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NATIONAL
SECURITY
COMPLEX**

MANAGED BY
BWXT Y-12, L.L.C.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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**CALENDAR YEAR 2002
GROUNDWATER MONITORING REPORT,
U.S. DEPARTMENT OF ENERGY
Y-12 NATIONAL SECURITY COMPLEX,
OAK RIDGE, TENNESSEE**

March 2003

Prepared by

**Elvado Environmental LLC
Under Subcontract No. 4300021559**

for the

**Environmental Compliance Department
Environment, Safety, and Health Organization
Y-12 National Security Complex
Oak Ridge, Tennessee 37831**

Managed by

**BWXT Y-12, L.L.C.
for the U.S. Department of Energy
Under Contract No. DE-AC05-00OR22800**

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Acronyms and Abbreviations

ACO	Analytical Chemistry Organization
BCK	Bear Creek kilometer
BCV	Bear Creek Valley
Bear Creek Regime	Bear Creek Hydrogeologic Regime
BJC	Bechtel Jacobs Company LLC
BWXT	BWXT Y-12, L.L.C.
CDL	Construction/Demolition Landfill
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Chestnut Ridge Regime	Chestnut Ridge Hydrogeologic Regime
CRSDB	Chestnut Ridge Sediment Disposal Basin
CRSP	Chestnut Ridge Security Pits
CY	calendar year
DOE	U.S. Department of Energy
DQO	data quality objective
East Fork Regime	Upper East Fork Poplar Creek Hydrogeologic Regime
EMWMF	Environmental Management Waste Management Facility
ft	feet
GWPP	Groundwater Protection Program
IL	Industrial Landfill
LMES	Lockheed Martin Energy Systems, Inc.
NT	northern tributary (of Bear Creek)
OF	outfall (subsurface drains in Y-12)
ORR	Oak Ridge Reservation
POC	point-of-compliance
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
REDOX	oxidation-reduction potential
ROD	record of decision (CERCLA)
SAP	sampling and analysis plan
SCR	south Chestnut Ridge
SS	south side (of Bear Creek)
SWDF	Solid Waste Disposal Facility
TDEC	Tennessee Department of Environment and Conservation
UEFPC	Upper East Fork Poplar Creek
VOC	volatile organic compound
WRRP	Water Resources Restoration Program
Y-12	Y-12 National Security Complex

1.0 INTRODUCTION

This report contains the groundwater and surface water monitoring data that were obtained during calendar year (CY) 2002 at the U.S. Department of Energy (DOE) Y-12 National Security Complex (hereafter referenced as Y-12) on the DOE Oak Ridge Reservation (ORR) in Oak Ridge, Tennessee. The CY 2002 monitoring data were obtained from groundwater and surface water sampling locations in three hydrogeologic regimes at Y-12 (Figure A.1). The Bear Creek Hydrogeologic Regime (Bear Creek Regime) encompasses a section of Bear Creek Valley (BCV) between the west end of Y-12 and the west end of the Bear Creek Watershed (directions are in reference to the Y-12 grid system). The Upper East Fork Poplar Creek Hydrogeologic Regime (East Fork Regime) encompasses the Y-12 industrial facilities and support structures in BCV. The Chestnut Ridge Hydrogeologic Regime (Chestnut Ridge Regime) encompasses a section of Chestnut Ridge south of Y-12.

The CY 2002 monitoring data were obtained under the Y-12 Groundwater Protection Program (GWPP) managed by BWXT Y-12, L.L.C. (BWXT) and several monitoring programs managed by Bechtel Jacobs Company LLC (BJC). Data contained in this report meet applicable requirements of DOE Order 5400.1 (*General Environmental Protection Program*). As described in the *Environmental Monitoring Plan for the Oak Ridge Reservation* (DOE 2001), DOE Order 5400.1 requires groundwater and surface water quality monitoring: (1) in areas which are, or could be, affected by operations at Y-12 (DOE Order 5400.1 site surveillance monitoring) and (2) in areas where contaminants from Y-12 are most likely to migrate beyond the boundaries of the ORR (DOE Order 5400.1 exit pathway/perimeter monitoring).

The following sections of this report provide details regarding the CY 2002 groundwater and surface water monitoring activities in the Bear Creek, East Fork, and Chestnut Ridge Regimes. Section 2 describes the monitoring programs implemented by the Y-12 GWPP and BJC during CY 2002. Section 3 identifies the sampling locations in each hydrogeologic regime and the corresponding sampling frequency during CY 2002, along with the associated quality assurance/quality control (QA/QC) sampling. Section 4 describes groundwater and surface water sample collection and Section 5 identifies the field measurements and laboratory analytes for each sampling location. Section 6 outlines the data management protocols and data quality objectives (DQOs). Section 7 describes the groundwater elevation monitoring in each regime during CY 2002 and Section 8 lists the documents cited for more detailed operational, regulatory, and technical information.

The narrative sections of the report reference several appendices. Figures (maps and diagrams) and tables (excluding data summary tables presented in the narrative sections) are in Appendix A and Appendix B, respectively. Monitoring well construction details are in Appendix C. Results of field measurements and laboratory analyses of the groundwater and surface water samples collected during CY 2002 are in Appendix D (Bear Creek Regime), Appendix E (East Fork Regime and surrounding areas), and Appendix F (Chestnut Ridge Regime). Appendix G contains data for QA/QC samples associated with monitoring performed by the Y-12 GWPP.

2.0 MONITORING PROGRAMS

Groundwater and surface water sampling and analysis activities performed during CY 2002 specifically for the purposes of DOE Order 5400.1 were implemented in accordance with the Y-12 GWPP sampling and analysis plan (SAP) for CY 2002 (BWXT 2001a), and modified by applicable addenda (Table B.1). These sampling and analysis activities are hereafter referenced as DOE Order 5400.1 monitoring.

Groundwater and surface water sampling and analysis activities managed by BJC during CY 2002 were performed under the ORR Water Resources Restoration Program (WRRP), the ORR Landfill Operations for Solid Waste Disposal, and operation of the Environmental Management Waste Management Facility (EMWMF). Monitoring activities were performed in accordance with the WRRP SAP for fiscal years 2002 (BJC 2001) and 2003 (BJC 2002a) for the following purposes: (1) Resource Conservation and Recovery Act (RCRA) post-closure detection monitoring and RCRA post-closure corrective action monitoring (collectively referenced as RCRA monitoring), as specified in applicable RCRA post-closure permits issued by the Tennessee Department of Environment and Conservation (TDEC); (2) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation effectiveness monitoring (CERCLA monitoring), as specified in the applicable record of decision (ROD) or decision documents pending final approval (referenced as CERCLA ROD monitoring), and CERCLA pre-remediation baseline water quality monitoring (referenced as CERCLA baseline monitoring). Detection monitoring for several nonhazardous solid waste disposal facilities (SWDFs) located in the Chestnut Ridge Regime (referenced as SWDF detection monitoring) was performed in accordance with the SAP (Duratek Federal Services 2002) and to comply with site-specific operating permits issued by the TDEC. Quarterly CERCLA monitoring at the EMWMF, located in the Bear Creek Regime, was performed in accordance with the site-specific requirements of an environmental monitoring plan for the site (DOE 2002).

3.0 SAMPLING LOCATIONS AND FREQUENCY

The CY 2002 groundwater and surface water quality monitoring addressed in this report includes a total of 203 sampling locations. Samples were collected from 159 monitoring wells (complete construction details for each well are provided in Appendix C), 12 springs, and 32 surface water stations. Cooperation between the Y-12 GWPP and BJC monitoring programs (i.e., preparing SAPs, coordinating sample collection, and sharing data) ensures that the CY 2002 monitoring results fulfill requirements of applicable monitoring drivers (DOE Order 5400.1, RCRA, CERCLA, and SWDF) with minimal duplication of sampling and analysis activities. Although the monitoring data from all of the CY 2002 sampling locations serve DOE Order 5400.1 monitoring purposes, the following sections identify the specific monitoring driver under which samples were collected in each regime.

3.1 BEAR CREEK REGIME

As shown below (Table 1), 67 monitoring wells, six springs, and 17 surface water stations in the Bear Creek Regime were sampled during CY 2002 for the purposes of DOE Order 5400.1 monitoring, RCRA monitoring, and CERCLA monitoring.

Table 1. CY 2002 sampling locations in the Bear Creek Regime

Monitoring Driver	Monitoring Wells	Springs	Surface Water Stations
DOE Order 5400.1	39	3	6
	8	0	0
	20	3	11
Totals:	67	6	17

Samples were collected semiannually during CY 2002 from most of the sampling locations. Two wells, one spring, and eight surface water stations were sampled during only the first quarter of CY 2002, and 14 wells associated with the EMWMF were sampled during the third and fourth quarters of the year (Table B.2).

Thirty-nine monitoring wells in the Bear Creek Regime were sampled for the specific purposes of DOE Order 5400.1 site surveillance monitoring during CY 2002 (Table B.2 and Figure A.2). Twenty-four of these wells are located near waste management facilities in BCV, including the primary sources of groundwater contamination in the regime (S-3 Site, Oil Landfarm Waste Management Area, and Bear Creek Burial Grounds). The remaining wells are components of three Exit Pathway Pickets in the regime: Picket A (two wells) is located about 1,600 feet (ft) west of the Bear Creek Burial Grounds; Picket B (five wells) is located about 2,000 ft west of the Oil Landfarm; and Picket C (eight wells) is located about 3,000 ft west of the S-3 Site (Figure A.2). The wells in each Exit Pathway Picket are completed at various depths along strike-normal transects across the Maynardville Limestone, which is the primary contaminant migration pathway in the Bear Creek Regime.

Samples were collected from three springs and six surface water sampling stations in the Bear Creek Regime for the purposes of DOE Order 5400.1 exit pathway/perimeter monitoring during CY 2002 (Table B.2). The springs, which discharge into Bear Creek from the south side (SS) of the creek channel (Figure A.2), are located southwest (hydraulically downgradient) of the S-3 Site (SS-1), the Oil Landfarm (SS-4), and the Bear Creek Burial Grounds (SS-5). The surface water stations, as designated by the Bear Creek kilometer (BCK) value measured upstream from the confluence of Bear Creek and East Fork Poplar Creek, are located north of Pine Ridge (BCK-00.63); near the west end of BCV (BCK-04.55); about 6,200 ft (BCK-07.87) and 1,600 ft (BCK-09.40) downstream of the Bear Creek Burial Grounds; about 3,600 ft downstream of the S-3 Site (BCK-11.97); and in a northern tributary (NT) of Bear Creek (NT-01) about 1,500 ft west of the S-3 Site (Figure A.2).

Eight monitoring wells in the Bear Creek Regime were sampled for the specific purposes of RCRA post-closure corrective action monitoring during CY 2002 (Table B.2). These wells include a background well located hydraulically upgradient of contaminated groundwater in the regime (GW-115); point-of-compliance (POC) wells located downgradient of the S-3 Site (GW-276), the Oil Landfarm (GW-008), and the Bear Creek Burial Grounds (GW-046); and four plume boundary wells that comprise Exit Pathway Picket W, which is located about 6,500 ft west of the Bear Creek Burial Grounds (Figure A.2).

Twenty monitoring wells, three springs, and 11 surface water stations in the Bear Creek Regime were sampled for CERCLA monitoring purposes during CY 2002 (Table B.2 and Figure A.2). Fourteen monitoring wells located at the EMWMF were sampled quarterly (August and November 2002) after waste disposal at the site began (June 2002). Six monitoring wells, three springs, and seven surface water stations were sampled for the purposes of CERCLA ROD monitoring; the monitoring wells are located along contaminant migration pathways hydraulically downgradient of the S-3 Site (GW-526 and GW-835) and the Bear Creek Burial Grounds (GW-077, GW-078, GW-079, and GW-080). Four surface water stations located near the Bear Creek Burial Grounds (NT-07, NT-08, NT-8E, and NT-8W) were sampled for CERCLA baseline monitoring purposes.

3.2 EAST FORK REGIME

As shown below in Table 2, a total of 52 monitoring wells, two springs, and ten surface water stations in the East Fork Regime (and surrounding areas) were sampled during CY 2002 for the purposes of DOE Order 5400.1 monitoring, RCRA monitoring, and CERCLA monitoring.

Table 2. CY 2002 sampling locations in the East Fork Regime, north of Pine Ridge, and in Union Valley

Monitoring Driver	Monitoring Wells	Springs	Surface Water Stations
DOE Order 5400.1	32	0	6
RCRA	5	0	0
CERCLA	16	2	4
Totals:	52	2	10

Note: Samples were collected from one well (GW-722) for DOE Order 5400.1 (February and July) and CERCLA (May and November) monitoring purposes (see Table B.3).

Fifty-one of these sampling locations lie within the boundaries of the East Fork Regime (Figure A.3), which is divided into the three major areas for the purposes of this report: the western Y-12 area between Old Bear Creek Road and grid coordinate easting 55,000; the central Y-12 area between grid coordinate eastings 55,000 and 62,000; and the eastern Y-12 area between grid coordinate easting 62,000 and Scarboro Road. The other thirteen CY 2002 sampling locations lie outside the boundaries of the regime, including six wells and two springs located in Union Valley east the ORR boundary at Scarboro Road (Figure A.3), and five surface water stations located in drainage features along the ORR boundary on the north side of Pine Ridge (Figure A.4). Samples were collected at least semiannually from each CY 2002 sampling location; four of the monitoring wells were sampled quarterly and three wells were sampled only once during the year (Table B.3).

A total of 32 monitoring wells and six surface water stations were sampled for DOE Order 5400.1 monitoring purposes in the East Fork Regime during CY 2002. Groundwater samples from 23 monitoring wells were collected for the specific purposes of DOE Order 5400.1 site surveillance monitoring (Table B.3). Seven of these wells are located in the western Y-12 area, 11 wells are in the central Y-12 area, and five wells are in the eastern Y-12 area (Figure A.3). Nine monitoring wells and six surface water locations were sampled for the purposes of DOE Order 5400.1 exit pathway/perimeter monitoring in the East Fork Regime (Table B.3). Three of these monitoring wells are located next to Upper East Fork Poplar Creek (UEFPC) in the gap through Pine Ridge northeast of Y-12 (Figure A.3) and the other six wells are located between UEFPC and Scarboro Road at the east end of Y-12. One of these wells is equipped with a dedicated Westbay™ multi-port sampling apparatus (Westbay well GW-722), with sampling ports set at ten discrete depths intervals in the well (Figure A.5). Surface water samples were collected from the exit point of the New Hope Pond Distribution Channel underdrain (LRSPW on Figure A.3) and from five tributaries located north of Pine Ridge (Figure A.4).

Five wells were sampled for the specific purposes of RCRA post-closure corrective action monitoring in the East Fork Regime during CY 2002. These wells include one POC well (GW-108) which is located in the western Y-12 area about 800 ft southeast of the S-3 Site, and four plume delineation wells (GW-193, GW-605, GW-606, and GW-733) which are located several thousand ft east-southeast of the S-3 Site (Figure A.3). A background well (GW-115) which is located about 500 ft north (upgradient) of the S-3 Site in the Bear Creek Regime (Section 3.1) also serves RCRA monitoring purposes in the East Fork Regime.

Sixteen monitoring wells, two springs, and four surface water stations were sampled during CY 2002 specifically for CERCLA monitoring purposes (Table B.3). Six monitoring wells and two springs located in Union Valley east of the ORR boundary along Scarboro Road, and eight monitoring wells (GW-151, GW-154, GW-223, GW-380, GW-382, GW-722, GW-762, and GW-832) in the eastern Y-12 area were sampled for CERCLA ROD monitoring purposes (Figure A.3). Sampling locations used for CERCLA baseline monitoring

include two monitoring wells located in the western Y-12 area (GW-253 and GW-618) and four surface water stations (Table B.3): Outfall (OF) 51, OF 200, and Station 8 located in the central Y-12 area, and Station 17 located in the eastern Y-12 area (Figure A.3).

3.3 CHESTNUT RIDGE REGIME

As shown below in Table 3, a total of 40 monitoring wells, four springs, and five surface water stations in the Chestnut Ridge Regime were sampled during CY 2002 for the purposes of DOE Order 5400.1 monitoring, SWDF detection monitoring, RCRA monitoring, and CERCLA monitoring.

Table 3. CY 2002 sampling locations in the Chestnut Ridge Regime

Monitoring Driver	Monitoring Wells	Springs	Surface Water Stations
DOE Order 5400.1	0	1	3
SWDF	22	1	0
RCRA	14	0	0
CERCLA	6	2	2
Totals:	40	4	5

Note: Two wells (GW-562 and GW-798) were sampled for SWDF and RCRA monitoring purposes during January and July (see Table B.4).

Groundwater samples were collected semiannually during CY 2002 from all of the monitoring locations except for one well (GW-305) that was sampled during each quarter of the year (Table B.4). Samples were collected from the springs and surface water stations during seasonally wet (January-February) and seasonally dry (July-September) flow conditions (Table B.4).

Three surface water stations and one spring were sampled during CY 2002 for the specific purposes of DOE Order 5400.1 exit pathway/perimeter monitoring in the Chestnut Ridge Regime (Table B.4). Tributaries on south Chestnut Ridge (SCR) are numbered in ascending order from west to east (SCR1 through SCR5), and the surface water sampling stations (SCR1.5SW, SCR2.2SW, and SCR4.4SW) are located in main channels along Bethel Valley Road where surface water exits the Chestnut Ridge Regime (Figure A.6). The spring (SCR5.2SP) is located about 200 ft west of Kerr Hollow Quarry (Figure A.6).

Twenty-two monitoring wells and one spring in the Chestnut Ridge Regime were sampled during CY 2002 for the purposes of SWDF detection monitoring (Table B.4). The monitoring wells are located at five SWDFs: four wells at Industrial Landfill (IL) II; five wells at IL IV; five wells at IL V; four wells at Construction/Demolition Landfill (CDL) VI; and four wells at CDL VII (Figure A.6). A spring (SCR4.3SP) was sampled for the purposes of SWDF detection monitoring at IL V and is located about 2,400 ft southeast of the site (Figure A.6). At the request of the TDEC, samples were collected quarterly from well GW-305 at IL IV during CY 2002 because the nickel concentration reported for the sample collected in July 1999 exceeded the Groundwater Protection Standard defined in the operating permit for the site (TDEC 1999).

A total of 14 monitoring wells were sampled for RCRA monitoring purposes during CY 2002 in the Chestnut Ridge Regime: five wells for RCRA post-closure corrective action monitoring and nine wells for RCRA post-closure detective monitoring (Table B.4). RCRA post-closure corrective action monitoring at the Chestnut Ridge Security Pits (CRSP) included one POC well (GW-177) located at the west end of the site and four

plume delineation wells: one at the former Chestnut Ridge Borrow Area Waste Pile (GW-301) about 3,000 ft east of the site; two at the CDL VII about 1,800 ft (GW-798) and 3,200 ft (GW-562) southeast of the site; and one at the Filled Coal Ash Pond (GW-831) about 2,000 ft southwest of the site (Figure A.6). Note that the SWDF detection monitoring results for one background well (GW-521) at IL IV and three plume delineation wells (GW-557, GW-799, and GW-801) at IL V (Figure A.6) also serve the purposes of RCRA post-closure corrective action monitoring at the CRSP. RCRA post-closure detection monitoring included four wells at the Chestnut Ridge Sediment Disposal Basin (CRSDB) and five wells at Kerr Hollow Quarry (Table B.4). The RCRA monitoring well network at the CRSDB includes one well (GW-159) located hydraulically upgradient (northwest) of the site and three POC wells (GW-156, GW-731, and GW-732) to the east-southeast (hydraulically downgradient) of the site (Figure A.6). Two upgradient/background wells (GW-142 and GW-231) and three downgradient POC wells (GW-143, GW-144, and GW-145) comprise the RCRA monitoring well network at Kerr Hollow Quarry (Figure A.6).

Samples were collected from six monitoring wells, two springs, and two surface water stations for the specific purposes of CERCLA monitoring in the Chestnut Ridge Regime during CY 2002. The wells, located at the United Nuclear Corporation Site (Figure A.6), were sampled for CERCLA ROD monitoring purposes (Table B.4). Two surface water stations (MCK 2.0 and MCK 2.05) and one spring (SCR3.5 SP) located in McCoy Branch and one spring (SCR1.25SP) in the southwestern portion of the regime (Figure A.6) were sampled for CERCLA baseline monitoring purposes (Table B.4).

3.4 QUALITY ASSURANCE/QUALITY CONTROL SAMPLING

The following discussion pertains to the QA/QC sampling activities managed by the Y-12 GWPP during CY 2002. Comparable QA/QC protocols were performed by monitoring programs managed by BJC (BJC 1999, Duratek Federal Services 2002). As shown below in Table 4, the QA/QC samples associated with the groundwater and surface water sampling performed under the Y-12 GWPP during CY 2002 include a total of 90 trip blanks, 54 method (laboratory) blanks, four field blanks, three equipment rinsate samples, and 22 duplicate groundwater and surface water samples.

Table 4. QA/QC samples analyzed in CY 2002 for the Y-12 GWPP

Sample Type	Total Number of Samples per Quarter of CY 2002				Annual Total
	First	Second	Third	Fourth	
Trip Blank Samples	28	17	28	17	90
Method Blank Samples	17	11	15	11	54
Field Blank Samples	1	1	1	1	4
Equipment Rinsate Samples	1	0	1	1	3
Duplicate Groundwater/Surface Water Samples	7	4	7	4	22

The blanks and equipment rinsate samples were prepared and analyzed as specified in the *Quality Assurance Plan for the Analytical Chemistry Organization* (BWXT 2002a). Analytical results for the blank samples help assess the environmental conditions in the field and laboratory under which associated groundwater and surface water samples were collected, transported, stored, and analyzed. Trip blanks were samples of deionized water prepared in the laboratory and transported to the field and then to the laboratory in coolers containing groundwater and surface water samples. Field blanks were samples of deionized water that were transported to the field in a sealed glass container and transferred to sample bottles at monitoring wells GW-225 (first and third quarters) and GW-383 (second and fourth quarters) and then transported to the

laboratory in the cooler with other samples from the well. Method blanks were samples of deionized water that were analyzed along with one or more associated groundwater or surface water samples. Equipment rinsates were samples of the deionized water from the final rinse of the decontaminated portable sampling equipment after sampling was completed at Westbay well GW-722 (first and third quarters) and at well GW-689 (fourth quarter).

Method blanks, trip blanks, field blanks, and equipment rinsate samples were analyzed for volatile organic compounds (VOCs); equipment rinsates also were analyzed for miscellaneous analytes (e.g., suspended solids), major ions, trace metals, and radioanalytes. Analytical results for the QA/QC blanks and equipment rinsate samples are summarized in Appendix G.

A total of 22 field duplicate samples were collected for QA/QC purposes from sampling locations monitored under management of the Y-12 GWPP during CY 2002. These sampling locations include eight wells, one surface water station, and one spring in the Bear Creek Regime (Table B.2); six wells and one surface water station in the East Fork Regime and two surface water stations located north of Pine Ridge (Table B.3); and two surface water stations in the Chestnut Ridge Regime (Table B.4). The duplicate samples were analyzed for the same constituents and parameters specified for the sampling location from which they were collected; analytical results are presented with the regular sample results in Appendices D, E, and F.

4.0 SAMPLE COLLECTION AND HANDLING

The following discussion pertains to the groundwater and surface water sampling activities managed by the Y-12 GWPP during CY 2002. Personnel from the Sampling and Environmental Support Department of the Y-12 Analytical Chemistry Organization (ACO) were responsible for collection, transportation, and chain-of-custody control of the groundwater and surface water samples. Sampling was performed in accordance with the most recent version of the technical procedures approved by the Y-12 GWPP Manager (Lockheed Martin Energy Systems, Inc. [LMES] 1999a and BWXT 2000a). All samples were collected in appropriate containers, preserved as required, labeled, logged, placed in ice-filled coolers, and transported to the designated ACO laboratory in accordance with chain-of-custody control requirements. Similar protocols were followed under the monitoring programs managed by BJC during CY 2002.

Unfiltered samples were collected from the monitoring wells, springs, and surface water stations in each hydrogeologic regime during CY 2002. Groundwater samples were obtained from most monitoring wells with dedicated bladder pumps (Well Wizard™). However, samples were obtained from three wells in the East Fork Regime (GW-686, GW-687, and GW-689) with a portable Bennett pump and from one well equipped with a dedicated Westbay™ multi-port sampling apparatus (Westbay well GW-722).

Samples were collected from the wells equipped with dedicated bladder pumps using the low-flow minimal drawdown sampling method. Under this method, representative groundwater samples are obtained from discrete depth intervals without including stagnant water in the well casing. The well is pumped at a flow rate which is low enough (<300 milliliters per minute) to minimize drawdown of the water level in the well (<0.1 ft per quarter-hour). At five-minute intervals after the water-level drawdown has stabilized, field personnel record measurements of the pH, conductivity, temperature, oxidation-reduction potential (REDOX), and dissolved oxygen of the groundwater pumped from the well. Samples of the groundwater in the well are collected once the field measurements for each parameter show minimal variation over four consecutive readings.

Samples were collected from wells GW-686, GW-687, and GW-689 (with a portable Bennett pump) using the “conventional” sampling method, which was used to collect groundwater samples before the Y-12 GWPP began using the low-flow sampling method (October 1997). The conventional sampling method involves purging at least three well volumes of groundwater (or until the well is dry) at a much higher pumping rate (1.0 - 1.8 gallons per minute) before collecting samples.

Groundwater samples were collected from Westbay well GW-722 in accordance with the most recent and approved version of the operating procedures for the multi-port sampling equipment (BWXT 2002b and 2002c). One or more 250-milliliter non-vented stainless steel sample collection bottles were used to obtain groundwater samples from the sampling ports. The sample collection bottles were lowered to the designated sampling port, the sampling port valve was opened, and the bottles were allowed to fill with groundwater. The filled bottles were retrieved to the surface and the contents were poured into the appropriate laboratory sample bottle(s). The sample collection bottles were lowered, filled, and retrieved as many times as needed to completely fill the laboratory sample bottles. Groundwater in the first sample collection bottle retrieved from each sampling port was used as a “formation rinse” to obtain field measurements and to condition the sample collection bottle.

5.0 FIELD MEASUREMENTS AND LABORATORY ANALYTES

The following discussion pertains to the field measurements and laboratory analytes associated with the CY 2002 groundwater and surface water sampling activities in the Bear Creek, East Fork, and Chestnut Ridge hydrogeologic regimes that were performed by the Y-12 GWPP. Functionally equivalent field measurements and laboratory analyses were performed under the monitoring programs managed by BJC during CY 2002 (BJC 2001, BJC 2002a, and Duratek Federal Services 2002).

Field personnel measured the depth to the static water surface before sampling groundwater in each monitoring well, and recorded field measurements of pH, temperature, conductivity, dissolved oxygen, and REDOX for each groundwater and surface water sampling location (Table B.5). Note that the depth to water and REDOX were not recorded for Westbay well GW-722 (not applicable when a well is equipped with a multiport sampling apparatus). Field measurements were obtained in accordance with the most recent and approved technical procedures (LMES 1999b, BWXT 2000b, and BWXT 2001b). The field measurements recorded for the sampling locations in each regime are presented in Appendices D.1, E.1, and F.1.

All of the CY 2002 groundwater samples and surface water samples were analyzed for: (1) miscellaneous laboratory analytes—pH, conductivity, turbidity, total suspended solids, and total dissolved solids; (2) major ions and trace metals; (3) VOCs; and (4) gross alpha and gross beta activity (Table B.5). Laboratory analyses of the samples were performed by the Y-12 ACO laboratories in accordance with the analytical methods and procedures listed in Table B.5. Analytical results are presented in Appendix D (Bear Creek Regime), Appendix E (East Fork Regime), and Appendix F (Chestnut Ridge Regime). Note that each data appendix contains the analytical results only for laboratory analytes that were detected in at least one sample from the CY 2002 sampling locations.

6.0 DATA MANAGEMENT AND DQO EVALUATION

The ACO laboratories provided electronic files and hardcopy printouts of the analytical results and field measurements for the groundwater and surface water samples collected during CY 2002 under management of the Y-12 GWPP. The GWPP groundwater database management subcontractor downloaded the electronic files directly into SAS® files and verified the data in accordance with the *Y-12 Plant Groundwater Protection Program Data Management Plan* (LMES 2000). Appropriate ACO staff and the groundwater database management subcontractor worked to resolve any incomplete data transfers, irregular parameter names or reporting units, and discrepancies between electronic and hardcopy versions of the data.

Analytical results and field measurements associated with monitoring programs managed by BJC (see Section 2) were extracted from the project database by the GWPP groundwater database management subcontractor and formatted as SAS® files for presentation in this report. The BJC data management process (BJC 2002b) is similar to the process described above for the Y-12 GWPP.

The CY 2002 groundwater and surface water monitoring data presented in this report have been evaluated with respect to the DQO criteria defined in the *Y-12 Plant Groundwater Protection Program Data Management Plan* (LMES 2000) and the functionally equivalent DQO criteria for the monitoring programs managed by BJC (BJC 2002b). Specific DQO criteria apply to analytical results for major ions, trace metals, VOCs, radiological analytes (gross alpha, gross beta, and radionuclides), and miscellaneous laboratory analytes (e.g., total suspended solids). Only a few of the monitoring results (three charge balances and three sets of duplicate lead results) obtained under the Y-12 GWPP do not meet applicable DQOs; these results are flagged with an “R” qualifier in the applicable data appendices (Appendix D.1 and Appendix E.1).

7.0 GROUNDWATER ELEVATION MONITORING

As shown below in Table 5, respective networks of selected monitoring wells in the Bear Creek, East Fork, and Chestnut Ridge hydrogeologic regimes were used to monitor representative seasonal groundwater elevations during CY 2002.

Table 5. Summary of CY 2002 groundwater elevation monitoring in the Bear Creek, East Fork, and Chestnut Ridge Regimes

REGIME	DEPTH-TO-WATER MEASUREMENTS				GROUNDWATER ELEVATIONS	
	Seasonally High Flow		Seasonally Low Flow			
	No. of Wells	Dates	No. of Wells	Dates	Data	Contour Map
Bear Creek	64	April 8-12, 2002	56	September 17-30, 2002	Table B.6	Figure A.7
East Fork	61	April 8-11, 2002	58	September 18-26, 2002	Table B.7	Figure A.8
Chestnut Ridge	77	April 8-10, 2002	74	September 17-26, 2002	Table B.8	Figure A.9

Field personnel with the Y-12 GWPP measured the depth to the static water surface in each well during seasonally high flow conditions (April 2002) and field personnel subcontracted by the WRRP measured the depth to the static water surface in each well during seasonally low flow conditions (September 2002). These depth-to-water measurements were performed in accordance with the respective operating procedures for the Y-12 GWPP (LMES 1999b) and the WRRP (MDM Services Corporation 2000).

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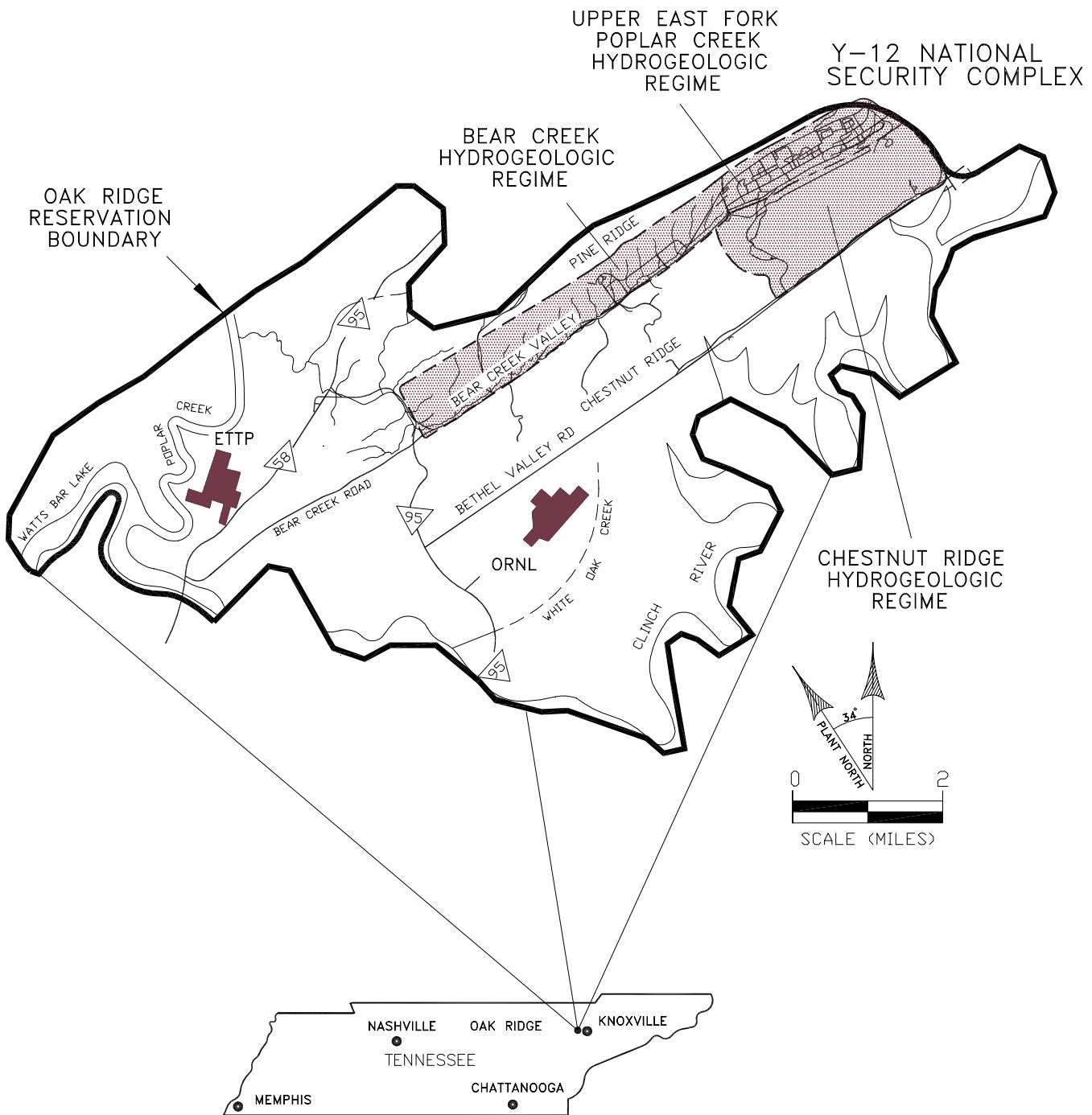
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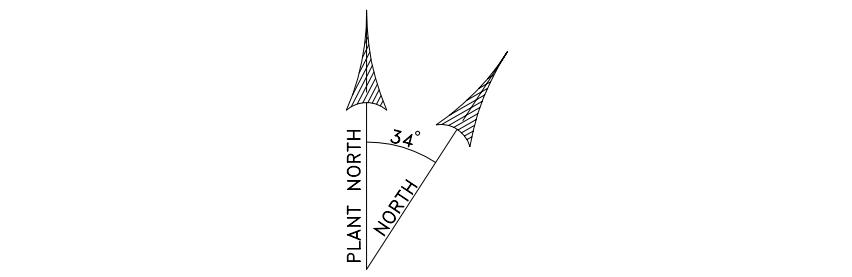
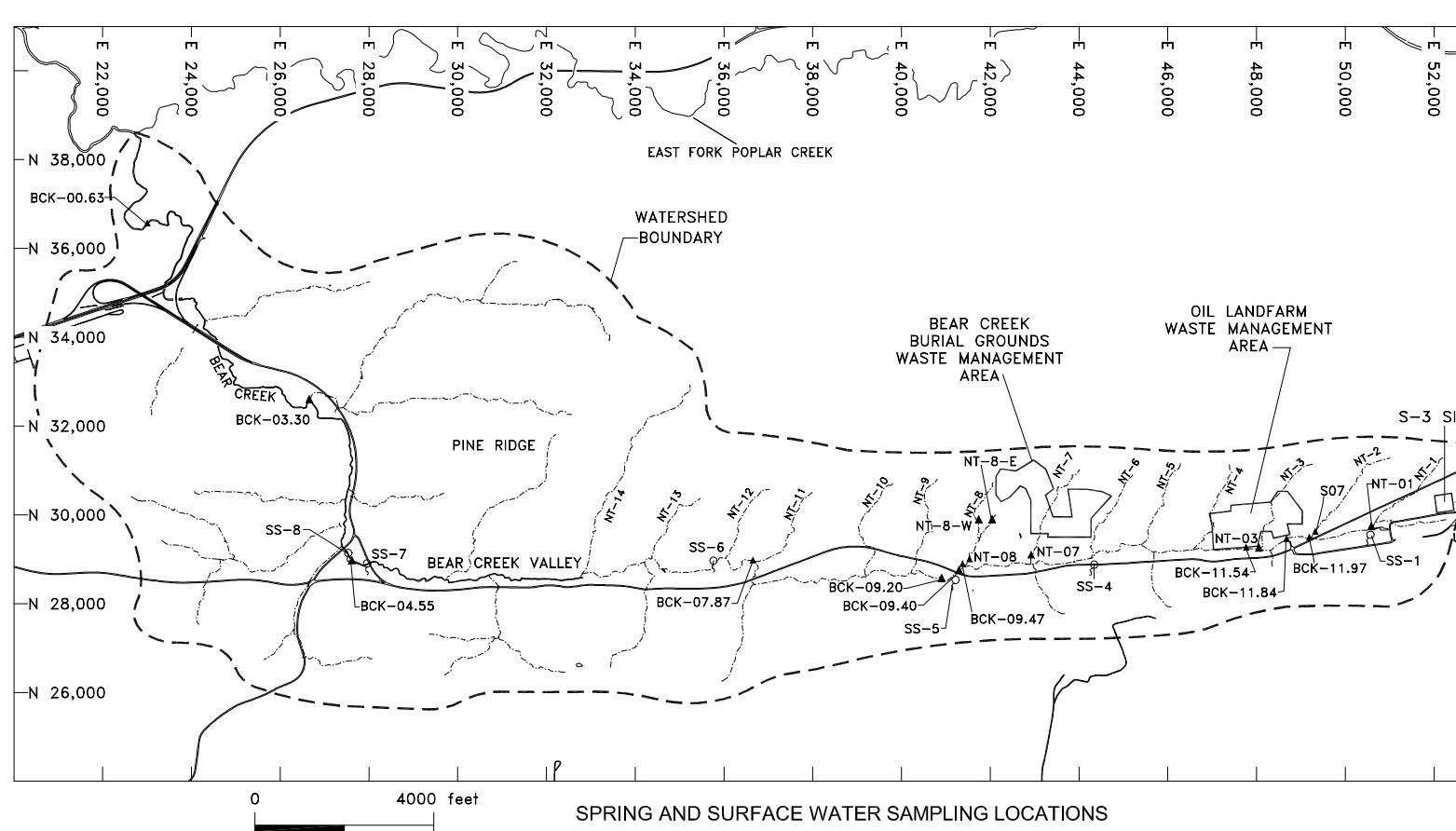
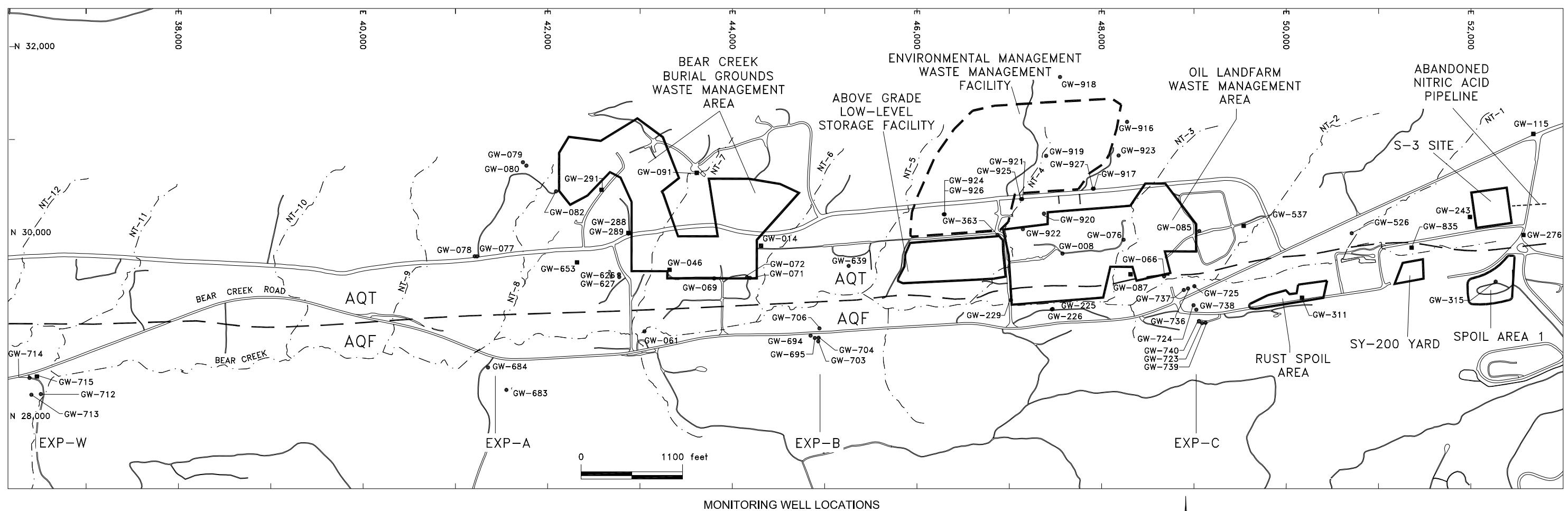
APPENDIX A

FIGURES



GWMR02_01.DWG 01/27/03

Fig. A.1. Hydrogeologic regimes at the Y-12 National Security Complex.



- — Water Table Monitoring Well
- — Bedrock Monitoring Well
- ▲ — Surface Water Sampling Station
- — Spring Sampling Station
- EXP-C — Exit Pathway, Maynardville Limestone Picket
- Surface Drainage Feature
- NT-5 — North Tributary
- AQT — Aquitard
- AQF — Aquifer

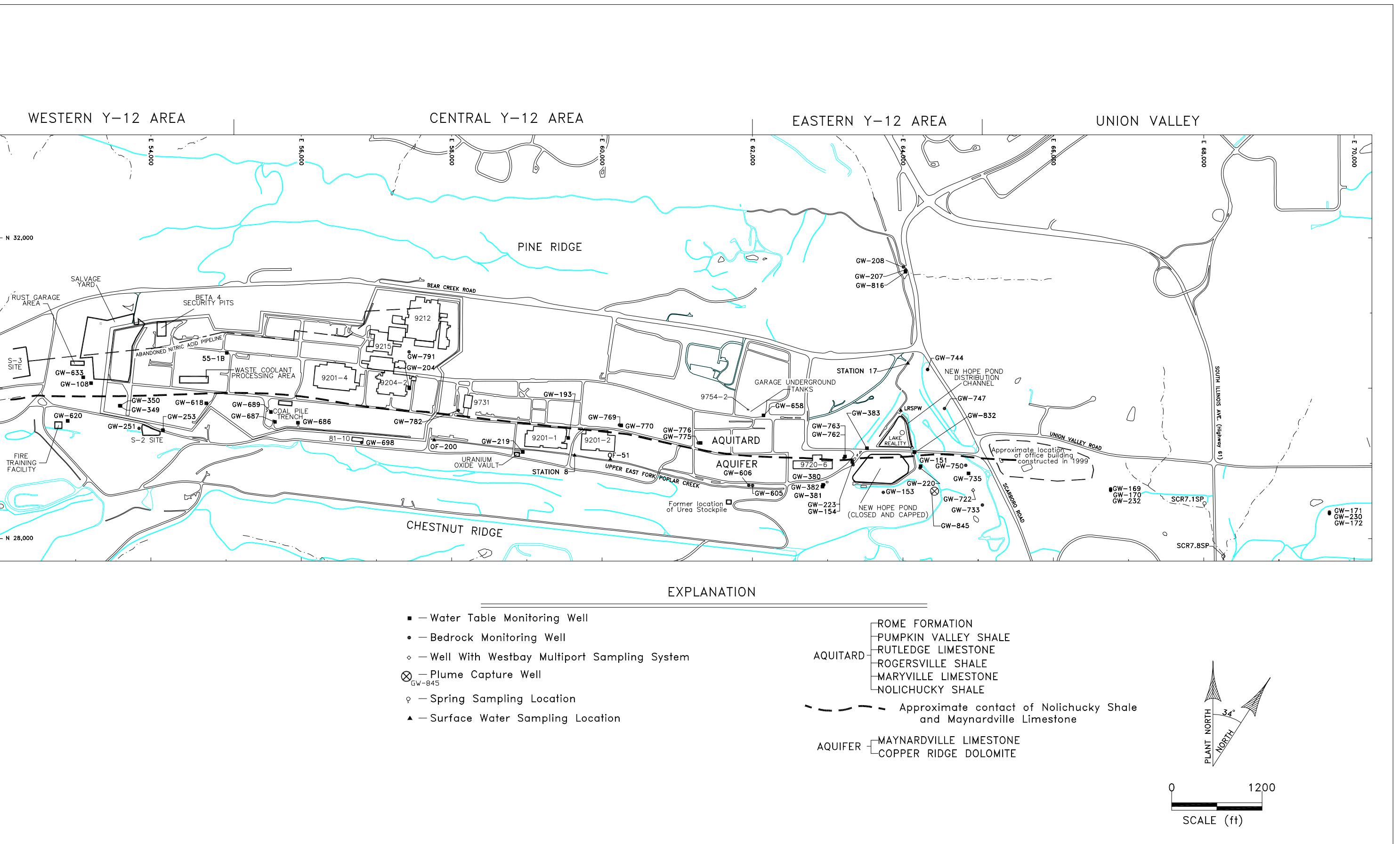
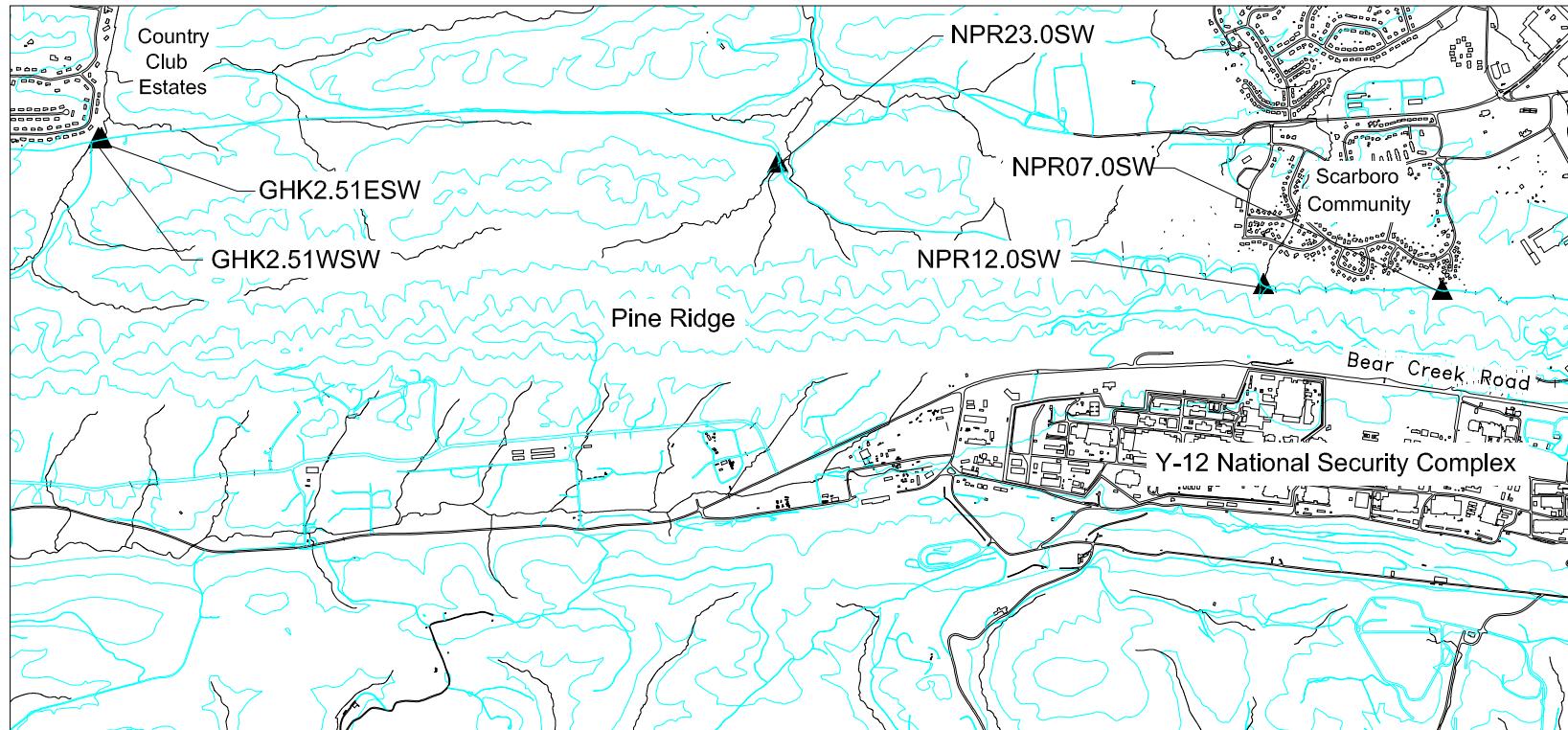


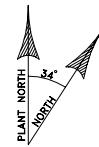
Fig. A.4. CY 2002 surface water sampling locations north of Pine Ridge.

A-4



EXPLANATION

▲ Surface Water Sampling Location



0 2500
SCALE (ft)

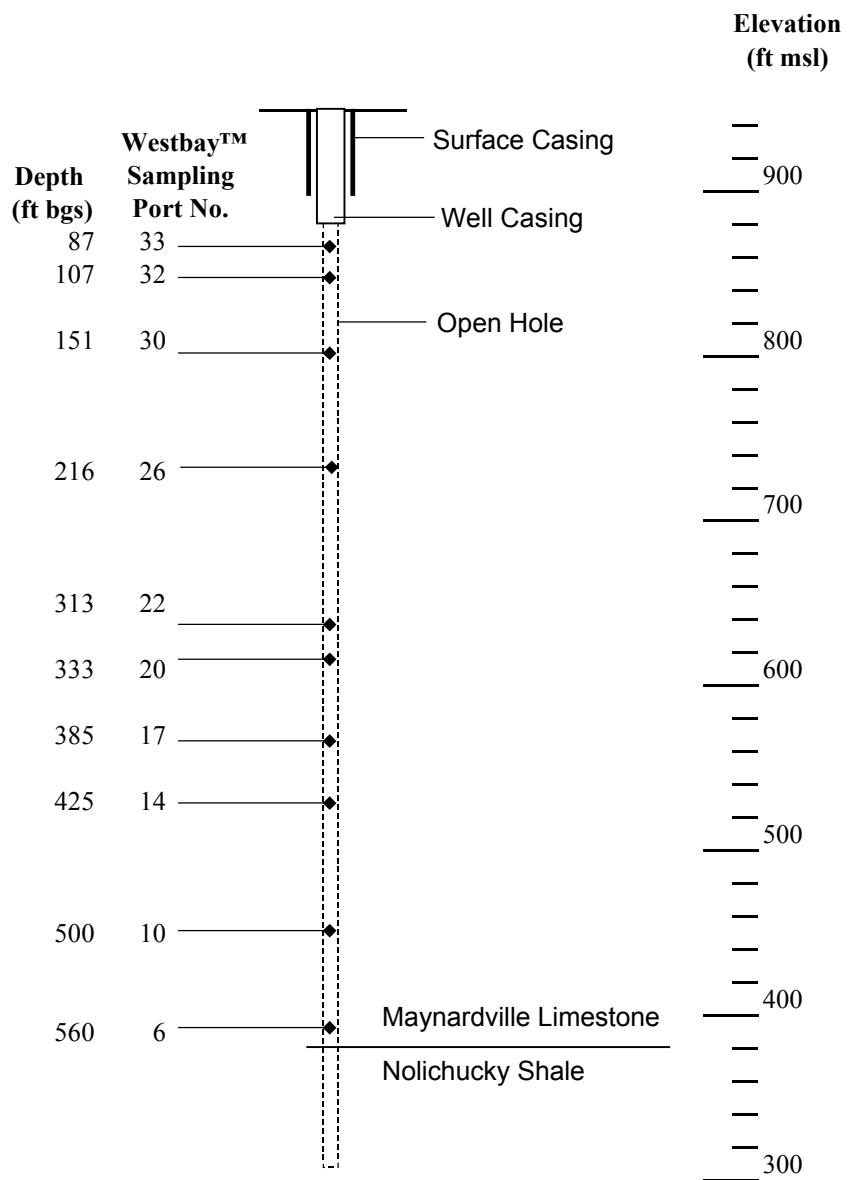
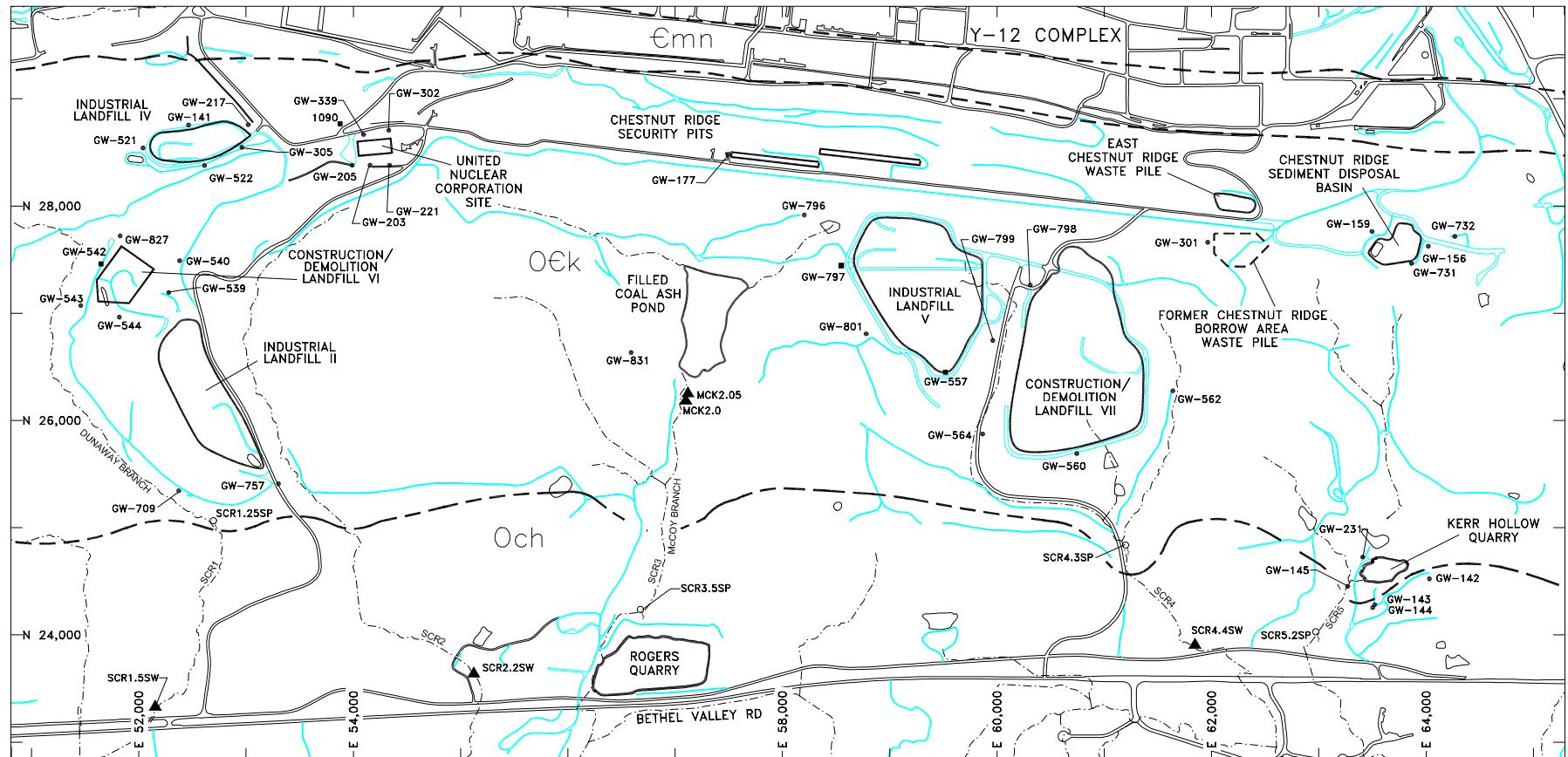


Fig. A.5. Westbay™ monitoring system sampling port depths in well GW-722.

Fig. A.6. CY 2002 sampling locations in the Chestnut Ridge Hydrogeologic Regime.

A-6

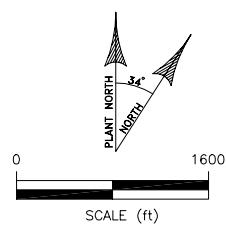
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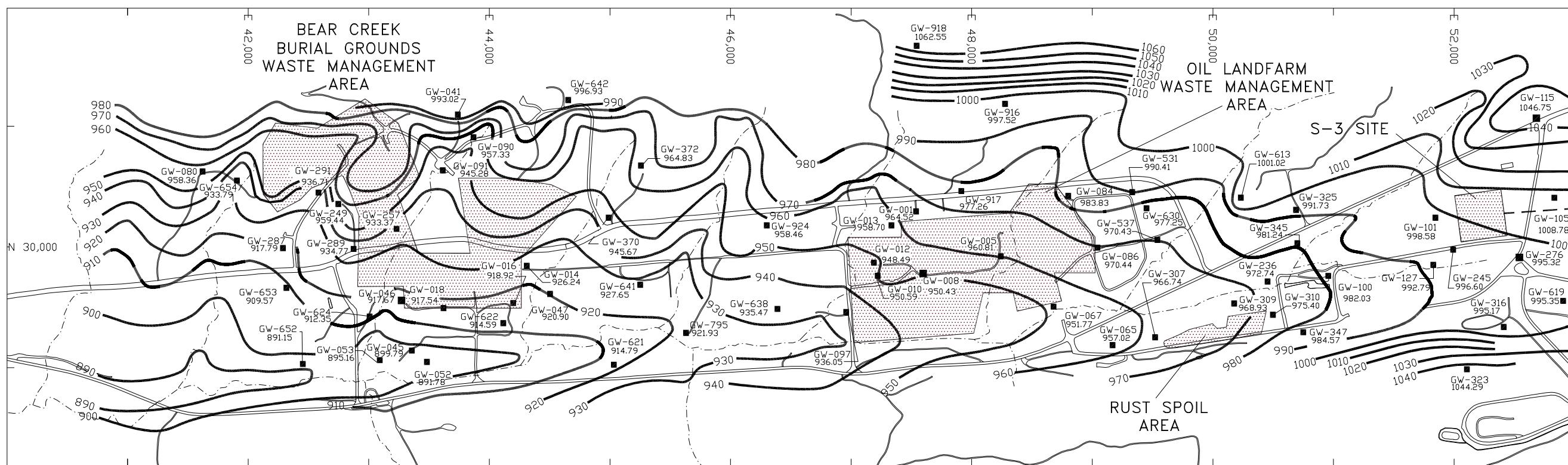


EXPLANATION

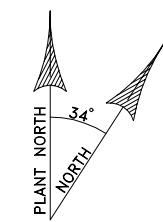
- — WATER TABLE MONITORING WELL
 - — BEDROCK MONITORING WELL
 - ◊ — SPRING SAMPLING LOCATION
 - ▲ — SURFACE WATER SAMPLING LOCATION

- - - - SURFACE DRAINAGE FEATURE
 ————— BOUNDARY OF SITE
 - - - - SURFACE GEOLOGIC CONTACT
 €mn — MAYNARDVILLE LIMESTONE
 ØCk — KNOX GROUP
 Och — CHICKAMAUGA GROUP

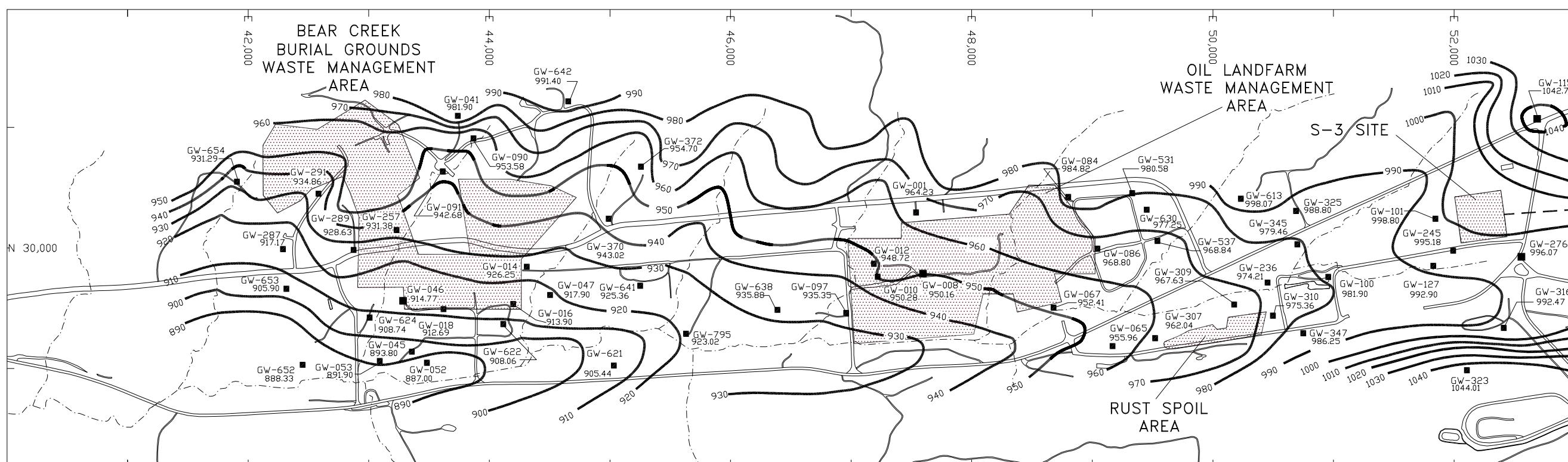




GROUNDWATER
ELEVATIONS
APRIL 8-12, 2002



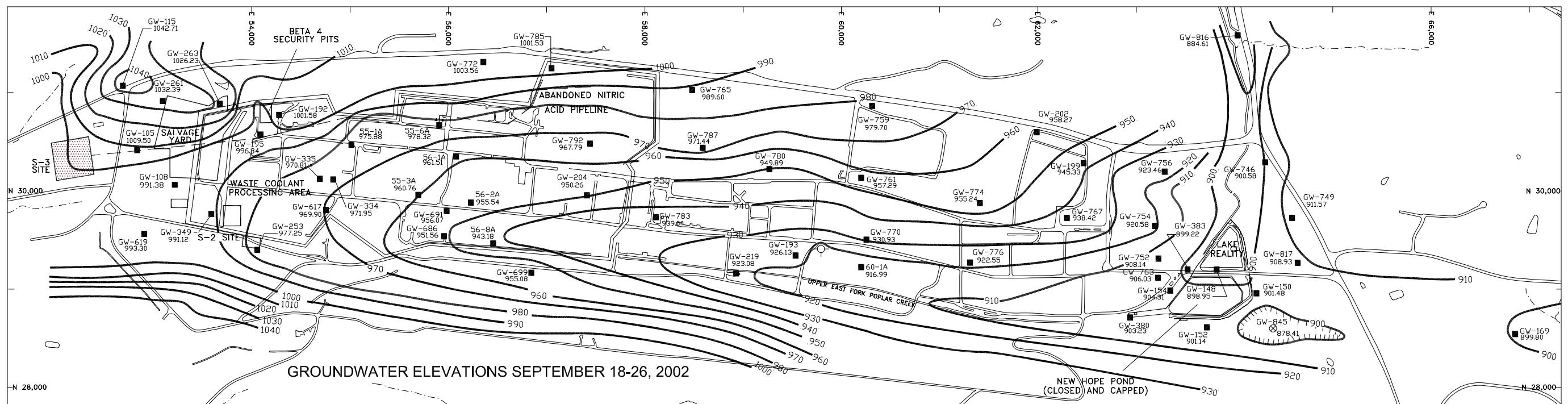
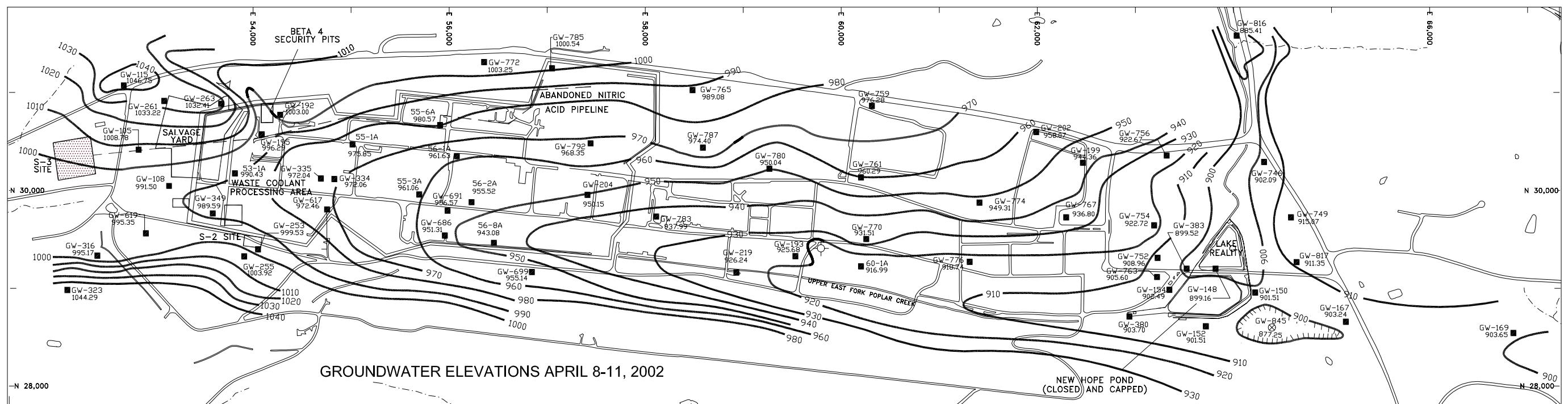
0
SCALE (ft)



GROUNDWATER
ELEVATIONS
SEPTEMBER
17-30, 2002

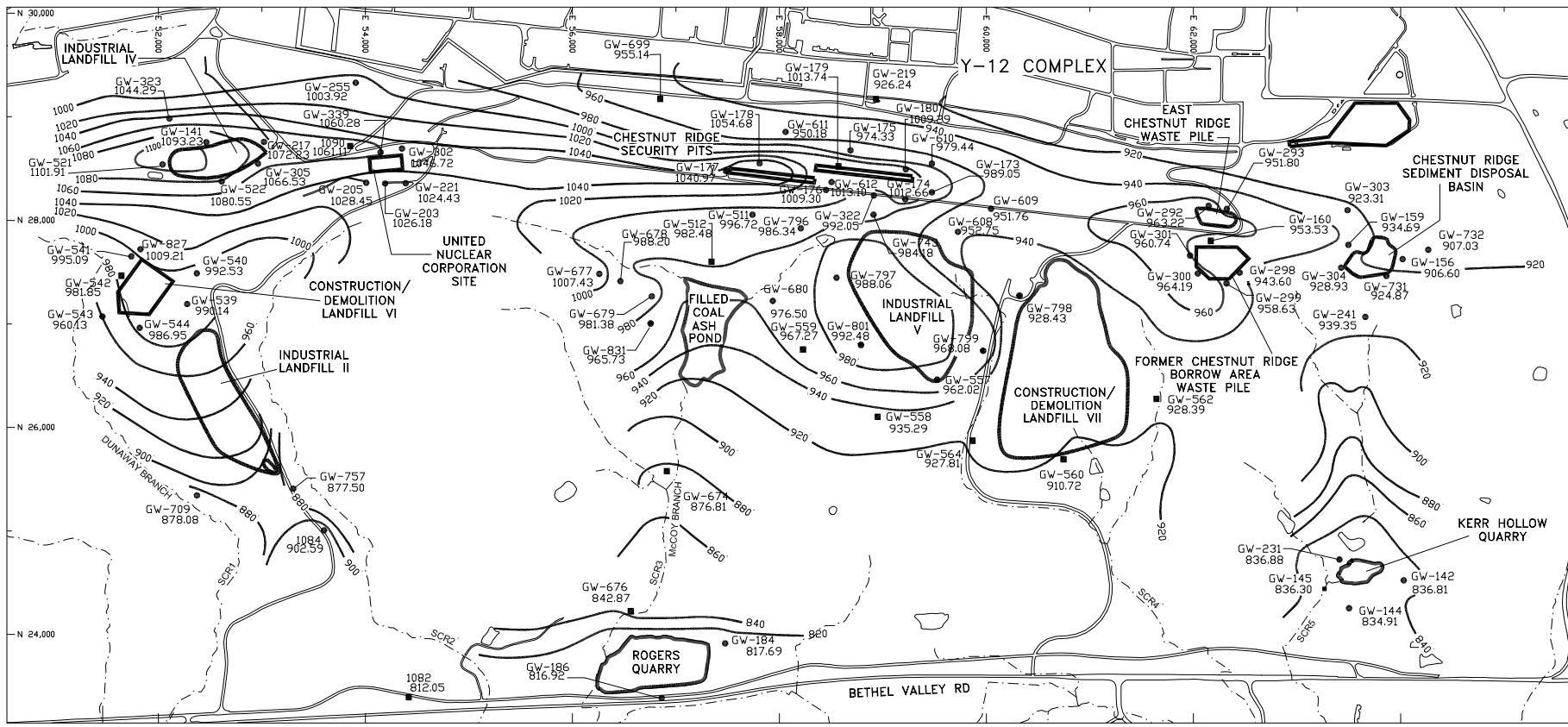
EXPLANATION

- WATER TABLE INTERVAL MONITORING WELL
- WATER-LEVEL ISOPLETH (ft msl)
- - - SURFACE DRAINAGE FEATURE

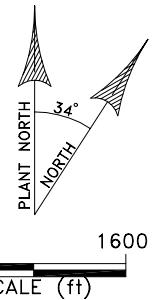


EXPLANATION

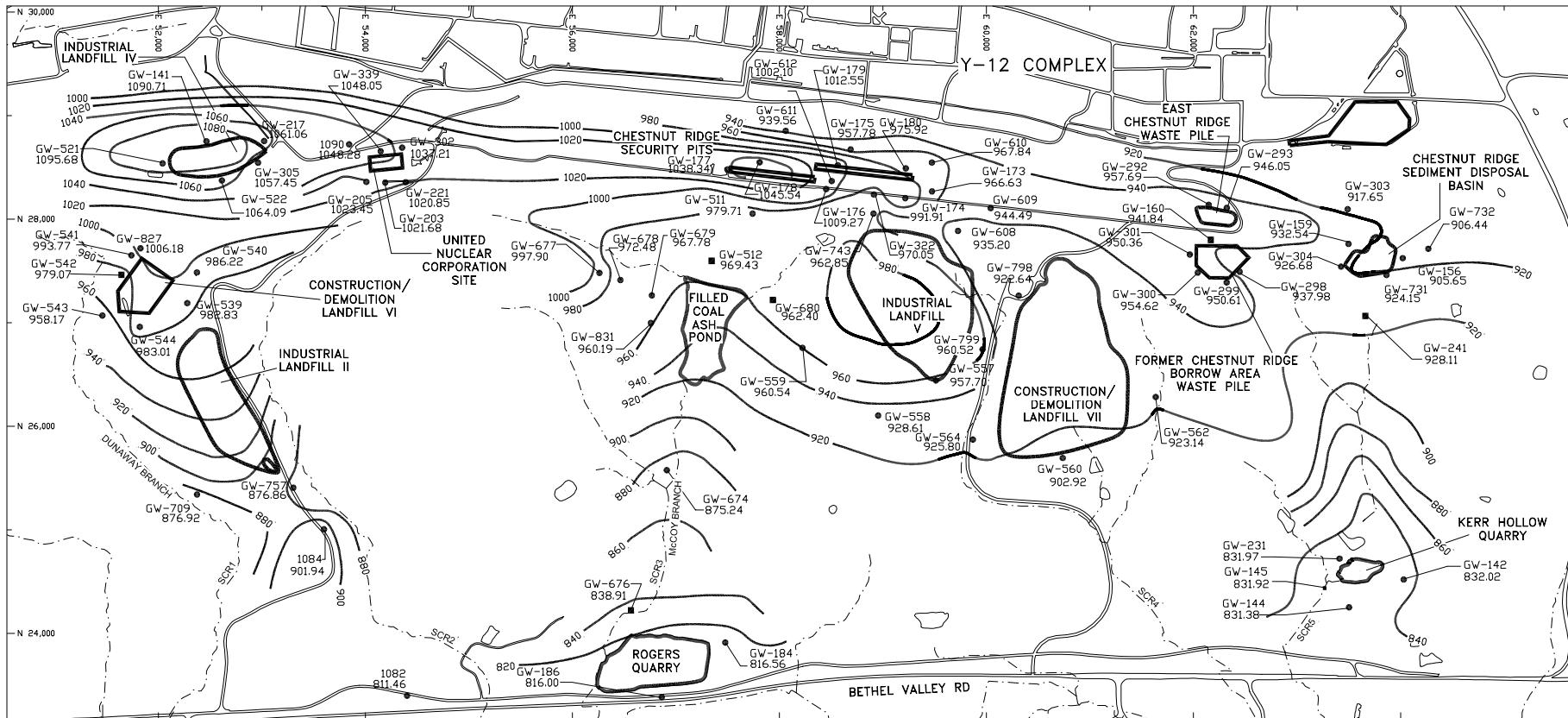
- — WATER TABLE INTERVAL MONITORING WELL
 - EXTRATION WELL AND APPROXIMATE ZONE OF INFLUENCE
 - APPROXIMATE WATER-LEVEL ISOPLETH (ft msl)
 - SURFACE DRAINAGE FEATURE
 - — BUILDING 9201-2 SUMP
- PLANT NORTH
NORTH
34°
- GW-845
- 0 1200
SCALE (ft)



GROUNDWATER ELEVATIONS
APRIL 8-10, 2002



0 1600
SCALE (ft)



GROUNDWATER ELEVATIONS
SEPTEMBER 17-26, 2002

EXPLANATION

- WATER TABLE INTERVAL MONITORING WELL
- BEDROCK INTERVAL MONITORING WELL

- 920 — WATER-LEVEL ISOPLETH (ft msl)
- - - SURFACE DRAINAGE FEATURE
- SPRING

APPENDIX B

TABLES

Table B.1. Summary of CY 2002 sampling and analysis plan addenda

Addendum No.	Effective Date	Modification to the CY 2002 Sampling and Analysis Plan ¹
2002-01	01/01/02	Removed well GW-688 (sample group EF-2) from CY 2002 monitoring schedules because the well was destroyed.
2002-02	01/01/02	Added Bottle Lists for STD, RAD(2,3) and STD, RAD(12) to Appendix C of the SAP.
2002-03	06/12/02	Resampled two wells (GW-763 and GW-381) in sample group EF-1 during the second quarter for volatile organics analyses.
2002-04	08/09/02	Removed wells GW-076 and GW-087 (sample group BC-5) from the third quarter sampling monitoring schedule because they were plugged and abandoned.
2002-05	11/14/02	Added wells GW-686, GW-687, and GW-689 to the fourth quarter monitoring schedule.

Note:

- 1 Modification to the *Y-12 Plant Groundwater Protection Program Groundwater and Surface Water Sampling and Analysis Plan for Calendar Year 2002* (BWXT 2001a).

**Table B.2. CY 2002 groundwater and surface water sampling dates
in the Bear Creek Hydrogeologic Regime**

BJC ¹		CERCLA ROD (!), Quarterly (Q), and Baseline (") Monitoring				RCRA Post-Closure Corrective Action Monitoring	
		DOE Order 5400.1 Exit Pathway/Perimeter Monitoring					
GWPP ²		DOE Order 5400.1 Surveillance Monitoring					
		CY 2002 Sampling Date ⁵					
Sampling Point ³	Sampling Location ⁴	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter		
BCK-00.63	EXP-SW	01/08/02	.	07/10/02	.	!	
BCK-03.30	EXP-SW	03/12/02	.	09/09/02	.		!
BCK-04.55	EXP-SW	01/09/02	.	07/10/02	.	!	
BCK-07.87	EXP-SW	01/08/02	.	07/10/02	.	!	
BCK-09.20	EXP-SW	03/11/02	.	09/09/02	.		!
BCK-09.40	EXP-SW	01/09/02	.	07/11/02 D	.	!	
BCK-09.47	EXP-SW	03/11/02	.	Dry	.		!
BCK-11.54	EXP-SW	03/11/02	.	09/09/02	.		!
BCK-11.84	EXP-SW	03/11/02	.	Dry	.		!
BCK-11.97	EXP-SW	01/09/02	.	07/11/02	.	!	
GW-008	OLF	01/07/02	.	07/02/02	.		!
GW-014	BG	03/14/02 D	.	08/12/02	.	!	
GW-046	BG	01/07/02	.	07/02/02	.		!
GW-061	BG	03/12/02	.	08/05/02	.	!	
GW-066	OLF	03/25/02	.	08/13/02 D	.	!	
GW-069	BG	03/11/02	.	08/05/02	.	!	
GW-071	BG	03/12/02	.	08/06/02 D	.	!	
GW-072	BG	03/11/02	.	08/06/02	.	!	
GW-076	OLF	03/19/02	.	.	.	!	
GW-077	BG	02/26/02	.	08/08/02	.		!
GW-078	BG	02/26/02	.	08/08/02	.		!
GW-079	BG	02/26/02 D	.	08/07/02 D	.	!	
GW-080	BG	02/26/02	.	08/07/02	.		!
GW-082	BG	02/12/02	.	07/29/02	.	!	
GW-085	OLF	02/18/02	.	07/31/02	.	!	
GW-087	OLF	03/25/02	.	.	.	!	
GW-091	BG	03/14/02	.	08/08/02	.	!	
GW-115	S3	01/07/02	.	07/08/02	.		!
GW-225	OLF	02/19/02	.	08/01/02	.	!	
GW-226	OLF	02/19/02	.	08/01/02	.	!	
GW-229	OLF	03/19/02 D	.	08/12/02	.	!	
GW-243	S3	03/21/02	.	08/13/02	.	!	
GW-276	S3	01/07/02	.	07/08/02	.		!
GW-288	BG	03/13/02	.	08/07/02	.	!	

Table B.2 (continued)

BJC ¹		CERCLA ROD (!), Quarterly (Q), and Baseline (") Monitoring					
		RCRA Post-Closure Corrective Action Monitoring					
GWPP ²		DOE Order 5400.1 Exit Pathway/Perimeter Monitoring					
		DOE Order 5400.1 Surveillance Monitoring					
Sampling Point ³	Sampling Location ⁴	CY 2002 Sampling Date ⁵					
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter		
GW-289	BG	03/13/02	.	08/08/02	.	!	
GW-291	BG	03/14/02	.	08/07/02	.	!	
GW-311	RS	02/13/02 D	.	07/30/02	.	!	
GW-315	SPI	02/13/02	.	07/30/02	.	!	
GW-363	EMWMF	.	.	08/14/02	12/04/02		Q
GW-526	S3	02/26/02	.	08/08/02	.		!
GW-537	OLF	02/18/02	.	07/31/02 D	.	!	
GW-626	BG	02/11/02	.	07/25/02	.	!	
GW-627	BG	02/11/02	.	07/29/02	.	!	
GW-639	EMWMF	.	.	08/14/02	12/04/02		Q
GW-653	BG	02/12/02	.	07/25/02	.	!	
GW-683	EXP-A	01/14/02	.	07/09/02	.	!	
GW-684	EXP-A	01/14/02	.	07/09/02 D	.	!	
GW-694	EXP-B	01/29/02	.	07/17/02	.	!	
GW-695	EXP-B	01/15/02	.	07/15/02	.	!	
GW-703	EXP-B	01/15/02	.	07/15/02	.	!	
GW-704	EXP-B	01/16/02 D	.	07/16/02	.	!	
GW-706	EXP-B	01/16/02	.	07/16/02	.	!	
GW-712	EXP-W	01/03/02	.	07/01/02	.		!
GW-713	EXP-W	01/03/02	.	07/01/02	.		!
GW-714	EXP-W	01/02/02	.	07/01/02	.		!
GW-715	EXP-W	01/02/02 D	.	07/01/02 D	.	!	
GW-723	EXP-C	03/05/02	.	07/23/02	.	!	
GW-724	EXP-C	01/30/02	.	07/23/02	.	!	
GW-725	EXP-C	01/31/02	.	07/18/02	.	!	
GW-736	EXP-C	03/06/02	.	07/17/02	.	!	
GW-737	EXP-C	03/06/02	.	07/18/02	.	!	
GW-738	EXP-C	01/30/02	.	07/23/02	.	!	
GW-739	EXP-C	03/05/02	.	07/22/02	.	!	
GW-740	EXP-C	01/29/02	.	07/22/02	.	!	
GW-835	S3	03/04/02	05/20/02	08/22/02	11/19/02		!
GW-916	EMWMF	.	.	08/15/02	12/10/02		Q
GW-917	EMWMF	.	.	08/12/02	12/05/02		Q
GW-918	EMWMF	.	.	08/15/02	12/10/02		Q

Table B.2 (continued)

BJC ¹		CERCLA ROD (!), Quarterly (Q), and Baseline (") Monitoring					
		RCRA Post-Closure Corrective Action Monitoring					
GWPP ²		DOE Order 5400.1 Exit Pathway/Perimeter Monitoring					
		DOE Order 5400.1 Surveillance Monitoring					
Sampling Point ³	Sampling Location ⁴	CY 2002 Sampling Date ⁵					
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter		
GW-919	EMWMF	.	.	08/14/02	12/09/02		Q
GW-920	EMWMF	.	.	08/13/02	12/05/02		Q
GW-921	EMWMF	.	.	08/12/02	12/04/02		Q
GW-922	EMWMF	.	.	08/13/02	12/09/02		Q
GW-923	EMWMF	.	.	08/14/02	12/09/02		Q
GW-924	EMWMF	.	.	08/13/02 D	12/10/02 D		Q
GW-925	EMWMF	.	.	08/12/02	12/04/02		Q
GW-926	EMWMF	.	.	08/13/02	12/10/02		Q
GW-927	EMWMF	.	.	08/12/02	12/05/02		Q
NT-01	EXP-SW	01/09/02	.	07/11/02	.	!	
NT-3	EXP-SW	03/11/02	.	Dry	.		!
NT-7	EXP-SW	03/13/02	.	Dry	.		"
NT-8	EXP-SW	03/13/02	.	Dry	.		"
NT-8-E	EXP-SW	03/13/02	.	Dry	.		"
NT-8-W	EXP-SW	03/13/02	.	Dry	.		"
S07(NT-02)	EXP-SW	03/11/02	.	Dry	.		!
SS-1	EXP-SW	01/09/02	.	07/15/02	.	!	
SS-4	EXP-SW	01/08/02	.	07/10/02	.	!	
SS-5	EXP-SW	01/08/02 D	.	07/10/02	.	!	
SS-6	EXP-SW	01/08/02	.	07/10/02	.		!
SS-7	EXP-SW	03/12/02	.	Dry	.		!
SS-8	EXP-SW	03/12/02 D	.	09/09/02 D	.		!

Notes:

- 1 Groundwater and surface water sampling performed for monitoring programs managed by Bechtel Jacobs Company LLC (BJC).
- 2 Groundwater and surface water sampling performed for the Y-12 Groundwater Protection Program (GWPP), managed by BWXT Y-12, L.L.C.
- 3
 - BCK - Bear Creek Kilometer
 - GW - Groundwater Monitoring Well
 - NT - Northern Tributary (to Bear Creek)
 - S07 - Surface water location in NT-2
 - SS - Spring sampling location (south side of Bear Creek)

Table B.2 (continued)

Notes: (continued)

- | | | | |
|---|--------|---|---|
| 4 | BG | - | Bear Creek Burial Grounds Waste Management Area |
| | EMWMF | - | Environmental Management Waste Management Facility |
| | EXP-A | - | Exit Pathway (Maynardville Limestone) Picket A |
| | EXP-B | - | Exit Pathway Picket B |
| | EXP-C | - | Exit Pathway Picket C |
| | EXP-W | - | Exit Pathway Picket W |
| | EXP-SW | - | Exit Pathway (Bear Creek) Surface Water |
| | OLF | - | Oil Landfarm Waste Management Area |
| | RS | - | Rust Spoil Area |
| | SPI | - | Spoil Area I |
| | S3 | - | S-3 Site |
| 5 | . | - | Not sampled |
| | D | - | Duplicate sample collected on specified date (shown in bold typeface) |

**Table B.3. CY 2002 groundwater and surface water sampling dates in the
Upper East Fork Poplar Creek Hydrogeologic Regime**

BJC ¹		CERCLA ROD (!) and Baseline ("') Monitoring				
		RCRA Post-Closure Corrective Action Monitoring				
GWPP ²		DOE Order 5400.1 Exit Pathway/Perimeter Monitoring				
		DOE Order 5400.1 Surveillance Monitoring				
Sampling Point ³	Sampling Location ⁴	CY 2002 Sampling Date ⁵				
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
55-1B	GRIDB2	.	04/17/02 D	.	10/14/02	!
GHK2.51ESW	EXP-NPR	.	05/15/02	.	10/29/02	!
GHK2.51WSW	EXP-NPR	.	05/15/02	.	10/29/02 D	!
GW-108	S3	01/08/02	.	07/09/02	.	!
GW-151	NHP	01/30/02	.	08/05/02	.	!
GW-153	NHP	.	04/25/02	.	10/21/02	!
GW-154	NHP	01/30/02	.	08/05/02	.	!
GW-169	EXP-UV	02/04/02	05/13/02	08/06/02	11/11/02	!
GW-170	EXP-UV	02/04/02 D	05/14/02 D	08/06/02 D	11/11/02 D	!
GW-171	EXP-UV	02/05/02	.	08/07/02	.	!
GW-172	EXP-UV	02/05/02	.	08/07/02	.	!
GW-193	T2331	01/08/02	.	07/09/02	.	!
GW-204	T0134	.	05/02/02	.	11/06/02	!
GW-207	EXP-SR	.	05/08/02	.	11/19/02 D	!
GW-208	EXP-SR	.	05/08/02	.	11/19/02	!
GW-219	UOV	.	05/06/02	.	11/07/02 D	!
GW-220	NHP	.	05/14/02	.	11/21/02	!
GW-223	NHP	01/31/02	.	08/05/02	.	!
GW-230	EXP-UV	02/05/02	.	08/07/02	.	!
GW-232	EXP-UV	02/04/02	05/13/02	08/06/02	11/11/02	!
GW-251	S2	.	04/18/02	.	.	!
GW-253	S2	.	05/07/02	.	11/07/02	"
GW-349	S2	.	04/16/02	.	10/14/02	!
GW-350	S2	.	04/16/02	.	10/15/02 D	!
GW-380	NHP	02/04/02	.	08/05/02	.	!
GW-381	NHP	.	04/24/02 *	.	10/22/02	!
GW-382	NHP	02/04/02	.	08/06/02	.	!
GW-383	NHP	.	04/25/02	.	10/22/02	!
GW-605	EXP-I	01/08/02 D	.	07/08/02 D	.	!
GW-606	EXP-I	01/08/02	.	07/08/02	.	!
GW-618	EXP-E	.	05/09/02	.	11/07/02	"
GW-620	FTF	.	04/23/02	.	10/15/02	!
GW-633	RG	.	04/23/02	.	10/17/02	!
GW-658	FF	.	04/24/02	.	10/17/02	!
GW-686	CPT	.	.	.	11/14/02 C	!
GW-687	CPT	.	.	.	11/14/02 C	!

Table B.3 (continued)

BJC ¹		CERCLA ROD (!) and Baseline ("") Monitoring				
		RCRA Post-Closure Corrective Action Monitoring				
GWPP ²		DOE Order 5400.1 Exit Pathway/Perimeter Monitoring				
		DOE Order 5400.1 Surveillance Monitoring				
Sampling Point ³	Sampling Location ⁴	CY 2002 Sampling Date ⁵				
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
GW-689	CPT	.	.	.	11/14/02 C	!
GW-698	B8110	.	05/02/02 D	.	11/07/02	!
GW-722-06	EXP-J	02/04/02	.	07/15/02	.	!
GW-722-06	EXP-J	.	05/23/02	.	11/07/02	!
GW-722-10	EXP-J	02/06/02	.	07/16/02	.	!
GW-722-10	EXP-J	.	05/29/02	.	11/12/02	!
GW-722-14	EXP-J	02/08/02	.	07/17/02	.	!
GW-722-14	EXP-J	.	05/30/02	.	11/13/02	!
GW-722-17	EXP-J	02/08/02	.	07/17/02	.	!
GW-722-17	EXP-J	.	06/03/02	.	11/13/02	!
GW-722-20	EXP-J	.	.	07/17/02 D	.	!
GW-722-20	EXP-J	.	05/30/02	.	11/12/02	!
GW-722-22	EXP-J	02/07/02 D	.	.	.	!
GW-722-22	EXP-J	.	05/30/02	.	11/12/02	!
GW-722-26	EXP-J	02/05/02	.	07/15/02	.	!
GW-722-26	EXP-J	.	05/28/02 D	.	11/11/02 D	!
GW-722-30	EXP-J	02/05/02	.	07/15/02	.	!
GW-722-30	EXP-J	.	05/28/02	.	11/11/02	!
GW-722-32	EXP-J	02/05/02	.	07/15/02	.	!
GW-722-32	EXP-J	.	05/28/02	.	11/12/02	!
GW-722-33	EXP-J	02/06/02	.	07/16/02	.	!
GW-722-33	EXP-J	.	05/29/02	.	11/12/02	!
GW-733	EXP-J	01/08/02	.	07/09/02	.	!
GW-735	EXP-J	.	05/14/02	.	11/21/02	!
GW-744	GRIDK1	.	05/07/02	.	11/18/02	!
GW-747	GRIDK2	.	05/09/02	.	11/20/02	!
GW-750	EXP-J	.	05/05/02	.	11/20/02	!
GW-762	GRIDJ3	01/31/02 D	.	07/31/02 D	.	!
GW-763	GRIDJ3	.	04/18/02 *	.	10/21/02	!
GW-769	GRIDG3	.	04/29/02	.	10/30/02	!
GW-770	GRIDG3	.	04/29/02	.	10/30/02	!
GW-775	GRIDH3	.	04/30/02	.	10/31/02	!
GW-776	GRIDH3	.	04/30/02	.	10/31/02	!
GW-782	GRIDE3	.	05/01/02	.	11/04/02	!
GW-791	GRIDD2	.	05/01/02	.	11/06/02	!
GW-816	EXP-SR	.	05/07/02	.	11/18/02	!
GW-832	NHP	01/31/02	.	08/05/02	.	!

Table B.3 (continued)

BJC ¹		CERCLA ROD (!) and Baseline ("") Monitoring				
		RCRA Post-Closure Corrective Action Monitoring				
GWPP ²		DOE Order 5400.1 Exit Pathway/Perimeter Monitoring				
		DOE Order 5400.1 Surveillance Monitoring				
Sampling Point ³	Sampling Location ⁴	CY 2002 Sampling Date ⁵				
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
LRSPW	EXP-SW	.	05/06/02 D	.	11/19/02	!
NPR07.0SW	EXP-NPR	.	05/15/02	.	10/29/02	!
NPR12.0SW	EXP-NPR	.	05/15/02 D	.	10/29/02	!
NPR23.0SW	EXP-NPR	.	05/15/02	.	10/29/02	!
OF 51	EXP-SW	02/14/02	.	09/03/02	.	"
OF 200	EXP-SW	02/01/02 S	.	08/20/02 S	.	"
SCR7.1SP	EXP-UV	02/11/02	.	07/11/02	.	!
SCR7.8SP	EXP-UV	02/11/02	.	07/11/02	.	!
STATION 17	EXP-SW	02/01/02 S	.	08/20/02 S	.	"
STATION 8	EXP-SW	02/01/02 S	.	08/20/02 S	.	"

Notes:

- 1 Groundwater and surface water sampling performed for monitoring programs managed by Bechtel Jacobs Company LLC (BJC).
- 2 Groundwater and surface water sampling performed for the Y-12 Groundwater Protection Program (GWPP), managed by BWXT Y-12, L.L.C.
- 3
 - GHK - Gum Hollow Branch Kilometer
 - GW - Groundwater Monitoring Well (also 55-1B)
 - LRSPW - Outfall of the New Hope Pond distribution channel underdrain
 - NPR - North of Pine Ridge near the Scarboro Community
 - OF - Storm drain outfall
 - SCR - Spring sampling location in Union Valley
 - SP - Spring sampling location (suffix)
 - STATION - Surface water sampling location in Upper East Fork Poplar Creek
 - SW - Surface water sampling location (suffix)
- 4
 - B8110 - Building 81-10
 - CPT - Coal Pile Trench
 - EXP - Exit Pathway monitoring location:
 - E, -I, or -J: Maynardville Limestone Picket monitoring well.
 - NPR: Surface water station located north of Pine Ridge where drainage exits the ORR.
 - SW: Onsite surface water station
 - SR: Along Scarboro Road in the gap through Pine Ridge
 - UV: East of the Oak Ridge Reservation boundary in Union Valley
 - FF - Fuel Facility (Building 9754-2)
 - FTF - Fire Training Facility
 - GRID - Comprehensive Groundwater Monitoring Plan Grid Location
 - NHP - New Hope Pond
 - RG - Rust Garage Area

Table B.3 (continued)

Notes: (continued)

S2	-	S-2 Site
S3	-	S-3 Site
T0134	-	Tank 0134-U
T2331	-	Tank 2331-U
UOV	-	Uranium Oxide Vault
5	.	Not sampled.
C	-	Conventional sampling method used (see Section 4.0)
D	-	Duplicate sample collected on specified date (shown in bold typeface).
*	-	Resampled on 06/12/02 for organics analyses.
S	-	Two sets of samples were collected: a stormflow sample on the date shown (within six hours after a 0.5-inch or more rainfall) and a baseflow sample collected later (02/14/02 during the first quarter and 09/03/02 during the third quarter).

**Table B.4. CY 2002 groundwater and surface water sampling dates
in the Chestnut Ridge Hydrogeologic Regime**

BJC ¹		Solid Waste Disposal Facility Detection Monitoring					
		RCRA Post-Closure Detection (!) and Corrective Action ("") Monitoring					
		CERCLA ROD (!) and Baseline ("") Monitoring					
GWPP ²		DOE Order 5400.1 Exit Pathway/Perimeter Monitoring					
Sampling Point ³	Sampling Location ⁴	CY 2002 Sampling Date ⁵					
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter		
1090	UNCS	01/30/02	.	07/30/02	.	!	
GW-141	LIV	01/23/02	.	07/25/02	.		!
GW-142	KHQ	.	04/10/02	.	10/16/02	!	
GW-143	KHQ	.	04/09/02	.	10/16/02	!	
GW-144	KHQ	.	04/09/02	.	10/16/02	!	
GW-145	KHQ	.	04/08/02	.	10/21/02	!	
GW-156	CRSDB	.	04/15/02 D	.	10/14/02 D	!	
GW-159	CRSDB	.	04/15/02	.	10/16/02	!	
GW-177	CRSP	01/09/02	.	07/10/02	.	"	
GW-203	UNCS	01/29/02	.	07/30/02	.	!	
GW-205	UNCS	01/30/02	.	07/30/02	.	!	
GW-217	LIV	01/22/02 *	.	07/22/02	.		!
GW-221	UNCS	01/29/02	.	07/30/02	.	!	
GW-231	KHQ	.	04/08/02 D	.	10/17/02 D	!	
GW-301	CRBAWP	01/09/02 D	.	07/10/02 D	.	"	
GW-302	UNCS	01/31/02	.	07/31/02	.	!	
GW-305	LIV	01/22/02 *	05/02/02	07/15/02	11/21/02		!
GW-339	UNCS	01/29/02 D	.	07/30/02 D	.	!	
GW-521	LIV	01/10/02	.	07/15/02	.		!
GW-522	LIV	01/22/02 *	.	07/15/02	.		!
GW-539	LII	01/14/02	.	07/17/02	.		!
GW-540	LII/CDLVII	01/16/02	.	07/18/02	.		!
GW-542	CDLVI	01/16/02	.	07/18/02	.		!
GW-543	CDLVI	01/15/02	.	07/18/02	.		!
GW-544	CDLVI	01/15/02	.	07/22/02	.		!
GW-557	LV	01/10/02 D	.	07/11/02 D	.		!
GW-560	CDLVII	01/17/02	.	07/16/02	.		!
GW-562	CDLVII	01/09/02	.	07/10/02	.	"	
GW-562	CDLVII	01/22/02 *	.	07/16/02	.		!
GW-564	CDLVII	01/16/02 D	.	07/16/02 D	.		!
GW-709	LII	01/15/02	.	07/17/02	.		!
GW-731	CRSDB	.	04/16/02	.	10/15/02	!	
GW-732	CRSDB	.	04/16/02	.	10/15/02	!	

Table B.4 (continued)

BJC ¹		Solid Waste Disposal Facility Detection Monitoring					
		RCRA Post-Closure Detection (!) and Corrective Action ("') Monitoring					
		CERCLA ROD (!) and Baseline ("') Monitoring					
GWPP ²		DOE Order 5400.1 Exit Pathway/Perimeter Monitoring					
Sampling Point ³	Sampling Location ⁴	CY 2002 Sampling Date ⁵					
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter		
GW-757	LII	01/15/02	.	07/17/02	.		
GW-796	LV	01/14/02	.	07/11/02	.		
GW-797	LV	01/14/02	.	07/11/02	.		
GW-798	CDLVII	01/09/02	.	07/10/02	.	"	
GW-798	CDLVII	01/16/02	.	07/16/02	.		
GW-799	LV	01/10/02	.	07/11/02	.		
GW-801	LV	01/14/02	.	07/15/02	.		
GW-827	CDLVI	01/17/02	.	07/18/02	.		
GW-831	FCAP	01/09/02	.	07/09/02	.	"	
MCK 2.0	FCAP	02/21/02	.	07/09/02	.	"	
MCK 2.05	FCAP	02/21/02 D	.	07/09/02 D	.	"	
SCR1.25SP	EXP	02/21/02	.	07/10/02	.	"	
SCR1.5SW	EXP	02/21/02 D	.	08/19/02	.	!	
SCR2.2SW	EXP	03/21/02	.	09/23/02	.	!	
SCR3.5SP	EXP	02/21/02	.	07/10/02	.	"	
SCR4.3SP	LV	01/14/02	.	07/15/02	.		
SCR4.4SW	EXP	02/21/02	.	09/23/02 D	.	!	
SCR5.2SP	EXP	02/21/02	.	08/19/02	.	!	

Notes:

- 1 Groundwater and surface water sampling performed under monitoring programs managed by Bechtel Jacobs Company LLC (BJC).
- 2 Surface water sampling performed under the Y-12 Groundwater Protection Program (GWPP) managed by BWXT Y-12, L.L.C.
- 3
 - GW - Groundwater monitoring well (also 1090)
 - MCK - McCoy Branch Kilometer
 - SCR - South Chestnut Ridge (tributary prefix)
 - SP - Spring sampling location (suffix)
 - SW - Surface water sampling location (suffix)

Table B.4 (continued)

Notes: (continued)

- | | | | |
|---|--------|---|---|
| 4 | CDLVI | - | Construction/Demolition Landfill VI |
| | CDLVII | - | Construction/Demolition Landfill VII |
| | CRBAWP | - | Chestnut Ridge Borrow Area Waste Pile (formerly) |
| | CRSDB | - | Chestnut Ridge Sediment Disposal Basin |
| | CRSP | - | Chestnut Ridge Security Pits |
| | EXP | - | Exit Pathway (spring or surface water sampling location) |
| | FCAP | - | Filled Coal Ash Pond |
| | KHQ | - | Kerr Hollow Quarry |
| | LII | - | Industrial Landfill II |
| | LIV | - | Industrial Landfill IV |
| | LV | - | Industrial Landfill V |
| | UNCS | - | United Nuclear Corporation Site |
| 5 | . | - | Not Sampled. |
| | D | - | Duplicate sample collected on specified date (shown in bold typeface). |
| | * | - | Groundwater samples were collected for organics analyses from wells GW-217, GW-305, GW-522, and GW-562 on January 28, 2002. |

Table B.5. Field measurements and laboratory analytes for CY 2002 groundwater and surface water samples

Field Measurements	Analytical Method ¹	Reporting Limit ²	Units ³
Depth to Water	Y50-71-015	NA	ft
Water Temperature	Y50-71-001	NA	centigrade
pH	Y50-71-001	NA	pH units
Conductivity	Y50-71-001	NA	µmho/cm
Dissolved Oxygen	Y50-71-001	NA	ppm
Oxidation-Reduction Potential	Y/P65-9156	NA	mV
Miscellaneous Laboratory Analytes			
pH	SW846-9040	NA	pH units
Conductivity	SW846-9050	NA	µmho/cm
Total Dissolved Solids	EPA-160.1	1	mg/L
Total Suspended Solids	EPA-160.2	1	mg/L
Turbidity	EPA-180.1	0.1	NTU
Anions			
Alkalinity - HCO ₃	EPA-310.1	1.0	mg/L
Alkalinity - CO ₃	EPA-310.1	1.0	mg/L
Chloride	EPA-300.0	0.2	mg/L
Fluoride	EPA-340.2	0.1	mg/L
Nitrate (as Nitrogen)	EPA-300.0	0.028	mg/L
Sulfate	EPA-300.0	0.25	mg/L
Metals/Cations			
Aluminum	SW846-6010B	0.2	mg/L
Antimony	EPA-200.8	0.0025	mg/L
Arsenic	EPA-200.8	0.005	mg/L
Barium	SW846-6010B	0.004	mg/L
Beryllium	SW846-6010B	0.0005	mg/L
Boron	SW846-6010B	0.1	mg/L
Cadmium	EPA-200.8	0.0005	mg/L
Calcium	SW846-6010B	0.2	mg/L
Chromium	EPA-200.8	0.0025	mg/L
Cobalt	SW846-6010B	0.02	mg/L
Copper	SW846-6010B	0.02	mg/L
Iron	SW846-6010B	0.05	mg/L
Lead	EPA-200.8	0.0005	mg/L
Lithium	SW846-6010B	0.01	mg/L
Magnesium	SW846-6010B	0.2	mg/L
Manganese	SW846-6010B	0.005	mg/L
Mercury	SW846-7470	0.0002	mg/L
Molybdenum	SW846-6010B	0.05	mg/L
Nickel	EPA-200.8	0.005	mg/L

Table B.5 (continued)

Metals/Cations (continued)	Analytical Method¹	Reporting Limit²	Units³
Potassium	SW846-6010B	2	mg/L
Selenium	EPA-200.8	0.01	mg/L
Silver	SW846-6010B	0.02	mg/L
Sodium	SW846-6010B	0.2	mg/L
Strontium	SW846-6010B	0.005	mg/L
Thallium	EPA-200.8	0.0005	mg/L
Thorium	SW846-6010B	0.2	mg/L
Uranium	EPA-200.8	0.0005	mg/L
Vanadium	SW846-6010B	0.02	mg/L
Zinc	SW846-6010B	0.05	mg/L
Volatile Organic Compounds		CRQL⁴	
Acetone	SW846-8260B UP	10	µg/L
Acrolein	SW846-8260B UP	10	µg/L
Acrylonitrile	SW846-8260B UP	5	µg/L
Benzene	SW846-8260B UP	5	µg/L
Bromochloromethane	SW846-8260B UP	5	µg/L
Bromodichloromethane	SW846-8260B UP	5	µg/L
Bromoform	SW846-8260B UP	5	µg/L
Bromomethane	SW846-8260B UP	5	µg/L
2-Butanone	SW846-8260B UP	5	µg/L
Carbon disulfide	SW846-8260B UP	5	µg/L
Carbon tetrachloride	SW846-8260B UP	5	µg/L
Chlorobenzene	SW846-8260B UP	5	µg/L
Chloroethane	SW846-8260B UP	5	µg/L
2-Chloroethyl vinyl ether	SW846-8260B UP	10	µg/L
Chloroform	SW846-8260B UP	5	µg/L
Chloromethane	SW846-8260B UP	5	µg/L
Dibromochloromethane	SW846-8260B UP	5	µg/L
1,2-Dibromo-3-chloropropane	SW846-8260B UP	10	µg/L
1,2-Dibromoethane	SW846-8260B UP	5	µg/L
Dibromomethane	SW846-8260B UP	5	µg/L
1,2-Dichlorobenzene	SW846-8260B UP	5	µg/L
1,4-Dichlorobenzene	SW846-8260B UP	5	µg/L
1,4-Dichloro-2-butene	SW846-8260B UP	5	µg/L
trans-1,4-Dichloro-2-butene	SW846-8260B UP	5	µg/L
Dichlorodifluoromethane	SW846-8260B UP	5	µg/L
1,1-Dichloroethane	SW846-8260B UP	5	µg/L
1,2-Dichloroethane	SW846-8260B UP	5	µg/L
1,1-Dichloroethene	SW846-8260B UP	5	µg/L
cis-1,2-Dichloroethene	SW846-8260B UP	5	µg/L
trans-1,2-Dichloroethene	SW846-8260B UP	5	µg/L
1,2-Dichloropropane	SW846-8260B UP	5	µg/L

Table B.5 (continued)

Volatile Organic Compounds (cont'd)	Analytical Method¹	CRQL⁴	Units³
cis-1,3-Dichloropropene	SW846-8260B UP	5	µg/L
trans-1,3-Dichloropropene	SW846-8260B UP	5	µg/L
Dimethylbenzene	SW846-8260B UP	5	µg/L
Ethanol	SW846-8260B UP	200	µg/L
Ethylbenzene	SW846-8260B UP	5	µg/L
Ethyl methacrylate	SW846-8260B UP	5	µg/L
2-Hexanone	SW846-8260B UP	5	µg/L
Iodomethane	SW846-8260B UP	5	µg/L
4-Methyl-2-pentanone	SW846-8260B UP	5	µg/L
Methylene chloride	SW846-8260B UP	5	µg/L
Styrene	SW846-8260B UP	5	µg/L
1,1,1,2-Tetrachloroethane	SW846-8260B UP	5	µg/L
1,1,2,2-Tetrachloroethane	SW846-8260B UP	5	µg/L
Tetrachloroethene	SW846-8260B UP	5	µg/L
Toluene	SW846-8260B UP	5	µg/L
1,1,1-Trichloroethane	SW846-8260B UP	5	µg/L
1,1,2-Trichloroethane	SW846-8260B UP	5	µg/L
Trichloroethene	SW846-8260B UP	5	µg/L
Trichlorofluoromethane	SW846-8260B UP	5	µg/L
1,2,3-Trichloropropane	SW846-8260B UP	10	µg/L
Vinyl acetate	SW846-8260B UP	10	µg/L
Vinyl chloride	SW846-8260B UP	2	µg/L
Radiological Analytes		Target MDA⁵	
Gross Alpha Activity	EPA-900.0	3.5	pCi/L
Gross Beta Activity	EPA-900.0	7.0	pCi/L
Americium-241	Y/P65-7226	0.4	pCi/L
Iodine-129	EPA-901.1	3.0	pCi/L
Neptunium-237	Y/P65-7206	0.4	pCi/L
Plutonium-238 & -239/240	Y/P65-7226	0.4	pCi/L
Radium-223/224/226	EPA-903.0 / 904.0	0.5	pCi/L
Strontium-89/90	Y/P65-7037	4.0	pCi/L
Technetium-99	Y/P65-7060	10	pCi/L
Thorium-228, 230, 232, & 234	Y/P65-7052	0.4	pCi/L
Tritium	EPA-906.0	300	pCi/L
Uranium-234, 235, & 238	Y/P65-7061	0.4	pCi/L
Total Uranium and weight % Uranium-234, 235, 236, & 238	Y/P65-8044	0.002	mg/L

Table B.5 (continued)

Notes:

1 Analytical/field methods/procedures from:

- ! Y-12 System Operation Procedures (BWXT 2000b, BWXT 2001b, and LMES 1999b)
- ! *Test Methods for Evaluating Solid Waste Physical/Chemical Methods*
(U.S. Environmental Protection Agency 1996)
- ! *Methods for Chemical Analysis of Water and Wastes*
(U.S. Environmental Protection Agency 1983)
- ! BWXT Y-12 Analytical Chemistry Organization Control Procedures:
(Y/P65-7037, Y/P65-7052, Y/P65-7060, Y/P65-7061, Y/P65-7206, Y/P65-7226,
and Y/P65-8044)

2 The lowest concentration reported.

NA - not applicable

3 ft - feet

$\mu\text{g}/\text{L}$ - micrograms per liter

$\mu\text{mho}/\text{cm}$ - micromhos per centimeter

mg/L - milligrams per liter

mV - millivolts

NTU - nephelometric turbidity units

ppm - parts per million

pCi/L - picoCuries per liter

4 CRQL - contract-required quantitation limit; estimated values are reported below this level and above the instrument detection limit. Results below the instrument detection limit are reported as not detected at the CRQL.

5 MDA - minimum detectable activity. The target MDA may be obtained under optimal analytical conditions; actual MDAs are sample-specific and, in some cases, may vary significantly from the target value.

Table B.6. Depth-to-water measurements and groundwater elevations in the Bear Creek Hydrogeologic Regime, April and September 2002

Groundwater Elevation (ft above mean sea level)				September 17-30, 2002					
				April 8-12, 2002					
				Seasonal Fluctuation (+/- ft)					
Depth-to-Water (ft below measuring point)				September 17-30, 2002					
				April 8-12, 2002					
Well Number	Location ¹	Hydrogeologic Unit ²		Measuring Pt. Elevation ³	Seasonal Fluctuation (+/- ft)				
		Aquifer	Aquitard		September 17-30, 2002	April 8-12, 2002			
GW-001	OLF		"	981.00	16.48	16.77	-0.29	964.52	964.23
GW-005	OLF		"	967.81	7.00	NM ⁴	NA ⁵	960.81	NA
GW-008	OLF		"	965.39	14.96	15.23	-0.27	950.43	950.16
GW-010	OLF		"	952.70	2.11	2.42	-0.31	950.59	950.28
GW-012	OLF		"	955.57	7.08	6.85	0.23	948.49	948.72
GW-013	OLF		"	965.12	6.42	NM	NA	958.70	NA
GW-014	BG		"	934.50	8.26	8.25	0.01	926.24	926.25
GW-016	BG		"	928.80	9.88	14.90	-5.02	918.92	913.90
GW-018	BG		"	924.49	6.95	11.80	-4.85	917.54	912.69
GW-041	BG		"	1008.10	15.08	26.20	-11.12	993.02	981.90
GW-045	BG	M		910.30	10.51	16.50	-5.99	899.79	893.80
GW-046	BG		"	921.17	3.50	6.40	-2.90	917.67	914.77
GW-047	BG		"	929.00	8.10	11.10	-3.00	920.90	917.90
GW-052	BG	M		905.70	13.92	18.70	-4.78	891.78	887.00
GW-053	BG	"		903.40	8.24	11.50	-3.26	895.16	891.90
GW-065	OLF	"		982.50	25.48	26.54	-1.06	957.02	955.96
GW-067	OLF	"		961.60	9.83	9.19	0.64	951.77	952.41
GW-080	BG		"	981.00	22.64	NM	NA	958.36	NA
GW-084	OLF		"	997.20	13.37	12.38	0.99	983.83	984.82
GW-086	OLF		"	982.80	12.36	14.00	-1.64	970.44	968.80
GW-090	BG		"	961.88	4.55	8.30	-3.75	957.33	953.58
GW-091	BG		"	953.48	8.20	10.80	-2.60	945.28	942.68
GW-097	OLF		"	945.30	9.25	9.95	-0.70	936.05	935.35
GW-100	S3	"		987.40	5.37	5.50	-0.13	982.03	981.90
GW-101	S3		"	1008.00	9.42	9.20	0.22	998.58	998.80
GW-115	S3		"	1055.01	8.26	12.30	-4.04	1046.75	1042.71
GW-127	S3		"	1005.90	13.11	13.00	0.11	992.79	992.90
GW-236	S3	"		983.21	10.47	9.00	1.47	972.74	974.21
GW-245	S3		"	1009.08	12.48	13.90	-1.42	996.60	995.18
GW-249	BG		"	991.15	31.71	NM	NA	959.44	NA
GW-257	BG		"	961.68	28.31	30.30	-1.99	933.37	931.38
GW-276	S3		"	1001.57	6.25	5.50	0.75	995.32	996.07
GW-287	BG		"	927.07	9.28	9.90	-0.62	917.79	917.17
GW-289	BG		"	948.73	13.96	20.10	-6.14	934.77	928.63
GW-291	BG		"	948.56	11.85	13.70	-1.85	936.71	934.86

Table B.6 (continued)

Groundwater Elevation (ft above mean sea level)				September 17-30, 2002					
				April 8-12, 2002					
				Seasonal Fluctuation (+/- ft)					
Depth-to-Water (ft below measuring point)				September 17-30, 2002					
Well Number	Location ¹	Hydrogeologic Unit ²		Measuring Pt. Elevation ³	September 17-30, 2002		April 8-12, 2002		
		Aquifer	Aquitard						
GW-307	RS	"		993.14	26.40	31.10	-4.70	966.74	962.04
GW-309	RS	"		988.17	19.24	20.54	-1.30	968.93	967.63
GW-310	RS	"		995.35	19.95	19.99	-0.04	975.40	975.36
GW-316	SPI	"		1047.17	52.00	54.70	-2.70	995.17	992.47
GW-323	SPI	"		1130.11	85.82	86.10	-0.28	1044.29	1044.01
GW-325	S3		"	1003.00	11.27	14.20	-2.93	991.73	988.80
GW-345	S3		"	999.66	18.42	20.20	-1.78	981.24	979.46
GW-347	S3	M		1001.05	16.48	14.80	1.68	984.57	986.25
GW-370	BG		"	960.82	15.15	17.80	-2.65	945.67	943.02
GW-372	BG		"	983.20	18.37	28.50	-10.13	964.83	954.70
GW-531	LD		"	1004.61	14.20	24.03	-9.83	990.41	980.58
GW-537	OLF		"	976.44	6.01	7.60	-1.59	970.43	968.84
GW-613	S3		"	1013.57	12.55	15.50	-2.95	1001.02	998.07
GW-621	EXP-B	"		925.44	10.65	20.00	-9.35	914.79	905.44
GW-622	BG		"	924.16	9.57	16.10	-6.53	914.59	908.06
GW-624	BG		"	922.14	9.79	13.40	-3.61	912.35	908.74
GW-630	LD		"	986.65	9.40	9.40	0.00	977.25	977.25
GW-638	OLF		"	941.77	6.30	5.89	0.41	935.47	935.88
GW-641	BG		"	946.66	19.01	21.30	-2.29	927.65	925.36
GW-642	BG		"	1014.90	17.97	23.50	-5.53	996.93	991.40
GW-648	RS	M		1029.20	65.22	69.83	-4.61	963.98	959.37
GW-652	BG	M		900.83	9.68	12.50	-2.82	891.15	888.33
GW-653	BG		"	931.80	22.23	25.90	-3.67	909.57	905.90
GW-654	BG		"	940.79	7.00	9.50	-2.50	933.79	931.29
GW-795	AGLLSF		"	925.98	4.05	2.96	1.09	921.93	923.02
GW-916	EMWMF		"	1002.85	5.33	NM	NA	997.52	NA
GW-917	EMWMF		"	997.10	19.84	NM	NA	977.26	NA
GW-918	EMWMF		"	1067.96	5.41	NM	NA	1062.55	NA
GW-924	EMWMF		"	968.90	10.44	NM	NA	958.46	NA

Table B.6 (continued)

Notes:

- 1 AGLLSF - Above Grade Low-Level Storage Facility
 BG - Bear Creek Burial Grounds Waste Management Area
EMWMF - Environmental Management Waste Management Facility
EXP-B - Exit Pathway (Maynardville Limestone) Picket B
LD - Lysimeter Demonstration Site
OLF - Oil Landfarm Waste Management Area
RS - Rust Spoil Area
SPI - Spoil Area I
S3 - S-3 Site

2 Aquifer - Completed in the upper Conasauga Group (Maynardville Limestone) or the Knox Group
Aquitard - Completed in the lower Conasauga Group (Nolichucky Shale, Maryville Limestone,
 Rogersville Shale, Rutledge Limestone, or Pumpkin Valley Shale)

3 Measuring point elevation in feet above mean sea level. The measuring point is either the top of the
innermost well casing or the top of dedicated sampling equipment mounted on the casing.

4 NM - Not Measured

5 NA - Not Applicable

**Table B.7. Depth-to-water measurements and groundwater elevations in the Upper East Fork
Poplar Creek Hydrogeologic Regime, April and September 2002**

Groundwater Elevation (ft above mean sea level)		September 18-26, 2002						
		April 8-11, 2002						
		Seasonal Fluctuation (+/- ft)						
Depth-to-Water (ft below measuring point)		September 18-26, 2002						
		April 8-11, 2002						
Well Number	Location ¹	Hydrogeologic Unit ²		Measuring Point Elevation ³				
		Aquifer	Aquitard					
53-1A	Y12		"	993.65	3.22	NM ⁴	NA ⁵	990.43 NA
55-1A	Y12		"	986.67	10.82	10.79	0.03	975.85 975.88
55-3A	Y12		"	972.46	11.40	11.70	-0.30	961.06 960.76
55-6A	Y12		"	989.04	8.47	10.72	-2.25	980.57 978.32
56-1A	Y12		"	969.25	7.62	7.74	-0.12	961.63 961.51
56-2A	Y12		"	963.30	7.78	7.76	0.02	955.52 955.54
56-8A	Y12	"		962.46	19.38	19.28	0.10	943.08 943.18
60-1A	Y12	"		929.66	12.67	12.67	0.00	916.99 916.99
GW-105	S3		"	1018.20	9.42	8.70	0.72	1008.78 1009.50
GW-108	S3		"	999.00	7.50	7.50	0.00	991.50 991.50
GW-115	S3		"	1055.01	8.26	12.3	-4.04	1046.75 1042.71
GW-148	NHP	"		907.56	8.40	8.61	-0.21	899.16 898.95
GW-150	NHP	"		915.56	14.05	14.08	-0.03	901.51 901.48
GW-152	NHP	"		921.18	19.67	20.04	-0.37	901.51 901.14
GW-154	NHP	"		911.50	9.01	7.19	1.82	902.49 904.31
GW-167	EXP	"		931.97	28.73	NM	NA	903.24 NA
GW-169	EXP-UV	"		932.12	28.47	32.32	-3.85	903.65 899.80
GW-191	B4		"	1011.27	3.65	6.07	-2.42	1007.62 1005.20
GW-192	B4		"	1008.83	5.83	7.25	-1.42	1003.00 1001.58
GW-193	T2331	"		934.17	8.49	8.04	0.45	925.68 926.13
GW-195	B4		"	1002.90	6.61	6.06	0.55	996.29 996.84
GW-199	GRIDI1		"	961.08	16.72	15.75	0.97	944.36 945.33
GW-202	RDS		"	968.02	9.95	9.75	0.20	958.07 958.27
GW-204	T0134		"	958.77	8.62	8.51	0.11	950.15 950.26
GW-219	UOV	"		935.84	9.60	12.76	-3.16	926.24 923.08
GW-253	S2	"		1004.24	4.71	26.99	-22.28	999.53 977.25
GW-255	S2	"		1027.13	23.21	NM	NA	1003.92 NA
GW-261	SY		"	1049.99	16.77	17.60	-0.83	1033.22 1032.39
GW-263	SY		"	1057.73	25.32	31.50	-6.18	1032.41 1026.23
GW-334	WC		"	983.73	11.67	11.78	-0.11	972.06 971.95
GW-335	WC		"	981.88	9.84	11.07	-1.23	972.04 970.81
GW-349	S2	"		993.50	3.91	2.38	1.53	989.59 991.12
GW-380	NHP	"		913.55	9.85	10.32	-0.47	903.70 903.23
GW-383	NHP		"	908.77	9.25	9.55	-0.30	899.52 899.22
GW-384	NHP		"	909.23	10.96	11.20	-0.24	898.27 898.03

Table B.7 (continued)

Groundwater Elevation (ft above mean sea level)		Seasonal Fluctuation (+/- ft)						
		September 18-26, 2002			April 8-11, 2002			
Well Number	Location ¹	Depth-to-Water (ft below measuring point)		Measuring Point Elevation ³	September 18-26, 2002		April 8-11, 2002	
		Aquifer	Aquitard		985.31	12.85	15.41	-2.56
GW-617	EXP-E	"		985.31	12.85	15.41	-2.56	972.46
GW-619	FTF	"		1015.50	20.15	22.20	-2.05	995.35
GW-686	CPT	"		963.76	12.45	12.20	0.25	951.31
GW-691	CPT	"		968.59	12.02	12.52	-0.50	956.57
GW-699	B8110	"		971.14	16.00	16.06	-0.06	955.14
GW-746	GRIDK1		"	906.88	4.79	6.30	-1.51	902.09
GW-749	GRIDK2		"	921.19	6.12	9.62	-3.50	915.07
GW-752	GRIDJ3		"	912.78	3.82	4.64	-0.82	908.96
GW-754	GRIDJ2		"	928.78	6.06	8.20	-2.14	922.72
GW-756	GRIDJ1		"	928.12	5.45	4.66	0.79	922.67
GW-759	GRIDG1		"	994.01	17.73	14.31	3.42	976.28
GW-761	GRIDG2		"	968.23	7.94	10.94	-3.00	960.29
GW-763	GRIDJ3		"	915.05	9.45	9.02	0.43	905.60
GW-765	GRIDE1		"	1008.54	19.46	18.94	0.52	989.08
GW-767	GRIDI2		"	948.54	11.74	10.12	1.62	936.80
GW-770	GRIDG3		"	944.71	13.20	13.78	-0.58	931.51
GW-772	GRIDC1		"	1012.66	9.41	9.10	0.31	1003.25
GW-774	GRIDH2		"	963.16	13.85	7.92	5.93	949.31
GW-776	GRIDH3		"	931.25	12.51	8.70	3.81	918.74
GW-780	GRIDF2		"	963.40	13.36	13.51	-0.15	950.04
GW-783	GRIDE3		"	948.49	10.50	9.45	1.05	937.99
GW-785	GRIDD1		"	1009.43	8.89	7.90	0.99	1000.54
GW-787	GRIDE2		"	987.85	13.45	16.41	-2.96	974.40
GW-792	GRIDD2		"	992.74	24.39	24.95	-0.56	968.35
GW-816	EXP-SR		"	898.41	13.00	13.80	-0.80	885.41
GW-817	GRIDK3		"	918.32	6.97	9.39	-2.42	911.35

Table B.7 (continued)

Notes:

- 1 B4 - Beta-4 Security Pits
B8110 - Building 81-10
CPT - Coal Pile Trench
EXP - Exit Pathway (Maynardville Limestone) monitoring well
 ! -E: Maynardville Limestone Picket
 ! -UV: Offsite in Union Valley
 ! -SR: Along Scarboro Road in the gap through Pine Ridge
FTF - Fire Training Facility
GRID - Comprehensive Groundwater Monitoring Plan Grid Location
NHP - New Hope Pond
RDS - Ravine Disposal Site
RG - Rust Garage Area
S2 - S-2 Site
S3 - S-3 Site
SY - Y-12 Plant Salvage Yard
T0134 - Tank 0134-U
T2331 - Tank 2331-U
UOV - Uranium Oxide Vault
WC - Waste Coolant Processing Area
Y12 - Y-12 Complex
- 2 Aquifer - Completed in the upper Conasauga Group (Maynardville Limestone) or the Knox Group
Aquitard - Completed in the lower Conasauga Group (Nolichucky Shale, Maryville Limestone, Rogersville Shale, Rutledge Limestone, or Pumpkin Valley Shale)
- 3 Measuring point elevation is in feet above mean sea level. The measuring point is either the top of the innermost well casing or the top of dedicated sampling equipment.
- 4 NM - Not measured or unusable
- 5 NA - Not applicable

Table B.8. Depth-to-water measurements and groundwater elevations in the Chestnut Ridge Hydrogeologic Regime, April and September 2002

Groundwater Elevation (ft above mean sea level)		September 17-26, 2002					
		April 8-10, 2002					
		Seasonal Fluctuation (+/- ft)					
Depth-to-Water (ft below measuring point)		September 17-26, 2002					
		April 8-10, 2002					
Well Number	Location ¹	Measuring Point Elevation ²					
1082	ORSF	837.28	25.23	25.82	-0.59	812.05	811.46
1084	ORSF	965.40	62.81	63.46	-0.65	902.59	901.94
1090	UNCS	1104.48	43.37	56.20	-12.83	1061.11	1048.28
GW-141	LIV	1186.23	93.00	95.52	-2.52	1093.23	1090.71
GW-142	KHQ	971.15	134.34	139.13	-4.79	836.81	832.02
GW-144	KHQ	913.54	78.63	82.16	-3.53	834.91	831.38
GW-145	KHQ	840.24	3.94	8.32	-4.38	836.30	831.92
GW-156	CRSDB	1049.30	142.70	143.65	-0.95	906.60	905.65
GW-159	CRSDB	1051.40	116.71	118.86	-2.15	934.69	932.54
GW-160	CRBAWP	1093.09	139.56	151.25	-11.69	953.53	941.84
GW-173	CRSP	1115.00	125.95	148.37	-22.42	989.05	966.63
GW-174	CRSP	1116.66	104.00	124.75	-20.75	1012.66	991.91
GW-175	CRSP	1084.19	109.86	126.41	-16.55	974.33	957.78
GW-176	CRSP	1125.30	116.00	116.03	-0.03	1009.30	1009.27
GW-177	CRSP	1158.20	117.23	119.86	-2.63	1040.97	1038.34
GW-178	CRSP	1143.49	88.81	97.95	-9.14	1054.68	1045.54
GW-179	CRSP	1128.00	114.26	115.45	-1.19	1013.74	1012.55
GW-180	CRSP	1104.14	94.85	128.22	-33.37	1009.29	975.92
GW-184	RQ	927.63	109.94	111.07	-1.13	817.69	816.56
GW-186	RQ	831.32	14.40	15.32	-0.92	816.92	816.00
GW-203	UNCS	1105.45	79.27	83.77	-4.50	1026.18	1021.68
GW-205	UNCS	1104.14	75.69	80.69	-5.00	1028.45	1023.45
GW-217	LIV	1177.06	104.83	116.00	-11.17	1072.23	1061.06
GW-221	UNCS	1106.16	81.73	85.31	-3.58	1024.43	1020.85
GW-231	KHQ	849.67	12.79	17.70	-4.91	836.88	831.97
GW-241	CRSDB	982.84	43.49	54.73	-11.24	939.35	928.11
GW-292	ECRWP	1073.00	109.78	115.31	-5.53	963.22	957.69
GW-293	ECRWP	1063.90	112.10	117.85	-5.75	951.80	946.05
GW-298	CRBAWP	1049.01	105.41	111.03	-5.62	943.60	937.98
GW-299	CRBAWP	1053.86	95.23	103.25	-8.02	958.63	950.61
GW-300	CRBAWP	1073.12	108.93	118.50	-9.57	964.19	954.62

Table B.8 (continued)

Groundwater Elevation (ft above mean sea level)		September 17-26, 2002					
		April 8-10, 2002					
		Seasonal Fluctuation (+/- ft)					
Depth-to-Water (ft below measuring point)		September 17-26, 2002					
		April 8-10, 2002					
Well Number	Location ¹	Measuring Point Elevation ²					
GW-301	CRBAWP	1086.55	125.81	136.19	-10.38	960.74	950.36
GW-302	UNCS	1141.84	95.12	104.63	-9.51	1046.72	1037.21
GW-303	CRSDB	1007.16	83.85	89.51	-5.66	923.31	917.65
GW-304	CRSDB	1045.49	116.56	118.81	-2.25	928.93	926.68
GW-305	LIV	1183.75	117.22	126.30	-9.08	1066.53	1057.45
GW-322	CRSP	1135.05	143.00	165.00	-22.00	992.05	970.05
GW-339	UNCS	1124.83	64.55	76.78	-12.23	1060.28	1048.05
GW-511	CRSP	1093.21	96.49	113.50	-17.01	996.72	979.71
GW-512	FCAP	1001.54	19.06	32.11	-13.05	982.48	969.43
GW-521	LIV	1182.88	80.97	87.20	-6.23	1101.91	1095.68
GW-522	LIV	1175.49	94.94	111.40	-16.46	1080.55	1064.09
GW-539	LII	1093.00	102.86	110.17	-7.31	990.14	982.83
GW-540	CDLVI	1072.32	79.79	86.10	-6.31	992.53	986.22
GW-541	CDLVI	1058.40	63.31	64.63	-1.32	995.09	993.77
GW-542	CDLVI	1051.77	69.92	72.70	-2.78	981.85	979.07
GW-543	CDLVI	1023.98	63.85	65.81	-1.96	960.13	958.17
GW-544	CDLVI	1045.20	58.25	62.19	-3.94	986.95	983.01
GW-557	LV	1081.36	119.34	123.66	-4.32	962.02	957.70
GW-558	SSCR	981.42	46.13	52.81	-6.68	935.29	928.61
GW-559	SSCR	1102.79	135.52	142.25	-6.73	967.27	960.54
GW-560	CDLVII	949.05	38.33	46.13	-7.80	910.72	902.92
GW-562	CDLVII	934.69	6.30	11.55	-5.25	928.39	923.14
GW-564	CDLVII	937.97	10.16	12.17	-2.01	927.81	925.80
GW-608	CRSP	1074.75	122.00	139.55	-17.55	952.75	935.20
GW-609	CRSP	1112.31	160.55	167.82	-7.27	951.76	944.49
GW-610	CRSP	1059.44	80.00	91.60	-11.60	979.44	967.84
GW-611	CRSP	1048.38	98.20	108.82	-10.62	950.18	939.56
GW-612	CRSP	1131.03	117.93	128.93	-11.00	1013.10	1002.10
GW-674	FCAP	883.79	6.98	8.55	-1.57	876.81	875.24
GW-676	FCAP	846.50	3.63	7.59	-3.96	842.87	838.91
GW-677	FCAP	1030.40	22.97	32.50	-9.53	1007.43	997.90
GW-678	FCAP	1000.70	12.50	28.22	-15.72	988.20	972.48
GW-679	FCAP	1026.90	45.52	59.12	-13.60	981.38	967.78
GW-680	FCAP	1001.50	25.00	39.10	-14.10	976.50	962.40
GW-709	LII	906.78	28.70	29.86	-1.16	878.08	876.92

Table B.8 (continued)

Groundwater Elevation (ft above mean sea level)		September 17-26, 2002					
		April 8-10, 2002					
		Seasonal Fluctuation (+/- ft)					
Depth-to-Water (ft below measuring point)		September 17-26, 2002					
		April 8-10, 2002					
Well Number	Location ¹	Measuring Point Elevation ²					
GW-731	CRSDB	1049.38	124.51	125.23	-0.72	924.87	924.15
GW-732	CRSDB	1064.29	157.26	157.85	-0.59	907.03	906.44
GW-743	CRSP	1100.36	116.18	137.51	-21.33	984.18	962.85
GW-757	LII	961.61	84.11	84.75	-0.64	877.50	876.86
GW-796	LV	1052.62	66.28	NM ³	NA ⁴	986.34	NA
GW-797	LV	1060.00	71.94	NM	NA	988.06	NA
GW-798	CDLVII	1006.00	77.57	83.36	-5.79	928.43	922.64
GW-799	LV	981.29	13.21	20.77	-7.56	968.08	960.52
GW-801	LV	1097.16	104.68	NM	NA	992.48	NA
GW-827	CDLVI	1051.58	42.37	45.40	-3.03	1009.21	1006.18
GW-831	FCAP	1091.29	125.56	131.10	-5.54	965.73	960.19

Notes:

- 1 CDLVI - Construction/Demolition Landfill VI
- CDLVII - Construction/Demolition Landfill VII
- CRBAWP - Chestnut Ridge Borrow Area Waste Pile
- CRSDB - Chestnut Ridge Sediment Disposal Basin
- CRSP - Chestnut Ridge Security Pits
- ECRWP - East Chestnut Ridge Waste Pile
- FCAP - Filled Coal Ash Pond
- KHQ - Kerr Hollow Quarry
- LII - Industrial Landfill II
- LIV - Industrial Landfill IV
- LV - Industrial Landfill V
- ORSF - Oak Ridge Sludge Farm
- RQ - Rogers Quarry
- SSCR - South Side Chestnut Ridge
- UNCS - United Nuclear Corporation Site

2 Measuring point elevation is in feet above mean sea level. The measuring point is either the top of the innermost well casing or the top of dedicated sampling equipment mounted on the casing.

3 NM - Not measured or unusable

4 NA - Not applicable

APPENDIX C

MONITORING WELL CONSTRUCTION DETAILS

EXPLANATION

Hydrogeologic Regime:

- | | | |
|----|---|---|
| BC | - | Bear Creek Hydrogeologic Regime |
| CR | - | Chestnut Ridge Hydrogeologic Regime |
| EF | - | Upper East Fork Poplar Creek Hydrogeologic Regime |

Location:

- | | | |
|--------|---|---|
| B8110 | - | Building 81-10 |
| BG | - | Bear Creek Burial Grounds WMA |
| CDLVI | - | Construction/Demolition Landfill VI |
| CDLVII | - | Construction/Demolition Landfill VII |
| CPT | - | Coal Pile Trench |
| CRBAWP | - | Chestnut Ridge Borrow Area Waste Pile (former site) |
| CRSDB | - | Chestnut Ridge Sediment Disposal Basin |
| CRSP | - | Chestnut Ridge Security Pits |
| EMWMF | - | Environmental Management Waste Management Facility |
| EXP | - | Exit Pathway Monitoring Location:
Maynardville Limestone Picket (-A, -B, -C, -E, -I, -J, and -W)
Along Scarboro Road in the gap through Pine Ridge (-SR)
East of Scarboro Road in Union Valley (-UV) |
| FCAP | - | Filled Coal Ash Pond |
| FF | - | Fuel Facility (Building 9754-2) |
| FTF | - | Fire Training Facility |
| GRID | - | Comprehensive Groundwater Monitoring Plan Grid Location |
| KHQ | - | Kerr Hollow Quarry |
| LII | - | Industrial Landfill II |
| LIV | - | Industrial Landfill IV |
| LV | - | Industrial Landfill V |
| NHP | - | New Hope Pond |
| OLF | - | Oil Landfarm WMA |
| RG | - | Rust Garage Area |
| RS | - | Rust Spoil Area |
| S2 | - | S-2 Site |
| S3 | - | S-3 Site |
| SPI | - | Spoil Area I |
| T0134 | - | Tank 0134-U |
| T2331 | - | Tank 2331-U, near Building 9201-1 |
| UNCS | - | United Nuclear Corporation Site |
| UOV | - | Uranium Oxide Vault |

EXPLANATION (continued)

General Information:

Depth	- Feet below ground surface (rounded to nearest 0.1 ft)
Coordinates	- Y-12 grid system (rounded to nearest foot)
Measuring Point	- Top of well casing or Well Wizard™
Elevation	- Feet above mean sea level (rounded to nearest 0.01 ft)
.	- Not Applicable or not available

Geologic Information (regarding the monitored interval):

Hydrostratigraphic Unit:

AQF	- Aquifer (Maynardville Limestone and Knox Group)
AQT	- Aquitard (other formations of the Conasauga Group)

Geologic Formation:

Och	- Chickamauga Group, undifferentiated
OCl	- Knox Group, undifferentiated
Cc	- Conasauga Group, undifferentiated
Cm	- Maryville Limestone
Cn	- Nolichucky Shale
Cmn	- Maynardville Limestone
Cpv	- Pumpkin Valley Shale
Crg	- Rogersville Shale
Cr	- Rome Formation

Aquifer Zone:

BDR	- Bedrock interval (monitored interval top is in fresh rock)
WT	- Water table interval (monitored interval top is above fresh rock)

Depth	- Feet below ground surface (rounded to nearest 0.1 ft)
-------	---

Conductor (Surface) Casing and Well Casing:

Depth	- Feet below ground surface (rounded to nearest 0.1 ft)
Diameter	- Outside dimensions, in inches (nominal)
PVC40	- Polyvinyl chloride, schedule 40
SS304	- Stainless steel, schedule 304
STL	- Carbon steel
SF25/SJ55	- Steel; American Petroleum Institute Grade

Monitored Interval:

Top	- Depth to top of filter pack or open-hole (feet below ground surface)
Bottom	- Depth to bottom of filter pack or open-hole (feet below ground surface)

Screen Material:

PVC/sl	- PVC/slotted
PVC/sw	- PVC, spiral wound
SS/sw	- Stainless steel, spiral wound
SS/ppk	- Stainless steel prepack screen, spiral wound

Slot Size	- size of screen openings, in inches
-----------	--------------------------------------

EXPLANATION (continued)

Dedicated Pump:

- | | | |
|-----------------|---|---|
| Screen Midpoint | - | Depth (feet below the top of casing [TOC]) |
| Pump Intake | - | Depth to the intake of the Well Wizard™ pump (feet below the TOC) |

NOTE:

Data compiled from the *Updated Subsurface Data Base for Bear Creek Valley, Chestnut Ridge, and parts of Bethel Valley on the U.S. Department of Energy Oak Ridge Reservation* (LMES 1998).

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	1090 CR UNCS	55-1B PC Y12	GW-008 BC OLF	GW-014 BC BG	GW-046 BC BG	GW-061 BC BG	GW-066 BC OLF	GW-069 BC BG	GW-071 BC BG	GW-072 BC BG
General Information										
Date Installed	. .	09/12/83	09/21/83	09/29/83	10/27/83	03/21/84	03/24/84	03/26/84	03/25/84	03/30/84
Total Depth Drilled	96.7	38.8	25.5	13.2	20.5	25.0	55.8	100.0	220.6	101.4
East Coordinate	53,853	55,010	47,596	44,308	43,284	43,049	48,677	43,802	44,191	44,159
North Coordinate	28,718	30,469	29,783	29,848	29,562	28,916	29,513	29,489	29,495	29,502
Measuring Point Elevation	1,104.48	986.26	965.39	934.50	921.17	904.60	961.60	927.60	928.90	930.50
Well Wizard Elevation	1,104.48	. .	965.39	934.50	921.17	. .	. .	927.60	928.90	930.51
Top of Casing Elevation	1,103.88	986.26	964.79	933.90	920.57	904.60	961.60	927.00	928.30	929.90
Ground Surface Elevation	1,101.58	986.05	962.11	931.50	918.13	901.00	960.52	924.20	925.40	926.30
Geologic Information										
Hydrostratigraphic Unit	AQF	AQT	AQT	AQT	AQT	AQF	AQF	AQT	AQT	AQT
Geologic Formation	Ock	Cn	Cn	Cn	Cn	Cmn	Cmn	Cn	Cn	Cn
Aquifer Zone	WT	WT	WT	WT	WT	BDR	BDR	BDR	BDR	BDR
Weathered Rock-Depth	. .	8.0	0.6	4.0	7.7	. .	. .	3.0	5.5	5.0
Fresh Rock-Depth	. .	. .	. .	. .	. .	15.7	16.2	24.0	16.0	34.0
Conductor Casing										
Casing Depth	. .	. .	. .	. .	. .	15.7	. .	19.0	16.0	13.2
Casing Diameter	. .	. .	. .	. .	. .	. .	. .	10.75	10.63	10.63
Casing Material	. .	. .	. .	. .	. .	. .	. .	PVC	PVC40	PVC40
Well Casing										
Borehole Depth	96.7	38.8	25.5	13.2	20.5	25.0	55.8	100.0	220.6	101.4
Borehole Diameter	8	6	4.5	6	6	4.75	4	7.88	8.75	8.75
Casing Depth	. .	33.8	15.7	10.0	8.1	19.6	52.9	89.0	198.4	87.8
Casing Diameter	6.5	4.5	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
Casing Material	PVC40	PVC40	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	. .	30.8	13.0	5.0	5.0	17.5	50.0	79.0	195.1	84.5
Midpoint-Depth	. .	34.8	19.3	9.1	12.7	21.1	52.5	89.1	207.1	91.5
Bottom of Screen-Depth	. .	38.8	20.7	12.0	18.1	24.6	54.9	99.2	219.0	98.4
Bottom-Depth	. .	38.8	25.5	13.2	20.3	24.6	54.9	99.2	219.0	98.4
Top-Elevation	. .	955.25	949.11	926.50	913.13	883.50	910.52	845.20	730.30	841.80
Midpoint-Elevation	. .	951.25	942.86	922.40	905.48	879.95	908.07	835.10	718.35	834.85
Bottom-Elevation	. .	947.25	936.61	918.30	897.83	876.40	905.62	825.00	706.40	827.90
Screen Length	. .	5	5	2	10	5	2	10.2	20.6	10.6
Screen Material	PVC/sl	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw
Slot Size	. .	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Open-Hole Diameter	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Dedicated Pump										
Screen Midpoint-(TOC)	. .	36.5	20.9	13.4	15.5	25.7	55.0	96.9	211.6	96.7
Pump Intake-(TOC)	. .	36.5	21.0	12.0	15.0	25.0	58.0	96.0	212.0	98.0
Intake-Elevation	. .	949.8	943.8	921.9	905.6	879.6	903.6	831.0	716.3	831.9

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-076 BC OLF	GW-077 BC BG	GW-078 BC BG	GW-079 BC BG	GW-080 BC BG	GW-082 BC BG	GW-085 BC OLF	GW-087 BC OLF	GW-091 BC BG	GW-108 PC S3
General Information										
Date Installed	03/28/84	03/29/84	03/30/84	03/23/84	03/24/84	03/17/84	03/22/84	03/23/84	.	09/26/84
Total Depth Drilled	81.0	100.5	21.1	65.0	30.0	35.0	62.0	19.0	25.0	58.6
East Coordinate	48,238	41,234	41,209	41,616	41,621	42,090	49,058	48,313	43,621	53,207
North Coordinate	29,909	29,729	29,730	30,630	30,622	30,434	30,003	29,534	30,621	30,070
Measuring Point Elevation	967.06	919.30	918.10	981.20	981.00	964.00	983.50	961.20	953.48	999.00
Well Wizard Elevation	.	919.30	918.10	981.20	981.00	964.00	983.57	961.18	.	999.00
Top of Casing Elevation	967.06	918.70	917.50	980.60	980.40	963.40	982.90	960.60	952.62	998.80
Ground Surface Elevation	964.01	914.70	914.50	977.20	977.10	960.52	979.80	957.30	949.82	995.80
Geologic Information										
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	Cn	Cn	Cn	Crg	Crg	Cm	Cn	Cn	Crg	Cn
Aquifer Zone	BDR	BDR	BDR	BDR	WT	BDR	BDR	WT	WT	WT
Weathered Rock-Depth	12.0	7.0	6.5	4.0	3.5	7.0	2.0	19.0	.	4.0
Fresh Rock-Depth	48.0	13.0	8.5	26.5	23.5	23.0	40.0	.	.	.
Conductor Casing										
Casing Depth	19.0	35.0	.	.	.	25.0	.	.	.	20.7
Casing Diameter	10.63	4.5	.	.	.	6.5	.	.	.	10.63
Casing Material	PVC40	STL	.	.	.	STL	.	.	.	PVC40
Well Casing										
Borehole Depth	81.0	100.5	21.1	65.0	30.0	35.0	62.0	19.0	25.0	58.6
Borehole Diameter	8.75	3.88	6.5	6.5	6.5	4	4	6.5	6.5	9
Casing Depth	69.7	90.3	16.1	59.9	24.7	29.4	53.8	9.0	23.0	46.7
Casing Diameter	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	4.5
Casing Material	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	PVC40
Monitored Interval										
Top-Depth	67.8	87.4	11.7	49.9	20.8	24.1	48.4	7.5	20.0	41.0
Midpoint-Depth	74.1	93.9	16.4	57.4	25.3	29.3	53.6	13.3	22.5	49.8
Bottom of Screen-Depth	80.3	100.3	21.1	64.9	29.7	34.4	58.8	19.0	25.0	55.7
Bottom-Depth	80.3	100.3	21.1	64.9	29.7	34.4	58.8	19.0	25.0	58.6
Top-Elevation	896.21	827.30	902.80	927.30	956.30	936.42	931.40	949.80	929.82	954.80
Midpoint-Elevation	889.96	820.85	898.10	919.80	951.85	931.27	926.20	944.05	927.32	946.00
Bottom-Elevation	883.71	814.40	893.40	912.30	947.40	926.12	921.00	938.30	924.82	937.20
Screen Length	10.6	10	5	5	5	5	5	10	2	9
Screen Material	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	PVC/sl
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.
Dedicated Pump										
Screen Midpoint-(TOC)	78.1	99.3	21.6	65.8	30.5	34.8	59.4	17.3	26.8	54.2
Pump Intake-(TOC)	79.0	.	.	.	.	35.0	55.0	18.0	26.5	53.0
Intake-Elevation	888.1	.	.	.	.	928.4	927.9	942.6	926.1	945.8

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-115 BC S3	GW-141 CR LIV	GW-142 CR KHQ	GW-143 CR KHQ	GW-144 CR KHQ	GW-145 CR KHQ	GW-151 PC NHP	GW-153 PC NHP	GW-154 PC NHP	GW-156 CR CRSDB
General Information										
Date Installed		09/04/87	10/03/85	10/24/85	10/24/85	10/14/85	08/14/85	10/31/85	07/30/85	10/18/85
Total Depth Drilled	53.0	156.0	295.0	253.0	195.0	110.0	96.5	60.0	11.2	157.6
East Coordinate	52,685	52,463	64,030	63,522	63,502	63,266	64,232	63,728	63,346	64,020
North Coordinate	31,073	28,755	24,524	24,257	24,255	24,441	28,958	28,613	28,987	27,626
Measuring Point Elevation	1,055.01	1,186.23	971.15	913.98	913.54	840.24	916.17	921.64	911.70	1,049.30
Well Wizard Elevation	1,055.01	1,186.23	971.15	913.98	913.54	840.24	916.17	921.68	911.70	1,049.28
Top of Casing Elevation	1,054.41	1,186.06	970.35	913.18	913.34	840.04	915.97	921.44	911.50	1,049.10
Ground Surface Elevation	1,051.92	1,183.45	968.29	911.04	910.48	837.29	913.06	918.53	908.60	1,046.94
Geologic Information										
Hydrostratigraphic Unit	AQT	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Cm	Ock	Ock	Ock	Ock/Och	Ock	Cmn	Cmn	Cmn	Ock
Aquifer Zone	WT	BDR	BDR	BDR	BDR	WT	BDR	BDR	WT	BDR
Weathered Rock-Depth	20.0								11.2	84.0
Fresh Rock-Depth		57.0		18.0	40.0	12.0	12.0	12.0	14.0	93.0
Conductor Casing										
Casing Depth		65.0	20.0	20.0	40.0	12.0	12.0	29.0		94.0
Casing Diameter		10.75	12.5	10.63	12.5	12.5	12.5	10.63		10.75
Casing Material		SF25	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40		SF25
Well Casing										
Borehole Depth	53.0	156.0	250.0	205.0	195.0	110.0	96.5	60.0	11.2	157.0
Borehole Diameter		10	11	10	11	11	11	11	8	8.5
Casing Depth	42.0	144.5	248.5	205.0	150.0	88.5	86.0	49.5	5.7	147.0
Casing Diameter	2.37	4.5	6.62	6.62	4.5	4.5	4.5	4.5	4.5	4.5
Casing Material	SS304	SS304	SF25	SF25	PVC40	PVC40	PVC40	PVC40	PVC40	PVC40
Monitored Interval										
Top-Depth	37.6	141.0	248.5	205.0	148.0	86.0	85.0	45.0	4.7	145.0
Midpoint-Depth	45.3	148.5	271.8	229.0	171.5	98.0	90.8	52.5	8.0	151.3
Bottom of Screen-Depth	52.0	155.2			190.0	108.5	96.0	59.5	10.7	157.0
Bottom-Depth	53.0	156.0	295.0	253.0	195.0	110.0	96.5	60.0	11.2	157.6
Top-Elevation	1014.32	1042.45	719.79	706.04	762.48	751.29	828.06	873.53	903.90	901.94
Midpoint-Elevation	1006.62	1034.95	696.54	682.04	738.98	739.29	822.31	866.03	900.65	895.64
Bottom-Elevation	998.92	1027.45	673.29	658.04	715.48	727.29	816.56	858.53	897.40	889.34
Screen Length	10	10.7			40	20	10	10	5	10
Screen Material	SS/sw	SS/sw			PVC/sw	PVC/sw	PVC/sw	PVC/sw	PVC/sw	PVC/sw
Slot Size	0.01	0.01			0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length			46.5	48						
Open-Hole Diameter			6	6						
Dedicated Pump										
Screen Midpoint-(TOC)	49.5	152.5			172.9	101.3	93.9	57.4	11.1	154.2
Pump Intake-(TOC)	50.0	150.5	275.0	229.0	174.0	103.0		56.0		153.0
Intake-Elevation	1004.4	1035.6	695.4	684.2	739.3	737.0		865.4		896.1

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-159 CR CRSDB	GW-169 PC EXP-UV	GW-170 PC EXP-UV	GW-171 PC EXP-UV	GW-172 PC EXP-UV	GW-177 CR CRSP	GW-193 PC T2331	GW-203 CR UNCS	GW-204 PC T0134	GW-205 CR UNCS
General Information										
Date Installed	10/18/85	09/16/86	04/01/86	02/26/86	05/05/86	10/24/85	08/04/89	10/24/85	08/30/89	10/25/85
Total Depth Drilled	157.0	34.8	156.9	31.2	133.9	145.0	18.5	156.0	17.5	164.0
East Coordinate	63,496	66,854	66,843	69,654	69,579	57,497	59,536	54,190	57,411	54,008
North Coordinate	27,764	28,545	28,545	28,403	28,358	28,483	29,344	28,356	29,956	28,363
Measuring Point Elevation	1,051.40	932.12	932.63	920.72	926.57	1,158.20	934.17	1,105.45	958.77	1,104.14
Well Wizard Elevation	1,051.38	932.12	932.64	920.72	926.69	1,158.20	934.17	1,105.45	958.74	1,104.14
Top of Casing Elevation	1,051.20	931.50	932.44	920.10	926.37	1,158.00	934.00	1,105.26	958.57	1,103.97
Ground Surface Elevation	1,048.79	929.95	930.70	918.55	922.85	1,155.52	931.11	1,102.34	955.47	1,101.46
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQT	AQF
Geologic Formation	Ock	Cmn	Cmn	Cmn	Ock	Cmn	Ock	Cc	OCK	Ock
Aquifer Zone	BDR	WT	BDR	WT	BDR	BDR	WT	BDR	WT	BDR
Weathered Rock-Depth	.	.	.	.	15.0	62.0	2.5	86.0	10.0	100.0
Fresh Rock-Depth	100.0	.	30.0	.	19.0	98.0	.	93.0	.	146.0
Conductor Casing										
Casing Depth	123.0	.	30.0	.	35.0	82.0	5.0	94.0	.	154.0
Casing Diameter	10.75	.	8.63	.	8.63	10.75	9.63	10.75	.	10.75
Casing Material	SF25	.	PVC40	.	SF25	SF25	STL	SF25	.	SF25
Well Casing										
Borehole Depth	157.0	42.0	104.0	31.2	105.0	145.0	18.5	156.0	17.5	164.0
Borehole Diameter	8.5	8	6.62	8	6.62	8	8	8.5	6	10
Casing Depth	147.0	29.7	104.0	26.8	105.0	133.0	8.2	146.0	7.3	154.0
Casing Diameter	4.5	2.37	4.38	2.37	4.38	4.5	4.5	4.5	4.5	4.5
Casing Material	PVC40	PVC40	STL	PVC40	STL	PVC40	SS304	PVC40	SS304	PVC40
Monitored Interval										
Top-Depth	145.0	28.7	104.0	25.8	105.0	130.0	5.5	144.0	6.5	152.0
Midpoint-Depth	151.0	31.8	130.5	28.5	119.4	137.5	12.0	150.0	11.9	158.0
Bottom of Screen-Depth	157.0	34.7	.	31.2	.	143.0	18.5	156.0	17.3	164.0
Bottom-Depth	157.0	34.8	156.9	31.2	133.8	145.0	18.5	156.0	17.3	164.0
Top-Elevation	903.79	901.25	826.70	892.75	817.85	1025.52	925.61	958.34	948.97	949.46
Midpoint-Elevation	897.79	898.20	800.25	890.05	803.45	1018.02	919.14	952.34	943.57	943.46
Bottom-Elevation	891.79	895.15	773.80	887.35	789.05	1010.52	912.66	946.34	938.17	937.46
Screen Length	10	5	.	4.4	.	10	10.3	10	10	10
Screen Material	PVC/sw	PVC/sl	.	PVC/sl	.	PVC/sl	SS/sw	PVC/sl	SS/sw	PVC/sl
Slot Size	0.01	0.01	.	0.01	.	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	52.9	.	28.8	.	.	.	.	.
Open-Hole Diameter	.	.	3.88	.	3.63	.	.	.	.	.
Dedicated Pump										
Screen Midpoint-(TOC)	154.4	33.8	.	30.6	.	140.5	16.2	153.9	15.4	161.5
Pump Intake-(TOC)	150.8	.	.	.	.	.	17.0	.	15.0	.
Intake-Elevation	900.4	.	.	.	.	.	917.0	.	943.6	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-207 PC EXP-SR	GW-208 PC EXP-SR	GW-217 CR LIV	GW-219 PC UOV	GW-220 PC NHP	GW-221 CR UNCS	GW-223 PC NHP	GW-225 BC OLF	GW-226 BC OLF	GW-229 BC OLF
General Information										
Date Installed	09/25/85	05/14/86	08/13/87	07/30/87	08/22/85	10/24/85	08/21/85	10/08/85	10/14/85	10/30/85
Total Depth Drilled	109.6	412.8	180.0	11.3	45.2	158.0	90.5	200.0	55.0	55.0
East Coordinate	64,023	64,008	53,020	58,929	64,225	54,389	63,311	47,461	47,473	47,017
North Coordinate	31,596	31,613	28,758	29,163	28,949	28,359	28,938	29,155	29,156	29,256
Measuring Point Elevation	898.80	897.72	1,177.06	935.84	915.84	1,106.16	911.82	943.11	943.60	949.00
Well Wizard Elevation	.	.	1,177.03	935.83	916.47	1,106.16	911.82	.	943.57	.
Top of Casing Elevation	899.40	898.05	1,176.86	935.64	915.64	1,106.00	911.62	943.11	943.40	949.00
Ground Surface Elevation	894.38	894.55	1,174.29	931.27	912.74	1,103.36	908.97	940.21	940.56	945.71
Geologic Information										
Hydrostratigraphic Unit	AQT	AQT	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Cr	Cr	Ock	Cmn	Ock	Cmn	Cmn	Cmn	Cmn	Cmn
Aquifer Zone	BDR	BDR	BDR	WT	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock-Depth	.	.	55.0	.	.	36.0	.	.	.	.
Fresh Rock-Depth	.	12.0	75.0	.	11.0	90.0	10.0	25.0	26.0	30.0
Conductor Casing										
Casing Depth	17.0	24.0	81.7	.	13.0	92.0	11.0	32.0	30.0	37.0
Casing Diameter	8.63	8.63	10.75	.	12.5	6.63	12.5	10.75	10.75	10.75
Casing Material	PVC40	PVC40	SF25	.	PVC40	SF25	PVC40	STL	STL	STL
Well Casing										
Borehole Depth	100.0	404.0	180.0	11.3	45.2	158.0	90.5	150.0	45.0	40.0
Borehole Diameter	7.87	6.62	10	10	11	6	11	10	10	10
Casing Depth	100.0	404.0	166.8	5.7	34.7	148.0	80.0	150.0	45.0	40.0
Casing Diameter	4.38	4.38	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Casing Material	PVC40	STL	SS304	SS304	PVC40	PVC40	PVC40	STL	STL	STL
Monitored Interval										
Top-Depth	100.0	404.0	165.2	4.3	31.0	146.0	79.0	150.0	45.0	40.0
Midpoint-Depth	104.8	408.4	172.6	7.8	38.1	152.0	84.8	175.0	50.0	47.5
Bottom of Screen-Depth	.	.	177.4	11.3	44.7	158.0	90.0	.	.	.
Bottom-Depth	109.6	412.8	180.0	11.3	45.2	158.0	90.5	200.0	55.0	55.0
Top-Elevation	794.38	490.55	1009.09	926.97	881.74	957.36	829.97	790.21	895.56	905.71
Midpoint-Elevation	789.58	486.15	1001.69	923.47	874.64	951.36	824.22	765.21	890.56	898.21
Bottom-Elevation	784.78	481.75	994.29	919.97	867.54	945.36	818.47	740.21	885.56	890.71
Screen Length	.	.	10.6	5.6	10	10	10	.	.	.
Screen Material	.	.	SS/sw	SS/sw	PVC/sw	PVC/sw	PVC/sw	.	.	.
Slot Size	.	.	0.01	0.01	0.01	0.01	0.01	.	.	.
Open-Hole Length	9.6	8.8	.	.	.	.	.	50	10	15
Open-Hole Diameter	3.88	3.63	.	.	.	.	.	4	4	4
Dedicated Pump										
Screen Midpoint-(TOC)	.	.	174.7	12.9	42.6	155.6	87.7	.	.	.
Pump Intake-(TOC)	.	.	175.0	13.5	44.0	.	87.0	193.0	53.0	48.0
Intake-Elevation	.	.	1001.9	922.1	871.6	.	824.6	750.1	890.4	901.0

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-230 PC EXP-UV	GW-231 CR KHQ	GW-232 PC EXP-UV	GW-243 BC S3	GW-251 PC S2	GW-253 PC S2	GW-276 BC S3	GW-288 BC BG	GW-289 BC BG	GW-291 BC BG
General Information										
Date Installed	05/12/86	10/02/85	03/27/86	03/10/86	04/08/86	04/11/86	07/15/86	11/13/86	11/20/86	11/14/86
Total Depth Drilled	406.4	35.0	411.7	77.0	51.0	50.0	18.5	60.0	40.8	14.2
East Coordinate	69,617	63,410	66,863	51,990	53,843	54,057	52,557	42,874	42,875	42,583
North Coordinate	28,388	24,725	28,546	30,155	29,467	29,404	29,926	29,975	29,982	30,449
Measuring Point Elevation	923.14	849.67	931.42	1,011.75	1,003.80	1,004.24	1,001.57	948.36	948.73	948.56
Well Wizard Elevation	923.11	849.67	931.39	1,011.75	1,003.80	1,004.24	1,001.57	948.36	948.73	948.56
Top of Casing Elevation	922.86	849.47	931.22	1,011.55	1,003.60	1,003.99	1,001.27	948.36	948.47	948.36
Ground Surface Elevation	919.57	846.90	929.52	1,008.58	1,001.60	1,001.60	998.70	946.07	946.32	945.12
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQT	AQF	AQF	AQT	AQT	AQT	AQT
Geologic Formation	Cmn	Ock	Cmn	Cn	Cmn	Cmn	Cn	Cm	Cm	Cm
Aquifer Zone	BDR	BDR	BDR	WT	BDR	WT	WT	BDR	WT	WT
Weathered Rock-Depth	19.0	.	.	20.0	32.5	.	18.5	25.0	24.0	8.0
Fresh Rock-Depth	38.0	10.5	.	.	.	.	42.0	38.0	.	.
Conductor Casing										
Casing Depth	31.0	11.0	33.0	37.8	.	.	.	43.0	.	.
Casing Diameter	8.63	10.63	8.63	12.5	.	.	.	10.75	.	.
Casing Material	STL	PVC40	PVC40	PVC40	.	.	.	STL	.	.
Well Casing										
Borehole Depth	341.0	35.0	401.0	77.0	51.0	50.0	18.5	60.0	40.8	17.0
Borehole Diameter	5.5	11	6.62	11	8.25	8.25	8	9	9	9
Casing Depth	341.0	24.5	401.0	45.1	37.5	37.0	13.0	49.1	30.6	8.7
Casing Diameter	4.38	4.5	4.38	6.5	4.5	4.5	4.5	4.5	4.5	4.5
Casing Material	STL	PVC40	STL	PVC40	PVC40	PVC40	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	341.0	22.8	401.0	43.2	35.0	36.2	11.3	46.0	28.9	6.7
Midpoint-Depth	373.7	28.9	406.4	60.1	43.0	43.1	14.9	53.0	34.9	10.5
Bottom of Screen-Depth	.	34.5	.	72.9	47.1	46.7	18.3	59.1	40.6	13.7
Bottom-Depth	406.4	35.0	411.7	77.0	51.0	50.0	18.5	60.0	40.8	14.2
Top-Elevation	578.57	824.10	528.52	965.38	966.60	965.40	987.40	900.07	917.42	938.42
Midpoint-Elevation	545.87	818.00	523.17	948.48	958.60	958.50	983.80	893.07	911.47	934.67
Bottom-Elevation	513.17	811.90	517.82	931.58	950.60	951.60	980.20	886.07	905.52	930.92
Screen Length	.	10	.	27.8	9.6	9.7	5.3	10	10	5
Screen Material	.	PVC/sw	.	PVC/sw	PVC/sl	PVC/sl	SS/sw	SS/sw	SS/sw	SS/sw
Slot Size	.	0.01	.	0.03	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	65.4	.	10.7	.	.	.	.	.	.	.
Open-Hole Diameter	3.63	.	3.88	.	.	.	.	.	.	.
Dedicated Pump										
Screen Midpoint-(TOC)	.	32.1	.	62.0	44.3	44.2	18.2	56.4	37.8	14.4
Pump Intake-(TOC)	.	32.4	.	70.0	45.0	.	17.0	58.0	38.0	17.8
Intake-Elevation	.	817.1	.	941.6	958.6	.	984.3	890.4	910.5	930.6

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-301 CR CRBAWP	GW-302 CR UNCS	GW-305 CR LIV	GW-311 BC RS	GW-315 BC SPI	GW-339 CR UNCS	GW-349 PC S2	GW-350 PC S2	GW-363 BC EMWMF	GW-380 PC NHP
General Information										
Date Installed	07/02/87	11/10/89	08/25/87	07/15/87	09/25/87	12/04/89	05/31/88	05/27/88	03/16/88	08/19/88
Total Depth Drilled	182.0	136.0	179.6	40.3	104.0	114.0	25.5	46.0	75.0	15.5
East Coordinate	61,964	54,353	52,962	50,126	52,268	54,147	53,588	53,595	46,872	62,938
North Coordinate	27,662	28,694	28,548	29,267	29,455	28,659	29,766	29,764	29,961	28,714
Measuring Point Elevation	1,086.55	1,141.84	1,183.75	999.65	1,047.48	1,124.83	993.50	993.51	958.71	913.75
Well Wizard Elevation	1,086.55	1,141.84	1,183.72	999.52	1,047.45	1,124.83	.	.	958.71	913.75
Top of Casing Elevation	1,086.38	1,141.67	1,183.55	999.35	1,047.28	1,124.59	993.50	993.51	957.91	913.55
Ground Surface Elevation	1,083.94	1,139.59	1,181.07	996.43	1,044.84	1,122.18	990.98	991.00	955.41	913.66
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQT	AQF
Geologic Formation	OClk	OClk	OClk	Cmn	Cmn	OClk	Cmn	Cmn	Cn	Cmn
Aquifer Zone	BDR	BDR	BDR	WT	BDR	BDR	WT	WT	BDR	WT
Weathered Rock-Depth	94.0	63.0	53.0	40.3	54.0	45.0	25.5	18.0	9.0	15.5
Fresh Rock-Depth	136.0	102.0	84.0	.	71.0	91.0	.	.	21.0	.
Conductor Casing										
Casing Depth	105.0	63.8	64.0	.	84.4	91.0	.	18.0	36.0	.
Casing Diameter	10.75	10.75	10.75	.	10.75	10.75	.	10.75	10.75	.
Casing Material	SF25	STL	SF25	.	SF25	STL	.	STL	STL	.
Well Casing										
Borehole Depth	163.5	136.0	179.6	40.3	104.0	114.0	25.5	46.0	50.0	15.5
Borehole Diameter	10	9.5	10	10	10	9.5	8	9.5	9.5	10
Casing Depth	151.0	124.5	168.9	29.7	93.3	103.7	9.0	33.4	48.3	4.8
Casing Diameter	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	6.62	4.5
Casing Material	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SF25	SS304
Monitored Interval										
Top-Depth	148.5	121.5	165.3	25.6	90.0	101.0	5.0	28.0	50.0	2.8
Midpoint-Depth	156.0	128.2	172.5	33.0	97.0	107.5	14.7	35.9	62.5	9.2
Bottom of Screen-Depth	161.0	134.8	179.6	40.3	103.3	114.0	24.0	43.4	.	15.2
Bottom-Depth	163.5	134.8	179.6	40.3	104.0	114.0	24.3	43.7	75.0	15.5
Top-Elevation	935.44	1018.09	1015.77	970.83	954.84	1021.18	985.98	963.00	905.41	910.86
Midpoint-Elevation	927.94	1011.44	1008.62	963.48	947.84	1014.68	976.33	955.15	892.91	904.51
Bottom-Elevation	920.44	1004.79	1001.47	956.13	940.84	1008.18	966.68	947.30	880.41	898.16
Screen Length	10	10.3	10.7	10.6	10	10.3	15	10	.	10.4
Screen Material	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	.	SS/sw
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	.	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	25	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	6	.
Dedicated Pump										
Screen Midpoint-(TOC)	158.4	131.7	176.7	37.9	100.7	111.3	19.0	40.9	.	9.9
Pump Intake-(TOC)	160.5	.	176.0	40.0	100.0	.	23.0	41.0	.	12.5
Intake-Elevation	925.9	.	1007.6	959.4	947.3	.	970.5	952.5	.	901.1

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Well Number Hydrogeologic Regime Location	GW-381 PC NHP	GW-382 PC NHP	GW-383 PC NHP	GW-521 CR LIV	GW-522 CR LIV	GW-526 BC S3	GW-537 BC OLF	GW-539 CR LII	GW-540 CR LII	GW-542 CR CDLVI
General Information										
Date Installed	04/25/88	04/11/88	04/04/88	09/14/88	09/20/88	06/13/88	09/14/88	05/11/89	06/02/89	05/18/89
Total Depth Drilled	60.4	173.0	24.1	136.0	195.5	123.0	24.5	156.0	171.5	77.5
East Coordinate	62,948	62,956	63,522	52,040	52,612	50,708	49,539	52,278	52,371	51,642
North Coordinate	28,715	28,716	29,201	28,541	28,377	30,033	30,057	27,193	27,489	27,466
Measuring Point Elevation	913.36	913.17	908.77	1,182.88	1,175.49	998.25	976.44	1,093.22	1,072.32	1,051.77
Well Wizard Elevation	.	.	908.77	1,182.88	1,175.48	998.25	976.41	1,093.20	1,072.31	1,051.81
Top of Casing Elevation	913.36	913.17	908.50	1,182.68	1,175.31	997.45	976.24	1,093.00	1,072.12	1,051.60
Ground Surface Elevation	913.44	913.16	906.00	1,179.46	1,172.04	995.34	974.19	1,090.39	1,069.38	1,049.03
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQT	AQF	AQF	AQT	AQT	AQF	AQF	AQF
Geologic Formation	Cmn	Cmn	Cn	Ock	Ock	Cn	Cn	Ock	Ock	Ock
Aquifer Zone	BDR	BDR	WT	BDR	BDR	BDR	WT	BDR	BDR	WT
Weathered Rock-Depth	13.5	12.7	11.5	.	85.0	3.5	14.9	.	110.0	.
Fresh Rock-Depth	26.0	17.0	.	54.0	130.0	23.6	.	74.0	150.0	.
Conductor Casing										
Casing Depth	17.3	12.7	5.0	60.5	90.0	23.6	.	79.0	154.0	.
Casing Diameter	10.75	10.75	10.75	10.75	10.75	10.75	.	10.75	10.75	.
Casing Material	STL	STL	STL	STL	STL	STL	.	STL	STL	.
Well Casing										
Borehole Depth	49.3	125.0	24.1	136.0	195.5	101.0	24.5	156.0	171.5	76.5
Borehole Diameter	9.5	9.5	8.75	9.5	9.5	9.5	8.75	9.25	9.25	9.25
Casing Depth	47.8	123.2	18.1	124.9	184.6	99.7	8.0	139.8	161.2	60.8
Casing Diameter	6.62	6.62	4.5	4.5	4.5	6.62	4.5	4.5	4.5	4.5
Casing Material	SF25	SF25	SS304	SS304	SS304	SF25	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	49.3	125.0	16.6	123.2	183.0	101.0	4.8	136.4	158.5	59.0
Midpoint-Depth	54.9	149.0	20.1	129.6	189.2	112.0	14.1	146.2	165.0	67.8
Bottom of Screen-Depth	.	.	23.1	135.2	195.0	.	23.0	155.7	171.5	76.5
Bottom-Depth	60.4	173.0	23.6	136.0	195.3	123.0	23.3	156.0	171.5	76.5
Top-Elevation	864.14	788.16	889.40	1056.26	989.04	894.34	969.39	953.99	910.88	990.03
Midpoint-Elevation	858.59	764.16	885.90	1049.86	982.89	883.34	960.14	944.19	904.38	981.28
Bottom-Elevation	853.04	740.16	882.40	1043.46	976.74	872.34	950.89	934.39	897.88	972.53
Screen Length	.	.	5	10.3	10.4	.	15	15.9	10.3	15.7
Screen Material	.	.	SS/sw	SS/sw	SS/sw	.	SS/sw	SS/sl	SS/sl	SS/sl
Slot Size	.	.	0.01	0.01	0.01	.	0.01	0.01	0.01	0.01
Open-Hole Length	11.1	48	.	.	.	22	.	.	.	.
Open-Hole Diameter	6.1	6.13	.	.	.	6.1	.	.	.	.
Dedicated Pump										
Screen Midpoint-(TOC)	.	.	23.1	133.3	193.1	.	17.6	150.4	169.1	71.2
Pump Intake-(TOC)	55.4	.	23.3	132.4	191.0	115.0	25.0	150.0	169.0	78.0
Intake-Elevation	858.0	.	885.2	1050.3	984.3	882.5	951.2	943.0	903.1	973.6

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-543 CR CDLVI	GW-544 CR CDLVI	GW-557 CR LV	GW-560 CR CDLVII	GW-562 CR CDLVII	GW-564 CR CDLVII	GW-605 PC EXP-I	GW-606 PC EXP-I	GW-618 PC EXP-E	GW-620 PC FTF
General Information										
Date Installed	06/02/89	05/30/89	12/02/88	12/30/88	01/13/89	01/27/89	03/19/91	03/20/91	03/15/90	03/27/90
Total Depth Drilled	94.0	110.0	139.0	117.0	133.0	88.0	40.5	175.0	37.0	75.0
East Coordinate	51,458	51,820	59,520	60,743	61,640	59,865	62,002	61,951	54,738	52,895
North Coordinate	27,072	26,963	26,450	25,692	26,276	25,873	28,707	28,708	29,798	29,565
Measuring Point Elevation	1,023.98	1,045.20	1,081.36	949.05	934.69	937.97	919.06	919.59	985.14	1,015.54
Well Wizard Elevation	1,024.01	1,045.19	1,081.36	949.05	934.69	938.07	919.06	919.59	985.14	1,015.57
Top of Casing Elevation	1,023.80	1,044.99	1,081.16	948.85	934.49	937.77	918.88	919.39	984.94	1,015.34
Ground Surface Elevation	1,021.19	1,042.53	1,078.63	945.76	931.86	935.12	916.97	916.98	982.64	1,012.84
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Ock	Ock	Ock	Ock	Ock	Ock	Cmn	Cmn	Cmn	Cmn
Aquifer Zone	BDR	BDR	WT	WT	WT	WT	BDR	BDR	WT	WT
Weathered Rock-Depth	16.0	47.0	113.8	92.0	.	.	.	.	25.0	41.0
Fresh Rock-Depth	37.0	52.5	134.0	.	52.0	72.0	9.5	10.8	27.0	70.0
Conductor Casing										
Casing Depth	29.3	54.5	85.0	.	.	.	9.5	64.7	27.5	42.5
Casing Diameter	10.75	10.75	10.75	.	.	.	11.75	7	10.75	10.75
Casing Material	STL	STL	STL	.	.	.	SJ55	SJ55	SJ55	SJ55
Well Casing										
Borehole Depth	93.6	109.3	138.0	117.0	60.0	81.0	40.5	175.0	37.0	75.0
Borehole Diameter	9.25	9.25	9.5	9.5	9.5	9.5	10.6	9.63	9.5	9.5
Casing Depth	78.0	93.4	115.8	49.0	38.0	55.3	29.7	161.0	26.7	64.2
Casing Diameter	4.5	4.5	4.5	4.5	4.5	4.5	4.25	4.25	4.5	4.5
Casing Material	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	76.2	91.0	112.9	45.2	36.0	52.0	28.2	155.0	26.0	61.7
Midpoint-Depth	84.9	100.2	125.5	57.1	48.0	66.5	34.1	163.0	31.5	68.4
Bottom of Screen-Depth	93.6	109.3	135.8	69.0	58.0	75.3	39.7	171.0	37.0	75.0
Bottom-Depth	93.6	109.3	138.0	69.0	60.0	81.0	39.9	171.0	37.0	75.0
Top-Elevation	944.99	951.53	965.73	900.56	895.86	883.12	888.77	761.98	956.64	951.14
Midpoint-Elevation	936.29	942.38	953.18	888.66	883.86	868.62	882.92	753.98	951.14	944.49
Bottom-Elevation	927.59	933.23	940.63	876.76	871.86	854.12	877.07	745.98	945.64	937.84
Screen Length	15.65	15.9	20	20	20	20	10	10	10.3	10.8
Screen Material	SS/sl	SS/sl	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/ppk	SS/sw	SS/sw
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.
Dedicated Pump										
Screen Midpoint-(TOC)	88.4	103.8	128.3	62.1	50.6	67.9	36.6	168.4	34.2	72.1
Pump Intake-(TOC)	88.4	103.5	126.3	.	.	.	36.0	169.0	35.0	72.0
Intake-Elevation	935.4	941.5	954.9	.	.	.	882.9	750.4	949.9	943.3

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-626 BC BG	GW-627 BC BG	GW-633 PC RG	GW-639 BC EMWMF	GW-653 BC BG	GW-658 PC FF	GW-683 BC EXP-A	GW-684 BC EXP-A	GW-686 PC CPT	GW-687 PC CPT
General Information										
Date Installed	12/15/89	12/11/89	05/03/90	06/15/90	08/10/90	08/31/90	12/03/90	10/09/90	10/18/90	10/18/90
Total Depth Drilled	78.0	270.0	15.0	125.5	39.0	19.1	197.5	129.6	17.0	32.0
East Coordinate	42,772	42,774	53,100	45,260	42,317	62,146	41,552	41,354	55,956	55,651
North Coordinate	29,535	29,505	30,145	29,626	29,660	29,638	28,282	28,525	29,540	29,551
Measuring Point Elevation	942.87	943.65	996.30	940.70	931.80	945.08	972.26	898.86	963.76	964.89
Well Wizard Elevation	942.87	943.51	.	.	931.84	945.08	972.23	898.83	.	.
Top of Casing Elevation	942.61	942.85	996.43	940.70	931.60	944.81	972.06	898.66	963.76	964.89
Ground Surface Elevation	939.95	940.39	996.66	937.98	928.85	942.04	969.45	895.53	964.43	964.59
Geologic Information										
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT	AQF	AQF	AQF	AQF
Geologic Formation	Cn	Cn	Cn	Cn	Cn	Cn	Ock	Cmn	Cmn	Cmn
Aquifer Zone	BDR	BDR	WT	BDR	WT	WT	BDR	BDR	WT	WT
Weathered Rock-Depth	2.0	3.0	8.5	3.0	3.5	1.5	22.0	.	17.0	32.0
Fresh Rock-Depth	64.0	43.0	.	20.0	35.0	.	26.0	9.5	.	.
Conductor Casing										
Casing Depth	62.5	47.5	.	31.0	.	3.5	82.0	87.0	.	.
Casing Diameter	11.75	11.75	.	11.75	.	10.75	11.75	11.75	.	.
Casing Material	SJ55	SJ55	.	SJ55	.	SJ55	SJ55	SJ55	.	.
Well Casing										
Borehole Depth	78.0	254.0	15.0	95.5	39.0	19.1	197.5	129.6	16.0	32.0
Borehole Diameter	9.5	10.63	10.5	10	9.5	9.5	10.63	10.5	12	12
Casing Depth	67.7	252.7	5.0	94.5	29.0	8.8	146.0	113.8	6.0	22.0
Casing Diameter	4.5	7	4.5	7	4.5	4.5	4.5	4.5	4.5	4.5
Casing Material	SS304	SF25	PVC	SF25	SS304	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	63.0	254.0	3.5	95.5	26.3	6.9	133.9	106.4	4.0	20.0
Midpoint-Depth	70.5	262.0	9.3	110.5	32.7	13.0	165.4	118.0	10.0	26.0
Bottom of Screen-Depth	77.7	.	15.0	.	39.0	18.8	196.8	128.4	16.0	32.0
Bottom-Depth	78.0	270.0	15.0	125.5	39.0	19.1	196.8	129.6	16.0	32.0
Top-Elevation	876.95	686.39	993.16	842.48	902.55	935.14	835.55	789.13	960.43	944.59
Midpoint-Elevation	869.45	678.39	987.41	827.48	896.20	929.04	804.10	777.53	954.43	938.59
Bottom-Elevation	861.95	670.39	981.66	812.48	889.85	922.94	772.65	765.93	948.43	932.59
Screen Length	10	.	10	.	10	10	50.8	14.6	10	10
Screen Material	SS/sw	.	PVC/sl	.	SS/sw	SS/sw	SS/ppk	SS/ppk	SS/sw	SS/sw
Slot Size	0.01	.	0.01	.	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	16	.	30	.	.	.	.	.	.
Open-Hole Diameter	.	6.25	.	6.25	.	.	.	.	.	.
Dedicated Pump										
Screen Midpoint-(TOC)	75.4	.	9.8	.	36.8	16.6	174.0	124.2	10.3	27.3
Pump Intake-(TOC)	76.2	259.0	12.0	.	36.3	13.0	174.0	122.0	13.0	30.0
Intake-Elevation	866.4	683.9	984.4	.	895.3	931.8	798.1	776.7	950.8	934.9

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-689 PC CPT	GW-694 BC EXP-B	GW-695 BC EXP-B	GW-698 PC B8110	GW-703 BC EXP-B	GW-704 BC EXP-B	GW-706 BC EXP-B	GW-709 CR LII	GW-712 BC EXP-W	GW-713 BC EXP-W
General Information										
Date Installed	10/22/90	02/07/91	02/21/91	11/02/90	12/07/90	12/20/90	01/27/91	04/05/91	06/20/91	01/13/92
Total Depth Drilled	20.0	204.5	62.6	75.0	182.0	256.0	182.5	80.6	457.5	315.2
East Coordinate	55,597	44,893	44,868	56,804	44,931	44,935	44,944	52,372	36,507	36,434
North Coordinate	29,683	28,845	28,845	29,277	28,806	28,845	28,946	25,344	28,233	28,236
Measuring Point Elevation	967.00	942.24	939.57	970.29	955.49	945.53	929.47	906.78	877.89	881.43
Well Wizard Elevation		941.98	939.54	970.29	955.29	945.33	929.47	906.81	877.89	881.43
Top of Casing Elevation	967.00	941.38	939.37	970.09	954.69	944.73	928.67	906.60	877.09	880.63
Ground Surface Elevation	967.34	938.58	937.22	970.09	951.80	941.99	925.78	903.84	873.61	877.83
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF
Geologic Formation	Cmn	Cmn	Ock	Cmn	Cmn	Cmn	Cmn	Ock	Ock	Cmn
Aquifer Zone	WT	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock-Depth	20.0	11.0	6.0	42.0	7.0	16.0	17.0	39.0	12.0	26.8
Fresh Rock-Depth	.	21.0	18.0	.	10.0	23.0	27.0	43.0	66.0	63.8
Conductor Casing										
Casing Depth	.	25.8	22.5	42.0	.	21.0	40.3	50.0	44.8	80.2
Casing Diameter	.	11.75	11.75	10.5	.	11.75	11.75	11.75	11.75	.
Casing Material	.	STL	SJ55	PVC40	.	SJ55	SJ55	SJ55	SJ55	SJ55
Well Casing										
Borehole Depth	20.0	154.0	62.6	75.0	135.0	246.0	157.0	80.6	441.5	305.0
Borehole Diameter	12	10.6	9.88	8.5	10.63	10.63	10.6	10.6	10.6	10.6
Casing Depth	10.0	152.0	52.4	65.0	132.8	243.5	155.1	70.4	440.2	303.7
Casing Diameter	4.5	7	4.5	4.5	7	7	7	4.25	7	7
Casing Material	SS304	SF25	SS304	SS304	SF25	SF25	SF25	SS304	SF25	SF25
Monitored Interval										
Top-Depth	8.0	153.0	50.6	63.0	133.8	244.5	156.1	68.7	441.5	305.0
Midpoint-Depth	14.0	178.8	56.6	69.0	157.9	250.3	169.3	74.7	449.5	310.1
Bottom of Screen-Depth	20.0	.	62.4	75.0	.	.	.	80.4	.	.
Bottom-Depth	20.0	204.5	62.6	75.0	182.0	256.0	182.5	80.6	457.5	315.2
Top-Elevation	959.34	785.58	886.62	907.09	818.00	697.49	769.68	835.14	432.11	572.83
Midpoint-Elevation	953.34	759.83	880.62	901.09	793.90	691.74	756.48	829.19	424.11	567.73
Bottom-Elevation	947.34	734.08	874.62	895.09	769.80	685.99	743.28	823.24	416.11	562.63
Screen Length	10	.	10	10	.	.	.	10	.	.
Screen Material	SS/sw	.	SS/sw	SS/sw	.	.	.	SS/sw	.	.
Slot Size	0.01	.	0.01	0.01	.	.	.	0.01	.	.
Open-Hole Length	.	51.5	.	.	48.2	11.5	26.4	.	16	10.2
Open-Hole Diameter	.	6.25	.	.	6.25	6.5	6.25	.	6.25	6.25
Dedicated Pump										
Screen Midpoint-(TOC)	14.7	.	59.6	70.0	.	.	.	78.2	.	.
Pump Intake-(TOC)	.	183.0	60.0	20.0	162.0	254.5	178.5	76.0	450.5	311.0
Intake-Elevation	.	758.4	879.4	950.1	792.7	690.2	750.2	830.6	426.6	569.6

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-714 BC EXP-W	GW-715 BC EXP-W	GW-722 PC NHP	GW-723 BC EXP-C	GW-724 BC EXP-C	GW-725 BC EXP-C	GW-731 CR CRSDB	GW-732 CR CRSDB	GW-733 PC EXP-J	GW-735 PC EXP-J
General Information										
Date Installed	01/24/92	01/29/92	08/09/91	08/15/91	08/12/91	08/27/91	09/12/91	09/11/91	10/02/91	10/30/91
Total Depth Drilled	145.0	44.6	644.3	444.5	301.6	142.5	180.4	190.6	256.5	83.0
East Coordinate	36,435	36,453	64,926	49,089	48,995	48,989	63,863	64,268	65,067	64,872
North Coordinate	28,422	28,425	28,532	29,006	29,198	29,405	27,464	27,717	28,447	28,867
Measuring Point Elevation	875.88	874.92	953.71	1,022.23	979.27	961.05	1,049.38	1,064.29	959.84	924.46
Well Wizard Elevation	875.88	874.92	.	.	979.75	961.63	1,049.29	1,064.29	959.84	924.46
Top of Casing Elevation	875.08	874.72	953.71	1,022.23	979.27	961.05	1,049.18	1,064.09	959.04	924.28
Ground Surface Elevation	872.30	872.17	951.04	1,019.31	976.62	958.26	1,045.75	1,060.65	955.69	921.34
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQF	AQT
Geologic Formation	Cmn	Cmn	Cmn	Cmn	Cmn	Ock	Ock	Cmn	Cmn	Cn
Aquifer Zone	BDR	WT	BDR	BDR	BDR	BDR	BDR	BDR	BDR	WT
Weathered Rock-Depth	27.0	34.0	54.0	26.7	33.5	14.0	95.4	85.0	42.5	19.0
Fresh Rock-Depth	35.0	.	73.0	29.7	40.0	17.5	129.4	96.0	47.1	77.5
Conductor Casing										
Casing Depth	40.5	.	56.2	39.0	40.0	21.0	122.0	100.7	51.8	25.5
Casing Diameter	11.75	.	10.75	11.75	11.75	11.75	11.75	11.75	11.75	11.75
Casing Material	SJ55	.	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55
Well Casing										
Borehole Depth	115.1	44.6	75.0	340.6	289.6	132.5	175.4	189.5	240.1	83.0
Borehole Diameter	10.6	10.6	6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Casing Depth	113.8	33.1	74.5	339.3	288.3	131.2	165.2	179.3	238.8	67.9
Casing Diameter	7	4.25	4.5	7	7	7	4.5	4.5	7	4.5
Casing Material	SF25	SS304	SJ55	SF25	SF25	SF25	SS304	SS304	SF25	SS304
Monitored Interval										
Top-Depth	115.1	32.0	74.5	340.6	289.6	132.5	164.0	178.3	240.1	67.5
Midpoint-Depth	130.1	38.0	359.4	392.6	295.6	137.5	171.4	184.2	248.3	73.4
Bottom of Screen-Depth	.	43.1	.	.	.	.	175.2	189.3	.	77.9
Bottom-Depth	145.0	44.0	644.3	444.5	301.6	142.5	178.7	190.0	256.5	79.2
Top-Elevation	757.20	840.17	876.54	678.71	687.02	825.76	881.75	882.35	715.59	853.84
Midpoint-Elevation	742.25	834.17	591.64	626.76	681.02	820.76	874.40	876.50	707.39	847.99
Bottom-Elevation	727.30	828.17	306.74	574.81	675.02	815.76	867.05	870.65	699.19	842.14
Screen Length	.	10	.	.	.	.	10	10	.	10
Screen Material	.	SS/sw	.	.	.	.	SS/sw	SS/sw	.	SS/sw
Slot Size	.	0.01	.	.	.	.	0.01	0.01	.	0.01
Open-Hole Length	29.9	.	569.8	103.9	12	10	.	.	16.4	.
Open-Hole Diameter	6.25	.	3.5	6.25	6.25	6.25	.	.	6.25	.
Dedicated Pump										
Screen Midpoint-(TOC)	.	40.7	.	.	.	.	173.6	187.7	.	75.8
Pump Intake-(TOC)	142.0	40.0	.	437.0	297.5	140.5	173.5	188.0	253.0	76.7
Intake-Elevation	733.1	834.7	.	585.2	681.8	820.6	875.7	876.1	706.0	847.6

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-736 BC EXP-C	GW-737 BC EXP-C	GW-738 BC EXP-C	GW-739 BC EXP-C	GW-740 BC EXP-C	GW-744 PC GRIDK1	GW-747 PC GRIDK2	GW-750 PC EXP-J	GW-757 CR LII	GW-762 PC GRIDJ3
General Information										
Date Installed	10/25/91	11/07/91	11/21/91	11/26/91	12/20/91	01/08/92	01/28/92	02/06/92	04/24/92	05/15/92
Total Depth Drilled	105.0	89.5	90.1	320.0	190.0	69.5	79.9	72.8	166.5	60.2
East Coordinate	48,936	48,890	49,026	49,126	49,055	64,324	64,570	64,835	53,303	63,193
North Coordinate	29,381	29,365	29,150	29,010	29,027	30,282	29,730	28,975	25,410	29,115
Measuring Point Elevation	960.12	959.91	983.08	1,023.74	1,020.43	907.62	921.13	919.03	961.61	915.34
Well Wizard Elevation	960.12	960.07	.	.	1,020.33	907.60	921.14	919.03	961.64	915.56
Top of Casing Elevation	960.12	959.91	983.08	1,023.74	1,019.63	907.43	920.96	918.86	961.43	915.34
Ground Surface Elevation	957.55	957.50	980.36	1,020.66	1,016.95	905.05	918.33	915.96	958.65	911.85
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQT	AQT	AQT	AQF	AQT
Geologic Formation	Cmn	Cmn	Cmn	Cmn	Cmn	Cpv	Cm	Cn	Ock	Cn
Aquifer Zone	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR	BDR
Weathered Rock-Depth	7.5	.	12.0	34.0	38.1	9.6	10.5	18.5	29.5	12.0
Fresh Rock-Depth	12.0	14.0	15.1	42.0	45.1	14.6	12.0	24.8	48.0	14.5
Conductor Casing										
Casing Depth	21.5	22.0	16.5	60.3	46.9	27.6	23.8	21.7	46.8	19.4
Casing Diameter	11.75	11.75	11.75	11.75	11.75	10.75	10.75	11.75	10.75	11.75
Casing Material	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55	SJ55
Well Casing										
Borehole Depth	102.5	89.5	90.1	289.2	165.6	69.5	79.9	72.8	166.5	60.2
Borehole Diameter	10.6	10.6	10.6	10.6	10.6	9.87	9.87	10.6	9.62	9.87
Casing Depth	92.4	79.4	67.3	287.9	164.3	57.0	69.2	62.4	135.5	48.2
Casing Diameter	4.5	4.5	4.5	7	7	4.5	4.5	4.5	4.5	4.5
Casing Material	SS304	SS304	SS304	SF25	SF25	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	92.0	79.0	63.5	289.2	165.6	55.0	67.4	61.2	134.0	46.4
Midpoint-Depth	98.5	84.3	75.8	304.6	177.8	62.3	73.5	67.0	150.3	52.6
Bottom of Screen-Depth	102.4	89.4	87.3	.	.	66.9	79.1	72.3	165.5	58.1
Bottom-Depth	105.0	89.5	88.0	320.0	190.0	69.5	79.6	72.7	166.5	58.7
Top-Elevation	865.55	878.50	916.86	731.46	851.35	850.05	850.93	854.76	824.65	865.45
Midpoint-Elevation	859.05	873.25	904.61	716.06	839.15	842.80	844.83	849.01	808.40	859.30
Bottom-Elevation	852.55	868.00	892.36	700.66	826.95	835.55	838.73	843.26	792.15	853.15
Screen Length	10	10	20	.	.	9.9	9.9	9.9	30	9.9
Screen Material	SS/sw	SS/sw	SS/sw	.	.	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw
Slot Size	0.01	0.01	0.01	.	.	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	30.8	24.4	.	.	.	.	.
Open-Hole Diameter	.	.	.	6.25	6.25	.	.	.	.	.
Dedicated Pump										
Screen Midpoint-(TOC)	100.0	86.8	80.0	.	.	64.3	76.8	70.3	153.3	56.6
Pump Intake-(TOC)	99.0	87.0	81.5	317.0	187.0	67.5	78.0	70.7	158.0	.
Intake-Elevation	861.1	872.9	901.6	706.7	832.6	839.9	843.0	848.2	803.4	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-763 PC GRIDJ3	GW-769 PC GRIDG3	GW-770 PC GRIDG3	GW-775 PC GRIDH3	GW-776 PC GRIDH3	GW-782 PC GRIDE3	GW-791 PC GRIDD2	GW-796 CR LV	GW-797 CR LV	GW-798 CR CDLVII
General Information										
Date Installed	05/13/92	06/04/92	06/04/92	07/16/92	07/21/92	08/12/92	09/21/92	03/04/93	03/16/93	03/18/93
Total Depth Drilled	17.0	61.4	20.0	60.5	24.0	36.0	70.6	139.7	134.1	135.5
East Coordinate	63,220	60,230	60,255	61,278	61,309	58,099	57,423	58,206	58,550	60,310
North Coordinate	29,117	29,510	29,505	29,272	29,271	29,719	30,483	27,924	27,447	27,265
Measuring Point Elevation	915.05	944.44	944.71	931.35	931.25	947.76	992.16	1,052.62	1,060.00	1,006.00
Well Wizard Elevation	915.03	944.43	944.72	.	.	947.73	992.13	1,052.62	1,060.00	1,006.00
Top of Casing Elevation	914.85	944.26	944.55	931.35	931.25	947.56	991.96	1,052.42	1,059.80	1,005.80
Ground Surface Elevation	911.38	941.53	941.67	931.48	931.44	944.48	988.51	1,048.80	1,056.10	1,002.42
Geologic Information										
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQF	AQF	AQF
Geologic Formation	Cn	Cn	Cn	Cn	Cn	Cn	Cm	Ock	Ock	Ock
Aquifer Zone	WT	BDR	WT	BDR	WT	BDR	BDR	BDR	BDR	BDR
Weathered Rock-Depth	17.0	14.2	12.0	.	14.5	1.0	14.7	102.0	67.1	94.4
Fresh Rock-Depth	.	.	16.5	16.7	19.3	7.5	26.0	103.0	89.0	95.8
Conductor Casing										
Casing Depth	.	17.2	.	16.7	.	.	31.5	107.6	95.0	99.7
Casing Diameter	.	11.75	.	11.75	.	.	10.75	10.75	10.75	10.75
Casing Material	.	SJ55	.	SJ55	.	.	SJ55	SJ55	SJ55	SJ55
Well Casing										
Borehole Depth	17.0	61.4	20.0	60.5	24.0	36.0	70.6	139.7	134.1	135.5
Borehole Diameter	8	10.62	10.62	10.62	9.87	9.87	9.87	9.5	9.5	9.5
Casing Depth	5.2	49.4	8.5	46.3	12.3	25.0	59.0	126.5	123.5	124.5
Casing Diameter	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Casing Material	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304
Monitored Interval										
Top-Depth	4.0	48.2	7.5	45.0	10.6	23.8	57.5	122.9	118.0	122.0
Midpoint-Depth	10.0	54.3	13.3	50.7	16.8	29.9	64.1	129.7	126.1	128.7
Bottom of Screen-Depth	15.2	59.3	18.4	56.2	22.2	34.9	68.9	136.4	133.4	134.4
Bottom-Depth	16.0	60.3	19.0	56.4	23.0	35.9	70.6	136.5	134.1	135.4
Top-Elevation	907.38	893.33	934.17	886.48	920.84	920.68	931.01	925.90	938.10	880.42
Midpoint-Elevation	901.38	887.28	928.42	880.78	914.64	914.63	924.46	919.10	930.05	873.72
Bottom-Elevation	895.38	881.23	922.67	875.08	908.44	908.58	917.91	912.30	922.00	867.02
Screen Length	10	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
Screen Material	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.
Dedicated Pump										
Screen Midpoint-(TOC)	13.6	57.1	16.3	51.1	17.1	33.0	67.4	135.1	132.2	132.8
Pump Intake-(TOC)	15.4	57.8	16.7	51.0	17.0	33.0	67.4	135.0	132.2	.
Intake-Elevation	899.5	886.5	927.9	880.4	914.3	914.6	924.6	917.4	927.6	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-799 CR LV	GW-801 CR LV	GW-816 PC EXP-SR	GW-827 CR CDLVI	GW-831 CR FCAP	GW-832 PC NHP	GW-835 BC S3	GW-916 BC EMWMF	GW-917 BC EMWMF	GW-918 BC EMWMF
General Information										
Date Installed	03/25/93	07/01/93	06/02/94	01/24/95	07/30/96	05/09/96	.	01/29/01	01/22/01	02/02/01
Total Depth Drilled	92.0	188.9	16.1	135.0	200.0	11.9	19.2	36.0	51.0	75.0
East Coordinate	59,961	58,780	64,031	51,826	56,593	64,134	51,358	48,276	47,914	47,549
North Coordinate	26,746	26,808	31,582	27,721	26,654	29,142	29,822	31,186	30,463	31,672
Measuring Point Elevation	981.29	1,097.16	898.41	1,051.58	1,091.29	906.18	1,000.91	1,002.85	997.10	1,067.96
Well Wizard Elevation	981.29	1,097.16	898.42	1,051.60	1,091.29	.	.	.	.	.
Top of Casing Elevation	981.09	1,096.96	898.21	1,051.39	1,091.09	906.18	1,000.91	1,002.85	997.10	1,067.96
Ground Surface Elevation	978.10	1,093.82	894.56	1,048.13	1,088.04	906.83	998.04	.	.	.
Geologic Information										
Hydrostratigraphic Unit	AQF	AQF	AQT	AQF	AQF	AQF	.	AQT	AQT	AQT
Geologic Formation	OClk	OClk	Cr	OClk	OClk	Cmn	.	CC	CC	CC
Aquifer Zone	BDR	BDR	WT	BDR	BDR	WT	WT	WT	WT	WT
Weathered Rock-Depth	60.8	112.5	.	.	134.8	.	19.2	10.0	21.0	.
Fresh Rock-Depth	62.8	113.4	.	40.5	140.8	.	.	15.0	27.0	30.0
Conductor Casing										
Casing Depth	65.0	115.4	.	43.4	138.3	.	.	.	.	.
Casing Diameter	10.75	10.75	.	10.75	10.75	.	.	.	.	.
Casing Material	SJ55	SJ55	.	STL	STL	.	.	.	.	.
Well Casing										
Borehole Depth	92.0	188.9	15.8	135.0	200.0	11.9	.	.	.	.
Borehole Diameter	9.5	9.87	10	9.87	9.87	12	.	.	.	.
Casing Depth	81.0	178.1	4.2	124.1	183.2	5.9	17.2	.	20.0	20.0
Casing Diameter	4.5	4.5	4.500	4.500	4.500	6.630	4.500	.	2.370	.
Casing Material	SS304	SS304	SS304	SS304	SLS	PVC	PVC	.	SS304	SS304
Monitored Interval										
Top-Depth	78.7	175.8	2.9	122.1	182.0	4.0	16.2	13.0	18.0	18.0
Midpoint-Depth	85.4	182.4	9.4	128.5	190.8	7.9	17.7	24.5	34.5	25.5
Bottom of Screen-Depth	90.9	188.0	13.6	134.1	193.6	10.9	19.2	35.0	50.0	30.0
Bottom-Depth	92.0	188.9	15.8	134.8	199.6	11.8	19.2	36.0	51.0	33.0
Top-Elevation	899.40	918.02	891.66	926.03	906.04	902.83	981.84	.	.	.
Midpoint-Elevation	892.75	911.47	885.21	919.68	897.24	898.93	980.34	.	.	.
Bottom-Elevation	886.10	904.92	878.76	913.33	888.44	895.03	978.84	.	.	.
Screen Length	9.9	9.9	9.4	10	10.4	5	2	20	30	10
Screen Material	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	PVC/sl	PVC/sl	SS/sw	SS/sw	SS/sw
Slot Size	0.01	0.01	0.01	0.01	0.01	0.02	.	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.	.
Dedicated Pump										
Screen Midpoint-(TOC)	88.9	186.2	12.6	132.4	191.5	.	.	.	.	.
Pump Intake-(TOC)	89.0	181.0	15.0	132.2	192.0	.	.	.	.	.
Intake-Elevation	892.1	916.0	883.2	919.2	899.1	.	.	.	.	.

APPENDIX C: MONITORING WELL CONSTRUCTION DETAILS, 2002

Well Number Hydrogeologic Regime Location	GW-919 BC EMWMF	GW-920 BC EMWMF	GW-921 BC EMWMF	GW-922 BC EMWMF	GW-923 BC EMWMF	GW-924 BC EMWMF	GW-925 BC EMWMF	GW-926 BC EMWMF	GW-927 BC EMWMF
General Information									
Date Installed	08/21/01	01/16/01	01/31/01	01/17/01	02/01/01	01/29/01	02/05/01	02/01/01	02/01/01
Total Depth Drilled	32.0	55.0	50.0	46.0	102.0	54.0	170.0	145.0	172.0
East Coordinate	47,326	47,375	47,139	47,147	48,184	46,300	47,128	46,290	47,906
North Coordinate	30,739	30,193	30,350	30,024	30,822	30,185	30,349	30,185	30,463
Measuring Point Elevation	990.52	967.43	971.29	956.91	1,016.73	968.90	971.14	968.94	997.19
Well Wizard Elevation									
Top of Casing Elevation	990.52	967.43	971.29	956.91	1,016.73	968.90	971.14	968.94	997.19
Ground Surface Elevation	987.50								
Geologic Information									
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	CC	CC	CC	CC	CC	CC	CC	CC	CC
Aquifer Zone	WT	BDR	BDR	BDR	WT	WT	BDR	BDR	BDR
Weathered Rock-Depth	12.0				10.0		21.8		15.0
Fresh Rock-Depth	22.0	12.0	13.0	13.0	62.0	22.0	15.0	18.0	30.0
Conductor Casing									
Casing Depth	.	.	.	.	.	.	.	.	.
Casing Diameter	.	.	.	.	.	.	.	.	.
Casing Material	.	.	.	.	.	.	.	.	.
Well Casing									
Borehole Depth	.	.	.	.	.	.	.	.	.
Borehole Diameter	.	.	.	.	.	.	.	.	.
Casing Depth	16.5	24.0	18.0	25.0	40.0	23.0	97.0	113.0	60.0
Casing Diameter	2.380	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370
Casing Material	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304	SS304
Monitored Interval									
Top-Depth	11.6	22.0	16.0	23.0	36.0	21.0	92.0	103.0	57.0
Midpoint-Depth	21.8	38.5	33.0	34.5	55.5	37.5	120.0	124.0	74.5
Bottom of Screen-Depth	31.5	54.0	48.0	45.0	70.0	53.0	147.0	143.0	90.0
Bottom-Depth	32.0	55.0	50.0	46.0	75.0	54.0	148.0	145.0	92.0
Top-Elevation	975.90	.	.	.	.	.	.	.	.
Midpoint-Elevation	965.70	.	.	.	.	.	.	.	.
Bottom-Elevation	955.50	.	.	.	.	.	.	.	.
Screen Length	15	30	30	20	30	30	50	30	30
Screen Material	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw	SS/sw
Slot Size	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Open-Hole Length	.	.	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.	.	.
Dedicated Pump									
Screen Midpoint-(TOC)	.	.	.	.	.	.	.	.	.
Pump Intake-(TOC)	.	.	.	.	.	.	.	.	.
Intake-Elevation	.	.	.	.	.	.	.	.	.

APPENDIX D

CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME

EXPLANATION

Sampling Point:

BCK - Bear Creek Kilometer
GW - Monitoring Well
NT - Northern Tributary (Bear Creek)
SS - South Side (of Bear Creek, spring sampling station)

Location:

BG - Bear Creek Burial Grounds
EMWMF - Environmental Management Waste Management Facility
EXP - Exit Pathway Monitoring Location:
Maynardville Limestone Picket (-A, -B, -C, -W)
Spring or Surface Water Location (-SW)
OLF - Oil Landfarm
RS - Rust Spoil Area
S3 - S-3 Site
SPI - Spoil Area I

Monitoring Program:

BJC - managed by Bechtel Jacobs Company LLC
GWPP - managed by Y-12 Groundwater Protection Program

Sample Type:

Dup - Field Duplicate Sample

Units:

ft - feet (elevations are above mean sea level and depths are below grade)
 $\mu\text{g/L}$ - micrograms per liter
mg/L - milligrams per liter
mV - millivolts
 $\mu\text{mho}/\text{cm}$ - micromhos per centimeter
NTU - Nephelometric Turbidity Units
pCi/L - picoCuries per liter
ppm - parts per million

EXPLANATION (continued)

Only the analytes that were detected above the program reporting limits in at least one sample are included in this appendix. Additionally, results that are below the reporting limits are replaced with missing values (e.g., “<”) to emphasize the detected results. The following sections describe the reporting limits and data qualifiers for each sub-appendix. A comprehensive list of the GWPP analytes, analytical methods, and reporting limits is provided in Appendix B, Table B.5.

D.1 Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals:

Results for all of the field measurements, miscellaneous analytes, and major ions are included in this appendix. The reporting limits for the major ions are shown in the following summary.

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Cations			Anions		
Calcium	0.2	0.25	Alkalinity - HCO ₃	1.0	NA
Magnesium	0.2	0.05	Alkalinity - CO ₃	1.0	NA
Potassium	2.0	0.25	Chloride	0.2	0.1
Sodium	0.2	0.25	Fluoride	0.1	0.05
			Nitrate (as Nitrogen)	0.028	0.1
			Sulfate	0.25	0.1

The major ion results for the January 2002 sample from NT-01 are qualitative because the ion charge balance (relative percent difference) exceeds 20%.

The Y-12 GWPP SAP (BWXT 2001a) specifies reporting limits for trace metals that are appropriate for DOE Order 5400.1 monitoring. The laboratories subcontracted by monitoring programs managed by BJC may use reporting limits (sometimes reporting estimated values) that are lower than the GWPP reporting limits for the metals. To retain the highest quality data for DOE Order 5400.1 monitoring purposes and to standardize reporting limits for trace metal results obtained from all sources, the GWPP reporting limits were given precedence over the BJC reporting limits (BJC 2001 and 2002a) shown below. The trace metals shown in bold typeface below were detected in at least one groundwater or surface water sample collected during CY 2002 and are presented in Appendix D.1.

EXPLANATION (continued)

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Aluminum	0.2	0.05*	Lithium	0.01	0.01
Antimony (PMS)	0.0025	.	Manganese	0.005	0.005
Antimony	.	0.006	Mercury (CVAA)	0.0002	0.0002
Arsenic (PMS)	0.005	.	Molybdenum	0.05	.*
Arsenic	.	0.005	Nickel (PMS)	0.005	.
Barium	0.004	0.005	Nickel	.	0.01
Beryllium	0.001	0.001	Selenium (PMS)	0.01	.
Boron	0.1	0.01*	Selenium	.	0.005
Cadmium (PMS)	0.0005	.	Silver	0.02	0.005*
Cadmium	.	0.001	Strontium	0.005	0.005
Chromium (PMS)	0.0025	.	Thallium (PMS)	0.0005	.
Chromium	.	0.005	Thallium	.	0.002
Cobalt	0.02	0.005*	Thorium	0.2	.
Copper	0.02	0.005*	Uranium (PMS)	0.0005	.
Iron	0.05	0.01	Uranium (KPA)	.	0.004
Lead (PMS)	0.0005	.	Vanadium	0.02	0.01*
Lead	.	0.003	Zinc	0.05	0.01*

Note: * - the GWPP reporting limit was used instead of the BJC reporting limit; “.” - not specified.

Metals analyses were performed using the inductively coupled plasma (ICP) spectroscopy method (SW846-6010B) unless otherwise noted.

- CVAA - Cold Vapor Atomic Absorption (EPA-7470)
- KPA - Kinetic Phosphorescent Analysis (ASTM-D5174-M)
- PMS - Plasma Mass Spectroscopy (EPA-200.8)

Groundwater samples collected from the following wells for metals analysis by the ICP method during CY 2002 were diluted before analysis to obtain an optimum matrix. The detected results are valid, but some metals may be present at concentrations below the elevated reporting limits.

Sampling Location	Date Sampled	Dilution Factor	Sampling Location	Date Sampled	Dilution Factor
GW-091	08/08/02	2 X	GW-537	02/18/02	2 X
GW-243	03/21/02	100 X	GW-537	07/31/02	2 X
GW-243	08/13/02	50 X	NT-01	07/11/02	10 X

The following symbols and data qualifiers are used in Appendix D.1:

- . - Not analyzed or not applicable
- < - Analyzed but not detected at the project reporting level
- R - Result does not meet data quality objectives (charge balance for NT-01 and duplicate lead results for GW-311 that differ by at least an order of magnitude).

EXPLANATION (continued)

D.2 Volatile Organic Compounds:

The Y-12 GWPP reporting limits for volatile organic compounds (Table B.5) and those used for monitoring programs managed by BJC are contract-required quantitation limits. Results below the quantitation limit and above the instrument detection limit are reported as estimated quantities. Therefore, non-detected results are assumed to equal zero for all compounds.

As summarized below, 27 compounds were detected (of the 53 compounds requested) in the CY 2002 groundwater and surface water samples collected in the Bear Creek Regime. Results for these compounds are grouped by similar chemical composition (e.g., chloroethenes) in Appendix D.2.

Compound	No. Detected	Maximum (µg/L)	Compound	No. Detected	Maximum (µg/L)
Trichloroethene	71	710	Toluene	5	10
cis-1,2-Dichloroethene	71	7,200	1,2-Dichloroethane	4	32
Tetrachloroethene	49	4,400	Dichlorodifluoromethane	4	12
1,1-Dichloroethene	33	120	Chlorobenzene	3	8
1,1-Dichloroethane	26	1,780	Chloromethane	3	3 J
Vinyl chloride	24	1,200	Dimethylbenzene	3	9
Benzene	16	820	Trichlorofluoromethane	3	5
1,1,1-Trichloroethane	15	120	2-Butanone	2	25
Chloroethane	12	25	Bromoform	2	3 J
Chloroform	12	100	Ethylbenzene	2	2 J
trans-1,2-Dichloroethene	12	13	1,1,2-Trichloroethane	1	2 J
Acetone	6	700	1,2-Dichloropropane	1	1 J
Carbon tetrachloride	5	8	1,4-Dichlorobenzene	1	3 J
Methylene chloride	5	120			

The following symbols and data qualifiers are used in Appendix D.2.

- . - Not analyzed
- < - Analyzed but not detected (also false-positive results for data provided by the WRRP)
- J - Positively identified; estimated concentration

EXPLANATION (continued)

D.3 Radiological Analytes:

Reporting limits for radiological analytes are sample-specific and analyte-specific minimum detectable activities that are reported with each result. The following summary shows the radiological analytes reported for at least one groundwater sample collected during CY 2002 in the Bear Creek Regime.

Analyte	No. of Results	No. Detected	Analyte	No. of Results	No. Detected
Alpha activity	134	74	Radium-223/224/226	4	2
Beta activity	146	97	Total Radium Alpha*	18	11
Americium-241	51	3	Srontium-89/90	38	4
Carbon-14	30	0	Strontium-90*	18	1
Cesium-137	15	0	Technetium-99	99	42
Cobalt-60	15	0	Thorium-228	4	2
Curium-242	15	0	Thorium-230	4	4
Curium-243/244	16	0	Thorium-232	4	1
Europium-152	15	0	Thorium-231/234	4	4
Europium-154	15	0	Tritium	38	2
Europium-155	15	0	Uranium-233/234*	95	76
Iodine-129	34	0	Uranium-234	8	8
Neptunium-237	52	8	Uranium-235	73	28
Plutonium-238	34	1	Uranium-235/236*	30	1
Plutonium-239/240	34	0	Uranium-236	65	15
			Uranium-238	103	60

Note: * = Reported by BJC laboratories are reported in Appendix D.3 as equivalent GWPP analytes:
Total radium alpha=Ra 223/224/226; Sr-90 = Sr-89/90; U-233/234 = U-234; U-235/236 = U-235.

All of the results for gross alpha and gross beta are presented in the first three pages of Appendix D.3, followed by results for the isotopes detected in at least one sample (shown in bold typeface above) on pages D.3-5 through D.3-24.

The following notes and qualifiers apply to Appendix D.3:

- Activity - Result in picoCuries per liter (pCi/L)
- Error - Counting error (two standard deviations)
- MDA - Minimum detectable activity
- Q - Inconsistent with historical measurements for the location (e.g., gross beta at GW-627)
- R - Result does not meet data quality objectives: exceeds the MDA but is less than the error (e.g., neptunium-237 at GW-008).

EXPLANATION (continued)

Additional Analytes Not Presented in Appendix D tables:

The Y-12 GWPP requested determination of the weight percent of uranium isotopes for the samples from the following sampling locations.

Sampling Location	Date Sampled	Total Uranium (mg/L)	Weight Percent			
			U-234	U-235	U-236	U-238
BCK-11.97	01/09/02	0.148	0.0025	0.386	0.023	99.59
BCK-11.97	07/11/02	0.14	0.002	0.414	0.004	99.58
GW-243	03/21/02	0.82	0.003	0.325	0.002	99.67
GW-243	08/13/02	0.76	0.002	0.317	0.006	99.68

The WRRP also requested field measurement of iron and manganese metal species at well GW-835, associated with remedial actions at the S-3 Site.

Well Number	Date Sampled	Manganese ++ (mg/L)	Iron ++ (mg/L)
GW-835	03/04/02	1.8	0.01
	05/20/02	1.7	0.01
	08/22/02	1.8	0
	11/19/02	1.5	0.01

APPENDIX D.1

FIELD MEASUREMENTS, MISCELLANEOUS ANALYTES, MAJOR IONS, AND TRACE METALS

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		BCK-00.63		BCK-03.30		BCK-04.55		BCK-07.87	
Location		EXP-SW		EXP-SW		EXP-SW		EXP-SW	
Date Sampled		01/08/02	07/10/02	03/12/02	09/09/02	01/09/02	07/10/02	01/08/02	07/10/02
Program		GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP	GWPP
Sample Type									
Field Measurements									
Time Sampled		9:30	8:15	9:56	10:41	9:45	8:45	10:00	9:05
Measuring Point Elev. (ft)		.	.	.	.	.	.	.	.
Depth to Water (ft)		.	.	.	.	.	.	.	.
Groundwater Elevation (ft)		.	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)		625	519	157	181	640	364	768	512
Dissolved Oxygen (ppm)		9.44	3.22	14.1	9.43	7.21	4.24	9.31	3.52
Oxidation/Reduction (mV)		249	220	155	170	249	177	239	166
Temperature (degrees C)		2.4	21.9	10.5	19.1	4.9	17.6	1.1	22.7
Turbidity (NTU)		.	.	8	28	.	.	.	.
pH		7.36	7.58	7.89	7.42	7.51	7.46	7.69	7.9
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)		348	381	.	.	420	339	589	474
Dissolved Solids (mg/L)		208	255	184	214	230	190	367	295
Suspended Solids (mg/L)		<	<	<	<	<	4	6	<
Turbidity (NTU)		2.81	1.86	.	.	3.79	7.26	2.17	3.93
pH		8.02	8.02	.	.	7.96	7.8	8.03	8.22
Major Ions (mg/L)									
Calcium		52	49.3	44.6	47	61.9	42.4	90.6	61.2
Magnesium		13.3	17.5	11.8	17.2	13.7	18.4	16.3	19.9
Potassium		<	<	1.2	1.41	<	<	<	<
Sodium		4.8	3.25	4.33	3.01	6.34	2.05	11.1	7.4
Alkalinity as CO ₃		<	<	<	<	<	<	<	<
Alkalinity as HCO ₃		137	153	138	177	165	171	198	193
Chloride		6.26	3.17	7.8	5.6	9.52	3.55	17.9	15.1
Fluoride		<	0.118	<	<	0.121	<	0.24	0.172
Nitrate as N		2.82	0.176	4.1	0.44	6.69	0.234	17	3.52
Sulfate		23.9	39.3	10	7.4	13.5	4.11	20.9	13.4
Charge balance (RPD)		3.8	0.7	-0.9	0.6	1.8	1.3	1.8	1.9
Trace Metals (mg/L)									
Aluminum		<	<	<	0.289	0.231	0.645	<	0.319
Antimony	PMS	<	<	.	.	<	<	<	<
Arsenic	PMS	<	<	.	.	<	<	<	<
Barium		0.0577	0.065	0.0569	0.0661	0.067	0.0636	0.0971	0.0882
Beryllium		<	<	<	<	<	<	<	<
Boron		<	<	<	<	<	<	0.175	0.1
Cadmium	PMS	<	<	.	.	<	<	<	<
Cadmium		.	.	<	<	.	.	.	.
Chromium	PMS	<	<	.	.	<	<	<	<
Chromium		.	.	<	<	.	.	.	.
Cobalt		<	<	<	<	<	<	<	<
Copper		<	<	<	<	<	<	<	<
Iron		0.203	0.128	0.203	0.341	0.182	0.4	0.112	0.175
Lead	PMS	<	0.00111	.	.	<	0.00259	0.00106	0.00128
Lead		.	.	<	<	.	.	.	.
Lithium		<	<	<	<	0.014	<	0.0372	0.0144
Manganese		0.0295	0.0407	0.0169	0.0324	0.0168	0.0621	0.0248	0.0251
Mercury	CVAA	<	<	<	<	<	<	<	<
Nickel	PMS	<	<	.	.	<	<	<	<
Nickel		.	.	<	<	.	.	.	.
Selenium	PMS	<	<	.	.	<	<	<	<
Strontium		0.138	0.175	0.084	0.0745	0.117	0.0518	0.208	0.138
Thallium	PMS	<	<	.	.	<	<	<	<
Thallium		.	.	<	<	.	.	.	.
Uranium	PMS	0.0242	0.0118	.	.	0.0568	0.00916	0.153	0.0693
Uranium	KPA	.	.	0.0345	0.0173	.	.	.	.
Vanadium		<	<	<	<	<	<	<	<
Zinc		<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	BCK-09.20		BCK-09.40			BCK-09.47	BCK-11.54		
Location	EXP-SW		EXP-SW			EXP-SW	EXP-SW		
Date Sampled	03/11/02	09/09/02	01/09/02	07/11/02		03/11/02	03/11/02	09/09/02	
Program	BJC	BJC	GWPP	GWPP	GWPP	BJC	BJC	BJC	
Sample Type			Dup						
Field Measurements									
Time Sampled	12:59	13:14	10:15	8:30	8:30	12:44	13:12	13:42	
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	282	287	740	439	439	332	477	190	
Dissolved Oxygen (ppm)	12.29	8.3	8.33	1.4	1.4	13.3	12.24	7.15	
Oxidation/Reduction (mV)	155	155	230	215	215	165	155	115	
Temperature (degrees C)	11.7	19	1.4	22.1	22.1	10	11.9	24.3	
Turbidity (NTU)	2	29	.	.	.	6	4	6	
pH	8.34	6.38	7.48	7.27	7.27	8.5	8.11	7.33	
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	598	358	357	.	.	.	
Dissolved Solids (mg/L)	333	390	376	226	231	419	641	212	
Suspended Solids (mg/L)	<	<	<	27	26	<	<	6.4	
Turbidity (NTU)	.	.	3.15	34.8	34	.	.	.	
pH	.	.	8.03	7.68	7.75	.	.	.	
Major Ions (mg/L)									
Calcium	77.8	74.3	93.1	55.7	56.5	87.2	140	42.7	
Magnesium	17.2	20.2	14.4	7.01	7.02	15.5	19.8	24.6	
Potassium	1.88	2.21	2.29	3.64	3.66	2.32	2.8	1.08	
Sodium	9.78	9.09	11.1	5.38	5.36	12.3	18.3	0.68	
Alkalinity as CO_3	<	<	<	<	<	<	<	<	
Alkalinity as HCO_3	177	190	186	152	150	173	161	174	
Chloride	19	19	19.7	16.2	15.7	25.5	32.1	1.6	
Fluoride	0.14	0.18	0.282	0.237	0.239	0.17	0.32	0.18	
Nitrate as N	15.9	9.9	19.4	0.042	0.0412	23.4	61.2	0.041	
Sulfate	17.4	16.9	23.1	8.51	8.36	19.3	25.1	3.2	
Charge balance (RPD)	1.7	3.7	1.7	-0.1	1.3	-0.3	2.4	7.8	
Trace Metals (mg/L)									
Aluminum	<	<	<	2.97	3.72	<	<	<	
Antimony	PMS	.	.	<	<	.	.	.	
Arsenic	PMS	.	.	<	<	.	.	.	
Barium	0.101	0.103	0.104	0.107	0.111	0.116	0.219	0.148	
Beryllium	<	<	<	<	<	<	<	<	
Boron	0.152	<	0.404	2.12	2.1	0.351	<	<	
Cadmium	PMS	.	.	<	<	.	.	.	
Cadmium	<	<	.	.	.	<	0.0018	<	
Chromium	PMS	.	.	<	<	.	.	.	
Chromium	<	<	.	.	.	<	<	<	
Cobalt	<	<	.	<	<	<	<	<	
Copper	<	<	.	<	<	<	<	<	
Iron	0.081	0.0906	0.157	1.6	2.04	0.145	0.0729	0.193	
Lead	PMS	.	.	<	0.00136	0.00137	.	.	
Lead	<	<	.	.	.	<	<	<	
Lithium	0.0282	0.0107	0.0676	0.235	0.235	0.062	0.0112	<	
Manganese	0.0221	0.0069	0.0825	0.52	0.577	0.0747	0.317	0.0512	
Mercury	CVAA	<	<	<	<	<	<	<	
Nickel	PMS	.	.	<	0.00581	.	.	.	
Nickel	<	<	.	.	.	<	0.0107	<	
Selenium	PMS	.	.	<	<	.	.	.	
Strontium	0.182	0.16	0.226	0.142	0.142	0.235	0.38	0.0603	
Thallium	PMS	.	.	<	<	.	.	.	
Thallium	<	<	.	.	.	<	<	<	
Uranium	PMS	.	.	0.204	0.154	0.18	.	.	
Uranium	KPA	0.121	0.0625	.	.	.	0.205	0.145	
Vanadium	<	<	<	<	<	<	<	<	
Zinc	<	<	<	<	<	<	<	<	

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	BCK-11.84	BCK-11.97		GW-008		GW-014		
Location	EXP-SW	EXP-SW		OLF		BG		
Date Sampled	03/11/02	01/09/02	07/11/02	01/07/02	07/02/02	03/14/02		08/12/02
Program	BJC	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP
Sample Type						Dup		
Field Measurements								
Time Sampled	13:45	10:40	9:00	13:20	9:55	8:35	8:35	8:30
Measuring Point Elev. (ft)	.	.	.	965.39	965.39	934.50	934.50	934.50
Depth to Water (ft)	.	.	.	15.70	17.56	7.21	7.21	9.15
Groundwater Elevation (ft)	.	.	.	949.69	947.83	927.29	927.29	925.35
Conductivity ($\mu\text{mho}/\text{cm}$)	636	1,631	2,810	131	190	665	665	514
Dissolved Oxygen (ppm)	13.54	6.78	3.41	0.81	1.1	5.14	5.14	4.49
Oxidation/Reduction (mV)	105	236	203	51	145	218	218	157
Temperature (degrees C)	9.6	1.7	21.6	13.5	17.4	11.4	11.4	19.6
Turbidity (NTU)	7	.	.	16	16	.	.	.
pH	8.03	7.79	7.76	5.71	5.26	7.2	7.2	7.43
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	1,348	2,680	.	.	640	647	641
Dissolved Solids (mg/L)	994	6,380 Q	2,030	99	75.8	372	371	375
Suspended Solids (mg/L)	<	<	4	<	<	<	<	<
Turbidity (NTU)	.	0.609	2.74	.	.	0.896	0.886	1.04
pH	.	8.02	7.92	.	.	7.28	7.26	7.68
Major Ions (mg/L)								
Calcium	165	206	359	12	9.54	98.3	99.3	101
Magnesium	22.8	25.3	48.7	6.95	5.59	16	16.3	15.6
Potassium	3.11	3.74	9.19	1.05	1.04	<	<	<
Sodium	25.6	32.5	70.7	2.45	2.37	9.79	9.91	9.7
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	181	258	153	40	37.6	302	316	308
Chloride	48.6	45.3	78.6	8.6	11.6	16.6	16.3	16.5
Fluoride	0.48	0.916	0.959	<	<	<	<	<
Nitrate as N	88.8	83.8	257	0.11	0.89	<	<	<
Sulfate	29.3	38.6	40.7	1.9	2.6	7.01	7.3	5.47
Charge balance (RPD)	-2.9	2.2	1.4	9	-5.5	0	-1.5	0.1
Trace Metals (mg/L)								
Aluminum	<	0.27	<	<	<	<	<	<
Antimony	PMS	.	<	<	.	<	<	<
Arsenic	PMS	.	<	<	.	<	<	<
Barium	0.297	0.297	0.612	0.0754	0.0785	0.548	0.558	0.56
Beryllium	.	<	<	<	<	<	<	<
Boron	0.0049	0.012	0.000573	.	<	.	.	0.000531
Cadmium	PMS	.	<	<	.	.	.	.
Cadmium	0.0049	.	<	<	.	.	.	.
Chromium	PMS	.	<	<	.	0.0359	0.0315	<
Chromium	.	<	.	<	.	.	.	.
Cobalt	0.0556	0.0935	0.126	1.79	1.86	0.054	<	<
Copper	PMS	.	<	<	<	<	<	<
Iron	0.0556	0.0935	0.126	1.79	1.86	0.054	<	<
Lead	PMS	.	<	0.00122	.	0.00355	0.00294	0.00158
Lead	.	<	.	<	<	.	.	.
Lithium	0.874	2.09	0.0433	1.48	1.33	0.149	0.163	0.278
Manganese	CVAA	<	<	<	<	<	<	<
Mercury	PMS	.	0.057	0.00985	.	0.0117	0.0101	0.0194
Nickel	0.023	.	0.0217	0.0237	.	.	.	.
Nickel	PMS	0.015	.	.	.	<	<	<
Selenium	PMS	0.514	0.54	0.999	0.0257	0.0237	0.347	0.353
Strontium	PMS	.	<	<	.	<	<	<
Thallium	PMS	0.151	0.14	.	.	0.00384	0.00365	0.00247
Thallium	.	.	.	.	.	.	.	.
Uranium	PMS	0.109	.	.	.	.	.	.
Uranium	KPA	.	.	.	.	.	.	.
Vanadium	CVAA	<	<	<	<	<	<	<
Zinc	PMS	<	<	<	<	<	<	<

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		GW-046		GW-061		GW-066			GW-069	
Location		BG		BG		OLF			BG	
Date Sampled	01/07/02	07/02/02	03/12/02	08/05/02	03/25/02	08/13/02		03/11/02	08/05/02	
Program	BJC	BJC	GWPP							
Sample Type						Dup				
Field Measurements										
Time Sampled		14:40	9:30	10:45	10:20	10:10	7:50	7:50	10:15	9:00
Measuring Point Elev. (ft)		921.17	921.17	904.60	904.60	961.60	961.60	961.60	927.60	927.60
Depth to Water (ft)		5.26	5.17	16.71	18.17	7.34	9.98	9.98	10.34	11.96
Groundwater Elevation (ft)		915.91	916.00	887.89	886.43	954.26	951.62	951.62	917.26	915.64
Conductivity ($\mu\text{mho}/\text{cm}$)		197	217	702	666	864	749	749	477	465
Dissolved Oxygen (ppm)		0.67	2.12	1.95	0.31	2.26	1.19	1.19	0.45	1.69
Oxidation/Reduction (mV)		143	223	104	130	55	-49	-49	-233	-268
Temperature (degrees C)		11.5	18.3	12	14.2	14.8	16.4	16.4	13.1	18.4
Turbidity (NTU)		39	34	.	.	.	.	.	.	.
pH		5.43	5.39	7.02	7.08	7.31	7.38	7.38	9.53	9.07
Miscellaneous Analytes										
Conductivity ($\mu\text{mho}/\text{cm}$)		.	.	640	634	864	754	764	434	446
Dissolved Solids (mg/L)		126	132	400	385	515	480	516	238	251
Suspended Solids (mg/L)		<	<	42	248	<	<	<	<	<
Turbidity (NTU)		.	.	70	271	3.3	1.97	1.98	1.28	0.923
pH		.	.	7.22	7.73	7.18	7.28	7.16	8.87	8.86
Major Ions (mg/L)										
Calcium		18.5	18.6	95.8	104	128	97.8	92	8.19	9.38
Magnesium		5.35	4.74	16.2	19.3	28.8	30.1	30.9	6.48	6.44
Potassium		3.99	3.15	3.62	6.96	3.25	5.01	5.2	7.67	6.93
Sodium		4.65	5.63	9.08	9	11	8.63	9.11	74.3	73.6
Alkalinity as CO_3		<	<	<	<	<	<	<	17.2	19.9
Alkalinity as HCO_3		40	45.5	224	240	306	270	280	121	126
Chloride		22.1	20.4	19.6	18.8	9.79	7.93	8.15	51.5	48.2
Fluoride		<	<	0.129	0.155	<	<	<	0.107	<
Nitrate as N		0.034	1.2	13.2	8.73	2.77	2.47	2.71	<	0.0305
Sulfate		11.9	6.4	28.5	37.2	120	108	103	1.95	1.99
Charge balance (RPD)		-0.1	-1.7	0.2	4.4	1.2	-1.2	-3.2	0.9	0.5
Trace Metals (mg/L)										
Aluminum		<	<	7.16	22.3	0.292	<	<	<	<
Antimony	PMS	.	.	<	<	<	<	<	<	<
Arsenic	PMS	.	.	<	<	<	<	<	0.00654	<
Barium		0.164	0.167	0.117	0.218	0.14	0.11	0.111	0.392	0.386
Beryllium		<	<	<	0.00107	<	<	<	<	<
Boron		<	<	<	<	<	<	<	0.11	0.11
Cadmium	PMS	.	.	<	<	<	<	<	0.00297	0.00063
Cadmium		<	<	.	.	.	.	.	.	.
Chromium	PMS	.	.	0.00364	0.00478	<	<	<	0.0117	0.00358
Chromium		<	<	.	.	.	.	.	.	.
Cobalt		0.0239	<	<	<	<	<	<	<	<
Copper		<	<	<	<	<	<	<	<	<
Iron		3.14	0.423	4.27	17.8	0.119	0.0973	0.161	0.0666	0.0769
Lead	PMS	.	.	0.00969	0.0137	0.00268	0.000586	0.000963	0.000965	0.00117
Lead		<	<	.	.	.	.	.	.	.
Lithium		0.0528	0.137	0.011	0.0273	0.012	0.012	0.0117	0.0439	0.0427
Manganese		1.67	1.22	0.326	1.55	0.0136	0.00766	0.00901	<	<
Mercury	CVAA	<	<	<	<	<	<	<	<	<
Nickel	PMS	.	.	0.00748	0.0164	0.0119	0.0211	0.0304	0.00608	<
Nickel		0.0174	0.0153	.	.	.	.	.	.	.
Selenium	PMS	.	.	<	<	<	<	<	0.0266	0.0143
Strontium		0.0704	0.07	0.187	0.199	0.298	0.296	0.315	0.995	0.967
Thallium	PMS	.	.	<	<	<	0.00106	0.00116	<	<
Thallium		<	<	.	.	.	.	.	.	.
Uranium	PMS	.	.	0.0642	0.0581	0.00719	0.00969	0.0109	<	<
Uranium	KPA	.	.	.	.	.	.	.	.	.
Vanadium		<	<	<	0.0254	<	<	<	<	<
Zinc		<	<	<	0.0575	<	<	<	<	<

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-071			GW-072		GW-076	GW-077	
Location	BG			BG		OLF	BG	
Date Sampled	03/12/02	08/06/02		03/11/02	08/06/02	03/19/02	02/26/02	08/08/02
Program	GWPP		GWPP	GWPP		GWPP	BJC	
Sample Type	Dup							
Field Measurements								
Time Sampled	9:10	10:00	10:00	8:40	8:25	9:20	13:10	11:15
Measuring Point Elev. (ft)	928.90	928.90	928.90	930.51	930.51	967.06	919.30	919.30
Depth to Water (ft)	8.42	10.12	10.12	11.48	13.61	4.06	9.35	11.97
Groundwater Elevation (ft)	920.48	918.78	918.78	919.03	916.90	963.00	909.95	907.33
Conductivity ($\mu\text{mho}/\text{cm}$)	2,210	2,070	2,070	640	601	414	353	411
Dissolved Oxygen (ppm)	0.13	0.78	0.78	0.77	1.38	0.31	1.25	3.11
Oxidation/Reduction (mV)	-373	-385	-385	-328	-285	-242	52	-20
Temperature (degrees C)	11.4	19.4	19.4	11.8	18.5	14.1	11.3	17.6
Turbidity (NTU)	.	.	.	.	.	.	28	8
pH	11.4	11.13	11.13	9.98	9.62	8.47	7.48	6.84
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	1,997	1,951	1,953	561	556	393	.	.
Dissolved Solids (mg/L)	969	970	973	299	309	224	214	220
Suspended Solids (mg/L)	4	4	2	<	<	2	<	6.9
Turbidity (NTU)	4.52	5.65	5.5	2.2	5.05	0.795	.	.
pH	11.21	11.13	11.1	9.99	9.83	8.16	.	.
Major Ions (mg/L)								
Calcium	3.82	2.49	3.52	1.56	2.24	21.2	49.7	51.2
Magnesium	<	<	<	0.527	0.971	10.8	11.7	11.5
Potassium	2.32	2.38	2.14	2.58	2.18	6.84	2.37	2.45
Sodium	403	401	387	122	119	42.2	6.75	6.38
Alkalinity as CO ₃	712	784	776	138	115	<	<	<
Alkalinity as HCO ₃	<	<	<	90	121	174	173	175
Chloride	21.3	37.3	35.7	24.3	52.9	13.5	1.4	1.3
Fluoride	6.02	6	6.08	0.336	0.354	0.254	<	0.13
Nitrate as N	0.0347	<	<	<	0.0439	<	0.058	0.18
Sulfate	12.5	10.9	10.1	3.88	1.74	5.25	11.4	10.9
Charge balance (RPD)	-0.4	-2.7	-3.7	0.5	-7.5	-0.3	0.8	0.8
Trace Metals (mg/L)								
Aluminum	1.54	1.37	1.32	<	0.463	<	<	<
Antimony	PMS	<	<	<	<	<	.	.
Arsenic	PMS	0.0139	0.0103	0.0108	<	<	.	.
Barium		0.0687	0.068	0.0718	0.176	0.208	0.329	0.415
Beryllium		<	<	<	<	<	<	<
Boron		0.819	0.813	0.786	0.293	0.294	<	<
Cadmium	PMS	<	<	<	<	0.00136	<	.
Cadmium		.	.	.	.	.	<	<
Chromium	PMS	<	<	<	<	<	.	.
Chromium		.	.	.	.	.	<	<
Cobalt		<	<	<	<	<	<	<
Copper		<	<	<	<	<	<	<
Iron		<	<	<	<	0.346	<	0.105
Lead	PMS	0.00141	0.000703	0.00103	0.000562	0.00694	0.00102	.
Lead		.	.	.	.	.	<	<
Lithium		0.109	0.116	0.111	0.0606	0.0622	0.0316	0.0106
Manganese		<	<	<	<	0.0129	<	0.063
Mercury	CVAA	<	<	<	<	<	.	.
Nickel	PMS	<	<	<	<	<	.	.
Nickel		.	.	.	.	.	<	<
Selenium	PMS	0.0158	<	<	0.0188	0.0121	<	.
Strontium		0.248	0.221	0.237	0.321	0.347	0.866	1.24
Thallium	PMS	<	<	<	<	<	.	.
Thallium		.	.	.	.	.	<	<
Uranium	PMS	<	<	<	<	<	.	.
Uranium	KPA	.	.	.	.	.	<	<
Vanadium		<	<	<	<	<	<	<
Zinc		<	<	<	<	<	<	<

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		GW-078		GW-079		GW-080			
Location		BG		BG		BG			
Date Sampled		02/26/02	08/08/02	02/26/02	08/07/02	02/26/02		08/07/02	
Program		BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type						Dup			Dup
Field Measurements									
Time Sampled		12:41	9:21	14:35	13:15	13:42	.	9:15	.
Measuring Point Elev. (ft)		918.10	918.10	981.20	981.20	981.00	.	981.00	.
Depth to Water (ft)		8.21	10.42	21.30	24.16	23.60	.	.	.
Groundwater Elevation (ft)		909.89	907.68	959.90	957.04	957.40	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)		373	408	232	345	182	.	236	.
Dissolved Oxygen (ppm)		3.01	1.17	1.23	1.5	6.21	.	0.5	.
Oxidation/Reduction (mV)		229	189	-61	-112	69	.	-54	.
Temperature (degrees C)		13.6	15.4	12.5	20.9	12.4	.	16.1	.
Turbidity (NTU)		18	6	10	21	32	.	28	.
pH		8.05	6.79	7.25	7.19	8.21	.	6.35	.
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)		.	.	.	.	.	.	.	.
Dissolved Solids (mg/L)		249	239	151	199	117	97	102	100
Suspended Solids (mg/L)		<	<	<	5.8	9	9	11.9	14.9
Turbidity (NTU)		.	.	.	.	.	.	.	.
pH		.	.	.	.	.	.	.	.
Major Ions (mg/L)									
Calcium		62.9	62.9	35.6	51.6	6.25	5.96	6.36	6.28
Magnesium		8.13	7.65	3.85	5.53	6.82	6.52	7.02	6.92
Potassium		1.24	1.36	1.12	2.65	1.49	1.43	1.84	1.67
Sodium		4.46	4.69	4.26	5.57	14.3	13.8	13	12.6
Alkalinity as CO_3		<	<	<	<	<	<	<	<
Alkalinity as HCO_3		185	178	106	174	73	74	73	70
Chloride		1.8	1.5	1	1.5	0.95	1	1.3	1.2
Fluoride		<	0.16	<	<	0.13	0.13	0.17	0.16
Nitrate as N		0.071	0.25	0.04	<	0.076	0.075	0.087	0.099
Sulfate		15.5	11.7	7.3	1.7	12.2	11.7	13.1	13.1
Charge balance (RPD)		-0.5	1.7	0.1	-3.1	-6.7	.	-8.4	.
Trace Metals (mg/L)									
Aluminum		<	<	<	<	<	<	<	<
Antimony	PMS	.	.	.	.	.	.	.	.
Arsenic	PMS	.	.	.	.	.	.	.	.
Barium		0.165	0.171	0.209	0.47	0.0286	0.0276	0.0305	0.0295
Beryllium		<	<	<	<	<	<	<	<
Boron		<	<	<	<	<	<	<	<
Cadmium	PMS	.	.	.	.	.	.	.	.
Cadmium		<	<	<	<	<	<	<	<
Chromium	PMS	.	.	.	.	.	.	.	.
Chromium		<	<	<	<	<	<	<	<
Cobalt		<	<	<	<	<	<	<	<
Copper		<	<	<	<	<	<	<	<
Iron		0.062	0.0608	0.199	1.58	5.88	6.2	7.15	7.05
Lead	PMS	.	.	.	.	.	.	.	.
Lead		<	<	<	0.0038	<	<	0.004	<
Lithium		0.0109	0.0112	<	<	0.0121	0.0118	0.0112	0.0112
Manganese		0.009	0.0257	0.0824	0.232	0.239	0.239	0.262	0.259
Mercury	CVAA	.	.	.	.	.	.	.	.
Nickel	PMS	.	.	.	.	.	.	.	.
Nickel		<	<	<	<	<	<	<	<
Selenium	PMS	.	.	.	.	.	.	.	.
Strontium		0.124	0.123	0.128	0.207	0.0301	0.0292	0.0307	0.0303
Thallium	PMS	.	.	.	.	.	.	.	.
Thallium		<	<	<	<	<	<	<	<
Uranium	PMS	.	.	.	.	.	.	.	.
Uranium	KPA	.	.	.	.	.	.	.	.
Vanadium		<	<	<	<	<	<	<	<
Zinc		<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		GW-082		GW-085		GW-087		GW-091		GW-115	
Location		BG		OLF		OLF		BG		BG	
Date Sampled	02/12/02	07/29/02	02/18/02	07/31/02	03/25/02	03/14/02	08/08/02	01/07/02	07/08/02	S3	
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC		
Sample Type											
Field Measurements											
Time Sampled	10:40	9:50	9:10	8:05	11:35	11:35	10:15	12:40	9:40		
Measuring Point Elev. (ft)	964.00	964.00	983.57	983.57	961.18	952.62	952.62	1,055.01	1,055.01		
Depth to Water (ft)	21.31	21.71	13.87	15.79	8.09	7.91	9.73	12.96	14.23		
Groundwater Elevation (ft)	942.69	942.29	969.70	967.78	953.09	944.71	942.89	1,042.05	1,040.78		
Conductivity ($\mu\text{mho}/\text{cm}$)	1,121	941	2,560	2,430	469	179.1	471	610	502		
Dissolved Oxygen (ppm)	0.02	1.01	0.66	1.27	0.42	0.43	0.76	0.65	3.46		
Oxidation/Reduction (mV)	-133	-65	170	188	-145	111	-76	-53	-52		
Temperature (degrees C)	13.2	16	15.1	16.9	15.3	12.2	17.2	14.7	18.8		
Turbidity (NTU)	.	.	.	.	.	.	.	17	6		
pH	7.16	6.96	6.97	6.72	6.41	5.9	6.05	7.31	7.56		
Miscellaneous Analytes											
Conductivity ($\mu\text{mho}/\text{cm}$)	1,084	916	2,310	2,310	377	168.5	442	.	.		
Dissolved Solids (mg/L)	822	708	1,630	1,830	197	95	267	341	380		
Suspended Solids (mg/L)	<	2	8	16	5	8	7	<	<		
Turbidity (NTU)	3.92	5.4	5.06	14.7	66.5	25.4	11.4	.	.		
pH	6.97	7.16	7.02	6.9	6.36	6.03	6.33	.	.		
Major Ions (mg/L)											
Calcium	172	147	398	392	47.5	17.1	56.5	95.9	88.9		
Magnesium	18.5	17.4	25.9	25.9	7	5.27	14.2	16.6	16		
Potassium	<	<	2.43	2.99	5.06	<	<	2.14	2.96		
Sodium	9.48	8.57	15.4	15.8	13.4	1.68	7.99	12.1	12.7		
Alkalinity as CO_3	<	<	<	<	<	<	<	<	<		
Alkalinity as HCO_3	302	302	206	218	148	55.6	195	233	248		
Chloride	147	114	15.5	14.1	4.89	1.22	11.7	38.6	35.6		
Fluoride	<	<	<	<	<	<	<	<	<		
Nitrate as N	0.0802	<	244	233	<	0.0281	<	<	0.1		
Sulfate	4.86	6.28	6.87	7.28	19.5	21.2	23.4	16.2	16.9		
Charge balance (RPD)	1.1	-1.3	1.3	2.1	2.2	-7.7	-4.2	5.1	0.5		
Trace Metals (mg/L)											
Aluminum	<	<	0.727	2.03	<	1.59	1.26	<	<		
Antimony	PMS	<	<	<	<	<	<	.	.		
Arsenic	PMS	<	<	<	<	<	<	.	.		
Barium	1.2	0.925	1.08	1.08	0.115	0.116	0.173	0.231	0.229		
Beryllium	<	<	<	<	<	<	<	<	<		
Boron	19.6	13.2	<	<	0.207	<	<	<	<		
Cadmium	PMS	<	<	<	<	<	<	.	.		
Chromium	PMS	<	0.0147	<	0.0259	<	<	.	.		
Chromium	.	.	.	.	.	.	.	.	.
Cobalt	<	<	<	<	<	<	<	<	<		
Copper	<	<	<	<	<	<	<	<	<		
Iron	0.554	0.923	0.416	1.18	10.4	2.4	6.3	0.459	0.706		
Lead	PMS	0.126	0.00331	0.00111	0.0015	0.00691	0.00919	0.00172	.		
Lead	.	.	.	.	.	.	.	.	.
Lithium	0.508	0.236	0.0264	0.0256	<	<	<	0.023	0.0241		
Manganese	1.35	1.36	0.0158	0.0348	1.71	5.43	8.91	0.743	0.72		
Mercury	CVAA	<	<	<	<	<	<	<	<		
Nickel	PMS	0.0282	0.0641	0.00561	0.00586	0.01	0.00625	0.00734	.		
Nickel	.	.	.	.	.	.	.	.	.
Selenium	PMS	<	<	<	<	<	<	.	.		
Strontium	0.325	0.289	0.924	0.935	0.107	0.0632	0.275	0.165	0.16		
Thallium	PMS	0.000645	<	<	<	<	<	.	.		
Thallium	.	.	.	.	.	.	.	.	.
Uranium	PMS	<	<	0.000616	<	0.023	0.00331	0.0129	.		
Uranium	KPA	.	.	.	.	.	.	.	.
Vanadium	.	.	.	.	.	.	.	.	.
Zinc	<	<	<	<	<	<	<	<	<		

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		GW-225		GW-226		GW-229			GW-243	
Location		OLF		OLF		OLF			S3	
Date Sampled	02/19/02	08/01/02	02/19/02	08/01/02	03/19/02	03/19/02	08/12/02	03/21/02	08/13/02	
Program	GWPP									
Sample Type					Dup					
Field Measurements										
Time Sampled	10:05	10:25	8:50	9:05	13:10	13:10	10:05	8:50	9:45	
Measuring Point Elev. (ft)	943.11	943.11	943.40	943.40	949.00	949.00	949.00	1,011.75	1,011.75	
Depth to Water (ft)	13.05	18.45	14.00	18.78	14.22	14.22	28.51	15.94	17.60	
Groundwater Elevation (ft)	930.06	924.66	929.40	924.62	934.78	934.78	920.49	995.81	994.15	
Conductivity ($\mu\text{mho}/\text{cm}$)	1,134	1,032	1,182	802	1,486	1,486	1575	35,300	35,700	
Dissolved Oxygen (ppm)	0.01	0.99	0.1	0.46	0.22	0.22	1.83	0.62	0.53	
Oxidation/Reduction (mV)	147	-8	193	7	-108	-108	-127	271	300	
Temperature (degrees C)	13.2	18.3	10.6	12.1	15.5	15.5	16.4	16.2	18.4	
Turbidity (NTU)	.	.	.	.	.	.	.	.	.
pH	7.53	6.46	6.93	7.35	6.65	6.65	6.55	5.6	5.42	
Miscellaneous Analytes										
Conductivity ($\mu\text{mho}/\text{cm}$)	1,029	1,007	1,072	779	1,447	1,443	1430	46,000	47,000	
Dissolved Solids (mg/L)	559	549	587	439	751	753	827	48300	51300	
Suspended Solids (mg/L)	<	<	<	<	9	11	32	136	106	
Turbidity (NTU)	1.17	2.1	9.18	3.62	217	214	255	150	11	
pH	7.32	7.53	7.16	7.1	6.71	6.58	6.7	5.64	5.66	
Major Ions (mg/L)										
Calcium	107	104	137	84.6	154	157	162	9,010	9,270	
Magnesium	45.6	44.9	42.1	25.9	29.8	29.9	29.8	1,230	1,160	
Potassium	2.87	2.72	3.11	6.48	11.4	11.7	11.5	<	<	
Sodium	23.2	22.9	23.8	20.8	65	65.4	69.9	658	656	
Alkalinity as CO_3	<	<	<	<	<	<	<	<	<	
Alkalinity as HCO_3	214	210	396	280	542	522	520	774	728	
Chloride	63.6	59.9	66.2	41.7	119	120	125	384	353	
Fluoride	0.514	0.594	<	<	0.2	0.204	0.207	5.21	1.47	
Nitrate as N	37.4	34.9	10.3	12.2	<	0.219	<	7,240	8,480	
Sulfate	57.1	62.8	49.1	21.7	31.5	31.4	29.2	14.9	9.77	
Charge balance (RPD)	1.1	1.2	-0.5	-4.3	-5.7	-3.8	-2.3	3.2	-3.6	
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	<	<	
Antimony	PMS	<	<	<	<	<	<	<	<	
Arsenic	PMS	<	<	<	0.00801	0.00894	0.00866	<	<	
Barium	0.15	0.15	0.199	0.128	1.16	1.17	1.17	54.9	55	
Beryllium	<	<	<	<	<	<	<	<	<	
Boron	0.127	0.129	0.171	0.115	3.41	3.43	3.41	<	<	
Cadmium	PMS	<	<	<	<	<	<	2.37	1.92	
Cadmium	.	.	.	.	.	.	.	.	.
Chromium	PMS	<	<	<	<	<	<	0.0113	<	
Chromium	.	.	.	.	.	.	.	.	.
Cobalt	<	<	<	<	<	<	<	<	<	
Copper	<	<	<	<	<	<	<	<	<	
Iron	0.234	0.317	0.999	0.704	25.8	25.8	22	7.55	<	
Lead	PMS	0.00123	<	0.00163	0.000605	<	<	0.000978	0.00434	0.00219
Lead	.	.	.	.	.	.	.	.	.
Lithium	0.0206	0.0192	0.0188	0.0142	0.139	0.14	0.148	<	<	
Manganese	<	0.0425	0.878	0.538	5	5	4.44	276	261	
Mercury	CVAA	<	<	<	<	<	<	0.00272	0.00384	
Nickel	PMS	<	<	0.011	0.00728	0.0429	0.0439	0.0487	4.41	3.27
Nickel	.	.	.	.	.	.	.	.	.
Selenium	PMS	<	<	<	<	0.0104	<	<	<	
Strontium	2.16	2.14	0.613	0.405	0.496	0.499	0.508	24.1	24.9	
Thallium	PMS	0.000805	<	0.00109	<	<	<	0.001	0.00276	
Thallium	.	.	.	.	.	.	.	.	.
Uranium	PMS	0.00372	0.00356	0.0189	0.00828	0.238	0.242	0.266	0.839	0.653
Uranium	KPA	.	.	.	.	.	.	.	.
Vanadium	<	<	<	<	<	<	<	<	<	
Zinc	<	<	<	<	<	<	<	<	<	

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-276		GW-288		GW-289		GW-291	
Location	S3		BG		BG		BG	
Date Sampled	01/07/02	07/08/02	03/13/02	08/07/02	03/13/02	08/08/02	03/14/02	08/07/02
Program	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type								
Field Measurements								
Time Sampled	10:15	9:35	9:00	10:25	9:50	8:45	10:15	8:50
Measuring Point Elev. (ft)	1,001.57	1,001.57	948.36	948.36	948.73	948.73	948.56	948.56
Depth to Water (ft)	6.47	7.95	16.95	18.40	17.75	19.14	11.13	13.69
Groundwater Elevation (ft)	995.10	993.62	931.41	929.96	930.98	929.59	937.43	934.87
Conductivity ($\mu\text{mho}/\text{cm}$)	1,123	1,298	347	330	294	328	467	412
Dissolved Oxygen (ppm)	4.55	1.04	0.14	0.89	0.96	1.25	1.74	0.39
Oxidation/Reduction (mV)	265	212	53	25	158	176	275	237
Temperature (degrees C)	13.9	22.7	14.8	17.3	15.4	17.6	13.2	17.9
Turbidity (NTU)	15	14	.	.	.	.	.	.
pH	5.28	5.64	7.17	7.2	6.52	6.63	6.74	6.46
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	285	299	235	284	437	320
Dissolved Solids (mg/L)	705	1,030	183	183	148	205	256	176
Suspended Solids (mg/L)	<	<	<	<	<	<	<	<
Turbidity (NTU)	.	.	0.817	1.97	0.11	1.14	0.57	0.605
pH	.	.	7.46	7.18	6.85	6.73	6.94	6.54
Major Ions (mg/L)								
Calcium	86.4	109	50.4	50.5	37.1	45.6	61.2	48.3
Magnesium	14.8	17.4	5.05	4.83	5.03	5.78	11.1	9.02
Potassium	10.5	10.2	<	<	<	<	<	<
Sodium	76.2	67.6	4.23	4.22	5.05	5.36	10.4	8.58
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	5	32.7	150	149	110	134	206	140
Chloride	173	181	3.35	3.53	2.95	3.23	3.95	5.03
Fluoride	1.9	1.5	<	<	<	<	<	<
Nitrate as N	51.3	73.7	0.0849	<	0.307	0.221	0.234	0.242
Sulfate	42.9	53.8	6.03	6.27	6.9	6.86	18.2	17.2
Charge balance (RPD)	-2.8	-9.6	-1.7	-1.7	0.8	1	-2.3	3.1
Trace Metals (mg/L)								
Aluminum	2.93	2.23	<	<	<	<	<	<
Antimony	PMS	.	.	.	.	.	.	.
Arsenic	PMS	.	<	<	<	<	<	<
Barium	0.204	0.202	0.28	0.278	0.0929	0.109	0.198	0.167
Beryllium	0.0041	0.0033	<	<	<	<	<	<
Boron	.	<	<	<	<	<	2.42	2.22
Cadmium	PMS	.	.	.	.	.	.	.
Cadmium	0.0214	0.0168	.	.	.	.	.	.
Chromium	PMS	.	.	<	<	<	<	<
Chromium	.	<	0.0127	.	.	.	.	.
Cobalt	0.0898	0.0542	<	<	<	<	<	<
Copper	.	<	<	<	<	<	0.152	0.0528
Iron	.	<	0.0527	0.117	0.169	<	<	<
Lead	PMS	.	.	0.00079	0.000788	<	0.00297	0.00245
Lead	.	<	<	.	.	.	.	.
Lithium	0.0209	0.0133	<	<	<	<	0.0144	0.0111
Manganese	4.26	3.67	0.025	0.0312	<	<	<	0.0103
Mercury	CVAA	<	<	<	<	<	<	<
Nickel	PMS	.	.	0.0125	<	<	<	<
Nickel	0.223	0.254	.	.	.	.	.	.
Selenium	PMS	.	.	<	<	<	<	<
Strontium	0.202	0.253	0.104	0.103	0.0755	0.0896	0.13	0.104
Thallium	PMS	.	.	<	<	<	<	<
Thallium	.	<	<	.	.	.	.	.
Uranium	PMS	.	.	<	<	<	<	<
Uranium	KPA	0.723	0.79	.	.	.	.	.
Vanadium	.	<	<	<	<	<	<	<
Zinc	0.0599	<	<	<	<	<	<	<

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		GW-311			GW-315		GW-363		GW-526		
Location		RS			SPI		EMWMF		S3		
Date Sampled		02/13/02		07/30/02	02/13/02		07/30/02	08/14/02	12/04/02	02/26/02	08/08/02
Program		GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup									
Field Measurements											
Time Sampled		8:45	8:45	10:20	10:25	8:40	10:25	13:45	9:20	9:40	
Measuring Point Elev. (ft)		999.52	999.52	999.52	1,047.45	1,047.45	958.71	958.71	998.25	998.25	
Depth to Water (ft)		33.55	33.55	39.47	53.45	59.90	7.78	4.77	14.52	14.25	
Groundwater Elevation (ft)		965.97	965.97	960.05	994.00	987.55	950.93	953.94	983.73	984.00	
Conductivity ($\mu\text{mho}/\text{cm}$)		485	485	495	809	809	491	504	6,220	7,250	
Dissolved Oxygen (ppm)		4.73	4.73	1.87	0.09	1	1.29	2.13	1.38	0.92	
Oxidation/Reduction (mV)		225	225	154	153	135	138	335	225	180	
Temperature (degrees C)		10.3	10.3	19.3	14.2	17	22.4	7.6	10.4	19.5	
Turbidity (NTU)		.	.	.	.	.	15	12	24	6	
pH		7.13	7.13	6.88	7.08	7.28	8.93	6.56	8.52	8.33	
Miscellaneous Analytes											
Conductivity ($\mu\text{mho}/\text{cm}$)		431	431	451	733	746	.	.	.	.
Dissolved Solids (mg/L)		243	238	262	449	462	.	.	7,370	8,800	
Suspended Solids (mg/L)		<	<	<	<	<	.	.	8	9.1	
Turbidity (NTU)		0.342	0.32	0.325	0.405	0.125	.	.	.	.
pH		7.44	7.29	7.38	7.35	7.32	.	.	.	.
Major Ions (mg/L)											
Calcium		78.4	79.7	84	123	126	.	.	174	168	
Magnesium		5.1	5.12	5.69	14.1	15.1	.	.	63.3	64.8	
Potassium		<	<	<	3.48	3.48	.	.	27.4	27.4	
Sodium		3.17	3.23	3.19	7.4	8	.	.	1,450	1,780	
Alkalinity as CO_3		<	<	<	<	<	.	.	<	<	
Alkalinity as HCO_3		216	212	242	270	300	.	.	41	44	
Chloride		2.24	2.12	2.22	12.3	13	.	.	25.7	29.5	
Fluoride		<	<	<	<	<	.	.	<	<	
Nitrate as N		0.276	0.274	0.331	7.84	7.77	.	.	1,260	1,300	
Sulfate		2.85	2.63	3.34	64.9	65.6	.	.	2.7	<	
Charge balance (RPD)		0.1	1.9	-2	0.4	-1.9	.	.	-8.2	-1.4	
Trace Metals (mg/L)											
Aluminum		<	<	<	<	<	.	.	<	<	
Antimony	PMS	<	<	<	<	<	.	.	.	.
Arsenic	PMS	<	<	<	<	<	.	.	.	.
Barium		0.0185	0.0185	0.0199	0.0606	0.0637	0.067	0.069	14.6	15.3	
Beryllium		<	<	<	<	<	.	.	<	<	
Boron		<	<	<	<	<	.	.	0.215	0.225	
Cadmium	PMS	<	<	<	<	<	.	.	.	.
Cadmium		.	.	.	.	.	.	.	.	.
Chromium	PMS	0.00565	0.00597	0.00403	<	<	.	.	.	.
Chromium		.	.	.	.	.	.	.	.	.
Cobalt		<	<	<	<	<	.	.	<	<	
Copper		<	<	<	<	<	.	.	<	<	
Iron		<	<	<	<	<	0.0563	.	0.197	0.859	
Lead	PMS	0.00585 R	0.0005 R	<	0.00105	0.0066	.	.	.	.
Lead		.	.	.	.	.	.	.	.	.
Lithium		<	<	<	<	<	.	.	1.39	0.996	
Manganese		<	<	<	0.0124	0.11	.	.	0.0345	0.0408	
Mercury	CVAA	<	<	<	<	<	.	.	.	.
Nickel	PMS	<	<	<	<	<	.	.	.	.
Nickel		.	.	.	.	.	.	.	.	.
Selenium	PMS	<	<	<	<	<	.	.	.	.
Strontium		0.069	0.0691	0.0745	0.205	0.208	0.087	0.085	19	19.4	
Thallium	PMS	<	<	<	<	<	.	.	<	<	
Thallium		.	.	.	.	.	.	.	.	.
Uranium	PMS	<	<	<	0.00259	0.00236	.	.	.	.
Uranium	KPA	.	.	.	.	.	.	.	.	.
Vanadium		<	<	<	<	<	.	.	<	<	
Zinc		<	<	<	<	<	.	.	<	<	

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		GW-537			GW-626		GW-627		GW-639	
Location		OLF			BG		BG		EMWMF	
Date Sampled	02/18/02	07/31/02		02/11/02	07/25/02	02/11/02	07/29/02	08/14/02	12/04/02	
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	
Sample Type		Dup								
Field Measurements										
Time Sampled		9:55	9:10	9:10	9:45	9:55	8:45	8:40	9:55	
Measuring Point Elev. (ft)		976.41	976.41	976.41	942.87	942.87	943.51	943.51	940.70	
Depth to Water (ft)		6.75	7.86	7.86	26.64	27.78	24.27	25.72	12.70	
Groundwater Elevation (ft)		969.66	968.55	968.55	916.23	915.09	919.24	917.79	928.00	
Conductivity ($\mu\text{mho}/\text{cm}$)		5,710	5,260	5,260	671	420	1,436	1,311	1,088	
Dissolved Oxygen (ppm)		0.18	0.42	0.42	0.02	1.78	0	0.88	1.89	
Oxidation/Reduction (mV)		171	176	176	-175	-16	-307	-285	186	
Temperature (degrees C)		14.9	15.9	15.9	14.1	16.1	13.8	15.8	20.9	
Turbidity (NTU)		.	.	.	.	.	.	10	10
pH		6.78	6.46	6.46	7.39	7.28	9.11	9.1	9.06	
Miscellaneous Analytes										
Conductivity ($\mu\text{mho}/\text{cm}$)		5,380	5,270	5,220	577	376	1,228	1,229	.	
Dissolved Solids (mg/L)		4,150	4,390	4,370	349	238	721	722	.	
Suspended Solids (mg/L)		<	<	<	<	<	<	<	.	
Turbidity (NTU)		1.16	1.77	1.74	0.313	0.452	0.934	0.707	.	
pH		6.78	6.72	6.7	7.46	7.56	9.18	9.15	.	
Major Ions (mg/L)										
Calcium		973	944	921	104	68.2	1.27	1.21	.	
Magnesium		71.6	68.7	68	6.9	4.33	0.243	0.237	.	
Potassium		<	<	<	<	<	<	<	.	
Sodium		43	39.2	38.5	6.58	4.88	309	293	.	
Alkalinity as CO_3		<	<	<	<	<	123	110	.	
Alkalinity as HCO_3		334	310	294	224	186	435	482	.	
Chloride		34.3	29.9	29.8	43.5	10.3	47.5	51.1	.	
Fluoride		<	<	<	<	<	4.99	4.72	.	
Nitrate as N		669	610	586	<	0.0307	<	<	.	
Sulfate		4.43	3.86	3.9	7.14	3.55	13.5	11.9	.	
Charge balance (RPD)		0.7	3.6	4.5	1.6	-1.4	1.8	-3.6	.	
Trace Metals (mg/L)										
Aluminum		<	<	<	<	<	<	<	.	
Antimony	PMS	<	<	<	<	<	<	<	.	
Arsenic	PMS	<	<	<	<	<	<	<	.	
Barium		2.38	2.25	2.21	0.33	0.205	0.0471	0.0453	0.08	
Beryllium		<	<	<	<	<	<	<	.	
Boron		<	<	<	<	<	0.499	0.48	.	
Cadmium	PMS	<	<	<	<	<	<	<	.	
Cadmium		.	.	.	.	.	.	.	.
Chromium	PMS	<	<	<	<	<	<	<	.	
Chromium		.	.	.	.	.	.	.	<.
Cobalt		<	<	<	<	<	<	<	.	
Copper		<	<	<	<	<	<	<	.	
Iron		<	<	0.125	0.0778	<	0.105	0.146	.	
Lead	PMS	0.00086	0.00122	<	<	<	<	0.0191	.	
Lead		.	.	.	.	.	.	.	<.
Lithium		0.0417	0.0356	0.0362	0.0164	0.0112	0.0925	0.0885	.	
Manganese		<	<	<	<	<	0.0152	0.0148	.	
Mercury	CVAA	<	<	<	<	<	<	<	.	
Nickel	PMS	0.0142	0.0141	0.0143	0.119	0.0288	<	<	.	
Nickel		.	.	.	.	.	.	.	.
Selenium	PMS	<	<	<	<	<	<	<	.	
Strontium		2.71	2.59	2.56	0.222	0.14	0.0888	0.0855	0.14	
Thallium	PMS	0.00116	<	<	<	<	<	<	.	
Thallium		.	.	.	.	.	.	.	.
Uranium	PMS	0.00156	0.0011	0.00111	<	<	<	<	.	
Uranium	KPA	.	.	.	.	.	.	.	.
Vanadium		<	<	<	<	<	<	<	.	
Zinc		<	<	<	<	<	<	<	.	

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		GW-653		GW-683		GW-684			GW-694	
Location		BG		EXP-A		EXP-A			EXP-B	
Date Sampled	02/12/02	07/25/02	01/14/02	07/09/02	01/14/02	07/09/02		01/29/02	07/17/02	
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type						Dup				
Field Measurements										
Time Sampled		8:45	8:40	11:05	8:05	10:05	9:20	9:20	9:20	9:20
Measuring Point Elev. (ft)		931.84	931.84	972.23	972.23	898.83	898.83	898.83	941.98	941.98
Depth to Water (ft)		22.69	24.86	88.95	89.12	15.72	15.91	15.91	23.28	31.56
Groundwater Elevation (ft)		909.15	906.98	883.28	883.11	883.11	882.92	882.92	918.70	910.42
Conductivity ($\mu\text{mho}/\text{cm}$)		41.4	40.6	659	524	642	579	579	499	456
Dissolved Oxygen (ppm)		5.65	2.24	0.87	2.32	0.22	1.34	1.34	0.1	0.19
Oxidation/Reduction (mV)		291	306	173	189	14	161	161	54	-29
Temperature (degrees C)		12.6	14.4	12.6	13.2	13.2	14.1	14.1	13.3	14.4
Turbidity (NTU)		.	.	.	.	.	.	.	.	.
pH		5.4	4.79	7.63	7.58	7.49	7.57	7.57	7.62	7.54
Miscellaneous Analytes										
Conductivity ($\mu\text{mho}/\text{cm}$)		32.3	31.8	581	423	575	472	474	443	439
Dissolved Solids (mg/L)		40	60	315	256	311	288	288	240	260
Suspended Solids (mg/L)		<	<	<	2	<	<	<	<	<
Turbidity (NTU)		0.407	0.641	1.95	10.7	1.22	0.807	0.819	6.85	6.15
pH		5.67	5.64	7.6	7.95	7.53	7.95	7.96	7.86	7.99
Major Ions (mg/L)										
Calcium		1.94	1.9	79.7	53.2	78.9	60.9	61.8	59.2	54.4
Magnesium		1.07	1.05	23.8	20.7	19.3	19.1	19.6	15.4	15.1
Potassium		<	<	<	<	6.65	4.82	4.94	3.26	3.64
Sodium		2.17	2.13	7.92	2.99	8.67	5.9	6.06	9.28	8.68
Alkalinity as CO_3		<	<	<	<	<	<	<	<	<
Alkalinity as HCO_3		12.4	13.4	226	191	222	197	200	174	157
Chloride		1.04	1.1	19.2	5.41	24.2	13.1	13.3	16.3	15.3
Fluoride		<	<	0.116	0.112	0.17	0.17	0.168	0.298	0.289
Nitrate as N		<	<	13.3	2.65	9.95	4.36	4.36	4.79	3.69
Sulfate		1.84	1.32	29.4	17.2	24.4	10.3	11.3	19.4	17.8
Charge balance (RPD)		-5.4	-5.9	-2.7	-0.4	-2.2	1.5	1.6	0.1	2.4
Trace Metals (mg/L)										
Aluminum		<	<	<	0.609	<	<	<	<	<
Antimony	PMS	<	<	<	<	<	<	<	<	<
Arsenic	PMS	<	<	<	<	<	<	<	<	<
Barium		0.0335	0.0314	0.134	0.111	0.12	0.0826	0.0842	0.0856	0.0805
Beryllium		<	<	<	<	<	<	<	<	<
Boron		<	<	<	<	<	<	<	<	<
Cadmium	PMS	<	<	<	<	<	<	<	<	<
Cadmium		.	.	.	.	.	.	.	.	.
Chromium	PMS	0.00294	0.00271	<	0.00645	<	<	<	<	<
Chromium		.	.	.	.	.	.	.	.	.
Cobalt		<	<	<	<	<	<	<	<	<
Copper		<	<	<	<	<	<	<	<	<
Iron		<	<	0.143	0.49	0.0904	<	<	0.841	0.424
Lead	PMS	<	0.000717	<	0.00094	<	<	<	<	<
Lead		.	.	.	.	.	.	.	.	.
Lithium		<	<	<	<	0.0326	0.0252	0.0248	0.0134	0.0124
Manganese		<	<	<	0.0116	0.0976	0.017	0.0174	0.121	0.0718
Mercury	CVAA	<	<	<	<	<	<	<	<	<
Nickel	PMS	<	<	0.0141	0.00941	<	<	<	<	<
Nickel		.	.	.	.	.	.	.	.	.
Selenium	PMS	<	<	<	<	<	<	<	<	<
Strontium		0.0177	0.0172	0.171	0.137	0.166	0.124	0.127	0.146	0.135
Thallium	PMS	<	<	<	<	<	<	<	<	<
Thallium		.	.	.	.	.	.	.	.	.
Uranium	PMS	<	<	0.0485	0.0231	0.0454	0.0269	0.0257	0.0393	0.0355
Uranium	KPA	.	.	.	.	.	.	.	.	.
Vanadium		<	<	<	<	<	<	<	<	<
Zinc		<	<	<	<	<	<	<	<	<

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		GW-695		GW-703		GW-704			GW-706		
Location		EXP-B		EXP-B		EXP-B			EXP-B		
Date Sampled	01/15/02	07/15/02	01/15/02	07/15/02	01/16/02	07/16/02	01/16/02	07/16/02	01/16/02	07/16/02	
Program	GWPP										
Sample Type					Dup						
Field Measurements											
Time Sampled	10:00	9:25	8:50	8:20	10:05	10:05	8:25	11:40	9:40		
Measuring Point Elev. (ft)	939.54	939.54	954.69	954.69	944.73	944.73	944.73	929.47	929.47		
Depth to Water (ft)	30.21	28.22	44.05	44.94	36.56	36.56	34.80	18.54	17.69		
Groundwater Elevation (ft)	909.33	911.32	910.64	909.75	908.17	908.17	909.93	910.93	911.78		
Conductivity ($\mu\text{mho}/\text{cm}$)	633	577	798	779	664	664	645	1,072	845		
Dissolved Oxygen (ppm)	3.81	1.95	0.13	0.6	0.08	0.08	1.42	0	0.94		
Oxidation/Reduction (mV)	178	182	207	139	23	23	41	87	37		
Temperature (degrees C)	11.5	16.7	11.1	15.7	12.7	12.7	14.2	13.3	15.3		
Turbidity (NTU)	.	.	.	.	.	.	.	.	.
pH	7.34	7.42	7.31	7.33	7.76	7.76	7.45	7.65	7.13		
Miscellaneous Analytes											
Conductivity ($\mu\text{mho}/\text{cm}$)	543	531	707	727	629	626	591	956	795		
Dissolved Solids (mg/L)	288	326	375	434	335	332	333	562	454		
Suspended Solids (mg/L)	<	2	<	<	3	<	<	<	<		
Turbidity (NTU)	0.774	6.37	3.38	5.8	28.8	28.2	3.88	0.606	3.7		
pH	7.7	7.77	7.65	7.65	7.64	7.71	7.68	7.45	7.36		
Major Ions (mg/L)											
Calcium	65	58.9	79	79.8	64.5	63.3	61.2	136	109		
Magnesium	27.1	25.1	33.1	32	29.9	30.3	27.9	25.3	23.7		
Potassium	2.16	3.65	4.08	3.82	5.19	5.82	3.89	7	5.31		
Sodium	6.87	8.23	13.2	13.1	13.5	13.6	11.7	20.7	14.9		
Alkalinity as CO_3	<	<	<	<	<	<	<	<	<		
Alkalinity as HCO_3	210	200	224	226	206	214	198	254	270		
Chloride	14.6	13	25	25.4	25.9	26.4	24	45	32.2		
Fluoride	<	0.109	0.182	0.172	0.174	0.175	0.183	0.292	0.25		
Nitrate as N	12	10.8	20.8	20.7	14.5	14.1	12	36.8	15.7		
Sulfate	15.8	13	29.6	26.6	23.7	26.6	21	33.9	21.9		
Charge balance (RPD)	0.3	0.4	0.3	0.1	0.1	-1.5	0.2	1.3	1.7		
Trace Metals (mg/L)											
Aluminum	<	<	<	<	<	<	<	<	<		
Antimony	PMS	<	<	<	<	<	<	<	<		
Arsenic	PMS	<	<	<	<	<	<	<	<		
Barium	0.0471	0.0443	0.0925	0.0959	0.105	0.104	0.0939	0.181	0.153		
Beryllium	<	<	<	<	<	<	<	<	<		
Boron	<	<	<	<	<	<	<	0.137	0.145		
Cadmium	PMS	<	0.000617	<	<	<	<	<	<		
Cadmium	.	.	.	.	.	.	.	.	.
Chromium	PMS	<	0.014	<	<	<	<	<	<		
Chromium	.	.	.	.	.	.	.	.	.
Cobalt	<	<	<	<	<	<	<	<	<		
Copper	<	<	<	<	<	<	<	<	<		
Iron	<	0.725	0.472	0.384	0.414	0.508	0.469	0.324	0.684		
Lead	PMS	0.00068	0.000922	0.000551	0.000558	<	<	0.000574	<	0.000523	
Lead	.	.	.	.	.	.	.	.	.
Lithium	<	0.011	0.0201	0.0185	0.0189	0.0188	0.0152	0.0246	0.0198		
Manganese	<	0.00537	0.0816	0.0381	0.0127	0.0145	0.00755	0.0126	0.00663		
Mercury	CVAA	<	<	<	<	<	<	<	<		
Nickel	PMS	<	<	<	0.00691	<	<	<	<		
Nickel	.	.	.	.	.	.	.	.	.
Selenium	PMS	<	<	<	<	<	<	<	<		
Strontium	0.0954	0.092	0.274	0.27	0.264	0.26	0.249	0.433	0.312		
Thallium	PMS	<	<	<	0.000554	<	<	<	<		
Thallium	.	.	.	.	.	.	.	.	.
Uranium	PMS	0.00666	0.00589	0.00669	0.00718	0.0104	0.0101	0.0127	0.132	0.106	
Uranium	KPA	
Vanadium	
Zinc	<	<	<	<	<	<	<	<	<		

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-712		GW-713		GW-714		GW-715	
Location	EXP-W		EXP-W		EXP-W		EXP-W	
Date Sampled	01/03/02	07/01/02	01/03/02	07/01/02	01/02/02	07/01/02	01/02/02	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type							Dup	
Field Measurements								
Time Sampled	14:05	13:50	10:05	13:50	10:05	10:05	13:15	.
Measuring Point Elev. (ft)	877.89	877.89	881.43	881.43	875.88	875.88	874.92	.
Depth to Water (ft)	35.05	35.77	38.24	39.03	30.68	31.27	28.95	.
Groundwater Elevation (ft)	842.84	842.12	843.19	842.40	845.20	844.61	845.97	.
Conductivity ($\mu\text{mho}/\text{cm}$)	478	483	558	523	493	530	512	.
Dissolved Oxygen (ppm)	1.15	2.56	0.8	2.31	1.06	2.62	5.65	.
Oxidation/Reduction (mV)	-77	-139	-167	-26	218	198	144	.
Temperature (degrees C)	7.3	17.5	6.4	23.5	3	21.1	9.4	.
Turbidity (NTU)	30	25	44	29	38	60	25	.
pH	8.25	7.89	7.92	7.87	8.07	8.05	7.2	.
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	.	.
Dissolved Solids (mg/L)	292	318	340	367	263	295	277	272
Suspended Solids (mg/L)	<	<	<	6.4	<	10.3	<	<
Turbidity (NTU)	.	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.	.
Major Ions (mg/L)								
Calcium	57.3	50	62.1	56.9	60.8	58.4	69.1	78
Magnesium	33.2	32.4	32.8	32.3	24.5	24.1	11.1	12.5
Potassium	2.13	2.3	2.8	3.03	1.56	2	1.39	1.55
Sodium	8.31	8.74	12.1	12.4	5.08	5.29	16.3	18.2
Alkalinity as CO_3	<	<	<	<	<	<	<	<
Alkalinity as HCO_3	164	178	157	179	188	190	182	183
Chloride	9.7	10.2	16.1	14.6	12.4	11	24.5	24.4
Fluoride	0.27	0.32	0.39	0.44	0.26	0.44	<	<
Nitrate as N	<	0.034	<	<	1.6	1.7	1.3	1.2
Sulfate	79.2	70.7	90.6	88.9	38.8	33.9	13.9	13.9
Charge balance (RPD)	7	2.4	7.5	2.1	2.6	2.2	4	.
Trace Metals (mg/L)								
Aluminum	<	<	<	<	<	<	<	<
Antimony	PMS	.	.	.	.	.	.	.
Arsenic	PMS	.	.	.	.	.	.	.
Barium	0.0371	0.034	0.0403	0.0396	0.0699	0.0724	0.0636	0.0716
Beryllium	.	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<
Cadmium	PMS	.	.	.	.	.	.	.
Cadmium	.	<	<	<	<	<	<	.
Chromium	PMS	.	.	.	.	.	.	.
Chromium	.	<	<	<	<	<	0.0576	0.0534
Cobalt	.	<	<	<	<	<	<	.
Copper	.	<	<	<	<	<	<	.
Iron	1.38	2.52	3.75	3.41	3.43	6.21	0.425	0.39
Lead	PMS	.	.	.	.	.	.	.
Lead	.	<	<	<	<	<	<	.
Lithium	0.0114	0.0117	0.0152	0.0154	<	<	<	<
Manganese	0.17	0.18	0.141	0.147	0.0141	0.0609	0.0152	0.0146
Mercury	CVAA	<	<	<	<	<	<	<
Nickel	PMS	.	.	.	.	.	.	.
Nickel	.	<	<	<	<	<	0.134	0.159
Selenium	PMS	.	.	.	.	.	.	.
Strontium	0.693	0.593	1.27	1.21	0.264	0.256	0.0717	0.0811
Thallium	PMS	.	.	.	.	.	.	.
Thallium	.	<	<	<	<	<	<	<
Uranium	PMS	.	.	.	.	.	.	.
Uranium	KPA	.	<	<	<	<	0.0145	0.0139
Vanadium	.	<	<	<	<	<	<	.
Zinc	.	<	<	<	<	<	<	.

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-715		GW-723		GW-724		GW-725	
Location	EXP-W		EXP-C		EXP-C		EXP-C	
Date Sampled	07/01/02		03/05/02	07/23/02	01/30/02	07/23/02	01/31/02	07/18/02
Program	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type	Dup							
Field Measurements								
Time Sampled	9:55	.	9:40	8:35	10:55	9:35	9:05	8:35
Measuring Point Elev. (ft)	874.92	.	1,022.23	1,022.23	979.27	979.27	961.05	961.05
Depth to Water (ft)	29.09	.	68.74	70.73	25.14	31.66	7.26	13.00
Groundwater Elevation (ft)	845.83	.	953.49	951.50	954.13	947.61	953.79	948.05
Conductivity ($\mu\text{mho}/\text{cm}$)	469	.	390	374	1,006	783	1,321	1,140
Dissolved Oxygen (ppm)	3.38	.	0.14	1.19	1.27	0.26	0.1	0.94
Oxidation/Reduction (mV)	170	.	-235	-278	113	-76	64	72
Temperature (degrees C)	18	.	11.5	14.5	14.4	15.6	14.1	15.6
Turbidity (NTU)	9	.	.	.	.	.	.	.
pH	7.15	.	8.17	8.16	7.3	7.62	6.96	6.76
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	347	347	920	747	1,210	1,095
Dissolved Solids (mg/L)	268	282	170	195	490	427	719	704
Suspended Solids (mg/L)	<	<	4	<	<	<	2	<
Turbidity (NTU)	.	.	21.2	10.8	2	6.59	5.46	3.96
pH	.	.	8.08	8.11	7.54	7.74	7.14	7.08
Major Ions (mg/L)								
Calcium	63.3	63.2	16.2	15.4	97	57.6	179	155
Magnesium	16.4	16.2	28.6	27.7	40.8	36.1	35.5	23.3
Potassium	1.63	1.64	2.55	2.5	2.22	4.05	2.91	2.97
Sodium	7.68	7.58	7.18	7.04	31.2	28	23.3	29.4
Alkalinity as CO_3	<	<	<	<	<	<	<	<
Alkalinity as HCO_3	188	190	131	140	234	186	286	318
Chloride	14.9	15.3	10	9.21	75.8	71.1	75.2	73.3
Fluoride	<	0.11	0.406	0.34	0.216	0.189	0.103	0.237
Nitrate as N	4.2	4.2	<	<	25.8	12	48.2	18.5
Sulfate	13.4	13.5	35.6	33	30.1	29.7	40.2	39.5
Charge balance (RPD)	1.3	.	-1.7	-4.8	1.7	-0.3	3.3	2
Trace Metals (mg/L)								
Aluminum	<	<	<	<	<	<	<	<
Antimony	PMS	.	.	0.00663	.	.	.	.
Arsenic	PMS	.	.	<	<	<	<	<
Barium	0.0571	0.0573	0.0444	0.0436	0.183	0.144	0.296	0.218
Beryllium	.	<	<	<	<	<	<	<
Boron	.	<	<	<	<	<	<	<
Cadmium	PMS	.	.	.	.	.	.	.
Cadmium	.	<	<	.	.	.	.	.
Chromium	PMS	.	.	<	<	<	<	<
Chromium	0.019	0.0211	.	.	.	.	.	.
Cobalt	.	<	<	<	<	<	<	<
Copper	.	<	<	<	<	<	<	<
Iron	0.223	0.231	3.18	2	0.536	1.55	0.391	0.269
Lead	PMS	.	0.000693	<	<	<	<	<
Lead	.	<	<	.	.	.	.	.
Lithium	0.0108	0.0105	0.0142	0.0136	0.0189	0.0179	<	<
Manganese	0.0204	0.0202	0.213	0.203	0.00997	0.0262	0.159	0.768
Mercury	CVAA	<	<	<	<	<	<	<
Nickel	PMS	.	.	<	<	<	<	<
Nickel	0.0281	0.0291	.	.	.	.	.	.
Selenium	PMS	.	.	<	<	<	<	<
Strontium	0.123	0.123	0.368	0.358	1.32	0.789	0.763	0.386
Thallium	PMS	.	0.00273	<	<	0.000803	<	0.000706
Thallium	.	<	<	.	.	.	.	.
Uranium	PMS	.	.	<	<	0.000619	<	0.00446
Uranium	KPA	0.043	0.0396	.	.	.	.	0.0105
Vanadium	.	<	<	<	<	<	<	<
Zinc	.	<	<	<	<	<	<	<

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		GW-736		GW-737		GW-738		GW-739	
Location		EXP-C		EXP-C		EXP-C		EXP-C	
Date Sampled		03/06/02	07/17/02	03/06/02	07/18/02	01/30/02	07/23/02	03/05/02	07/22/02
Program		GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type									
Field Measurements									
Time Sampled		8:55	10:25	9:50	9:35	9:35	10:35	10:45	9:50
Measuring Point Elev. (ft)		960.12	960.12	959.91	959.91	983.08	983.08	1,023.74	1,023.74
Depth to Water (ft)		10.19	11.47	10.08	11.47	26.41	30.58	75.13	75.83
Groundwater Elevation (ft)		949.93	948.65	949.83	948.44	956.67	952.50	948.61	947.91
Conductivity ($\mu\text{mho}/\text{cm}$)		1,239	1,159	1,242	1,152	949	893	556	562
Dissolved Oxygen (ppm)		0	2.48	0.06	2.27	1	1.35	0.27	2.22
Oxidation/Reduction (mV)		191	203	159	122	218	84	-6	157
Temperature (degrees C)		14	17.5	14.1	16	14.3	15.9	12.3	14.6
Turbidity (NTU)									
pH		7.12	6.72	7.29	6.85	6.89	6.9	7.69	7.5
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)		1,173	1,111	1,157	1,111	862	861	506	520
Dissolved Solids (mg/L)		956	776	666	670	459	498	270	303
Suspended Solids (mg/L)		91	8	<	<	<	<	<	3
Turbidity (NTU)		184	44.4	0.689	1.55	0.322	0.916	3.96	27.4
pH		7.06	7.7	7.4	7.08	7.1	7.16	7.77	7.83
Major Ions (mg/L)									
Calcium		173	164	157	157	131	134	52.9	56.7
Magnesium		26	23	22.7	22.2	29.1	25.5	32	31.6
Potassium		10.5	5.39	3.33	3.29	2.25	2.43	2.56	2.55
Sodium		35.3	35.1	40.2	35.9	9.03	8.6	2.2	2.23
Alkalinity as CO ₃		<	<	<	<	<	<	<	<
Alkalinity as HCO ₃		360	344	344	364	334	350	238	238
Chloride		95.7	87.8	96.3	79.5	22.7	18.9	8.51	7.61
Fluoride		0.357	0.344	0.142	0.154	<	<	0.356	0.3
Nitrate as N		17.8	15.3	14.2	11.6	17.2	15.1	1.33	1.7
Sulfate		43.5	40.9	40.6	40.3	30.1	30.6	19.5	20.5
Charge balance (RPD)		2	1.9	0.3	0.5	1.1	-0.1	-0.8	0.5
Trace Metals (mg/L)									
Aluminum		30.7	9.35	<	<	<	<	<	<
Antimony	PMS	<	<	<	<	<	<	<	<
Arsenic	PMS	0.00764	<	<	<	<	<	<	<
Barium		0.327	0.229	0.194	0.186	0.0542	0.0546	0.0326	0.0335
Beryllium		0.0009	<	<	<	<	<	<	<
Boron		<	<	<	<	<	<	<	<
Cadmium	PMS	<	<	<	<	<	<	<	<
Cadmium									
Chromium	PMS	0.0182	<	<	<	<	<	<	<
Chromium									
Cobalt		<	<	<	<	<	<	<	<
Copper		0.0488	<	<	<	<	<	<	<
Iron		20.7	5.14	<	<	<	0.0513	0.273	2.19
Lead	PMS	0.0282	0.00484	0.00293	<	0.012	<	0.0199	<
Lead									
Lithium		0.0355	0.0109	<	<	<	<	0.017	0.017
Manganese		1.1	0.772	0.926	0.925	<	<	0.0218	0.0236
Mercury	CVAA	<	<	<	<	<	<	<	<
Nickel	PMS	0.0292	0.0112	0.0101	0.00592	<	<	<	<
Nickel									
Selenium	PMS	<	<	<	<	<	<	<	<
Strontium		0.389	0.364	0.324	0.32	0.129	0.135	0.108	0.108
Thallium	PMS	0.00735	<	0.00129	<	<	<	<	<
Thallium									
Uranium	PMS	0.0298	0.0256	0.0162	0.0141	0.00177	0.00228	0.000729	0.000503
Uranium	KPA								
Vanadium		0.0253	<	<	<	<	<	<	<
Zinc		0.0823	<	<	<	<	<	<	<

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point		GW-740		GW-835				GW-916	
Location		EXP-C		S3				EMWMF	
Date Sampled		01/29/02	07/22/02	03/04/02	05/20/02	08/22/02	11/19/02	08/15/02	12/10/02
Program		GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									
Field Measurements									
Time Sampled		10:30	11:00	10:46	13:14	13:49	14:10	10:00	10:13
Measuring Point Elev. (ft)		1,019.63	1,019.63	1,000.91	1,000.91	1,000.91	1,000.91	1,002.85	1,002.85
Depth to Water (ft)		65.99	72.43	15.31	15.04	15.52	14.80	7.60	4.85
Groundwater Elevation (ft)		953.64	947.20	985.60	985.87	985.39	986.11	995.25	998.00
Conductivity ($\mu\text{mho}/\text{cm}$)		614	599	923	900	932	915	444	384
Dissolved Oxygen (ppm)		1.86	1.19	3.18	2.4	2.85	7.45	3.1	5.25
Oxidation/Reduction (mV)		207	71	177	160	213	185	171	203
Temperature (degrees C)		13.5	15	15.2	16.3	21	19.5	17.2	13.6
Turbidity (NTU)		.	.	5	20	8	1	18	18
pH		7.29	7.14	6.63	6.72	6.48	6.77	7.32	7.32
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)		548	558	.	.	.	.	.	.
Dissolved Solids (mg/L)		290	317	.	.	.	.	.	.
Suspended Solids (mg/L)		<	<	.	.	.	.	.	.
Turbidity (NTU)		1.03	3.44	.	.	.	.	.	.
pH		7.57	7.59	.	.	.	.	.	.
Major Ions (mg/L)									
Calcium		69.3	67.1	147	146	<	130	.	.
Magnesium		32.8	30.4	23.9	24.3	24.8	23.8	.	.
Potassium		<	<	4.59	5.87	5.93	<	.	.
Sodium		2.11	1.85	17.8	21.3	18.2	<	.	.
Alkalinity as CO ₃		<	<	<	<	<	<	.	.
Alkalinity as HCO ₃		278	274	316	313	328	362	.	.
Chloride		7.1	5.93	19.1	30.5	24.1	16.1	.	.
Fluoride		0.177	0.189	0.52	0.5	0.64	0.7	.	.
Nitrate as N		2.44	2.29	19.9	11.5	15	6.5	.	.
Sulfate		12.7	11.8	228	83	99.1	91	.	.
Charge balance (RPD)		0.4	-1.1	-12.3	3.3	0.6	-2.3	.	.
Trace Metals (mg/L)									
Aluminum		<	<	<	<	<	<	.	.
Antimony	PMS	<	<	.	.	.	.	.	.
Arsenic	PMS	<	<	.	.	.	.	.	.
Barium		0.0925	0.086	0.0732	0.0751	0.0717	0.074	0.25	0.22
Beryllium		<	<	<	<	<	<	.	.
Boron		<	<	<	<	<	<	.	.
Cadmium	PMS	<	<	.	.	.	.	.	.
Cadmium		.	.	0.0054	0.0043	0.0069	0.0021	.	.
Chromium	PMS	<	<	.	.	.	.	.	.
Chromium		.	.	<	<	<	<	<	<
Cobalt		<	<	<	<	<	<	.	.
Copper		<	<	<	<	<	<	.	.
Iron		0.65	0.402	<	<	<	<	.	.
Lead	PMS	<	0.000672	.	.	.	.	.	.
Lead		.	.	<	<	<	<	.	.
Lithium		0.0154	0.0143	0.0261	0.025	0.0236	0.04	.	.
Manganese		<	<	1.81	2.18	2.3	1.6	.	.
Mercury	CVAA	<	<	.	.	.	<	.	.
Nickel	PMS	<	<	.	.	.	.	.	.
Nickel		.	.	<	<	<	<	.	.
Selenium	PMS	<	<	.	.	.	.	.	.
Strontium		0.0574	0.0534	0.41	0.402	0.419	0.41	0.86	0.79
Thallium	PMS	<	<	.	.	.	.	.	.
Thallium		.	.	<	<	<	0.002	.	.
Uranium	PMS	<	0.000522	.	.	.	.	.	.
Uranium	KPA	.	.	1.21	1.37	1.45	1.31	.	.
Vanadium		<	<	<	<	<	<	.	.
Zinc		<	<	<	<	<	<	.	.

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-917		GW-918		GW-919		GW-920	
Location	EMWMF		EMWMF		EMWMF		EMWMF	
Date Sampled	08/12/02	12/05/02	08/15/02	12/10/02	08/14/02	12/09/02	08/13/02	12/05/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								
Field Measurements								
Time Sampled	9:55	13:08	9:55	9:56	13:45	13:14	9:42	14:35
Measuring Point Elev. (ft)	997.10	997.10	1,067.96	1,067.96	990.52	990.52	967.43	967.43
Depth to Water (ft)	22.60	21.80	5.58	5.55	4.11	2.72	10.55	7.30
Groundwater Elevation (ft)	974.50	975.30	1,062.38	1,062.41	986.41	987.80	956.88	960.13
Conductivity ($\mu\text{mho}/\text{cm}$)	463	423	109	114	429	461	329	366
Dissolved Oxygen (ppm)	0.34	1.97	5.28	6.51	1.18	1.35	0.68	1.44
Oxidation/Reduction (mV)	87	157	306	242	18	144	31	144
Temperature (degrees C)	15.7	13.7	15.7	14.8	17.7	15.3	16.4	12.7
Turbidity (NTU)	16	26	37	35	48	45	18	19
pH	6.71	7.37	5.7	6.34	6.97	6.96	7.31	7.57
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	.	.
Dissolved Solids (mg/L)	.	.	.	.	.	.	.	.
Suspended Solids (mg/L)	.	.	.	.	.	.	.	.
Turbidity (NTU)	.	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.	.
Major Ions (mg/L)								
Calcium	.	.	.	.	.	.	.	.
Magnesium	.	.	.	.	.	.	.	.
Potassium	.	.	.	.	.	.	.	.
Sodium	.	.	.	.	.	.	.	.
Alkalinity as CO ₃	.	.	.	.	.	.	.	.
Alkalinity as HCO ₃	.	.	.	.	.	.	.	.
Chloride	.	.	.	.	.	.	.	.
Fluoride	.	.	.	.	.	.	.	.
Nitrate as N	.	.	.	.	.	.	.	.
Sulfate	.	.	.	.	.	.	.	.
Charge balance (RPD)	.	.	.	.	.	.	.	.
Trace Metals (mg/L)								
Aluminum	.	.	.	.	.	.	.	.
Antimony	PMS	.	.	.	.	.	.	.
Arsenic	PMS	.	.	.	.	.	.	.
Barium	0.18	0.17	0.13	0.16	0.15	0.16	0.25	0.24
Beryllium	.	.	.	.	.	.	.	.
Boron	.	.	.	.	.	.	.	.
Cadmium	PMS	.	.	.	.	.	.	.
Cadmium	.	.	.	.	.	.	.	.
Chromium	PMS	<	<	<	<	<	<	<
Chromium	.	.	.	.	.	.	.	.
Cobalt	.	.	.	.	.	.	.	.
Copper	.	.	.	.	.	.	.	.
Iron	.	.	.	.	.	.	.	.
Lead	PMS	.	.	.	.	.	.	.
Lead	.	<	<	<	<	<	<	<
Lithium	.	.	.	.	.	.	.	.
Manganese	.	.	.	.	.	.	.	.
Mercury	CVAA	.	.	.	.	.	.	.
Nickel	PMS	.	.	.	.	.	.	.
Nickel	.	.	.	.	.	.	.	.
Selenium	PMS	.	.	.	.	.	.	.
Strontium	0.14	0.12	0.052	0.047	0.26	0.26	0.44	0.38
Thallium	PMS	.	.	.	.	.	.	.
Thallium	.	.	.	.	.	.	.	.
Uranium	PMS	.	.	.	.	.	.	.
Uranium	KPA	.	.	.	.	.	.	.
Vanadium	.	.	.	.	.	.	.	.
Zinc	.	.	.	.	.	.	.	.

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-921		GW-922		GW-923		GW-924	
Location	EMWMF		EMWMF		EMWMF		EMWMF	
Date Sampled	08/12/02	12/04/02	08/13/02	12/09/02	08/14/02	12/09/02	08/13/02	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type							Dup	
Field Measurements								
Time Sampled	13:14	10:42	10:05	10:06	13:32	14:11	13:09	.
Measuring Point Elev. (ft)	971.29	971.29	956.91	956.91	1,016.73	1,016.73	968.90	.
Depth to Water (ft)	6.26	5.95	5.90	5.31	31.00	29.00	12.92	.
Groundwater Elevation (ft)	965.03	965.34	951.01	951.60	985.73	987.73	955.98	.
Conductivity ($\mu\text{mho}/\text{cm}$)	388	396	399	366	468	444	326	.
Dissolved Oxygen (ppm)	0.91	1.75	1.14	2.32	2.22	3.7	1.18	.
Oxidation/Reduction (mV)	-40	183	-29	121	174	186	118	.
Temperature (degrees C)	16.2	13.6	15.4	14.1	18	13.7	16.4	.
Turbidity (NTU)	16	15	8	21	80	65	22	.
pH	7.62	7.62	7	7.62	6.73	7.1	7.53	.
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	.	.
Dissolved Solids (mg/L)	.	.	.	.	.	.	.	.
Suspended Solids (mg/L)	.	.	.	.	.	.	.	.
Turbidity (NTU)	.	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.	.
Major Ions (mg/L)								
Calcium	.	.	.	.	.	.	.	.
Magnesium	.	.	.	.	.	.	.	.
Potassium	.	.	.	.	.	.	.	.
Sodium	.	.	.	.	.	.	.	.
Alkalinity as CO ₃	.	.	.	.	.	.	.	.
Alkalinity as HCO ₃	.	.	.	.	.	.	.	.
Chloride	.	.	.	.	.	.	.	.
Fluoride	.	.	.	.	.	.	.	.
Nitrate as N	.	.	.	.	.	.	.	.
Sulfate	.	.	.	.	.	.	.	.
Charge balance (RPD)	.	.	.	.	.	.	.	.
Trace Metals (mg/L)								
Aluminum	.	.	.	.	.	.	.	.
Antimony	PMS	.	.	.	.	.	.	.
Arsenic	PMS	.	.	.	.	.	.	.
Barium	0.25	0.25	0.66	0.75	0.097	0.17	0.26	0.25
Beryllium	.	.	.	.	.	.	.	.
Boron	.	.	.	.	.	.	.	.
Cadmium	PMS	.	.	.	.	.	.	.
Cadmium	.	.	.	.	.	.	.	.
Chromium	PMS	.	.	.	.	.	.	.
Chromium	<	<	<	<	0.0054	0.0077	<	<
Cobalt	.	.	.	.	.	.	.	.
Copper	.	.	.	.	.	.	.	.
Iron	.	.	.	.	.	.	.	.
Lead	PMS	.	.	.	.	.	.	.
Lead	.	<	0.003	<	<	0.0042	<	<
Lithium	.	.	.	.	.	.	.	.
Manganese	.	.	.	.	.	.	.	.
Mercury	CVAA	.	.	.	.	.	.	.
Nickel	PMS	.	.	.	.	.	.	.
Nickel	.	.	.	.	.	.	.	.
Selenium	PMS	.	.	.	.	.	.	.
Strontium	1.3	1	0.78	0.83	0.11	0.12	0.1	0.1
Thallium	PMS	.	.	.	.	.	.	.
Thallium	.	.	.	.	.	.	.	.
Uranium	PMS	.	.	.	.	.	.	.
Uranium	KPA	.	.	.	.	.	.	.
Vanadium	.	.	.	.	.	.	.	.
Zinc	.	.	.	.	.	.	.	.

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-924		GW-925		GW-926		GW-927	
Location	EMWMF		EMWMF		EMWMF		EMWMF	
Date Sampled	12/10/02		08/12/02	12/04/02	08/13/02	12/10/02	08/12/02	12/05/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type	Dup							
Field Measurements								
Time Sampled	13:50	.	13:05	14:05	13:10	13:55	10:15	10:35
Measuring Point Elev. (ft)	968.90	.	971.14	971.14	968.94	968.94	997.19	997.19
Depth to Water (ft)	9.04	.	1.60	1.20	10.50	7.95	19.14	18.75
Groundwater Elevation (ft)	959.86	.	969.54	969.94	958.44	960.99	978.05	978.44
Conductivity ($\mu\text{mho}/\text{cm}$)	319	.	698	904	395	635	347	393
Dissolved Oxygen (ppm)	1.55	.	1.43	1.41	1.85	0.43	3.88	1.87
Oxidation/Reduction (mV)	189	.	127	163	-43	150	-34	182
Temperature (degrees C)	15.4	.	24.1	6.1	24.1	13.9	15.5	12.9
Turbidity (NTU)	19	.	80	60	6	16	13	18
pH	7.62	.	8.46	9.09	7.66	7.74	7.45	7.39
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	.	.
Dissolved Solids (mg/L)	.	.	.	.	.	.	.	.
Suspended Solids (mg/L)	.	.	.	.	.	.	.	.
Turbidity (NTU)	.	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.	.
Major Ions (mg/L)								
Calcium	.	.	.	.	.	.	.	.
Magnesium	.	.	.	.	.	.	.	.
Potassium	.	.	.	.	.	.	.	.
Sodium	.	.	.	.	.	.	.	.
Alkalinity as CO ₃	.	.	.	.	.	.	.	.
Alkalinity as HCO ₃	.	.	.	.	.	.	.	.
Chloride	.	.	.	.	.	.	.	.
Fluoride	.	.	.	.	.	.	.	.
Nitrate as N	.	.	.	.	.	.	.	.
Sulfate	.	.	.	.	.	.	.	.
Charge balance (RPD)	.	.	.	.	.	.	.	.
Trace Metals (mg/L)								
Aluminum	.	.	.	.	.	.	.	.
Antimony	PMS	.	.	.	.	.	.	.
Arsenic	PMS	.	.	.	.	.	.	.
Barium	0.27	0.26	0.11	0.092	0.2	0.2	0.2	0.19
Beryllium	.	.	.	.	.	.	.	.
Boron	.	.	.	.	.	.	.	.
Cadmium	PMS	.	.	.	.	.	.	.
Cadmium	.	.	.	.	.	.	.	.
Chromium	PMS	.	.	.	.	.	.	.
Chromium	<	<	0.0075	0.005	<	<	<	<
Cobalt	.	.	.	.	.	.	.	.
Copper	.	.	.	.	.	.	.	.
Iron	.	.	.	.	.	.	.	.
Lead	PMS	.	.	.	.	.	.	.
Lead	.	<	<	<	<	<	<	<
Lithium	.	.	.	.	.	.	.	.
Manganese	.	.	.	.	.	.	.	.
Mercury	CVAA	.	.	.	.	.	.	.
Nickel	PMS	.	.	.	.	.	.	.
Nickel	.	.	.	.	.	.	.	.
Selenium	PMS	.	.	.	.	.	.	.
Strontium	0.1	0.11	0.19	0.16	0.58	0.54	0.11	0.095
Thallium	PMS	.	.	.	.	.	.	.
Thallium	.	.	.	.	.	.	.	.
Uranium	PMS	.	.	.	.	.	.	.
Uranium	KPA	.	.	.	.	.	.	.
Vanadium	.	.	.	.	.	.	.	.
Zinc	.	.	.	.	.	.	.	.

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	NT-01		NT-03	NT-07	NT-08	NT-8-E	NT-8-W	S07
Location	EXP-SW		EXP-SW	EXP-SW	EXP-SW	EXP-SW	EXP-SW	EXP-SW
Date Sampled	01/09/02	07/11/02	03/11/02	03/13/02	03/13/02	03/13/02	03/13/02	03/11/02
Program	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								
Field Measurements								
Time Sampled	11:10	9:30	13:26	13:16	12:49	13:32	13:48	14:00
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	2,650	9,130	200	164	131	56	156	373
Dissolved Oxygen (ppm)	7.15	2.68	12.75	12.94	11.97	12.09	12.71	13.9
Oxidation/Reduction (mV)	250	209	110	115	135	-30	20	150
Temperature (degrees C)	2	22.8	11.2	10.3	11.9	11.7	11.1	9.5
Turbidity (NTU)	.	.	3	13	19	3	19	3
pH	6.57	6.56	8.31	8.14	8.9	8.17	7.79	8.13
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	2,300	9,440	.	.	.	.	.	.
Dissolved Solids (mg/L)	1,630	7,540	.	197	161	209	83	.
Suspended Solids (mg/L)	4	3	.	<	<	7.2	9.1	.
Turbidity (NTU)	7.2	5.79	.	.	.	.	.	.
pH	6.58	6.8	.	.	.	.	.	.
Major Ions (mg/L)								
Calcium	341	1,450	.	50.9	41.4	52.9	14.9	.
Magnesium	43.3	186	.	8.17	4.42	5.64	3.06	.
Potassium	4.97	27	.	2.39	1.79	3.1	1.59	.
Sodium	43.7	212	.	4.94	3.59	2.69	4.1	.
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	185	238	144	128	110	136	39.4	71.9
Chloride	28.8	111	2.9	18.9	8	6.3	8.4	6.3
Fluoride	1.71	4.16	0.79	<	<	<	0.2	<
Nitrate as N	479	1,180	0.02	0.11	0.045	0.13	0.029	61.2
Sulfate	26.4	55.2	50.7	16.8	9.5	14.6	6.5	12.8
Charge balance (RPD)	-27 R	2.1	.	0.5	0	1.4	1.7	.
Trace Metals (mg/L)								
Aluminum	1.72	<	.	<	0.204	0.443	<	.
Antimony	PMS	<	<	.	.	.	.	.
Arsenic	PMS	<	<	.	.	.	.	.
Barium	0.755	3.7	.	0.041	0.063	0.0672	0.0383	.
Beryllium	0.00086	<	.	<	<	<	<	.
Boron	PMS	<	<	0.308	0.97	1.95	1.35	.
Cadmium	PMS	0.0493	0.24	.	.	.	.	.
Cadmium	PMS	.	.	<	<	<	<	.
Chromium	PMS	<	<	.	.	.	.	.
Chromium	PMS	.	.	<	<	<	<	.
Cobalt	PMS	0.0227	<	.	<	<	<	.
Copper	PMS	<	<	.	<	<	<	.
Iron	PMS	0.0642	<	0.248	0.636	1.13	1.02	.
Lead	PMS	<	<	.	.	.	.	.
Lead	PMS	.	.	<	<	<	<	.
Lithium	PMS	<	<	0.0693	0.178	0.566	0.0898	.
Manganese	PMS	9.32	46.1	0.0103	0.212	0.177	0.242	.
Mercury	CVAA	<	<	.	.	.	.	.
Nickel	PMS	0.225	0.997	.	.	.	.	.
Nickel	PMS	.	.	<	<	<	<	.
Selenium	PMS	<	<	.	.	.	.	.
Strontium	PMS	0.878	3.68	0.115	0.0964	0.0966	0.0535	.
Thallium	PMS	<	<	.	<	<	<	.
Thallium	PMS	.	.	<	<	<	<	.
Uranium	PMS	0.0286	0.132	.	0.0154	0.361	1.16 Q	0.016
Uranium	KPA	.	.	.	.	.	.	.
Vanadium	PMS	<	<	.	<	<	<	.
Zinc	PMS	<	<	.	<	<	<	.

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	SS-1		SS-4		SS-5		
Location	EXP-SW		EXP-SW		EXP-SW		
Date Sampled	01/09/02	07/15/02	01/08/02	07/10/02	01/08/02	07/10/02	07/10/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type					Dup		
Field Measurements							
Time Sampled	10:55	7:20	11:00	9:45	10:30	10:30	9:20
Measuring Point Elev. (ft)	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	1,560	1,401	1,154	787	849	849	558
Dissolved Oxygen (ppm)	7.54	3.65	5.73	1.16	5.41	5.41	3.63
Oxidation/Reduction (mV)	216	208	222	164	233	233	168
Temperature (degrees C)	7	18.9	7.9	15.3	10.1	10.1	15.9
Turbidity (NTU)	.	.	.	.	.	.	.
pH	7.57	7.06	7.01	6.77	7.21	7.21	7.06
Miscellaneous Analytes							
Conductivity ($\mu\text{mho}/\text{cm}$)	1,290	1,314	874	737	639	635	525
Dissolved Solids (mg/L)	827	869	642	455	387	386	325
Suspended Solids (mg/L)	<	9	<	2	<	<	<
Turbidity (NTU)	1.9	10.7	1.34	2.17	1.8	1.83	3.12
pH	7.66	7.48	7.26	7.26	7.38	7.39	7.59
Major Ions (mg/L)							
Calcium	215	199	133	97.7	96.9	94	70.5
Magnesium	20.2	19.1	20.3	23.9	19.7	19.3	20.5
Potassium	4.19	4.02	2.75	2.79	2.14	<	<
Sodium	39.8	38.1	17.1	14.1	11.6	11.4	7.39
Alkalinity as CO_3	<	<	<	<	<	<	<
Alkalinity as HCO_3	376	366	210	288	218	218	218
Chloride	120	130	24.3	31	19.2	18.8	16.2
Fluoride	0.279	0.271	0.502	0.241	0.241	0.245	0.156
Nitrate as N	18.5	17.4	43.7	8.53	16.6	16.5	4.48
Sulfate	69.9	54.4	31.2	20.4	22.6	23.7	13.6
Charge balance (RPD)	1.9	-0.4	2.5	-1	3.3	1.5	0.9
Trace Metals (mg/L)							
Aluminum	<	1.38	<	<	<	<	0.272
Antimony	PMS	<	<	<	<	<	<
Arsenic	PMS	<	<	<	<	<	<
Barium	0.1	0.103	0.165	0.154	0.106	0.104	0.0945
Beryllium	<	<	<	<	<	<	<
Boron	<	<	<	0.185	<	<	<
Cadmium	PMS	<	<	<	<	<	<
Cadmium	.	.	.	.	.	.	.
Chromium	PMS	<	<	<	<	<	<
Chromium	.	.	.	.	.	.	.
Cobalt	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<
Iron	0.116	0.934	0.135	0.153	0.0621	0.0736	0.156
Lead	PMS	0.000689	0.00216	<	<	<	0.000512
Lead	.	.	.	.	.	.	.
Lithium	<	<	0.0167	0.0208	0.0117	0.0118	<
Manganese	0.018	0.16	0.0461	0.0267	<	<	0.0105
Mercury	CVAA	<	<	<	<	<	<
Nickel	PMS	<	<	0.00563	0.00572	<	<
Nickel	.	.	.	.	.	.	.
Selenium	PMS	<	<	<	<	<	<
Strontium	0.647	0.616	0.354	0.241	0.209	0.206	0.137
Thallium	PMS	<	<	<	<	<	<
Thallium	.	.	.	.	.	.	.
Uranium	PMS	0.0415	0.0373	0.182	0.0945	0.109	0.106
Uranium	KPA	.	.	.	.	.	.
Vanadium	.	.	.	.	.	.	.
Zinc	<	<	<	<	<	<	<

APPENDIX D.1: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	SS-7	SS-8		
Location	EXP-SW	EXP-SW		
Date Sampled	03/12/02	03/12/02	09/09/02	
Program	BJC	BJC	BJC	BJC
Sample Type			Dup	
Field Measurements				
Time Sampled	9:14	9:40	10:02	.
Measuring Point Elev. (ft)	.	.	.	.
Depth to Water (ft)	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	167	127	158	.
Dissolved Oxygen (ppm)	11.72	12.69	10.39	.
Oxidation/Reduction (mV)	185	160	180	.
Temperature (degrees C)	13.2	12.4	14.7	.
Turbidity (NTU)	0	3	51	.
pH	8.44	7.8	7.02	.
Miscellaneous Analytes				
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.
Dissolved Solids (mg/L)	180	151	172	174
Suspended Solids (mg/L)	<	<	<	<
Turbidity (NTU)	.	.	.	.
pH	.	.	.	.
Major Ions (mg/L)				
Calcium	40.5	37.1	39.1	38.5
Magnesium	17.1	11.4	17.2	16.9
Potassium	0.937	0.91	0.915	0.896
Sodium	3.4	2.01	1.12	1.1
Alkalinity as CO_3	<	<	<	<
Alkalinity as HCO_3	146	130	169	160
Chloride	6.3	2.7	2.2	2.2
Fluoride	<	<	0.11	<
Nitrate as N	1.9	0.29	0.24	0.24
Sulfate	7.2	3.5	2.3	2.3
Charge balance (RPD)	3.1	2.3	-1	.
Trace Metals (mg/L)				
Aluminum	<	<	0.213	<
Antimony	PMS	.	.	.
Arsenic	PMS	.	.	.
Barium	0.0532	0.0415	0.0607	0.0593
Beryllium	<	<	<	<
Boron	<	<	<	<
Cadmium	PMS	.	.	.
Cadmium	0.0532	0.0415	0.0607	0.0593
Chromium	PMS	.	.	.
Chromium	<	<	<	<
Cobalt	<	<	<	<
Copper	<	<	<	<
Iron	<	0.111	0.292	0.229
Lead	PMS	.	.	.
Lead	<	<	<	0.0041
Lithium	<	<	<	<
Manganese	<	0.0062	0.0145	0.0128
Mercury	CVAA	<	<	<
Nickel	PMS	.	.	.
Nickel	<	<	<	<
Selenium	PMS	.	.	.
Strontium	0.0493	0.0447	0.0404	0.0396
Thallium	PMS	.	.	.
Thallium	<	<	<	<
Uranium	PMS	.	.	.
Uranium	KPA	0.0161	<	<
Vanadium	<	<	<	<
Zinc	<	<	<	<

APPENDIX D.2

VOLATILE ORGANIC COMPOUNDS

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	BCK-00.63		BCK-03.30		BCK-04.55		BCK-07.87		BCK-09.20	
Location	EXP-SW		EXP-SW		EXP-SW		EXP-SW		EXP-SW	
Date Sampled	01/08/02	07/10/02	03/12/02	09/09/02	01/09/02	07/10/02	01/08/02	07/10/02	03/11/02	09/09/02
Program	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP	GWPP	BJC	BJC
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	2 J	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	.	.	<	<	<	<	.	.
2-Butanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	.	.	<	<	<	<	.	.
Trichlorofluoromethane	<	<	.	.	<	<	<	<	.	.

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	BCK-09.40			BCK-09.47	BCK-11.54		BCK-11.84	BCK-11.97		GW-008	
Location	EXP-SW			EXP-SW	EXP-SW		EXP-SW	EXP-SW		OLF	
Date Sampled	01/09/02	07/11/02		03/11/02	03/11/02	09/09/02	03/11/02	01/09/02	07/11/02	01/07/02	07/02/02
Program	GWPP	GWPP	GWPP	BJC		BJC	BJC	GWPP	GWPP	BJC	BJC
Sample Type	Dup										
Chloroethenes (µg/L)											
Tetrachloroethene	2 J	<	<	2 J		^	^	^	^	53	89
Trichloroethene	2 J	<	<	1 J		^	^	^	^	16	11
cis-1,2-Dichloroethene	21	<	<	14		^	^	^	^	21	27
trans-1,2-Dichloroethene	<	<	<	<		^	^	^	^	<	<
1,1-Dichloroethene	<	<	<	<		^	^	^	^	6	7
Vinyl chloride	<	<	<	<		^	^	^	^	<	<
Chloroethanes (µg/L)											
1,1,1-Trichloroethane	<	<	<	<		^	^	^	^	<	<
1,1,2-Trichloroethane	<	<	<	<		^	^	^	^	<	<
1,2-Dichloroethane	<	<	<	<		^	^	^	^	<	<
1,1-Dichloroethane	<	<	<	<		^	^	^	^	11	14
Chloroethane	<	<	<	<		^	^	^	^	<	<
Chloromethanes (µg/L)											
Carbon tetrachloride	<	<	<	<		^	^	^	^	<	<
Chloroform	<	<	<	<		^	^	^	^	<	<
Methylene chloride	<	<	<	<		^	^	^	^	<	<
Chloromethane	<	<	<	2 J		^	^	^	^	<	<
Petrol. Hydrocarb. (µg/L)											
Benzene	<	<	<	<		^	^	^	^	1 J	1 J
Dimethylbenzene	<	<	<	<		^	^	^	^	<	<
Ethylbenzene	<	<	<	<		^	^	^	^	<	<
Toluene	<	<	<	<		^	^	^	^	<	<
Miscellaneous (µg/L)											
1,2-Dichloropropane	<	<	<	<		^	^	^	^	1 J	<
1,4-Dichlorobenzene	<	<	<	<		.	.	.	.	.	.
2-Butanone	<	<	<	<		^	^	^	^	<	<
Acetone	<	<	<	<		^	^	^	^	<	<
Bromoform	<	<	<	<		^	^	^	^	<	<
Chlorobenzene	<	<	<	<		^	^	^	^	<	<
Dichlorodifluoromethane	<	<	<	<		.	.	.	.	.	.
Trichlorofluoromethane	<	<	<	<		.	.	.	.	.	.

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-014			GW-046		GW-061		GW-066		
Location	BG			BG		BG		OLF		
Date Sampled	03/14/02	03/14/02	08/12/02	01/07/02	07/02/02	03/12/02	08/05/02	03/25/02	08/13/02	
Program	GWPP	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type	Dup								Dup	
Chloroethenes (µg/L)										
Tetrachloroethene	21	19	18	500	990	<	<	8	6	6
Trichloroethene	160	170	140	1,000	980	<	<	5 J	4 J	4 J
cis-1,2-Dichloroethene	720	860	970	2,600	2,000	<	<	2 J	<	<
trans-1,2-Dichloroethene	2 J	2 J	2 J	13	11	<	<	<	<	<
1,1-Dichloroethene	37	40	25	83	40	<	<	<	<	<
Vinyl chloride	75	84	87	230	260	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	77	32	<	<	<	<	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	2 J	2 J	<	<	<	<	<
1,1-Dichloroethane	200	250	170	140	73	<	<	<	<	<
Chloroethane	7	8	8	5 J	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	2 J	1 J	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	2 J	10	9	<	<	<	<	<
Dimethylbenzene	<	<	<	2 J	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	.	.	<	<	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	.	.	<	<	<	<	<
Trichlorofluoromethane	<	<	<	.	.	<	<	<	<	<

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-069		GW-071			GW-072		GW-076	GW-077	
Location	BG		BG			BG		OLF	BG	
Date Sampled	03/11/02	08/05/02	03/12/02	08/06/02		03/11/02	08/06/02	03/19/02	02/26/02	08/08/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC
Sample Type				Dup						
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	320	390	410	<	<	<	<	<
Trichloroethene	<	<	110	99	64	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	35	25	23	<	2 J	<	<	<
trans-1,2-Dichloroethene	<	<	9	6	4 J	<	<	<	<	<
1,1-Dichloroethene	<	<	38	40	32	2 J	6	<	<	<
Vinyl chloride	<	2 J	2 J	2 J	2 J	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	14	120	80	<	<	<	<	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	1,780	1,600	1,600	64	130	<	<	<
Chloroethane	<	<	9	13	11	<	4 J	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	820	750	790	<	<	<	<	<
Dimethylbenzene	<	<	7	9	<	<	<	<	<	<
Ethylbenzene	<	<	2 J	2 J	<	<	<	<	<	<
Toluene	<	<	10	10	6	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	.	.
2-Butanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	48	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	3 J	3 J	<	<	<	.	.
Trichlorofluoromethane	<	<	<	<	<	<	<	<	.	.

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-078		GW-079		GW-080				GW-082	
Location	BG		BG		BG				BG	
Date Sampled	02/26/02	08/08/02	02/26/02	08/07/02	02/26/02		08/07/02		02/12/02	07/29/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP
Sample Type					Dup		Dup			
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	3 J	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	1,100	820
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	43	22
Vinyl chloride	<	<	<	<	<	<	<	<	290	200
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	6	4 J
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	1,600	730
Chloroethane	<	<	<	<	<	<	<	<	17	25
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	45	22
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene
2-Butanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane
Trichlorofluoromethane

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-085		GW-087	GW-091		GW-115		GW-225		GW-226	
Location	OLF		OLF	BG		S3		OLF		OLF	
Date Sampled	02/18/02	07/31/02	03/25/02	03/14/02	08/08/02	01/07/02	07/08/02	02/19/02	08/01/02	02/19/02	08/01/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP	GWPP
Sample Type											
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	<	<	9	<	<	<	<	<	<	<	<
Trichloroethene	<	<	20	<	<	<	<	190	180	110	89
cis-1,2-Dichloroethene	<	<	59	<	<	<	<	3 J	2 J	6	3 J
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	2 J	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	<	<	<	<	<	4 J	2 J	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	3 J	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	2 J	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	.	.	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	7 J	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	12	<	<	<	.	.	<	<	<
Trichlorofluoromethane	<	<	<	<	<	<	.	.	<	<	<

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-229			GW-243		GW-276		GW-288		GW-289	
Location	OLF		S3		S3		BG		BG		
Date Sampled	03/19/02		08/12/02	03/21/02	08/13/02	01/07/02	07/08/02	03/13/02	08/07/02	03/13/02	08/08/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP	GWPP
Sample Type	Dup										
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	<	<	<	4,400	3,600	8	10	180	250	670	690
Trichloroethene	<	<	<	20	17	<	<	11	14	13	14
cis-1,2-Dichloroethene	110	100	100	19	12	<	<	3 J	3 J	2 J	2 J
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	11	10	10	6	4 J	<	<	<	<	<	<
Vinyl chloride	37	32	40	<	<	<	<	3	4	2 J	2
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	12	8	<	<	<	<	<	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	6	6	6	<	<	<	<	<	<	<	<
Chloroethane	2 J	<	2 J	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	39	29	<	2 J	<	<	<	<
Methylene chloride	<	<	<	120	100	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	8	7	6	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	4 J	4 J	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	3 J	<	<	.	.	<	<	<	<
2-Butanone	<	<	<	25	15	<	<	<	<	<	<
Acetone	<	<	4 J	700	280	<	<	<	<	<	<
Bromoform	<	<	<	3 J	3 J	<	<	<	<	<	<
Chlorobenzene	8	7	7	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	4 J	.	.	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	.	.	<	<	<	<

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-291		GW-311			GW-315		GW-363		GW-526	
Location	BG		RS			SPI		EMWMF		S3	
Date Sampled	03/14/02	08/07/02	02/13/02		07/30/02	02/13/02	07/30/02	08/14/02	12/04/02	02/26/02	08/08/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC
Sample Type			Dup								
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	340	380	<	<	<	9	11	<	<	<	<
Trichloroethene	42	37	3 J	3 J	4 J	5 J	4 J	<	<	<	<
cis-1,2-Dichloroethene	3 J	3 J	<	<	<	2 J	2 J	.	.	.	.
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	.	.	.	.
1,1-Dichloroethene	<	<	<	<	<	<	<	.	.	<	<
Vinyl chloride	<	<	<	<	<	<	<	.	.	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	<	<	<	<	.	.	<	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	.	.	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	.	.	<	<
1,1-Dichloroethane	<	2 J	<	<	<	<	<	.	.	<	<
Chloroethane	<	<	<	<	<	<	<	.	.	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	<	<	<	<	<	.	<	<	<
Chloroform	<	<	<	<	<	<	<	.	<	<	<
Methylene chloride	<	<	<	<	<	<	<	.	<	<	<
Chloromethane	<	<	<	<	<	<	<	.	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	<	<	<	<	<	.	.	<	<
Dimethylbenzene	<	<	<	<	<	<	<	.	.	<	<
Ethylbenzene	<	<	<	<	<	<	<	.	.	<	<
Toluene	<	<	<	<	<	<	<	~	~	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dichloropropane	<	<	<	<	<	<	<	.	.	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	.	.	.	.
2-Butanone	<	<	<	<	<	<	<	.	.	<	<
Acetone	<	<	<	<	<	<	<	~	~	<	<
Bromoform	<	<	<	<	<	<	<	.	.	<	<
Chlorobenzene	<	<	<	<	<	<	<	.	.	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	.	.	.	.
Trichlorofluoromethane	5 J	5 J	<	<	<	<	<	.	.	.	.

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-537			GW-626		GW-627		GW-639		GW-653	
Location	OLF			BG		BG		EMWMF		BG	
Date Sampled	02/18/02	07/31/02		02/11/02	07/25/02	02/11/02	07/29/02	08/14/02	12/04/02	02/12/02	07/25/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	GWPP	GWPP
Sample Type			Dup								
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	<	<	<	920	320	550	530	<	<	11	10
Trichloroethene	<	<	<	710	190	160	190	<	<	8	6
cis-1,2-Dichloroethene	<	<	<	7,200	1,500	12	14	.	.	170	130
trans-1,2-Dichloroethene	<	<	<	13	2 J	2 J	2 J	.	.	<	<
1,1-Dichloroethene	<	<	<	120	38	19	23	.	.	5	4 J
Vinyl chloride	<	<	<	1,200	42	18	20	.	.	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	44	13	<	<	.	.	2 J	<
1,1,2-Trichloroethane	<	<	<	2 J	<	<	<	.	.	<	<
1,2-Dichloroethane	<	<	<	32	7	<	<	.	.	<	<
1,1-Dichloroethane	<	<	<	290	65	68	70	.	.	12	9
Chloroethane	<	<	<	<	<	<	<	.	.	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	<	8	<	<	<	.	.	<	<
Chloroform	<	2 J	2 J	100	24	<	<	.	.	<	<
Methylene chloride	<	<	<	6	<	<	<	.	.	<	<
Chloromethane	<	<	<	<	<	<	<	.	.	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	<	190	4 J	<	<	.	.	<	<
Dimethylbenzene	<	<	<	<	<	<	<	.	.	<	<
Ethylbenzene	<	<	<	<	<	<	<	.	.	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dichloropropane	<	<	<	<	<	<	<	.	.	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	.	.	<	<
2-Butanone	<	<	<	<	<	<	<	.	.	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	.	.	<	<
Chlorobenzene	<	<	<	<	<	<	<	.	.	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	.	.	<	<
Trichlorofluoromethane	<	<	<	3 J	<	<	<	.	.	<	<

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-683		GW-684			GW-694		GW-695		GW-703	
Location	EXP-A		EXP-A			EXP-B		EXP-B		EXP-B	
Date Sampled	01/14/02	07/09/02	01/14/02	07/09/02		01/29/02	07/17/02	01/15/02	07/15/02	01/15/02	07/15/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type				Dup							
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	3 J	5	5 J	15	16
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	3 J	2 J	6	6
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-704		GW-706		GW-712		GW-713		GW-714	
Location	EXP-B		EXP-B		EXP-W		EXP-W		EXP-W	
Date Sampled	01/16/02	07/16/02	01/16/02	07/16/02	01/03/02	07/01/02	01/03/02	07/01/02	01/02/02	07/01/02
Program	GWPP	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type	Dup									
Chloroethenes ($\mu\text{g/L}$)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	45	44	41	17	16	<	<	<	<	<
cis-1,2-Dichloroethene	4 J	4 J	4 J	14	13	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	4 J	4 J	3 J	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)										
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	.	.	.	.	.
2-Butanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	.	.	.	.	.
Trichlorofluoromethane	<	<	<	<	<	.	.	.	.	.

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-715				GW-723		GW-724		GW-725	
Location	EXP-W				EXP-C		EXP-C		EXP-C	
Date Sampled	01/02/02		07/01/02		03/05/02	07/23/02	01/30/02	07/23/02	01/31/02	07/18/02
Program	BJC	BJC	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type	Dup		Dup							
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	3 J	3 J	<	2 J
Trichloroethene	<	<	<	<	6	6	98	110	200	15
cis-1,2-Dichloroethene	<	<	<	<	<	<	3 J	3 J	4 J	2 J
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	5	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	3 J	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	2 J	<	7	<
Chloroform	<	<	<	<	<	<	<	<	2 J	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<
Trichlorofluoromethane	<	<	<	<

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-736		GW-737		GW-738		GW-739		GW-740	
Location	EXP-C		EXP-C		EXP-C		EXP-C		EXP-C	
Date Sampled	03/06/02	07/17/02	03/06/02	07/18/02	01/30/02	07/23/02	03/05/02	07/22/02	01/29/02	07/22/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	<	2 J	3 J	2 J	<	<	<	<	<	<
Trichloroethene	8	9	5	7	37	25	36	37	58	57
cis-1,2-Dichloroethene	2 J	3 J	2 J	<	2 J	<	<	<	2 J	2 J
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	2 J	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	<	<	<	<
2-Butanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	6 J	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<	<

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-835				GW-916		GW-917		GW-918	
Location	S3				EMWMF		EMWMF		EMWMF	
Date Sampled	03/04/02	05/20/02	08/22/02	11/19/02	08/15/02	12/10/02	08/12/02	12/05/02	08/15/02	12/10/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	3 J	3 J	4 J	4	<	<	<	<	<	<
Trichloroethene	<	<	<	1	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	0.9	.	.	.	.	.	.
trans-1,2-Dichloroethene	<	<	<	<	.	.	.	.	.	.
1,1-Dichloroethene	<	<	<	<	.	.	.	.	.	.
Vinyl chloride	<	<	<	<	.	.	.	.	.	.
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	.	.	.	.	.	.
1,1,2-Trichloroethane	<	<	<	<	.	.	.	.	.	.
1,2-Dichloroethane	<	<	<	<	.	.	.	.	.	.
1,1-Dichloroethane	<	<	<	<	.	.	.	.	.	.
Chloroethane	<	<	<	<	.	.	.	.	.	.
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	.	<	.	<	.	<
Chloroform	<	<	<	<	.	<	.	<	.	<
Methylene chloride	<	<	<	<	.	.	.	.	.	.
Chloromethane	<	<	<	<	.	.	.	.	.	.
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	.	.	.	.	.	.
Dimethylbenzene	<	<	<	<	.	.	.	.	.	.
Ethylbenzene	<	<	<	<	.	.	.	.	.	.
Toluene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dichloropropane	<	<	<	<	.	.	.	.	.	.
1,4-Dichlorobenzene	.	.	.	.	.	.	.	.	.	.
2-Butanone	<	<	<	<	.	.	.	.	.	.
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	.	.	.	.	.	.
Chlorobenzene	<	<	<	<	.	.	.	.	.	.
Dichlorodifluoromethane	.	.	.	.	.	.	.	.	.	.
Trichlorofluoromethane	.	.	.	.	.	.	.	.	.	.

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-919		GW-920		GW-921		GW-922		GW-923	
Location	EMWMF		EMWMF		EMWMF		EMWMF		EMWMF	
Date Sampled	08/14/02	12/09/02	08/13/02	12/05/02	08/12/02	12/04/02	08/13/02	12/09/02	08/14/02	12/09/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene
trans-1,2-Dichloroethene
1,1-Dichloroethene
Vinyl chloride
Chloroethanes (µg/L)										
1,1,1-Trichloroethane
1,1,2-Trichloroethane
1,2-Dichloroethane
1,1-Dichloroethane
Chloroethane
Chloromethanes (µg/L)										
Carbon tetrachloride	.	.	<	.	<	.	<	.	<	.
Chloroform	.	.	<	.	<	.	<	.	<	.
Methylene chloride
Chloromethane
Petrol. Hydrocarb. (µg/L)										
Benzene
Dimethylbenzene
Ethylbenzene	.	.	<	.	<	.	<	.	<	.
Toluene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dichloropropane
1,4-Dichlorobenzene
2-Butanone	.	.	<	.	<	.	<	.	<	.
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform
Chlorobenzene
Dichlorodifluoromethane
Trichlorofluoromethane

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-924				GW-925		GW-926		GW-927	
Location	EMWMF				EMWMF		EMWMF		EMWMF	
Date Sampled	08/13/02		12/10/02		08/12/02	12/04/02	08/13/02	12/10/02	08/12/02	12/05/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type	Dup		Dup							
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene
trans-1,2-Dichloroethene
1,1-Dichloroethene
Vinyl chloride
Chloroethanes (µg/L)										
1,1,1-Trichloroethane
1,1,2-Trichloroethane
1,2-Dichloroethane
1,1-Dichloroethane
Chloroethane
Chloromethanes (µg/L)										
Carbon tetrachloride	.	.	<	<	.	<	.	<	.	<
Chloroform	.	.	<	<	.	<	.	<	.	<
Methylene chloride
Chloromethane
Petrol. Hydrocarb. (µg/L)										
Benzene
Dimethylbenzene
Ethylbenzene	.	<	<	<	.	<	.	<	.	<
Toluene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dichloropropane
1,4-Dichlorobenzene
2-Butanone
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform
Chlorobenzene
Dichlorodifluoromethane
Trichlorofluoromethane

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	NT-01		NT-03	NT-07	NT-08	NT-8-E	NT-8-W	S07	SS-1	
Location	EXP-SW		EXP-SW	EXP-SW	EXP-SW	EXP-SW	EXP-SW	EXP-SW	EXP-SW	
Date Sampled	01/09/02	07/11/02	03/11/02	03/13/02	03/13/02	03/13/02	03/13/02	03/11/02	01/09/02	07/15/02
Program	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	62	58	<	28	11	<	<	<	<	<
Trichloroethene	<	<	<	23	6	<	<	<	<	<
cis-1,2-Dichloroethene	2 J	2 J	<	85	66	2 J	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	3 J	1 J	<	<	<	<	<
Vinyl chloride	<	<	<	3	1 J	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	2 J	<	<	<	<	<	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	8	4 J	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	2 J	<	1 J	<	<	<	<	<	<
Methylene chloride	4 J	3 J	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	2 J	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	.	.	.	.	.	.	.	.
2-Butanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	.	.	.	.	.	.	.	.
Trichlorofluoromethane	<	<	.	.	.	.	.	.	.	.

APPENDIX D.2: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	SS-4		SS-5			SS-7	SS-8		
Location	EXP-SW		EXP-SW			EXP-SW	EXP-SW		
Date Sampled	01/08/02	07/10/02	01/08/02		07/10/02	03/12/02	03/12/02	09/09/02	
Program	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC
Sample Type			Dup					Dup	
Chloroethenes ($\mu\text{g/L}$)									
Tetrachloroethene	<	<	<	<	<	<	<	<	<
Trichloroethene	8	20	<	<	<	2 J	<	<	<
cis-1,2-Dichloroethene	4 J	17	2 J	2 J	3 J	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	2 J	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)									
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,1,2-Trichloroethane	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)									
Carbon tetrachloride	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<
Chloromethane	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)									
Benzene	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)									
1,2-Dichloropropane	<	<	<	<	<	<	<	<	<
1,4-Dichlorobenzene	<	<	<	<	<	<	.	.	.
2-Butanone	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<
Dichlorodifluoromethane	<	<	<	<	<	.	.	.	.
Trichlorofluoromethane	<	<	<	<	<	.	.	.	.

APPENDIX D.3
RADIOLOGICAL ANALYTES

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Location	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	Error	MDA	Activity	Error	MDA
BCK-00.63	EXP-SW	01/08/02	GWPP	9	3.5	3.2	15	6.1	8.9
BCK-00.63	EXP-SW	07/10/02	GWPP	5.7	3.1	3.5	10	5.5	8.2
BCK-03.30	EXP-SW	03/12/02	BJC	.	.	.	15.96	1.78	1.57
BCK-03.30	EXP-SW	09/09/02	BJC	.	.	.	6.94	1.51	1.81
BCK-04.55	EXP-SW	01/09/02	GWPP	21	5.1	3.3	32	6.6	7.7
BCK-04.55	EXP-SW	07/10/02	GWPP	5.3	3	3.5	11	4	5.4
BCK-07.87	EXP-SW	01/08/02	GWPP	62	8.7	2.7	110	11	8.8
BCK-07.87	EXP-SW	07/10/02	GWPP	31	6	2.6	33	6.4	7.2
BCK-09.20	EXP-SW	03/11/02	BJC	.	.	.	50.04	2.86	1.78
BCK-09.20	EXP-SW	09/09/02	BJC	.	.	.	48.28	3.23	2.24
BCK-09.40	EXP-SW	01/09/02	GWPP	80	9.8	0.82	120	11	7.4
BCK-09.40	EXP-SW	07/11/02	GWPP	68	8.9	3.9	23	5.8	7.2
BCK-09.40 Dup	EXP-SW	07/11/02	GWPP	67	8.8	2.6	35	6.7	7.5
BCK-09.47	EXP-SW	03/11/02	BJC	.	.	.	76.09	3.81	2.14
BCK-11.54	EXP-SW	03/11/02	BJC	.	.	.	158.71	4.68	2.14
BCK-11.54	EXP-SW	09/09/02	BJC	.	.	.	4.3	1.39	1.83
BCK-11.84	EXP-SW	03/11/02	BJC	.	.	.	222.91	5.31	2.33
BCK-11.97	EXP-SW	01/09/02	GWPP	89	12	4.8	410	21	11
BCK-11.97	EXP-SW	07/11/02	GWPP	83	19	12	780	25	6.9
GW-008	OLF	01/07/02	BJC	<MDA	.	1.09	<MDA	.	1.88
GW-008	OLF	07/02/02	BJC	<MDA	.	1.23	2.52	1.06	1.45
GW-014	BG	03/14/02	GWPP	<MDA	.	3.3	<MDA	.	7.3
GW-014 Dup	BG	03/14/02	GWPP	1.3	1.3	0.85	<MDA	.	8.4
GW-014	BG	08/12/02	GWPP	2.3	1.8	2	<MDA	.	10
GW-046	BG	01/07/02	BJC	1.84	0.99	1.23	5.38	1.48	1.92
GW-046	BG	07/02/02	BJC	0.98	0.72	0.97	3.71	1.09	1.39
GW-061	BG	03/12/02	GWPP	37	6.9	0.89	63	7.5	6.3
GW-061	BG	08/05/02	GWPP	42	8.7	3.4	73	9.3	8.9
GW-066	OLF	03/25/02	GWPP	7.4	3.6	4	<MDA	.	9.3
GW-066	OLF	08/13/02	GWPP	6.7	3.5	3.8	<MDA	.	7.9
GW-066 Dup	OLF	08/13/02	GWPP	12	4.2	3	10	5.2	7.7
GW-069	BG	03/11/02	GWPP	<MDA	.	0.95	7.6	4	5.8
GW-069	BG	08/05/02	GWPP	<MDA	.	2.7	11	5.9	8.9
GW-071	BG	03/12/02	GWPP	<MDA	.	24	<MDA	.	72
GW-071	BG	08/06/02	GWPP	<MDA	.	35	<MDA	.	90
GW-071 Dup	BG	08/06/02	GWPP	<MDA	.	35	<MDA	.	69
GW-072	BG	03/11/02	GWPP	<MDA	.	0.98	<MDA	.	7.5
GW-072	BG	08/06/02	GWPP	<MDA	.	4.7	<MDA	.	8.2
GW-076	OLF	03/19/02	GWPP	<MDA	.	2.3	<MDA	.	9.9
GW-077	BG	02/26/02	BJC	<MDA	.	1.75	<MDA	.	2
GW-077	BG	08/08/02	BJC	<MDA	.	1.83	3.19	1.3	1.77
GW-078	BG	02/26/02	BJC	<MDA	.	1.71	<MDA	.	1.99
GW-078	BG	08/08/02	BJC	<MDA	.	0.6	<MDA	.	0.99
GW-079	BG	02/26/02	BJC	<MDA	.	1.29	<MDA	.	1.89
GW-079	BG	08/07/02	BJC	<MDA	.	1.72	2.63	1.31	1.86
GW-080	BG	02/26/02	BJC	<MDA	.	1.31	3.51	1.38	1.89
GW-080 Dup	BG	02/26/02	BJC	<MDA	.	1.29	<MDA	.	1.89
GW-080	BG	08/07/02	BJC	<MDA	.	0.9	1.61	1.1	1.6
GW-080 Dup	BG	08/07/02	BJC	<MDA	.	1.14	<MDA	.	1.91

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Location	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	Error	MDA	Activity	Error	MDA
GW-082	BG	02/12/02	GWPP	<MDA	.	5.3	<MDA	.	8.8
GW-082	BG	07/29/02	GWPP	<MDA	.	4.8	<MDA	.	8.9
GW-085	OLF	02/18/02	GWPP	<MDA	.	8.4	240	16	11
GW-085	OLF	07/31/02	GWPP	<MDA	.	6.4	220	15	9.6
GW-087	OLF	03/25/02	GWPP	20	5	2.3	15	6.8	10
GW-091	BG	03/14/02	GWPP	2	1.5	0.77	<MDA	.	10
GW-091	BG	08/08/02	GWPP	8.3	3.2	1.9	<MDA	.	8.2
GW-115	S3	01/07/02	BJC	<MDA	.	1.61	2.29	1.76	2.08
GW-115	S3	07/08/02	BJC	<MDA	.	3.47	6.54	1.95	2.14
GW-225	OLF	02/19/02	GWPP	<MDA	.	5.3	19	5.4	6.8
GW-225	OLF	08/01/02	GWPP	<MDA	.	3.6	19	5	6.1
GW-226	OLF	02/19/02	GWPP	8.4	4.4	5.3	17	5.2	6.8
GW-226	OLF	08/01/02	GWPP	4.5	2.6	2.4	17	4.8	5.9
GW-229	OLF	03/19/02	GWPP	110	14	1.2	84	10	9.8
GW-229 Dup	OLF	03/19/02	GWPP	260	22	3.7	130	13	12
GW-229	OLF	08/12/02	GWPP	73	30	24	87	48	73
GW-243	S3	03/21/02	GWPP	540	190	44	13,000	520	220
GW-243	S3	08/13/02	GWPP	<MDA	.	740	17,000	1,300	840
GW-276	S3	01/07/02	BJC	238.65	12.17	3.47	357.54	8.47	3.63
GW-276	S3	07/08/02	BJC	210.7	11.06	4.23	391.23	7.68	2.46
GW-288	BG	03/13/02	GWPP	<MDA	.	2.5	<MDA	.	7.6
GW-288	BG	08/07/02	GWPP	<MDA	.	2.1	<MDA	.	7.8
GW-289	BG	03/13/02	GWPP	<MDA	.	0.74	<MDA	.	6.5
GW-289	BG	08/08/02	GWPP	<MDA	.	2.1	<MDA	.	8.5
GW-291	BG	03/14/02	GWPP	<MDA	.	2.6	<MDA	.	7.3
GW-291	BG	08/07/02	GWPP	<MDA	.	3.2	<MDA	.	6.8
GW-311	RS	02/13/02	GWPP	4.6	3.1	4.2	<MDA	.	8.7
GW-311 Dup	RS	02/13/02	GWPP	<MDA	.	3.6	<MDA	.	8.8
GW-311	RS	07/30/02	GWPP	<MDA	.	2.7	<MDA	.	7
GW-315	SPI	02/13/02	GWPP	<MDA	.	5.5	27	8.3	11
GW-315	SPI	07/30/02	GWPP	<MDA	.	2.4	38	6.7	6.9
GW-526	S3	02/26/02	BJC	<MDA	.	40.2	<MDA	.	43.58
GW-526	S3	08/08/02	BJC	<MDA	.	27.04	<MDA	.	41.82
GW-537	OLF	02/18/02	GWPP	<MDA	.	20	540	34	22
GW-537	OLF	07/31/02	GWPP	<MDA	.	14	640	51	36
GW-537 Dup	OLF	07/31/02	GWPP	<MDA	.	15	660	46	25
GW-626	BG	02/11/02	GWPP	<MDA	.	3	<MDA	.	9.9
GW-626	BG	07/25/02	GWPP	<MDA	.	4.3	<MDA	.	7.4
GW-627	BG	02/11/02	GWPP	<MDA	.	22	<MDA	.	11
GW-627	BG	07/29/02	GWPP	19 Q	9.9	10	<MDA	.	18
GW-653	BG	02/12/02	GWPP	<MDA	.	3.6	<MDA	.	8.4
GW-653	BG	07/25/02	GWPP	<MDA	.	2.5	<MDA	.	9.6
GW-683	EXP-A	01/14/02	GWPP	20	4.9	0.81	46	7.3	7.4
GW-683	EXP-A	07/09/02	GWPP	15	4.2	0.78	20	6	7.7
GW-684	EXP-A	01/14/02	GWPP	23	5.6	3.4	49	9.4	11
GW-684	EXP-A	07/09/02	GWPP	17	4.9	4.1	31	6.4	7.3
GW-684 Dup	EXP-A	07/09/02	GWPP	16	4.4	2.6	31	6.2	6.7
GW-694	EXP-B	01/29/02	GWPP	22	5.1	3	14	5.9	8.5
GW-694	EXP-B	07/17/02	GWPP	15	4.5	3.6	20	5.7	7.2

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Location	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	Error	MDA	Activity	Error	MDA
GW-695	EXP-B	01/15/02	GWPP	5.7	2.8	2.7	50	8	8.5
GW-695	EXP-B	07/15/02	GWPP	7.4	3.4	3.7	42	7.3	8
GW-703	EXP-B	01/15/02	GWPP	7.8	3.5	3.5	62	8.9	9.3
GW-703	EXP-B	07/15/02	GWPP	4.1	2.5	2.5	62	8.2	7.3
GW-704	EXP-B	01/16/02	GWPP	6.2	3.2	3.5	26	5.7	6.7
GW-704 Dup	EXP-B	01/16/02	GWPP	5.2	3.3	4.3	27	5.5	5.9
GW-704	EXP-B	07/16/02	GWPP	6.2	2.9	2	41	8.1	8.8
GW-706	EXP-B	01/16/02	GWPP	58	9	3.9	140	11	6.8
GW-706	EXP-B	07/16/02	GWPP	45	7.8	2.1	72	8.5	6.9
GW-712	EXP-W	01/03/02	BJC	<MDA	.	1.98	2.3	1.23	1.74
GW-712	EXP-W	07/01/02	BJC	2.13	1.68	1.96	5.73	2.17	2.45
GW-713	EXP-W	01/03/02	BJC	1.66	1.1	1.22	7.73	1.57	1.79
GW-713	EXP-W	07/01/02	BJC	15.75	2.77	2.09	39.75	3.06	2.48
GW-714	EXP-W	01/02/02	BJC	2.2	1.36	1.75	6.1	1.54	1.94
GW-714	EXP-W	07/01/02	BJC	3	1.61	1.76	4.38	2.09	2.41
GW-715	EXP-W	01/02/02	BJC	5.7	2.14	2.26	5.33	1.53	1.99
GW-715 Dup	EXP-W	01/02/02	BJC	5.24	1.61	1.51	4.91	1.84	2.09
GW-715	EXP-W	07/01/02	BJC	17.96	2.5	1.67	39.92	2.97	2.38
GW-715 Dup	EXP-W	07/01/02	BJC	16.02	2.45	1.72	22.57	2.58	2.39
GW-723	EXP-C	03/05/02	GWPP	1.9	1.4	0.74	<MDA	.	6.5
GW-723	EXP-C	07/23/02	GWPP	6.3	3.2	3.7	<MDA	.	9.3
GW-724	EXP-C	01/30/02	GWPP	<MDA	.	3.5	38	8.7	11
GW-724	EXP-C	07/23/02	GWPP	<MDA	.	3.4	<MDA	.	9.7
GW-725	EXP-C	01/31/02	GWPP	<MDA	.	4.6	32	7.5	9.2
GW-725	EXP-C	07/18/02	GWPP	8.4	3.9	3.1	29	5.8	6.3
GW-736	EXP-C	03/06/02	GWPP	24	7.6	5.7	68	9.2	7.9
GW-736	EXP-C	07/17/02	GWPP	<MDA	.	4.3	<MDA	.	9
GW-737	EXP-C	03/06/02	GWPP	9.6	3.8	1	32	7.3	9
GW-737	EXP-C	07/18/02	GWPP	5.9	3.8	4.5	29	5.7	5.9
GW-738	EXP-C	01/30/02	GWPP	<MDA	.	2.6	57	8.5	9.1
GW-738	EXP-C	07/23/02	GWPP	7.5	3.7	3.7	55	9.1	10
GW-739	EXP-C	03/05/02	GWPP	<MDA	.	2.6	<MDA	.	6.1
GW-739	EXP-C	07/22/02	GWPP	<MDA	.	2.6	<MDA	.	9.3
GW-740	EXP-C	01/29/02	GWPP	<MDA	.	2.2	<MDA	.	9.4
GW-740	EXP-C	07/22/02	GWPP	<MDA	.	4.2	<MDA	.	12
NT-01	EXP-SW	01/09/02	GWPP	20	7.6	6.5	970	33	12
NT-01	EXP-SW	07/11/02	GWPP	150	48	29	6000	250	88
SS-1	EXP-SW	01/09/02	GWPP	21	6.4	5.2	60	8.2	7.4
SS-1	EXP-SW	07/15/02	GWPP	29	7.4	4	51	7.6	7.2
SS-4	EXP-SW	01/08/02	GWPP	73	9.9	4.5	180	13	8.2
SS-4	EXP-SW	07/10/02	GWPP	43	7.6	2.5	53	7.1	6.3
SS-5	EXP-SW	01/08/02	GWPP	48	7.8	2.8	81	8.4	6.7
SS-5 Dup	EXP-SW	01/08/02	GWPP	55	8.3	2.4	75	8.1	6.4
SS-5	EXP-SW	07/10/02	GWPP	31	6	2.3	37	7	8
SS-7	EXP-SW	03/12/02	BJC	.	.	.	9.29	1.68	1.69
SS-8	EXP-SW	03/12/02	BJC	.	.	.	2.71	1.14	1.54
SS-8	EXP-SW	09/09/02	BJC	.	.	.	<MDA	.	1.8
SS-8 Dup	EXP-SW	09/09/02	BJC	.	.	.	<MDA	.	1.79

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	BCK-00.63						BCK-03.30		
Location	EXP-SW						EXP-SW		
Date Sampled	01/08/02			07/10/02			03/12/02		
Program	GWPP			GWPP			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	9	3.5	3.2	5.7	3.1	3.5	.	.	.
Gross Beta	15	6.1	8.9	10	5.5	8.2	15.96	1.78	1.57
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	4.4	<MDA	.	2.3	.	.	.
Technetium-99	18	8	13	<MDA	.	13	19.54	3.92	6.07
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	3.7	0.7	0.16	1.2	0.37	0.13	3.64	0.98	0.1
Uranium-235	<MDA	.	0.25	<MDA	.	0.14	0.18	0.18	0.12
Uranium-236	.	.	.	.	.	.	<MDA	.	0.18
Uranium-238	7.2	1.1	0.16	2.9	0.6	0.12	8.87	1.98	0.23

Sampling Point	BCK-03.30			BCK-04.55					
Location	EXP-SW			EXP-SW					
Date Sampled	09/09/02			01/09/02			07/10/02		
Program	BJC			GWPP			GWPP		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	21	5.1	3.3	5.3	3	3.5
Gross Beta	6.94	1.51	1.81	32	6.6	7.7	11	4	5.4
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	6.08	<MDA	.	4.2	<MDA	.	2.9
Technetium-99	.	.	.	38	8.3	13	<MDA	.	13
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	3.76	1.46	0.76	7.5	1.1	0.064	1.6	0.41	0.19
Uranium-235	<MDA	.	0.78	0.47	0.24	0.08	<MDA	.	0.14
Uranium-236	<MDA	.	0.35	.	.	.	.	.	.
Uranium-238	4.09	1.53	0.76	17	2.1	0.064	2.5	0.53	0.15

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	BCK-07.87						BCK-09.20		
Location	EXP-SW						EXP-SW		
Date Sampled	01/08/02			07/10/02			03/11/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	62	8.7	2.7	31	6	2.6	.	.	.
Gross Beta	110	11	8.8	33	6.4	7.2	50.04	2.86	1.78
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	74.44	5.75	7.85	21.34	4.68	7.28	69.84	4.6	5.82
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	18.4	3.81	0.19	12.52	4.09	1.88	14.19	3.14	0.18
Uranium-235	0.78	0.44	0.38	<MDA	.	1.48	0.79	0.41	0.22
Uranium-236	0.58	0.35	0.28	<MDA	.	1.14	0.41	0.28	0.19
Uranium-238	44.05	8.53	0.23	21.56	5.92	1.8	30.29	6.3	0.17

Sampling Point	BCK-09.20			BCK-09.47			BCK-11.54		
Location	EXP-SW			EXP-SW			EXP-SW		
Date Sampled	09/09/02			03/11/02			03/11/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	48.28	3.23	2.24	76.09	3.81	2.14	158.71	4.68	2.14
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	54.47	4.43	5.93	118.07	6.05	7.07	235.57	6.58	5.78
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	11.26	3.25	1.16	16.76	4.1	0.55	18.07	3.78	0.23
Uranium-235	1.13	0.97	0.89	0.81	0.54	0.47	0.57	0.35	0.13
Uranium-236	<MDA	.	1.13	0.63	0.44	0.19	0.64	0.35	0.12
Uranium-238	19.12	4.67	0.72	44.46	9.99	0.17	30.72	6.15	0.23

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	BCK-11.54			BCK-11.84			BCK-11.97		
Location	EXP-SW			EXP-SW			EXP-SW		
Date Sampled	09/09/02			03/11/02			01/09/02		
Program	BJC			BJC			GWPP		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha							89	12	4.8
Gross Beta	4.3	1.39	1.83	222.91	5.31	2.33	410	21	11
Americium-241							<MDA		0.29
Neptunium-237							2.1	0.53	0.086
Plutonium-238							<MDA		0.22
Radium-223/224/226							<MDA		1.1
Strontium-89/90							5.3	2.9	4.4
Technetium-99	<MDA		6.08	403.11	8.16	5.83	400	12	13
Thorium-228							<MDA		0.34
Thorium-230							0.16	0.14	0.087
Thorium-232							<MDA		0.086
Thorium-234							46	4.5	0.12
Tritium									
Uranium-234	2.38	1.17	0.81	19.38	4.18	0.34	26	2.7	0.12
Uranium-235	<MDA		0.83	1.36	0.63	0.33	0.88	0.3	0.15
Uranium-236	<MDA		0.74	1.11	0.54	0.33			
Uranium-238	3.66	1.46	0.57	30.11	6.23	0.26	46	4.5	0.12

Sampling Point	BCK-11.97			GW-008		
Location	EXP-SW			OLF		
Date Sampled	07/11/02			01/07/02		07/02/02
Program	GWPP			BJC		BJC
Sample Type						
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	83	19	12	<MDA		1.09
Gross Beta	780	25	6.9	<MDA		1.88
Americium-241				<MDA		1.57
Neptunium-237	0.53	0.28	0.2	0.21 R	0.22	0.14
Plutonium-238	<MDA		0.14			<MDA
Radium-223/224/226	<MDA		2.5	1.73	0.81	0.85
Strontium-89/90	4.4	1.8	2.5	<MDA		1.64
Technetium-99	1500	23	13	<MDA		11.18
Thorium-228	<MDA		0.15			
Thorium-230	0.26	0.23	0.17			
Thorium-232	<MDA		0.099			
Thorium-234	43	4.1	0.066			
Tritium						
Uranium-234	25	2.6	0.097	<MDA		0.23
Uranium-235	1.1	0.31	0.083	<MDA		0.19
Uranium-236				<MDA		0.24
Uranium-238	43	4.1	0.066	<MDA		0.27

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-046						GW-077		
Location	BG						BG		
Date Sampled	01/07/02			07/02/02			02/26/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	1.84	0.99	1.23	0.98	0.72	0.97	<MDA	.	1.75
Gross Beta	5.38	1.48	1.92	3.71	1.09	1.39	<MDA	.	2
Americium-241	<MDA	.	1.83	<MDA	.	0.2	.	.	.
Neptunium-237	0.23	0.21	0.22	<MDA	.	0.27	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	3.53	1.08	0.8	<MDA	.	0.45	.	.	.
Strontium-89/90	<MDA	.	1.32	<MDA	.	1.51	.	.	.
Technetium-99	<MDA	.	10.79	<MDA	.	14.27	<MDA	.	6.53
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	<MDA	.	0.41	<MDA	.	0.32	<MDA	.	0.39
Uranium-235	<MDA	.	0.32	<MDA	.	0.4	<MDA	.	0.14
Uranium-236	<MDA	.	0.31	<MDA	.	0.36	<MDA	.	0.28
Uranium-238	<MDA	.	0.32	<MDA	.	0.32	<MDA	.	0.36

Sampling Point	GW-077			GW-078					
Location	BG			BG					
Date Sampled	08/08/02			02/26/02		08/08/02			
Program	BJC			BJC		BJC			
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA			
Gross Alpha	<MDA	.	1.83	<MDA	.	1.71	<MDA	.	0.6
Gross Beta	3.19	1.3	1.77	<MDA	.	1.99	<MDA	.	0.99
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	<MDA	.	5.75	<MDA	.	6.59	<MDA	.	5.85
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.29	0.2	0.2	0.38	0.28	0.31	0.36	0.2	0.15
Uranium-235	<MDA	.	0.1	<MDA	.	0.14	<MDA	.	0.14
Uranium-236	<MDA	.	0.15	<MDA	.	0.21	<MDA	.	0.07
Uranium-238	<MDA	.	0.19	<MDA	.	0.19	0.18	0.14	0.15

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-079						GW-080		
Location	BG						BG		
Date Sampled	02/26/02			08/07/02			02/26/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA	.	1.29	<MDA	.	1.72	<MDA	.	1.31
Gross Beta	<MDA	.	1.89	2.63	1.31	1.86	3.51	1.38	1.89
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	<MDA	.	7.28	<MDA	.	6.04	<MDA	.	6.64
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.25	0.2	0.1	0.21	0.17	0.21	<MDA	.	0.26
Uranium-235	<MDA	.	0.12	0.11 R	0.13	0.1	<MDA	.	0.23
Uranium-236	<MDA	.	0.24	<MDA	.	0.18	<MDA	.	0.18
Uranium-238	<MDA	.	0.19	<MDA	.	0.16	<MDA	.	0.23

Sampling Point	GW-080								
Location	BG								
Date Sampled	02/26/02			08/07/02					
Program	BJC			BJC					
Sample Type	DUP						DUP		
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA	.	1.29	<MDA	.	0.9	<MDA	.	1.14
Gross Beta	<MDA	.	1.89	1.61	1.1	1.6	<MDA	.	1.91
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	<MDA	.	6.6	<MDA	.	5.97	<MDA	.	6.04
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.4	0.26	0.23	0.24	0.17	0.17	0.55	0.27	0.24
Uranium-235	<MDA	.	0.24	<MDA	.	0.09	<MDA	.	0.21
Uranium-236	<MDA	.	0.24	<MDA	.	0.08	<MDA	.	0.14
Uranium-238	<MDA	.	0.21	<MDA	.	0.14	<MDA	.	0.28

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-115						GW-243		
Location	S3						S3		
Date Sampled	01/07/02			07/08/02			03/21/02		
Program	BJC			BJC			GWPP		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA		1.61	<MDA		3.47	540	190	44
Gross Beta	2.29	1.76	2.08	6.54	1.95	2.14	13,000	520	220
Americium-241	4.36	Q	1.91	1.03	<MDA	0.09	<MDA		0.6
Neptunium-237	<MDA		0.3	<MDA		0.31	30	2.7	0.29
Plutonium-238							<MDA		3.5
Radium-223/224/226	3.31	1.08	0.79	1.87	0.81	0.7	39	11	5.7
Strontium-89/90	<MDA		1.42	<MDA		1.3	4.1	2.5	3.9
Technetium-99	<MDA		11.08	<MDA		7.47	8,300	52	13
Thorium-228							0.89	0.39	0.24
Thorium-230							5.6	1.2	0.099
Thorium-232							0.48	0.28	0.24
Thorium-234							270	27	0.13
Tritium									
Uranium-234	<MDA		0.44	<MDA		0.23	110	12	0.31
Uranium-235	0.28	0.24	0.22	<MDA		0.41	5.9	1.3	0.39
Uranium-236	<MDA		0.26	<MDA		0.26			
Uranium-238	<MDA		0.25	<MDA		0.27	270	27	0.13

Sampling Point	GW-243			GW-276					
Location	S3			S3					
Date Sampled	08/13/02			01/07/02			07/08/02		
Program	GWPP			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA		740	238.65	12.17	3.47	210.7	11.06	4.23
Gross Beta	17,000	1,300	840	357.54	8.47	3.63	391.23	7.68	2.46
Americium-241	<MDA		0.26	<MDA		0.42	<MDA		0.19
Neptunium-237	32	2.2	0.15	15.67	3.31	0.3	9.64	1.55	0.32
Plutonium-238	0.35	0.21	0.11						
Radium-223/224/226	53	17	13	4.4	1.06	0.64	2.46	0.94	0.73
Strontium-89/90	32	7.4	8.5	<MDA		2.29	2.71	0.21	1.28
Technetium-99	14,000	70	40	501.55	11.3	11.29	501.01	10.36	7.61
Thorium-228	0.75	0.48	0.42						
Thorium-230	2.9	1.1	0.31						
Thorium-232	<MDA		0.29						
Thorium-234	270	29	0.18						
Tritium									
Uranium-234	110	12	0.17	80.45	31.68	3.78	73.7	20.37	2.77
Uranium-235	5.7	1.1	0.18	3.44	3.42	3.3	8.4	4.79	2.62
Uranium-236				5.01	4.04	2.96	2.46	2.35	2.36
Uranium-238	270	29	0.18	182.3	67.91	4.26	193.8	47.78	2.12

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-363						GW-526		
Location	EMWMF						S3		
Date Sampled	08/14/02			12/04/02			02/26/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha							<MDA		40.2
Gross Beta							<MDA		43.58
Americium-241	<MDA		0.12	<MDA		0.107			
Neptunium-237	<MDA		0.122	<MDA		0.105			
Plutonium-238	<MDA		0.102	<MDA		0.22			
Radium-223/224/226									
Strontium-89/90	<MDA		0.53	<MDA		1.11			
Technetium-99	<MDA		7.04	13.3	3.4	7.42			
Thorium-228									
Thorium-230									
Thorium-232									
Thorium-234									
Tritium									
Uranium-234	0.0562	0.037	0.0169	0.159	0.097	0.0978	0.29	0.22	0.23
Uranium-235	<MDA		0.0285	<MDA		0.0913	<MDA		0.22
Uranium-236							<MDA		0.11
Uranium-238	<MDA		0.0333	<MDA		0.0839	<MDA		0.27

Sampling Point	GW-526			GW-639		
Location	S3			EMWMF		
Date Sampled	08/08/02			08/14/02		12/04/02
Program	BJC			BJC		BJC
Sample Type						
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA		27.04			
Gross Beta	<MDA		41.82			
Americium-241				<MDA		0.115
Neptunium-237				<MDA		0.114
Plutonium-238				<MDA		0.175
Radium-223/224/226						
Strontium-89/90				<MDA		0.663
Technetium-99				<MDA		7.02
Thorium-228						
Thorium-230						
Thorium-232						
Thorium-234						
Tritium						
Uranium-234	0.35	0.2	0.13	0.327	0.092	0.0174
Uranium-235	<MDA		0.15	<MDA		0.0174
Uranium-236	<MDA		0.14			<MDA
Uranium-238	<MDA		0.12	0.0577	0.038	0.0174
						0.106
						0.08
						0.0409

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-694						GW-695		
Location	EXP-B						EXP-B		
Date Sampled	01/29/02			07/17/02			01/15/02		
Program	GWPP			GWPP			GWPP		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	22	5.1	3	15	4.5	3.6	5.7	2.8	2.7
Gross Beta	14	5.9	8.5	20	5.7	7.2	50	8	8.5
Americium-241
Neptunium-237
Plutonium-238
Radium-223/224/226
Strontium-89/90
Technetium-99	<MDA	.	13	<MDA	.	.	13	43	8.2
Thorium-228
Thorium-230
Thorium-232
Thorium-234
Tritium
Uranium-234
Uranium-235
Uranium-236
Uranium-238

Sampling Point	GW-695			GW-703		
Location	EXP-B			EXP-B		
Date Sampled	07/15/02			01/15/02		07/15/02
Program	GWPP			GWPP		GWPP
Sample Type						
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	7.4	3.4	3.7	7.8	3.5	3.5
Gross Beta	42	7.3	8	62	8.9	9.3
Americium-241
Neptunium-237
Plutonium-238
Radium-223/224/226
Strontium-89/90
Technetium-99	45	8.7	13	66	8.6	13
Thorium-228
Thorium-230
Thorium-232
Thorium-234
Tritium
Uranium-234
Uranium-235
Uranium-236
Uranium-238

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-704								
Location	EXP-B								
Date Sampled	01/16/02								
Program	GWPP						BJC		
Sample Type				DUP					
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	6.2	3.2	3.5	5.2	3.3	4.3	.	.	.
Gross Beta	26	5.7	6.7	27	5.5	5.9	.	.	.
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	38	8.2	13	32	8.2	13	.	.	.
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	2.89	0.89	0.32
Uranium-234	.	.	.	.	.	.	<MDA	.	0.32
Uranium-235	.	.	.	.	.	.	<MDA	.	0.22
Uranium-236	.	.	.	.	.	.	<MDA	.	0.22
Uranium-238	.	.	.	.	.	.	4.63	1.25	0.53

Sampling Point	GW-704						GW-706		
Location	EXP-B						EXP-B		
Date Sampled	07/16/02						01/16/02		
Program	GWPP			BJC			GWPP		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	6.2	2.9	2	.	.	.	58	9	3.9
Gross Beta	41	8.1	8.8	.	.	.	140	11	6.8
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	30	8.3	13	.	.	.	160	10	13
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	.	.	.	3.07	0.99	0.28	.	.	.
Uranium-235	.	.	.	<MDA	.	0.45	.	.	.
Uranium-236	.	.	.	<MDA	.	0.18	.	.	.
Uranium-238	.	.	.	5.34	1.41	0.28	.	.	.

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-706								
Location	EXP-B								
Date Sampled	01/16/02			07/16/02					
Program	BJC			GWPP			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	45	7.8	2.1	.	.	.
Gross Beta	.	.	.	72	8.5	6.9	.	.	.
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	.	.	.	57	8	13	.	.	.
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	21.89	4.74	0.34	.	.	.	19.78	4.72	0.8
Uranium-235	1.79	0.79	0.32	.	.	.	1.45	1.05	0.49
Uranium-236	0.67	0.43	0.29	.	.	.	0.49 R	0.57	0.44
Uranium-238	45.9	9.36	0.37	.	.	.	32.99	6.99	0.88

Sampling Point	GW-712						GW-713		
Location	EXP-W						EXP-W		
Date Sampled	01/03/02			07/01/02			01/03/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA	.	1.98	2.13	1.68	1.96	1.66	1.1	1.22
Gross Beta	2.3	1.23	1.74	5.73	2.17	2.45	7.73	1.57	1.79
Americium-241	<MDA	.	1.7	<MDA	.	0.04	<MDA	.	1.4
Neptunium-237	<MDA	.	0.44	<MDA	.	0.1	<MDA	.	0.28
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	0.98	0.62	0.76	<MDA	.	0.36	3.73	1.14	0.84
Strontium-89/90	<MDA	.	1.33	<MDA	.	1.38	<MDA	.	1.41
Technetium-99	<MDA	.	13.75	<MDA	.	7.74	15.59	8.21	13.48
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	<MDA	.	1.07	0.4	0.27	0.25	<MDA	.	0.36
Uranium-235	<MDA	.	0.96	<MDA	.	0.26	<MDA	.	0.41
Uranium-236	<MDA	.	0.43	<MDA	.	0.23	<MDA	.	0.37
Uranium-238	<MDA	.	1.34	<MDA	.	0.18	<MDA	.	0.44

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-713			GW-714					
Location	EXP-W			EXP-W					
Date Sampled	07/01/02			01/02/02			07/01/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	15.75	2.77	2.09	2.2	1.36	1.75	3	1.61	1.76
Gross Beta	39.75	3.06	2.48	6.1	1.54	1.94	4.38	2.09	2.41
Americium-241	<MDA	.	0.07	<MDA	.	1.61	<MDA	.	0.11
Neptunium-237	<MDA	.	0.24	0.43	0.34	0.42	<MDA	.	0.17
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	<MDA	.	0.3	3.78	1.02	0.63	<MDA	.	0.59
Strontium-89/90	<MDA	.	1.35	<MDA	.	1.47	<MDA	.	1.66
Technetium-99	<MDA	.	7.87	27.34	9.9	15.91	<MDA	.	7.9
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	<MDA	.	0.32	1.34	0.51	0.23	0.8	0.36	0.15
Uranium-235	<MDA	.	0.12	<MDA	.	0.24	<MDA	.	0.11
Uranium-236	<MDA	.	0.27	<MDA	.	0.24	<MDA	.	0.1
Uranium-238	<MDA	.	0.28	0.67	0.33	0.19	0.61	0.31	0.2

Sampling Point	GW-715								
Location	EXP-W								
Date Sampled	01/02/02						07/01/02		
Program	BJC			BJC			BJC		
Sample Type				DUP					
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	5.7	2.14	2.26	5.24	1.61	1.51	17.96	2.5	1.67
Gross Beta	5.33	1.53	1.99	4.91	1.84	2.09	39.92	2.97	2.38
Americium-241	<MDA	.	2.03	5.03	2.06	1.57	<MDA	.	0.04
Neptunium-237	<MDA	.	0.38	<MDA	.	1.32	<MDA	.	0.18
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	6.01	1.29	0.69	4.27	1.05	0.6	<MDA	.	0.42
Strontium-89/90	<MDA	.	1.5	<MDA	.	1.46	<MDA	.	1.34
Technetium-99	19.4	8.75	14.23	20.96	8.39	13.57	17.33	5.06	8.08
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	1.9	0.62	0.22	2.63	0.81	0.18	4.77	2.01	1.01
Uranium-235	<MDA	.	0.21	<MDA	.	0.13	<MDA	.	0.96
Uranium-236	0.12 R	0.14	0.11	<MDA	.	0.12	<MDA	.	0.86
Uranium-238	3.79	0.98	0.25	2.84	0.85	0.24	10.15	3.2	0.77

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-715			GW-835					
Location	EXP-W			S3					
Date Sampled	07/01/02			03/04/02			05/20/02		
Program	BJC			BJC			BJC		
Sample Type	DUP								
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	16.02	2.45	1.72	.	.	.	.	.	.
Gross Beta	22.57	2.58	2.39	.	.	.	.	.	.
Americium-241	0.1	0.08	0.04	.	.	.	.	.	.
Neptunium-237	<MDA	.	0.1	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	<MDA	.	0.4	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.55	.	.	.	.	.	.
Technetium-99	16.45	4.81	7.67	.	.	.	.	.	.
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	3.78	1.84	1.41	161.5	45.02	2.77	146.8	36.91	5.94
Uranium-235	<MDA	.	1.35	5.91	4.43	2	12.69	7.59	4.58
Uranium-236	<MDA	.	0.93	9.28	5.48	1.8	<MDA	.	4.82
Uranium-238	8.79	2.97	0.98	399.9	104.9	1.62	407.5	90.3	5.23

Sampling Point	GW-835						GW-916		
Location	S3						EMWMF		
Date Sampled	08/22/02			11/19/02			08/15/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	.	.	.	.	.	.	<MDA	.	0.227
Neptunium-237	.	.	.	.	.	.	<MDA	.	0.129
Plutonium-238	.	.	.	.	.	.	<MDA	.	0.206
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	<MDA	.	0.597
Technetium-99	.	.	.	.	.	.	<MDA	.	6.85
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	173.8	52.54	6.38	157.4	38.34	3.59	0.202	0.078	0.0345
Uranium-235	10.64	7.03	2.62	11.42	8.83	4.42	<MDA	.	0.0345
Uranium-236	12.01	7.27	4.02	7.33	6.66	3.97	.	.	.
Uranium-238	407.7	115.9	5.46	348.6	70.44	7.14	0.121	0.06	0.0204

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-916			GW-917					
Location	EMWMF			EMWMF					
Date Sampled	12/10/02			08/12/02			12/05/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.627	<MDA	.	0.26	<MDA	.	0.112
Neptunium-237	<MDA	.	0.349	<MDA	.	0.143	<MDA	.	0.282
Plutonium-238	<MDA	.	0.135	<MDA	.	0.191	<MDA	.	0.126
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.28	<MDA	.	0.779	<MDA	.	1.03
Technetium-99	<MDA	.	7.1	<MDA	.	6.91	<MDA	.	7.22
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.122	0.086	0.0805	0.0373	0.031	0.0292	<MDA	.	0.0668
Uranium-235	<MDA	.	0.0682	<MDA	.	0.0292	<MDA	.	0.0378
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	0.114	0.081	0.0386	<MDA	.	0.0464	0.0418 R	0.048	0.0378

Sampling Point	GW-918						GW-919		
Location	EMWMF						EMWMF		
Date Sampled	08/15/02			12/10/02			08/14/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	0.129 R	0.15	0.117	<MDA	.	0.113	<MDA	.	0.12
Neptunium-237	<MDA	.	0.13	<MDA	.	0.165	<MDA	.	0.108
Plutonium-238	<MDA	.	0.191	<MDA	.	0.328	<MDA	.	0.105
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	0.538	<MDA	.	1.34	<MDA	.	0.66
Technetium-99	<MDA	.	6.9	<MDA	.	7.03	<MDA	.	6.93
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.0491	0.036	0.0286	0.193	0.11	0.0722	0.12	0.065	0.0697
Uranium-235	<MDA	.	0.0286	<MDA	.	0.0409	<MDA	.	0.0203
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.0455	0.0905	0.074	0.0409	<MDA	.	0.0424

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-919			GW-920					
Location	EMWMF			EMWMF					
Date Sampled	12/09/02			08/13/02			12/05/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.119	<MDA	.	0.106	<MDA	.	0.181
Neptunium-237	<MDA	.	0.0618	<MDA	.	0.116	<MDA	.	0.208
Plutonium-238	<MDA	.	0.229	<MDA	.	0.161	<MDA	.	0.107
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	0.991	<MDA	.	0.66	<MDA	.	1.01
Technetium-99	<MDA	.	7.26	7.42	3.1	7	<MDA	.	7.27
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.108	0.087	0.0923	0.0253	0.025	0.0171	<MDA	.	0.0764
Uranium-235	<MDA	.	0.0782	<MDA	.	0.0171	<MDA	.	0.0432
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	0.111	0.087	0.0782	<MDA	.	0.0171	<MDA	.	0.0432

Sampling Point	GW-921						GW-922		
Location	EMWMF						EMWMF		
Date Sampled	08/12/02			12/04/02			08/13/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.209	<MDA	.	0.116	<MDA	.	0.172
Neptunium-237	<MDA	.	0.124	<MDA	.	0.122	<MDA	.	0.127
Plutonium-238	<MDA	.	0.11	<MDA	.	0.211	<MDA	.	0.129
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	0.76	<MDA	.	0.994	<MDA	.	0.482
Technetium-99	<MDA	.	7.03	8.27	3.3	7.38	<MDA	.	7.02
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.0202 R	0.023	0.0183	<MDA	.	0.0844	0.0786	0.046	0.0303
Uranium-235	<MDA	.	0.0381	<MDA	.	0.0588	<MDA	.	0.0303
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.0381	<MDA	.	0.0844	<MDA	.	0.0482

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-922			GW-923					
Location	EMWMF			EMWMF					
Date Sampled	12/09/02			08/14/02			12/09/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.121	<MDA	.	0.131	<MDA	.	0.128
Neptunium-237	<MDA	.	0.135	<MDA	.	0.174	<MDA	.	0.207
Plutonium-238	<MDA	.	0.127	<MDA	.	0.112	<MDA	.	0.125
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.02	<MDA	.	0.752	<MDA	.	0.931
Technetium-99	<MDA	.	7.23	<MDA	.	7.04	<MDA	.	7.36
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.172	0.11	0.14	0.394	0.11	0.034	0.315	0.15	0.116
Uranium-235	<MDA	.	0.107	0.0372	0.033	0.0202	<MDA	.	0.108
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.125	0.219	0.082	0.0479	0.195	0.11	0.0995

Sampling Point	GW-924								
Location	EMWMF								
Date Sampled	08/13/02						12/10/02		
Program	BJC						BJC		
Sample Type				DUP					
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.243	<MDA	.	0.126	<MDA	.	0.125
Neptunium-237	<MDA	.	0.118	<MDA	.	0.197	<MDA	.	0.285
Plutonium-238	<MDA	.	0.172	<MDA	.	0.0956	<MDA	.	0.385
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.29	<MDA	.	0.919	<MDA	.	1.1
Technetium-99	<MDA	.	7.08	<MDA	.	7.07	<MDA	.	7.17
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.139	0.062	0.0188	0.0759	0.051	0.0228	<MDA	.	0.0634
Uranium-235	<MDA	.	0.0392	<MDA	.	0.0228	<MDA	.	0.0358
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.0392	0.0422	0.038	0.0228	0.0397 R	0.046	0.0358

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-924			GW-925					
Location	EMWMF			EMWMF					
Date Sampled	12/10/02			08/12/02			12/04/02		
Program	BJC			BJC			BJC		
Sample Type	DUP								
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.104	<MDA	.	0.112	<MDA	.	0.154
Neptunium-237	<MDA	.	0.164	<MDA	.	0.204	<MDA	.	0.213
Plutonium-238	<MDA	.	0.263	<MDA	.	0.0949	<MDA	.	0.132
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.23	<MDA	.	0.69	<MDA	.	1.07
Technetium-99	<MDA	.	7.1	<MDA	.	7.02	<MDA	.	7.44
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.136	0.091	0.041	0.439	0.14	0.029	0.693	0.2	0.0774
Uranium-235	<MDA	.	0.041	<MDA	.	0.029	<MDA	.	0.0656
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	0.0605 R	0.061	0.041	0.171	0.086	0.029	0.246	0.12	0.0371

Sampling Point	GW-926						GW-927		
Location	EMWMF						EMWMF		
Date Sampled	08/13/02			12/10/02			08/12/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.115	<MDA	.	0.118	0.126 R	0.15	0.113
Neptunium-237	<MDA	.	0.134	<MDA	.	0.175	<MDA	.	0.196
Plutonium-238	<MDA	.	0.107	<MDA	.	0.0987	<MDA	.	0.106
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.37	<MDA	.	1.22	<MDA	.	0.809
Technetium-99	11.6	3.3	7.07	<MDA	.	7	<MDA	.	7.05
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.0775	0.057	0.0687	<MDA	.	0.034	<MDA	.	0.0658
Uranium-235	<MDA	.	0.0498	<MDA	.	0.034	<MDA	.	0.0476
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	<MDA	.	0.0605	<MDA	.	0.0601	<MDA	.	0.0579

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-927			NT-03			NT-07		
Location	EMWMF			EXP-SW			EXP-SW		
Date Sampled	12/05/02			03/11/02			03/13/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	<MDA	.	0.115	.	.	.	.	.	.
Neptunium-237	<MDA	.	0.124	.	.	.	.	.	.
Plutonium-238	<MDA	.	0.13	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	<MDA	.	1.11	.	.	.	.	.	.
Technetium-99	<MDA	.	7.29	30.16	3.96	5.81	.	.	.
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	<MDA	.	0.0342	.	.	.	2.56	0.83	0.31
Uranium-235	<MDA	.	0.0342	.	.	.	0.15 R	0.17	0.13
Uranium-236	.	.	.	.	.	.	<MDA	.	0.21
Uranium-238	<MDA	.	0.0342	.	.	.	4.27	1.19	0.22

Sampling Point	NT-08			NT-8-E			NT-8-W		
Location	EXP-SW			EXP-SW			EXP-SW		
Date Sampled	03/13/02			03/13/02			03/13/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	.	.	.	.	.	.	.	.	.
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	17.83	5.18	1.39	50.25 Q	22.02	5.97	1.3	0.52	0.28
Uranium-235	1.23	1.05	1.14	9.27	7.79	6.28	<MDA	.	0.13
Uranium-236	<MDA	.	1.03	8.33	7	5.64	<MDA	.	0.24
Uranium-238	90.59	21.46	0.92	223.2 Q	78.37	5.94	4.03	1.12	0.56

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	S07			SS-4					
Location	EXP-SW			EXP-SW					
Date Sampled	03/11/02			01/08/02					
Program	BJC			GWPP			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	73	9.9	4.5	.	.	.
Gross Beta	.	.	.	180	13	8.2	.	.	.
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	94.14	4.92	5.78	180	10	13	.	.	.
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.36	0.26	0.25	.	.	.	28.11	5.81	0.22
Uranium-235	<MDA	.	0.26	.	.	.	0.98	0.52	0.32
Uranium-236	<MDA	.	0.12	.	.	.	0.76	0.43	0.32
Uranium-238	0.36	0.25	0.25	.	.	.	53.34	10.61	0.37

Sampling Point	SS-4								
Location	EXP-SW								
Date Sampled	01/08/02			07/10/02					
Program	BJC			GWPP			BJC		
Sample Type	DUP								
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	43	7.6	2.5	.	.	.
Gross Beta	.	.	.	53	7.1	6.3	.	.	.
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	.	.	.	34	9.8	13	.	.	.
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	31.58	7.01	0.31	.	.	.	18.65	5.96	2.04
Uranium-235	1.11	0.6	0.32	.	.	.	<MDA	.	0.97
Uranium-236	1.19	0.6	0.17	.	.	.	<MDA	.	1.94
Uranium-238	63.6	13.59	0.26	.	.	.	31.07	8.59	1.9

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	SS-4			SS-5					
Location	EXP-SW			EXP-SW					
Date Sampled	07/10/02			01/08/02			07/10/02		
Program	BJC			BJC			BJC		
Sample Type	DUP								
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	48	7.8	2.8	31	6	2.3
Gross Beta	.	.	.	81	8.4	6.7	37	7	8
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	78.57	5.76	7.77	16.17	4.63	7.36
Technetium-99	.	.	.	.	.	.	.	.	.
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	14.42	4.7	1.51	20.69	4.03	0.24	8.54	3.46	1.24
Uranium-235	1.55	1.41	0.84	0.53	0.33	0.13	<MDA	.	1.8
Uranium-236	0.83 R	0.98	0.75	0.51	0.31	0.2	<MDA	.	1.38
Uranium-238	33.59	8.6	1.51	36.72	6.82	0.23	15.18	4.99	1.24

Sampling Point	SS-6						SS-7		
Location	EXP-SW						EXP-SW		
Date Sampled	01/08/02			07/10/02			03/12/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	9.29	1.68	1.69
Gross Beta	.	.	.	.	.	.	.	.	.
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	<MDA	.	7.91	<MDA	.	7.23	6.23	3.53	5.81
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	2.71	0.81	0.29	1.57	0.82	0.65	1.59	0.54	0.2
Uranium-235	0.19	0.19	0.13	<MDA	.	0.29	<MDA	.	0.19
Uranium-236	<MDA	.	0.23	<MDA	.	0.45	<MDA	.	0.17
Uranium-238	5.14	1.29	0.23	3.28	1.23	0.47	3.77	0.97	0.26

APPENDIX D.3: CY 2002 MONITORING DATA FOR THE BEAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	SS-8								
Location	EXP-SW								
Date Sampled	03/12/02			09/09/02					
Program	BJC			BJC					
Sample Type							DUP		
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	.	.	.	.	.	.	.	.	.
Gross Beta	2.71	1.14	1.54	<MDA	.	.	1.8	<MDA	.
Americium-241	.	.	.	.	.	.	.	.	.
Neptunium-237	.	.	.	.	.	.	.	.	.
Plutonium-238	.	.	.	.	.	.	.	.	.
Radium-223/224/226	.	.	.	.	.	.	.	.	.
Strontium-89/90	.	.	.	.	.	.	.	.	.
Technetium-99	<MDA	.	6.19	<MDA	.	.	5.98	<MDA	.
Thorium-228	.	.	.	.	.	.	.	.	.
Thorium-230	.	.	.	.	.	.	.	.	.
Thorium-232	.	.	.	.	.	.	.	.	.
Thorium-234	.	.	.	.	.	.	.	.	.
Tritium	.	.	.	.	.	.	.	.	.
Uranium-234	0.52	0.27	0.19	0.27	0.24	0.26	0.35	0.29	0.16
Uranium-235	<MDA	.	0.11	<MDA	.	0.32	<MDA	.	0.19
Uranium-236	<MDA	.	0.16	<MDA	.	0.14	<MDA	.	0.17
Uranium-238	<MDA	.	0.17	<MDA	.	0.22	<MDA	.	0.31

APPENDIX E

**CY 2002 MONITORING DATA FOR THE
UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME**

EXPLANATION

Sampling Point:

- GHK - Gum Hollow Branch Kilometer (surface water sampling location)
- GW - Groundwater Monitoring Well; Westbay well GW-722
- LRSPW - Exit point of the New Hope Pond Distribution Channel underdrain (surface water sampling location)
- NPR - North of Pine Ridge near the Scarboro Community (surface water sampling location)
- OF - Storm drain outfall (surface water sampling location)
- SCR - Spring sampling location in Union Valley
- STATION - Surface water sampling location in Upper East Fork Poplar Creek

Location:

- B8810 - Building 88-10
- CPT - Coal Pile Trench
- EXP - Exit Pathway monitoring location:
 - ! -E, -I, or -J: Maynardville Limestone Picket monitoring well.
 - ! -NPR: Surface water station located north of Pine Ridge
 - ! -SW: Onsite spring or surface water station
 - ! -SR: Along Scarboro Road in the gap through Pine Ridge
 - ! -UV: East of the Oak Ridge Reservation boundary in Union Valley
- FF - Fuel Facility (Building 9754-2)
- FTF - Fire Training Facility
- GRID - Comprehensive Groundwater Monitoring Plan Grid Location
- NHP - New Hope Pond
- RG - Rust Garage Area
- S2 - S-2 Site
- S3 - S-3 Site
- T0134 - Tank 0134-U
- T2331 - Tank 2331-U
- UOV - Uranium Oxide Vault

Monitoring Program:

- BJC - managed by Bechtel Jacobs Company LLC
- GWPP - managed by the Y-12 Groundwater Protection Program

Sample Type:

- Dup - Field Duplicate Sample

Units:

- ft - feet (elevations are above mean sea level and depths are below grade)
- $\mu\text{g/L}$ - micrograms per liter
- mg/L - milligrams per liter
- mV - millivolts
- $\mu\text{mho}/\text{cm}$ - micromhos per centimeter
- NTU - nephelometric turbidity units
- pCi/L - picoCuries per liter
- ppm - parts per million

EXPLANATION (continued)

Only analytes detected above reporting limits in at least one sample are included in this appendix. Additionally, results that are below the reporting limits are replaced with missing values (e.g., “<”) to emphasize the detected results. The following sections describe the analytes, reporting limits, and data qualifiers for each subappendix. A comprehensive list of the GWPP analytes, analytical methods, and reporting limits is provided in Appendix B, Table B.5.

E.1 Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals:

Results for all of the field measurements, miscellaneous analytes, and major ions are included in this appendix. The reporting limits for the major ions are shown in the following summary.

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Cations			Anions		
Calcium	0.2	0.25	Alkalinity - HCO ₃	1.0	NA
Magnesium	0.2	0.05	Alkalinity - CO ₃	1.0	NA
Potassium	2.0	0.25	Chloride	0.2	0.1
Sodium	0.2	0.25	Fluoride	0.1	0.05
			Nitrate (as Nitrogen)	0.028	0.1
			Sulfate	0.25	0.1

The major ion results for the following samples are qualitative because the ion charge balance (relative percent difference [RPD]) exceeds 20%.

Sampling Point	Date Sampled	Ion Charge Balance RPD	Suspected Source of Error
GW-170	02/04/02	-36.3	High pH
GW-170	05/14/02	-56.0	High pH
GW-170	11/11/02	-53.5	High pH
GW-232	11/11/02	-24.9	High alkalinity
GW-253	11/07/02	-67.9	Very high nitrate
GW-618	05/09/02	35.0	Low bicarbonate
GW-618	11/07/02	-93.9	Extremely high nitrate
GW-620	04/23/02	-51.6	High pH
GW-689	11/14/02	-51.3	Low pH

EXPLANATION (continued)

The Y-12 GWPP SAP (BWXT 2001a) specifies reporting limits for trace metals that are appropriate for DOE Order 5400.1 monitoring. The laboratories subcontracted for the monitoring programs managed by BJC may use reporting limits (sometimes reporting estimated values) that are lower than the GWPP reporting limits for the metals. To retain the highest quality data for DOE Order 5400.1 monitoring purposes and to standardize reporting limits for trace metal results obtained from all sources, the GWPP reporting limits were given precedence over the BJC reporting limits (BJC 2001 and 2002a) shown below. The trace metals shown in bold typeface below were detected in at least one sample collected during CY 2002 and are presented in Appendix E.1.

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Aluminum	0.2	0.05*	Lithium	0.01	0.01
Antimony (PMS)	0.0025	.	Manganese	0.005	0.005
Antimony	.	0.006	Mercury (CVAA)	0.0002	0.0002
Arsenic (PMS)	0.005	.	Molybdenum	0.05	*
Arsenic	.	0.005	Nickel (PMS)	0.005	.
Barium	0.004	0.005	Nickel	.	0.01
Beryllium	0.001	0.001	Selenium (PMS)	0.01	.
Boron	0.1	0.01*	Selenium	.	0.005
Cadmium (PMS)	0.0005	.	Silver	0.02	0.005*
Cadmium	.	0.001	Strontium	0.005	0.005
Chromium (PMS)	0.0025	.	Thallium (PMS)	0.0005	.
Chromium	.	0.005	Thallium	.	0.002
Cobalt	0.02	0.005*	Thorium	0.2	.
Copper	0.02	0.005*	Uranium (PMS)	0.0005	.
Iron	0.05	0.01*	Uranium (KPA)	.	0.004
Lead (PMS)	0.0005	.	Vanadium	0.02	0.01*
Lead	.	0.003	Zinc	0.05	0.01*

Note: * - the GWPP reporting limit was used instead of the BJC reporting limit; “.” - not specified.

All metals analyses were performed using the inductively coupled plasma (ICP) spectroscopy method (SW846-6010B) unless otherwise noted.

- CVAA - Cold Vapor Atomic Absorption (EPA-7470)
- KPA - Kinetic Phosphorescent Analysis (ASTM-D5174-M)
- PMS - Plasma Mass Spectroscopy (EPA-200.8)

Groundwater samples collected the following wells for metals analysis by the ICP method during CY 2002 were diluted before analysis to obtain an optimum matrix. The detected results are valid, but some metals may be present at concentrations below the elevated reporting limits.

Sampling Location	Date Sampled	Dilution Factor	Sampling Location	Date Sampled	Dilution Factor
GW-108	01/08/02	5X	GW-633	04/23/02	10X
GW-108	07/09/02	5X	GW-633	10/17/02	10X
GW-253	05/07/02	4X	GW-658	04/24/02	5X
			GW-658	10/17/02	10X
			GW-698	11/14/02	8X

EXPLANATION (continued)

The following symbols and qualifiers are used in Appendix E.1:

- . - Not analyzed or not applicable
- < - Analyzed but not detected at the project reporting level
- [] - Calculated value for total uranium (GW-108); high calcium concentration interferes with the KPA method, so uranium mass is calculated from isotopic activity by the laboratory.
- Q - Result is inconsistent with historical measurements.
- R - Result does not meet data quality objectives (charge balances and duplicate metal results that differ by at least an order of magnitude).

E.2 Volatile Organic Compounds:

The Y-12 GWPP reporting limits for volatile organic compounds (Table B.5) and those used for monitoring programs managed by BJC are contract-required quantitation limits. Results below the quantitation limit and above the instrument detection limit are reported as estimated quantities. Therefore, non-detected results are assumed to equal zero for all compounds.

As summarized below, 28 compounds were detected (of the 53 compounds requested) in the CY 2002 groundwater samples collected in the East Fork Regime. Results for these compounds are grouped by similar chemical composition (e.g., chloroethenes) in Appendix E.2.

Compound	No. Detected	Maximum (µg/L)	Compound	No. Detected	Maximum (µg/L)
Tetrachloroethene	86	2,400	1,1-Dichloroethane	8	180
Chloroform	78	620	Bromodichloromethane	8	2
Trichloroethene	71	610	Bromoform	8	5
Carbon tetrachloride	58	1,500	Methylene chloride	6	69
cis-1,2-Dichloroethene	52	260	Carbon disulfide	3	9
Toluene	18	4,900	Acetone	2	18
Ethylbenzene	15	1,400	Chlorodibromomethane	2	1
Vinyl chloride	14	63	Chloroethane	2	12
Benzene	12	8,700	Trichlorofluoromethane	2	3
1,1-Dichloroethene	11	60	1,2-Dibromoethane	1	77
Dimethylbenzene	10	8,800	1,2-Dichloroethane	1	570
trans-1,2-Dichloroethene	9	2	4-Methyl-2-pentanone	1	200
Styrene	9	4	Bromomethane	1	14
1,1,1-Trichloroethane	8	9	Chlorobenzene	1	1

The WRRP also requested analyses of volatile organic gases (ethane, ethylene, and methane) as natural attenuation indicators for groundwater samples collected from seven wells in the East Fork Regime during CY 2002. Because ethane was not detected in any of these samples, only ethylene and methane results are shown in the appendix.

EXPLANATION (continued)

The following symbols and data qualifiers are used in Appendix E.2.

- . - Not analyzed or not applicable
- < - Analyzed but not detected (also false-positive results for data provided by BJC)
- J - Positively identified, estimated concentration below the contract-required quantitation limit; one result that exceeds instrument calibration (tetrachloroethene at well GW-383)
- Q - Inconsistent with historical measurements for the location (e.g., carbon disulfide at well GW-253)
- R - Result does not meet data quality objectives; duplicate results that differ by at least an order of magnitude (e.g., benzene and chloroform at well GW-170)

E.3 Radiological Analytes:

Reporting limits for radiological analytes are sample-specific and analyte-specific minimum detectable activities that are reported with each result. The following summary shows the radiological analytes reported for at least one groundwater sample collected during CY 2002 in the East Fork Regime.

Analyte	No. of Results	No. Detected	Analyte	No. of Results	No. Detected
Gross Alpha	187	66	Uranium-233/234	18	16
Gross Beta	187	96	Uranium-234	10	10
Technetium-99	15	2	Uranium-235	28	13
			Uranium-236	17	4
			Uranium-238	28	26

Note: Uranium-233/234, reported by BJC laboratories, is shown as uranium-234 in the appendix.

Results for gross alpha and gross beta are presented in the first three pages of Appendix E.3, followed by the results for isotopes.

The following notes apply to Appendix E.3:

- Result - Activity in picoCuries per liter (pCi/L)
- Error - Counting error (two standard deviations)
- MDA - Minimum detectable activity
- Q - Elevated activity unsupported by historical results for the sampling location (e.g., gross alpha and gross beta at well GW-230).
- R - Result does not meet data quality objectives: activity that exceeds the MDA but is less than the associated error (e.g., uranium-235 at well GW-832).

APPENDIX E.1

FIELD MEASUREMENTS, MISCELLANEOUS ANALYTES, MAJOR IONS, AND TRACE METALS

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	55-1B			GHK2.51ESW		GHK2.51WSW		
Location	GRIDB2			EXP-NPR		EXP-NPR		
Date Sampled	04/17/02		10/14/02	05/15/02	10/29/02	05/15/02	10/29/02	
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type	Dup						Dup	
Field Measurements								
Time Sampled	9:30	9:30	9:10	10:20	8:50	10:30	9:00	9:00
Measuring Point Elev. (ft)	986.26	986.26	986.26	.	.	.	.	.
Depth to Water (ft)	11.18	11.18	10.90	.	.	.	.	.
Groundwater Elevation (ft)	975.08	975.08	975.36	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	1,440	1,440	1,395	351	545	142.6	154	154
Dissolved Oxygen (ppm)	0.63	0.63	0.63	4.51	2.05	5.64	3.85	3.85
Oxidation/Reduction (mV)	-38	-38	145	151	222	139	198	198
Temperature (degrees C)	17.8	17.8	16.1	12.8	16.3	13	16.1	16.1
Turbidity (NTU)	.	.	.	.	.	.	.	.
Iron ++ (mg/L)	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.
pH	7.5	7.5	7.6	7.14	6.9	7.34	6.86	6.86
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	1,346	1,364	1,289	313	332	121.9	115.8	116.1
Dissolved Solids (mg/L)	730	749	771	213	199	95	88	81
Suspended Solids (mg/L)	<	<	<	34.4	<	2.8	8	8
Turbidity (NTU)	14.9	15.9	5.74	5.85	12.9	6.77	17.6	17.5
pH	7.36	7.43	7.41	7.56	7.15	7.62	7.27	7.27
Major Ions (mg/L)								
Calcium	182	187	178	60	63	14.4	13.5	13.7
Magnesium	25.4	25.4	22.8	4	3	4.11	3.69	3.73
Potassium	3.32	3.36	3.09	<	2.07	2.17	2.63	2.79
Sodium	28	27.9	26.5	0.678	0.799	1.32	1.2	1.21
Alkalinity as CO_3	<	<	<	<	<	<	<	<
Alkalinity as HCO_3	122	121	160	160	157	45	39.6	39.6
Chloride	341	323	278	1.01	1.04	1.16	1.01	1.02
Fluoride	<	<	<	<	<	<	<	<
Nitrate as N	0.159	0.117	0.0847	0.15	0.0581	0.0693	0.0549	0.0583
Sulfate	48.6	48.1	42.9	5.52	13.5	12.1	12.6	12.7
Charge balance	-2.4	0.7	0.2	-0.9	0.3	-0.8	0.5	1.2
Trace Metals (mg/L)								
Aluminum	<	<	<	0.757	1.28	0.574	1.74	1.69
Arsenic (PMS)	<	<	<	<	<	<	<	<
Arsenic	.	.	.	.	.	.	.	.
Barium	0.24	0.239	0.254	0.0293	0.0367	0.0411	0.0499	0.0503
Beryllium	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<
Cadmium (PMS)	0.000787	<	<	<	<	<	<	<
Cadmium	.	.	.	.	.	.	.	.
Chromium (PMS)	0.381	0.351	0.141	0.00286	<	0.00271	0.00274	0.00284
Chromium	.	.	.	.	.	.	.	.
Cobalt	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	1.86	1.87	0.575	0.581	0.672	0.421	1	1
Lead (PMS)	0.000653	0.00567	<	0.000902	<	0.00064	<	<
Lead	.	.	.	.	.	.	.	.
Lithium	0.0313	0.0321	0.0292	<	<	<	<	<
Manganese	0.131	0.13	0.363	0.0829	0.017	0.0355	0.047	0.0471
Mercury (CVAA)	<	<	<	<	<	<	<	<
Nickel (PMS)	0.705	0.786	0.301	<	<	<	<	<
Nickel	.	.	.	.	.	.	.	.
Strontium	0.816	0.815	0.736	0.0838	0.0949	0.0416	0.0372	0.0377
Thallium (PMS)	<	<	<	<	<	<	<	<
Thallium	.	.	.	.	.	.	.	.
Uranium (PMS)	0.000742	0.000703	0.000914	<	<	<	<	<
Uranium (KPA)	.	.	.	.	.	.	.	.
Vanadium	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-108		GW-151		GW-153		GW-154	
Location	S3		NHP		NHP		NHP	
Date Sampled	01/08/02	07/09/02	01/30/02	08/05/02	04/25/02	10/21/02	01/30/02	08/05/02
Program	BJC	BJC	BJC	BJC	GWPP	GWPP	BJC	BJC
Sample Type								
Field Measurements								
Time Sampled	15:05	13:10	10:10	14:30	8:45	8:55	14:17	14:29
Measuring Point Elev. (ft)	999.00	999.00	916.17	916.17	921.68	921.68	911.70	911.70
Depth to Water (ft)	8.05	7.91	14.93	16.04	20.43	20.63	8.16	9.97
Groundwater Elevation (ft)	990.95	991.09	901.24	900.13	901.25	901.05	903.54	901.73
Conductivity ($\mu\text{mho}/\text{cm}$)	46,600	48,300	1,063	526	455	450	811	806
Dissolved Oxygen (ppm)	3.41	1.94	0.23	1	2.41	1.55	10.38	4.45
Oxidation/Reduction (mV)	355	238	246	-20	176	177	223	203
Temperature (degrees C)	15.6	21.8	15	19.4	14.3	15.7	14.3	24.8
Turbidity (NTU)	28	10	16	21	.	.	39	46
Iron ++ (mg/L)	.	.	0.02	0.01	.	.	0.02	0.28
Manganese ++ (mg/L)	.	.	0.2	0.1	.	.	0.3	0.6
pH	5.34	5.5	6.79	4.93	7.55	7.71	7.46	7.08
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	396	395	.	.
Dissolved Solids (mg/L)	57,700	69,200	285	323	220	232	495	568
Suspended Solids (mg/L)	18.3	34.9	<	<	<	<	<	8.5
Turbidity (NTU)	.	.	.	.	3.04	2.37	.	.
pH	.	.	.	.	7.8	7.77	.	.
Major Ions (mg/L)								
Calcium	11,600	11,800	55.3	58.9	44.9	41.7	120	146
Magnesium	999	1,160	25.4	27.6	19.1	18.5	21.2	22.5
Potassium	23.9	30.5	2.45	2.77	2.06	<	7.11	8.13
Sodium	479	554	7.25	7.46	10	10.3	18.1	13.6
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	280	689	230	218	169	159	294	360
Chloride	193	77.9	16.2	17.1	15.7	16.6	22.9	7.5
Fluoride	<	<	<	0.13	0.163	0.179	0.18	0.34
Nitrate as N	9,360	9,280	1.1	1.2	0.753	0.968	1.4	0.27
Sulfate	<	<	18.3	18.2	13.8	15.8	101	84.4
Charge balance	0.2	2.2	-2.7	2.8	1.5	0.0	-0.2	3.8
Trace Metals (mg/L)								
Aluminum	<	<	<	<	<	<	<	0.368
Arsenic (PMS)	.	.	.	.	.	.	.	.
Arsenic	<	<	<	<	.	.	<	<
Barium	86.9	86.8	0.178	0.184	0.0423	0.0413	0.0915	0.145
Beryllium	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	0.131
Cadmium (PMS)	.	.	.	.	.	.	.	.
Cadmium	<	<	<	<	.	.	<	<
Chromium (PMS)	.	.	.	.	0.00283	0.00375	.	.
Chromium	<	<	<	<	.	.	<	<
Cobalt	0.13	0.156	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	<	<	<	<	<	<	0.237	0.659
Lead (PMS)	.	.	.	.	.	.	.	.
Lead	<	<	<	<	.	.	<	0.0049
Lithium	0.553	<	<	<	<	<	<	<
Manganese	107	150	<	<	<	<	0.911	2.43
Mercury (CVAA)	<	<	.	.	.	.	.	.
Nickel (PMS)	.	.	.	.	.	.	.	.
Nickel	0.172	0.176	<	<	.	.	<	<
Strontium	31	30.8	0.544	0.552	0.161	0.154	0.45	0.499
Thallium (PMS)	.	.	.	.	<	<	.	.
Thallium	<	<	<	<	.	.	<	<
Uranium (PMS)	.	.	.	.	0.0013	0.00138	.	.
Uranium (KPA)	[0.0181]	[0.0157]	<	<	.	.	0.853	0.884
Vanadium	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-169				GW-170			
Location	EXP-UV				EXP-UV			
Date Sampled	02/04/02	05/13/02	08/06/02	11/11/02	02/04/02		05/14/02	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type					Dup		Dup	
Field Measurements								
Time Sampled	10:54	10:10	12:08	12:42	9:50		10:50	
Measuring Point Elev. (ft)	932.12	932.12	932.12	932.12	932.64		932.64	
Depth to Water (ft)	27.72	28.70	32.62	24.20	34.70		34.51	
Groundwater Elevation (ft)	904.40	903.42	899.50	907.92	897.94		898.13	
Conductivity ($\mu\text{mho}/\text{cm}$)	294	245	395	229	754		748	
Dissolved Oxygen (ppm)	5.1	6.2	4.75	5.45	0.43		0.43	
Oxidation/Reduction (mV)	125	229	194	464	-264		-60	
Temperature (degrees C)	10.2	14.5	17.2	14.6	12.5		13.9	
Turbidity (NTU)	22	19	4	27	22		6	
Iron ++ (mg/L)	0	0	0.02	0.03	0.01		0.03	
Manganese ++ (mg/L)	0.2	0.1	0.3	0	0.2		0.5	
pH	6.9	6.92	6.9	5.83	11.77		12.03	
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.		.
Dissolved Solids (mg/L)	180	134	214	105	112	170	161	165
Suspended Solids (mg/L)	<	<	11.2	<	5	6	<	<
Turbidity (NTU)	.	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.	.
Major Ions (mg/L)								
Calcium	50.6	44.1	73.1	34.5	52.4	53.3	48.3	48
Magnesium	2.75	2.42	3.84	1.7	0.754	0.769	0.75	0.761
Potassium	2.33	2.43	2.85	2.2	7.08	7.17	13.2	13.2
Sodium	1.14	1.23	1.44	1.4	7.25	7.36	8.75	8.66
Alkalinity as CO ₃	<	<	<	<	26	14	10	16
Alkalinity as HCO ₃	153	120	190	105	<	<	<	<
Chloride	1.3	1.4	1.7	1	10.8	11.2	10.6	10.9
Fluoride	<	<	<	<	<	<	<	<
Nitrate as N	0.74	0.65	1	0.52	<	0.089	0.026	<
Sulfate	5.1	3.6	6	3.2	3.5	3.5	4	4
Charge balance	-6.4	-0.9	0.7	-5.9	-36.3 R	.	-56 R	.
Trace Metals (mg/L)								
Aluminum	<	<	0.385	0.7	<	<	0.206	0.208
Arsenic (PMS)	.	.	.	.	.	.	.	.
Arsenic	<	<	<	<	<	<	<	<
Barium	0.0242	0.0232	0.0326	0.023	0.057	0.0586	0.0567	0.0561
Beryllium	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<
Cadmium (PMS)	.	.	.	.	.	.	.	.
Cadmium	<	<	<	<	<	<	<	<
Chromium (PMS)	.	.	.	.	.	.	.	.
Chromium	<	<	<	<	<	<	0.101 Q	0.145 Q
Cobalt	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	0.122	0.11	0.455	0.67	0.65	0.635	1.23	1.43
Lead (PMS)	.	.	.	.	.	.	.	.
Lead	<	<	<	0.0051	<	<	<	<
Lithium	<	<	<	<	0.0169	0.0171	0.0281	0.0277
Manganese	<	<	0.0131	0.0097	0.0051	<	0.0109	0.0136
Mercury (CVAA)	.	.	.	.	.	.	.	.
Nickel (PMS)	.	.	.	.	.	.	.	.
Nickel	<	<	<	<	<	<	0.0359 Q	0.0519 Q
Strontium	0.0627	0.0566	0.0905	0.052	0.286	0.291	0.291	0.287
Thallium (PMS)	.	.	.	.	.	.	.	.
Thallium	<	<	<	<	<	<	<	<
Uranium (PMS)	.	.	.	.	.	.	.	.
Uranium (KPA)	.	.	.	.	.	.	.	.
Vanadium	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-170				GW-171		GW-172	
Location	EXP-UV				EXP-UV		EXP-UV	
Date Sampled	08/06/02		11/11/02		02/05/02	08/07/02	02/05/02	08/07/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type	Dup	Dup	Dup	Dup				
Field Measurements								
Time Sampled	10:15		10:20		10:10	9:36	13:45	10:45
Measuring Point Elev. (ft)	932.64		932.64		920.72	920.72	926.69	926.69
Depth to Water (ft)	36.82		33.40		3.25	8.80	13.72	18.70
Groundwater Elevation (ft)	895.82		899.24		917.47	911.92	912.97	907.99
Conductivity ($\mu\text{mho}/\text{cm}$)	886		1618		442	475	680	732
Dissolved Oxygen (ppm)	1.16		0.52		0.73	0.99	0.96	2.65
Oxidation/Reduction (mV)	-94		-22		63	-13	-69	-60
Temperature (degrees C)	16		14.4		12.8	15.6	11.2	18.1
Turbidity (NTU)	0		0		2	37	5	20
Iron ++ (mg/L)	0.03		0.08		1.45	3.02	2.01	0.07
Manganese ++ (mg/L)	0.1		0.4		7.8	7.6	1.5	0.9
pH	11.4		11.97		6.21	5.83	7.03	6.67
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.		.		.	.	.	.
Dissolved Solids (mg/L)	192		194		157	162	224	226
Suspended Solids (mg/L)	<		<		<	<	21.9	30.8
Turbidity (NTU)	.		.		.	.	.	.
pH	.		.		.	.	.	.
Major Ions (mg/L)								
Calcium	60.1	59.3	50.1	51.1	.	.	.	.
Magnesium	0.574	0.548	1.1	1.1	.	.	.	.
Potassium	12.1	12.1	9.3	9.6	.	.	.	.
Sodium	8.21	8.14	7.6	7.7	.	.	.	.
Alkalinity as CO ₃	14	18	38	46	<	<	<	<
Alkalinity as HCO ₃	<	<	<	<	204	192	340	327
Chloride	11.5	11.8	8.3	8.2	4	4.1	28.5	27.3
Fluoride	0.12	.	0.1	<	<	<	<	<
Nitrate as N	0.23	0.46	<	0.11	0.2	0.18	0.05	0.18
Sulfate	4	4	4.3	4.2	10.8	10.7	3	3.6
Charge balance	7.1	.	-53.5 R	.	.	.	.	.
Trace Metals (mg/L)								
Aluminum	<	<	0.24	0.25	.	.	.	.
Arsenic (PMS)	.	.	.	.	.	.	.	.
Arsenic	<	<	<	<	.	.	.	.
Barium	0.0537	0.053	0.04	0.04	.	.	.	.
Beryllium	<	<	<	<	.	.	.	.
Boron	<	<	<	<	.	.	.	.
Cadmium (PMS)	.	.	.	.	.	.	.	.
Cadmium	<	<	0.0062 R	<	.	.	.	.
Chromium (PMS)	.	.	.	.	.	.	.	.
Chromium	<	<	<	<	.	.	.	.
Cobalt	<	<	<	<	.	.	.	.
Copper	<	<	<	<	.	.	.	.
Iron	0.861	0.744	0.81	0.46	.	.	.	.
Lead (PMS)	.	.	.	.	.	.	.	.
Lead	<	<	<	<	.	.	.	.
Lithium	0.0269	0.0263	0.024	0.024	.	.	.	.
Manganese	0.0058	0.0052	<	<	.	.	.	.
Mercury (CVAA)	.	.	<	<	.	.	.	.
Nickel (PMS)	.	.	.	.	.	.	.	.
Nickel	<	<	<	<	.	.	.	.
Strontium	0.263	0.26	0.18	0.18	.	.	.	.
Thallium (PMS)	.	.	.	.	.	.	.	.
Thallium	<	<	<	<	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.
Uranium (KPA)	.	.	.	.	.	.	.	.
Vanadium	<	<	<	<	.	.	.	.
Zinc	<	<	<	<	.	.	.	.

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-193		GW-204		GW-207			GW-208
Location	T2331		T0134		EXP-SR			EXP-SR
Date Sampled	01/08/02	07/09/02	05/02/02	11/06/02	05/08/02	11/19/02		05/08/02
Program	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type						Dup		
Field Measurements								
Time Sampled	11:20	9:40	10:25	9:30	8:35	10:55	10:55	7:45
Measuring Point Elev. (ft)	934.17	934.17	958.57	958.57	899.40	899.40	899.40	898.05
Depth to Water (ft)	8.67	9.61	8.53	8.36	1.39	3.47	3.47	1.36
Groundwater Elevation (ft)	925.50	924.56	950.04	950.21	898.01	895.93	895.93	896.69
Conductivity ($\mu\text{mho}/\text{cm}$)	817	606	389	356	666	734	734	674
Dissolved Oxygen (ppm)	2.09	1.03	0.79	0.82	2.39	1.63	1.63	2.79
Oxidation/Reduction (mV)	-214	-186	19	-221	-65	-69	-69	-161
Temperature (degrees C)	12.3	23.8	22.1	20.8	16.3	14.7	14.7	16
Turbidity (NTU)	28	12	.	.	.	.	.	.
Iron ++ (mg/L)	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.
pH	7.75	7.04	7.58	7.21	7.27	7.29	7.29	7.79
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	337	287	600	600	602	609
Dissolved Solids (mg/L)	551	363	191	159	348	360	358	383
Suspended Solids (mg/L)	<	<	<	4	<	<	<	3
Turbidity (NTU)	.	.	0.434	3.58	5.6	3.28	3.33	14.1
pH	.	.	7.77	7.65	7.78	7.82	7.81	8.03
Major Ions (mg/L)								
Calcium	104	81.1	50.8	46.5	59.8	60.9	60.1	72.9
Magnesium	34.1	22.7	8.86	6.55	39.1	40.6	40.3	26.3
Potassium	8.9	8.07	2.33	<	3.11	3.25	3.12	3.36
Sodium	5.41	4.82	3.34	1.64	10.4	10.8	10.6	16.5
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	181	236	135	142	278	288	280	214
Chloride	3.7	4.5	2.41	0.937	1.38	1.33	1.31	1.94
Fluoride	0.54	0.8	0.682	0.946	0.176	0.192	0.197	0.272
Nitrate as N	<	<	0.577	<	<	<	<	<
Sulfate	243	61.5	32.7	4.22	56.8	54.5	54.7	116
Charge balance	-2.1	1.3	-0.8	-1.2	-0.4	0.0	0.5	-1.2
Trace Metals (mg/L)								
Aluminum	<	<	<	<	<	<	<	<
Arsenic (PMS)	.	.	.	<	<	<	<	<
Arsenic	<	<	.	.	.	.	.	.
Barium	0.121	0.0854	0.0594	0.0713	0.0508	0.0542	0.0532	0.0386
Beryllium	<	<	<	<	<	<	<	<
Boron	<	<	<	<	0.119	0.119	0.118	0.233
Cadmium (PMS)	.	.	.	<	.	.	.	.
Cadmium	<	<	.	<	.	.	.	.
Chromium (PMS)	.	.	.	<	<	<	<	<
Chromium	<	<	.	.	.	.	.	.
Cobalt	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	<	<	<	0.752	0.767	0.524	0.465	1.31
Lead (PMS)	.	.	0.000533	<	0.00145	0.013	0.00698	0.00351
Lead	<	<	.	.	.	.	.	.
Lithium	<	<	0.121	0.052	0.0321	0.0334	0.0329	0.0332
Manganese	0.213	0.292	0.0463	2.86	0.0132	0.0183	0.0171	0.0169
Mercury (CVAA)	<	<	<	<	<	<	<	<
Nickel (PMS)	.	.	.	<	<	<	<	<
Nickel	<	<	.	.	.	.	.	.
Strontium	0.629	0.454	0.13	0.119	0.545	0.57	0.56	1.28
Thallium (PMS)	.	.	.	<	<	<	<	<
Thallium	<	<	.	.	.	.	.	.
Uranium (PMS)	.	.	0.0439	0.0336	<	<	<	<
Uranium (KPA)	<	<	.	.	.	.	.	.
Vanadium	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	1.73

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-208	GW-219			GW-220		GW-223	
Location	EXP-SR	UOV			NHP		NHP	
Date Sampled	11/19/02	05/06/02	11/07/02		05/14/02	11/21/02	01/31/02	08/05/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC
Sample Type			Dup					
Field Measurements								
Time Sampled	10:10	9:00	9:55	9:55	9:55	11:05	14:10	10:35
Measuring Point Elev. (ft)	898.05	935.64	935.64	935.64	916.47	916.47	911.62	911.62
Depth to Water (ft)	3.75	9.48	9.37	9.37	16.25	16.20	9.22	10.36
Groundwater Elevation (ft)	894.30	926.16	926.27	926.27	900.22	900.27	902.40	901.26
Conductivity ($\mu\text{mho}/\text{cm}$)	727	526	762	762	544	588	659	668
Dissolved Oxygen (ppm)	0.7	3.13	1.6	1.6	0.44	-0.03	9.67	1.08
Oxidation/Reduction (mV)	-147	108	95	95	56	81	-2	2
Temperature (degrees C)	15.2	16.6	18.2	18.2	15.5	15.6	17.3	20
Turbidity (NTU)	.	.	.	.	.	.	1	26
Iron ++ (mg/L)	.	.	.	.	.	.	0.32	0.11
Manganese ++ (mg/L)	.	.	.	.	.	.	0.6	0.8
pH	7.72	7.1	7.38	7.38	7.68	7.72	6.86	7.02
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	597	450	630	627	498	492	.	.
Dissolved Solids (mg/L)	381	277	369	374	304	280	405	402
Suspended Solids (mg/L)	2.8	<	<	<	<	10	<	<
Turbidity (NTU)	11.3	1.62	0.794	0.797	1.54	8.08	.	.
pH	8.06	7.27	7.16	7.23	7.77	7.78	.	.
Major Ions (mg/L)								
Calcium	76.2	71.5	107	105	59.3	59	102	104
Magnesium	29.2	8.97	12	12.5	25.3	26.6	13	13.6
Potassium	3.82	4.01	4.8	4.97	2.48	2.64	2.27	2.32
Sodium	18	11.2	15.4	15.6	4.92	4.93	12.7	12.4
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	202	218	298	294	230	232	306	271
Chloride	1.65	3.76	3.13	3.89	13.7	12.9	27.8	26.8
Fluoride	0.275	<	0.12	0.117	<	<	<	0.1
Nitrate as N	<	<	0.426	0.425	0.852	0.744	<	0.038
Sulfate	114	21.1	37.7	37.4	16.1	14.4	40.3	35.7
Charge balance	4.5	-0.1	1.8	2.0	-0.6	0.6	-6.7	-0.1
Trace Metals (mg/L)								
Aluminum	<	<	<	<	<	0.45	<	<
Arsenic (PMS)	<	<	<	<	<	<	.	.
Arsenic	.	.	.	.	.	.	<	<
Barium	0.0409	0.0574	0.0904	0.0917	0.104	0.11	0.293	0.295
Beryllium	<	<	<	<	<	<	<	<
Boron	0.253	<	<	<	<	<	<	<
Cadmium (PMS)	<	<	<	<	<	<	.	.
Cadmium	.	.	.	.	.	.	<	<
Chromium (PMS)	<	0.00411	0.00271	0.00279	<	<	.	.
Chromium	.	.	.	.	.	.	<	<
Cobalt	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	1.27	<	0.053	0.0616	0.0955	0.31	0.382	0.396
Lead (PMS)	0.0123	<0.000537 R	0.0139 R	<	0.000753	.	.	.
Lead	.	.	.	.	.	.	<	<
Lithium	0.0364	<	<	<	<	<	<	<
Manganese	0.0184	0.00969	0.0117	0.00912	<	0.012	0.704	0.71
Mercury (CVAA)	<	<	<	<	<	<	.	.
Nickel (PMS)	<	<	0.0707	0.0719	<	<	.	.
Nickel	.	.	.	.	.	.	<	<
Strontium	1.33	0.157	0.215	0.219	0.435	0.444	0.273	0.277
Thallium (PMS)	<	<	<	<	<	<	.	.
Thallium	.	.	.	.	.	.	<	<
Uranium (PMS)	<	0.359	0.594	0.592	<	<	.	.
Uranium (KPA)	.	.	.	.	.	.	0.0343	0.0305
Vanadium	<	<	<	<	<	<	<	<
Zinc	1.77	<	<	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-230		GW-232				GW-251	
Location	EXP-UV		EXP-UV				S2	
Date Sampled	02/05/02	08/07/02	02/04/02	05/13/02	08/06/02	11/11/02	04/18/02	10/16/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP
Sample Type								
Field Measurements								
Time Sampled	12:50	13:55	13:45	13:00	13:35	14:15	8:15	9:40
Measuring Point Elev. (ft)	923.11	923.11	931.39	931.39	931.39	931.39	1,003.80	1,003.80
Depth to Water (ft)	12.20	16.07	34.35	34.71	36.27	33.11	16.10	16.06
Groundwater Elevation (ft)	910.91	907.04	897.04	896.68	895.12	898.28	987.70	987.74
Conductivity ($\mu\text{mho}/\text{cm}$)	1,060	1,055	941	937	989	1,778	1,037	810
Dissolved Oxygen (ppm)	0.5	1.38	0.63	1.12	0.51	0.45	1.08	0.04
Oxidation/Reduction (mV)	-94	-122	-214	-110	-162	4	268	268
Temperature (degrees C)	12.5	19.5	8.9	15.5	20.2	15.4	15	15.2
Turbidity (NTU)	26	122	22	3	0	4	.	.
Iron ++ (mg/L)	3.83	1.42	0	0.02	0.01	0.02	.	.
Manganese ++ (mg/L)	1	0.6	0.1	0	0.1	0.2	.	.
pH	6.97	6.7	9.76	9.99	9.55	8.69	6.35	6.7
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	857	733
Dissolved Solids (mg/L)	407	641	556	507	595	505	514	482
Suspended Solids (mg/L)	<	22.4	<	<	<	<	2	5
Turbidity (NTU)	.	.	.	.	.	.	3.44	10.8
pH	.	.	.	.	.	.	6.53	6.79
Major Ions (mg/L)								
Calcium	.	.	1.38	1.48	1.36	1.1	110	96.5
Magnesium	.	.	0.951	0.953	0.92	0.69	14.6	13
Potassium	.	.	6.05	5.8	5.67	5.7	3.18	2.62
Sodium	.	.	188	222	222	184	14	10.1
Alkalinity as CO ₃	<	<	192	152	174	184 Q	<	<
Alkalinity as HCO ₃	427	405	258	295	458	479 Q	164	177
Chloride	107	112	11.9	12.1	12.6	9.7	8.05	5.58
Fluoride	<	<	2	1.9	1.8	2.7	0.89	1.31
Nitrate as N	0.024	0.2	<	<	0.34	<	62.4	41.2
Sulfate	1.3	1	5.3	4.6	4.1	3.2	13.6	10.9
Charge balance	.	.	-6.2	2.0	-14.2	-24.9 R	-5.8	-4.1
Trace Metals (mg/L)								
Aluminum	.	.	<	<	<	<	0.345	0.856
Arsenic (PMS)	.	.	.	.	.	.	<	<
Arsenic	.	.	<	<	<	<	.	.
Barium	.	0.0149	0.0153	0.0151	0.013	0.112	0.0782	.
Beryllium	.	<	<	<	<	<	<	<
Boron	.	1.31	1.31	1.33	1.1	.	<	<
Cadmium (PMS)	.	.	.	.	.	.	0.116	0.0746
Cadmium	.	<	<	<	0.0065	.	<	0.00282
Chromium (PMS)	.	.	.	.	.	.	.	.
Chromium	.	<	0.0729	<	<	.	.	.
Cobalt	.	<	<	<	<	<	<	<
Copper	.	<	<	<	<	<	0.235	0.155
Iron	.	0.053	0.396	<	0.44	0.221	0.571	.
Lead (PMS)	.	.	.	.	.	.	0.00116	0.00482
Lead	.	<	<	<	<	<	.	.
Lithium	.	0.201	0.18	0.182	0.19	<	<	<
Manganese	.	<	0.0061	<	<	3.6	.	1.7
Mercury (CVAA)	.	.	.	.	.	.	<	<
Nickel (PMS)	.	.	.	.	.	.	0.0312	0.015
Nickel	.	<	0.03	<	<	.	.	.
Strontium	.	0.408	0.404	0.411	0.35	0.191	0.137	.
Thallium (PMS)	.	.	.	.	.	.	0.00183	0.00149
Thallium	.	<	<	<	<	<	.	.
Uranium (PMS)	.	.	.	.	.	.	0.00395	0.00385
Uranium (KPA)	.	.	.	.	.	.	.	.
Vanadium	.	<	<	<	<	<	<	<
Zinc	.	<	<	<	<	0.0576	<	.

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-253		GW-349		GW-350		GW-380	
Location	S2		S2		S2		NHP	
Date Sampled	05/07/02	11/07/02	04/16/02	10/14/02	04/16/02	10/15/02	10/15/02	02/04/02
Program	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	BJC
Sample Type							Dup	
Field Measurements								
Time Sampled	9:55	13:45	10:40	10:30	9:55	9:15	9:15	11:01
Measuring Point Elev. (ft)	1,004.24	1,004.24	993.50	993.50	993.51	993.51	993.51	913.75
Depth to Water (ft)	4.42	2.98	4.44	4.50	4.35	4.50	4.50	9.92
Groundwater Elevation (ft)	999.82	1,001.26	989.06	989.00	989.16	989.01	989.01	903.83
Conductivity ($\mu\text{mho}/\text{cm}$)	9,110	9,900	564	471	576	606	606	773
Dissolved Oxygen (ppm)	7.18	0.45	1.28	0.03	1.97	0.03	0.03	13.87
Oxidation/Reduction (mV)	232	285	27	15	-11	-15	-15	223
Temperature (degrees C)	16.1	16.9	18.6	21.3	18.5	19.6	19.6	13.2
Turbidity (NTU)	13	34	.	.	.	.	.	47
Iron ++ (mg/L)	0.07	0.2	.	.	.	.	.	.
Manganese ++ (mg/L)	28	31	.	.	.	.	.	.
pH	5.59	5.51	6.68	6.35	6.92	6.61	6.61	6.82
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	518	430	515	540	541	.
Dissolved Solids (mg/L)	3,990	4,990	289	241	302	306	303	415
Suspended Solids (mg/L)	<	<	<	<	<	<	<	<
Turbidity (NTU)	.	.	3.34	2.29	7.88	2.91	2.97	.
pH	.	.	6.83	6.66	7.06	7.01	7.05	.
Major Ions (mg/L)								
Calcium	585	566	92	73.5	96.9	99	99.2	50.4
Magnesium	133	101	10	7.22	7.24	7.48	7.25	21.2
Potassium	9.05	14	2.68	2.72	2.99	2.98	2.99	1.56
Sodium	147	150	4.83	4.26	3.95	4.05	4	74.4
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	62.9	71	258	202	252	290	264	165
Chloride	127	118	11.3	9.3	8.52	7.73	7.94	143
Fluoride	4.7	0.9	<	<	<	<	<	<
Nitrate as N	852	3,100 Q	<	<	<	<	<	1.4
Sulfate	76.5	65.3	9.02	13.1	14.1	14.7	14.9	13.1
Charge balance	-18.2	-67.9 R	0.3	-0.6	1.0	-4.2	-0.1	-1.1
Trace Metals (mg/L)								
Aluminum	4.2	4	<	<	<	<	<	<
Arsenic (PMS)	.	.	<	<	<	<	<	.
Arsenic	<	0.0062	.	.	.	.	.	<
Barium	0.325	0.29	0.116	0.0855	0.0377	0.0406	0.0397	0.0396
Beryllium	0.0122	0.011	<	<	<	<	<	<
Boron	0.331	0.3	<	<	<	<	<	<
Cadmium (PMS)	.	.	0.000753	<	0.00126	0.00063	0.000609	.
Cadmium	4.35	4.8	.	.	.	.	.	<
Chromium (PMS)	.	.	<	<	<	<	<	.
Chromium	<	<	.	.	.	.	.	0.405
Cobalt	0.309	0.26	<	<	<	<	<	<
Copper	68.7	77.4	<	<	<	<	<	<
Iron	<	<	0.412	0.526	0.567	0.502	0.459	1.16
Lead (PMS)	.	.	0.000782	<	0.00205	0.0005 R	0.00908 R	.
Lead	0.031	0.13	.	.	.	.	.	<
Lithium	0.0745	0.085	<	<	<	<	<	<
Manganese	52.8	54	3.34	1.32	0.471	0.557	0.538	0.0482
Mercury (CVAA)	.	0.0091	<	<	<	<	<	.
Nickel (PMS)	.	.	<	<	<	<	<	.
Nickel	2.46	2.1	.	.	.	.	.	0.153
Strontium	1.1	1.1	0.131	0.102	0.113	0.12	0.117	0.0589
Thallium (PMS)	.	.	<	<	<	<	<	.
Thallium	0.0172	0.04	.	.	.	.	.	<
Uranium (PMS)	.	.	<	<	<	<	<	.
Uranium (KPA)	<	<	.	.	.	.	.	<
Vanadium	<	<	<	<	<	<	<	<
Zinc	6.29	7	<	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-380	GW-381			GW-382		GW-383	
Location	NHP	NHP			NHP		NHP	
Date Sampled	08/05/02	04/24/02	06/12/02	10/22/02	02/04/02	08/06/02	04/25/02	10/22/02
Program	BJC	GWPP	GWPP	GWPP	BJC	BJC	GWPP	GWPP
Sample Type								
Field Measurements								
Time Sampled	9:53	10:10	9:00	10:00	13:50	9:55	10:20	8:45
Measuring Point Elev. (ft)	913.75	913.36	913.36	913.36	913.17	913.17	908.77	908.77
Depth to Water (ft)	11.19	10.64	10.53	10.60	11.38	11.36	9.34	9.53
Groundwater Elevation (ft)	902.56	902.72	902.83	902.76	901.79	901.81	899.43	899.24
Conductivity ($\mu\text{mho}/\text{cm}$)	469	744	821	886	657	670	677	708
Dissolved Oxygen (ppm)	4.24	0.36	0.78	0.2	9.33	3.18	0.11	0
Oxidation/Reduction (mV)	37	-160	-182	-151	149	-41	-29	-85
Temperature (degrees C)	22.1	15.4	17.8	18.8	12.9	25.1	16	19.1
Turbidity (NTU)	40	.	.	.	31	26	.	.
Iron ++ (mg/L)	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.
pH	6.38	7.45	7.36	7.53	7.74	7.26	7.35	7.2
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	665	.	764	.	.	624	625
Dissolved Solids (mg/L)	242	346	.	432	387	382	343	375
Suspended Solids (mg/L)	13.6	9	.	8	8.1	16.1	<	<
Turbidity (NTU)	.	79.3	.	119	.	.	3.25	8.4
pH	.	7.6	.	7.16	.	.	7.39	7.32
Major Ions (mg/L)								
Calcium	35.5	81	.	99.1	90.7	88.9	94.6	95.8
Magnesium	13.9	23.2	.	23.1	24.8	24.5	12.2	12.3
Potassium	1.39	2.41	.	2.76	5.26	5.04	2.64	2.79
Sodium	33.7	21.4	.	19.3	12	12.2	14.3	14.3
Alkalinity as CO_3	<	<	.	<	<	<	<	<
Alkalinity as HCO_3	149	232	.	288	267	275	230	234
Chloride	32.7	76.9	.	68.7	53.6	58	44.8	44.6
Fluoride	0.14	<	.	<	<	0.11	<	<
Nitrate as N	1.6	<	.	0.0283	0.02	<	<	<
Sulfate	24.9	1.5	.	5.79	3.8	3.5	18.9	18.9
Charge balance	-1.4	0.8	.	-0.4	2.1	-0.7	1.3	1.2
Trace Metals (mg/L)								
Aluminum	<	<	.	<	<	<	<	<
Arsenic (PMS)	.	<	.	<	.	.	<	<
Arsenic	<	.	.	.	<	<	.	.
Barium	0.0304	0.182	.	0.318	0.619	0.634	0.616	0.661
Beryllium	<	<	.	<	<	<	<	<
Boron	<	<	.	<	<	<	<	0.103
Cadmium (PMS)	.	<	.	<	.	.	<	<
Cadmium	<	.	.	.	<	<	.	.
Chromium (PMS)	.	<	.	<	.	.	0.0043	0.00458
Chromium	0.186	.	.	.	<	<	.	.
Cobalt	<	<	.	<	<	<	<	<
Copper	<	<	.	<	<	<	<	<
Iron	1.87	5.87	.	8.89	2.42	8.5	0.506	1.09
Lead (PMS)	.	<	.	<	.	.	<	<
Lead	<	.	.	.	<	<	.	.
Lithium	<	<	.	<	<	<	0.0154	0.016
Manganese	0.0829	0.243	.	0.542	0.0395	0.0493	0.0948	0.118
Mercury (CVAA)	.	<	.	<	.	.	<	<
Nickel (PMS)	.	<	.	<	.	.	0.0239	<
Nickel	0.338	.	.	.	<	<	.	.
Strontium	0.0425	0.155	.	0.203	0.312	0.307	0.445	0.455
Thallium (PMS)	.	<	.	<	.	.	<	<
Thallium	<	.	.	.	<	<	.	.
Uranium (PMS)	.	<	.	<	.	.	<	<
Uranium (KPA)	<	.	.	.	<	<	.	.
Vanadium	<	<	.	<	<	<	<	<
Zinc	<	<	.	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-605				GW-606		GW-618	
Location	EXP-I				EXP-I		EXP-E	
Date Sampled	01/08/02		07/08/02		01/08/02	07/08/02	05/09/02	11/07/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type	Dup	Dup	Dup	Dup				
Field Measurements								
Time Sampled	9:35		12:55		9:55	13:15	10:20	10:35
Measuring Point Elev. (ft)	919.06		919.06		919.59	919.59	985.14	985.14
Depth to Water (ft)	11.37		11.25		14.44	14.03	12.79	12.63
Groundwater Elevation (ft)	907.69		907.81		905.15	905.56	972.35	972.51
Conductivity ($\mu\text{mho}/\text{cm}$)	607		579		426	664	690	657
Dissolved Oxygen (ppm)	1.33		2.21		1.43	3.23	0.67	0.38
Oxidation/Reduction (mV)	188		253		216	142	31	-15
Temperature (degrees C)	16.1		19.9		9.7	21.9	18.1	17.4
Turbidity (NTU)	16		19		9	4	3	16
Iron ++ (mg/L)							0.24	0.14
Manganese ++ (mg/L)							1.9	1
pH	7.38		7.52		10.61	7.96	6.59	6.66
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)								
Dissolved Solids (mg/L)	357	344	356	358	225	393	364	360
Suspended Solids (mg/L)	<	<	<	<	9.9	<	<	<
Turbidity (NTU)								
pH								
Major Ions (mg/L)								
Calcium	78.9	77.3	80.2	79.4	41.9	53.1	101	88.6
Magnesium	17.8	17.4	18.9	18.6	6.16	38.3	8.72	7.5
Potassium	2.44	2.39	2.89	2.82	12.1	4.27	4.38	4.1
Sodium	10.9	10.7	13	12.8	6.94	8.46	16.4	16.7
Alkalinity as CO ₃	<	<	<	<	4 Q	<	<	<
Alkalinity as HCO ₃	216	220	244	240	2 Q	198	119 Q	333
Chloride	21.8	22.5	21.9	21.4	36.3	35.1	12.1	10.9
Fluoride	<	<	0.11	<	0.14	0.1	0.21	0.3
Nitrate as N	0.14	0.13	0.5	0.76	5.5	12	0.18	2,490 Q
Sulfate	28.4	28.5	30.5	30.6	83.7	44.6	20.3	19
Charge balance	3.5	.	0.2	.	-6.5	-3.5	35 R	-93.9 R
Trace Metals (mg/L)								
Aluminum	<	<	<	<	<	<	<	<
Arsenic (PMS)	.	.	.	.	.	.	.	.
Arsenic	<	<	<	<	<	<	<	<
Barium	0.0447	0.0437	0.0485	0.0478	0.173	0.104	0.0532	0.05
Beryllium	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	0.105	0.12
Cadmium (PMS)	.	.	.	.	.	.	.	.
Cadmium	<	<	<	<	<	<	0.0046	0.0032
Chromium (PMS)	.	.	.	.	.	.	.	.
Chromium	0.0056	<	<	<	<	<	0.144 Q	<
Cobalt	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	0.0989	0.0809	0.0986	0.103	<	<	0.775	0.14
Lead (PMS)	.	.	.	.	.	.	.	.
Lead	<	<	<	<	<	<	<	<
Lithium	<	<	<	<	0.0502	0.0136	<	<
Manganese	0.306	0.271	0.198	0.184	<	0.0057	1.2	0.9
Mercury (CVAA)	<	<	<	<	<	<	.	<
Nickel (PMS)	.	.	.	.	.	.	.	.
Nickel	<	<	<	<	<	<	0.0621 Q	<
Strontium	0.153	0.15	0.157	0.156	1.52	0.615	0.198	0.18
Thallium (PMS)	.	.	.	.	.	.	.	.
Thallium	<	<	<	<	<	<	<	<
Uranium (PMS)	.	.	.	.	.	.	.	.
Uranium (KPA)	0.0983	0.108	0.114	0.107	<	<	<	<
Vanadium	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-620		GW-633		GW-658		GW-686	GW-687
Location	FTF		RG		FF		CPT	CPT
Date Sampled	04/23/02	10/15/02	04/23/02	10/17/02	04/24/02	10/17/02	11/14/02	11/14/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type								
Field Measurements								
Time Sampled	10:35	7:45	9:00	10:45	8:30	9:45	9:56	10:58
Measuring Point Elev. (ft)	1,015.57	1,015.57	996.43	996.43	945.08	945.08	963.76	964.89
Depth to Water (ft)	25.33	25.49	3.14	2.44	11.43	11.08	12.35	10.11
Groundwater Elevation (ft)	990.24	990.08	993.29	993.99	933.65	934.00	951.41	954.78
Conductivity ($\mu\text{mho}/\text{cm}$)	1,475	1,335	10,820	6,000	519	426	1,173	4,310
Dissolved Oxygen (ppm)	0.59	0.69	0.65	0.44	-0.04	-0.02	2.9	2.52
Oxidation/Reduction (mV)	-33	-37	249	234	-114	-118	-31	189
Temperature (degrees C)	16.5	16	16.5	23.4	16.6	21.5	13	16.6
Turbidity (NTU)	.	.	.	.	.	.	.	.
Iron ++ (mg/L)	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.
pH	12.26	11.61	5.57	5.84	6.32	6.31	6.94	6.89
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	1,327	1,165	11,170	10,810	463	519	949	3,960
Dissolved Solids (mg/L)	320	288	9,270	9,050	238	299	611	4,010
Suspended Solids (mg/L)	<	<	<	2	17	9	215	324
Turbidity (NTU)	1.02	1.1	0.855	0.723	40.4	17.6	277	421
pH	11.71	11.62	5.7	5.69	6.53	6.5	7.27	7.18
Major Ions (mg/L)								
Calcium	113	95.7	2,170	1,980	44.4	50.1	170	600
Magnesium	<	<	194	189	13.3	14.4	24.1	343
Potassium	14.1	13.2	<	<	<	<	5.06	11.4
Sodium	2.34	2.23	87	91.3	13.5	13.2	13.3	82.1
Alkalinity as CO ₃	32	32	<	<	<	<	<	<
Alkalinity as HCO ₃	<	<	298	314	204	236	340	520
Chloride	2.12	1.82	52.2	51.4	17.1	14.6	14.7	23.5
Fluoride	0.154	0.156	<	<	<	0.109	<	<
Nitrate as N	1.13	1.14	1,520	1,510	<	<	<	<
Sulfate	6.1	5.61	3.15	5.74	<	<	169	2,290
Charge balance	-51.6 R	2.3	4.9	1.1	-7.8	-9.3	2.0	2.7
Trace Metals (mg/L)								
Aluminum	1.26	1.02	<	<	<	<	13.6	18.8
Arsenic (PMS)	<	<	<	<	<	0.00712	<	0.01
Arsenic	.	.	.	.	.	.	.	.
Barium	0.0333	0.0334	10	9.56	0.141	0.173	0.2	0.145
Beryllium	<	<	<	<	<	<	0.00052	0.00116
Boron	<	<	<	<	<	<	<	0.15
Cadmium (PMS)	0.000857	<	0.00191	0.000757	<	<	0.00589	0.00656
Cadmium	.	.	.	.	.	.	.	.
Chromium (PMS)	<	<	<	<	<	<	0.0249	0.0236
Chromium	.	.	.	.	.	.	.	.
Cobalt	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	0.0668	0.0343
Iron	<	0.135	<	<	15.9	20.4	19	20
Lead (PMS)	0.00133	<	0.000509	0.000548	0.00467	<	0.0528	0.043
Lead	.	.	.	.	.	.	.	.
Lithium	0.0242	0.0257	0.177	0.15	<	<	0.0122	0.0551
Manganese	<	<	4.13	5.95	17.1	20.4	3.98	5.62
Mercury (CVAA)	<	<	<	<	<	<	<	<
Nickel (PMS)	<	<	0.297	0.293	0.00794	0.00519	0.0179	0.0425
Nickel	.	.	.	.	.	.	.	.
Strontium	0.391	0.385	5.37	4.98	0.14	0.15	0.389	1.34
Thallium (PMS)	<	<	<	<	<	<	<	<
Thallium	.	.	.	.	.	.	.	.
Uranium (PMS)	<	<	0.00156	0.00191	<	<	0.00119	0.00773
Uranium (KPA)	.	.	.	.	.	.	.	.
Vanadium	<	<	<	<	<	<	<	0.0248
Zinc	<	<	<	<	<	<	0.0824	0.0998

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-689	GW-698			GW-722-06			
Location	CPT	B8110			EXP-J			
Date Sampled	11/14/02	05/02/02		11/07/02	02/04/02	05/23/02	07/15/02	11/07/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	GWPP	BJC
Sample Type		Dup						
Field Measurements								
Time Sampled	12:02	8:35	8:35	8:55	18:22	9:20	9:25	12:35
Measuring Point Elev. (ft)	967.00	970.29	970.29	970.29	.	.	.	.
Depth to Water (ft)	8.76	35.80	35.80	27.48	.	.	.	.
Groundwater Elevation (ft)	958.24	934.49	934.49	942.81	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	8,600	1,971	1,971	1,158	919	948	922	1,240
Dissolved Oxygen (ppm)	3.78	0.27	0.27	0.04	12	3.71	10.2	5.18
Oxidation/Reduction (mV)	429	203	203	106	.	44	.	-84
Temperature (degrees C)	18.9	17.1	17.1	17.1	10.1	20.5	20.2	19.1
Turbidity (NTU)	.	.	.	.	.	8	.	7
Iron ++ (mg/L)	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.
pH	2.76	6.84	6.84	7.35	7.8	6.35	7.5	8.32
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	7,150	1,820	1,810	1,008	1,005	.	989	.
Dissolved Solids (mg/L)	10,200	1,280	1,300	623	557	556	592	510
Suspended Solids (mg/L)	46	2	2	<	<	<	<	<
Turbidity (NTU)	47.6	4.25	5.33	2.07	1.94	.	1.41	.
pH	2.5	7.06	7.12	7.1	8.13	.	8.19	.
Major Ions (mg/L)								
Calcium	490	229	222	142	18.3	18.4	17.2	14.5
Magnesium	179	70.9	69.4	34.4	13.9	12.8	13.5	10.3
Potassium	<	3.56	3.52	2.53	5.11	6.71	4.7	6.8
Sodium	93.9	25.6	25.1	17.4	176	164	167	152
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	<	268	286	260	252	248	254	255
Chloride	31.4	20.6	20.2	16.3	130	135	122	115
Fluoride	<	<	<	<	1.1	0.81	1.05	1.1
Nitrate as N	<	145	143	48	<	0.071	<	0.36
Sulfate	6,660	68.3	68.2	55.2	53.5	50.9	53.9	53.3
Charge balance	-51.3 R	2.1	0.1	2.4	-0.2	-3.1	-1.8	-6.6
Trace Metals (mg/L)								
Aluminum	262	0.205	0.212	<	<	<	<	<
Arsenic (PMS)	0.0434	<	<	<	<	.	<	.
Arsenic	.	.	.	.	.	<	.	<
Barium	<	0.226	0.221	0.139	0.0341	0.0327	0.0338	0.03
Beryllium	0.0711	<	<	<	<	<	<	<
Boron	1.22	<	<	0.1	0.703	0.672	0.686	0.61
Cadmium (PMS)	0.0642	<	<	<	<	.	<	.
Cadmium	.	.	.	.	.	<	.	<
Chromium (PMS)	0.0706	<	<	<	<	.	<	.
Chromium	.	.	.	.	.	<	.	<
Cobalt	1.14	<	<	<	<	<	<	<
Copper	6.31	<	<	<	<	<	<	<
Iron	1190	0.183	0.175	<	0.121	0.0806	0.101	0.066
Lead (PMS)	0.0786	<	<	<	<	.	<	.
Lead	.	.	.	.	.	<	.	<
Lithium	0.502	<	<	<	0.128	0.154	0.122	0.17
Manganese	39.5	0.106	0.103	0.0974	0.0068	0.0063	0.00627	0.0051
Mercury (CVAA)	<	0.000427	0.000368	0.0011	<	.	<	<
Nickel (PMS)	1.97	<	<	<	<	.	<	.
Nickel	.	.	.	.	.	<	.	<
Strontium	0.713	0.672	0.657	0.387	4.2	3.86	4	3.7
Thallium (PMS)	0.00127	<	<	<	<	.	<	.
Thallium	.	.	.	.	.	<	.	<
Uranium (PMS)	0.058	0.00141	0.00146	0.00182	<	.	<	.
Uranium (KPA)	.	.	.	.	.	<	.	<
Vanadium	<	<	<	<	<	<	<	<
Zinc	9.79	<	<	<	<	0.329	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-722-10					GW-722-14			
Location	EXP-J					EXP-J			
Date Sampled	02/06/02	05/29/02	07/16/02	11/12/02	12/12/02	02/08/02	05/30/02	07/17/02	11/13/02
Program	GWPP	BJC	GWPP	BJC	BJC	GWPP	BJC	GWPP	BJC
Sample Type									
Field Measurements									
Time Sampled	17:25	13:25	10:35	11:20	10:05	11:15	13:00	14:00	9:00
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	784	832	779	816	77.3	499	541	519	813
Dissolved Oxygen (ppm)	13	4.59	10	7.51	4.81	11.8	7.02	10	5.33
Oxidation/Reduction (mV)	.	144	.	47	-66	.	174	.	205
Temperature (degrees C)	12	25.1	17.8	17.3	12.1	11.5	23.1	18.9	15.7
Turbidity (NTU)	.	6	.	5	11	.	9	.	9
Iron ++ (mg/L)	.	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.	.
pH	7.4	7.35	7.5	8.23	8.03	7.6	7.1	7.1	7.65
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	865	.	837	.	.	564	.	555	.
Dissolved Solids (mg/L)	464	454	477	480	.	297	268	301	336
Suspended Solids (mg/L)	<	<	<	<	.	4	<	<	<
Turbidity (NTU)	1.62	.	0.733	.	.	3.27	.	1.75	.
pH	8.05	.	8	.	.	7.8	.	7.73	.
Major Ions (mg/L)									
Calcium	30.8	30.1	27	27.5	.	53.6	54.4	55.3	<
Magnesium	20.7	21	19.7	<	.	26.7	28.1	26.2	<
Potassium	3.79	5.36	3.67	<	.	<	2.06	<	<
Sodium	116	115	112	120	.	23.7	20.9	22.2	<
Alkalinity as CO_3	<	<	<	<	.	<	<	<	<
Alkalinity as HCO_3	210	211	222	211	.	242	243	244	250
Chloride	109	109	93.8	98.5	.	17.5	16.7	17	13.4
Fluoride	0.943	0.67	0.861	0.7	.	0.315	0.2	0.318	0.3
Nitrate as N	<	<	<	0.13	.	0.553	0.56	0.444	0.76
Sulfate	68.1	50.8	44.9	55.3	.	20.3	18.7	20.6	17.6
Charge balance	-2.1	-0.1	-0.8	0.9	.	0.8	1.9	0.4	1.7
Trace Metals (mg/L)									
Aluminum	<	<	<	<	.	<	<	<	<
Arsenic (PMS)	<	.	<	.	.	<	.	<	.
Arsenic	.	<	.	<	.	<	.	<	<
Barium	0.0578	0.0594	0.0557	<	.	0.11	0.107	0.103	<
Beryllium	<	<	<	<	.	<	<	<	<
Boron	0.442	0.457	0.444	0.42	.	0.143	0.139	0.147	0.13
Cadmium (PMS)	<	.	<	.	.	<	.	<	<
Cadmium	.	<	.	<	.	.	<	.	<
Chromium (PMS)	<	.	<	.	.	0.00295	.	<	.
Chromium	.	<	.	<	.	.	<	.	<
Cobalt	<	<	<	<	.	<	<	<	<
Copper	<	<	<	<	.	<	<	<	<
Iron	0.249	0.191	0.327	0.18	.	0.0605	<	0.0522	<
Lead (PMS)	<	.	0.000613	.	.	<	.	0.000582	.
Lead	.	<	.	<	.	.	<	.	<
Lithium	0.0904	0.123	0.0899	0.14	.	0.0194	0.0234	0.0204	<
Manganese	<	<	<	<	.	<	<	<	<
Mercury (CVAA)	<	.	<	<	.	<	.	<	<
Nickel (PMS)	<	.	<	.	.	<	.	<	.
Nickel	.	<	.	<	.	.	<	.	<
Strontium	3.04	3.12	2.98	<	.	0.787	0.789	0.782	<
Thallium (PMS)	<	.	0.000577	.	.	<	.	<	.
Thallium	.	<	.	<	.	.	<	.	<
Uranium (PMS)	<	.	<	.	.	<	.	0.000536	.
Uranium (KPA)	.	<	.	<	.	.	<	.	<
Vanadium	<	<	<	<	.	<	<	<	<
Zinc	<	<	0.0737	<	.	<	<	0.106	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-722-17				GW-722-20				
Location	EXP-J				EXP-J				
Date Sampled	02/08/02	06/03/02	07/17/02	11/13/02	02/07/02	05/30/02	07/17/02		11/12/02
Program	GWPP	BJC	GWPP	BJC	GWPP	BJC	GWPP	GWPP	BJC
Sample Type							Dup		
Field Measurements									
Time Sampled	12:42	8:55	15:05	10:00	18:05	10:00	9:30	9:30	12:40
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	515	572	523	691	488	525	500	500	538
Dissolved Oxygen (ppm)	11.6	6.43	10.4	6.21	13.2	3.08	10.2	10.2	3.88
Oxidation/Reduction (mV)	.	187	.	158	.	77	.	.	123
Temperature (degrees C)	12.2	25	18.2	15.8	11	22.8	16.9	16.9	18.6
Turbidity (NTU)	.	5	.	8	.	8	.	.	8
Iron ++ (mg/L)	.	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.	.
pH	7.5	7.52	7.2	7.71	7.6	7.45	7.42	7.42	8.2
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	575	.	583	.	532	.	526	535	.
Dissolved Solids (mg/L)	303	305	321	328	283	261	311	306	297
Suspended Solids (mg/L)	4	<	<	<	<	<	<	<	<
Turbidity (NTU)	7.81	.	2.97	.	1.74	.	2.71	2.61	.
pH	7.96	.	7.91	.	7.88	.	8.03	7.96	.
Major Ions (mg/L)									
Calcium	49.5	48.3	50	<	52.4	51.5	51.8	52.5	44.9
Magnesium	27.9	29.2	26.8	<	29	29.8	27.3	28.5	<
Potassium	<	2.39	<	<	<	1.89	<	<	<
Sodium	29.3	30.8	29.5	<	17.8	16.8	17	17.6	17.5
Alkalinity as CO_3	<	<	<	<	<	<	<	<	<
Alkalinity as HCO_3	220	231	210	228	222	219	228	230	222
Chloride	33.7	31.6	32.9	26.7	20.3	20.3	18.5	21.8	17.6
Fluoride	0.481	0.3	0.506	0.5	0.408	0.3	0.385	0.391	0.4
Nitrate as N	0.523	0.52	0.312	0.44	1.18	1.2	0.925	1.24	1.2
Sulfate	31.1	26.9	31.4	26.2	28.9	26.3	26	34.5	27.3
Charge balance	-0.2	0.7	1.3	-7.2	0.5	1.8	-1.2	-2.6	-3.0
Trace Metals (mg/L)									
Aluminum	<	<	<	<	<	<	<	<	<
Arsenic (PMS)	<	.	<	.	<	.	<	<	.
Arsenic	.	<	.	<	.	<	.	<	<
Barium	0.0893	0.1	0.0841	<	0.0688	0.0759	0.069	0.0713	<
Beryllium	<	<	<	<	<	<	<	<	<
Boron	0.136	0.138	0.143	0.32	<	<	<	<	<
Cadmium (PMS)	<	.	<	.	<	.	<	<	.
Cadmium	.	<	.	<	.	<	.	.	<
Chromium (PMS)	<	.	<	.	<	.	<	<	.
Chromium	.	<	.	<	.	<	.	.	0.0057
Cobalt	<	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<	<
Iron	<	<	0.0684	0.05	0.167	<	0.0948	<	0.082
Lead (PMS)	<	.	0.00427	.	<	.	<	0.000652	.
Lead	.	<	.	<	.	<	.	<	.
Lithium	0.0226	0.0313	0.0241	<	0.0154	0.0185	0.0153	0.0156	0.022
Manganese	<	<	<	<	<	<	<	<	<
Mercury (CVAA)	<	.	<	<	<	.	<	<	<
Nickel (PMS)	<	.	<	.	<	.	<	<	.
Nickel	.	<	.	<	.	<	.	<	<
Strontium	0.909	0.965	0.916	<	0.74	0.72	0.703	0.724	<
Thallium (PMS)	<	.	<	.	<	.	<	<	.
Thallium	.	<	.	<	.	<	.	.	<
Uranium (PMS)	<	.	<	.	<	.	<	<	.
Uranium (KPA)	.	<	.	<	.	<	.	.	<
Vanadium	<	<	<	<	<	<	<	<	<
Zinc	<	<	0.157	1.9	0.132	<	0.101	<	0.071

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-722-22					GW-722-26		
Location	EXP-J					EXP-J		
Date Sampled	02/07/02		05/30/02	07/16/02	11/12/02	02/05/02	05/28/02	
Program	GWPP	GWPP	BJC	GWPP	BJC	GWPP	BJC	BJC
Sample Type	Dup						Dup	
Field Measurements								
Time Sampled	15:35	15:35	8:55	14:25	12:06	16:00	10:00	.
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)								
Conductivity ($\mu\text{mho}/\text{cm}$)	480	480	741	480	538	396	423	.
Dissolved Oxygen (ppm)	12.2	12.2	5.01	10.1	6.4	8.4	2.68	.
Oxidation/Reduction (mV)	.	.	177	.	16	.	-74	.
Temperature (degrees C)	12.2	12.2	21.8	18.8	16.9	11.6	19	.
Turbidity (NTU)	.	.	6	.	9	.	4	.
Iron ++ (mg/L)	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.
pH	7.4	7.4	7.18	7.23	7.93	7.5	7.31	.
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	519	518	.	518	.	423	.	.
Dissolved Solids (mg/L)	272	275	262	286	303	230	221	223
Suspended Solids (mg/L)	<	<	<	<	<	<	<	<
Turbidity (NTU)	3.93	3.98	.	1.26	.	12	.	.
pH	8.18	8.2	.	7.73	.	7.75	.	.
Major Ions (mg/L)								
Calcium	53.7	52.2	53.8	53.6	47	52.1	51.1	51.3
Magnesium	26.6	26.7	28.3	26.2	<	21.1	21.6	21.5
Potassium	<	<	1.83	<	<	2.29	2.69	2.55
Sodium	18.2	18.3	16.7	16.8	20.2	3.07	3.08	2.96
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	238	240	242	246	247	220	213	217
Chloride	10.9	11.1	13.5	7.72	7.6	3.7	3.9	3.8
Fluoride	0.322	0.323	0.2	0.334	0.2	1.31	0.86	0.86
Nitrate as N	0.544	0.575	0.041	0.369	0.7	<	<	<
Sulfate	20	19.5	18.7	15.5	18.3	0.28	0.31	0.29
Charge balance	1.1	0.2	1.5	0.5	-2.2	-0.5	1.2	.
Trace Metals (mg/L)								
Aluminum	<	<	<	<	<	<	<	<
Arsenic (PMS)	<	<	.	<	.	<	.	.
Arsenic	.	.	.	.	.	.	.	.
Barium	0.0967	0.0953	0.0962	0.0912	<	0.197	0.196	0.188
Beryllium	<	<	<	<	<	<	<	<
Boron	0.117	0.113	0.111	0.114	0.12	<	<	<
Cadmium (PMS)	<	<	.	<	.	<	.	.
Cadmium	.	.	.	.	<	.	<	.
Chromium (PMS)	<	<	.	<	.	<	.	.
Chromium	.	.	.	.	.	.	<	<
Cobalt	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	0.131	0.0799	0.0768	<	0.17	0.916	0.529	0.271
Lead (PMS)	<	<	.	<	.	<	.	.
Lead	.	.	.	<	.	.	<	<
Lithium	0.0149	0.0158	0.0186	0.0137	0.024	<	<	<
Manganese	<	<	<	<	<	0.11	0.11	0.103
Mercury (CVAA)	<	<	.	<	<	<	.	.
Nickel (PMS)	<	<	.	<	.	<	.	.
Nickel	.	.	.	.	<	.	<	<
Strontium	0.719	0.715	0.716	0.671	<	1.53	1.55	1.48
Thallium (PMS)	<	<	.	<	.	<	.	.
Thallium	.	.	.	<	.	.	<	<
Uranium (PMS)	<	<	.	<	.	<	.	.
Uranium (KPA)	.	.	.	<	.	<	<	<
Vanadium	<	<	<	<	<	<	<	<
Zinc	0.0946	<	<	<	<	0.056	0.126	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-722-26					GW-722-30		
Location	EXP-J					EXP-J		
Date Sampled	07/15/02	11/11/02		12/12/02		02/05/02	05/28/02	07/15/02
Program	GWPP	BJC	BJC	BJC	BJC	GWPP	BJC	GWPP
Sample Type		Dup		Dup				
Field Measurements								
Time Sampled	14:05	12:50		9:15		14:20	8:55	10:25
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	666	411		628		299.4	470	305
Dissolved Oxygen (ppm)	5.3	5.24		450		9.1	2.9	7.8
Oxidation/Reduction (mV)	.	-70		-79		.	158	.
Temperature (degrees C)	19.1	19.9		12.6		10.9	19.1	18.3
Turbidity (NTU)	.	8		8		.	6	.
Iron ++ (mg/L)	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.
pH	7	7.86		7.47		7.8	6.76	7.6
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	415	.	.	.	.	282	.	304
Dissolved Solids (mg/L)	225	158	120	.	.	163	163	177
Suspended Solids (mg/L)	<	<	<	.	.	<	<	<
Turbidity (NTU)	2.01	.	.	.	.	1.18	.	0.651
pH	7.91	.	.	.	.	7.92	.	7.95
Major Ions (mg/L)								
Calcium	52.7	43.9	44.1	.	.	41.5	39.3	38.7
Magnesium	20.1	18.2	18.2	.	.	15	14.8	14.5
Potassium	2.27	2.1	2.1	.	.	<	1.44	<
Sodium	2.83	3	3.2	.	.	0.742	0.84	0.723
Alkalinity as CO ₃	<	<	<	.	.	<	<	<
Alkalinity as HCO ₃	218	217	217	.	.	150	148	144
Chloride	3.76	3.2	3.2	.	.	2.48	7	2.71
Fluoride	1.19	1.2	1	.	.	0.179	0.14	0.181
Nitrate as N	<	0.17	0.2	.	.	<	0.07	0.116
Sulfate	0.258	0.24	0.32	.	.	9.49	10.4	9.94
Charge balance	-0.7	-7.6	.	.	.	0.9	-2.0	-0.4
Trace Metals (mg/L)								
Aluminum	<	<	<	.	.	<	<	<
Arsenic (PMS)	<	.	.	.	.	<	.	<
Arsenic	.	.	<	.	.	.	<	.
Barium	0.172	0.17	0.18	.	.	0.0468	0.0487	0.0442
Beryllium	<	<	<	.	.	<	<	<
Boron	<	<	<	.	.	<	<	<
Cadmium (PMS)	<	.	.	.	.	<	.	<
Cadmium	.	0.0031 R	.	<	.	.	.	.
Chromium (PMS)	<	.	.	.	.	<	.	<
Chromium	.	<	<	.	.	.	<	.
Cobalt	<	<	<	.	.	<	<	<
Copper	<	<	<	.	.	<	<	<
Iron	0.742	0.85	0.68	.	.	0.0698	0.0787	<
Lead (PMS)	<	.	.	.	.	<	.	<
Lead	.	<	<	.	.	.	<	.
Lithium	<	<	<	.	.	<	<	<
Manganese	0.112	0.1	0.094	.	.	0.0056	<	<
Mercury (CVAA)	<	<	<	.	.	<	.	<
Nickel (PMS)	<	.	.	.	.	<	.	<
Nickel	.	<	<	.	.	.	<	.
Strontium	1.37	1.4	1.4	.	.	0.0817	0.0791	0.0894
Thallium (PMS)	<	.	.	.	.	<	.	<
Thallium	.	<	<	.	.	.	<	.
Uranium (PMS)	<	.	.	.	.	0.000571	.	0.00057
Uranium (KPA)	.	<	<	.	.	.	<	.
Vanadium	<	<	<	.	.	<	<	<
Zinc	0.177	<	0.088 R	.	.	<	<	0.0958

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-722-30		GW-722-32					
Location	EXP-J		EXP-J					
Date Sampled	11/11/02	12/12/02	02/05/02	05/28/02	07/15/02	11/12/02	12/12/02	
Program	BJC	BJC	GWPP	BJC	GWPP	BJC	BJC	
Sample Type								
Field Measurements								
Time Sampled	11:30	12:37	17:45	13:10	8:05	9:00	13:00	
Measuring Point Elev. (ft)	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	559	331	393	430	440	720	415	
Dissolved Oxygen (ppm)	4.75	2.95	9.4	4.51	8.8	6.81	5.89	
Oxidation/Reduction (mV)	143	217	.	69	.	181	141	
Temperature (degrees C)	20.9	12	11.1	20.3	19.7	14.9	12.3	
Turbidity (NTU)	12	9	.	7	.	7	4	
Iron ++ (mg/L)	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.
pH	8.08	7.68	7.4	6.98	7.3	7.5	7.3	
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	435	.	456	.	.	
Dissolved Solids (mg/L)	82	.	249	233	265	230	.	
Suspended Solids (mg/L)	<	.	5	<	<	<	.	
Turbidity (NTU)	.	.	21.7	.	2.42	.	.	
pH	.	.	7.46	.	7.55	.	.	
Major Ions (mg/L)								
Calcium	31.9	.	74.1	71	79.8	59.7	.	
Magnesium	12.2	.	10.9	11.1	12.9	<	.	
Potassium	0.98	.	2.4	2.04	<	<	.	
Sodium	1.2	.	3.13	3.27	3.05	3.3	.	
Alkalinity as CO ₃	<	.	<	<	<	<	.	
Alkalinity as HCO ₃	148	.	210	205	226	203	.	
Chloride	2.1	.	3.84	4.2	3.7	2.8	.	
Fluoride	0.1	.	<	<	<	<	.	
Nitrate as N	0.33	.	0.658	0.83	0.777	0.85	.	
Sulfate	8.8	.	10.5	10.6	10	9.3	.	
Charge balance	-9.4	.	2.4	1.7	2.9	-5.8	.	
Trace Metals (mg/L)								
Aluminum	<	.	2.02	<	0.274	<	.	
Arsenic (PMS)	.	.	<	.	<	.	.	
Arsenic	<	.	.	<	.	<	.	
Barium	0.041	.	0.0359	0.0316	0.0346	.	.	
Beryllium	<	.	<	<	<	<	.	
Boron	<	.	<	<	<	<	.	
Cadmium (PMS)	.	.	<	.	<	.	.	
Cadmium	0.0024	.	.	.	.	.	<
Chromium (PMS)	.	.	0.00554	.	0.00251	.	.	
Chromium	<	.	.	<	.	<	.	
Cobalt	<	.	<	<	<	<	.	
Copper	<	.	<	<	<	<	.	
Iron	0.28	.	2	<	0.406	0.052	.	
Lead (PMS)	.	.	0.00297	.	0.00127	.	.	
Lead	<	.	.	<	.	<	.	
Lithium	<	.	<	<	<	<	.	
Manganese	<	.	0.0314	<	0.0104	<	.	
Mercury (CVAA)	<	.	<	.	<	<	.	
Nickel (PMS)	.	.	<	.	<	.	.	
Nickel	<	.	.	<	.	<	.	
Strontium	0.082	.	0.072	0.0718	0.0804	<	.	
Thallium (PMS)	.	.	<	.	<	.	.	
Thallium	<	.	.	<	.	<	.	
Uranium (PMS)	.	.	<	.	<	.	.	
Uranium (KPA)	<	.	.	<	.	<	.	
Vanadium	<	.	<	<	<	<	.	
Zinc	<	.	<	<	0.143	<	.	

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-722-33					GW-733		GW-735	
Location	EXP-J					EXP-J		EXP-J	
Date Sampled	02/06/02	05/29/02	07/16/02	11/12/02	12/12/02	01/08/02	07/09/02	05/14/02	11/21/02
Program	GWPP	BJC	GWPP	BJC	BJC	BJC	BJC	GWPP	GWPP
Sample Type									
Field Measurements									
Time Sampled	14:40	12:40	9:05	9:50	13:15	13:45	9:25	8:15	9:55
Measuring Point Elev. (ft)	.	.	.	.	.	959.84	959.84	924.46	924.46
Depth to Water (ft)	.	.	.	.	.	59.76	59.87	20.22	22.24
Groundwater Elevation (ft)	.	.	.	.	.	900.08	899.97	904.24	902.22
Conductivity ($\mu\text{mho}/\text{cm}$)	376	572	443	476	419	338	309	788	829
Dissolved Oxygen (ppm)	10.1	5.51	8.5	5.94	5.56	1.82	1.97	0.82	0.17
Oxidation/Reduction (mV)	.	157	.	188	205	205	3	126	140
Temperature (degrees C)	11.6	21.5	21	15	12.1	9.5	21.6	14.4	14.4
Turbidity (NTU)	.	5	.	7	7	13	8	.	.
Iron ++ (mg/L)	.	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.	.
pH	6.9	6.62	7	7.53	7.39	7.87	7.98	7.03	6.93
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	425	.	484	.	.	.	.	716	701
Dissolved Solids (mg/L)	231	246	274	237	.	210	204	460	426
Suspended Solids (mg/L)	<	<	<	<	.	<	<	<	<
Turbidity (NTU)	1.94	.	0.401	.	.	.	.	0.75	0.553
pH	7.39	.	7.53	.	.	.	.	7.5	7.27
Major Ions (mg/L)									
Calcium	72.3	69.6	77.5	61.7	.	39.8	42.7	134	129
Magnesium	10.2	10.7	14.4	<	.	16.3	17.3	9.79	9.88
Potassium	<	2.02	2.33	<	.	1.54	1.81	2.27	2.18
Sodium	3.11	3.18	3.06	3.3	.	2.28	2.54	8.63	6.24
Alkalinity as CO_3	<	<	<	<	.	<	<	<	<
Alkalinity as HCO_3	208	212	232	213	.	150	144	346	334
Chloride	4.12	4.2	3.99	2.8	.	10	12.7	15.7	14.9
Fluoride	<	<	<	<	.	0.18	0.22	<	<
Nitrate as N	0.681	0.081	0.738	0.84	.	0.46	0.41	0.551	0.323
Sulfate	10.5	10.6	11.1	9.3	.	8.5	8.4	35	27.3
Charge balance	0.5	-0.4	2.1	-6.6	.	-0.5	3.6	-1.2	-0.7
Trace Metals (mg/L)									
Aluminum	<	<	<	<	.	<	<	<	<
Arsenic (PMS)	<	.	<	.	.	.	.	<	<
Arsenic	.	<	.	<	.	<	.	<	.
Barium	0.0295	0.0301	0.0369	<	.	0.0231	0.0238	0.295	0.299
Beryllium	<	<	<	<	.	<	<	<	<
Boron	<	<	<	<	.	<	<	<	<
Cadmium (PMS)	<	.	<	.	.	<	<	<	<
Cadmium	.	<	.	<	.	<	<	.	.
Chromium (PMS)	0.00403	.	<	.	.	<	.	<	<
Chromium	.	<	.	<	.	<	<	.	.
Cobalt	<	<	<	<	.	<	<	<	<
Copper	<	<	<	<	.	<	<	<	<
Iron	0.22	<	0.0847	<	.	<	<	<	<
Lead (PMS)	<	.	<	.	.	<	.	<	<
Lead	.	<	.	<	.	<	<	.	.
Lithium	<	<	<	<	.	<	<	<	<
Manganese	0.00508	<	<	<	.	<	0.0054	<	<
Mercury (CVAA)	<	.	<	<	.	<	<	<	<
Nickel (PMS)	<	.	<	.	.	.	.	<	<
Nickel	.	<	.	<	.	<	0.0109	.	.
Strontium	0.0686	0.0676	0.0724	<	.	0.0956	0.0993	0.275	0.287
Thallium (PMS)	<	.	<	.	.	<	<	<	<
Thallium	.	<	.	<	.	<	<	.	.
Uranium (PMS)	<	.	<	.	.	<	.	<	<
Uranium (KPA)	.	<	.	<	.	<	<	.	.
Vanadium	<	<	<	<	.	<	<	<	<
Zinc	0.113	<	0.0648	<	.	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-744		GW-747		GW-750		GW-762	
Location	GRIDK1		GRIDK2		EXP-J		GRIDJ3	
Date Sampled	05/07/02	11/18/02	05/09/02	11/20/02	05/05/02	11/20/02	01/31/02	
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC
Sample Type							Dup	
Field Measurements								
Time Sampled	10:25	10:45	8:50	10:20	10:00	11:10	12:55	.
Measuring Point Elev. (ft)	907.60	907.60	921.14	921.14	919.03	919.03	915.34	.
Depth to Water (ft)	5.40	5.79	3.62	3.43	10.97	11.81	13.42	.
Groundwater Elevation (ft)	902.20	901.81	917.52	917.71	908.06	907.22	901.92	.
Conductivity ($\mu\text{mho}/\text{cm}$)	498	629	460	490	565	599	638	.
Dissolved Oxygen (ppm)	2.14	0.1	2.13	-0.02	2.38	0.09	3.31	.
Oxidation/Reduction (mV)	-234	-204	58	6	-43	-34	180	.
Temperature (degrees C)	17.5	17.1	17	16.2	16.8	15	19	.
Turbidity (NTU)	.	.	.	.	.	.	12	.
Iron ++ (mg/L)	.	.	.	.	.	.	0.04	.
Manganese ++ (mg/L)	.	.	.	.	.	.	0.1	.
pH	7.76	7.75	7.09	7.57	6.62	7.5	6.86	.
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	456	502	415	402	514	494	.	.
Dissolved Solids (mg/L)	293	317	244	269	303	312	309	394
Suspended Solids (mg/L)	<	<	<	<	<	<	<	<
Turbidity (NTU)	0.436	2.51	0.166	0.219	1.58	1.19	.	.
pH	7.57	7.54	7.95	7.92	7.67	7.77	.	.
Major Ions (mg/L)								
Calcium	45.1	57.5	46.7	45	83.5	84.5	81.4	81.2
Magnesium	11.2	10.9	10.7	10.6	11.9	12.1	24	24
Potassium	3.39	3.15	<	2.05	4.49	4.76	3.92	3.88
Sodium	35.7	34.2	27	26.8	6.04	6.36	10.4	10.4
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	218	228	200	196	242	248	308	321
Chloride	8.3	9.64	2.13	1.79	5.51	5.2	34.9	39.2
Fluoride	<	<	0.137	0.164	<	<	<	<
Nitrate as N	<	<	<	<	<	<	0.069	0.037
Sulfate	13	20	17.1	15.8	20.9	18.1	15.5	14.8
Charge balance	-0.5	0.8	-0.4	0.4	0.9	1.2	-6.2	.
Trace Metals (mg/L)								
Aluminum	<	<	<	<	<	<	<	<
Arsenic (PMS)	<	<	<	<	<	<	.	.
Arsenic	.	.	.	.	.	.	<	<
Barium	0.282	0.259	0.153	0.153	0.729	0.772	0.515	0.513
Beryllium	<	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<	<
Cadmium (PMS)	<	<	<	<	<	<	.	.
Cadmium	.	.	.	.	.	.	<	<
Chromium (PMS)	<	<	<	<	<	<	.	.
Chromium	.	.	.	.	.	.	<	<
Cobalt	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	<	0.282	<	<	0.178	0.159	<	<
Lead (PMS)	<	0.0144	<	<	<	<	.	.
Lead	.	.	.	.	.	.	<	<
Lithium	0.0274	0.0272	0.015	0.0144	<	0.0104	0.016	0.016
Manganese	0.0395	0.132	0.0144	0.014	0.054	0.0555	0.057	0.057
Mercury (CVAA)	<	<	<	<	<	<	.	.
Nickel (PMS)	<	<	<	<	<	<	.	.
Nickel	.	.	.	.	.	.	<	<
Strontium	1.29	1.24	0.615	0.613	0.693	0.707	0.736	0.731
Thallium (PMS)	<	<	<	<	<	<	.	.
Thallium	.	.	.	.	.	.	<	<
Uranium (PMS)	<	<	<	<	<	<	.	.
Uranium (KPA)	.	.	.	.	.	.	<	<
Vanadium	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-762		GW-763			GW-769		GW-770	
Location	GRIDJ3		GRIDJ3			GRIDG3		GRIDG3	
Date Sampled	07/31/02		04/18/02	06/12/02	10/21/02	04/29/02	10/30/02	04/29/02	10/30/02
Program	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type	Dup								
Field Measurements									
Time Sampled	13:20	.	9:35	10:00	10:15	9:00	9:40	9:45	10:35
Measuring Point Elev. (ft)	915.34	.	915.03	915.03	915.03	944.43	944.43	944.72	944.72
Depth to Water (ft)	14.02	.	9.69	9.93	9.69	10.84	8.41	13.72	10.25
Groundwater Elevation (ft)	901.32	.	905.34	905.10	905.34	933.59	936.02	931.00	934.47
Conductivity ($\mu\text{mho}/\text{cm}$)	682	.	850	955	901	557	565	402	405
Dissolved Oxygen (ppm)	1.66	.	0.22	0.83	0	0.09	0.09	3.8	1.46
Oxidation/Reduction (mV)	118	.	-97	-185	-173	-10	-6	108	136
Temperature (degrees C)	20.1	.	17.7	19.4	22.6	18.4	19.5	16.8	21.1
Turbidity (NTU)	23	.	.	.	.	.	.	.	.
Iron ++ (mg/L)	0	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	0	.	.	.	.	.	.	.	.
pH	6.92	.	6.92	6.9	6.62	7.29	7.17	7.14	6.9
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	545	.	777	485	502	340	357
Dissolved Solids (mg/L)	378	367	430	.	413	283	291	202	201
Suspended Solids (mg/L)	<	<	17	.	33	<	<	<	2
Turbidity (NTU)	.	.	110	.	137	0.627	0.369	2.14	8.4
pH	.	.	6.83	.	6.78	7.4	7.1	7.11	7.05
Major Ions (mg/L)									
Calcium	83.5	83.4	120	.	111	80.4	79.3	55	55.4
Magnesium	24.6	24.6	15	.	14.8	9.5	9.68	4.65	4.97
Potassium	3.91	3.89	<	.	<	2.54	2.57	2.2	2.49
Sodium	10.6	10.8	14.9	.	16.3	7.32	7.28	8	7.64
Alkalinity as CO_3	<	<	<	.	<	<	<	<	<
Alkalinity as HCO_3	256	257	306	.	280	214	216	132	142
Chloride	42.6	43.2	72.9	.	70.4	14.5	15	10.2	5.89
Fluoride	<	<	0.216	.	0.245	<	<	0.2	0.219
Nitrate as N	0.23	0.19	<	.	<	0.1	0.133	0.625	0.716
Sulfate	14.9	15	2.73	.	1.58	20.8	20.9	27.6	24.3
Charge balance	0.8	.	-2.3	.	-1.1	0.5	-0.5	-0.3	0.0
Trace Metals (mg/L)									
Aluminum	<	<	<	.	<	<	<	<	<
Arsenic (PMS)	.	.	<	.	<	<	<	<	<
Arsenic	<	.	<	.	.	.	.	.	.
Barium	0.527	0.528	0.0823	.	0.0569	0.376	0.384	0.0584	0.0686
Beryllium	<	<	<	.	<	<	<	<	<
Boron	<	<	<	.	<	<	<	<	<
Cadmium (PMS)	.	.	<	.	<	<	<	<	<
Cadmium	<	.	<	.	.	.	.	.	.
Chromium (PMS)	.	.	<	.	<	<	<	0.0314	0.278
Chromium	<	.	<	.	.	.	.	.	.
Cobalt	<	.	<	.	<	<	<	<	<
Copper	<	.	<	.	<	<	<	<	<
Iron	<	.	13.1	.	22.7	<	<	0.244	3.42
Lead (PMS)	.	.	0.000638	.	<	<	<	<	<
Lead	<	.	<	.	.	.	.	.	.
Lithium	0.0156	0.0159	<	.	<	0.0152	0.0153	<	<
Manganese	0.0503	0.0504	0.893	.	0.842	0.00861	0.00806	0.00808	0.0481
Mercury (CVAA)	.	.	<	.	<	<	<	<	<
Nickel (PMS)	.	.	<	.	<	<	<	0.148	0.115
Nickel	<	.	<	.	.	.	.	.	.
Strontium	0.743	0.744	0.259	.	0.24	0.377	0.377	0.077	0.0847
Thallium (PMS)	.	.	<	.	<	<	<	<	<
Thallium	<	.	<	.	.	.	.	.	.
Uranium (PMS)	.	.	<	.	<	<	<	0.000732	0.00133
Uranium (KPA)	<	.	<	.	.	.	.	.	.
Vanadium	<	.	<	.	<	<	<	<	<
Zinc	<	.	<	.	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-775		GW-776		GW-782		GW-791	
Location	GRIDH3		GRIDH3		GRIDE3		GRID2	
Date Sampled	04/30/02	10/31/02	04/30/02	10/31/02	05/01/02	11/04/02	05/01/02	11/06/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type								
Field Measurements								
Time Sampled	9:00	10:00	10:00	11:00	8:40	9:00	10:20	11:00
Measuring Point Elev. (ft)	931.35	931.35	931.25	931.25	947.73	947.73	992.13	992.13
Depth to Water (ft)	14.31	9.97	14.39	10.13	8.55	9.24	23.59	23.09
Groundwater Elevation (ft)	917.04	921.38	916.86	921.12	939.18	938.49	968.54	969.04
Conductivity ($\mu\text{mho}/\text{cm}$)	622	615	618	656	588	629	507	561
Dissolved Oxygen (ppm)	0.2	0.55	2.25	1.95	0.03	0.01	1.02	5.09
Oxidation/Reduction (mV)	49	119	48	38	28	-44	2	-41
Temperature (degrees C)	18.3	18.7	18.1	18.9	17.1	18	19.3	17.7
Turbidity (NTU)	.	.	.	.	.	.	.	.
Iron ++ (mg/L)	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.
pH	7.44	6.9	7.3	7.07	7.04	7.33	7.17	7.12
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	556	553	554	581	521	529	460	457
Dissolved Solids (mg/L)	316	319	325	337	299	296	268	274
Suspended Solids (mg/L)	<	<	<	<	2	2	<	<
Turbidity (NTU)	0.292	0.316	8.31	2.01	6.91	7.58	0.157	0.324
pH	7.35	7.44	7.27	7.17	7.48	7.43	7.7	7.53
Major Ions (mg/L)								
Calcium	95.4	94.1	94	101	77.2	77.8	67	70.2
Magnesium	8.04	7.85	5.3	4.74	17.2	16.7	14.5	13.9
Potassium	2.59	2.41	3.59	2.79	5.28	5.46	2.01	<
Sodium	4.86	5.63	13.6	12.2	9.25	9.38	7.11	7.11
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	206	190	195	206	242	242	222	216
Chloride	30.6	30.8	32	30.7	12.8	11.6	7.6	7.73
Fluoride	<	<	<	<	<	<	<	<
Nitrate as N	0.383	0.657	2.91	1.3	<	<	<	<
Sulfate	30.4	33.8	37.9	36.6	16.8	15.4	12.5	12.1
Charge balance	0.5	2.1	0.1	1.6	2.3	2.8	-0.1	1.7
Trace Metals (mg/L)								
Aluminum	<	<	<	<	<	<	<	<
Arsenic (PMS)	<	<	<	<	<	<	<	<
Arsenic	.	.	.	.	.	.	.	.
Barium	0.2	0.203	0.0814	0.0822	0.544	0.549	0.249	0.247
Beryllium	<	<	<	<	<	<	<	<
Boron	<	<	<	<	0.139	0.13	<	<
Cadmium (PMS)	<	<	<	<	<	<	<	<
Cadmium	.	.	.	.	.	.	.	.
Chromium (PMS)	<	<	0.0952	0.0432	<	<	<	<
Chromium	.	.	.	.	.	.	.	.
Cobalt	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	<	<	0.877	0.264	1.08	1.35	<	0.063
Lead (PMS)	0.000837	0.0105	<	<	0.00243	<	<	0.00151
Lead	.	.	.	.	.	.	.	.
Lithium	0.0114	0.0101	<	<	0.019	0.0201	0.0128	0.0132
Manganese	<	<	0.00952	0.0107	0.0434	0.0482	0.0154	0.0186
Mercury (CVAA)	<	<	<	<	<	<	<	<
Nickel (PMS)	<	<	0.546	0.204	<	<	<	<
Nickel	.	.	.	.	.	.	.	.
Strontium	0.244	0.242	0.158	0.16	1.17	1.16	0.407	0.392
Thallium (PMS)	<	<	<	<	<	<	<	<
Thallium	.	.	.	.	.	.	.	.
Uranium (PMS)	<	<	<	<	0.00169	0.00124	<	<
Uranium (KPA)	.	.	.	.	.	.	.	.
Vanadium	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	GW-816		GW-832		LRSPW			NPR07.0SW		
Location	EXP-SR		NHP		EXP-SW			EXP-NPR		
Date Sampled	05/07/02	11/18/02	01/31/02	08/05/02	05/06/02		11/19/02	05/15/02	10/29/02	
Program	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	
Sample Type					Dup					
Field Measurements										
Time Sampled	8:55	9:50	10:34	13:00	9:45	9:45	8:50	8:30	10:15	
Measuring Point Elev. (ft)	898.42	898.42	906.18	906.18	.	.	.	.	.
Depth to Water (ft)	12.31	12.40	7.10	7.10	.	.	.	.	.
Groundwater Elevation (ft)	886.11	886.02	899.08	899.08	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	554	645	485	356	494	494	621	233	196	
Dissolved Oxygen (ppm)	0.81	0.1	11.64	4.77	3.41	3.41	3.8	5.86	3.53	
Oxidation/Reduction (mV)	-25	-111	233	123	187	187	10	204	132	
Temperature (degrees C)	15.5	15.6	15.4	22.6	17.1	17.1	15.4	12.8	16.1	
Turbidity (NTU)	.	.	11	3	.	.	.	.	.
Iron ++ (mg/L)	.	.	0.02	0.01	.	.	.	.	.
Manganese ++ (mg/L)	.	.	0.1	0.4	.	.	.	.	.
pH	6.4	6.35	7.05	7.52	7.39	7.39	6.93	7.29	7.22	
Miscellaneous Analytes										
Conductivity ($\mu\text{mho}/\text{cm}$)	483	485	.	.	410	403	401	79.5	147.6	
Dissolved Solids (mg/L)	306	276	302	206	259	268	257	62	90	
Suspended Solids (mg/L)	45	12	<	<	10	12	<	3.6	12	
Turbidity (NTU)	171	57.9	.	.	4.41	4.45	1.17	1.89	9.54	
pH	6.58	6.72	.	.	7.42	7.41	7.97	7	7.37	
Major Ions (mg/L)										
Calcium	61.9	60.5	77.9	42.9	58.5	60.6	59.8	5.52	11.8	
Magnesium	17.9	17.2	11.7	10.6	12.3	13.3	11.2	3.43	6.95	
Potassium	4.82	4.85	2.56	2.27	2.13	2.69	2.19	2.7	3.51	
Sodium	7.88	7.02	7.46	9	9.08	9.2	7.97	1.93	3.63	
Alkalinity as CO ₃	<	<	<	<	<	<	<	<	<	
Alkalinity as HCO ₃	192	216	252	125	170	175	163	23.2	51	
Chloride	20.7	13.4	10.2	12.6	11	10.8	8.33	1.31	1.21	
Fluoride	<	0.106	<	0.49	0.234	0.244	0.266	<	<	
Nitrate as N	<	<	1.4	1.8	1.45	1.47	1.49	<	<	
Sulfate	25.1	15.6	18.7	28.3	24.9	26.1	25.2	11.8	17.3	
Charge balance	0.8	-1.6	-5.2	-1.9	0.4	1.4	2.0	-2.5	-0.2	
Trace Metals (mg/L)										
Aluminum	<	<	<	<	0.291	0.642	<	<	1.23	
Arsenic (PMS)	<	<	.	.	<	<	<	<	<	
Arsenic	.	.	.	.	.	.	.	.	.
Barium	0.144	0.133	0.0597	0.0443	0.0574	0.0642	0.0525	0.0427	0.0733	
Beryllium	<	<	<	<	<	<	<	<	<	
Boron	<	<	<	<	<	<	<	<	<	
Cadmium (PMS)	<	<	.	.	.	0.000501	<	<	<	
Cadmium	.	.	.	.	.	.	.	.	.
Chromium (PMS)	<	<	.	.	<	0.00321	<	<	<	
Chromium	.	.	.	.	.	.	.	.	.
Cobalt	<	<	<	<	<	<	<	<	<	
Copper	<	<	<	<	<	<	<	<	<	
Iron	28.5	13.1	0.0536	<	0.327	0.904	0.0509	0.152	0.977	
Lead (PMS)	<	0.0162	.	.	0.00157	0.00262	0.00368	0.00081	<	
Lead	.	.	.	.	.	.	.	.	.
Lithium	<	<	<	0.0108	<	<	0.0114	<	<	
Manganese	0.812	0.751	<	<	0.0653	0.134	0.00553	0.022	0.113	
Mercury (CVAA)	<	<	.	.	0.000383	0.000734	<	<	<	
Nickel (PMS)	<	<	.	.	<	<	<	<	<	
Nickel	.	.	.	.	.	.	.	.	.
Strontium	0.0952	0.0907	0.171	0.114	0.139	0.143	0.132	0.0325	0.0702	
Thallium (PMS)	<	<	.	.	<	<	<	<	<	
Thallium	.	.	.	.	.	.	.	.	.
Uranium (PMS)	<	<	.	.	0.0119	0.0117	0.00805	<	<	
Uranium (KPA)	.	.	0.0136	<	.	.	.	.	.
Vanadium	<	<	<	<	<	<	<	<	<	
Zinc	<	<	<	<	<	0.064	<	<	<	

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	NPR12.0SW		NPR23.0SW		OF 51		
Location	EXP-NPR		EXP-NPR		EXP-SW		
Date Sampled	05/15/02		10/29/02	05/15/02	10/29/02	02/14/02	09/03/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC
Sample Type	Dup						
Field Measurements							
Time Sampled	9:00	9:00	9:55	9:30	9:30	10:31	13:45
Measuring Point Elev. (ft)	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.
Groundwater Elevation (ft)							
Conductivity ($\mu\text{mho}/\text{cm}$)	98.1	98.1	186	166.4	124	242	223
Dissolved Oxygen (ppm)	4.71	4.71	3.58	4.26	3.78	10.6	8.81
Oxidation/Reduction (mV)	209	209	174	190	188	85	35
Temperature (degrees C)	13	13	16.1	13.6	16	14	19.3
Turbidity (NTU)	.	.	.	.	.	1	8
Iron ++ (mg/L)	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.
pH	6.86	6.86	7	7.03	6.88	8.1	7.76
Miscellaneous Analytes							
Conductivity ($\mu\text{mho}/\text{cm}$)	82.4	81.6	140.4	71.9	124	.	.
Dissolved Solids (mg/L)	64	79	90	68	83	139	257
Suspended Solids (mg/L)	122	19.6	29	2.8	17	<	<
Turbidity (NTU)	8.82	8.56	8.68	5.03	12.5	.	.
pH	7.5	7.51	7.4	7.36	7.27	.	.
Major Ions (mg/L)							
Calcium	7.02	6.46	12.1	5.72	10.5	56.6	54.2
Magnesium	3.64	3.4	6.33	2.95	3.97	25.3	17.7
Potassium	3.05	2.72	3.15	2.55	3.01	1.62	1.99
Sodium	2.31	2.22	3.85	1.48	1.99	5.81	7.75
Alkalinity as CO ₃	<	<	<	<	<	<	<
Alkalinity as HCO ₃	27.8	28.8	54.6	23.6	41	242	196
Chloride	1.06	1.13	1.21	0.99	0.82	9.2	11
Fluoride	<	<	<	<	<	0.15	0.29
Nitrate as N	<	<	<	<	<	4.4	4.9
Sulfate	9.88	9.92	12.9	9.7	10.6	17.1	25.6
Charge balance	2.3	-2.9	-0.8	-3.2	-2.4	-5.2	-6.0
Trace Metals (mg/L)							
Aluminum	0.778	0.278	0.783	0.412	1.61	<	<
Arsenic (PMS)	<	<	<	<	<	.	.
Arsenic	.	.	.	.	.	<	<
Barium	0.066	0.048	0.0742	0.036	0.054	0.0804	0.0704
Beryllium	<	<	<	<	<	<	<
Boron	<	<	<	<	<	<	<
Cadmium (PMS)	<	<	<	<	<	.	.
Cadmium	.	.	.	.	.	<	<
Chromium (PMS)	0.00253	<	<	0.00278	0.00338	.	.
Chromium	.	.	.	.	.	<	<
Cobalt	<	<	<	<	<	<	<
Copper	<	<	<	<	<	0.0209	<
Iron	0.952	0.356	0.723	0.279	1.03	<	0.105
Lead (PMS)	0.00136	0.000641	0.00156	0.00074	<	.	.
Lead	.	.	.	.	.	<	<
Lithium	<	<	<	<	<	<	0.0114
Manganese	0.127	0.0324	0.0854	0.0112	0.0356	0.0078	0.0123
Mercury (CVAA)	<	<	<	<	<	.	.
Nickel (PMS)	<	<	<	<	<	.	.
Nickel	.	.	.	.	.	<	<
Strontium	0.0356	0.0324	0.0626	0.023	0.031	0.0893	0.128
Thallium (PMS)	<	<	<	<	<	.	.
Thallium	.	.	.	.	.	<	<
Uranium (PMS)	<	<	<	<	<	.	.
Uranium (KPA)	.	.	.	.	.	0.00892	0.00881
Vanadium	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	OF 200				SCR7.1SP		SCR7.8SP	
Location	EXP-SW				EXP-UV		EXP-UV	
Date Sampled	02/01/02	02/14/02	08/20/02	09/03/02	02/11/02	07/11/02	02/11/02	07/11/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								
Field Measurements								
Time Sampled	13:13	9:54	13:18	13:00	14:05	9:49	14:18	9:30
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	174	221	191	142	292	212	194	204
Dissolved Oxygen (ppm)	9.82	9.3	7.3	6.16	11.79	10.59	11.82	11.2
Oxidation/Reduction (mV)	175	115	55	40	20	95	45	85
Temperature (degrees C)	17.6	15.9	24	25.4	11.7	16.7	12.5	17.1
Turbidity (NTU)	7	4	4	33	35	22	3	45
Iron ++ (mg/L)	.	.	.	.	0.02	0.03	0	0.01
Manganese ++ (mg/L)	.	.	.	.	0	0.1	0.2	0.1
pH	7.7	8.9	8	7.86	8.9	7.93	8.87	8.05
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	.	.
Dissolved Solids (mg/L)	247	216	242	238	272	282	194	261
Suspended Solids (mg/L)	<	<	<	<	<	6.9	<	<
Turbidity (NTU)	.	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.	.
Major Ions (mg/L)								
Calcium	53.4	52.7	49.7	45.4	.	.	.	.
Magnesium	11.3	11.6	11.2	11	.	.	.	.
Potassium	2.62	2.58	2.7	2.72	.	.	.	.
Sodium	9.97	10.8	9.65	9.16	.	.	.	.
Alkalinity as CO_3	<	<	<	<	<	<	<	<
Alkalinity as HCO_3	142	110	110	114	165	184	166	190
Chloride	16.2	15.7	14.8	18.5	12.1	5.6	10.3	7.3
Fluoride	0.61	0.87	1.1	1.1	<	<	<	<
Nitrate as N	7.2	7.7	5.8	4.3	0.6	0.38	0.77	1.1
Sulfate	32.5	36.2	35.2	33.2	27.4	19.8	12	9.9
Charge balance	-4.9	1.5	0.9	-2.9	.	.	.	.
Trace Metals (mg/L)								
Aluminum	<	<	<	<	.	.	.	.
Arsenic (PMS)	.	.	.	.	.	.	.	.
Arsenic	<	<	<	<	.	.	.	.
Barium	0.0572	0.0545	0.0558	0.0478	.	.	.	.
Beryllium	<	<	<	<	.	.	.	.
Boron	0.365	<	<	<	.	.	.	.
Cadmium (PMS)	.	.	.	.	.	.	.	.
Cadmium	<	<	<	<	.	.	.	.
Chromium (PMS)	.	.	.	.	.	.	.	.
Chromium	<	<	<	<	.	.	.	.
Cobalt	<	<	<	<	.	.	.	.
Copper	<	<	<	<	.	.	.	.
Iron	0.154	0.137	0.0656	<	.	.	.	.
Lead (PMS)	.	.	.	.	.	.	.	.
Lead	<	<	<	<	.	.	.	.
Lithium	0.126	0.0607	0.0279	0.0184	.	.	.	.
Manganese	0.0594	0.0685	0.0388	0.0251	.	.	.	.
Mercury (CVAA)	.	.	.	.	.	.	.	.
Nickel (PMS)	.	.	.	.	.	.	.	.
Nickel	<	<	<	<	.	.	.	.
Strontium	0.154	0.155	0.146	0.135	.	.	.	.
Thallium (PMS)	.	.	.	.	.	.	.	.
Thallium	<	<	<	<	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.
Uranium (KPA)	0.12	0.073	0.0344	0.00761	.	.	.	.
Vanadium	<	<	<	<	.	.	.	.
Zinc	<	<	<	<	.	.	.	.

APPENDIX E.1: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Sampling Point	STATION 17				STATION 8			
Location	EXP-SW				EXP-SW			
Date Sampled	02/01/02	02/14/02	08/20/02	09/03/02	02/01/02	02/14/02	08/20/02	09/03/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								
Field Measurements								
Time Sampled	13:56	10:53	12:37	14:00	13:31	10:18	13:57	13:30
Measuring Point Elev. (ft)	.	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.	.
Groundwater Elevation (ft)								
Conductivity ($\mu\text{mho}/\text{cm}$)	136	170	186	161	135	169	154	153
Dissolved Oxygen (ppm)	11.45	12.2	6.95	7.35	11.84	11.12	7.8	9.09
Oxidation/Reduction (mV)	155	75	35	30	180	70	45	25
Temperature (degrees C)	15.4	11.5	24.8	23.7	14.5	12.4	22.8	21.3
Turbidity (NTU)	31	3	27	34	10	6	10	56
Iron ++ (mg/L)	.	.	.	.	.	.	.	.
Manganese ++ (mg/L)	.	.	.	.	.	.	.	.
pH	8.09	8.31	7.77	7.93	7.88	8.38	7.93	7.88
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	.	.
Dissolved Solids (mg/L)	201	191	194	194	203	188	200	201
Suspended Solids (mg/L)	<	<	<	<	<	<	<	<
Turbidity (NTU)	.	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.	.
Major Ions (mg/L)								
Calcium	44	42.5	40.7	38.6	41.2	42	39.5	38.3
Magnesium	11.5	11.7	10.2	9.76	10.7	11.1	9.88	9.76
Potassium	2.32	2.11	2.25	2.2	2.24	2.22	2.21	2.13
Sodium	9.93	9.59	9.42	8.23	9.35	9.31	7.67	7.35
Alkalinity as CO ₃	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	135	123	108	105	136	125	105	105
Chloride	12.9	11.6	12.8	11.7	11.6	11.6	10.2	10.4
Fluoride	0.24	0.36	0.6	0.45	0.25	0.36	0.54	0.39
Nitrate as N	2.5	1.5	2.1	1.4	2.7	2.5	2.1	1.4
Sulfate	31.3	31.4	30.4	27.9	31.3	32.3	28.4	27.2
Charge balance	-3.6	-0.2	0.0	0.1	-6.9	-3.2	0.3	0.1
Trace Metals (mg/L)								
Aluminum	0.325	<	<	0.211	<	<	<	<
Arsenic (PMS)	.	.	.	.	.	.	.	.
Arsenic	<	<	<	<	<	<	<	<
Barium	0.0484	0.0424	0.0438	0.0395	0.0423	0.0407	0.0422	0.039
Beryllium	<	<	<	<	<	<	<	<
Boron	<	<	<	<	0.124	<	<	<
Cadmium (PMS)	.	.	.	.	.	.	.	.
Cadmium	<	<	<	<	<	<	<	<
Chromium (PMS)	.	.	.	.	.	.	.	.
Chromium	<	<	<	<	<	<	<	<
Cobalt	<	<	<	<	<	<	<	<
Copper	<	<	<	<	<	<	<	<
Iron	0.394	0.137	0.176	0.176	0.243	0.172	0.266	0.239
Lead (PMS)	.	.	.	.	.	.	.	.
Lead	<	<	<	<	<	<	<	<
Lithium	0.0334	0.0311	0.0113	<	0.0428	0.0208	0.0127	<
Manganese	0.0462	0.0338	0.0453	0.0487	0.0645	0.0566	0.0892	0.08
Mercury (CVAA)	.	.	.	.	.	.	.	.
Nickel (PMS)	.	.	.	.	.	.	.	.
Nickel	<	<	<	<	<	<	<	<
Strontium	0.131	0.124	0.119	0.113	0.134	0.13	0.117	0.114
Thallium (PMS)	.	.	.	.	.	.	.	.
Thallium	<	<	<	<	<	<	<	<
Uranium (PMS)	.	.	.	.	.	.	.	.
Uranium (KPA)	0.0281	0.0172	0.00877	<	0.04	0.0185	0.00958	<
Vanadium	<	<	<	<	<	<	<	<
Zinc	<	<	<	<	<	<	<	<

APPENDIX E.2
VOLATILE ORGANIC COMPOUNDS

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	55-1B			GHK2.51ESW		GHK2.51WSW			GW-108	
Location	GRIDB2			EXP-NPR		EXP-NPR			S3	
Date Sampled	04/17/02		10/14/02	05/15/02	10/29/02	05/15/02	10/29/02		01/08/02	07/09/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC
Sample Type	Dup						Dup			
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	1 J	2 J
Trichloroethene	<	<	<	<	<	<	<	<	3 J	3 J
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	29	32
Methylene chloride	<	<	<	<	<	<	<	<	<	69
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dibromoethane	<	<	<	<	<	<	<	<	.	.
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	18
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	4 J	5 J
Bromomethane	<	<	<	<	<	<	<	<	<	14
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	<	<	<	.	.
Natural Attenuation (µg/L)										
Ethylene
Methane

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-151		GW-153		GW-154		GW-169			
Location	NHP		NHP		NHP		EXP-UV			
Date Sampled	01/30/02	08/05/02	04/25/02	10/21/02	01/30/02	08/05/02	02/04/02	05/13/02	08/06/02	11/11/02
Program	BJC	BJC	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	240	500	2 J	4 J	<	<	2 J	2 J	2 J	1
Trichloroethene	120	120	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	32	46	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	1,100	1,500	110	140	<	<	<	<	<	<
Chloroform	77	91	7	7	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dibromoethane	.	.	<	<	.	.	.	.	.	.
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	63 Q	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	.	.	<	<	.	.	.	.	.	.
Natural Attenuation (µg/L)										
Ethylene	<	<	.	.	<	<	.	.	.	.
Methane	12	16	.	.	18	10	.	.	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-170								GW-171			
	EXP-UV				EXP-UV				02/05/02	08/07/02		
Date Sampled	02/04/02		05/14/02		08/06/02		11/11/02					
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC				
Sample Type	Dup	Dup	Dup	Dup	Dup	Dup	Dup	Dup				
Chloroethenes (µg/L)												
Tetrachloroethene	2 J	3 J	3 J	3 J	2 J	3 J	3	0.6	<	<		
Trichloroethene	1 J	2 J	2 J	2 J	2 J	2 J	2	<	<	<		
cis-1,2-Dichloroethene	<	<	<	<	<	<	0.3 J	<	<	<		
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<		
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<		
Vinyl chloride	<	<	<	<	<	<	<	<	<	<		
Chloroethanes (µg/L)												
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<		
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<		
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<		
Chloroethane	<	<	<	<	<	<	<	<	<	<		
Chloromethanes (µg/L)												
Carbon tetrachloride	3 J	3 J	2 J	2 J	2 J	2 J	5	2	<	<		
Chloroform	8	8	8	8	7	7	6 R	0.2 R	<	<		
Methylene chloride	<	<	<	<	<	<	<	<	<	<		
Petrol. Hydrocarb. (µg/L)												
Benzene	3 J	3 J	4 J	4 J	<	<	5 R	0.5 R	<	<		
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<		
Ethylbenzene	<	<	<	<	<	<	<	<	<	<		
Toluene	<	<	<	<	<	<	0.4 J	<	<	<		
Styrene	<	<	<	<	<	<	<	<	<	<		
Miscellaneous (µg/L)												
1,2-Dibromoethane	.	.	.	.	.	.	.	.	.	.
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<		
Acetone	<	<	<	<	<	<	<	<	<	<		
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<		
Bromoform	<	<	<	<	<	<	<	<	<	<		
Bromomethane	<	<	<	<	<	<	<	<	<	<		
Carbon disulfide	<	<	<	<	<	<	<	<	<	<		
Chlorobenzene	<	<	<	<	<	<	<	<	<	<		
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<		
Trichlorofluoromethane	.	.	.	.	.	.	.	.	.	.
Natural Attenuation (µg/L)												
Ethylene	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-172		GW-193		GW-204		GW-207			GW-208	
Location	EXP-UV		T2331		T0134		EXP-SR			EXP-SR	
Date Sampled	02/05/02	08/07/02	01/08/02	07/09/02	05/02/02	11/06/02	05/08/02	11/19/02		05/08/02	11/19/02
Program	BJC	BJC	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type									Dup		
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	25	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dibromoethane	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	59 Q	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	<
Natural Attenuation ($\mu\text{g/L}$)											
Ethylene
Methane

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-219			GW-220		GW-223		GW-230		GW-232	
Location	UOV			NHP		NHP		EXP-UV		EXP-UV	
Date Sampled	05/06/02	11/07/02		05/14/02	11/21/02	01/31/02	08/05/02	02/05/02	08/07/02	02/04/02	05/13/02
Program	GWPP	GWPP		GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup									
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	<	<	<	270	310	45	40	<	<	<	<
Trichloroethene	<	<	<	56	61	15	15	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	21	21	44	52	13	10	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	2 J	<	4	<	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	<	1,000	1,200	<	<	<	<	<	<
Chloroform	<	<	<	54	59	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dibromoethane	<	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	1 J	<	<
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<	<	<
Natural Attenuation ($\mu\text{g/L}$)											
Ethylene	<	<
Methane	120	61	.	.	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-232		GW-251		GW-253		GW-349		GW-350		
Location	EXP-UV		S2		S2		S2		S2		
Date Sampled	08/06/02	11/11/02	04/18/02	10/16/02	05/07/02	11/07/02	04/16/02	10/14/02	04/16/02	10/15/02	10/15/02
Program	BJC	BJC	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type											Dup
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	<	<	230	81	680	580	<	<	<	<	<
Trichloroethene	<	<	130	38	600	610	<	2 J	<	2 J	<
cis-1,2-Dichloroethene	<	<	11	2 J	260	150	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	2 J	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	63	39	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	6	<	35	19	<	<	<	<	<
Chloroform	<	<	11	7	46	32	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	0.6	<	<	1 J	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dibromoethane	.	.	<	<	.	.	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	.	.	<	<	.	.	<	<	<	<	<
Natural Attenuation ($\mu\text{g/L}$)											
Ethylene	0.8 J	.	.	.	.	.
Methane	5	4	.	.	.	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-380		GW-381		GW-382		GW-383		GW-605	
Location	NHP		NHP		NHP		NHP		EXP-I	
Date Sampled	02/04/02	08/05/02	06/12/02	10/22/02	02/04/02	08/06/02	04/25/02	10/22/02	01/08/02	
Program	BJC	BJC	GWPP	GWPP	BJC	BJC	GWPP	GWPP	BJC	BJC
Sample Type									Dup	
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	5 J	<	8	9 J	400	380 J	76	77
Trichloroethene	<	<	<	<	2 J	<	170	200	82	85
cis-1,2-Dichloroethene	<	<	6	2 J	2 J	<	130	140	140	150
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	1 J	1 J
1,1-Dichloroethene	<	<	<	<	<	<	3 J	3 J	<	<
Vinyl chloride	<	<	<	<	<	<	<	2 J	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	380	160	510	230	<	<	53	54
Chloroform	<	5	620	19	380	400	<	<	11	11
Methylene chloride	<	<	120 Q	11	<	43	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dibromoethane	.	.	<	<	.	.	<	<	.	.
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	9 J	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	.	.	<	<	.	.	<	<	.	.
Natural Attenuation (µg/L)										
Ethylene
Methane

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-605		GW-606		GW-618		GW-620		GW-633	
Location	EXP-I		EXP-I		EXP-E		FTF		RG	
Date Sampled	07/08/02		01/08/02	07/08/02	05/09/02	11/07/02	04/23/02	10/15/02	04/23/02	10/17/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	GWPP	GWPP	GWPP	GWPP
Sample Type	Dup									
Chloroethenes (µg/L)										
Tetrachloroethene	33	30	5	7	4 J	7	15	17	180	170
Trichloroethene	33	32	<	<	11	16	7	7	8	6
cis-1,2-Dichloroethene	50	50	<	<	17	31	17	13	10	10
trans-1,2-Dichloroethene	<	<	<	<	<	0.5	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	3 J	<
Vinyl chloride	<	<	<	<	<	3	<	<	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	19	18	110	180	<	<	<	<	<	<
Chloroform	12	12	230	140	<	<	<	<	20	17
Methylene chloride	<	<	<	<	<	<	<	<	36	27
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	840	850
Dimethylbenzene	<	<	<	<	<	<	<	4 J	110	95
Ethylbenzene	<	<	<	<	<	<	<	<	20	8
Toluene	<	<	<	<	<	<	1 J	2 J	4 J	2 J
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dibromoethane	.	.	.	.	.	.	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	4 J	3 J
Bromomethane	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	.	.	.	.	.	.	<	<	<	<
Natural Attenuation (µg/L)										
Ethylene	.	.	.	.	<	<	.	.	.	.
Methane	.	.	.	.	9	14	.	.	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-658		GW-686	GW-687	GW-689	GW-698			GW-722-06				
Location	FF		CPT	CPT	CPT	B8110			EXP-J				
Date Sampled	04/24/02	10/17/02	11/14/02	11/14/02	11/14/02	05/02/02		11/07/02	02/04/02	05/23/02	07/15/02	11/07/02	
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	GWPP	BJC	
Sample Type							Dup						
Chloroethenes (µg/L)													
Tetrachloroethene	<	<	<	<	<	150	130	130	<	<	<	<	<
Trichloroethene	<	<	<	<	<	340	350	180	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	36	<	<	21	20	43	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	11	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)													
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	570	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)													
Carbon tetrachloride	<	<	<	<	<	11	10	3 J	<	<	<	<	<
Chloroform	<	<	<	<	<	16	17	5	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)													
Benzene	7,800	8,700	<	<	<	<	<	<	<	<	<	<	0.2 J
Dimethylbenzene	8,800	8,800	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	920	1,400	<	<	<	<	<	<	<	<	<	<	<
Toluene	4,800	4,900	<	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)													
1,2-Dibromoethane	<	77	<	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	200	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<	<	<	<	<
Natural Attenuation (µg/L)													
Ethylene	.	.	.	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-722-10					GW-722-14				
	EXP-J					EXP-J				
Date Sampled	02/06/02	05/29/02	07/16/02	11/12/02	12/12/02	02/08/02	05/30/02	07/17/02	11/13/02	
Program	GWPP	BJC	GWPP	BJC	BJC	GWPP	BJC	GWPP	BJC	
Sample Type										
Chloroethenes ($\mu\text{g/L}$)										
Tetrachloroethylene	<	3 J	<	2	3	10	6	4 J	0.2 J	
Trichloroethylene	<	<	<	0.5	0.8	2 J	2 J	<	<	
cis-1,2-Dichloroethylene	<	<	<	0.3 J	<	<	<	<	<	0.3 J
trans-1,2-Dichloroethylene	<	<	<	<	<	<	<	<	<	
1,1-Dichloroethylene	<	<	<	<	<	<	<	<	<	
Vinyl chloride	<	<	<	<	<	<	<	<	<	
Chloroethanes ($\mu\text{g/L}$)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	
Chloroethane	<	<	<	<	<	<	<	<	<	
Chloromethanes ($\mu\text{g/L}$)										
Carbon tetrachloride	<	<	<	0.4 J	<	160	65	55	7 Q	
Chloroform	<	<	<	<	0.4 J	11	12	7	<	
Methylene chloride	<	<	<	<	<	<	<	<	<	
Petrol. Hydrocarb. ($\mu\text{g/L}$)										
Benzene	<	<	<	<	<	<	<	<	<	
Dimethylbenzene	<	1 J	<	<	<	<	<	<	<	
Ethylbenzene	<	1 J	<	<	<	2	<	<	<	
Toluene	<	<	<	<	0.4 J	<	<	<	<	
Styrene	<	<	<	<	0.3 J	<	<	<	<	
Miscellaneous ($\mu\text{g/L}$)										
1,2-Dibromoethane	<	.	<	.	.	<	.	.	<	
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	
Acetone	<	<	<	<	<	<	5 J	<	<	
Bromodichloromethane	<	<	<	<	<	<	<	<	<	
Bromoform	<	<	<	<	<	<	<	<	<	
Bromomethane	<	<	<	<	<	<	<	<	<	
Carbon disulfide	<	<	<	<	<	<	<	<	<	
Chlorobenzene	<	<	<	<	<	<	<	<	<	
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	
Trichlorofluoromethane	<	.	<	
Natural Attenuation ($\mu\text{g/L}$)										
Ethylene	
Methane	

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-722-17				GW-722-20				GW-722-22		
Location	EXP-J				EXP-J				EXP-J		
Date Sampled	02/08/02	06/03/02	07/17/02	11/13/02	02/07/02	05/30/02	07/17/02		11/12/02	02/07/02	
Program	GWPP	BJC	GWPP	BJC	GWPP	BJC	GWPP	GWPP	BJC	GWPP	GWPP
Sample Type							Dup			Dup	
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	11	11	11	< Q	13	25	25	21	77	10	18
Trichloroethene	2 J	2 J	2 J	<	2 J	4 J	4 J	3 J	6	2 J	3 J
cis-1,2-Dichloroethene	<	<	<	<	2 J	3 J	<	2 J	4	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	1	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	1	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	0.6	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	150	58	110	< Q	140	190	290	280	390	97	180
Chloroform	17	16	14	< Q	28	43	34	30	72	16	19
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dibromoethane	<	.	<	.	<	.	<	<	.	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	.	<	.	<	.	3 J	3 J	.	<	<
Natural Attenuation ($\mu\text{g/L}$)											
Ethylene	.	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-722-22				GW-722-26							
Location	EXP-J				EXP-J							
Date Sampled	05/30/02	07/16/02	11/12/02	02/05/02	05/28/02		07/15/02	11/11/02		12/12/02		
Program	BJC	GWPP	BJC	GWPP	BJC	BJC	GWPP	BJC	BJC	BJC	BJC	
Sample Type					Dup			Dup		Dup		
Chloroethenes ($\mu\text{g/L}$)												
Tetrachloroethene	11	13	0.3 Q	<	<	<	<	<	<	<	<	
Trichloroethene	2 J	2 J	<	<	<	<	<	<	<	<	<	
cis-1,2-Dichloroethene	1 J	<	<	<	<	<	<	<	<	<	<	
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<	
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<	
Vinyl chloride	<	<	<	<	<	<	<	<	<	<	<	
Chloroethanes ($\mu\text{g/L}$)												
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<	
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<	
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<	
Chloroethane	<	<	<	<	<	<	<	<	<	<	<	
Chloromethanes ($\mu\text{g/L}$)												
Carbon tetrachloride	89	83	4 Q	<	<	<	<	<	<	<	<	
Chloroform	21	13	1 Q	<	<	<	<	<	<	<	<	
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<	
Petrol. Hydrocarb. ($\mu\text{g/L}$)												
Benzene	<	<	<	<	<	<	<	<	0.8	1	1	
Dimethylbenzene	<	<	<	<	<	<	<	<	2	2	2	
Ethylbenzene	<	<	<	2 J	3 J	3 J	3 J	3 J	3	4	4	
Toluene	<	<	<	2 J	3 J	3 J	2 J	3 J	3	3	3	
Styrene	<	<	<	3 J	1 J	1 J	4 J	1	0.8	0.9	0.6	
Miscellaneous ($\mu\text{g/L}$)												
1,2-Dibromoethane	.	<	.	<	.	.	<	.	.	.	.
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<	
Acetone	<	<	<	<	<	<	<	<	<	<	<	
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<	<	
Bromoform	<	<	<	<	<	<	<	<	<	<	<	
Bromomethane	<	<	<	<	<	<	<	<	<	<	<	
Carbon disulfide	<	<	<	<	<	<	<	<	1	0.4 J	<	
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<	
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<	<	
Trichlorofluoromethane	.	<	.	<	.	.	<	.	.	.	.
Natural Attenuation ($\mu\text{g/L}$)												
Ethylene	.	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-722-30					GW-722-32				
Location	EXP-J					EXP-J				
Date Sampled	02/05/02	05/28/02	07/15/02	11/11/02	12/12/02	02/05/02	05/28/02	07/15/02	11/12/02	12/12/02
Program	GWPP	BJC	GWPP	BJC	BJC	GWPP	BJC	GWPP	BJC	BJC
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	0.9	1
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	0.3 J	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dibromoethane	<	.	<	.	.	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	.	<	.	.	<	.	<	.	.
Natural Attenuation (µg/L)										
Ethylene
Methane

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-722-33					GW-733		GW-735		GW-744	
Location	EXP-J					EXP-J		EXP-J		GRIDK1	
Date Sampled	02/06/02	05/29/02	07/16/02	11/12/02	12/12/02	01/08/02	07/09/02	05/14/02	11/21/02	05/07/02	11/18/02
Program	GWPP	BJC	GWPP	BJC	BJC	BJC	BJC	GWPP	GWPP	GWPP	GWPP
Sample Type											
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	<	<	<	10	5	<	<	<	<
Chloroform	<	<	<	<	1	1	<	1 J	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dibromoethane	<	.	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	.	<	<	<	<
Natural Attenuation ($\mu\text{g/L}$)											
Ethylene
Methane

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-747		GW-750		GW-762				GW-763	
Location	GRIDK2		EXP-J		GRIDJ3				GRIDJ3	
Date Sampled	05/09/02	11/20/02	05/05/02	11/20/02	01/31/02		07/31/02		06/12/02	10/21/02
Program	GWPP	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	GWPP	GWPP
Sample Type					Dup		Dup			
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	2,200	2,100	2,400	2,300	32	43
Trichloroethene	<	<	<	<	110 J	190	150	170	8	10
cis-1,2-Dichloroethene	<	<	<	<	70	67	50	58	79	130
trans-1,2-Dichloroethene	<	<	<	<	2 J	2 J	2 J	2 J	<	<
1,1-Dichloroethene	<	<	<	<	<	<	44	60	3 J	4 J
Vinyl chloride	<	<	<	<	4	5	4	4	5	10
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	6	5	4 J	4 J	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	15	13	10	12	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<
Chloromethanes (µg/L)										
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	<	<	<	<	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dibromoethane	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	<
Natural Attenuation (µg/L)										
Ethylene	8 J	<	<	8	.	.
Methane	46	39	46	55	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-769		GW-770		GW-775		GW-776		GW-782	
Location	GRIDG3		GRIDG3		GRIDH3		GRIDH3		GRIDE3	
Date Sampled	04/29/02	10/30/02	04/29/02	10/30/02	04/30/02	10/31/02	04/30/02	10/31/02	05/01/02	11/04/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type										
Chloroethenes (µg/L)										
Tetrachloroethylene	11	22	<	<	<	<	<	<	170	160
Trichloroethylene	3 J	6	<	<	4 J	6	<	2 J	60	56
cis-1,2-Dichloroethylene	3 J	6	<	<	<	<	<	<	13	13
trans-1,2-Dichloroethylene	<	<	<	<	<	<	<	<	2 J	2 J
1,1-Dichloroethylene	<	<	<	<	<	<	<	<	48	32
Vinyl chloride	<	<	<	<	<	<	<	<	<	2
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	9	3 J
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	180	130
Chloroethane	<	<	<	<	<	<	<	<	12	7
Chloromethanes (µg/L)										
Carbon tetrachloride	58	160	3 J	7	<	<	<	<	<	<
Chloroform	3 J	6	5 J	3 J	<	<	<	<	<	<
Methylene chloride	<	7	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. (µg/L)										
Benzene	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
1,2-Dibromoethane	<	<	<	<	<	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<	<
Natural Attenuation (µg/L)										
Ethylene	.	.	.	.	.	.	.	.	.	.
Methane	.	.	.	.	.	.	.	.	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	GW-791		GW-816		GW-832		LRSPW			NPR07.0SW	
Location	GRID2		EXP-SR		NHP		EXP-SW			EXP-NPR	
Date Sampled	05/01/02	11/06/02	05/07/02	11/18/02	01/31/02	08/05/02	05/06/02		11/19/02	05/15/02	10/29/02
Program	GWPP	GWPP	GWPP	GWPP	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type							Dup				
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	260	650	<	<	4 J	4 J	3 J	2 J	4 J	<	<
Trichloroethene	2 J	3 J	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	<	<	9	6	5	5 J	14	<	<
Chloroform	<	<	<	<	2 J	8	3 J	3 J	4 J	<	<
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dibromoethane	<	<	<	<	<	.	.	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<	<
Bromoform	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	.	.	<	<	<	<	<
Natural Attenuation ($\mu\text{g/L}$)											
Ethylene	.	.	.	.	.	<	<	.	.	.	.
Methane	.	.	.	.	.	<	<	.	.	.	.

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	NPR12.0SW			NPR23.0SW		OF 51		OF 200			
Location	EXP-NPR			EXP-NPR		EXP-SW		EXP-SW			
Date Sampled	05/15/02	05/15/02	10/29/02	05/15/02	10/29/02	02/14/02	09/03/02	02/01/02	02/14/02	08/20/02	09/03/02
Program	GWPP	GWPP	GWPP	GWPP	GWPP	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type	Dup										
Chloroethenes ($\mu\text{g/L}$)											
Tetrachloroethene	<	<	<	<	<	12	24	<	4 J	2 J	1 J
Trichloroethene	<	<	<	<	<	5 J	10	<	1 J	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	5	12	<	1 J	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)											
1,1,1-Trichloroethane	<	<	<	<	<	1 J	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	1 J	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)											
Carbon tetrachloride	<	<	<	<	<	<	1 J	<	<	<	<
Chloroform	<	<	<	<	<	2 J	7	5	4 J	8	8
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)											
Benzene	<	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)											
1,2-Dibromoethane	<	<	<	<	<
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	2 J	1 J	2 J	2 J
Bromoform	<	<	<	<	<	<	<	1 J	1 J	4 J	3 J
Bromomethane	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	1 J	1 J
Trichlorofluoromethane	<	<	<	<	<
Natural Attenuation ($\mu\text{g/L}$)											
Ethylene
Methane

APPENDIX E.2: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Sampling Point	SCR7.1SP		SCR7.8SP		STATION 17					STATION 8				
Location	EXP-UV		EXP-UV		EXP-SW					EXP-SW				
Date Sampled	02/11/02	07/11/02	02/11/02	07/11/02	02/01/02	02/14/02	08/20/02	09/03/02	02/01/02	02/14/02	08/20/02	09/03/02		
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC		
Sample Type														
Chloroethenes ($\mu\text{g/L}$)														
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
trans-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Vinyl chloride	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethanes ($\mu\text{g/L}$)														
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,2-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroethane	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloromethanes ($\mu\text{g/L}$)														
Carbon tetrachloride	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chloroform	<	<	<	<	2 J	2 J	5 J	5 J	5 J	5 J	5	9	9	
Methylene chloride	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Petrol. Hydrocarb. ($\mu\text{g/L}$)														
Benzene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Dimethylbenzene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Ethylbenzene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Toluene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Styrene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Miscellaneous ($\mu\text{g/L}$)														
1,2-Dibromoethane
4-Methyl-2-pentanone	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Acetone	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromodichloromethane	<	<	<	<	<	<	<	<	<	<	2 J	2 J	2 J	2 J
Bromoform	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Bromomethane	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Carbon disulfide	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorobenzene	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Chlorodibromomethane	<	<	<	<	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane
Natural Attenuation ($\mu\text{g/L}$)														
Ethylene
Methane

APPENDIX E.3
RADIOLOGICAL ANALYTES

APPENDIX E.3: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Location	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	Error	MDA	Activity	Error	MDA
55-1B	GRIDB2	04/17/02	GWPP	6.4	3.8	4.6	<MDA	.	9.1
55-1B Dup	GRIDB2	04/17/02	GWPP	3.8	2.9	3.6	<MDA	.	8.7
55-1B	GRIDB2	10/14/02	GWPP	<MDA	.	4	<MDA	.	9.8
GHK2.51ESW	EXP-NPR	05/15/02	GWPP	<MDA	.	3.9	7.40	4.8	7.3
GHK2.51ESW	EXP-NPR	10/29/02	GWPP	<MDA	.	2.6	<MDA	.	7.8
GHK2.51WSW	EXP-NPR	05/15/02	GWPP	<MDA	.	4	<MDA	.	9.9
GHK2.51WSW	EXP-NPR	10/29/02	GWPP	<MDA	.	2	<MDA	.	6.8
GHK2.51WSW Dup	EXP-NPR	10/29/02	GWPP	<MDA	.	2.1	<MDA	.	8.2
GW-108	S3	01/08/02	BJC	<MDA	.	109.95	7,954.49	183.42	82.38
GW-108	S3	07/09/02	BJC	146.63	97.76	93.97	11,532.61	213.59	81.55
GW-151	NHP	01/30/02	BJC	2.21	1.56	2.14	7.12	1.6	1.99
GW-151	NHP	08/05/02	BJC	<MDA	.	1.03	2.99	1.68	1.61
GW-153	NHP	04/25/02	GWPP	<MDA	.	3.3	<MDA	.	7.7
GW-153	NHP	10/21/02	GWPP	<MDA	.	3.1	<MDA	.	8.3
GW-154	NHP	01/30/02	BJC	755.5	23.57	3.76	103.65	4.41	2.37
GW-154	NHP	08/05/02	BJC	1,270.56	30.92	4.98	275.92	7.57	3.85
GW-169	EXP-UV	02/04/02	BJC	1.89	1.15	1.51	3.74	1.33	1.8
GW-169	EXP-UV	05/13/02	BJC	<MDA	.	2.27	3.12	1.33	1.82
GW-169	EXP-UV	08/06/02	BJC	2.03	1	1.02	3.81	1.79	2.06
GW-169	EXP-UV	11/11/02	BJC	<MDA	.	1.83	<MDA	.	4.01
GW-170	EXP-UV	02/04/02	BJC	<MDA	.	1.72	7.04	1.52	1.84
GW-170 Dup	EXP-UV	02/04/02	BJC	<MDA	.	1.63	6.62	1.49	1.82
GW-170	EXP-UV	05/14/02	BJC	<MDA	.	1.41	12.21	1.54	1.54
GW-170 Dup	EXP-UV	05/14/02	BJC	1.5	1.08	1.44	8.57	1.4	1.55
GW-170	EXP-UV	08/06/02	BJC	<MDA	.	0.77	10.14	1.43	1.43
GW-170 Dup	EXP-UV	08/06/02	BJC	0.91	0.76	0.89	10.93	1.62	1.59
GW-170	EXP-UV	11/11/02	BJC	<MDA	.	2.17	7.02	3.58	3.43
GW-170 Dup	EXP-UV	11/11/02	BJC	<MDA	.	2.17	5.6	3.14	3.02
GW-171	EXP-UV	02/05/02	BJC	<MDA	.	1.92	7.09	1.54	1.87
GW-171	EXP-UV	08/07/02	BJC	2.26	1.45	1.89	12.93	1.72	1.8
GW-172	EXP-UV	02/05/02	BJC	<MDA	.	2.17	3.52	1.39	1.9
GW-172	EXP-UV	08/07/02	BJC	2.08	1.36	1.73	2.51	1.21	1.69
GW-193	T2331	01/08/02	BJC	<MDA	.	4.61	9.13	2.01	2.46
GW-193	T2331	07/09/02	BJC	<MDA	.	2.21	7.29	1.64	2
GW-204	T0134	05/02/02	GWPP	35	6.4	2.2	<MDA	.	7.9
GW-204	T0134	11/06/02	GWPP	22	6.3	7.2	16	5.1	6.8
GW-207	EXP-SR	05/08/02	GWPP	<MDA	.	3	7	4.6	7
GW-207	EXP-SR	11/19/02	GWPP	<MDA	.	3	<MDA	.	9.6
GW-207 Dup	EXP-SR	11/19/02	GWPP	2.3	1.9	2	<MDA	.	7.3
GW-208	EXP-SR	05/08/02	GWPP	<MDA	.	4	<MDA	.	8
GW-208	EXP-SR	11/19/02	GWPP	<MDA	.	2.7	7.7	4.6	6.8
GW-219	UOV	05/06/02	GWPP	120	13	4	77	9.5	8
GW-219	UOV	11/07/02	GWPP	170	15	7.6	91	8.8	7.1
GW-219 Dup	UOV	11/07/02	GWPP	210	17	7.5	100	9.4	7.1
GW-220	NHP	05/14/02	GWPP	<MDA	.	2.8	5.7	3.3	4.7
GW-220	NHP	11/21/02	GWPP	3.9	2.6	3.2	<MDA	.	7.9
GW-223	NHP	01/31/02	BJC	12.19	2.38	1.97	6.13	1.82	2.02
GW-223	NHP	08/05/02	BJC	14	2.17	0.99	15.24	3.37	3.04

APPENDIX E.3: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Location	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	Error	MDA	Activity	Error	MDA
GW-230	EXP-UV	02/05/02	BJC	<MDA		3.79	10.03	2.72	2.52
GW-230	EXP-UV	08/07/02	BJC	46.34 Q	5.62	1.48	2,560.37 Q	19.29	2.05
GW-232	EXP-UV	02/04/02	BJC	<MDA		2.96	1.9	1.29	1.88
GW-232	EXP-UV	05/13/02	BJC	<MDA		2.92	4.25	3.06	3.61
GW-232	EXP-UV	08/06/02	BJC	<MDA		3.45	<MDA		2.76
GW-232	EXP-UV	11/11/02	BJC	<MDA		4.46	<MDA		4.23
GW-251	S2	04/18/02	GWPP	7.5	3.4	3	<MDA		6.9
GW-251	S2	10/16/02	GWPP	8.3	3.8	4.1	<MDA		7.3
GW-253	S2	05/07/02	BJC	45.1	9.67	5.53	25.44	11.29	10.73
GW-253	S2	11/07/02	BJC	29.98	12.51	11.43	20.45	8.77	8.35
GW-349	S2	04/16/02	GWPP	5.9	2.9	2.7	<MDA		8.7
GW-349	S2	10/14/02	GWPP	<MDA		4.2	<MDA		8.5
GW-350	S2	04/16/02	GWPP	4.5	2.8	3.2	<MDA		8.4
GW-350	S2	10/15/02	GWPP	<MDA		3.6	<MDA		8.8
GW-350 Dup	S2	10/15/02	GWPP	<MDA		3	<MDA		7.9
GW-380	NHP	02/04/02	BJC	<MDA		3.8	3.29	1.72	2.43
GW-380	NHP	08/05/02	BJC	<MDA		1.84	6.86	3.08	2.93
GW-381	NHP	04/24/02	GWPP	<MDA		3	<MDA		8.2
GW-381	NHP	10/22/02	GWPP	<MDA		3.9	<MDA		10
GW-382	NHP	02/04/02	BJC	2.55	1.73	2.34	5.79	1.51	1.91
GW-382	NHP	08/06/02	BJC	1.76	1.46	1.72	3.71	1.28	1.44
GW-383	NHP	04/25/02	GWPP	<MDA		3.6	<MDA		8.7
GW-383	NHP	10/22/02	GWPP	<MDA		3.2	<MDA		9.7
GW-605	EXP-I	01/08/02	BJC	48.42	5.12	2.83	14.94	2.15	2.29
GW-605 Dup	EXP-I	01/08/02	BJC	44.82	5.27	3.18	13.39	1.84	1.94
GW-605	EXP-I	07/08/02	BJC	51.84	4.16	2.21	21.23	2.14	1.88
GW-605 Dup	EXP-I	07/08/02	BJC	52.08	5.75	3.78	28.77	2.73	2.34
GW-606	EXP-I	01/08/02	BJC	<MDA		2.83	18.6	2.37	2.42
GW-606	EXP-I	07/08/02	BJC	5.63	2.41	2.94	9.83	1.84	2.11
GW-618	EXP-E	05/09/02	BJC	<MDA		2.52	7.98	1.79	2.17
GW-618	EXP-E	11/07/02	BJC	<MDA		1.86	<MDA		3.35
GW-620	FTF	04/23/02	GWPP	<MDA		3	<MDA		9
GW-620	FTF	10/15/02	GWPP	<MDA		3.4	<MDA		9.6
GW-633	RG	04/23/02	GWPP	<MDA		44	3000	150	71
GW-633	RG	10/17/02	GWPP	<MDA		43	3700	170	71
GW-658	FF	04/24/02	GWPP	<MDA		2.9	<MDA		7
GW-658	FF	10/17/02	GWPP	<MDA		3.7	<MDA		6.7
GW-686	CPT	11/14/02	GWPP	<MDA		34	<MDA		68
GW-687	CPT	11/14/02	GWPP	<MDA		50	<MDA		84
GW-689	CPT	11/14/02	GWPP	100	56	53	<MDA		140
GW-698	B8110	05/02/02	GWPP	2.8	2.5	1.5	7.3	4.4	6.6
GW-698 Dup	B8110	05/02/02	GWPP	<MDA		4.1	<MDA		6.5
GW-698	B8110	11/07/02	GWPP	<MDA		8.7	<MDA		7.9
GW-722-06	EXP-J	02/04/02	GWPP	<MDA		4.6	<MDA		9
GW-722-06	EXP-J	05/23/02	BJC	<MDA		4.1	15.99	4.29	3.97
GW-722-06	EXP-J	07/15/02	GWPP	<MDA		10	<MDA		9.3
GW-722-06	EXP-J	11/07/02	BJC	<MDA		3.8	10.95	3.95	3.73

APPENDIX E.3: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Location	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	Error	MDA	Activity	Error	MDA
GW-722-10	EXP-J	02/06/02	GWPP	<MDA	.	3.2	<MDA	.	7.4
GW-722-10	EXP-J	05/29/02	BJC	<MDA	.	3.74	7.79	6.39	6.22
GW-722-10	EXP-J	07/16/02	GWPP	<MDA	.	7	<MDA	.	9.2
GW-722-10	EXP-J	11/12/02	BJC	<MDA	.	2.55	3.56	2.84	2.77
GW-722-14	EXP-J	02/08/02	GWPP	<MDA	.	2.7	<MDA	.	8.4
GW-722-14	EXP-J	05/30/02	BJC	<MDA	.	2.53	<MDA	.	3.51
GW-722-14	EXP-J	07/17/02	GWPP	<MDA	.	3.6	<MDA	.	7.4
GW-722-14	EXP-J	11/13/02	BJC	9.58	2.72	2.29	13.22	3.86	3.59
GW-722-17	EXP-J	02/08/02	GWPP	2.6	2	2.3	<MDA	.	8.5
GW-722-17	EXP-J	06/03/02	BJC	<MDA	.	2.06	<MDA	.	3.11
GW-722-17	EXP-J	07/17/02	GWPP	<MDA	.	4.1	<MDA	.	8.3
GW-722-17	EXP-J	11/13/02	BJC	<MDA	.	2.37	3.93	3.7	3.61
GW-722-20	EXP-J	02/07/02	GWPP	<MDA	.	3.1	<MDA	.	7.5
GW-722-20	EXP-J	05/30/02	BJC	<MDA	.	1.49	<MDA	.	3.38
GW-722-20	EXP-J	07/17/02	GWPP	<MDA	.	2.9	<MDA	.	6.5
GW-722-20 Dup	EXP-J	07/17/02	GWPP	<MDA	.	2.9	<MDA	.	8.1
GW-722-20	EXP-J	11/12/02	BJC	<MDA	.	1.97	<MDA	.	2.44
GW-722-22	EXP-J	02/07/02	GWPP	<MDA	.	2.7	<MDA	.	6.8
GW-722-22 Dup	EXP-J	02/07/02	GWPP	<MDA	.	2.6	<MDA	.	8.2
GW-722-22	EXP-J	05/30/02	BJC	2.62	1.49	1.39	<MDA	.	3.17
GW-722-22	EXP-J	07/16/02	GWPP	<MDA	.	4.1	<MDA	.	5.8
GW-722-22	EXP-J	11/12/02	BJC	<MDA	.	1.94	8.02	2.24	2.44
GW-722-26	EXP-J	02/05/02	GWPP	1.9	1.5	0.74	<MDA	.	8.3
GW-722-26	EXP-J	05/28/02	BJC	<MDA	.	2.09	9.48	3.45	3.25
GW-722-26 Dup	EXP-J	05/28/02	BJC	4.59	2.15	1.98	<MDA	.	3.84
GW-722-26	EXP-J	07/15/02	GWPP	<MDA	.	2.6	<MDA	.	9.1
GW-722-26	EXP-J	11/11/02	BJC	<MDA	.	1.83	8.81	2.74	2.53
GW-722-26 Dup	EXP-J	11/11/02	BJC	<MDA	.	2.27	3.74	3.1	3.02
GW-722-30	EXP-J	02/05/02	GWPP	<MDA	.	3.1	<MDA	.	11
GW-722-30	EXP-J	05/28/02	BJC	1.96	1.83	1.82	11.22	3.59	3.36
GW-722-30	EXP-J	07/15/02	GWPP	<MDA	.	2.6	<MDA	.	7.4
GW-722-30	EXP-J	11/11/02	BJC	<MDA	.	1.73	28.4	3.79	3.24
GW-722-32	EXP-J	02/05/02	GWPP	8.1	3.1	0.81	<MDA	.	9.6
GW-722-32	EXP-J	05/28/02	BJC	<MDA	.	1.82	<MDA	.	3.8
GW-722-32	EXP-J	07/15/02	GWPP	<MDA	.	2.3	<MDA	.	7
GW-722-32	EXP-J	11/12/02	BJC	44.16 Q	4.28	2.29	5.43	3.68	3.57
GW-722-33	EXP-J	02/06/02	GWPP	<MDA	.	2.2	<MDA	.	6.4
GW-722-33	EXP-J	05/29/02	BJC	<MDA	.	6.61	<MDA	.	8.88
GW-722-33	EXP-J	07/16/02	GWPP	<MDA	.	3.9	<MDA	.	7.5
GW-722-33	EXP-J	11/12/02	BJC	3.24	1.65	1.78	19.73	2.55	2.4
GW-733	EXP-J	01/08/02	BJC	<MDA	.	1.84	3.41	1.33	1.82
GW-733	EXP-J	07/09/02	BJC	<MDA	.	1.94	<MDA	.	3.57
GW-735	EXP-J	05/14/02	GWPP	<MDA	.	4.9	<MDA	.	6.4
GW-735	EXP-J	11/21/02	GWPP	<MDA	.	2.8	<MDA	.	6.8
GW-744	GRIDK1	05/07/02	GWPP	4.9	2.9	3.2	6.3	4.1	6.2
GW-744	GRIDK1	11/18/02	GWPP	<MDA	.	2.1	<MDA	.	7.7
GW-747	GRIDK2	05/09/02	GWPP	1.2	1.2	0.83	<MDA	.	7.5
GW-747	GRIDK2	11/20/02	GWPP	<MDA	.	3.3	<MDA	.	5.7

APPENDIX E.3: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Location	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Activity	Error	MDA	Activity	Error	MDA
GW-750	EXP-J	05/05/02	GWPP	<MDA	.	2.4	<MDA	.	7.4
GW-750	EXP-J	11/20/02	GWPP	<MDA	.	1.8	<MDA	.	6.1
GW-762	GRIDJ3	01/31/02	BJC	<MDA	.	2.06	5.4	1.42	1.74
GW-762 Dup	GRIDJ3	01/31/02	BJC	<MDA	.	1.54	5.28	1.44	1.55
GW-762	GRIDJ3	07/31/02	BJC	<MDA	.	1.23	3.84	1.61	1.53
GW-762 Dup	GRIDJ3	07/31/02	BJC	<MDA	.	0.76	2.68	1.33	1.27
GW-763	GRIDJ3	04/18/02	GWPP	<MDA	.	4.2	<MDA	.	7.1
GW-763	GRIDJ3	10/21/02	GWPP	<MDA	.	4	<MDA	.	9.2
GW-769	GRIDG3	04/29/02	GWPP	2.9	2.2	2.8	<MDA	.	8.9
GW-769	GRIDG3	10/30/02	GWPP	<MDA	.	7.3	<MDA	.	8.6
GW-770	GRIDG3	04/29/02	GWPP	<MDA	.	3.7	<MDA	.	7.9
GW-770	GRIDG3	10/30/02	GWPP	<MDA	.	7	<MDA	.	9.3
GW-775	GRIDH3	04/30/02	GWPP	<MDA	.	0.83	<MDA	.	7.4
GW-775	GRIDH3	10/31/02	GWPP	<MDA	.	7.3	<MDA	.	8.4
GW-776	GRIDH3	04/30/02	GWPP	<MDA	.	2.4	7.5	4.6	7
GW-776	GRIDH3	10/31/02	GWPP	<MDA	.	7.8	<MDA	.	8.4
GW-782	GRIDE3	05/01/02	GWPP	45	7.7	2.5	9	4.6	6.7
GW-782	GRIDE3	11/04/02	GWPP	38	7.8	7.3	11	6.3	9.7
GW-791	GRIDD2	05/01/02	GWPP	<MDA	.	2.7	<MDA	.	8.7
GW-791	GRIDD2	11/06/02	GWPP	<MDA	.	7	<MDA	.	9.2
GW-816	EXP-SR	05/07/02	GWPP	<MDA	.	3.5	8.7	5.5	8.5
GW-816	EXP-SR	11/18/02	GWPP	<MDA	.	2.3	7.2	4.6	6.9
GW-832	NHP	01/31/02	BJC	4.67	1.82	2.08	5.15	1.51	1.98
GW-832	NHP	08/05/02	BJC	2.72	1.06	0.93	4.23	1.93	1.85
LRSPW	EXP-SW	05/06/02	GWPP	8.8	3.5	3.2	10	5	7.4
LRSPW Dup	EXP-SW	05/06/02	GWPP	5.9	3.3	4	8.3	4.9	7.3
LRSPW	EXP-SW	11/19/02	GWPP	7	3	2.5	10	5.1	7.6
NPR07.0SW	EXP-NPR	05/15/02	GWPP	<MDA	.	3.1	<MDA	.	8
NPR07.0SW	EXP-NPR	10/29/02	GWPP	3.7	2.1	1.7	9.8	5	7.3
NPR12.0SW	EXP-NPR	05/15/02	GWPP	6.8	3.1	3.3	11	5.7	8.5
NPR12.0SW Dup	EXP-NPR	05/15/02	GWPP	<MDA	.	2.9	<MDA	.	7.2
NPR12.0SW	EXP-NPR	10/29/02	GWPP	<MDA	.	2.5	6.9	3.8	5.5
NPR23.0SW	EXP-NPR	05/15/02	GWPP	<MDA	.	3.1	<MDA	.	7
NPR23.0SW	EXP-NPR	10/29/02	GWPP	3.7	2.5	3	<MDA	.	9.7
OF 51	EXP-SW	02/14/02	BJC	4.27	1.39	1.18	4.67	1.3	1.68
OF 51	EXP-SW	09/03/02	BJC	3.74	1.3	1.16	4.89	1.17	1.41
SCR7.1SP	EXP-UV	02/11/02	BJC	1.85	1.03	1.2	3.39	1.3	1.78
SCR7.1SP	EXP-UV	07/11/02	BJC	<MDA	.	1.9	2.53	1.21	1.7
SCR7.8SP	EXP-UV	02/11/02	BJC	<MDA	.	1.27	2.39	1.3	1.85
SCR7.8SP	EXP-UV	07/11/02	BJC	<MDA	.	1.15	3.53	1.08	1.39
STATION 8	EXP-SW	02/01/02	BJC	16.72	2.73	1.92	8.96	1.66	1.95
STATION 8	EXP-SW	02/14/02	BJC	7.6	2.16	2.14	7.31	1.41	1.64
STATION 8	EXP-SW	08/20/02	BJC	3.56	1.25	1.2	5.43	1.42	1.77
STATION 8	EXP-SW	09/03/02	BJC	2.35	1.08	1.18	4.28	1.26	1.64

APPENDIX E.3: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-108						GW-151		
Location	S3						NHP		
Date Sampled	01/08/02			07/09/02			01/30/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA	.	109.95	146.63	97.76	93.97	2.21	1.56	2.14
Gross Beta	7,954.49	183.42	82.38	11,532.61	213.59	81.55	7.12	1.6	1.99
Technetium-99	29,525.35	201.6	31	26,872.71	65.54	6.77	.	.	.
Uranium-234	15	3.58	0.47	12.91	2.63	0.14	0.48	0.39	0.47
Uranium-235	<MDA	.	0.64	0.38	0.32	0.17	<MDA	.	0.45
Uranium-236	.	.	.	<MDA	.	0.15	<MDA	.	0.34
Uranium-238	6.04	1.82	0.46	5.23	1.33	0.14	<MDA	.	0.44

Sampling Point	GW-151						GW-154		
Location	NHP						NHP		
Date Sampled	08/05/02			01/30/02			08/05/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA	.	1.03	755.5	23.57	3.76	1,270.56	30.92	4.98
Gross Beta	2.99	1.68	1.61	103.65	4.41	2.37	275.92	7.57	3.85
Technetium-99	.	.	.	.	.	.	.	.	.
Uranium-234	<MDA	.	0.88	392.7	139.6	3.83	295.3	54.14	6.69
Uranium-235	<MDA	.	0.83	14.9	7.72	2.92	10.99	6.2	3.68
Uranium-236	<MDA	.	0.44	9.1	5.39	3.77	11.42	5.99	1.93
Uranium-238	<MDA	.	0.88	251	90.13	2.85	248	46.52	3.87

Sampling Point	GW-193						GW-204		
Location	T2331						T0134		
Date Sampled	01/08/02			07/09/02			05/02/02		
Program	BJC			BJC			GWPP		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA	.	4.61	<MDA	.	2.21	35	6.4	2.2
Gross Beta	9.13	2.01	2.46	7.29	1.64	2	<MDA	.	7.9
Technetium-99	<MDA	.	32.92	<MDA	.	7.2	.	.	.
Uranium-234	.	.	.	.	.	.	21	2.6	0.11
Uranium-235	.	.	.	.	.	.	0.84	0.35	0.14
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	.	.	.	.	.	.	16	2	0.14

Sampling Point	GW-204						GW-219		
Location	T0134						UOV		
Date Sampled	11/06/02			05/06/02			11/07/02		
Program	GWPP			GWPP			GWPP		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	22	6.3	7.2	120	13	4	170	15	7.6
Gross Beta	16	5.1	6.8	77	9.5	8	91	8.8	7.1
Technetium-99	.	.	.	.	.	.	.	.	.
Uranium-234	13	1.7	0.14	18	2.1	0.14	27	3	0.17
Uranium-235	0.45	0.25	0.16	1.4	0.41	0.11	2.8	0.6	0.17
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	10	1.4	0.14	120	12	0.16	190	19	0.14

APPENDIX E.3: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-219			GW-223					
Location	UOV			NHP					
Date Sampled	11/07/02			01/31/02			08/05/02		
Program	GWPP			BJC			BJC		
Sample Type	Dup								
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	210	17	7.5	12.19	2.38	1.97	14	2.17	0.99
Gross Beta	100	9.4	7.1	6.13	1.82	2.02	15.24	3.37	3.04
Technetium-99	.	.	.	.	.	.	.	.	.
Uranium-234	30	3.4	0.14	3.88	1.29	0.72	5.02	1.72	0.54
Uranium-235	2.5	0.6	0.14	0.66	0.49	0.39	<MDA	.	0.67
Uranium-236	.	.	.	<MDA	.	0.45	<MDA	.	0.6
Uranium-238	200	20	0.12	9.17	2.35	0.55	9.2	2.52	0.54

Sampling Point	GW-253			GW-605					
Location	S2			EXP-I					
Date Sampled	05/07/02			01/08/02					
Program	BJC			BJC					
Sample Type							Dup		
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	45.1	9.67	5.53	48.42	5.12	2.83	44.82	5.27	3.18
Gross Beta	25.44	11.29	10.73	14.94	2.15	2.29	13.39	1.84	1.94
Technetium-99	.	.	.	<MDA	.	32.06	<MDA	.	32.1
Uranium-234	7.15	1.93	0.44	.	.	.	.	.	.
Uranium-235	<MDA	.	0.36	.	.	.	.	.	.
Uranium-236	<MDA	.	0.16	.	.	.	.	.	.
Uranium-238	1.36	0.62	0.35	.	.	.	.	.	.

Sampling Point	GW-605						GW-606		
Location	EXP-I						EXP-I		
Date Sampled	07/08/02						01/08/02		
Program	BJC			BJC			BJC		
Sample Type							Dup		
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	51.84	4.16	2.21	52.08	5.75	3.78	<MDA	.	2.83
Gross Beta	21.23	2.14	1.88	28.77	2.73	2.34	18.6	2.37	2.42
Technetium-99	<MDA	.	7.49	<MDA	.	7.42	<MDA	.	33.17
Uranium-234	.	.	.	.	.	.	.	.	.
Uranium-235	.	.	.	.	.	.	.	.	.
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	.	.	.	.	.	.	.	.	.

Sampling Point	GW-606			GW-618			GW-686		
Location	EXP-I			EXP-E			CPT		
Date Sampled	07/08/02			05/09/02			11/14/02		
Program	BJC			BJC			GWPP		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	5.63	2.41	2.94	<MDA	.	2.52	<MDA	.	34
Gross Beta	9.83	1.84	2.11	7.98	1.79	2.17	<MDA	.	68
Technetium-99	<MDA	.	7.6	<MDA	.	.	<MDA	.	13
Uranium-234	.	.	.	<MDA	.	0.4	.	.	.
Uranium-235	.	.	.	<MDA	.	0.28	.	.	.
Uranium-236	.	.	.	<MDA	.	0.23	.	.	.
Uranium-238	.	.	.	0.28	0.22	0.25	.	.	.

APPENDIX E.3: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	GW-687			GW-689			GW-698		
Location	CPT			CPT			B8110		
Date Sampled	11/14/02			11/14/02			05/02/02		
Program	GWPP			GWPP			GWPP		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA	.	50	100	56	53	2.8	2.5	1.5
Gross Beta	<MDA	.	84	<MDA	.	140	7.3	4.4	6.6
Technetium-99	<MDA	.	13	<MDA	.	13	.	.	.
Uranium-234	.	.	.	.	.	.	1.2	0.39	0.17
Uranium-235	.	.	.	.	.	.	<MDA	.	0.17
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	.	.	.	.	.	.	0.34	0.19	0.11

Sampling Point	GW-698						GW-733		
Location	B8110						EXP-J		
Date Sampled	05/02/02			11/07/02			01/08/02		
Program	GWPP			GWPP			BJC		
Sample Type	Dup								
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA	.	4.1	<MDA	.	8.7	<MDA	.	1.84
Gross Beta	<MDA	.	6.5	<MDA	.	7.9	3.41	1.33	1.82
Technetium-99	.	.	.	.	.	.	<MDA	.	30.22
Uranium-234	0.92	0.33	0.17	0.82	0.29	0.12	.	.	.
Uranium-235	<MDA	.	0.19	<MDA	.	0.12	.	.	.
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	0.43	0.22	0.11	0.72	0.28	0.13	.	.	.

Sampling Point	GW-733			GW-782					
Location	EXP-J			GRIDE3					
Date Sampled	07/09/02			05/01/02			11/04/02		
Program	BJC			GWPP			GWPP		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	<MDA	.	1.94	45	7.7	2.5	38	7.8	7.3
Gross Beta	<MDA	.	3.57	9	4.6	6.7	11	6.3	9.7
Technetium-99	<MDA	.	7.19	.	.	.	.	.	.
Uranium-234	.	.	.	49	5	0.13	44	4.9	0.16
Uranium-235	.	.	.	0.33	0.2	0.11	0.16	0.14	0.15
Uranium-236	.	.	.	.	.	.	.	.	.
Uranium-238	.	.	.	0.47	0.21	0.13	0.53	0.25	0.14

Sampling Point	GW-832						OF 51		
Location	NHP						EXP-SW		
Date Sampled	01/31/02			08/05/02			02/14/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	4.67	1.82	2.08	2.72	1.06	0.93	4.27	1.39	1.18
Gross Beta	5.15	1.51	1.98	4.23	1.93	1.85	4.67	1.3	1.68
Technetium-99	.	.	.	.	.	.	.	.	.
Uranium-234	2.74	0.97	0.28	0.68	0.37	0.31	1.66	0.61	0.11
Uranium-235	0.3 R	0.31	0.2	<MDA	.	0.15	0.2 R	0.21	0.14
Uranium-236	<MDA	.	0.31	<MDA	.	0.23	<MDA	.	0.21
Uranium-238	3.39	1.13	0.58	1.66	0.6	0.29	2.21	0.73	0.25

APPENDIX E.3: CY 2002 MONITORING DATA FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
Radiological Analytes: Isotope Activity

Sampling Point	OF 51			STATION 8					
Location	EXP-SW			EXP-SW					
Date Sampled	09/03/02			02/01/02			02/14/02		
Program	BJC			BJC			BJC		
Sample Type									
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	3.74	1.3	1.16	16.72	2.73	1.92	7.6	2.16	2.14
Gross Beta	4.89	1.17	1.41	8.96	1.66	1.95	7.31	1.41	1.64
Technetium-99	.	.	.	.	.	.	.	.	.
Uranium-234	1.9	0.56	0.17	3.49	1.02	0.32	1.17	0.47	0.23
Uranium-235	<MDA	.	0.17	0.33	0.28	0.31	<MDA	.	0.2
Uranium-236	<MDA	.	0.19	<MDA	.	0.25	0.19	0.18	0.18
Uranium-238	2.49	0.67	0.17	8.97	2.12	0.55	4.44	1.16	0.26

Sampling Point	STATION 8					
Location	EXP-SW					
Date Sampled	08/20/02			09/03/02		
Program	BJC			BJC		
Sample Type						
Result (pCi/L)	Activity	Error	MDA	Activity	Error	MDA
Gross Alpha	3.56	1.25	1.2	2.35	1.08	1.18
Gross Beta	5.43	1.42	1.77	4.28	1.26	1.64
Technetium-99	.	.	.	.	.	.
Uranium-234	1.43	0.6	0.14	1.37	0.74	0.63
Uranium-235	<MDA	.	0.3	0.96	0.64	0.26
Uranium-236	<MDA	.	0.27	0.5	0.43	0.4
Uranium-238	2.54	0.84	0.14	1.79	0.85	0.54

APPENDIX F

**CY 2002 MONITORING DATA FOR THE
CHESTNUT RIDGE HYDROGEOLOGIC REGIME**

EXPLANATION

Sampling Point:

- GW - Groundwater monitoring well (also 1090)
MCK - McCoy Branch Kilometer
SCR - South Chestnut Ridge (tributary prefix for spring and surface water sampling locations)

Location:

- CDLVI - Construction/Demolition Landfill VI
CDLVII - Construction/Demolition Landfill VII
CRBAWP - Chestnut Ridge Borrow Area Waste Pile
CRSDB - Chestnut Ridge Sediment Disposal Basin
CRSP - Chestnut Ridge Security Pits
EXP-SW - Exit Pathway (spring or surface water sampling location)
FCAP - Filled Coal Ash Pond
KHQ - Kerr Hollow Quarry
LII - Industrial Landfill II
LIV - Industrial Landfill IV
LV - Industrial Landfill V
UNCS - United Nuclear Corporation Site

Monitoring Program:

- BJC - monitoring program managed by Bechtel Jacobs Company LLC
GWPP - managed by the Y-12 Groundwater Protection Program

Sample Type:

- Dup - Field Duplicate Sample

Units:

- ft - feet (elevations are above mean sea level and depths are below grade)
 $\mu\text{g/L}$ - micrograms per liter
mg/L - milligrams per liter
mV - millivolts
 $\mu\text{mho}/\text{cm}$ - micromhos per centimeter
NTU - Nephelometric Turbidity Units
pCi/L - picoCuries per liter
ppm - parts per million
RPD - relative percent difference (charge balance for major ions)

EXPLANATION (continued)

Only analytes detected above the program reporting limits in at least one sample are included in this appendix. Additionally, results that are below the reporting limits are replaced with values (e.g., “<”) to emphasize the detected results. The following sections describe the reporting limits and data qualifiers for each subsection of the appendix. A comprehensive list of the Y-12 GWPP analytes, analytical methods, and reporting limits is provided in Appendix B, Table B.5.

F.1 Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

The Y-12 GWPP SAP (BWXT 2001a) specifies reporting limits for trace metals that are appropriate for DOE Order 5400.1 monitoring. Some of the laboratories used for the monitoring programs managed by BJC report metals results (often as estimated values) that are much lower than the GWPP reporting limits for the metals using the same analytical method. To retain the highest quality data for DOE Order 5400.1 monitoring purposes and to standardize reporting limits for trace metal results obtained from all sources, the GWPP reporting limits were given precedence over the BJC reporting limits (BJC 2001 and 2002a) shown below. Results for the trace metals shown in bold typeface below are presented in Appendix F.1 because the metal was detected at a level above the associated reporting limit in at least one groundwater or surface water sample.

Analyte	Reporting Limit (mg/L)		Analyte	Reporting Limit (mg/L)	
	GWPP	BJC		GWPP	BJC
Cations			Anions		
Calcium	0.2	0.25	Alkalinity - HCO ₃	1.0	NA
Magnesium	0.2	0.05	Alkalinity - CO ₃	1.0	NA
Potassium	2.0	0.25	Chloride	0.2	0.1
Sodium	0.2	0.25	Fluoride	0.1	0.05
			Nitrate (as Nitrogen)	0.028	0.1
			Sulfate	0.25	0.1
Trace Metals			Trace Metals (continued)		
Aluminum	0.2	0.05*	Lithium	0.01	0.01
Antimony (PMS)	0.0025	.	Manganese	0.005	0.005
Antimony	.	0.006	Mercury (CVAA)	0.0002	0.0002
Arsenic (PMS)	0.005	.	Molybdenum	0.05	.
Arsenic	.	0.005	Nickel (PMS)	0.005	.
Barium	0.004	0.005	Nickel	.	0.01
Beryllium	0.001	0.001	Selenium (PMS)	0.01	.
Boron	0.1	0.01*	Selenium	.	0.005
Cadmium (PMS)	0.0005	.	Silver	0.02	0.005*
Cadmium	.	0.001	Strontium	0.005	0.005
Chromium (PMS)	0.0025	.	Thallium (PMS)	0.0005	.
Chromium	.	0.005	Thallium	.	0.002
Cobalt	0.02	0.005*	Thorium	0.2	.
Copper	0.02	0.005*	Uranium (PMS)	0.0005	.
Iron	0.05	0.01*	Uranium (KPA)	.	0.004
Lead (PMS)	0.0005	.	Vanadium	0.02	0.01*
Lead	.	0.003	Zinc	0.05	0.01*

Note: * - the GWPP reporting limit was used instead of the BJC reporting limit; “.” - not specified.

EXPLANATION (continued)

Metals analyses were performed using the inductively coupled plasma spectroscopy method (SW846-6010B) unless otherwise noted:

- CVAA - Cold Vapor Atomic Absorption (SW846-7470)
KPA - Kinetic Phosphorescent Analysis (ASTM-D5174-M)
PMS - Plasma Mass Spectroscopy (EPA-200.8)

The following symbols and data qualifiers are used in Appendix F.1:

- . - Not analyzed or not applicable
< - Analyzed but not detected at the project reporting level
J - Positively identified; estimated concentration (BJC data for landfills)
Q - Inconsistent with historical measurements for a sampling location (low bicarbonate alkalinity at MCK 2.0)
R - Unusable result that does not meet data quality objectives: duplicate results differ by an order of magnitude (dissolved solids and boron at GW-156); charge balance out of acceptable range (MCK 2.0).

F.2 Volatile Organic Compounds

The reporting limits for volatile organic compounds shown in Table B.5 and those used for monitoring programs managed by BJC are contract-required quantitation limits. Results below the quantitation limit and above the instrument detection limit are reported as estimated quantities. Therefore, non-detected results are assumed to equal zero for all compounds.

The following symbols and data qualifiers are used in Appendix F.2.

- . - Not analyzed or not applicable
< - Analyzed but not detected at the project reporting level (also false-positive results for data provided by BJC)
J - Positively identified; estimated concentration below the contract-required quantitation limit.

Only 15 compounds were detected (of the 53 compounds requested) in the CY 2002 groundwater samples collected in the Chestnut Ridge. Results for the following eight compounds were detected in at least two samples.

Compound	No. Detected	Maximum (µg/L)	Compound	No. Detected	Maximum (µg/L)
1,1,1-Trichloroethane	12	22	cis-1,2-Dichloroethene	4	7
1,1-Dichloroethane	10	25	Chloroform	4	2.4
1,1-Dichloroethene	9	8	Trichloroethene	2	0.78 J
Tetrachloroethene	6	7.1	Trichlorofluoromethane	2	11

EXPLANATION (continued)

Because seven compounds were detected in only one sample at very low (estimated) concentrations during CY 2002, results for these compounds are shown below and are not presented in Appendix F.2.

Well Number	Location	Date Sampled	Compound	Result ($\mu\text{g/L}$)
GW-522	LIV	07/15/02	1,1,2,2-Tetrachloroethane	0.57 J
GW-143	KHQ	12/02/02	Acetone	1 J
GW-543	CDLVI	01/15/02	Bromoform	0.48 J
SCR4.3SP	EXP-SW	01/14/02	Carbon disulfide	0.39 J
GW-557	LV	01/10/02	Chloromethane	0.42 J
GW-539	LII	01/14/02	Ethanol	280 Q
GW-142	KHQ	12/02/02	Methylene chloride	0.2 J
GW-798	CDLVII	07/16/02	trans-1,2-Dichloroethene	0.39 J

Note: Q - inconsistent with historical measurements for the location.

F.3 Radiological Analytes

Reporting limits for radiological analytes are sample-specific and analyte-specific minimum detectable activities that are reported with each result. The following summary shows the radiological analytes reported for at least one groundwater sample collected during CY 2002 in the Chestnut Ridge Regime.

Analyte	No. of Results	No. Detected	Analyte	No. of Results	No. Detected
Gross Alpha	110	26	Technetium-99	2	1
Gross Beta	110	58	Uranium-233/234	14	11
Cesium-137	2	0	Uranium-235	14	0
Cobalt-60	2	0	Uranium-236	14	0
Potassium-40	2	2	Uranium-238	14	6
Strontium-90	14	1			

Only the results for gross alpha and gross beta are presented in Appendix F.3, and the following notes apply to this appendix:

- Result - Activity in picoCuries per liter (pCi/L)
- Error - Counting error (two standard deviations)
- MDA - Minimum detectable activity

EXPLANATION (continued)

The CY 2002 isotopic results that exceed MDAs, all for wells at the UNCS, are shown below:

Well Number	Date Sampled	Isotope	Activity (pCi/L)		
			Result	Error	MDA
1090	01/30/02	Uranium-238	0.29	0.22	0.25
1090	07/30/02	Uranium-233/234	0.5	0.26	0.2
GW-203	01/29/02	Uranium-238	0.25	0.2	0.24
GW-203	07/30/02	Uranium-233/234	0.46	0.25	0.21
GW-203	07/30/02	Uranium-238	0.14	0.14	0.14
GW-205	01/30/02	Potassium-40	52.22	49.65	43.79
GW-205	01/30/02	Technetium-99	10.59	6.14	10.17
GW-205	01/30/02	Uranium-233/234	0.54	0.3	0.27
GW-205	01/30/02	Uranium-238	0.22	0.19	0.22
GW-205	07/30/02	Potassium-40	89.36	52.76	46.7
GW-205	07/30/02	Uranium-233/234	0.22	0.17	0.18
GW-221	01/29/02	Uranium-233/234	0.34	0.24	0.27
GW-302	01/31/02	Strontium-90	1.66 Q	0.07	1.56
GW-302	01/31/02	Uranium-233/234	0.41	0.27	0.31
GW-302	07/31/02	Uranium-233/234	0.64	0.42	0.3
GW-302	07/31/02	Uranium-238	0.26	0.26	0.17
GW-339	01/29/02	Uranium-233/234	0.58	0.34	0.35
GW-339D	01/29/02	Uranium-233/234	0.45	0.27	0.2
GW-339	07/30/02	Uranium-233/234	0.38	0.23	0.18
GW-339D	07/30/02	Uranium-233/234	0.43	0.24	0.2
GW-339	07/30/02	Uranium-238	0.12	0.12	0.08

Note: Q - inconsistent with historical measurements for the location; D - field duplicate;
 Uranium-233/234 is functionally equivalent to Uranium-234 analysis.

APPENDIX F.1

FIELD MEASUREMENTS, MISCELLANEOUS ANALYTES, MAJOR IONS, AND TRACE METALS

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	1090		GW-141		GW-142			GW-143	
Site	UNCS		LIV		KHQ			KHQ	
Date	01/30/02	07/30/02	01/23/02	07/25/02	04/10/02	10/16/02	12/02/02	04/09/02	10/16/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									
Field Measurements									
Time Sampled	9:55	9:10	9:55	9:55	9:40	12:41	10:50	9:45	14:30
Measuring Point Elev. (ft)	1104.48	1104.48	1186.23	1186.23	971.15	971.15	971.15	913.98	913.98
Depth to Water (ft)	40.95	58.23	90.18	97.36	133.98	138.40	135.81	78.37	81.45
Groundwater Elevation (ft)	1063.53	1046.25	1096.05	1088.87	837.17	832.75	835.34	835.61	832.53
Conductivity ($\mu\text{mho}/\text{cm}$)	550	572	408	402	358	365	686	494	470
Dissolved Oxygen (ppm)	4.03	2.08	9.9	6.75	4.77	1.2	1.1	3.88	2.7
Oxidation/Reduction (mV)	209	151	267	183	173	47	-123	133	-79
Temperature (degrees C)	15.3	17	12.4	18.8	15.9	18.8	10.1	14.9	16.9
Turbidity (NTU)	18	15	29	10	31	89	76	9	12
pH	7.04	6.63	6.23	6.59	7.4	8.02	8.21	7.58	8.22
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	332 J	354 J	.	.	.	.	.
Dissolved Solids (mg/L)	341	285	214	202	197	171	.	276	264
Suspended Solids (mg/L)	<	<	<	<	8.3	10	.	<	<
Turbidity (NTU)	.	.	4.5	1.4	.	.	.	.	.
pH	.	.	7.3	7.4	.	.	.	.	.
Major Ions (mg/L)									
Calcium	54.7	58.7	40.7	42.1	29.4	27.7	.	30.1	28.6
Magnesium	32.4	34.2	25	26.4	29.9	29.1	.	25.4	23.8
Potassium	0.999	1.04	<	<	4.17	4.4	.	17.9	18.6
Sodium	8.82	9.33	<	<	0.973	1.3	.	20.8	23.2
Alkalinity as CO ₃	<	<	<	<	.	.	.	.	.
Alkalinity as HCO ₃	384	259	207	215	.	.	.	.	.
Chloride	18.5	21.9	2 J	2.3 J	.	.	.	.	.
Fluoride	<	<	<	0.16 J	.	.	.	.	.
Nitrate as N	0.72	0.97	0.44 J	0.43 J	.	.	.	.	.
Sulfate	3.5	3.4	2.3 J	2.5 J	.	.	.	.	.
Charge Balance (RPD)	-17.8	2	-2	-1.9	.	.	.	.	.
Trace Metals (mg/L)									
Aluminum	<	<	<	<	<	<	.	<	<
Arsenic	<	<	<	<	<	<	.	<	<
Barium	0.029	0.0292	0.017	0.014	0.397	0.41	.	0.0462	0.045
Boron	<	<	<	<	<	<	.	0.866	0.84
Cadmium (PMS)	.	.	.	.	.	.	.	.	.
Chromium	<	<	<	0.0056	<	<	.	<	<
Iron	<	<	<	<	3.81	5.6	.	0.552	0.74
Lead (PMS)	.	.	.	.	.	.	.	.	.
Lithium	<	<	.	.	0.0262	0.032	.	0.311	0.4
Manganese	<	<	<	<	0.0497	0.054	.	0.0111	0.01
Nickel	<	<	<	<	<	<	.	<	<
Strontium	0.025	0.0257	0.014	0.016	0.315	0.31	.	3.05	3
Thallium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (KPA)	<	0.0127	<	<	<	<	.	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-143	GW-144			GW-145			GW-156	
Site	KHQ	KHQ	KHQ	KHQ	KHQ			CRSDB	
Date	12/02/02	04/09/02	10/16/02	12/02/02	04/08/02	10/21/02	12/02/02	04/15/02	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								Dup	
Field Measurements									
Time Sampled	13:45	13:00	13:35	14:35	13:15	9:35	13:40	12:45	.
Measuring Point Elev. (ft)	913.98	913.54	913.54	913.54	840.24	840.24	840.24	1049.28	.
Depth to Water (ft)	79.58	78.40	81.35	79.74	3.50	7.44	5.04	142.85	.
Groundwater Elevation (ft)	834.40	835.14	832.19	833.80	836.74	832.80	835.20	906.43	.
Conductivity ($\mu\text{mho}/\text{cm}$)	937	343	355	674	520	535	565	679	.
Dissolved Oxygen (ppm)	1.73	5.78	6.4	3.11	3.79	2.24	5.18	4.08	.
Oxidation/Reduction (mV)	-77	194	129	94	198	171	188	198	.
Temperature (degrees C)	8.5	14.7	15.1	13.7	19.8	15	10.6	17	.
Turbidity (NTU)	23	10	9	19	9	12	12	6	.
pH	8.31	7.17	7.72	7.79	6.63	7.4	8.55	7.06	.
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	.	.	.
Dissolved Solids (mg/L)	.	189	177	.	316	298	.	387 R	35 R
Suspended Solids (mg/L)	.	<	15	.	<	<	.	<	<
Turbidity (NTU)	.	.	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.	.	.
Major Ions (mg/L)									
Calcium	.	44.9	53.1	.	42.9	37.4	.	67	66
Magnesium	.	16.1	16.5	.	36.1	33.1	.	42.9	42.1
Potassium	.	1.41	1.6	.	12.3	12.2	.	29.7	29.1
Sodium	.	0.974	1.4	.	4.23	5	.	7.51	7.41
Alkalinity as CO ₃	.	.	.	.	.	.	.	.	.
Alkalinity as HCO ₃	.	.	.	.	.	.	.	.	.
Chloride	.	.	.	.	.	.	.	.	.
Fluoride	.	.	.	.	.	.	.	.	.
Nitrate as N	.	.	.	.	.	.	.	.	.
Sulfate	.	.	.	.	.	.	.	.	.
Charge Balance (RPD)	.	.	.	.	.	.	.	.	.
Trace Metals (mg/L)									
Aluminum	.	<	<	.	<	<	.	<	<
Arsenic	.	<	<	.	<	<	.	<	<
Barium	.	0.045	0.048	.	0.0851	0.088	.	0.0423	0.0418
Boron	.	<	<	.	0.239	0.22	.	<	<
Cadmium (PMS)	.	.	.	.	.	.	.	.	.
Chromium	.	<	<	.	<	<	.	0.0096	<
Iron	.	<	<	.	<	<	.	<	<
Lead (PMS)	.	.	.	.	.	.	.	.	.
Lithium	.	0.0235	0.035	.	0.113	0.14	.	<	<
Manganese	.	<	<	.	<	<	.	<	<
Nickel	.	<	<	.	<	<	.	<	<
Strontium	.	0.0818	0.11	.	7.36	7.5	.	0.0269	0.0266
Thallium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (KPA)	.	<	<	.	0.0143	0.0123	.	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-156		GW-159		GW-177		GW-203	
Site	CRSDB		CRSDB		CRSP		UNCS	
Date	10/14/02		04/15/02	10/16/02	01/09/02	07/10/02	01/29/02	07/30/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type	Dup							
Field Measurements								
Time Sampled	13:15	.	9:50	9:55	13:45	15:15	9:15	10:25
Measuring Point Elev. (ft)	1049.28	.	1051.38	1051.38	1158.20	1158.20	1105.45	1105.45
Depth to Water (ft)	143.64	.	116.83	118.56	120.24	119.90	85.52	81.28
Groundwater Elevation (ft)	905.64	.	934.55	932.82	1037.96	1038.30	1019.93	1024.17
Conductivity ($\mu\text{mho}/\text{cm}$)	664	.	390	416	455	447	347	321
Dissolved Oxygen (ppm)	7.17	.	3.64	3.35	5.23	4.57	3.69	4.09
Oxidation/Reduction (mV)	185	.	191	187	211	113	205	146
Temperature (degrees C)	16.5	.	15.8	14.7	14.8	24.8	14.8	18.8
Turbidity (NTU)	6	.	10	11	21	27	21	13
pH	7.26	.	7.31	7.45	7.86	7.57	7.63	6.97
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	.	.
Dissolved Solids (mg/L)	322	349	197	201	268	235	159	148
Suspended Solids (mg/L)	<	<	<	<	<	<	<	<
Turbidity (NTU)	.	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.	.
Major Ions (mg/L)								
Calcium	65.1	64.3	39.7	40.7	46.6	48.1	34.8	34.1
Magnesium	40.7	40.1	26.1	24.5	29.1	29.2	20	18.5
Potassium	15.4	15.3	1.47	0.93	3.47	3.63	0.82	0.84
Sodium	5.8	6.5	0.494	1.2	1.65	1.41	0.625	0.542
Alkalinity as CO ₃	.	.	.	.	.	.	<	<
Alkalinity as HCO ₃	.	.	.	.	.	.	178	146
Chloride	.	.	.	.	.	.	2.9	1.6
Fluoride	.	.	.	.	.	.	<	<
Nitrate as N	.	.	.	.	.	.	1.4	0.47
Sulfate	.	.	.	.	.	.	1.9	1.6
Charge Balance (RPD)	.	.	.	.	.	.	-4.8	3.8
Trace Metals (mg/L)								
Aluminum	<	0.36	<	0.21	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<
Barium	0.032	0.032	0.0135	0.013	0.0183	0.0189	0.0121	0.0112
Boron	<	0.32 R	<	0.4	<	<	<	<
Cadmium (PMS)	.	.	.	.	.	.	.	.
Chromium	<	<	<	<	0.0095	0.0129	<	<
Iron	0.22	0.069	<	<	<	<	<	<
Lead (PMS)	.	.	.	.	.	.	.	.
Lithium	<	<	<	<	<	<	<	<
Manganese	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<
Strontium	0.029	0.029	0.0216	0.018	0.0178	0.0171	0.0113	0.0114
Thallium (PMS)	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.
Uranium (KPA)	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-205		GW-217			GW-221		GW-231	
Site	UNCS		LIV			UNCS		KHQ	
Date	01/30/02	07/30/02	01/22/02	01/28/02	07/22/02	01/29/02	07/30/02	04/08/02	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								Dup	
Field Measurements									
Time Sampled	14:20	9:15	11:30	9:30	9:25	10:45	13:20	9:50	.
Measuring Point Elev. (ft)	1104.14	1104.14	1177.03	1177.03	1177.03	1106.16	1106.16	849.67	.
Depth to Water (ft)	80.55	78.74	112.15	104.01	114.99	88.15	82.70	12.23	.
Groundwater Elevation (ft)	1023.59	1025.40	1064.88	1073.02	1062.04	1018.01	1023.46	837.44	.
Conductivity ($\mu\text{mho}/\text{cm}$)	416	365	361	365	363	289	306	293	.
Dissolved Oxygen (ppm)	3.35	3.08	8.96	7.84	4.89	3.82	3.77	2.27	.
Oxidation/Reduction (mV)	120	97	213	214	166	197	143	182	.
Temperature (degrees C)	18.8	21.6	14.2	11.1	21.2	15.1	17.3	12	.
Turbidity (NTU)	16	9	20	27	14	22	7	15	.
pH	10.18	9.83	8	7.87	8.06	7.72	7.44	6.75	.
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	315 J	.	332 J	.	.	.	.
Dissolved Solids (mg/L)	232	235	197	.	178 J	138	144	144	140
Suspended Solids (mg/L)	<	<	2.2 J	.	<	<	<	<	11.1
Turbidity (NTU)	.	.	<	.	0.12	.	.	.	.
pH	.	.	8.1	.	8	.	.	.	.
Major Ions (mg/L)									
Calcium	9.28	1.36	28.7	.	33.7	30	33.1	29.3	29.2
Magnesium	11.2	10.3	17.6	.	21.1	18	19.1	14.9	14.9
Potassium	64.8	78	<	.	<	0.885	1.07	1.03	1.03
Sodium	10	12.4	5.4	.	5.7	0.456	0.543	0.679	0.669
Alkalinity as CO ₃	128	95.6	<	.	<	<	<	.	.
Alkalinity as HCO ₃	52	66.6	185	.	175	141	143	.	.
Chloride	2.3	2.5	2.5 J	.	4 J	1.1	1.2	.	.
Fluoride	<	<	<	.	<	<	<	.	.
Nitrate as N	0.12	0.058	0.44 J	.	0.45 J	0.59	0.9	.	.
Sulfate	2.6	3.1	7.7	.	6.4	1.3	1.3	.	.
Charge Balance (RPD)	-5.4	0	-11.5	.	-0.9	1.7	4.6	.	.
Trace Metals (mg/L)									
Aluminum	<	<	<	.	<	<	<	<	<
Arsenic	<	<	<	.	<	<	<	<	<
Barium	0.005	<	0.03	.	0.033	0.0073	0.0082	0.0506	0.0506
Boron	<	<	<	.	<	<	<	<	<
Cadmium (PMS)	.	.	.	.	.	.	.	.	.
Chromium	<	<	<	.	<	<	<	<	<
Iron	<	<	<	.	<	<	<	<	<
Lead (PMS)	.	.	.	.	.	.	.	.	.
Lithium	0.114	0.154	.	.	.	<	<	<	<
Manganese	<	<	<	.	<	<	<	<	<
Nickel	<	<	<	.	<	<	<	<	<
Strontium	0.0057	<	0.016	.	0.017	0.0091	0.01	0.0299	0.0297
Thallium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (KPA)	<	<	<	.	<	<	<	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-231				GW-301				GW-302
Site	KHQ				CRBAWP				UNCS
Date	10/17/02		12/02/02		01/09/02		07/10/02		01/31/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup		Dup		Dup		Dup	
Field Measurements									
Time Sampled	9:50	.	9:55	.	10:05	.	9:40	.	9:30
Measuring Point Elev. (ft)	849.67	.	849.67	.	1086.55	.	1086.55	.	1141.84
Depth to Water (ft)	16.56	.	14.40	.	137.00	.	134.86	.	97.74
Groundwater Elevation (ft)	833.11	.	835.27	.	949.55	.	951.69	.	1044.10
Conductivity ($\mu\text{mho}/\text{cm}$)	378	.	320	.	452	.	432	.	545
Dissolved Oxygen (ppm)	0.41	.	0.72	.	10.2	.	5.37	.	3.75
Oxidation/Reduction (mV)	167	.	145	.	181	.	229	.	264
Temperature (degrees C)	14.5	.	13.8	.	10.5	.	19.9	.	15
Turbidity (NTU)	7	.	9	.	5	.	7	.	59
pH	7.1	.	8.05	.	8.2	.	8.01	.	6.99
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	.	.	.
Dissolved Solids (mg/L)	188	194	.	.	206	207	230	221	282
Suspended Solids (mg/L)	<	<	.	.	<	<	<	<	10.9
Turbidity (NTU)	.	.	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.	.	.
Major Ions (mg/L)									
Calcium	40.9	44.1	.	.	37.6	36.8	44.3	44.4	49.5
Magnesium	21.5	23.3	.	.	26.2	25.6	27.9	28	30
Potassium	1.1	1.3	.	.	0.697	0.687	0.773	0.776	1.06
Sodium	0.93	1	.	.	1.03	0.988	0.837	0.906	12.3
Alkalinity as CO ₃	.	.	.	.	.	.	.	.	<
Alkalinity as HCO ₃	.	.	.	.	.	.	.	.	235
Chloride	.	.	.	.	.	.	.	.	28.4
Fluoride	.	.	.	.	.	.	.	.	<
Nitrate as N	.	.	.	.	.	.	.	.	0.94
Sulfate	.	.	.	.	.	.	.	.	4.2
Charge Balance (RPD)	.	.	.	.	.	.	.	.	-1.4
Trace Metals (mg/L)									
Aluminum	<	<	.	.	<	<	<	<	<
Arsenic	<	<	.	.	<	<	<	<	<
Barium	0.087	0.093	.	.	0.0249	0.0247	0.0215	0.0214	0.0213
Boron	<	<	.	.	<	<	<	<	<
Cadmium (PMS)	.	.	.	.	.	.	.	.	.
Chromium	<	<	.	.	<	<	<	<	0.0769
Iron	<	<	.	.	<	<	<	<	1.69
Lead (PMS)	.	.	.	.	.	.	.	.	.
Lithium	<	<	.	.	<	<	<	<	<
Manganese	0.012	0.012	.	.	<	<	<	<	0.0489
Nickel	<	<	.	.	<	<	<	<	0.32
Strontium	0.042	0.044	.	.	0.0225	0.0221	0.0221	0.0222	0.0182
Thallium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (KPA)	<	<	.	.	<	<	<	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-302	GW-305						GW-339
Site	UNCS	LIV						UNCS
Date	07/31/02	01/22/02	01/28/02	05/02/02	07/15/02	11/21/02	01/29/02	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								Dup
Field Measurements								
Time Sampled	10:00	10:40	10:25	10:05	11:55	10:20	13:35	.
Measuring Point Elev. (ft)	1141.84	1183.72	1183.72	1183.72	1183.72	1183.72	1124.83	.
Depth to Water (ft)	104.82	123.89	115.93	121.89	125.40	121.10	63.15	.
Groundwater Elevation (ft)	1037.02	1059.83	1067.79	1061.83	1058.32	1062.62	1061.68	.
Conductivity ($\mu\text{mho}/\text{cm}$)	579	323	315	394	413	381	587	.
Dissolved Oxygen (ppm)	2.31	5.75	4.99	4.39	2.55	3.82	4.74	.
Oxidation/Reduction (mV)	147	218	231	233	139	238	165	.
Temperature (degrees C)	18.2	12.2	13.4	18.8	18.9	14	18	.
Turbidity (NTU)	20	12	13	20	10	9	25	.
pH	6.71	7.43	7.56	7.48	7.26	8.14	7.4	.
Miscellaneous Analytes								
Conductivity ($\mu\text{mho}/\text{cm}$)	.	273 J	.	410 J	277 J	310 J	.	.
Dissolved Solids (mg/L)	282	174	.	190	167 J	150	301	300
Suspended Solids (mg/L)	<	<	.	<	<	<	<	<
Turbidity (NTU)	.	0.1	.	1.3	0.19	0.14	.	.
pH	.	8.2	.	7.8	8	8	.	.
Major Ions (mg/L)								
Calcium	51.7	26.9	.	<	26.9	32	57.5	58
Magnesium	31.6	17.6	.	20.3	18.9	20	34.6	34.8
Potassium	1.02	<	.	<	<	<	1.51	1.49
Sodium	11.6	<	.	<	<	<	9.85	9.9
Alkalinity as CO_3	<	<	.	<	<	<	<	<
Alkalinity as HCO_3	237	169	.	184	158	160	288	261
Chloride	26.2	3.1	.	5.4	3.9 J	5 J	18.8	17.9
Fluoride	<	<	.	<	<	0.11 J	<	<
Nitrate as N	1.2	0.45 J	.	0.58	0.43 J	0.41 J	0.7	0.71
Sulfate	3.6	1.3 J	.	1.7 J	1.6 J	1.9 J	3.7	3.6
Charge Balance (RPD)	0.7	-11.6	.	-5	-4.7	-1.3	-1.8	.
Trace Metals (mg/L)								
Aluminum	<	<	.	<	<	<	<	<
Arsenic	<	<	.	<	<	<	<	<
Barium	0.0223	0.01	.	0.014	<	0.01	0.0225	0.0214
Boron	<	<	.	<	<	<	<	<
Cadmium (PMS)	.	.	.	.	.	.	.	.
Chromium	0.0425	<	.	<	<	<	<	<
Iron	0.383	<	.	<	<	<	0.205	0.218
Lead (PMS)	.	.	.	.	.	.	.	.
Lithium	<	.	.	.	.	.	<	<
Manganese	0.0079	<	.	0.012	<	<	0.0054	0.0071
Nickel	0.0548	0.25	.	0.76	0.31	0.39	0.161	0.162
Strontium	0.019	0.014	.	0.024	0.015	0.017	0.0247	0.0247
Thallium (PMS)	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.
Uranium (KPA)	<	<	.	<	<	<	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-339		GW-521		GW-522			GW-539	
Site	UNCS		LIV		LIV			LII	
Date	07/30/02		01/10/02	07/15/02	01/22/02	01/28/02	07/15/02	01/14/02	07/17/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type	Dup								
Field Measurements									
Time Sampled	13:35	.	10:45	10:25	12:10	11:25	11:45	9:59	10:00
Measuring Point Elev. (ft)	1124.83	.	1182.88	1182.88	1175.48	1175.48	1175.48	1093.20	1093.20
Depth to Water (ft)	78.48	.	91.54	85.19	109.30	94.65	107.52	113.58	107.60
Groundwater Elevation (ft)	1046.35	.	1091.34	1097.69	1066.18	1080.83	1067.96	979.62	985.60
Conductivity ($\mu\text{mho}/\text{cm}$)	579	.	306	301	292	358	358	339	351
Dissolved Oxygen (ppm)	0.69	.	5.73	4.49	5.97	6.22	5.21	6.47	4.89
Oxidation/Reduction (mV)	174	.	247	165	229	208	177	246	201
Temperature (degrees C)	21.4	.	13.6	18.1	14.6	13.8	17.3	9.3	21.5
Turbidity (NTU)	11	.	14	13	8	9	10	10	9
pH	7.47	.	7.65	8.45	7.79	7.34	8.18	7.79	8.29
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	234 J	254 J	258 J	.	276 J	303 J	280 J
Dissolved Solids (mg/L)	311	313	163	157 J	169	.	169 J	178	164
Suspended Solids (mg/L)	<	<	<	<	<	.	<	<	<
Turbidity (NTU)	.	.	0.15	1.7	0.31	.	0.08 J	0.06 J	0.24
pH	.	.	7.5	8.2	7.9	.	7.8	8.1	8
Major Ions (mg/L)									
Calcium	64.6	64.5	<	27.9	28.1	.	32.3	33.4	34.7
Magnesium	37	37	21.2	20.1	17.3	.	20.1	20.7	21.2
Potassium	2.49	2.56	<	<	<	.	<	<	<
Sodium	10.6	10.8	<	<	<	.	<	<	<
Alkalinity as CO ₃	<	<	<	<	<	.	<	<	<
Alkalinity as HCO ₃	280	279	160	153	160	.	163	168	164
Chloride	18.8	19.9	1.9 J	1.9 J	2 J	.	2.4 J	4.2	4.1
Fluoride	<	<	<	<	<	.	0.14 J	<	<
Nitrate as N	0.49	0.51	0.35 J	0.3 J	0.5	.	0.53	0.52	0.51
Sulfate	3.7	3.6	2 J	1.8 J	1.7 J	.	3.1 J	6.3	7.1
Charge Balance (RPD)	4.3	.	0.7	-0.2	-8.1	.	-1	-3.9	0.9
Trace Metals (mg/L)									
Aluminum	<	<	<	<	<	.	<	<	<
Arsenic	<	<	<	<	<	.	<	<	<
Barium	0.0218	0.0226	<	<	<	.	<	<	<
Boron	<	<	<	<	<	.	<	<	<
Cadmium (PMS)	.	.	.	.	.	.	.	.	.
Chromium	0.0117	0.0122	<	<	<	.	<	0.0069	0.0057
Iron	<	0.053	<	<	<	.	<	<	<
Lead (PMS)	.	.	.	.	.	.	.	.	.
Lithium	<	<	.	.	.	.	.	.	.
Manganese	<	<	<	<	<	.	<	<	<
Nickel	0.2	0.198	<	<	<	.	<	0.022	0.022
Strontium	0.0269	0.0275	0.011	0.011	0.011	.	0.014	0.019	0.019
Thallium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (KPA)	<	<	<	<	<	.	<	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-540		GW-542		GW-543		GW-544		GW-557	
Site	LII		CDLVI		CDLVI		CDLVI		LV	
Date	01/16/02	07/18/02	01/16/02	07/18/02	01/15/02	07/18/02	01/15/02	07/22/02	01/10/02	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									Dup	
Field Measurements										
Time Sampled	11:30	9:55	9:45	9:35	11:25	11:20	10:00	9:50	10:20	.
Measuring Point Elev. (ft)	1072.31	1072.31	1051.81	1051.81	1024.01	1024.01	1045.19	1045.19	1081.36	.
Depth to Water (ft)	88.98	83.75	72.14	70.08	65.77	65.37	65.22	61.14	125.20	.
Groundwater Elevation (ft)	983.33	988.56	979.67	981.73	958.24	958.64	979.97	984.05	956.16	.
Conductivity ($\mu\text{mho}/\text{cm}$)	415	435	229	171	528	508	507	545	358	.
Dissolved Oxygen (ppm)	0.77	6.13	4.77	8.13	6.37	4.37	2.51	3.82	7.01	.
Oxidation/Reduction (mV)	175	142	248	239	221	219	239	183	214	.
Temperature (degrees C)	13.1	19.8	13.2	17.3	11.8	16.8	9.4	19.3	14.1	.
Turbidity (NTU)	11	11	27	12	6	9	5	15	14	.
pH	8.04	7.48	6.66	6.38	6.83	6.73	7.19	7.32	7.55	.
Miscellaneous Analytes										
Conductivity ($\mu\text{mho}/\text{cm}$)	345 J	375 J	188 J	153 J	440 J	444 J	420 J	480 J	256 J	263 J
Dissolved Solids (mg/L)	220	221 J	137	104 J	286	259 J	273	274 J	179	172
Suspended Solids (mg/L)	8.2	2 J	7.2	<	<	<	<	<	<	<
Turbidity (NTU)	0.08 J	2.5	2.9	0.65	0.09 J	<	0.06 J	0.07 J	0.26	0.33
pH	7.9	7.8	7.2	6.9	7.4	7.3	7.9	7.8	7.6	7.6
Major Ions (mg/L)										
Calcium	36.1	38.5	25.6	21.5	58.3	53.5	52.8	53.9	<	<
Magnesium	25.7	27.3	13.6	8	34.1	31.5	30.8	31.6	21.3	21.3
Potassium	<	<	<	<	<	<	<	<	<	<
Sodium	14.1	14.7	<	<	<	<	5.6	5.8	<	<
Alkalinity as CO ₃	<	<	<	<	<	<	<	<	<	<
Alkalinity as HCO ₃	217	218	117	90.1	265	244	261	237	170	168
Chloride	2.2 J	6.3	1.7 J	1.8 J	2.8 J	5.4	9.4	9.7 J	2.1 J	2.2 J
Fluoride	0.19 J	<	0.19 J	0.16 J	<	<	<	<	0.19 J	<
Nitrate as N	0.17 J	<	0.4 J	0.37 J	0.41 J	0.37 J	0.63	0.6	0.73	0.73
Sulfate	9.3	8.3	2.9 J	2.3 J	18.2	15.1	19	25.2	2 J	2.1 J
Charge Balance (RPD)	0	1.6	1.2	-1.9	0.3	0.8	-4.5	0	0.2	.
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.012	0.012	0.016	0.015	0.013	0.014	0.014	0.015	0.011	0.011
Boron	<	<	<	<	<	<	<	<	<	<
Cadmium (PMS)	.	.	.	.	.	.	.	.	.	.
Chromium	<	<	<	<	<	<	<	<	<	<
Iron	<	<	<	<	<	<	<	<	<	<
Lead (PMS)	.	.	.	.	.	.	.	.	.	.
Lithium	.	.	.	.	.	.	.	.	.	.
Manganese	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Strontium	0.027	0.03	0.019	0.02	0.031	0.037	0.028	0.031	0.018	0.018
Thallium (PMS)	.	.	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.	.	.
Uranium (KPA)	<	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-557		GW-560		GW-562					
Site	LV		CDLVII		CDLVII					
Date	07/11/02		01/17/02	07/16/02	01/09/02	01/22/02	01/28/02	07/10/02	07/16/02	
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	
Sample Type	Dup									
Field Measurements										
Time Sampled	11:15	.	10:55	11:23	14:15	9:50	13:35	9:35	9:43	
Measuring Point Elev. (ft)	1081.36	.	949.05	949.05	934.69	934.69	934.69	934.69	934.69	
Depth to Water (ft)	122.78	.	48.99	42.13	13.85	12.90	10.15	8.64	8.78	
Groundwater Elevation (ft)	958.58	.	900.06	906.92	920.84	921.79	924.54	926.05	925.91	
Conductivity ($\mu\text{mho/cm}$)	344	.	332	330	385	370	366	405	390	
Dissolved Oxygen (ppm)	7.5	.	8.6	6.43	6.89	8.89	3.41	4.7	6.2	
Oxidation/Reduction (mV)	176	.	249	206	182	205	176	161	142	
Temperature (degrees C)	17.1	.	13.7	17	13.7	13	13.8	18.7	17.2	
Turbidity (NTU)	4	.	16	9	11	16	11	12	11	
pH	7.15	.	7.54	7.16	7.72	7.6	7.22	7.19	7.18	
Miscellaneous Analytes										
Conductivity ($\mu\text{mho/cm}$)	308 J	308 J	264 J	278 J	.	308 J	.	.	319 J	
Dissolved Solids (mg/L)	165 J	179 J	181	157	211	209	.	214	171	
Suspended Solids (mg/L)	<	<	<	<	<	<	.	<	<	
Turbidity (NTU)	0.2	0.21	0.17	0.21	.	5.2	.	.	3.2	
pH	7.8	7.8	7.7	7.7	.	7.4	.	.	7.7	
Major Ions (mg/L)										
Calcium	36.5	37.3	37.7	37.4	39.6	29.9	.	41.4	38.5	
Magnesium	21	21.4	16.2	16	23.6	17.2	.	24	22.7	
Potassium	<	<	<	<	0.609	<	.	0.665	<	
Sodium	<	<	<	<	2.81	<	.	2.58	<	
Alkalinity as CO_3	<	<	<	<	.	<	.	.	<	
Alkalinity as HCO_3	172	173	169	162	.	196	.	.	192	
Chloride	3.2	2.1 J	2.2 J	2 J	.	2.3 J	.	.	2.5 J	
Fluoride	0.13 J	0.13 J	0.21 J	0.15 J	.	<	.	.	0.14 J	
Nitrate as N	0.69	0.7	0.34 J	0.29 J	.	0.36 J	.	.	0.34 J	
Sulfate	3.8 J	2.2 J	3.1 J	2.8 J	.	1.9 J	.	.	2.2 J	
Charge Balance (RPD)	-1.2	.	-4.5	-2.6	.	-16.4	.	.	-0.8	
Trace Metals (mg/L)										
Aluminum	<	<	<	<	0.311	<	.	0.332	<	
Arsenic	<	<	<	<	<	<	.	<	<	
Barium	0.013	0.011	0.23	0.25	0.0123	<	.	0.013	0.011	
Boron	<	<	<	<	<	<	.	<	<	
Cadmium (PMS)	.	.	.	.	.	.	.	.	.
Chromium	<	<	<	<	<	<	.	<	<	
Iron	<	<	<	<	0.285	<	.	0.41	<	
Lead (PMS)	.	.	.	.	.	.	.	.	.
Lithium	.	.	.	.	<	.	.	<	.
Manganese	<	<	<	<	0.0055	<	.	0.0087	<	
Nickel	<	<	<	<	<	<	.	<	<	
Strontium	0.018	0.018	0.025	0.027	0.0206	0.017	.	0.0209	0.022	
Thallium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (KPA)	<	<	<	<	<	<	.	<	<	

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-564				GW-709		GW-731		GW-732	
Site	CDLVII				LII		CRSDB		CRSDB	
Date	01/16/02		07/16/02		01/15/02	07/17/02	04/16/02	10/15/02	04/16/02	10/15/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup		Dup						
Field Measurements										
Time Sampled	10:10	.	9:20	.	9:40	11:35	12:30	14:48	13:40	10:07
Measuring Point Elev. (ft)	938.07	.	938.07	.	906.81	906.81	1049.29	1049.29	1064.29	1064.29
Depth to Water (ft)	13.17	.	11.47	.	30.02	29.79	124.70	126.08	157.50	157.90
Groundwater Elevation (ft)	924.90	.	926.60	.	876.79	877.02	924.59	923.21	906.79	906.39
Conductivity ($\mu\text{mho}/\text{cm}$)	277	.	274	.	304	283	261	246	269	313
Dissolved Oxygen (ppm)	5.74	.	5.48	.	1.32	2.8	5.31	6.72	5.13	7.21
Oxidation/Reduction (mV)	234	.	195	.	190	154	172	169	180	199
Temperature (degrees C)	14.2	.	16	.	7.5	23.2	18.2	16.4	17	15.6
Turbidity (NTU)	11	.	9	.	15	6	12	17	14	10
pH	6.49	.	7.16	.	8.66	8.68	7.87	7.6	8.41	7.64
Miscellaneous Analytes										
Conductivity ($\mu\text{mho}/\text{cm}$)	223 J	226 J	239 J	233 J	241 J	244 J	.	.	.	.
Dissolved Solids (mg/L)	159	157	131	142	150	133	138	111	156	118
Suspended Solids (mg/L)	<	6	<	<	6.2	<	<	4	<	<
Turbidity (NTU)	0.59	0.41	0.6	0.56	0.32	0.19	.	.	.	.
pH	6.8	6.9	7.2	7.2	7.8	8.4	.	.	.	.
Major Ions (mg/L)										
Calcium	32.2	34	32.4	32.5	18.7	20.1	28.4	25.3	26.8	29.6
Magnesium	11.4	11.7	14	14	23	24.5	17.9	14.3	18.3	15.9
Potassium	<	<	<	<	<	<	1.09	2.6	1.26	5.2
Sodium	<	<	<	<	<	<	0.652	1.7	0.667	2.5
Alkalinity as CO ₃	<	<	<	<	85.7	6.5	.	.	.	.
Alkalinity as HCO ₃	107	109	132	130	26.7	140	.	.	.	.
Chloride	4.4 J	4.2 J	2.5 J	2.5 J	2.7 J	2.1 J	.	.	.	.
Fluoride	0.19 J	0.19 J	0.13 J	0.14 J	0.2 J	<	.	.	.	.
Nitrate as N	1.6	1.5	0.53	0.53	<	<	.	.	.	.
Sulfate	16	15.9	6.4	6.4	4.9 J	5.3	.	.	.	.
Charge Balance (RPD)	-0.4	.	-1.5	.	11.3	1.2	.	.	.	.
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	0.3	<	0.36
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.029	0.034	0.016	0.016	0.47	0.46	0.0078	0.01	0.0101	0.021
Boron	<	<	<	<	<	<	<	<	<	0.36
Cadmium (PMS)	.	.	.	.	.	.	.	.	.	.
Chromium	<	<	<	<	<	<	<	<	<	0.0056
Iron	<	<	<	<	<	<	<	0.3	0.131	0.14
Lead (PMS)	.	.	.	.	.	.	.	.	.	.
Lithium	.	.	.	.	.	.	<	<	<	0.017
Manganese	<	<	<	<	<	<	<	0.015	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Strontium	0.072	0.077	0.035	0.035	0.034	0.035	0.0147	0.033	0.015	0.033
Thallium (PMS)	.	.	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.	.	.
Uranium (KPA)	<	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-757		GW-796		GW-797		GW-798			
Site	LII		LV		LV		CDLVII			
Date	01/15/02	07/17/02	01/14/02	07/11/02	01/14/02	07/11/02	01/09/02	01/16/02	07/10/02	07/16/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										
Field Measurements										
Time Sampled	11:15	10:30	9:30	11:20	10:50	9:35	12:55	11:15	10:45	10:30
Measuring Point Elev. (ft)	961.64	961.64	1052.62	1052.62	1060.00	1060.00	1006.00	1006.00	1006.00	1006.00
Depth to Water (ft)	84.96	84.80	88.05	80.53	78.40	75.60	85.78	86.27	80.16	80.50
Groundwater Elevation (ft)	876.68	876.84	964.57	972.09	981.60	984.40	920.22	919.73	925.84	925.50
Conductivity ($\mu\text{mho}/\text{cm}$)	304	311	250	264	390	417	276	274	280	271
Dissolved Oxygen (ppm)	1.16	2.06	8.09	6.07	4.73	6.7	10.41	8.62	4.81	5.41
Oxidation/Reduction (mV)	42	135	213	230	205	179	166	214	135	165
Temperature (degrees C)	9.1	21.9	13.9	16.7	11.4	20.5	14.9	14.6	18.4	17.7
Turbidity (NTU)	12	16	17	11	19	7	8	15	8	5
pH	10.11	9.47	8.35	8.3	8.04	7.71	7.88	7.84	8.09	8.06
Miscellaneous Analytes										
Conductivity ($\mu\text{mho}/\text{cm}$)	228 J	254 J	201 J	217 J	326 J	369 J	.	232 J	.	246 J
Dissolved Solids (mg/L)	157	141	119	133 J	200	215 J	168	147	155	128
Suspended Solids (mg/L)	<	2.8 J	2 J	<	<	<	<	2.6 J	<	<
Turbidity (NTU)	1.7	1.5	5.3	3	0.13	0.22	.	0.06 J	.	<
pH	9.8	10	7.6	8.1	7.9	7.9	.	7.6	.	7.8
Major Ions (mg/L)										
Calcium	3.2	2.9	22.1	25.8	36.3	41.4	28.8	28.5	29.5	27.5
Magnesium	3.7	3.3	13.7	15.2	21.5	24.1	16.5	16.2	16.5	15.7
Potassium	17.7	17.1	<	<	<	<	1.71	<	1.35	<
Sodium	41	41.3	<	<	<	<	0.479	<	0.461	<
Alkalinity as CO ₃	<	70.7	<	<	<	<	.	<	.	<
Alkalinity as HCO ₃	139	43.6	125	123	177	173	.	135	.	134
Chloride	2.1 J	1.8 J	1.4 J	2.2 J	3.5	5.3	.	1.6 J	.	1.7 J
Fluoride	1.7	1.7	<	0.13 J	<	0.15 J	.	0.19 J	.	0.13 J
Nitrate as N	0.31 J	0.33 J	0.21 J	0.19 J	0.63	0.74	.	0.76	.	0.74
Sulfate	14.3	14.6	1.2 J	1.3 J	20.8	25.2	.	3.1 J	.	2.8 J
Charge Balance (RPD)	-9.9	-2.4	-6.3	-0.2	-4.1	0.8	.	-1.2	.	-2.8
Trace Metals (mg/L)										
Aluminum	<	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	<	<
Barium	0.071	0.069	<	<	<	<	0.011	0.013	0.0105	0.01
Boron	<	<	<	<	<	<	<	<	<	<
Cadmium (PMS)	.	.	.	.	.	.	.	.	.	.
Chromium	<	<	<	<	<	0.0053	<	<	<	<
Iron	<	<	<	<	<	<	<	<	<	<
Lead (PMS)	.	.	.	.	.	.	.	.	.	.
Lithium	.	.	.	.	.	.	<	.	<	.
Manganese	<	<	<	<	<	<	<	<	<	<
Nickel	<	<	<	<	<	<	<	<	<	<
Strontium	0.18	0.18	0.013	0.014	0.025	0.026	0.0176	0.019	0.0166	0.018
Thallium (PMS)	.	.	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.	.	.
Uranium (KPA)	<	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	GW-799		GW-801		GW-827		GW-831		MCK 2.0
Site	LV		LV		CDLVI		FCAP		EXP-SW
Date	01/10/02	07/11/02	01/14/02	07/15/02	01/17/02	07/18/02	01/09/02	07/09/02	02/21/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									
Field Measurements									
Time Sampled	11:50	9:50	12:10	10:20	9:30	10:35	10:05	13:40	14:20
Measuring Point Elev. (ft)	981.29	981.29	1097.16	1097.16	1051.60	1051.60	1091.29	1091.29	.
Depth to Water (ft)	21.55	18.40	121.24	114.85	47.81	43.66	134.00	129.28	.
Groundwater Elevation (ft)	959.74	962.89	975.92	982.31	1003.79	1007.94	957.29	962.01	.
Conductivity ($\mu\text{mho}/\text{cm}$)	291	291	285	297	316	298	392	335	194
Dissolved Oxygen (ppm)	3.19	2.17	8.07	6.03	5.29	6.65	2.14	2.52	10.58
Oxidation/Reduction (mV)	226	152	209	133	210	268	241	4	115
Temperature (degrees C)	13.4	16.8	12.7	15.2	13.2	16.3	8.5	24.3	14.8
Turbidity (NTU)	12	11	9	12	11	12	12	17	2
pH	8.2	8.46	7.69	7.47	7.75	7.78	8.51	8.6	6.12
Miscellaneous Analytes									
Conductivity ($\mu\text{mho}/\text{cm}$)	229 J	260 J	249 J	247 J	247 J	261 J	.	.	.
Dissolved Solids (mg/L)	143	155 J	148	139 J	161	146 J	215	210	236
Suspended Solids (mg/L)	3 J	<	<	<	<	<	<	<	<
Turbidity (NTU)	4.6	0.41	0.78	0.29	2.6	0.46	.	.	.
pH	8.2	8.3	7.6	7.9	7.4	7.8	.	.	.
Major Ions (mg/L)									
Calcium	<	32.5	29.1	28.4	31.3	31.5	38.9	40.6	51.1
Magnesium	17.3	17.3	17	16.7	18	18.7	25.2	26.4	16
Potassium	<	<	<	<	<	<	1.52	1.66	4.61
Sodium	<	<	<	<	<	<	0.526	0.549	2.23
Alkalinity as CO ₃	<	3.4 J	<	<	<	<	.	.	<
Alkalinity as HCO ₃	141	138	147	148	157	165	.	.	164
Chloride	1.8 J	1.8 J	1.3 J	2 J	1.6 J	1.7 J	.	.	1.8
Fluoride	0.23 J	0.18 J	<	0.13 J	0.19 J	0.17 J	.	.	<
Nitrate as N	1.1	1	0.21 J	0.19 J	0.2 J	0.19 J	.	.	.
Sulfate	3.7 J	3.5 J	2.8 J	3.3 J	2 J	2 J	.	.	42
Charge Balance (RPD)	-0.4	0.5	-3	-5	-1.5	-4.1	.	.	-1.5
Trace Metals (mg/L)									
Aluminum	<	<	<	<	<	<	<	<	<
Arsenic	<	<	<	<	<	<	<	<	0.0111
Barium	<	<	<	<	<	<	0.0211	0.0199	0.0817
Boron	<	<	<	<	<	<	<	<	0.251
Cadmium (PMS)	.	.	.	.	.	.	.	.	.
Chromium	0.061	0.051	<	<	<	<	<	<	<
Iron	<	<	<	<	<	<	0.0785	0.0932	0.0609
Lead (PMS)	.	.	.	.	.	.	.	.	.
Lithium	.	.	.	.	.	.	<	<	0.0908
Manganese	<	<	<	<	<	<	0.0295	0.0259	0.0308
Nickel	<	<	<	<	<	<	<	<	<
Strontium	0.022	0.021	0.016	0.016	0.018	0.018	0.0263	0.0258	0.994
Thallium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.	.	.
Uranium (KPA)	<	<	<	<	<	<	<	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	MCK 2.0	MCK 2.05				SCR1.25SP	
Site	EXP-SW	EXP-SW				EXP-SW	
Date	07/09/02	02/21/02		07/09/02		02/21/02	07/10/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup		Dup			
Field Measurements							
Time Sampled	13:55	14:33	.	14:10	.	14:07	14:30
Measuring Point Elev. (ft)	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	211	198	.	197	.	127	163
Dissolved Oxygen (ppm)	9.48	10.35	.	12	.	11.54	9.85
Oxidation/Reduction (mV)	120	-10	.	20	.	180	110
Temperature (degrees C)	19.1	13.9	.	16.7	.	13.3	18.4
Turbidity (NTU)	51	4	.	12	.	4	45
pH	7.76	6.35	.	7.85	.	5.6	7.91
Miscellaneous Analytes							
Conductivity ($\mu\text{mho}/\text{cm}$)	.	.	.	.	.	.	.
Dissolved Solids (mg/L)	477	262	249	274	253	132	188
Suspended Solids (mg/L)	<	<	<	<	<	<	59.9
Turbidity (NTU)	.	.	.	.	.	.	.
pH	.	.	.	.	.	.	.
Major Ions (mg/L)							
Calcium	50.6	51.5	49.7	51.9	50.8	30.3	41.2
Magnesium	16.8	16.5	16	17.6	17.3	12.4	18.3
Potassium	4.46	4.64	4.55	4.61	4.61	0.843	1.21
Sodium	2.48	2.28	2.23	2.45	2.43	1.36	1.42
Alkalinity as CO_3	<	<	<	<	<	<	<
Alkalinity as HCO_3	<Q	162	161	170	160	114	151
Chloride	1.9	1.9	1.8	2.1	2.2	2.7	2.8
Fluoride	0.11	<	<	<	0.12	<	<
Nitrate as N	.	.	.	.	.	.	.
Sulfate	33.5	41.8	41.8	33.9	34.1	7.7	4.7
Charge Balance (RPD)	69 R	-0.2	.	1.2	.	2	6.7
Trace Metals (mg/L)							
Aluminum	<	<	<	<	<	<	0.331
Arsenic	0.0144	0.0559	0.0551	0.0504	0.0498	<	<
Barium	0.0741	0.104	0.103	0.103	0.102	0.0451	0.0729
Boron	0.215	0.251	0.246	0.224	0.224	<	<
Cadmium (PMS)	.	.	.	.	.	.	.
Chromium	<	<	<	<	<	<	<
Iron	0.229	1.46	1.48	1.24	1.16	0.108	0.464
Lead (PMS)	.	.	.	.	.	.	.
Lithium	0.0798	0.0893	0.0886	0.0801	0.08	<	<
Manganese	0.123	1.49	1.49	1.5	1.47	0.0129	0.0677
Nickel	<	<	<	0.0175	<	<	<
Strontium	0.955	1	0.995	0.983	0.967	0.036	0.0455
Thallium (PMS)	.	.	.	.	.	.	.
Uranium (PMS)	.	.	.	.	.	.	.
Uranium (KPA)	<	<	<	<	<	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	SCR1.5SW			SCR2.2SW		SCR3.5SP	
Site	EXP-SW			EXP-SW		EXP-SW	
Date	02/21/02	08/19/02	03/21/02	09/23/02	02/21/02	07/10/02	
Program	GWPP	GWPP	GWPP	GWPP	BJC	BJC	
Sample Type	Dup						
Field Measurements							
Time Sampled	9:30	9:30	8:20	7:45	9:15	14:50	13:40
Measuring Point Elev. (ft)	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	309	309	597	243	339	163	196
Dissolved Oxygen (ppm)	5.23	5.23	3.1	5.54	4.21	11.73	8.54
Oxidation/Reduction (mV)	232	232	199	221	208	40	190
Temperature (degrees C)	9.4	9.4	21.1	11.6	16.7	13.2	20.9
Turbidity (NTU)	.	.	.	.	.	54	51
pH	7.07	7.07	7.49	7.24	7.06	6.86	8.41
Miscellaneous Analytes							
Conductivity ($\mu\text{mho}/\text{cm}$)	275	276	339	166.3	259	.	.
Dissolved Solids (mg/L)	139	136	183	91	154	185	232
Suspended Solids (mg/L)	<	<	<	<	<	<	8.1
Turbidity (NTU)	2.65	2.72	10	5.63	7.15	.	.
pH	8.16	8.17	7.95	7.8	8.1	.	.
Major Ions (mg/L)							
Calcium	34.8	34.8	39.8	19.1	34.6	46.6	50.5
Magnesium	14	14.3	18.7	6.61	10.2	14.7	16.6
Potassium	<	<	<	<	<	2.09	2.46
Sodium	1.57	1.59	1.23	2.04	2.92	1.43	1.75
Alkalinity as CO ₃	<	<	<	<	<	<	<
Alkalinity as HCO ₃	133	135	179	71.2	110	149	178
Chloride	2.85	2.87	1.99	3.5	4.59	1.6	2.1
Fluoride	<	<	<	<	<	<	<
Nitrate as N	0.0715	0.0719	0.123	0.141	0.231	.	.
Sulfate	7.37	7.17	5.65	6.65	12.1	16.9	14.6
Charge Balance (RPD)	1	0.8	-2.5	-2.6	1.8	3.9	1.3
Trace Metals (mg/L)							
Aluminum	<	0.217	0.96	0.306	0.397	<	<
Arsenic	.	.	.	.	.	<	<
Barium	0.0423	0.0436	0.0646	0.0207	0.0309	0.0723	0.0922
Boron	<	<	<	<	<	<	<
Cadmium (PMS)	<	<	0.00089	<	<	.	.
Chromium	.	.	.	.	.	<	<
Iron	0.0794	0.119	0.59	0.134	0.568	0.196	0.337
Lead (PMS)	<	<	0.000688	0.0028	<	.	.
Lithium	<	<	<	<	<	0.0207	0.0232
Manganese	<	0.00628	0.04	<	0.00608	0.0334	0.0523
Nickel	.	.	.	.	.	<	<
Strontium	0.0446	0.0454	0.0606	0.0298	0.0509	0.303	0.339
Thallium (PMS)	<	<	0.000799	<	<	.	.
Uranium (PMS)	0.00157	0.00149	0.00161	0.00585	0.00678	.	.
Uranium (KPA)	.	.	.	.	.	<	<

APPENDIX F.1: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Field Measurements, Miscellaneous Analytes, Major Ions, and Trace Metals

Station	SCR4.3SP		SCR4.4SW			SCR5.2SP	
Site	EXP-SW		EXP-SW			EXP-SW	
Date	01/14/02	07/15/02	02/21/02	09/23/02		02/21/02	08/19/02
Program	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type				Dup			
Field Measurements							
Time Sampled	13:32	9:24	8:45	8:50	8:50	8:15	9:00
Measuring Point Elev. (ft)	.	.	.	.	.	.	.
Depth to Water (ft)	.	.	.	.	.	.	.
Groundwater Elevation (ft)	.	.	.	.	.	.	.
Conductivity ($\mu\text{mho}/\text{cm}$)	370	563	312	361	361	521	624
Dissolved Oxygen (ppm)	4.07	4.26	6.48	4.28	4.28	4.64	4.8
Oxidation/Reduction (mV)	208	101	220	213	213	238	160
Temperature (degrees C)	11.5	17.7	6.1	18.7	18.7	12.9	16.4
Turbidity (NTU)	.	40	.	.	.	.	.
pH	6.96	6.37	7.63	6.89	6.89	7.05	7.2
Miscellaneous Analytes							
Conductivity ($\mu\text{mho}/\text{cm}$)	293 J	263 J	280	213	213	434	465
Dissolved Solids (mg/L)	195	178 J	150	234	235	224	257
Suspended Solids (mg/L)	<	7.2	<	12	11	<	<
Turbidity (NTU)	2.8	28.1	11.9	148	149	0.941	1.38
pH	7.1	7	7.93	7.78	7.72	7.48	7.41
Major Ions (mg/L)							
Calcium	39.7	34.5	34.9	27.9	27.5	60.4	63.8
Magnesium	16.3	10.7	13	6.53	6.32	17.3	19.6
Potassium	<	<	<	3.12	2.82	<	<
Sodium	<	<	1.31	1	0.968	1.2	1.46
Alkalinity as CO ₃	<	<	<	<	<	<	<
Alkalinity as HCO ₃	158	115	123	89	87.4	199	226
Chloride	2.9 J	3.3 J	2.76	1.88	1.87	2.27	1.89
Fluoride	0.15 J	0.22 J	<	0.122	0.12	0.131	0.147
Nitrate as N	1.7	0.84	1.24	0.415	0.449	5.53	3.16
Sulfate	10.6	25.6	9.98	29.8	29.6	9.49	9.1
Charge Balance (RPD)	-3.2	-4.4	0.6	-9.6	-10	-1.7	-1.4
Trace Metals (mg/L)							
Aluminum	<	0.62	0.888	7.78	5.92	<	<
Arsenic	<	<	.	.	.	.	.
Barium	0.15	0.12	0.0801	0.0501	0.0484	0.046	0.0623
Boron	<	<	<	<	<	<	<
Cadmium (PMS)	.	.	<	<	<	<	<
Chromium	<	<	.	.	.	.	.
Iron	<	0.67	0.374	4.22	4.09	<	<
Lead (PMS)	.	.	<	0.0019	0.00794	<	0.00186
Lithium	.	.	<	<	<	<	<
Manganese	<	<	<	0.0549	0.0544	<	0.00568
Nickel	<	<	.	.	.	.	.
Strontium	0.11	0.13	0.0944	0.0984	0.0962	0.0673	0.0902
Thallium (PMS)	.	.	<	<	<	<	<
Uranium (PMS)	.	.	<	<	<	0.00055	0.000738
Uranium (KPA)	<	<	.	.	.	.	.

APPENDIX F.2
VOLATILE ORGANIC COMPOUNDS

APPENDIX F.2: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Station	GW-141		GW-142			GW-143			GW-144
Site	LIV		KHQ			KHQ			KHQ
Date	01/23/02	07/25/02	04/10/02	10/16/02	12/02/02	04/09/02	10/16/02	12/02/02	04/09/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									
Chloroethanes (µg/L)									
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)									
Chloroform	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<

Station	GW-144		GW-145			GW-177		GW-217	
Site	KHQ		KHQ			CRSP		LIV	
Date	10/16/02	12/02/02	04/08/02	10/21/02	12/02/02	01/09/02	07/10/02	01/28/02	07/22/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									
Chloroethanes (µg/L)									
1,1,1-Trichloroethane	<	<	<	<	<	16	12	<	<
1,1-Dichloroethane	<	<	<	<	<	25	19	<	<
Chloroethenes (µg/L)			0.4 J						
Tetrachloroethene	<	0.4 J	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	8	5	<	<
Miscellaneous (µg/L)									
Chloroform	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane

Station	GW-231						GW-301		
Site	KHQ						CRBAWP		
Date	04/08/02		10/17/02		12/02/02		01/09/02		07/10/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type		Dup		Dup		Dup		Dup	
Chloroethanes (µg/L)									
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)									
Chloroform	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane

APPENDIX F.2: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Station	GW-301		GW-305				GW-521		GW-522	
Site	CRBAWP		LIV				LIV		LIV	
Date	07/10/02	01/28/02	05/02/02	07/15/02	11/21/02		01/10/02	07/15/02	01/28/02	07/15/02
Program	BJC	BJC	BJC	BJC	BJC		BJC	BJC	BJC	BJC
Sample Type	Dup									
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	22		17	18	18	<	<	<	<
1,1-Dichloroethane	<	15		12	13	13	<	<	<	<
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	0.43 J
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	4.1	3.7	4.3	<	<	<	<	<
Miscellaneous (µg/L)										
Chloroform	<	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	.	<	<	<	<	<	<	<	<	<

Station	GW-539		GW-540		GW-542		GW-543		GW-544	
Site	LII		LII		CDLVI		CDLVI		CDLVI	
Date	01/14/02	07/17/02	01/16/02	07/18/02	01/16/02	07/18/02	01/15/02	07/18/02	01/15/02	01/15/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type										
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	0.37 J	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
Chloroform	<	<	<	<	<	<	<	<	<	1.4
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<	<

Station	GW-544		GW-557				GW-560		GW-562	
Site	CDLVI		LV				CDLVII		CDLVII	
Date	07/22/02	01/10/02		07/11/02			01/17/02	07/16/02	01/09/02	01/28/02
Program	BJC	BJC	BJC	BJC	Dup	Dup	BJC	BJC	BJC	BJC
Sample Type										
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<	<
Chloroethenes (µg/L)										
Tetrachloroethene	<	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)										
Chloroform	2.4	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	<	<	<	<	<

APPENDIX F.2: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Station	GW-562		GW-564				GW-709		GW-757
Site	CDLVII		CDLVII				LII		LII
Date	07/10/02	07/16/02	01/16/02		07/16/02		01/15/02	07/17/02	01/15/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type				Dup		Dup			
Chloroethanes (µg/L)									
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<	<
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)									
Chloroform	<	<	0.3 J	0.3 J	<	<	<	<	<
Trichlorofluoromethane	.	<	<	<	.	<	.	<	<

Station	GW-757	GW-796		GW-797		GW-798			
Site	LII	LV		LV		CDLVII			
Date	07/17/02	01/14/02	07/11/02	01/14/02	07/11/02	01/09/02	01/16/02	07/10/02	07/16/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type									
Chloroethanes (µg/L)									
1,1,1-Trichloroethane	<	0.8 J	0.64 J	<	<	3 J	2.6	4 J	3.2
1,1-Dichloroethane	<	<	<	<	<	2 J	2.3	3 J	2.6
Chloroethenes (µg/L)									
Tetrachloroethene	<	<	<	<	<	5 J	5.1	7	7.1
Trichloroethene	<	<	<	<	<	<	0.55 J	<	0.78 J
cis-1,2-Dichloroethene	<	<	<	<	<	3 J	5.1	7	6
1,1-Dichloroethene	<	<	<	<	<	<	2.5	5	2.3
Miscellaneous (µg/L)									
Chloroform	<	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	.	11	.	10

Station	GW-799		GW-801		GW-827		GW-831	
Site	LV		LV		CDLVI		FCAP	
Date	01/10/02	07/11/02	01/14/02	07/15/02	01/17/02	07/18/02	01/09/02	07/09/02
Program	BJC	BJC	BJC	BJC	BJC	BJC	BJC	BJC
Sample Type								
Chloroethanes (µg/L)								
1,1,1-Trichloroethane	<	<	<	<	<	<	<	<
1,1-Dichloroethane	<	<	<	<	<	<	<	<
Chloroethenes (µg/L)								
Tetrachloroethene	<	<	<	<	<	<	<	<
Trichloroethene	<	<	<	<	<	<	<	<
cis-1,2-Dichloroethene	<	<	<	<	<	<	<	<
1,1-Dichloroethene	<	<	<	<	<	<	<	<
Miscellaneous (µg/L)								
Chloroform	<	<	<	<	<	<	<	<
Trichlorofluoromethane	<	<	<	<	<	.	.	.

APPENDIX F.2: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Volatile Organic Compounds

Station	SCR1.25SP		SCR1.5SW			SCR2.2SW		SCR3.5SP		
Site	EXP-SW		EXP-SW			EXP-SW		EXP-SW		
Date	02/21/02	07/10/02	02/21/02		08/19/02	03/21/02	09/23/02	02/21/02	07/10/02	
Program	BJC		GWPP		GWPP	GWPP	GWPP	BJC		
Sample Type			Dup							
Chloroethanes (µg/L)										
1,1,1-Trichloroethane	<		<			<		<		
1,1-Dichloroethane	<		<			<		<		
Chloroethenes (µg/L)										
Tetrachloroethene	<		<			<		<		
Trichloroethene	<		<			<		<		
cis-1,2-Dichloroethene	<		<			<		<		
1,1-Dichloroethene	<		<			<		<		
Miscellaneous (µg/L)										
Chloroform	<		<			<		<		
Trichlorofluoromethane	.		.			<		.		

Station	SCR4.3SP		SCR4.4SW			SCR5.2SP	
Site	EXP-SW	EXP-SW	EXP-SW			EXP-SW	
Date	01/14/02	07/15/02	02/21/02	09/23/02		02/21/02	08/19/02
Program	BJC	BJC	GWPP	GWPP	GWPP	GWPP	GWPP
Sample Type			Dup				
Chloroethanes (µg/L)							
1,1,1-Trichloroethane	<		<			<	
1,1-Dichloroethane	<		<			<	
Chloroethenes (µg/L)							
Tetrachloroethene	<		<			<	
Trichloroethene	<		<			<	
cis-1,2-Dichloroethene	<		<			<	
1,1-Dichloroethene	<		<			<	
Miscellaneous (µg/L)							
Chloroform	<		<			<	
Trichlorofluoromethane	<		<			<	

APPENDIX F.3
RADIOLOGICAL ANALYTES

APPENDIX F.3: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Location	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Result	Error	MDA	Result	Error	MDA
1090	UNCS	01/30/02	BJC	<MDA	.	1.86	4.21	1.29	1.64
1090	UNCS	07/30/02	BJC	<MDA	.	1.57	5.35	1.1	1.15
GW-141	LIV	01/23/02	BJC	<MDA	.	2.7	<MDA	.	2.2
GW-141	LIV	07/25/02	BJC	<MDA	.	4	<MDA	.	2.5
GW-142	KHQ	04/10/02	BJC	<MDA	.	1.22	5.8	1.22	1.41
GW-142	KHQ	10/16/02	BJC	<MDA	.	3.2	<MDA	.	4.19
GW-143	KHQ	04/09/02	BJC	3.65	1.37	1.01	17.37	1.83	1.72
GW-143	KHQ	10/16/02	BJC	<MDA	.	2.19	15.73	2.62	2.27
GW-144	KHQ	04/09/02	BJC	2.26	0.96	0.9	1.7	1.04	1.5
GW-144	KHQ	10/16/02	BJC	2.64	1.9	1.84	3.28	2.14	2.07
GW-145	KHQ	04/08/02	BJC	8.82	2.36	2.31	11.31	1.76	1.95
GW-145	KHQ	10/21/02	BJC	9.69	1.93	1.4	13.54	2.33	2.38
GW-177	CRSP	01/09/02	BJC	4.56	1.57	1.55	6.66	1.43	1.72
GW-177	CRSP	07/10/02	BJC	<MDA	.	1.82	4.52	1.41	1.86
GW-203	UNCS	01/29/02	BJC	2.92	1.22	1.41	4.95	1.2	1.47
GW-203	UNCS	07/30/02	BJC	3.77	0.84	0.6	7.96	1.12	1.09
GW-205	UNCS	01/30/02	BJC	2.47	1.64	2.17	47.23	3.06	1.88
GW-205	UNCS	07/30/02	BJC	2.86	1.35	1.41	84.85	2.56	1.32
GW-217	LIV	01/22/02	BJC	<MDA	.	2.7	<MDA	.	2.2
GW-217	LIV	07/22/02	BJC	<MDA	.	3.1	2.3	1.4	2.2
GW-221	UNCS	01/29/02	BJC	2.89	1.09	1.07	3.26	1.18	1.59
GW-221	UNCS	07/30/02	BJC	0.95	0.66	0.76	3.08	1.05	1.18
GW-231	KHQ	04/08/02	BJC	<MDA	.	1.43	<MDA	.	1.79
GW-231 Dup	KHQ	04/08/02	BJC	<MDA	.	1.48	1.82	1.24	1.8
GW-231	KHQ	10/17/02	BJC	<MDA	.	1	2.19	1.48	1.73
GW-231 Dup	KHQ	10/17/02	BJC	<MDA	.	1.28	2.36	1.59	1.87
GW-301	CRBAWP	01/09/02	BJC	<MDA	.	1.68	2.55	1.27	1.81
GW-301 Dup	CRBAWP	01/09/02	BJC	3.43	1.19	1.07	5.58	1.31	1.61
GW-301	CRBAWP	07/10/02	BJC	<MDA	.	1.61	<MDA	.	1.82
GW-301 Dup	CRBAWP	07/10/02	BJC	<MDA	.	1.61	<MDA	.	1.82
GW-302	UNCS	01/31/02	BJC	2.68	1.36	1.47	4.22	1.55	1.73
GW-302	UNCS	07/31/02	BJC	10.77	1.37	0.82	6.26	1.56	1.45
GW-305	LIV	01/22/02	BJC	<MDA	.	2.5	<MDA	.	1.9
GW-305	LIV	05/02/02	BJC	<MDA	.	2.6	<MDA	.	2
GW-305	LIV	07/15/02	BJC	<MDA	.	3	<MDA	.	3
GW-305	LIV	11/21/02	BJC	<MDA	.	2.1	<MDA	.	1.9
GW-339	UNCS	01/29/02	BJC	2.19	1.14	1.28	2.59	1.07	1.46
GW-339 Dup	UNCS	01/29/02	BJC	<MDA	.	1.12	2.04	1.3	1.89
GW-339	UNCS	07/30/02	BJC	<MDA	.	1.47	<MDA	.	1.81
GW-339 Dup	UNCS	07/30/02	BJC	2.07	1.16	1.26	5.29	1.36	1.48
GW-521	LIV	01/10/02	BJC	<MDA	.	2.4	<MDA	.	2
GW-521	LIV	07/15/02	BJC	<MDA	.	3.1	<MDA	.	3
GW-522	LIV	01/22/02	BJC	<MDA	.	2.3	2.4	1.2	1.8
GW-522	LIV	07/15/02	BJC	<MDA	.	3	<MDA	.	2.9
GW-539	LII	01/14/02	BJC	<MDA	.	2.6	<MDA	.	2
GW-539	LII	07/17/02	BJC	<MDA	.	3.6	<MDA	.	3.3
GW-540	LII	01/16/02	BJC	<MDA	.	2.9	3.2	1.3	2
GW-540	LII	07/18/02	BJC	<MDA	.	4.5	<MDA	.	3.2
GW-542	CDLVI	01/16/02	BJC	<MDA	.	1.6	2	1.2	1.9
GW-542	CDLVI	07/18/02	BJC	<MDA	.	1.9	2.1	1.2	1.9
GW-543	CDLVI	01/15/02	BJC	<MDA	.	1.6	2.4	1.1	1.8
GW-543	CDLVI	07/18/02	BJC	<MDA	.	4.4	<MDA	.	3.6

APPENDIX F.3: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Location	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Result	Error	MDA	Result	Error	MDA
GW-544	CDLVI	01/15/02	BJC	<MDA	.	2.5	3	1.3	2
GW-544	CDLVI	07/22/02	BJC	<MDA	.	4.6	4.5	2.3	3.5
GW-557	LV	01/10/02	BJC	<MDA	.	2.9	<MDA	.	4.2
GW-557 Dup	LV	01/10/02	BJC	<MDA	.	2.5	<MDA	.	1.9
GW-557	LV	07/11/02	BJC	<MDA	.	30	<MDA	.	24
GW-557 Dup	LV	07/11/02	BJC	<MDA	.	2.4	2.1	1.3	2.1
GW-560	CDLVII	01/17/02	BJC	<MDA	.	2.1	2.1	1.2	2
GW-560	CDLVII	07/16/02	BJC	<MDA	.	3.6	<MDA	.	3.2
GW-562	CDLVII	01/09/02	BJC	1.25	0.78	0.96	<MDA	.	1.71
GW-562	CDLVII	01/22/02	BJC	<MDA	.	2	<MDA	.	1.9
GW-562	CDLVII	07/10/02	BJC	<MDA	.	1.28	2.37	1.91	1.86
GW-562	CDLVII	07/16/02	BJC	<MDA	.	4.2	<MDA	.	3.6
GW-564	CDLVII	01/16/02	BJC	<MDA	.	1.6	<MDA	.	1.9
GW-564 Dup	CDLVII	01/16/02	BJC	<MDA	.	2	<MDA	.	2
GW-564	CDLVII	07/16/02	BJC	<MDA	.	3.4	<MDA	.	2.6
GW-564 Dup	CDLVII	07/16/02	BJC	<MDA	.	3	<MDA	.	2.1
GW-709	LII	01/15/02	BJC	<MDA	.	1.7	2	1.2	1.9
GW-709	LII	07/17/02	BJC	<MDA	.	2.1	<MDA	.	2
GW-757	LII	01/15/02	BJC	2.1	1.3	1.8	15.4	2.3	1.9
GW-757	LII	07/17/02	BJC	4.1	1.8	2.2	17.8	2.6	2.1
GW-796	LV	01/14/02	BJC	<MDA	.	2	<MDA	.	1.9
GW-796	LV	07/11/02	BJC	3.3	1.5	1.8	<MDA	.	1.9
GW-797	LV	01/14/02	BJC	<MDA	.	2.2	<MDA	.	2.2
GW-797	LV	07/11/02	BJC	<MDA	.	31	<MDA	.	27
GW-798	CDLVII	01/09/02	BJC	<MDA	.	1.52	3.59	1.12	1.46
GW-798	CDLVII	01/16/02	BJC	<MDA	.	1.8	2.7	1.2	1.8
GW-798	CDLVII	07/10/02	BJC	<MDA	.	1.34	1.96	1.22	1.76
GW-798	CDLVII	07/16/02	BJC	<MDA	.	2.7	<MDA	.	2.5
GW-799	LV	01/10/02	BJC	<MDA	.	1.6	<MDA	.	1.9
GW-799	LV	07/11/02	BJC	<MDA	.	26	<MDA	.	21
GW-801	LV	01/14/02	BJC	<MDA	.	2.5	<MDA	.	1.9
GW-801	LV	07/15/02	BJC	<MDA	.	2.4	<MDA	.	2.7
GW-827	CDLVI	01/17/02	BJC	<MDA	.	1.8	4.4	1.6	2.5
GW-827	CDLVI	07/18/02	BJC	<MDA	.	3	<MDA	.	2.3
GW-831	FCAP	01/09/02	BJC	<MDA	.	1.71	2.69	1.29	1.82
GW-831	FCAP	07/09/02	BJC	<MDA	.	1.37	2.15	1.25	1.79
MCK 2.0	EXP-SW	02/21/02	BJC	<MDA	.	1.57	5.26	1.55	1.91
MCK 2.0	EXP-SW	07/09/02	BJC	<MDA	.	2.14	4.57	1.59	2.16
MCK 2.05	EXP-SW	02/21/02	BJC	<MDA	.	1.89	4.76	1.72	2.18
MCK 2.05 Dup	EXP-SW	02/21/02	BJC	<MDA	.	1.63	6.21	1.44	1.72
MCK 2.05	EXP-SW	07/09/02	BJC	<MDA	.	2.23	5.98	1.6	2.08
MCK 2.05 Dup	EXP-SW	07/09/02	BJC	<MDA	.	2.31	5.03	1.81	2.46
SCR1.25SP	EXP-SW	02/21/02	BJC	1.5	0.9	1.11	1.97	1.2	1.61
SCR1.25SP	EXP-SW	07/10/02	BJC	2.91	1.12	1.06	2.72	1.19	1.63
SCR1.5SW	EXP-SW	02/21/02	GWPP	<MDA	.	3.9	<MDA	.	7.2
SCR1.5SW Dup	EXP-SW	02/21/02	GWPP	<MDA	.	3.6	<MDA	.	8.5
SCR1.5SW	EXP-SW	08/19/02	GWPP	3.7	2.1	1.7	<MDA	.	9.3
SCR2.2SW	EXP-SW	03/21/02	GWPP	3.7	2.2	2.1	<MDA	.	7.9
SCR2.2SW	EXP-SW	09/23/02	GWPP	11	3.6	2.9	<MDA	.	7.7
SCR3.5SP	EXP-SW	02/21/02	BJC	<MDA	.	1.42	<MDA	.	2.07
SCR3.5SP	EXP-SW	07/10/02	BJC	<MDA	.	1.33	4.33	1.19	1.52

APPENDIX F.3: CY 2002 MONITORING DATA FOR THE CHESTNUT RIDGE HYDROGEOLOGIC REGIME
Radiological Analytes: Gross Alpha and Gross Beta Activity

Sampling Point	Location	Date Sampled	Program	Gross Alpha (pCi/L)			Gross Beta (pCi/L)		
				Result	Error	MDA	Result	Error	MDA
SCR4.3SP	EXP-SW	01/14/02	BJC	<MDA	.	1.8	3.2	1.3	1.9
SCR4.3SP	EXP-SW	07/15/02	BJC	<MDA	.	2.9	<MDA	.	2.6
SCR4.4SW	EXP-SW	02/21/02	GWPP	<MDA	.	4.2	<MDA	.	7.7
SCR4.4SW	EXP-SW	09/23/02	GWPP	<MDA	.	3	7.2	4.7	7.2
SCR4.4SW Dup	EXP-SW	09/23/02	GWPP	<MDA	.	2.6	<MDA	.	8.4
SCR5.2SP	EXP-SW	02/21/02	GWPP	<MDA	.	4	<MDA	.	8.6
SCR5.2SP	EXP-SW	08/19/02	GWPP	<MDA	.	2.2	<MDA	.	8.6

APPENDIX G

CY 2002 QUALITY ASSURANCE/QUALITY CONTROL DATA

EXPLANATION

Sampling Point:

- BCK - Bear Creek Kilometer
- GHK - Gum Hollow Branch Kilometer
- GW - Monitoring Well (also 55-1B)
- LRSPW - Outfall of the New Hope Pond Distribution Channel underdrain
- NPR - North of Pine Ridge near the Scarboro Community (surface water sampling location)
- NT - Northern Tributary to Bear Creek
- SCR - South Chestnut Ridge (tributary prefix for spring or surface water sampling location)
- SS - Spring (Bear Creek Regime)
- Dup - Field Duplicate Sample

Hydrogeologic Regime:

- BC - Bear Creek Hydrogeologic Regime
- CR - Chestnut Ridge Hydrogeologic Regime
- EF - Upper East Fork Poplar Creek Hydrogeologic Regime

Notes:

Appendix G shows the method (laboratory) blank and trip blank samples associated with each groundwater and surface water sample collected under management of the GWPP during CY 2002. Each method and trip blank was analyzed for volatile organic compounds (VOCs). As summarized below, VOCs were only detected in one method blank and one trip blank sample. Note that no groundwater or surface water sample results were screened as false positive.

Sample Type	Sample Number	Compound	Result ($\mu\text{g/L}$)	Associated Locations	Date Sampled
Method Blank	Q023170043	Tetrachloroethene	2 J	GW-219, GW-689	11/07/02
Trip Blank	A020420208	Acetone	19	Rinsate (GW-722-17)	02/08/02

A field blank sample was collected once during each calendar year quarter at the following wells in the Bear Creek and East Fork Regimes.

Bear Creek Regime			East Fork Regime		
Sample Number	Monitoring Well	Date Sampled	Sample Number	Monitoring Well	Date Sampled
A020150121	GW-226	03/01/02	A020930116	GW-383	05/08/02
A021820123	GW-225	08/12/02	A022730012	GW-383	10/31/02

The field blanks were analyzed for VOCs and none were detected in the samples.

EXPLANATION (continued)

A total of three equipment rinsate samples were collected during CY 2002: two were collected at well GW-722 (first and third quarter samples) and one at well GW-689 (fourth quarter sample) in the East Fork Regime. The rinsate samples were analyzed for the standard suite of analytes (see Section 3.3), but only the constituents shown below were detected.

Well/Port	Sample Number	Date Sampled	Analyte	Result	Units
GW-722-17	A020080109	02/08/02	Acetone Alkalinity as HCO ₃ Conductivity Sodium Turbidity pH	46 2.46 0.9 0.517 0.505 7.61	µg/L mg/L µmho/cm mg/L NTU
GW-722-17	A021820166	07/17/02	Alkalinity as HCO ₃ Conductivity Lead Turbidity pH	2.32 0.9 0.0013 0.278 7.92	mg/L µmho/cm mg/L NTU
GW-689	A023100003	11/14/02	Conductivity Dissolved Solids Turbidity pH Barium Iron Sodium Chloride Sulfate	7.6 15 0.525 4.75 0.0073 0.135 0.205 0.0569 3.07	µmho/cm mg/L NTU mg/L mg/L mg/L mg/L mg/L

APPENDIX G: CY 2001 QUALITY ASSURANCE/QUALITY CONTROL DATA
Correlation with Associated Groundwater and Surface Water Samples

Sampling Point	Hydrogeologic Regime	Date Sampled	Sample Number	Trip Blank Sample Number	Method Blank Sample Number
55-1B	EF	04/17/02	A020930104	A020930099	Q021300058
55-1B Dup	EF	04/17/02	A020930105	A020930099	Q021300058
55-1B	EF	10/14/02	A022730000	A022730072	Q022950185
BCK-00.63	BC	01/08/02	A020080000	A020080029	Q020160446
BCK-00.63	BC	07/10/02	A021820124	A021890276	Q021990086
BCK-04.55	BC	01/09/02	A020080001	A020080030	Q020160446
BCK-04.55	BC	07/10/02	A021820125	A021890276	Q021990086
BCK-07.87	BC	01/08/02	A020080002	A020080029	Q020160446
BCK-07.87	BC	07/10/02	A021820126	A021890276	Q021990086
BCK-09.40	BC	01/09/02	A020080005	A020080030	Q020160446
BCK-09.40	BC	07/11/02	A021820128	A021890277	Q021990085
BCK-09.40 Dup	BC	07/11/02	A021820129	A021890277	Q021990085
BCK-11.97	BC	01/09/02	A020080009	A020080030	Q020220075
BCK-11.97	BC	07/11/02	A021820133	A021890277	Q021990085
GHK2.51ESW	EF	05/15/02	A020930122	A020930117	Q021510035
GHK2.51ESW	EF	10/29/02	A022730164	A022760214	Q023110022
GHK2.51WSW	EF	05/15/02	A020930123	A020930117	Q021510035
GHK2.51WSW	EF	10/29/02	A022730165	A022760214	Q023110022
GHK2.51WSW Dup	EF	10/29/02	A022730166	A022760214	Q023110022
GW-014	BC	03/14/02	A020080050	A020170239	Q020950030
GW-014 Dup	BC	03/14/02	A020080051	A020170239	Q020950030
GW-014	BC	08/12/02	A021820143	A022050189	Q022330016
GW-061	BC	03/12/02	A020080043	A020170237	Q020950026
GW-061	BC	08/05/02	A021820135	A022050185	Q022330017
GW-066	BC	03/25/02	A020080055	A020170244	Q020940174
GW-066	BC	08/13/02	A021820146	A022050190	Q022330364
GW-066 Dup	BC	08/13/02	A021820147	A022050190	Q022330364
GW-069	BC	03/11/02	A020080042	A020170236	Q020950052
GW-069	BC	08/05/02	A021820134	A022050185	Q022330017
GW-071	BC	03/12/02	A020080045	A020170237	Q020950026
GW-071	BC	08/06/02	A021820137	A022050186	Q022330017
GW-071 Dup	BC	08/06/02	A021820138	A022050186	Q022330017
GW-072	BC	03/11/02	A020080044	A020170236	Q020950052
GW-072	BC	08/06/02	A021820136	A022050186	Q022330017
GW-076	BC	03/19/02	A020080052	A020170242	Q020950073
GW-082	BC	02/12/02	A020080034	A020170231	Q020500049
GW-082	BC	07/29/02	A021820114	A022050134	Q022320143
GW-085	BC	02/18/02	A020080038	A020170233	Q020710001
GW-085	BC	07/31/02	A021820117	A022050136	Q022320201
GW-087	BC	03/25/02	A020080056	A020170244	Q020940174
GW-091	BC	03/14/02	A020080049	A020170239	Q020950026
GW-091	BC	08/08/02	A021820142	A022050188	Q022330016
GW-153	EF	04/25/02	A020930114	A020930103	Q021300334
GW-153	EF	10/21/02	A022730010	A022730076	Q023100049
GW-204	EF	05/02/02	A020930141	A020930127	Q021500035
GW-204	EF	11/06/02	A022730139	A022760178	Q023120054
GW-207	EF	05/08/02	A021010110	A021010103	Q021400174
GW-207	EF	11/19/02	A022730153	A022760210	Q023400005
GW-207 Dup	EF	11/19/02	A022730154	A022760210	Q023400005

APPENDIX G: CY 2001 QUALITY ASSURANCE/QUALITY CONTROL DATA
Correlation with Associated Groundwater and Surface Water Samples

Sampling Point	Hydrogeologic Regime	Date Sampled	Sample Number	Trip Blank Sample Number	Method Blank Sample Number
GW-208	EF	05/08/02	A021010109	A021010103	Q021400174
GW-208	EF	11/19/02	A022730152	A022760210	Q023400005
GW-219	EF	05/06/02	A020930142	A020930128	Q021510042
GW-219	EF	11/07/02	A022730140	A022760179	Q023170043
GW-219 Dup	EF	11/07/02	A022730141	A022760179	Q023170043
GW-220	EF	05/14/02	A021010116	A021010105	Q021500036
GW-220	EF	11/21/02	A022730160	A022760212	Q023390011
GW-225	BC	02/19/02	A020080041	A020170234	Q020670116
GW-225	BC	08/01/02	A021820121	A022050137	Q022320201
GW-226	BC	02/19/02	A020080040	A020170234	Q020670116
GW-226	BC	08/01/02	A021820120	A022050137	Q022320201
GW-229	BC	03/19/02	A020080053	A020170242	Q020950073
GW-229 Dup	BC	03/19/02	A020080054	A020170242	Q020950073
GW-229	BC	08/12/02	A021820145	A022050189	Q022330364
GW-243	BC	03/21/02	A020080092	A020170243	Q020950073
GW-243	BC	08/13/02	A021820149	A022050190	Q022330364
GW-251	EF	04/18/02	A020930109	A020930100	Q021300058
GW-251	EF	10/16/02	A022730005	A022730074	Q022960100
GW-288	BC	03/13/02	A020080047	A020170238	Q020950026
GW-288	BC	08/07/02	A021820140	A022050187	Q022330017
GW-289	BC	03/13/02	A020080048	A020170238	Q020950026
GW-289	BC	08/08/02	A021820141	A022050188	Q022330016
GW-291	BC	03/14/02	A020080046	A020170239	Q020950026
GW-291	BC	08/07/02	A021820139	A022050187	Q022330017
GW-311	BC	02/13/02	A020080036	A020170232	Q020500055
GW-311 Dup	BC	02/13/02	A020080037	A020170232	Q020500055
GW-311	BC	07/30/02	A021820116	A022050135	Q022320143
GW-315	BC	02/13/02	A020080035	A020170232	Q020500055
GW-315	BC	07/30/02	A021820115	A022050135	Q022320143
GW-349	EF	04/16/02	A020930106	A020930098	Q021300058
GW-349	EF	10/14/02	A022730001	A022730072	Q022950185
GW-350	EF	04/16/02	A020930107	A020930098	Q021300058
GW-350	EF	10/15/02	A022730002	A022730073	Q022960100
GW-350 Dup	EF	10/15/02	A022730003	A022730073	Q022960100
GW-381	EF	04/24/02	A020930113	A020930102	Q021300334
GW-381	EF	06/12/02	A021620086	A021620088	Q021650007
GW-381	EF	10/22/02	A022730009	A022730077	Q023100049
GW-383	EF	04/25/02	A020930115	A020930103	Q021300334
GW-383	EF	10/22/02	A022730011	A022730077	Q023100049
GW-537	BC	02/18/02	A020080039	A020170233	Q020710001
GW-537	BC	07/31/02	A021820118	A022050136	Q022320201
GW-537 Dup	BC	07/31/02	A021820119	A022050136	Q022320201
GW-620	EF	04/23/02	A020930108	A020930101	Q021300062
GW-620	EF	10/15/02	A022730004	A022730073	Q022960100
GW-626	BC	02/11/02	A020080033	A020170230	Q020500028
GW-626	BC	07/25/02	A021820113	A022050133	Q022320143
GW-627	BC	02/11/02	A020080032	A020170230	Q020500049
GW-627	BC	07/29/02	A021820112	A022050134	Q022320143
GW-633	EF	04/23/02	A020930110	A020930101	Q021300062

APPENDIX G: CY 2001 QUALITY ASSURANCE/QUALITY CONTROL DATA
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Sampling Point	Hydrogeologic Regime	Date Sampled	Sample Number	Trip Blank Sample Number	Method Blank Sample Number
GW-633	EF	10/17/02	A022730006	A022730075	Q023100089
GW-653	BC	02/12/02	A020080031	A020170231	Q020500049
GW-653	BC	07/25/02	A021820111	A022050133	Q022190138
GW-658	EF	04/24/02	A020930111	A020930102	Q021300334
GW-658	EF	10/17/02	A022730007	A022730075	Q023100089
GW-683	BC	01/14/02	A020070179	A020070171	Q020280008
GW-683	BC	07/09/02	A021820086	A021890264	Q021990086
GW-684	BC	01/14/02	A020070180	A020070171	Q020280008
GW-684	BC	07/09/02	A021820084	A021890264	Q021990086
GW-684 Dup	BC	07/09/02	A021820085	A021890264	Q021990086
GW-686	EF	11/14/02	A023100001	A023170059	Q023240142
GW-687	EF	11/14/02	A023100002	A023170059	Q023240142
GW-689	EF	11/14/02	A023100004	A023170059	Q023240142
GW-694	BC	01/29/02	A020080016	A020070174	Q020500012
GW-694	BC	07/17/02	A021820099	A021890267	Q022190132
GW-695	BC	01/15/02	A020080011	A020070172	Q020280008
GW-695	BC	07/15/02	A021820095	A021890265	Q022030237
GW-698	EF	05/02/02	A020930139	A020930127	Q021500035
GW-698 Dup	EF	05/02/02	A020930140	A020930127	Q021500035
GW-698	EF	11/07/02	A022730138	A022760179	Q023170043
GW-703	BC	01/15/02	A020080012	A020070172	Q020280008
GW-703	BC	07/15/02	A021820096	A021890265	Q022030237
GW-704	BC	01/16/02	A020080013	A020070173	Q020280008
GW-704 Dup	BC	01/16/02	A020080014	A020070173	Q020280008
GW-704	BC	07/16/02	A021820097	A021890266	Q022030237
GW-706	BC	01/16/02	A020080015	A020070173	Q020280008
GW-706	BC	07/16/02	A021820098	A021890266	Q022030237
GW-722-06	EF	02/04/02	A020080098	A020360070	Q020500020
GW-722-06	EF	07/15/02	A021820155	A021960125	Q022070046
GW-722-10	EF	02/06/02	A020080103	A020380048	Q020500024
GW-722-10	EF	07/16/02	A021820160	A021970081	Q022030237
GW-722-14	EF	02/08/02	A020080107	A020390064	Q020500028
GW-722-14	EF	07/17/02	A021820164	A021990073	Q022180314
GW-722-17	EF	02/08/02	A020080106	A020390064	Q020500028
GW-722-17	EF	07/17/02	A021820165	A021990073	Q022180314
GW-722-20	EF	02/07/02	A020080108	A020390054	Q020500028
GW-722-20	EF	07/17/02	A021820162	A021980076	Q022180314
GW-722-20 Dup	EF	07/17/02	A021820163	A021980076	Q022180314
GW-722-22	EF	02/07/02	A020080104	A020390054	Q020500028
GW-722-22 Dup	EF	02/07/02	A020080105	A020390054	Q020500028
GW-722-22	EF	07/16/02	A021820161	A021970127	Q022030237
GW-722-26	EF	02/05/02	A020080100	A020370037	Q020500020
GW-722-26	EF	07/15/02	A021820157	A021970003	Q022070046
GW-722-30	EF	02/05/02	A020080099	A020370037	Q020500020
GW-722-30	EF	07/15/02	A021820156	A021960125	Q022070046
GW-722-32	EF	02/05/02	A020080101	A020370037	Q020500020
GW-722-32	EF	07/15/02	A021820158	A021970081	Q022030237
GW-722-33	EF	02/06/02	A020080102	A020380048	Q020500024
GW-722-33	EF	07/16/02	A021820159	A021970081	Q022030237

APPENDIX G: CY 2001 QUALITY ASSURANCE/QUALITY CONTROL DATA
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Sampling Point	Hydrogeologic Regime	Date Sampled	Sample Number	Trip Blank Sample Number	Method Blank Sample Number
GW-723	BC	03/05/02	A020070187	A020070177	Q020950052
GW-723	BC	07/23/02	A021820087	A021890270	Q022190138
GW-724	BC	01/30/02	A020070193	A020070175	Q020500012
GW-724	BC	07/23/02	A021820093	A021890270	Q022190138
GW-725	BC	01/31/02	A020070194	A020070176	Q020500013
GW-725	BC	07/18/02	A021820094	A021890268	Q022190136
GW-735	EF	05/14/02	A021010115	A021010105	Q021500036
GW-735	EF	11/21/02	A022730159	A022760212	Q023390011
GW-736	BC	03/06/02	A020070188	A020070178	Q020950052
GW-736	BC	07/17/02	A021820088	A021890267	Q022190132
GW-737	BC	03/06/02	A020070189	A020070178	Q020950052
GW-737	BC	07/18/02	A021820089	A021890268	Q022190136
GW-738	BC	01/30/02	A020070192	A020070175	Q020500012
GW-738	BC	07/23/02	A021820092	A021890270	Q022190138
GW-739	BC	03/05/02	A020070190	A020070177	Q020950052
GW-739	BC	07/22/02	A021820090	A021890269	Q022190136
GW-740	BC	01/29/02	A020070191	A020070174	Q020500012
GW-740	BC	07/22/02	A021820091	A021890269	Q022190136
GW-744	EF	05/07/02	A021010112	A021010102	Q021510042
GW-744	EF	11/18/02	A022730156	A022760209	Q023400005
GW-747	EF	05/09/02	A021010113	A021010104	Q021500036
GW-747	EF	11/20/02	A022730157	A022760211	Q023390011
GW-750	EF	05/05/02	A021010114	A021010104	Q021500036
GW-750	EF	11/20/02	A022730158	A022760211	Q023390011
GW-763	EF	04/18/02	A020930112	A020930100	Q021300058
GW-763	EF	06/12/02	A021620087	A021620088	Q021650007
GW-763	EF	10/21/02	A022730008	A022730076	Q023100089
GW-769	EF	04/29/02	A020930136	A020930124	Q021300333
GW-769	EF	10/30/02	A022730135	A022760175	Q023110022
GW-770	EF	04/29/02	A020930135	A020930124	Q021300333
GW-770	EF	10/30/02	A022730134	A022760175	Q023110022
GW-775	EF	04/30/02	A020930133	A020930125	Q021300333
GW-775	EF	10/31/02	A022730132	A022760176	Q023110160
GW-776	EF	04/30/02	A020930134	A020930125	Q021300333
GW-776	EF	10/31/02	A022730133	A022760176	Q023110160
GW-782	EF	05/01/02	A020930138	A020930126	Q021490004
GW-782	EF	11/04/02	A022730137	A022760177	Q023110160
GW-791	EF	05/01/02	A020930137	A020930126	Q021490004
GW-791	EF	11/06/02	A022730136	A022760178	Q023120054
GW-816	EF	05/07/02	A021010111	A021010102	Q021510042
GW-816	EF	11/18/02	A022730155	A022760209	Q023400005
LRSPW	EF	05/06/02	A021010107	A020930128	Q021510042
LRSPW Dup	EF	05/06/02	A021010108	A020930128	Q021510042
LRSPW	EF	11/19/02	A022730151	A022760210	Q023400005
NPR07.0SW	EF	05/15/02	A020930118	A020930117	Q021510035
NPR07.0SW	EF	10/29/02	A022730161	A022760214	Q023110022
NPR12.0SW	EF	05/15/02	A020930119	A020930117	Q021510035
NPR12.0SW Dup	EF	05/15/02	A020930120	A020930117	Q021510035
NPR12.0SW	EF	10/29/02	A022730162	A022760214	Q023110022

APPENDIX G: CY 2001 QUALITY ASSURANCE/QUALITY CONTROL DATA
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Sampling Point	Hydrogeologic Regime	Date Sampled	Sample Number	Trip Blank Sample Number	Method Blank Sample Number
NPR23.0SW	EF	05/15/02	A020930121	A020930117	Q021510035
NPR23.0SW	EF	10/29/02	A022730163	A022760214	Q023110022
NT-01	BC	01/09/02	A020080008	A020080030	Q020220075
NT-01	BC	07/11/02	A021820131	A021890277	Q021990085
SCR1.5SW	CR	02/21/02	A020080093	A020170245	Q020670116
SCR1.5SW Dup	CR	02/21/02	A020080094	A020170245	Q020670116
SCR1.5SW	CR	08/19/02	A021820150	A022050193	Q022330365
SCR2.2SW	CR	03/21/02	A020080095	A020170243	Q020950073
SCR2.2SW	CR	09/23/02	A021820151	A022660111	Q022760007
SCR4.4SW	CR	02/21/02	A020080096	A020170245	Q020670116
SCR4.4SW	CR	09/23/02	A021820152	A022660111	Q022760007
SCR4.4SW Dup	CR	09/23/02	A021820153	A022660111	Q022760007
SCR5.2SP	CR	02/21/02	A020080097	A020170245	Q020670116
SCR5.2SP	CR	08/19/02	A021820154	A022050193	Q022330365
SS-1	BC	01/09/02	A020080007	A020080030	Q020220075
SS-1	BC	07/15/02	A021820130	A021890265	Q022030237
SS-4	BC	01/08/02	A020080010	A020080029	Q020160446
SS-4	BC	07/10/02	A021820132	A021890276	Q021990086
SS-5	BC	01/08/02	A020080003	A020080029	Q020160446
SS-5 Dup	BC	01/08/02	A020080004	A020080029	Q020160446
SS-5	BC	07/10/02	A021820127	A021890276	Q021990086

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