SWMU 3 – Used Carbon Brick and Furnace Liner Pile

Table of Contents

List of Tables

List of Figures

List of Appendices

5.5.3 SWMU 3 – Used Carbon Brick and Furnace Liner Pile

The location of Solid Waste Management Unit (SWMU) 3 is shown on Figure 5.5.3-1 and SWMU 3 monitoring stations and sample locations are provided on Figure 5.5.3-2. The Used Carbon Brick and Furnace Liner Pile, SWMU 3, was an outdoor pile of used carbon brick, furnace liner, carbon blocks, and used or broken electrodes that were managed as detailed in Rhodia's Completion Report, Used Carbon and Electrode Project, Silver Bow, Montana, April 9, 2009 and approved by EPA in the May 15, 2009 letter.

SWMU 3 is located in the area shown on Figure 5.5.3-1. SWMU 3 is located northeast of the coarse slag pile (SWMU 12), east of SWMU 4, and south of the elemental phosphorus production area (SWMU 7) (*see* Figure 5.5.3-2). There are no underground utilities or process pipelines in the area. An abandoned railroad spur is located just east of the SWMU. The rail road spur provided rail access to the Warming Shed and Track Hopper structures.

The pile of used carbon materials was approximately 300 feet long by 30 feet wide (*see* Figure 5.5.3-2) and approximately 10 feet high. The sizes of the carbon pieces stored in the SWMU ranged from cinder bricks to refrigerator-sized blocks. Rhodia estimated the total mass of used carbon bricks, furnace liners, carbon blocks, and used or broken electrodes at approximately 2,000 tons. The electric arc furnaces consisted of a steel shell lined with carbon brick on the lower eight feet of the walls (refractory brick was used on the upper portions of the furnace walls and ceiling areas); carbon blocks on the front of the furnaces at the flush hole and tap hole locations; and carbon hexagon logs on the floor (*see* Furnace Diagram in Appendix 5.5.3-A). Carbon electrodes were inserted through the roof of the furnace and transferred electric current into the furnace. The electric current would arc between the electrode and the materials placed in the furnace, thereby releasing sufficient heat to melt the raw materials and convert the phosphate to elemental phosphorus. The electrodes were consumed during the process and as the electrodes became too short, additional electrodes were attached to the top of the operating electrodes to continue furnace operation. This procedure is commonly referred to as "building electrodes". Used electrodes that were removed from the furnaces for various maintenance reasons were placed in SWMU 3.

The carbon bricks, blocks, and floor logs were in continuous contact with the molten materials (i.e., slag and ferrophosphorus) at the bottom of the furnaces. Eventually, the carbon bricks, blocks, and floor logs were consumed or sufficiently eroded to require replacement. The carbon bricks, blocks, and floor logs were replaced either during "block jobs" where only specific bricks and blocks were

replaced, or during a "furnace digout" where all of the bricks, blocks, and floor logs were replaced. The furnaces were relined with new carbon bricks, blocks, and floor logs, and returned to service.

The removed carbon materials were either placed in the coarse slag pile (SWMU 12) or stored in SWMU 3 for future recycling to the furnaces. Recycling of this carbon material in the furnaces was not successful, so the carbon material remained in SWMU 3 until corrective measures were implemented in 2008.

5.5.3.1 Carbon Materials Characteristics

The carbon materials were tested for hazardous waste characteristics of metals and ignitability. The carbon materials are not considered a hazardous waste due to metals based on results of the toxicity characteristic leaching procedure (TCLP - Method 1311). A site-specific testing procedure was developed with the EPA to determine whether the carbon materials were a hazardous waste due to ignitability (i.e., D001).

5.5.3.1.1 Toxicity Test Results

Extraction Procedure (EP) Toxicity[1] tests were run on the carbon brick in December 1980 on behalf of Stauffer Chemical, which then owned the plant. Two laboratories, Ford Chemical Laboratories and ERC (a/k/a IT Enviroscience), conducted tests on the carbon. All metals in both sets of analyses were below regulatory limits, except 150.8 mg/l of barium was reported by the Ford Chemical Laboratory (*see* Table 5.5.3-1) for the sample from 11/4/1980. ERC reported only 0.38 mg/l of barium. The EP toxicity limit was 100 mg/l. When Rhone-Poulenc acquired the plant, it could not confirm the elevated barium concentration, and the Ford Chemical Laboratory result was believed to be an anomaly. Later testing, discussed below, confirmed this conclusion. The two laboratory reports from Ford Chemical Laboratory dated 12/09/80 and from ERC dated 12/30/80, as well as a Stauffer memo explaining the ERC results are included in Appendix 5.5.3-B.

The carbon brick and block was analyzed again in 1992, this time using TCLP Method 1311. A randomly selected grab sample was taken from SWMU 3, pulverized, and sent to the laboratory for analysis. Arsenic, lead, mercury, selenium, and silver were not detected in the sample. The concentrations of barium, cadmium, and chromium were 0.205, 0.22, and 0.156 mg/l respectively, which are all consistent with their regulatory limits (*see* Table 5.5.3-1). This data confirmed that the brick and liner were not a characteristic hazardous waste for barium or any other metal. The lab

[1] Analyses were conducted according to procedures described in the RCRA Protocol, Federal Register, Volume 45, Number 98, May 19, 1980

report from Century Testing Laboratories dated 1/24/92 (date received) is included in Appendix 5.5.3-C.

5.5.3.1.2 VOCs and SVOCs

In March 1999, the scrap carbon brick and furnace liner was tested for semi-volatile organic compounds (SVOCs) (Method 8270B) and volatile organic compounds (VOCs) (Method 8260A). These organic compounds were not detected (*see* Tables 5.5.3-2 and 5.5.3-3, respectively). The lab reports from Energy Laboratories dated 4/01/99 are included in Appendix 5.5.3-C. The reference "SCB" means spent carbon brick.

5.5.3.1.3 Ignitability

Although the brick, block, and electrodes are manufactured from carbon, this carbon in bulk shapes is non-combustible (*see* the highlighted section of page 1 of the materials safety data sheet in Appendix 5.5.3-D). Therefore, the carbon brick, block, and electrodes in bulk shapes would not propagate a flame.

The surfaces of some of the used carbon brick and block contained a thin veneer of amorphous phosphorus. This amorphous phosphorus does not spontaneously react with air, but may ignite when sufficient friction is applied to its surface. Amorphous phosphorus and yellow phosphorus are different forms of the same element (as graphite and diamond are different forms of carbon). When yellow phosphorus is heated to its boiling point (~280 °C), most of the material vaporizes, but under certain conditions, some of the yellow phosphorus converts to amorphous phosphorus.

The amorphous phosphorus that is contained on the blocks and bricks from a dismantled furnace is the result of yellow elemental phosphorus condensing in the furnace during a "furnace dig-out" or "block job" and depositing in the cracks and joints between the pieces of block and brick. Typically, any phosphorus on the surface of the blocks or bricks in an operating furnace is consumed with the carbon in the furnace process, but as the furnace cools during shutdown, some of the yellow phosphorus condenses on the furnace brick and blocks. Certain conditions inside the furnace then result in the formation of some amorphous phosphorus. This amorphous phosphorus cools and solidifies as a thin veneer in the interfaces between, and in some cases the surfaces of, the pieces of block and brick.

Amorphous phosphorus is relatively inert in the environment and will not self-ignite like yellow phosphorus unless friction is applied. A common application of amorphous (red) phosphorus is in the

striking strip of safety matches where it is mixed with fine sand/glass and glue to produce enough heat when struck to ignite the match head.

The amorphous phosphorus on the surface of the bricks at the Silver Bow Plant has most likely oxidized with the ambient air to form a very thin layer of oxidized phosphorus compounds. This thin layer of oxidized phosphorus compounds seals out air and once disturbed, the phosphorus is exposed to air, and friction or impact might cause ignition and burning until the exposed phosphorus is consumed. As detailed in Section 5.5.3.3, Rhodia and U.S. EPA developed a testing procedure to determine which carbon pieces were non-hazardous and which pieces needed to be managed as D001 hazardous waste due to ignitability.

5.5.3.2 RCRA 7003 Order

During an inspection at the Silver Bow Plant in May 2000, the U.S. EPA found pieces of used carbon brick that had some form of amorphous phosphorus on its surface. The U.S. EPA inspectors were able to obtain ignition by striking the bricks with rocks or other pieces of carbon brick. U.S. EPA Region 8 issued an Administrative Order (7003 Order), Docket No. RCRA-8-2000-07, under § 7003 of the Solid Waste Disposal Act, as amended (42 U.S.C. § 6973). This Order was issued on June 12, 2000 and amended on December 27, 2000 and required Rhodia to undertake immediate and interim measures to protect public health and the environment, including wildlife. The immediate and interim measures, including fencing the pile, installing a wind sock, and installing bird netting above the pile were completed before the respective deadlines under the 7003 Order.

The 7003 Order remains in effect, since, as stated in Section VI.B. of the 3008(h) Order, the 7003 Order is the mechanism to address investigation and closure matters regarding the used carbon brick and furnace liner pile. As such, this RCRA Facility Investigation (RFI) Report will summarize the corrective measures that were completed and the environmental data that was collected under the 7003 Order, as well as the plan for follow-up data collection as part of the RFI.

5.5.3.3 Corrective Measures

The 7003 Order required Rhodia to develop a Waste Plan that evaluated alternatives for the lawful disposition of the brick and furnace liner, and at least one alternative that evaluated the lawful removal and disposal of the used brick and furnace liner. The Final Waste Plan was submitted to U.S. EPA on November 16, 2001. Based on this information, U.S. EPA selected a modified segregation and off-site incineration alternative for the lawful disposition for the used brick and furnace liner.

Rhodia and U.S. EPA developed a work plan for management of the used brick and furnace liner materials that included recycling of carbon materials that were not considered hazardous waste. During the development of the work plan, Rhodia conducted a Pilot Test Program in 2006 to demonstrate a procedure to sample the carbon material to determine ignitability. Based on the Pilot Test Program results, it was determined that the used carbon brick was a hazardous waste due to the ignitability characteristic (*see* Letter to U.S. EPA dated May 23, 2008 and U.S. EPA's response dated May 28, 2008 in Appendix 5.5.3- E). The work plan summarized the activities related to inspection and testing of each piece of carbon block and electrode, containerizing the hazardous waste carbon, shipping the hazardous waste carbon to an off-site hazardous waste incinerator, and recycling the clean carbon materials. This Design Work Plan, Used Carbon Brick and Furnace Liner Pile (Rhodia, 2006) was approved by the U.S. EPA in a letter dated May 28, 2008 (Design Work Plan is included as Attachment A of Rhodia's Completion Report in Appendix 5.5.3-F).

Rhodia implemented the U.S. EPA-approved work plan between June 6, 2008 and January 19, 2009 as detailed in Rhodia's Completion Report (*see* Appendix 5.5.3-F). In addition, the carbon materials from SWMU 4 and SWMU 5 were also managed under this work plan as agreed by U.S. EPA; however, no used carbon brick was found in SWMU 4 and 5.

Based on the inspection and testing protocols established in the work plan, Rhodia was able to demonstrate which carbon materials needed to be managed as D001 hazardous waste and which were available for recycling. A total of 2,396 pieces of carbon block and 74 pieces of electrode were sampled resulting in 7,307 individual core samples for evaluation. All electrode samples passed the crush test. Fifteen samples of carbon block, representing 8 different carbon blocks, failed the crush test. As determined in the 2006 Pilot Test Program, all used carbon brick was considered to be hazardous waste because of the ignitability characteristic.

The used carbon brick and the eight pieces of hazardous waste carbon block were containerized in 108, 30-gallon drums. A total of 80,200 pounds (about 40.1 tons) of hazardous waste was shipped to Heritage Environmental Services in Sauget, Illinois for incineration.

Approximately 818 tons of nonhazardous carbon blocks and electrodes were recycled by Pamas and Company in Elberton, Georgia.

A portion of the nonhazardous carbon blocks and electrodes were too small to be recycled, or passed the crush test, but had evidence of amorphous phosphorus on the surface. The carbon pieces that passed the crush test, but had evidence of amorphous phosphorus on the surface were discussed with

U.S. EPA as detailed in emails between U.S. EPA and Rhodia in August 2008 (*see* Appendix 5.5.3-G). A total of 19 electrode pieces and 33 block pieces remain on-site, just north of the coarse slag pile, and will be managed as non-hazardous solid waste, as described in the U.S. EPA approved Completion Report (*see* Appendix 5.5.3-F). A sample of this carbon material was tested for TCLP metals, and the toxicity thresholds were not exceeded (*see* Table 5.5.3-4). Consistent with prior TCLP results, the carbon materials are not hazardous waste due to metals.

Some of the used carbon bricks, blocks and electrodes in SWMU 3 were covered in soil. Additional soil was disturbed as the carbon was removed from the stockpile. This soil was placed in three piles within the SWMU 3 area (SP-1, SP-2, and SP-3; *see* Figure 5.5.3-2). As requested by the U.S. EPA, these soil piles were sampled and tested for TCLP metals. Four subsamples were collected from each soil pile. The four subsamples were mixed in a decontaminated stainless steel bowl to prepare the composite sample for each soil pile. The composite samples were analyzed for TCLP metals. The analytical results are summarized in Table 5.5.3-4 and demonstrate that this soil does not exhibit a toxicity characteristic for metals. Rhodia submitted the Completion Report (Rhodia, 2009) to the U.S. EPA on April 9, 2009, and U.S. EPA approved the completion report in a letter dated May 15, 2009 (*see* Appendix 5.5.3-H).

5.5.3.4 RFI Activities and Results

Soil samples were collected from a randomly selected location in SWMU 3 as detailed in the October 2012 Work Plan (Barr, 2012). Soil samples were collected from the 0-2 inch interval (SWMU-3 SP-4 0-2") and the 2-12 inch interval (SWMU-3 SP-4 2-12") of a test pit excavated with a rubber tire backhoe. The test pit log is provided in Appendix 5.5.3-I, and the test pit location is shown on Figure 5.5.3-2 (SWMU-3 SP-4). The soil samples were analyzed for general and site-specific parameters and metals (*see* Tables 5.5.3-5 and 5.5.3-6, respectively). The soil samples were also analyzed in the field according to the XRF screening and confirmatory program described in Section 5.4.2.

Soil data from SWMU 3 were compared to the background/reference area concentrations. Concentrations above the 95% upper confidence limit of the mean background/reference area concentrations are highlighted on the constituent delineation figures presented in this section. Where a 95% upper limit could not be calculated, the maximum detected concentration or the maximum detection limit was selected.

Constituent concentrations are described in this report as above background/reference area concentrations if the mean and maximum concentrations of the SWMU data exceed both of the mean and maximum background/reference area values. All data will be retained for evaluation in the human health and ecological risk assessments. The definitive background comparison will be conducted in the risk assessment using a statistical approach consistent with EPA guidance (U.S. EPA, 2002).

5.5.3.4.1 General Chemistry

The general chemistry analytical data are presented in Table 5.5.3-5 and shown on Figure 5.5.3-3. Fluoride was detected in both soil samples with a maximum concentration of 17.8 mg/kg. Fluoride concentrations are consistent with background/reference area concentrations. Elemental phosphorus was not detected above the laboratory detection limit of 0.000015 mg/kg. Total phosphorus was detected in both soil samples with a maximum concentration of 52,400 mg/kg. The mean total phosphorus concentration in Silver Bow County is 880 mg/kg (USGS, 2012).

5.5.3.4.2 Metals

The analytical laboratory and correlated XRF data were combined to assist the delineation of the hazardous constituents. Hazardous constituent concentrations based on the XRF data were estimated using the linear equations presented in Section 5.4.2 for the respective metals. The correlation coefficient (R^2) is greater than 0.7 for these metals. The 2012 metals data for SWMU 3 are presented in Table 5.5.3-6 and includes both laboratory analytical results and field (XRF) data.

The metals analytical data are presented in Table 5.5.3-6 and the distribution of the metal constituents in the 0-2 inch and the 2-12 inch interval are shown on Figures 5.5.3-4 and 5.5.3-5, respectively. Arsenic, beryllium, cobalt, copper, iron, and mercury concentrations are consistent with concentrations in the background data set. The mean and maximum concentrations of antimony, calcium, chromium, magnesium, nickel, potassium, selenium, silver, sodium, thallium, uranium, and zinc exceeded the mean and maximum concentrations in the background data set, so these metals are considered above background.

Barium, cadmium, lead, manganese, and vanadium were present in the laboratory samples, but the concentrations could not be accurately determined due to matrix interferences that caused the concentrations to be over estimated. As such, the barium, cadmium, lead, manganese, and vanadium concentrations for the laboratory data were rejected during the data validation process.

5.5.3.5 Groundwater Monitoring Results

The U.S. EPA required Rhodia to conduct pre-closure groundwater monitoring of the area near the brick pile under the 7003 Order. A Field Sampling Plan and Quality Assurance Project Plan (Sampling Plan) (Barr, 2001) for pre-closure groundwater monitoring at the used carbon brick and furnace liner pile was approved by U.S. EPA in a letter dated September 6, 2001. Three water table monitoring wells were installed at the carbon pile in accordance with the Sampling Plan. MW-01-1 was installed upgradient (i.e., south) of SWMU 3, and MW-01-4 and MW-01-5 were installed downgradient of SWMU 3 (*see* Figure 5.5.3-2). The well construction details are provided in Table 5.5.3-7 and the Monitoring Well Construction Logs are provided in Appendix 5.5.3-J. The Final Pre-closure Groundwater Monitoring Report (Barr, 2002) provides the details of the groundwater monitoring program and the analytical laboratory reports prior to the RFI.

Split-barrel soil samples were collected and described as detailed on the well construction logs *(see* (Appendix 5.5.3-J). The soils consisted mainly of homogeneous sandy silt with some clay. Similar silty sand/sandy silt was observed in both MW-01-4 and MW-01-5. A very thin (0.3") lens of gravel was found in the screened interval of MW-01-5. Other than this, sediments in this area were fine-grained silty sand with some clay.

Groundwater elevations in the vicinity of the used carbon brick and furnace liner pile are summarized and charted in Appendix 5.5.3-K. The typical groundwater elevations are also shown on Figure 5.5.3-2. The groundwater elevations consistently show a groundwater gradient of approximately 0.0045 ft/ft to the north. Three rounds of groundwater samples were collected during the pre-closure groundwater monitoring program and analyzed for general and site-specific parameters, metals, VOCs, SVOCs, and radionuclides. The results were summarized in the Final Pre-Closure Groundwater Monitoring Report (Barr, 2002). The Final Pre-Closure Groundwater Monitoring Report concluded that there are no significant groundwater impacts associated with the used brick and furnace liner pile.

The SWMU 3 monitoring wells were included in the site-wide groundwater quality monitoring program included in the RFI Work Plan (Barr, 2009). The remainder of this section summarizes and evaluates the complete groundwater quality dataset for SWMU 3. The analytical results for the groundwater samples from SWMU 3 monitoring wells are summarized on Tables 5.5.3-8 thru 5.5.3-13.

5.5.3.5.1 General and Site-Specific Parameters

The analytical results for the general and site-specific parameters included in the SWMU 3 data set are summarized in Table 5.5.3-8. The analytical data for samples from the downgradient wells are shaded if the concentration is above the maximum detected concentration or the maximum detection limit for the data from well MW-01-1. The concentration for each general and site-specific parameter for samples from the SWMU 3 monitoring wells are plotted on Figures 5.5.3-6 thru 5.5.3-14.

The downgradient dataset is consistent with the upgradient dataset for the general and site-specific parameters. Although the total phosphorus concentration in the October 4, 2001 sample from MW-01-5 is slightly above the maximum concentration at MW-01-1, the difference is within analytical error, and is not considered a significant excursion.

Elemental phosphorus was not detected in any sample collected from the SWMU 3 monitoring wells.

The groundwater dataset was evaluated by charting the concentrations reported for the upgradient and downgradient samples. The charts are provided in Appendix 5.5.3-L. The constituent concentrations for the upgradient samples are charted as blue diamonds and the constituent concentrations for the downgradient well MW-01-4 samples are charted as green, open triangles and downgradient well MW-01-5 are charted as orange, open squares. In nearly all cases, the upgradient concentrations are equal to or above the downgradient concentrations.

5.5.3.5.2 Metals

The analytical results for the metal constituents included in the SWMU 3 data set are summarized in Table 5.5.3-9. The analytical data for samples from the downgradient wells are shaded if the concentration is above the maximum detected concentration or the maximum detection limit for the data from well MW-01-1.

The downgradient dataset is consistent with the upgradient dataset for the metal constituents. Although the initial total iron concentrations in the October 4, 2001 samples from MW-01-4 and MW-01-5 were above the MW-01-1 concentration, the samples collected in 2008 are consistent with the MW-01-1 concentration.

The concentration for each metal constituent for samples from the SWMU 3 monitoring wells are plotted on Figures 5.5.3-15 thru 5.5.3-37. No significant differences or trends are evident from these figures. In particular, there is no trend of increasing concentration downgradient of SWMU 3.

The groundwater dataset was evaluated by charting the concentrations reported for the upgradient and downgradient samples. The charts are provided in Appendix 5.5.3-L. The constituent concentrations for the upgradient samples are charted as blue diamonds and the constituent concentrations for the downgradient well MW-01-4 samples are charted as green, open triangles and downgradient well MW-01-5 are charted as orange, open squares. In nearly all cases, the upgradient concentrations are equal to or above the downgradient concentrations.

5.5.3.5.3 SVOCs

The analytical results for the SVOCs included in the SWMU 3 data set are summarized in Table 5.5.3-10. The analytical data for samples from the downgradient wells are shaded if the concentration is above the maximum detected concentration or the maximum detection limit for the data from well MW-01-1. Detection limits for the October 4, 2001 samples were not selected for comparison since the detection limits are significantly higher than those required for the RFI.

Bis(2-ethylhexyl)phthalate was detected in the October 4, 2001 samples from the SWMU 3 wells. Bis(2-ethylhexyl)phthalate is a component of plastics and is a common laboratory contaminant. The detected values are qualified as not meeting some QA/QC aspect. In addition, bis(2-ethylhexyl)phthalate was not detected in the May 16, 2008 samples from MW-01-4 and MW-01-5. As such, the October 1, 2001 concentrations are highly suspect and do not merit further evaluation.

Very low concentrations of certain PAH compounds were detected in certain groundwater samples from the wells. The detected concentrations are flagged with a J-qualifier as the concentrations are below the method reporting limits and above the method detection limits. Although the J-qualified values are slightly above the values reported in samples from MW-01-1, the J-qualified values are consistent with the values reported for the site-wide concentrations, as discussed in Section 5.3 and shown on Table 5.3-4c.

The SVOC concentrations were not plotted on maps because the SVOCs were not detected in sufficient samples to gain any insight from a graphical presentation.

5.5.3.5.4 VOCs

The analytical results for the VOCs included in the SWMU 3 data set are summarized in Table 5.5.3-11. The analytical data for samples from the downgradient wells are shaded if the concentration is above the maximum detected concentration or the maximum detection limit for the data from well MW-01-1. Detection limits for the October 4, 2001 samples were not selected for comparison since the detection limits are significantly higher than those required for the RFI.

The data summary tables show little difference for the groundwater quality across the SWMU 3 locations.

Chloroform was identified in the October 4, 2001 sample from downgradient well MW-01-4 at a concentration of 1.4 µg/L. Chloroform was also detected in the field blank sample at an estimated concentration of 0.24 µg/L. Detection of a parameter in a quality control sample such as a field blank is strong evidence of a laboratory or sampling contaminant. Chloroform was not detected at a detection limit of 0.042 µg/L in samples collected in 2008. As such, the October 1, 2001 concentrations are highly suspect and do not merit further evaluation.

The VOC concentrations were not plotted on maps because the VOCs were not detected in sufficient samples to gain any insight from a graphical presentation.

5.5.3.5.5 Radionuclides

The analytical results for the radionuclides included in the SWMU 3 data set are summarized in Table 5.5.3-12. The analytical data for samples from the downgradient wells are shaded if the concentration is above the maximum detected concentration or the maximum detection limit for the data from well MW-01-1.

The downgradient dataset is consistent with the upgradient dataset for the radionuclides as no values for samples from the downgradient wells are above the maximum values reported in the samples from well MW-01-1.

The concentration for each radionuclide for samples from the SWMU 3 monitoring wells are plotted on Figures 5.5.3-38 through 5.5.3-41. No significant differences or trends are evident from these figures.

The groundwater dataset was evaluated by charting the concentrations reported for the upgradient and downgradient samples. The charts are provided in Appendix 5.5.3-L. The constituent concentrations for the upgradient samples are charted as blue diamonds and the constituent concentrations for the downgradient well MW-01-4 samples are charted as green, open triangles and downgradient well MW-01-5 are charted as orange, open squares. In all cases, the upgradient concentrations are equal to or above the downgradient concentrations; no exceedances were noted on Table 5.5.3-12.

5.5.3.5.6 PCBs

The analytical results for the PCBs included in the data set are summarized in Table 5.5.3-13. PCBs were not detected in any groundwater samples from the SWMU 3 monitoring wells. The PCB concentrations were not plotted on maps because PCBs were not detected in any SWMU 3 groundwater samples.

5.5.3.5.7 Conclusions for Groundwater Quality

As previously discussed, the Final Pre-Closure Groundwater Monitoring Report (Barr, 2002) concluded that there are no significant groundwater impacts associated with the used brick and furnace liner pile (i.e., SWMU 3). The RFI groundwater analytical data are consistent with the previous dataset for this SWMU. Therefore, it is reasonable to conclude that there are no significant groundwater impacts related to the former pile of used carbon brick and furnace liner.

5.5.3.6 Conclusions

Corrective measures required under the 7003 Order are complete as the hazardous waste carbon materials have been removed from the SWMU and properly managed. The following conclusions were developed based on review of the information presented in this section:

- The used carbon materials were tested and found to not be a characteristic hazardous waste for metals.
- The used carbon materials were tested to demonstrate which carbon pieces needed to be managed as D001 hazardous waste and which carbon pieces did not.
- Used carbon materials that failed the testing protocol were managed as D001 hazardous waste. A total of 80,200 pounds (about 40.1 tons) of hazardous waste was packaged in drums and shipped to Heritage Environmental Services in Sauget, Illinois for incineration.
- Large pieces of carbon blocks and electrodes that passed the testing protocol were managed as recyclable materials. Approximately, 818 tons of nonhazardous carbon blocks and electrodes were recycled by Pamas and Company in Elberton, Georgia.
- Nineteen electrode pieces and thirty-three block pieces remain on-site, just north of the coarse slag pile, and will be managed as non-hazardous solid waste.
- U.S. EPA approved the Completion Report in a letter dated May 15, 2009 signifying that corrective measures under the 7003 Order are complete.
- SWMU 3 surface soil sampling identified total phosphorus concentrations above the mean concentration for Silver Bow County.

- Surface soil sampling in SWMU 3 revealed metals above background concentrations, including: antimony, calcium, chromium, magnesium, nickel, potassium, selenium, silver, sodium, thallium, uranium, vanadium and zinc.The groundwater quality dataset demonstrates that there are no significant groundwater impacts related to the former pile of used carbon brick and furnace liner in SWMU 3.

There is currently sufficient information to conduct the risk assessment for SWMU 3. The risk assessment will identify which parameters, if any, are present at concentrations that warrant corrective measures. The dataset would be reviewed at that time and additional sampling may be necessary to inform the corrective measures study or later during the corrective measures design phase.

5.5.3.7 References

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Tables

Table 5.5.3-1
Carbon Materials Data - EPTOX and TCLP Metals
SWMU 3
Rhodia Silver Bow Plant

Station ID		Carbon Brick		Carbon Brick		Carbon Brick		SWMU-3 Carbon	
Sample Date		11/4/1980		12/30/1980		1/22/1992		9/22/2008	
Sample ID		Carbon Scrap		Carbon Scrap		Spent Carbon		SWMU-3 CarbonTC	
Lab Name		Ford		ITE		Century		Columbia Analyt	
Lab ID	Regulatory	N/A		N/A		8880-1		K0809273	
Report	Level	Material Charac		Material Charac		Material Charac		RFI-2008 SWMU #	
	Exceedances Shade								
Arsenic, EPTOX	5.0 mg/l	0.22	mg/l	0.19	mg/l				
Barium, EPTOX	100.0 mg/l	**150.8**	**mg/l**	0.38	mg/l				
Cadmium, EPTOX	1.0 mg/l	0.36	mg/l	0.009	mg/l				
Chromium, EPTOX	5.0 mg/l	0.25	mg/l	0.03	mg/l				
Lead, EPTOX	5.0 mg/l	0.296	mg/l	0.01 U	mg/l				
Mercury, EPTOX	0.2 mg/l	0.0013	mg/l	0.001 U	mg/l				
Selenium, EPTOX	1.0 mg/l	0.009	mg/l	0.001 U	mg/l				
Silver, EPTOX	5.0 mg/l	0.001 U	mg/l	0.006 U	mg/l				
Arsenic, TCLP	5.0 mg/l					0.015 U	mg/L	0.04 B	mg/L
Barium, TCLP	100.0 mg/l					0.205	mg/L	0.26 U	mg/L
Cadmium, TCLP	1.0 mg/l					0.022	mg/L	0.0159	mg/L
Chromium, TCLP	5.0 mg/l					0.156	mg/L	0.004 B	mg/L
Lead, TCLP	5.0 mg/l					0.04 U	mg/L	0.01 U	mg/L
Mercury, TCLP	0.2 mg/l					0.0003 U	mg/L	0.0002 U	mg/L
Selenium, TCLP	1.0 mg/l					0.02 U	mg/L	0.009 U	mg/L
Silver, TCLP	5.0 mg/l					0.006 U	mg/L	0.0007 U	mg/L

U - Not detected at specified detection limit.

Table 5.5.3-2
Carbon Materials Data - SVOCs
SWMU 3
Rhodia Silver Bow Plant

Station ID	Carbon Brick	
Sample Date	3/22/1999	
Sample ID	SCB-1	
Lab Name	Energy	
Lab ID	003-99-50887	
Report	Material Charac	
1,2,4-Trichlorobenzene	0.33 U	mg/Kg
1,2-Dichlorobenzene	0.33 U	mg/Kg
1,3-Dichlorobenzene	0.33 U	mg/Kg
1,4-Dichlorobenzene	0.33 U	mg/Kg
2,4,5-Trichlorophenol	0.33 U	mg/Kg
2,4,6-Trichlorophenol	0.33 U	mg/Kg
2,4-Dichlorophenol	0.33 U	mg/Kg
2,4-Dimethylphenol	0.33 U	mg/Kg
2,4-Dinitrophenol	1.7 U	mg/Kg
2,4-Dinitrotoluene	0.33 U	mg/Kg
2,6-Dinitrotoluene	0.33 U	mg/Kg
2-Chloronaphthalene	0.33 U	mg/Kg
2-Chlorophenol	0.33 U	mg/Kg
2-Methylnaphthalene	0.33 U	mg/Kg
2-Nitrophenol	0.33 U	mg/Kg
3,3`-Dichlorobenzidine	0.33 U	mg/Kg
2-Methyl-4,6-dinitrophenol	1.7 U	mg/Kg
4-Bromophenyl phenyl ether	0.33 U	mg/Kg
4-Chloro-3-methylphenol	0.33 U	mg/Kg
4-Chlorophenyl phenyl ether	0.33 U	mg/Kg
4-Nitrophenol	1.7 U	mg/Kg
Acenaphthene	0.33 U	mg/Kg
Acenaphthylene	0.33 U	mg/Kg
Anthracene	0.33 U	mg/Kg
Benzidine	0.67 U	mg/Kg
Benzo(a)anthracene	0.33 U	mg/Kg
Benzo(a)pyrene	0.33 U	mg/Kg
Benzo(b)fluoranthene	0.33 U	mg/Kg
Benzo(g,h,i)perylene	0.33 U	mg/Kg
Benzo(k)fluoranthene	0.33 U	mg/Kg
Bis(2-chloroethoxy)methane	0.33 U	mg/Kg
Bis(2-chloroethyl)ether	0.33 U	mg/Kg
Bis(2-chloroisopropyl)ether	0.33 U	mg/Kg
Bis(2-ethylhexyl)phthalate	0.33 U	mg/Kg
Butyl benzyl phthalate	0.33 U	mg/Kg
Chrysene	0.33 U	mg/Kg
Dibenz(a,h)anthracene	0.33 U	mg/Kg
Diethyl phthalate	0.33 U	mg/Kg
Dimethyl phthalate	0.33 U	mg/Kg
Di-n-butyl phthalate	0.33 U	mg/Kg
Di-n-octyl phthalate	0.33 U	mg/Kg
Fluoranthene	0.33 U	mg/Kg
Fluorene	0.33 U	mg/Kg
Hexachlorobenzene	0.33 U	mg/Kg
Hexachlorobutadiene	0.33 U	mg/Kg
Hexachlorocyclopentadiene	0.33 U	mg/Kg
Hexachloroethane	0.33 U	mg/Kg
Indeno(1,2,3-cd)pyrene	0.33 U	mg/Kg
Isophorone	0.33 U	mg/Kg

Table 5.5.3-2
Carbon Materials Data - SVOCs
SWMU 3
Rhodia Silver Bow Plant

Station ID	Carbon Brick	
Sample Date	3/22/1999	
Sample ID	SCB-1	
Lab Name	Energy	
Lab ID	003-99-50887	
Report	Material Charac	
Naphthalene	0.33 U	mg/Kg
Nitrobenzene	0.33 U	mg/Kg
N-Nitrosodimethylamine	0.33 U	mg/Kg
N-Nitrosodi-n-propylamine	0.33 U	mg/Kg
N-Nitrosodiphenylamine	0.33 U	mg/Kg
o-Cresol	0.33 U	mg/Kg
Pentachlorophenol	1.7 U	mg/Kg
Phenanthrene	0.33 U	mg/Kg
Phenol	0.33 U	mg/Kg
Pyrene	0.33 U	mg/Kg
Pyridine	0.33 U	mg/Kg

U - Not detected at specified detection limit.

Table 5.5.3-3
Carbon Materials Data - VOCs
SWMU 3
Rhodia Silver Bow Plant

Station ID	Carbon Brick	
Sample Date	3/22/1999	
Sample ID	SCB-1	
Lab Name	Energy	
Lab ID	003-99-50887	
Report	Material Charac	
Acetone	10 U	mg/Kg
Acrolein	4 U	mg/Kg
Acrylonitrile	4 U	mg/Kg
Benzene	0.2 U	mg/Kg
Bromobenzene	0.2 U	mg/Kg
Bromochloromethane	0.2 U	mg/Kg
Bromodichloromethane	0.2 U	mg/Kg
Bromoform	0.2 U	mg/Kg
Bromomethane	0.2 U	mg/Kg
Butyl benzene	0.2 U	mg/Kg
Butylbenzene, sec-	0.2 U	mg/Kg
Butylbenzene, tert-	0.2 U	mg/Kg
Carbon disulfide	0.2 U	mg/Kg
Carbon tetrachloride	0.2 U	mg/Kg
Chlorobenzene	0.2 U	mg/Kg
Chlorodibromomethane	0.2 U	mg/Kg
Chloroethane	0.2 U	mg/Kg
2-Chloroethylvinyl ether	0.2 U	mg/Kg
Chloroform	0.2 U	mg/Kg
Chloromethane	0.2 U	mg/Kg
Chlorotoluene, o-	0.2 U	mg/Kg
Chlorotoluene, p-	0.2 U	mg/Kg
1,2-Dibromo-3-chloropropane	0.2 U	mg/Kg
1,2-Dibromoethane	0.2 U	mg/Kg
Dibromomethane	0.2 U	mg/Kg
1,2-Dichlorobenzene	0.2 U	mg/Kg
1,3-Dichlorobenzene	0.2 U	mg/Kg
1,4-Dichlorobenzene	0.2 U	mg/Kg
Dichlorodifluoromethane	0.2 U	mg/Kg
1,1-Dichloroethane	0.2 U	mg/Kg
1,2-Dichloroethane	0.2 U	mg/Kg
1,1-Dichloroethylene	0.2 U	mg/Kg
1,2-Dichloroethylene, cis-	0.2 U	mg/Kg
1,2-Dichloroethylene, trans-	0.2 U	mg/Kg
1,2-Dichloropropane	0.2 U	mg/Kg
1,3-Dichloropropane	0.2 U	mg/Kg
2,2-Dichloropropane	0.2 U	mg/Kg
1,1-Dichloro-1-propene	0.2 U	mg/Kg
1,3-Dichloro-1-propene, cis-	0.2 U	mg/Kg
1,3-Dichloro-1-propene, trans-	0.2 U	mg/Kg
Ethyl benzene	0.2 U	mg/Kg
Hexachlorobutadiene	0.2 U	mg/Kg
2-Hexanone	4 U	mg/Kg
Iodomethane	0.2 U	mg/Kg
Cumene (isopropyl benzene)	0.2 U	mg/Kg
Cymene, p-	0.2 U	mg/Kg
Methyl tertiary butyl ether	0.2 U	mg/Kg
Methyl ethyl ketone	4 U	mg/Kg
Methyl isobutyl ketone	4 U	mg/Kg

Table 5.5.3-3
Carbon Materials Data - VOCs
SWMU 3
Rhodia Silver Bow Plant

Station ID	Carbon Brick	
Sample Date	3/22/1999	
Sample ID	SCB-1	
Lab Name	Energy	
Lab ID	003-99-50887	
Report	Material Charac	
Methylene chloride	0.2 U	mg/Kg
Naphthalene	0.2 U	mg/Kg
Propylbenzene	0.2 U	mg/Kg
Styrene	0.2 U	mg/Kg
1,1,1,2-Tetrachloroethane	0.2 U	mg/Kg
1,1,2,2-Tetrachloroethane	0.2 U	mg/Kg
Tetrachloroethylene	0.2 U	mg/Kg
Toluene	0.2 U	mg/Kg
1,2,3-Trichlorobenzene	0.2 U	mg/Kg
1,2,4-Trichlorobenzene	0.2 U	mg/Kg
1,1,1-Trichloroethane	0.2 U	mg/Kg
1,1,2-Trichloroethane	0.2 U	mg/Kg
Trichloroethylene	0.2 U	mg/Kg
Trichlorofluoromethane	0.2 U	mg/Kg
1,2,3-Trichloropropane	0.2 U	mg/Kg
1,2,4-Trimethylbenzene	0.2 U	mg/Kg
1,3,5-Trimethylbenzene	0.2 U	mg/Kg
Vinyl acetate	0.2 U	mg/Kg
Vinyl chloride	0.2 U	mg/Kg
Xylenes, Total	0.2 U	mg/Kg

U - Not detected at specified detection limit.

Table 5.5.3-4
SWMU 3 - Soil Quality Data - TCLP Metals
Rhodia Silver Bow Plant
[concentration in mg/l]

Location ID		Carbon	Soil			
Sample Date	TCLP	SWMU-3 Carbon 9/22/2008	SWMU-3 SP-1 9/22/2008	SWMU-3 SP-2 9/22/2008		SWMU-3 SP-3 9/22/2008
Sample Type	Regulatory Level	N	N	N	FD	N
	Exceedances Shaded					
Arsenic	5.0	0.04 J	0.08 J	0.10 J	0.10	0.10
Barium	100.0	< 0.260	< 0.200	< 0.200	< 0.200	< 0.200
Cadmium	1.0	0.0159	0.0031 J	0.0039 J	0.0054 J	0.0164
Chromium	5.0	0.004 J	0.011	0.007 J	0.005 J	0.010 J
Lead	5.0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury	0.2	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Selenium	1.0	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009
Silver	5.0	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007

Table 5.5.3-5
Soil Data - General and Site Specific Parameters
SWMU 3
Rhodia Silver Bow Plant
[concentrations in mg/kg]

			Chemical Name	Fluoride	Phosphorus, elemental (white)	Phosphorus, total
Background Mean, Exceedances **Bold**				**4.1**		
Background Maximum, Exceedances Underline				37		
Background 95% UCL, Exceedances *Italic*				*7.6*		
Location ID	**Sample Date**	**Depth**	**Sample Type**			
SWMU-3 SP-4	10/02/2012	0 - 2 in	N	***5.38***	< 0.000015	52400
SWMU-3 SP-4	10/02/2012	2 - 12 in	N	***17.8***	< 0.000015	7330

Table 5.5.3-6
Soil Data - Metals
SWMU 3
Rhodia Silver Bow Plant
[concentrations in mg/kg]

Chemical Name / Analysis Location				Antimony Lab	Arsenic Lab	Arsenic Field	Barium Lab	Beryllium Lab	Cadmium Lab	Cadmium Field	Calcium Lab	Chromium Lab	Chromium Field	Cobalt Lab	Copper Lab	Iron Lab	Lead Lab	Lead Field	Magnesium Lab	Manganese Lab	Manganese Field	Mercury Lab	Nickel Lab	Potassium Lab	Selenium Lab	Selenium Field
Background Mean, Exceedances **Bold**				**0.50**	23	23	**150**	**0.51**	**1.6**	**1.6**	**3900**	**11**	**11**	5.9	**35**	19600	**17**	**17**	**3500**	540	540	**0.021**	**5.3**	**3000**	**0.41**	0.41
Background Maximum, Exceedances Underline				3.9	120	120	290	1.3	8.9	8.9	14000	48	48	9.5	301	35300	190	190	5700	1100	1100	0.20	21	5300	0.70	0.70
Background 95% UCL, Exceedances *Italic*				*1.0*	40	40	170	*0.55*	*1.1*	*1.1*	*4500*	*12*	*12*	6.1	*64*	20600	*35*	*35*	*3700*	570	570	0.038	*6.0*	*3200*	*0.47*	0.47
Location ID	**Sample Date**	**Depth**	**Sample Type**																							
SWMU-3 SP-4	10/02/2012	0 - 2 in	N	***4.15***	13.2	--	**155 R**	***1.22 J***	***20.18 R***	--	***137000***	***329***	--	5.00 J	***85.2***	16600	***138 R***	--	3490	222 R	--	**0.038**	***71.4***	***4890***	***2.9***	--
SWMU-3 SP-4	10/02/2012	2 - 12 in	N	**0.670**	14.7	--	**152 R**	***1.27 J***	***4.75 R***	--	***50900***	***38.9***	--	5.66 J	29.5	18400	***49.1 R***	--	***6760***	452 R	--	0.021	***16.6 J***	***5320***	***2.2***	--
SWMU-3 SP-4	10/05/2012	0 - 2 in	N	--	--	15.54 J	--	--	--	***15.51 J***	--	--	***194.95 J***	--	--	--	--	***92.93 J***	--	--	259.88	--	--	--	--	< 0.7
SWMU-3 SP-4	10/05/2012	2 - 12 in	N	--	--	19.65 J	--	--	--	< 0.2 J	--	--	***56.72 J***	--	--	--	--	**26.10 J**	--	--	396.86	--	--	--	--	< 0.7

Table 5.5.3-6
Soil Data - Metals
SWMU 3
Rhodia Silver Bow Plant
[concentrations in mg/kg]

Chemical Name / Analysis Location				Silver Lab	Silver Field	Sodium Lab	Thallium Lab	Uranium Lab	Uranium Field	Vanadium Lab	Vanadium Field	Zinc Lab	Zinc Field
Background Mean, Exceedances **Bold**				**0.73 (1)**	**0.73 (1)**	**140**	**0.35**	**1.8**	**1.8**	**41**	**41**	**59**	**59**
Background Maximum, Exceedances Underline				1.7 (1)	1.7 (1)	620	1.0	4.1	4.1	83	83	380	380
Background 95% UCL, Exceedances *Italic*				*0.35 (1)*	*0.35 (1)*	*220*	*0.46*	*2.0*	*2.0*	*43*	*43*	*98*	*98*
Location ID	**Sample Date**	**Depth**	**Sample Type**										
SWMU-3 SP-4	10/02/2012	0 - 2 in	N	***8.0 J***	--	***1520***	***1.890***	***42.0 J***	--	***347 R***	--	***1850***	--
SWMU-3 SP-4	10/02/2012	2 - 12 in	N	< 1.0	--	***466***	***0.963***	***15.9 J***	--	***66.4 R***	--	***324***	--
SWMU-3 SP-4	10/05/2012	0 - 2 in	N	--	***9.34 J***	--	--	--	***32.77 J***	--	***255.27***	--	***1886.64 J***
SWMU-3 SP-4	10/05/2012	2 - 12 in	N	--	< 0.4 J	--	--	--	***9.69 J***	--	***67.25 J***	--	***559.38 J***

Table 5.5.3-7
Monitoring Well Construction Details
SWMU 3
Rhodia Silver Bow Plant

Monitoring Location	Date Installed	Elevations [ft. MSL, NAVD 88]					Depth [ft bgs]			Screen Dimensions		Construction Materials		Location	
		Riser Pipe	Protective Casing	Ground Surface	Top of Screen	Bottom of Screen	Water Surface	Top of Screen	Bottom of Screen	Length	Diameter	Casing	Screen	Easting	Northing
Rhodia Silver Bow Wells															
MW-01-1	09/19/01	5372.79	5370.7	5370.7	5330.4	5320.4	41.1	40.3	50.3	10	2	PVC	PVC	354064.08	198378.33
MW-01-4	09/20/01	5368.05	5366.4	5366.4	5328.0	5318.0	37.9	38.4	48.4	10	2	PVC	PVC	354060.24	198464.95
MW-01-5	09/20/01	5368.33	5366.2	5366.2	5330.2	5320.2	37.7	36.0	46.0	10	2	PVC	PVC	354067.08	198464.13

Table 5.5.3-8
SWMU 3 - Groundwater Quality Data - General Parameters
Rhodia Silver Bow Plant
[concentration in mg/l, unless otherwise specified]

Location ID	Site-wide	MW-01-1	MW-01-1	MW-01-1	MW-01-1	MW-01-1	MW-01-1	MW-01-4	MW-01-4		MW-01-4	MW-01-4	MW-01-4
Sample Date	Background	10/8/2001-9/17/2008	10/8/2001	1/16/2002	9/4/2002	5/16/2008	9/17/2008	10/4/2001	1/16/2002		9/3/2002	5/16/2008	9/16/2008
Sample Type	Concentration	Maximum	N	N	N	N	N	N	N	SPLIT	N	N	N
		Exceedances Shade											
Alkalinity, bicarbonate as CaCO3	224.6	158	--	--	--	158	158	--	--	--	--	135	132
Alkalinity, carbonate as CaCO3	2.0	2	--	--	--	< 2	< 2	--	--	--	--	< 2	< 2
Chloride	252.6	471	463	471	--	324	299	153	161	--	--	175	169
Fluoride	0.393	0.2	0.16	0.13	--	< 0.2	0.010	0.16	0.15	--	--	< 0.2	0.160 J
Nitrate + Nitrite	0.638	5.62	2.33	2.57	--	5.11	5.62	1.26	1.36	--	--	1.93	2.07
Nitrogen, ammonia as N	0.05	0.1	< 0.01	< 0.1	--	< 0.05	< 0.05	< 0.05	< 0.1	--	--	< 0.05 J	< 0.05
Phosphorus, elemental (white)	0.000716	0.0005	< 0.000004	< 0.00050	< 0.0005	< 0.0000234	< 0.0000234	< 0.000004	< 0.0000040	< 0.00050	< 0.0005	< 0.0000234	< 0.0000234
Phosphorus, total	2.552	0.096	0.096	0.04 h	0.04	0.05	0.04	0.038	0.02 h	--	0.04	0.05	0.03
Sulfate	38.36	457	215	233	--	457	441	104	113	--	--	147	147

Table 5.5.3-8
SWMU 3 - Groundwater Quality Data - General Parameters
Rhodia Silver Bow Plant
[concentration in mg/l, unless otherwise specified]

Location ID Sample Date Sample Type	Site-wide Background Concentration	MW-01-1 10/8/2001-9/17/2008 Maximum	MW-01-5 10/4/2001 N	MW-01-5 1/16/2002 N	 SPLIT	MW-01-5 9/3/2002 N	MW-01-5 5/17/2008 N	MW-01-5 9/16/2008 N
		Exceedances Shade						
Alkalinity, bicarbonate as CaCO3	224.6	158	--	--	--	--	137	134
Alkalinity, carbonate as CaCO3	2.0	2	--	--	--	--	< 2	< 2
Chloride	252.6	471	138	144	--	--	182	183
Fluoride	0.393	0.2	0.16	0.16	0.15	--	< 0.2	0.142 J
Nitrate + Nitrite	0.638	5.62	1.23	1.34	--	--	1.86	2.00
Nitrogen, ammonia as N	0.05	0.1	< 0.05	< 0.1	--	--	< 0.05	< 0.05
Phosphorus, elemental (white)	0.000716	0.0005	< 0.000004	< 0.0000040	< 0.00050	< 0.0005	< 0.0000234	< 0.0000234
Phosphorus, total	2.552	0.096	**0.104**	0.02 h	0.07	0.04	0.05	0.05
Sulfate	38.36	457	108	113	115	--	153	155

Table 5.5.3-9
SWMU 3 - Groundwater Quality Data - Metals
Rhodia Silver Bow Plant
[concentration in ug/l]

Location ID		Site-wide	MW-01-1	MW-01-1	MW-01-1	MW-01-1	MW-01-1	MW-01-1	MW-01-4	MW-01-4	MW-01-4	MW-01-4	MW-01-5	MW-01-5		MW-01-5	MW-01-5
Sample Date		Background	10/8/2001-9/17/2008	10/8/2001	1/16/2002	9/4/2002	5/16/2008	9/17/2008	10/4/2001	1/16/2002	5/16/2008	9/16/2008	10/4/2001	1/16/2002		5/17/2008	9/16/2008
Sample Type		Concentration	Maximum	N	N	N	N	N	N	N	N	N	N	N	SPLIT	N	N
			Exceedances Shade														
Antimony	Dissolved	0.243	3	<3	<3	--	--	--	< 3	< 3	--	--	< 3	< 3	< 3	--	--
	Total	0.243	3	<3	--	--	0.10	0.09	< 3	--	0.07	0.09	< 3	--	--	0.07	0.09
Arsenic	Dissolved	19.1	3	<3	3	--	--	--	< 3	3	--	--	< 3	3	< 3	--	--
	Total	19.1	4.7	<3	--	--	3.1	4.7	< 3	--	2.9	3.7	< 3	--	--	3	3.5
Barium	Dissolved	71.08	301	301	237	--	--	--	252	260	--	--	247	250	240	--	--
	Total	71.08	296	296	--	--	86.3	90.0	251	--	116	113	260	--	--	113	124
Beryllium	Dissolved	4.3	1	<1	<1	--	--	--	< 1	< 1	--	--	< 1	< 1	< 1	--	--
	Total	4.3	1	<1	--	--	<0.02	<0.025	< 1	--	< 0.02	< 0.020	< 1	--	--	< 0.02	< 0.020
Cadmium	Dissolved	0.25	1	<1	<1	--	--	--	< 0.1	< 1	--	--	< 0.1	< 1	< 0.1	--	--
	Total	0.25	0.1	<1	--	--	<0.02	0.02	< 0.1	--	< 0.02	0.03	< 0.1	--	--	< 0.02	< 0.02
Calcium	Dissolved	142800	275000	259000	275000	--	--	--	114000	112000	--	--	111000	106000	--	--	--
	Total	142800	354000	262000	--	--	354000	318000	114000	--	146000	139000	108000	--	--	137000	141000
Chromium	Dissolved	2.1	2	2	2	--	--	--	1	< 1	--	--	< 1	< 1	< 1	--	--
	Total	2.1	5	5	--	--	0.2	<0.56	1	--	0.2	< 0.83	1	--	--	0.2	< 0.37
Cobalt	Dissolved	0.264	10	<10	<10	--	--	--	< 10	< 10	--	--	< 10	< 10	< 10	--	--
	Total	0.264	10	<10	--	--	0.70	<0.847	< 10	--	0.37	< 0.369	< 10	--	--	0.33	< 0.414
Copper	Dissolved	12.03	4	4	3	--	--	--	2	1	--	--	3	1	< 1	--	--
	Total	12.03	8.2	5	--	--	4.5	<8.233	5	--	< 1.9	< 1.164	7	--	--	2.8	< 3.090
Iron	Dissolved	229.1	30	<30	<30	--	--	--	< 10	< 30	--	--	< 10	< 30	< 10	--	--
	Total	229.1	290	290	--	--	79	<20	**590**	--	32	< 50	**1510**	--	--	135	< 400
Lead	Dissolved	3.819	2	<2	<2	--	--	--	< 3	< 2	--	--	< 3	< 2	< 2	--	--
	Total	3.819	2	<2	--	--	<0.36	<0.219	< 3	--	< 0.14	< 0.414	< 3	--	--	0.43	< 0.742
Magnesium	Dissolved	20335	55000	54000	55000	--	--	--	24000	22000	--	--	23000	21000	--	--	--
	Total	20335	63800	55000	--	--	63800	62600	23000	--	29100	28200	22000	--	--	27900	28400
Manganese	Dissolved	23.3	95	95	30	--	--	--	51	10	--	--	19	< 10	--	--	--
	Total	23.3	114	114	--	--	2.55	<0.625	66	--	0.54	< 0.658	39	--	--	1.68	< 3.8
Mercury	Dissolved	1.0	0.6	<0.6	<0.1	--	--	--	< 0.6	< 0.1	--	--	< 0.6	< 0.1	< 0.6	--	--
	Total	1.0	0.6	<0.6	--	--	<0.2	<0.20	< 0.6	--	< 0.2	< 0.20	< 0.6	--	--	< 0.2	< 0.20
Molybdenum	Dissolved	--	--						--	--	--	--	--	8	--	--	--
Nickel	Dissolved	2.871	10	<10	<5	--	--	--	< 20	< 5	--	--	< 20	< 5	< 10	--	--
	Total	2.871	10	<10	--	--	2.6	5.0	< 20	--	1.2	1.9	< 20	--	--	1.1	1.7
Potassium	Dissolved	10078	17000	17000	16000	--	--	--	12000	10000	--	--	12000	10000	--	--	--
	Total	10078	18000	18000	--	--	17200	17600	12000	--	12400	12300	12000	--	--	12600	12800
Selenium	Dissolved	1.465	9	6	9	--	--	--	3	4	--	--	3	4	5	--	--
	Total	1.465	18.7	6	--	--	11.0	18.7	2	--	4.5	8.2	2	--	--	4.6	7.2
Silver	Dissolved	5.0	3	<3	<3	--	--	--	< 3	< 3	--	--	< 3	< 3	< 3	--	--
	Total	5.0	3	<3	--	--	0.03	<0.020	< 3	--	< 0.02	< 0.020	< 3	--	--	< 0.03	< 0.020
Sodium	Dissolved	71458	40000	40000	37000	--	--	--	27000	25000	--	--	28000	25000	--	--	--
	Total	71458	43400	42000	--	--	42400	43400	28000	--	29400	29300	28000	--	--	29200	30200
Thallium	Dissolved	2.9	2	<2	<1	--	--	--	< 3	< 1	--	--	< 3	< 1	< 2	--	--
	Total	2.9	2	<2	--	--	<0.02	<0.020	< 3	--	< 0.02	< 0.020	< 3	--	--	< 0.02	< 0.020
Uranium	Dissolved	21.61	45.3	--	45.3	--	--	--	--	20.2	--	--	--	21	17	--	--
	Total	21.61	53.602	31.0	--	--	52.2	53.602	13.4	--	23.3	20.712	15	--	--	23.3	23.122
Vanadium	Dissolved	8.003	100	<100	<10	--	--	--	< 100	< 10	--	--	< 100	< 10	< 100	--	--
	Total	8.003	100	<100	--	--	3.4	2.9	< 100	--	4.6	3.8	< 100	--	--	4.5	4.1
Zinc	Dissolved	24.86	20	20	8	--	--	--	< 10	< 1	--	--	20	3	< 10	--	--
	Total	24.86	20	20	--	--	<3.9	<5.5	20	--	< 1.2	< 3.0	20	--	--	1.5	< 3.7

Table 5.5.3-10
SWMU 3 - Groundwater Quality Data - SVOCs
Rhodia Silver Bow Plant
[concentration in ug/l]

Location ID Sample Date Sample Type	Site-wide Background Concentration	MW-01-1 10/8/2001-9/17/2008 Maximum	MW-01-1 10/8/2001 N	MW-01-1 1/16/2002 N	MW-01-1 9/4/2002 N	MW-01-1 5/16/2008 N	MW-01-1 9/17/2008 N	MW-01-4 10/4/2001 N	MW-01-4 5/16/2008 N	MW-01-5 10/4/2001 N
		Exceedances Shade								
1,2,4,5-Tetrachlorobenzene			< 10	--	--	--	--	< 10	--	< 10
1,2,4-Trichlorobenzene	0.016	0.016	< 10	--	--	< 0.016	< 0.016	< 10	< 0.018	< 10
1,2-Dichlorobenzene	0.022	0.022	< 10	--	--	< 0.022	< 0.022	< 10	< 0.025	< 10
1,3-Dichlorobenzene	0.021	0.021	< 10	--	--	< 0.021	< 0.021	< 10	< 0.024	< 10
1,4-Dichlorobenzene	0.029	0.029	< 10	--	--	< 0.029	< 0.029	< 10	< 0.032	< 10
2,4,5-Trichlorophenol	0.031	0.031	< 10	--	--	< 0.031	< 0.031	< 10	< 0.035	< 10
2,4,6-Trichlorophenol	0.058	0.058	< 10	--	--	< 0.058	< 0.058	< 10	< 0.064	< 10
2,4-Dichlorophenol	0.047	0.047	< 10	--	--	< 0.047	< 0.047	< 10	< 0.052	< 10
2,4-Dimethylphenol	2.2	2.2	< 10	--	--	< 2.2	< 2.2	< 10	< 2.5	< 10
2,4-Dinitrophenol	0.17	0.17	< 50	--	--	< 0.17	< 0.17 R	< 50	< 0.19	< 50
2,4-Dinitrotoluene	0.018	0.018	< 10	--	--	< 0.018	< 0.018	< 10	< 0.020	< 10
2,6-Dinitrotoluene	0.033	0.033	< 10	--	--	< 0.033	< 0.033	< 10	< 0.037	< 10
2-Chloronaphthalene	0.041	0.041	< 10	--	--	< 0.041	< 0.041	< 10	< 0.046	< 10
2-Chlorophenol	0.054	0.054	< 10	--	--	< 0.054	< 0.054	< 10	< 0.060	< 10
2-Methyl-4,6-dinitrophenol	0.025	0.025	< 50	--	--	< 0.025	< 0.025 R	< 50	< 0.028	< 50
2-Methylnaphthalene	0.026	0.026	< 10	--	--	< 0.026	< 0.026	< 10	< 0.029	< 10
2-Nitroaniline	0.024	0.024	--	--	--	< 0.024	< 0.024	--	< 0.027	--
2-Nitrophenol	0.063	0.063	< 10	--	--	< 0.063	< 0.063	< 10	< 0.070	< 10
3,3`-Dichlorobenzidine	0.43	0.43	< 20	--	--	< 0.43 R	< 0.43	< 20	< 0.48 R	< 20
3-Nitroaniline	0.029	0.029	--	--	--	< 0.029	< 0.029	--	< 0.032	--
4-Bromophenyl phenyl ether	0.026	0.026	< 10	--	--	< 0.026	< 0.026	< 10	< 0.029	< 10
4-Chloro-3-methylphenol	0.037	0.037	< 10	--	--	< 0.037	< 0.037	< 10	< 0.041	< 10
4-Chloroaniline	0.025	0.025	--	--	--	< 0.025	< 0.025	--	< 0.028	--
4-Chlorophenyl phenyl ether	0.027	0.027	< 10	--	--	< 0.027	< 0.027	< 10	< 0.030	< 10
4-Nitroaniline	0.019	0.019	--	--	--	< 0.019	< 0.019	--	< 0.021	--
4-Nitrophenol	0.28	0.28	< 50	--	--	< 0.28	< 0.28	< 50	< 0.31	< 50
Acenaphthene	0.029	0.026	< 10	--	--	< 0.026	< 0.0044	< 10	< 0.029	< 10
Acenaphthylene	0.015	0.015	< 10	--	--	< 0.015	< 0.0034	< 10	< 0.017	< 10
Anthracene	0.024	0.024	< 10	--	--	< 0.024	< 0.0036	< 10	< 0.027	< 10
Azobenzene	0.021	0.021	--	--	--	< 0.021	< 0.021	--	< 0.024	--
Benzidine	--	--	< 20	--	--	--	--	< 20	--	< 20
Benzo(a)anthracene	0.042	0.018	< 10	--	--	< 0.018	0.0036 J	< 10	< 0.020	< 10
Benzo(a)pyrene	0.039	0.031	< 10	--	--	< 0.031	< 0.0043	< 10	< 0.035	< 10
Benzo(b)fluoranthene	0.052	0.017	< 10	--	--	< 0.017	< 0.0023	< 10	< 0.019	< 10
Benzo(g,h,i)perylene	0.048	0.019	< 10	--	--	< 0.019	< 0.0029	< 10	< 0.021	< 10
Benzo(k)fluoranthene	0.024	0.024	< 10	--	--	< 0.024	< 0.0025	< 10	< 0.027	< 10
Benzoic Acid	--	1.7	--	--	--	< 1.6	1.7 R	--	< 1.3	--
Benzyl alcohol	0.073	0.074	--	--	--	< 0.073	< 0.074	--	< 0.081	--
Bis(2-chloroethoxy)methane	0.024	0.024	< 10	--	--	< 0.024	< 0.024	< 10	< 0.027	< 10
Bis(2-chloroethyl)ether	0.035	0.035	< 10	--	--	< 0.035	< 0.035	< 10	< 0.039	< 10
Bis(2-chloroisopropyl)ether	0.026	0.026	< 10	--	--	< 0.026	< 0.026	< 10	< 0.029	< 10
Bis(2-ethylhexyl)phthalate	3.5	1.61	1.61 jBQQ	--	--	< 0.33	< 0.19	**9.11 J BQQ**	< 0.74	1.5 J BQQ
Butyl benzyl phthalate	0.063	0.018	< 10	--	--	< 0.018	< 0.018	< 10	< 0.020	< 10
Carbazole	0.018	0.018	--	--	--	< 0.018	< 0.018	--	< 0.020	--
Chrysene	0.075	0.028	< 10	--	--	< 0.028	< 0.0034	< 10	< 0.031	< 10
Dibenz(a,h)anthracene	0.017	0.017	< 10	--	--	< 0.017	< 0.0025	< 10	< 0.019	< 10
Dibenzofuran	0.0018	0.018	--	--	--	< 0.018	< 0.018	--	< 0.020	--
Diethyl phthalate	0.062	0.045	< 10	--	--	0.045 J	< 0.037	< 10	< 0.014	< 10
Dimethyl phthalate	0.021	0.021	< 10	--	--	< 0.021	< 0.021	< 10	< 0.024	< 10
Di-n-butyl phthalate	0.092	0.09	< 10	--	--	< 0.077	<0.090	< 10	< 0.083	< 10
Di-n-octyl phthalate	0.018	0.018	< 10	--	--	< 0.018	< 0.018	< 10	< 0.020	< 10
Fluoranthene	0.130	0.020	< 10	--	--	< 0.020	0.0045 J	< 10	< 0.022	< 10
Fluorene	0.027	0.027	< 10	--	--	< 0.027	< 0.0038	< 10	< 0.030	< 10
Hexachlorobenzene	0.022	0.022	< 10	--	--	< 0.022	< 0.022	< 10	< 0.025	< 10
Hexachlorobutadiene	0.027	0.027	< 10	--	--	< 0.027 R	< 0.027 R	< 10	< 0.030 R	< 10
Hexachlorocyclopentadiene	--	0.19	< 20	--	--	< 0.19 R	< 0.19 R	< 20	< 0.21 R	< 20
Hexachloroethane	0.024	0.024	< 10	--	--	< 0.024	< 0.024 R	< 10	< 0.027	< 10
Indeno(1,2,3-cd)pyrene	0.039	0.021	< 10	--	--	< 0.021	< 0.0026	< 10	< 0.024	< 10
Isophorone	0.016	0.016	< 10	--	--	< 0.016	< 0.016	< 10	< 0.018	< 10
Naphthalene	0.022	0.025	< 10	--	--	0.025 J	<0.010	< 10	< 0.025	< 10
Nitrobenzene	0.028	0.028	< 10	--	--	< 0.028	< 0.028	< 10	< 0.031	< 10
N-Nitrosodimethylamine	0.42	0.42	< 10	--	--	< 0.42	< 0.42	< 10	< 0.47	< 10
N-Nitrosodi-n-propylamine	0.037	0.037	< 10	--	--	< 0.037	< 0.037	< 10	< 0.041	< 10
N-Nitrosodiphenylamine	0.048	0.048	< 10	--	--	< 0.048	< 0.048	< 10	< 0.053	< 10
N-Nitrosopyrrolidine	#N/A	--	< 10	--	--	--	--	< 10	--	< 10
o-Cresol	0.11	0.11	< 10	--	--	< 0.11	< 0.11	< 10	< 0.13	< 10
p & m Cresol	--	--	< 10	--	--	--	--	< 10	--	< 10
p-Cresol	0.12	0.12	--	--	--	< 0.12	< 0.12	--	< 0.14	--
Pentachlorobenzene	--	--	< 10	--	--	--	--	< 10	--	< 10
Pentachlorophenol	0.34	0.34	< 50	--	--	< 0.34	< 0.34 R	< 50	< 0.38	< 50
Phenanthrene	0.037	0.022	< 10	--	--	< 0.022	<0.0050	< 10	< 0.025	< 10
Phenol	8.9	2.7	< 10	--	--	< 2.7	< 0.063	< 10	< 0.070	< 10
Pyrene	0.17	0.019	< 10	--	--	< 0.019	0.0042 J	< 10	< 0.021	< 10
Pyridine	--	1.4	< 20	--	--	--	< 1.4 R	< 20	--	< 20

Table 5.5.3-10
SWMU 3 - Groundwater Quality Data - SVOCs
Rhodia Silver Bow Plant
[concentration in ug/l]

Location ID Sample Date Sample Type	Site-wide Background Concentration	MW-01-1 10/8/2001-9/17/2008 Maximum	MW-01-5 5/17/2008 N	MW-01-5 9/16/2008 N
		Exceedances Shade		
1,2,4,5-Tetrachlorobenzene			--	--
1,2,4-Trichlorobenzene	0.016	0.016	< 0.016	< 0.016
1,2-Dichlorobenzene	0.022	0.022	< 0.022	< 0.022
1,3-Dichlorobenzene	0.021	0.021	< 0.021	< 0.021
1,4-Dichlorobenzene	0.029	0.029	< 0.029	< 0.029
2,4,5-Trichlorophenol	0.031	0.031	< 0.031	< 0.031
2,4,6-Trichlorophenol	0.058	0.058	< 0.058	< 0.058
2,4-Dichlorophenol	0.047	0.047	< 0.047	< 0.047
2,4-Dimethylphenol	2.2	2.2	< 2.2	< 2.2
2,4-Dinitrophenol	0.17	0.17	< 0.17	< 0.17 R
2,4-Dinitrotoluene	0.018	0.018	< 0.018	< 0.018
2,6-Dinitrotoluene	0.033	0.033	< 0.033	< 0.033
2-Chloronaphthalene	0.041	0.041	< 0.041	< 0.041
2-Chlorophenol	0.054	0.054	< 0.054	< 0.054
2-Methyl-4,6-dinitrophenol	0.025	0.025	< 0.025	< 0.025 R
2-Methylnaphthalene	0.026	0.026	< 0.026	< 0.026
2-Nitroaniline	0.024	0.024	< 0.024	< 0.024
2-Nitrophenol	0.063	0.063	< 0.063	< 0.063
3,3`-Dichlorobenzidine	0.43	0.43	< 0.43 R	< 0.43
3-Nitroaniline	0.029	0.029	< 0.029	< 0.029
4-Bromophenyl phenyl ether	0.026	0.026	< 0.026	< 0.026
4-Chloro-3-methylphenol	0.037	0.037	< 0.037	< 0.037
4-Chloroaniline	0.025	0.025	< 0.025	< 0.025
4-Chlorophenyl phenyl ether	0.027	0.027	< 0.027	< 0.027
4-Nitroaniline	0.019	0.019	< 0.019	< 0.019
4-Nitrophenol	0.28	0.28	< 0.28	< 0.28
Acenaphthene	0.029	0.026	< 0.026	< 0.026
Acenaphthylene	0.015	0.015	< 0.015	**0.072 J**
Anthracene	0.024	0.024	< 0.024	< 0.024
Azobenzene	0.021	0.021	< 0.021	< 0.021
Benzidine	--	--	--	--
Benzo(a)anthracene	0.042	0.018	< 0.018	**0.024 J**
Benzo(a)pyrene	0.039	0.031	< 0.031	< 0.031
Benzo(b)fluoranthene	0.052	0.017	< 0.017	< 0.017
Benzo(g,h,i)perylene	0.048	0.019	< 0.019	**0.020 J**
Benzo(k)fluoranthene	0.024	0.024	< 0.024	< 0.024
Benzoic Acid	--	1.7	< 1.3	1.6 R
Benzyl alcohol	0.073	0.074	< 0.073	< 0.073
Bis(2-chloroethoxy)methane	0.024	0.024	< 0.024	< 0.024
Bis(2-chloroethyl)ether	0.035	0.035	< 0.035	< 0.035
Bis(2-chloroisopropyl)ether	0.026	0.026	< 0.026	< 0.026
Bis(2-ethylhexyl)phthalate	3.5	1.61	1.5	< 0.13
Butyl benzyl phthalate	0.063	0.018	< 0.018	< 0.018
Carbazole	0.018	0.018	< 0.018	< 0.018
Chrysene	0.075	0.028	< 0.028	< 0.028
Dibenz(a,h)anthracene	0.017	0.017	< 0.017	< 0.017
Dibenzofuran	0.0018	0.018	< 0.018	< 0.018
Diethyl phthalate	0.062	0.045	0.034 J	< 0.028
Dimethyl phthalate	0.021	0.021	< 0.021	< 0.021
Di-n-butyl phthalate	0.092	0.09	< 0.070	< 0.070
Di-n-octyl phthalate	0.018	0.018	< 0.018	< 0.018
Fluoranthene	0.130	0.020	< 0.020	**0.043 J**
Fluorene	0.027	0.027	< 0.027	< 0.027
Hexachlorobenzene	0.022	0.022	< 0.022	< 0.022
Hexachlorobutadiene	0.027	0.027	< 0.027 R	< 0.027 R
Hexachlorocyclopentadiene	--	0.19	< 0.19 R	< 0.19 R
Hexachloroethane	0.024	0.024	< 0.024	< 0.024 R
Indeno(1,2,3-cd)pyrene	0.039	0.021	< 0.021	< 0.021
Isophorone	0.016	0.016	< 0.016	< 0.016
Naphthalene	0.022	0.025	< 0.022	< 0.022
Nitrobenzene	0.028	0.028	< 0.028	< 0.028
N-Nitrosodimethylamine	0.42	0.42	< 0.42	< 0.42
N-Nitrosodi-n-propylamine	0.037	0.037	< 0.037	< 0.037
N-Nitrosodiphenylamine	0.048	0.048	< 0.048	< 0.048
N-Nitrosopyrrolidine	#N/A	--	--	--
o-Cresol	0.11	0.11	< 0.11	< 0.11
p & m Cresol	--	--	--	--
p-Cresol	0.12	0.12	< 0.12	< 0.12
Pentachlorobenzene	--	--	--	--
Pentachlorophenol	0.34	0.34	< 0.34	< 0.34 R
Phenanthrene	0.037	0.022	< 0.022	**0.026 J**
Phenol	8.9	2.7	2.4	< 0.063
Pyrene	0.17	0.019	< 0.019	**0.046 J**
Pyridine	--	1.4	--	< 1.4 R

Table 5.5.3-11
SWMU 3 - Groundwater Quality Data - VOCs
Rhodia Silver Bow Plant
[concentration in ug/l]

Location ID Sample Date Sample Type	Site-wide Background Concentration	MW-01-1 10/8/2001-9/17/2008 Maximum	MW-01-1 10/8/2001 N	MW-01-1 1/16/2002 N	MW-01-1 9/4/2002 N	MW-01-1 5/16/2008 N	MW-01-1 9/17/2008 N	MW-01-4 10/4/2001 N	MW-01-4 5/16/2008 N	MW-01-5 10/4/2001 N
		Exceedances Shade								
1,1,1,2-Tetrachloroethane	**0.047**	**0.047**	<1.0	--	--	< 0.047	< 0.047	< 1.0	< 0.047	< 1.0
1,1,1-Trichloroethane	**0.05**	**0.050**	<1.0	--	--	<0.050	<0.050	< 1.0	< 0.050	< 1.0
1,1,2,2-Tetrachloroethane	**0.064**	**0.064**	<1.0	--	--	< 0.064	< 0.064	< 1.0	< 0.064	< 1.0
1,1,2-Trichloroethane	**0.061**	**0.061**	<1.0	--	--	< 0.061	< 0.061	< 1.0	< 0.061	< 1.0
1,1-Dichloro-1-propene	**0.051**	**0.051**	--	--	--	< 0.051	< 0.051	< 1.0	< 0.051	< 1.0
1,1-Dichloroethane	**0.042**	**0.042**	<1.0	--	--	< 0.042	< 0.042	< 1.0	< 0.042	< 1.0
1,1-Dichloroethylene	**0.1**	**0.10**	<1.0	--	--	<0.10	<0.10	< 1.0	< 0.10	< 1.0
1,2,3-Trichlorobenzene	**0.1**	**0.10**	--	--	--	<0.10	<0.10	< 1.0	< 0.10	< 1.0
1,2,3-Trichloropropane	**0.14**	**0.14**	<1.0	--	--	< 0.14	< 0.14	< 1.0	< 0.14	< 1.0
1,2,4-Trichlorobenzene	**0.13**	**0.13**	--	--	--	< 0.13	< 0.13	< 1.0	< 0.13	< 1.0
1,2,4-Trimethylbenzene	**0.037**	**0.037**	--	--	--	< 0.037	< 0.037	< 1.0	< 0.037	< 1.0
1,2-Dibromo-3-chloropropane	**0.22**	**0.22**	<1.0	--	--	< 0.22	< 0.22	< 1.0	< 0.22	< 1.0
1,2-Dibromoethane	**0.084**	**0.084**	<1.0	--	--	< 0.084	< 0.084	< 1.0	< 0.084	< 1.0
1,2-Dichlorobenzene	**0.044**	**0.044**	--	--	--	< 0.044	< 0.044	< 1.0	< 0.044	< 1.0
1,2-Dichloroethane	**0.073**	**0.073**	<1.0	--	--	< 0.073	< 0.073	< 1.0	< 0.073	< 1.0
1,2-Dichloroethylene, cis	**0.045**	**0.045**	<1.0	--	--	< 0.045	< 0.045	< 1.0	< 0.045	< 1.0
1,2-Dichloroethylene, trans	**0.048**	**0.048**	<1.0	--	--	< 0.048	< 0.048	< 1.0	< 0.048	< 1.0
1,2-Dichloropropane	**0.042**	**0.042**	<1.0	--	--	< 0.042	< 0.042	< 1.0	< 0.042	< 1.0
1,3,5-Trimethylbenzene	**0.042**	**0.042**	--	--	--	< 0.042	< 0.042	< 1.0	< 0.042	< 1.0
1,3-Dichloro-1-propene trans	**0.041**	**0.041**	<1.0	--	--	< 0.041	< 0.041	< 1.0	< 0.041	< 1.0
1,3-Dichloro-1-propene, cis	**0.038**	**0.038**	<1.0	--	--	< 0.038	< 0.038	< 1.0	< 0.038	< 1.0
1,3-Dichlorobenzene	**0.041**	**0.041**	--	--	--	< 0.041	< 0.041	< 1.0	< 0.041	< 1.0
1,3-Dichloropropane	**0.032**	**0.032**	--	--	--	< 0.032	< 0.032	< 1.0	< 0.032	< 1.0
1,4-Dichlorobenzene	**0.054**	**0.054**	--	--	--	< 0.054	< 0.054	< 1.0	< 0.054	< 1.0
2,2-Dichloropropane	**0.050**	**0.050**	--	--	--	<0.050	<0.050	< 1.0	< 0.050	< 1.0
2-Chloroethyl Vinyl Ether	**--**	**0.19**	--	--	--	< 0.19 R	< 0.19 R	< 1.0	< 0.19 R	< 1.0
2-Hexanone	**2.9**	**2.9**	< 20	--	--	< 2.9	< 2.9	< 20	< 2.9	< 20
Acetone	**7.9**	**3.6**	< 20	--	--	< 2.5	< 3.6	< 20	< 2.5	< 20
Acrolein	**2**	**2.0**	--	--	--	<2.0	<2.0	< 20	< 2.0	< 20
Acrylonitrile	**0.31**	**0.31**	--	--	--	< 0.31	< 0.31	< 20	< 0.31	< 20
Benzene	**0.045**	**0.045**	<1.0	--	--	< 0.045	< 0.045	< 1.0	< 0.045	< 1.0
Bromobenzene	**0.027**	**0.027**	--	--	--	< 0.027	< 0.027	< 1.0	< 0.027	< 1.0
Bromochloromethane	**0.091**	**0.091**	--	--	--	< 0.091	< 0.091	< 1.0	< 0.091	< 1.0
Bromodichloromethane	**0.036**	**0.036**	<1.0	--	--	< 0.036	< 0.036	< 1.0	< 0.036	< 1.0
Bromoform	**0.12**	**0.080**	<1.0	--	--	<0.080	< 0.080 J	< 1.0	< 0.080	< 1.0
Bromomethane	**0.072**	**0.072**	<1.0	--	--	< 0.072	< 0.072	< 1.0	< 0.072	< 1.0
Butyl benzene	**0.056**	**0.056**	--	--	--	< 0.056	< 0.056	< 1.0	< 0.056	< 1.0
Butylbenzene sec	**0.036**	**0.036**	--	--	--	< 0.036	< 0.036	< 1.0	< 0.036	< 1.0
Butylbenzene tert-	**0.038**	**0.038**	--	--	--	< 0.038	< 0.038	< 1.0	< 0.038	< 1.0
Carbon disulfide	**0.045**	**1.1**	1.1 *	--	--	< 0.045	< 0.045	< 1.0	< 0.045	< 1.0
Carbon tetrachloride	**0.068**	**0.068**	<1.0	--	--	< 0.068	< 0.068	< 1.0	< 0.068	< 1.0
Chlorobenzene	**0.045**	**0.045**	<1.0	--	--	< 0.045	< 0.045	< 1.0	< 0.045	< 1.0
Chlorodibromomethane	**0.057**	**0.057**	<1.0	--	--	< 0.057	< 0.057	< 1.0	< 0.057	< 1.0
Chloroethane	**0.13**	**0.13**	<1.0	--	--	< 0.13	< 0.13	< 1.0	< 0.13	< 1.0
Chloroform	**0.13**	**0.042**	<1.0	--	--	< 0.042	< 0.042	**1.4**	< 0.042	< 1.0
Chloromethane	**0.12**	**0.053**	<1.0	--	--	< 0.053	< 0.053	< 1.0	< 0.053	< 1.0
Chlorotoluene o-	**0.035**	**0.035**	--	--	--	< 0.035	< 0.035	< 1.0	< 0.035	< 1.0
Chlorotoluene p-	**0.025**	**0.025**	--	--	--	< 0.025	< 0.025	< 1.0	< 0.025	< 1.0
Cumene (isopropyl benzene)	**0.031**	**0.031**	--	--	--	< 0.031	< 0.031	< 1.0	< 0.031	< 1.0
Cymene p- (Toluene isopropyl p-)	**0.044**	**0.044**	--	--	--	< 0.044	< 0.044	< 1.0	< 0.044	< 1.0
Dibromomethane (methylene bromide)	**0.089**	**0.089**	--	--	--	< 0.089	< 0.089	< 1.0	< 0.089	< 1.0
Dichlorodifluoromethane (CFC-12)	**0.083**	**0.083**	<1.0	--	--	< 0.083	< 0.083	< 1.0	< 0.083	< 1.0
Ethyl benzene	**0.042**	**0.042**	<1.0	--	--	< 0.042	< 0.042	< 1.0	< 0.042	< 1.0
Hexachlorobutadiene	**0.19**	**0.19**	--	--	--	< 0.19	< 0.19	< 1.0	< 0.19	< 1.0
Iodomethane	**0.27**	**0.27**	<1.0	--	--	< 0.27	< 0.27	< 1.0	< 0.27	< 1.0
Methyl ethyl ketone	**3.8**	**3.8**	< 20	--	--	< 3.8	< 3.8	< 20	< 3.8	< 20
Methyl isobutyl ketone	**3**	**3.0**	< 20	--	--	<3.0	<3.0	< 20	< 3.0	< 20
Methyl tertiary butyl ether (MTBE)	**0.07**	**0.070**	--	--	--	<0.070	<0.070	< 1.0	< 0.070	< 1.0
Methylene chloride	**0.23**	**0.23**	<1.0	--	--	< 0.23	< 0.23	< 1.0	< 0.23	< 1.0
Naphthalene	**0.1**	**0.10**	--	--	--	<0.10	<0.10	< 1.0	< 0.10	< 1.0
Propylbenzene	**0.037**	**0.037**	--	--	--	< 0.037	< 0.037	< 1.0	< 0.037	< 1.0
Styrene	**0.039**	**0.039**	<1.0	--	--	< 0.039	< 0.039	< 1.0	< 0.039	< 1.0
Tetrachloroethylene	**0.077**	**0.077**	<1.0	--	--	< 0.077	< 0.077	< 1.0	< 0.077	< 1.0
Toluene	**0.31**	**0.36**	<1.0	--	--	<0.090	< 0.36	< 1.0	< 0.070	< 1.0
Trichloroethylene	**0.061**	**0.061**	<1.0	--	--	< 0.061	< 0.061	< 1.0	< 0.061	< 1.0
Trichlorofluoromethane	**0.086**	**0.086**	<1.0	--	--	< 0.086	< 0.086	< 1.0	< 0.086	< 1.0
Vinyl acetate	**0.91**	**0.91**	<1.0	--	--	< 0.91	< 0.91	< 1.0	< 0.91	< 1.0
Vinyl chloride	**0.071**	**0.071**	<1.0	--	--	< 0.071	< 0.071	< 1.0	< 0.071	< 1.0
Xylene m & p	**0.078**	**0.078**	<1.0	--	--	< 0.078	< 0.078	< 1.0	< 0.078	< 1.0
Xylene, o-	**0.037**	**0.037**	<1.0	--	--	< 0.037	< 0.037	< 1.0	< 0.037	< 1.0
Xylenes, total	--	--	<1.0	--	--	--	--	< 1.0	--	< 1.0

Table 5.5.3-11
SWMU 3 - Groundwater Quality Data - VOCs
Rhodia Silver Bow Plant
[concentration in ug/l]

Location ID Sample Date Sample Type	Site-wide Background Concentration	MW-01-1 10/8/2001-9/17/2008 Maximum	MW-01-5 5/17/2008 N	MW-01-5 9/16/2008 N
		Exceedances Shade		
1,1,1,2-Tetrachloroethane	**0.047**	**0.047**	< 0.047	< 0.047
1,1,1-Trichloroethane	**0.05**	**0.050**	< 0.050	< 0.050
1,1,2,2-Tetrachloroethane	**0.064**	**0.064**	< 0.064	< 0.064
1,1,2-Trichloroethane	**0.061**	**0.061**	< 0.061	< 0.061
1,1-Dichloro-1-propene	**0.051**	**0.051**	< 0.051	< 0.051
1,1-Dichloroethane	**0.042**	**0.042**	< 0.042	< 0.042
1,1-Dichloroethylene	**0.1**	**0.10**	< 0.10	< 0.10
1,2,3-Trichlorobenzene	**0.1**	**0.10**	< 0.10	< 0.10
1,2,3-Trichloropropane	**0.14**	**0.14**	< 0.14	< 0.14
1,2,4-Trichlorobenzene	**0.13**	**0.13**	< 0.13	< 0.13
1,2,4-Trimethylbenzene	**0.037**	**0.037**	< 0.037	< 0.037
1,2-Dibromo-3-chloropropane	**0.22**	**0.22**	< 0.22	< 0.22
1,2-Dibromoethane	**0.084**	**0.084**	< 0.084	< 0.084
1,2-Dichlorobenzene	**0.044**	**0.044**	< 0.044	< 0.044
1,2-Dichloroethane	**0.073**	**0.073**	< 0.073	< 0.073
1,2-Dichloroethylene, cis	**0.045**	**0.045**	< 0.045	< 0.045
1,2-Dichloroethylene, trans	**0.048**	**0.048**	< 0.048	< 0.048
1,2-Dichloropropane	**0.042**	**0.042**	< 0.042	< 0.042
1,3,5-Trimethylbenzene	**0.042**	**0.042**	< 0.042	< 0.042
1,3-Dichloro-1-propene trans	**0.041**	**0.041**	< 0.041	< 0.041
1,3-Dichloro-1-propene, cis	**0.038**	**0.038**	< 0.038	< 0.038
1,3-Dichlorobenzene	**0.041**	**0.041**	< 0.041	< 0.041
1,3-Dichloropropane	**0.032**	**0.032**	< 0.032	< 0.032
1,4-Dichlorobenzene	**0.054**	**0.054**	< 0.054	< 0.054
2,2-Dichloropropane	**0.050**	**0.050**	< 0.050	< 0.050
2-Chloroethyl Vinyl Ether	**--**	**0.19**	< 0.19 R	< 0.19 R
2-Hexanone	**2.9**	**2.9**	< 2.9	< 2.9
Acetone	**7.9**	**3.6**	< 2.5	< 6.7
Acrolein	**2**	**2.0**	< 2.0	< 2.0 R
Acrylonitrile	**0.31**	**0.31**	< 0.31	< 0.31
Benzene	**0.045**	**0.045**	< 0.045	< 0.045
Bromobenzene	**0.027**	**0.027**	< 0.027	< 0.027
Bromochloromethane	**0.091**	**0.091**	< 0.091	< 0.091
Bromodichloromethane	**0.036**	**0.036**	< 0.036	< 0.036
Bromoform	**0.12**	**0.080**	< 0.080	< 0.080
Bromomethane	**0.072**	**0.072**	< 0.072	< 0.072 R
Butyl benzene	**0.056**	**0.056**	< 0.056	< 0.056
Butylbenzene sec	**0.036**	**0.036**	< 0.036	< 0.036
Butylbenzene tert-	**0.038**	**0.038**	< 0.038	< 0.038
Carbon disulfide	**0.045**	**1.1**	0.050 J	< 0.045
Carbon tetrachloride	**0.068**	**0.068**	< 0.068	< 0.068
Chlorobenzene	**0.045**	**0.045**	< 0.045	< 0.045
Chlorodibromomethane	**0.057**	**0.057**	< 0.057	< 0.057
Chloroethane	**0.13**	**0.13**	< 0.13	< 0.13
Chloroform	**0.13**	**0.042**	< 0.042	< 0.042
Chloromethane	**0.12**	**0.053**	< 0.053	< 0.053
Chlorotoluene o-	**0.035**	**0.035**	< 0.035	< 0.035
Chlorotoluene p-	**0.025**	**0.025**	< 0.025	< 0.025
Cumene (isopropyl benzene)	**0.031**	**0.031**	< 0.031	< 0.031
Cymene p- (Toluene isopropyl p-)	**0.044**	**0.044**	< 0.044	< 0.044
Dibromomethane (methylene bromide)	**0.089**	**0.089**	< 0.089	< 0.089
Dichlorodifluoromethane (CFC-12)	**0.083**	**0.083**	< 0.083	< 0.083
Ethyl benzene	**0.042**	**0.042**	< 0.042	< 0.042
Hexachlorobutadiene	**0.19**	**0.19**	< 0.19	< 0.19
Iodomethane	**0.27**	**0.27**	< 0.27	< 0.27
Methyl ethyl ketone	**3.8**	**3.8**	< 3.8	< 3.8
Methyl isobutyl ketone	**3**	**3.0**	< 3.0	< 3.0
Methyl tertiary butyl ether (MTBE)	**0.07**	**0.070**	< 0.070	< 0.070
Methylene chloride	**0.23**	**0.23**	< 0.23	< 0.23
Naphthalene	**0.1**	**0.10**	< 0.10	< 0.10
Propylbenzene	**0.037**	**0.037**	< 0.037	< 0.037
Styrene	**0.039**	**0.039**	< 0.039	< 0.039
Tetrachloroethylene	**0.077**	**0.077**	< 0.077	< 0.077
Toluene	**0.31**	**0.36**	0.10 J	< 0.070
Trichloroethylene	**0.061**	**0.061**	< 0.061	< 0.061
Trichlorofluoromethane	**0.086**	**0.086**	< 0.086	< 0.086
Vinyl acetate	**0.91**	**0.91**	< 0.91	< 0.91
Vinyl chloride	**0.071**	**0.071**	< 0.071	< 0.071
Xylene m & p	**0.078**	**0.078**	< 0.078	< 0.078
Xylene, o-	**0.037**	**0.037**	< 0.037	< 0.037
Xylenes, total	--	--	--	--

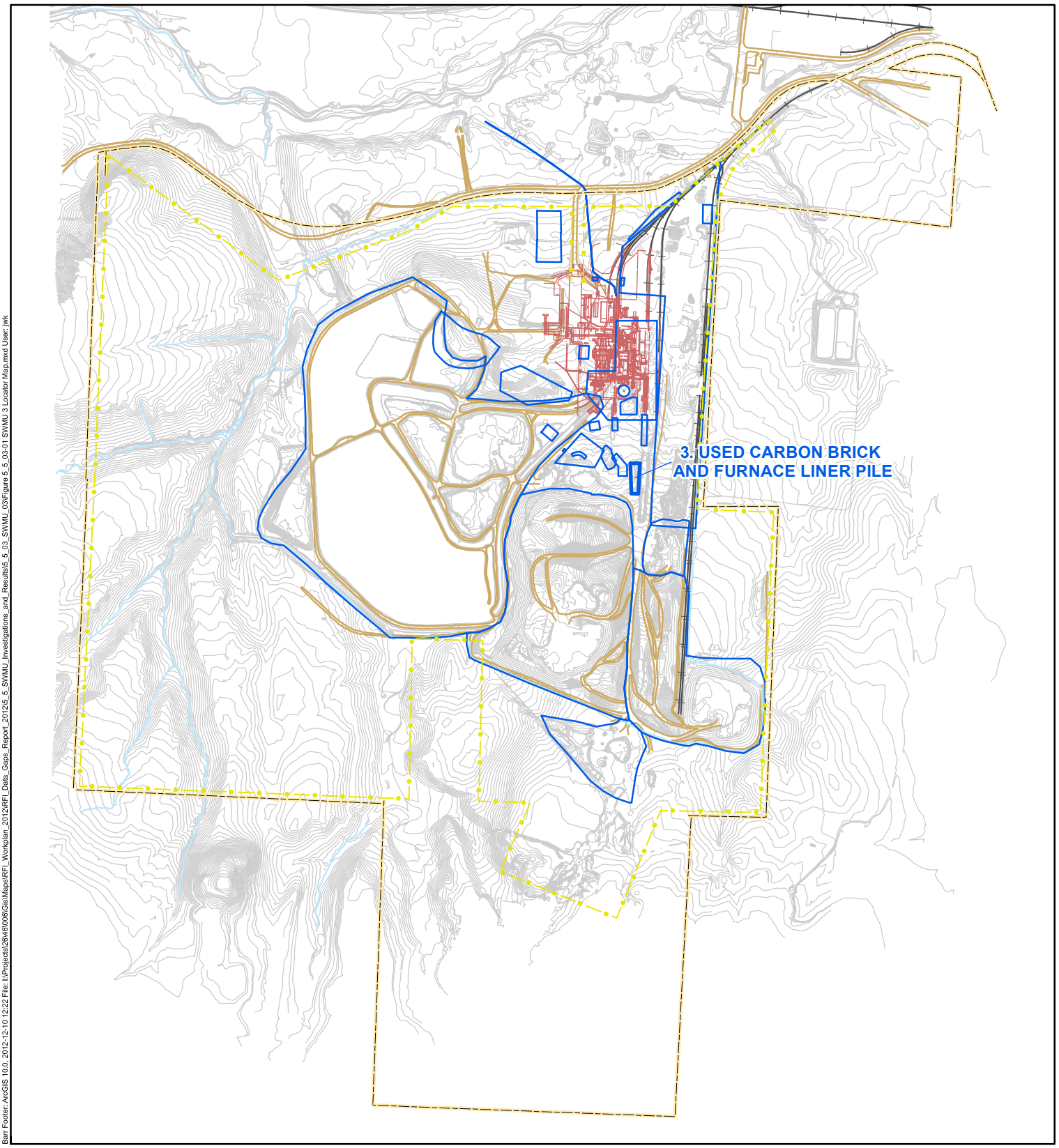
Table 5.5.3-12
SWMU 3 - Groundwater Quality Data - Radionclides
Rhodia Silver Bow Plant
[concentration in pCi/l]

Location ID Sample Date Sample Type	Site-wide Background Concentration	MW-01-1 10/8/2001-9/17/2008 Maximum	MW-01-1 10/8/2001 N	MW-01-1 1/16/2002 N	MW-01-1 9/4/2002 N	MW-01-1 5/16/2008 N	MW-01-1 9/17/2008 N	MW-01-4 10/4/2001 N	MW-01-4 1/16/2002 N	MW-01-4 5/16/2008 N	MW-01-4 9/16/2008 N	MW-01-5 10/4/2001 N	MW-01-5 1/16/2002 N	MW-01-5 5/17/2008 N	MW-01-5 9/16/2008 N
		Exceedances Shade													
Gross Alpha (radiation)	10	**33**	10	15	--	24	33	6.5	8.3	14	16	10	8.1	29	15
Gross Beta (radiation)	16	**37**	12	17	--	37	22	11	17	19	16	15	19	17	18
Radium 226	5.7	**0.70**	0.70	0.40	--	< 0.28	< 0.22	0.30	0.50	< 0.22	< 0.19	< 0.20	< 0.20	< 0.25	< 0.4
Radium 228	12.5	**4.5**	2.4	1.8	--	< 0.77	4.5	2.5	< 1.0	< 0.74	< 0.7	< 1.0	< 1.0	< 0.73	< 0.69
Strontium 90	--	--	< 10	< 10	--	--	--	< 8.7	< 10	--	--	< 8.7	< 10	--	--

Table 5.5.3-13
SWMU 3 - Groundwater Quality Data - PCBs
Rhodia Silver Bow Plant
[concentration in ug/l]

Location ID Sample Date Sample Type	Site-wide Background Concentration	MW-01-1 10/8/2001-9/17/2008 Maximum	MW-01-1 5/16/2008 N	MW-01-4 5/16/2008 N	MW-01-5 5/17/2008 N
		Exceedances Shade			
Aroclor 1016	0.0094	0.013	< 0.013	< 0.0099	< 0.0094
Aroclor 1221	0.020	0.020	<0.020	< 0.022	< 0.020
Aroclor 1232	0.023	0.023	< 0.023	< 0.025	< 0.023
Aroclor 1242	0.013	0.013	< 0.013	< 0.014	< 0.013
Aroclor 1248	0.0054	0.011	< 0.011	< 0.0057	< 0.0054
Aroclor 1254	0.007	0.0096	< 0.0096	< 0.0097	< 0.0070
Aroclor 1260	0.0031	0.0057	< 0.0057	< 0.0043	< 0.0034
Aroclor 1262	0.0048	0.0048	< 0.0048	< 0.0051	< 0.0048
Aroclor 1268	0.0065	0.0065	< 0.0065	< 0.0069	< 0.0065

Figures



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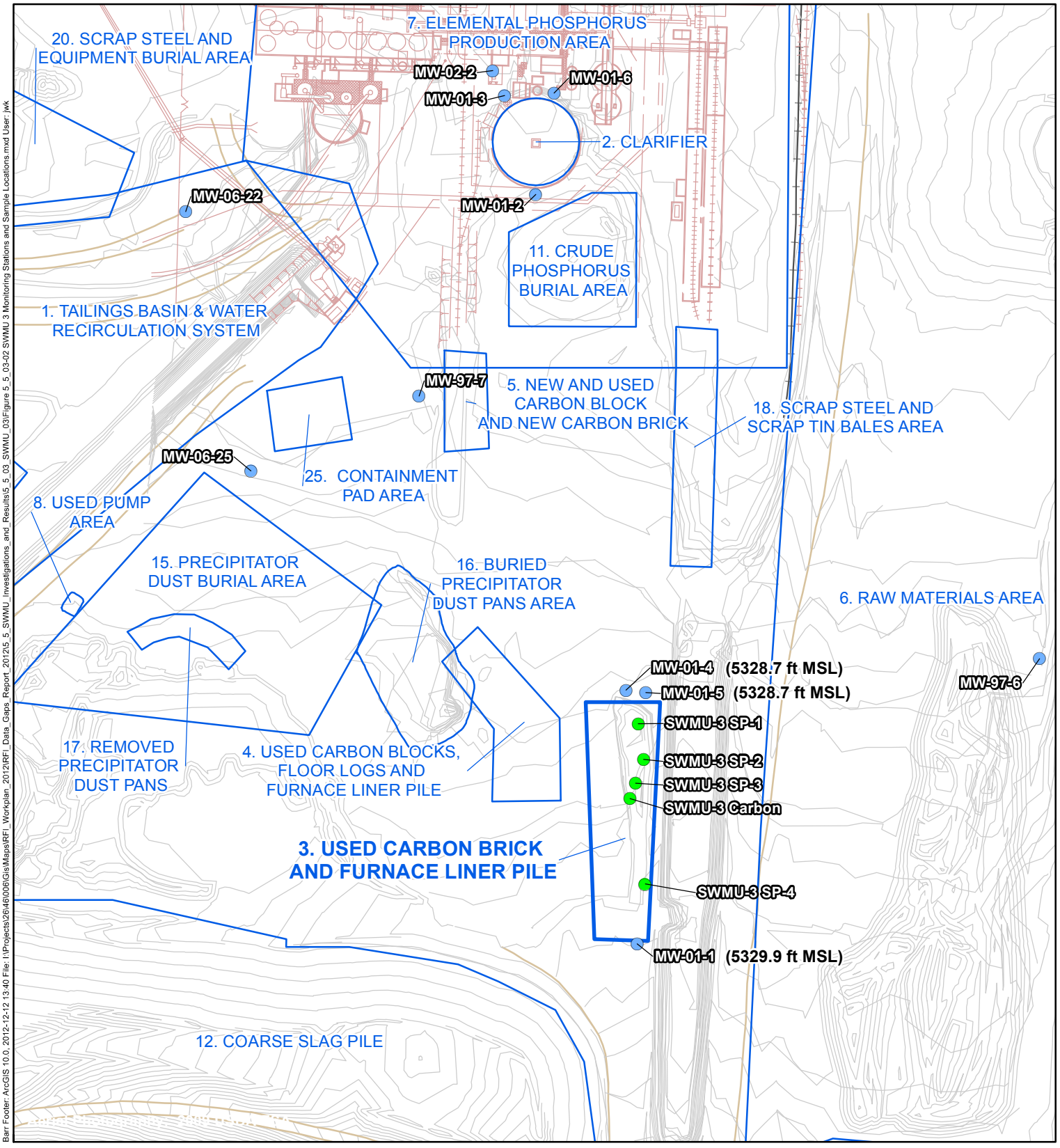
SWMU 3
Other SWMUs
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures
Property Boundary
Fence Line

N

Feet
1,000 0 1,000

Figure 5.5.3-1

SWMU 3 LOCATION
Rhodia Silver Bow Plant
Montana



Monitoring Well
Soil Sample
SWMU 3
Other SWMUs
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

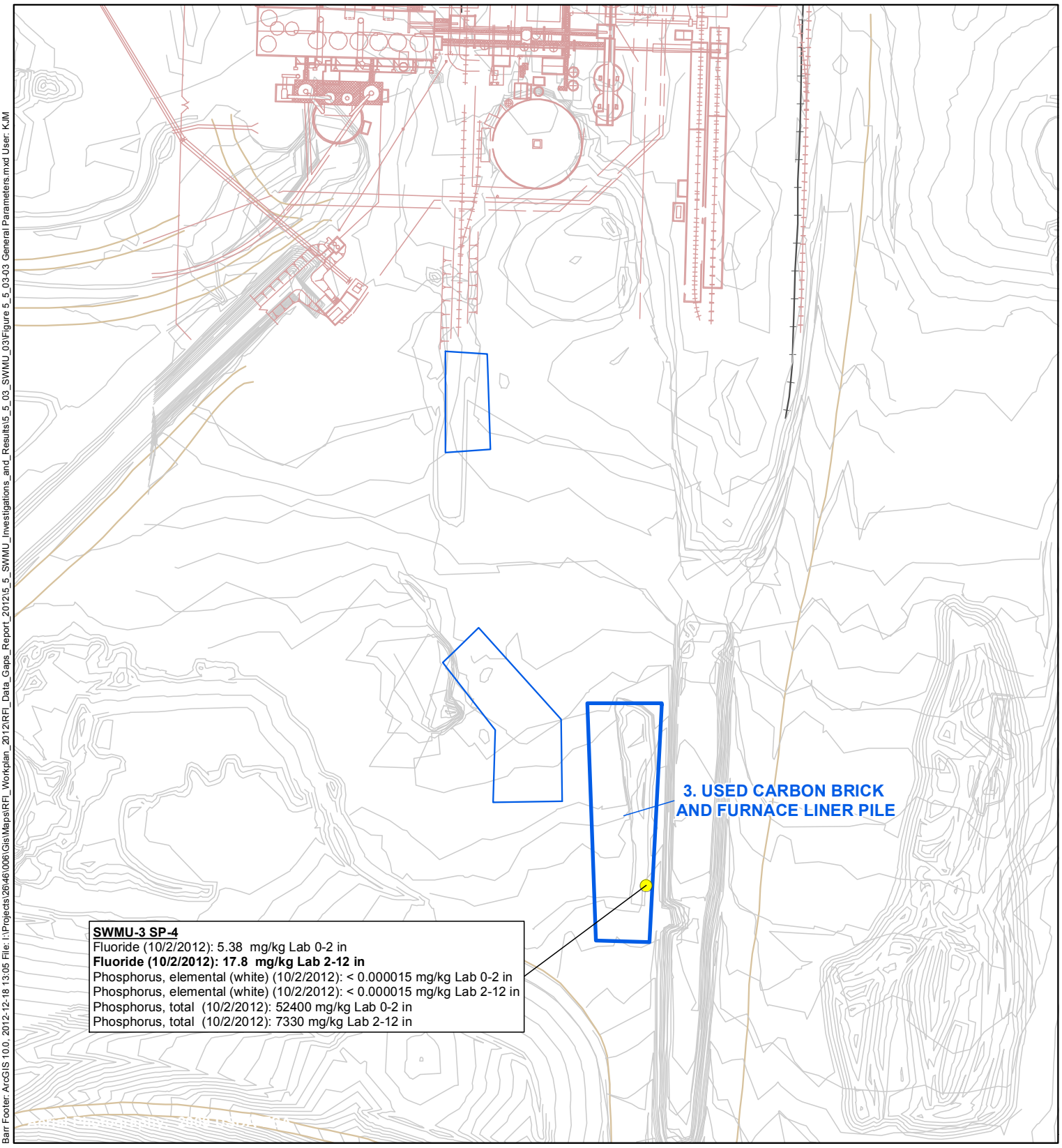
(5329.9 ft MSL) Typical groundwater elevation

N

Feet
150 0 150

Figure 5.5.3-2

SWMU 3
MONITORING STATIONS
AND SAMPLE LOCATIONS
Rhodia Silver Bow Plant
Montana



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Sample Location
SWMU 3
Other SWMUs
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

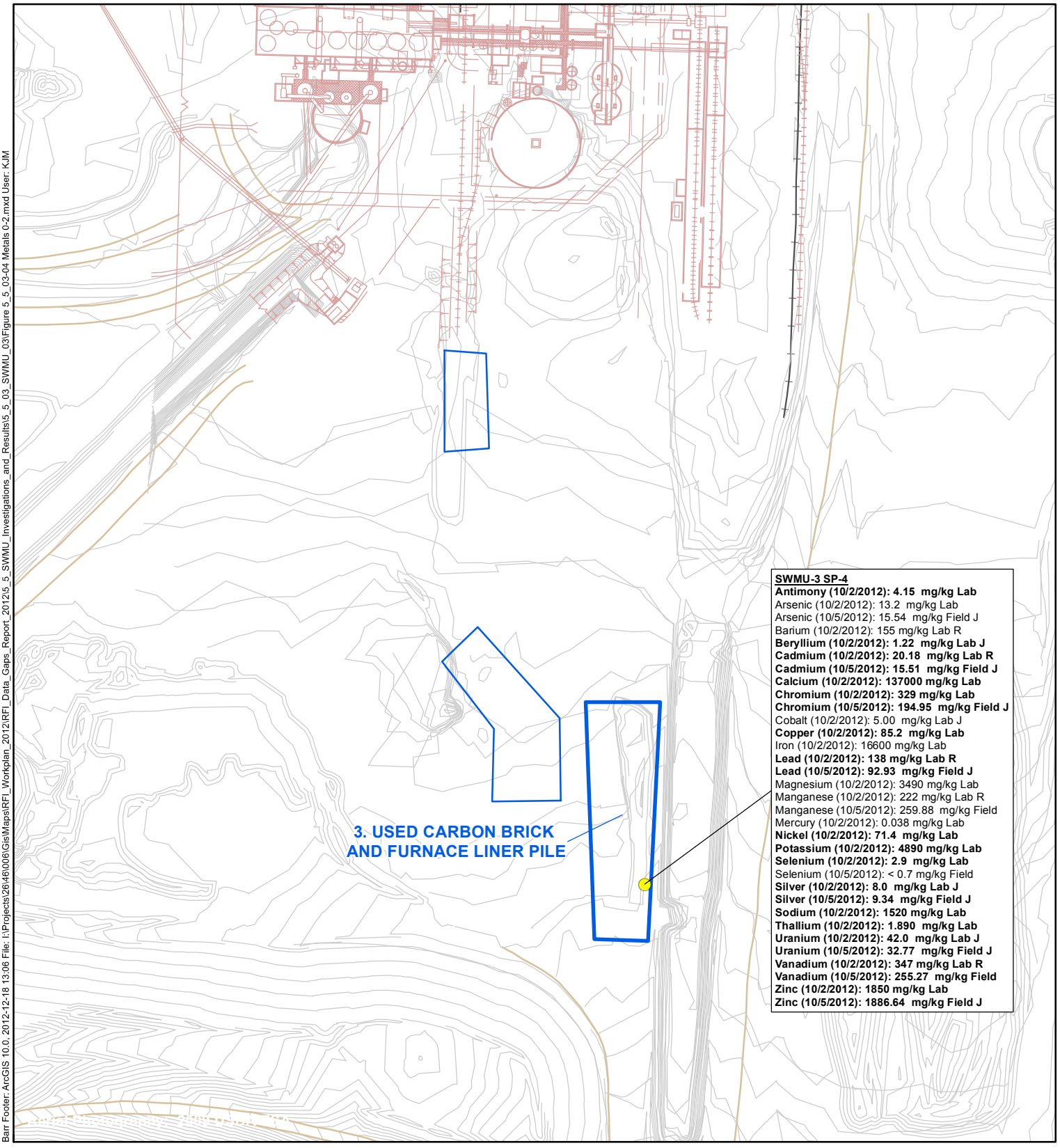
Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

N

Feet
150 0 150

Figure 5.5.3-3

SWMU 3
GENERAL PARAMETERS
Rhodia Silver Bow Plant
Montana



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Sample Location
SWMU 3
Other SWMUs
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

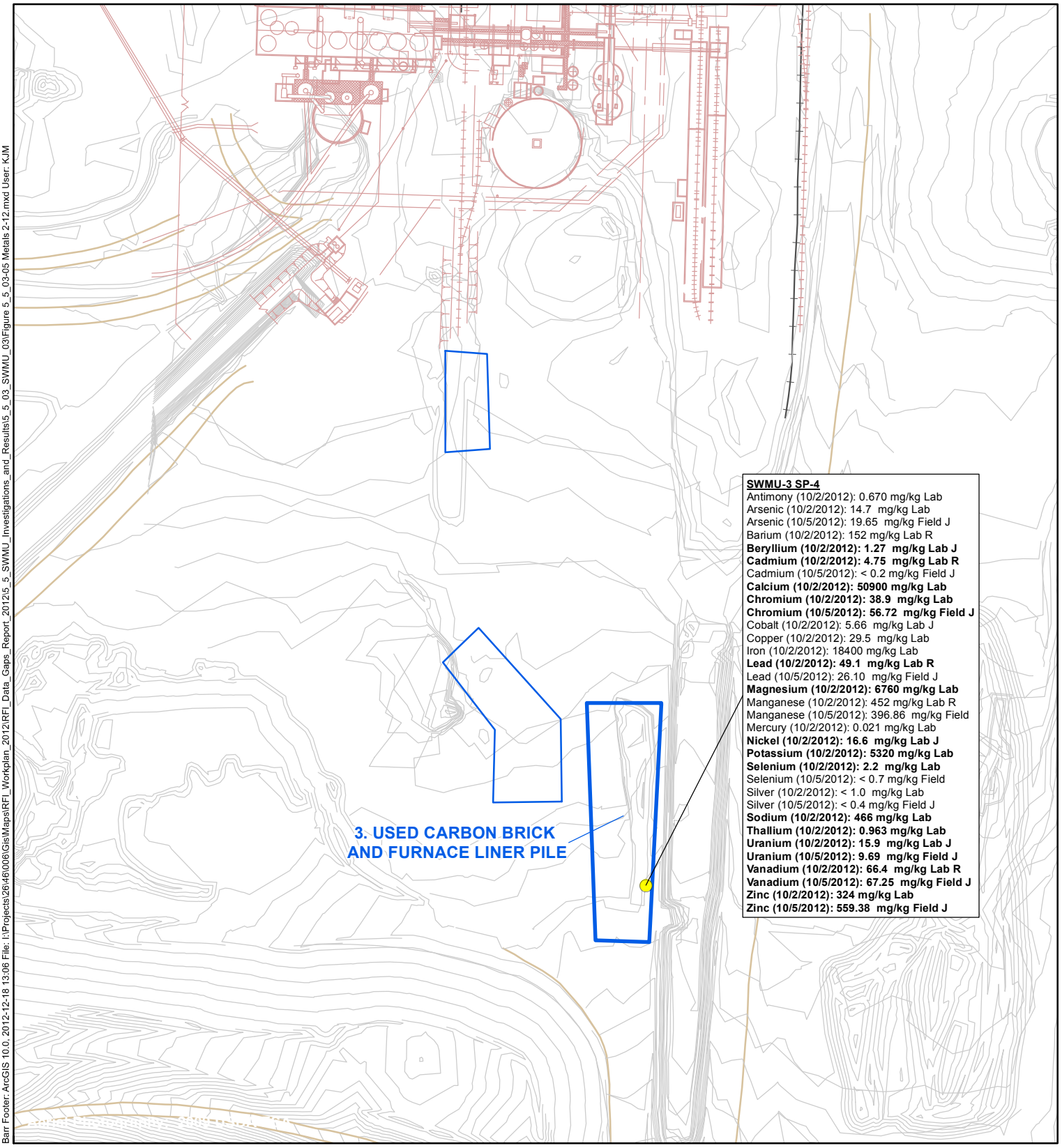
Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

N

Feet
150 0 150

Figure 5.5.3-4

SWMU 3
METALS, 0-2 INCHES
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-18 13:06 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-05 Metals 2-12.mxd User: KJM

- Sample Location
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

Bold font indicates that sample concentration is greater than the 95% UCL of mean Reference Area Concentration.

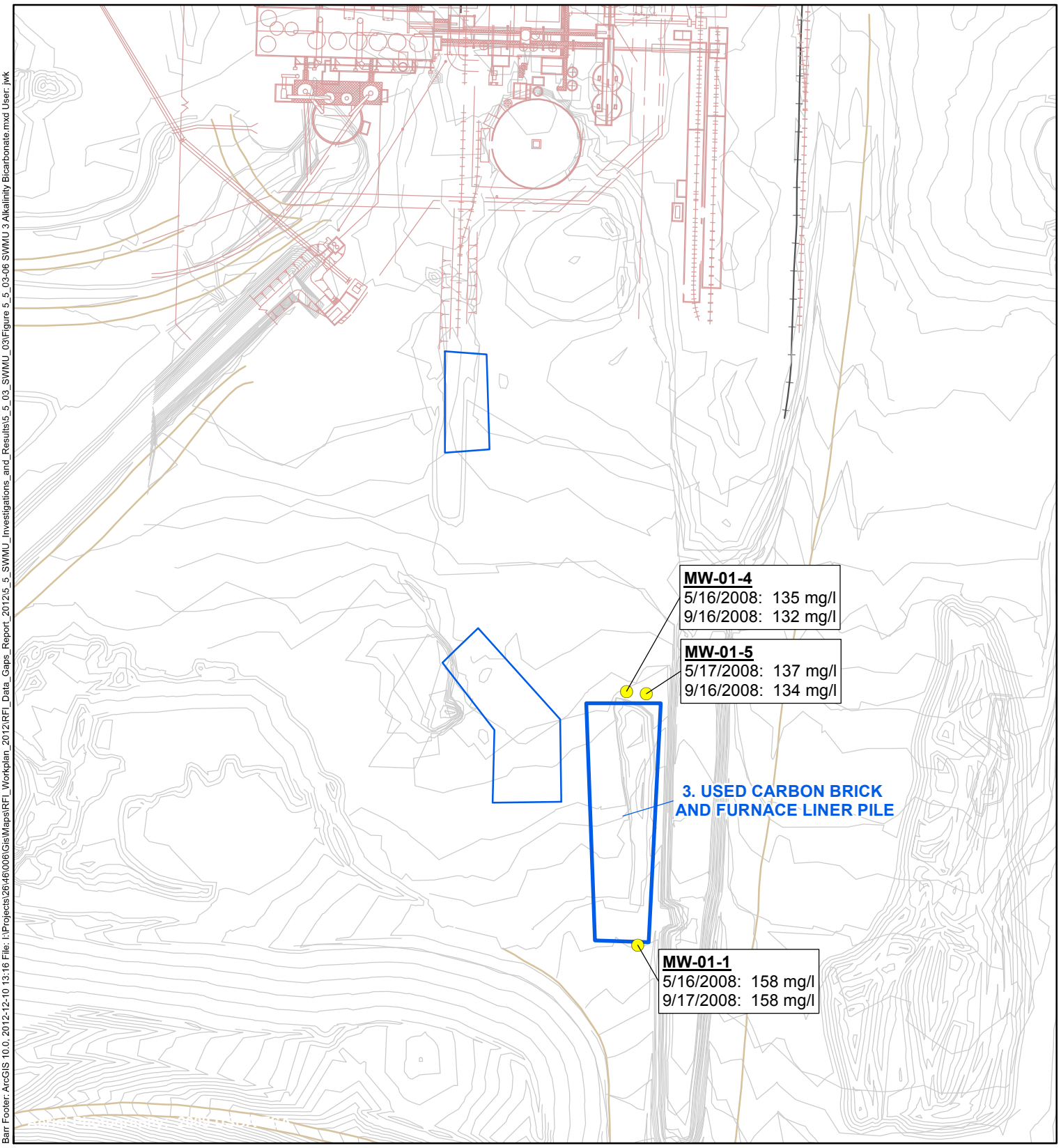
N

Feet

150 0 150

Figure 5.5.3-5

SWMU 3
METALS, 2-12 INCHES
Rhodia Silver Bow Plant
Montana



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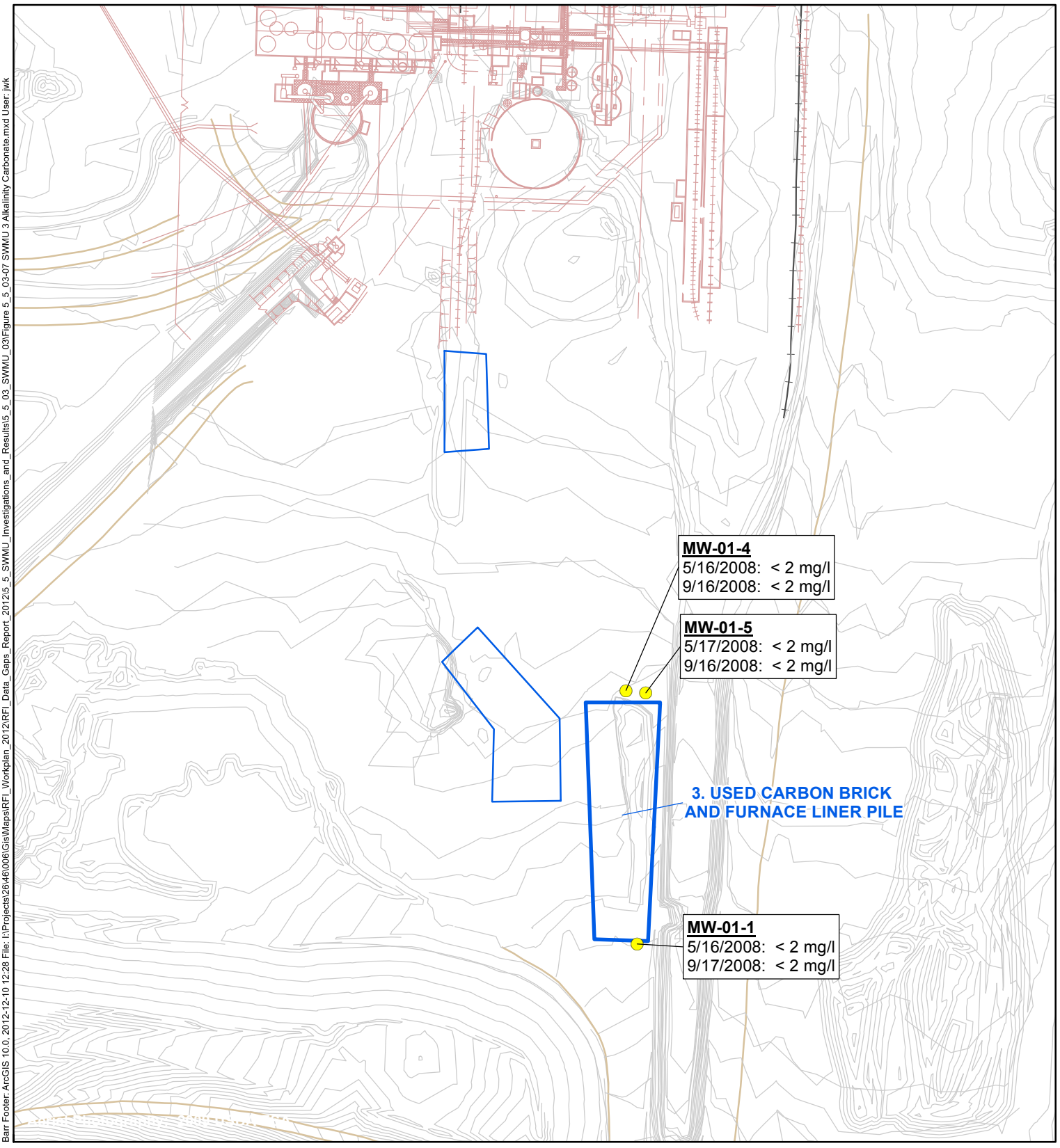
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-6

SWMU 3:
ALKALINITY,
BICARBONATE as $CaCO_3$
Rhodia Silver Bow Plant
Montana



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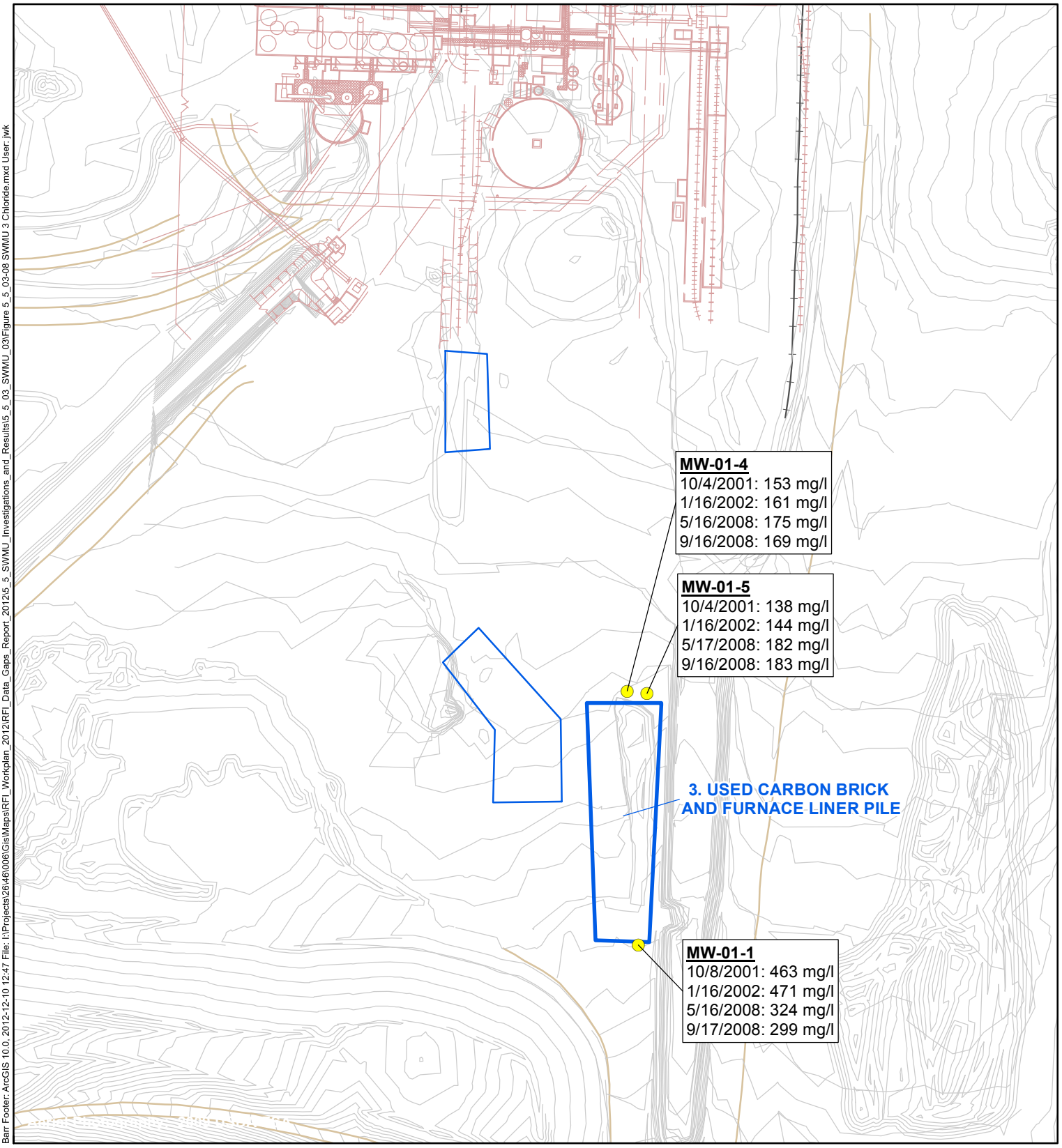
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-7

SWMU 3:
ALKALINITY,
CARBONATE as $CaCO_3$
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 12:47 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-08 SWMU 3 Chloride.mxd User: jwk

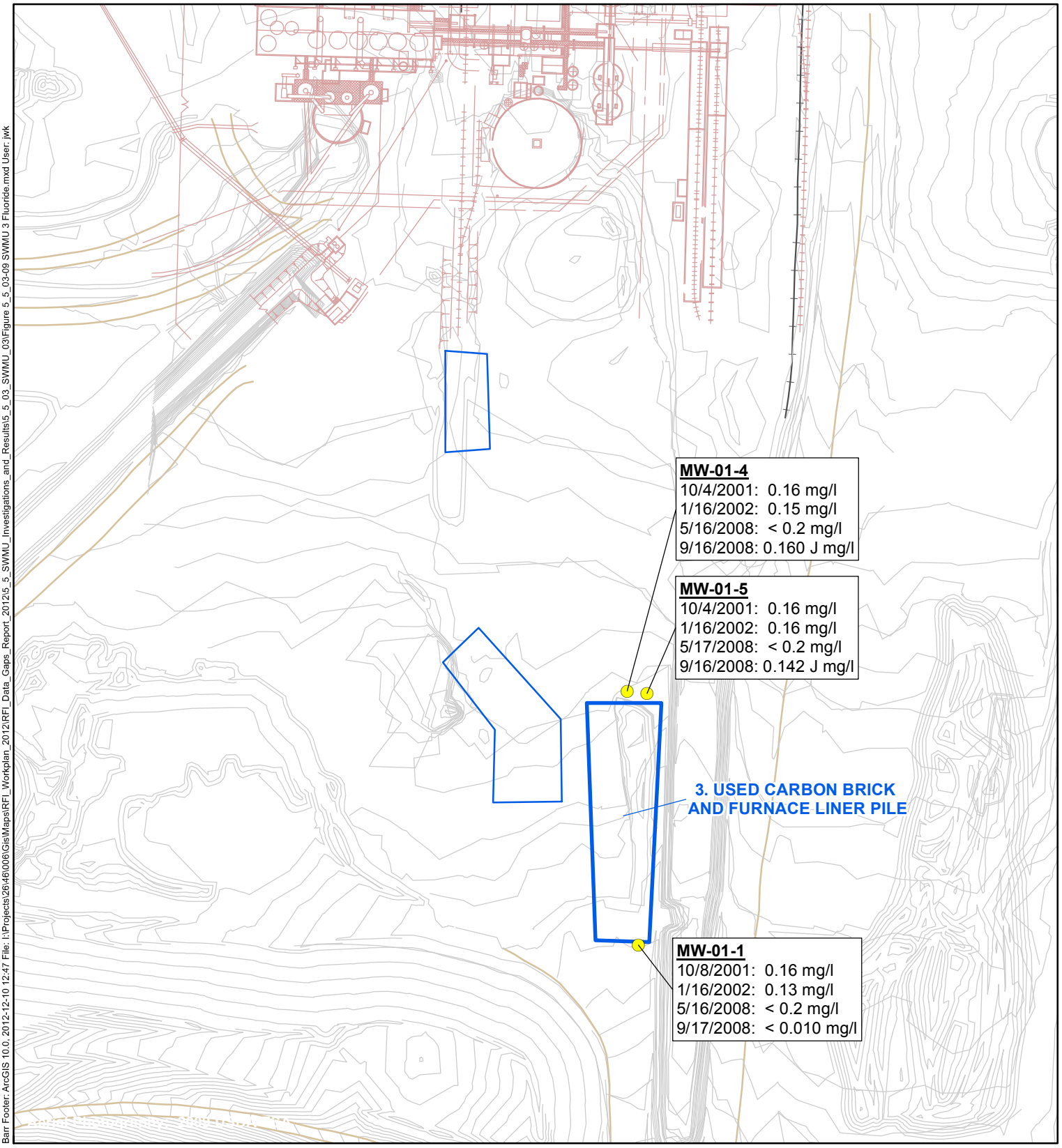
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-8

SWMU 3:
CHLORIDE
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 12:47 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-09 SWMU 3 Fluoride.mxd User: jwk

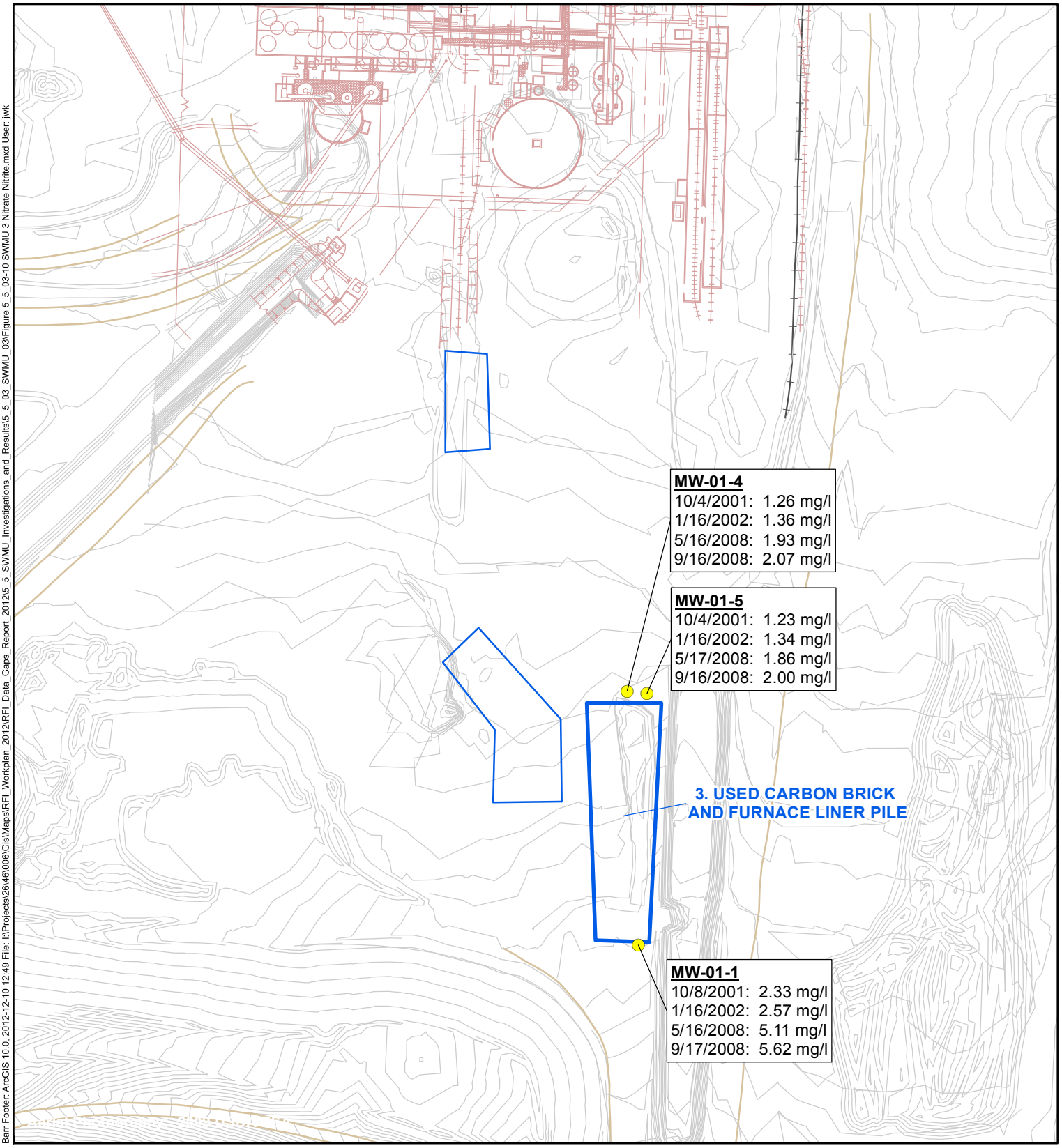
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-9

SWMU 3:
FLUORIDE
Rhodia Silver Bow Plant
Montana



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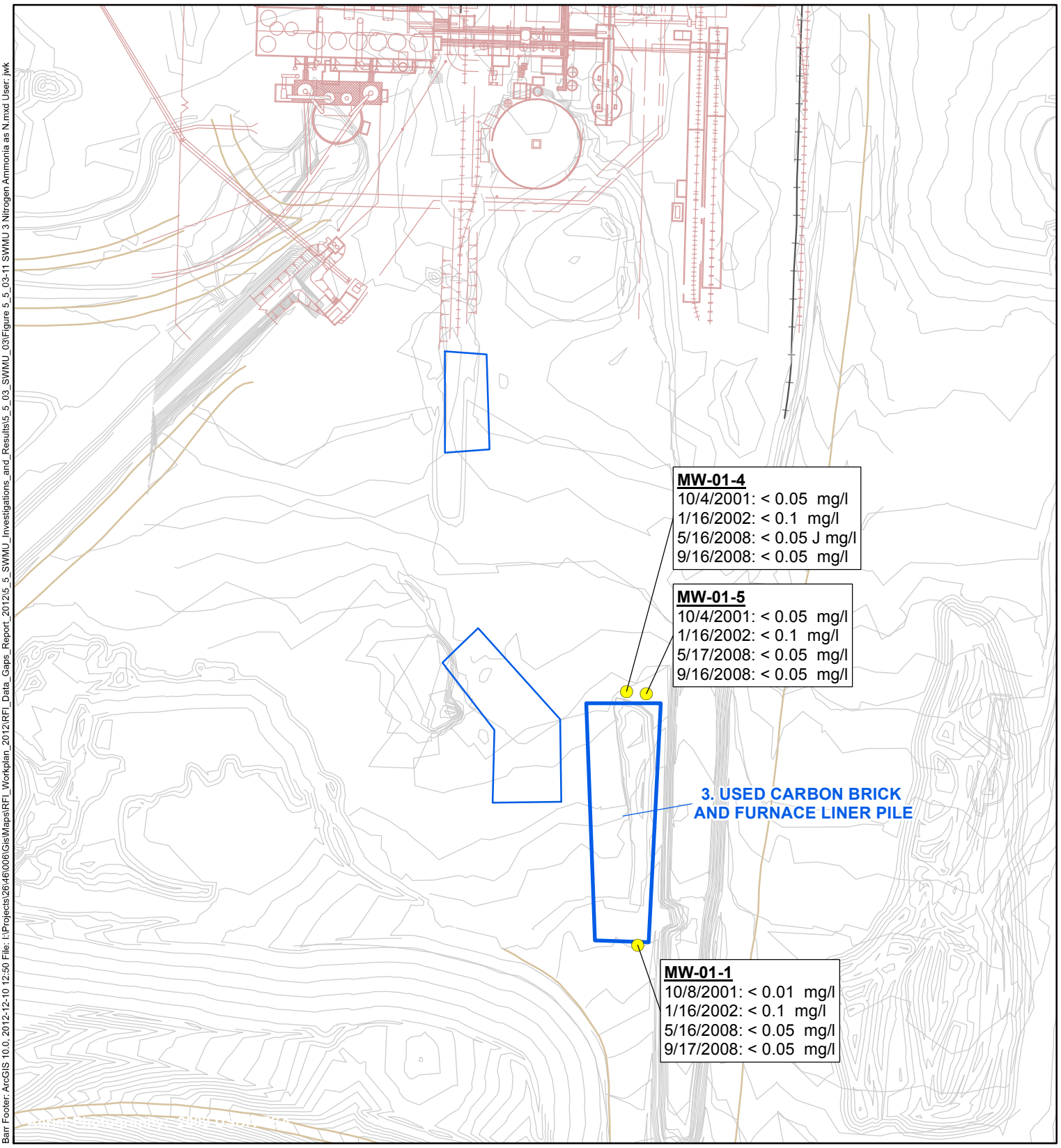
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-10

SWMU 3:
NITRATE + NITRITE
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 12:50 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-11 SWMU 3 Nitrogen Ammonia as N.mxd User: jwk

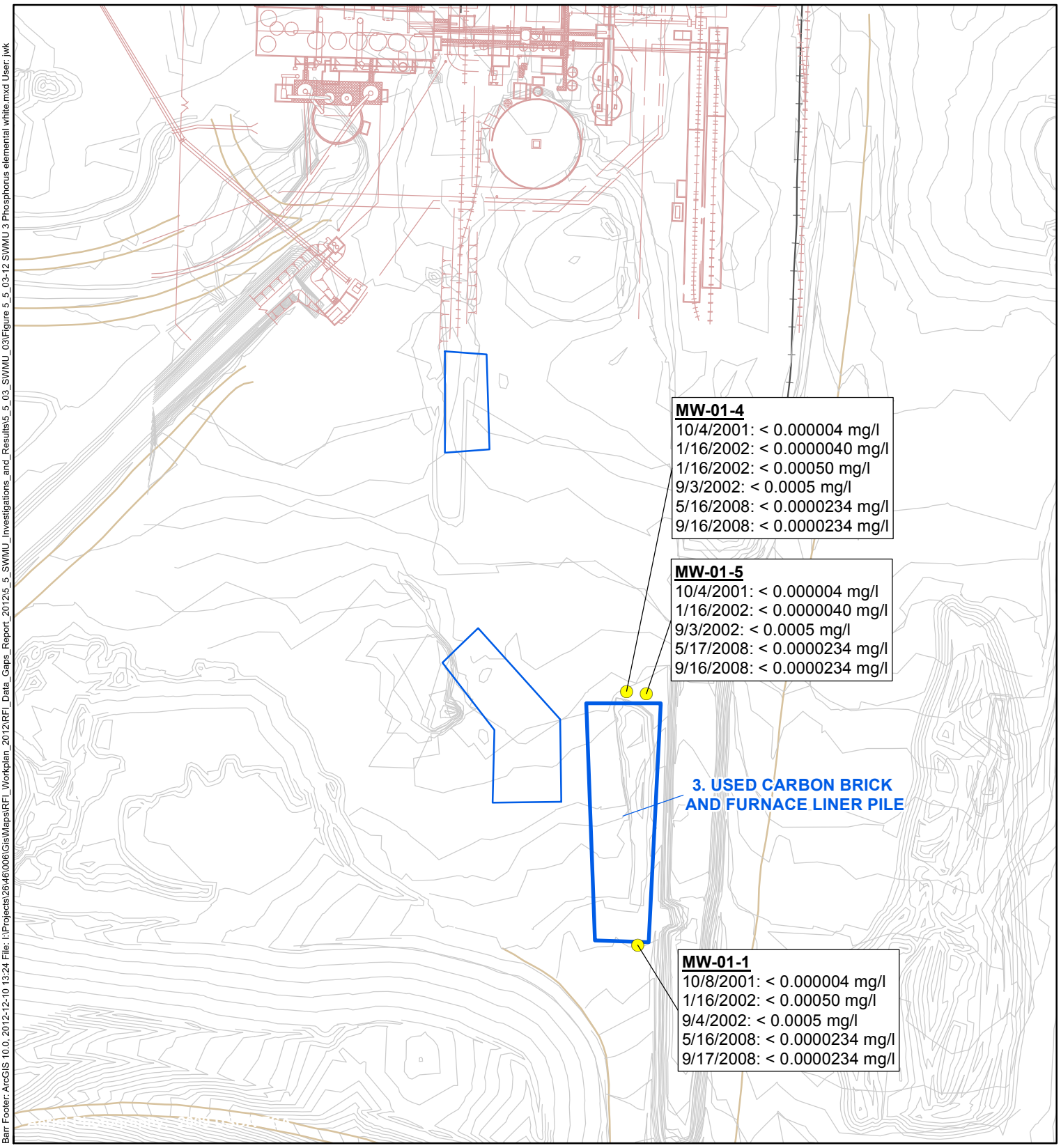
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-11

SWMU 3:
NITROGEN, AMMONIA AS N
Rhodia Silver Bow Plant
Montana



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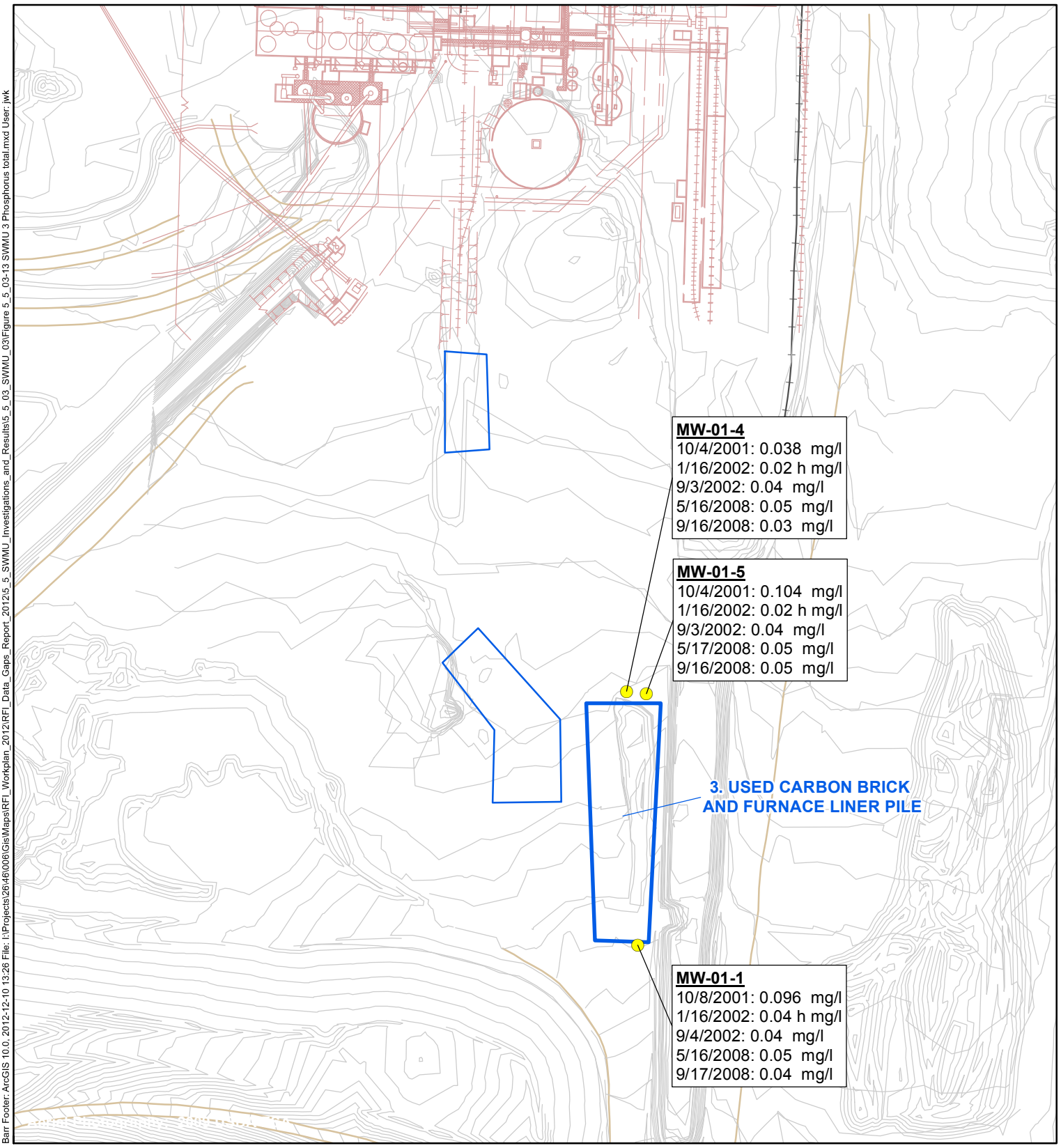
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-12

SWMU 3:
PHOSPHORUS, ELEMENTAL (WHITE)
Rhodia Silver Bow Plant
Montana



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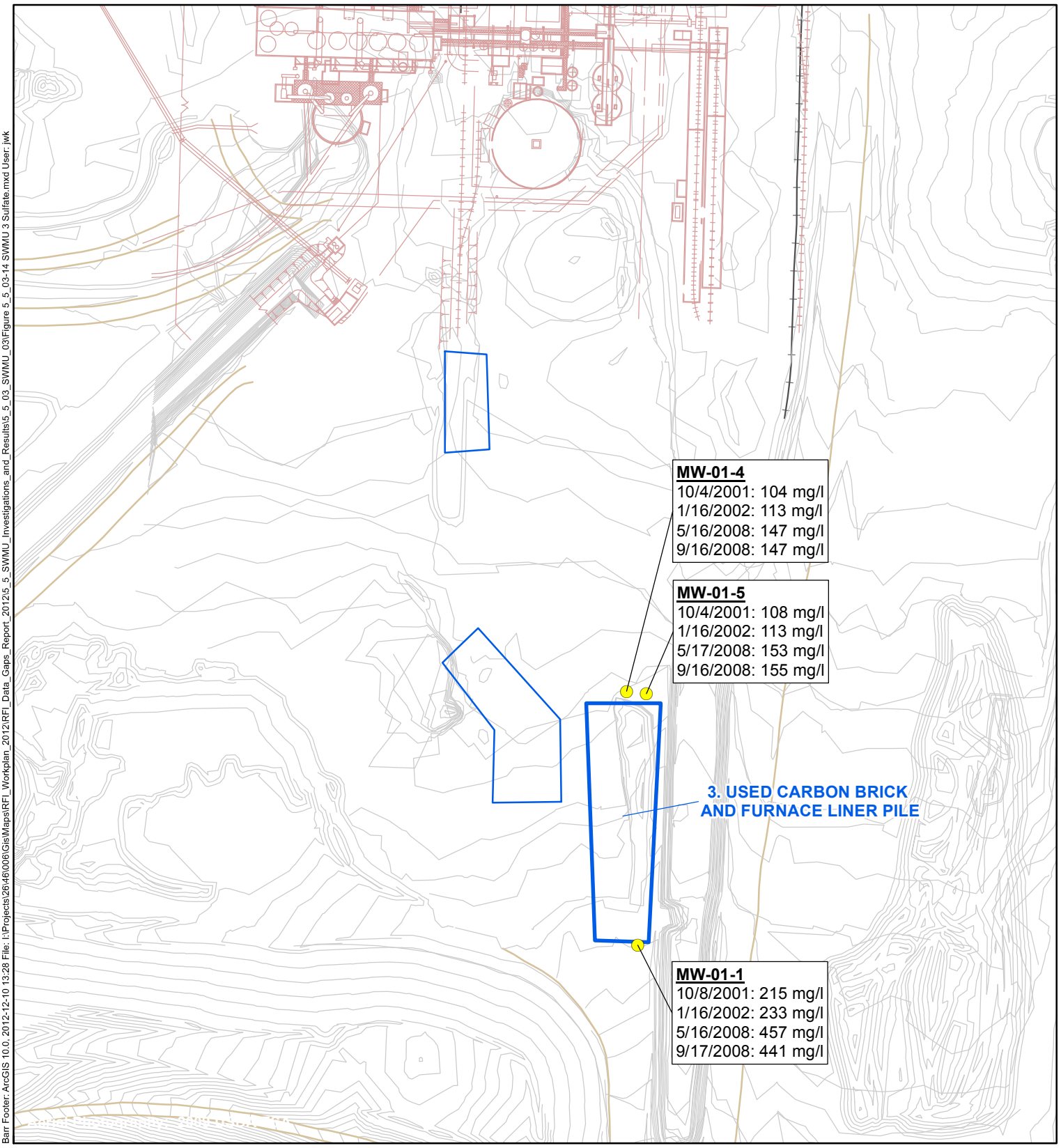
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-13

SWMU 3:
PHOSPHORUS, TOTAL
Rhodia Silver Bow Plant
Montana



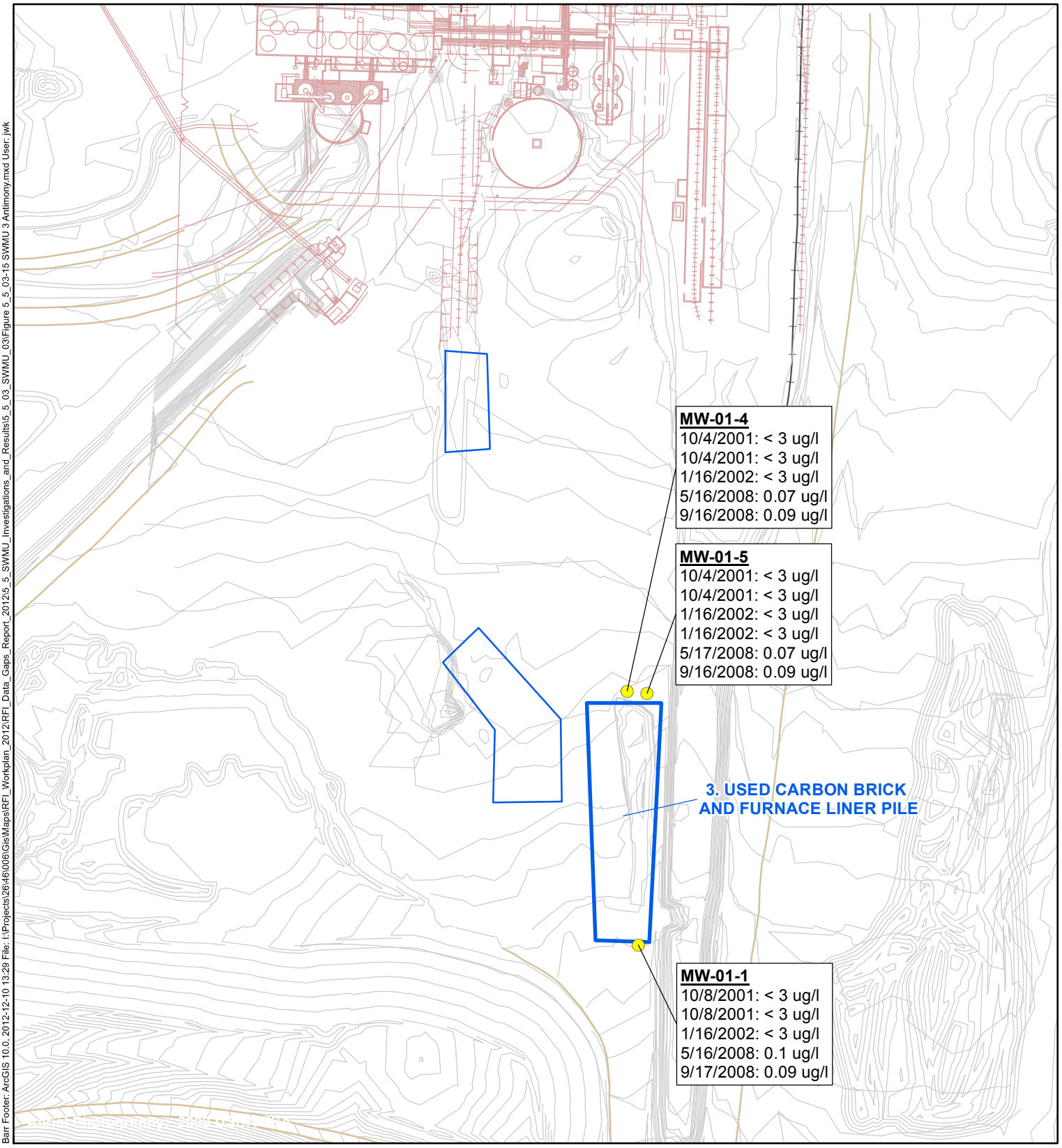
Monitoring Well
SWMU 3
Other SWMUs
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-14

SWMU 3:
SULFATE
Rhodia Silver Bow Plant
Montana



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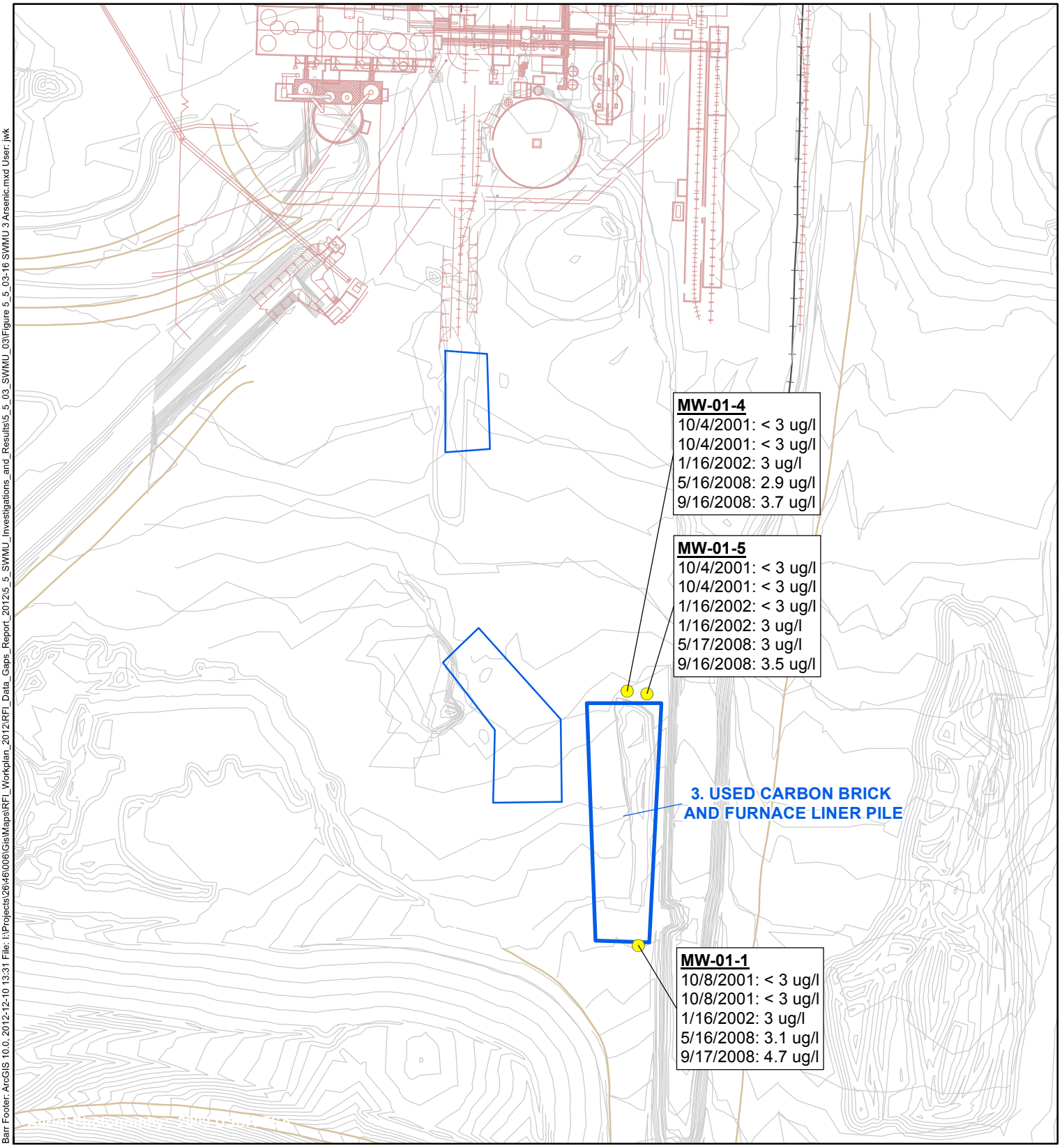
Monitoring Well
SWMU 3
Other SWMUs
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-15

SWMU 3:
ANTIMONY
Rhodia Silver Bow Plant
Montana



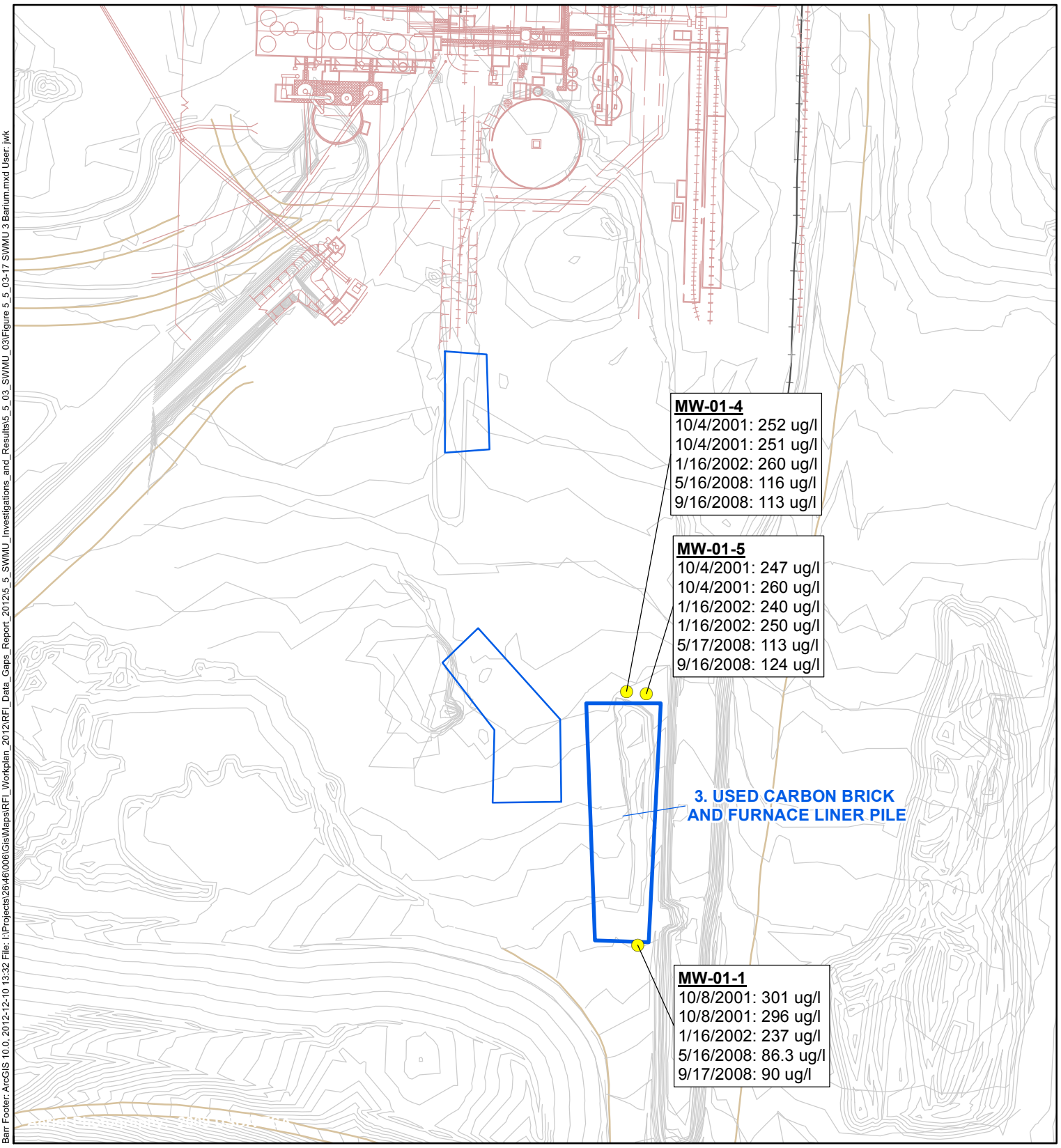
Monitoring Well
SWMU 3
Other SWMUs
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-16

SWMU 3:
ARSENIC
Rhodia Silver Bow Plant
Montana



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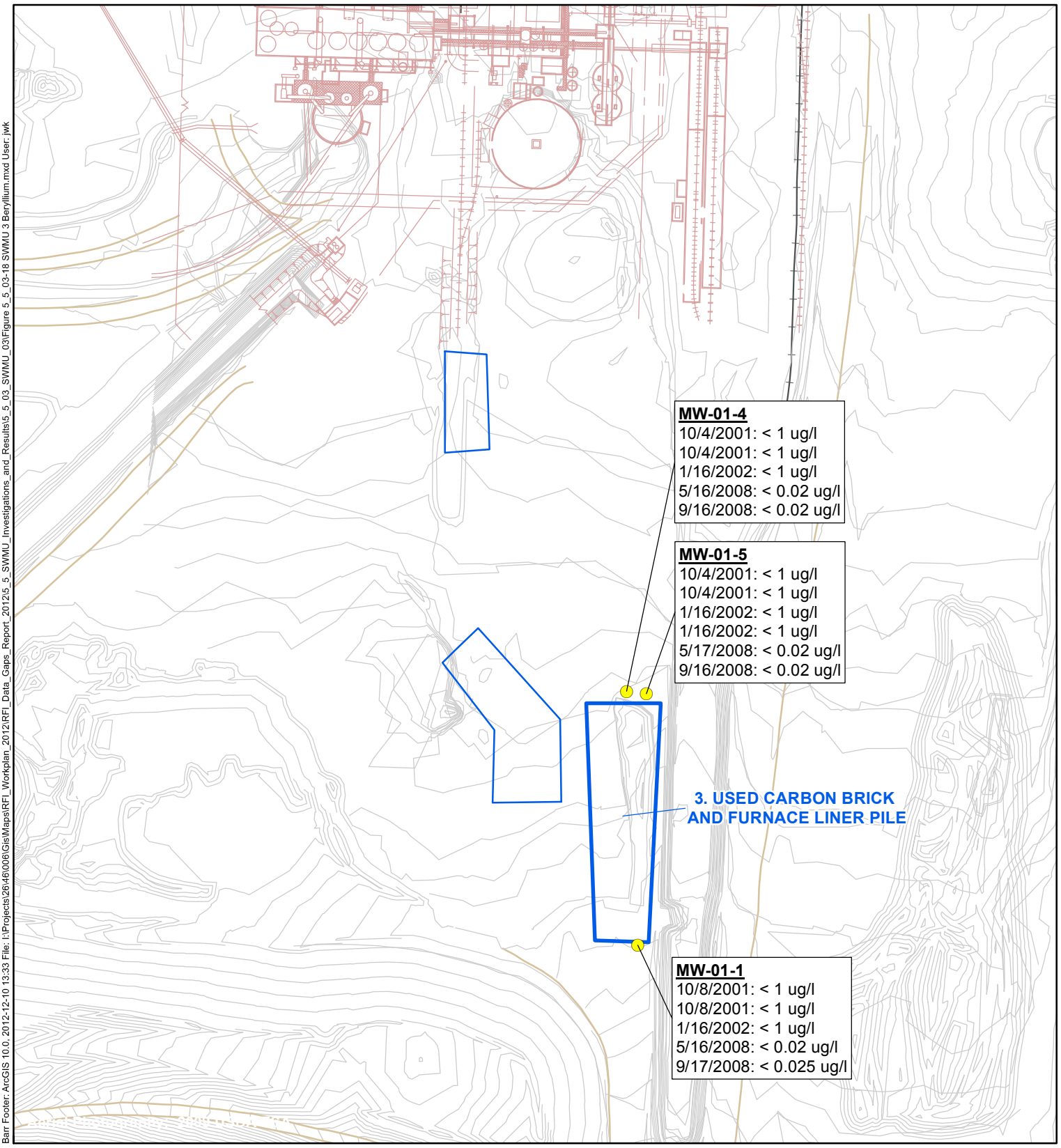
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-17

SWMU 3:
BARIUM
Rhodia Silver Bow Plant
Montana



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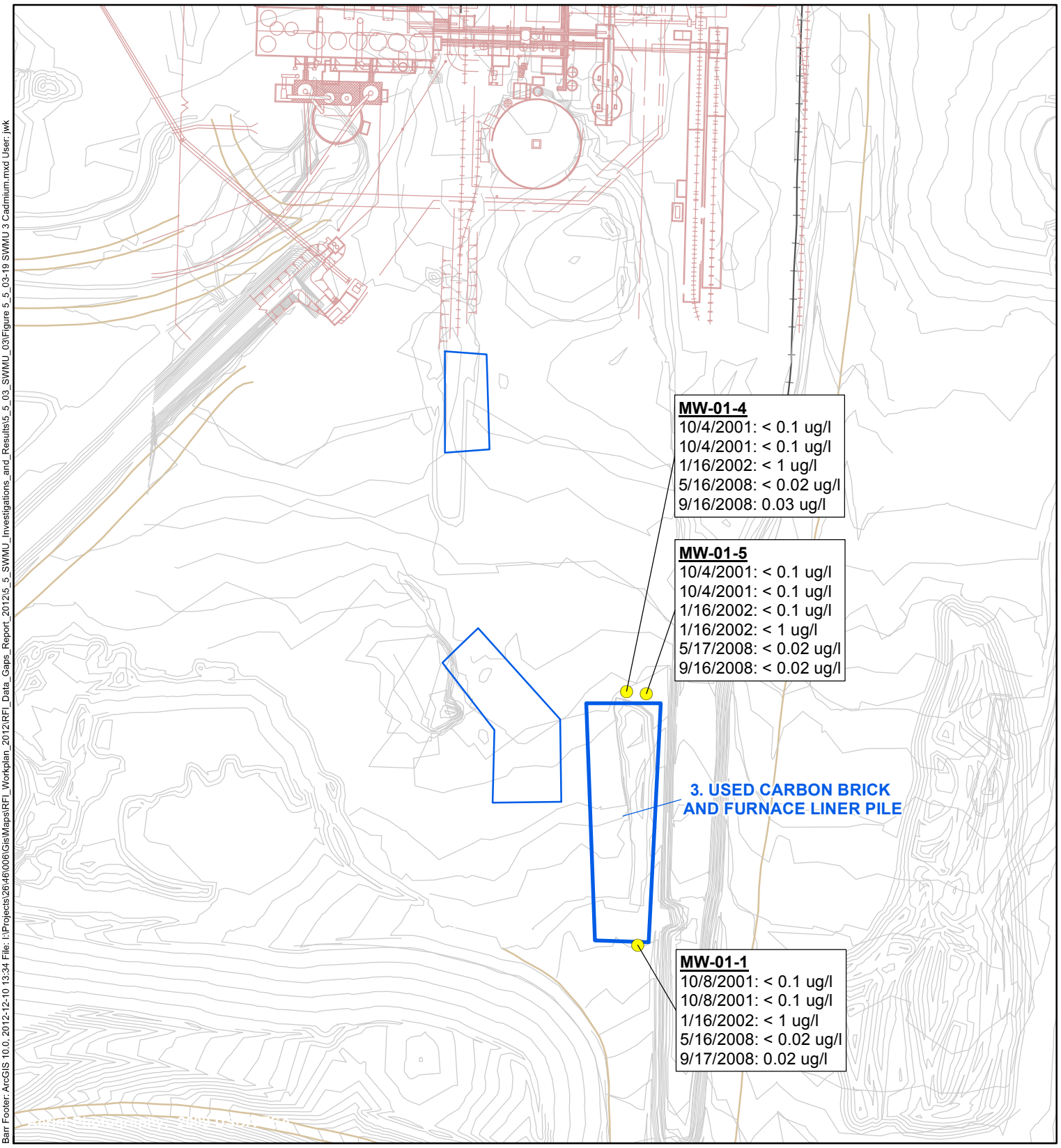
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-18

SWMU 3:
BERYLLIUM
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 13:34 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-19 SWMU 3 Cadmium.mxd User: jwk

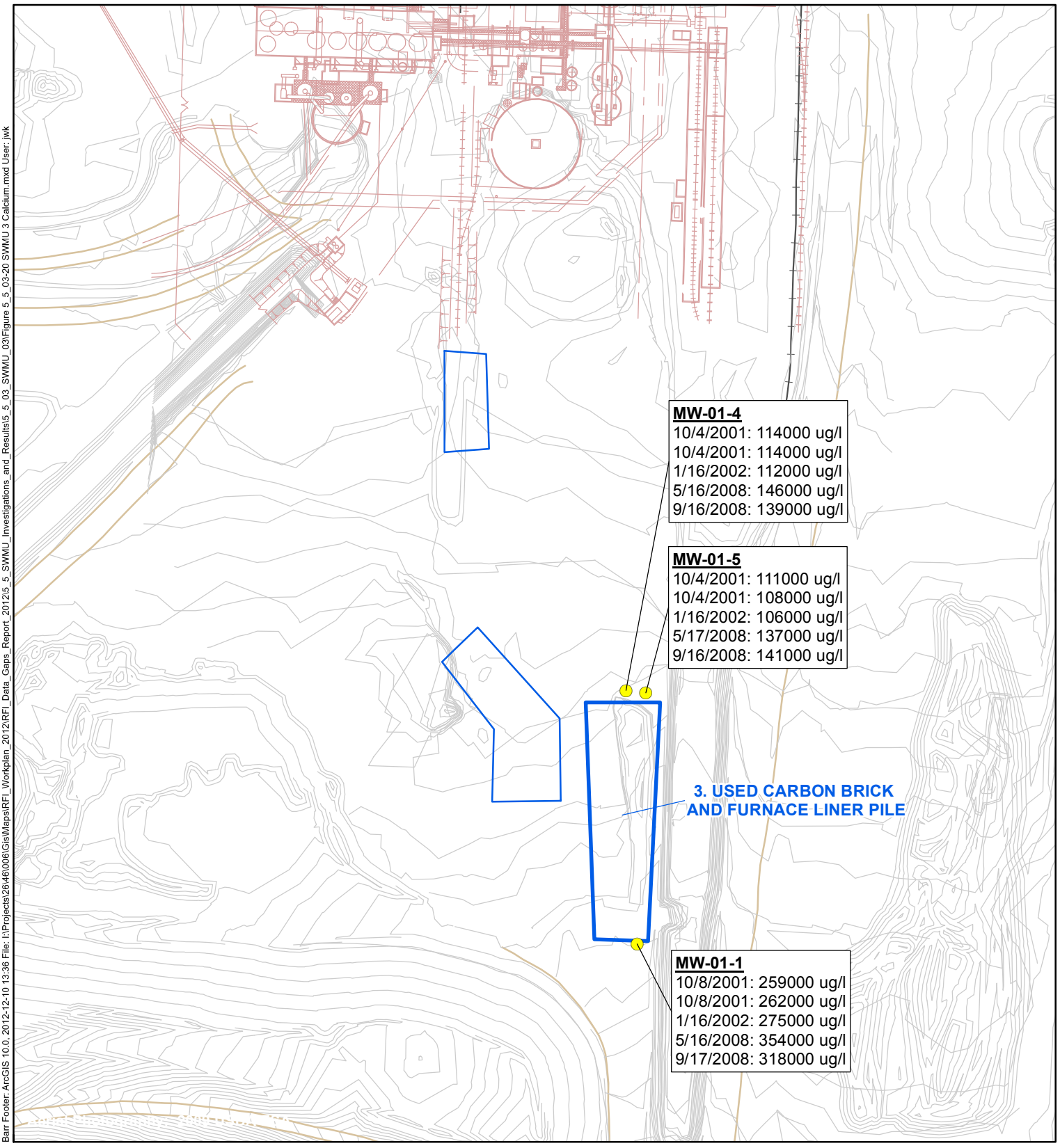
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-19

SWMU 3:
CADMIUM
Rhodia Silver Bow Plant
Montana



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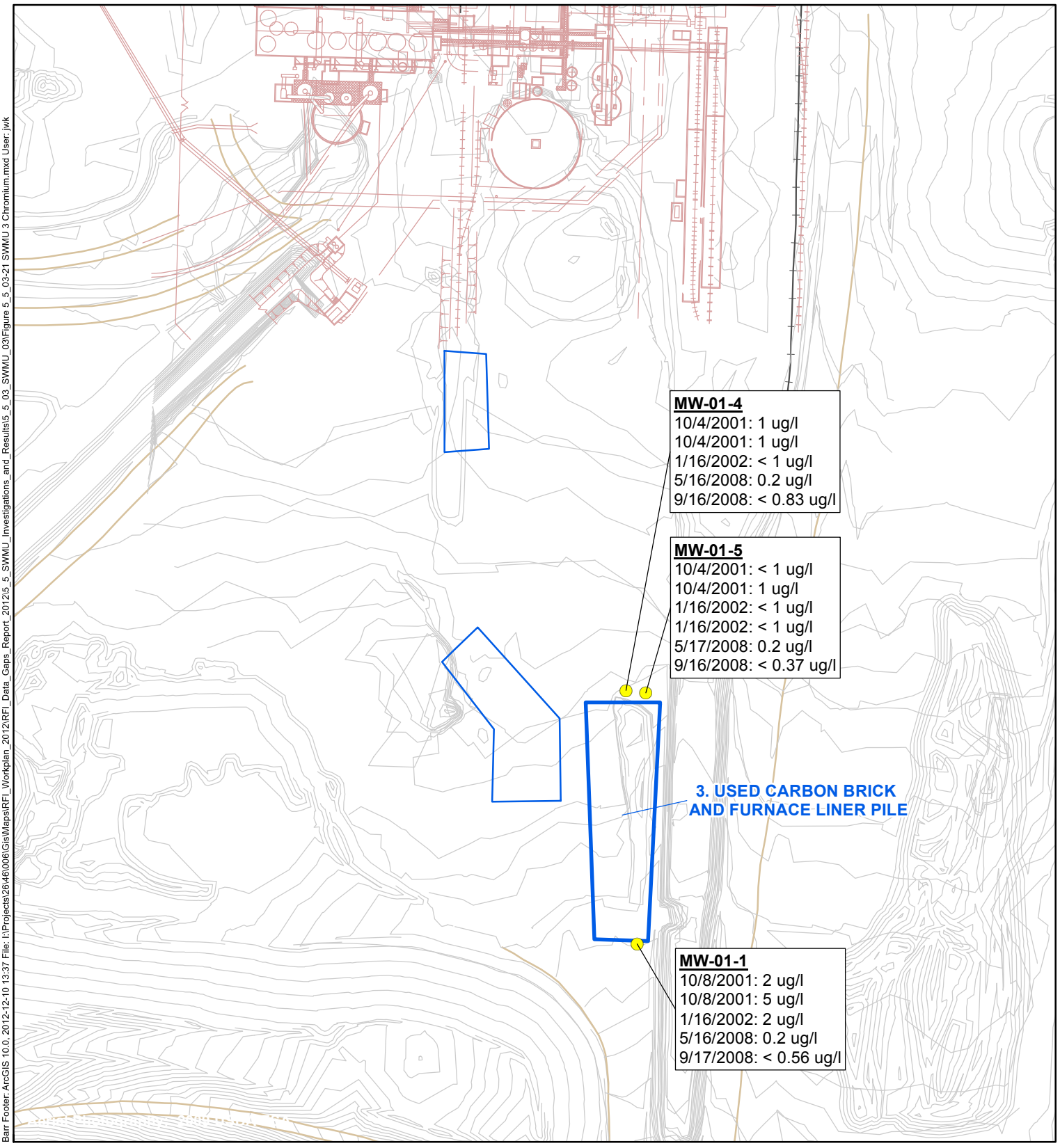
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-20

SWMU 3:
CALCIUM
Rhodia Silver Bow Plant
Montana



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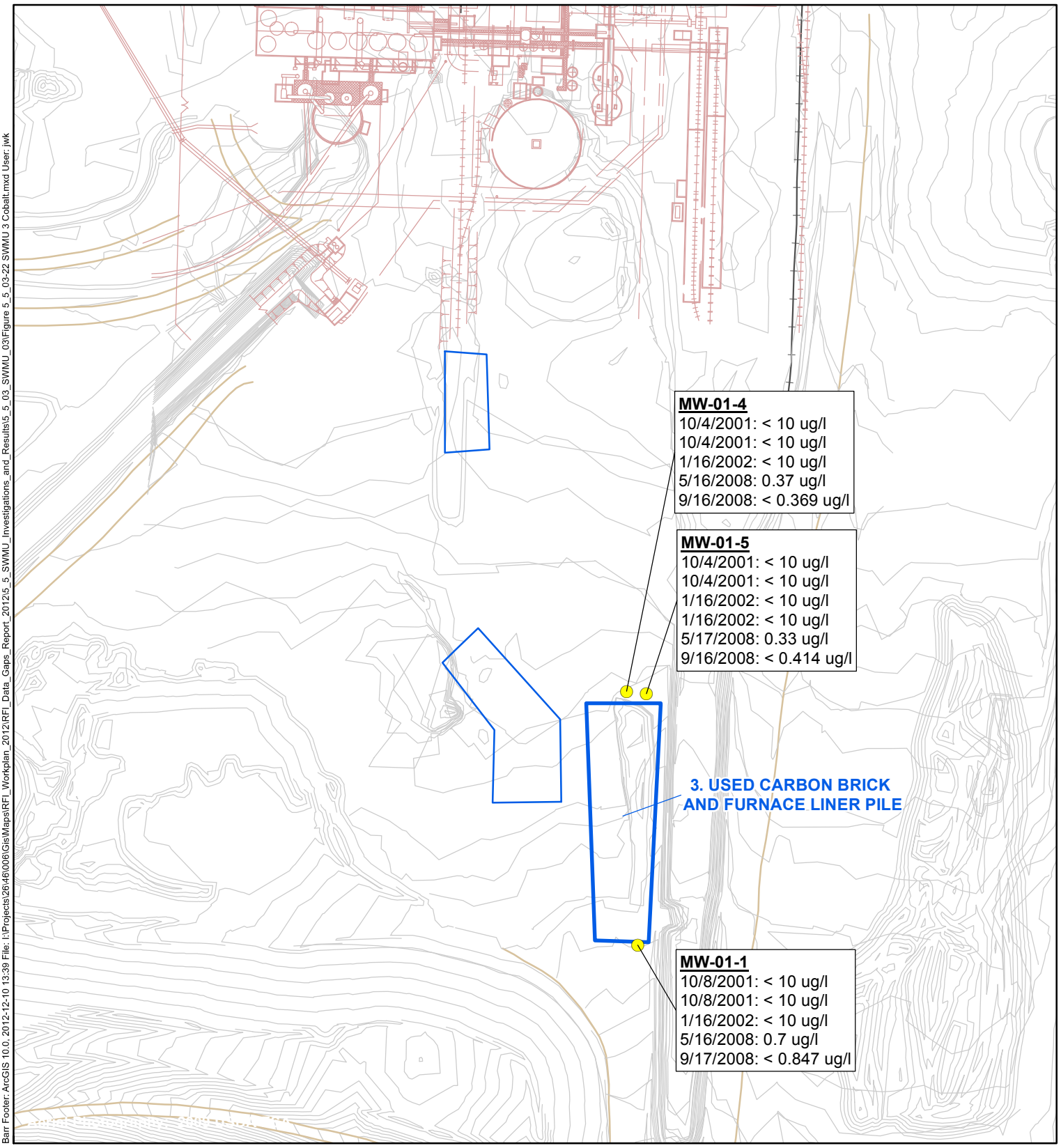
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-21

SWMU 3:
CHROMIUM
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 13:39 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-22 SWMU 3 Cobalt.mxd User: jwk

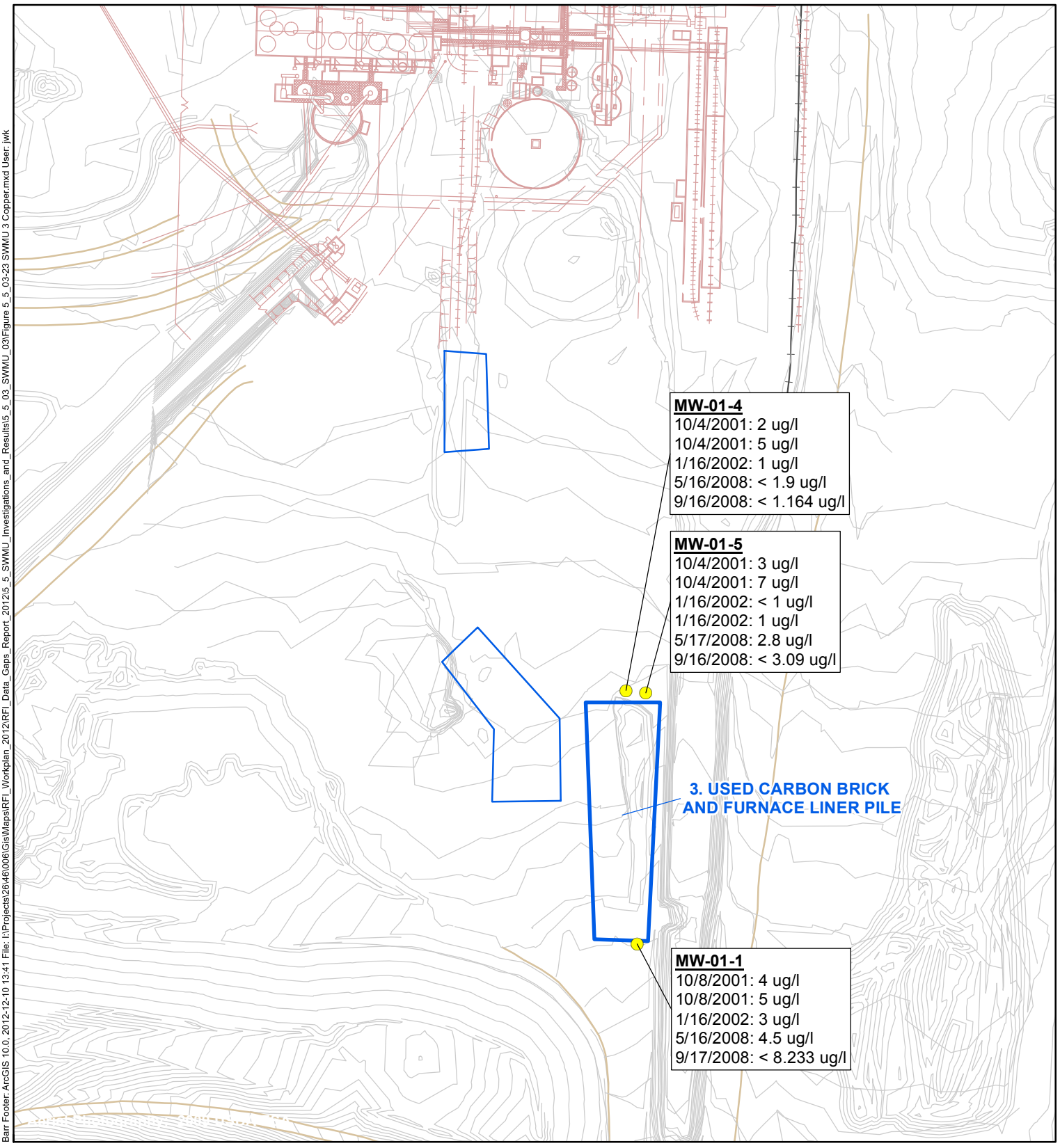
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-22

SWMU 3:
COBALT
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 13:41 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-23 SWMU 3 Copper.mxd User: jwk

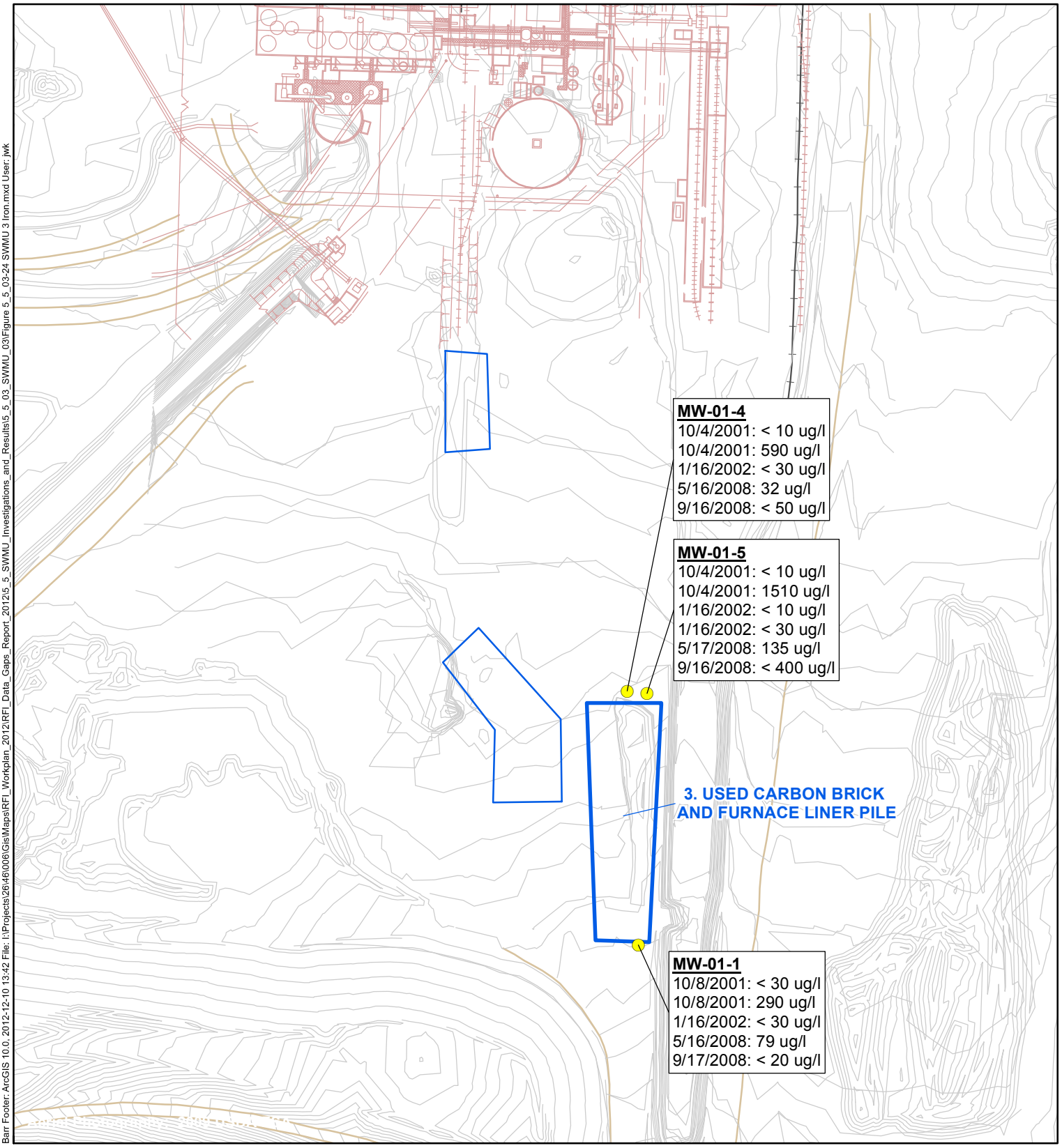
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-23

SWMU 3:
COPPER
Rhodia Silver Bow Plant
Montana



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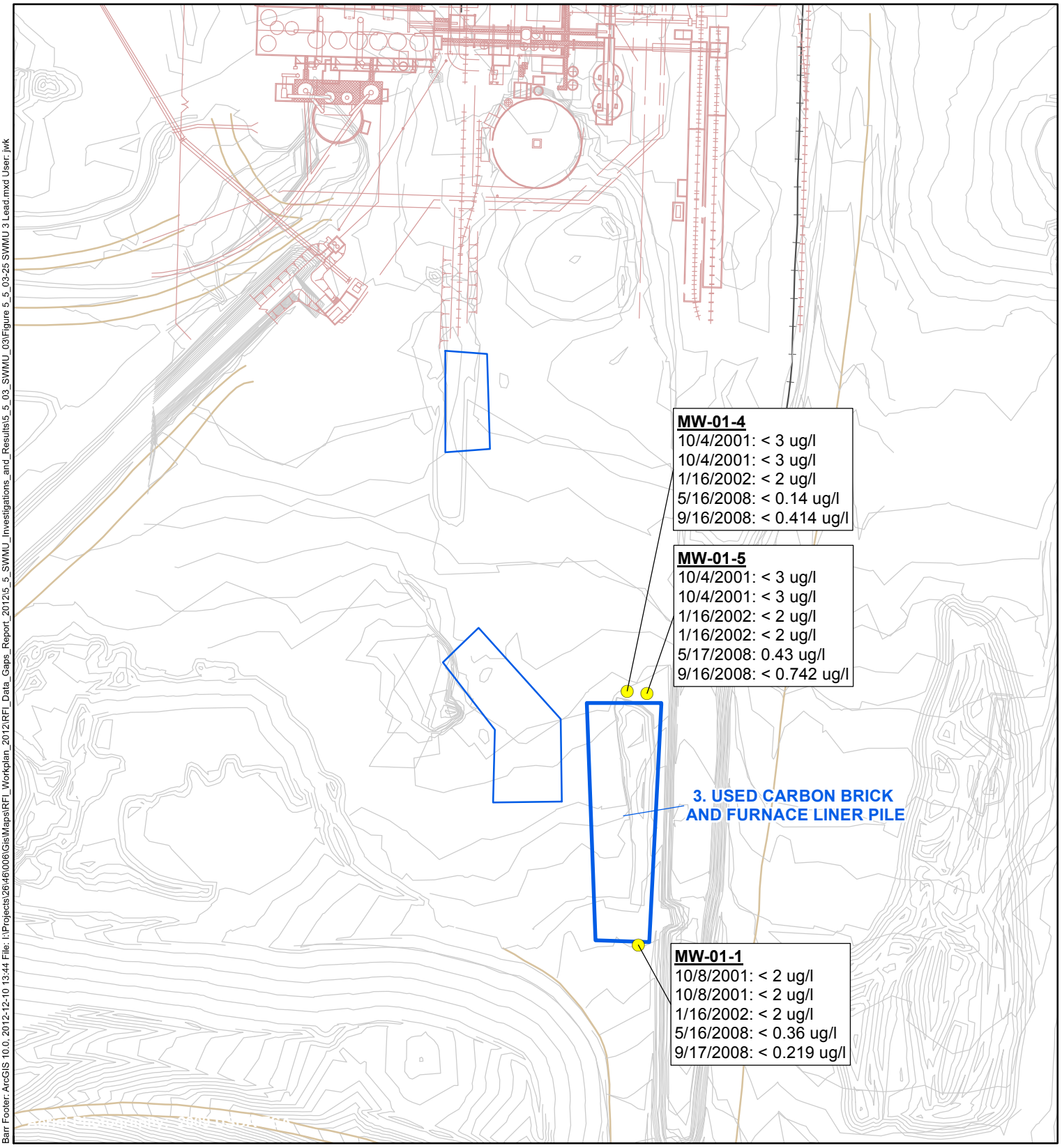
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-24

SWMU 3:
IRON
Rhodia Silver Bow Plant
Montana



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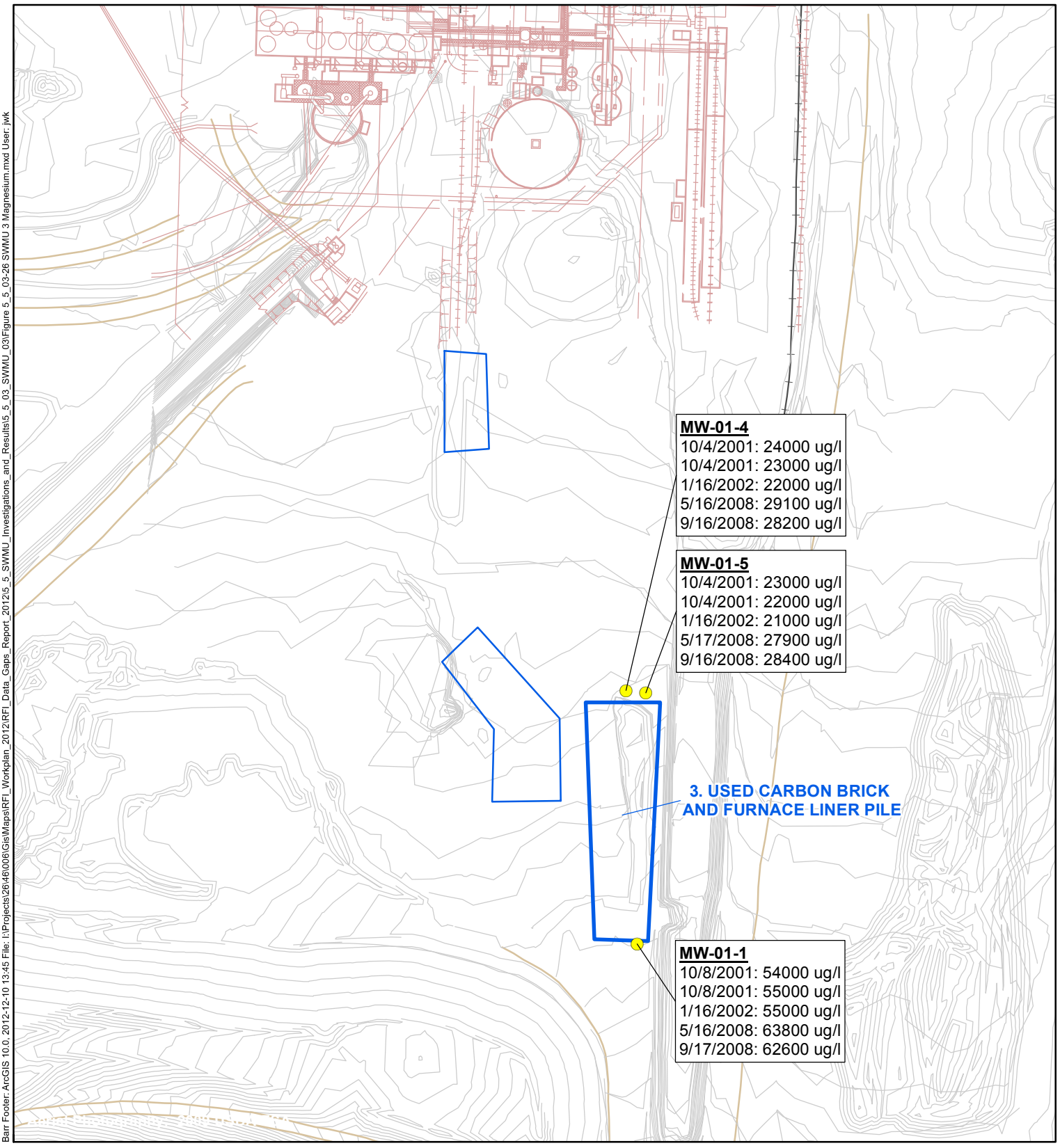
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-25

SWMU 3:
LEAD
Rhodia Silver Bow Plant
Montana



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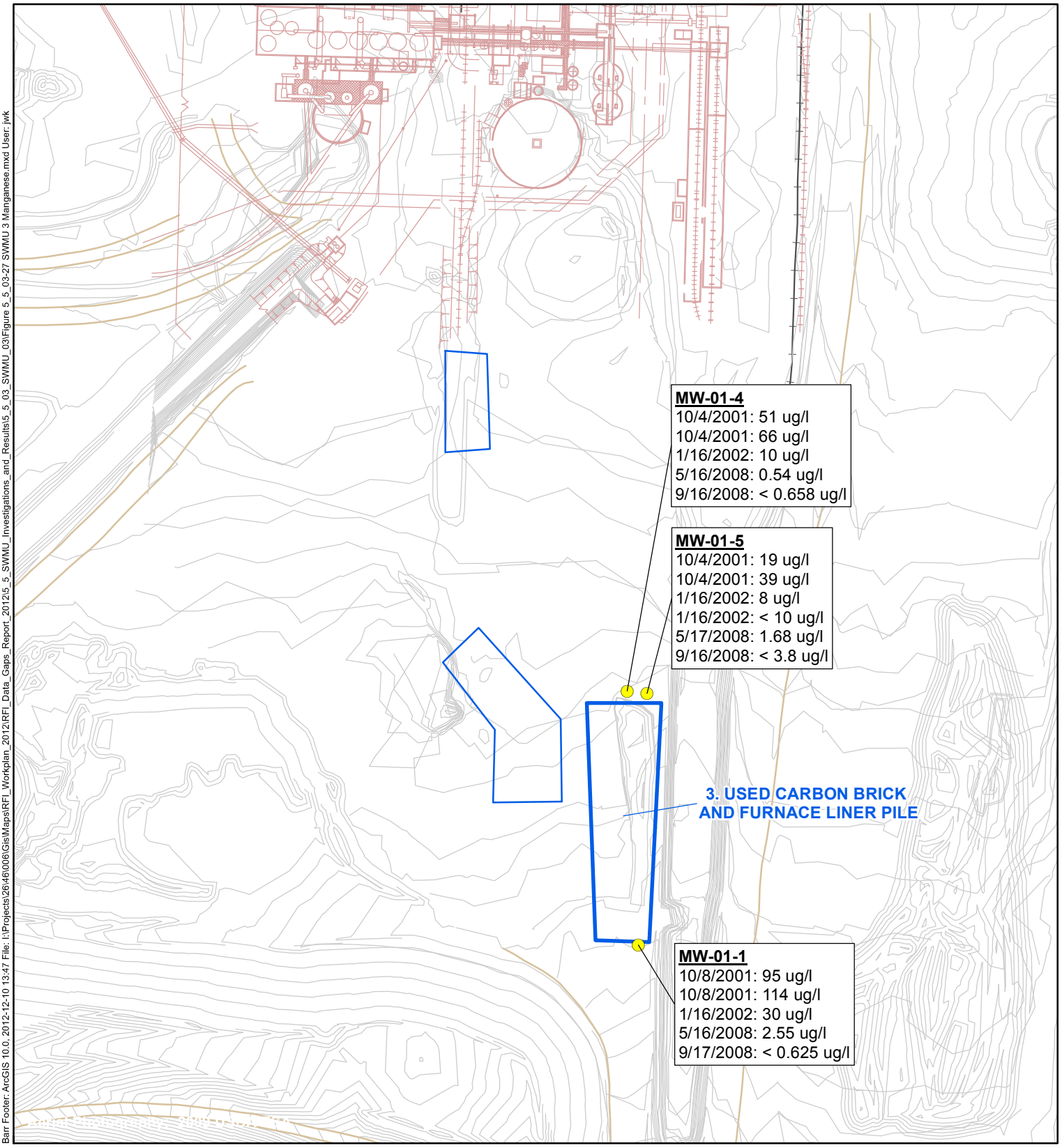
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-26

SWMU 3:
MAGNESIUM
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 13:47 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-27 SWMU 3 Manganese.mxd User: jwk

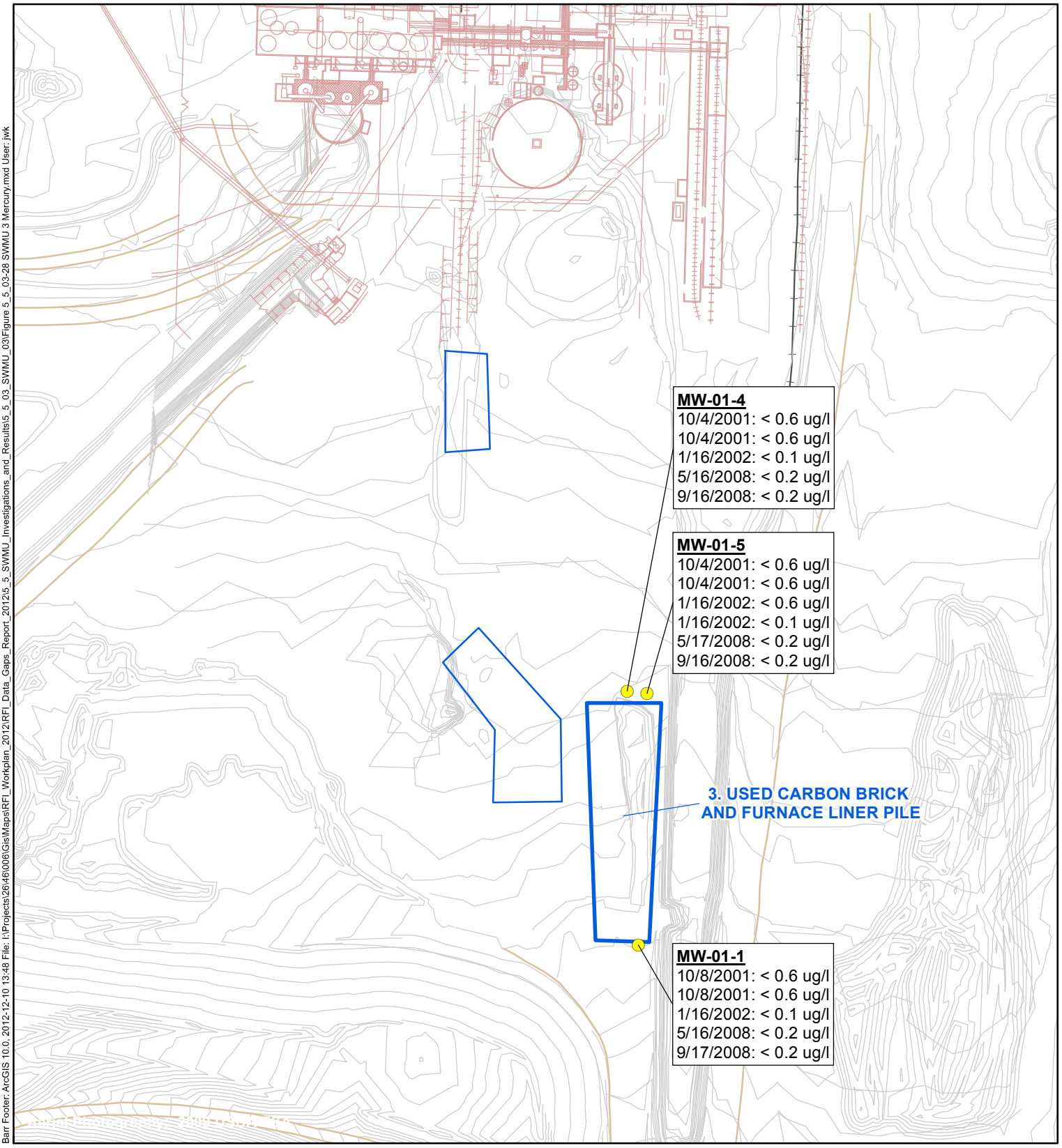
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-27

SWMU 3:
MANGANESE
Rhodia Silver Bow Plant
Montana



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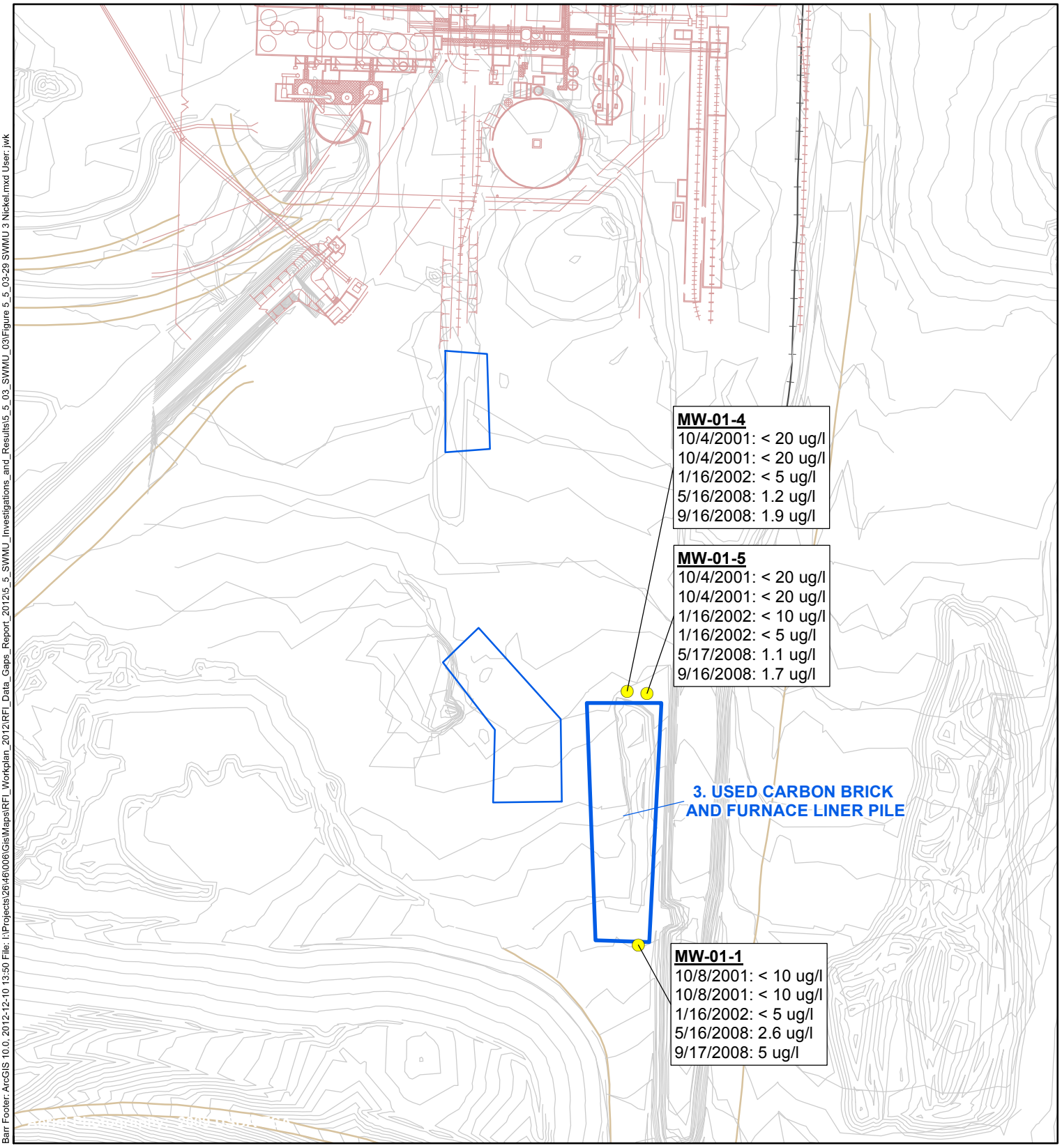
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-28

SWMU 3:
MERCURY
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 13:50 File: I:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-29 SWMU 3 Nickel.mxd User: jwk

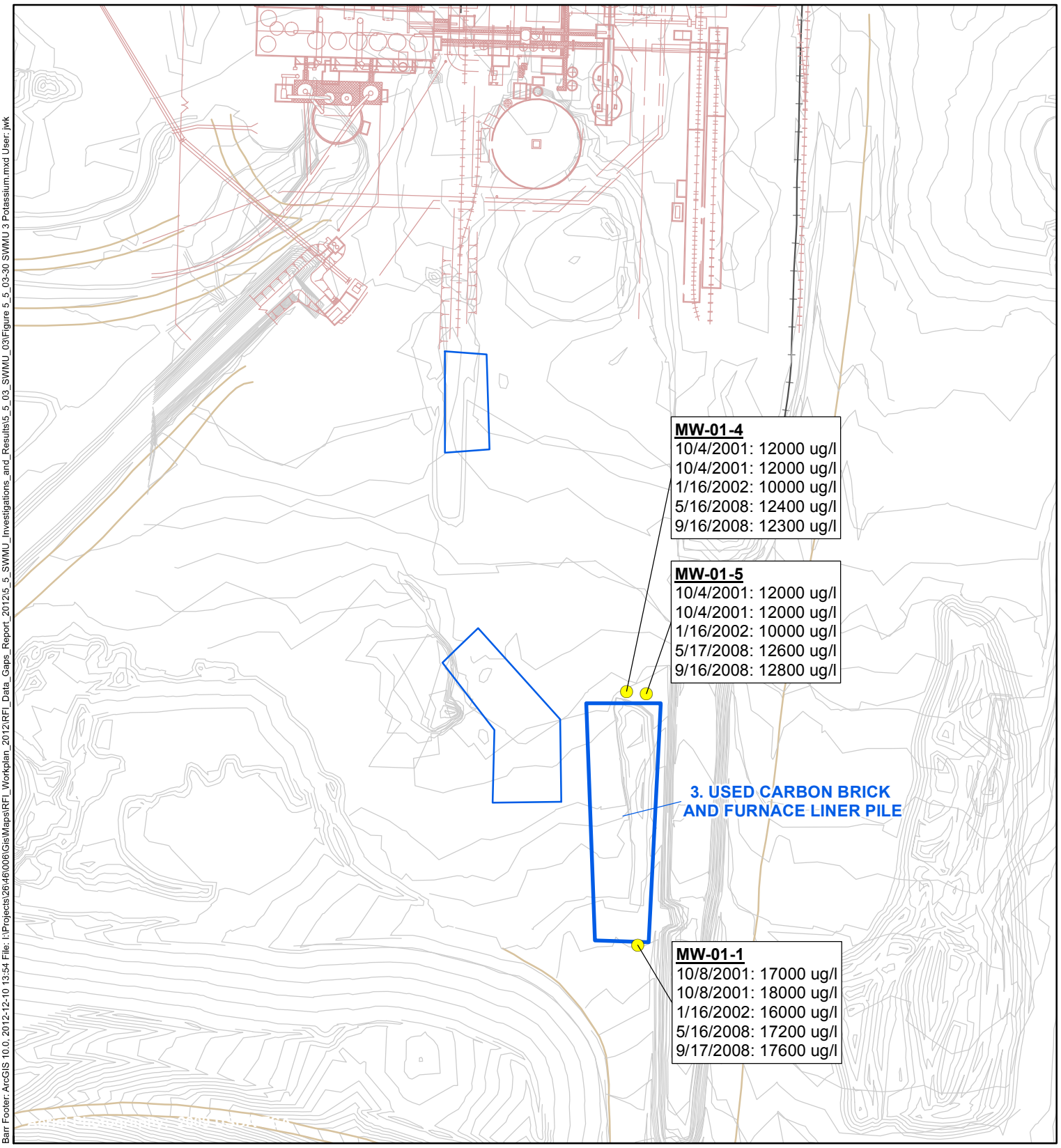
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-29

SWMU 3:
NICKEL
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 13:54 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-30 SWMU 3 Potassium.mxd User: jwk

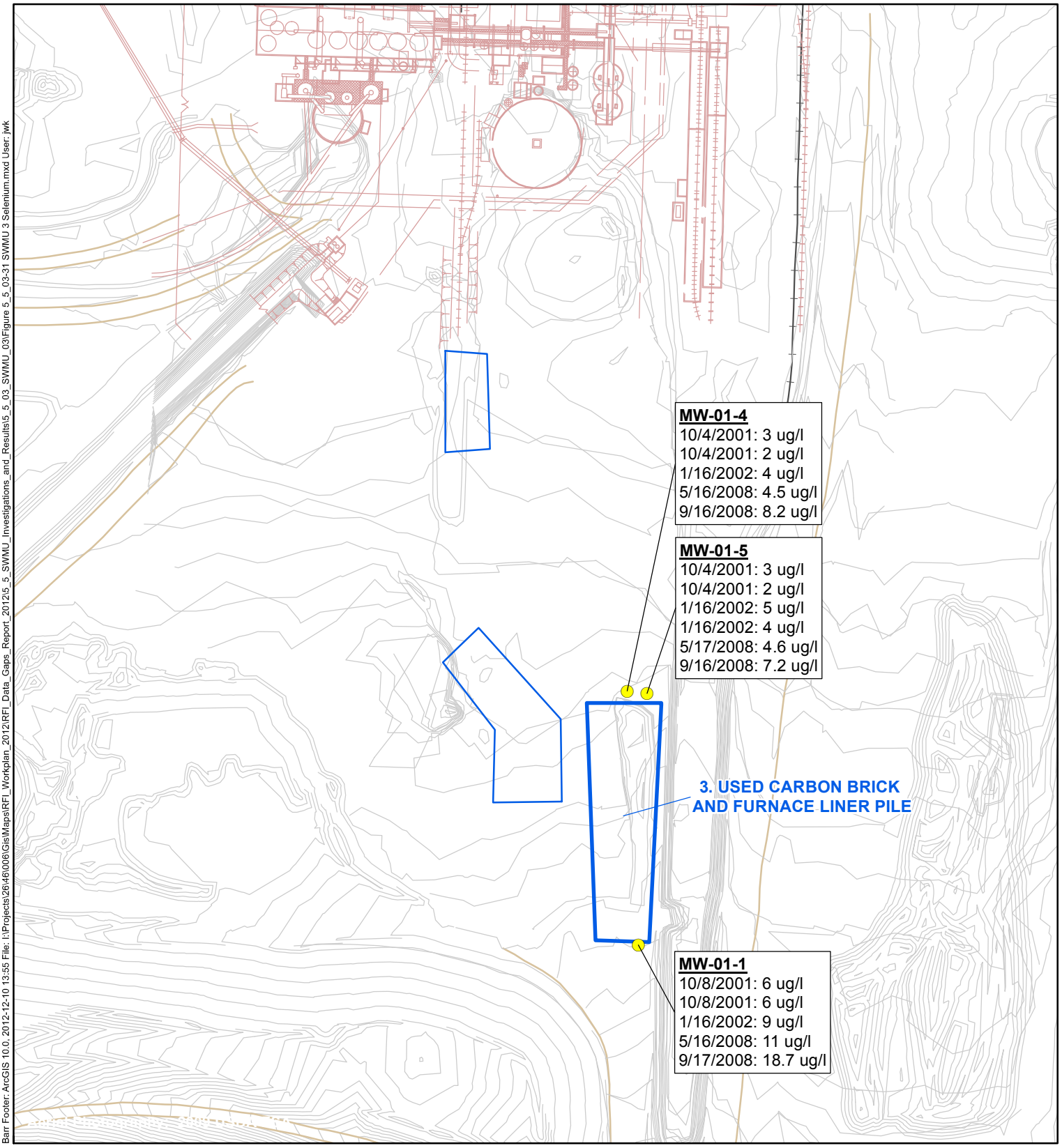
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-30

SWMU 3:
POTASSIUM
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 13:55 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-31 SWMU 3 Selenium.mxd User: jwk

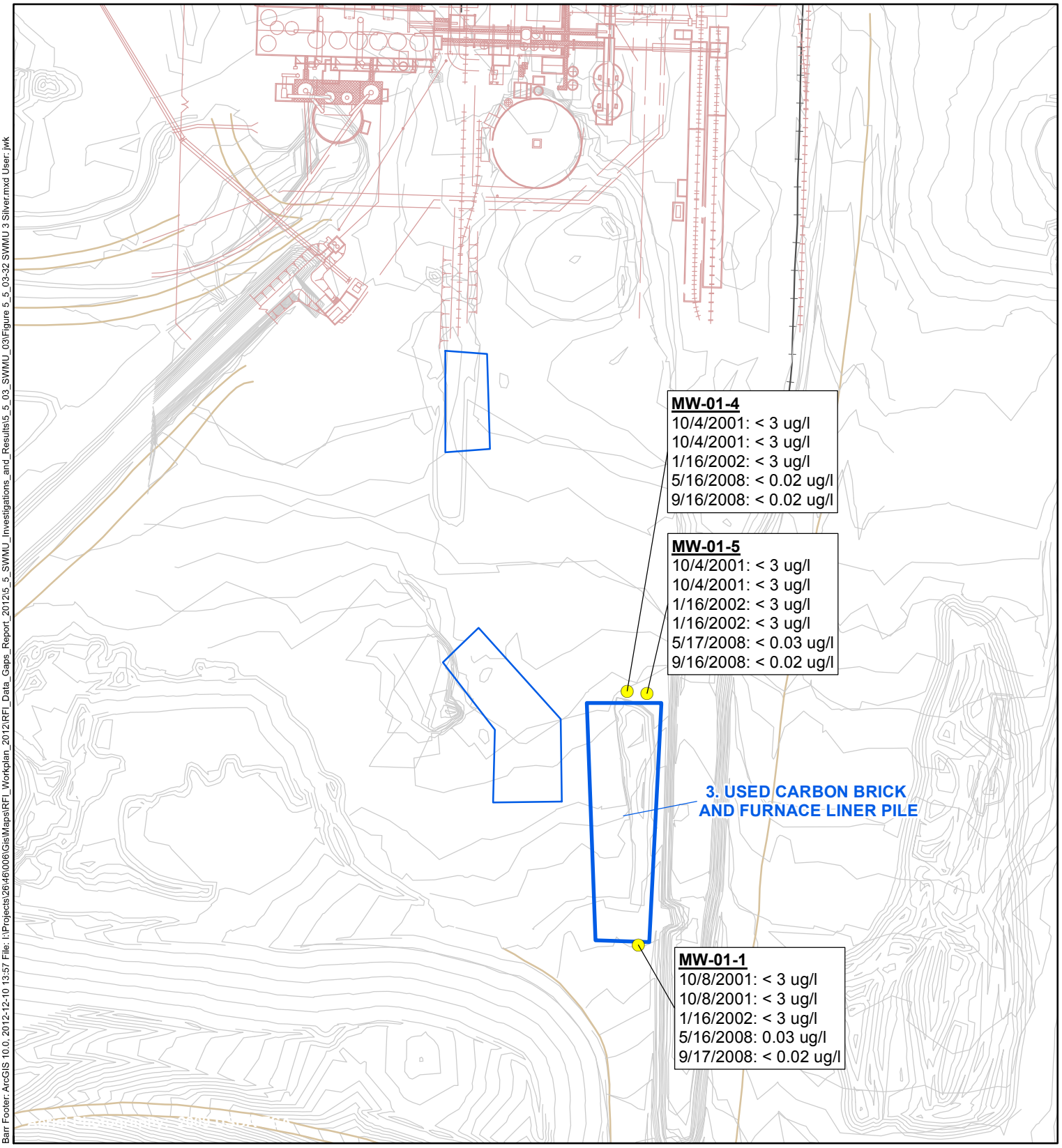
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-31

SWMU 3:
SELENIUM
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 13:57 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-32 SWMU 3 Silver.mxd User: jwk

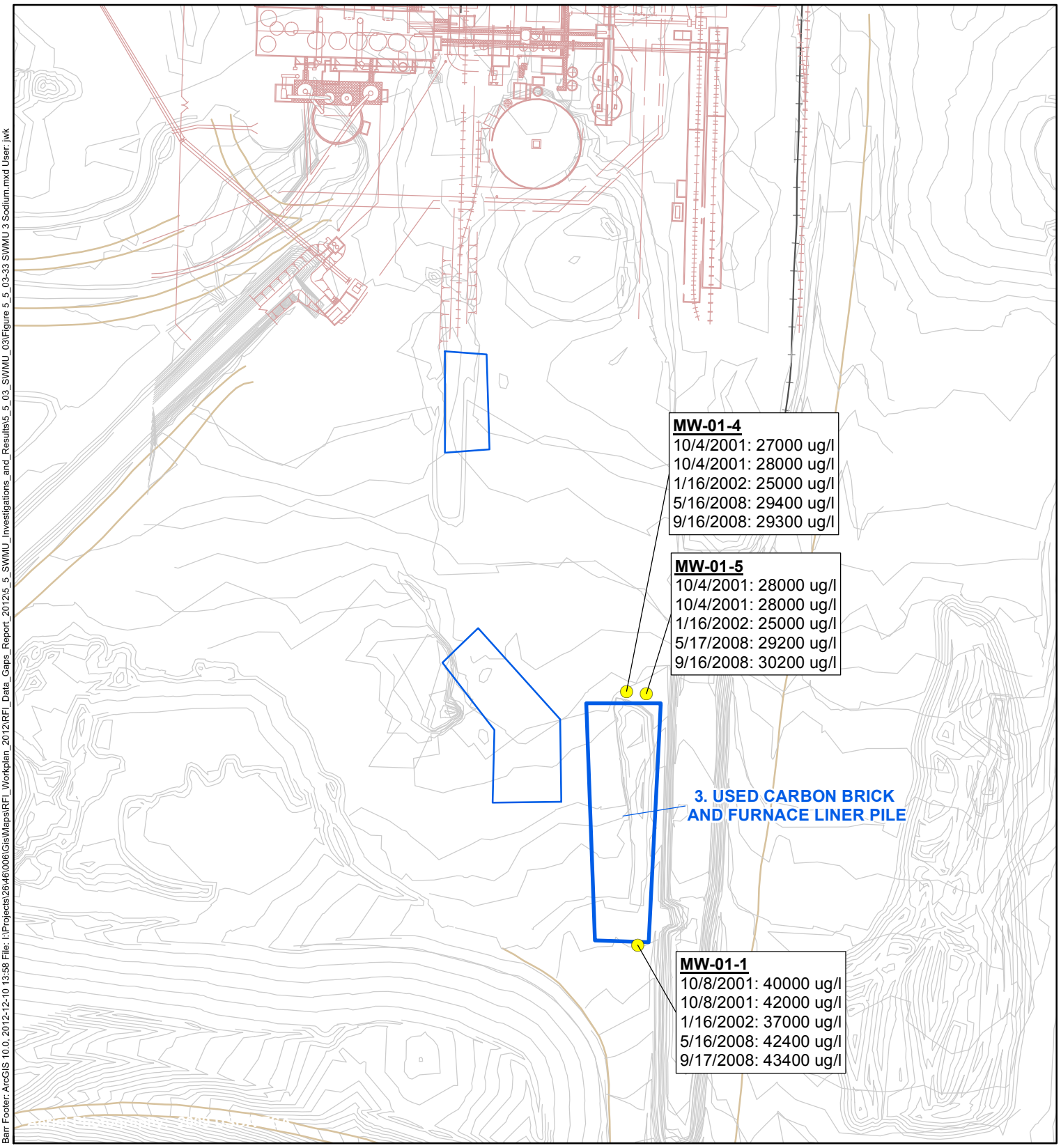
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-32

SWMU 3:
SILVER
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 13:58 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-33 SWMU 3 Sodium.mxd User: jwk

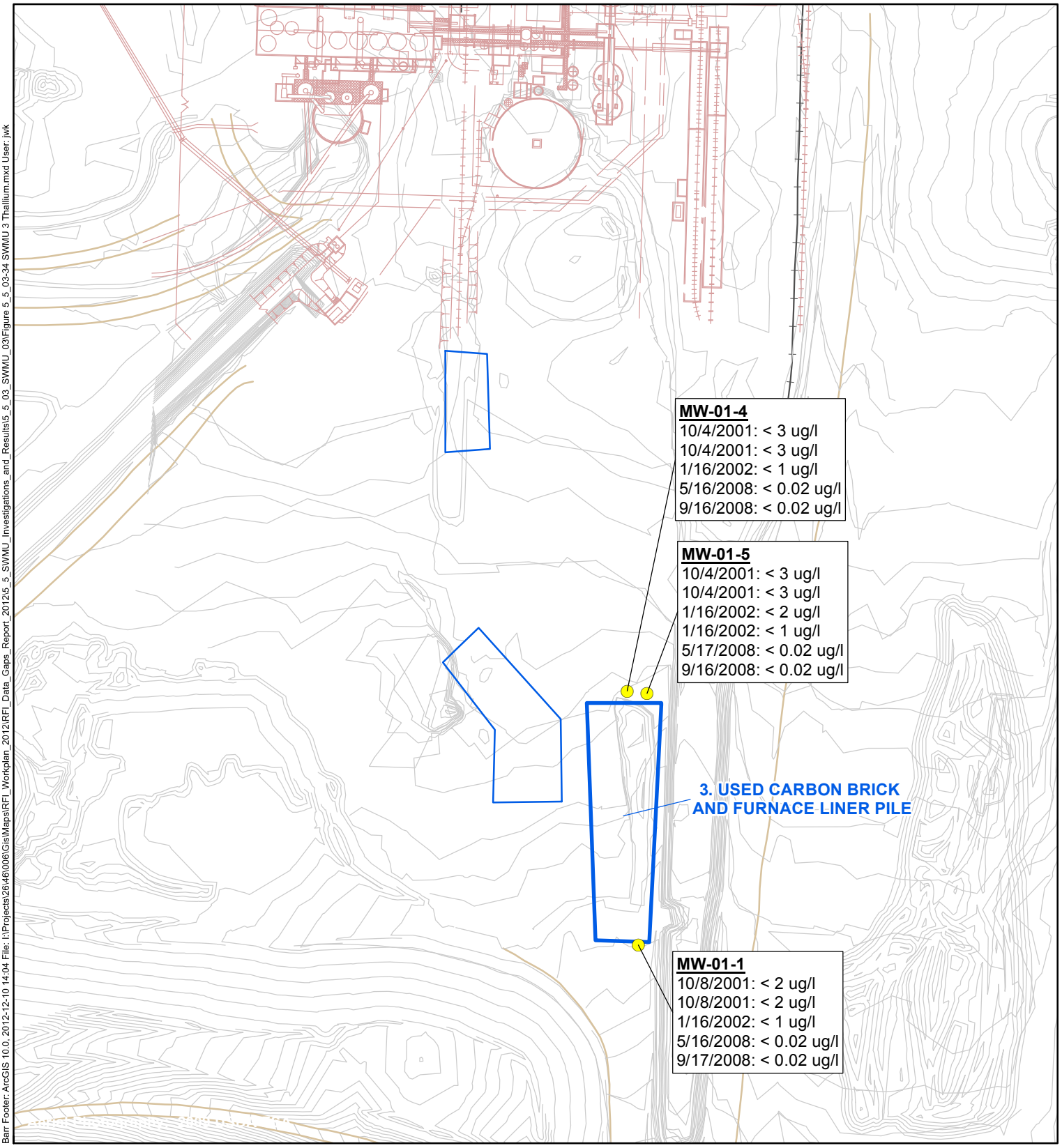
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-33

SWMU 3:
SODIUM
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 14:04 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-34 SWMU 3 Thallium.mxd User: jwk

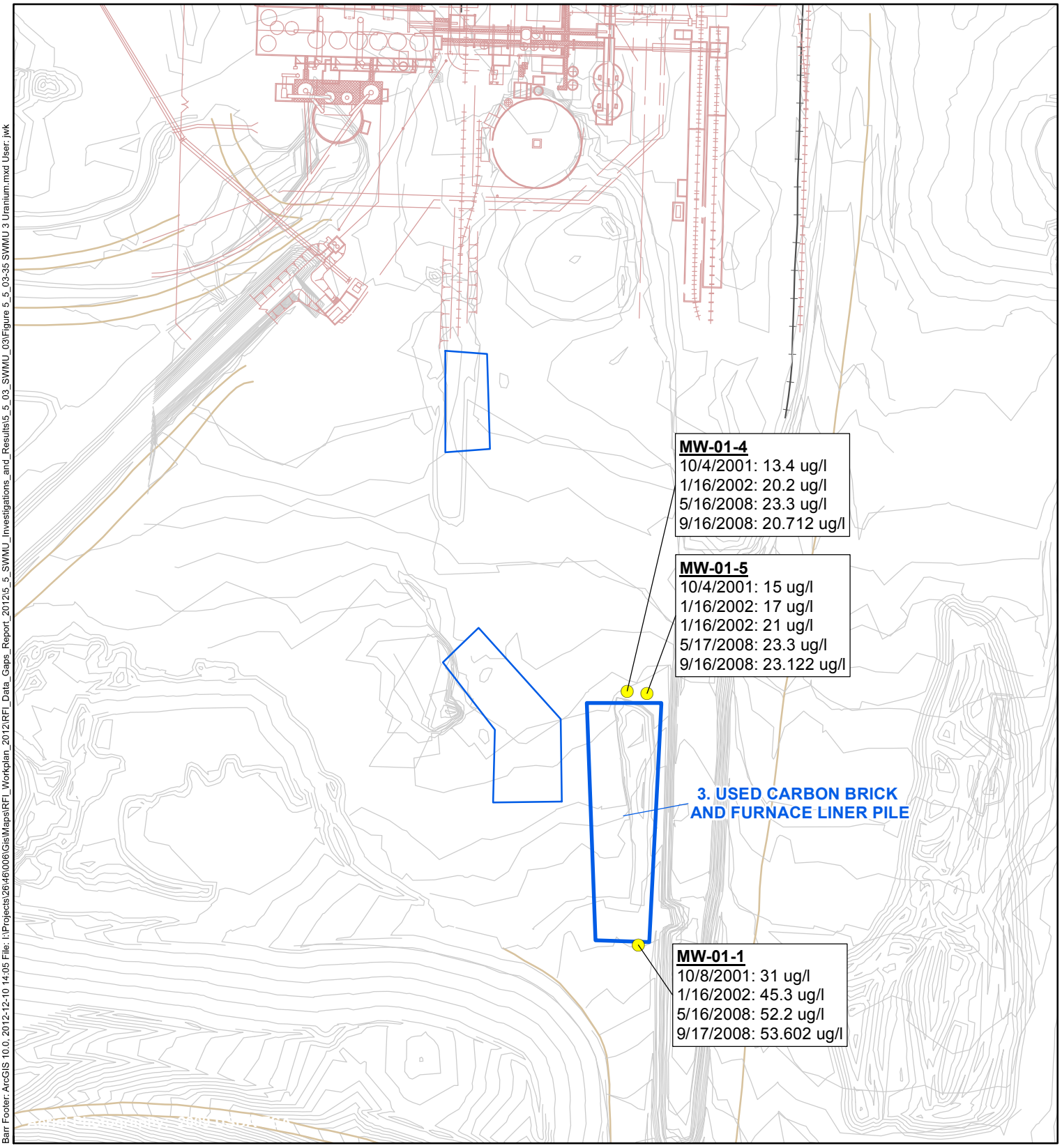
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-34

SWMU 3:
THALLIUM
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 14:05 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-35 SWMU 3 Uranium.mxd User: jwk

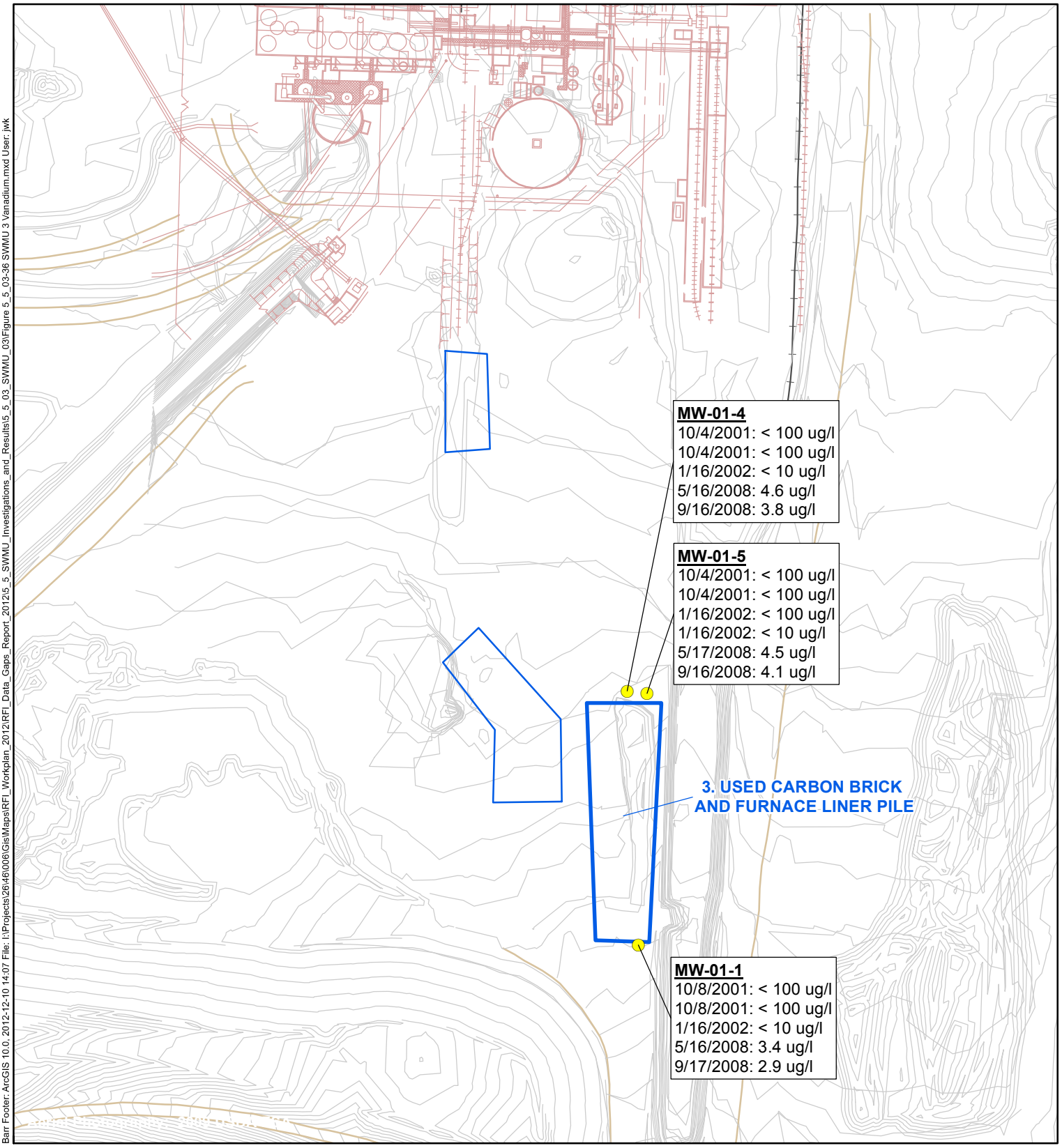
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-35

SWMU 3:
URANIUM
Rhodia Silver Bow Plant
Montana



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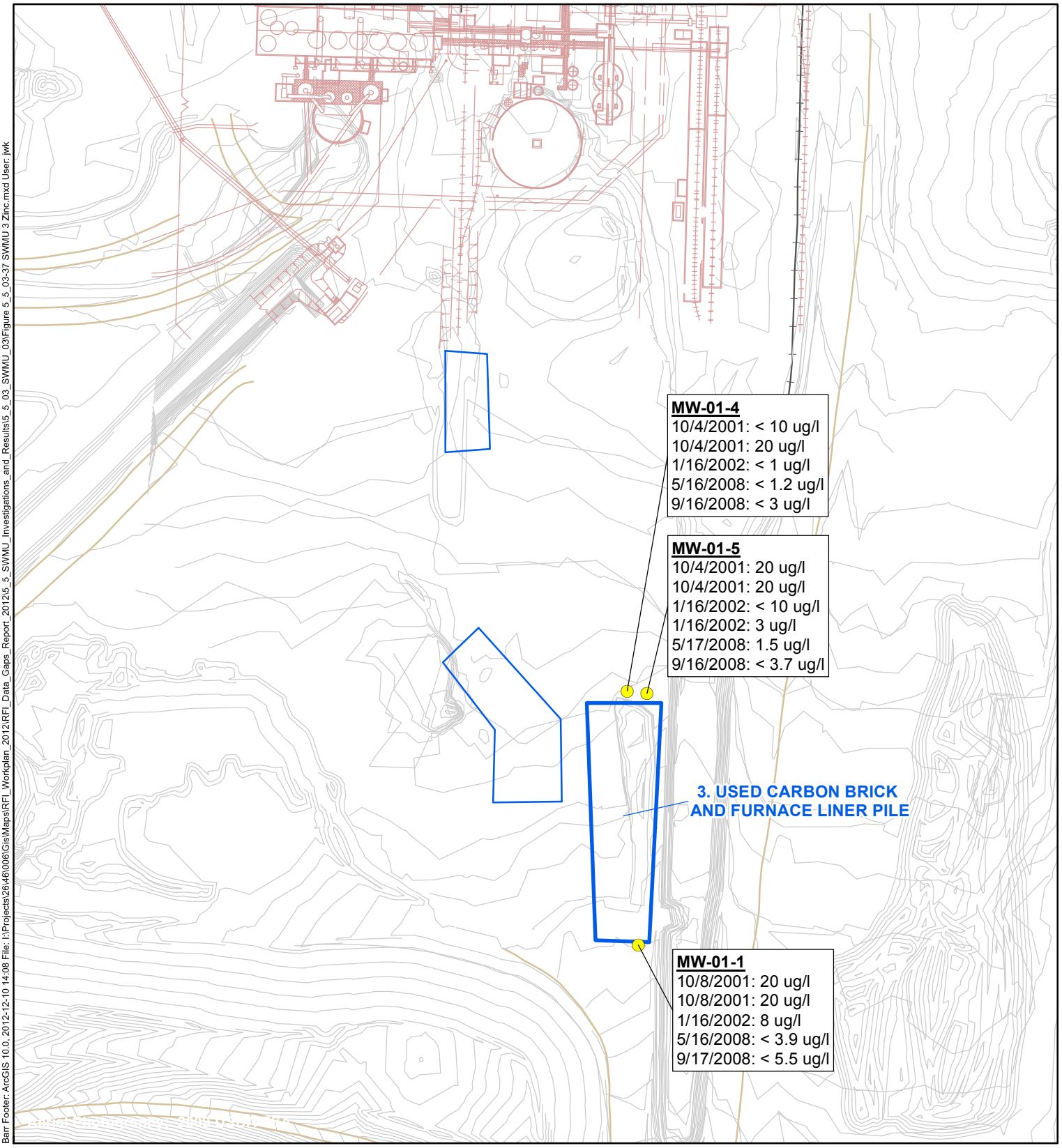
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-36

SWMU 3:
VANADIUM
Rhodia Silver Bow Plant
Montana



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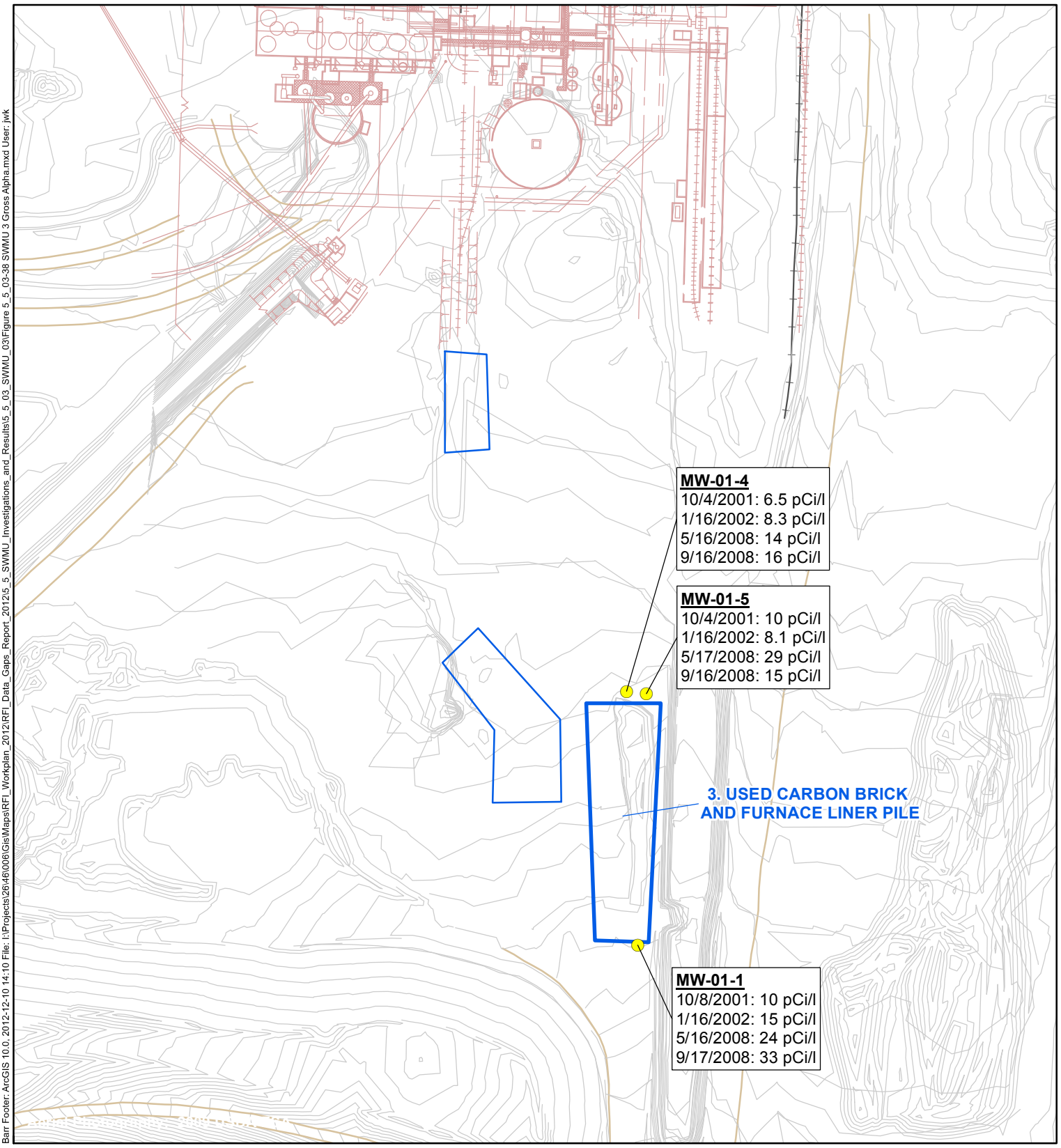
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-37

SWMU 3:
ZINC
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 14:10 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-38 SWMU 3 Gross Alpha.mxd User: jwk

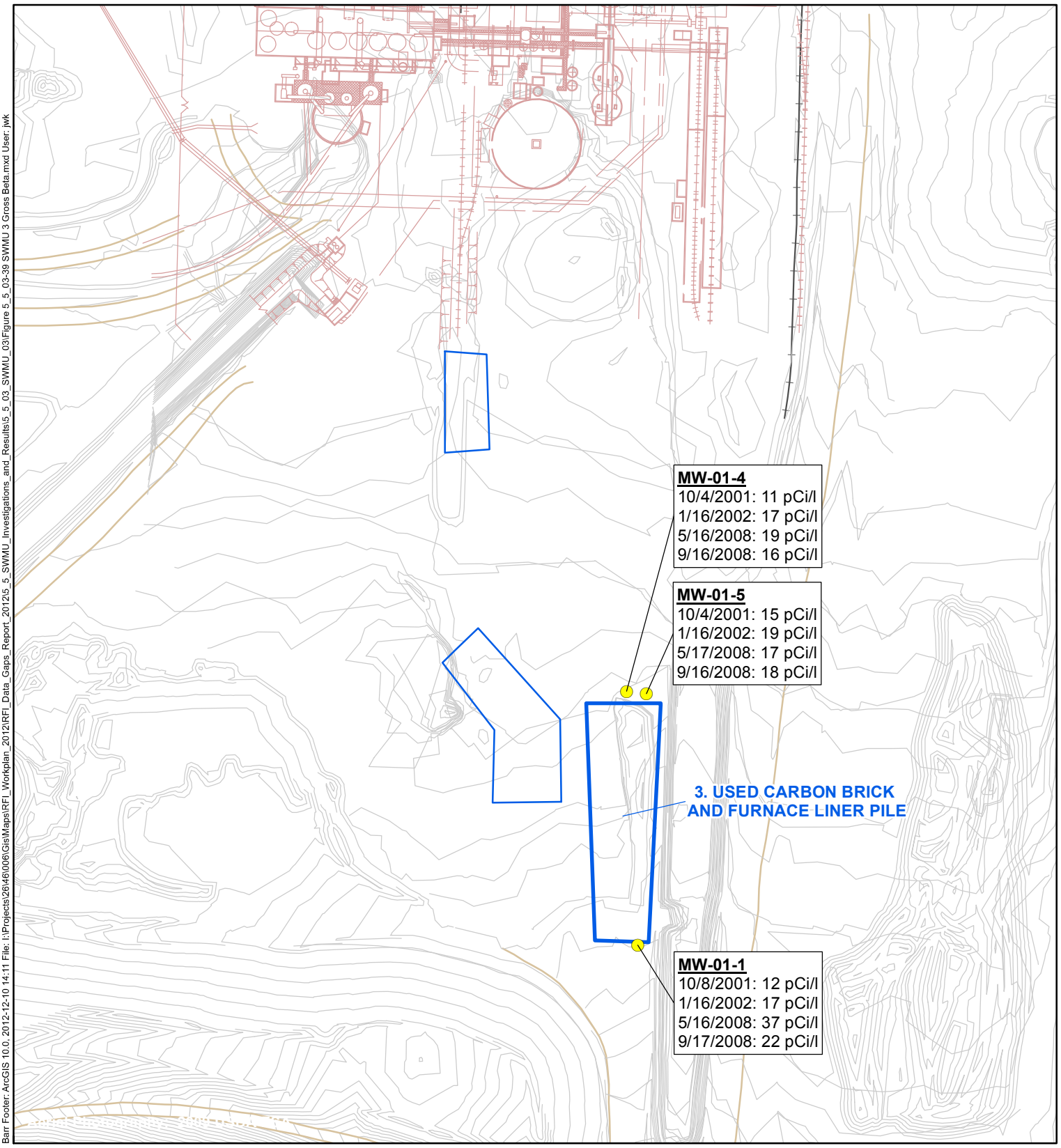
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-38

SWMU 3:
GROSS ALPHA
Rhodia Silver Bow Plant
Montana



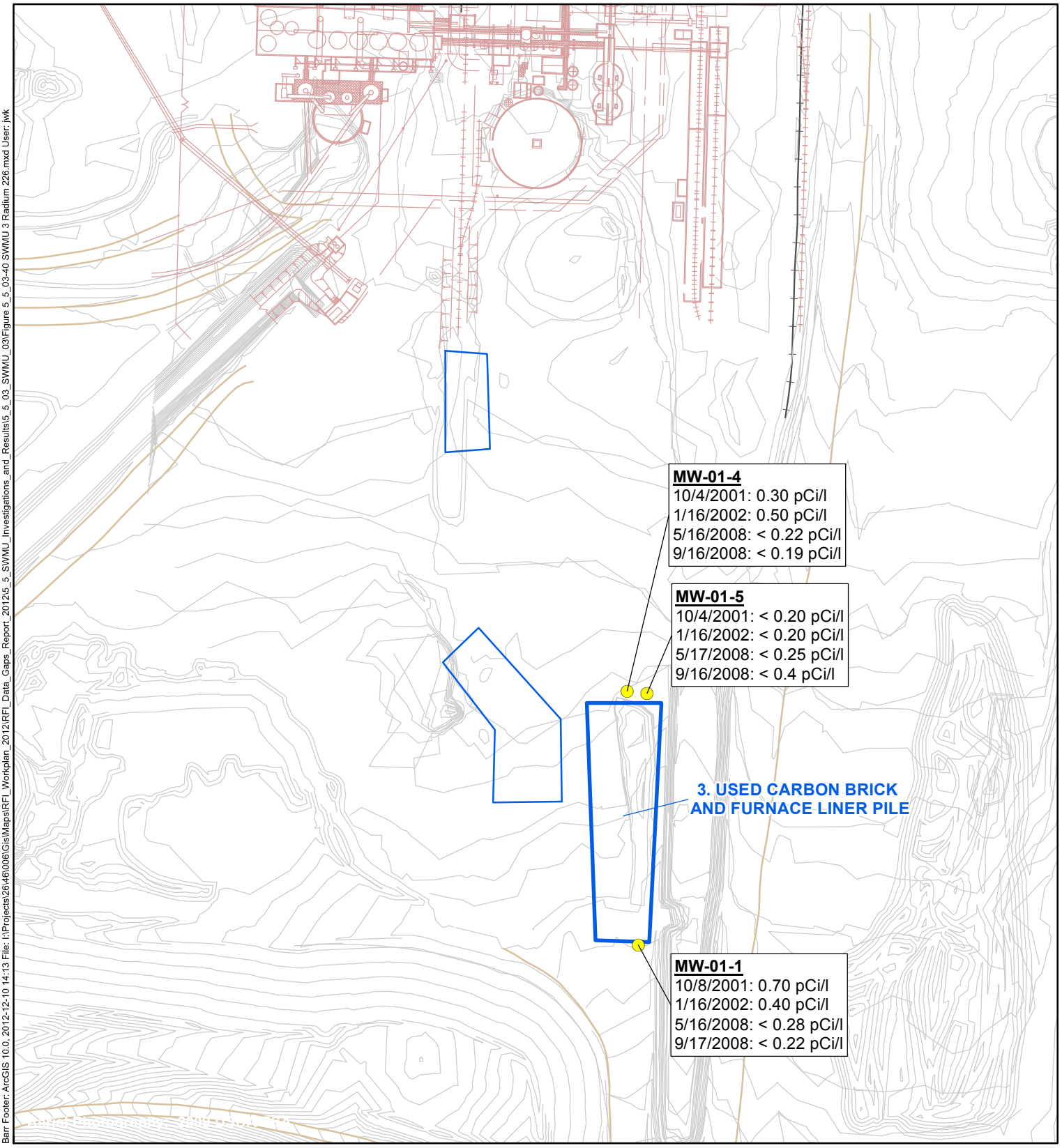
Monitoring Well
SWMU 3
Other SWMUs
Elevation Contour
Drainage
Railroad
Road
Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-39

SWMU 3:
GROSS BETA
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 14:13 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-40 SWMU 3 Radium 226.mxd User: jwk

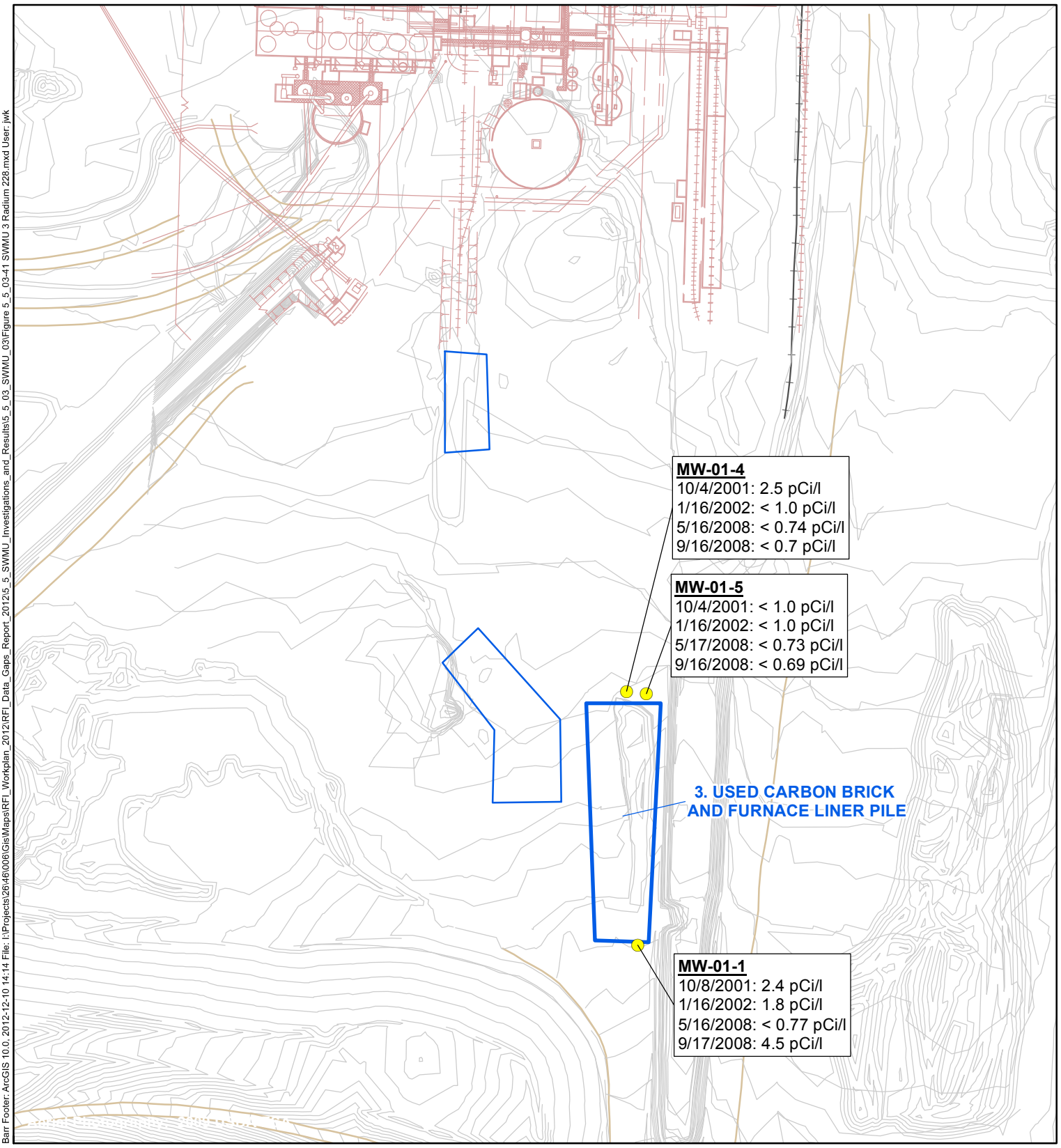
- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

Figure 5.5.3-40

SWMU 3:
RADIUM 226
Rhodia Silver Bow Plant
Montana



Barr Footer: ArcGIS 10.0, 2012-12-10 14:14 File: i:\Projects\26\46\006\Gis\Maps\RFI_Workplan_2012\RFI_Data_Gaps_Report_2012\5_5_SWMU_Investigations_and_Results\5_5_03_SWMU_03\Figure 5_5_03-41 SWMU 3 Radium 228.mxd User: jwk

- Monitoring Well
- SWMU 3
- Other SWMUs
- Elevation Contour
- Drainage
- Railroad
- Road
- Former Plant Structures

N

Feet
150 0 150

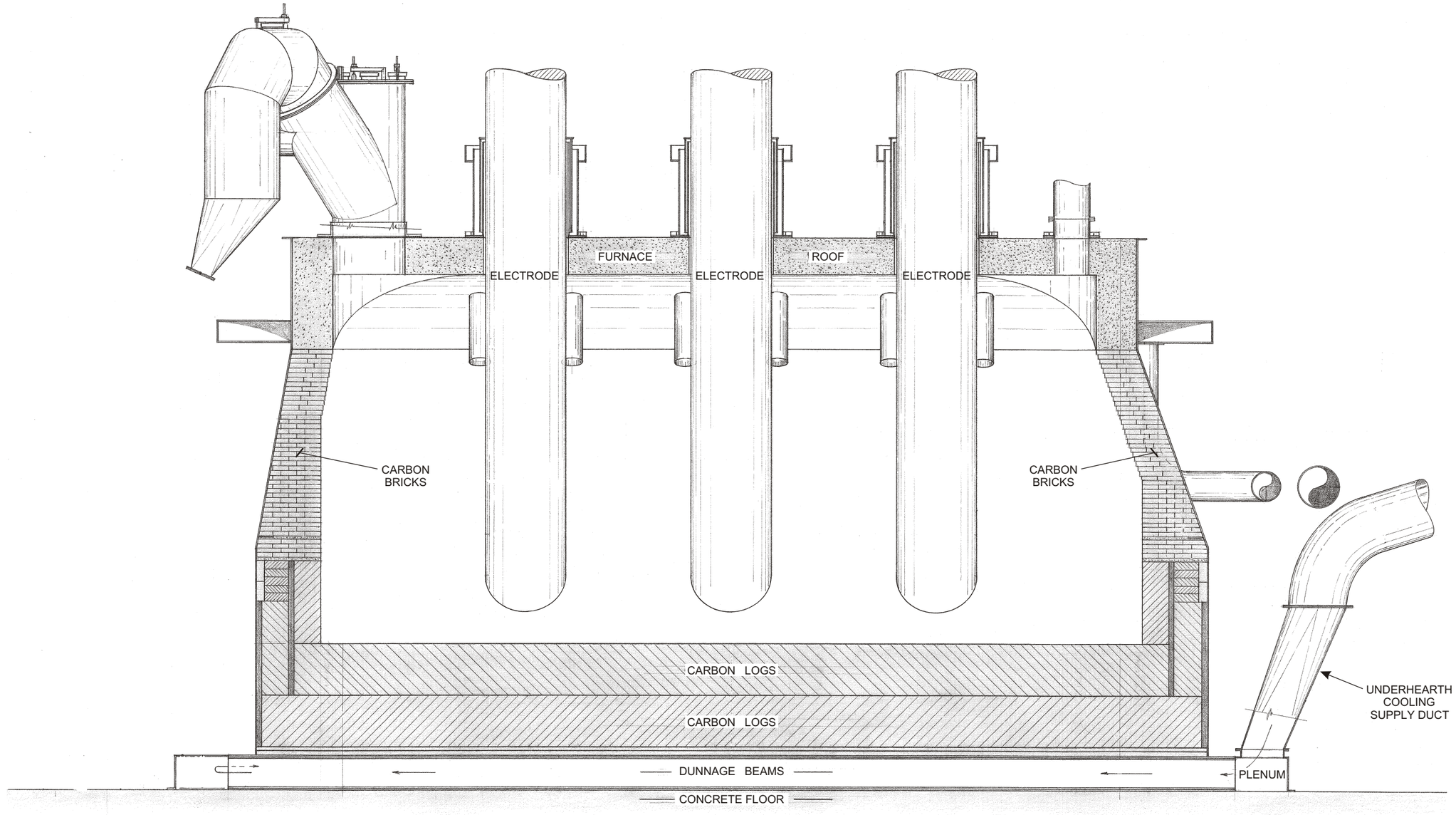
Figure 5.5.3-41

SWMU 3:
RADIUM 228
Rhodia Silver Bow Plant
Montana

Appendices

Appendix 5.5.3-A

Diagram of Carbon Brick and Carbon Block Refractory Lining of EAF



P:\Mpls\26 MT\46\26480006\WorkFiles\Figures_Graphics\Furnace No 2.CDR RLG 02-14-12

Appendix 5.5.3-A

DIAGRAM OF CARBON BRICK AND CARBON BLOCK REFRACTORY LINING OF ELECTRIC AVENUE FURNACE

Appendix 5.5.3-B

Results of RCRA Extraction Procedure (EP) Toxicity Study

Stauffer CHEMICALS

INTER-OFFICE CORRESPONDENCE

Dobbs Ferry

Westport

K. G. Hebel

3/2/81

M. Reale

RCRA - Waste Classification

S. F. Adler
S. Altscher
J. W. Call
H. J. Caspers
G. Chatriand
D. Eddlemon
D. S. Hackett
R. Harry
W. Pagano
R. Stampley
E. N. Walsh
Central File

PROJ: Pollution Control - ICD 169700

RRA#: 81001, 81015

KWDS: RCRA, Toxic Waste, EP Toxicity, Silver Bow, EPA, Phosphorus, Slag, Precipitator Dust, Carbon Scrap

8114-0100

Attachments

COMPANY CONFIDENTIAL

Attached in Table I are the results of the Resource Conservation and Recovery Act (RCRA) Extraction Procedure (EP) Toxicity Study performed at ERC on prepitator dusts, carbon scrap and slags collected at the Silver Bow Plant and received at ERC on 12/30/80. The Labeling Department specified that RCRA metals determinations were to be performed on the EP extract.

The analyses were conducted according to procedures described in the RCRA Protocol, Federal Register, Vol. 45, No. 98, May 19, 1980. Results are based on a single analysis of a composite sample collected by the plant personnel.

Results of quality assurance sample analyses (Table II) associated with this testing agree with known additions of metal ions to typical samples. Therefore, this data as reported by IT Enviroscience Inc. is considered acceptable.

Elemental phosphorus determinations were performed on both precipitator dust samples by the Rushing Method*. No elemental phosphorus (lower limit of detection = 2 ppm) was found in either sample.

K. G. Hebel

Ref.: GAS No. 02763, 10097

* P. E. Rushing, "A Tentative Method for the Determination of Elemental Phosphorus in Air", AIHA Journal, 23, 383-387, 9-10/62

Work Done By: F. Staples, R. Vanstrom, IT Enviroscience Inc.

KGH/jh

SAFEGUARD COMPANY INFORMATION

TABLE I

RESULTS OF RCRA EP TOXICITY TEST

GAS #02763

RRA #81001

ERC Notebook: 6537-25,26,27
6592-4,11

PLANT: Silver Bow

DATE SAMPLES REC'D.: 12/30/80

Contaminant	Maximum Allowable Concentration (mg/L)	LLD* (mg/L)	Granulated** Slag (mg/L)	Idaho** Precipitator Dust (mg/L)	Montana** Precipitator Dust (mg/L)	Carbon** Scrap (mg/L)	Pit Run** Slag (mg/L)
Arsenic	5.0	0.001	0.003	0.12	0.26	0.19	N.D.
Barium	100.0	--	0.14	0.12	0.12	0.38	0.94
Cadmium	1.0	0.001	N.D.	0.107	0.108	0.009	N.D.
Chromium	5.0	0.01	0.03	0.03	0.03	0.03	N.D.
Lead	5.0	0.01	N.D.	N.D.	0.02	N.D.	N.D.
Mercury	0.2	0.001	N.D.	N.D.	N.D.	N.D.	N.D.
Selenium	1.0	0.001	N.D.	0.003	0.007	N.D.	0.002
Silver	5.0	0.006	N.D.	N.D.	0.010	N.D.	0.010
Initial pH of the EP extract =			9.5	5.1	4.95	3.0	7.0
Final pH of the EP extract =			5.2	5.2	5.1	2.9	5.2

* N.D. = not detected; LLD = lower limit of detection

** Results reported by IT Enviroscience Inc. This data is considered acceptable based on our evaluation of associated quality assurance data.

TABLE II

IT ENVIROSCIENCE ANALYTICAL RESULTS

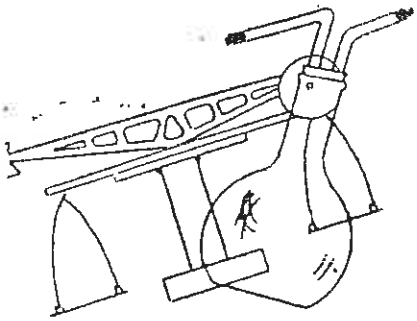
QUALITY ASSURANCE DATA

REPORT NO. HK-338

Metal	LLD (ppb)*	Distilled Water Spike (ppb)**			Sample Spike (ppb)**			Blind Dup. Samples (ppb			
		Added	Found	% Recovery	Added	Found	% Recovery	#1	#1	#2	#2
Arsenic	1	300	290	97	300	190	63	37	25	82	130
Barium	20	3000	2600	90	--	--	--	320	320	200	200
Cadmium	1	59	2300 59	77 100	59	60	102	106	107	ND	ND
Chromium	10	299	300	100	299	300	100	ND	ND	ND	ND
Lead	10	300	290	97	300	300	100	ND	ND	ND	ND
Mercury	1	12	11	92	12	5	42	ND	ND	ND	ND
Selenium	1	59	42	71	59	57	97	ND	ND	11	16
Silver	5	300	297	99	--	--	--	20	20	ND	ND

* LLD = Lower Limit of Detection

** Samples spiked at ERC



Ford Chemical
LABORATORY, INC.
Bacteriological and Chemical Analysis
40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115
PHONE ~~485-5761~~
(801) 466-8761

DATE: 12/09/80

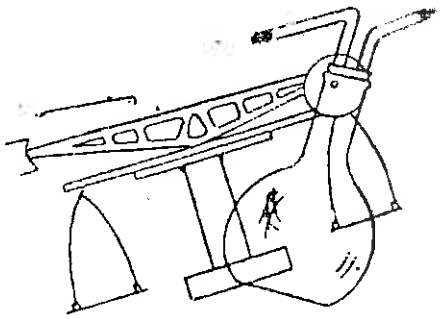
CERTIFICATE OF ANALYSIS

STAUFFER CHEMICAL CO
BOX 3146
BUTTE, MONTANA
59701

80-001431

SAMPLE: CARBON SCRAP RECEIVED 11-4-80 FOR E.P. TOXICITY, UNDER P.O. #169530.

	RESULTS
2, 4, D mg/l	<.001
.4,5, -TP (Silvex) mg/l	<.001
Arsenic as As mg/l	.220
Barium as Ba mg/l	150.800
Cadmium as Cd mg/l	.360
Chromium as Cr mg/l	.250
Endrin mg/l	<.001
Lead as Pb mg/l	.296
Lindane mg/l	<.001
Mercury as Hg mg/l	.00130
Methoxychlor mg/l	<.001
Selenium as Se mg/l	.009
Silver as Ag mg/l	<.001



Ford Chemical
LABORATORY, INC.
Bacteriological and Chemical Analysis
40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115
PHONE 485-5761

CERTIFICATE OF ANALYSIS
80-001431

RESULTS

Toxaphene mg/l	<.001

FORD CHEMICAL LABORATORY, INC.

Appendix 5.5.3-C

Carbon Brick and Furnace Liner Analytical Reports

1992 Carbon Brick and Furnace Liner Sample

Century Testing Laboratories, Inc.

Mail: Post Office Box 1174
Bend, Oregon 97709
503-382-6432

LABORATORY ANALYSIS

TOXICITY CHARACTERISTICS LEACHING PROCEDURE (TCLP)

RHONE-POULENC
BASIC CHEMICAL
119130 GERMAN GULCH RD
BUTTE, MT 59750

EXTRACTION METHOD: TCLP.40CFR.Pt.268.App 1
LAB SAMPLE NO.: 8880-1
SAMPLE DESCRIP.: SPENT FURNACE CARBON BRICK
MATRIX: OTHER
DATE SUBMITTED: 1/22/92
DATE EXTRACTED: 1/22/92
DATE ANALYZED: 1/23/92
DISCARD DATE: 3/22/92
COLLECTED BY: CAM BALENTINE

ANALYSIS METHOD NUMBER	CONSTITUENT	SAMPLE CONC.*	METHOD DETECTION LIMIT	MAXIMUM ALLOWABLE CONC.	UNITS	PERCENT RECOVERY**
EPA 7060	ARSENIC	N.D.	0.015	5.0	mg/l	96.0%
EPA 6010	BARIUM	0.205	0.015	100	mg/l	120.0%
EPA 7130	CADMIUM	0.022	0.004	1.0	mg/l	96.0%
EPA 7190	CHROMIUM	0.156	0.020	5.0	mg/l	104.0%
EPA 7420	LEAD	N.D.	0.040	5.0	mg/l	88.0%
EPA 7470	MERCURY	N.D.	0.0003	0.2	mg/l	88.5%
EPA 7740	SELENIUM	N.D.	0.02	1.0	mg/l	105.0%
EPA 7760	SILVER	N.D.	0.006	5.0	mg/l	97.0%

*N.D. means "not detected."

**Percent Recovery values were within established control limits.

CENTURY TESTING LABORATORIES, INC.

Reviewed and approved by:

Bruce H. Bale
Quality Assurance Manager

01/24/92

1999 Carbon Brick and Furnace Liner Sample

ENERGY LABORATORIES, INC.
P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: MSE-HKM, Inc.
Date Sampled: 22-MAR-99 15:35
Date Received: 24-MAR-99
Extraction Date: 30-MAR-1999
Analysis Date: 31-MAR-1999 15:47
Project Info: RHODIA, INC.
Sample Info: SCB-1

Lab No.: 003-99-50887
Report Date: 04/01/99 10:03
Sample Matrix: SOIL; Moisture=7%
Extraction Method: EPA 3550
Prep Info: 30g to 1ml

EPA METHOD 8270B: SEMI-VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/g (ppm)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Acenaphthene	83-32-9	<0.33	U
Acenaphthylene	208-96-8	<0.33	U
Anthracene	120-12-7	<0.33	U
Azobenzene	103-33-3	<0.33	U
Benzidine	92-87-5	<0.67	U
Benzo(a)Anthracene	56-55-3	<0.33	U
Benzo(b)fluoranthene	205-99-2	<0.33	U
Benzo(k)fluoranthene	207-08-9	<0.33	U
Benzo(g,h,i)perylene	191-24-2	<0.33	U
Benzo(a)pyrene	50-32-8	<0.33	U
4-Bromophenyl-phenylether	101-55-3	<0.33	U
Butylbenzylphthalate	85-68-7	<0.33	U
4-Chloro-3-Methylphenol	59-50-7	<0.33	U
bis(-2-Chloroethoxy)Methane	111-91-1	<0.33	U
bis(-2-Chloroethyl)Ether	111-44-4	<0.33	U
bis(2-Chloroisopropyl)ether	108-60-1	<0.33	U
2-Chloronaphthalene	91-58-7	<0.33	U
2-Chlorophenol	95-57-8	<0.33	U
4-Chlorophenol	106-48-9	<0.33	U
4-Chlorophenyl-phenylether	7005-72-3	<0.33	U
Chrysene	218-01-9	<0.33	U
Dibenzo(a,h)anthracene	53-70-3	<0.33	U
1,2-Dichlorobenzene	95-50-1	<0.33	U
1,3-Dichlorobenzene	541-73-1	<0.33	U
1,4-Dichlorobenzene	106-46-7	<0.33	U
3,3'-Dichlorobenzidine	91-94-1	<0.67	U
2,4-Dichlorophenol	120-83-2	<0.33	U
Diethylphthalate	84-66-2	<0.33	U
Dimethyl Phthalate	131-11-3	<0.33	U
2,4-Dimethylphenol	105-67-9	<0.33	U
Di-n-Butylphthalate	84-74-2	<0.33	U
4,6-Dinitro-2-methylphenol	534-52-1	<1.7	U
2,4-Dinitrophenol	51-28-5	<1.7	U
2,4-Dinitrotoluene	121-14-2	<0.33	U
2,6-Dinitrotoluene	606-20-2	<0.33	U
Di-n-octyl Phthalate	117-84-0	<0.33	U
bis(2-ethylhexyl)Phthalate	117-81-7	<0.33	U
Fluoranthene	206-44-0	<0.33	U
Fluorene	86-73-7	<0.33	U
Hexachlorobenzene	118-74-1	<0.33	U
Hexachlorobutadiene	87-68-3	<0.33	U
Hexachlorocyclopentadiene	77-47-4	<0.33	U
Hexachloroethane	67-72-1	<0.33	U

(report continued on page 2)

EPA METHOD 8270B: SEMI-VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/g (ppm)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Indeno(1,2,3-c,d)pyrene	193-39-5	<0.33	U
Isophorone	78-59-1	<0.33	U
1-Methylnaphthalene	90-12-0	<0.33	U
2-Methylnaphthalene	91-57-6	<0.33	U
2-Methylphenol	95-48-7	<0.33	U
4Methylphenol/3Methylphenol	106445/108394	<0.33	U
Naphthalene	91-20-3	<0.33	U
Nitrobenzene	98-95-3	<0.33	U
2-Nitrophenol	88-75-5	<0.33	U
4-Nitrophenol	100-02-7	<1.7	U
N-Nitrosodimethylamine	62-75-9	<0.33	U
N-nitroso-Di-n-propylamine	621-64-7	<0.33	U
N-nitrosodiphenylamine	86-30-6	<0.33	U
Pentachlorophenol	87-86-5	<1.7	U
Phenanthrene	85-01-8	<0.33	U
Phenol	108-95-2	<0.33	U
Pyrene	129-00-0	<0.33	U
Pyridine	110-86-1	<0.67	U
1,2,4-Trichlorobenzene	120-82-1	<0.33	U
2,4,5-Trichlorophenol	95-95-4	<0.33	U
2,4,6-Trichlorophenol	88-06-2	<0.33	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added-ug/g	Measured-ug/g	%Rec	QC Limits
2-Fluorophenol	6.67	3.77	57	25--121
Phenol-d5	6.67	3.92	59	24--113
Nitrobenzene-d5	3.33	2.07	62	23--120
2-Fluorobiphenyl	3.33	2.16	65	30--115
2,4,6-Tribromophenol	6.67	6.09	91	19--122
Terphenyl-d14	3.33	1.74	52	18--137

QUALIFIER CODE EXPLANATIONS AND NOTES:

Note: Results are reported on a wet weight basis. To convert a result to dry weight basis divide by 0.93.

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: _____ Reviewing Supervisor: _____ /disk3/SV5972.i/sb033199.b/31mar0901009.d

ENERGY LABORATORIES, INC.
P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325
FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

ient: MSE-HKM, Inc.
ate Sampled: 22-MAR-99 15:35
Date Received: 24-MAR-9
Analysis Date: 29-MAR-1999 22:44
Project Info: RHODIA, INC.
Sample Info: SCB-1

Lab No.: 003-99-50887
Report Date: 03/31/99 15:51
Extraction Method: EPA 5030
Sample Matrix: SOIL; Moisture=7%

EPA METHOD 8260A: VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/g (ppm)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Acetone	67-64-1	<10	U
Acrolein	107-02-8	<4.0	U
Acrylonitrile	107-13-1	<4.0	U
Benzene	71-43-2	<0.20	U
Bromobenzene	108-86-1	<0.20	U
Bromochloromethane	74-97-5	<0.20	U
Bromodichloromethane	75-27-4	<0.20	U
Bromoform	75-25-2	<0.20	U
Bromomethane	74-83-9	<0.20	U
n-Butylbenzene	104-51-8	<0.20	U
sec-Butylbenzene	135-98-8	<0.20	U
tert-Butylbenzene	98-06-6	<0.20	U
Carbon disulfide	75-15-0	<0.20	U
Carbon tetrachloride	56-23-5	<0.20	U
Chlorobenzene	108-90-7	<0.20	U
Chloroethane	75-00-3	<0.20	U
2-Chloroethylvinyl ether	110-75-8	<0.20	U
Chloroform	67-66-3	<0.20	U
Chloromethane	74-87-3	<0.20	U
2-Chlorotoluene	95-49-8	<0.20	U
4-Chlorotoluene	106-43-4	<0.20	U
Chlorodibromomethane	124-48-1	<0.20	U
1,2-Dibromo-3-chloropropane	96-12-8	<0.20	U
1,2-Dibromoethane	106-93-4	<0.20	U
Dibromomethane	74-95-3	<0.20	U
1,2-Dichlorobenzene	95-50-1	<0.20	U
1,3-Dichlorobenzene	541-73-1	<0.20	U
1,4-Dichlorobenzene	106-46-7	<0.20	U
Dichlorodifluoromethane	75-71-8	<0.20	U
1,1-Dichloroethane	75-34-3	<0.20	U
1,2-Dichloroethane	107-06-2	<0.20	U
1,1-Dichloroethene	75-35-4	<0.20	U
cis-1,2-Dichloroethene	156-59-2	<0.20	U
trans-1,2-Dichloroethene	156-60-5	<0.20	U
1,2-Dichloropropane	78-87-5	<0.20	U
1,3-Dichloropropane	142-28-9	<0.20	U
2,2-Dichloropropane	594-20-7	<0.20	U
1,1-Dichloropropene	563-58-6	<0.20	U
cis-1,3-Dichloropropene	10061-01-5	<0.20	U
trans-1,3-Dichloropropene	10061-02-6	<0.20	U
Ethylbenzene	100-41-4	<0.20	U
Hexachlorobutadiene	87-68-3	<0.20	U
2-Hexanone	591-78-6	<4.0	U
Iodomethane	74-88-4	<0.20	U
Methyl-t-butyl ether	1634-04-4	<0.20	U
Methyl isobutyl ketone	108-10-1	<4.0	U

(report continued on page 2)

EPA METHOD 8260A: VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/g (ppm)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Methylene chloride	75-09-2	<0.20	U
Methyl ethyl ketone	78-93-3	<4.0	U
Naphthalene	91-20-3	<0.20	U
Isopropylbenzene	98-82-8	<0.20	U
n-Propylbenzene	103-65-1	<0.20	U
p-Isopropyltoluene	99-87-6	<0.20	U
Styrene	100-42-5	<0.20	U
1,1,1,2-Tetrachloroethane	630-20-6	<0.20	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.20	U
Tetrachloroethene	127-18-4	<0.20	U
Toluene	108-88-3	<0.20	U
1,2,3-Trichlorobenzene	87-61-6	<0.20	U
1,2,4-Trichlorobenzene	120-82-1	<0.20	U
1,1,1-Trichloroethane	71-55-6	<0.20	U
1,1,2-Trichloroethane	79-00-5	<0.20	U
Trichloroethene	79-01-6	<0.20	U
Trichlorofluoromethane	75-69-4	<0.20	U
1,2,3-Trichloropropane	96-18-4	<0.20	U
1,3,5-Trimethylbenzene	108-67-8	<0.20	U
1,2,4-Trimethylbenzene	95-63-6	<0.20	U
Vinyl acetate	108-05-4	<0.20	U
Vinyl chloride	75-01-4	<0.20	U
m+p-Xylenes	108383/106423	<0.20	U
o-Xylene	95-47-6	<0.20	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added-ug/g	Measured-ug/g	%Rec	QC Limits
1,2-Dichloroethane d4	2.00	2.15	108	80--120
Toluene d8	2.00	1.91	96	80--120
p-Bromofluorobenzene	2.00	1.64	82	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

Note: Results are reported on a wet weight basis. To convert a result to dry weight basis divide by 0.93.

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: _____ Reviewing Supervisor: _____ /IONTRAP1.i/vb032999.b/09mar29.d

Appendix 5.5.3-D

Material Safety Data Sheet
UCAR Carbon Block and Brick, Grade D

UCAR CARBON COMPANY INC.
MATERIAL SAFETY DATA SHEET

UCAR CARBON REQUESTS THE USERS OF THIS PRODUCT TO STUDY THIS MATERIAL SAFETY DATA SHEET (MSDS) AND BECOME AWARE OF PRODUCT HAZARDS AND SAFETY INFORMATION. TO PROMOTE SAFE USE OF THIS PRODUCT, USERS SHOULD NOTIFY THEIR EMPLOYEES, AGENTS AND CONTRACTORS OF THE INFORMATION ON THIS MSDS AND ANY PRODUCT HAZARDS AND SAFETY INFORMATION.

UCAR CARBON COMPANY INC 39 OLD RIDGEBURY ROAD, DANBURY, CT 06817-0001	EMERGENCY TELEPHONE NUMBER 1-800-822-4357 (24 HOURS)
TRADE NAME UCAR(R) CARBON BLOCK AND BRICK, GRADE D, AND GRADE CJD	MSDS NUMBER 6014
CHEMICAL NAME CARBON BLOCK AND BRICK	SYNONYMS CARBON
ACGIH TLV - 1992-1993 OSHA PEL - 1989	DATE OF ISSUE / REVISION 1/93 2/94

1. HAZARDOUS INGREDIENTS

MATERIAL	PERCENT	ACGIH (TLV)	OSHA (PEL)
1. COAL (NO CAS NUMBER)	65-85	2 MG/M3 RESPIRABLE	2.4 MG/M3 RESPIRABLE
2. GRAPHITE (CAS #7782-42-5)	3-20	2.0 MG/M3 RESPIRABLE	5.0 MG/M3 RESPIRABLE
3. CARBON (CAS #7440-44-0)	11.6	10 MG/M3	15 MG/M3
4. CRYSTALLINE SILICA (CAS #14808-60-7)	< 3.0	0.1 MG/M3 RESPIRABLE	0.1 MG/M3 RESPIRABLE

2. PHYSICAL DATA

APPEARANCE BLACK SHAPES	ODOR NONE	MELT POINT > 5000 DEGREES F	SPECIFIC GRAVITY NOT APPLICABLE
VAPOR DENSITY (AIR=1) NOT APPLICABLE	% VOLATILE BY VOLUME NOT VOLATILE	BULK DENSITY 1.6 - 1.8 G/CC	BOILING POINT NOT APPLICABLE
VAPOR PRESSURE NOT APPLICABLE	% SOLUBILITY (H2O) NEGLIGIBLE	EVAPORATION RATE (BUOAC=1) NOT APPLICABLE	OTHER NOT APPLICABLE

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT & METHOD
NOT APPLICABLE

FLAMMABLE LIMITS
LEL - NOT APPLICABLE UEL - NOT APPLICABLE

EXTINGUISHING MEDIA
BULK MATERIAL IS NONCOMBUSTIBLE. DUSTS ARE COMBUSTIBLE - USE WATER, CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

SPECIAL FIRE FIGHTING PROCEDURES
MATERIAL IN OR NEAR FIRES SHOULD BE COOLED WITH A WATER SPRAY OR FOG. A SELF-CONTAINED BREATHING APPARATUS, OPERATING IN THE POSITIVE PRESSURE MODE, AND FULL FIRE-FIGHTING PROTECTIVE CLOTHING SHOULD BE WORN FOR COMBATING FIRES.

UNUSUAL FIRE AND EXPLOSION HAZARDS
THERMAL DECOMPOSITION OR COMBUSTION MAY PRODUCE DENSE SMOKE, OXIDES OF CARBON AND SILICON, AS WELL AS LOW MOLECULAR WEIGHT ORGANIC COMPOUNDS WHOSE COMPOSITIONS HAVE NOT BEEN CHARACTERIZED. FINELY DIVIDED CARBON DUSTS FORM POTENTIALLY EXPLOSIVE MIXTURES IN AIR AT CONCENTRATIONS GREATER THAN

4. HEALTH HAZARD DATA

LD50 ORAL (INGESTION)	LD50 DERMAL (SKIN CONTACT)	LD50 (INHALATION)
NOT ESTABLISHED FOR PRODUCT	NOT ESTABLISHED FOR PRODUCT	NOT ESTABLISHED FOR PRODUCT

PRIMARY ROUTE OF EXPOSURE	THRESHOLD LIMIT VALUES (TLV)
INHALATION OF DUSTS GENERATED DURING PROCESSING AND HANDLING AND DERMAL AND OCULAR CONTACT.	NOT ESTABLISHED FOR PRODUCT - SEE SECTIONS 1 AND 11

EFFECTS OF OVEREXPOSURE

ACUTE :

HIGH CONCENTRATIONS OF CARBON AND/OR CRYSTALLINE SILICA DUSTS MAY BE IRRITATING TO THE EYES, SKIN, MUCOUS MEMBRANES AND RESPIRATORY TRACT.

CHRONIC :

INHALATION OF HIGH CONCENTRATIONS OF CARBON DUSTS OVER PROLONGED PERIODS OF TIME MAY CAUSE CARBON PNEUMOCONIOSIS. SYMPTOMS CAN INCLUDE COUGH, SHORTNESS OF BREATH AND A DECREASE IN PULMONARY FUNCTION.

INHALATION OF HIGH CONCENTRATIONS OF CRYSTALLINE SILICA DUSTS OVER PROLONGED PERIODS OF TIME MAY CAUSE SILICOSIS, A PROGRESSIVELY DEBILITATING LUNG DISEASE. THE SYMPTOMS ARE SIMILAR TO THOSE CITED ABOVE FOR CARBON PNEUMOCONIOSIS. INHALATION OF HIGH CONCENTRATIONS OF CRYSTALLINE SILICA OVER PROLONGED PERIODS OF TIME HAS ALSO BEEN LINKED TO AN INCREASED INCIDENCE OF LUNG CANCER.

PREEXISTING PULMONARY DISORDERS SUCH AS EMPHYSEMA MAY POSSIBLY BE AGGRAVATED BY PROLONGED EXPOSURES TO HIGH CONCENTRATIONS OF CARBON AND/OR CRYSTALLINE SILICA DUSTS.

SEE SECTION 11.

5. EMERGENCY AND FIRST AID PROCEDURES

FOR OVEREXPOSURE TO PARTICULATE MATTER, MOVE THE EXPOSED PERSON TO FRESH AIR. IF BREATHING IS DIFFICULT, OXYGEN MAY BE ADMINISTERED. IF BREATHING HAS STOPPED, ARTIFICIAL RESPIRATION SHOULD BE STARTED IMMEDIATELY. SEEK MEDICAL ATTENTION.

IF THE MATERIAL ENTERS THE EYES, FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.

IF THE MATERIAL GETS ON THE SKIN, WASH THOROUGHLY WITH MILD SOAP AND WATER. SEEK MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS. DERMATITIS SHOULD BE TREATED SYMPTOMATICALLY BY A PHYSICIAN.

INGESTION IS NOT EXPECTED TO BE AN IMPORTANT ROUTE OF ENTRY INTO THE BODY. IF, HOWEVER, THE MATERIAL IS INGESTED, GIVE TWO GLASSES OF WATER AND INDUCE VOMITING. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. SEEK MEDICAL ATTENTION.

6. PHYSICAL HAZARDS

CARBON DUSTS ARE ELECTRICALLY CONDUCTIVE. ACCUMULATIONS OF DUST MAY CAUSE SHORTING OF ELECTRICAL CIRCUITS. CARE SHOULD BE TAKEN TO SEAL ELECTRICAL CIRCUITS AND SWITCHES THAT MAY BE AFFECTED. DUSTS SHOULD NOT BE EMITTED INTO THE ATMOSPHERE WHERE THEY MAY SETTLE ON AND CAUSE SHORTING OF OUTSIDE ELECTRICAL EQUIPMENT.

7. SPECIAL PROTECTION INFORMATION

VENTILATION
IF DUSTS ARE GENERATED DURING PROCESSING OR USE, LOCAL EXHAUST VENTILATION SHOULD BE PROVIDED TO MAINTAIN EXPOSURES BELOW THE LIMITS CITED IN SECTION 1. DESIGN DETAILS FOR LOCAL EXHAUST VENTILATION SYSTEMS MAY BE FOUND IN THE LATEST EDITION OF "INDUSTRIAL VENTILATION: A MANUAL OF RECOMMENDED PRACTICES" PUBLISHED BY THE ACGIH COMMITTEE ON INDUSTRIAL VENTILATION, P. O. BOX 16153, LANSING, MI 48910. THE NEED FOR LOCAL EXHAUST VENTILATION SHOULD BE EVALUATED BY A PROFESSIONAL INDUSTRIAL HYGIENIST. LOCAL EXHAUST VENTILATION SYSTEMS SHOULD BE DESIGNED BY A PROFESSIONAL ENGINEER.

RESPIRATORY
IF EXPOSURES EXCEED THE LIMITS CITED IN SECTION 1 BY LESS THAN A FACTOR OF 10, USE AS A MINIMUM A NIOSH APPROVED 1/2 FACEPIECE RESPIRATOR EQUIPPED WITH CARTRIDGES APPROVED FOR PARTICULATE MATTER WITH AN EXPOSURE LIMIT OF NOT LESS THAN 0.05 MG/M3. IF EXPOSURES EXCEED 10 TIMES THE LIMITS CITED IN SECTION 1, CONSULT A PROFESSIONAL INDUSTRIAL HYGIENIST OR YOUR RESPIRATORY PROTECTIVE EQUIPMENT SUPPLIER FOR SELECTION OF THE PROPER EQUIPMENT. THE EVALUATION OF THE NEED FOR RESPIRATORY PROTECTION SHOULD BE DETERMINED BY A PROFESSIONAL INDUSTRIAL HYGIENIST.

EYE PROTECTION
PROTECTIVE GLASSES WITH SIDESHIELDS SHOULD BE WORN TO PREVENT EYE CONTACT WITH PARTICULATE MATTER.

PROTECTIVE GLOVES:
PROTECTIVE GLOVES ARE RECOMMENDED TO PREVENT CUTS, ABRASIONS AND IRRITATION DURING HANDLING AND PROCESSING.

OTHER:
WHERE NORMAL WORK CLOTHES MAY BECOME SOILED WITH DUSTS, COVERALLS ARE RECOMMENDED. WASH SOILED CLOTHING BEFORE REUSE.

ALL CHEMICALS SHOULD BE HANDLED SO AS TO PREVENT EYE CONTACT AND EXCESSIVE OR REPEATED SKIN CONTACT. APPROPRIATE EYE AND SKIN PROTECTION SHOULD BE EMPLOYED. INHALATION OF DUSTS AND VAPORS SHOULD BE AVOIDED.

8. CHEMICAL REACTIVITY

CONDITION CAUSING INSTABILITY
NONE THAT ARE KNOWN. MATERIAL IS STABLE. HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

INCOMPATABILITY (MATERIALS TO AVOID)
AVOID CONTACT WITH STRONG OXIDIZING AND REDUCING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS
SEE SECTION 3 FOR POSSIBLE COMBUSTION AND/OR THERMAL DECOMPOSITION PRODUCTS. THESE WOULD BE EXPECTED ONLY DURING EMERGENCY CONDITIONS.

SPECIAL SENSITIVITY
NONE THAT ARE KNOWN.

9. STORAGE INFORMATION

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
STORE AWAY FROM HEAT, SPARKS, OPEN FLAMES AND OTHER SOURCES OF IGNITION. DO NOT STORE WITH OR NEAR INCOMPATIBLE CHEMICALS CITED IN SECTION 8. DO NOT LET MATERIAL ACCUMULATE IN THE WORKPLACE. PROMPTLY CLEAN UP ANY SPILLS THAT MAY OCCUR. ANY DUSTS GENERATED DURING HANDLING OR PROCESSING SHOULD BE CLEANED UP BY WET MOPPING OR VACUUMING WITH A HEPA FILTER. DRY SWEEPING CAN RESUSPEND PARTICULATE MATTER INTO THE ATMOSPHERE.

10. SPILL, LEAK, AND DISPOSAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS SPILLED OR RELEASED
SPILLED OR RELEASED MATERIAL SHOULD BE PICKED UP WITH A SUITABLE IMPLEMENT. IF NOT REUSABLE, THE MATERIAL SHOULD BE PLACED IN DOT APPROVED CONTAINERS FOR DISPOSAL. PERSONNEL INVOLVED IN THE CLEANUP SHOULD WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. SEE SECTION 7. UNAUTHORIZED PERSONNEL SHOULD BE KEPT CLEAR OF THE AREA OF SPILLS OR RELEASES. DO NOT ALLOW MATERIAL TO ENTER STORM OR SANITARY SEWERS, GROUNDWATER OR SOIL. RELEASES MAY BE REPORTABLE TO LOCAL, STATE OR FEDERAL AUTHORITIES.

EPA RCRA ID NUMBER
NOT APPLICABLE.

WASTE DISPOSAL METHOD
MATERIAL SHOULD BE DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS. DISPOSAL IN AN EPA APPROVED LANDFILL IS RECOMMENDED.

7. SPECIAL PROTECTION INFORMATION

VENTILATION
IF DUSTS ARE GENERATED DURING PROCESSING OR USE, LOCAL EXHAUST VENTILATION SHOULD BE PROVIDED TO MAINTAIN EXPOSURES BELOW THE LIMITS CITED IN SECTION 1. DESIGN DETAILS FOR LOCAL EXHAUST VENTILATION SYSTEMS MAY BE FOUND IN THE LATEST EDITION OF "INDUSTRIAL VENTILATION: A MANUAL OF RECOMMENDED PRACTICES" PUBLISHED BY THE ACGIH COMMITTEE ON INDUSTRIAL VENTILATION, P. O. BOX 16153, LANSING, MI 48910. THE NEED FOR LOCAL EXHAUST VENTILATION SHOULD BE EVALUATED BY A PROFESSIONAL INDUSTRIAL HYGIENIST. LOCAL EXHAUST VENTILATION SYSTEMS SHOULD BE DESIGNED BY A PROFESSIONAL ENGINEER.

RESPIRATORY
IF EXPOSURES EXCEED THE LIMITS CITED IN SECTION 1 BY LESS THAN A FACTOR OF 10, USE AS A MINIMUM A NIOSH APPROVED 1/2 FACEPIECE RESPIRATOR EQUIPPED WITH CARTRIDGES APPROVED FOR PARTICULATE MATTER WITH AN EXPOSURE LIMIT OF NOT LESS THAN 0.05 MG/M3. IF EXPOSURES EXCEED 10 TIMES THE LIMITS CITED IN SECTION 1, CONSULT A PROFESSIONAL INDUSTRIAL HYGIENIST OR YOUR RESPIRATORY PROTECTIVE EQUIPMENT SUPPLIER FOR SELECTION OF THE PROPER EQUIPMENT. THE EVALUATION OF THE NEED FOR RESPIRATORY PROTECTION SHOULD BE DETERMINED BY A PROFESSIONAL INDUSTRIAL HYGIENIST.

EYE PROTECTION
PROTECTIVE GLASSES WITH SIDESHIELDS SHOULD BE WORN TO PREVENT EYE CONTACT WITH PARTICULATE MATTER.

PROTECTIVE GLOVES:
PROTECTIVE GLOVES ARE RECOMMENDED TO PREVENT CUTS, ABRASIONS AND IRRITATION DURING HANDLING AND PROCESSING.

OTHER:
WHERE NORMAL WORK CLOTHES MAY BECOME SOILED WITH DUSTS, COVERALLS ARE RECOMMENDED. WASH SOILED CLOTHING BEFORE REUSE.

ALL CHEMICALS SHOULD BE HANDLED SO AS TO PREVENT EYE CONTACT AND EXCESSIVE OR REPEATED SKIN CONTACT. APPROPRIATE EYE AND SKIN PROTECTION SHOULD BE EMPLOYED. INHALATION OF DUSTS AND VAPORS SHOULD BE AVOIDED.

8. CHEMICAL REACTIVITY

CONDITION CAUSING INSTABILITY
NONE THAT ARE KNOWN. MATERIAL IS STABLE. HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

INCOMPATIBILITY (MATERIALS TO AVOID)
AVOID CONTACT WITH STRONG OXIDIZING AND REDUCING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS
SEE SECTION 3 FOR POSSIBLE COMBUSTION AND/OR THERMAL DECOMPOSITION PRODUCTS. THESE WOULD BE EXPECTED ONLY DURING EMERGENCY CONDITIONS.

SPECIAL SENSITIVITY
NONE THAT ARE KNOWN.

9. STORAGE INFORMATION

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
STORE AWAY FROM HEAT, SPARKS, OPEN FLAMES AND OTHER SOURCES OF IGNITION. DO NOT STORE WITH OR NEAR INCOMPATIBLE CHEMICALS CITED IN SECTION 8. DO NOT LET MATERIAL ACCUMULATE IN THE WORKPLACE. PROMPTLY CLEAN UP ANY SPILLS THAT MAY OCCUR. ANY DUSTS GENERATED DURING HANDLING OR PROCESSING SHOULD BE CLEANED UP BY WET MOPPING OR VACUUMING WITH A HEPA FILTER. DRY SWEEPING CAN RESUSPEND PARTICULATE MATTER INTO THE ATMOSPHERE.

10. SPILL, LEAK, AND DISPOSAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS SPILLED OR RELEASED
SPILLED OR RELEASED MATERIAL SHOULD BE PICKED UP WITH A SUITABLE IMPLEMENT. IF NOT REUSABLE, THE MATERIAL SHOULD BE PLACED IN DOT APPROVED CONTAINERS FOR DISPOSAL. PERSONNEL INVOLVED IN THE CLEANUP SHOULD WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. SEE SECTION 7. UNAUTHORIZED PERSONNEL SHOULD BE KEPT CLEAR OF THE AREA OF SPILLS OR RELEASES. DO NOT ALLOW MATERIAL TO ENTER STORM OR SANITARY SEWERS, GROUNDWATER OR SOIL. RELEASES MAY BE REPORTABLE TO LOCAL, STATE OR FEDERAL AUTHORITIES.

EPA RCRA ID NUMBER
NOT APPLICABLE.

WASTE DISPOSAL METHOD
MATERIAL SHOULD BE DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS. DISPOSAL IN AN EPA APPROVED LANDFILL IS RECOMMENDED.

1. NOTICE FROM UCAR CARBON COMPANY INC. THE DATA IN THIS MATERIAL SAFETY DATA SHEET RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED HEREIN AND DOES NOT RELATE TO USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY PROCESS. THE OPTIONS EXPRESSED HEREIN ARE THOSE OF QUALIFIED EXPERTS WITHIN UCAR CARBON COMPANY INC. WE BELIEVE THAT THE INFORMATION CONTAINED HEREIN IS CURRENT AS TO THE DATE OF ISSUE OF THIS MATERIAL SAFETY DATA SHEET. SINCE THE USE OF THIS INFORMATION AND THESE OPTIONS AND THE CONDITIONS OF USE OF THE PRODUCT ARE NOT WITHIN THE CONTROL OF UCAR CARBON COMPANY INC., IT IS THE USER'S OBLIGATION TO DETERMINE THE CONDITIONS OF SAFE USE OF THIS PRODUCT.

2. THE CRYSTALLINE SILICA (14808-60-7) COMPONENT OF THIS FORMULATION IS LISTED AS AN ANIMAL CARCINOGEN AND A PROBABLE HUMAN CARCINOGEN BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC). IT HAS NOT BEEN LISTED AS A CARCINOGEN OR POTENTIAL CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM (NTP) OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

3. WARNING: THE CRYSTALLINE SILICA COMPONENT OF THIS FORMULATON HAS BEEN IDENTIFIED AS A "CHEMICAL KNOWN TO CAUSE CANCER" BY THE STATE OF CALIFORNIA.

Appendix 5.5.3-E

Correspondence between Rhodia and U.S. EPA Concerning Used Brick and Carbon Pile Work Plan

Silver Bow Plant
P.O. Box 3146
Butte, MT 59702
406-782-1215
406-782-4498 (FAX)

May ~~28~~ 23, 2008

Sara Sparks
RCRA Project Manager for Rhodia Inc., Silver Bow Plant
U.S. EPA, Region 8, Butte Office
Butte/Silver Bow Courthouse
Butte, MT 59701

Re: Used Brick and Carbon Pile

Dear Ms. Sparks:

Thank you for meeting with Cam, Mark Smith, Tim Whiteus, Becky Holmes and myself on Friday, May 16, 2008. Below is the plan to which we agreed and the additional issues that were discussed. As we mentioned in the meeting, work will begin on site during the week of June 9, 2008.

Phase 1: Segregate the furnace electrodes and carbon block from the furnace brick. Since our testing showed that the brick could be contaminated with elemental phosphorus, this material will be placed into drums and classified as hazardous waste. We would then core sample each block and electrode, using the procedure developed for the pilot test conducted by Kase-Warbonnet.

- For the electrodes, four samples would be taken from each piece. If all of the samples for an electrode do not ignite and smoke when crushed, that electrode would be considered to be clean. If an electrode sample ignites and smokes, that electrode would be classified as hazardous waste.
- For the carbon blocks, six samples would be taken from each piece. If all of the samples for a block do not ignite and smoke when crushed, that block would be considered to be clean. If a block sample ignites and smokes, that block would be classified as hazardous waste.

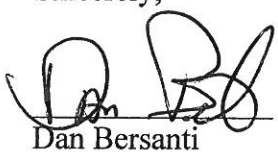
Phase 2: As the testing proceeds, a new pile will be created of electrodes that do not smoke and ignite, as well as a new pile of carbon blocks that do not smoke and ignite. Rhodia will proceed to arrange for either recycling of these electrodes and/or the block, or we will have them disposed as non-hazardous wastes. Any electrodes and carbon blocks that smoked and ignited will be either sized and placed in drums or placed back into the area of the existing carbon pile and later sized and placed in drums. This material will be classified as hazardous waste.

Other issues relating to this project regarding the process were also discussed. Below is a list of these issues and the agreement that was reached.

1. In accordance with Section XX of the 3008(h) Order, any of the carbon that is determined to be hazardous waste may be accumulated in the pile and for more than 90 days in drums on-site. For example, more than 90 day accumulation may be necessary when waiting until there is a full load of drums of hazardous waste before a shipment is made to the incinerator. All drums that are filled with hazardous waste will be shipped before the end of 2008.
2. The number of samples for small pieces of carbon and electrodes will be determined by the size of the piece and will be determined in the field. Pieces that are roughly half the size of a full piece will have half the number of samples. However, any piece that is kept for recycle will be sampled at least once.
3. Large carbon pieces outside of the containment area (west of the brick pile) and electrodes north of the office building will be sampled in place.
4. Bird netting covering the pile and the fence around the pile will be partially removed to allow access to the brick pile. This netting and fence will be re-installed over the remaining brick at the end of the project if it is not completed in 2008.
5. Contaminated carbon blocks, electrodes and brick will be sized in a 5' x 5' metal pan so that this material can be placed in drums.
6. Carbon paste that adheres to a block or electrode will be removed and placed in a drum and classified as hazardous waste. The block or electrode will then be sampled.
7. Work will begin in June, 2008 and will continue until weather forces the project to be stopped or the project is complete. Remaining carbon will be sampled in 2009. Work will commence in 2009 as weather permits.

We look forward to completing this project in 2008 and removing this issue from consideration in future work at the site.

Sincerely,



Dan Bersanti

Cc: Rebecca Holmes
Mark Smith
Tim Whiteus
Floyd Balentine

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 W. 15th STREET, SUITE 3200
HELENA, MONTANA 59626

Ref: 8MO

May 28, 2008

Mr. Dan Bersanti
Rhodia
Silver Bow Plant
P.O. Box 3146
Butte, MT 59702

Re: Agency Comments on Rhodia's letter dated May 23, 2008 concerning the Used Brick and Carbon Pile.

Dear Dan:

The U. S. Environmental Protection Agency (EPA) and the Montana Department of Environmental Quality (DEQ) have reviewed your May 23, 2008 Brick and Carbon Pile workplan. The Agencies have two points that need to be clarified. The first is the definition of ignitibility. The document uses the terms smokes and ignites as the determination of the brick being a hazardous waste. The Agencies agree with Rhodia that these terms may be used FOR the IGNITIBILITY determination ON THE MATERIALS IN the brick pile. However, the definition of ignitibility for other materials at the Rhodia site will be determined as we move forward in the process. Second, the Agencies encourage Rhodia to complete the work during 2008; however, Rhodia shall complete the project, including shipping of all hazardous waste off-site for disposal by December 2009.

As set forth in paragraph XIII.A.1.b.of the Corrective Action Order on Consent, Docket No. RCRA-8-2004-0001, this preliminary approval with modifications letter triggers the requirement that Rhodia obtain financial assurance for this portion of the waste plan. Please send all documents relating to financial assurance to me, with a copy to Chuck Figur in our Denver office. Also please be advised that EPA believes it is appropriate for Rhodia to begin work before the financial assurance instrument is in place.

If you have technical questions or concerns, please contact me at (406) 782-7415. If you have legal questions or concerns, please contact Charles Figur at (303) 312-6915.

Sincerely,

Sara Sparks
Remedial Project Manager

cc: Charles Figur; 8ENF-L(e-mail copy)
Rebecca Holmes; MDEQ
Mark Hall; MDEQ
John Wardell; 8MO(e-mail copy)
Phebe Davol; BAH(e-mail copy)
Julie DalSolglio; 8MO(e-mail copy)

Appendix 5.5.3-F

Completion Report – Used Carbon and Electrode Project (Design Work Plan, U.S. EPA Correspondence and Work Plan Modifications included as Attachments)

Rhodia's Completion Report

Used Carbon and Electrode Project

Silver Bow, Montana

April 9, 2009

Completion Report
For the
Used Carbon and Electrode
Project

Table of Contents

List of Attachments

Completion Report
For the
Used Carbon and Electrode
Project

April 9, 2009

1.0 Introduction:

This Completion Report was prepared pursuant to the Amended Administrative Order under RCRA 7003 ("7003 Order") that was issued to Rhodia Inc. by EPA, Region 8 on December 27, 2000. The 7003 Order requires Rhodia to undertake certain activities related to the used brick and electrode piles at Rhodia's Silver Bow Plant near Butte, Montana. These activities were described in the Design Work Plan, Used Carbon Brick and Furnace Liner Pile that was approved by the EPA on May 28, 2008. A copy of the approved Work Plan is provided as Attachment A. EPA correspondence related to the used brick and carbon pile is contained in Attachment B.

KASE/Warbonnet, located in Pocatello, Idaho, was awarded the contract for this project. Their work began in June 2008 and was completed by the end of the year.

1.1 Work Plan Activities:

The following tasks were completed in accordance with the approved Work Plan.

Phase 1: The furnace electrodes and carbon block were segregated from the furnace brick. The furnace brick was placed into drums and classified as hazardous waste since the pilot test demonstrated that the brick could be contaminated with elemental phosphorus. Each carbon block and electrode was cored using the procedure developed for the pilot test conducted by KASE/Warbonnet.

- For the electrodes, four samples were cored from each piece. If all of the samples for an electrode did not ignite and smoke when crushed, that electrode was considered to be clean. If an electrode sample ignited and smoked, that electrode was managed as hazardous waste.
- For the carbon blocks, six samples were cored from each piece. If all of the samples for a block did not ignite and smoke when crushed, that block was considered to be clean. If a block sample ignited and smoked, that block was managed as hazardous waste.

Phase 2: As the testing progressed, a new pile of electrodes and carbon block that did not smoke and ignite was created. Rhodia arranged for recycling of the electrodes and block that were of the correct size at Pamas and Company in Elberton, Georgia. Clean electrodes and carbon blocks that were not recycled remain in a pile at the Plant and will

be managed as non-hazardous solid waste. Electrodes and carbon blocks that smoked and ignited were either sized and placed in drums, or temporarily placed back into the existing carbon pile and were later sized and placed in drums. This material was managed as hazardous waste. This hazardous waste was incinerated at Heritage Environmental in Sauget, Illinois.

Other procedures authorized under the approved Work Plan are listed below.

1. In accordance with Section XX of the 3008(h) Order, any of the carbon that was determined to be hazardous waste could be accumulated in the pile and for more than 90 days in drums on-site. For example, more than 90 day accumulation could be necessary when waiting until there was a full load of drums of hazardous waste before a shipment was made to the incinerator. All drums that were filled with hazardous waste were shipped before the end of 2008.
2. The number of samples for small pieces of carbon and electrodes was determined by the size of the piece and was determined in the field. Pieces that were roughly half the size of a full piece had half the number of samples. However, any piece that was kept for recycle was sampled at least once.
3. Large carbon pieces outside of the containment area (west of the brick pile) and electrodes north of the office building were sampled in place.
4. Bird netting covering the pile and the fence around the pile was partially removed to allow access to the brick pile. This netting and fence would have been re-installed over the remaining brick at the end of the project if it was not completed in 2008.
5. Contaminated carbon blocks, electrodes and brick were sized in a 5' x 5' metal pan so that this material could be placed in drums.
6. Carbon paste that adhered to a block or electrode was removed, placed in a drum and classified as hazardous waste. The block or electrode was then cored.
7. Work began in June, 2008 and continued until the project was complete.

There was a clarification to the Work Plan proposed by Kase Warbonnet on June 25, 2008 and accepted by EPA to address material encountered during the work that was not addressed in the Work Plan. Specifically, early sampling found that carbon paste was not smoking and igniting, and therefore, rather than remove it from blocks and manage it as hazardous waste, it was left on blocks and core sampled. Carbon debris (material generally smaller than a microwave oven) and carbon rubble (material generally smaller than a quart jar) was removed from the brick pile enclosure and stockpiled. This material will be treated as solid waste and will be either landfilled on-site or sent off-site to a landfill. Details of this clarification are included as Attachment C.

Additional details of the project including sampling results, tracking logs, safety, procedures, and photos are provided in the compact disc in Attachment E.

2.0 Project Completion Schedule:

June 6, 2008 – Project start date.

June 23, 2008 – First Project Report for work completed through June 20, 2008 was submitted by Kase Warbonnet to Rhodia.

- 985 samples taken
- 2 samples failed
- No drums of hazardous waste shipped

July 7, 2008 – Second Project Report for work completed June 21, 2008 through July 4, 2008 was submitted by Kase Warbonnet to Rhodia.

- 1491 samples taken
- 2 samples failed
- No drums of hazardous waste shipped

August 11, 2008 – Third Project Report for work completed July 4, 2008 through August 1, 2008 was submitted by Kase Warbonnet to Rhodia.

- 1866 samples taken
- 2 samples failed
- No drums of hazardous waste shipped

September 4, 2008 - First shipment of hazardous waste sent to Heritage Environmental

September 29, 2008 - Second shipment of hazardous waste sent to Heritage Environmental. Final day of work for Kase/Warbonnet

January 19, 2009 - Final shipment of used carbon shipped off-site to be recycled

3.0 Material Recycled:

Carbon blocks and electrodes of the correct size that were determined to be clean were able to be recycled by Pamas and Company in Elberton, Georgia. As of January 19, 2009, 1,636,000 pounds of carbon and electrodes (818 tons) have been recycled. Copies of the shipping papers for the recycled materials are contained in Attachment F.

4.0 Waste Generated:

1. Hazardous Waste
   During this project, a total of 80,200 pounds of hazardous waste was generated. This material was placed into 30 gallon drums (108 drums) and shipped to Heritage Environmental Services in Sauget, Illinois for incineration. All hazardous waste from this project was shipped off-site in 2008. Copies of the hazardous waste manifests are contained in Attachment G.

2. Carbon and Electrodes
   A portion of the carbon blocks and electrodes were too small to be recycled, even though they were determined to be clean. This material, approximately 200,000 pounds (100 tons) was piled on-site and will be managed as non-hazardous solid waste.

3. Soil Piles
   Part of the used carbon and electrodes were covered in soil. Additional soil was disturbed as the carbon was removed from the stockpile. The soil was placed in three piles within the enclosure area (SP-1, SP-2, and SP-3). As requested by EPA, these piles were sampled and tested for TCLP metals (Attachment D). The results showed that this material does not exhibit a hazardous characteristic. This material will be sampled using a hand held Niton XRF analyzer during the summer of 2009. If the metals are below action levels, the soil will be used as fill on site.

5.0 Sampling Results:

The totals for the project are:

	Carbon Block	Electrodes
Pieces Sampled	2396	74
Cores Crushed	7031	276
Pieces failing crush test	8	0
Samples failing crush test	15	0

- All brick was considered to be hazardous waste. The hazardous waste brick and the eight pieces of hazardous waste carbon were containerized in 108 (30) gallon drums and disposed off-site as hazardous waste.

Attachment A

DESIGN WORK PLAN
USED CARBON BRICK AND FURNACE LINER PILE

ADMINISTRATIVE ORDER § 7003
DOCKET NO. RCRA-8-2000-07

Rhodia Silver Bow Plant
Butte, Montana

June 9, 2006

Design Work Plan
Used Carbon Brick and Furnace Liner Pile

Table of Contents

List of Figures

List of Attachments

1.0 Introduction

Pursuant to the RCRA §7003 Administrative Order in Docket No. RCRA-8-2000-07, the Corrective Action Order on Consent in Docket to RCRA-08-2004-0001,[1] and the May 23, 2006 letter from Sara Sparks to Dan Bersanti, Rhodia Inc. ("Rhodia") is pleased to present this Design Work Plan to EPA regarding the used carbon materials from the furnaces (liner, electrodes, and brick) (hereafter "carbon" or "brick") at Rhodia's Silver Bow Plant, near Butte, Montana, as depicted on Figure 1. This Work Plan summarizes the proposed activities related to inspecting all of the material in the brick pile, cleaning pieces of brick that have visible elemental phosphorus present, shipping elemental phosphorus to a hazardous waste incinerator, and managing the clean and decontaminated brick.

1.1 Work Plan Activities

The following tasks are proposed:

- Inspect each individual piece of brick located in the brick pile for a veneer of elemental phosphorus.

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[1] Section XX of the 3008(h) Corrective Action Order on Consent provides:

> "XX. *Other Applicable Laws.*
>
> *The Parties recognize and agree that the storage, treatment or disposal of any hazardous waste at the Facility may continue under this Order and the 7003 Order without Respondent having to meet applicable hazardous waste management standards or obtain a hazardous waste management permit, and Respondent shall not be deemed out-of-compliance with any applicable law or regulation relating to hazardous waste, including the requirement to obtain a hazardous waste permit, provided Respondent is otherwise in compliance with this Order ….*"

This provision allows the storage, treatment and disposal of the carbon to be done in a manner that is considered protective by EPA, but not necessarily in accordance with hazardous waste management requirements. Similarly, RCRA §7003, which is the authority for the Order regarding the brick pile, begins "*Notwithstanding any other provision of this Chapter ....*" This clause has been interpreted by EPA to allow management of waste in a protective fashion but not necessarily in accordance with all hazardous waste management requirements.

- Segregate the pieces of brick that contain no visible veneer of elemental phosphorus ("clean brick") from the brick with a visible veneer of elemental phosphorus[2] ("contaminated brick") by stockpiling clean brick and transporting the contaminated brick to the cleaning pad.

- Containerize any loose elemental phosphorus found during the segregation activities.

- Clean the contaminated brick and place all elemental phosphorus residue in drums

- Test pieces of the decontaminated and clean brick, using core sampling, to verify the brick does not exhibit the characteristic of ignitability.

- Stockpile decontaminated and clean carbon for landfilling on-site, landfilling off-site, or for recycling as scrap.

- Arrange for off-site transportation and incineration of drums of elemental phosphorus material.

1.2 Work Plan Organization

This document provides the following information:

- Section 2.0 Proposed Field Activities and Methods

- Section 3.0 Schedule

- Section 4.0 Reporting

- Section 5.0 Modifications

[2] Elemental phosphorus appears as red "amorphous" phosphorus when it is on the veneer of furnace carbon.

2.0 Field Activities and Methods

This Section describes the anticipated work that will be needed to inspect each piece of carbon in the brick pile, clean it if necessary, and manage all residuals.

2.1 Site Preparation/Maintenance and Site Security

The following activities will be conducted prior to the onset of any work:

1. Project health and safety plan will be reviewed and updated by Contractor as necessary to include planned activities.

2. Remove netting and portions of the chain link fence to create an open work area.

The following activities will be conducted on an "as-needed" basis during the work:

1. Contractor will provide measures necessary to control dust and, if necessary, any fires at the Work Area. Water and/or dust suppressant will be applied to the work and transportation areas to minimize the generation of dust and fires, if necessary, from excavation, hauling of contaminated carbon, hauling clean carbon, and moving drums.

2.2 Inspection/Segregation/Transportation Sequence

Work will begin on the northwest side of the pile and progress to the south and east. The netting and fence will be removed from the work area as necessary. It is anticipated that the contractor will use a track-mounted excavator, or similar hydraulic equipment, equipped with a "thumb" to remove carbon from the brick pile. The excavator will first remove the pieces closest to the perimeter of the pile and a contractor will inspect each piece. The contractor will also inspect the soil beneath and around the removed piece of carbon for visible loose elemental phosphorus material. Any loose elemental phosphorus material that is found will be placed in thirty (30) gallon drums following the procedure detailed in Attachment A. Drums of elemental phosphorus material will be labeled as "Hazardous Waste." The date each drum is filled will be marked on each container, and this will be the "start-date" for its 90-day accumulation. At the end of each day, the filled drums will be transported to the drum storage pad. The drums will be managed at the Plant according to the less-than 90-day generator rules at 40 CFR § 262.34.
Clean pieces of carbon will be stockpiled in an area north of the current brick pile. Pieces of clean carbon will be tested, using core sampling, to confirm that it does not exhibit the

characteristic of ignitability (*See* Section 2.5 and Attachments C and D). Carbon that does contain a visible veneer of elemental phosphorus will be transported to the cleaning pad.

2.3 Cleaning Brick and Managing Residues

Carbon will be cleaned in accordance with the procedures in Attachment B. The cleaning pad is approximately 50' x 50' concrete area with an underlying leak collection system made of high density polyethylene and perforated HDPE pipe. Any leaks through the concrete pad would be conveyed through the leak collection system to a standpipe, which can be monitored and pumped, if needed. The cleaning pad consists of a drum storage area, staging area and cleaning area. The cleaning area includes an inclined pad designed to direct water and residual phosphorus to a collection sump. The sump is covered with metal grating and has a sloped bottom that is designed to collect residue in the end of the sump. The cleaning area is surrounded on three sides by an eight (8) feet high, metal wall. This walled cleaning pad was accepted by EPA and MDEQ for use in cleaning the discharge pipe under an Administrative Order on Consent, and it worked well for that purpose.

Each piece of carbon and any other material or equipment requiring cleaning will be washed with hot water with a high-pressure washer. Spraying will be done in a manner so that wash water is directed downward onto the cleaning pad or into a large metal container, which will be on the cleaning pad and used as a "wash tub" for the spraying operation. After washing, the surface of each decontaminated brick will be heated with a propane torch to burn off any microns of elemental phosphorus that may not have been removed by washing.

The carbon will be treated to meet land disposal restriction standards at 40 CFR Part 268 in one of three ways:

(1) Meet the alternative treatment standard for debris at 40 CFR § 268.45, Table 1, Section A.1.e. This treatment standard involves the use of high pressure steam or water to achieve "a clean debris surface" and to remove at least 0.6 centimeters of carbon.

If the alternative treatment standard for debris described above cannot be met, one of the following two standards will be met:

(2) The alternative debris standard involving water washing and spraying at 40 CFR § 268.45, Table 1, Section A.2.a. and a waiver will be obtained regarding the thickness limit based on an approval of an "equivalent technology" demonstration under 40 CFR § 268.42(b), or

(3) The normal LDR treatment standard for D001 ignitable (low TOC), which require deactivating the carbon by removing the phosphorus materials so the carbon is not ignitable and meeting universal treatment standards for underlying hazardous constituents.

All elemental phosphorus-containing residue will be either collected in a drum, or in a large metal container or the collection sump, from which the residue will be removed and placed in a drum. All elemental phosphorus will be drummed. The elemental phosphorus in the drums will be covered with water to prevent the phosphorus material from being exposed to air, following the procedure detailed in Attachment A. Each drum will be covered loosely to facilitate measurement of the pH each working day, and, as necessary, the addition of a buffer to adjust the pH. After the pH adjusts to a neutral range, the cover of each drum will be tightened. The drums will be labeled as "Hazardous Waste." Each drum will bear the 90-day accumulation period "start-date" that corresponds to the date on which the drum was initially filled. This method for handling the elemental phosphorus was accepted by EPA and MDEQ with regard to the discharge pipe project, and it worked well. All drums of phosphorus material will be manifested and sent off-site within 90 days as a Hazardous Waste for incineration and disposal and in accordance with the land disposal restriction requirements in 40 CFR Part 268. All drums of elemental phosphorus material will be shipped from the Plant to the incineration facility in accordance with Department of Transportation hazardous materials regulations in 49 CFR Subchapter C.

2.4 Disposal and Recycling

Rhodia will use the following approach to demonstrate, as referenced in Sara Sparks' May 23, 2006 letter to Dan Bersanti, that visual identification is a practical way of identifying the pieces of carbon that require cleaning and that the clean carbon and decontaminated carbon do not have sufficient elemental phosphorus under the surface to cause the carbon to be considered ignitable hazardous waste. In addition, the sampling method will be used to classify the carbon as nonhazardous for on-site or off-site landfilling or recycling as scrap.

First, Rhodia will take core samples of five pieces of clean carbon. The coring method is described in Attachment C, which is a procedure from the contractor Rhodia plans to use. The pieces of clean carbon that will be sampled will be randomly selected from among pieces that do not have a visible veneer of elemental phosphorus. The cores will be crushed (Attachment D) and observed to determine if they are ignitable, *i.e.*, flame and burn vigorously and persistently. If not ignitable, the clean carbon will be considered nonhazardous. Confirmatory sampling will

also occur by taking a core of every 50th piece of clean carbon that is segregated and stockpiled for future handling. In the event that any core sample of the clean carbon is ignitable when crushed, Rhodia will continue to sample the clean carbon (the pieces without a visible veneer of elemental phosphorus) in the same proportion as the number of core samples that were found to be ignitable. For example, if only one of the five core samples are found to be ignitable, Rhodia will sample 20% of all pieces of clean carbon.

With regard to the decontaminated pieces of carbon, *i.e.*, those that have had their veneer of elemental phosphorus removed through the washing procedure described above, Rhodia will also sample the first five pieces of carbon that have been cleaned by taking a core sample. The core sample will be crushed and will be observed to determine if it is ignitable. If none of the core samples are ignitable, Rhodia will continue to sample every 25th piece of decontaminated carbon. If any core sample does ignite, a sampling frequency will be established based on the number of core samples that were ignitable versus those that were not ignitable. For example, if 2 of 5 core samples are ignitable, the frequency of future core sampling will be set at 40%.

Any piece of carbon that has been sampled and found to ignite will be either: (1) further cleaned, core sampled, and determined not to be ignitable; or (2), stored temporarily in the original brick pile surrounded by fencing and netting pending additional evaluation by Rhodia, EPA and MDEQ of available options. If, by chance, a large portion of the clean and/or decontaminated carbon pieces that are core-sampled is found to be ignitable, this brick pile project can be suspended pending additional evaluation by Rhodia, EPA and MDEQ of available options.

Any piece of carbon that has been tested and found not to ignite, may be landfilled on-site as nonhazardous waste, or sent off-site for disposal in a nonhazardous waste landfill or for recycling as scrap.

Other pieces of clean carbon that were not themselves tested may be landfilled on-site as nonhazardous waste, or sent off-site as nonhazardous waste for landfilling or as scrap, provided at least 90% of the core samples of the clean carbon are found not to be ignitable. In the event less than 90% of the core samples of the clean carbon are found not to be ignitable, the unsampled pieces of clean carbon may only be landfilled on-site.

With respect to the decontaminated pieces of carbon, if 90% or more of the core samples of the decontaminated carbon are found not to be ignitable, all of the pieces of unsampled decontaminated carbon may be landfilled on-site as nonhazardous waste or sent off-site as nonhazardous waste to a landfill or for recycling as scrap. If less than 90% of the core samples of the decontaminated carbon are found not to be ignitable, the unsampled pieces of the

decontaminated carbon must be landfilled on-site, and not sent off-site for landfilling or recycling as scrap.

3.0 Schedule

Work will begin within forty-five (45) days after receiving written approval of the Work Plan by EPA. Work will continue as long as weather conditions allow. If all carbon is not cleaned in 2006, the remaining carbon will be cleaned in the 2007 construction season.
The preliminary schedule was originally presented to the EPA in a May 11, 2006 email to Sara Sparks, U.S. EPA from Dan Bersanti, Rhodia Inc. Figure 3 presents a revised preliminary schedule that includes the EPA's selection of the corrective measure and shortens the time period to begin on-site work.

4.0 Completion Report

Within 30 days of completion of all work specified in the Work Plan, Rhodia shall provide EPA and MDEQ with a written report explaining the details and confirming the completion of the work pursuant to this Work Plan.

5.0 Modifications

Any procedure herein may be modified if agreed to by Rhodia and US EPA Region 8. In the event of an emergency situation where obtaining prior agreement to modify this Work Plan is not feasible, Rhodia may alter procedures specified herein in a manner that will prevent or mitigate harm or the threat of harm to the workers, other humans and/or the environment. In such event, the changed procedures shall be reported as promptly as possible to US EPA Region 8 with copies to the Montana Department of Environmental Quality.

Silver Bow Plant

P.O. Box 3146
Butte, MT 59702
406-782-1215
406-782-4498 (FAX)

April 25, 2008

Sara Sparks
RCRA Project Manager for Rhodia Inc., Silver Bow Plant
U.S. EPA, Region 8, Butte Office
Butte/Silver Bow Courthouse
Butte, MT 59701

Re: Used Brick and Carbon Pile

Dear Ms. Sparks:

Thank you for meeting with Cam, Jim and myself on Thursday, April 17, 2008. I think the meeting gave us a better understanding of what is needed to modify the RFI Work Plan so that it meets your approval.

As we discussed, Rhodia is willing to start work on the Used Brick and Carbon Pile this summer. I would propose to plan this work for 2 phases. They are:

Phase 1: Segregate the furnace electrodes and carbon block from the furnace brick. Since our testing showed that the brick could be contaminated with elemental phosphorus, this material will be left in the existing pile and dealt with differently than the electrodes and carbon block. We would then core sample each block and electrode, using the procedure developed for the pilot test conducted by Kase-Warbonnet. For the first ten electrodes and the first ten carbon blocks, four samples would be taken from each piece. If all four of the samples for an electrode or block do not ignite and smoke when crushed, that electrode or block would be considered to be clean. If an electrode or block ignites and smokes, that electrode or block would be classified as hazardous waste. If the first ten pieces of carbon block do not ignite, the sampling frequency would be reduced to taking samples from one out of every 10 carbon blocks. Similarly, if the first ten pieces of electrodes do not smoke and ignite, the sampling frequency for the electrodes would be reduced to one out of every 10. This would continue unless a sample smoked and

ignited when crushed. In this event, we would return to the initial frequency and sample each block or electrode.

Phase 2: As the testing proceeds, a new pile will be created of electrodes that do not smoke and fire, as well as a new pile of carbon blocks that do not smoke and fire. Rhodia will proceed to arrange for either recycling of these electrodes and/or the block, or we will have them disposed as non-hazardous wastes. Any electrodes and carbon blocks that fired and smoked will be placed back into the existing carbon pile. Rhodia would then evaluate options for disposal of such electrodes, carbon block and the brick, and submit a recommendation to EPA.

Phase 1 could be started in late May or early June and should be complete by the end of September of 2008. The Phase 2 evaluation would be completed by March of 2009, so that all material could be properly recycled or disposed by September of 2009.

Please respond by May 15 if this plan is acceptable.

Sincerely,

_____
Dan Bersanti

Silver Bow Plant

P.O. Box 3146
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406-782-1215
406-782-4498 (FAX)

May 28, 2008

Sara Sparks
RCRA Project Manager for Rhodia Inc., Silver Bow Plant
U.S. EPA, Region 8, Butte Office
Butte/Silver Bow Courthouse
Butte, MT 59701

Re: Used Brick and Carbon Pile

Dear Ms. Sparks:

Thank you for meeting with Cam, Mark Smith, Tim Whiteus, Becky Holmes and myself on Friday, May 16, 2008. Below is the plan to which we agreed and the additional issues that were discussed. As we mentioned in the meeting, work will begin on site during the week of June 9, 2008.

Phase 1: Segregate the furnace electrodes and carbon block from the furnace brick. Since our testing showed that the brick could be contaminated with elemental phosphorus, this material will be placed into drums and classified as hazardous waste. We would then core sample each block and electrode, using the procedure developed for the pilot test conducted by Kase-Warbonnet.

- For the electrodes, four samples would be taken from each piece. If all of the samples for an electrode do not ignite and smoke when crushed, that electrode would be considered to be clean. If an electrode sample ignites and smokes, that electrode would be classified as hazardous waste.
- For the carbon blocks, six samples would be taken from each piece. If all of the samples for a block do not ignite and smoke when crushed, that block would be considered to be clean. If a block sample ignites and smokes, that block would be classified as hazardous waste.

Phase 2: As the testing proceeds, a new pile will be created of electrodes that do not smoke and ignite, as well as a new pile of carbon blocks that do not smoke and ignite.

Rhodia will proceed to arrange for either recycling of these electrodes and/or the block, or we will have them disposed as non-hazardous wastes. Any electrodes and carbon blocks that smoked and ignited will be either sized and placed in drums or placed back into the area of the existing carbon pile and later sized and placed in drums. This material will be classified as hazardous waste.

Other issues relating to this project regarding the process were also discussed. Below is a list of these issues and the agreement that was reached.

8. In accordance with Section XX of the 3008(h) Order, any of the carbon that is determined to be hazardous waste may be accumulated in the pile and for more than 90 days in drums on-site. For example, more than 90 day accumulation may be necessary when waiting until there is a full load of drums of hazardous waste before a shipment is made to the incinerator. All drums that are filled with hazardous waste will be shipped before the end of 2008.
9. The number of samples for small pieces of carbon and electrodes will be determined by the size of the piece and will be determined in the field. Pieces that are roughly half the size of a full piece will have half the number of samples. However, any piece that is kept for recycle will be sampled at least once.
10. Large carbon pieces outside of the containment area (west of the brick pile) and electrodes north of the office building will be sampled in place.
11. Bird netting covering the pile and the fence around the pile will be partially removed to allow access to the brick pile. This netting and fence will be re-installed over the remaining brick at the end of the project if it is not completed in 2008.
12. Contaminated carbon blocks, electrodes and brick will be sized in a 5' x 5' metal pan so that this material can be placed in drums.
13. Carbon paste that adheres to a block or electrode will be removed and placed in a drum and classified as hazardous waste. The block or electrode will then be sampled.
14. Work will begin in June, 2008 and will continue until weather forces the project to be stopped or the project is complete. Remaining carbon will be sampled in 2009. Work will commence in 2009 as weather permits.

We look forward to completing this project in 2008 and removing this issue from consideration in future work at the site.

Sincerely,

_____

Dan Bersanti

Cc: Rebecca Holmes
Mark Smith
Tim Whiteus
Floyd Balentine

Attachment B

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 W. 15th STREET, SUITE 3200

Ref: 8MO

May 6, 2008

Mr. Dan Bersanti
Rhodia
Silver Bow Plant
P.O. Box 3146
Butte, MT 59702

Re: Agency Comments on Rhodia's letter dated April 25, 2008 concerning the Used Brick and Carbon Pile.

Dear Dan:

This letter reflects the verbal agreement reached between the U.S. Environmental Protection Agency (EPA) and Rhodia during our telephone call on May 5, 2008 regarding the steps to be taken to address the "Brick Pile" located at the facility. EPA, Rhodia and the Montana Department of Environmental Quality have engaged in lengthy discussions over a long line of proposed modifications to a draft waste plan for the Brick Pile first submitted in 2001, pursuant to an amended administrative order issued pursuant to section 7003 of the Resource Conservation

and Recovery Act (RCRA), Docket No. RCRA-8-2000-07 (7003 Order). (All such documents are referred to together as the Brick Pile Waste Plan.)

We are pleased to have reached a verbal agreement regarding the final modifications to the Brick Pile Waste Plan, and look forward to meeting with you, MDEQ, and your contractor on May 16, 2008, at 9:00 am to kick off work on the Brick Pile.

We request that you submit one more short modification to the Brick Pile Waste Plan after the May 16 meeting reflecting all of the issues discussed here and during the meeting. During the May 16 meeting, we believe we can address the steps Rhodia and its contractors will take to ensure that Rhodia does not inadvertently generate hazardous waste before the waste is prepared for, and shipped to an acceptable off-site facility.

Pursuant to paragraphs VII.N. and VII.O. of the 7003 Order, EPA hereby preliminarily approves the brick pile waste plan with the following modifications.

Based on the core sampling and testing conducted on the furnace brick, there is elemental phosphorous present. These brick need to be shipped to a RCRA Hazardous Waste facility for disposal. It has been determined the brick need to be shipped to a RCRA Hazardous Waste facility by the end of 2008. Also, any other material in the brick pile that is contaminated with phosphorous needs to be addressed in a similar manner this year.

The testing procedures for the carbon block and furnace electrodes will be conducted as first discussed in our April 17 meeting. The carbon block will be sampled on each side (6 sides) at a depth of 6 inches. The furnace electrodes will be cored four times at equally spaced locations around the electrode. If the block and furnace electrodes are contaminated, they must be shipped to a RCRA approved disposal facility. If the block and furnace electrodes are not contaminated, they may be stored on site till a disposal method is determined. The Agencies will discuss on-site storage methods with Rhodia during the May 16, 2008 meeting.

The Agency realizes that this is a significant amount of work and an extension may be granted to Rhodia if Rhodia provides substantial justification in writing prior to the end of the year.

As set forth in paragraph XIII.A.1.b.of the Corrective Action Order on Consent, Docket No. RCRA-8-2004-0001, this preliminary approval with modifications letter triggers the requirement that Rhodia obtain financial assurance for this portion of the waste plan. Please send all documents relating to financial assurance to me, with a copy to Chuck Figur in our Denver office. Also please be advised that EPA believes it is appropriate for Rhodia to begin work before the financial assurance instrument is in place.

If you have technical questions or concerns, please contact me at (406) 782-7415. If you have legal questions or concerns, please contact Charles Figur at (303) 312-6915.

Sincerely,

Sara Sparks
Remedial Project Manager

cc: Charles Figur; 8ENF-L(e-mail copy)
Rebecca Holmes; MDEQ
Mark Hall; MDEQ
John Wardell; 8MO(e-mail copy)
Phebe Davol; BAH(e-mail copy)
Julie DalSolglio; 8MO(e-mail copy)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 W. 15th STREET, SUITE 3200

Ref: 8MO

May 28, 2008

Mr. Dan Bersanti
Rhodia
Silver Bow Plant
P.O. Box 3146
Butte, MT 59702

Re: Agency Comments on Rhodia's letter dated May 23, 2008 concerning the Used Brick and Carbon Pile.

Dear Dan:

The U. S. Environmental Protection Agency (EPA) and the Montana Department of Environmental Quality (DEQ) have reviewed your May 23, 2008 Brick and Carbon Pile workplan. The Agencies have two points that need to be clarified. The first is the definition of ignitibility. The document uses the terms smokes and ignites as the determination of the brick being a hazardous waste. The Agencies agree with Rhodia that these terms may be used FOR the IGNITIBILITY determination ON THE MATERIALS IN the brick pile. However, the definition of ignitibility for other materials at the Rhodia site will be determined as we move forward in the process. Second, the Agencies encourage Rhodia to complete the work during 2008; however, Rhodia shall complete the project, including shipping of all hazardous waste off-site for disposal by December 2009.

As set forth in paragraph XIII.A.1.b.of the Corrective Action Order on Consent, Docket No. RCRA-8-2004-0001, this preliminary approval with modifications letter triggers the requirement that Rhodia obtain financial assurance for this portion of the waste plan. Please send all documents relating to financial assurance to me, with a copy to Chuck Figur in our Denver office. Also please be advised that EPA believes it is appropriate for Rhodia to begin work before the financial assurance instrument is in place.

If you have technical questions or concerns, please contact me at (406) 782-7415. If you have legal questions or concerns, please contact Charles Figur at (303) 312-6915.

Sincerely,

Sara Sparks
Remedial Project Manager

cc: Charles Figur; 8ENF-L(e-mail copy)
Rebecca Holmes; MDEQ
Mark Hall; MDEQ
John Wardell; 8MO(e-mail copy)
Phebe Davol; BAH(e-mail copy)
Julie DalSolglio; 8MO(e-mail copy)

Attachment C

Date: 25 June 2008
To: Dan Bersanti
From: Tim Whiteus
Subject: Work Plan Clarifications

As work progresses into the used brick and carbon pile, we would like to suggest several modifications to the original work plan. The modifications should increase the efficiency of the treatment operations without any sacrifice of safety or environmental controls. If you agree with these proposals, please obtain the necessary approval from the EPA.

Carbon Paste. Several large carbon blocks have been recently retrieved from the carbon pile with a significant amount of carbon paste still adhered to the block. The paste material is typically 1" – 3" thick and located randomly on the block. The original work plan allowed for removal of this paste to a hazardous waste drum and sampling of the block where the paste was removed to verify the pass/fail status of the block. The work plan procedure was followed for the first few blocks identified as having paste on the surface. During removal and subsequent handling the paste material showed no signs of smoke or flame. Six separate samples of the paste material was then crushed and again showed no sign of flame or smoke. KW proposes to modify the sampling procedure as it pertains to carbon blocks that have paste material adhering to the surface. KW proposes to drill thru the paste into the block. If all the samples from that block pass, the block will be removed to the clean block storage area. If any of the samples fail, the paste will be scraped from the block and the block will be re-sampled per the original work plan.

Additionally, several types of carbon material have been identified that were not specifically addressed in the work plan.

Carbon Debris. A large quantity of carbon debris is accumulating inside the impound area. These carbon pieces are for the most part smaller than a microwave oven and are usually irregular in shape which makes it difficult to apply a unique identification mark. Many will require only one core sample or

may be better sampled by removing a corner piece with a hammer. KW proposes to stockpile this carbon material in the north end of the enclosure for processing after the larger bulk material has been handled. There are several methods for pass/fail identification depending on the final quantity of material in this stockpile that will be discussed with the EPA before final processing of this material.

Carbon Rubble. Carbon rubble is smaller pieces of carbon broken off the larger carbon blocks by the KW track hoe or other previous handling operations. Carbon rubble is normally smaller than a quart jar and many pieces are the size of a baseball or golf ball. KW proposes to also stockpile this material until the large carbon blocks have been processed. This stockpile will be located within the enclosure or the rubble will be placed in metal pans. Further evaluation of this material can be discussed with the EPA.

If additional information is required or if I can be of further assistance in this matter please contact me.

Regards,
Tim Whiteus

cc: Cam Balentine, Rhodia Silver Bow
Mark Smith, KASE/Warbonnet, Inc

Attachment D

TCLP Summary Data for Soil and Carbon

	Regulatory Level	SWMU-3 SP-1		SWMU-3 SP-2		SWMU-3 SP-3		SWMU-3 Carbon	
Arsenic	5	0.08	J	0.1	J	0.1		0.04	J
Barium	100	0.2	U	0.2	U	0.2	U	0.26	U
Cadmium	1	0.0031	J	0.0039	J	0.0164		0.0159	
Chromium	5	0.011		0.007	J	0.01	J	0.004	J
Mercury	0.2	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Lead	5	0.01	U	0.01	U	0.01	U	0.01	U
Selenium	1	0.009	U	0.009	U	0.009	U	0.009	U
Silver	5	0.007	U	0.007	U	0.007	U	0.007	U

Notes:

J Estimated concentration that is less than the MRL but greater than MDL.

U Not detected at specified concentration

Attachment E

Attachment F

Attachment G

Appendix 5.5.3-G

Email Correspondence between Rhodia and U.S. EPA Concerning Management of Used Carbon

From: Bersanti, Dan
Sent: Thursday, August 14, 2008 3:59 PM
To: 'Sparks.Sara@epamail.epa.gov'
Cc: 'Holmes, Rebecca'
Subject: Used Carbon

Sara,
I received your voice message today on the small pieces of carbon and the piles of dirt within the containment area. I would like to confirm our understanding of the plan for this material.

1. We will take four samples of each pile, composite them and analyze for TCLP metals. If levels are below action levels, we will move this dirt to an area near the slag pile.

2. During the RFI sampling this fall, we will sample the area within the enclosure at 0-2", 10"-12", and 18"-20".
3. We will move the small pieces of carbon to an area near the slag pile. This small pieces will not be sampled since they have been handled several times and have not exhibited any signs of contamination. These pieces will be either disposed in a non-hazardous on-site landfill or a non-hazardous off-site landfill.

Thanks for your help. Please let me know if you need anything else from me.
Dan

From: Bersanti, Dan
Sent: Friday, August 15, 2008 8:36 AM
To: Sparks.Sara@epamail.epa.gov
Cc: Holmes, Rebecca
Subject: Carbon

Sara,
As we discussed, there are several blocks that we will not recycle. These blocks pass the crush test but when we observed the crushed core, there are small pieces of red material. We will dispose of these blocks in the same manner as the small pieces of carbon, either in an on-site non-hazardous landfill or an off-site non-hazardous landfill.

Thanks,
Dan

From: Bersanti, Dan
Sent: Tuesday, August 26, 2008 8:59 AM
To: 'Sparks.Sara@epamail.epa.gov'
Cc: Balentine, Floyd; 'Holmes, Rebecca'
Subject: Carbon

Sara,
As I mentioned yesterday, we have found another piece of carbon that contains red phosphorus. It is a piece that had carbon paste adhered to the bottom of the block. We were attempting to remove the paste and broke a corner off of the block. When we did this, we found a small seam of red phosphorus in the block near the paste that smoked and burned. We will remove the red phosphorus from this block and drum the material as hazardous waste. There are several other blocks that have paste adhered to the outside of the block. Although all of these have passed the coring test, we will break these blocks to see if there is red phosphorus near the paste. If there is red phosphorus, we will remove it and drum the material as hazardous waste. Otherwise, we will treat these blocks as non-hazardous waste. Please let me know if you have questions.

Thanks,
Dan

Appendix 5.5.3-H

U.S. EPA's Approval Letter for Rhodia's Completion Report (May 15, 2009)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 W. 15th STREET, SUITE 3200
HELENA, MONTANA 59626

Ref: 8MO

May 15, 2009

Mr. Dan Bersanti
Rhodia
Silver Bow Plant
P.O. Box 3146
Butte, MT 59702

Re: Agency Approval of Rhodia's Completion Report-Used Carbon and Electrode Program Report dated April 9, 2009.

Dear Dan:

The U. S. Environmental Protection Agency (EPA) and the Department of Environmental Quality have reviewed the above mentioned report and approve the document as submitted. Per Rhodia's request for a letter from the Agencies, the approval of the construction completion report concludes the used carbon and electrode RCRA action.

Rhodia states in the Completion Report for the Used Carbon and Electrode Project that a portion of the carbon blocks and electrodes were too small in size to be recycled, even though they were determined to be clean. This material, approximately 200,000 pounds (100 tons) was piled on-site and would be managed as non-hazardous solid waste. Under RCRA, it is a generator's responsibility to determine whether a waste is hazardous. According to information provided by Rhodia in the Completion Report, Rhodia relied on observation of crushed cores of the carbon blocks and electrodes to determine whether the material exhibited the characteristic of ignitability. Based on information provided by Rhodia in the Completion Report, EPA concurs with Rhodia's determination that the portion of the carbon blocks and electrodes determined to be clean but too small in size to be recycled would not be regulated as a hazardous waste.

If you have technical questions or concerns, please contact Sara Sparks at (406) 782-7415. If you have legal questions or concerns, please contact Charles Figur at (303) 312-6915.

Sincerely,

Sara Sparks
Remedial Project Manager

cc: Charles Figur; 8ENF-L (e-mail copy)
Rebecca Holmes; MDEQ
Mark Hall; MDEQ
John Wardell; 8MO (e-mail copy)

Appendix 5.5.3-I

SWMU 3 – Test Pit Log

PROJECT NO. 26460006

TEST PIT NO. SWMU-3 SP-4 SHEET 1 OF 1

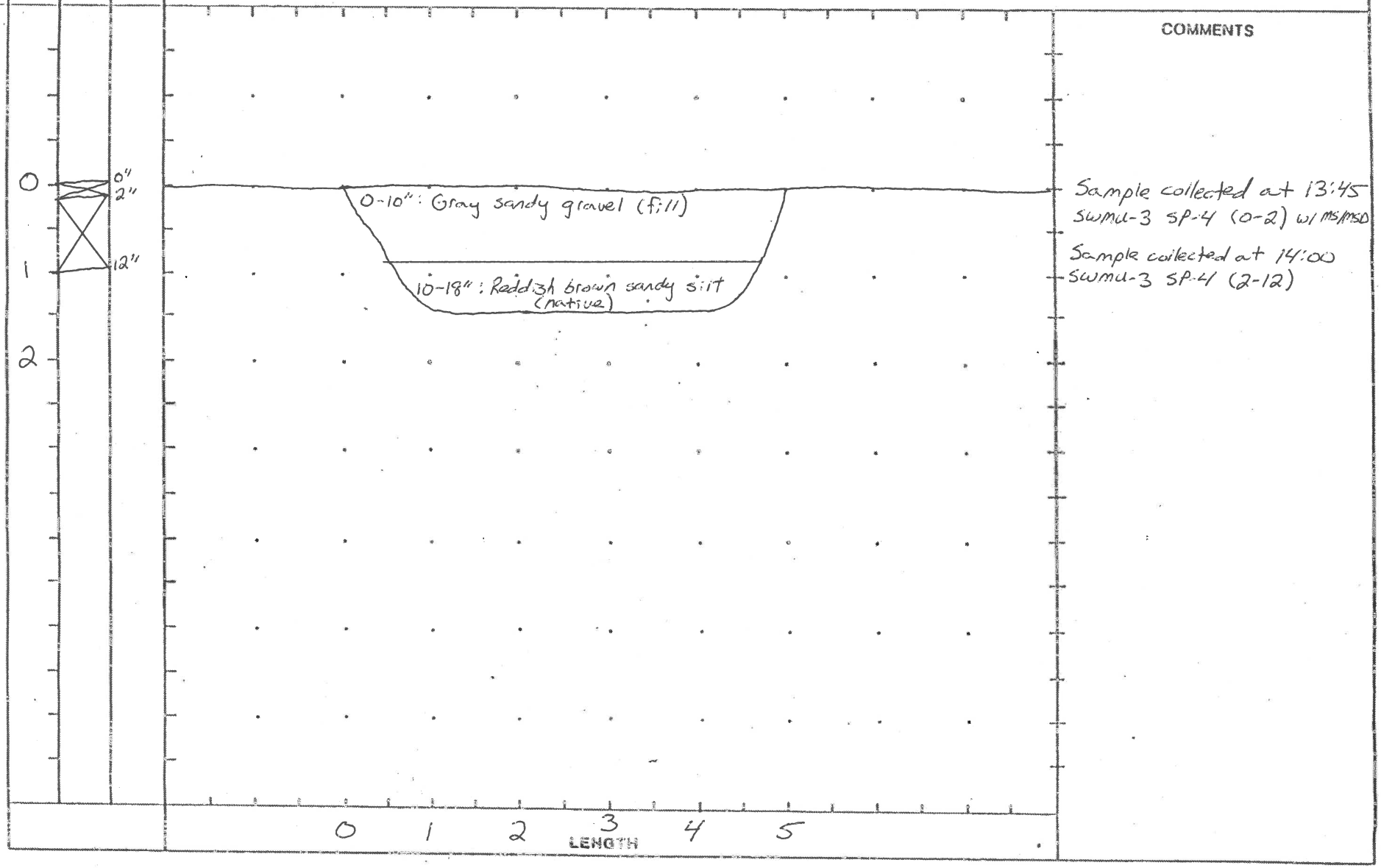
TEST PIT WALL LOG

PROJECT Rhodia RFI LOCATION SWMU-3 Used carbon Brick MAP OF S WALL OF PIT

ELEVATION N/A CONTRACTOR MT Reclamation & Landscaping DATE EXCAVATED 10/2/12

WATER LEVEL AND DATE N/A - Dry EXCAVATION METHOD Backhoe LOGGER CML2

APPROXIMATE DIMENSIONS LENGTH 5' WIDTH 2' DEPTH 1.5' REMARKS



Appendix 5.5.3-J

SWMU 3 – Monitoring Well Logs

Bart Engineering Company

Ref. Boring # n/a

Well # MW-01-1

Project: Pre-Closure Groundwater Monitoring Program

Project Number:	26/25/001-JSL-021	**Total Drilled Depth (ft):**	50.3
Boring Location:	Rhodia Silver Bow Plant - Butte, Montana	**Ground Surface Elevation (ft):**	5370.7
Drilling Contractor:	O'Keefe Drilling	**Depth to Groundwater (ft):**	42.41
Drilling Method:	Hollow Stemmed Auger	**Riser Elevation (ft):**	5372.79
Driller:	Steve Malkovich	**Date Started:**	9/17/01
Geologist:	Sheryl Filby	**Date Completed:**	9/19/01

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Depth (ft. bgs)	Split spoon Recovery (ft)	Blow Count	Moisture/W.L.	ASTM	Lithologic Unit	Material Descriptions and Remarks	Well Construction/ Comments	Elevation
						: Split-spoon sampling began at 19.2'.		
20	1.5	16/18/18/19	none	SM	Sand	SAND: Poorly sorted medium to coarse grained sand. 4/6/7.5YR (dark brown) color. Increased fines including silt and clay sized particles to 21'.		
22	1.8	11/14/17/21	none	SM-CL	Silty sand with clay	SILTY SAND WITH CLAY: Silty sand with some clay. 5/6/7.5YR. At 28', increased mica flakes. At 30', some subangular pebbles and mica. Color has graded in 4/6/7.5YR. At 32', increased fines (silt and clay) content. Very tight and stiff (holds shape of spoon). At 38', increased water content which steadily increases until water		
24	1.8	14/33/37/50+	none	SM-CL				

2" PVC Well Pipe

Neat Cement Grout

5372 5370 5368 5366 5364 5362 5360 5358 5356 5354 5352 5350 5348 5346

P:\26\25\001\Well Logs\mw_01

Barr Engineering Company

Ref. Boring # n/a

Well # MW-01-1

Depth (ft. bgs)	Sample Type/ Recovery (ft.)	Blow Count	Moisture\W.L.	ASTM	Lithologic Unit	Material Descriptions and Remarks	Well Construction/ Comments	Elevation
26	1.5	33/34/43/50+	none	SM-CL		table is reached at 43.3'. Samples are saturated below water table and sediment is same as above.		5344
28	1.8	27/38/42/43	none	SM-CL				5342
30	1.0	28/33/44/50+	none	SM-CL				5340
32	1.7	20/30/32/39	slight	SM-CL				5338
34	1.7	19/31/41/50+	slight	SM-CL				5336
36	1.7	15/19/37/40	slight	SM-CL			Hole Plug	5334
38	1.0	21/37/50+	slight-mokst	SM-CL			100-mesh Sand	5332
40	1.8	19/44/48/50+	slight-mokst	SM-CL				5330
42	1.0	44/50/50+	mokst-sat	SM-CL				5328
44	1.2	23/29/50+	sat	SM-CL				5326
46	1.9	17/17/39/50+	sat	SM-CL			#6-slot 2" PVC Screen	5324
48	1.0	35/50+	sat	SM-CL			Specified Sand Pack	5322
50								

Bart Engineering Company

Ref. Boring # n/a

Well # MW-01-4

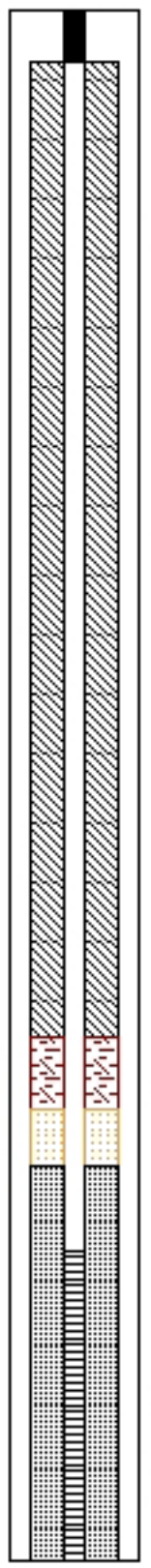
Project: Pre-Closure Groundwater Monitoring Program

Project Number:	26/25/001-JSL-021	**Total Drilled Depth (ft):**	48.4
Boring Location:	Rhodia Silver Bow Plant - Butte, Montana	**Ground Surface Elevation (ft):**	5366.4
Drilling Contractor:	O'Keefe Drilling	**Depth to Groundwater (ft):**	39.11
Drilling Method:	Hollow Stemmed Auger	**Riser Elevation (ft):**	5368.05
Driller:	Steve Malkovich	**Date Started:**	9/19/01
Geologist:	Sheryl Filby	**Date Completed:**	9/20/01

P:\26\25\001\Well Logs\mw_01_4.dat

Depth (ft. bgs)	Split spoon Recovery (ft)	Blow Count	Moisture/W.L.	ASTM	Lithologic Unit	Material Descriptions and Remarks
30	1.7	14/26/30/40	none	SM-ML	Silty sand	SILTY SAND: Fine sand with silt. 4/4/7.5YR. Homogeneous throughout with mica flakes. At 31.4 increased silt content in sand which continues to 39.4.
32	1.9	11/17/27/30	moist	SM-ML		
34	1.8	13/19/25/25	moist	SM-ML		
36	1.7	12/21/43/50+	moist	SM-ML		
38	1.0	19/50+	moist	SM-ML		
40	1.7	17/21/34/43	moist	SM-CL	Silty sand with clay	SILTY SAND WITH CLAY: Increased silt and clay from 29.4-39.4'. 4/6/7.5YR.
42	2.0	10/15/20/28	sat.	SM-CL		
44	1.7	35/50+	sat.	SM-CL		
46	1.1	35/50+	sat.	SM-CL		
48						

: Split-spoon sampling began at 29.4'.



Elevation
5368
5366
5364
5362
5360
5358
5356
5354
5352
5350
5348
5346
5344
5342
5340
5338
5336
5334
5332
5330
5328
5326
5324
5322
5320
5318

Bart Engineering Company

Ref. Boring # n/a

Well # MW-01-5

Project: Pre-Closure Groundwater Monitoring Program

Project Number:	26/25/001-JSL-021	**Total Drilled Depth (ft):**	46.3
Boring Location:	Rhodia Silver Bow Plant - Butte, Montana	**Ground Surface Elevation (ft):**	5366.2
Drilling Contractor:	O'Keefe Drilling	**Depth to Groundwater (ft):**	39.36
Drilling Method:	Hollow Stemmed Auger	**Riser Elevation (ft):**	5368.33
Driller:	Steve Malkovich	**Date Started:**	9/20/01
Geologist:	Sheryl Filby	**Date Completed:**	9/20/01

P:\26\25\001\Well Logs\mw_01_5.dat

Depth (ft. bgs)	Split spoon Recovery (ft)	Blow Count	Moisture/W.L.	ASTM	Lithologic Unit	Material Descriptions and Remarks	Well Construction/ Comments	Elevation
						: Split-spoon sampling began at 36.3'.	2" PVC Well Pipe Neat Cement Grout Hole Plug 100-mesh Sand #6-slot 2" PVC Screen Specified Sand Pack	5368 5366 5364 5362 5360 5358 5356 5354 5352 5350 5348 5346 5344 5342 5340 5338 5336 5334 5332 5330 5328 5326 5324 5322 5320
36								
38	1.8	17/21/25/32	moist	SM-SC	Silty sand with clay	SILTY SAND WITH CLAY: Fine sand with some clay and silt. Mica flakes present. 4/6/7.5YR. 36.7-37.0 - increased fines (40/30/30). 37.0-37.2 - increased sand (50/25/25). 37.2-37.6 - increased fines (40/30/30) 37.6-38.3 - increased sand (60/20/20). All same color throughout grain size variations. 38.3 - 44.3 - Silty sand with clay (40/30/30). 44.3-44.6 - sand and gravel layer. 44-6 - 46.3 - Silty sand with clay		
40	1.9	14/14/29/50+	sat.	SM-SC				
42	1.2	19/37/50+	sat.	SM-SC				
44	1.8	15/21/24/34	sat.	SM-SC				
46		12/27/50+	sat.	SM-SC				

Appendix 5.5.3-K

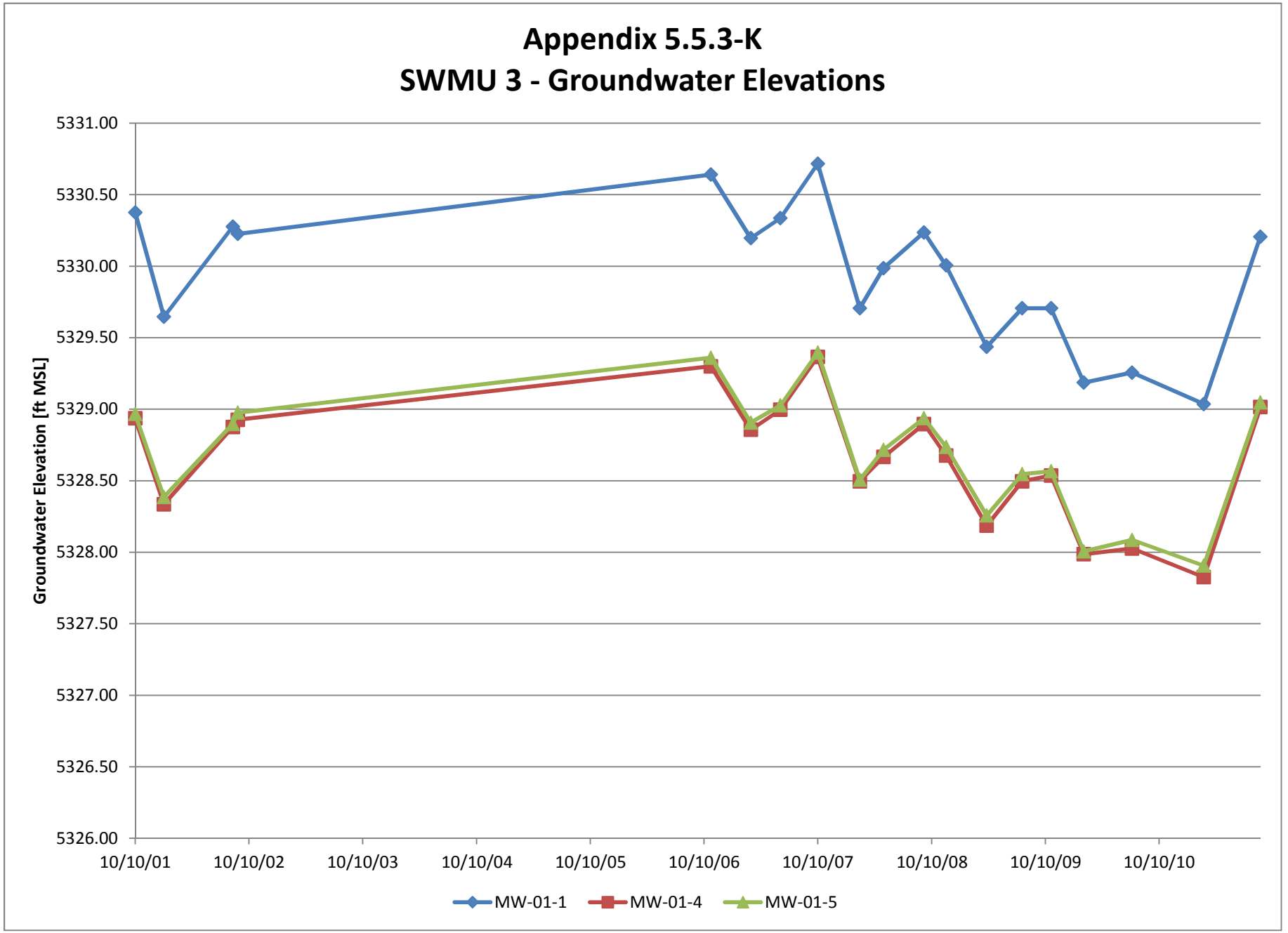
SWMU 3 - Groundwater Elevations

Appendix 5.5.3-K

SWMU 3 - Groundwater Elevations
Rhodia Silver Bow Plant

Location	MW-01-1 [ft MSL]	MW-01-4 [ft MSL]	MW-01-5 [ft MSL]	Gradient [ft/ft]
10/10/01	5330.38	5328.94	5328.97	0.0051
01/10/02	5329.65	5328.34	5328.39	0.0046
08/19/02	5330.28	5328.88	5328.90	0.0050
09/04/02	5330.23	5328.93	5328.98	0.0046
11/01/06	5330.64	5329.30	5329.36	0.0047
03/09/07	5330.20	5328.86	5328.91	0.0047
06/12/07	5330.34	5329.00	5329.03	0.0047
10/10/07	5330.72	5329.37	5329.40	0.0048
02/22/08	5329.71	5328.50	5328.51	0.0043
05/08/08	5329.99	5328.67	5328.72	0.0046
09/15/08	5330.24	5328.90	5328.94	0.0047
11/25/08	5330.01	5328.68	5328.74	0.0046
04/04/09	5329.44	5328.19	5328.26	0.0043
07/27/09	5329.71	5328.50	5328.55	0.0042
10/28/09	5329.71	5328.54	5328.57	0.0041
02/10/10	5329.19	5327.99	5328.01	0.0043
07/15/10	5329.26	5328.03	5328.09	0.0043
03/02/11	5329.04	5327.83	5327.91	0.0042
08/31/11	5330.21	5329.02	5329.05	0.0042
Typical	**5329.9**	**5328.7**	**5328.7**	**0.0045**

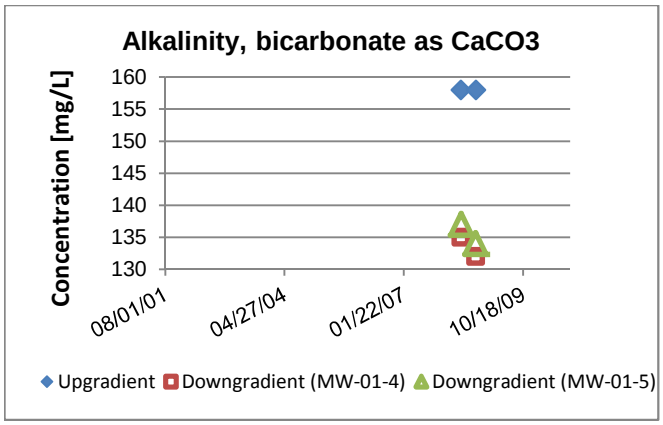
Appendix 5.5.3-K
SWMU 3 - Groundwater Elevations

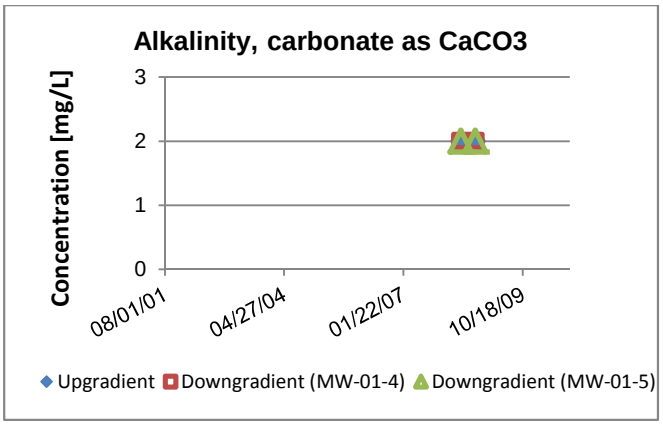


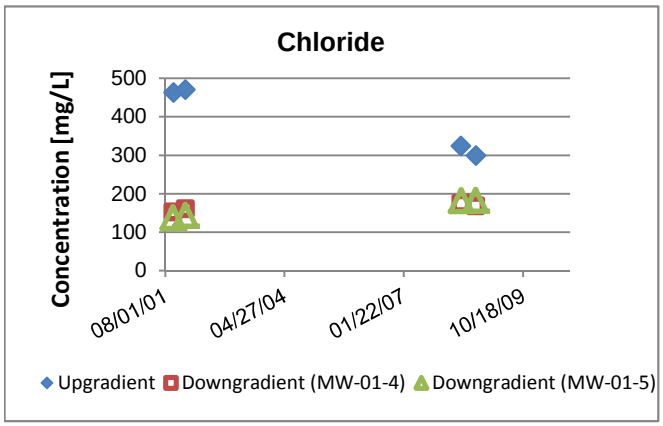
Appendix 5.5.3-L

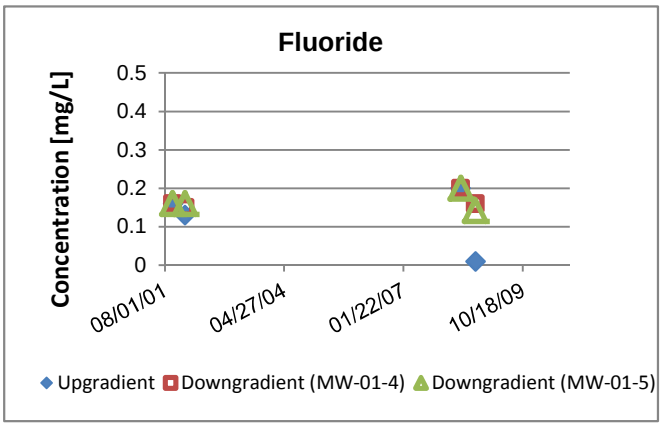
Groundwater Quality Charts,SWMU 3 Monitoring Wells

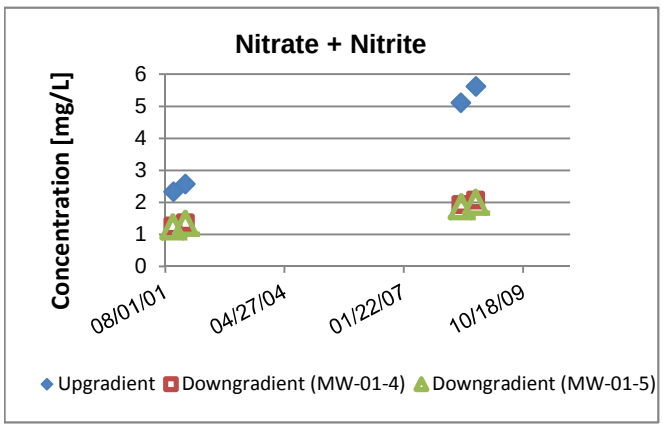
Appendix 5.5.3-L
Groundwater Quality Charts
SWMU 3 Monitoring Wells

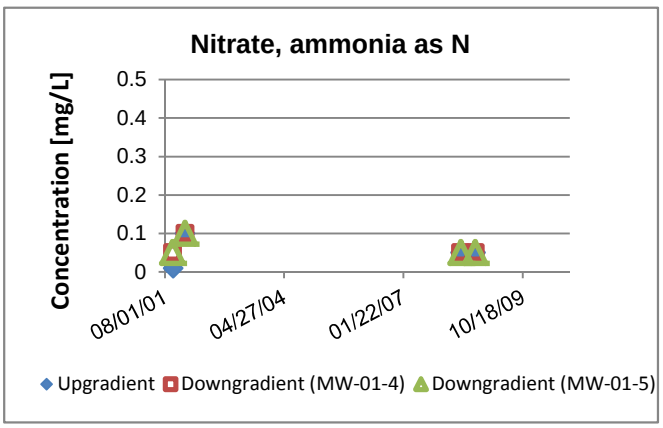


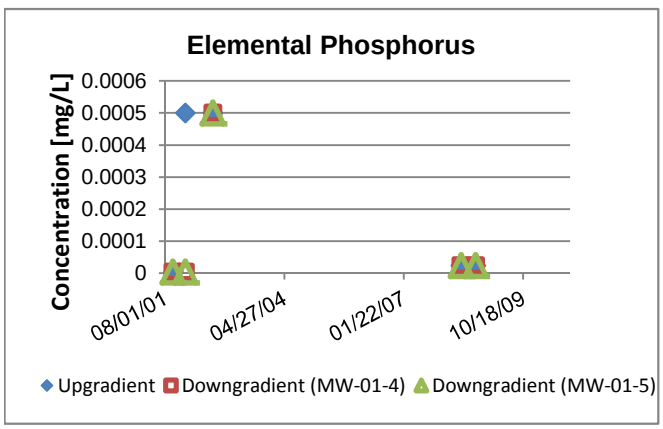


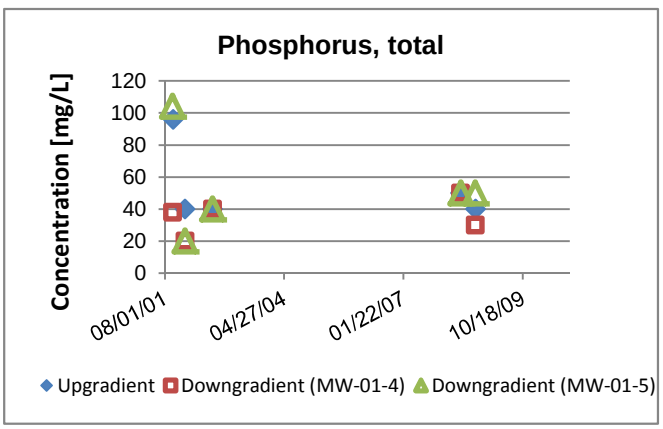




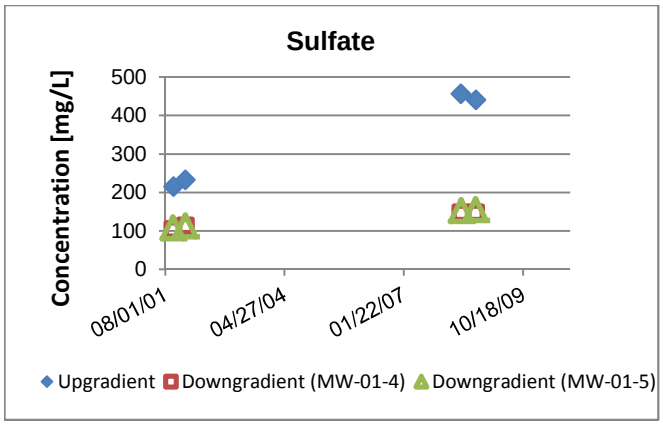


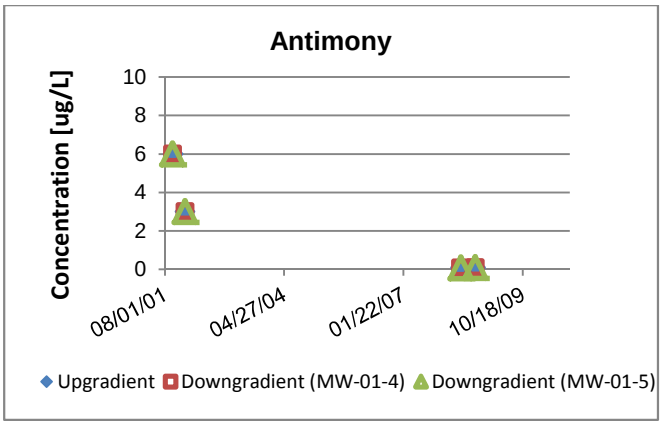


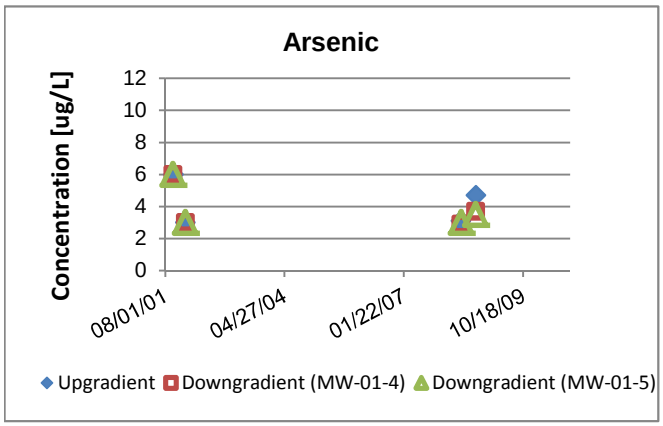


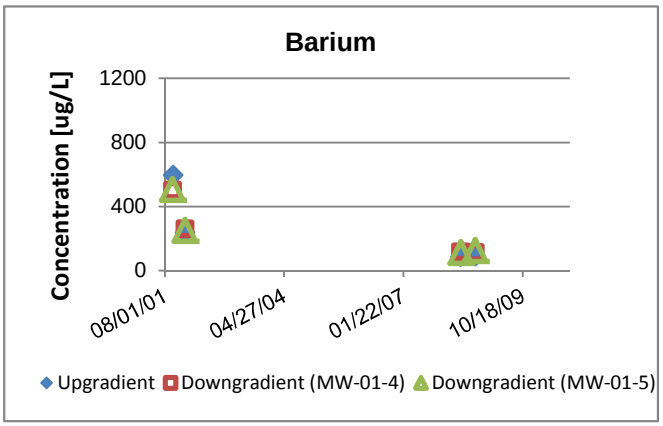


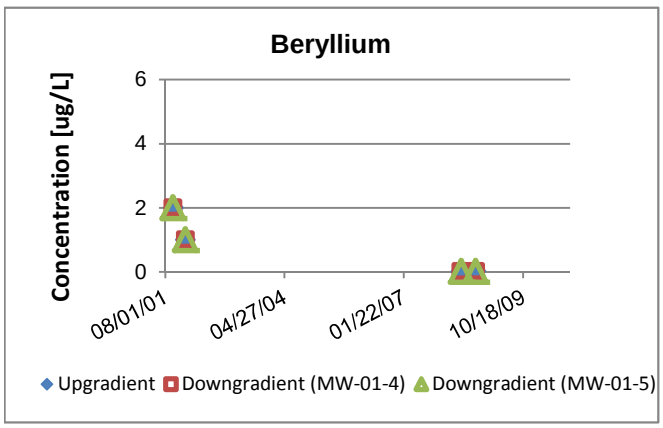
Appendix 5.5.3-L
Groundwater Quality Charts
SWMU 3 Monitoring Wells

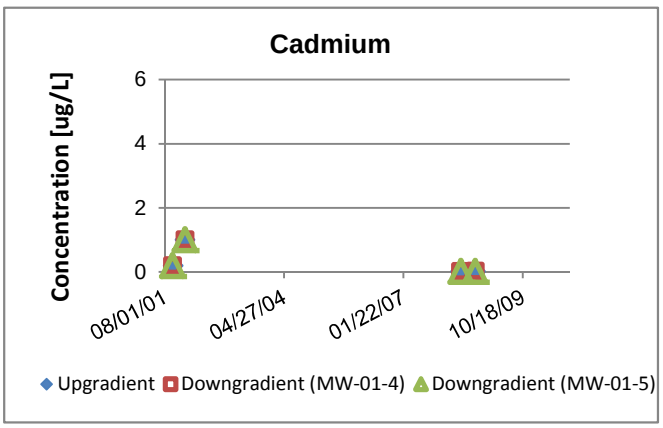


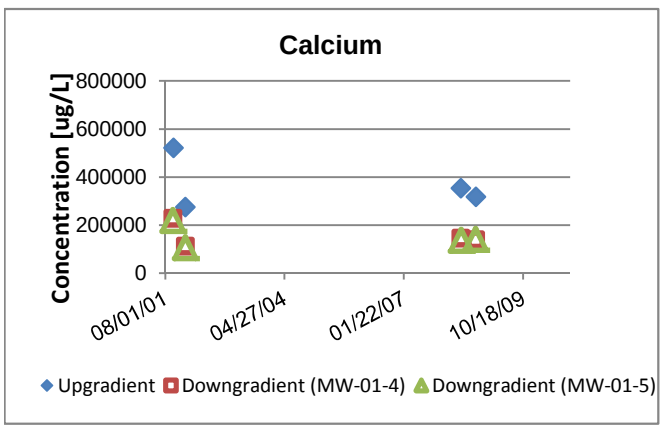


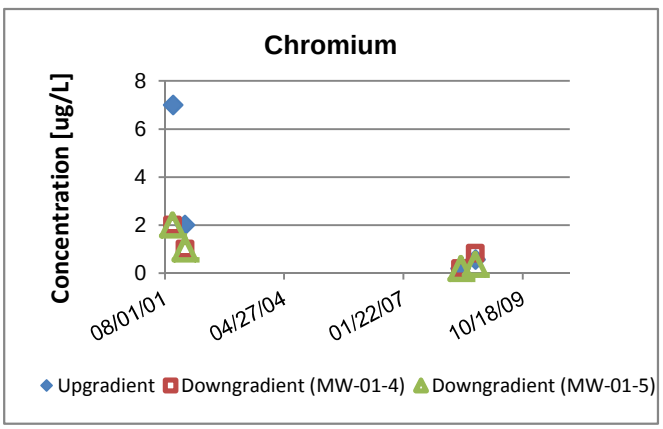




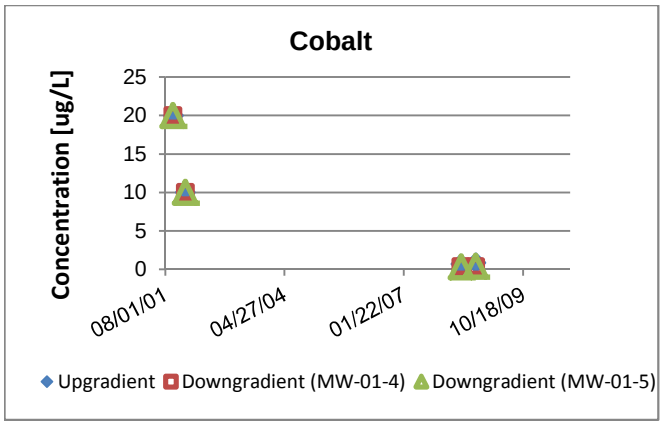


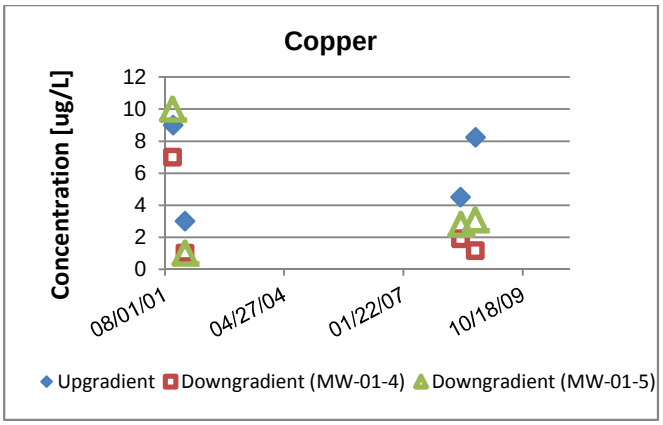


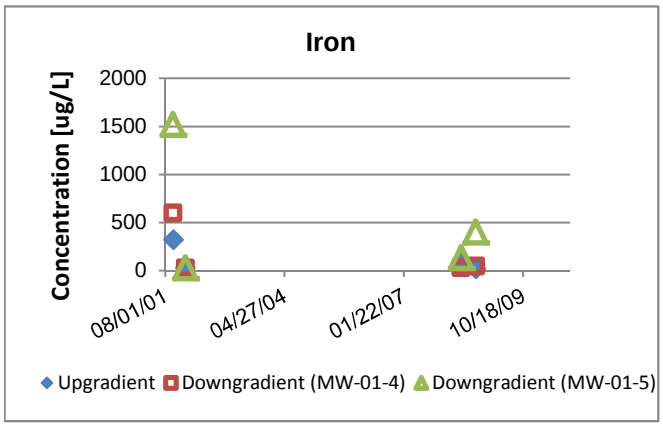


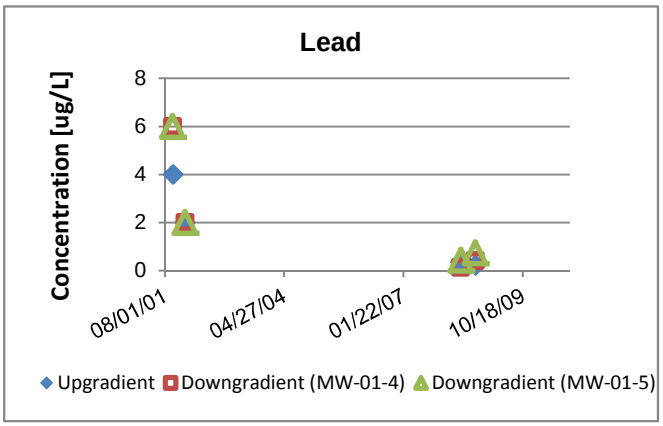


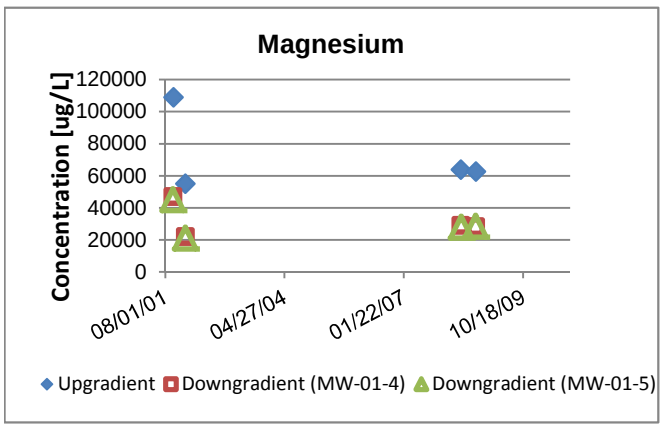
Appendix 5.5.3-L
Groundwater Quality Charts
SWMU 3 Monitoring Wells

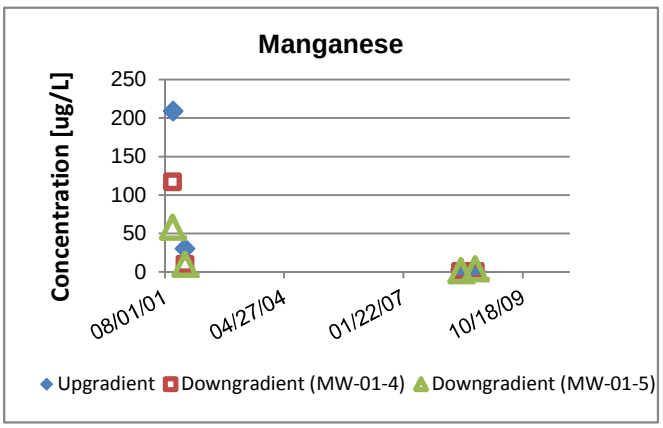


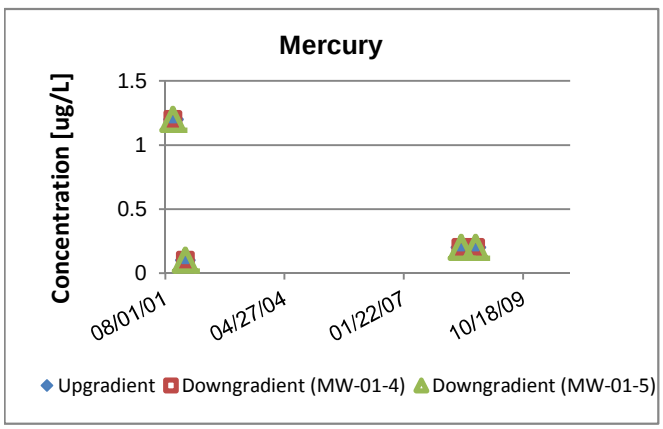


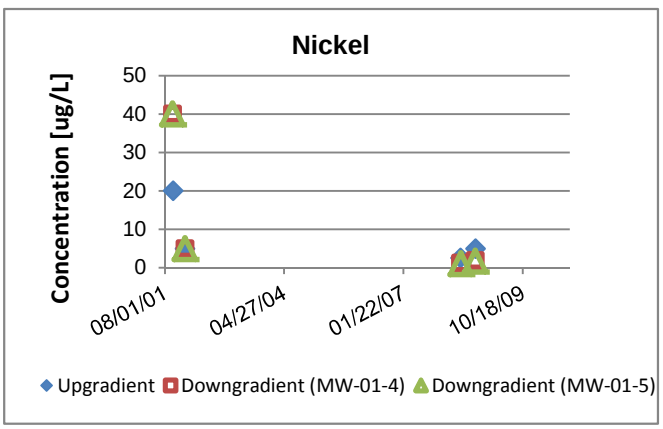




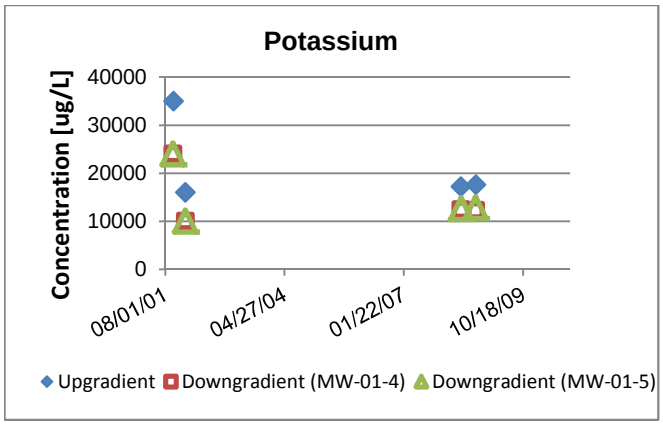


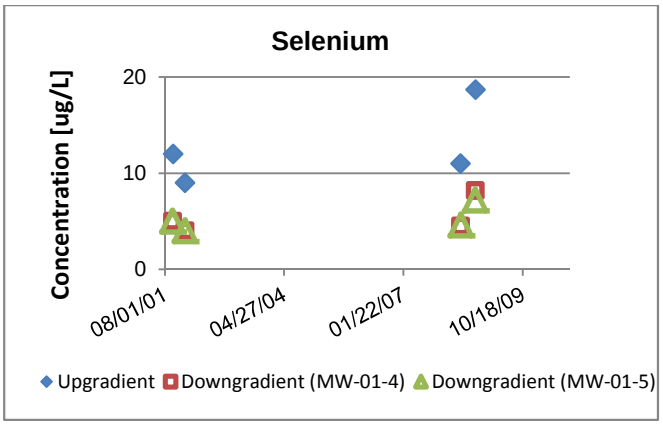


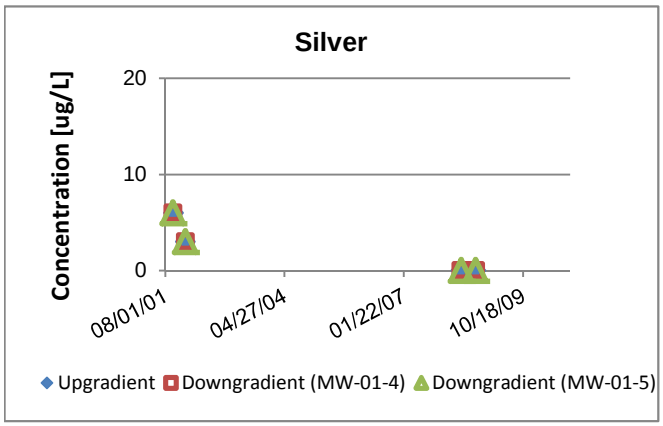


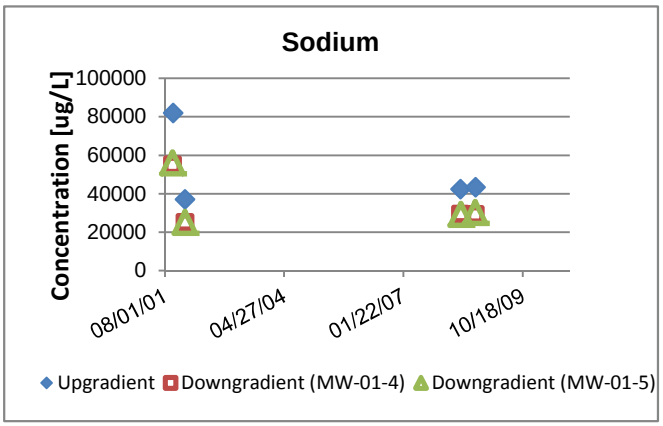


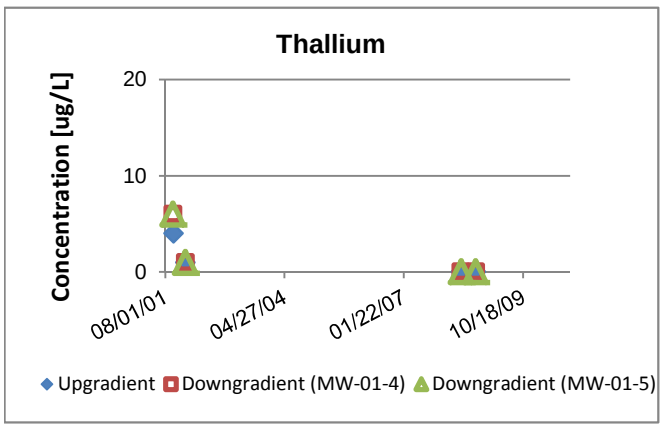
Appendix 5.5.3-L
Groundwater Quality Charts
SWMU 3 Monitoring Wells

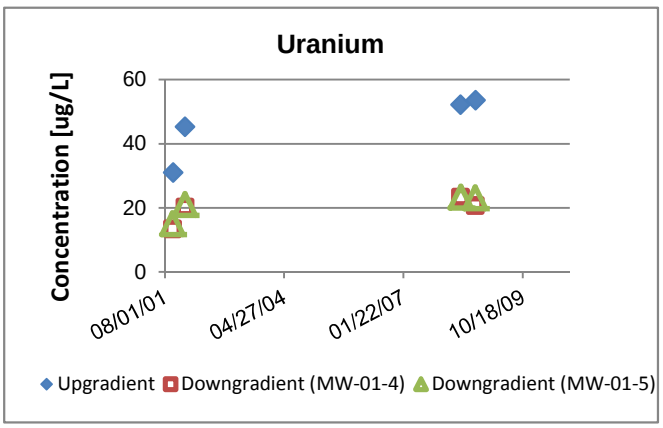


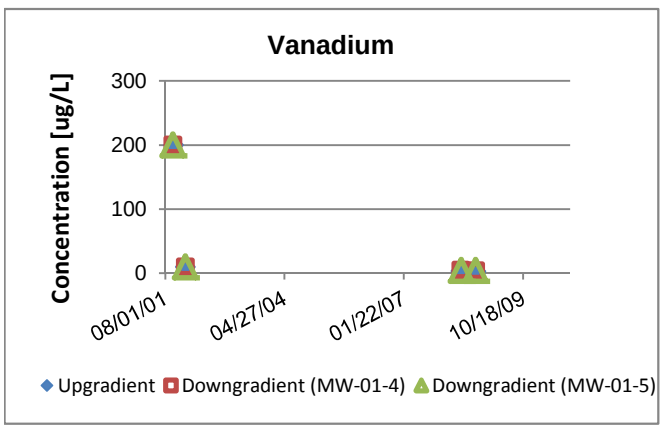


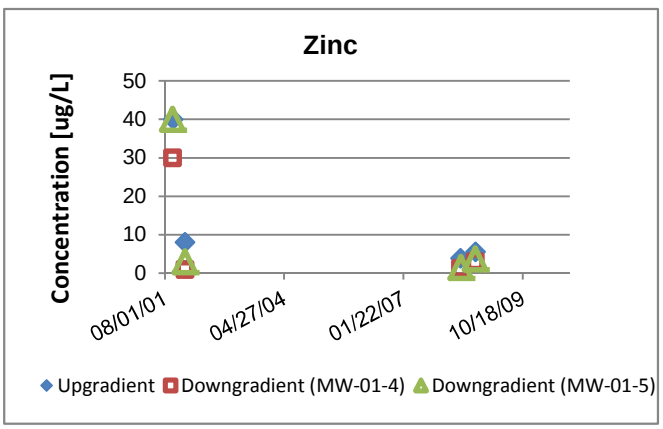




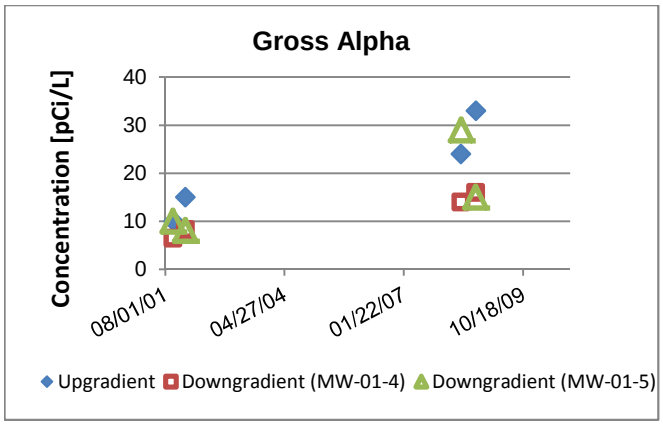


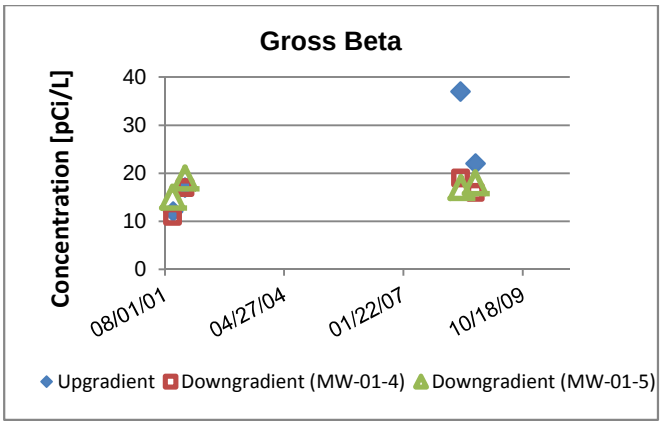


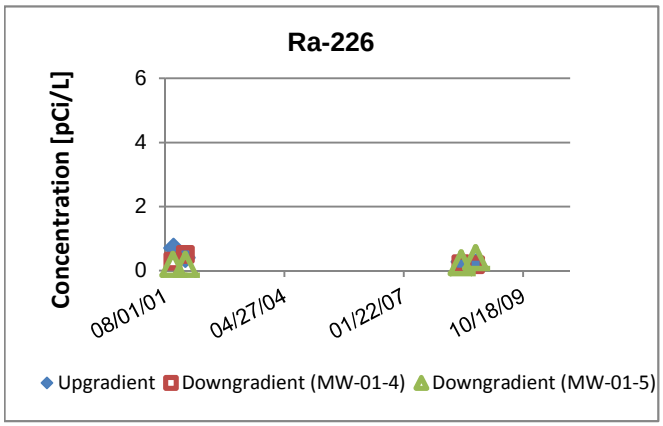


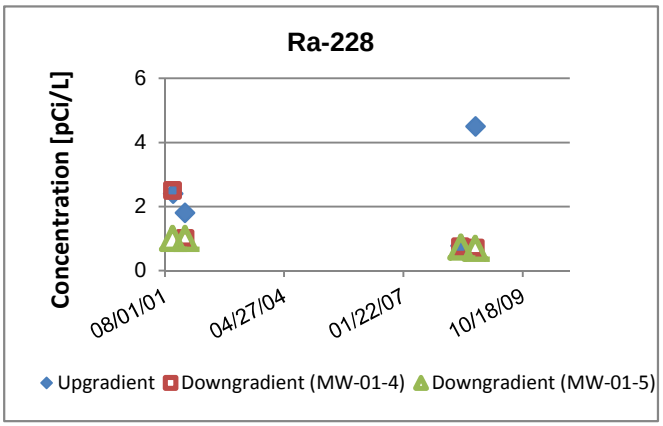


Appendix 5.5.3-L
Groundwater Quality Charts
SWMU 3 Monitoring Wells









Appendix 5.5.3-M

2012 XRF Data Presentation

Appendix 5.5.3-M - Soil Quality Data - XRF

Element	SWMU-3 SP-4 0-2 in			SWMU-3 SP-4 2-12 in		
	Concentration	Instrument		Concentration	Instrument	
		Reading	2σ		Reading	2σ
Molybdenum	11 J	10.53	4.65	10 U	< LOD	6.39
Zirconium	283	282.52	11.63	279	279.29	10.86
Strontium	537	536.97	12.62	414	413.9	10.74
Uranium	48 J	48.01	11.48	24 J	24.22	10.31
Rubidium	76	76.06	6.14	96	96.49	6.27
Thorium	12 J	12.45	6.64	20 J	19.85	6.3
Lead	127	127.34	12.41	42	41.67	7.87
Selenium	8 U	< LOD	5.51	7 U	< LOD	4.84
Arsenic	18 J	17.9	10.4	24 J	24.23	7.24
Mercury	20 U	< LOD	13.64	16 U	< LOD	10.68
Zinc	2446	2446.21	61.36	785	785.33	34.27
Tungsten	163 U	< LOD	108.34	119 U	< LOD	79.53
Copper	98 J	97.66	21.3	73 J	72.53	18.82
Nickel	94 J	94.31	43.4	75 J	74.64	40.75
Cobalt	246 U	< LOD	163.86	269 U	< LOD	179.63
Iron	21350	21349.79	326.48	27474	27473.75	357.59
Manganese	367	366.5	68.49	549	549.14	75.74
Chromium	299	298.72	23.47	130	130.15	21.35
Vanadium	250	250.18	36.07	125 J	124.83	36.7
Titanium	2446	2445.65	111.5	3164	3164.13	122.68
Scandium	316 J	316	116.88	213 J	213.37	88.28
Calcium	75649	75649.48	635.21	38788	38788.26	476.24
Potassium	16523	16522.65	454.89	17713	17713	473.22
Sulfur	1386 U	< LOD	924.22	1143 U	< LOD	762.22
Barium	597	597.4	37.96	566	566.29	36.31
Cesium	103	102.84	10.33	77	76.9	9.8
Tellurium	180	180.12	32.94	141 J	140.81	31.31
Antimony	53 J	53.03	12.26	43 J	43.14	11.65
Tin	48 J	48.08	10.66	41 J	40.71	10.14
Cadmium	36 J	35.51	7.74	16 J	15.65	7.05
Silver	20 J	20.28	5.69	9 J	9.37	5.18
Palladium	16 U	< LOD	10.49	16 U	< LOD	10.35
Correlated Concentrations						
Arsenic	16 J			20 J		
Cadmium	27 J			14 J		
Chromium	198			88		
Lead	86			31		
Manganese	242			361		
Selenium	9 U			8 U		
Silver	17 J			10 J		
Uranium	35 J			20 J		
Vanadium	166			85 J		
Zinc	1886			559		