nitrate will be required in order to meet the long-term goals for protection of North Walnut Creek.

3.3 Alternatives Analysis

Appendix A details the results of the alternative analysis. The five alternatives subject to a more comprehensive alternative analysis were:

- No Action (Direct Release),
- Managed Release,
- Treatment at Building 995,
- Reactive Barrier, and
- Phytoremediation.

Each alternative was evaluated with respect to effectiveness, implementability, and cost. National Environmental Policy Act (NEPA) values also played an important role in alternative selection. In particular, emphasis was placed on preserving the habitat of Preble's Meadow Jumping Mouse, a threatened species under the Endangered Species Act. Emphasis was also placed on long-term passive remediation methods. Additionally, the alternatives were evaluated based on their ability to remove both nitrates and uranium. The decision process ultimately was used to determine which alternative was feasible and offered the greatest degree of protectiveness to the public, workers, and the environment including Preble's Meadow Jumping Mouse habitat. Table 3-1 summarizes the overall comparison of alternatives.

The reactive barrier was selected as the preferred alternative because, as presented in Table 3-1, the other alternatives were found to be ineffective in treating the contaminants (Alternatives 1 and 3) or did not achieve the long-term goals for the SPP and RFETS (Alternative 2). With respect to Alternative 4, there is not sufficient space available for either of the phytoremediation approaches. The passive system as designed would require about 18 acres, but only about one-third of the nitrate loading could be addressed. The passive/active system would require 61 acres which is greater than the plume extent, and the construction of additional phytoremediation areas elsewhere would result in the spread of contamination to previously uncontaminated areas.

Reactive barrier has moderate capital costs; however, it would provide the greatest level of groundwater treatment of all the alternatives. It is the recommended alternative for the following reasons:

- Nitrates would be reduced;
- It offers the greatest degree of protectiveness;
- It would have very minimal impacts to Preble's Meadow Jumping Mouse habitat;
- Most of the disruption during installation will occur outside the habitat area;
- It is a long-term solution;
- It does not require elements of the RFETS infrastructure that are likely to be abandoned;
- The technology is available and has become more established;
- Groundwater flow can be restored its natural discharge point in the drainage system (i.e., under natural conditions, groundwater discharges to the North Walnut Creek drainage at the base of the hill slope);
- It offers the greatest degree of flexibility;
- The reactive barrier is passive and low maintenance;
- Anthropogenic uranium in ITS water and uranium which might be mobilized from the SEPs would be removed.

Table 3-1. Overall Comparison of Alternatives[1]

	ALTERNATIVES				
Criteria	Alternative 1- No Action	Alternative 2 – Managed Release	Alternative 3 - Treatment at Building 995	Alternative 4 – Phytoremediation	Alternative 5 - Reactive Barrier
Effectiveness	**Not Effective –** Nitrate concentrations would increase and exceed ARARs for North Walnut Creek	**Moderate** - Provides good short-term protection since water would be analyzed prior to release.	**Not Effective** - STP can not handle high loading due to precipitation events. Uranium is not addressed if biosolids are to be land farmed. This is not a long-term alternative because the STP will be closed down.	**Low** - Could only address one third of the current ITS liquid waste stream.	**Good**- uranium is treated and water is denitrified to ensure applicable surface water standards are met.
Implementability	**High** – This alternative would require little effort other than closure of the ITS.	**Low** – The technology is readily available. Implementation would consist of installing additional lines and decommissioning the ITS. Highly dependent on surface water ARARs and a point of compliance downstream of A-4 Pond.	**Low** - This would be very implementable as long as biosolids continued to be sent to Nevada Test Site; however, it is dependent on continued operation of the STP.	**Low** – Impediments to implementability construction in Preble's Mouse habitat must be approved by USFWS	**Moderate** - Reactive barriers have become a more prevalent technology. It is possible to implement with minimal impact to Preble's Mouse habitat.
Cost	**Cost=$207,000** **Low Cost**- The cost is low because no treatment would be implemented to address the plume.	**Cost-$748,000** **Moderate Cost**- Cost-effective due to both low capital and annual costs	**Cost = $17,233,800** **High Cost**- High annual costs made this the most costly alternative	**Cost = $1,046,000** **Moderate Cost** – Annual costs are relatively low	**Cost = $1,752,000** **Moderate Cost**- This alternative had the highest capital costs but low annual cost.

[1]Consistent with the Implementation Guidance Document, the purpose of the overall comparison is to rank, on a semi-quantitative basis (i.e., low, moderate, high), so that a recommended alternative may be selected.

2

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER
SW093	3/23/89	NITRATE/NITRITE	5.4	mg/L	TRG	
SW093	5/25/89	NITRATE/NITRITE	4.2	mg/L	TRG	
SW093	6/8/89	NITRATE/NITRITE	3.1	mg/L	TRG	
SW093	7/5/89	NITRATE/NITRITE	5.1	mg/L	TRG	
SW093	8/3/89	NITRATE/NITRITE	2.7	mg/L	TRG	
SW093	9/7/89	NITRATE/NITRITE	4	mg/L	TRG	
SW093	10/10/89	NITRATE/NITRITE	4.8	mg/L	TRG	
SW093	11/2/89	NITRATE/NITRITE	6.7	mg/L	TRG	
SW093	12/7/89	NITRATE/NITRITE	2.7	mg/L	TRG	
SW093	1/29/90	NITRATE/NITRITE	4.2	mg/L	TRG	
SW093	2/21/90	NITRATE/NITRITE	3.6	mg/L	TRG	
SW093	3/16/90	NITRATE/NITRITE	8.3	mg/L	TRG	
SW093	4/30/90	NITRATE/NITRITE	4.2	mg/L	TRG	
SW093	7/31/90	NITRATE/NITRITE	4.9	mg/L	TRG	
SW093	8/30/90	NITRATE/NITRITE	2.9	mg/L	TRG	
SW093	9/10/90	NITRATE/NITRITE	1.8	mg/L	TRG	
SW093	9/21/90	NITRATE/NITRITE	3.1	mg/L	TRG	
SW093	9/25/90	NITRATE/NITRITE	1.9	mg/L	TRG	
SW093	11/19/90	NITRATE/NITRITE	2	mg/L	TRG	
SW093	12/6/90	NITRATE/NITRITE	2.4	mg/L	TRG	
SW093	3/14/91	NITRATE/NITRITE	1.8	mg/L	TRG	
SW093	4/15/91	NITRATE/NITRITE	1.4	mg/L	TRG	
SW093	5/22/91	NITRATE/NITRITE	2.9	mg/L	TRG	
SW093	6/11/91	NITRATE/NITRITE	1.3	mg/L	TRG	
SW093	6/26/91	NITRATE/NITRITE	2.2	mg/L	TRG	
SW093	7/29/91	NITRATE/NITRITE	1.8	mg/L	TRG	
SW093	8/14/91	NITRATE/NITRITE	2.2	mg/L	TRG	
SW093	9/19/91	NITRATE/NITRITE	4.3	mg/L	TRG	
SW093	10/28/91	NITRATE/NITRITE	1.2	mg/L	TRG	
SW093	2/26/92	NITRATE/NITRITE	1.6	mg/L	TRG	
SW093	5/31/94	NITRATE/NITRITE	0.92	mg/L	TRG	
SW093	6/21/94	NITRATE/NITRITE	0.64	mg/L	TRG	
SW093	6/22/94	NITRATE/NITRITE	0.72	mg/L	TRG	
SW093	8/10/94	NITRATE/NITRITE	0.68	mg/L	TRG	
SW093	10/17/94	NITRATE/NITRITE	0.6	mg/L	TRG	
SW093	4/26/95	NITRATE/NITRITE	0.93	mg/L	TR1	
SW093	5/16/95	NITRATE/NITRITE	0.61	mg/L	TR1	
SW093	5/26/95	NITRATE/NITRITE	0.99	mg/L	TR1	
SW093	6/28/95	NITRATE/NITRITE	0.99	mg/L	TRG	
SW118	10/29/90	NITRATE/NITRITE	0.02	mg/L	TRG	
SW118	11/27/90	NITRATE/NITRITE	0.16	mg/L	TRG	
SW118	12/13/90	NITRATE/NITRITE	0.3	mg/L	TRG	
SW118	3/21/91	NITRATE/NITRITE	0.11	mg/L	TRG	

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER
SW118	4/10/91	NITRATE/NITRITE	0.1	mg/L	TRG	U
SW118	5/9/91	NITRATE/NITRITE	0.1	mg/L	TRG	U
SW118	6/3/91	NITRATE/NITRITE	0.6	mg/L	TRG	
SW118	6/11/91	NITRATE/NITRITE	1.4	mg/L	TRG	
SW118	6/26/91	NITRATE/NITRITE	0.1	mg/L	TRG	U
SW118	7/24/91	NITRATE/NITRITE	0.1	mg/L	TRG	U
SW118	8/7/91	NITRATE/NITRITE	0.1	mg/L	TRG	U
SW118	3/12/92	NITRATE/NITRITE	0.52	mg/L	TRG	

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER	UNCERTAINTY
GS13	5/17/91	URANIUM-233,-234	0.81	pCi/L	TRG		0.34
GS13	5/20/91	URANIUM-233,-234	0.17	pCi/L	REP	U	0.3
GS13	5/24/91	URANIUM-233,-234	0.72	pCi/L	TRG		0.58
GS13	7/3/91	URANIUM-233,-234	1.5	pCi/L	TRG		0.39
GS13	7/12/91	URANIUM-233,-234	1.5	pCi/L	TRG		0.36
GS13	7/23/91	URANIUM-233,-234	3.2	pCi/L	TRG		0.55
GS13	8/8/91	URANIUM-233,-234	1.1	pCi/L	TRG		0.93
GS13	8/14/91	URANIUM-233,-234	1.5	pCi/L	TRG		0.496
GS13	6/3/92	URANIUM-233,-234	1.5	pCi/L	TRG		0.895328
GS13	6/3/92	URANIUM-233,-234	1.1	pCi/L	TRG	B	0.7645961
SW093	7/7/88	URANIUM-233,-234	2.22	pCi/L	TRG		0.396
SW093	7/7/88	URANIUM-233,-234	6.25	pCi/L	TRG		0.709
SW093	3/23/89	URANIUM-233,-234	2.8	pCi/L	TRG		0.78
SW093	3/23/89	URANIUM-233,-234	2.5	pCi/L	TRG		0.3
SW093	5/25/89	URANIUM-233,-234	2.2	pCi/L	TRG		0.18
SW093	7/5/89	URANIUM-233,-234	3.5	pCi/L	TRG		0.6
SW093	9/7/89	URANIUM-233,-234	6	pCi/L	TRG		0.39
SW093	10/10/89	URANIUM-233,-234	4.22	pCi/L	TRG		0.27
SW093	1/29/90	URANIUM-233,-234	3.64	pCi/L	TRG		0.25
SW093	2/21/90	URANIUM-233,-234	3	pCi/L	TRG		0.15
SW093	5/29/90	URANIUM-233,-234	5.55	pCi/L	TRG		0.708
SW093	6/22/90	URANIUM-233,-234	3.31	pCi/L	TRG		0.544
SW093	7/30/90	URANIUM-233,-234	3.603	pCi/L	TRG		0.07
SW093	8/30/90	URANIUM-233,-234	3.86	pCi/L	TRG		0.0038
SW093	9/25/90	URANIUM-233,-234	3.321	pCi/L	TRG		0.054
SW093	10/17/90	URANIUM-233,-234	2.557	pCi/L	TRG		0.076
SW093	5/22/91	URANIUM-233,-234	2.197	pCi/L	DUP		0.044
SW093	5/22/91	URANIUM-233,-234	2.448	pCi/L	TRG		0.079
SW093	6/26/91	URANIUM-233,-234	2.646	pCi/L	TRG		0.059
SW093	7/29/91	URANIUM-233,-234	2.745	pCi/L	DUP		0.06
SW093	7/29/91	URANIUM-233,-234	2.066	pCi/L	TRG		0.08
SW093	8/14/91	URANIUM-233,-234	2.072	pCi/L	TRG		0.061
SW093	9/19/91	URANIUM-233,-234	1.9	pCi/L	TRG	B	0.032
SW093	10/28/91	URANIUM-233,-234	2.1	pCi/L	TRG		0.043
SW093	2/26/92	URANIUM-233,-234	0.8649	pCi/L	TRG		0.041
SW093	5/28/94	URANIUM-233,-234	1.7	pCi/L	TRG		0.08
SW093	5/31/94	URANIUM-233,-234	0.81	pCi/L	TRG		0.07
SW093	6/21/94	URANIUM-233,-234	1.5	pCi/L	TRG	B	0.06
SW093	6/22/94	URANIUM-233,-234	1.3	pCi/L	TRG	B	0.07
SW093	8/10/94	URANIUM-233,-234	0.83	pCi/L	TRG		0.06
SW093	10/17/94	URANIUM-233,-234	0.8	pCi/L	TRG		0.07
SW093	10/28/94	URANIUM-233,-234	0.072	pCi/L	TRG	U	0.056

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER	UNCERTAINTY
SW093	4/26/95	URANIUM-233,-234	1.17	pCi/L	TR1		0.037
SW093	5/16/95	URANIUM-233,-234	0.67	pCi/L	TR1		0.034
SW093	5/26/95	URANIUM-233,-234	0.575	pCi/L	RP1	J	0.034
SW093	5/26/95	URANIUM-233,-234	0.582	pCi/L	TR1	J	0.058
SW093	6/28/95	URANIUM-233,-234	1.251	pCi/L	RP1		0.054
SW093	6/28/95	URANIUM-233,-234	1.225	pCi/L	TR1		0.102
SW093	1/3/96	URANIUM-233,-234	1.564	pCi/L	TR1		0.077
SW093	1/3/96	URANIUM-233,-234	1.396	pCi/L	RP1		0.069
SW093	1/8/96	URANIUM-233,-234	0.951	pCi/L	TR1		0.057
SW093	5/9/96	URANIUM-233,-234	0.952	pCi/L	TR1		0.049
SW093	5/28/96	URANIUM-233,-234	0.462	pCi/L	TR1	J	0.026
SW093	6/15/96	URANIUM-233,-234	0.34	pCi/L	TR1	J	0.031
SW093	6/15/96	URANIUM-233,-234	0.308	pCi/L	TR1	J	0.05
SW093	7/9/96	URANIUM-233,-234	0.646	pCi/L	TR1		0.09
SW093	10/1/96	URANIUM-233,-234	2.56	pCi/L	TR1		0.09
SW093	10/15/96	URANIUM-233,-234	2.64	pCi/L	TR1		0.07
SW093	10/24/96	URANIUM-233,-234	1.78	pCi/L	TR1		0.11
SW093	10/31/96	URANIUM-233,-234	2.82	pCi/L	TR1		0.07
SW093	11/19/96	URANIUM-233,-234	2	pCi/L	TR1		0.5
SW118	10/29/90	URANIUM-233,-234	2.1	pCi/L	TRG		0.4
SW118	6/26/91	URANIUM-233,-234	2.269	pCi/L	TRG		0.4
SW118	7/24/91	URANIUM-233,-234	1.247	pCi/L	TRG		0.805
SW118	8/7/91	URANIUM-233,-234	1.418	pCi/L	TRG		0.751
SW118	3/12/92	URANIUM-233,-234	0.338	pCi/L	TRG		0.518

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER	UNCERTAINTY
GS13	5/17/91	URANIUM-235	0.16	pCi/L	TRG	U	0.11
GS13	5/20/91	URANIUM-235	0	pCi/L	REP	U	0.11
GS13	5/24/91	URANIUM-235	0.058	pCi/L	TRG	U	0.058
GS13	7/3/91	URANIUM-235	0.11	pCi/L	TRG	U	0.1
GS13	7/12/91	URANIUM-235	0.083	pCi/L	TRG	U	0.23
GS13	7/23/91	URANIUM-235	0.16	pCi/L	TRG	J	0.0825
GS13	8/8/91	URANIUM-235	0.029	pCi/L	TRG	U	0.204428
GS13	8/14/91	URANIUM-235	0.051	pCi/L	TRG	U	0.213248
GS13	6/3/92	URANIUM-235	0.44	pCi/L	TRG	J	0.0628
GS13	6/3/92	URANIUM-235	-0.005	pCi/L	TRG	U	0.148
SW093	3/23/89	URANIUM-235	0.1	pCi/L	TRG		0.14
SW093	3/23/89	URANIUM-235	0.1	pCi/L	TRG		0.055
SW093	5/25/89	URANIUM-235	0.2	pCi/L	TRG		0.12
SW093	7/5/89	URANIUM-235	0.1	pCi/L	TRG		0.14
SW093	9/7/89	URANIUM-235	0.36	pCi/L	TRG		0.13
SW093	10/10/89	URANIUM-235	0.08	pCi/L	TRG		0.053
SW093	1/29/90	URANIUM-235	0.14	pCi/L	TRG		0.085
SW093	2/21/90	URANIUM-235	0.13	pCi/L	TRG		0.088
SW093	5/29/90	URANIUM-235	0.17	pCi/L	TRG		0.011
SW093	6/22/90	URANIUM-235	0.1	pCi/L	TRG		0.006
SW093	7/30/90	URANIUM-235	0.1806	pCi/L	TRG	J	0.009
SW093	8/30/90	URANIUM-235	0.1558	pCi/L	TRG		0.008
SW093	9/25/90	URANIUM-235	0.2792	pCi/L	TRG		0.007
SW093	10/17/90	URANIUM-235	0.3202	pCi/L	TRG		0.011
SW093	11/19/90	URANIUM-235	0.204	pCi/L	TRG	U	0.008
SW093	4/15/91	URANIUM-235	0.04	pCi/L	TRG	U	0.009
SW093	5/22/91	URANIUM-235	0.1363	pCi/L	DUP	J	0.012
SW093	5/22/91	URANIUM-235	0.05725	pCi/L	TRG	J	0.01
SW093	6/26/91	URANIUM-235	0.1074	pCi/L	TRG	J	0.008
SW093	7/29/91	URANIUM-235	0.04971	pCi/L	TRG	J	0.005
SW093	7/29/91	URANIUM-235	0.09645	pCi/L	DUP	J	0.008
SW093	8/14/91	URANIUM-235	0.09877	pCi/L	TRG	J	0.01
SW093	9/19/91	URANIUM-235	0	pCi/L	TRG	U	0.011
SW093	10/28/91	URANIUM-235	0	pCi/L	TRG	U	0.008
SW093	2/26/92	URANIUM-235	0.027	pCi/L	TRG	J	0.007
SW093	5/28/94	URANIUM-235	0.041	pCi/L	TRG	U	0.011
SW093	5/31/94	URANIUM-235	0.32	pCi/L	TRG	J	0.01
SW093	6/21/94	URANIUM-235	0.13	pCi/L	TRG	U	0.009
SW093	6/22/94	URANIUM-235	0.13	pCi/L	TRG	U	0.006
SW093	8/10/94	URANIUM-235	0.053	pCi/L	TRG	U	0.006
SW093	10/17/94	URANIUM-235	0.042	pCi/L	TRG	U	0.005
SW093	10/28/94	URANIUM-235	0	pCi/L	TRG	U	0.006

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER	UNCERTAINTY
SW093	4/26/95	URANIUM-235	0.05	pCi/L	TR1	J	0.007
SW093	5/16/95	URANIUM-235	0.028	pCi/L	TR1	J	0.011
SW093	5/26/95	URANIUM-235	0.026	pCi/L	RP1	J	0.013
SW093	5/26/95	URANIUM-235	0.015	pCi/L	TR1	J	0.011
SW093	6/28/95	URANIUM-235	0.025	pCi/L	TR1	J	0.008
SW093	6/28/95	URANIUM-235	0.03	pCi/L	RP1	J	0.01
SW093	1/3/96	URANIUM-235	0.057	pCi/L	RP1	J	0.004
SW093	1/3/96	URANIUM-235	0.051	pCi/L	TR1	J	0.008
SW093	1/8/96	URANIUM-235	0.031	pCi/L	TR1	J	0.007
SW093	5/9/96	URANIUM-235	0.028	pCi/L	TR1	J	0.011
SW093	5/28/96	URANIUM-235	0.022	pCi/L	TR1	J	0.012
SW093	6/15/96	URANIUM-235	0.01	pCi/L	TR1	J	0.011
SW093	6/15/96	URANIUM-235	0.011	pCi/L	TR1	U	0.015
SW093	7/9/96	URANIUM-235	0.018	pCi/L	TR1	J	0.009
SW093	10/1/96	URANIUM-235	0.081	pCi/L	TR1	J	0.1
SW093	10/15/96	URANIUM-235	0.09	pCi/L	TR1	J	0.1
SW093	10/24/96	URANIUM-235	0.07	pCi/L	TR1	J	0.1
SW093	10/31/96	URANIUM-235	0.12	pCi/L	TR1	J	0.119
SW093	11/19/96	URANIUM-235	0.056	pCi/L	TR1	J	0.137
SW118	11/27/90	URANIUM-235	0.4	pCi/L	TRG	U	
SW118	12/13/90	URANIUM-235	0	pCi/L	TRG	U	0.057
SW118	3/21/91	URANIUM-235	0.09	pCi/L	TRG	U	
SW118	4/10/91	URANIUM-235	0.102	pCi/L	TRG	U	0.098
SW118	6/26/91	URANIUM-235	0	pCi/L	TRG	J	0.138
SW118	7/24/91	URANIUM-235	0.04987	pCi/L	TRG	J	0.109
SW118	8/7/91	URANIUM-235	0.08044	pCi/L	TRG	J	0.119

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LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER	UNCERTAINTY
GS13	5/17/91	URANIUM-238	1.5	pCi/L	TRG		0.23
GS13	5/20/91	URANIUM-238	0.17	pCi/L	REP	U	0.16
GS13	5/24/91	URANIUM-238	0.99	pCi/L	TRG		0.39
GS13	7/3/91	URANIUM-238	3.1	pCi/L	TRG		0.059
GS13	7/12/91	URANIUM-238	3.2	pCi/L	TRG		0.58
GS13	7/23/91	URANIUM-238	4.9	pCi/L	TRG		0.17
GS13	8/8/91	URANIUM-238	1.9	pCi/L	TRG		0.31
GS13	8/14/91	URANIUM-238	1.1	pCi/L	TRG		0.84
GS13	6/3/92	URANIUM-238	2.7	pCi/L	TRG		0.63
GS13	6/3/92	URANIUM-238	1.3	pCi/L	TRG		0.47
SW093	7/7/88	URANIUM-238	8.15	pCi/L	TRG		0.45
SW093	7/7/88	URANIUM-238	18.5	pCi/L	TRG		1.04
SW093	3/23/89	URANIUM-238	6.8	pCi/L	TRG		0.918
SW093	3/23/89	URANIUM-238	7	pCi/L	TRG		1.253812
SW093	5/25/89	URANIUM-238	6	pCi/L	TRG		1.183056
SW093	7/5/89	URANIUM-238	9.2	pCi/L	TRG		0.548
SW093	9/7/89	URANIUM-238	7.57	pCi/L	TRG		1.17
SW093	10/10/89	URANIUM-238	5.31	pCi/L	TRG		1.1
SW093	1/29/90	URANIUM-238	4.36	pCi/L	TRG		0.3
SW093	2/21/90	URANIUM-238	5.5	pCi/L	TRG		0.2
SW093	5/29/90	URANIUM-238	4.15	pCi/L	TRG		0.6
SW093	6/22/90	URANIUM-238	7.02	pCi/L	TRG		0.45
SW093	7/30/90	URANIUM-238	7.91	pCi/L	TRG		0.27
SW093	8/30/90	URANIUM-238	6.004	pCi/L	TRG		0.34
SW093	9/25/90	URANIUM-238	6.918	pCi/L	TRG		0.072
SW093	10/17/90	URANIUM-238	5.511	pCi/L	TRG		0.65
SW093	11/19/90	URANIUM-238	7.2	pCi/L	TRG		0.504
SW093	12/6/90	URANIUM-238	5.9	pCi/L	TRG		0.044
SW093	4/15/91	URANIUM-238	2.4	pCi/L	TRG		0.035
SW093	5/22/91	URANIUM-238	4.557	pCi/L	DUP		0.052
SW093	5/22/91	URANIUM-238	5.086	pCi/L	TRG		0.068
SW093	6/26/91	URANIUM-238	4.152	pCi/L	TRG		0.044
SW093	7/29/91	URANIUM-238	4.477	pCi/L	DUP		0.065
SW093	7/29/91	URANIUM-238	3.427	pCi/L	TRG		0.057
SW093	8/14/91	URANIUM-238	4.783	pCi/L	TRG		0.061
SW093	9/19/91	URANIUM-238	5.7	pCi/L	TRG	B	0.09
SW093	10/28/91	URANIUM-238	3.3	pCi/L	TRG		0.063
SW093	2/26/92	URANIUM-238	0.8649	pCi/L	TRG		0.031
SW093	5/28/94	URANIUM-238	1.7	pCi/L	TRG		0.039
SW093	5/31/94	URANIUM-238	1	pCi/L	TRG		0.047
SW093	6/21/94	URANIUM-238	1.5	pCi/L	TRG		0.08
SW093	6/22/94	URANIUM-238	1.5	pCi/L	TRG		0.06

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER	UNCERTAINTY
SW093	8/10/94	URANIUM-238	0.83	pCi/L	TRG		0.05
SW093	10/17/94	URANIUM-238	1.4	pCi/L	TRG		0.06
SW093	10/28/94	URANIUM-238	0	pCi/L	TRG	U	0.07
SW093	4/26/95	URANIUM-238	0.666	pCi/L	TR1		0.08
SW093	5/16/95	URANIUM-238	0.238	pCi/L	TR1	J	0.038
SW093	5/26/95	URANIUM-238	0.505	pCi/L	TR1	J	0.019
SW093	5/26/95	URANIUM-238	0.508	pCi/L	RP1	J	0.031
SW093	6/28/95	URANIUM-238	0.887	pCi/L	TR1		0.031
SW093	6/28/95	URANIUM-238	0.94	pCi/L	RP1		0.043
SW093	1/3/96	URANIUM-238	2.033	pCi/L	RP1		0.047
SW093	1/3/96	URANIUM-238	1.917	pCi/L	TR1		0.102
SW093	1/8/96	URANIUM-238	1.607	pCi/L	TR1		0.119
SW093	5/9/96	URANIUM-238	1.31	pCi/L	TR1		0.1
SW093	5/28/96	URANIUM-238	0.769	pCi/L	TR1		0.07
SW093	6/15/96	URANIUM-238	0.151	pCi/L	TR1	J	0.067
SW093	6/15/96	URANIUM-238	0.371	pCi/L	TR1	J	0.017
SW093	7/9/96	URANIUM-238	0.588	pCi/L	TR1	J	0.034
SW093	10/1/96	URANIUM-238	3.96	pCi/L	TR1		0.047
SW093	10/15/96	URANIUM-238	3.91	pCi/L	TR1		0.13
SW093	10/24/96	URANIUM-238	2.33	pCi/L	TR1		0.13
SW093	10/31/96	URANIUM-238	3.65	pCi/L	TR1		0.08
SW093	11/19/96	URANIUM-238	2.69	pCi/L	TR1		0.13
SW118	10/29/90	URANIUM-238	2.8	pCi/L	TRG		0.09
SW118	11/27/90	URANIUM-238	2	pCi/L	TRG		0.7
SW118	12/13/90	URANIUM-238	1.3	pCi/L	TRG		0.6
SW118	3/21/91	URANIUM-238	2	pCi/L	TRG		0.6
SW118	4/10/91	URANIUM-238	1.9	pCi/L	TRG		1.08
SW118	6/26/91	URANIUM-238	1.966	pCi/L	TRG		1.01
SW118	7/24/91	URANIUM-238	1.071	pCi/L	TRG		0.8
SW118	8/7/91	URANIUM-238	0.7089	pCi/L	TRG		0.5
SW118	3/12/92	URANIUM-238	0.246	pCi/L	TRG		0.356

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER
GS10	10/26/92	NITRATE/NITRITE	1.2	mg/L	TRG	
GS10	5/31/94	NITRATE/NITRITE	1	mg/L	TRG	
GS10	6/20/94	NITRATE/NITRITE	5.7	mg/L	DIL	
GS10	6/21/94	NITRATE/NITRITE	1.5	mg/L	TRG	
GS10	6/22/94	NITRATE/NITRITE	1.4	mg/L	DUP	
GS10	6/22/94	NITRATE/NITRITE	1.4	mg/L	TRG	
GS10	9/21/94	NITRATE/NITRITE	2.7	mg/L	DIL	
GS10	9/22/94	NITRATE/NITRITE	0.1	mg/L	TRG	U
GS10	10/17/94	NITRATE/NITRITE	0.63	mg/L	TRG	
GS10	10/17/94	NITRATE/NITRITE	2.2	mg/L	DIL	
GS10	4/26/95	NITRATE/NITRITE	0.69	mg/L	TR1	
GS10	4/26/95	NITRATE/NITRITE	0.69	mg/L	RP1	
GS10	5/16/95	NITRATE/NITRITE	1.14	mg/L	TR1	
GS10	5/26/95	NITRATE/NITRITE	1.5	mg/L	TR1	
GS10	5/31/95	NITRATE/NITRITE	1.4	mg/L	TR1	
GS10	6/28/95	NITRATE/NITRITE	1.1	mg/L	TRG	
GS10	10/22/95	NITRATE/NITRITE	1.13	mg/L	TR1	

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER	UNCERTAINTY
GS10	5/17/91	URANIUM-233,-234	1.3	pCi/L	TRG		0.2
GS10	5/17/91	URANIUM-233,-234	0.92	pCi/L	REP		0.18
GS10	5/24/91	URANIUM-233,-234	1.3	pCi/L	TRG		0.75
GS10	7/23/91	URANIUM-233,-234	1.8	pCi/L	REP		0.14
GS10	7/23/91	URANIUM-233,-234	2.3	pCi/L	TRG		0.94
GS10	8/8/91	URANIUM-233,-234	1.2	pCi/L	TRG		0.29252
GS10	8/8/91	URANIUM-233,-234	1.1	pCi/L	REP		0.4
GS10	8/14/91	URANIUM-233,-234	2.1	pCi/L	TRG		0.14
GS10	3/31/92	URANIUM-233,-234	0.55	pCi/L	TRG		0.14
GS10	4/15/92	URANIUM-233,-234	1	pCi/L	TRG	J	0.26
GS10	4/17/92	URANIUM-233,-234	3.5	pCi/L	TRG		0.62
GS10	4/17/92	URANIUM-233,-234	0.036	pCi/L	TRG	U	1
GS10	5/14/92	URANIUM-233,-234	0.76	pCi/L	TRG	B	0.43
GS10	6/3/92	URANIUM-233,-234	0.97	pCi/L	TRG	B	0.6
GS10	6/3/92	URANIUM-233,-234	1.3	pCi/L	TRG	B	0.7
GS10	6/3/92	URANIUM-233,-234	1.2	pCi/L	TRG	B	0.89
GS10	10/26/92	URANIUM-233,-234	0.55	pCi/L	TRG		0.707
GS10	5/28/94	URANIUM-233,-234	2.3	pCi/L	TRG		0.816
GS10	5/28/94	URANIUM-233,-234	1.6	pCi/L	REP		1
GS10	5/31/94	URANIUM-233,-234	1.5	pCi/L	TRG		0.514
GS10	10/17/94	URANIUM-233,-234	2.3	pCi/L	TRG		0.544
GS10	10/28/94	URANIUM-233,-234	-0.03	pCi/L	TRG	U	0.52
GS10	4/26/95	URANIUM-233,-234	1.471	pCi/L	TR1		0.43
GS10	5/16/95	URANIUM-233,-234	0.682	pCi/L	TR1		0.54
GS10	5/26/95	URANIUM-233,-234	0.952	pCi/L	TR1		0.51
GS10	6/28/95	URANIUM-233,-234	1.958	pCi/L	TR1		0.53
GS10	10/22/95	URANIUM-233,-234	0.663	pCi/L	TR1		0.3
GS10	1/8/96	URANIUM-233,-234	1.21	pCi/L	TR1		0.44
GS10	3/14/96	URANIUM-233,-234	0.758	pCi/L	TR1		0.64
GS10	4/22/96	URANIUM-233,-234	0.839	pCi/L	TR1		0.36
GS10	5/9/96	URANIUM-233,-234	1.64	pCi/L	TR1		0.63
GS10	5/28/96	URANIUM-233,-234	0.805	pCi/L	TR1		0.56
GS10	6/15/96	URANIUM-233,-234	0.368	pCi/L	TR1	J	0.48
GS10	6/15/96	URANIUM-233,-234	0.626	pCi/L	TR1		0.27
GS10	7/9/96	URANIUM-233,-234	0.675	pCi/L	TR1		0.52
GS10	10/1/96	URANIUM-233,-234	2.13	pCi/L	TR1		0.34
GS10	10/16/96	URANIUM-233,-234	1.4	pCi/L	TR1		0.42
GS10	10/16/96	URANIUM-233,-234	1.36	pCi/L	TR1		0.27
GS10	10/31/96	URANIUM-233,-234	1.7	pCi/L	RP1		0.2
GS10	10/31/96	URANIUM-233,-234	1.62	pCi/L	TR1		0.5
GS10	11/20/96	URANIUM-233,-234	1.78	pCi/L	TR1		0.12
							0.38

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER	UNCERTAINTY
GS10	5/17/91	URANIUM-235	0	pCi/L	TRG	U	0.079
GS10	5/17/91	URANIUM-235	0	pCi/L	REP	U	0.045
GS10	5/24/91	URANIUM-235	0.051	pCi/L	TRG	U	0.21
GS10	7/23/91	URANIUM-235	0.14	pCi/L	TRG	J	0.087
GS10	7/23/91	URANIUM-235	0.14	pCi/L	REP	U	0.38
GS10	8/8/91	URANIUM-235	0.11	pCi/L	TRG	J	0
GS10	8/8/91	URANIUM-235	0.084	pCi/L	REP	U	0.1
GS10	8/14/91	URANIUM-235	0.05	pCi/L	TRG	U	0.11
GS10	3/31/92	URANIUM-235	0.02	pCi/L	TRG	U	0.59
GS10	4/15/92	URANIUM-235	0.045	pCi/L	TRG	U	0.08
GS10	4/17/92	URANIUM-235	0.31	pCi/L	TRG	J	0.1
GS10	4/17/92	URANIUM-235	-0.044	pCi/L	TRG	U	0.18
GS10	5/14/92	URANIUM-235	0.11	pCi/L	TRG	J	0.15
GS10	6/3/92	URANIUM-235	0.29	pCi/L	TRG	J	0.405
GS10	6/3/92	URANIUM-235	0	pCi/L	TRG	U	0.202
GS10	6/3/92	URANIUM-235	-0.008	pCi/L	TRG	U	0.168
GS10	10/26/92	URANIUM-235	0	pCi/L	TRG	U	0.115
GS10	8/31/94	URANIUM-235	0	pCi/L	TRG	U	0.12
GS10	9/21/94	URANIUM-235	0.18	pCi/L	TRG	U	0.12
GS10	9/22/94	URANIUM-235	0.081	pCi/L	TRG	U	0.1
GS10	10/17/94	URANIUM-235	0.047	pCi/L	TRG	U	0.12
GS10	10/17/94	URANIUM-235	0.14	pCi/L	TRG	U	0.14
GS10	10/28/94	URANIUM-235	-0.036	pCi/L	TRG	U	0.085
GS10	4/26/95	URANIUM-235	0.072	pCi/L	TR1	J	0.084
GS10	5/16/95	URANIUM-235	0.021	pCi/L	TR1	J	0.1
GS10	5/26/95	URANIUM-235	0.039	pCi/L	TR1	J	0.12
GS10	6/28/95	URANIUM-235	0.052	pCi/L	TR1	J	0.34
GS10	10/22/95	URANIUM-235	0.014	pCi/L	TR1		0.001
GS10	1/8/96	URANIUM-235	0.04	pCi/L	TR1	J	0.1
GS10	3/14/96	URANIUM-235	0.021	pCi/L	TR1	J	0.047
GS10	4/22/96	URANIUM-235	0.031	pCi/L	TR1	J	0.054
GS10	5/9/96	URANIUM-235	0.073	pCi/L	TR1	J	0.17
GS10	5/28/96	URANIUM-235	0.027	pCi/L	TR1	J	0.092
GS10	6/15/96	URANIUM-235	0.025	pCi/L	TR1	J	0.049
GS10	6/15/96	URANIUM-235	0.012	pCi/L	TR1	J	0.16
GS10	7/9/96	URANIUM-235	0.031	pCi/L	TR1	J	0.11
GS10	10/1/96	URANIUM-235	0.054	pCi/L	TR1	J	0.094
GS10	10/16/96	URANIUM-235	0.048	pCi/L	TR1	J	0.11
GS10	10/16/96	URANIUM-235	0.039	pCi/L	TR1	J	0.072
GS10	10/31/96	URANIUM-235	0.037	pCi/L	TR1	J	0.22
GS10	10/31/96	URANIUM-235	0.063	pCi/L	RP1	J	0.2
GS10	11/20/96	URANIUM-235	0.072	pCi/L	TR1	J	0.059

LOCATION CODE	COLLECTION DATE	DESCRIPTION	RESULT	UNITS	RESULT TYPE	LAB QUALIFIER	UNCERTAINTY
GS10	5/17/91	URANIUM-238	0.82	pCi/L	REP		0.17
GS10	5/17/91	URANIUM-238	1.1	pCi/L	TRG		0.15
GS10	5/24/91	URANIUM-238	0.93	pCi/L	TRG		0.66
GS10	7/23/91	URANIUM-238	1.7	pCi/L	REP		0.072
GS10	7/23/91	URANIUM-238	2.1	pCi/L	TRG		0.46
GS10	8/8/91	URANIUM-238	1.2	pCi/L	TRG		0.82
GS10	8/8/91	URANIUM-238	0.9	pCi/L	REP		1.4
GS10	8/14/91	URANIUM-238	1.6	pCi/L	TRG		0.47
GS10	3/31/92	URANIUM-238	0.39	pCi/L	TRG	J	0.67
GS10	4/15/92	URANIUM-238	0.86	pCi/L	TRG		1.1
GS10	4/17/92	URANIUM-238	2.9	pCi/L	TRG		1.38
GS10	4/17/92	URANIUM-238	0.072	pCi/L	TRG	U	1.7
GS10	5/14/92	URANIUM-238	1.1	pCi/L	TRG	B	0.6
GS10	6/3/92	URANIUM-238	1.2	pCi/L	TRG		1.09
GS10	6/3/92	URANIUM-238	0.32	pCi/L	TRG	J	1.27
GS10	6/3/92	URANIUM-238	1.2	pCi/L	TRG		1.2
GS10	10/26/92	URANIUM-238	0.82	pCi/L	TRG		0.4
GS10	5/28/94	URANIUM-238	2	pCi/L	TRG		0.4
GS10	5/28/94	URANIUM-238	1.5	pCi/L	REP		0.35487
GS10	5/31/94	URANIUM-238	1.9	pCi/L	TRG		0.972
GS10	6/20/94	URANIUM-238	0.54	pCi/L	TRG	J	0.923
GS10	4/26/95	URANIUM-238	0.76	pCi/L	TR1		0.42
GS10	5/16/95	URANIUM-238	0.598	pCi/L	TR1	J	0.51
GS10	5/26/95	URANIUM-238	0.905	pCi/L	TR1		0.44
GS10	6/28/95	URANIUM-238	1.722	pCi/L	TR1		0.5
GS10	10/22/95	URANIUM-238	0.661	pCi/L	TR1		0.48
GS10	1/8/96	URANIUM-238	0.913	pCi/L	TR1		0.33
GS10	3/14/96	URANIUM-238	0.73	pCi/L	TR1		0.36
GS10	4/22/96	URANIUM-238	0.85	pCi/L	TR1		0.54
GS10	5/9/96	URANIUM-238	1.72	pCi/L	TR1		0.44
GS10	5/28/96	URANIUM-238	0.848	pCi/L	TR1		0.69
GS10	6/15/96	URANIUM-238	0.349	pCi/L	TR1	J	0.56
GS10	6/15/96	URANIUM-238	0.541	pCi/L	TR1	J	0.47
GS10	7/9/96	URANIUM-238	0.824	pCi/L	TR1		0.4
GS10	10/1/96	URANIUM-238	2.1	pCi/L	TR1		0.3
GS10	10/16/96	URANIUM-238	1.21	pCi/L	TR1		0.16
GS10	10/16/96	URANIUM-238	1.1	pCi/L	TR1		0.52
GS10	10/31/96	URANIUM-238	1.47	pCi/L	TR1		0.27
GS10	10/31/96	URANIUM-238	1.47	pCi/L	RP1		0.3
GS10	11/20/96	URANIUM-238	2.42	pCi/L	TR1		0.42