

APPENDIX D

ATTACHMENT D-1
REGULATORY AGENCY CORRESPONDENCE
(Electronic Copy)

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD -
LOS ANGELES REGION**

101 CENTRE PLAZA DRIVE
MONTEREY PARK, CALIFORNIA 91754-2136
(213) 266-7500

April 6, 1990

✓ Mr. S. R. Lafflam
Manager, Environmental Unit
Facilities & Plant Operations
Rocketdyne Division
Rockwell International Corporation
6633 Canoga Avenue
Canoga Park, CA 91303

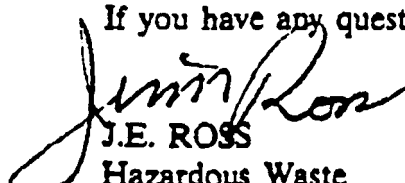
**TPCA DETERMINATION-LOWER POND OF THE SODIUM BURN PIT-SANTA
SUSANA FIELD LABORATORY (FILE NO 200.003)**

On January 19 and 25, 1990, staff inspected the Rockwell facility and took soil and ground water samples in area IV in the vicinity of the Sodium Burn Pit. A copy of our laboratory analysis is enclosed. Upon reviewing the results from the analysis, it was determined that the lower pond area is subject to TPCA.

You are directed to submit a Hydrogeological Assessment Report (HAR) by June 1, 1990 for the lower pond area; in addition, you are to fill out the enclosed attachment and include an annual fee of \$300.00 and \$150.00 for this additional surface impoundment.

Enclosed is an application which you will resubmit along with the HAR report to this regional board and enclose a check for \$450.00 made out to the State Water Resource Control Board. Also enclosed is a copy of the lab results.

If you have any questions, please call Ms. Irma Salinas at (213) 266-7610.


J.E. ROSS
Hazardous Waste
Unit Chief

enclosure

cc: Mr. Jim Parsons, State Water Resources Control Board,
Division of Water Quality
✓ Ms. Carmen Santos, EPA
Mr. Larry Petersen, Department of Health Services, Toxic Substances Control
Division Region 3, Burbank
Assemblyman Richard Katz, District 39

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—

LOS ANGELES REGION

101 CENTRE PLAZA DRIVE

MONTEREY PARK, CA 91754-2136

(213) 266-7300

Enclosure 1 to
91ETEC-DRF-2192
September 27, 1991

April 30, 1991

Mr. S.R. Lafflam
Manager, Environmental Unit
Facilities & Plant Operations
Rocketdyne Division
Rockwell International Corporation
6633 Canoga Avenue
Canoga Park, CA 91303

CLEAN UP AND ABATEMENT ORDER NO. 91-061 (File No. 200.003)

Enclosed is a clean up and Abatement Order directing you to close the surface impoundments in area IV of Rockwell, Santa Susana Field Laboratory (SSFL). You are directed to investigate and cleanup any soil and/or ground water contamination resulting from operations at the subject site. Please note that the Order calls for progress reports, with first report due by July 30, 1991.

This Order is issued in accordance with Section 13304 of the California Water Code. If you fail to comply with the terms and conditions of this Order, the Board may impose civil penalties or seek injunctive relief in accordance with Section 13350 of the California Water Code.

If you have any questions concerning this matter, please contact Dennis Dasker at (213) 266-7518 or Jim Ross at (213) 266-7550.

ROBERT P. GHIRELLI, D.Env.
Executive Officer

CC: Mr. James Giannopoulos, State Water Resources Control Board
Mr. Jorge Leon, State Water Resources Control Board, Office of Chief Counsel
Mr. Scott Simpson, Department of Health Services, Toxic substances Control Board
Mr. Carl Sjoberg, Los Angeles County, Department of Public Works
Mr. Anastacio Medina, Los Angeles County, Department of Health Services

Enclosure

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD— LOS ANGELES REGION

101 CENTRE PLAZA DRIVE
MONTEREY PARK, CA 91754-2156
(213) 266-7500



February 11, 1992

Mr. S. R. Lafflam, Director
Director Environmental Control
Rocketdyne Division
Rockwell International Corporation
6633 Canoga Avenue
Canoga Park, CA 91303

Mr. Roger Liddle
U.S. Department of Energy
San Francisco Field Office
ESS Division
1333 Broadway
Oakland, CA 94612

FORMER SODIUM DISPOSAL FACILITY B/886 SANTA SUSANA FIELD
LABORATORY (SSFL) - CLOSURE PLAN APPROVAL (File NO. 200.003)

We have reviewed your submittal, received January 7, 1992, for the subject project. In addition, staff from Toxic Substances Control Division (DTSC) and the Regional Board met with Rockwell staff on February 7, 1992, to finalize our modifications and requirements necessary for approval of the closure plan.

We are approving the closure plan, subject to our specific conditions for the pilot study detailed below. DTSC is issuing a separate approval letter, dated February 11, 1992, detailing the modifications and requirements as discussed at the meeting.

You are authorized to proceed with closure activities at the site upon written notification to both agencies of the acceptance of the modifications and conditions set forth in these approval letters.

Our specific conditions for the pilot study are as follows:

1. All completion dates detailed in the CRWQCB Cleanup and Abatement Order No. 91-061, issued April 30, 1991, remain in effect.
2. In lieu of additional assessment activity at the Lower Pond only, an area within the Lower Pond for the pilot study will be identified by Regional Board staff. The study will verify existing assessment data and planned remediation techniques.
3. The soil shall be removed within this area down to bedrock, debris segregated and all soil and debris classified as per the Closure Plan. *is this the Phase Plan?*
4. Verification sampling and Analysis will be completed and approval by staff obtained prior to any backfilling or removal

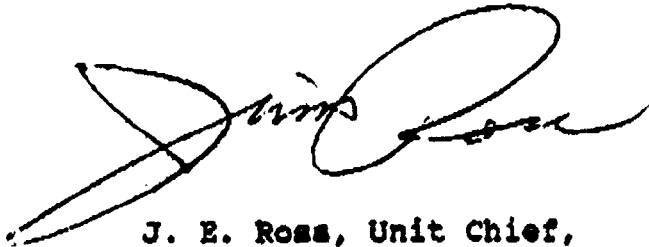
will we be able to review the area prior to starting. is this a test to see if we know what we are doing

Mr. S.R. Lafflam/Mr. Roger Liddle
Page 2

- of excavated soil or debris from the site. Agency staff will require 48 hours notification prior to any such sampling.
5. We are approving the start of this work following the issuance of the "Fact Sheet" as required by DTSC, on or before February 18, 1992.
 6. A method for controlling odors shall be in place during all work activity at the site.
 7. The existing concrete flatwork and lined pit, in the vicinity of the sodium burn pit, could be used to clean metal and other debris in order to minimize additional soil contamination.

A report detailing your success in achieving the stated objectives (Item 2 above) shall be submitted to this Board within 30 days of completion of the study. At that time, the procedure for completing closure of the remaining portions of the Lower Pond shall be discussed.

If you have any questions, please call me at (213) 266-7550.



J. E. Ross, Unit Chief,
Site Cleanup Unit

cc: Dennis Dickerson, DTSC, Region 3, Burbank
Karren Basette, SWRCB

*To we need to have the
RWQCB work on process
or just appear
this does not meet with
133 doing the work on Suspect
containers*

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
LOS ANGELES REGION**

101 CENTRE PLAZA DRIVE
MONTEREY PARK, CA 91754-2156
(213) 266-7500

DRF 2280



December 29, 1992

Mr. S. R. Lafflam, Director
Environmental Control
Rocketdyne Division
Rockwell International Corporation
6633 Canoga Avenue
Canoga Park, CA 91303

Mr. Roger Liddle
ESS Division
San Francisco Field Office
U.S. Department of Energy
1333 Broadway
Oakland, CA 94612

ROCKWELL INTERNATIONAL CORPORATION, ROCKETDYNE DIVISION - CLOSURE
OF SURFACE IMPOUNDMENT IN AREA IV, FORMER SODIUM DISPOSAL FACILITY
B/886 LOWER POND, UNDER THE TOXIC PIT CLEANUP ACT (TPCA) PROGRAM
(FILE NO. 200.003)

We have completed evaluation of all data and submittals pertaining to the subject surface impoundment. Your latest report, dated December 22, 1992, indicated that all debris and contaminated soil has been removed from the Lower Pond (facility) and that all Board requirements have been met for closure of this facility. The following is our determination:

1. For this facility, you are in compliance with the TPCA requirements regarding submittal of a completed Hydrogeologic Assessment Report (HAR) as specified in Section 25208.8 of the Health and Safety Code.
2. You have submitted sampling and analysis data taken from the final excavated condition of the Lower Pond, and into the bedrock and remaining side wall of the Pond along with excavation and disposal documentation. In addition, Water Board staff has inspected this excavation of soil and debris removal and disposal operation during the progress of the work, and has verified instrumentation analysis for the levels of radioactivity, volatile organics, and metals contamination in the bedrock.
- 3., For this facility, you are in compliance with the TPCA requirements for cease discharge as defined in Section 25208.4 of the Health and Safety Code.

Post-It™ brand fax transmittal memo 7671		# of pages > 3
To: <u>Gerry Gaylord</u>	From: <u>Steve Lafflam</u>	
Co.	Co.	
Dept.	Phone # <u>586-2577</u>	
Fax # <u>90-5118</u>	Fax # <u>586-7470</u>	

Post-It™ brand fax transmittal memo 7671		# of pages > 3
To: <u>Mary Shoemaker</u>	From: <u>Steve Lafflam</u>	
Co.	Co.	
Dept.	Phone # <u>586-2577</u>	
Fax # <u>90-5889</u>	Fax # <u>586-7470</u>	

1992 05 14 14:40 HOFFMAN HALL 586-7470



BNA04295219

HDMSe00449991

Based upon the above information, we concur that all debris and soil contamination have been removed from the Lower Pond in accordance with this Board's Cleanup and Abatement Order (CAO) No. 91-061, issued on April 30, 1991, and this TPCA surface impoundment is considered closed in accordance with the TPCA requirements for closure.

You indicated that a small quantity of soil will be left on the surface of the bedrock which can not be removed in any practical sense. If this material does not contain contaminants, we have no objection to leaving this small quantity of soil in place. This material must be sampled and analyzed in accordance with our October 9, 1992, sampling plan, and the results submitted to this Board.

Your December 22, 1992, submittal also included a post-closure plan for incorporating the remediation of the ground water contamination caused by this surface impoundment into the overall site cleanup. This would satisfy the requirements of this Board's CAO and Section 25208.2 of TPCA. These requirements were stipulated in the CAO as a result of the conclusions in your Hydrogeological Assessment Report for the surface impoundment which identified this impoundment as a continuing source of ground water contamination.

In addition, your verification sampling and analysis has confirmed that some low level contamination of the bedrock has occurred. Your submittal details a plan for verifying the extent of any residual contamination and a proposal for long term remediation of this condition as appropriate. Please note your final post-closure plan is due to this Board 60 days following approval of this submittal by the Executive Officer.

We also have no objection to your plan to backfill the Lower Pond following final excavation of the Upper Pond. However, you will be required to comply with the following conditions during the interim:

1. All localized low areas within the Lower Pond bottom shall be filled to create a smooth grade across the entire bottom.
2. A water-tight liner shall be placed over the bottom surface area to contain all rainfall entering the lined pond.
3. Rainfall runoff water entering the pond shall be removed within 24 hours so that there will be no percolation into the formations below the impoundment.



4. Until backfilling is complete, reports shall be submitted to this Board describing the precautions taken to prevent discharge, the quantity of rainfall stored, the length of time water remained in the pond and the disposition of the water removed. The reports shall be submitted within 72 hours of each event or at the end of a continuous rainfall period with one day or less interruption, whichever is less.

Please note with final closure of the Lower Pond and removal of this surface impoundment from the TPCA program, TPCA requirements no longer apply to this site. All remaining post-closure activities will be completed in accordance with the provisions of Chapter 15, Title 23, California Code Regulations, and appropriate RCRA regulations. To that end, your submittal indicated that the Chapter 15, Article 5 and Article 8 requirements, as appropriate, will be implemented by Rockwell for post-closure compliance.

With the closure of this surface impoundment, a significant source of ground water contamination has been eliminated. Your diligent prosecution of this work in completing the closure and meeting the ordered compliance date is considered a noteworthy achievement.

If you have any questions, please call me at (213) 266-7510 or Jim Ross, Chief of our Site Cleanup Unit, at (213) 266-7550.

Robert P. Ghirelli

for
ROBERT P. GHIRELLI, D.Env
Executive Officer

cc: Regional Board Members
Assemblyman Richard Katz
John Adams, State Water Resources Control Board, Division of
Clean Water Programs
Florence Pearson, Department of Toxic Substances Control,
Region 3, Burbank
Penny McIay, Department of Health Services, Environmental
Management Branch
Karen Schwinn, US EPA, Region 9
Ventura County Air Pollution Control District
Ventura County Health Department
City of Simi Valley, Health Department
Daily News
Los Angeles Times, Valley Edition



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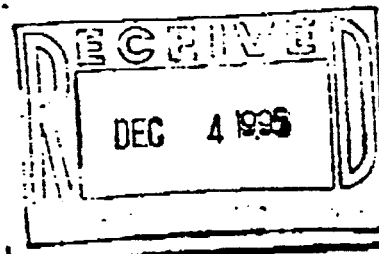
DRF- ETEC FSDF 951004

STATE OF CALIFORNIA CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

PETE WILSON, Governor

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

GRANDVIEW AVENUE
 GLENDALE, CA 91201
 (818) 551 2800



December 1, 1995

CERTIFIED MAIL

Return Receipt Requested

X 142 855 482

Mr. Randy Ueshiro
 Acting Director
 Remediation Programs
 Environmental Protection
 Rocketdyne Division
 Rockwell International Corporation
 6633 Canoga Avenue
 Canoga Park, CA 91309-7922

Post-It™ brand fax transmittal memo 7671

of pages 2

To	Satuk	From	Ueshiro
Co.		Co.	
Dept.		Phone #	66015
Fax #	5072	Fax #	

Dear Mr. Ueshiro:

INTERIM MEASURES FOR FORMER SODIUM DISPOSAL FACILITY, SANTA
 SUSANA FIELD LABORATORY, AREA IV, EPA ID NO. CAD 000 629 972

The Department of Toxic Substances Control (DTSC) has received the Draft Closure Report for the Sodium Disposal Facility (FSDF) dated October 27, 1995, Draft Risk Assessment (RA) Workplan, FSDF, dated October 4, 1995, and the FSDF Offsite Drainage Report dated October 4, 1995. DTSC is currently reviewing these documents. The purpose of this letter is to address the interim measures necessary to contain the hazardous constituents on-site during the upcoming rainy season.

Because the levels of some constituents in the FSDF appear to indicate contamination above background, even to the extent that some exceed hazardous waste criteria, DTSC considers that interim measures are necessary to insure that these constituents do not continue to migrate outside the facility boundaries. In conversations between Carla Slepak of DTSC and Michael Sullivan of your staff, Sullivan discussed a plan which would include placement of a tarp over the contaminated portions of the FSDF and construction of sediment traps. Please present the details of the plan to DTSC before December 15, 1995 and prior to implementing the plan. The presentation should include the location, size, hold down system and construction materials of the tarp; number, size and construction details of the sediment collection traps; and proposed maintenance schedules for these systems. In addition, the presentation should indicate the spatial relationships between these systems and the drainages surrounding the FSDF.

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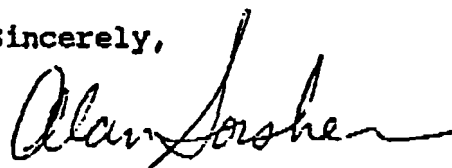
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Mr. Randy Ueshiro
December 1, 1995
Page 2

DTSC has the authority granted under Rockwell's Hazardous Waste Treatment and Storage Permit #93-3-TS-002, Part IV, section C.2-3 to require submission of an IM workplan. Interim measures continue until DTSC, based on the results of an approved health risk assessment, determines that no further action is needed within this area or in the offsite areas surrounding the PSDF in order to protect human health and the environment.

If you have any questions, please contact Carla Slepak of this office at (818) 551-2959.

Sincerely,



Alan Sorsher, P.E.
Unit Chief
Facility Permitting Branch

Certified Mail
Z 142 855 482
Return Receipt Requested

cc: Mr. Michael Sullivan
Remediation Programs, Environmental Protection
Rocketdyne Division
Rockwell International Corporation
6633 Canoga Avenue
P.O. Box 7922
Canoga Park, California 91309-7922

Mr. Mark Pumford
L.A. Regional Water Quality Control Board
101 Centre Plaza Drive
Monterey Park, California 91754-2156

Mr. Jim Ross
L.A. Regional Water Quality Control Board
101 Centre Plaza Drive
Monterey Park, California 91754-2156

Mr. Tom Kelly (H-3-2)
U.S. EPA, Region IX
75 Hawthorne Street
San Francisco, California 94105

Mr. Joel Cehn
1036 Hubert Road
Oakland, California 94610

Rocketdyne Division
Rockwell International Corporation
6633 Canoga Avenue
P.O. Box 7922
Canoga Park, California 91309-7922



Telex: 698478
ROCKETDYN CNPK

December 20, 1995

In reply refer to 95RC-08251

Carla Slepak
Associate Hazardous Materials Specialist
California Environmental Protection Agency
Department of Toxic Substances Control
Facilities Management Branch
Region 3
1101 North Grandview Avenue
Glendale, California 91201

Subject: Former Sodium Disposal Facility Interim Measures

Dear Ms. Slepak:

This letter and the enclosed information is in response to the Department of Toxic Substances Control's (DTSC) letter dated December 1, 1995 requesting information on interim measures at the Former Sodium Disposal Facility (FSDF) in Area IV of Santa Susana Field Laboratory. This letter follows the meeting on Friday, December 15, 1995 at your offices to discuss the measures. The interim measures described herein incorporate DTSC comments.

There are two purposes for the interim measures. First, the interim measures minimize any pooling of water which could migrate into bedrock in the lower pond. Second, the interim measures minimize the migration of sediment from on-property areas to off-property areas. The following components of the interim measures are described:

- V-ditch
- tarp
- weirs

These interim measures are already in place or under construction. The V-ditch has been in place since the FSDF was excavated to control surface water flow across the former ponds. The tarp is placed at the site each winter as per Los Angeles Regional Water Quality Control Board (LARWQCB) requirements until final backfilling and grading of the site is completed. The weirs have been in planning and are currently under construction in order to have them in place in a timely manner. Rocketdyne recognizes that DTSC's letter requests this information prior to implementing the interim measures. However, Rocketdyne believes the better course of action is to complete these measures at this time. All of the interim measures are completely on Rocketdyne property.

The interim measures described in this letter adequately achieve the stated purposes. Additional measures have been evaluated and rejected because they may result in increasing sediment migration instead of minimizing migration. For example, there are some areas of the site having concentrations of polychlorinated biphenyls (PCBs) and polychlorinated dibenzo-p-dioxin (PCDD) and polychlorinated dibenzofuran (PCDF) compounds detected above background which are not covered with the tarp. These areas are currently stabilized by the natural vegetation. The placement of a tarp would kill the vegetation resulting in increased sediment migration.

V-DITCH

The V-ditch was installed to control surface water flow across the former ponds through redirecting surface water. The V-ditch is shown on the attached map. The ditch is located on the southern edge of FSDF area 2 running east-west along the access road. It then turns north along the western edge of FSDF areas 2 and 3 carrying water around the former ponds and intersecting FSDF channel A north of the former lower pond. When observed during actual rain events, this ditch successfully keeps surface water from entering the pond area as runoff from higher elevations.

TARP

The tarp is installed over FSDF areas 2 and 3 which include the former ponds. The tarp is custom-made and is installed as per the attached map. The tarp is purchased from Reef Industries in Houston, Texas. Its trade name is Griffolyn TX-1200. An MSDS for the tarp is included with this letter. A sample of the tarp material is also included. At the lower end of the ponds, the tarp is lain over the pond embankments except where a drainage channel has been created at the northern end of the lower pond. This drainage channel joins the V-ditch and becomes FSDF channel A. The location of the tarp-covered areas is shown on the attached map.

Water entering the tarp-covered area is controlled in two ways. First, water falling on the top of the tarp drains into FSDF channel A. Water which might find its way underneath the tarp (generally from seepage through bedrock) is trapped in a catch area and pumped into a Baker tank. This water is then analyzed and handled in an appropriate manner.

WEIRS

Rocketdyne is constructing two weirs in the FSDF channels. One will be located in FSDF channel A and one in channel B. The purpose of the weirs is to slow the rate of surface water flow in the channel to allow the settling of suspended sediment. Both weirs are located immediately downstream of the NPDES sampling points in the channels. Since the weir in FSDF channel A (the western channel) receives water from above the former ponds via the V-ditch and from on top of the tarp, this water will not contain impacted sediment. However, the stretch of channel A between the former lower pond and the weir does contain impacted sediment and this would be captured by the weir. The weir in FSDF channel B (the eastern channel) will not receive water from the former ponds but does drain the entire length of channel B which has levels of PCBs and PCDD/PCDF compounds above background. However, since the upper reaches of channel B are not channeled and are well vegetated, migration of sediment from these stable areas is not expected. The location of the weirs are shown on the enclosed map.

The weirs will be constructed using concrete slurry-filled sandbags. These will be placed in the channels at the designated locations. Once the sandbags are wetted, the concrete will harden to increase the rigidity and strength of the weirs. Proposed designs for the two weirs are attached. Once the construction is complete, as-built drawings will be completed. For FSDF channel A, approximately 8 rows of sandbags will be placed in the channel to hold back the flowing water creating a settling area. For FSDF channel B, approximately 6 rows of sandbags will be placed in the channel to hold back the flowing water creating a settling area. In channel B, 5 metal posts will be secured into the bedrock via coring and cementing in-place to support the sandbags. The heights of the weirs will be set so as not to interfere with the NPDES sampling locations immediately upstream. Although not shown, the top row of sandbags at each weir will be arranged to direct the flow of water over the weir into the center of the channel.

It is anticipated that the weirs will successfully retard the migration of sediment in the FSDF channels. Therefore, over time the weir settling areas themselves will contain some sediment. Rocketdyne proposes to collect one sample from the center of the sediment in each weir once a year, at the end of the rainy season in June. These sediment samples will

be analyzed for PCBs (EPA Method 8080) and PCDD/PCDF compounds (EPA Method 8290). The results of this monitoring will be reported to DTSC and will be used to determine the appropriate disposition of the sediment. Once the sediment's appropriate disposition has been determined, the sediment will be removed from each of the weir settling areas and handled accordingly.

In the event that the weir, sediment sampling, and sediment removal become part of the long-term closure requirements for the FSDF, then criteria for the termination of this activity need to be established. Rocketdyne proposes that this criteria be set using the results of the risk assessment to be completed for the FSDF.

The FSDF interim measures to control sediment migration do not affect the ongoing NPDES sampling program. Currently, surface water samples are collected in both channels at the NPDES sampling locations during appropriate rainfall events according to our NPDES permit. Surface water samples from the FSDF channels are analyzed quarterly for PCBs. Due to the extremely low water solubility of PCDD/PCDF compounds and the fact that they bind tightly to sediment, Rocketdyne concludes that the current NPDES sampling program is sufficient to characterize surface water runoff.

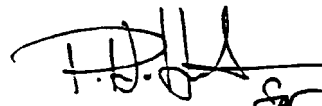
We look forward to discussing the issue of the FSDF interim measure with you soon. Rocketdyne is also anxious to receive DTSC's comments on the risk assessment workplan in order to complete the risk assessment and determine the final activities necessary for FSDF closure. Once closure is complete and the FSDF areas are backfilled, graded, and seeded, the likelihood of sediment migration to off-site location will significantly diminish and the need for sediment migration controls eliminated.

If you have any questions, please do not hesitate to contact Michael Sullivan at (818) 586-6004 or Majelle Jensen at (818) 586-5283.

Sincerely,



for Michael J. Sullivan, Ph.D.
Environmental Remediation



Majelle Jensen, Program Mgr.
ETEC

cc: w/encl.: J. Cehn

cc: w/out encl. M. Pumford, LARWQCB
J. Ross, LARWQCB
T. Kelly, USEPA

DEPARTMENT OF HEALTH SERVICES

1744 P STREET
BOX 942732
SACRAMENTO, CA 94234-7320



(916) 445-0931

May 15, 1998

P.D. Rutherford, Manager
Radiation Protection & Health Physics Services
Boeing North America/Rocketdyne Division
P.O. Box 7922, MS-T100
6633 Canoga Avenue
Canoga Park, CA 91309-7922

Dear Mr. Rutherford:

This letter is to confirm the release of Former Sodium Disposal Facility (FSDF) at the Rockwell International Santa Susana Field Laboratory. A final gamma radiation survey and a sampling of soil and rock demonstrated satisfactory removal of the radioactive contamination.

Amendment number 98 to California Radioactive Material License Number 0015-19 was issued on May 6, 1998 releasing the Former Sodium Disposal Facility (FSDF) to unrestricted use.

Sincerely,

A handwritten signature in cursive script that reads 'Gerard Wong'.

Gerard Wong, Ph.D., Chief
Radioactive Material Licensing Section
Radiologic Health Branch

003463 RC

05-20-98 A10:54 IN

HDMSP00025224



Department of Toxic Substances Control



Winston H. Hickox
Secretary for
Environmental
Protection

Edwin F. Lowry, Director
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106

Gray Davis
Governor

July 15, 1999

Mr. David W. Dassler, P.E.
Safety, Health & Environmental Affairs
Rocketdyne Propulsion & Power
Boeing North American, Incorporated
6633 Canoga Avenue
P.O. Box 7922
Canoga Park, California 91309-7922

Dear Mr. Dassler:

TECHNICAL REVIEW OF DRAFT FINAL INTERIM MEASURES WORKPLAN FOR SOIL CLEANUP AT THE FORMER SODIUM DISPOSAL FACILITY, SANTA SUSANA FIELD LABORATORY, SIMI HILLS, CALIFORNIA CAD 000629972

The Department of Toxic Substances Control (DTSC) has reviewed the Draft Final Interim Measures Workplan for Soil Cleanup at the Former Sodium Disposal Facility (FSDF) dated June 18, 1999, and subsequently revised July 9, 1999. The July 9, 1999 revision incorporates the metals background data set, which will be used as a basis for screening clean, imported fill.

Based on our review, DTSC has determined that the draft FSDF IM Workplan is complete and technically acceptable such that it may be public noticed. An Initial Study has been prepared for this project pursuant to requirements of the California Environmental Quality Act (CEQA). The Draft Final IM FSDF Workplan and CEQA documents will be public noticed for thirty days to invite public comment.

07-19-99P01:23 RCVD

004653 RC

California Environmental Protection Agency
♻️ Printed on Recycled Paper



GA. | dm/jg
GA03W.079

OSP 99 25436

Mr. David W. Dassler

July 15, 1999

Page 2

If you have any questions, please do not hesitate to contact me at (916) 255-3600.

Sincerely,



Gerard J. Abrams
Hazardous Substances
Engineering Geologist
Land Disposal Branch

Enclosure

cc: Mr. Joe Lyou
Mr. Dan Hirsch
Committee to Bridge the Gap
1637 Butler Avenue, Suite 203
Los Angeles, California 90025

Dr. Michael Sullivan
Rocketdyne Propulsion & Power
Boeing North American, Incorporated
6633 Canoga Avenue
P.O. Box 7922
Canoga Park, California 91309-7922

Mr. Tom Kelly
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105

Dr. T. R. Hathaway
Dr. Michael Anderson
Department of Toxic Substances Control
301 Capitol Mall, 1st Floor
Sacramento, California 95814

Mr. David W. Dassler

July 15, 1999
Page 3

cc: Mr. Jose Kou
Department of Toxic Substances Control
1011 N. Grandview Avenue
Glendale, California 91201-2205

Mr. Hannibal Joma
Department of Energy
Oakland Operations Office
1301 Clay Street, 700N
Oakland, California 94612-5208

Mr. Steve Hsu
Mr. Roger Lupo
Radiologic Health Branch
Department of Health Services
601 N. 7th Street
Sacramento, California 95814

Department of Toxic Substances Control

Edwin F. Lowry, Director
400 P Street, 4th Floor, P.O. Box 806
Sacramento, California 95812-0806



Gray Davis
Governor


Winston H. Hickox
Secretary for
Environmental
Protection

MEMORANDUM

To: Gerard Abrams, Project Manager
Permitting Branch (Croydon Office)
Department of Toxic Substances Control
California Environmental Protection Agency
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106

From: TR Hathaway, DVM, MS, DABT
Staff Toxicologist, Human and Ecological Risk Section (HERS)
Human and Ecological Risk Division (HERD)
Science, Pollution Prevention, and Technology (SPPT)
Department of Toxic Substances Control (DTSC)
California Environmental Protection Agency

Date: July 2, 1999

Subject: Interim Remedial Measure Workplan for Soil Cleanup -FSDF
Santa Susana Field Laboratory (Boeing / Rocketdyne)
PCA Code: 24120 Site Codes: 300381
Workphase: 57 MPC Code: 37

Background

The document, "1997 Amendment to the Former Sodium Disposal Facility Interim Remedial Measure Workplan for Soil Cleanup," dated September 8, 1997, was reviewed as a "stand-alone" Interim Remedial Measures Workplan (IRMWP), as requested by the project manager. The document was unclear relative to the planned area of remediation.

Document Reviewed

Draft Final 1998 Interim Remedial Measure Workplan for Soil Cleanup at the Former Sodium Disposal Facility Santa Susana Field Laboratory. Volumes 1 and 2 were dated June 18, 1999.

Scope of Review

The Department of Toxic Substances Control (DTSC) Project Manager requested review and comments on adequacy and completeness of the responses and to determine if previously agreed upon text changes were included.

California Environmental Protection Agency

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Comments

1. Page 1-1 The first sentence should indicate that this workplan deals only with chemical contamination.
2. Page 1-5 The second sentence which alludes to elimination of chemicals, must indicate that only inorganic chemicals have been eliminated by comparisons with background concentrations. Dioxin concentrations which were above "background" were removed.
3. Appendix J has not been included and has, as yet, not been received. See John Charles McMillan e-mail June 21, 1999 (attached).
4. Figures 1-4, 5, and 6 were not included.
5. Page 2-12 The final paragraph states that "...no Cleanup Goals..." were established for mercury. A level of 20 milligrams per kilogram was proposed in the risk assessment document. Has this number been withdrawn or changed?
6. Section 6 Two figures which differ greatly are both labeled "Figure 6-1." The John Charles McMillan e-mail (June 21, 1999) states only that the schedule will be updated..

Conclusion

This workplan adequately addresses previous HERD comments and is acceptable. Typographical errors should be corrected in future versions of this document.

Reviewer: Deborah J. Oudiz, Ph.D.
Senior Toxicologist, HERD



cc: Mike Anderson, Ph.D.
Associate Toxicologist, HERD

Penny Nakashima, Project Manager
Permitting Branch (Glendale Office)



Department of Toxic Substances Control

Edwin F. Lowry, Director
400 P Street, 4th Floor, P.O. Box 806
Sacramento, California 95812-0806



Gray Davis
Governor

Winston H. Hickox
Secretary for
Environmental
Protection

MEMORANDUM

To: Gerard Abrams, Project Manager
Permitting Branch (Croydon Office)
Department of Toxic Substances Control
California Environmental Protection Agency
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106

From: TR Hathaway, DVM, MS, DABT
Staff Toxicologist, Human and Ecological Risk Section (HERS)
Human and Ecological Risk Division (HERD)
Science, Pollution Prevention, and Technology (SPPT)
Department of Toxic Substances Control (DTSC)
California Environmental Protection Agency

Date: July 9, 1999

Subject: Former Sodium Disposal Facility Interim Measures Metals Background Dataset
Santa Susana Field Laboratory (Boeing / Rocketdyne)
PCA Code: 24120 Site Codes: 300381
Workphase: 57 MPC Code: 37

Background

Background concentrations of metals identified in three soil sampling studies, *i.e.*, McLaren/Hart (1993), ICF Kaiser (1996), and Ogden (1996), are presented as an acceptable dataset for use in the Former Sodium Disposal Facility risk assessment. These data were collected under guidance from DTSC and data have been validated by Ogden Environmental and Energy Services Co., Inc.

Document Reviewed

The document "Former Sodium Disposal Facility Interim Measures Metals Background Dataset" received on July 9, 1999 was dated July, 1999.

Scope of Review

The Department of Toxic Substances Control (DTSC) Project Manager requested review of the dataset and determination of acceptability.

California Environmental Protection Agency

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Comments

The data presented in Appendix A of the report are acceptable.

Conclusion

This interim measures background metals dataset is acceptable to HERD for evaluation and determination of concentrations of onsite metals which exceed concentrations identified in a well characterized, unimpacted background.

Reviewer:

Deborah J. Oudiz, Ph.D.
Senior Toxicologist, HERD



cc:

Mike Anderson, Ph.D.
Associate Toxicologist, HERD

Penny Nakashima, Project Manager
Permitting Branch (Glendale Office)



Department of Toxic Substances Control



Winston H. Hickox
Secretary for
Environmental
Protection

Edwin F. Lowry, Director
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106

Gray Davis
Governor

July 15, 1999

Mr. David W. Dassler, P.E.
Safety, Health & Environmental Affairs
Rocketdyne Propulsion & Power
Boeing North American, Incorporated
6633 Canoga Avenue
P.O. Box 7922
Canoga Park, California 91309-7922

Dear Mr. Dassler:

APPROVAL OF DRAFT FINAL INTERIM MEASURES RISK ASSESSMENT, FORMER
SODIUM DISPOSAL FACILITY, SANTA SUSANA FIELD LABORATORY, SIMI HILLS,
CALIFORNIA CAD 000629972

The Department of Toxic Substances Control (DTSC) has reviewed the Draft Final Interim Measures Risk Assessment for Soil Cleanup at the Former Sodium Disposal Facility (FSDF) dated July 9, 1999.

Based on our review, DTSC has determined that the Draft Final IM Risk Assessment is complete, technically acceptable, and hereby is approved.

If you have any questions, please do not hesitate to contact me at (916) 255-3600.

Sincerely,

Gerard J. Abrams
Hazardous Substances
Engineering Geologist
Land Disposal Branch

Enclosure

cc: See next page.

California Environmental Protection Agency
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07-19-99P01:23 RCVD

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GA.dm/jg
GA02W.079

OSP 99 25436



Mr. David W. Dassler, P.E.
Final Draft of IM FSDF Workplan
July 15, 1999
Page 2

cc: Mr. Joe Lyou
Mr. Dan Hirsch
Committee to Bridge the Gap
1637 Butler Avenue, Suite 203
Los Angeles, California 90025

Dr. Michael Sullivan
Rocketdyne Propulsion & Power
Boeing North American, Incorporated
6633 Canoga Avenue
P.O. Box 7922
Canoga Park, California 91309-7922

Mr. Tom Kelly
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105

Dr. T. R. Hathaway
Dr. Michael Anderson
Department of Toxic Substances Control
301 Capitol Mall, 1st Floor
Sacramento, California 95814

Mr. Jose Kou
Department of Toxic Substances Control
1011 N. Grandview Avenue
Glendale, California 91201-2205

Mr. Hannibal Joma
Department of Energy
Oakland Operations Office
1301 Clay Street, 700N
Oakland, California 94612-5208

Mr. David W. Dassler, P.E.
Final Draft of IM FSDF Workplan

July 15, 1999
Page 3

cc: Mr. Steve Hsu
Mr. Roger Lupo
Radiologic Health Branch
Department of Health Services
601 N. 7th Street
Sacramento, California 95814



Winston H. Hickox
Secretary for
Environmental
Protection

Department of Toxic Substances Control

Edwin F. Lowry, Director
400 P Street, 4th Floor, P.O. Box 806
Sacramento, California 95812-0806



Gray Davis
Governor

MEMORANDUM

To: Gerard Abrams, Project Manager
Permitting Branch (Croydon Office)
Department of Toxic Substances Control
California Environmental Protection Agency
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106

From: TR Hathaway, DVM, MS, DABT
Staff Toxicologist, Human and Ecological Risk Section (HERS)
Human and Ecological Risk Division (HERD)
Science, Pollution Prevention, and Technology (SPPT)
Department of Toxic Substances Control (DTSC)
California Environmental Protection Agency

Date: July 10, 1999

Subject: Draft Final Interim Measures Risk Assessment Former Sodium Disposal Facility
Santa Susana Field Laboratory (Boeing / Rocketdyne)
PCA Code: 24120 Site Codes: 300381
Workphase: 57 MPC Code: 37

Background

The document, "Former Sodium Disposal Facility Santa Susana Field Laboratory Final Risk Assessment," dated September 5, 1997, was reviewed and a memorandum, dated October 27, 1997, communicated the findings of that review to the Project Manager.

Underline/strikeout pages were submitted in response to specific and general comments in the HERD memorandum (October 27, 1997) relative to the document "Former Sodium Disposal Facility Santa Susana Field Laboratory, Final Risk Assessment."

The Draft Final Risk Assessment for the Former Sodium Disposal Facility, dated June 18 (1999) was reviewed and a memorandum dated July 2, 1999, communicated the findings of that review to the DTSC Project Manager. The subject document has been revised in response to the previous HERD comments.



Winston H. Hickox
Secretary for
Environmental
Protection

Department of Toxic Substances Control

Edwin F. Lowry, Director
400 P Street, 4th Floor, P.O. Box 806
Sacramento, California 95812-0806



Gray Davis
Governor

MEMORANDUM

To: Gerard Abrams, Project Manager
Permitting Branch (Croydon Office)
Department of Toxic Substances Control
California Environmental Protection Agency
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106

From: TR Hathaway, DVM, MS, DABT
Staff Toxicologist, Human and Ecological Risk Section (HERS)
Human and Ecological Risk Division (HERD)
Science, Pollution Prevention, and Technology (SPPT)
Department of Toxic Substances Control (DTSC)
California Environmental Protection Agency

Date: July 2, 1999

Subject: Final Risk Assessment Former Sodium Disposal Facility
Santa Susana Field Laboratory (Boeing / Rocketdyne)
PCA Code: 24120 Site Codes: 300381
Workphase: 57 MPC Code: 37

Background

A Draft Closure Report, dated October 26, 1995, for the Former Sodium Disposal Facility (FSDF) was previously reviewed and the findings of that review were communicated to the former DTSC project manager, Carla Slepach, in a memorandum dated December 6, 1995.

A Risk Assessment Workplan for the FSDF, dated October 4, 1995, was reviewed and the findings of that review were communicated in a memorandum dated January 31, 1996. The workplan was unacceptable to HERD.

The draft risk assessment for the Former Sodium Disposal Facility was prepared by ICF Kaiser Engineers for Rocketdyne Division, Rockwell International Corporation, Canoga Park, California, and was dated October 15, 1996. A memorandum to the current project manager, Penny Nakashima, dated March 4, 1997, communicated the findings of that review.

A memorandum, dated May 5, 1997, to the project manager reiterated and resolved action items from an earlier meeting of DTSC, Rockwell, and ICF Kaiser.

The document, "Former Sodium Disposal Facility Santa Susana Field Laboratory Final Risk Assessment," dated September 5, 1997, was reviewed and a memorandum, dated October 27, 1997, communicated the findings of that review to the Project Manager.

California Environmental Protection Agency

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Underline/strikeout pages were submitted in response to specific and general comments in the HERD memorandum (October 27, 1997) relative to the document "Former Sodium Disposal Facility Santa Susana Field Laboratory, Final Risk Assessment."

Document Reviewed

Draft Final Risk Assessment Former Sodium Disposal Facility Santa Susana Field Laboratory.
The document was dated June 18, 1999.

Scope of Review

The Department of Toxic Substances Control (DTSC) Project Manager requested review and comments on adequacy and completeness of the responses.

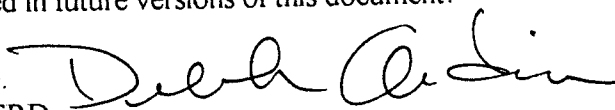
Comments

1. Page 3-10 The minimum daily requirement (MDR) for copper which is reported here as 10 mg/ kg would result in a daily dose of 700 mg copper for a 70 kg person. The MDR may be 0.05 milligrams per kilogram. Please ensure that the correct MDR is provided..
2. Page 4-19 Please delete all references to background levels of dioxin until a background data set is chosen.
3. Table 7-6 This table should report the scenario(s) addressed and chrysene should be included in the list of other compounds regardless of magnitude of risk, since it has been previously identified as a chemical of potential concern.

Conclusion

This risk assessment adequately addresses previous HERD comments and is acceptable. Typographical errors should be corrected in future versions of this document.

Reviewer: Deborah J. Oudiz, Ph.D.
Senior Toxicologist, HERD



cc: Mike Anderson, Ph.D.
Associate Toxicologist, HERD

Penny Nakashima, Project Manager
Permitting Branch (Glendale Office)

DATE: 7-15-99

D/092 INCOMING

ENVIRONMENTAL

ACTION ASSIGNED TO:		letter	encl	letter	encl
ADDRESSEE: <i>D. Daooller</i>		HARCOMBE R.	T487	RAHIMIAN A	DB52
ACTION A&R DUE:		HARD P.S.	T487	REEDER S.	T019
INFORMATION		HARDY R.B.	T038	RENER K.	AB57
ADV COPY W/ENC.		HARTMANN R.	CA08	RIEDMAN S.	BA46
ALL WITH ENCLOSURES		HERNANDEZ G.	BA46	ROBERTSON M.	T487
NUMBER:		HIMMONS W.	FA27	RODMAN L.E.	T487
4654RC		HODGSON I.	AB57	RUDOLF J.	DB52
		HORTON P.H.	T038	RUTHERFORD P.D.	T487
		HURT B.	T487		
		JIMERSON M.P.	AA47		
		JOMA H.	T038	SABA V.	T487
ACCTS/PAYABLE	NB16			SCHAEPPI W.	T487
ALEX G.	T487			SCOTT J.	T487
AMAR R.	T038			SEAMANS R. 001	B35
AMPAYA J.	T038			SECURITY	AA89
ASSARIAN T.	DB52	KNEFF D.	T038	SHAH N.	T487
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BARNES J.G.	T487			SHAO J.	DB52
BASSAT I.B.	T038			SHEA LIBRARY	T487
BECK D. C.	AB57			SHERER R.S.	DB52
BELL G.	T100	LAFFLAM S.R.	T487	SHERMAN J.M.	T487
BERGIN K.	001- D48	LEE M.E.	T038	SHESTAG S.L.	T487
BLACK G. M.	001 B30	LEENEY B.C.	T487	SHIROMA P.	DB52
BRADLEY J.W.	AA52	LENOX A.J.	T487	SKOLNICK M.L.	WB57
		LORAN B. I.	T487	SUJATA B.D.	T487
CHUNG D.	T487	LUDWIG B.K.	T487	SULLIVAN M.J.	T487
CIRLCE L.A.	AB57	LUTHER W.J.	AB61	SWANSON F.	BA46
COSTA P.J.	T487				
DAHL F.C.	T100	MAKIN R. S, Wa.	03-45	TAVASOLI K.	SS19
DARCY K.	T100	MARSHALL R.	T038	TAYLOR C.W.	T487
DAVIDS T.	T487	MASTER FILE	AA01	TEWELDE L.	DB52
DAVIDS T.	T487	MATTERA N.L.	AA80	TRIPPEDA D.M.	T020
DAW D.	T487	MC GINNIS E.R.	T487	TUCKER J.	DB52
DCMC	NA14	MC ILVAINE W.D.	FA27		
DOSIMETERY FILE	T487	MEYER R.D.	T038		
		MOORE R.M.	T038		
EDSTROM J.C.	T487	MOSSMAN B.	T487	USER AUTH.	T487
ERMAN J.	T487	MUKHERJEE N.	T487		
				VENABLE T.	T487
FOWLER P.	LA39			WAITE P.	T059
		O'ROURKE K.	T487	WOOD B.	AA49
GIUSIANA M. S, Wa.	13-08				

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REVISED 7-15-99

With Enclosure

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Department of Toxic Substances Control

Edwin F. Lowry, Director
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency



Gray Davis
Governor

D.W. DASSLER

DEC 16 1999

December 14, 1999

Mr. David W. Dassler
Environmental Remediation
Rocketdyne Propulsion & Power
6633 Canoga Avenue
Post Office Box 7922
Canoga Park, California 91309-7922

APPROVAL OF INTERIM MEASURES WORKPLAN, FORMER SODIUM DISPOSAL
FACILITY, SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY,
CALIFORNIA, EPA ID NO. CAD 000629972

Dear Mr. Dassler:

The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) has made a decision to approve the Interim Measures Workplan for the Former Sodium Disposal Facility (FSDF) located in the west end of the Santa Susana Field Laboratory, Simi Hills, California.

On July 20, 1999, DTSC issued a public notice to request public comments on the Draft Interim Measures Workplan dated July 9, 1999 and the Draft Mitigated Negative Declaration for the FSDF. The public comment period was open through August 19, 1999. A public hearing was held on July 28, 1999, at the Radisson Hotel Simi Valley, to receive oral and written comments for the record. Comments received during the public comment period were considered before DTSC made its approval decision. DTSC has prepared a Response to Comments document which contains DTSC's responses to the comments received on both the Interim Measures Workplan and the Draft Mitigated Negative Declaration.

After considering the comments received, DTSC made changes to the Draft Interim Measures Workplan. These changes are outlined in Attachment A, and shall be incorporated into the final Interim Measures Workplan. A copy of the Response to Comments document is enclosed for your records. You may instruct your contractor to begin activities.

Mr. David W. Dassler
December 14, 1999
Page 2

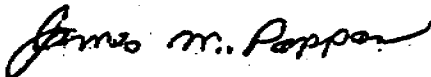
If excavation activities are to proceed during the upcoming winter season, an HDPE liner cover must be maintained as a contingency. Existing emergency controls in place to remove water which collects on or beneath the HDPE liner during rain events shall be continued until the clay backfill cover is installed and the interim measures project is complete. During rainfall events, the excavation activities will cease and the impoundments covered with the HDPE liner to minimize possible spread of contaminants. You are required to provide DTSC with a schedule of activities identifying the tasks and the dates of field activities one week prior to commencing with any excavation or removal activities.

As you are aware, DTSC would like to proceed with completion of characterization for the FSDF as expeditiously as possible. Prior to backfilling the excavation and no later than 60 days from the date of this letter, please submit an Infiltration Monitoring Workplan to DTSC for review. The infiltration monitoring probes should be capable of evaluating moisture infiltration rates through the backfill soils. Please submit an RFI workplan for contaminant characterization (including characterization of the vadose zone) no later than 120 days from the date of this letter.

A copy of the final administrative record for the Interim Measures Workplan approval is available for review at our Glendale Office.

If you have any questions, please feel free to contact Gerard Abrams at (916) 255-3600.

Sincerely,



James M. Pappas, P.E., Chief
Land Disposal Branch
Hazardous Waste Management Program

Enclosures

cc: Mr. Joe Lyou (w 3 copies)
Executive Director
Rocketdyne Cleanup Coalition
c/o Committee to Bridge the Gap
1637 Butler Avenue, Suite 203
Los Angeles, California 90025

Mr. David W. Dassler
December 14, 1999
Page 3

cc: Ms. Kim Rener (w 1 copy)
The Boeing Company, Rocketdyne
6633 Canoga Avenue
Post Office Box 7922
Canoga Park, California 91309-7922

Mr. Tom Kelly, Project Manager (w 1 copy)
U.S. Environmental Protection Agency
Waste Management Division
75 Hawthorne Street
San Francisco, California 94105

Mr. Roger Lupo (w 1 copy)
Radiologic Health Branch
601 N. 7th Street (MS 178)
Sacramento, California 95814

Mr. Mike Lopez (w 1 copy)
Oakland Operations Office
1301 Clay Street, N825
Oakland, California 94612

Mr. Steve Cain (w 1 copy)
Public Participation
Department of Toxic Substances Control
1011 N. Grandview Avenue
Glendale, California 91201

Mr. T.R. Hathaway (w 1 copy)
Human & Ecologic Risk Division
Department of Toxic Substances Control
301 Capital Mall, 3rd Floor
Sacramento, California 95813

Mr. Gerard Abrams (w 1 copy)
Senior Hazardous Substances Engineering Geologist
Land Disposal Branch
Department of Toxic Substances Control
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106

Mr. David W. Dassler
December 14, 1999
Page 4

cc: Glendale File Room (w 2 copies)
c/o Mr. Stephen Baxter
Senior Hazardous Substances Engineer
Department of Toxic Substances Control
1011 North Grandview Avenue
Glendale, California 91201



Department of Toxic Substances Control

Edwin F. Lowry, Director
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106



Gray Davis
Governor

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

September 29, 2000

Mr. David H. Chung, P.E.
Environmental Remediation
Rocketdyne Propulsion & Power
The Boeing Company
6633 Canoga Avenue
Post Office Box 7922
Canoga Park, California 91309-7922

PROPOSED BORROW AREA SAMPLING RESULTS, JULY 1999, SANTA SUSANA
FIELD LABORATORY, VENTURA COUNTY, CALIFORNIA

Dear Mr. Chung:

The Department of Toxic Substances Control (DTSC) has reviewed the Proposed Borrow Area Sampling Results prepared by Ogden Environmental Services dated November 1999. The report describes the results of sampling conducted in July 1999 at the proposed borrow area location.

Based on DTSC's review of the analytical data, levels of all chemical constituents are within the range of unimpacted background samples as specified in the approved Former Sodium Disposal Facility Interim Measures Workplan, and the soils may be used as a source area for fill material.

If you have any questions, please do not hesitate to contact me at (916) 255-3600.

Sincerely,



Gerard J. Abrams, R.G.
Senior Hazardous Substances
Engineering Geologist
Land Disposal Branch

Enclosure

cc: See next page.

10-05-00P01:42 RCV D

004528 RC

SAFETY, HEALTH, & ENVIRONMENTAL AFFAIRS
CONTROLLED DOCUMENT



SHEA-091370

David H. Chung
September 29, 2000
Page 2

cc: Committee to Bridge the Gap
1637 Butler Avenue, Suite 203
Los Angeles, California 90025

Mr. Stephen Baxter
Department of Toxic Substances Control
1011 N. Grandview Avenue
Glendale, California 91201-2205

Mr. Christopher Bonds
Department of Toxic Substances Control
1011 N. Grandview Avenue
Glendale, California 91201-2205

Mr. Tom Kelly
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105



Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Department of Toxic Substances Control

Edwin F. Lowry, Director
400 P Street, 4th Floor, P.O. Box 806
Sacramento, California 95812-0806



Gray Davis
Governor

MEMORANDUM

To: Gerard Abrams, Project Manager
Permitting Branch (Croydon Office)
Department of Toxic Substances Control
California Environmental Protection Agency
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106

FROM: TR Hathaway, DVM, MS, DABT
Staff Toxicologist, Human and Ecological Risk Section (HERS)
Human and Ecological Risk Division (HERD)
Science, Pollution Prevention, and Technology (SPPT)
Department of Toxic Substances Control (DTSC)
California Environmental Protection Agency

DATE: September 26, 2000

SUBJECT: PROPOSED BORROW AREA SAMPLING RESULTS
Former Sodium Disposal Facility
Santa Susana Field Laboratory (Boeing / Rocketdyne)
PCA Code: 22120 Site Codes: 300381 Workphase: 00

Background

Interim remediation of the Former Sodium Disposal Facility requires excavation and subsequent backfilling. An unimpacted location in Area IV was selected as a potential borrow site to provide fill dirt.

Soil samples were collected at depths of four and eight feet at each of four discrete sites. The area and the sampling sites were approved by a Department of Toxic Substances Control (DTSC) geologist. Samples were analyzed for Volatile Organic Compounds (VOCs), Total Petroleum Hydrocarbons, metals, Semivolatile Organic Compounds, dioxins, and PCBS.

Document Reviewed

The document, "Proposed Borrow Area Sampling Results (July 1999)," was prepared by Ogden Environmental and Energy Services for Boeing North America, Inc. and was dated November 1999.

Scope of Review

DTSC Project Manager requested review of the document and Human and Ecological Risk Division's opinion on the conclusion that this soil meets the criteria for classification as clean fill.

Comments

Levels of all chemical constituents are within the range of unimpacted background samples. Vanadium is similar to other background samples collected in similar geologic formations.

Conclusion

These samples are not different from samples collected from unimpacted areas of Southern California and this site may be used as a source area for fill material for excavated areas of the Former Sodium Disposal Facility.

Reviewer: Stephen DiZio, Ph.D. 
Senior Toxicologist, HERD

cc: Mike Anderson, Ph.D.
Staff Toxicologist, HERD

C:\ssfl-boe\Area_IV\SWMUs\ga092600.H16

APPENDIX D

ATTACHMENT D-2

**SUBSURFACE INFORMATION
(Electronic Copy)**

SOIL BORING LOGS

Boring ID: **BBBS0001**

Borehole Diam. (in.): 3	Total Depth (ft): 0.8	Project: Group 8 Data Gap Sampling	
Northing (ft): 267942.91	Easting (ft): 1783756.21	Job Number: 1891306 / 1891307.021105	Site: Brandeis Bardin Institute
Drill Start Date: 04-05-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-05-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: At base of 60-ft-high sandstone slide in 10-ft x 10-ft catch basin.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 04-05-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		SP	Surface Elevation: 1449.1 ft Poorly Graded Sand, very dark brown (10YR 2/2), loose, dry to moist, fine to medium sand, few coarse sand, few gravel	5	10	40	45	
						1			Total Depth = 0.8 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

Boring ID: **BBBS0002**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 267970.35	Easting (ft): 1783714.85	Job Number: 1891306 / 1891307.021105	Site: Brandeis Bardin Institute
Drill Start Date: 04-05-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-05-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: In drainage 25 ft S of tank; 12 in. of leaves / organics overlying soil surface.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 04-05-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		SW	Surface Elevation: 1435.5 ft Well Graded Sand with Gravel, very dark brown (10YR 2/2), loose, moist, fine to coarse sand, fine gravel	30	20	30	20	
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **BBBS0003**

Borehole Diam. (in.): 3	Total Depth (ft): 0.3	Project: Group 8 Data Gap Sampling	
Northing (ft): 268055.95	Easting (ft): 1783606.50	Job Number: 1891306 / 1891307.021105	Site: Brandeis Bardin Institute
Drill Start Date: 04-05-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-05-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: In drainage bottom 10 ft wide with 15-ft-high sides sloped at 1:1 gradient.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 04-05-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SP	Surface Elevation: 1415.1 ft Poorly Graded Sand, very dark brown (10YR 2/2), loose, moist, fine to medium sand, few coarse sand Total Depth = 0.3 ft; refusal on bedrock. Collected soil sample S01.		10	50	40	
						1								
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **BBBS0004**

Borehole Diam. (in.): 3	Total Depth (ft): 1.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 268129.30	Easting (ft): 1783448.78	Job Number: 1891306 / 1891307.021105	Site: Brandeis Bardin Institute
Drill Start Date: 04-05-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-05-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand auger / hand trowel		Soil Backfill Date: 04-05-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SP	Surface Elevation: 1370.3 ft Poorly Graded Sand, very dark brown (10YR 2/2), loose, moist, fine to medium sand, few coarse sand		5	60	35	
						2			Total Depth = 1.5 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **BBBS0005**

Borehole Diam. (in.): 3	Total Depth (ft): 0.3	Project: Group 8 Data Gap Sampling	
Northing (ft): 268262.99	Easting (ft): 1783179.32	Job Number: 1891306 / 1891307.021105	Site: Brandeis Bardin Institute
Drill Start Date: 04-05-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-05-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: Sample taken about 50 yards up drainage from road.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 04-05-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
0 - 0.3	S					0		GW	Well Graded Gravel with Sand, very dark brown (10YR 2/2), loose, moist, fine to coarse gravel, fine to coarse sand Total Depth = 0.3 ft; refusal on bedrock. Collected soil sample S01.	60	10	20	10	
						1								
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **BBBS0006**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 267934.34	Easting (ft): 1783766.39	Job Number: 1891306 / 1891307.021105	Site: Brandeis Bardin Institute
Drill Start Date: 04-05-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-05-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: On 3-ft-wide ledge 6 ft up from base of sandstone slide, W side.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 04-05-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		SP	Surface Elevation: 1455.5 ft Poorly Graded Sand, very dark brown (10YR 2/2), loose, moist, fine to medium sand, few coarse sand		10	50	40	
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

**MWH**

Sloping

↑ N

outcrop

RS-54
FSB501
37'
OBD-54A

Gravel
Access Road

outcrop

Site Sketch Map

Boring #: FSB501 MW#:

Sheet 1 of 1

Project: SSFL-VMS

Job #: Site: FSDP Area

Logged By: J Dolmat Reviewed By:

Drilling Contractor: DL Hall Inc

Drill Rig Type/Method: Hand Auger

Drillers Name: Ben

Borehole Diam./Drill Bit Type:

3"

Total Depth

7.5 ft

Ref. Elev.

Sampler Type: Slam bar drive Method

Depth to 1st Water (▽): — Time/Date: —

Drill Start Time/Date: 1135 7/27/06 Drill Finish Time/Date: 7/27/06 1240 hrs

Depth to Water After Drilling (▽): — Time/Date: —

Well Completion Time/Date: NA

Depth to other Water Bearing Zones: —

Soil Boring Backfill Time/Date: 1250 hrs 7/27/06

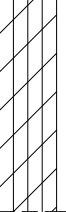
S01

S02

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of				
										Gravel	Sand			
											Coarse	Medium	Fine	Silt/clay
							1		Surface sloping 30-40° NE, low, dry grassy vegetation					
	X						2	ML	Sandy SILT 10YR 3/3 dark brown med stiff Slightly moist	—	—	—	45	55%
							3							
							4		same	—	—	—	45	55%
							5							
	X						6	SM-ML	SILT with sand and clay 10YR 3/3 stiff, slightly moist	—	—	—	40	40/20
	X						7		same color increase clay	—	—	—	30	30/40
							8		Total Depth = 7.5 ft bgs					
							9							
							10							
							11							
							12							

Boring ID: **FSBS0002**

Borehole Diam. (in.): 2-1/2	Total Depth (ft): 8.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-22-2007	Start Time: 12:14	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-22-2007	Finish Time: 12:21	Drilling Contractor: Hydrogeo Spectrum	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Rob Giberson / Alex Felix	
Comments: Vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Geoprobe macrocore with acetate sleeve		Soil Backfill Date: 02-22-2007	Backfill Time: 12:21

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		ML	Silt, dark brown (10YR 3/3), very soft, moist, some clay					100
						2								
						4		CL	Lean Clay, dark yellowish brown (10YR 4/4), medium stiff, moist, low to medium plasticity, trace fine sand				tr	100
	S					8		CL	Lean Clay with Sand, dark yellowish brown (10YR 4/4), medium stiff, moist, fine sand, low to medium plasticity				20	80
						10			Total Depth = 8.0 ft; refusal on bedrock. Collected soil samples S01 (by hand) and S02 (with geoprobe sampler).					
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0003**

Borehole Diam. (in.): 2-1/2	Total Depth (ft): 6.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-22-2007	Start Time: 11:30	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-22-2007	Finish Time: 11:42	Drilling Contractor: Hydrogeo Spectrum	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Rob Giberson / Alex Felix	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Geoprobe macrocore with acetate sleeve		Soil Backfill Date: 02-22-2007
		Backfill Time: 11:45

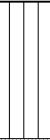
Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		ML	Silt, dark yellowish brown (10YR 3/4), soft, moist, some clay, few fine sand				10	90
						2								
						4		CL	Lean Clay with Sand, dark brown (10YR 3/3), stiff, moist, fine sand, some silt				15	85
	S					6			SANDSTONE, brownish yellow (10YR 6/6), weathered Total Depth = 6.5 ft; refusal on bedrock. Collected soil samples S01 and S02.					
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0004**

Borehole Diam. (in.): 3	Total Depth (ft): 2.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-12-2007	Start Time: 10:00	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-12-2007	Finish Time: 10:30	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	

Comments: Vegetation and grass at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-12-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		ML	Silt, dark yellowish brown (10YR 3/6), soft, moist, few fine sand, trace clay				10	90
						2			SANDSTONE, brownish yellow (10YR 6/6), weathered Total Depth = 2.0 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0005**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-12-2007	Start Time: 10:55	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-12-2007	Finish Time: 11:15	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	
Comments: Vegetation in drainage at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Grab from trowel		Soil Backfill Date: 02-12-2007	Backfill Time: 11:27

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		ML	Silt, dark yellowish brown (10YR 3/6), soft, moist to wet, trace fine sand and clay				tr	100
						1			Total Depth = 0.5 ft; did not reach bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0006**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-12-2007	Start Time: 11:40	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-12-2007	Finish Time: 11:59	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	
Comments: Vegetation in drainage at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Grab from trowel		Soil Backfill Date: 02-12-2007	Backfill Time: 12:00

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
0				0.0		0		ML	Silt, dark yellowish brown (10YR 3/6), soft, moist to wet, trace fine sand and clay				tr	100
						1			Total Depth = 0.5 ft; did not reach bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

Boring ID: **FSBS0007**

Borehole Diam. (in.): 3	Total Depth (ft): 1.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-12-2007	Start Time: 12:01	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-12-2007	Finish Time: 12:10	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	
Comments: Vegetation in drainage at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Grab from trowel		Soil Backfill Date: 02-12-2007	Backfill Time: 12:11

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
0 - 0.5	S			0.0		0		ML	Silt, dark yellowish brown (10YR 3/6), soft, moist to wet, trace fine sand and clay				tr	100
						2			Total Depth = 1.5 ft; refusal on weathered bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								



Boring ID: **FSBS0007A**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 266242.00	Easting (ft): 1783202.00	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 05-17-2007	Start Time: 11:26	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 05-17-2007	Finish Time: 11:43	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Nathan Seaver	

Comments: Resample of FSBS0007 in drainage	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with drive sampler	Soil Backfill Date: 05-17-2007	Backfill Time: 11:48

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		ML/CL	Surface Elevation: 1842.6 ft Clayey Silt with Sand, brown (10YR 4/3), stiff, dry to moist, fine sand				15	85
						2			Total Depth = 1.0 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0008**

Borehole Diam. (in.): 2-1/2	Total Depth (ft): 8.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-22-2007	Start Time: 11:50	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-22-2007	Finish Time: 12:04	Drilling Contractor: Hydrogeo Spectrum	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Rob Giberson / Alex Felix	
Comments:		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Geoprobe macrocore with acetate sleeve		Soil Backfill Date: 02-22-2007	Backfill Time: 12:08

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		ML	Silt, dark brown (10YR 3/3), soft, moist, some clay				10	90
						2		CL	Lean Clay with Sand, dark brown (10YR 3/3), soft, moist, fine sand, some silt, medium plasticity				15	85
	S					4								
						6		ML	Silt, brown (10YR 5/3), some clay, trace fine sand				tr	100
						8								
						10			Total Depth = 8.5 ft; refusal on bedrock. Collected soil samples S01 and S02.					
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0009**

Borehole Diam. (in.): 2-1/2	Total Depth (ft): 4.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-22-2007	Start Time: 12:34	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-22-2007	Finish Time: 12:43	Drilling Contractor: Hydrogeo Spectrum	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Rob Giberson / Alex Felix	

Comments: Vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Geoprobe macrocore with acetate sleeve	Soil Backfill Date: 02-22-2007	Backfill Time: 12:43

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		CL	Lean Clay, dark brown (10YR 3/3), soft, moist, some silt, trace fine sand					tr 100
						2			↙ becomes stiff					
	S					4			Total Depth = 4.0 ft; refusal on bedrock. Collected soil samples S01, S01SP, and S02.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0010**

Borehole Diam. (in.): 3	Total Depth (ft): 1.2	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-22-2007	Start Time: 11:30	Logged By: Mark Davis	Reviewed By:
Drill Finish Date: 02-22-2007	Finish Time: 12:10	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Mark Davis	

Comments: Moderate growth of weeds and grasses at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-22-2007	Backfill Time: 12:10

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		ML	Silt, very dark grayish brown (10YR 3/2), soft to medium stiff, dry to moist, some clay, few fine sand, common organics (root hairs), occasional gravel (aggregate from road)	tr			10	90
								ML	Silt, light yellowish brown (10YR 6/4), medium stiff, moist, some clay, few sand				10	90
						1			Sandstone, light yellowish brown (10YR 6/4), moderately weathered, fine to medium sand [Santa Susanna Formation] Total Depth = 1.2 ft; in bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/23/07

Boring ID: **FSBS0011**

Borehole Diam. (in.): 3	Total Depth (ft): 1.3	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-16-2007	Start Time: 08:31	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-16-2007	Finish Time: 09:05	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments:		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-16-2007	Backfill Time: 09:07

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
0	S					0		ML	Sandy Silt, dark yellowish brown (10YR 3/4), medium stiff, moist, fine sand, trace clay, rootlets				30	70
						2			Total Depth = 1.3 ft; refusal on bedrock. Collected soil samples S01 and D01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0012**

Borehole Diam. (in.): 3	Total Depth (ft): 0.3	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-16-2007	Start Time: 09:10	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-16-2007	Finish Time: 09:28	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-16-2007 Backfill Time: 09:31

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
0	s			0.8		0		ML	Sandy Silt, dark yellowish brown (10YR 3/4), medium stiff, moist, fine sand, trace clay Total Depth = 0.3 ft; refusal on weathered bedrock. Collected soil samples S01 and S01MS/MSD.				30	70
						1								
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0013**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-16-2007	Start Time: 09:40	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-16-2007	Finish Time: 09:57	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-16-2007 Backfill Time: 09:58

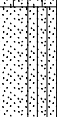
Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
0	S			0.2		0		SM	Silty Sand, very dark grayish brown (10YR 3/2), loose, moist, fine sand			tr	70	30
						2			Total Depth = 1.0 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0014**

Borehole Diam. (in.): 3	Total Depth (ft): 7.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-13-2007	Start Time: 13:00	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time:	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel and Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-13-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SM	Silty Sand, very dark brown (10YR 2/2), loose, moist, fine sand				70	30
						2								
						4		SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 3/4), medium dense, moist, fine sand, few medium sand, few silt			5	90	5
	S					6			Sandstone, weathered					
						8			Total Depth = 7.5 ft; refusal in bedrock. Collected soil samples S01 and S02.					
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0015**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-14-2007	Start Time: 14:06	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 14:14	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-14-2007 Backfill Time: 14:15

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
0-1	S			0.0		0		SP	Poorly Graded Sand, brown (10YR 4/3), very loose, dry to moist, fine sand, few medium sand			5	95	
						2			Total Depth = 1.0 ft; refusal on bedrock.					
						2			Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0016**

Borehole Diam. (in.): 3	Total Depth (ft): 0.8	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-13-2007	Start Time: 13:55	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time: 14:05	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel and Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	
Comments: Vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Grab from trowel		Soil Backfill Date: 02-13-2007	Backfill Time: 14:07

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SP-SM	Poorly Graded Sand with Silt, very dark gray (7.5YR 3/1), loose, moist, fine sand, few silt, organics				90	10
						1			Total Depth = 0.8 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

Boring ID: **FSBS0017**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-13-2007	Start Time: 13:49	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time: 14:05	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel and Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	
Comments: Vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Grab from trowel		Soil Backfill Date: 02-13-2007	Backfill Time: 14:05

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		SP-SM	Poorly Graded Sand with Silt, very dark gray (7.5YR 3/1), loose, moist, fine sand, few silt, organics				90	10
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

Boring ID: **FSBS0018**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-13-2007	Start Time: 13:10	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time: 13:25	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	
Comments:		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Grab from trowel		Soil Backfill Date: 02-13-2007	Backfill Time: 13:25

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 S						0		SM	Silty Sand, very dark grayish brown (10YR 3/2), loose, moist, fine sand				70	30
						2			Total Depth = 1.0 ft; refusal on bedrock. Collected soil samples S01 and S01SP.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0019**

Borehole Diam. (in.): 3	Total Depth (ft): 2.3	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-13-2007	Start Time: 14:15	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time: 14:21	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel and Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	
Comments: Vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Grab from trowel		Soil Backfill Date: 02-13-2007	Backfill Time: 14:21

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s						0		SP-SM	Poorly Graded Sand with Silt, very dark gray (7.5YR 3/1), loose, moist, fine sand, few silt, organics			tr	90	10
						2								
						4			Total Depth = 2.3 ft; refusal on bedrock. Collected soil sample S01.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0020**

Borehole Diam. (in.): 3	Total Depth (ft): 0.8	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-13-2007	Start Time: 14:28	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time: 14:37	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel and Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Grab from trowel		Soil Backfill Date: 02-13-2007
		Backfill Time: 14:37

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SP-SM	Poorly Graded Sand with Silt, very dark gray (7.5YR 3/1), loose, moist, fine sand, few silt, organics			tr	90	10
						1			Total Depth = 0.8 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0021**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-14-2007	Start Time: 09:12	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 09:17	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments: Boring at bottom of drainage		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-14-2007	Backfill Time: 09:17

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
0-1	S			0.0		0		SW	Well Graded Sand, dark brown (10YR 3/3), loose, moist, moderately well-graded fine to coarse sand (mostly fine), trace fines		10	20	70	tr
						2			Total Depth = 1.0 ft; refusal on bedrock.					
						2			Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07



Boring ID: **FSBS0021A**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 266808.00	Easting (ft): 1783212.00	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 04-02-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-02-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: Resample of FSBS0021 at bottom of drainage; vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 04-02-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		SW	Surface Elevation: 1785.9 ft Well Graded Sand, dark brown (10YR 3/3), medium dense, moist, fine to coarse sand, few fine gravel, few rootlets	5	25	35	35	
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0022**

Borehole Diam. (in.): 3	Total Depth (ft): 4.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-14-2007	Start Time: 09:17	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 09:28	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-14-2007	Backfill Time: 09:28

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SM	Silty Sand, dark brown (10YR 3/3), medium dense, moist, mostly fine sand, few medium and trace coarse sand, roots		tr	10	70	20
						2		SP	Poorly Graded Sand, dark yellowish brown (10YR 4/4), dense, moist, fine to coarse sand (mostly fine), trace fines		5	25	70	tr
 s				0.0		4			Total Depth = 4.0 ft; refusal on bedrock. Collected soil samples S01 and S02.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0023**

Borehole Diam. (in.): 3	Total Depth (ft): 0.8	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-14-2007	Start Time: 09:29	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 09:32	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-14-2007	Backfill Time: 09:32

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SM	Silty Sand, dark brown (10YR 3/3), medium dense, moist, mostly fine sand, few medium and trace coarse sand, rootlets		tr	10	70	20
						1			Total Depth = 0.8 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0024**

Borehole Diam. (in.): 3	Total Depth (ft): 4.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-14-2007	Start Time: 09:33	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 09:41	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-14-2007	Backfill Time: 09:41

Sample Interval Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
									Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 S			0.0		0		SM	Silty Sand, dark brown (10YR 3/3), loose, moist, fine sand, organics, rootlets				60	40
					2		SM	Silty Sand, yellowish brown (10YR 5/6), dense, moist, fine sand, few medium sand; weathered bedrock			5	80	15
 S			0.0		4			Total Depth = 4.0 ft; refusal on bedrock. Collected soil samples S01 and S02.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0025**

Borehole Diam. (in.): 3	Total Depth (ft): 5.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-14-2007	Start Time: 09:42	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 10:02	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-14-2007	Backfill Time: 10:03

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SM	Silty Sand, dark brown (10YR 3/3), loose, moist, fine sand, organics, rootlets				60	40
						2		SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 4/4), dense, moist, fine sand, few silt			tr	90	10
	S			0.0		4			Total Depth = 5.0 ft; refusal on bedrock. Collected soil samples S01 and S02.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0026**

Borehole Diam. (in.): 3	Total Depth (ft): 0.8	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-14-2007	Start Time: 13:08	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 13:20	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring at bottom of drainage	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-14-2007	Backfill Time: 13:20

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SW	Well Graded Sand, very dark gray (10YR 3/1), loose, moist, fine to coarse sand, organics		15	40	45	
						1			Total Depth = 0.8 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								



Boring ID: **FSBS0026A**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 266996.00	Easting (ft): 1783418.00	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 04-02-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-02-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: Resample of FSBS0026 at bottom of drainage; vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 04-02-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		SW	Surface Elevation: 1759.3 ft Well Graded Sand, dark brown (10YR 3/3), medium dense, moist, fine to coarse sand, few fine gravel, few rootlets	5	25	35	35	
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil samples S01 and D01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0027**

Borehole Diam. (in.): 3	Total Depth (ft): 0.8	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-14-2007	Start Time: 13:21	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 13:25	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

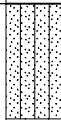
Comments: Boring on slope of drainage, vegetation and ashes at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-14-2007	Backfill Time: 13:45

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SP-SM	Poorly Graded Sand with Silt, brown (10YR 4/3), loose, dry to moist, fine sand, few silt			tr	90	10
						1			Total Depth = 0.8 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0028**

Borehole Diam. (in.): 3	Total Depth (ft): 0.8	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-14-2007	Start Time: 13:29	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 13:32	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments: Boring on slope of drainage, vegetation and ashes at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-14-2007	Backfill Time: 13:45

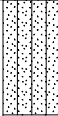
Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SM	Silty Sand, very dark grayish brown (10YR 3/2), loose, moist, fine sand, organics			tr	80	20
						1			Total Depth = 0.8 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0029**

Borehole Diam. (in.): 3	Total Depth (ft): 0.8	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-14-2007	Start Time: 13:26	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 13:28	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage, vegetation and ashes at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-14-2007	Backfill Time: 13:45

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SM	Silty Sand, very dark grayish brown (10YR 3/2), loose, moist, fine sand			tr	80	20
						1			Total Depth = 0.8 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0030**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-14-2007	Start Time: 13:31	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 13:38	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments: Boring on slope of drainage, vegetation and ashes at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-14-2007	Backfill Time: 13:45

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SP-SM	Poorly Graded Sand with Silt, brown (10YR 4/3), loose, dry to moist, fine sand, few silt			tr	90	10
						2			Total Depth = 1.0 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07



Boring ID: **FSBS0031A**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 267566.00	Easting (ft): 1783867.00	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 04-03-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-03-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: Resample of FSBS0031 at bottom of drainage; vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 04-03-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		SW	Surface Elevation: 1648.7 ft Well Graded Sand, dark brown (10YR 3/3), loose, dry to moist, fine to coarse sand, few gravel 1/2 to 1 inch, some organics (plants and roots)	10	20	25	45	
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0031**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 13:15	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 13:18	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments: Boring at bottom of drainage, vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-15-2007	Backfill Time: 13:19

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SW	Well Graded Sand, very dark gray (10YR 3/1), very loose, moist, fine to coarse sand, trace subrounded sandstone chips 1/4-1/2 inch	tr	15	40	45	
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0032**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-15-2007	Start Time: 13:28	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 13:31	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments: Boring on slope of drainage, vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-15-2007	Backfill Time: 13:31

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SP-SM	Poorly Graded Sand with Silt, very dark brown (10YR 2/2), medium dense, moist, fine sand, few silt				90	10
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

Boring ID: **FSBS0033**

Borehole Diam. (in.): 3	Total Depth (ft): 1.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-15-2007	Start Time: 13:20	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 13:23	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 13:23

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 S						0		SM	Silty Sand, very dark brown (10YR 2/2), loose, moist, fine sand			tr	70	30
						2			Total Depth = 1.5 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0034**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 13:32	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 13:34	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments: Boring on slope of drainage, vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-15-2007	Backfill Time: 13:34

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SM	Silty Sand, very dark brown (10YR 2/2), very loose to loose, moist, fine sand			tr	70	30
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

Boring ID: **FSBS0035**

Borehole Diam. (in.): 3	Total Depth (ft): 1.3	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 13:23	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 13:26	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Chris Nevison	
Comments: Boring on slope of drainage, vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-15-2007	Backfill Time: 13:26

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 S						0		SM	Silty Sand, very dark brown (10YR 2/2), loose, moist, fine sand				70	30
						2			Total Depth = 1.3 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0036A**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 267673.00	Easting (ft): 1783855.00	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 06-07-2007	Start Time: 13:45	Logged By: Shelby Valenzuela	Reviewed By: Shelby Valenzuela
Drill Finish Date: 06-07-2007	Finish Time: 14:00	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Shelby Valenzuela	
Comments: Resample of FSBS0036; removed 4 inches of organic debris from surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel and 6-inch-long sleeve		Soil Backfill Date: 06-07-2007	Backfill Time: 14:00

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SW	Surface Elevation: 1594.8 ft Well Graded Sand, yellowish brown (10YR 5/6), loose, dry, fine to medium sand, few coarse sand, subrounded grains, trace fines, no cementation, some organic debris, some mica		10	30	60	tr
						2			Total Depth = 1.0 ft; refusal on bedrock. Collected soil ample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0036**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 13:55	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 14:04	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-15-2007 Backfill Time: 14:05

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SP-SM	Poorly Graded Sand with Silt, very dark brown (10YR 2/2), very loose, moist, fine sand, few silt				90	10
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil samples S01 and S01SP.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0041**

Borehole Diam. (in.): 3	Total Depth (ft): 0.8	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-15-2007	Start Time: 08:33	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 08:37	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring at bottom of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 08:37

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SP	Poorly Graded Sand, dark grayish brown (10YR 4/2), loose, moist, fine sand, trace medium and coarse sand, trace silt		tr	tr	90	tr
						1			Total Depth = 0.8 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0042**

Borehole Diam. (in.): 3	Total Depth (ft): 2.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 08:38	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 08:41	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 08:41

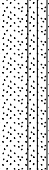
Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 4/4), loose, moist, fine sand, few silt, rootlets				90	10
						2			Total Depth = 2.0 ft; refusal on weathered bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0043**

Borehole Diam. (in.): 3	Total Depth (ft): 2.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 08:47	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 08:53	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 08:53

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SP-SM	Poorly Graded Sand with Silt, brown (10YR 4/3), loose, moist, fine sand, few silt, rootlets				90	10
						2								
						4			Total Depth = 2.5 ft; refusal on bedrock. Collected soil sample S01.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0044**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 08:42	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 08:46	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 08:47

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 3/4), loose, moist, fine sand, few silt, rootlets				95	5
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

Boring ID: **FSBS0045**

Borehole Diam. (in.): 3	Total Depth (ft): 1.3	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 08:54	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 09:01	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments: Boring on slope of drainage, vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-15-2007	Backfill Time: 09:02

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 3/4), loose, moist, fine sand, few silt				95	5
						2			Total Depth = 1.3 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0046**

Borehole Diam. (in.): 3	Total Depth (ft): 0.3	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 09:24	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 09:28	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring at bottom of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 09:28

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
0	s			0.0		0		SW	Well Graded Sand, very dark gray (10YR 3/1), very loose, moist, fine to coarse sand, trace gravel, organics Total Depth = 0.3 ft; refusal on bedrock. Collected soil sample S01.	tr	15	30	55	
						1								
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0047**

Borehole Diam. (in.): 3	Total Depth (ft): 1.3	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 09:37	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 09:40	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 09:40

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 3/4), loose, moist, fine sand, few silt, trace sandstone chips			tr	90	10
						2			Total Depth = 1.3 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0048**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 09:29	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 09:32	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 09:33

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 4/6), loose, moist, fine sand, few silt; weathered sandstone				95	5
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

Boring ID: **FSBS0049**

Borehole Diam. (in.): 3	Total Depth (ft): 2.3	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 09:41	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 09:47	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 09:50

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, moist, fine sand				70	30
						2			Total Depth = 2.3 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0050**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 09:33	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 09:35	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments: Boring on slope of drainage, vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-15-2007	Backfill Time: 09:35

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SP-SM	Poorly Graded Sand with Silt, brown (10YR 4/3), loose, moist, fine sand, few silt, rootlets			tr	90	10
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0051**

Borehole Diam. (in.): 3	Total Depth (ft): 0.8	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 10:29	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 10:33	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring at bottom of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 10:33

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SW	Well Graded Sand, very dark gray (10YR 3/1), very loose, moist, fine to coarse sand, organics		20	40	40	
						1			Total Depth = 0.8 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

Boring ID: **FSBS0052**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 10:34	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 10:36	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments: Boring on slope of drainage, sand at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-15-2007	Backfill Time: 10:36

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 3/4), medium dense, moist, fine sand, few silt, rounded sandstone fragments, organics			tr	90	10
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0053**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-15-2007	Start Time: 10:39	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 10:41	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	
Comments: Boring on slope of drainage, vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-15-2007	Backfill Time: 10:41

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SP	Poorly Graded Sand, dark brown (10YR 3/3), medium dense, moist, fine sand, few medium and coarse sand, organics and roots		5	10	80	
						2			Total Depth = 1.0 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0054**

Borehole Diam. (in.): 3	Total Depth (ft): 2.3	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 10:43	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 10:47	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 10:48

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SM	Silty Sand, dark brown (10YR 3/3), loose, moist, fine sand				70	30
						2			Total Depth = 2.3 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0055**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 10:36	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 10:39	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Boring on slope of drainage, vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 10:39

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SP-SM	Poorly Graded Sand with Silt, dark brown (10YR 3/3), medium dense, moist, fine sand, few medium sand, few silt, organics and roots			5	90	5
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0061**

Borehole Diam. (in.): 3	Total Depth (ft): 3.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-14-2007	Start Time: 10:30	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 10:48	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-14-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 4/4), dense, moist, fine sand, few silt				90	10
	S			0.0		2			becomes very dense					
						4			Total Depth = 3.5 ft; refusal on bedrock. Collected soil samples S01 and S02.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0062**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-15-2007	Start Time: 10:04	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-15-2007	Finish Time: 10:09	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments: Vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-15-2007	Backfill Time: 10:10

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SW	Well Graded Sand, very dark gray (10YR 3/1), very loose, moist, fine to coarse sand, organics		20	40	40	
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0063**

Borehole Diam. (in.): 3	Total Depth (ft): 1.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-14-2007	Start Time: 13:50	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-14-2007	Finish Time: 14:01	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: S. Terranova	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-14-2007 Backfill Time: 14:02

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
0-1.5	S			0.0		0		SP	Poorly Graded Sand, brown (10YR 4/3), loose, dry to moist, fine sand, few medium sand			5	95	
						2			Total Depth = 1.5 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0064**

Borehole Diam. (in.): 3	Total Depth (ft): 11.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-13-2007	Start Time: 10:41	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time:	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-13-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SM	Silty Sand, very dark brown (7.5YR 2.5/2), loose, moist, fine sand				70	30
						2		SP-SM	Poorly Graded Sand with Silt, dark yellowish brown (10YR 3/4), medium dense, moist, fine sand, few silt				95	5
	S					4		SP	Poorly Graded Sand, strong brown (7.5YR 4/6) to brown (7.5YR 4/4), dense, moist, fine sand, trace silt; weathered sandstone				100	tr
	S					7								
						12			Total Depth = 11.0 ft; in weathered bedrock. Collected soil samples S01, S02, and S03.					
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0065**

Borehole Diam. (in.): 3	Total Depth (ft): 2.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-13-2007	Start Time: 10:05	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time: 10:30	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	

Comments: Vegetation at surface, under oak large oak tree	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-13-2007	Backfill Time: 10:33

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SM	Silty Sand, very dark brown (7.5YR 2.5/2), loose, moist, fine sand				70	30
						2			Total Depth = 2.0 ft; refusal on tree roots, same in attempts at two adjacent locations under large tree. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0066**

Borehole Diam. (in.): 3	Total Depth (ft): 6.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-13-2007	Start Time: 09:18	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time: 09:59	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	

Comments: Vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-13-2007	Backfill Time: 10:01

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			9.2		0		SM	Silty Sand, very dark brown (7.5YR 2.5/2), loose, moist, fine sand				70	30
						2								
						4		SP-SM	Poorly Graded Sand with Silt, dark brown (10YR 3/3), medium dense, moist, fine sand, few medium sand, few silt			5	90	5
	S					6			Sandstone, yellowish brown (10YR 5/4), weathered					
						8			Total Depth = 6.5 ft; in weathered bedrock.					
						10			Collected soil samples S01, D01, and S02.					
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0067**

Borehole Diam. (in.): 3	Total Depth (ft): 3.3	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-13-2007	Start Time: 08:30	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time: 09:15	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	

Comments: Boring next to access road, gravel at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-13-2007	Backfill Time: 09:15

Sample Interval Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
									Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 S			0.0		0		SM	Silty Sand, very dark brown (7.5YR 2.5/2), loose, moist, fine sand				70	30
 S			0.0		2		SP-SM	Poorly Graded Sand with Silt, dark brown (10YR 3/3), medium dense, moist, fine sand, few medium sand, few silt			5	90	5
					4			Total Depth = 3.3 ft; refusal on bedrock. Collected soil samples S01 and S02.					
					6								
					8								
					10								
					12								
					14								
					16								
					18								
					20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0068**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-13-2007	Start Time: 12:00	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-13-2007	Finish Time: 12:10	Drilling Contractor: N/A	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	
Comments: Vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Grab from trowel		Soil Backfill Date: 02-13-2007	Backfill Time: 12:12

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SM	Silty Sand, very dark grayish brown (10YR 3/2), loose, moist, fine sand, rootlets				70	30
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

Boring ID: **FSBS0069**

Borehole Diam. (in.): 3	Total Depth (ft): 2.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-12-2007	Start Time: 13:07	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-12-2007	Finish Time: 13:19	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel and Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	

Comments: Vegetation at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-12-2007	Backfill Time: 13:19

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s				0.0		0		SM	Silty Sand, dark yellowish brown (10YR 4/4), loose, moist, fine sand				70	30
						2			Total Depth = 2.0 ft; refusal on bedrock. Collected soil samples S01 and S01MS.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0070**

Borehole Diam. (in.): 3	Total Depth (ft): 5.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-12-2007	Start Time: 13:35	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-12-2007	Finish Time: 14:20	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-12-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SM	Silty Sand, dark brown (10YR 3/3), very dense, moist, fine sand, trace medium sand; hard compacted fill			tr	70	30
						2		SP-SM	Poorly Graded Sand with Silt, dark brown (7.5YR 3/2), medium dense, moist, fine sand, few medium sand, few silt			10	80	10
	S			0.0		4			Sandstone, dark yellowish brown (10YR 4/4), weathered, fine sand with few medium grains, few silt			5	90	5
						6			Total Depth = 5.0 ft; refusal in weathered bedrock. Collected soil samples S01 and S02.					
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0071**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDF
Drill Start Date: 02-12-2007	Start Time: 12:45	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-12-2007	Finish Time: 13:05	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel and Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: P. Chang	
Comments: Vegetation at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Grab from trowel		Soil Backfill Date: 02-12-2007	Backfill Time: 13:05

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SM	Silty Sand, very dark gray (10YR 3/1), loose, moist, fine sand				70	30
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSBS0072**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 266024.92	Easting (ft): 1783203.07	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 04-02-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-02-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: Previous nearby sampling locations were advanced to bedrock.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with drive sampler		Soil Backfill Date: 04-02-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		CL	Surface Elevation: 1866.7 ft Sandy Lean Clay, dark brown (10YR 3/3), very stiff, moist, fine to medium sand, few gravel [Fill]	5		15	20	60
						1			Total Depth = 0.5 ft (did not reach bedrock). Collected soil samples S01 and D01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0079**

Borehole Diam. (in.): 3	Total Depth (ft): 4.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 266794.54	Easting (ft): 1783428.40	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 04-02-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-02-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	

Comments: Gravel road at surface	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with drive sampler	Soil Backfill Date: 04-02-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Surface Elevation: 1787.7 ft					
	S			0.5		0		GP	Poorly Graded Gravel, coarse gravel (road surface)					
	S					1		ML	Silt with Sand, very dark grayish brown (10YR 3/2), medium stiff to stiff, moist, fine sand, few medium sand			5	20	75
	S					2		SM	Silty Sand, brown (10YR 4/3), medium dense, moist, fine sand, few medium sand			5	55	40
	S					3		SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), medium dense, dry to moist, fine to medium sand (mostly fine)			20	75	5
						4			Total Depth = 4.0 ft; refusal on bedrock.					
						6			Collected soil samples S01 and S02.					
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0080**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 266565.87	Easting (ft): 1783452.76	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 04-02-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-02-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with drive sampler		Soil Backfill Date: 04-02-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		SM	Surface Elevation: 1810.4 ft Silty Sand, dark yellowish brown (10YR 3/4), medium dense, moist, fine to medium sand (mostly fine)			15	70	15
						2			Total Depth = 1.0 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0081**

Borehole Diam. (in.): 3	Total Depth (ft): 2.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 266583.48	Easting (ft): 1783375.34	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 04-02-2007	Start Time:	Logged By: Chris Nevison	Reviewed By: Shelby Valenzuela
Drill Finish Date: 04-02-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with drive sampler		Soil Backfill Date: 04-02-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.0		0		CL-ML	Surface Elevation: 1806.8 ft Silty Clay, yellowish brown (10YR 5/4), stiff, moist, few fine sand				10	90
								ML/CL	Clayey Silt with Sand, dark brown (10YR 3/3), stiff, moist, fine sand				15	85
						2		SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/6), medium dense, moist, fine to medium sand, few coarse sand Total Depth = 2.5 ft; refusal on bedrock. Collected soil sample S01.		5	30	60	5
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0084**

Borehole Diam. (in.): 3	Total Depth (ft): 5.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 266124.85	Easting (ft): 1782857.48	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 05-17-2007	Start Time: 08:34	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 05-17-2007	Finish Time:	Drilling Contractor: HGS / Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Tom Morris	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Macrocore		Soil Backfill Date: 05-17-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Surface Elevation: 1867.2 ft					
	S			1.8		0		ML/CL	Clayey Silt, strong brown (7.5YR 4/6), very stiff, dry to moist, few fine sand				5	95
						2								
						4			← calcium carbonate veinlets					
	S			0.7		4								
						6			Total Depth = 5.0 ft; refusal on bedrock.					
						6			Collected soil samples S01, S01SP, and S02.					
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0085**

Borehole Diam. (in.): 3	Total Depth (ft): 4.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 266116.38	Easting (ft): 1782947.59	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 05-17-2007	Start Time: 09:46	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 05-17-2007	Finish Time: 09:57	Drilling Contractor: HGS / Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Tom Morris	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Macrocore	Soil Backfill Date: 05-17-2007	Backfill Time: 10:02

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			Surface Elevation: 1865.1 ft					
	S			2.9		0		ML/CL	Clayey Silt, brown (10YR 4/3), medium stiff to stiff, dry to moist, few fine sand				10	90
	S			4.8		4			Total Depth = 4.0 ft; refusal on bedrock. Collected soil samples S01, D01, and S02.					
						2								
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0086**

Borehole Diam. (in.): 3	Total Depth (ft): 7.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 266085.17	Easting (ft): 1783073.54	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 05-17-2007	Start Time: 09:08	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 05-17-2007	Finish Time: 09:39	Drilling Contractor: HGS / Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Tom Morris	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Macrocore	Soil Backfill Date: 05-17-2007	Backfill Time: 09:41

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		ML/CL	Surface Elevation: 1868.8 ft Clayey Silt, strong brown (7.5YR 4/6), medium stiff to stiff, dry to moist, few fine sand				10	90
						2								
						4		CL-ML	Silty Clay, strong brown (7.5YR 4/6), very stiff, dry to moist					100
						6								
						8			Total Depth = 7.5 ft; refusal on bedrock. Collected soil samples S01, S01SP, and S02.					
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0087**

Borehole Diam. (in.): 3	Total Depth (ft): 8.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 266047.74	Easting (ft): 1783123.30	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 05-17-2007	Start Time: 10:17	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 05-17-2007	Finish Time: 10:46	Drilling Contractor: HGS / Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Tom Morris	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Macrocore	Soil Backfill Date: 05-17-2007	Backfill Time: 10:49

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		CL-ML	Surface Elevation: 1869.2 ft Silty Clay, strong brown (7.5YR 4/6), very stiff, dry to moist					100
						2								
						4								
						6								
						8			Total Depth = 8.0 ft; refusal on bedrock. Collected soil samples S01, D01, and S02.					
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0088**

Borehole Diam. (in.): 3	Total Depth (ft): 1.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 266287.58	Easting (ft): 1783380.78	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 05-30-2007	Start Time:	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 05-30-2007	Finish Time:	Drilling Contractor: Envirosolve / B.L. Mall	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Ben Cisneros	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with drive sampler		Soil Backfill Date: 05-30-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			0.1		0		ML	Surface Elevation: 1835.0 ft Sandy Silt, brown (10YR 5/3), stiff, moist, fine sand				35	65
						2			Total Depth = 1.5 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0089**

Borehole Diam. (in.): 3	Total Depth (ft): 7.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 266158.81	Easting (ft): 1783298.26	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 05-30-2007	Start Time:	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 05-30-2007	Finish Time:	Drilling Contractor: Envirosolve / B.L. Mall	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Ben Cisneros	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with drive sampler		Soil Backfill Date: 05-30-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		ML/CL	Surface Elevation: 1848.3 ft Clayey Silt, yellowish brown (10YR 5/6), stiff, dry to moist, few fine sand				10	90
						2		ML	Silt with Sand, yellowish brown (10YR 5/6), stiff, dry to moist, fine sand				25	75
						6								
						8			Total Depth = 7.0 ft; refusal on bedrock. Collected soil samples S01 and S02.					
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0090**

Borehole Diam. (in.): 3	Total Depth (ft): 0.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 266115.13	Easting (ft): 1783108.58	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 06-05-2007	Start Time: 08:00	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 06-05-2007	Finish Time: 08:04	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Shelby Valenzuela	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 06-05-2007 Backfill Time: 08:07

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		ML/CL	Surface Elevation: 1860.6 ft Clayey Silt with Sand, brown (10YR 4/3), medium stiff, dry to moist, fine sand, few rootlets and root hairs				15	85
						1			Total Depth = 0.5 ft; refusal on bedrock. Collected soil sample S01.					
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0091**

Borehole Diam. (in.): 3	Total Depth (ft): 5.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 266096.03	Easting (ft): 1783199.45	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 06-05-2007	Start Time: 08:10	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 06-05-2007	Finish Time: 08:34	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Shelby Valenzuela	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with drive sampler		Soil Backfill Date: 06-05-2007
		Backfill Time: 08:37

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		ML	Surface Elevation: 1856.1 ft					
	S							ML	Sandy Silt, brown (10YR 4/3), medium stiff, dry to moist, fine to medium sand, few coarse sand, few 3/4-inch gravel [Fill]	5	5	10	20	60
						2		ML/CL	Clayey Silt, very dark brown (10YR 2/2) mottled with dark yellowish brown (10YR 4/6), very stiff, dry to moist, few fine sand, few root hairs [Fill]				5	95
						4		ML/CL	Clayey Silt, yellowish brown (10YR 5/6), stiff, dry to moist					100
	S					6			Total Depth = 5.0 ft.					
						8			Collected soil samples S01 and S02.					
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0092**

Borehole Diam. (in.): 3	Total Depth (ft): 2.5	Project: Group 8 Data Gap Sampling	
Northing (ft): 266801.23	Easting (ft): 1783424.07	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 05-17-2007	Start Time: 07:31	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 05-17-2007	Finish Time: 07:47	Drilling Contractor: Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Nathan Seaver	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with drive sampler		Soil Backfill Date: 05-17-2007
		Backfill Time: 07:50

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		ML	Surface Elevation: 1788.0 ft Sandy Silt, dark brown (10YR 3/3), medium stiff, dry to moist, fine sand				30	70
						2								
						4			Total Depth = 2.5 ft; refusal on bedrock. Collected soil samples S01, D01, and S02.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0093**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 266748.86	Easting (ft): 1783526.72	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 05-17-2007	Start Time: 07:54	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 05-17-2007	Finish Time: 08:11	Drilling Contractor: Envirosolve	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Nathan Seaver	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with drive sampler		Soil Backfill Date: 05-17-2007
		Backfill Time: 08:14

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			5.5		0		SM	Surface Elevation: 1809.5 ft Silty Sand, dark brown (10YR 3/3), loose to medium dense, dry to moist, fine to medium sand			30	35	35
						2			Total Depth = 1.0 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0094**

Borehole Diam. (in.): 3	Total Depth (ft): 12.0	Project: Group 8 Data Gap Sampling	
Northing (ft): 265974.31	Easting (ft): 1783545.19	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 05-16-2007	Start Time: 13:18	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 05-16-2007	Finish Time:	Drilling Contractor: HGS / Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Tom Morris	

Comments:	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Macrocore		Soil Backfill Date: 05-16-2007
		Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 S						0		CL-ML	Surface Elevation: 1863.9 ft Silty Clay, yellowish brown (10YR 5/6), very stiff, dry to moist					100
						2								
 S						4								
						6								
 S						8		ML/CL	Clayey Silt, very pale brown (10YR 7/4), very stiff, dry to moist, few fine sand				5	95
						10								
 S						12			Total Depth = 12.0 ft; refusal on bedrock. Collected soil samples S01 and S02.					
						14								
S						16								
						18								
S						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSBS0095**

Borehole Diam. (in.): 3	Total Depth (ft): 0.3	Project: Group 8 Data Gap Sampling	
Northing (ft): 267809.95	Easting (ft): 1783801.88	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 06-07-2007	Start Time:	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 06-07-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: 1/2-inch thickness of scattered leaves and organics at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 06-07-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SW	Surface Elevation: 1523.7 ft Well Graded Sand, yellowish brown (10YR 5/6), loose, dry to moist, fine to coarse sand, few gravel, some mica Total Depth = 0.3 ft; refusal on bedrock. Collected soil sample S01.	5	35	35	25	
						1								
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07



Boring ID: **FSBS0096**

Borehole Diam. (in.): 3	Total Depth (ft): 0.3	Project: Group 8 Data Gap Sampling	
Northing (ft): 267865.00	Easting (ft): 1783779.00	Job Number: 1891306 / 1891307.021105	Site: FSDf
Drill Start Date: 06-07-2007	Start Time:	Logged By: Matt Baumgardner	Reviewed By: Shelby Valenzuela
Drill Finish Date: 06-07-2007	Finish Time:	Drilling Contractor: Envirosolve	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Trowel	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Matt Baumgardner	
Comments: 1-inch thickness of leaves and organics at surface		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Hand trowel		Soil Backfill Date: 06-07-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		SW	Surface Elevation: 1504.4 ft Well Graded Sand, yellowish brown (10YR 5/6), loose, dry to moist, fine to coarse sand, few fine gravel Total Depth = 0.3 ft; refusal on bedrock. Collected soil sample S01. Siltstone beds located on east-facing ascending slope above sample basin.	10	30	30	30	
						1								
						2								
						3								
						4								
						5								
						6								
						7								
						8								
						9								
						10								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 7/7/07

Boring ID: **FSSV0004**

Borehole Diam. (in.): 1-1/4	Total Depth (ft): 9.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-20-2007	Start Time: 10:22	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-20-2007	Finish Time: 10:29	Drilling Contractor: Hydrogeo Spectrum	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Alex Felix	
Comments: Vegetation at surface. Boring drilled for vapor probe installation only.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: No sample collected		Soil Backfill Date: 02-20-2007	Backfill Time: 10:34

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			No sampling or logging performed. Boring advanced to install vapor probes.					
						2			<u>Vapor Probe Installation:</u> Benseal ... 0-3 ft Sand ... 3-4 ft Brown probe ... 3-4 ft					
						4								
						6								
						8			Benseal ... 4-7.5 ft Sand ... 7.5-9 ft Yellow probe ... 7.5-8.5 ft					
						10			Total Depth = 9.0 ft; refusal on bedrock. No soil sample collected.					
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSSV0005**

Borehole Diam. (in.): 1-1/4	Total Depth (ft): 10.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-21-2007	Start Time: 08:12	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-21-2007	Finish Time: 08:17	Drilling Contractor: Hydrogeo Spectrum	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Rob Giberson	
Comments: Vegetation at surface. Boring drilled for vapor probe installation only.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: No sample collected		Soil Backfill Date: 02-21-2007	Backfill Time: 08:24

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			No sampling or logging performed. Boring advanced to install vapor probes.					
						2			<u>Vapor Probe Installation:</u>					
						4			Benseal ... 0-4 ft Sand ... 4-5 ft Yellow probe ... 4-5 ft					
						6								
						8								
						10			Benseal ... 5-9 ft Sand ... 9-10.5 ft Orange probe ... 9-10 ft					
						12			Total Depth = 10.5 ft; refusal on bedrock. No soil sample collected.					
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSSV0006**

Borehole Diam. (in.): 1-1/4	Total Depth (ft): 4.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-20-2007	Start Time: 12:17	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-20-2007	Finish Time: 12:22	Drilling Contractor: Hydrogeo Spectrum	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Alex Felix	
Comments: Vegetation at surface. Boring drilled for vapor probe installation only.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: No sample collected		Soil Backfill Date: 02-20-2007	Backfill Time: 12:27

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			No sampling or logging performed. Boring advanced to install vapor probe.					
						2			<u>Vapor Probe Installation:</u> Benseal ... 0-3 ft Sand ... 3-4.5 ft Brown probe ... 3-4 ft					
						4								
						6			Total Depth = 4.5 ft; refusal on bedrock. No soil sample collected.					
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSSV0007**

Borehole Diam. (in.): 1-1/4	Total Depth (ft): 11.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-20-2007	Start Time: 12:52	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-20-2007	Finish Time: 12:55	Drilling Contractor: Hydrogeo Spectrum	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Alex Felix	
Comments: Vegetation at surface. Boring drilled for vapor probe installation only.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: No sample collected		Soil Backfill Date: 02-20-2007	Backfill Time: 12:59

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			No sampling or logging performed. Boring advanced to install vapor probes.					
						2			<u>Vapor Probe Installation:</u>					
						4			Benseal ... 0-4 ft Sand ... 4-5 ft Brown probe ... 4-5 ft					
						6								
						8								
						10			Benseal ... 5-9 ft Sand ... 9-11 ft Yellow probe ... 9-10 ft					
						12			Total Depth = 11.0 ft; refusal on bedrock. No soil sample collected.					
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **FSSV0008**

Borehole Diam. (in.): 1-1/4	Total Depth (ft): 6.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-20-2007	Start Time: 13:09	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-20-2007	Finish Time: 13:11	Drilling Contractor: Hydrogeo Spectrum	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Alex Felix	
Comments: Vegetation at surface. Boring drilled for vapor probe installation only.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: No sample collected		Soil Backfill Date: 02-20-2007	Backfill Time: 13:13

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			No sampling or logging performed. Boring advanced to install vapor probe.					
						2			<u>Vapor Probe Installation:</u>					
						4			Benseal ... 0-4 ft Sand ... 4-6 ft Brown probe ... 4-5 ft					
						6			Total Depth = 6.0 ft; refusal on bedrock. No soil sample collected.					
						8								
						10								
						12								
						14								
						16								
						18								
						20								

Boring ID: **FSSV0009**

Borehole Diam. (in.): 1-1/4	Total Depth (ft): 4.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891264.0111811	Site: FSDf
Drill Start Date: 02-20-2007	Start Time: 13:02	Logged By: Chris Nevison	Reviewed By:
Drill Finish Date: 02-20-2007	Finish Time: 13:03	Drilling Contractor: Hydrogeo Spectrum	Field Instrumentation: N/A
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Geoprobe	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Alex Felix	
Comments: Vegetation at surface. Boring drilled for vapor probe installation only.		Well Comp. Date: N/A	Completion Time: N/A
Samplers: No sample collected		Soil Backfill Date: 02-20-2007	Backfill Time: 13:08

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0			No sampling or logging performed. Boring advanced to install vapor probe.					
						2			<u>Vapor Probe Installation:</u> Benseal ... 0-3 ft Sand ... 3-4.5 ft Brown probe ... 3-4 ft					
						4								
						6			Total Depth = 4.5 ft; refusal on bedrock. No soil sample collected.					
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/31/07

Boring ID: **PRBS0001**

Borehole Diam. (in.): 3	Total Depth (ft): 4.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891263.0111811	Site: Area IV Pistol Range
Drill Start Date: 02-21-2007	Start Time: 13:00	Logged By: J. Parkes	Reviewed By:
Drill Finish Date: 02-21-2007	Finish Time: 13:20	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Alex Felix	
Comments: Light vegetation at surface, near tree, ~25 ft from bedrock outcrop		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-21-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		ML	Sandy Silt, very dark brown (10YR 2/2), soft, dry, fine sand				35	65
						2		SM	Silty Sand, dark brown (10YR 3/3), loose, dry, fine to medium sand (mostly fine), nonplastic fines			20	50	30
	S					4			▼ sand grades finer			10	60	30
						6			Total Depth = 4.5 ft. Collected soil samples S01 and S02.					
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/23/07

Boring ID: **PRBS0002**

Borehole Diam. (in.): 3	Total Depth (ft): 9.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891263.0111811	Site: Area IV Pistol Range
Drill Start Date: 02-21-2007	Start Time: 10:50	Logged By: J. Parkes	Reviewed By:
Drill Finish Date: 02-21-2007	Finish Time: 11:35	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Alex Felix	
Comments: Geofabric covering on soil at surface, ~15 ft SE of bedrock outcrop		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-21-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S			12.2		0		SM	Silty Sand, dark brown (10YR 3/3), loose, wet, fine to medium sand, nonplastic fines ← plastic membrane ← soil stained with black substance			40	40	20
						2								
	S					4			↓ becomes very dark brown (10YR 2/2), moist, more medium and less fine sand			60	20	20
						6			↓ becomes very dark grayish brown (10YR 3/2), wet					
	S					8		SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), loose, moist, fine to medium sand (mostly medium), some white mottling Total Depth = 9.0 ft.			70	10	20
						10			Collected soil samples S01 and S02.					
	S					12								
						14								
	S					16								
						18								
	S					20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/23/07

Boring ID: **PRBS0003**

Borehole Diam. (in.): 3	Total Depth (ft): 6.5	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891263.0111811	Site: Area IV Pistol Range
Drill Start Date: 02-21-2007	Start Time: 09:05	Logged By: J. Parkes	Reviewed By:
Drill Finish Date: 02-21-2007	Finish Time: 09:40	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Alex Felix	
Comments: Geofabric covering on soil at surface, ~10 ft SE of bedrock outcrop		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-21-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SM	Silty Sand, dark brown (10YR 3/3), loose, moist, fine to medium sand, nonplastic fines			50	20	30
						1			becomes very dark brown (10YR 2/2), more fine and less medium sand			30	40	30
	S					2		SP-SM	becomes very loose					
						4			becomes dark yellowish brown (10YR 3/4), loose, more medium and less fine sand			50	20	30
						6		SP-SM	Poorly Graded Sand with Silt, yellowish brown (10YR 5/4), loose, moist, fine to medium sand (mostly medium), possibly extremely weathered sandstone			70	20	10
						6.5			Total Depth = 6.5 ft. Collected soil samples S01 and S02.					
						8		SP-SM						
						10		SP-SM						
						12		SP-SM						
						14		SP-SM						
						16		SP-SM						
						18		SP-SM						
						20		SP-SM						
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/23/07

Boring ID: **PRBS0004**

Borehole Diam. (in.): 3	Total Depth (ft): 1.0	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891263.0111811	Site: Area IV Pistol Range
Drill Start Date: 02-21-2007	Start Time: 13:30	Logged By: J. Parkes	Reviewed By:
Drill Finish Date: 02-21-2007	Finish Time: 13:40	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Alex Felix	
Comments: Light vegetation at surface, between two bedrock outcrops		Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve		Soil Backfill Date: 02-21-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
 s						0		SM	Silty Sand, yellowish brown (10YR 5/4), loose, dry, fine to medium sand, nonplastic fines			40	30	30
						2			Total Depth = 1.0 ft; refusal on bedrock. Collected soil sample S01.					
						4								
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/23/07

Boring ID: **PRBS0005**

Borehole Diam. (in.): 3	Total Depth (ft): 3.8	Project: Group 8 Data Gap Sampling	
Northing (ft):	Easting (ft):	Job Number: 1891263.0111811	Site: Area IV Pistol Range
Drill Start Date: 02-21-2007	Start Time: 12:25	Logged By: J. Parkes	Reviewed By:
Drill Finish Date: 02-21-2007	Finish Time: 12:50	Drilling Contractor: N/A	Field Instrumentation: PID
Depth 1st H ₂ O (ft): N/A	Date / Time: N/A	Drill Rig Type/Method: Hand Auger	
Depth H ₂ O After Drilling (ft): N/A	Date / Time: N/A	Driller's Name: Alex Felix	

Comments: Light vegetation at surface, 5 ft N of bedrock outcrop	Well Comp. Date: N/A	Completion Time: N/A
Samplers: Slide hammer with 2-inch-dia. x 6-inch-long sleeve	Soil Backfill Date: 02-21-2007	Backfill Time:

Sample Interval Retained	Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil				
										Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
	S					0		SM	Silty Sand, dark brown (10YR 3/3), loose, moist, fine to medium sand (mostly medium), nonplastic fines			50	20	30
	S					2			becomes dark yellowish brown (10YR 4/4)					
						4			Total Depth = 3.8 ft. Collected soil samples S01 and S02.					
						6								
						8								
						10								
						12								
						14								
						16								
						18								
						20								

LOG OF BORING GROUP8.GPJ MWH WC.GDT 3/23/07

PIEZOMETER LOGS

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
							32							
							33		Harder again @ 33'					
							34							
							35		FINE SANDSTONE, GREY, UNOXIDIZED, MOIST, MICACEOUS, WITH SOME MEDIUM GRAINS, WELL CEMENTED	-	-	5	95	-
							36							
							37							
							38		VERY HARD @ 37.5 ft REFUSAL @ 37.5 ft TD = 37.5 ft					
							39							
							40		4.5 BAGS OF RMC #3 NATURAL MONTEREY BEACH SAND					
							41		1 BAG WYOBEN ENVIROPLUG MEDIUM BENTONITE CHIPS. HYDRATED IN 1.5 FOOT LIFTS.					
							42							
							43		4 BAGS OF COLTON PORTLAND CEMENT TYPE II/V MIXED WITH 22 GALS OF WATER TO CREATE CEMENT GROUT SEAL					
							44							
							45							
							46							
							47							
							48							
							49							
							50							
							51							
							52							



MONTGOMERY WATSON

Boring #: PT-112 MW#: PZ 099 Sheet 1 of 23

Project: DOE Shallow GW Investigation

Job #: Site: SSFL Area IV

Logged By: T. Burton Reviewed By:

Drilling Contractor: Layne

Drill Rig Type/Method: CME 850 All-Terrain/HSA

Drillers Name: Enrique Perez

Borehole Diam./Drill Bit Type:
8" Carbide bit w/ bullets

Total Depth 33' (28')

Ref. Elev.

Site Sketch Map

Sampler Type: 1.5" Split Spoon

Depth to 1st Water (V): Time/Date:

Drill Start Time/Date: 10/17/01 0920 Drill Finish Time/Date: 10/17/01 1050

Depth to Water After Drilling (V): Time/Date:

Well Completion Time/Date: 10/17/01 1150

Depth to other Water Bearing Zones:

Soil Boring Backfill Time/Date: N/A

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of				
										Gravel	Sand			Silt/clay
											Coarse	Medium	Fine	
									Surface: dry grass + soils					
							1							
							2	SM	Alluvium: silty sand, vf-med. grained, dry, loose					
							3		@ 3' Alluvium/Bedrock contact					
							4							
							5		"Medium Hard" Drilling 3-9.5'					
							6							
							7							
							8							
							9							
							10		Poorly sorted sandstone, brown, moist, moderately cemented, light oxidation banding, loose in sample		5	20	75	
							11		Same drill rate to 14.5'					
							12							

PID/OVA 8 PM	Sample Interval	Recovered (in.)	Blow Counts / 5 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (feet)	USCS Soil Type	Soil Description	Gravel	Coarse Med.	Fine	Silt/Clay
							2						
							3						
							4		Same drill rate ("Medium Hard")				
10.5	↓	4	100 1/4"		2" BLANK PVC CASING	Bentonite Chips	15		Sandstone, brown, moderately cemented, moist, mod. well sorted - mostly fine grains	15	85		
							6						
							7		Cuttings appear olive-colored (grayish-olive)				
							8		Hard zone 17.5 - 18'				
							9						
24	↓	3	100 1/3"		2" DIAM. PVC CASING w/ 0.020" SLOTTED PERFORATIONS	RMC LONE STAR #3 SAND	20		Fine sandstone, well cemented, moist, brownish gray, slight oxidation of (mafic) micas	10	90		
							1						
							2		Hard Drilling 20 - 25'				
							3						
							4						
20.5	↓	2	100 1/2"		2" DIAM. PVC CASING w/ 0.020" SLOTTED PERFORATIONS	RMC LONE STAR #3 SAND	25		As above; gray, unweathered fine sandstone, well cemented, moist - appears saturated	5	95		
							6						
							7		@ 27.5' Very Hard drilling				
							8						
							9						
2.5	↓	2	100 1/2"		2" DIAM. PVC CASING w/ 0.020" SLOTTED PERFORATIONS	RMC LONE STAR #3 SAND	30		As above, very fine ss		100		
							1		Same Drill rate				
							2		Total Depth = 33' bgs				

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis.	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Sand				
										Gravel	Coarse	Med.	Fine	Silt/Clay
						SAND	2		4.5 BGS RMC #3 NATURAL MONTEREY BEACH SAND					
							33		1 BG WYOBEN ENVIROPLUG MEDIUM BENTONITE CHIPS.					
							4		2 BGS COLTON PORTLAND CEMENT II/V MIXED WITH 11 GALS WATER TO FORM CEMENT GROUT					
							5							
							6							
							7							
							8							
							9							
							0							
							1							
							2							
							3							
							4							
							5							
							6							
							7							
							8							
							9							
							0							
							1							
							2							



MONTGOMERY WATSON

Boring #: PT-113 MW#: PZ-100 Sheet 1 of 2

Project: DOE SHALLOW GROUNDWATER

Job #: Site: FSD/SSFL

Logged By: T. HALL Reviewed By:

Drilling Contractor: LAYNE [ENRIQUE]

Drill Rig Type/Method: CME 850 / HSA

Drillers Name: ENRIQUE

Borehole Diam./Drill Bit Type:

Total Depth

16.5

8" / CARBIDE BIT

Ref. Elev.

GROUND SURF.

Site Sketch Map

Sampler Type: 1.5' SPLIT SPOON

Depth to 1st Water (▽): NONE Time/Date: 10/17/01

Drill Start Time/Date: 1255 10/17/01 Drill Finish Time/Date: 1405 10/17/01

Depth to Water After Drilling (▽): Time/Date:

Well Completion Time/Date: 1440 ON 10/17/01

Depth to other Water Bearing Zones:

Soil Boring Backfill Time/Date: N/A

PID/OVA (PPM)	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of				
										Gravel	Sand			Silt/clay
											Coarse	Medium	Fine	
0.0	X							SM	0-0.5 (SM) SILTY SAND WITH OCCASSIONAL GRAVEL, DRY, LOOSE, YELLOWISH-BROWN, FILL, STRONG BROWN	5	-	10	80	5
							1	FILL						
							2		GRAVEL (GP) FROM 0.5'-2'	75	15	5	5	-
							3							
							4							
0.0		6"	10		2" SCHED 40 PVC	BENTONITE	4.8"	SM	FIRST 4" SAME AS ABOVE	5	TR	10	80	5
0.0		6"	15		2" SCHED 40 PVC	BENTONITE	5.8"	BEDROCK	LAST 14" SILTY SANDSTONE, FINE, MOIST, LOOSE, OXIDIZED, BROWNISH-YELLOW, VERY LITTLE TO NO CEMENTATION, SLIGHTLY CEMENTED LAST 4"	-	-	5	85	10
0.1		6"	72		2" SCHED 40 PVC	BENTONITE	6.8"							
							7		DRILLING HARDER @ 7'					
							8							
							9		DRILLING HARDER @ 10'					
0.0		6"	100"		2" SCHED 40 PVC	BENTONITE	10		SILTY SAND, FINE, OXIDIZED, MOIST, MODERATELY CEMENTED, YELLOWISH-BROWN, INCREASED MICA CONTENT					
							11							
							12							

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of Sand				
										Gravel	Coarse	Med.	Fine	Silt/Clay
							12		DRILLING HARDER @ 12.5					
							13		WITH COLOR CHANGE IN CUTTINGS TO OLIVE-GREY.					
							14		DRILLING VERY HARD @ 13					
26.5	↓	4"	100 1/4"		2" DIAM SCREEN	RMC #3 SAND	15		SANDSTONE, FINE WITH	-	-	5	95	TR
							15.8"		OCCASSIONAL MEDIUM					
							16		GRAINS, MOIST, WELL CEMENTED, GRAY					
							17	TD	SLIGHTLY EASIER DRILLING @ 16 FEET, BUT STILL VERY HARD					
							18							
							19		TD = 16.5 FT (REFUSAL)					
							20		SCREEN 5.8' - 15.8' BGS					
							1		3.7 BGS RMC #3 NATURAL MONTEREY BEACH SAND					
							2		1 BG WYOBEN ENVIROPLUG MEDIUM BENTONITE CHIPS. HYDRATED IN 1.5 FT LIFTS					
							3							
							4		@ 1350 TALK W/ MCGINNIS 109, 101, 88, 87, 70 DONE					
							5							
							6							
							7							
							8							
							9							
							0							
							1							
							2							



MONTGOMERY WATSON

Boring #: PT-114 MW#: P2-101 Sheet 1 of 2

Project: DOE SHALLOW GROUNDWATER

Job #: Site: FSD/SSFL

Logged By: T. HALL Reviewed By: T. Burton

Drilling Contractor: LAYNE

Drill Rig Type/Method: CME 850/HSA

Drillers Name: ENRIQUE PEREZ

Borehole Diam./Drill Bit Type:

8" / CARBIDE

Total Depth

Ref. Elev.

Site Sketch Map

Sampler Type: 1.5' SPLIT SPOON

Depth to 1st Water (▽): Time/Date:

1515
Drill Start Time/Date: 10/17/01 Drill Finish Time/Date: 10/18/01

Depth to Water After Drilling (▽): Time/Date:

Well Completion Time/Date:

Depth to other Water Bearing Zones:

Soil Boring Backfill Time/Date:

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Estimated % Of				
										Gravel	Sand			Silt/clay
											Coarse	Medium	Fine	
0.0	X					CONCRETE	1	sm	SILTY SAND, FINE - MED, WITH OCCASSIONAL GRAVEL, MOIST, LOOSE, ROOTLETS, LIKELY FILL, YELLOWISH-BROWN.	5	10	30	45	10
0.0						CONCRETE	2							
0.0						CONCRETE	3							
0.0						CONCRETE	4							
0.0						CONCRETE	5	sm	SILTY SAND, FINE-MED GRAINS, MOIST, STRONG BROWN, MORE FINES THAN ABOVE (SILT/CLAY) LIKELY NATIVE ALLUVIUM.	—	5	10	55	30
0.0						BENTONITE	6	sm						
0.0						BENTONITE	7	sm						
0.0						BENTONITE	8		DRILLING HARDER @ 8 FT FOLLOWED BY COLOR CHANGE (POSSIBLE ALLUV/B.R. CONTACT)					
0.0						BENTONITE	9							
0.0						BENTONITE	10		SILTY SAND, V. FINE - MED GRAINS, MOIST, BROWNISH-YELLOW, MODERATELY CEMENTED	—	—	10	80	1
0.0						BENTONITE	11							
0.0						BENTONITE	12		DRILLING SLIGHTLY HARDER @ 10.5'					

PID/OVA	Sample Interval	Recovered (in.)	Blow Counts / 6 in.	Retained for Analysis	Casing Type & Size	Annulus Filler	Depth (Feet)	USCS Soil Type	Soil Description	Gravel	Coarse Med.	Fine	Silt/Clay
					0.020" SLOTS		12						
							13						
							14		HAMMER CHANGE BROKE AFTER 3 BLOWS.				
0.3	↓	3	100/3"				15		Fine sandstone, moist, mod. well cemented, mod well sorted, brownish gray, oxidized yellowish to strong brown in places (fracture?), micaceous	5	20	75	
							16						
							17						
							18		Medium Hard Drilling				
							19						
20	↓	2	100/2"				20		Well cemented Fine sandstone, moist, micaceous, oxidized yellowish brown, well sorted		tr 100		
							21						
							22		Very Hard Drilling @ 21'				
							23						
							24						
22	↓	2	100/2"				25		As above, w/some granitic fragments as coarse sand/ fine gravel, vf-fine sands, moist, olive gray, less oxidation	5	5	10	80
							26						
NA	↓	1	100/1"				27				tr 20	80	
							28		Refusal @ 27' w/auger				
							29		Sample: well cemented, gray, unweathered fine sandstone				
							30		10-20' Screen; 27-7' #3 sand				
							31		5-7' Bert. chips (medium)				
							32		2-5' cement grout				

Resume
10/18/01

WELL LOGS

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-98
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-21

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
110 - 175 cont'd	At 120 feet, dark grey, high moisture content. At 140 feet, well producing approximately 1 gpm.

TOTAL DEPTH OF BOREHOLE: 175 FEET

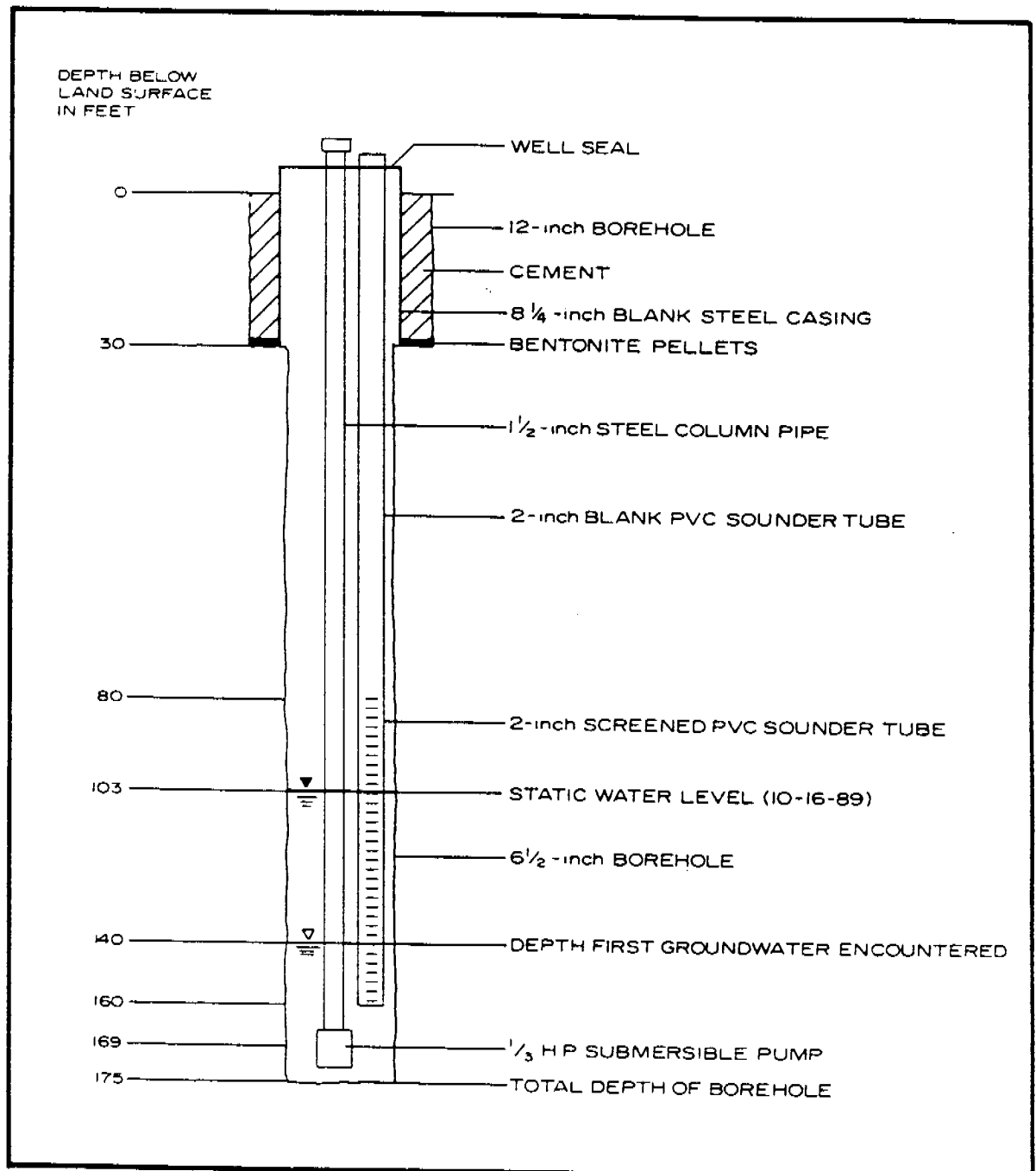


FIGURE E-23
SCHEMATIC DIAGRAM OF MONITOR WELL RD-21

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-99
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-22

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
360 - 385	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, moderate moisture content. At 380 feet, medium-grained sandstone.
385 - 400	SHALE	Grey, moderately cemented, moderate moisture content.
400 - 440	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, high moisture content. At 400 feet, water accumulating in hole.

TOTAL DEPTH OF BOREHOLE: 440 FEET

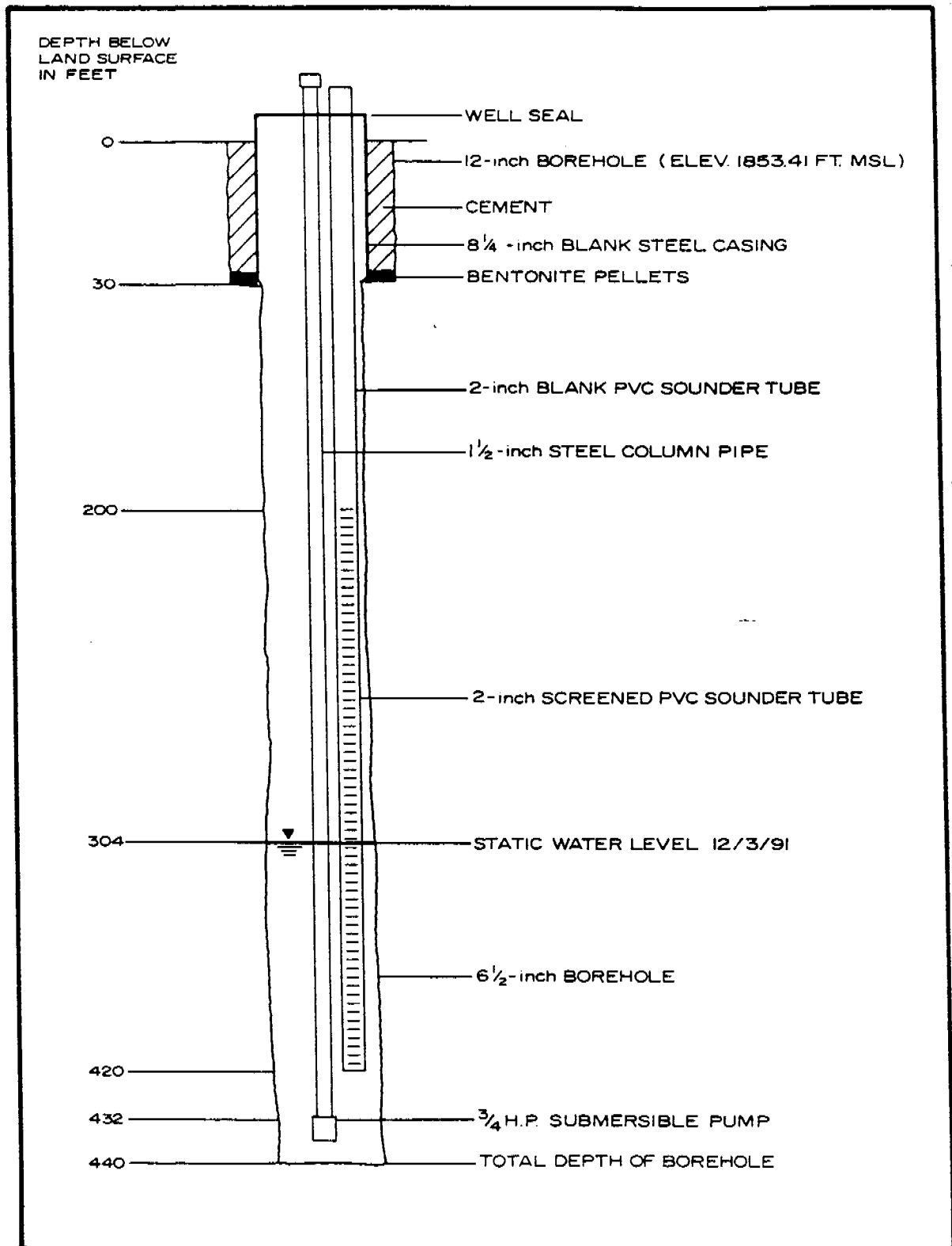


FIGURE E-24
SCHEMATIC DIAGRAM OF MONITOR WELL RD-22

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-100

LITHOLOGIC LOG OF MONITOR WELL RD-23

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 4	SANDY CLAY	Medium brown, low plasticity, fine-grained, very slightly moist, no odor.
4 - 9	SANDSTONE	Yellow-brown, fine-grained, well sorted, non-calcareous, slightly moist, no odor.
9 - 30	SILTSTONE	Blue-grey with calcareous cement, with fine sand interlayers, slightly moist, no odor.
30 - 140	SANDSTONE	From 11 to 15 feet, yellow-brown sandstone.
		Grey, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture content.
		From 60 to 65 feet, some siltstone.
		From 115 to 140 feet, some siltstone.
140 - 160	SILTSTONE	At 130 feet, increased moisture.
		Grey, moderately cemented, moderate to high moisture content.
160 - 210	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, moderate to high moisture content.
		From 209 to 210 feet, possible fracture, brown, clayey, high moisture content.
210 - 225	SHALE	Grey-brown, moderately cemented, moderate moisture content.
		At 220 feet, color changes to grey.
225 - 415	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, moderately cemented, moderate moisture content.
		From 270 to 280 feet, some siltstone.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-100
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-23

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
225 - 415 (con't)		From 340 to 345 feet, slightly coarser. From 380 to 385 feet, some shale, moderate to high moisture content.
415 - 420	SHALE	Dark grey, calcareous, moderately cemented, moderate moisture content.
420 - 440	SANDSTONE	Grey, fine-grained, moderately to well sorted, subrounded to subangular, calcareous, moderately cemented, moderate moisture content.

TOTAL DEPTH OF BOREHOLE: 440 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

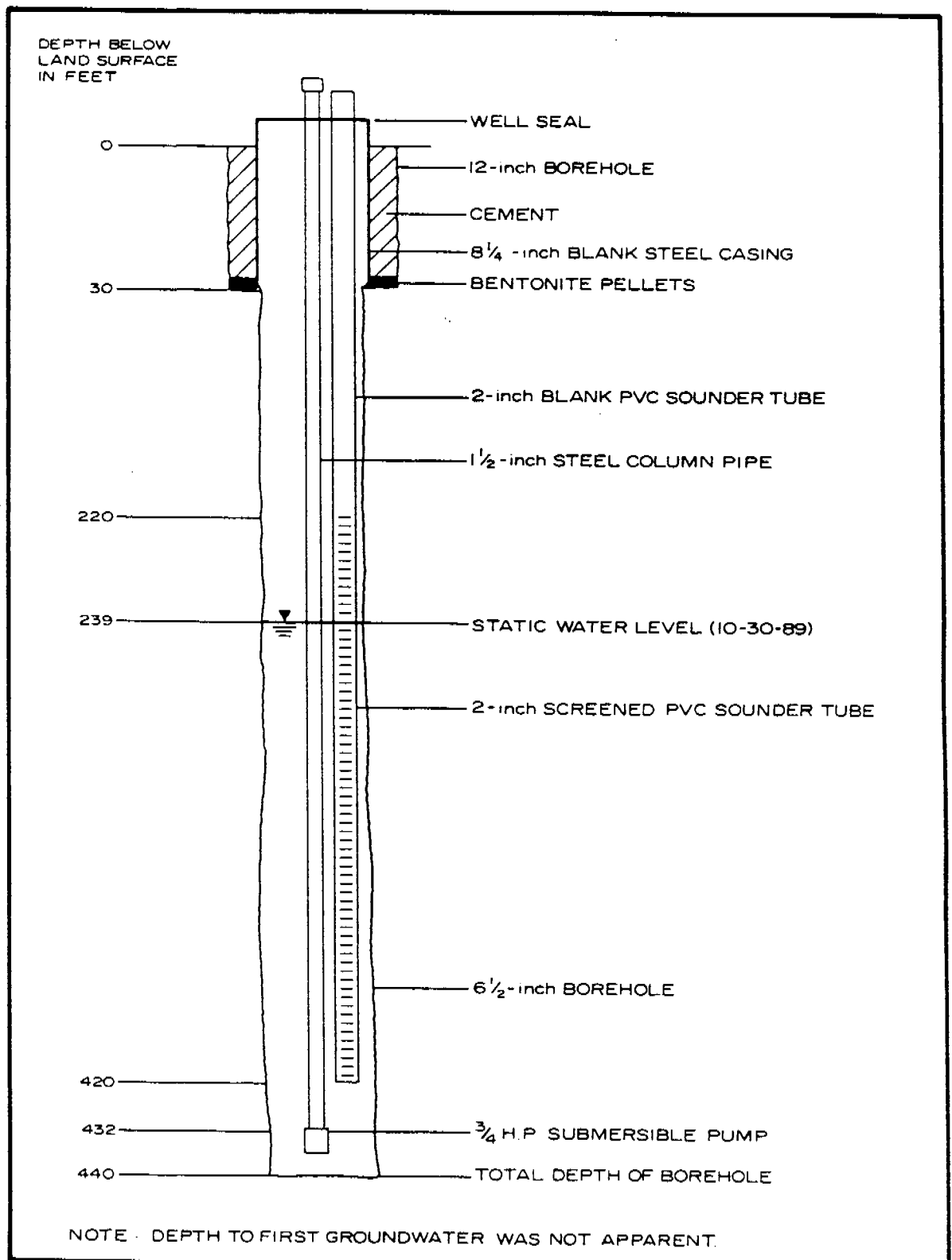


FIGURE E-25
SCHEMATIC DIAGRAM OF MONITOR WELL RD-23

TABLE A-110

LITHOLOGIC LOG OF MONITOR WELL RD-33A

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 3	SILTY SAND	Brown, trace clay, medium grained, moderately sorted, subangular, to subrounded, loose, slight plasticity, no cementation, dry, no odor.
3 - 30	SANDSTONE	Buff, trace silt, fine grained, moderate to well sorted, dense, non-calcareous, weak to moderate cementation, dry, no odor. From 3 to 5 feet weathered. At 10 feet moderate cementation.
30 - 320	SANDSTONE	Grey, some silt, trace clay, fine to medium grained, moderately sorted, subangular to subrounded, dense, calcareous, moderate to strong cementation, dry, no odor. At 35 feet color change to blue grey, strong calcareous cementation. At 85 feet slight increase in grain size, color change to grey. At 105 feet cementation decreases to moderate. From 125-130 feet color change to brown. At 130 feet color change to grey. From 140 to 145 feet some black claystone layers. From 155 to 160 feet some interbedded claystone. At 170 feet cementation becomes weak. From 170 to 180 feet some black claystone layers. At 180 feet slight increase in grain size.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-110
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-33A

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
30 - 320 cont'd	SANDSTONE	From 185 to 190 feet some interbedded claystone.
		From 210 to 215 feet some brown sandstone.
		At 235 feet cementation becomes moderate, some coarse sand present.
		At 275 feet moisture content increases to slightly moist, some black claystone present.
		At 285 feet moisture content increases to moist.
		At 295 feet moisture content increases to wet.
		From 315 to 320 feet some clay present.

TOTAL DEPTH OF BOREHOLE: 320 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

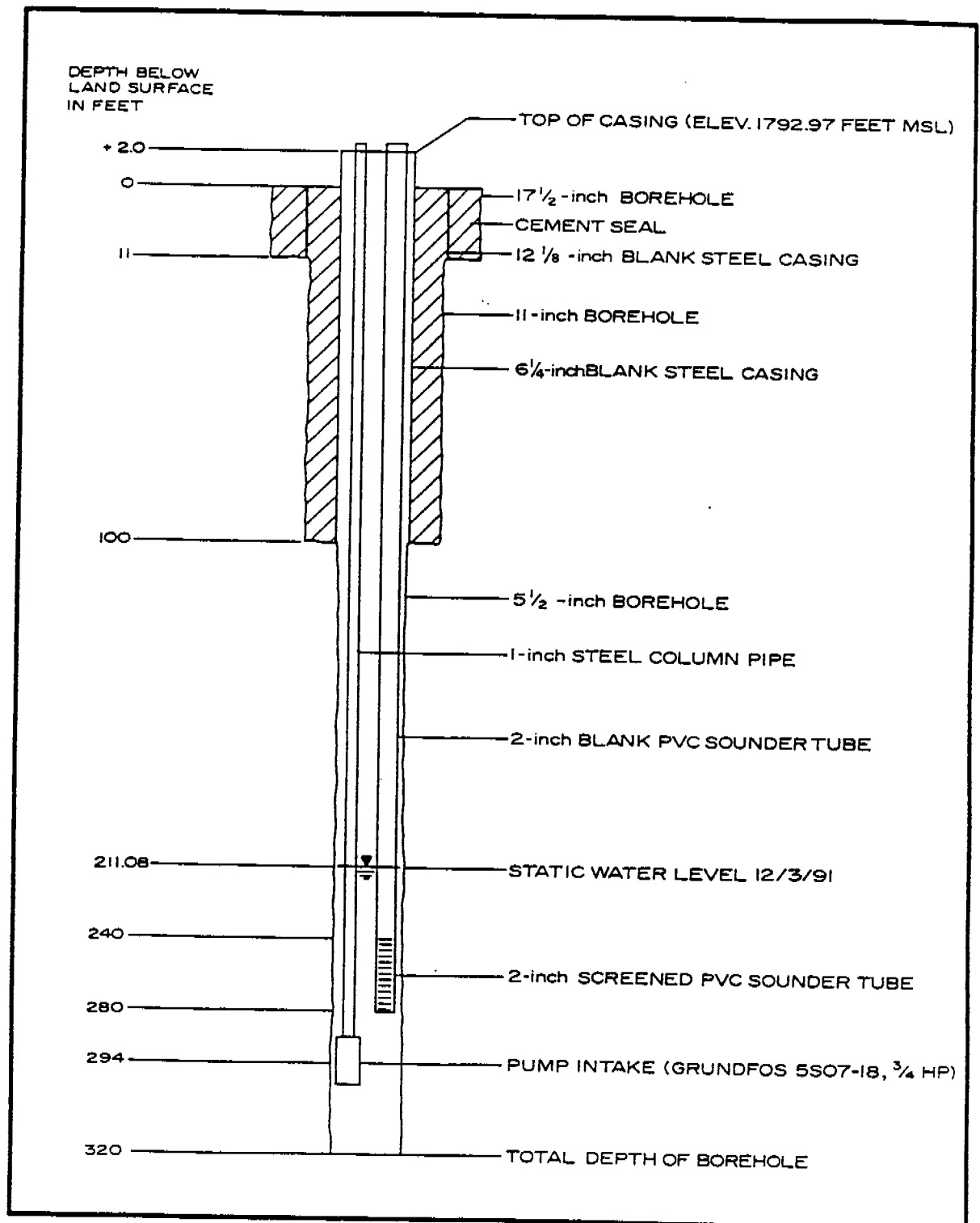


FIGURE E-35
SCHEMATIC DIAGRAM OF MONITOR WELL RD-33A

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-111
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-33B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
38 - 455 cont'd	SANDSTONE	From 175 to 180 feet some claystone present. At 232 feet silt and clay content increasing. At 260 feet slightly moist. From 282 to 283 feet water bearing fracture, producing 1 to 2 gpm on airlift, formation becomes wet. From 300 to 310 feet interlayers of brown clayey sandstone. At 320 feet cementation weak to moderate. Below 335 feet black claystone beds begin to appear. Below 345 feet white dolomitic vein filling. At 380 feet becomes finer grained. Below 395 feet cementation decreases to weak.
455 - 475	CLAYSTONE	Black, some interbedded sandstone, low to moderate plasticity, dense, non-calcareous, moderate cementation, wet, no odor. At 470 feet sandstone content increasing.
475 - 495	SANDSTONE	Blue-grey, some black claystone interlayers, fine to medium grained, well sorted, subangular, compact, non-calcareous, moderate cementation, wet, no odor.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-111
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-33B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
495 - 508	SANDSTONE WITH CLAYSTONE	Grey, with black claystone interlayers, fine-grained, moderately sorted, subangular, dense, non-calcareous, moderate cementation, wet, no odor. From 501 to 502 feet large water bearing fracture, yielding 75 to 100 gpm on airlift. At 505 feet sandstone content increasing, claystone interlayers decreasing.
508-678	SANDSTONE	Grey, some interbedded black claystone, fine to medium grained, moderately sorted, subangular, very dense, non-calcareous, moderate to strong cementation, wet, no odor. Below 518 feet claystone interbeds decreasing. At 521 feet fracture present. At 522 feet cementation decreases to moderate. Below 535 feet slight increase in grain size. From 605 to 610 feet some very fine to fine gravel present. From 620 to 630 feet some black claystone interlayers. At 645 feet small fracture. From 660 to 665 feet some black claystone interlayers.
TOTAL DEPTH OF BOREHOLE: 678 FEET ^{1/}		

^{1/} Borehole was cemented back to 415 feet during well completion

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-111

LITHOLOGIC LOG OF MONITOR WELL RD-33B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 2	SILTY SAND	Brown, trace clay, medium grained, moderately sorted, subangular, to subrounded, loose, slight plasticity, no cementation, dry, no odor.
2 - 38	SANDSTONE	Buff, trace silt, fine grained, moderate to well sorted, dense, non-calcareous, weak to moderate cementation, dry, no odor. Below 18 feet some medium and coarse grains. At 22 feet color change to light brown, moisture content increases to slightly moist. At 30 feet color change to grey brown.
38 - 455	SANDSTONE	Grey, some silt, trace clay, fine to medium grained, moderately sorted, subangular to subrounded, compact, calcareous, moderate cementation, slightly moist, no odor. At 82 feet becomes dry. At 85 feet strongly calcareous, cementation becomes strong. At 102 feet color change to brown, moderately calcareous cementation decreases to moderate. At 108 feet color change to grey-brown. At 128 feet predominantly fine-grained. At 140 feet strongly calcareous. At 150 feet color change to blue-grey. At 170 feet color change to grey-brown. At 175 feet color change to blue-grey.

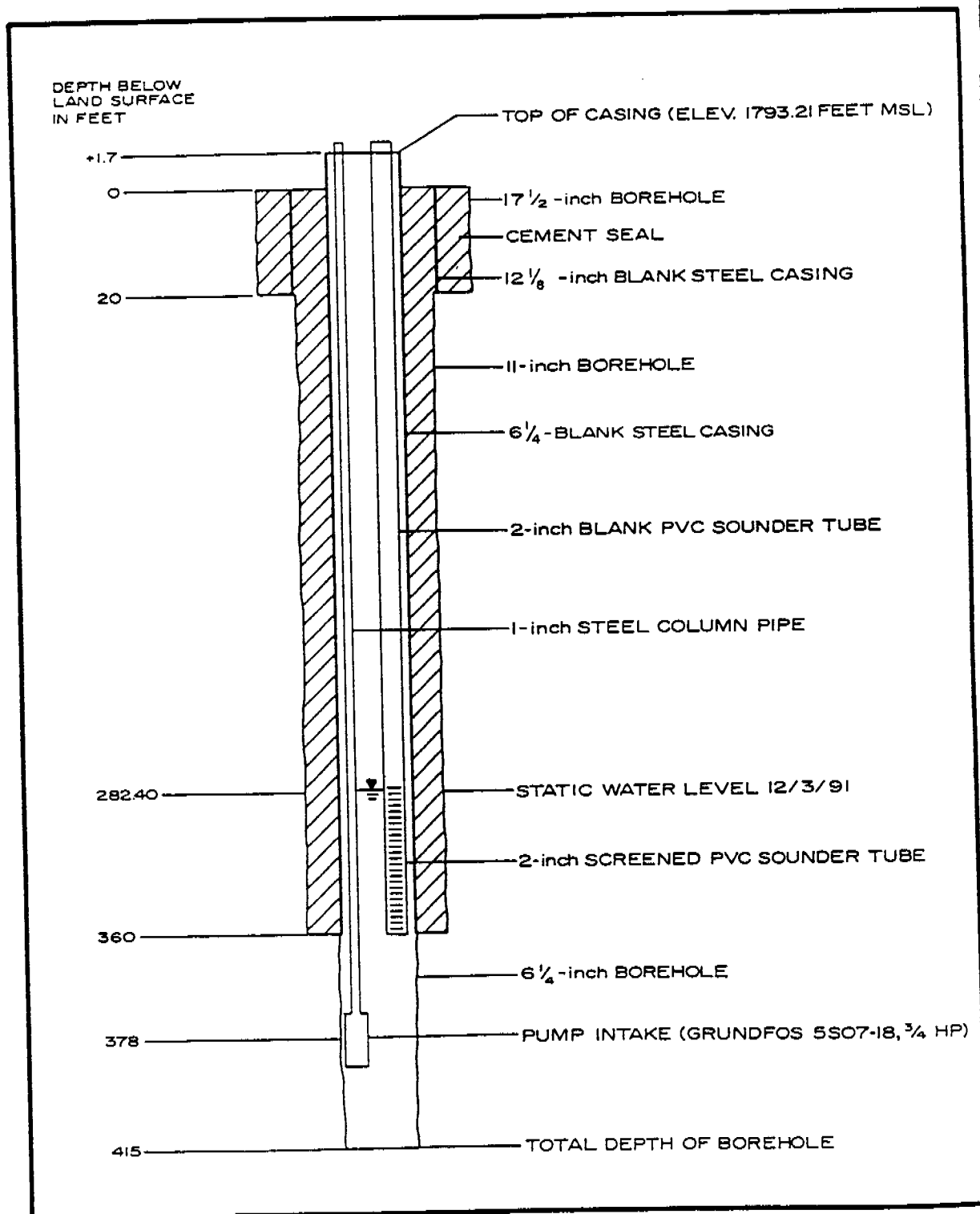


FIGURE E-36
SCHEMATIC DIAGRAM OF MONITOR WELL RD-33B

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-112

LITHOLOGIC LOG OF MONITOR WELL RD-33C

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 3	SILTY SAND	Light brown, trace clay, fine to medium grained, moderately sorted, subangular, to subrounded, loose, slight plasticity, no cementation, dry, no odor.
3 - 25	SANDSTONE	Buff, trace silt, fine grained moderate to well sorted, compact, non-calcareous, weak cementation, dry, no odor. From 3 to 5 feet weathered. At 5 feet cementation becomes moderate.
25 - 350	SANDSTONE	Grey-brown, some silt, trace clay, fine to medium grained, moderately sorted, subangular, dense, calcareous, moderate to strong cementation, dry, no odor. At 50 feet slight increase in grain size, moderate cementation At 60 feet color change to blue grey, becomes strongly calcareous. At 82 feet moderate to strong cementation. From 100 to 115 feet slightly moist. From 115 feet becomes dry. From 125 to 130 feet color change to light brown, slight decrease in cementation. From 185-195 feet color change to light brown, decrease in cementation. From 240 to 250 feet very fine grained. At 302 feet water bearing fracture. Below 310 feet some thin claystone beds are present.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-112
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-33C

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
		Below 340 feet some coarse sand and very fine gravel is present.
350 - 370	SANDSTONE	Grey black, with interbedded claystone, trace gravel, medium grained, poorly sorted, subangular, moderate to strong cement, non-calcareous, wet, no odor.
		Below 365 feet claystone content decreases.
370 - 520	SANDSTONE	Grey, trace very fine gravel, fine to medium grained, well sorted, subrounded, compact, moderate cementation, non-calcareous, wet, no odor.
		At 375 feet cementation becomes weak.
		At 380 feet grain size becomes very fine to fine.
		At 415 feet cementation increases to moderate.
		At 422 feet water bearing fracture, doubles flow rate.
		At 430 feet becomes fine to medium grained.
		At 480 feet becomes finer grained, silty and calcareous.
		From 480 to 485 feet color change to brown.
		At 499 feet small fracture bearing water.
		At 505 feet becomes medium grained.

TOTAL DEPTH OF BOREHOLE: 520 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

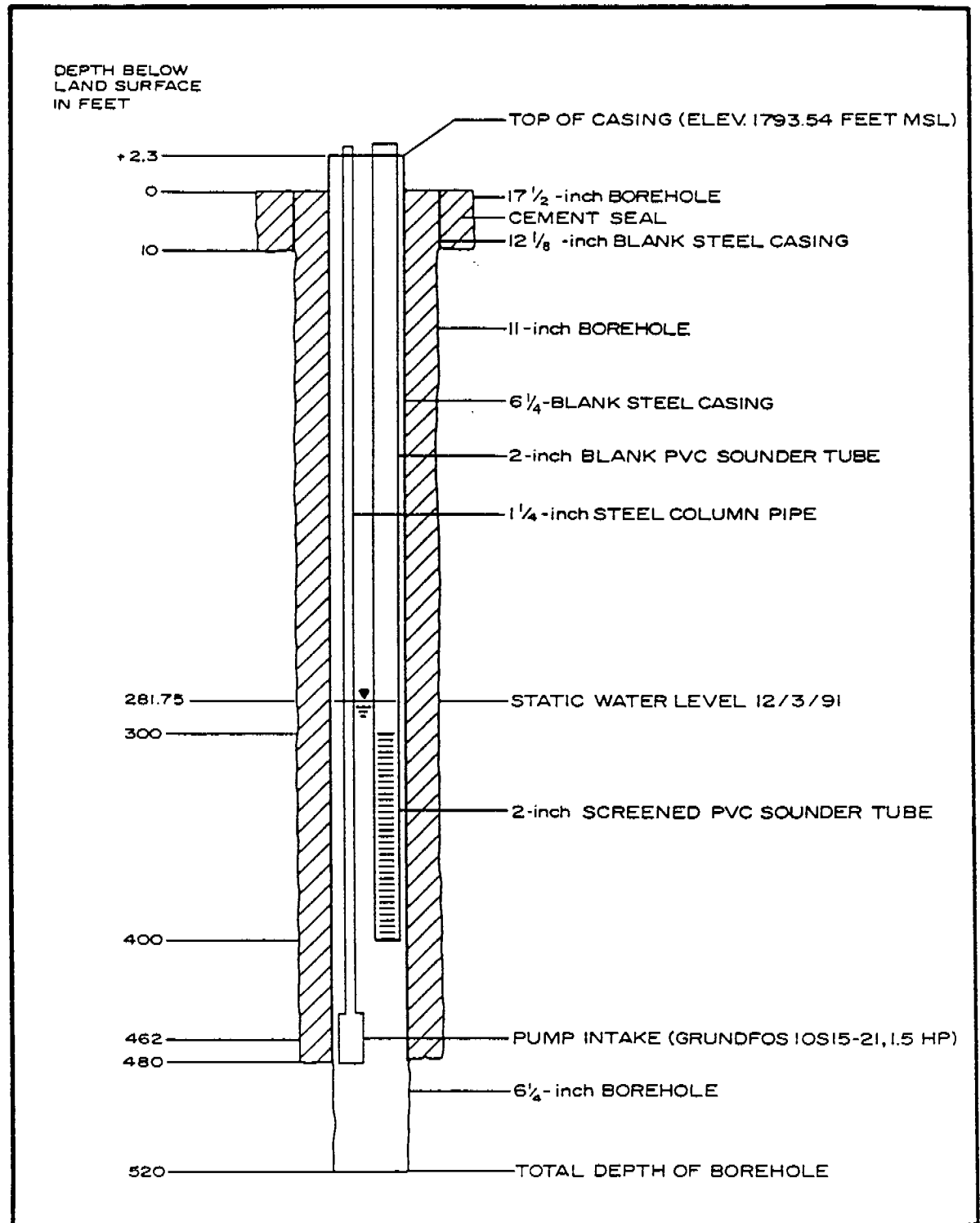


FIGURE E-37
SCHEMATIC DIAGRAM OF MONITOR WELL RD-33C

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-151
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-54A

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
14 - 278 (cont'd)	SANDSTONE	@ 237' fracture.
		@ 238' moist.
		@ 246' slightly moist.
		@ 270'-278' fine to medium grained.
TOTAL DEPTH OF BOREHOLE = 278 FEET		

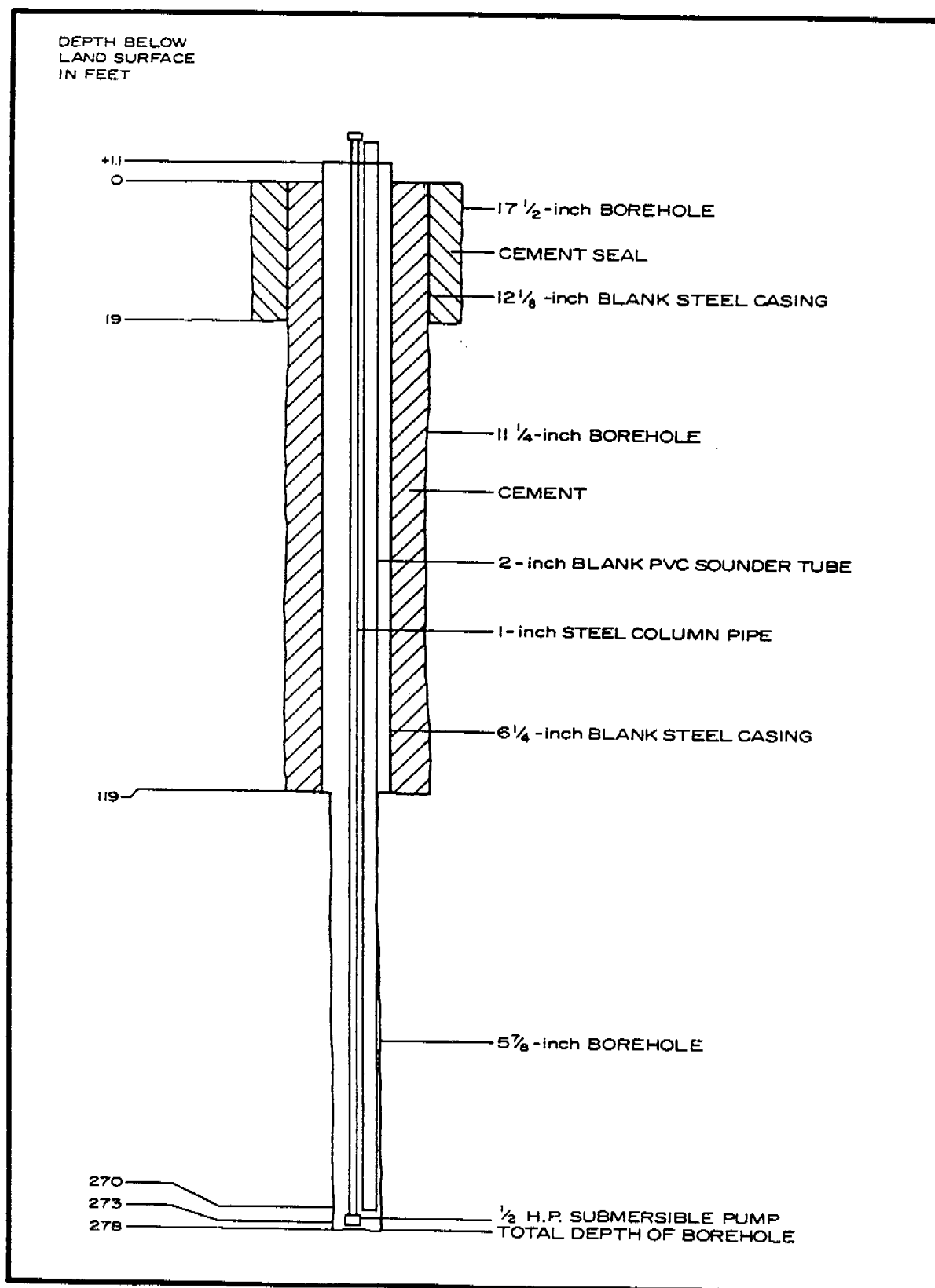


FIGURE E-76
SCHEMATIC DIAGRAM OF MONITOR WELL RD-54A

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-152

LITHOLOGIC LOG OF MONITOR WELL RD-54B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
0 - 158	SANDSTONE Light brown, some silt, fine to medium grained, some coarse sand, moderately to poorly graded, subrounded, compact, weak cementation, slightly calcareous, slightly moist. @ 4' grey, poorly graded, dense, moderate cementation, dry. @ 8-9' brownish grey, fractured, moist. @ 14' blue grey, moderate to strong cementation, moderately calcareous, moist. @ 18' olive grey, fine grained, subangular and subrounded, moist. @ 23' medium grey, very moist. @ 24' dense to very dense. @ 27' light grey, compact to dense, moderate cementation, slightly moist to moist. @ 32' slightly moist. @ 38' weak cementation. @ 48' moderate to poorly graded, some medium grained sand. @ 60' some silt. @ 84' none to weak cementation, dry to slightly moist. @ 90' weak cementation. @ 98' dry @ 102' dry to slightly moist. @ 108' none to weak cementation. @ 124' weak cementation. @ 128' weak to moderate cementation, slightly moist. @ 134' silty, fine grained sand, poorly graded. @ 138' moderate to strong cementation.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-152
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-54B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 158 (cont'd)	SANDSTONE	@ 144' some silt, strong cementation, dry to slightly moist. @ 148' moderate to strong cementation, slightly moist to moist. @ 154' moderately to poorly graded, weak to moderate cementation, dry to slightly moist. @ 156' loose to compact.
158 - 164	SILTSTONE	Light olive grey, sandy, clayey, fine grained sand, poorly graded, compact to dense, moderate cementation, slightly moist.
164 - 206	SANDSTONE	Light grey, medium grained, moderately to poorly graded, subangular and subrounded, compact to dense, weak cementation, dry. @ 168' dry to slightly moist. @ 178' weak to moderate cementation, slightly moist. @ 184' none to weak cementation, dry to slightly moist. @ 188' weak cementation @ 194' no cementation @ 198' fine grained, poorly graded, weak cementation, slightly moist. @ 205.5-206' fracture
206 - 218	SILTY SANDSTONE	Olive grey, clayey, very fine grained, compact, moderate to strong cementation, moist. @ 208' light olive grey, strong cementation, moist to slightly moist. @ 204' some clay
218 - 437	SANDSTONE	Silty, very fine grained, moderate cementation, moist. @ 228' some silt, strong cementation. @ 238' wet

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-152
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-54B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL
218 - 437 (cont'd)	SANDSTONE
	@ 240' fine grained, some silt, scattered medium grained sand.
	@ 244' increasing silt content.
	@ 246-278' no cuttings returned, no water in return.
	@ 278' olive grey, moderately to poorly graded, subangular and angular, compact, weak to moderate cementation, moist.
	@ 282' slightly clayey, strong cementation.
	@ 288' olive grey to light olive grey, fine grained, poorly graded.
	@ 300.5' very moist
	@ 305' olive grey, silty, slightly clayey.
	@ 308' no clay, less silt, moderately cemented.
	@ 312' loose to compact.
	@ 314' light olive grey to grey, compact, strong cementation, moist.
	@ 324' olive grey, slightly clayey.
	@ 358' moist to very moist.
	@ 368' moist
	@ 374' moist to very moist.
	@ 384' small increase in clay content, moist.
	@ 388' moist to very moist.
	@ 394' clay content decreases slightly.
	@ 398' dense, moderate to strong cementation, moist.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-152
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-54B

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
218 - 437 (cont'd)	SANDSTONE	@ 404' more clay, compact to dense, strong cementation. @ 418' light olive grey, minor to no clay, moderate to strong cementation, slightly moist. @ 428' olive grey, trace clay, slightly moist to moist. @ 436' slightly moist to dry.

TOTAL DEPTH OF BOREHOLE = 437 FEET

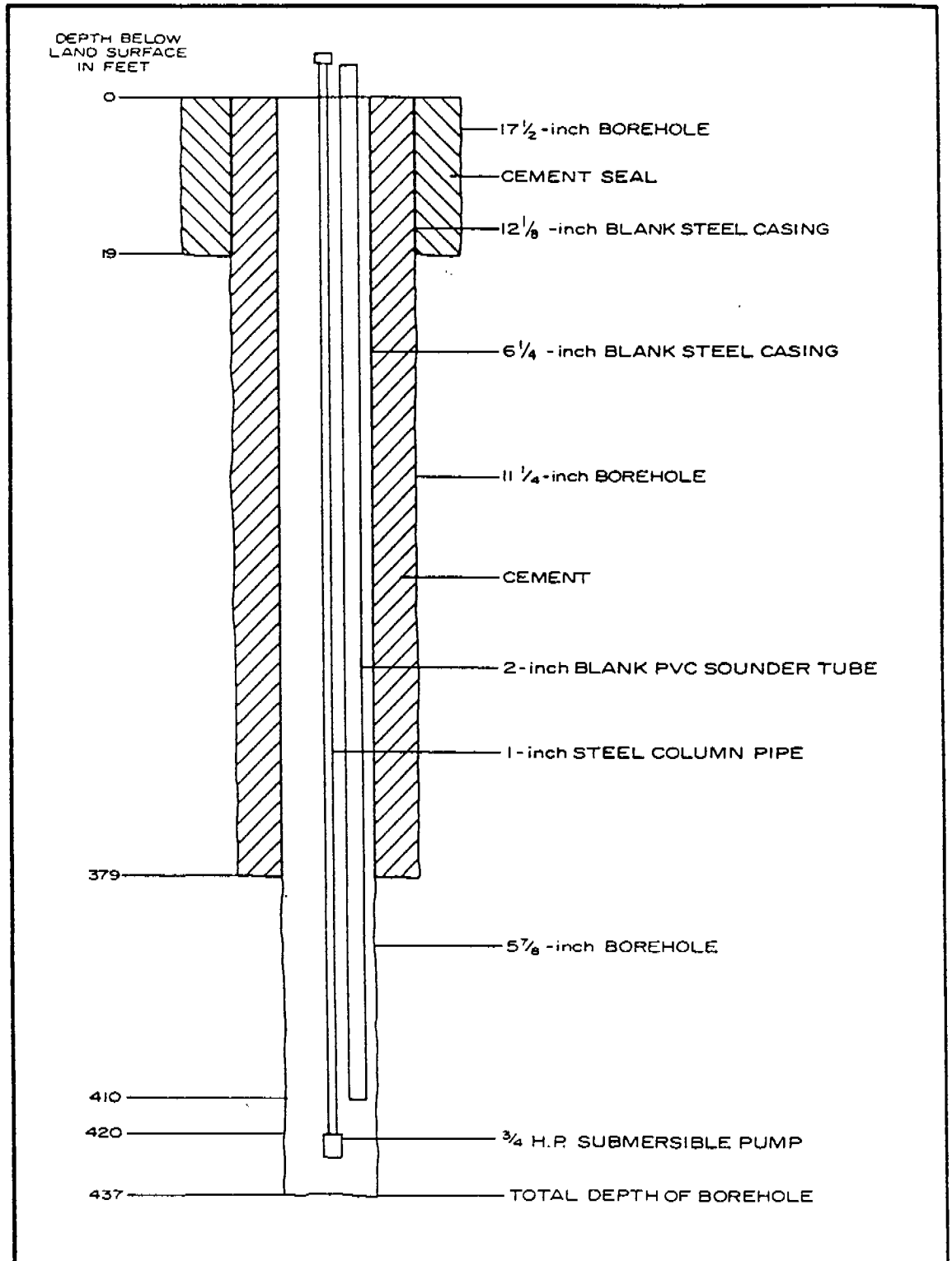


FIGURE E-77
SCHEMATIC DIAGRAM OF MONITOR WELL RD-54B

TABLE A-153

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-54C

LITHOLOGY			FRACTURES			COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE	
		TOP	BOTTOM			
0 - 620	SANDSTONE					
	Blue grey to tan, dry to slightly moist, very calcareous fine to medium grained.	4	5	?	?	filled with clay seepage @ 23.9-24.6'
	@ 12' blue grey.	22.2	24.6	?	structural	
	@ 20-21' claystone, calcareous, moist, blue grey.	40.2	41.8	closed	structural	
	@ 28-28.5' siltstone interbed.	56.5	58.2	thin	structural	filled
	@ 28-28.5' siltstone interbed.	183.5	185.5	1/16-1/2	structural	minor seepage @ 179.5'
	@ 90' formation becomes harder with depth.	201.6	202.4	thin/closed	structural	multiple fractures
	@ 142-156' clayey matrix.	218	218	O-1/16	bedding plane	static water @ 187'
	@ 216-234' clay content increases.	296	296	O-1/16	structural	
	@ 230' drill cuttings drying out.	301	304	O-1/16	structural	
	@ 278-290' increasing clay content.	327	327	filled	structural	
	@ 310-326' very calcareous.	405	405	O-1/16	structural	
	@ 332-340' some claystone interbeds.	417	417	O-1/16	bedding plane	
	@ 410' silty matrix, slightly calcareous.	426	426	O-1/16	structural	
	@ 420' air-lift discharge rate less than 1 gpm.	429	---	O-1/16	structural	vertical fracture
	@ 430-460' poor cuttings return, discharge system plugging.	514	514	O-1/16	bedding plane	
	@ 478-498' increasing clay content.	516	516	O-1/16	structural	
	@ 500-520' silty sandstone, very fine to fine grained, strongly calcareous, light grey, dry to slightly moist.	583	583	O-1/16	structural	
	@ 520' sandstone is light grey, fine grained.					

TABLE A-153
(continued)

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-54C

LITHOLOGY		FRACTURES				COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (Inches)	TYPE	
		TOP	BOTTOM			
0 - 620	SANDSTONE @ 540' slight increase in moisture, noticeable decrease in dust. @ 548' silty matrix. @ 580' increase in clay/silt content. @ 583' increase in moisture. @ 596' borehole producing 1-2 gpm during drilling operations. @ 607' increase in moisture. @ 620' decrease in silt/clay content.					
TOTAL DEPTH OF BOREHOLE: 620 FEET		TOTAL VIDEO LOG DEPTH: 597 FEET				

NOTE: Sandstone throughout borehole is predominately massive and fine to medium grained.

The initial video log of the RD-54C borehole was conducted on July 16. The log was relatively clear and the static water level was 187 feet. Unfortunately, the logging contractor's tape system malfunctioned and a copy of the video log tape could not be reproduced. However, detailed notes describing lithology and fractures were compiled during the video logging. After completion of packer testing, the borehole was video logged again on July 18. Unfortunately, the second log was not as clear as the initial log below a depth of 250 feet. The video log summary presented was developed from field notes prepared during the initial video logging and from review of the upper 250 feet of the second video log.

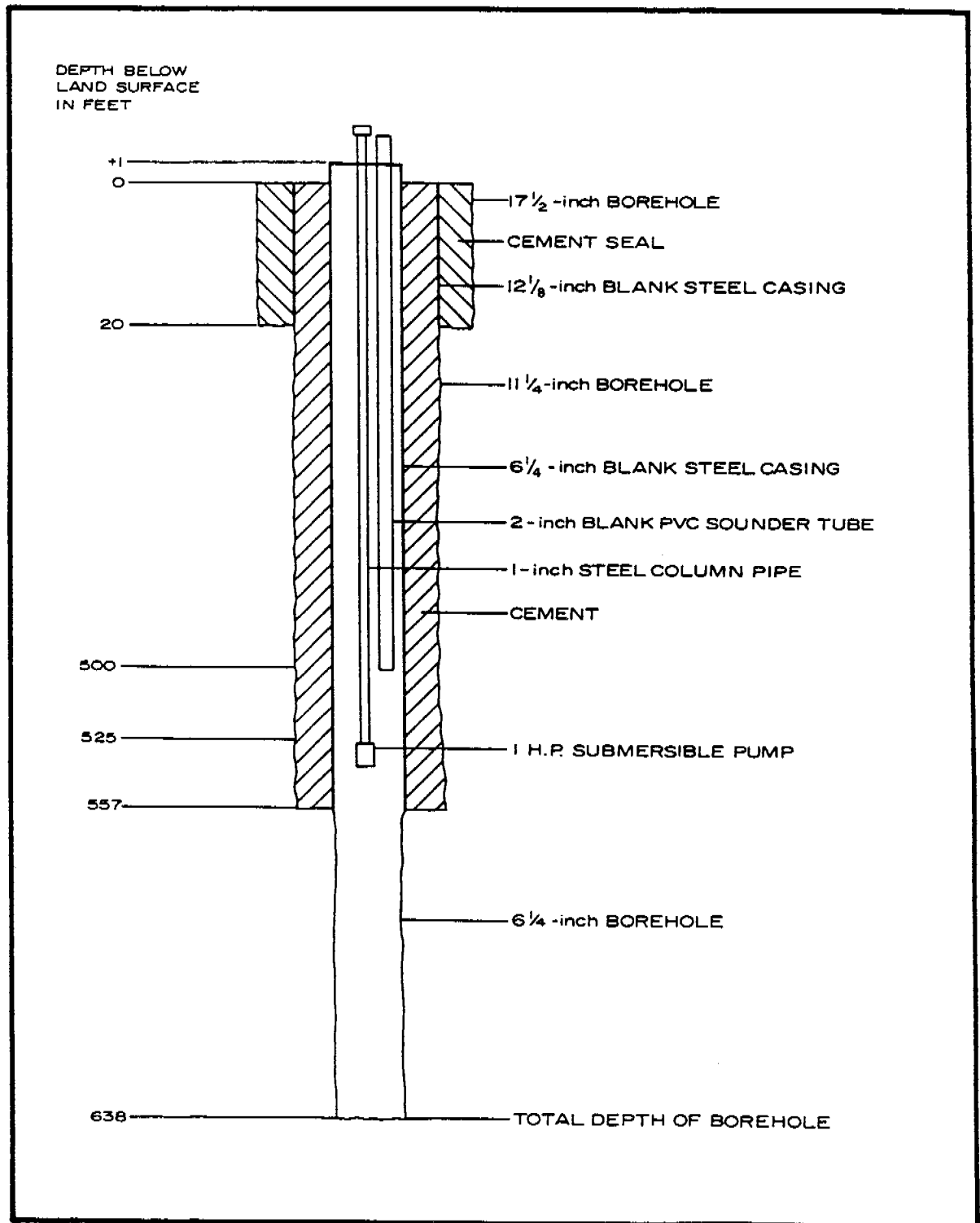


FIGURE E-78
SCHEMATIC DIAGRAM OF MONITOR WELL RD-54C

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-157
(continued)

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57

LITHOLOGY		FRACTURES			COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	
		TOP	BOTTOM		
3-380 cont'd	Silty Sandstone	314.4	314.7		
		322.0	322.3		
		329.1	329.5		
		330.5	330.8		
		332.7	333.2		
		336.8	337.1	0 - 1/16	
		343.2	343.8	0 - 1/16	
		347.0	347.4		
		349.47	351.87	1/16 - 1/8	
		352.6	352.9	0 - 1/16	
		355.77	356.6	1/16	
		360.1			
		360.9			
		361.7	361.3		
		363.0		0 - 1/16	
		364.3		0 - 1/16	
		364.6			
		365.8	366.47	0 - 1/16	
		366.9	367.2	0 - 1/16	
		368			
	@ 72' slightly moist to moist.				
	@ 74' light grey, some medium grained sand, moderately to poorly graded, dense to very dense, strong cementation, slightly moist.				
	@ 78' light brown grey, no to low plasticity.				
	@ 82' light grey, no clay, poorly graded, dense, no plasticity, moderate cementation.				
	@ 89' light yellow brown, moist.				
	@ 91' light grey, minor clay, no to low plasticity.				
	@ 96' no clay, no plasticity, moderate to strong cementation.				
	@ 97' slightly moist to moist.				
	@ 102' slightly moist.				
	@ 109' dry.				
	@ 114.5' light yellow brown, slightly clayey, compact to dense, low plasticity, moderate cementation, slightly moist to moist.				
	@ 120' light grey, dense, no plasticity, moderate to strong cementation.				
	@ 122' slightly harder, dense to very dense.				
	@ 130' slight increase in moisture.				
	@ 141' moisture decreases.				
	@ 149' very strongly calcareous, strong cementation, dry.				

TABLE A-157
(continued)

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57

LITHOLOGY		FRACTURES				COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE	
		TOP	BOTTOM			
3-380 cont'd	@ 154' gray, slightly moist to moist.					
	@ 156' slightly clayey, low plasticity.					
	@ 160' less silty, moderately to strongly calcareous, dense, no plasticity, moist.					
	@ 166' strongly calcareous.					
	@ 180' slightly moist.					
	@ 181' moist.					
	@ 190' trace of clay, no to low plasticity, moderately calcareous.					
	@ 193' slight decrease in moisture.					
	@ 196' no clay, some medium grained sand, moderately to poorly graded, no plasticity, strongly calcareous.					
	@ 200' light gray, very fine grained, very silty, minor clay, poorly graded, no to low plasticity, moderately calcareous.					
	From 204 to 205.5' clayey, strongly calcareous, dry.					
	@ 205.5' slightly moist.					
	@ 210' gray.					
	@ 217' dry, no plasticity.					
	@ 219' slightly moist, no to low plasticity.					
@ 226' damp, no plasticity.						
@ 230' slightly moist.						

TABLE A-157
(continued)

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57

***** LITHOLOGY *****					***** FRACTURES *****			COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE			
		TOP	BOTTOM					
3-380 cont'd	@ 236' clayey, low to medium plasticity, damp.							
	@ 240' no to low plasticity.							
	@ 243' dry.							
	@ 250' damp, no plasticity.							
	@ 256' slightly moist.							
	@ 270' slightly moist to moist.							
	@ 272' moist.							
	@ 274' damp.							
	@ 275' slightly moist, low plasticity.							
	@ 306' no to low plasticity, moderate cementation, moderately to strongly calcareous, slightly moist to moist.							
	@ 316' moderately calcareous, no plasticity.							
	@ 326' moderately to strongly calcareous.							
	@ 340' moderate to strong cementation, strongly calcareous.							
@ 350' moderate cementation, moderately to strongly calcareous.								
From 357 to 359' fractures.								
From 357 to 358' dry.								
@ 358' slightly moist to moist.								
From 365 to 375' no cutting returns.								

TABLE A-157
(continued)

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57

TABLE A-157 (continued)						
LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-57						
LITHOLOGY		FRACTURES				
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE	COMMENTS
		TOP	BOTTOM			
380- 419	Sandstone Fine to medium grained, slightly silty, moderately graded, subangular and subrounded, dense, weak to moderate cementation, weakly calcareous, damp. @ 386' very silty, fine grained only, poorly graded, clayey, moderate cementation, moderately to strongly calcareous, slightly moist. @ 390' strongly calcareous. @ 396' moderate plasticity. @ 400' some medium grained sand, trace of coarse, possibly less silt, weakly to moderately calcareous. @ 406' non-calcareous to weakly calcareous. From 410 to 415' some silty and sandy claystone layers.	381 390.8 412 415.5 417.2	391.3		bedding plane? stratigraphic bedding plane?	viability decreases bit marks? blebs bottom
TOTAL DEPTH OF BOREHOLE: 419					TOTAL VIDEO LOG DEPTH: 419	

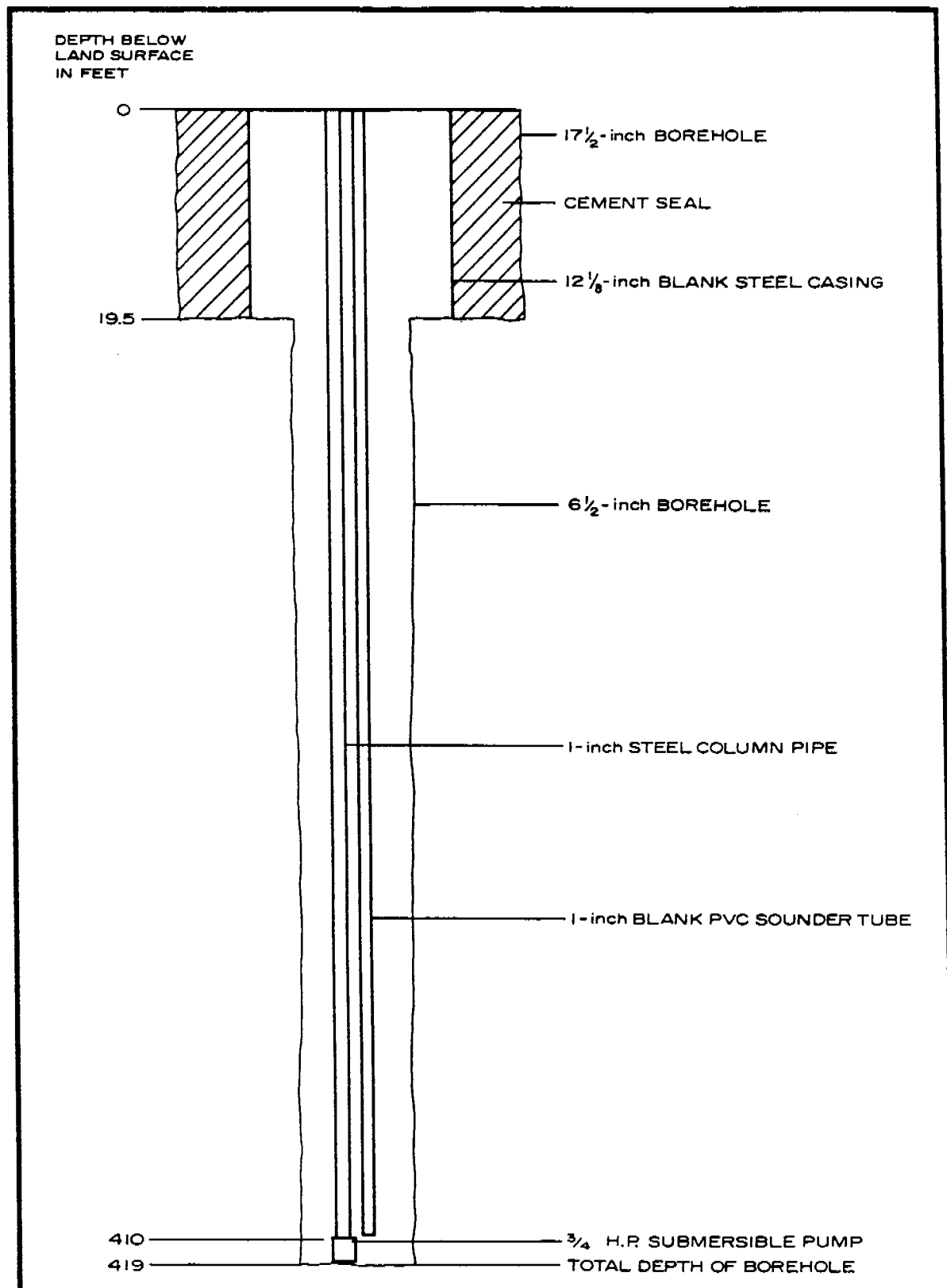


FIGURE E-82
SCHEMATIC DIAGRAM OF MONITOR WELL RD-57

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-168

LITHOLOGIC LOG OF MONITOR WELL RD-64

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 5	CLAYEY SAND	Dark brown, fine to medium grained sand, compact, low plasticity, no cementation, moist.
5 - 21	SILTY SANDSTONE (weathered)	Tan, fine-grained, some medium to coarse grained, moderately graded, dense, no plasticity, weak to moderate calcareous cementation, slightly moist. @ 13' dry, color changing to yellowish grey and grey, density increasing, slightly calcareous. @ 15' grey, moderately graded, dense to very dense, no plasticity, moderate cementation, slightly calcareous dry. @ 19' yellow grey, slightly moist.
21 - 398	SILTY SANDSTONE	Medium grey, dry, fine grained, dense to very dense, contains some medium and coarse grained sand. @ 37' light grey, slight increase in grain size, calcareous. @ 45' possible fractures. @ 50' coarse sand to gravel sized clasts, very dense. @ 68' coarse sand. @ 70' finer grained. @ 82' slightly coarser grained, calcareous. From 111 to 113', very dense, hard. From 132 to 140', very light grey, very dense and hard, calcareous. @ 140' light grey, slightly calcareous. @ 160' some very coarse sand grains. From 166 to 173', possible fracture zone. @ 172' very slightly moist. From 182 to 184', light grey, very coarse sand, some fine gravel clasts, slightly moist.

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-168
(continued)
LITHOLOGIC LOG OF MONITOR WELL RD-64

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
21 - 398 (cont'd)	SILTY SANDSTONE	@ 188' very fine to fine grained. @ 196' dry. From 201 to 206', decreased density. @ 248' very dense and hard, calcareous. @ 255' very light grey, fine to medium grained, very slightly moist. @ 264' possible fracture. @ 270' light grey, increased silt content. @ 273' Yellowish grey, fine to medium grained, calcareous. @ 276' light grey. @ 294' very dense and hard. @ 360' slightly moist. @ 370' dry. @ 375' very dense and hard. @ 380' increase to medium grained, slightly moist. @ 382' possible fracture. @ 386' dry. @ 390' very light grey, very fine to fine grained. @ 398' dry.

TOTAL DEPTH OF BOREHOLE: 398 FEET

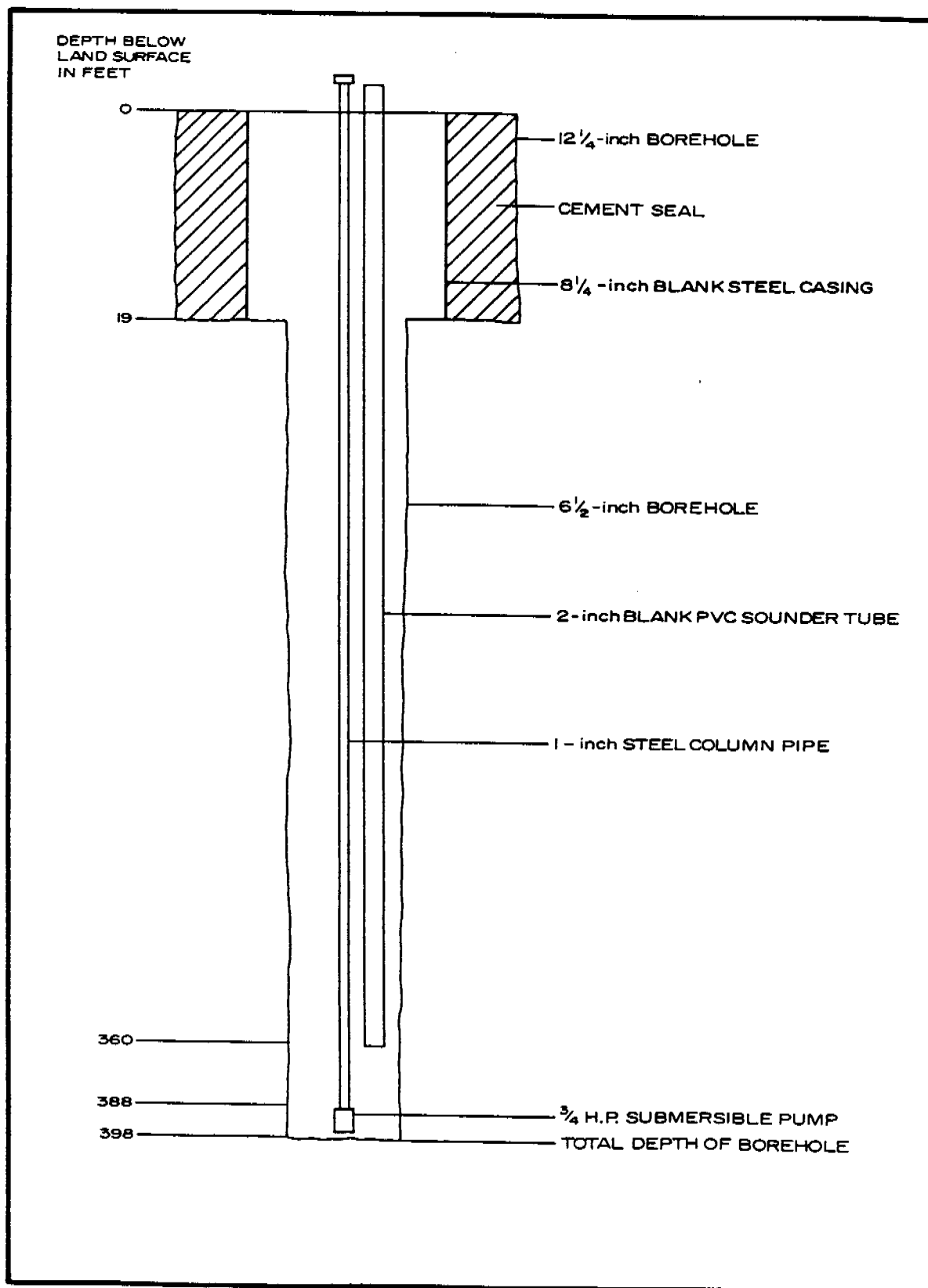


FIGURE E-93
SCHEMATIC DIAGRAM OF MONITOR WELL RD-64

TABLE A-169

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-65

***** LITHOLOGY *****			***** FRACTURES *****				COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE		
		TOP	BOTTOM				
0 - 5	SANDY CLAY						
5-397	SANDSTONE	Dark brown, firm, dry.					Borehole walls muddy to 212 feet.
		Light yellow brown, dry, fine to very coarse grained, dense, noncalcareous.					
		@ 20' some very light grey sandstone, harder.					
		@ 23' dense.					
		@ 24' very dense, hard, light grey, calcareous.					
		@ 40' calcareous to noncalcareous.					
		@ 43' some yellow brown sandstone with mudstone partings.					
		@ 45' very coarse grained, noncalcareous.					
		@ 47' light grey and light yellow brown, very fine to fine grained, silty.					
		@ 50' light grey, calcareous, dense.					
		@ 63' medium to coarse grained; trace of mudstone.					
		From 71-75' light yellow brown, fine to medium grained.					
		@ 75' very light grey, very fine to fine grained, but some medium to coarse grained grains, contains some very dense, calcareous, very fine to fine grained silty sandstone.					
		@ 104' very fine to coarse grained.					
@ 112' very fine to fine grained, silty.							
		26.5	27.5	0 - 1/8	Structural Bedding?		
		28.9			?		
		38.0	38.5		Bedding		
		38.0			Bedding?		
		42.0			?		
		45.1			Structural	Fracture?	
		59.3		0 - 1/16	?		
		62.6			Bedding		
		63.9			Structural?	Small open fractures? or mud cake cracks.	
		74.5			Structural?	Small open fractures? or mud cake cracks.	
		102.2			Bedding?		
		114.7			Bedding		
		116.6			Structural	Fracture?	
		158.8	159.2	0 - 1/16	Structural	Fracture?	
		159.5	160.0	0 - 1/8	Structural		
		163.1		0 - 1/16	Structural		

TABLE A-169
(continued)

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-65

LITHOLOGY		FRACTURES				COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE	
		TOP	BOTTOM			
5-397 cont'd	SANDSTONE					
	@ 125' very calcareous.	164.3	164.6	0 - 1/16	Structural Bedding?	Fracture?
	@ 142' fine to medium grained, calcareous, dense to very dense, very slightly moist.	169.3			Bedding?	
	@ 156' dry.	170.5	172.5	0 - 1/16	Structural	Fracture? @ 185' walls mud-caked. Mud cake cracks? Fracture parallel to bedding.
	@ 158' very coarse to coarse grained.	172.1				
	@ 159' soft zone (8"), moist.	190.4		0 - 1/16	Structural Bedding	Fracture or revelling parallel to bedding. As above.
	From 160-161' possible fracture, moist, very fine to medium grained.	196.5		0 - 1/8	Structural	@ 212' borehole walls cleaner.
	@ 163' very slightly moist, fine to medium grained, silty.	207.5	217	0 - 1/16	Bedding	@ 218' borehole walls muddy.
	@ 166' dry.	207.6			Bedding	
	From 171 to 172' sandy mudstone, brown grey, very fine to fine grained sand, calcareous.	209.5	219.8	0 - 1/16	Bedding	
	@ 172' sandstone, very light grey, dense, very fine to coarse grained.	210.7	230 ±		Structural?	Small cavity?
	@ 178' medium to coarse grained.	211			Structural	
	@ 185' very hard and dense, fine to very coarse grained, noncalcareous.	218.2			Structural?	Fracture or revelling parallel to bedding.
	@ 190' noncalcareous to slightly calcareous.	219			Structural	Fracture or mud cake cracks.
	@ 197' calcareous.	229.4			Structural?	Fracture of mud cake crack.
	@ 204' very fine to fine grained, silty.	250			Structural?	
	From 207 to 208' silty interbed grades to mudstone, soft.	276.2			Structural	
		277.3			Structural	
		285.2			Structural?	
		310.5			Structural?	
		312.2			Structural?	
		313.0			Structural?	
		314.3	315.2	0 - 1/4	Structural?	
		315.5		0 - 1/16	Structural	
		317.1		0 - 1/8	Structural?	
		319.5		0 - 1/16	Structural	
		335.8		0 - 1/16	Structural	
		340.2		0 - 1/16	Structural?	

TABLE A-169
(continued)

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-65

***** LITHOLOGY *****		***** FRACTURES *****				COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (inches)	TYPE	
		TOP	BOTTOM			
5-397 cont'd	SANDSTONE From 209 to 210' soft zone or possible fracture; sandy mudstone, medium brown grey, slightly moist to moist. @ 211' silty sandstone, light grey, very fine to fine grained, dense, dry. @ 216' sandstone, light grey, very fine to coarse grained, calcareous, very dense. From 220' to 222' mudstone interbed, brown grey, trace of black asphalt or tarry. @ 222' sandstone, fine to coarse grained, light grey, very dense, calcareous. @ 228' predominantly medium grained. @ 248' slightly moist to very slightly moist. @ 256' moist, fine to medium grained, dense. @ 270' slightly moist. From 274.5 to 277.5' soft, possibly a fracture zone, moist. @ 279' some thin interbeds of brown grey mudstone partings or interbeds; sandstone is very fine to fine grained, medium light grey, calcareous, some silt, slightly moist. @ 292' very slightly moist to slightly moist. @ 299' coarse to medium grained. From 305 to 305.5' soft zone, possibly a fracture or silt interbed, slightly moist.					

TABLE A-169
(continued)

LITHOLOGIC AND VIDEO CAMERA LOG SUMMARY OF MONITOR WELL RD-65

LITHOLOGY		FRACTURES				COMMENTS
DEPTH (ft)	DESCRIPTION	DEPTH (ft)		OPENNESS (Inches)	TYPE	
		TOP	BOTTOM			
5-397 cont'd	SANDSTONE From 316 to 317' possible fracture, moist, soft zone, very fine to medium grained, increase in silt, moist. From 319 to 322' very dense and hard, fine to coarse grained, very slightly moist to dry. @ 323' slight increase in moisture, decrease in grain size, decrease in density. @ 325' increase in density, dry to very slightly moist. @ 338' slightly moist. @ 345' very dense and hard. @ 354' very slightly moist to dry. @ 369' dense and hard. @ 376' dry. @ 383' fine to coarse grained.					@ 348.1' static water level. Camera did not log beneath water level. No visibility below.
TOTAL DEPTH OF BOREHOLE: 397'		TOTAL VIDEO LOG DEPTH: 348.2'				

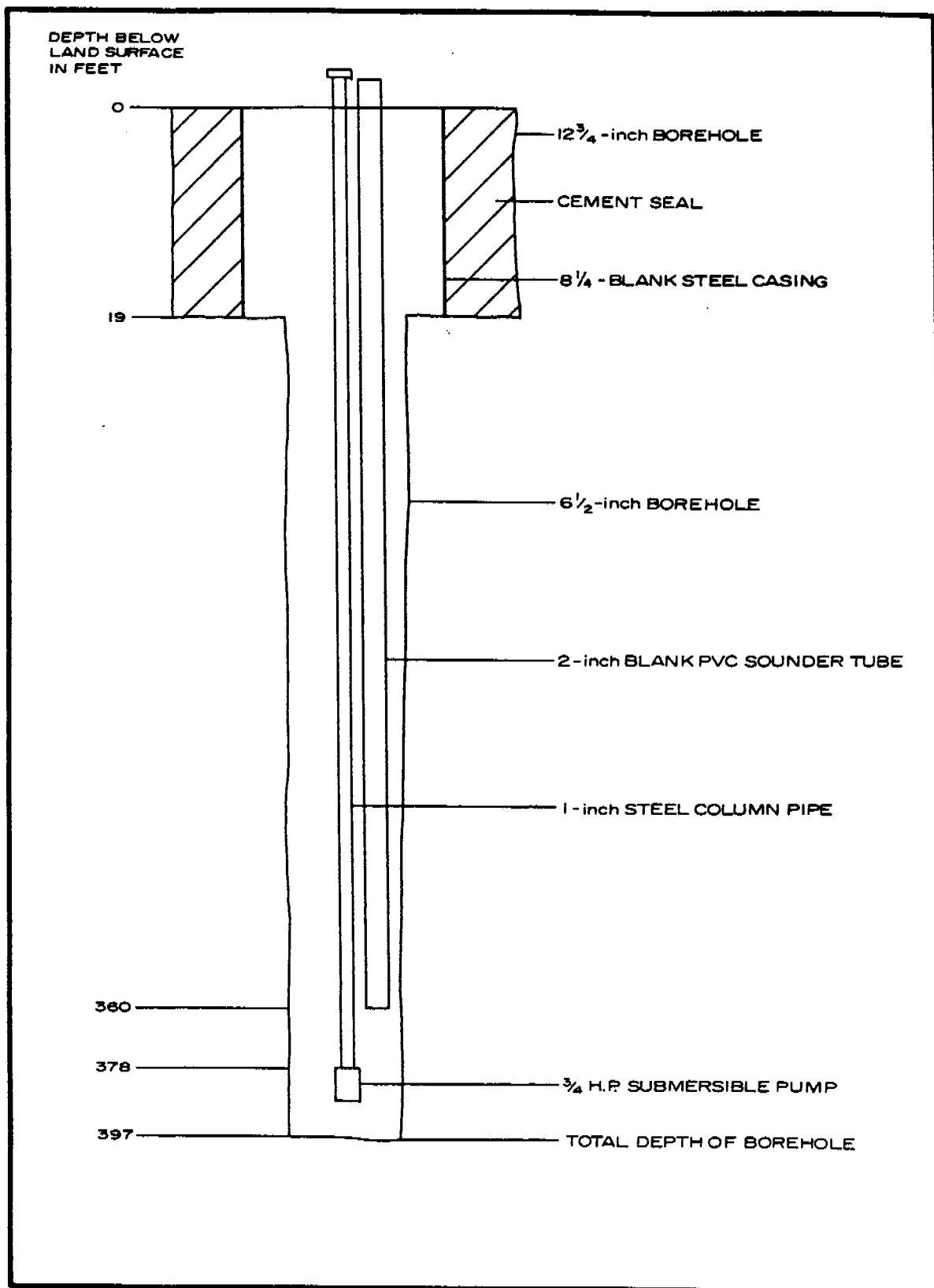


FIGURE E-94
SCHEMATIC DIAGRAM OF MONITOR WELL RD-65

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-29

LITHOLOGIC LOG OF MONITOR WELL RS-18

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 9.0	CLAYEY SAND	Brown, 2-inch layer of asphalt on surface, some red mottling; clay content decreasing with depth, no odor, damp. At 5.0 feet, light brown; trace fine pebbles.
9.0 - 13.0	SANDSTONE (CHATSWORTH FORMATION)	Yellow-brown, damp, weathered, friable; some siltstone interlayers, damp, no odor.

TOTAL DEPTH OF BOREHOLE: 13.0 FEET

GROUNDWATER RESOURCES CONSULTANTS, INC.

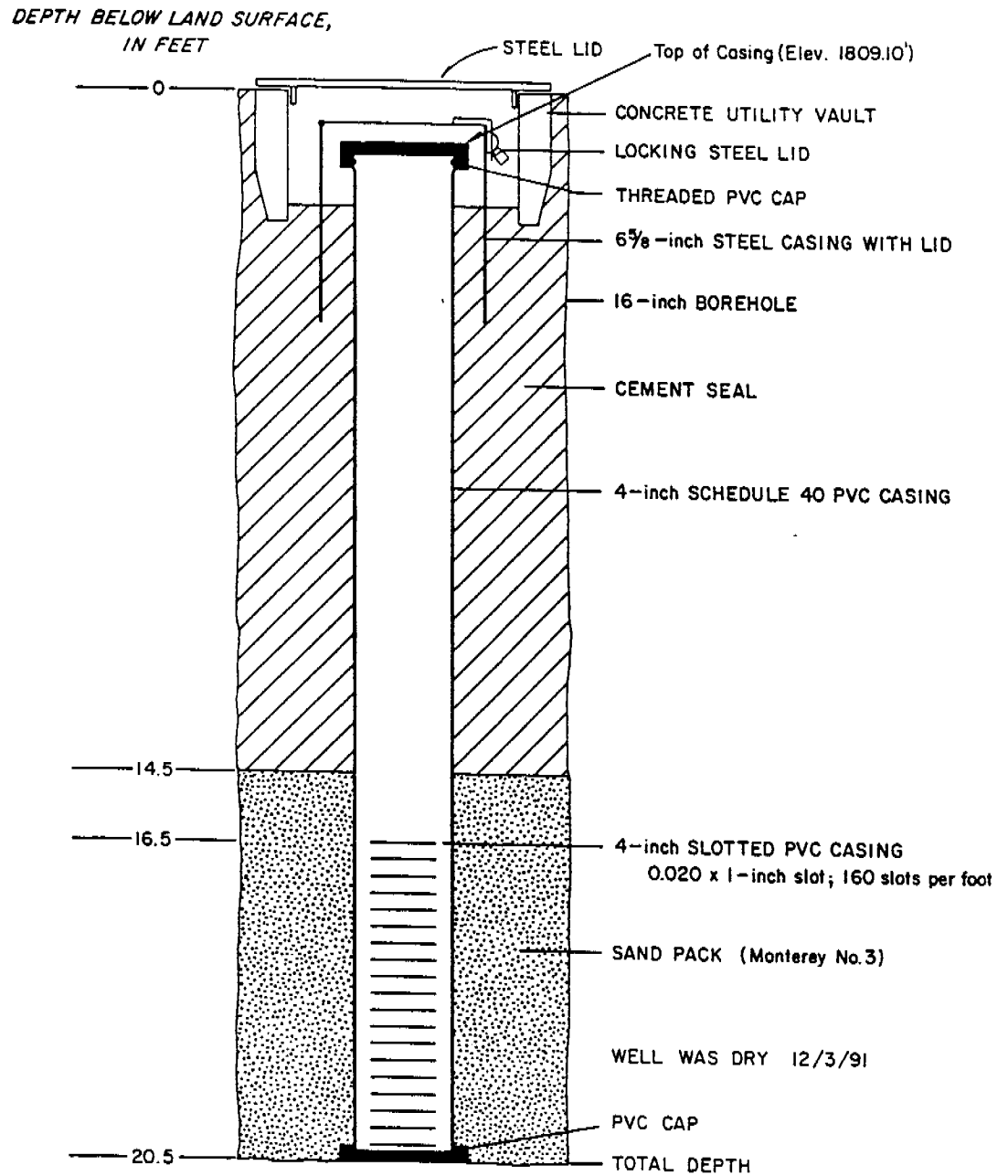


FIGURE C-16 SCHEMATIC CONSTRUCTION DIAGRAM OF MONITORING WELL RS-16

GROUNDWATER RESOURCES CONSULTANTS, INC.

TABLE A-43

LITHOLOGIC LOG OF MONITOR WELL RS-54

DEPTH INTERVAL (feet)	DESCRIPTION OF MATERIAL	
0 - 38	SANDSTONE	Brown, some silt, fine to medium grained, poorly graded, subrounded, compact, moderate cementation, slightly calcareous, dry. @ 2' blue grey. @ 8' light brown. @ 10' blue grey. @ 18' brown, fractured and weathered, very fine to fine grained, silty, weak cementation. @ 26' blue grey, dry. @ 34' brown, silty and clayey, fractured, weak cementation, moist.

TOTAL DEPTH OF BOREHOLE = 38 FEET

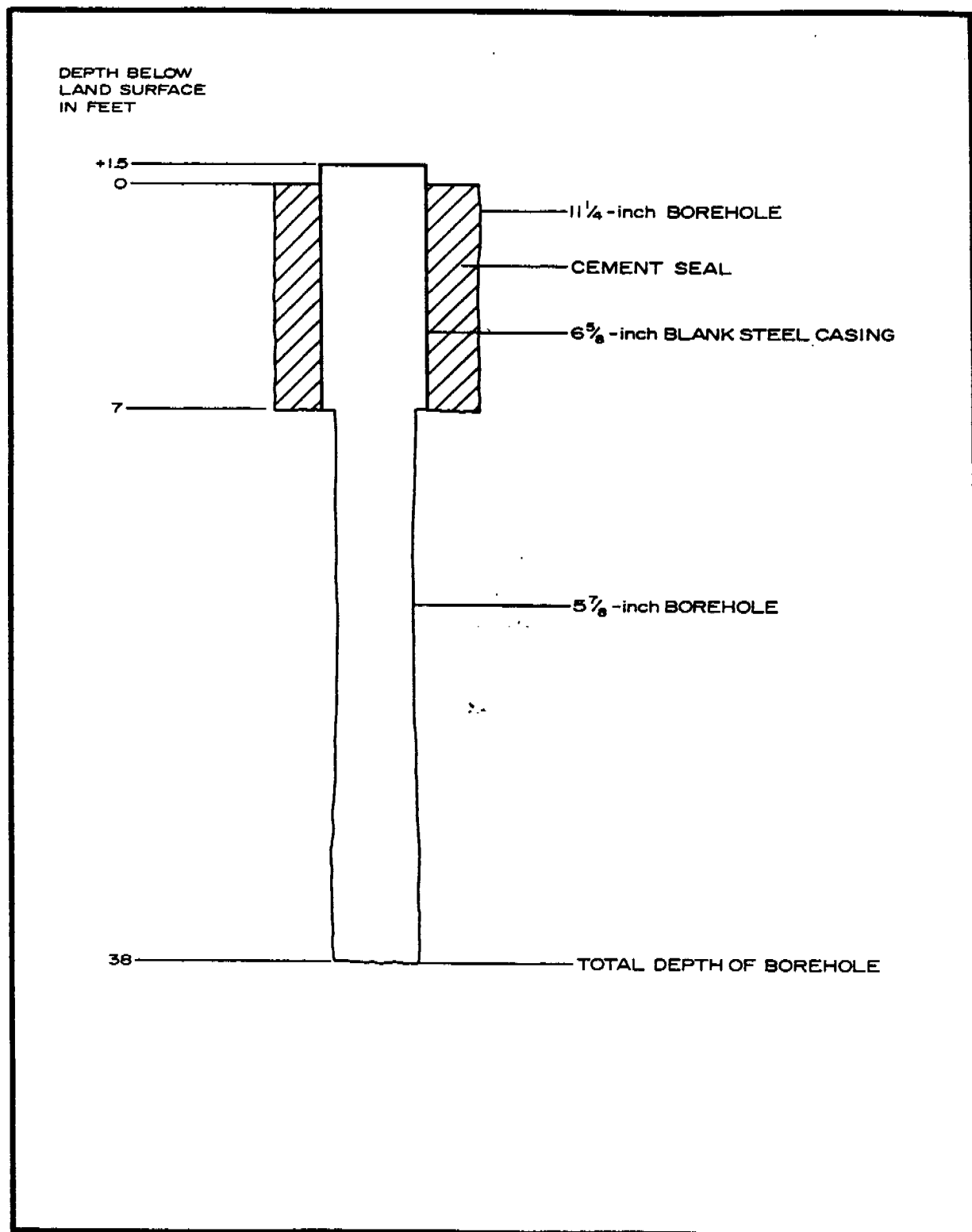
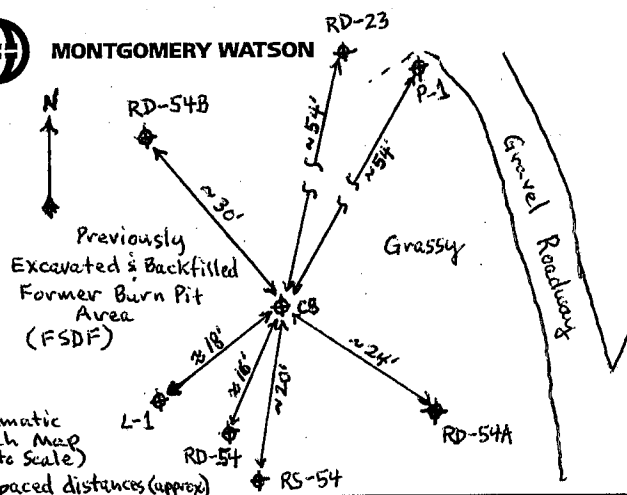


FIGURE C-32
SCHEMATIC DIAGRAM OF MONITOR WELL RS-54

COREHOLE C-8 BORING LOG



MONTGOMERY WATSON



Soil bin in way on distances marked with 2 dashes (--) => v. approx.
Depth to 1st Water (▽):

Depth to Water After Drilling (▽):

Depth to other Water Bearing Zones:

Boring #: MW#: **C8** Sheet **1** of **21**
Project: **Boeing Rocketdyne SSFL CFOU Investigation**
Job #: Former Sodium Disposal Facility (FSDF)
Logged By: **Adam Norris (AWN)** Reviewed By:
Drilling Contractor: **Layne Christensen**
Drill Rig Type/Method: **Ingersoll Rand TH-60 / Air Rotary with Water**
Drillers Name: **Ernesto Vargas**
Borehole Diam./Drill Bit Type: **Reamur Conductor 9 7/8" Pilot hole in alluvium; Boring to 5 1/2" Borehole @ 65'-400' bgs** Total Depth **400' bgs**
Ref. Elev. **1035**
Sampler Type: **3" ID Continuous Core Sampler (P3)**
Drill Start Time/Date: **1440 / 4/15/02** Drill Finish Time/Date: **1035 / 5/1/02**
Well Completion Time/Date: **1035 / 5/1/02**
Soil Boring Backfill Time/Date: **N/A**

C8 Well Details:

→ 12 1/4" diameter conductor boring @ 0-65' bgs
→ 8" ID (8.5" OD) mild steel conductor casing @ 0-65' bgs
→ 5" diameter corehole @ 65'-400' bgs
→ Cement-bentonite grout sanitary seal in outer conductor casing annulus @ 0-65' bgs (placed w/ tremie pipe.... tremie submerged in grout) during grout placement.
AWN

Geologic Description

Grass Cover

ML

SILT (ML), yellowish brown, very stiff, dry to moist, 95% silt, 5% fine sand, nonplastic to very low plasticity silt, sand is subangular to subrounded, [FILL].

ML

SILT (ML), brown, very stiff, moist, 95% silt, 5% fine sand, very low plasticity silt, sand is subangular to subrounded, [FILL].

Color change to Light yellowish brown @ 8.5' bgs; Grades with increased sand content.

SILTY SAND (SM), Light yellowish brown, dry to moist, 30% medium sand, 50% fine sand, 20% silt, subang. to subrounded sand, very low plasticity to nonplastic silt, [FILL].

NOTES:

* H=horizontal
Number=<(in degrees from horizontal)

** H=horizontal
V=vertical

B=parallel to bedding
Number=<(in degrees from horizontal)

QA/QC 10-00

Date & Time

4/15/02

1505
- hrs
0805
4/16/02

0820
0842

0849
0853
0856
0906
RWIN

0912

Boring #:		MW#:	C8		Project: Boeing Rocketdyne SSFL-CFOU Investigation		Sheet	2	of	21
Former Sodium Disposal Facility										
PID/GWA (ppm)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	RGD	Depth (Feet)	Geologic Description		
								Trace local silt seams.		
							1	SM		
							2	Interbedded SILTY SAND and SANDY SILT (SM/ML), yellowish brown; overall composition 20% medium sand, 30% fine sand, 50% silt; subangular to subrounded sand, very low plasticity to nonplastic silt, [FILL].		
							3	BEDROCK encountered @ approx. 14' bgs. Color changes to grayish brown @ 14' bgs.		
							4	SANDSTONE, fine-grained, slightly (sl) weathered, competent, Some silt content. PID @ top of borehole = 0.0 ppm @ 15' bgs.		
							5	SANDSTONE (SS), fine grained, sl weathered, competent, moist, well sorted, brownish gray; becomes fine to med. grained w/depth (@ approx. 16.5' bgs); grades w/trace v. coarse & coarse sand @ 18' bgs; becomes orange brown @ 18' bgs; becomes poorly sorted @ 18' bgs; subangular to subrounded grains; sl weathered, competent, local iron oxidation; moderately hard; olive gray; fin to med. SS @ 19' bgs; competent, sl weathered, some local iron oxidation, mod-		
							6	well sorted, subang. to subrounded sand grains, trace local coarse sand grains.		
							7	SS		
							8	Sandstone (SS), fn. to v. coarse, olive brown, sl weathered, competent, poorly sorted, subang. to subrounded grains, moderately hard; local iron oxidation @ 22' bgs.		
							9	Bedding laminations visible @ 21'-22' bgs; becomes fine to med. grained, well sorted; orange brown @ 22.5' bgs.		
							10	Becomes fn. to cs. grained @ 23' bgs, poorly sorted, moderately hard, subang. to subrounded grains, competent, sl weathered; orange brown.		
							11	Partially penetrating fracture @ 24' bgs; Iron oxidation on fracture surfaces.		
							12	SS: fn. to cs, weathered, competent, brown @ 24.5'-25' bgs.		
							13	SS SANDSTONE (SS), fn. to v. coarse, sl weathered, competent, poorly sorted, gray to orange brown, some local iron oxidation; some granules (2-4 mm long) & trace some subang. pebbles (4-8 mm long) @ 25.5'-26.5' bgs.		
							14	Becomes tannish brown @ 27' bgs; SS, fine to coarse sand, weathered, competent, moderate sorting, hard, local iron oxidation.		
							15	Becomes gray @ 28' bgs, SS, fine to med. gr. mostly w/trace cs. & v. cs sand grains; subang. to subrounded grains, mod. well sorted; hard, competent;		
							16	Becomes fn. to med. grain @ 29' bgs; trace local biotite; apparent quartz (silica) cement, massive.		
							17			
							18			
							19			
							20			
							21			
							22			
							23			
							24			
							25			
							26			
							27			
							28			
							29			
							30			

Date & Time

Boring #:		MW#:		C8		Project: Boeing Rocketdyne SSFL-CFOU Investigation		Sheet 3 of 21									
PID/OUT (ppm)		Cored Interval		Recovered		Retained for Analysis		Bedding*		Fractures**		RGD		Depth (Feet)		Geologic Description	
0.0										40°				SS		Sandstone (SS), fn. to med. grain, competent, hard, gray, Fracture @ 30.3' bgs has iron oxidation penetrating up to 1".	
														1		Convoluted laminations @ 30.6 to 31' bgs.	
														2		Some iron oxidation @ 31.5' bgs.	
												5/5		3		Becomes light brown @ 32' bgs, SS, fn. grn, well sorted, competent, hard, some weathering, massive, subang. to subrounded grns. (slight (sf) ^{fine})	
0.0												100%		4		Becomes gray @ 33.5' bgs, SS, fine to med. grn, competent, hard, subang. to subrounded grns, apparent silica	
0.0														5		Cementation, trace hornblende grains, some olive brown weathering discoloration @ 34' bgs. Becomes orangish brown @ 34.5' bgs; trace coarse sand grns.	
														6			
														7			
0.0														8		SS Sandstone (SS), yellowish brown, moist to very moist, competent, hard, fine to coarse grained, poorly sorted, ^{sl} weathered, subangular to subrounded grains.	
0.0														9		Becomes gray @ 37.5' bgs, SS, fine to med. grn, med. sorting, competent, hard, very moist to moist. Becomes fn. to cs. grn. @ 38' bgs and poorly sorted. Gray SS @ 39' bgs, fn. to cs. grn, poorly sorted, apparent silica cement, some black mineral content: (mafic) → apparent hornblende.	
0.0														40			
														1			
														2		SS No Recovery of Core between 40' and 50' bgs.	
														3		Lithology logged from cuttings.	
														4		SANDSTONE (SS), gray, very moist, fine to coarse grain, competent, hard, subangular to subrounded	
														5		grains, some mafic mineral content: hornblende; apparent silica cement; moderate to poor sorting.	
														6			
														7			
														8		SS SANDSTONE (SS), gray, very moist, fine to coarse grain, mod. to poor sorting, subangular to subrounded grains, apparent silica cement, competent, hard.	
														9			
														50			

Date & Time

Boring #:		MW#:		C8		Project: Boeing Rocketdyne SSFL-CFOU Investigation		Sheet 4 of 21	
PID (ppm)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	RQD	Depth (Feet)	Geologic Description	
0.0								SS	SANDSTONE (SS), gray, fn. to v. cs. grn, poorly sorted, competent, hard, massive, angular to subrounded grains, some mafic mineral content: hornblende; primary mineral content: quartz; apparent Silica (quartz) cementation, very moist to moist.
0.0						5/5	1		
0.0						100%	2		
0.0							3		Color change to light brown @ 52.75' bgs (52' 9");
0.0							4		SANDSTONE (SS), light brown, fn. to v. cs. grain, poorly sorted, competent, hard, massive, some mafic mineral content: hornblende; ^{apparent} trace biotite; angular to subrounded grains, ^{sl.} weathered, some local iron oxidation (orangish); trace granules (up to 4mm long), very moist to moist.
0.0	*	*					5	SS	SANDSTONE (SS), light brown, weathered, fine to very coarse grained (fn. to v. cs. grn.), trace granules (up to 3mm long), poorly sorted, angular to subrounded grains, competent, hard, massive, moist.
0.3						1.5 0.75 5	6		
0.2						30%	7		
							8		Partial core recovery. Apparently the core from 56.5' to 60' bgs dropped out of sampler.
							9		
							60	SS	^{AOWN} slightly (sl.) SANDSTONE (SS), light brown, ^{sl.} weathered, fn. to v. cs. grn., trace granules (up to 4mm), poorly sorted, competent, hard, angular to subrounded grains, some local iron oxidation (orangish), moist.
0.3					30°	4.5 5	1		Color changes to gray @ 61' bgs.
							2		SANDSTONE (SS), gray, fn. to v. cs. grn., trace granules (up to 4mm-long), poorly sorted, angular to subrounded grains, competent, moist, hard, some mafic mineral content, apparent quartz (silica) cementation.
0.3						90%	3		
							4		SANDSTONE (SS), gray, fn. to v. cs. gray, poorly sorted, angular to subrounded grains, competent, hard, moist, some mafic mineral content, apparent quartz (silica) cementation.
0.1							5		
0.2	*	*					5	SS	SANDSTONE (SS), medium gray (N5), fn. to v. cs. grn., poorly sorted, competent, hard, angular to subrounded grains, moist, some mafic mineral content (apparent hornblende).
0.1						5/5	6		
						100%	7		SANDSTONE (SS), medium light gray (N6), fn. to v. cs. grn., poorly sorted, competent, hard, angular to subrounded grains, moist, some mafic mineral content, predominately composed of quartz grains.
0.3							8		
							9		SANDSTONE (SS), medium light gray (N6), fn. to cs. grn., poorly sorted, competent, hard, angular to subrounded grains, moist, some mafic to mineral content.
0.9							9		
							0		

Date: 4/19/02
Time: 12:11

Boring #:	MW#:	C8	Project:	Boeing Rocketdyne SSFL - CFOU Investigation	Sheet	5	of	21
PID/OWA (Sept)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	ROD	Depth (Feet)	Geologic Description
								Former Sodium Disposal Facility
								No Recovery of Core from 70'-75' bgs. Lithology logged from cuttings.
							1	SS
							2	SANDSTONE (SS), med. lt. gray (N6), fn. to v. cs. grn., poorly sorted, angular to subrounded grains, hard, competent, moist, some mafic mineral content, predominate grain composition is quartz.
							3	SS
							4	SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., poorly sorted, angular to subrounded grains, hard, competent, some biotite content and hornblende content (mafic), predominate grain composition is quartz,
							5	massive, moist.
1217 1321	0.0					3/2	6	
	0.6					100%	7	
1325 1339	0.0					3/3	8	SS SANDSTONE (SS), medium gray (N5), fn. to v. cs. grn., poorly sorted, trace granules (up to 4mm-long), angular to subrounded grains, hard, competent, moist to very moist, massive, some mafic grains, mostly qtz. grains.
	0.0					100%	9	Grades with some pebbles up to 9 mm-long @ 79' bgs.
1343 1354	0.0						80	Fn. to v. cs. grain (without granules or pebbles) @ 79.3-80' bgs.
							1	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules up to 4mm-long, poorly sorted, angular to subrounded grains, hard, competent, moist to very moist. Healed fracture @ 82' bgs.
	0.0					5/5	2	Grades with trace local granules @ 83' bgs (granules up to 4-mm long).
	0.7					100%	3	Grades with trace pebbles @ 84.5' bgs (pebbles up to 11 mm-long).
	0.0						4	
1403 4/22/02 0856	0.0					5/5	5	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace local granules (up to 8mm-long), poorly sorted, angular to subrounded grains, hard, competent, moist to very moist, massive. (trace local granules (2-4 mm-long))
	0.0					100%	6	
	0.0						7	
	0.0						8	
	0.0						9	Grades with trace pebbles granules up to 10mm-long (slight increase in max. granule size).
0901							0	

Date: 4/22/02
Time: 1114

Boring #:		MW#: C8	Project: Boeing Rocketdyne SSFL-CFOU		Sheet 7 of 21		
Investigation - Former Sodium Disposal Facility							
PID (ppm)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	RQD	Geologic Description
							SS SANDSTONE (SS), medium gray (N5), fn. to v. cs. grn; trace granules (2-4 mm); poorly sorted, angular to subrounded grns; moist, hard, competent.
0.0						5/5	1
0.0						100%	2
0.0							3
0.0							4
0.0							5
0.0						5/5	6
0.0						100%	7
0.0							8
0.0							9
0.0							10
0.0						5/5	11
0.0						100%	12
0.0							13
0.0							14
0.0							15
0.0						5/5	16
0.0						100%	17
0.0							18
0.0							19
0.0							20
0.0						5/5	21
0.0						100%	22
0.0							23
0.0							24
0.0							25
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0.0							27
0.0							28
0.0							29
0.0							30
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0.0							

Date: 4/22/02
Time:

Boring #:		MW#: C8	Project: Boeing Rocketdyne SSFL-CFOU		Sheet 8 of 21		
Investigation - Former Sodium Disposal Facility							
PID/Depth (ft)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	RQD	Geologic Description
0.8						5/5	SS SANDSTONE (SS), medium gray (N5), fn. to v. cs. grn., poorly sorted, trace local granules (2-4 mm), angular to subrounded grains, moist, hard, competent, massive.
						100%	
0.1							
0.0							SS, med. gray (N5), fn. to v. cs. grn, trace local granules (2-4 mm), poorly sorted, angular to subrounded grns., moist, hard, competent, massive.
0.0							
0.0							
0.0						5/5	SS SANDSTONE, medium gray (N5), fn. to v. cs grn, trace local granules (2-4 mm), poorly sorted, ang. to subround. grns., sl. moist to moist, hard, competent, convoluted laminations @ 135.5' bgs.
						100%	
0.0							
0.0							
0.0							UPPER SIDE OF FRACTURE: SHALE (SH), thin bed ~1/4" thick, moderately soft, fissile, med. gray (N5), moist to sl. moist, iron oxidation does not permeate (penetrate) significantly, trace black lams. Fracture @ 139' bgs w/ iron oxidation on both sides. Iron oxidation permeates further (more) on lower side (coarser grns. this side) v. moist to wet on frac. surfaces. LOWER SIDE OF FRACTURE: SS, light brown, fn. to v. cs grn, sl. weathered, trace granules (2-4 mm), hard, competent, some iron oxidation (greatest closest to fracture).
0.0						5/5	SS SANDSTONE (SS), lt. brown becomes gray gradually downward, fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, angular to subrounded grns., sl. weathered, hard, competent, contact lt. brown to gray @ 140.8' bgs.
						100%	SH LITHOLOGIC CONTACT @ 141.4' bgs (dips 30°).
0.5							SH SHALE (SH), med. lt. gray (N6) to med. dk. gray (N4), fissile, friable, some silt content, locally micaceous, core broken-up (likely mechanical fractures, not native fracs.), moderately soft.
0.0							SS SANDSTONE (SS), med. gray (N5), fn. to cs. grn, poorly sorted, angular to subrounded grns, some convoluted laminations, hard, competent, moist.
0.2							SH SHALE (SH), med. lt. gray (N6), sl. moist, med. soft, fissile, friable, some convoluted laminations.
0.0						5/5	SS SANDSTONE (SS), med. gray (N5), fine to cs. grn, moderate to poor sorting, angular to subrounded grns., hard, competent, moist to v. moist.
0.0						100%	Likely mechanical fracture @ ~146.5' bgs (dips 50°), has no weathering, oxidation, or excess moisture.
0.0							
0.0							SH very thin shale bed (~1/2" thick), fissile, friable, med. soft, med. lt. gray (N6), moist.
0.0							SS SANDSTONE (SS), med. gray (N5), fn. to cs. grn, med. to poor sorting, ang. to subrounded grns, hard, competent, moist.

Date: 4/23/02
Time: 0837

Boring #: MW#: C8 Project: Boeing Rocketdyne SSFL-CFOU Investigation Sheet 9 of 21

- Former Sodium Disposal Facility -

4/23/02
0837

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0906

0911
0936

0940
1005

1009

PID (ppm)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	RQD	Depth (Feet)	Geologic Description
0.0						5/5	1	SS SANDSTONE (SS), med. gray (N5), mostly fn. to med. grn., some coarse grns., med. sorting, ang. to subrnd. grns., moist, hard, competent, some local bedding laminations visible (dip 30°).
0.0				30°	40°		2	Healed fracture @ ~151.6' (dips 40°).
0.0						100%	3	Grain size and sorting fluctuates gradually somewhat. Local v. cs. grn and trace granules (2-4 mm) with poor sorting.
0.0							4	
0.0							5	SS, fn. to v. cs. grn, med. gray (N5), poorly sorted, ang. to subrounded grns., moist, hard, competent.
0.0				30°		5/5	6	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn, trace local granules (2-4 mm), poorly sorted, ang. to subrnd. grns., moist, hard competent.
0.0				30 to 35°		100%	7	slightly convoluted laminations @ ~156' bgs (Dipping approx. 30° avg.). Convoluted laminations within thin siltstone interbed (~2" thick). SLTS: light gray (N7), mod. soft, some very fine sand, some mica content.
0.0				30-35°			8	156.2' to 160' SS: med. gray (N5), fn. to v. cs. grn, some granules (2-4 mm), poorly sorted, ang. to subrounded grns., some bedding laminations visible @ ~157-158' bgs
0.0							9	(lams dip ~30 to 35°), moist, hard, competent.
0.0							160	
0.0						5/5	1	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., some granules (2-4 mm-long), poorly sorted, ang. to subrounded grns., moist, hard, competent, massive.
0.0						100%	2	Grades with some local pebbles (4-10 mm) @ 162-165' bgs.
0.0							3	
0.0							4	164'-165' SS, med. gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, ang. to subrounded grns., moist, hard, competent.
0.1							5	
0.0				30°		5/5	6	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., some local granules (2-4 mm), angular to subangular grns. predominate, trace subrounded grns., poorly sorted, trace pebbles (4-10 mm) @ 165' to 165.5' bgs, moist, hard, competent. Bedding lamination visible @ 165.7' bgs (dips 30°).
0.0						100%	7	
0.0							8	166'-170' SS, med. gray (N5), fn. to v. cs. grn., some granules (2-4 mm), poorly sorted, ang. to subrounded grns, moist, hard, competent, some bedding laminations visible @ ~169' bgs (dip 35°).
0.0				35°			9	
							170	

Date: 4/23/02
Time: 1031

Boring #: MW#: C8 Project: Boeing Rocketdyne SSFL-CFOU Investig Sheet 10 of 21

- Former Sodium Disposal Facility -

Geologic Description

4/23/02
10311034
11021109
12341240
1258

1302

PID/Q/A# (ppm)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	RQD	Depth (Feet)	Geologic Description
0.0			X			5/5	1	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., some granules (2-4 mm), poorly sorted, subang. to subrounded grns., moist, hard, competent.
0.0						100	2	Trace pebbles (4-8 mm) @ approx 172'-173' bgs.
0.0			X				3	173'-175': SS, med. gray (N5), fn. to v. cs. grn., some granules (2-4 mm), poorly sorted, subang. to subrounded grns., moist, hard, competent.
0.0			X				4	
0.0							5	
0.0						5/5	6	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., some granules (2-4 mm), poorly sorted, subang. to subrounded grns., moist, hard, competent, massive.
0.0			X			100%	7	
0.0			X				8	
0.0							9	
0.0			X				10	
0.0							11	
0.0							12	
0.0			X			5/5	1	SS SANDSTONE (SS), medium gray (N5), fn. to v. cs. grn., some granules (2-4 mm), poorly sorted, subang. to subrounded grns., moist, hard, competent.
0.0			X			100%	2	Trace local pebbles (4-10 mm), massive.
0.0			X				3	
0.0			X				4	
0.0			X				5	
0.0							6	
0.0						5/5	7	SS SANDSTONE (SS), med. gray (N5), fine to v. cs. grn., poorly to mod. sorted, ang. to subrounded grns., moist, hard, competent.
0.0						100%	8	187'-188': SS, fine to med. grn., moderately sorted, some convoluted laminations (dip approx 30°), hard, competent, moist.
0.0							9	188'-189.5': SS, fine to cs. grn., mod. sorted, ang. to subrounded grns., moist, hard, competent.
0.0			X				10	SH SHALE (SH), med. gray (N5), moist, mod. soft, fissile, friable, slightly convoluted laminations.

Date: 4/23/02
Time

Boring #:		MW#:		C8		Project:		Boeing Rocketdyne SSFL-CFOU		Sheet		11 of 21	
Investigation - Former Sodium Disposal Facility													
Geologic Description													
PID#	(ppm)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	RQD	Depth (Feet)					
0.0					30/25			1	SS/SH	190' to 195': Interbedded SANDSTONE and SHALE, thinly to moderately bedded (~1" to 10" thick beds).			
0.0					25/25		5/5	2		SS: fn. to v. cs. grn, trace local granules (2-3mm) moist, hard, competent, med. gray (N5), some to subrounded grains.			
0.0					35		100%	3		SH: med. dk. gray (N4) to med. gray (N5); moist to very moist, some convoluted lamination fissile, friable, moderately soft.			
0.0								4		Bedding contacts and laminations visible in core. Core sample highly fractured (mechanical fractures) due to interbedded competent (ss) and incompetent (sh) beds.			
0.0								5		Highly convoluted laminations @ ~194.4' to 194.8' bgs within a Shale Bed.			
0.0					30		5/5	6	SS	195'-197': SANDSTONE (SS), med. gray (N5), v. fn. to v. cs. poorly sorted, ang. to subrnd. grns., moist, hard, competent, some visible laminations dip ~30°, some convoluted laminations.			
0.0							100%	7		197'-200': Interbedded SHALE and SANDSTONE thinly bedded, ^{to} laminations visible within some beds; (laminated) thin beds up to ~1"-thick.			
0.0					30/30			8	SH/ss	SS: v. fn. grn to fn. grn, well sorted, cross-bedding visible within thin sandstone beds, lt. gray (N7), moist, hard, competent.			
0.0								9		SH: med. gray (N5) to dk. gray (N4), moist to v. moist, fissile, friable, mod. soft.			
0.0								200		200'-203.5': SANDSTONE (SS), med. gray (N5), fn. to cs. grn., mod. sorted, v. moist to wet, hard, competent, angular to subrounded grains.			
0.0							4/5	1	SS	Highly fractured zone @ 201.5' to 202.5' bgs; wet, friable within fracture zone, local silt deposited on fracture faces. No apparent oxidation or weathering along fractures.			
0.0							80%	2		203.5'-205' bgs: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn. Some granules (2-4mm), v. moist to wet, hard, competent, angular to subrounded grains.			
0.0					30/55			3		Fracture @ ~204' bgs (dips 55°): no apparent oxidation or weathering along fracture; surface			
0.0					30/30		5/5	4	SS	205'-210': SANDSTONE (SS), med. gray (N5), f. to v. cs. grn.; trace granules (2-4mm), poorly sorted, ang. to subrounded grns., very moist to wet, hard, competent; trace local pebbles (4-15mm long).			
0.0							100%	5		Note: some bedding laminations visible between 205'-206.5' bgs; Massive between 206.5'-210' bgs (no bedding laminations visible).			
0.0								6					
0.0								7					
0.0								8					
0.0								9					
0.0								210					

Date: 4/24/02
Time:

Boring #:		MW#: C8		Project: Boeing Rocketdyne SSFL - CF04		Sheet 12 of 21	
Investigation - Former Sodium Disposal Facility							
PID (ft)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	RQD	Geologic Description
0.0							SS
0.0							SANDSTONE (SS), medium gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, v. moist to wet, ang. to subrounded grns., hard, competent.
0.0						5/5	1
							Fracture @ 210.9' bgs (dips 50°): weathered/friable zone along fracture surface penetrates up to
0.0						100%	2
							1/2-inch; wet fracture surface; main no obvious oxidation along fracture surfaces.
0.0							3
							Shale rip-up clasts sporadically occur btwn. 212-213.5' (up to approx. 2"-long) within SS matrix.
0.0							4
							SH
0.0							SHALE (SH), med. gray (N5), some fn. to med. sand content, mod. soft, friable, fissile.
0.0							5
							SS
0.0						5/5	SANDSTONE (SS), med. gray (N5), to lt. olive gray (5Y6/1), fn. to v. cs. grn., poorly sorted, ang. to subrounded grns., some weathering, moist to wet, hard, competent, trace granules (2-4 mm).
0.0							6
							216.5' - 217.5' bgs: SANDSTONE (SS), fn. to v. cs. grn., poorly sorted, ang. to subrounded grns., v. moist to wet, hard, competent, some faint bedding laminations locally visible (dip 35°).
0.0						100%	7
							217.5' - 220': SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., some granules (2-4 mm), poorly sorted, hard, competent, v. moist to wet, ang. to subrounded grns.
0.0							8
							9
0.0							220
							SS
0.0						5/5	SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, angular to subrounded grains, v. moist to wet, hard, competent, massive.
0.0						100%	2
							3
0.0							4
0.0							5
							SS
0.0						5/5	SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., poorly sorted, ang. to subrounded grns., v. moist to wet, hard, competent.
0.0							6
							(granule-rich) 1" thick layer abundant (approx. 30% granules (2-4 mm)) @ 226.7' bgs. Some bedding laminations visible btwn. 226.3' and 227.3' bgs.
0.0						100%	7
							228' - 230' bgs: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., some granules (2-4 mm), trace pebbles (4-6 mm), poorly sorted, angular to subrounded grns., v. moist to wet, hard, competent.
0.0							8
							9
0.0							230

Date: 4/24/02
Time: 1124

Boring #: MW#: C8 Project: Boeing Rocketdyne SSFL-CFOU Sheet 13 of 21

Investigation- Former Sodium Disposal Facility

Geologic Description

4/24/02
1124

PID (ft)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	ROD	Depth (Feet)
0.0						5/5	1
0.0				30°		100%	2
0.0				30°	50° Fault		3
0.0							4
0.0							5
0.0	*	*				5/5	6
0.0						100%	7
0.0							8
0.0							9
0.0	*	*					240
0.0						5/5	1
0.0						100%	2
0.0							3
0.0							4
0.0	*	*					5
0.0						4.5/5	6
0.0						90%	7
0.0							8
0.0							9
0.0							250

SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4mm), poorly sorted, ang. to subrounded grns., v. moist, hard, competent. 'Hanging Wall'

Thin granule rich lenses ($\leq 1''$ thick) @ approx. 231.7' to 232.2' bgs.

Thin fault gouge layer ($\leq 3/4''$ thick) @ 232.7' bgs

Associated fracture dips 50°

Slickenside striations are subparallel to fracture dip (approx. 20° off of fracture dip direction). Gouge is moist, v. dk. gray, smooth, foliated, friable, striated;

Footwall: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., some granules (2-4mm), poorly sorted, ang. to subrd. grns., v. moist to wet, hard, competent, trace local pebbles (4-10mm).

Steps perpendicular to striations suggest dip-slip reverse fault (steps face down dip of fault)

(Steep side of steps on footwall (fault) face face down footwall face.

235' - 240' bgs: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace local granules (2-4mm), poorly sorted, ang. to subrounded grns., v. moist to wet, hard, competent, massive.

240' - 241.5' bgs: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace local granules (2-4mm), poorly sorted, ang. to subrounded grns., v. moist to wet, hard, competent, massive.

241.5' - 245' bgs: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., poorly sorted, ang. to subrounded grns., moist to wet, hard, competent, massive.

245' - 250' bgs: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace local granules (2-3mm), ang. to subrd. grns., moist to v. moist, hard, competent.

Several Subhorizontal healed hairline fractures @ approx. 249' bgs.

Healed fracture @ 249.5' bgs; filled w/ white med. soft mineral, apparent calcite, (dips 80°).

Date: 4/24/02
Time: 1439

Boring #:	MW#: C8	Project: Boeing Rocketdyne SSFL-CFOU	Sheet 14 of 21					
PID/Alt (ft)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	ROD	Depth (Feet)	Investigation - Former Sodium Disposal Facility
								Geologic Description
010					80	3/5	1	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules & pebbles (2-6mm), moist to wet, poorly sorted, ang. to subrounded grns., hard, competent. Healed fracture extended down from 249.5' bgs to 251' bgs, dips 80° and is filled w/ calcite.
010					50	60%	2	Fracture @ 251.5' bgs dips 50°; mod. rough wet surfaces with some silt coating (soft coating), no apparent oxidation.
010							3	SANDSTONE grades without granules & pebbles @ 253'-255' bgs.
010					35		4	Fracture zone @ 252.5 - 254' bgs; med. gray (N5) silt coats fracture surfaces, wet surfaces, rough surfaces.
010					45		5	Fault fracture @ 254.3' bgs dips 45°; smooth surfaces, some calcite precipitation on surfaces, slightly striated, striations subparallel to fault plane dip suggesting a dip-slip fault, v. moist surfaces.
010							6	SS SANDSTONE (SS), med. gray (N5), fn. to cs. grn., moderately to poorly sorted, ang. to subrounded grns., moist to wet, hard, competent.
010						4.9/5	7	Grades with trace v. cs. sand @ ~258.5' - 259.8' bgs
010						98%	8	
010					50		9	Two subparallel fractures @ ~258.6' and 258.7' bgs; some local trace calcite precipitation on faces; some soft grey silt accumulated on fracture surfaces, wet frac. surfaces. Hairline healed frac. @ 259.5'
010					30		260	SH SHALE (SH), med. dk. gray (N4), mod. soft, fissile, friable, moist. Bedding contact @ 259.8' bgs (w/ overlying SS) dips 30°.
010					40		1	SH/SLTS 260'-265' bgs: Interbedded SHALE and SILTSTONE, med. gray (N5) to med. dk gray (N4), moist, mod. soft, friable, fissile. Healed hairline fracture @ 261' bgs dips 40°. The shale is more friable and fissile than the siltstone.
010					35		2	Bedding Laminations visible throughout much of core. Splits easily along bedding planes that dip 30°-35° throughout core from 260'-265' bgs.
010					30		3	
010							4	
010							5	SS SANDSTONE (SS), med. gray (N5), v. fn. grn to med. grn., mod. well sorted, ang. to subrnd. grns., moist, hard, competent; bedding contact w/ underlying unit dips 30°; some basal shale rip-up clast inclusions (tabular) up to 3/4" long.
010					30	5/5	6	SH/SLTS Interbedded SHALE and SILTSTONE; SH: med. dk gray (N4), mod. soft, moist, fissile, friable; SLTS: med. gray (N5), moist, hard; Bedding laminations visible, laminated to very thinly bedded, beds up to 3/4" thick, some convolution of laminae.
010						100%	7	SS SANDSTONE (SS), med. gray (N5), v. moist to wet, fn. to coarse grn., mod to poor sorting, ang. to subrnd. grns., hard, competent.
010					30		8	fn. to med. grn. interbed @ 267.8' to 268.7' bgs.
010							9	Fracture @ 269.5' dips 30°; wet surfaces w/ soft gray silt accum. on surfaces.
010					30		270	

Date: 4/25/02
Time:

Boring #:	MW#:	C8	Project:	Boeing Rocketdyne SSFL - CFOU Investig.	Sheet	15	of	21
- Former Sodium Disposal Facility -								
PID/PPM	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	ROD	Depth (Feet)	Geologic Description
0.0					50	4/5	1	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace local granules (2-4mm), poorly sorted, v. moist to wet, ang. to subrnd. grns., hard, competent.
0.0					30	80%	2	Thin. fn. grn. interbed w/ convoluted laminations @ 271.9'-272' bgs.
0.0							3	
0.0					45		4	v. moist to Fracture @ 273.5' bgs dips 45°, wet surface, sl. weathered surfaces, smooth surface to slightly rough.
0.0					40		5	Fracture zone @ 274'-275' bgs, fracs. dip 40°-45°, wet frac. surfaces; clayey silt coats surfaces of fracs and may be result of in place weathering, smooth to
0.0	*	*			45	4.8	6	Sl. rough surfaces, mod. to intensely fractured zone (274'-275'), no apparent oxidation.
0.0					40	5	7	275'-280' bgs SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., poorly sorted, ang. to subrounded grns., v. moist, hard, competent, (trace granules @ 279.2' to 280' bgs); Two fractures @ 275.7' & 275.9' dip 40°, wet surfaces, sl. rough surfaces, sl. weathered, but no oxidation apparent, 2 to smooth
0.0					45		8	Fracture @ 278' bgs dips 45°; surface of frac. slightly rough; silt accumulation (soft) possible result of weathering, no oxidation apparent.
0.0							9	SS: Grades with trace granules (2-4mm) from 279.2' to 280' bgs.
0.0							280	
0.0					45	3-4mm 3/5	1	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4mm), poorly sorted, ang. to subrounded grns., v. moist to wet, hard, competent.
0.0					70	5	2	Fracture @ 280.5' dips 45°, sl. rough surf., wet Healed fracture @ 281.3'-282' bgs, filled w/ calcite apparently, hairline to 1mm thick wide frac.; frac. dips 70°.
0.0						70% 60%	3	SS: sl. to mod. weathered, mod. soft to hard @ 282.5' bgs to 285' bgs.
0.0					45		4	Fracture @ 283.6' bgs dips 45°, surface slightly rough, wet, sl. weathered, some soft silt on frac. surfaces.
0.0					85		5	85° dip frac. @ 284.2' bgs, smooth to sl. rough surf., some soft silt, wet.
0.0	*	*			80		6	65° dip frac. @ 284.7' bgs, sl. rough surf., wet.
0.0					40	5/5	7	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., poorly sorted, ang. to subrounded grns., v. moist to wet, hard, competent.
0.2					40	100%	8	Healed frac. @ 285'-285.5' dips 80°. sl. to mod. Frac @ 285.7' dips 40°, wet, sl. rough surface, weathered surf., some soft silt on surface.
0.3							9	Fract. @ 286.5' dips 40°, surfaces: wet, sl. rough, sl. weathered.
0.2					45		10	Fract. @ 287.7' dips 45°, surfaces: smooth, v. moist, some striations subparallel to dip, no gouge.
0.0					25		11	Bedding contact dips 25°.
0.0					70		12	SHALE (SH) (med. gray (N5), moist, mod. soft, friable, fissile, SILTSTONE (SLTS) and SHALE (SH) interbedded, Healed partly penetrating frac. @ 289.7' bgs, hairline, apparent calcite fill in frac. (precipitate).

Date &
Time

Boring #: MW#: C-8 Project: Boeing Rocketdyne SSFL-CFOU Invest Sheet 16 of 21

- Former Sodium Disposal Facility -

Geologic Description

CONTACT @ 290' bgs

SILT/SH Interbedded SILTSTONE & SHALE

SS

290'-294' bgs:
SANDSTONE (SS), med. gray (N5), v. fn. grn. to cs. green.
poorly sorted, ang. to subrounded, sl. weathered; friable
near fault fracture (up to 2" above/below fault).
Fault fracture @ 290.4' bgs dips 55°; gouge zone ~ 3/4" thick.
Subhoriz. striations on surface suggest strike-slip, some
calcite precip. on surfaces and in gouge, moist.
SS coarsens slightly downward.
Frac. @ 291.8' dips 50°; surf.: smooth, v. moist, subhorizontal
striations.
Frac. @ 292.1' dips 50°; surf.: slightly rough, v. moist.

Frac. @ 293.3' dips 50° (but has different strike than next
two fracs above; all three fracs discordant w/ bedding though).
Sl. rough surf., v. moist.
294'-295' bgs: SS, med. gray (N5), fn. grn. to v. cs. grn., poorly sorted,
ang. to subrnd. grns., v. moist, hard, competent.

SS

295'-300' bgs:
SANDSTONE (SS), med. gray, fn. to v. cs. grn.,
poorly sorted, ang. to subrounded grns., v. moist,
hard, competent.
Fracture @ 295' dips 50°; surf.: sl. rough, v. moist.
Fracture @ 295.3' dips 45°, surf.: sl. rough, v. moist.
Fracture @ 295.4' dips 45°, surf.: sl. rough, v. moist.

SS

300'-305' bgs:
SANDSTONE (SS), med. gray (N5), fn. to
v. cs. grn., poorly sorted, ang. to subrounded
grns., grades slightly coarser downward (trace
granules (2-4 mm) @ 303.3'-305' bgs), v. moist to
wet, hard, competent, massive.

SS

305'-310' bgs:
SANDSTONE (SS), med. gray (N5), fn. to v. cs.
grn., poorly sorted, ang. to subrounded grns.,
(trace granules (2-4 mm) @ 307.8-308.7' bgs), v. moist,
hard, competent.

Hairline fracture @ 307.7' bgs dips 55°; surface:
v. moist, sl. rough.

Partly
Healed fractures @ 309.3' bgs (dip 55° ea in roughly opposite
directions) one frac. offsets the other w/ normal
separation; fracs. filled w/ gray silty material;
fracs. sl. rough to smooth. Silty material is med. soft.

Date: 4/26/02
Time:

Boring #: MW#: C8 Project: Boeing Rocketdyne SSFL-CFOU Sheet 17 of 21

Investigation - Former Sodium Disposal Facility

Geologic Description

PID (ft)	Cored Interval	Recovered	Retained for Analysis	Bedding	Fractures	RGD	Depth (Feet)	Geologic Description
0948	0.0				45°	16/5	1	310.0' - 310.3': Fault Gauge, platy, silty, apparent calcite inter laminations. Fault @ 310.0 - 310.3', mod. soft to soft, friable.
0952	0.0				55°		2	310.3' - 311.6' bgs: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., poorly sorted, ang. to subrnd. grns., hard, competent. Fracture @ 310.6' dips 45°, surf. smooth, moist, some calcification; oblique striations (plunge approx. 20°). Fracture @ 311' bgs dips 45°, surf. smooth, moist, some calcification.
1004	0.0					32%	3	311.6' bgs - 317' bgs: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, ang. to subrounded grns., v. moist to wet, hard, competent.
1006	0.0						4	
1059	0.0					3/2	5	
1059	0.0					100%	6	
1059	0.0					3/3	7	317' - 320' bgs: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, ang. to subrnd. grns., moist to v. moist, hard, competent, massive.
1103	0.0					100%	8	
1103	0.0						9	
1116	0.0					5/5	1	320' - 325' bgs: SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, ang. to subrounded grns., moist to v. moist, hard, competent.
	0.0				25°	100%	2	Bedding lamination @ 321.4' bgs dips 25°; ss grades slightly coarser downward w/ increased granule content and trace pebbles (4-10mm long) @ 322.4 - 324' bgs.
	0.0						3	
	0.0						4	
	0.0						5	
4/26/02	0.0					6/6	6	Interbedded SHALE and SILTSTONE, med. light gray (N6), moist, mod. soft; fissile, and friable shale, coarsens downward. Thin shale bed @ 324' (1/4" thick) overlies siltstone w/ some fine sand content. Siltstone has some convoluted laminations.
1120	0.0					100%	7	
1136	0.0						8	327.3' - 331' SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., moist, ang. to subrounded grns., hard, competent, poorly sorted.
1136	0.0						9	
1141	0.0						330	

Initial Core Recovery failed on 4/26/02, overdrilled 1' more foot to 331' on 4/29/02 and recovered 6' of core (325' - 331' bgs)

Date: 4/22/02
Time:

Boring #: 1120

MW#: C8

Project: Boeing Rocketdyne CFM Investigation

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(4/22/02)

(1120)

(1316)

4/30/02

(1319)

0850

0855

0905

0910

0932

0937

1010

PID (ft/min)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	ROD	Depth (Feet)	Geologic Description
							1	
							2	331.5 - 337' bgs: SANDSTONE (SS), med. gray (NS), fn. to v. cs. grn., trace granules (2-4 mm), trace pebbles (4-8 mm), angular to subrounded grains, v. moist to wet, hard, competent, some bedding laminations visible @ 336 - 337' bgs (dip 35°); grades without granules and pebbles @ 336 - 337' bgs.
0.0						5.5	3	
0.0						92%	4	
0.0							5	
0.0							6	
0.0							7	337' - 340' bgs: SANDSTONE (SS), med. gray (NS), fn. to v. cs. grn., ang. to subrounded grns., v. moist to wet, hard, poorly sorted, competent; bedding lamination visible @ 339.3' bgs; some granules (2-4 mm) and pebbles immediately below bedding lamination/contact but grades out downward without pebbles @ 339.6 - 340' bgs.
0.0						3/3	8	
0.0						100%	9	
0.0							340	340' - 343.5' bgs: SANDSTONE (SS), med. gray (NS), fn. to v. cs. grn., ang. to subrounded grns., v. moist to wet, poorly sorted, hard, competent, trace local granules (2-4 mm) and pebbles (4-10 mm) @ ~342.5' bgs.
0.0						5/5	1	
0.0						100%	2	
0.0							3	PEBBLY 343.5' - 344.2' bgs: SANDSTONE (SS), med. gray (NS), fn. to v. cs. grn., sand, some granules (2-4 mm), some pebbles (4-10 mm), angular to subrounded grains, poorly sorted, v. moist to wet, hard, competent.
0.0							4	
0.0							5	344.2' bgs - 345' bgs: SS, med. gray (NS), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, ang. to subrounded grns., v. moist to wet, hard, competent.
0.0							6	345' - 349' bgs: SANDSTONE (SS), med. gray (NS), fn. to very coarse grn., poorly sorted, some fn. to med. grn. interbeds (med. sorting), v. moist, hard, competent, ang. to subrounded grns.
0.0						5.5	7	
0.0						5.5	8	Single flat shale pebble (rip-up clast) @ 348-8' bgs (50 mm - long), within SS matrix.
0.0						100%	9	349' - 350.5' bgs: SS, med. gray (NS), fn. to v. cs. grn., trace granules (2-4 mm), trace local pebbles (4-20 mm), poorly sorted, angular to subrounded grains, v. moist,
0.0							350	

Date & Time

Boring #:	MW#:	C8	Project:	Boeing Rocketdyne SSFL-CFOU	Sheet:	19	of	21
Investigation - Former Sodium Disposal Facility								
PID (ppm)	Cored Interval	Recovered	Retained for Analysis	Bedding	Fractures	RQD	Depth (Feet)	Geologic Description
4/23/02								
1015		*	*					AWN
1034	0.0	*	*				1	SS 350.5 - 355' bgs:
0.0						4.5		SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, ang. to subrounded grains, v. moist to wet, hard,
0.0			X			4.5	2	competent, massive,
0.0							3	
0.0						100%		
0.0			X				4	Individual shale rip-up clast @ 354.2' bgs (45 mm - long), in SS matrix.
0.0			X				5	
1040		*	*					355 - 360' bgs:
1058	0.0	*	*				6	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted,
0.0			X			5/5		angular to subrounded grns, v. moist to wet, hard, competent;
0.0			X				7	inter-coarser layer @
0.0			X			100%		357.5' - 358.1' bgs:
0.0			X				8	Some granules (2-4 mm) and pebbles (4-10 mm) in SS matrix.
0.0							9	
0.0			X					
0.0								
1102		*	*				360	
1120	0.0	*	*				1	SS SANDSTONE (SS), med. gray (N5), moist to v. moist, fn. to v. cs. grn w/ trace granules (2-3 mm) @ 360' - 360.3' bgs;
0.0						5/5		fn. to cs. grn. @ 360.3' - 362' bgs; fn. to v. cs. grn w/ trace granules (2-4 mm) @ 362' - 363.8' bgs;
0.0			X				2	fn. to v. cs. grn w/ some granules (2-4 mm) and some pebbles (4-8 mm) @ 363.8' - 364.5' bgs;
0.0						100%	3	fn. to v. cs. grn. @ 364.5' - 365' bgs; angular to subrounded grns, moist to v. moist, hard, competent,
0.0							4	
0.0			X					
0.0			X				5	SS 365' - 370' bgs: SANDSTONE (SS), med. gray (N5), fn. to cs. grn., poorly sorted, ang. to subrounded grns, moist to wet, hard, competent
0.0		*	*			5/5	6	Some convoluted laminations @ 366.3' bgs.
0.0			X			35		Bedding lamination @ 366.5' bgs dips 35°.
0.0							7	
0.0						100%		
0.0							8	Two healed fractures @ 368.2' bgs dip 60° and 75° respectively. Fractures are hairline to 1 mm wide w/ white mod. soft mineral filling (likely calcite). The two fractures intersect at upper end.
0.0			X			60/75	9	
1300		*	*				370	

Date: 4/30/02
Time:

Boring #: MW#: C8 Project: Boeing Rocketdyne SSFL-CFOU Sheet 20 of 21

Investigation - Former Sodium Disposal Facility

Geologic Description

4/30/02
1320

PID (ft)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	ROD	Depth (Feet)
0.0						5/5	1
0.0						100%	2
0.0							3
0.0							4
0.0							5
0.0						5/5	6
0.0						100%	7
0.0							8
0.0							9
0.0							10
0.0							11
0.0							12
0.0							13
0.0							14
0.0							15
0.0							16
0.0							17
0.0							18
0.0							19
0.0							20
0.0							21
0.0							22
0.0							23
0.0							24
0.0							25
0.0							26
0.0							27
0.0							28
0.0							29
0.0							30
0.0							31
0.0							32
0.0							33
0.0							34
0.0							35
0.0							36
0.0							37
0.0							38
0.0							39
0.0							40
0.0							41
0.0							42
0.0							43
0.0							44
0.0							45
0.0							46
0.0							47
0.0							48
0.0							49
0.0							50
0.0							51
0.0							52
0.0							53
0.0							54
0.0							55
0.0							56
0.0							57
0.0							58
0.0							59
0.0							60
0.0							61
0.0							62
0.0							63
0.0							64
0.0							65
0.0							66
0.0							67
0.0							68
0.0							69
0.0							70
0.0							71
0.0							72
0.0							73
0.0							74
0.0							75
0.0							76
0.0							77
0.0							78
0.0							79
0.0							80
0.0							81
0.0							82
0.0							83
0.0							84
0.0							85
0.0							86
0.0							87
0.0							88
0.0							89
0.0							90
0.0							91
0.0							92
0.0							93
0.0							94
0.0							95
0.0							96
0.0							97
0.0							98
0.0							99
0.0							100

SS

370'-375' bgs:
SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace local granules (2-4 mm), poorly sorted, ang. to subrounded grains, v. moist to wet, hard, competent, massive.
Individual Shale rip-up clast observed @ 372.3' bgs (20 mm - long) in SS matrix.

SS

375'-380' bgs:
SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, ang. to subrounded grains, moist to wet, hard competent.

Bedding lamination visible @ 378' bgs dips 30°

SS

380'-382' bgs:
SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace local granules (2-4 mm), trace local pebbles (4-10 mm), poorly sorted, v. moist to wet, hard, competent, massive.
382'-385' bgs: SS, med. gray (N5), fn. to cs. grn., moderate to poor sorting, v. moist to wet, ang. to subrounded grains, hard, competent, massive.

SS

385'-387.8':
SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, ang. to subrounded grains, moist to v. moist, hard, competent.

SH

387.8'-388.4' bgs: SHALE (SH), med. gray (N5) to med. dark gray (N4), laminated, fissile, friable, mod. soft, moist to v. moist.

SS

SANDSTONE (SS), med. gray (N5), v. fn. to med. grain w/ convoluted lams @ 388.4'-389' bgs; fn. to cs. grn @ 389'-389.4' bgs; fn. to v. cs. grn. w/ trace shale rip-up clasts (up to 25 mm); ang. to subround. grains, poorly sorted, moist to v. moist.

Date: 5/1/02
Time:

Boring #: MW#: C8 Project: Boeing Rocketdyne SSFL - Sheet 21 of 21

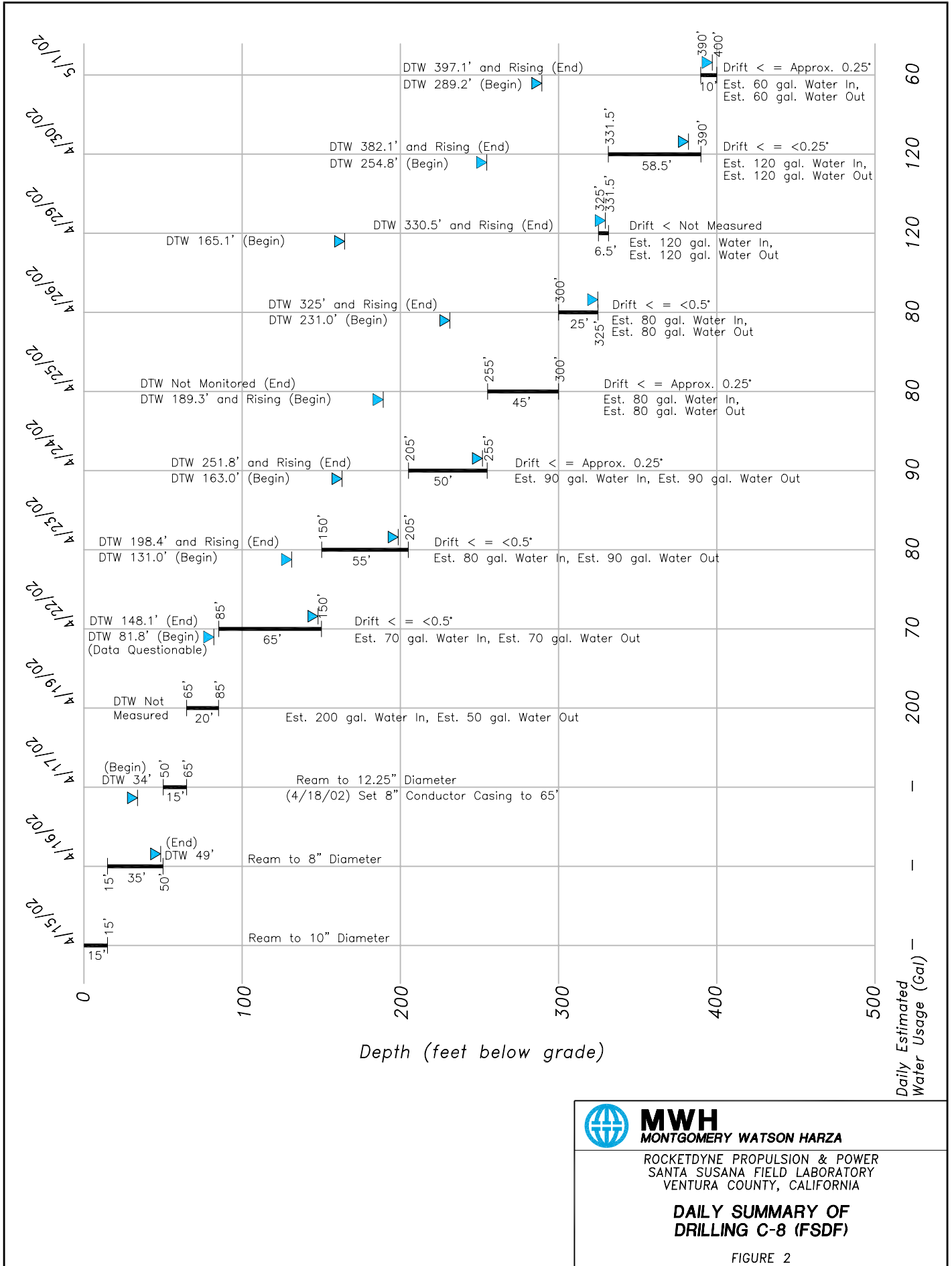
CFOU Investigation - Former Sodium Disposal Facility

5/1/02
0945

0950
1026

1032

PID (ft)	Cored Interval	Recovered	Retained for Analysis	Bedding*	Fractures**	RQD	Depth (Feet)	Geologic Description
0.0						5/5	1	SS SANDSTONE (SS), med. gray (N5), fn. to cs. grn., poorly sorted, ang. to subrounded grns.; v. moist to wet, hard, competent.
0.0				30			2	SH/SLTS Interbedded SHALE (SH) and SILTSTONE (SLTS), med. gray (N5) to med. dark gray (N4), some convoluted laminations, moist to v. moist; SS: fn. to cs. grn., poor to med. sorting, hard; SLTS: hard; SH: med. soft, fissile, friable.
0.0				30		100%	3	SS SH is the med. dk. gray component; Thin to laminated bedding.
0.0							4	392.2' - 395.5' bgs: SANDSTONE (SS), med. gray (N5), v. moist to wet, hard, competent; 392.2' - 393' bgs: v. fn. to med. grn., some convoluted laminations @ 392.2' - 392.6' bgs;
0.0							5	393' - 394.2' bgs: fn. to cs. grn., some local shale rip-up clasts up to 40 mm-long, poorly sorted.
0.0							6	394.2' - 395.5' bgs: fn. to med. grn., mod. sorting, basal shale rip-up clasts.
0.0				35		5/5	7	SH/SS Interbedded SHALE (SH) and SANDSTONE (SS), med. gray (N5), moist to wet, some convoluted laminations; SS: fn. to v. cs. grn., poorly sorted, hard; SH: fissile, friable, mod. soft, ang. to subround. grns. laminated.
0.0				35		100%	8	SS SANDSTONE (SS), med. gray (N5), fn. to v. cs. grn., trace granules (2-4 mm), poorly sorted, ang. to subrounded grns; moist to wet, hard, competent.
0.0							9	SH/SLTS Interbedded SHALE and SILTSTONE (SLTS), moist; SLTS: med. gray (N5), hard; SH: med. dark gray (N4), moist, fissile, friable, laminated; some convoluted laminations; thin to laminated bedding.
0.0							400	SS SANDSTONE (SS), med. gray (N5), v. moist, hard, competent fn. to v. cs. grn., poorly sorted, angular to subrounded grns.
							1	Bottom of Hole @ 400' bgs.
							2	
							3	
							4	
							5	
							6	
							7	
							8	
							9	
							0	



MWH
MONTGOMERY WATSON HARZA

ROCKETDYNE PROPULSION & POWER
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

**DAILY SUMMARY OF
DRILLING C-8 (FSDF)**

FIGURE 2

FSDP PISTOL RANGE ULS GEOPHYSICAL SURVEY



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SAN DIEGO, POCATELLO, HONOLULU, PORTLAND

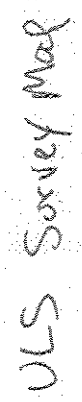
LIMITATIONS / CONSTRAINTS
Site Information/Notes/Problems
Site Specific Comments
PAGE: ____ OF ____

CLIENT:
PROJECT:
LOCATION:
DATE:
JOB PO#:
PRESENT AT SITE:

Comments/Limitations/Constraints below concerning field observations from EMPCL, EMIMD, GPR, EM Insertion, and Visual Methods:
AREA IV GUN CLUB SHOOTING RANGE NEAR MW 18

* Conducted Pancake Locator Survey in
Area Prescribed By OGDEN. 18 Points
Located & Marked w/ PINK STEAK CHASERS.
Recommend Sifting Points to Identify
Objects. Zone Marked in White Paint for
14/MAR/01 Survey.

11/14/2008
08:37:31



* ULS 291438



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LIMITATIONS / CONSTRAINTS		CLIENT: O E E S
Site Information/Notes/Problems Site Specific Comments		PROJECT: Rocketdyne SSFL
PAGE: <u>1</u> OF <u>1</u>		LOCATION: AREA II GUN CLUB RANGE 12 MAR 01 FSDP
		DATE: 12 MAR 01
		JOB PO#:
		PRESENT AT SITE: F.B. ULS

Comments/Limitations/Constraints below concerning field observations from EMPCL, EMIMD, GPR, EM Insertion, and Visual Methods:

FSDP AREA II GUN CLUB RANGE

* Conducted EM Survey of Areas Marked on Site Map Provided By OGDEN. 5 ANOMILIES Located, Marked w/ Pink Paint & Wire Flagged. Marked on Site Map.

* Conducted Passive UTILITY Survey. No UTILITIES OBSERVED.

