Section 2.0 Site Background

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2.0 Site Background

2.1 Facility Operations

This section briefly reviews the Silver Bow Plant's ownership and operational history. The operational history section examines the material handling and operations historically conducted at the Plant.

2.1.1 Ownership History

The site was agricultural land prior to 1950, when Victor Chemical Company began construction of the Silver Bow Plant. The legal description of the Silver Bow Plant is included in Appendix 2-A. Plant construction was completed in 1952. The Plant produced elemental phosphorus until 1997. The Silver Blow Plant ownership history is as follows:

1950	Victor Chemical Company began construction
1963	Stauffer acquisition
1985	Chesebrough-Pond acquisition
1986	Unilever acquisition
1987	ICI acquisition
1987	Rhône-Poulenc acquisition
1998	Rhodia Inc.

Rhône-Poulenc operated the Plant from 1987-1997. In 1997, Rhône-Poulenc shut down the Plant for decommissioning and closure. On January 1, 1998, Rhône-Poulenc transferred its chemical assets, including the Silver Bow Plant, to Rhodia Inc., a spin-off of Rhône-Poulenc. In September 2011, Solvay S.A. completed the acquisition of the shares of Rhodia S.A. (Rhodia Inc.'s ultimate parent) and Rhodia Inc. became a member of the Solvay Group.

2.1.2 Process Description

The Silver Bow Plant was constructed in the early 1950s to produce elemental phosphorus using an electric arc furnace method developed by the Tennessee Valley Authority. The process flow diagram for production of elemental phosphorus is shown on the Current Conditions Release Assessment reports (CCRA) Figure 2-23, included in Appendix 2-B. The major process areas are identified on CCRA Figure 2-24, included in Appendix 2-B. During its almost fifty years in productive service, the Silver Bow Plant has undergone several stages of development under different owners. Some of the significant structures at the facility and how they related to phosphorus production are described below. As an overview, aerial photos (CCRA Figures 2-6 and 2-25 through 2-30, included in Appendix 2-B), show the site development over time.

Prior to 1950, the property was agricultural land as seen in the August 27, 1947 aerial photo (CCRA Figure 2-6 in Appendix 2-B). Sheep Gulch, which appears to be a braided stream in the segment where the current tailing basin is located, flowed next to the small beaver pond that is north of the current tailing basin. Sheep Gulch and the beaver pond are visible in this photo. The Plant is present in the July 25, 1954, aerial photo (CCRA Figure 2-25 in Appendix 2-B), but the tailing basin had not been constructed. The Plant and the tailing basin are present in the 1977 aerial photo (CCRA Figure 2-26 in Appendix 2-B). By 1985, most of the buildings that existed in 1997 when the Plant was closed are visible (CCRA Figure 2-27 in Appendix 2-B). CCRA Figure 2-30 (Appendix 2-B) shows the September 2 and 12, 2002 recent aerial photo illustrating that much of the production Plant has been demolished.

2.1.2.1 Raw Materials Handling and Processing

The primary raw materials used at the Plant were phosphate ore, coke, silica, lime, and sulfuric acid. The phosphate ore, coke and silica were delivered to the Silver Bow Plant during the warm seasons of the year, and were stockpiled at the site so the Plant had a continuous supply and could operate year-round.

Phosphate Ore

Phosphate ore was the main raw material for the Plant. All of the phosphate ore was shipped to the Plant in 100-ton railroad cars, which were unloaded at either the car shaker or the rotary car tipple. The railroad car unloading facility is located at the railroad spur on the east property boundary of the site. The ore was shipped to the Plant only during the summer months and stockpiled in the area between the silos and the eastern boundary of the property.

Phosphate ore was then beneficiated[1] through one of two nodulizing kilns that operated at about 2,400 °F. This process drove off the volatile matter, sublimed the heavy metals, and agglomerated the ore into nodules, which were suitable furnace feed. The beneficiated ore was then sized and stored in the silos.

Coke

Coke was used in the electric arc furnaces as a reducing agent. The coke was delivered to the Plant by rail until the early 1990s when the coke was delivered by truck. All of the coke was stockpiled in the same area as the phosphate ore and silica, on the eastern portion of the property. The coke was dried in two natural gas fired rotary dryers located in the kiln building. The coke was then sized, and stored in the silos until it was mixed with the nodules and silica for furnace feed.

Silica

Silica was used as a flux in the electric arc furnaces. The silica was delivered to the Plant in 100-ton railroad cars, unloaded at the car shaker or the rotary car tipple, and stockpiled on the east portion of the property. Silica was transferred to the silos until it was mixed with the nodules and coke for furnace feed.

Lime

Lime was used to regulate the pH levels in the tailing basin during the operation of the Silver Bow Plant. The lime was delivered by truck and stored in an indoor bin until it was slurried to the tailing basin.

Sulfuric Acid

Sulfuric acid was used to adjust the pH of the process water in the phosphorus-processing portion of the Plant. The sulfuric acid was delivered to the Plant by truck and stored in an above-ground storage tank.

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[1] Beneficiated or beneficiation means chemical treatment or mechanical processes that improve a mineral or ore for its designated use. EPA's regulation at 40 CFR § 261.4(b)(7)(i) provides:

> "*beneficiation of ores and minerals is restricted to the following activities; crushing; grinding; washing; dissolution; crystallization; filtration; sorting; sizing; drying; sintering; pelletizing; briquetting; calcining to remove water and/or carbon dioxide; roasting, autoclaving, and/or chlorination in preparation for leaching (except where the roasting (and/or autoclaving and/or chlorination)/leaching sequence produces a final or intermediate product that does not undergo further beneficiation or processing); gravity concentration; magnetic separation; electrostatic separation; flotation; ion exchange; solvent extraction; electro-winnowing; precipitation; amalgamation; and heap, dump, vat, tank, and in situ leaching*."

2.1.2.2 Furnace Operations

The beneficiated phosphate ore nodules were mixed with coke and silica and charged into one of two electric arc furnaces (EAF) located in the furnace building. The furnaces converted the phosphate in the ore into elemental phosphorus in a reduced (i.e., oxygen-free) atmosphere. The elemental phosphorus left the furnaces as a vapor.

Slag (primarily calcium silicate) was drawn off the furnace as a liquid through the flush hole in the furnace. This molten material was cooled (i.e., solidified) via water emersion in the slag pit. The slag was subsequently excavated from the slag pit and stockpiled onsite at the coarse slag pile. From the mid-1980's until the end of furnace operations in 1995, approximately 50 percent of the slag was granulated with a high pressure water spray to a sand particle size and stockpiled separately at the granulated slag pile. Typical total slag production was approximately 200,000 tons/year.

Ferrophosphorus was also produced in the electric arc furnace. Iron, which is contained in the phosphate ore, was reduced to elemental iron as a side reaction. Phosphorus combines with the iron to form a very dense phosphorus-iron compound named ferrophosphorus. Other trace metals present in the ore, such as vanadium, silver, and gold are ferrophosphorus constituents. Approximately three times each day, molten ferrophosphorus was drained from the furnace through an opening in the furnace called a tap hole. Since the ferrophosphorus is heavier than slag, this opening was located below the flush hole in the furnace. The ferrophosphorus was collected in iron molds (chills) and allowed to air cool. This product was then sold to various vendors for use, or for metals recovery.

2.1.2.3 Condenser and Purification

The vapor stream from the electric arc furnace was cooled in lane condensers to liquefy the elemental phosphorus. The liquefied elemental phosphorus was then filtered to remove impurities from the product stream. The liquid phosphorus was moved through several different processing tanks during the filtering process. The purified elemental phosphorus was then stored in two 10,000-gallon above-ground storage tanks in the phosphorus handling area, and eventually loaded into specialized railroad tank cars for shipment.

The material retained on the filters (i.e., crude phosphorus) was sent to the Roaster Operations for additional processing.

2.1.2.4 Roaster Operations

Crude phosphorus awaiting roasting was stored in tanks and/or a 100 foot diameter clarifier. Crude phosphorus was processed through an externally heated rotary kiln. Crude phosphorus and roaster solids were metered into the rotary kiln. Elemental phosphorus was vaporized in the roaster. This vapor stream was condensed and the liquid phosphorus was sent to the product storage tanks.

The solids exited the roaster at the other end, and were cooled and stockpiled separately onsite for reuse in the roasting process, recycled to the kiln as a raw material, or sold as a by-product.

2.1.2.5 Tailing Basin

The tailing basin was constructed to handle process waters and stormwater and retain the tailing. A detailed description of the wastewater streams it received and recirculated is provided in Section 5.5.1. This current Section describes the physical make-up of the basin.

Several photographs of the dike construction have been found (Appendix 2-C). These photographs are dated September and October 1954, and show the construction methods which included transporting borrow to the construction area (trucks and scrapers), placing the borrow soils with bull dozers, and appropriate soils compaction equipment for construction of a water containment dike. One photo also shows a water truck spraying water on the work area, which suppresses dust and adjusts moisture to optimize compaction and minimize permeability of the borrow soils. The photos also indicate that the borrow soils were obtained from an area within the current footprint of the tailing basin.

In 1970-1971, the tailing basin was expanded to accommodate the water from new air pollution abatement systems (wet scrubbers) installed on the kilns and furnaces. During this time, or shortly thereafter, process slag was placed on the tops and slopes of the tailing basin dikes. The total tailing basin area is approximately 90 acres and includes the area between the influent and effluent channels and the north and south ponds (CCRA Figure 2-4 in Appendix 2-B). The tailing basin has a number of cells, several of which were normally dry. The combined water surface area of the wet cells during Plant operations was approximately 60 acres. When the tailing basin was expanded, the wash Plant tailings (fine material) and surrounding native clays were used as construction materials.

A lime addition system was also installed during the basin expansion to control the pH of the blowdown water from the kiln scrubbers. The pH control helped reduce the amount of gaseous fluoride released to the atmosphere from the tailing basin. After the solid materials settled out in the tailing basin, the water was recirculated to various Plant processes. During the early 1980s, the basin was beginning to fill up with tailing. To maintain the effectiveness of the basin for settling solids, the basin was divided into several cells to maximize settling of solids in cells with fewer tailing (*see* CCRA Figures 2-4 and 2-26 through 2-29 in Appendix 2-B). Tailing from full cells were removed by dredging and drag-lining and either placed in dry cells or elsewhere in the tailing basin area.

2.1.2.6 Discharge Pipeline

Beginning in the late 1960s, the Silver Bow Plant had a permit to discharge storm water runoff, uncontaminated cooling water and septic system water through a concrete discharge pipe running from the Plant to Silver Bow Creek. In 1972, a new septic system was installed to manage the septic system water, and a new pumping station was constructed to pump the uncontaminated cooling water to the tailing basin. The new pumping system did not function consistently, so the cooling water, as well as storm water runoff, continued to be discharged to Silver Bow Creek. In February of 1975, an improved pumping station was completed, known as the Final Pump Station, and all of the uncontaminated cooling water and storm water runoff was pumped to the basin. After February, 1975, there was no discharge of water off of the property through the discharge pipe. The discharge point of the old concrete discharge line to Silver Bow Creek was covered with slag. The pipe system north of German Gulch Road was removed in 2004 and 2005.

2.1.2.7 Phosphoric Acid Plant

The phosphoric acid plant (acid plant) was constructed at the site in 1960. The acid plant was located north of the furnace building and manufactured fertilizer-grade phosphoric acid from elemental phosphorus. The acid plant was shut down in 1978 and demolished in the early 1980's.

The phosphoric acid production process used by the Silver Bow Plant was the typical burning plant used in the industry. The process involved pumping elemental phosphorus (P4) to the bottom of a combustion chamber, where it was oxidized with combustion air. The reaction with oxygen formed a phosphorus pentoxide (P_2O_5). The phosphorus pentoxide was sent to a hydration tower where it was reacted with water to form the phosphoric acid product (H_3PO_4). The product acid was then sent offsite and used in the production of fertilizer. The process at Silver Bow did not involve separation of the trace arsenic from the elemental phosphorus raw material. The phosphoric acid product contained the trace arsenic, which was acceptable in this application for use as a fertilizer ingredient. As such, there were no process wastes. Carbon packing rings removed during the hydration tower demolition remain on the Plant site in SWMU 4 (*see* Section 5.5.4)

All of the drawings associated with the phosphoric acid plant were discarded when the phosphoric acid plant was demolished. Rhodia could not locate any records with analytical results for the phosphoric acid product or the elemental phosphorus that was used as the raw material during the acid plant operations, which ended around 1978.

2.2 Plant Demolition

After the furnace and kiln operations were shut down in December 1995, the process equipment in the Plant was mothballed and decontaminated, except for portions of the P4 Handling Department, the Powerhouse and boiler, the Roaster, and the 100 foot clarifier. The P4 Handling Department, Powerhouse, and Roaster were shut down and decontaminated in the spring of 1997. All of the phosphorus handling condensers, tanks (except for the 100-foot clarifier), and equipment were decontaminated with high pressure hot water. The pipes were either decontaminated with high pressure hot water or washed out with standard pressure (60 pounds per square inch) hot water. Phosphorus handling sumps, # 3 Catch Basin, and drain lines were also decontaminated with high pressure hot water. The slag and raw materials in the furnaces were removed in 1996 and the carbon block and brick liners, and roofs were removed from the furnaces in 1997. The refractory brick liners in the kilns were removed in 1997.

In 1998, the Kilns, the Kiln Building with all of the raw materials handling equipment, and the Kiln Feed Building were demolished. The Furnaces, the Furnace Building, the P4 Handling area, the Powerhouse Building, and the Roaster were demolished in 1999, and the area was covered with three to four feet of coarse slag.

Structures remaining on site include the 100 foot clarifier, two office buildings, the change house building, the maintenance shop, three large storage buildings, the concrete silos, the final pump station, three small electrical equipment motor control rooms, the electrical transformer substation, and the kiln scrubbers.

Water was used to decontaminate pipes, vessels, and miscellaneous equipment that did contain or could have contained phosphorus. Individual sections of piping, as well as individual vessels and equipment, were washed with hot water to remove any residual phosphorus. All of the water used for decontamination (some of which could have become contaminated with elemental phosphorus due to the decontamination process) was collected and sent to the 100-foot clarifier through existing piping. This decontamination water would be commingled with the other water in the clarifier and either still be in the clarifier, have gone to the tailing basin as clarifier overflow, evaporated or leaked from the clarifier. The decontamination water as well as dust control water used during the demolition was supplied by the Rhodia production wells. The overall pumping rates from the wells were lower than was typical during production. Other than that, the volume of decontamination water is not known and cannot be reliably estimated.

2.2.1 Disposition of Underground Piping

There are seven known categories of underground piping at the Plant: (1) water supply system pipes and recycled cooling water; (2) natural gas pipes; (3) sanitary sewer system pipes; (4) storm water drain system pipes (which were multi-purpose); (5) tailing basin recirculation water pipes (which were multi-purpose); (6) process water discharge pipes; and (7) boiler feed and non-contact cooling water.

The first two categories of pipe, water supply system pipes and natural gas pipes, would not contain elemental phosphorus. No elemental phosphorus was ever transmitted in these lines and there is no reason to believe that elemental phosphorus got into these lines. Water supply system pipes are the pipes that distribute water from the production wells, shown as purple lines on CCRA Figure 2-24 in Appendix 2-B. No wastewater was ever allowed in these pipes. Portions of both these systems are still functional and are in use.

Most of the sanitary sewer system pipes, the third category, are still functional and are in use. These pipes would have conveyed sanitary wastes and, except for the sanitary line from the laboratory, would not be expected to contain elemental phosphorus because floor drains and Plant water overflows were connected to the stormwater drain system, not the sanitary system. The sanitary sewer system pipes are shown as green lines on CCRA Figure 2-24 in Appendix 2-B.

The dark blue lines on CCRA Figure 2-24 in Appendix 2-B are storm water drain system pipes. Most of the stormwater drain system pipes (category 4) are still functional and are still in use. The Plant stormwater pipes flow to the Final Pump Station. The discharge piping from the Final Pump Station to the tailing basin is part of the storm water drain system and is still in use. Although elemental phosphorus water (phossy water) sometimes was carried by this system during the period of Plant operations, Rhodia has not seen evidence of elemental phosphorus in the outfall area (tailing basin) from the operation of the Final Pump Station since Plant demolition.

The tailing basin recirculation pipes (category 5) are those running from and those running to the tailing basin. The pipes carrying recycled water from the tailing basin are shown by orange lines on

CCRA Figure 2-24 in Appendix 2-B, and the line returning to the tailing basin, referred to as the "Hazelton Line," is shown in light blue. The typical water velocities in this pipe during operation were over 3 feet per second (4500 gpm in a 24 inch pipe), which would tend to keep small particles from settling out. The pumps have been disconnected and removed, and both ends of this system are currently buried beneath slag placed after demolition of the Plant. Aboveground portions of these pipes were taken out of use and were washed out with hot water during the Plant demolition process.

The process water discharge pipes (category 6) are the discharge lines that ran underground to the Plant water discharge trough. The ends of the 100-foot Clarifier sump discharge pipe are still present at the trough and Clarifier locations, and the discharge end of the #3 Catch Basin pipe is still located at the trough. The other end of the #3 Catch Basin pipe is currently buried beneath slag placed after demolition of the Plant. The below-ground portion of the #3 Catch Basin discharge pipe is shown on CCRA Figure 2-24 in Appendix 2-B. These pipes were routinely flushed with hot water during operational use, were flushed with hot water during demolition, and are not expected to contain elemental phosphorus.

There was some category 7 underground piping that was abandoned sometime before Plant closure, primarily boiler feed water lines and/or non-contact cooling water lines from the cooling tower. This piping would not be expected to contain elemental phosphorus since the water would not have come in contact with elemental phosphorus.

2.3 Land Use and Surrounding Area

2.3.1 Land Use

This section presents a summary of the current land uses at the Silver Bow Plant. A brief description of the current and reasonably anticipated future land use for the Plant property and the property immediately adjacent to the Silver Bow Plant is provided.

2.3.1.1 Current Land Use

The Silver Bow Plant ceased all elemental phosphorus producing activities in 1997. The current uses of the Rhodia property are management of the decommissioned facility, and agricultural use of portions of the Natural Area. The remaining structures at the Silver Bow Plant await demolition in conjunction with final closure of the Plant.

As described below, properties adjacent to the facility are currently used for industrial and agricultural purposes, or are managed under Superfund. The adjacent land uses are noted on CCRA Figure 2-2 in Appendix 2-B.

The Silver Bow Plant property and lands to the east and south of the property are within the County Industrial Development Zone (Silver Bow County, 2004). This area is zoned for industrial use. The Port of Montana is located to the northeast of the property, within the Industrial Zone. The Port consists of transloading facilities for trucks and railroad cars.

The former Silver Bow County sewage land injection site lies immediately to the east of the property and until 1997 it operated under an MPDES permit (MT0027430). Sewage injection ceased in 1997, and the area is currently used as a county-owned and operated sod farm. Additional data on the sludge, sediments, and groundwater from the site are presented in Appendix R of the CCRA and is included in this report as Appendix 2-D. The effects of the land sewage injection site on groundwater are further discussed in Section 5.3.2.

The Renewable Energy Corporation (REC) plant, formerly Advanced Silicon Materials, Inc. (ASiMI), a silicon production facility, is located south of the property, and is within the Industrial Zone. The REC plant is a RCRA large quantity generator (ID No. MTR000004754). The REC plant also holds an MPDES permit (Permit No. MT0030350) and discharges wastewater to Sheep Gulch. The permit allows the REC plant to discharge solutions with nitrogen, chlorine, and numerous metals including phosphorus, fluoride, and arsenic. Rhodia granted the REC plant an easement to allow their wastewater to travel through the Silver Bow Plant property. During periods of high discharge from the REC plant, their discharge produced surface water flow in Sheep Gulch. For several years, their wastewater discharge largely infiltrated to groundwater south of the Rhodia property and emerged as surface water discharge north of the tailing basin. Additional discussion about the REC plant wastewater discharge and groundwater quality is provided in Section 5.3.2.

Lands to the west of the property, which are currently used as dry pasture, are zoned for agricultural use. A few residences are present west of the Silver Bow Plant property along German Gulch Road and south of Silver Bow Creek. Specifically, there are six residences within ½ mile of the northwest corner of the Rhodia property.

The reach of Silver Bow Creek located north of the facility is within the Streamside Tailings Operable Unit (SSTOU) of the Silver Bow Creek/Butte Area National Priorities List (Superfund) site. Silver Bow Creek was used as a conduit for mining, smelting, industrial, and municipal wastes for over 100 years (MDEQ, 1995). The NPL site extends from above Butte, near the Continental Divide, westward along Silver Bow Creek to and including the Warm Springs Ponds (a treatment area). Unsaturated and saturated sediments, groundwater, and surface water adjacent to the creek were contaminated with arsenic, cadmium, copper, lead, mercury, and zinc. Remediation of the SSTOU was driven by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and was undertaken by the State of Montana. Rhodia is not a potentially responsible party at this site.

According to the Record of Decision (ROD), the Explanation of Significant Differences, and discussions with MDEQ project manager for the Stream Side Tailings Operable Unit, the tailings, impacted soils and sediments within the 100 year flood plain that exceed "order of magnitude reduction levels" will generally be excavated and relocated to local repositories outside of the 100 year flood plain. This order-of-magnitude criterion was intended to achieve the following metals levels, according to the State's project manager (Chavez, 2004):

- Arsenic generally less than 200 mg/kg.
- Cadmium generally less than 20 mg/kg.
- Copper, lead, and zinc generally less than 1,000 mg/kg.
- Mercury generally less than 10 mg/kg.

Remedial construction activities in the area north of the Rhodia property (Subarea 2, stream reaches F, G, and H) began in April 2004. Approximately 1,258,000 cubic yards of tailings and impacted soils and sediments were excavated from reaches F, G, and H, and were transported to the Opportunity Ponds tailings disposal facility near Anaconda, Montana (U.S. EPA, 2011). Approximately 17,500 cubic yards of contaminated soil in the adjacent railways were removed and a cap for remaining materials was installed over 16,440 square yards (U.S. EPA, 2011). Silver Bow Creek's channel bed and stream bank were reconstructed and a long term monitoring and maintenance program was implemented. The reconstruction of the Silver Bow Creek stream bank and channel bed along reaches F, G, and H was completed in March 2009, although revegetation and stream bank stability continue to be monitored (U.S. EPA, 2011).

Although a goal of the remediation is to have the surface water and groundwater concentrations eventually attain water quality standards, the tailings and impacted sediments and soils that will be left in place at the "order-of-magnitude" removal levels (e.g., arsenic at 200 mg/kg) are a continuing source of metals that will migrate into Silver Bow Creek. Despite these levels of remaining metals, the SSTOU remedy is based on the assumption that long-term contaminant attenuation in groundwater and surface water will achieve water quality standards. No timeline is specified for this eventual attainment. In addition, institutional controls have been implemented through the installation of a locked gate along on an access road to the Subarea. Additional signage, gates, and fencing were proposed in the third 5 year review conducted by the U.S. EPA (2011). The ROD states: "The selected remedy will protect human health and the environment through actions… together with permanent monitoring and maintenance of the remediated areas … through a comprehensive institutional controls, monitoring and maintenance program" and "[i]nstitutional controls restricting use of and exposure to contaminated groundwater will be necessary until the (groundwater) standards are attained" (MDEQ, 1995, pp.116-117).

2.3.1.2 Comprehensive Community Master Plan and Zoning

The Silver Bow Plant property is zoned for industrial land use as shown on the Butte-Silver Bow Future Land Use map on CCRA Figure 2-31 (Appendix 2-B). This figure also shows that the preferred future use of the Silver Bow Plant property is for industrial land use as defined in the *Butte-Silver Bow Growth Policy* (equivalent to a Comprehensive Community Master Plan). The *Growth Policy* defines rural industrial land use as being outside the urban corridor and land uses would include heavier industrial uses with needs for large tracts of land to avoid conflicts with residential users. This document was adopted in 2008. Adjacent property to the east and south is also zoned for industrial use. The property north of the German Gulch Road occupied by the Port of Montana is also zoned as industrial. West of the Silver Bow Plant, an area unaffected by Rhodia's Plant operations, agricultural land uses with a minimum parcel size of 10 acres will be allowed. Six existing residences are present in the agricultural area within ½ mile north and west of the Silver Bow Plant property along German Gulch Road and south of Silver Bow Creek. Future land use for land north of German Gulch Road and west of the Port of Montana is identified as rural with a minimum lot size of 1 acre, based on the *Growth Policy*. This land use is not likely, however. As indicated on CCRA Figure 2-31 in Appendix 2-B, the "Proposed Riparian Corridor" covers all this land between the Silver Bow Plant property and Silver Bow Creek, as well as a portion of the area north of Silver Bow Creek. This corridor also encompasses a Superfund site which is subject to land use and groundwater use restrictions that do not permit residential use, as described above. Significant portions of the area north of German Gulch Road are wetland or flood plain, an additional reason permanent dwelling construction may be restricted.

The only current residential area is in Ramsay, Montana, which is zoned as a rural center. Ramsay is also not affected by Rhodia's Plant operations since it is located north of Silver Bow Creek, which serves as a discharge point and barrier for groundwater and surface water flow from the Plant northward.

2.3.1.3 Reasonably Anticipated Future Land Use

Given the history of industrial land use on the Silver Bow Plant property and the presence of the Port of Montana, it is expected that the Plant property will be zoned as industrial for an extended period into the future. When closure is complete, structures remaining in the Plant Area will be two office buildings, including a laboratory, and a former maintenance shop. An existing railroad siding and car unloading facility will remain on the east side of the Plant Area. Selected portions of other railroad sidings in the Plant Area may also be preserved, as well as utilities and ancillary facilities, like fences and asphalt or concrete pads and foundations. Future industrial or commercial operations could benefit from this infrastructure and from the central location of the Plant in relation to adjacent operations to the east and south of the facility.

The future use of the Tailing/Slag Area shown on CCRA Figure 2-3 in Appendix 2-B will depend on the nature of the selected closure for the area, the adjacent land use in the former Plant area, and the land use zoning.

The Natural Area is the entire west and south portion of the property (CCRA Figure 2-3 in Appendix 2-B). The Natural Area has not been used for phosphorus production or stockpiling, and the groundwater underneath it is mostly upgradient of the Plant Area and Tailing/Slag Area. Borrow material is expected to be obtained from this area for use during closure activities. Future use of the Natural Area is expected to be consistent with existing and probable future agricultural or recreational uses in adjacent properties to the west. A change in zoning would be required for these uses. However, industrial use of this property would also be an acceptable alternative, or it could be used as buffer land for industrial use of the main Plant area.

Future uses of properties adjacent to the facility are expected to remain as industrial, commercial, and agricultural. These uses are consistent with county planning and zoning provisions.

2.3.2 Groundwater Use

This section presents a summary of the current use and potential future use of groundwater at the Silver Bow Plant. As of the date this document was finalized, exact plans for future groundwater use have not been finalized.

The upper 100 to 150 feet of the graben-fill aquifer in the vicinity of the site tends to be finer grained than the deeper zone of the aquifer, and wells screened in this upper zone typically produce poor yields of 25 to 50 gallons per minute (gpm). The Silver Bow Plant has five functional industrial wells that are screened in the deeper zone of the graben-fill aquifer, of which two are currently being used. The Silver Bow Plant wells can produce useful industrial water supply yields (over 600 gpm in some of the wells) from depths below 180 feet. Since phosphorus production has ceased at the Plant, Rhodia is presently operating only one production well at a time, either RP-W-1 or RP-W-7. Groundwater has not been used for drinking water since 1983 when bacteria were detected in some of the wells. Future use of onsite groundwater is anticipated to be supply of irrigation water for agricultural use or supply of process water for industrial applications.

The Montana Bureau of Mines and Geology (MBMG) database identifies at total of 146 wells within an approximate 2-mile radius of the Silver Bow Plant. The locations of the wells are depicted on CCRA Figure 2-32 in Appendix 2-B and the supporting data downloaded from the MBMG database are provided in Appendix 2-E. Geotechnical borings from the MBMG database were not included on the figure or in the appendix. During preparation of CCRA Figure 2-32 (Appendix 2-B), it became apparent that the MBMG database was not completely accurate. A review of the MBMG information for wells on the Rhodia Plant site was conducted. Five monitoring wells were misidentified in the MBMG database as boreholes and two well locations were inaccurate. The misidentified well locations are marked as such on the figure and the database table included in the appendix was edited to reflect the information about the known monitoring wells. The accuracy of the rest of database was not reviewed or confirmed.

There are seven wells classified as public water supply wells within two miles of the property. Two of the public water supply wells are in Ramsay, a rural center, and the five other wells supply water to area businesses: Renewable Energy Corporation, Port of Montana, Scoular Grain, and Pioneer Concrete. There is also a public water supply well owned by Mark Hanson. None of the drinking water wells shown on the MBMG database are known or expected to utilize groundwater that is impacted by the Silver Bow Plant. The public water supply and domestic wells identified in the

MBMG database are upgradient or sidegradient to the flow of groundwater under the Plant, or are north of Silver Bow Creek, which acts as a natural barrier to the flow of groundwater from the Plant.

Domestic wells to the northwest have intervening monitoring wells between the Plant and the domestic wells. These wells serve as a sentinel for any potential impacts at the domestic well locations (*See* Section 5.3 for additional information).

2.4 Regulatory History and Environmental Compliance

2.4.1 Environmental Permits, Exemptions and Registrations

The Silver Bow Plant has had two environmental permits, an exemption, and one registration. A water discharge permit was in effect from 1968 to 1972 to discharge storm water runoff, uncontaminated cooling water and septic system water to Silver Bow Creek. Until February 1975, storm water runoff and cooling water was discharged to Silver Bow Creek. After that time, sanitary water was discharged into a septic system and stormwater and Plant process water were discharged to the tailing basin system. The Montana Department of Health and Environmental Sciences (MDHES) declared Silver Bow Plant's tailing basin system exempt from the groundwater pollution control permitting requirements in 1983. The other environmental permit the Silver Bow Plant has obtained is an air quality permit, Permit No. 1636-07. In addition, the Plant filed a Title V air permit application in 1996.

The Silver Bow Plant has a U.S. EPA identification number, No. MTD057558546, and is designated as a large quantity generator.

The KEECO Analytical Laboratory, which leased laboratory space at the Silver Bow Plant from 1999 to 2003, was a RCRA small quantity generator, U.S EPA No. MTR000008235. The lease expired in 2003, and their laboratory is no longer in operation.

2.4.2 Compliance History

In accordance with a Compliance Order issued in the 1970s from the MDHES, the Silver Bow Plant installed air pollution control equipment.

The Silver Bow Plant has received citations from the MDHES Air Quality Bureau, for exceeding fluoride standards in forage. At issue were emissions of fluoride which deposited on the grasses consumed by cattle and affected the strength of their teeth. The Plant monitored the fluoride concentrations as required. Rhodia’s 1995 State Fluoride in Forage Report is included in

Appendix 2-F. The deposition of fluoride on vegetation ended with Plant closure and the associated complaints from the ranchers ceased.

The Plant received two citations from the MDHES Air Quality Bureau in 1984 and 1985 for exceeding opacity limits on the furnace tap hole fume scrubber. In 1992, the Silver Bow Plant received additional citations from the Air Quality Bureau for exceeding opacity and total particulate limits. This matter was resolved through a Consent Order in 1995.

In December 2003, Rhodia entered a guilty plea before the federal District Court for Montana to two felony counts of failing to have a hazardous waste permit for the storage of D001 ignitable hazardous waste in the clarifier and D001 ignitable hazardous waste in the furnace brick and liner pile and in pans containing electrostatic precipitator dust. The plea was accepted by the court and sentencing was entered on April 29, 2004 in United States v. Rhodia Inc., CR 03-29-BU-DWM (D. Ct. MT., judgment entered on 5/3/04). As a condition of probation, among other things, Rhodia is required to complete an investigation and, as necessary, corrective action at the Plant in accordance with a 7003 Order and a 3008(h) Order.

In a Consent Agreement filed on July 1, 2004, U.S EPA Region 8 agreed to resolve for no penalty all civil liability of Rhodia from the time it became owner of the Silver Bow facility through April 29, 2004 for violations of RCRA that could be alleged based on information known to U.S EPA through the date of execution of the Consent Agreement.

Similarly, in a letter dated January 13, 2004 from Jan Sensibaugh, Director of MDEQ, to Ken Kastner, counsel for Rhodia, MDEQ agreed that it would not bring a civil penalty action or seek criminal enforcement for any past violation or continuation of a past violation of the Montana Hazardous Waste Act at the Silver Bow Plant that could be based on the information presently known to DEQ concerning wastes that were the subject of the plea agreement (MDEQ, 2004). MDEQ also recognized and agreed in this letter that investigation and remediation of releases of hazardous waste and hazardous constituents from the Silver Bow facility will be conducted under the 3008(h) Order issued by U.S EPA and that matters relating to the investigation and closure of the clarifier and the used furnace brick and liner pile would be addressed in accordance with the 7003 Order issued by U.S EPA.

2.4.3 Other Regulatory Activity

2.4.3.1 Tolling and Standstill Agreement

On April 8, 2002, MDEQ and Rhodia executed a Tolling and Standstill Agreement to address regulatory issues associated with the 14 pans of phosphorus-bearing material, including eight pans of precipitator dust, that were being stored at Rhodia's Silver Bow Plant. The purpose of the Tolling and Standstill Agreement was to allow the continued storage of the material in the 14 pans in a manner that was lawful, safe and protective while a decision was made on the ultimate disposition of the material in the pans. It was agreed that Rhodia could continue to properly store the pans during the period of the Standstill Agreement, and that such storage beyond 90 days would not be the basis of an MDEQ enforcement action or penalty assessment.

By November 1, 2002, Rhodia had removed the phosphorus-bearing material from the 14 pans, drummed the material, and shipped the drums to Trade Waste Incineration in Sauget, Illinois. These drums were managed as conditional hazardous wastes and sent offsite with manifests and land disposal restrictions documentation. The cleaned pans were sold as scrap metal for recycling. By letter dated January 26, 2003, MDEQ agreed that as a result of the removal of the phosphorus material from the pans, the Tolling and Standstill Agreement terminated on November 1, 2002 (MDEQ, 2003).

2.4.3.2 Parcel 26 Wastewater Discharge Pipe MOA and AOC

The Montana Department of Environmental Quality is conducting a CERCLA remedial action for the Streamside Tailings Operable Unit (SSTOU) of the Silver Bow Creek/Butte Area NPL Site. A small portion of the SSTOU (i.e., Parcel 26) was once owned by Rhodia. A wastewater discharge pipe ran from the Silver Bow Plant through Parcel 26 to Silver Bow Creek, and some slag that was recycled for construction purposes was also placed in a few small piles on Parcel 26 (*see* Section 2.1.2.6 for the early history of the discharge pipe). Parcel 26 also contains mine tailings and related soil contamination (i.e., SSTOU materials) in and along the banks of Silver Bow Creek that are the subject of the CERCLA remedial action and that come from mining operations unrelated to operations of Rhodia or its predecessors.

In order to facilitate MDEQ's remedial work, Rhodia agreed to remove the discharge pipe north of German Gulch Road, clean and plug the pipe under the Road, and assist MDEQ in the handling and disposal of any elemental phosphorus that may be encountered. This agreement was memorialized in an Administrative Order on Consent (AOC) issued and filed by U.S EPA Region 8 on May 19, 2004 regarding the discharge pipe work in the non-floodplain portion of Parcel 26 and under German

Gulch Road. A separate Memorandum of Agreement (MOA) was entered into with MDEQ dated January 12, 2004 regarding the discharge pipe work in the floodplain portion of Parcel 26.

Rhodia removed and properly disposed of the pipeline in 2004 (*see* Section 5.5.24 for further details). Slag that covered the pipeline in the flood plain that had to be removed to excavate the pipe was stockpiled with other slag in Parcel 26.

2.4.3.3 RCRA § 7003 Order

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. The 7003 Order required Rhodia to perform the following work to address the clarifier and furnace liner and brick pile:

7003 Order Requirement	Completion Date
Prior to July 14, 2000:	
1. Install a security fence around the clarifier and the pile of used brick and furnace liner.	**July 10, 2000**
2. Post signs across the perimeter of the facility and upon the security fences referenced in (1).	**July 11, 2000**
Prior to July 29, 2000:	
1. Assess interim measures necessary to protect public health and the environment, including wildlife, develop an interim measures work plan (IMWP), and submit the IMWP to U.S. EPA.	**July 27, 2000**
Prior to October 25, 2000 (extended to December 2000) :	
1. Implement the approved IMWP.	**September 28, 2000**
2. Submit an Interim Measures Implementation Report in accordance with the approved IMWP schedule.	**December 22, 2000**
Prior to January 31, 2001	
1. Submit a written work plan that evaluates alternatives for the lawful removal and disposal of the contents of clarifier and used brick and furnace liner (i.e., Waste Plan)	**January 30, 2001**

Under the 7003 Order, U.S EPA also requested Rhodia to conduct pre-closure groundwater monitoring of the areas near the clarifier and brick pile. Rhodia conducted all requested monitoring and analysis, and has complied with all requirements of 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 all investigations and closure matters regarding the clarifier and the used carbon brick and furnace liner pile. As such, while this CCRA will review the current conditions relating to those units, it will not address further investigative, closure or remedial action with respect to them since that is being properly addressed under the 7003 Order.

2.4.3.4 RCRA § 3008(h) Order

U.S. EPA issued a Corrective Action Order on Consent (3008(h) Order), Docket No. RCRA-08-2004-0001, under § 3008(h) of the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6928(h)). The 3008(h) Order requires Rhodia to perform investigation and, as appropriate, corrective measures to address releases of hazardous waste and hazardous constituents at and from the Silver Bow Plant as necessary to protect human health and the environment considering site specific factors.

2.5 Waste Streams, Solid Waste Management Units and Areas of Concern

This section identifies the waste streams, the solid waste management units (SWMUs), and the areas of concern (AOCs) at the Silver Bow Plant. These waste streams, SWMUs and AOCs were identified through: (1) review of environmental investigations conducted by U.S EPA, MDEQ, Rhodia and Rhodia's predecessors; (2) discussions with current and former Plant personnel; (3) review of available aerial photos and Plant files; and (4) database records review of the property.

2.5.1 Identification of SWMUs and AOCs

The RCRA § 3008(h) Order defines a SWMU and an AOC as follows:

- ***SWMU***: *any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.*

- ***AOC***: *any area of the Facility at or from which a release to the environment of any hazardous waste or hazardous constituent has occurred, is suspected to have occurred or may occur, regardless of time, frequency, or duration of the release and which may present an unacceptable risk to human health or the environment regardless of whether such area meets the definition of a SWMU. The term Area of Concern includes, but is not limited to, areas and discernible units at which solid wastes have been placed, at any time, irrespective of whether the area or unit was intended for the management of solid or hazardous waste. Examples of Areas of Concern include, but are not limited to, landfills, surface impoundments, pits, waste piles, land treatment units, incinerators, tank systems (including any storage, treatment or accumulations tank systems), container storage units, waste or wastewater treatment systems units, and recycling units or other area or systems that* *received solid or hazardous waste or hazardous constituents or released hazardous waste or hazardous constituents at any time.*

The SWMUs/AOCs are identified and summarized in Table 2-1 which is adapted from the CCRA report. This summary includes the unit identification, map section identification (i.e., figure number), description of materials/wastes managed, dates of operation, description of the unit, discussion of the current status of the unit, and identification of the pertinent contaminants of potential concern (COPC) categories. COPC categories include groups of chemicals such as metals, elemental phosphorus, phosphorus (total- & ortho-), general chemical and site-specific parameters (e.g., fluoride, iron, magnesium, sulfate, etc.), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and radionuclides. Analytical parameter lists for each COPC category will be proposed in the RFI Work Plan for each media and sampling location where there is a complete or potentially complete pathway. COPC categories were identified for the various environmental media through review of the following information:

- Process knowledge;
- Discussion with current and former employees;
- Material Safety Data Sheets and Product information; and
- Existing analytical data from site samples.

Additional details about COPC identification is provided in the CCRA (Barr 2006) and SWMU/AOC specific COPC's are discussed in detail in their respective sections included in Section 5.5 of this report.

2.5.2 Material/Waste Stream Characteristics

This section summarizes each material/waste stream that was identified at the Plant.

2.5.2.1 Process Water

Water was used in several operations at the Silver Bow Plant. The Plant utilized groundwater from five production wells and recycled tailing basin water for the various operations. The principle uses of process water included: washing fines from the ore at the ore-washing plant; for slag (coarse and granulated) cooling water; for scrubber water; for covering elemental phosphorus (phossy water); and process cooling water. In addition to these uses of process water which contacted different materials present at the Plant, boiler blowdown water, stormwater and septic system water were also managed at the Plant. The process water is discussed in more detail in Section 5.5.1 of this report.

2.5.2.2 Wastewater Management

The tailing basin was constructed to receive and manage the process waters, cooling water, and storm water from the Plant area. The tailing basin allowed suspended solids in the water to settle out, so the water could be re-circulated and re-used in Plant processes. The tailing basin was designed and operated as a "closed-loop" system, with no discharge to other surface waters.

Discharges to the Tailing Basin

From the mid-1970s on, there was no discharge from the Plant to surface water. All water was either recirculated through the tailing basin, or discharged to the septic system.

In the early years of the Plant, the Montana ore was washed to remove fine-grained materials. The wash water containing the entrained clays and silts was discharged to the tailing basin. These fine-grained materials would be found at the base of the tailing basin, predominantly in the northern portion of the basin. When the Plant began using Idaho ore, the ore-washing plant was no longer needed. In the 1970s, Plant air emissions control systems were expanded, and the water associated with those systems was recirculated through the tailing basin, as described in more detail under the Kiln #1 and #2 paragraph below. Rhodia believes the majority of the tailing in the basin is particulate matter (and dirt) removed by the Plant scrubbing systems and the old ore-washing plant.

Table 2-2 presents a summary of the discharges to the tailing basin from the mid-1970s to Plant closure. The following descriptions provide additional detail regarding the material carried in the discharges.

There were three conveyance systems that delivered water to the tailing basin. The Plant water discharge trough carried the #3 Catch Basin stream, the 100-foot Clarifier overflow stream, and air scrubbing systems discharges. The #3 Catch Basin stream and the 100-foot Clarifier overflow stream discharged to the trough by way of underground pipes. The Plant water discharge trough (called “Launder” on CCRA Figure 2-24 in Appendix 2-B) was an above-ground system located southwest of the kiln scrubbers, which delivered water to the north portion of the tailing basin. This trough was constructed of fiberglass and had a semi-circular cross section, which was approximately 4 feet in diameter. Individual sections, approximately 8 feet in length, were supported by a steel frame.

These sections were bolted together and placed on the ground at the correct elevation to allow gravity flow to the tailing basin. The frame deteriorated in places allowing leakage into the surrounding soil.

A second conveyance was the Hazelton Line which carried the large flows from the slag granulation process. This is shown on CCRA Figure 2-24 in Appendix 2-B as a 24-inch underground pipe, color-coded in light blue. The third conveyance was the Final Pump Station, which discharged to the tailing basin through a buried pipe.

The #3 Catch Basin stream contained recycled tailing basin water used for cooling the slag pits, recycled tailing water used in the Plant cooling water system, well water, and boiler blow-down water. The location of the #3 Catch Basin is shown on CCRA Figure 2-24 in Appendix 2-B. The #3 Catch Basin was also the back-up system when the regular systems were not capable of handling process water from the roaster feed tank system, process water from the P4 sump, recycled tailing basin water from the slag granulation system, and flow from the 100-foot Clarifier. The #3 Catch Basin water was pumped to the Plant water discharge trough through an overhead pipe that has been removed, as shown on CCRA Figure 2-24 (Appendix 2-B).

The 100-foot Clarifier was designed with an outlet weir (a section of wall that was lower than the rest of the wall) to allow water at the surface to discharge to a steel trough which fed into the clarifier sump. This type of outlet discharges by overflowing across the weir that sets the water level, and is good for maintaining a relatively quiescent pool where solids can settle out. During Plant operations, this stream was referred to as the clarifier overflow stream, and that language has been maintained here. From the clarifier sump, the 100-foot Clarifier overflow stream would be pumped to the Plant water discharge trough through an underground pipe leading to the tailing basin. The stream consisted of process water from the P4 sump (which served the P4 Handling Area and Furnace Condenser Area) and process tanks. The streams from these areas were from P4 sump flows (which would be phossy water), from process tanks (including solids from the P4 filtering processes), water from the hot water tank, and non-contact water from the jacketed water line systems.

The Kiln Feed Building Moat stream was the water from a concrete moat located between the Kiln Building and the Kiln Feed Building. This stream consisted of recycled tailing basin water and fresh well water used in the Kiln Feed Building for washing down material transfer points and equipment. This stream contained kiln material handling water, and would not have contained phossy water. The solids in the Moat stream were mostly fine ore, coke, and silica dust. The stream was transferred to the tailing basin by pumping through overhead pipes to the Plant water discharge trough. On those occasions when the Moat Stream pumps were down, the flow from the Moat drained into the storm water drain system, which was pumped to the tailing basin by the Final Pump Station.

The #1 and #2 Kiln Scrubber streams were recycled tailing basin water used in the air pollution control scrubbers for the kiln emissions and other air scrubbing systems. The water used in the kiln scrubber systems carried away the dust and gaseous emissions scrubbed from the emissions from the kilns. The streams from the #1 and #2 Kiln scrubbers discharged directly to the Plant water discharge trough. The performance of the original kiln scrubbers was enhanced in 1971 when Rhodia increased the water flow through the scrubbers by using recycled tailing basin water rather than well water which was in limited supply. The CCRA Figure 2-24 in Appendix 2-B shows the recycled tailing basin water supply line to the Kiln Scrubbers in orange. Secondary scrubbers were added in 1976, which removed additional particulates (dirt). A 1993 upgrade increased the particulate removal effectiveness and improved emissions opacity control. The scrubbers have always discharged to the tailing basin, though in the early years the water passed through a kiln scrubber clarifier en route to the tailing basin. The tailing basin was expanded in the 1970s for the purpose of accommodating the scrubber water and associated solids. Rhodia believes the majority of the tailing in the basin is particulate matter (dirt) removed by the Plant scrubbing systems and the old ore-washing plant.

The Lime Treatment stream was water from the tailing basin to which lime had been added. The system was used to regulate the pH levels in the tailing basin. The Lime Treatment stream water was added via an above-ground pipe into the Plant water discharge trough, which discharged to the tailing basin.

The Hazelton Line pumped tailing basin water used in the slag granulation system back to the tailing basin through a large (24 inch) underground pipe. The light-blue line on CCRA Figure 2-24 in Appendix 2-B is the Hazelton Line. The parallel orange line is the tailing basin recycled water supply line. The Hazelton Line water likely carried some granulated slag, but did not normally include phossy water. Some of the #3 Catch Basin streams, which did include phossy water, were pumped to the tailing basin through the Hazelton Line when the normal #3 Catch Basin discharge was not available.

The Final Pump Station stream was conveyed to the tailing basin by an underground pipe that discharged into the north part of the basin. The pipelines into and out of the Final Pump Station are storm water drain system lines, shown in dark blue on CCRA Figure 2-24 in Appendix 2-B. Before the facility was demolished, the normal stream consisted of storm water runoff, overflow water from the slag pits (recycled tailing basin water), and water from various drains and applications where well water could overflow. Other flows that were handled by the Final Pump Station when the normal systems were not available were overflow water from the Kiln Feed Building Moat, overflows from the kiln dust collector scrubbers (recycled tailing basin water) Plant cooling water system overflows, and overflows from the #3 Catch Basin. The Final Pump Station became operational in 1975, and was equipped with a portable generator so that it could be kept functional even when other systems had no power.

Currently, the Final Pump Station stream consists of storm water runoff, well water discharges from periodic flushing of facility fire hydrants, and a small well water discharge from the shop building.

Tailing Basin Water Quality Evaluation

Rhodia prepared the *Tailings Pond and Groundwater Review* report and submitted the document to the Montana DEQ on November 8, 1996. The report provided a description and history of the Silver Bow Plant tailings basin and a summary of available groundwater data is summarized in Sections 5.5.1 and 5.3, respectively, of this report and is further discussed in the CCRA (Barr 2006). The Silver Bow Plant recirculated approximately 10,000 gpm of water through the tailing basin. The water flow rate and water quality data are summarized in Table 2-2.

2.5.2.3 Non-Wastewaters

2.5.2.3.1 Tailing

The tailing is the suspended solids that settled out in the tailing basin. Their primary source was initially the ore-washing operations, and subsequently, solids removed by the wet scrubber systems that provided air pollution control on the kilns and furnaces. The tailing is managed in SWMU 1 and is discussed in detail in Section 5.5.1.

2.5.2.3.2 Crude Phosphorus

After the elemental phosphorus was produced in the furnace, condensed and filtered, the residual filter cake from filtering was reprocessed as crude phosphorus. The crude phosphorus consisted of elemental phosphorus (about 20% volume/volume [v/v]); water (about 30% [v/v]); and solids (about 50% [v/v]) such as phosphate dust, coke dust and silica dust. Until March 1997, the crude phosphorus was further processed in the Plant's roaster to produce P4 product.

Crude phosphorus may ignite when exposed to air. It may also generate some phosphine gas when it is in contact with water at high pH, temperature and agitation conditions. Rhodia installed a continuous phosphine monitoring system around the clarifier as required by the RCRA § 7003 Order and submits annual phosphine monitoring reports[2] to U.S EPA. The time-weighted average values reported from the continuous monitoring for phosphine have typically been 0.0 ppmv. Crude phosphorus is further discussed in Section 5.5.2.

2.5.2.3.3 Used Carbon Brick/Furnace Liner/Electrodes

The used carbon brick and furnace liner is a refractory lining that was removed from electric arc furnaces that were used to convert phosphate ore and other feedstocks into elemental phosphorus. The electrodes were the heating elements of the furnaces. Although the brick, liner and electrodes could contain trace amounts of amorphous phosphorus and are manufactured from carbon, they are non-combustible (UCAR, 1994). These materials are managed in SWMUs 3 (Used Carbon Brick and Furnace Liner Pile), 4 (Used Carbon Blocks, Floor Logs and Furnace Liner Pile), and 5 (New and Used Carbon Block and New Carbon Brick) and are further discussed in Sections 5.5.3, 5.5.4 and 5.5.5 respectively.

Portions of the surfaces of a small fraction of the used carbon brick, liner and electrodes may contain a thin veneer of amorphous phosphorus, which appears as a noticeable red material adhering to the surface. Accordingly, assessing the presence or absence of amorphous phosphorus is a visual observation rather than a laboratory analytical procedure. This amorphous phosphorus does not spontaneously react with air, but may ignite when sufficient friction is applied to its surface. In all likelihood, the amorphous phosphorus on the surface of the bricks at the Silver Bow Plant has oxidized with the ambient air to form a very thin layer of oxidized phosphorus compounds. This thin layer essentially seals out the air. Friction or impact could disturb this thin layer causing ignition and burning until the amorphous phosphorus is consumed. The U.S EPA reported that during their National Enforcement Investigations Center (NEIC) inspection in May 2000, samples of brick ignited upon merely being exposed to air and did not require friction to cause ignition. In Rhodia's experience, friction through movement of the brick or from an external source is necessary for the amorphous phosphorus on brick to ignite. Rhodia has never observed ignition of the brick upon mere exposure to air.

[2] Monthly reports were submitted to U.S. EPA until the submittal schedule was changed to annual reporting as provided in the U.S. EPA's March 14, 2009 letter to Rhodia.

2.5.2.3.4 Kiln Brick and Concrete Debris

The kiln brick is a refractory lining that was removed from kilns used in the beneficiation of the phosphate ore. These bricks are the same material described in Section 2.5.2.3.3. These brick were not exposed to elemental phosphorus, and therefore, do not contain amorphous phosphorus. These brick were typically hauled to the coarse slag pile (SWMU 12) for disposal.

Concrete debris was generated during construction and demolition projects conducted at the Silver Bow Plant. Concrete foundation and structures were broken into manageable size pieces and hauled to the coarse slag pile (SWMU 12) for disposal. Further discussion of SWMU 12 is provided in Section 5.5.12.

2.5.2.3.5 Slag (Coarse and Granulated)

Slag is an inert rock-like material formed from the minerals in the nodulized phosphate ore, silica, and coke feedstocks in the phosphorus production furnace. Slag consists primarily of calcium silicate and is generally of cobble size. From the mid 1980's to 1997, the Silver Bow Plant granulated about 50 percent of the slag to a medium sand size, and stockpiled the granulated slag separately from the coarse slag. The coarse slag pile is identified as SWMU 12 and the granulated slag pile is designated SWMU 13. Historically, all material removed from the furnaces during a digout was placed in the slag pile or brick pile. This digout material included slag, furnace burden, used furnace brick, used furnace liner, and electrodes. During the last decade or so of operation, this material was placed in the southeast corner of the slag pile. Coarse and granulated slag is further discussed in detail in Sections 5.5.12 and 5.5.13 respectively.

2.5.2.3.6 Roaster Solids

After crude phosphorus sludge was roasted to recover additional phosphorus, residual roaster solids remained. Tests of this material show that it is about 40 percent CaO (lime), 30 percent P_2O_5 (phosphate), 15 percent SiO_2 (silica), 2 to 3 percent F (Fluoride), 1 to 2 percent Fe_2O_3 (iron oxide), and the balance (about 10 percent) is water. Like slag, roaster solids have been subjected to high heat, but unlike slag, roaster solids have not been melted and reconstituted as rock. Roaster solids are managed in SWMU 14. Roaster solids in SWMU 14 are discussed in detail in Section 5.5.14.

2.5.2.3.7 Precipitator Dust

Dust from the electrostatic precipitators, which were used to clean the furnace off-gas, was generated until early 1985 when the precipitators were shut down and removed from service. The precipitator dust that was generated during normal high temperature conditions did not contain elemental phosphorus and was sold as a product. Precipitator dust that was generated during start-ups and other lower temperature conditions contained elemental phosphorus. This precipitator dust was either buried onsite (SWMU 15 Precipitator Dust Burial Area), or placed in pans (adjacent to the coarse slag pile) (SWMU 17 Removed Precipitator Dust Pans Area) and covered with slag (SWMU 16 Buried Precipitator Dust Pans Area). The buried precipitator dust and dust pans are further discussed in Sections 5.5.15 and 5.5.16 respectively. The precipitator dust placed in pans (SWMU 17) were removed and properly disposed offsite in 2002, as discussed in Section 5.5.17.

2.5.2.3.8 Residual Phosphate Ore

Phosphate ore was obtained from offsite mines located in Montana and Idaho. It was beneficiated into nodules in the kilns and became a feedstock for the furnace. Some residual ore remains at the Plant mostly mixed in the soil where it was piled (SWMU 6 Raw Material Area). The residual phosphate ore is further discussed in Section 5.5.6.

2.5.2.3.9 Residual Kiln Nodules

Kiln nodules are phosphate ore that was nodulized in the beneficiation kilns and fed as a feedstock to the electric arc furnaces. Some residual nodules remain at the Plant mostly mixed in the soil where they were piled (SWMU 6 Raw Materials Area). The residual kiln nodules are further discussed in Section 5.5.6.

2.5.2.3.10 Waste Oil

Waste oil was generated during equipment maintenance operations. Some waste oil was poured on the stockpile of phosphate ore (identified as SWMU 6 Raw Materials Area). This phosphate ore with waste oil was fed to the kilns where the oil was combusted in the high temperature kilns and is further discussed in Section 5.5.6.

2.5.2.3.11 Residual Coke and Coke Fines

Coke was used as a feedstock to scavenge oxygen in the furnace. Some residual coke remains at the Plant mostly mixed in the soil where it was piled (SWMU 6 Raw Materials Area and SWMU 9 Coke Storage Area). The residual coke and coke fines are further discussed in Section 5.5.9.

2.5.2.3.12 Residual Coal

Coal was used as a fuel for the kilns. Some residual coal remains at the Plant mostly mixed in the soil where it was piled (SWMU 10 Coal Stockpile Area). The residual coal is further discussed in Section 5.5.9.

2.5.2.3.13 Residual Silica

Silica was a feedstock that was used as a flux in the furnace. Some residual silica remains at the Plant mostly mixed in the soil where it was piled (SWMU 6 Raw Material Area). The residual silica is further discussed in Section 5.5.6.

2.5.2.3.14 Residual Ferrophosphorus

Ferrophosphorus is an iron-rich solid ingot produced at the Plant and stockpiled in the raw materials area. The ferrophosphorus was sold as a product. Some residual ingots of this material remain at the Plant mostly mixed in the soil were it was piled (SWMU 26). The residual ferrophosphorous is further discussed in Section 5.5.26.

2.5.2.3.15 Pipes and Tanks containing Elemental Phosphorus

As part of the demolition process, pipes, tanks and other process equipment that were to be scrapped were cleaned prior to being sold as scrap. The piping was mainly 2 to 4-inch stainless steel pipe that was used in the phosphorus handling department. Process tanks that contained phosphorus were also primarily stainless steel. These tanks stored either elemental phosphorus product that was ready to be shipped or crude phosphorus that was being processed. Other debris that contained phosphorus was equipment used in the furnace and condensing system. This equipment was either stainless steel or carbon steel and had phosphorus contamination on the surface, prior to cleaning.

2.5.3 Other Releases

Over the operational life of the Silver Bow Plant, releases to the ground surface have occurred. Process water was necessary to handle and transfer elemental phosphorus between process vessels and tanks. However, process vessels and tanks were sometimes overfilled, resulting in a release of phossy water and/or elemental phosphorus to the ground surface. Process equipment and pipes occasionally ruptured or leaked, and released their contents to the ground. These releases could have occurred throughout the furnace side of the production area including the areas around the clarifier, the roaster, product and crude phosphorus tanks and product and crude phosphorus transfer areas.

Typically, releases of elemental phosphorus resulted in a fire that was immediately extinguished by covering it with water, soil or slag. After extinguishing the fire, any remaining product on the ground was recovered and transferred to the crude phosphorus operations for further processing and recovery of the elemental phosphorus. Water used to extinguish the fire and/or phossy water that was released as a part of the spill would be collected by a system of drain troughs that led to the P4

Sump or #3 Catch Basin, by the storm sewer system, or would infiltrate into the ground. The collection systems discharged to the tailing basin.

2.6 References

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Tables

Table 2-1

Identification of Solid Waste Management Units and Areas of Concern (SWMUs/AOCs)
Current Conditions/Release Assessment Report
Rhodia Silver Bow Plant

Unit Identification	Map ID	Materials/Wastes Managed	Dates of Operation	Description	Current Status (Entire Plant Area fenced and secured)	Contaminant of Potential Concern Catergory[1]
SWMU 1 Tailing Basin & Water Recirculation System	Figure 5.5.1-1a	• Wastewater from washing raw phosphate ore; • Wastewater from production process; • Phossy water and incidental crude phosphorus from clarifier overflow and catch basin discharge; • Pond pH control water; • Cooling water; • Boiler Blowdown; • Scrubber water air pollution control equipment on kilns and furnaces; • Slag Granulator water; • Storm water.	1950's to 1997	Approximately 70 acres of pond area created by dam across Sheep Gulch. Dikes constructed to the north, west, and south to expand capacity of the Tailing basin. Water was conveyed to Basin via trough and pipes and recirculated via pipe. Tailing were dredged, dewatered and placed at locations with SWMU to deepen the Tailing basin. Sheep Gulch channel constructed to divert surface water flow around the south and west side of the Tailing basin in the late 1970's.	Tailing basin is currently dry. Areas of the basin have been covered with slag to minimize fugitive dust emissions from the dried Tailing. Magnesium chloride applied to areas not covered by slag every year for dust control.	• General Chemical Analytes • Elemental Phosphorus • Metals • Radionuclides
SWMU 2 Clarifier	Figure 5.5.2-1a	• Excess crude phosphorus; • Product phosphorus and wash water from railcar cleaning activities; • Elemental phosphorus and wash water from decontamination activities during plant demolition.	1950's to 1997 1997 to current: water level maintenance	100 ft diameter concrete clarifier containing approximately 500,000 gallons of crude phosphorus material, which is covered by a water cap and 4" diameter plastic balls (Birdballs™). Water is added since clarifier loses water due to leakage and evaporation.	Subject of RCRA § 7003 Order. Immediate measures include security fence, and signage. Interim measures include automatic water level maintenance system, cover of Birdballs™, continuous phosphine monitoring system, and fence maintenance.	• General Chemical Analytes • Metals • Elemental Phosphorus • Radionuclides • Phosphine
SWMU 3 Used Carbon Brick and Furnace Liner Pile	Figure 5.5.3-1a	• Used carbon brick, furnace liners, and slag; • Used furnace electrodes.	1950's to 1997	An outdoor stockpile of used carbon brick, furnace liners and electrodes, approximately 300 feet long by 30 feet wide by 10 feet high.	Subject of RCRA § 7003 Order. Immediate measures include security fence, and signage. Interim measures include netting to prevent birds from landing on the bricks.	• Elemental Phosphorus • Metals

[1] This column identifies categories of COPCs that warrant further evaluation based on knowledge of operations at each SWMU or AOC.

Table 2-1

Identification of Solid Waste Management Units and Areas of Concern (SWMUs/AOCs)
Current Conditions/Release Assessment Report
Rhodia Silver Bow Plant

Unit Identification	Map ID	Materials/Wastes Managed	Dates of Operation	Description	Current Status (Entire Plant Area fenced and secured)	Contaminant of Potential Concern Catergory[1]
SWMU 4 Used Carbon Blocks, Floor Logs & Furnace Liner Pile	Figure 5.5.4-1a	• Used carbon brick and furnace liners	1950's to 1997	An outdoor stockpile of used carbon brick and furnace liners to the west of SWMU 3.	In place	• Elemental Phosphorus • Metals
		• Carbon packing rings	Early 1980s to 1997	Separate pile of used carbon rings removed from hydration tower of the Phosphoric Acid Plant.	In place (Adjacent to used carbon brick and furnace liners).	• None
SWMU 5 New and Used Carbon Block and New Carbon Brick	Figure 5.5.5-1a	• New and Used Carbon Block and New Carbon Brick	1950's to 1997	Small outdoor stockpiles of new and used carbon electrodes and furnace brick.	In place	• Elemental Phosphorus • Metals
SWMU 6 Raw Materials Area	Figure 5.5.6-1a	• Phosphate Ore • Coke • Silica • Kiln nodules • Waste motor oil • Coal	1950's to 1997	Large separate stockpiles of raw materials were located on the east side of the property. Raw material stockpiles removed. Residuals remain mixed in soil. Waste motor oil from the maintenance shop was periodically spread on the phosphate ore, which was then processed in the kilns. Clay and topsoil also currently stockpiled in this area.	Residual raw materials are in soil.	• General Chemical Analytes • Metals • SVOCs • Volatile Petroleum Hydrocarbons (VPH) • Radionuclides

[1] This column identifies categories of COPCs that warrant further evaluation based on knowledge of operations at each SWMU or AOC.

Table 2-1

Identification of Solid Waste Management Units and Areas of Concern (SWMUs/AOCs)
Current Conditions/Release Assessment Report
Rhodia Silver Bow Plant

Unit Identification	Map ID	Materials/Wastes Managed	Dates of Operation	Description	Current Status (Entire Plant Area fenced and secured)	Contaminant of Potential Concern Catergory[1]
SWMU 7 Elemental Phosphorus Production Area	Figure 5.5.7-1a	• Process wastewater • Phossy water	1950's to 1997	Production area of site where elemental phosphorus and crude phosphorus material were handled, processed, and stored. Production area includes furnace area, slag pits, phosphorus processing tanks, concrete silos, P4 Handling area, powerhouse area, roaster area, and granulation, and phosphoric acid plant. Phosphorus processing tanks were above ground or partially below ground. None of the tanks were more than partially below ground. Process water and phossy water may have been released to ground surface where it would have infiltrated. Although the clarifier is part of the production area, it is listed as a separate SWMU (see above).	Production facility was decontaminated during the demolition activities. Buildings were demolished and sold as scrap metal. Tanks, piping and equipment containing P4 were cleaned and recycled, except a few items stockpiled on site (see used pump area). The phosphorus storage tanks were above-ground stainless steel tanks, and have been cleaned and recycled. The phosphorus process tanks generally had bases recessed 4 feet into the ground, with the majority of the stainless steel tank above-ground. These tanks have also been cleaned and recycled. Foundations have been covered by 3 ft of soil/slag. Concrete silos and the kiln scrubbers remain.	• Elemental Phosphorus • Metals • Radionuclides • Phosphoric Acid
SWMU 8 Used Pump Area	Figure 5.5.8-1a	• Worn-out pumps used in production process.	1988 to about 1993	Progressive cavity pumps that have been cleaned.	In place	• Elemental Phosphorus
SWMU 9 Coke Fines Area	Figure 5.5.9-1a	• Coke fines unsuitable for production process.	1950's to 1997	Coke fines located south of coarse slag pile and by roaster solids.	Residuals remain mixed in soil.	• Metals
SWMU 10 Coal Stockpile Area	Figure 5.5.10-1a	• Coal residues	mid 1980's to early 1990's	Former stockpile of coal used as auxiliary fuel for kilns.	Residuals remain mixed in soil	• Metals
SWMU 11 Crude Phosphorus Burial Area	Figure 5.5.11-1a	• Excess crude phosphorus buried in trenches just south of 100 foot clarifier.	Likely 1960's to late 1970's	Closed land disposal unit.	Capped with 40 ml synthetic membrane liner; and five feet of soil/slag cover.	• General Chemical Analytes • Elemental Phosphorus • Metals • Radionuclides

[1] This column identifies categories of COPCs that warrant further evaluation based on knowledge of operations at each SWMU or AOC.

Table 2-1

Identification of Solid Waste Management Units and Areas of Concern (SWMUs/AOCs)
Current Conditions/Release Assessment Report
Rhodia Silver Bow Plant

Unit Identification	Map ID	Materials/Wastes Managed	Dates of Operation	Description	Current Status (Entire Plant Area fenced and secured)	Contaminant of Potential Concern Catergory[1]
<u>SWMU 12</u> Coarse Slag Pile	Figure 5.5.12-1a	• Coarse slag excavated from the slag cooling pits; • Furnace digout material, including some pieces of used furnace brick/liner; • Used kiln bricks and miscellaneous construction debris; and • Small amount of domestic refuse.	1950's to 1997	Several million ton stockpile of coarse slag material from the electric arc furnaces, located on the south side of the site, east of the Tailing basin.	In place	• Elemental Phosphorus • Metals • Radionuclides
<u>SWMU 13</u> Granulated Slag Pile	Figure 5.5.13-1a	• Granulated slag from the granulation process.	1979 to 1995	Several million ton stockpile of granulated slag located on the southeast side of the site and east of the coarse slag stockpile.	In place	• Metals • Radionuclides
<u>SWMU 14</u> Roaster Solids Area	Figure 5.5.14-1a	• Solid materials from the roaster operations.	1950's to 1997	Stockpile of sand-like material from roaster operation, located north of granulated slag stockpile.	In place	• Metals • Radionuclides • Elemental Phosphorus
<u>SWMU 15</u> Precipitator Dust Burial Areas	Figure 5.5.15-1a	• Dust recovered by electrostatic precipitators.	1950's to late 1970's	Closed land disposal unit located north of coarse slag pile with a small area just east of Tailing basin return water channel.	Capped with 40 ml synthetic membrane liner; and 4½ feet of slag/soil cover.	• Elemental Phosphorus • Metals
<u>SWMU 16</u> Buried Precipitator Dust Pans Area	Figure 5.5.16-1a	• Dust recovered by electrostatic precipitators.	late1970's to mid 1980's	Past operators report there are buried steel precipitator dust pans covered with several feet of soil and granulated slag. Located northeast of precipitator dust burial site.	Capped in place.	• Elemental Phosphorus • Metals
<u>SWMU 17</u> Removed Precipitator Dust Pans	Removed in 2002 Figure 5.5.17-1a shows former location.	• Dust recovered by electrostatic precipitators.	late 1970's to mid 1980's	Eight pans of precipitator dust placed at the north edge of the coarse slag pile and covered with slag during plant operations.	Subject of April 2002 Standstill Agreement. Pans were emptied and cleaned during 2002. The contents were disposed of by incineration at Trade Waste Incinerator. The cleaned pans were recycled.	• None

[1] This column identifies categories of COPCs that warrant further evaluation based on knowledge of operations at each SWMU or AOC.

Table 2-1

Identification of Solid Waste Management Units and Areas of Concern (SWMUs/AOCs)
Current Conditions/Release Assessment Report
Rhodia Silver Bow Plant

Unit Identification	Map ID	Materials/Wastes Managed	Dates of Operation	Description	Current Status (Entire Plant Area fenced and secured)	Contaminant of Potential Concern Catergory[1]
SWMU 18 Scrap Steel and Scrap Tin Bales Area	Figure 5.5.18-1a	• Scrap steel and scrap tin from demolition.	1998 to 1999	Scrap steel and scrap tin from demolition of plant. Most of the tin material is baled.	In place	• Metals • Radionuclides
SWMU 19 Refuse Disposal Area	Figure 5.5.19-1a	• Domestic garbage from plant and miscellaneous site refuse.	1950's to late 1970's	Closed land disposal unit located northeast of Tailing basin.	Capped with 3 feet of slag and soil.	• Metals • Elemental Phosphorus
SWMU 20 Scrap Steel and Equipment Burial Area	Figure 5.5.20-1a	• Equipment and steel that may contain P4.	1950's to late 1970's	Closed land disposal unit located east of kiln production area and northeast of Tailing basin .	Capped with 40 ml synthetic membrane liner; and 4½ feet of slag/soil cover.	• Metals • Elemental Phosphorus • Radionuclides
SWMU 21 Former Transformer Locations and Transformer Storage Area	Figure 5.5.21-1a	• Former locations of PCB-contaminated transformers, and • Former location of PCB contaminated transformer storage area .	1950's to 1998	Locations in the production process area where PCB contaminated transformers were used or stored prior to off-site disposal.	PCB-contaminated transformers were disposed of off-site. Confirmatory sampling performed and no PCB releases detected. PCB-contaminated equipment drained and disposed of offsite during plant demolition.	• PCBs • SVOCs
SWMU 22 Slag Granulation Water and Temporary Retention Ditch Area	Figure 5.5.22-1a	• Overflow from slag granulation system (recycled pond water).	1979 to 1995	Ditch used for temporary retention of recycled pond waters that ordinarily were discharged to Tailing basin .	In place	• Metals • Elemental Phosphorus
SWMU 23 Septic Tanks & Septic Drain Field	Figure 5.5.23-1a	• Sewage from lavatories and locker rooms. • Sink drains from laboratory. • Laboratory discharges (acids and solvents).	**Old drain field:** Early 1970's to early 1980's **New drain field:** Early 1980's to late 1990s **Addition to New Drain Field:** Late 1990s to present	Seven septic tanks near the plant, and perforated plastic pipe in the drain field..	Portion of the drain field area is still in use, but for sanitary wastes only (see Dates of Operation)..	• VOCs • SVOCs • General Chemical Analytes • Elemental Phosphorus • Metals

[1] This column identifies categories of COPCs that warrant further evaluation based on knowledge of operations at each SWMU or AOC.

Table 2-1

Identification of Solid Waste Management Units and Areas of Concern (SWMUs/AOCs)
Current Conditions/Release Assessment Report
Rhodia Silver Bow Plant

Unit Identification	Map ID	Materials/Wastes Managed	Dates of Operation	Description	Current Status (Entire Plant Area fenced and secured)	Contaminant of Potential Concern Catergory[1]
SWMU 24 Discharge Pipe Area	Figure 5.5.24-1a	• Sewage from lavatories and locker rooms. • Sink drains from laboratory • Cooling water • Process water • Storm drainage	1950's to early 1970's	Concrete sewer that discharged to Silver Bow Creek.	Discharge Pipe under German Gulch Road has been cleaned and plugged. Pipe north of German Gulch Road has been removed pursuant to AOC and MOA. This SWMU includes only the remaining discharge pipe south of German Gulch Road.	• Elemental Phosphorus • Metals
SWMU 25 Containment Pad Area	Figure 5.5.25-1a	• Precipitator Dust • P4 in scrap pipe and miscellaneous equipment. • Discharge pipe residuals.	2002 to present	Used to clean and drum precipitator dust, P4 contaminated scrap metal and equipment, and discharge pipe residuals. Containment pad constructed to RCRA standards. P4 materials incinerated at Trade Waste Incinerator. Metal pipe and equipment was recycled.	In place and available for use.	• Elemental Phosphorus • Metals • Radionuclides
SWMU 26 Ferrophosphorus Area	Figure 5.5.26-1a	• Ferrophosphorus	1950's to 1997	Stockpile of ferrophosphorus was located on the east side of the property. Ferrophosphorus stockpile removed. Residuals remain mixed in soil.	Residual ferrophosphorus is in soil.	• Elemental Phosphorus • Metals • Radionuclides
SWMU 27 Final Pump Station	5.5.27-1a	• Storm water runoff; • Overflow water from the slag pits (pond water); • Overflow water from the Moat; • Pond water overflows; • Discharges from the kiln dust collector scrubbers; • Various well water overflows and drains.	1972 to present	Concrete sump to collect process water prior to pumping to the tailing basin.		• Metals • Elemental Phosphorus

[1] This column identifies categories of COPCs that warrant further evaluation based on knowledge of operations at each SWMU or AOC.

Table 2-1

Identification of Solid Waste Management Units and Areas of Concern (SWMUs/AOCs)
Current Conditions/Release Assessment Report
Rhodia Silver Bow Plant

Unit Identification	Map ID	Materials/Wastes Managed	Dates of Operation	Description	Current Status (Entire Plant Area fenced and secured)	Contaminant of Potential Concern Catergory[1]
AOC A Petroleum Storage Areas	Figure 5.5.28-1	• Former and present locations of petroleum storage tanks. • Shop area where equipment was fueled and maintained. • Final Pump Station – Diesel Fuel Tanks.	1950's to present	The following tanks have been used for petroleum storage at the Plant: two underground gasoline tanks, five large above-ground diesel storage tanks, and the following smaller above-ground tanks:, a 1000 gallon gasoline tank, a 200 gallon portable diesel tank a 100 gallon diesel tank at the Final Pump Station, and at the Shop Building, three 1,000 gallon lubricating oil tanks and one 200 gallon waste oil tank. The two underground gasoline tanks were removed in the late 1980's. There was no evidence of contamination when they were removed. Three of the five large above-ground diesel tanks have been removed. All of the above ground tanks had containment dikes with soil bottoms.	The two underground gasoline tanks were removed. Three of the five large above-ground diesel tanks have been removed, and the two remaining tanks are empty and are not used. There is stained soil in the containment areas of the two remaining large diesel storage tanks. The 1,000 gallon above-ground gasoline storage tank was sold on February 1, 2006 and was removed. The 200 gallon portable above-ground diesel tank, currently unused, is stored next to the brick shed. Final Pump Station 100 gallon above-ground diesel tank. Shop Building Three 1000 gallon above-ground lubricating oil tanks. One 200 gallon above-ground waste oil tank.	• Volatile Petroleum Hydrocarbons (VPH) • Metals (Waste Oil)
AOC B Sulfuric Acid Tank Area	Figure 5.5.29-1	• Sulfuric acid	1952 to 1996	Above ground storage tank used to store sulfuric acid for the P4 handling process. Tank was located in north area of the P4 Handling area. Known spills of acid to ground surface.	Tank removed and area covered with several feet of soil and slag.	• Sulfuric Acid • General Chemical Analytes • Metals

[1] This column identifies categories of COPCs that warrant further evaluation based on knowledge of operations at each SWMU or AOC.

Table 2-2

Process Water Flow Rate and Water Quality Summary[1]
Rhodia Silver Bow Plant

Source	Stream	Flow[1] [gpm]	As [mg/L]	Ba [mg/L]	Cd [mg/L]	Cr [mg/L]	Pb [mg/L]	Hg [mg/L]	Nitrate [mg/L]	Se [mg/L]	F [mg/L]	pH
#3 Catch Basin .	Process Water, Slag Cooling	350	0.339	0.092	0.085	0.246	0.519	0.001	NA	ND	NA	6
100-foot Clarifier	Process Water	300	0.339	0.092	0.085	0.246	0.519	0.001	NA	ND	NA	6
Kiln Feed Building Moat	Material Handling Water	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
#1 Kiln Scrubber	Emissions Control	1,200	1.81	0.087	18.7	0.201	0.517	0.007	ND	ND	122	2
#2 Kiln Scrubber	Emissions Control	1,800	1.81	0.087	18.7	0.201	0.517	0.007	ND	ND	122	2
Lime Treatment	pH Treatment	90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hazelton Line	Slag Granulation	4,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Final Pump Station	Slag Cooling and Miscellaneous	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total		10,540										
Pond Return	From Tailing Basin	10,000	0.5	0.272	6	0.054	0.07	ND	NA	0.266	NA	5

Notes:

NA = Not available.

ND = Not detected.

[1]This table is adapted from Table 1 of the 1996 report Silver Bow Plant Tailings Pond and Groundwater Review, attached as Appendix I of the CCRA. The concentration, including those reported for Pond Return are analytical data, not mass balance calculated concentrations. Flows were estimated or measured by plant personnel.

Appendices

Appendix 2-A

Legal Description of Property

Appendix 2 – A

Legal Description

The Rhodia Silver Bow Plant site is located in Silver Bow County approximately seven miles west of Butte, Montana and approximately one mile south of Ramsey, Montana. The site occupies approximately 1.25 square miles in sections 23, 24, 25, and 26 in Township 3 North, Range 9 West (Figure 1-2). Specifically, the property description is as follows.

Section 23: Portion S2N2, Portion S2

Section 24 S1/2 NW1/4 (NORTHWEST PLACER #6114)

Section 25: W1/2 W1/2 NW1/4 – Portion of Nameless Placer

Section 26 Nameless Placer-NE1/4, Lillian Placer-NW1/4, & M.S. 470 (M.E. 372-Lot 39), SE1/4, Portion Katherine Placer Embracing Government Lots 8, 9, 10

Appendix 2-B

Select CCRA Figures

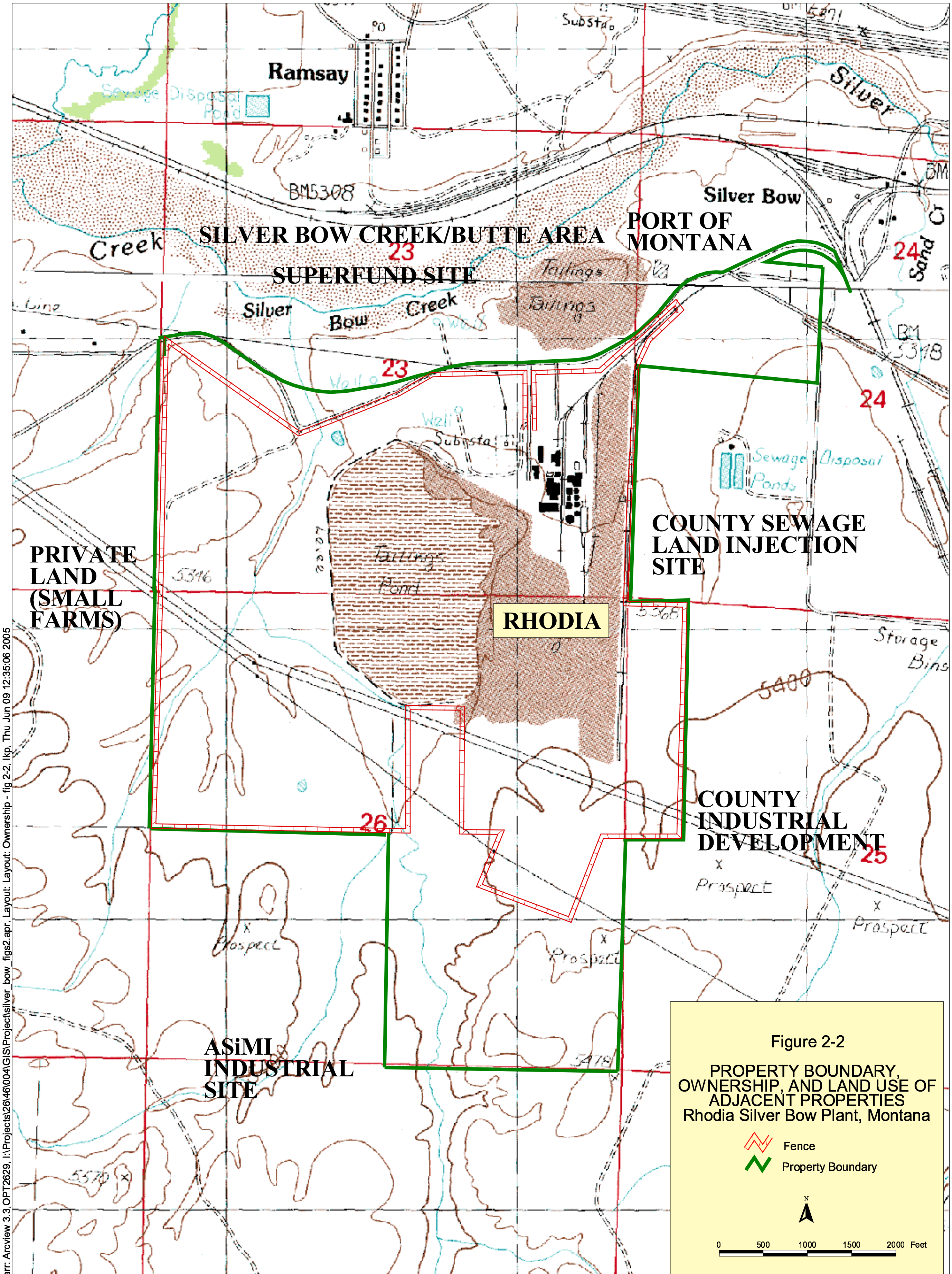
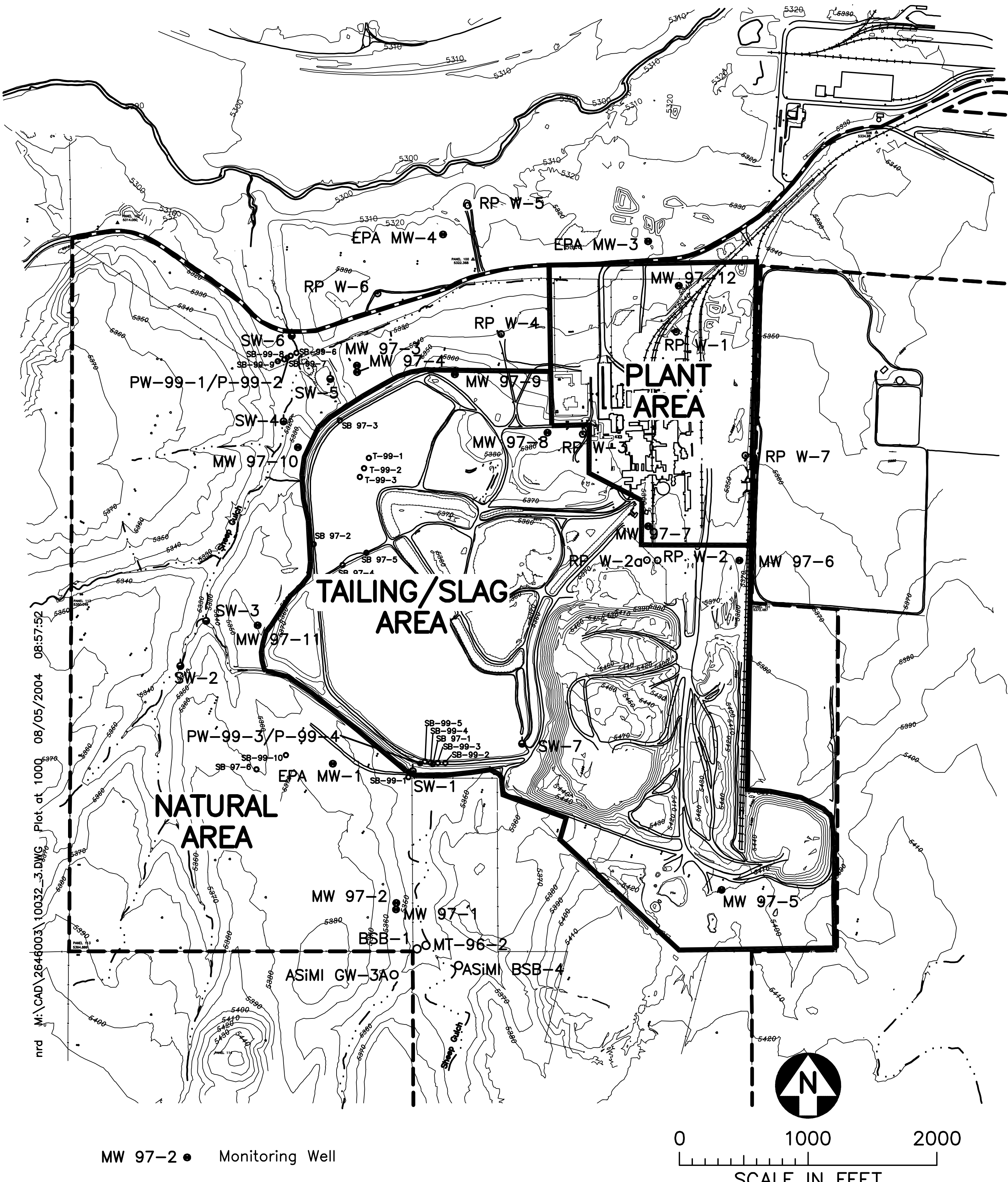


Figure 2-2

PROPERTY BOUNDARY, OWNERSHIP, AND LAND USE OF ADJACENT PROPERTIES
Rhodia Silver Bow Plant, Montana

Source: Buxton and Ramsay, Montana, Quadrangles, USGS 1989



MW 97-2 ● Monitoring Well

RP W-7 ○ Production Well

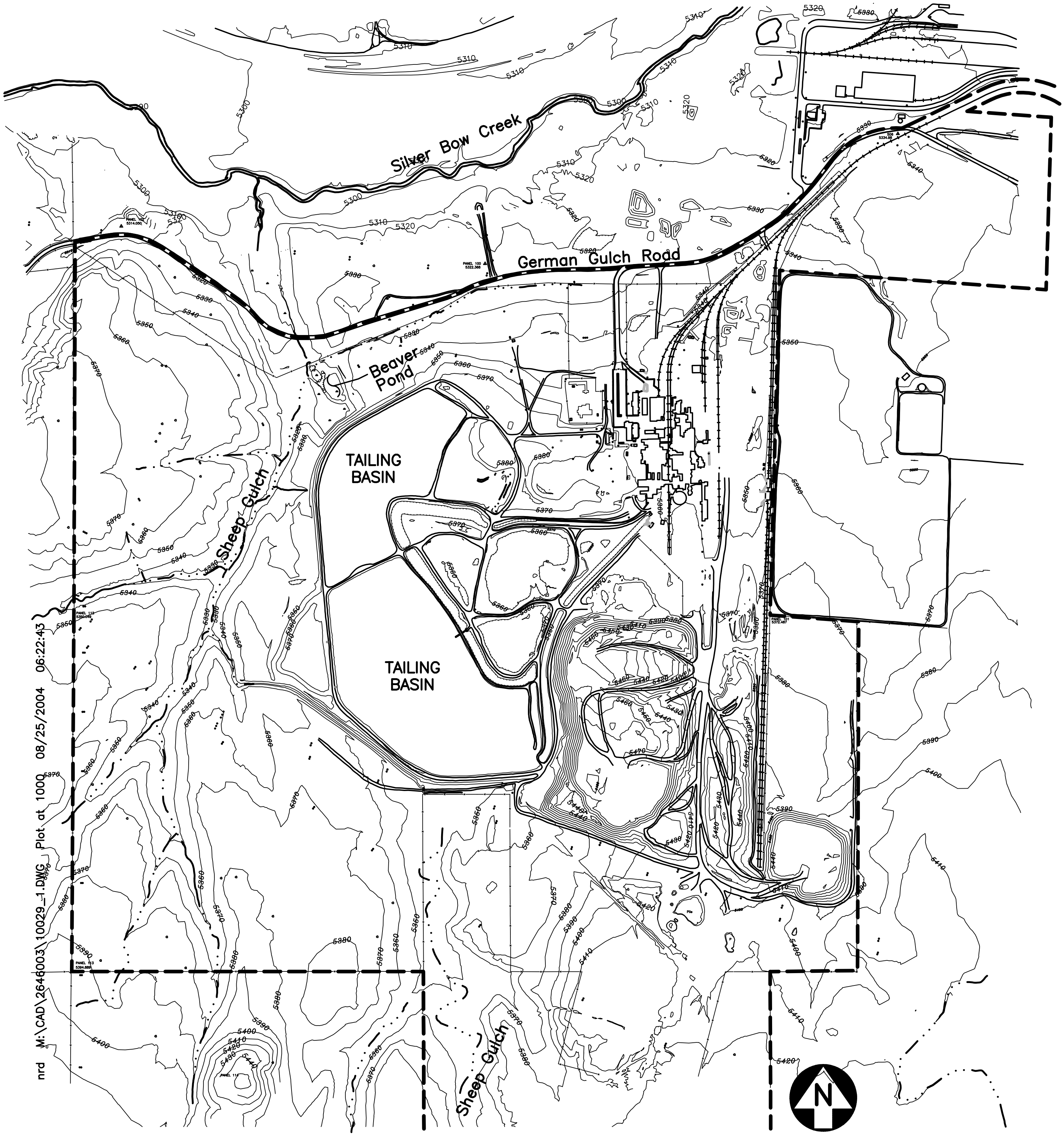
SW-1 Surface Water Station

SB 97-6 ○ Soil Boring

— — — Property Line

Figure 2–3

SITE AREAS
Rhodia Silver Bow Plant, Montana



Contour Interval: 10 Feet
Elevations shown are Feet
Above Mean Sea Level

0 1000 2000
SCALE IN FEET

Legend

Property Line

Figure 2-4

SITE TOPOGRAPHY
Rhodia Silver Bow Plant, Montana

P:26\46\006\Figures_Graphics\1947 Aerial.CDR RLG 08-20-04

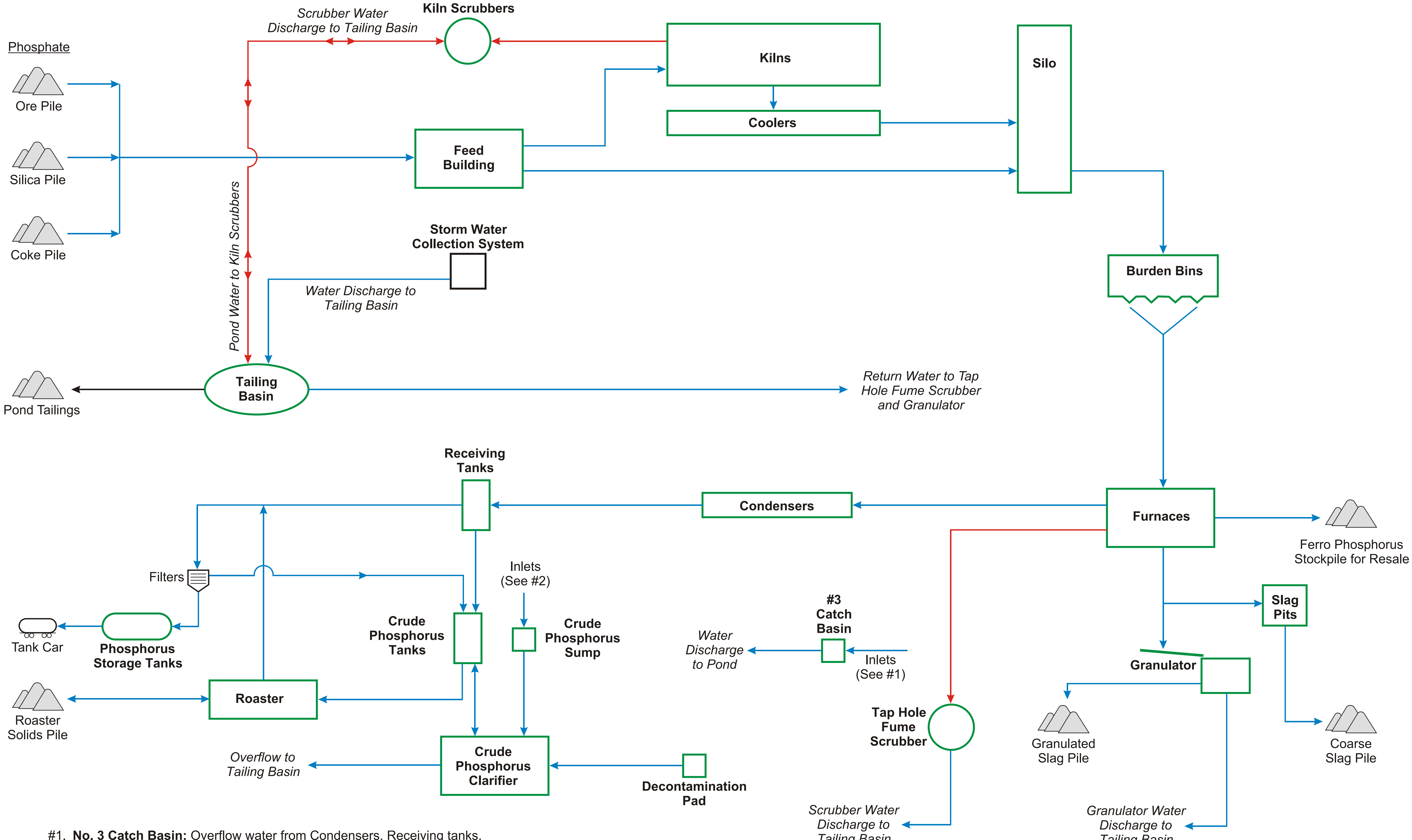
0 1000 2000

Approximate Scale in Feet

Figure 2-6

AERIAL PHOTO:
August 27, 1947
(Pre-Plant)

Rhodia Silver Bow Plant, Montana



#1. **No. 3 Catch Basin:** Overflow water from Condensers, Receiving tanks, Crude Phosphorus tanks and Crude Phosphorus Clarifier.

#2. **Crude Phosphorus Sump:** Overflow water from Condensers, Receiving tanks and Crude Phosphorus tanks.

Figure 2-23

PROCESS FLOW DIAGRAM:
ELEMENTAL PHOSPHORUS PRODUCTION

Rhodia Silver Bow Plant, Montana

P:26\46\006\Figures_Graphics\Plant Process Flow Diagram.CDR RLG 04-07-05

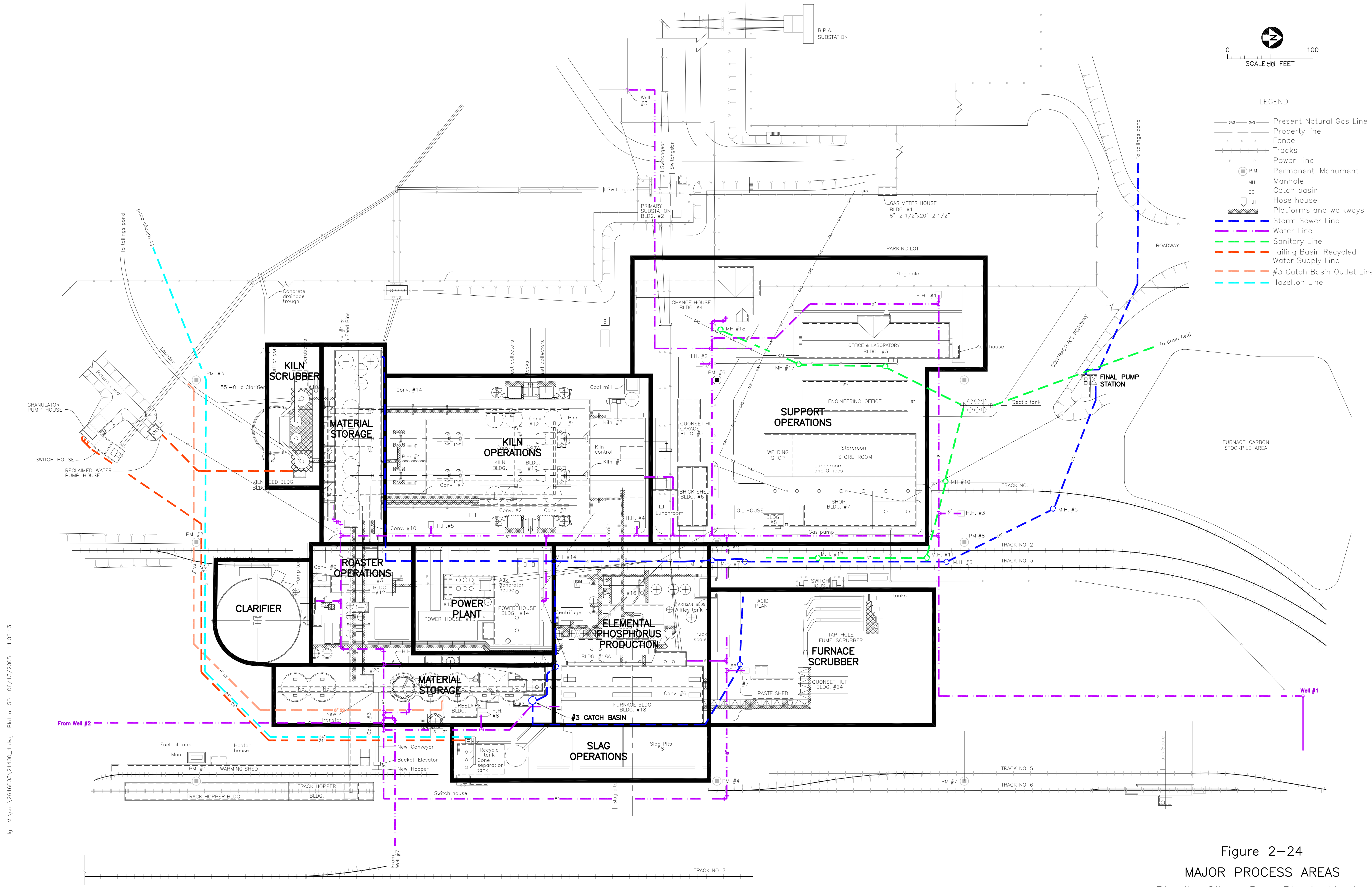


Figure 2–24
MAJOR PROCESS AREAS
Rhodia Silver Bow Plant, Montana

P:26\46\006\Figures_Graphics\1954 Aerial.CDR RLG 04-07-05

0 1000 2000

Approximate Scale in Feet

Figure 2-25

AERIAL PHOTO:
July 25, 1954
(Plant Present, Pre-Tailing Basin)

Rhodia Silver Bow Plant, Montana

P:26\46\006\Figures_Graphics\1977 Aerial.CDR RLG 04-07-05

Figure 2-26

AERIAL PHOTO:
July 30,1977

Rhodia Silver Bow Plant, Montana

P:26\46\006\Figures_Graphics\1985 Aerial.CDR RLG 04-07-05

0 1000 2000
Approximate Scale in Feet

Figure 2-27

AERIAL PHOTO:
August 18, 1985

Rhodia Silver Bow Plant, Montana

P:26\46\006\Figures_Graphics\1990 Aerial.CDR RLG 04-07-05

N

0 1000 2000

Approximate Scale in Feet

Figure 2-28

AERIAL PHOTO:
August 4, 1990

Rhodia Silver Bow Plant, Montana

P:26\46\006\Figures_Graphics\1995 Aerial.CDR RLG 04-07-05

N

0 1000 2000

Approximate Scale in Feet

Figure 2-29

AERIAL PHOTO:
August 1, 1995

Rhodia Silver Bow Plant, Montana

P:26\46\006\Figures_Graphics\2002 Aerial.CDR RLG 04-07-05

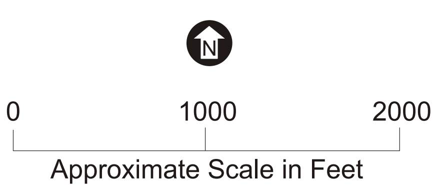
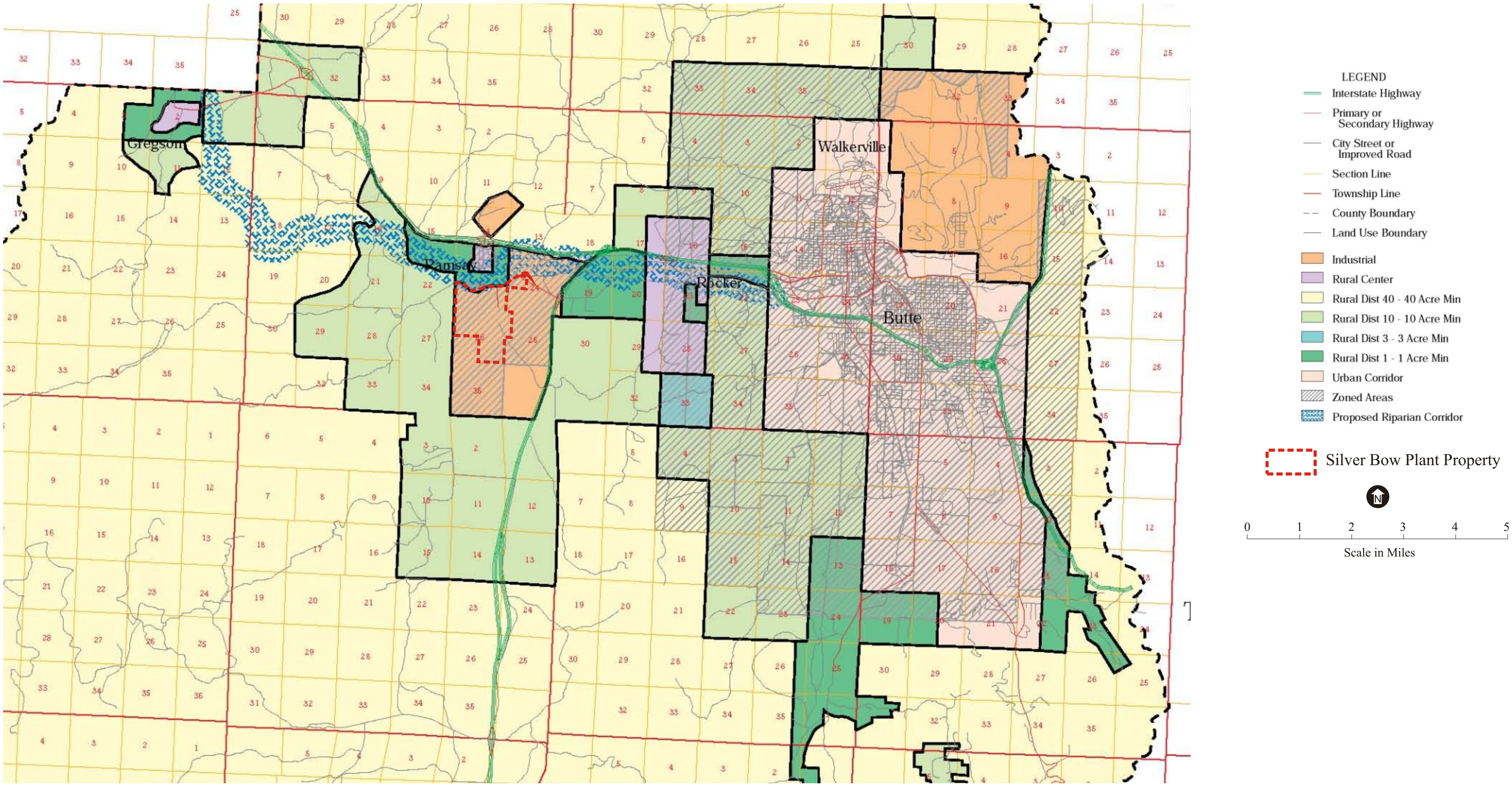


Figure 2-30

AERIAL PHOTO:
September 2 &12, 2002

Rhodia Silver Bow Plant, Montana

P:26\46\006\Figures_Graphics\Future Land Use.CDR RLG 04-07-05

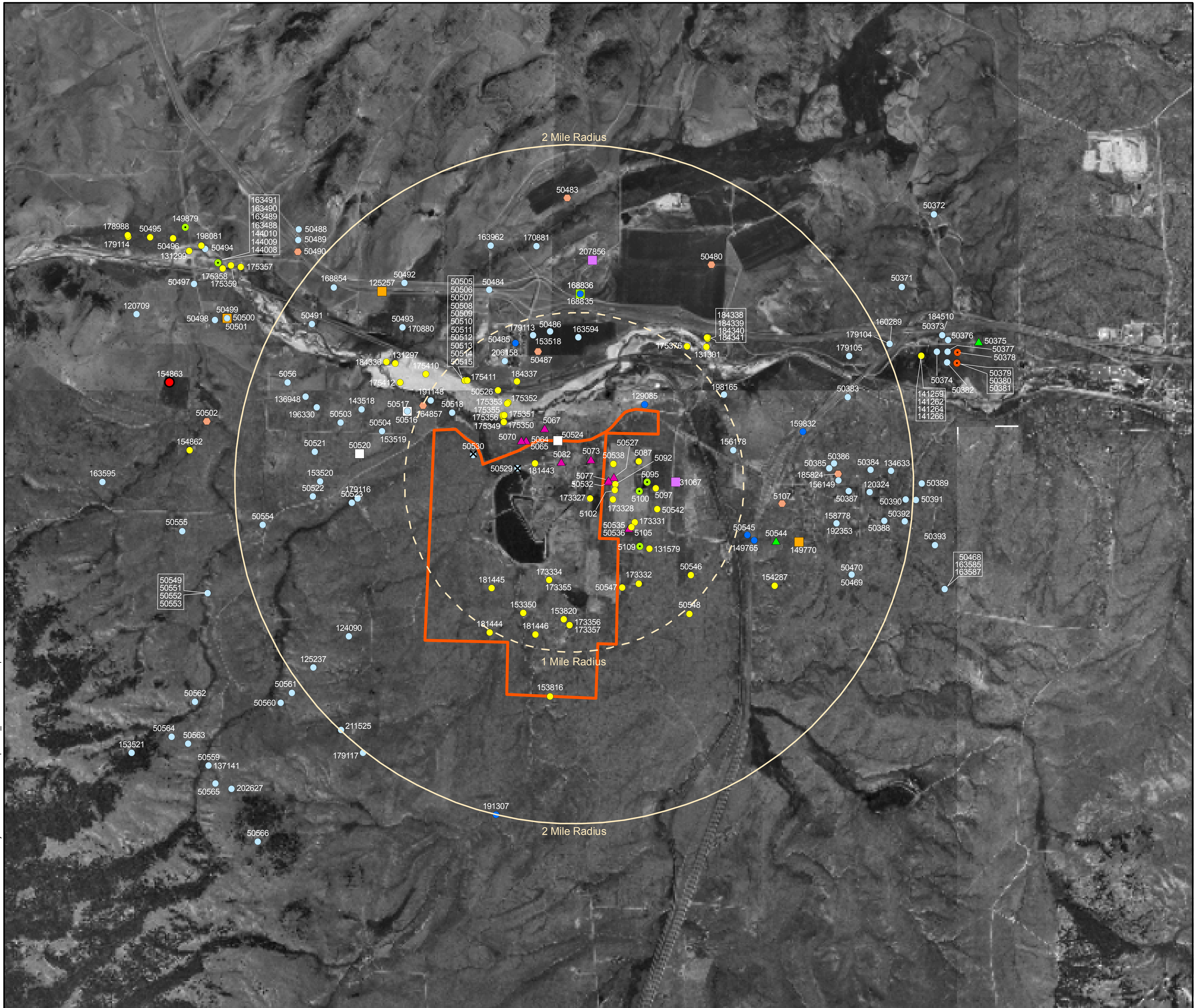


SOURCE: Butte-Silver Bow Local Government Website, Butte-Silver Bow Growth Plan, 1995.

Figure 2-31

FUTURE LAND USE IN BUTTE-SILVER BOW, MONTANA

Rhodia Silver Bow Plant, Montana



WELL USE

- NOT SPECIFIED
- COMMERCIAL
- DOMESTIC
- FIRE PROTECTION
- INDUSTRIAL
- IRRIGATION
- MONITORING
- OTHER
- PUBLIC WATER SUPPLY
- RESEARCH
- STOCKWATER
- UNKNOWN
- UNUSED
- PROPERTY BOUNDARY

× Misidentified locations on Rhodia property (wells 50530 & 50529)

N

Feet

1,500 0 1,500 3,000 4,500 6,000

Meters

500 0 500 1,000 1,500 2,000

Figure 2-32

WELLS WITHIN 2-MILE RADIUS
Rhodia Silver Bow Plant, Montana

Source: 1995 USGS DOQ modified by Montana State Library

Appendix 2-C

Photographs of Tailing Basin Dike During Construction

Tailings Dam 9-20-54

Tailings Dam 9-20-54

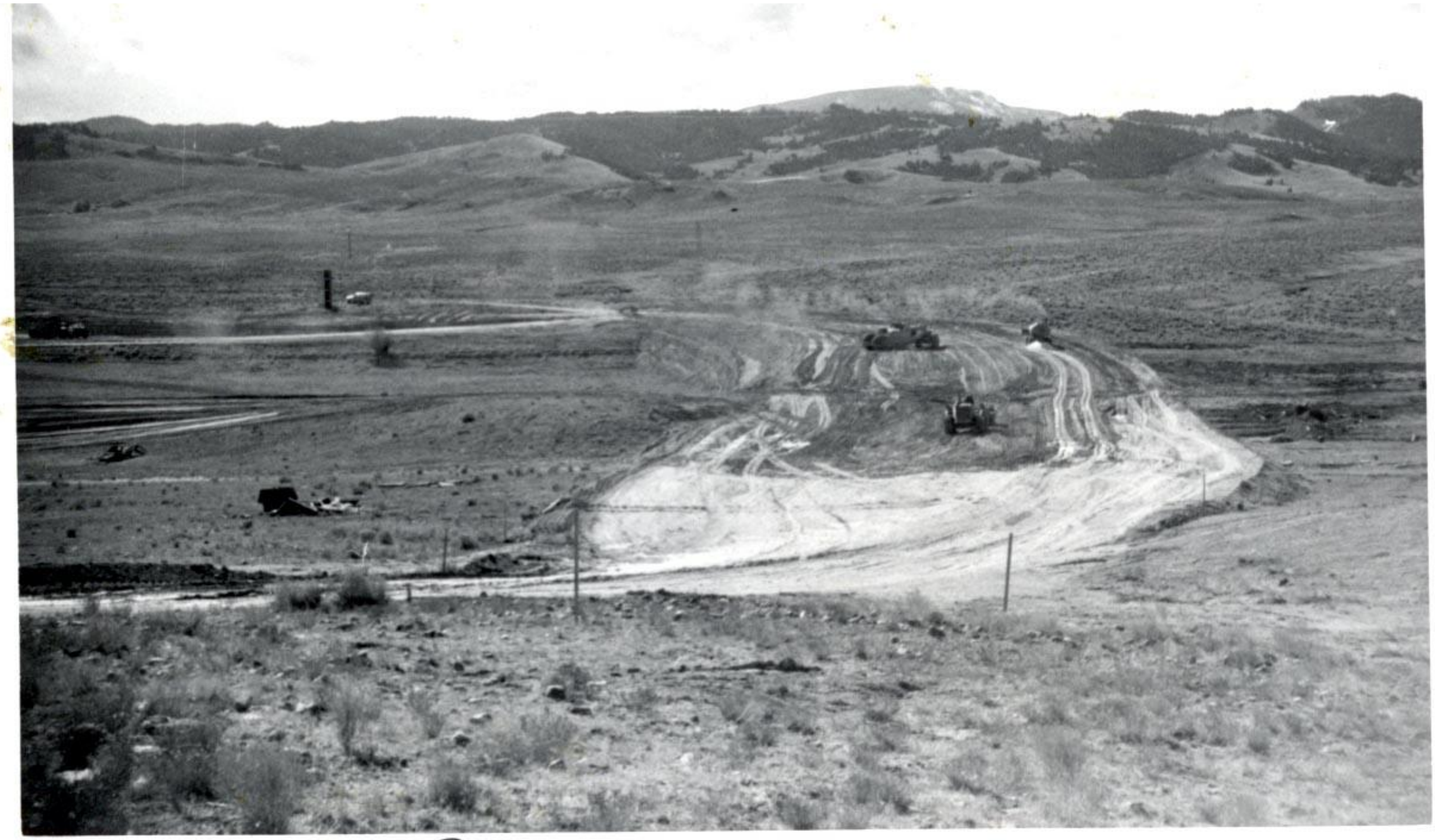
SB-275

Tailings Dam 9-20-54

Dam 9-20-54

Dam 9-30-54

Dam 10-10-54



Dam 10-10-54

Appendix 2-D

Sewage Injection
(Appendix R of the CCRA)

Appendix R
County Sewage Land Injection Site

The County Sewage Land Injection Site (CSLIS) is located just east of the Rhodia Silver Bow Plant as shown on Figure R-1. The CSLIS operated from the mid to late 1970s until 1996/1997 when it was shut down by the Butte Silver Bow Metro Sewer. Tables R-1, R-2, and R-3 summarize selected metals and other inorganic parameter concentrations in the injection site sludge, soil, and ground water, respectively. Each table lists the concentration and date of the earliest sample, possibly intermediate date samples, and the most recent sample found in the historical data that Barr obtained from the county. There are many more sampling events than are summarized in these tables. There may be some earlier samples than shown, but inconsistencies in analytical methods make some early data incommensurate with the later sample data. The earliest samples shown were selected because the analytical methods appear to be consistent with those of later dates.

Table R-1 shows a selection of data from tests of the sludge injected at the site. The table has sludge analyses from June, 1994, May 1995, June 1996, and February, 1997 (every fourth sample in a data table provided by Metro Sewer). Arsenic, cadmium, fluoride, and selenium were all found in the sludge. Arsenic concentrations in the sludge ranged as high as 89 mg/kg in the samples. Cadmium concentrations were generally near 10 mg/kg, but ranged as high as 22 mg/kg in the samples (7/30/96 sample, not shown in Table R-1). Fluoride concentrations ranged as high as 1140 mg/kg. Total phosphorus was generally around 2% to 3%. Selenium concentrations ranged as high as 78 mg/kg. The County also analyzed for other metals and nitrogen compounds.

Table R-2 is data from soil analysis. Soil samples were collected from the north and south ends of the injection site. Each location was sampled at the ground surface, 24 inches below ground surface (bgs), and 36 inches bgs. The earliest data ranges from 1981 to 1990, and the most recent data is from 1995. The samples generally show no strong trends over time. Other than an expected decrease in inorganic concentrations with depth, changes in concentrations of most parameters with time were minimal. The data in Table R-2 should not be taken to be representative of typical conditions toward the beginning or the end of the sewage injection, because the soil showed considerable variability throughout the duration. The data provide an indication of the parameters and concentrations present at the sewage injection site.

Table R-3 shows groundwater sample results for 4 monitoring wells at the injection site. Figures R-1 and R-2 show the locations of the wells at the site. Groundwater is expected to flow from southeast to northwest across the county property. Wells C and D are on the upgradient side of the site, F is downgradient, and B is side-gradient on the west. A is also downgradient, but there were no data available for that well. There is no well E because it was a dummy location used for duplicate samples of other wells.

The earliest data are from either September 1982 or February 1991, depending on the parameter. There were no noticeable changes in concentrations in samples from upgradient wells C and D. Over the course of the monitoring, there appears to have been a general increase in several parameter concentrations at downgradient well F. Among these are arsenic, chloride, phosphate, and orthophosphate.

Table R-1

Injection Site
Sludge Analysis

	Date			
Parameter	**6/2/1994**	**5/2/1995**	**6/6/1996**	**2/6/1997**
Arsenic, mg/kg	21	89	63	27
Cadmium, mg/kg	10	<10	13	13
Chromium, mg/kg	69	67	<35	20
Fluoride, mg/kg	3.9	1140	760	200
Lead, mg/kg	270	200	170	160
Mercury, mg/kg	3.7	<1	13	3
Phosphorus, %	2.5	3.22	2.54	2.6
Potassium, %	0.56	1.78	0.96	5.2
Selenium, mg/kg	78	11	<35	5

Table R-2

Injection Site
Soil Analysis

North Surface					South Surface				
Parameter	**(mg/kg)**	**Year**	**(mg/kg)**	**Year**	**Parameter**	**(mg/kg)**	**Year**	**(mg/kg)**	**Year**
Arsenic	44	1983	10	1995	Arsenic	31	1983	13	1995
Cadmium	4	1983	2	1995	Cadmium	3.7	1983	3	1995
Chromium	19	1983	8	1995	Chromium	68	1983	9	1995
Fluoride	130	1984	134	1995	Fluoride	75	1984	117	1995
Lead	44	1983	31	1995	Lead	32	1983	32	1995
Mercury	ND	1984	<1	1995	Mercury	ND	1984	<1	1995
Phosphorus	155	1981	2160	1995	Phosphorus	155	1982	2400	1995
Potassium	1130	1981	2650	1995	Potassium	1350	1982	2650	1995
Selenium	0.41	1983	<5	1995	Selenium	0.08	1983	<5	1995

North 24”					South 24”				
Parameter	**(mg/kg)**	**Year**	**(mg/kg)**	**Year**	**Parameter**	**(mg/kg)**	**Year**	**(mg/kg)**	**Year**
Arsenic	14	1990	<5	1995	Arsenic	12	1990	<5	1995
Cadmium	ND	1990	<1	1995	Cadmium	ND	1990	<1	1995
Chromium	30	1990	<5	1995	Chromium	25	1990	5	1995
Fluoride	84	1990	100	1995	Fluoride	109	1990	87	1995
Lead	ND	1990	8	1995	Lead	ND	1990	9	1995
Mercury	ND	1990	<1	1995	Mercury	ND	1990	<1	1995
Phosphorus	810	1990	134	1995	Phosphorus	1120	1990	960	1995
Potassium	6570	1990	3560	1995	Potassium	5740	1990	2610	1995
Selenium	ND	1993	<5	1995	Selenium	62	1990	49	1995

North 36”					South 36”				
Parameter	**(mg/kg)**	**Year**	**(mg/kg)**	**Year**	**Parameter**	**(mg/kg)**	**Year**	**(mg/kg)**	**Year**
Arsenic	15	1983	<5	1995	Arsenic	16	1983	<5	1995
Cadmium	0.1	1983	<1	1995	Cadmium	0.12	1983	<1	1995
Chromium	8.1	1983	<5	1995	Chromium	12	1983	<5	1995
Fluoride	76	1984	8.3	1995	Fluoride	122	1984	91	1995
Lead	5.3	1983	13	1995	Lead	7.2	1983	10	1995
Mercury	ND	1984	<1	1995	Mercury	ND	1983	<1	1995
Phosphorus	31	1982	620	1995	Phosphorus	6	1982	750	1995
Potassium	1870	1982	3300	1995	Potassium	1640	1982	2720	1995
Selenium	0.17	1983	<5	1995	Selenium	0.22	1983	<5	1995

Table R-3

Injection Site Well Samples
Groundwater Analysis

Parameter	Well B Conc.	Date	Conc.	Date	Conc.	Date	Well C Conc.	Date	Conc.	Date	Conc.	Date
Arsenic (µg/L)	3.2	Feb-91	<5	May-95	<5	Jun-98	4.8	Feb-91	6	May-95	<5	Jun-98
Cadmium (µg/L)	<2	Sep-82	<1	May-95	<1	Jun-98	<2	Sep-82	<1	May-95	<1	Jun-98
Chloride (mg/L)	54	Sep-82	120	May-95	93	Jun-98	12.5	Sep-82	14	May-95	17	Jun-98
Chromium (µg/L)	<2	Sep-82	<10	May-95	<10	Jun-98	2	Sep-82	<10	May-95	<10	Jun-98
Fluoride (mg/L)	0.5	Sep-82	0.19	May-95	0.2	Jun-98	0.3	Sep-82	0.29	May-95	0.25	Jun-98
Lead (µg/L)	<40	Sep-82	<10	May-95	<10	Jun-98	80	Sep-82	20	May-95	<10	Jun-98
Manganese (mg/L)	0.004	Sep-82	<0.01	May-95	<0.01	Jun-98	0.003	Sep-82	<0.01	May-95	<0.01	Jun-98
Mercury (µg/L)	<0.04	Feb-91	<1	May-95	<1	Jun-98	0.11	Feb-91	<1	May-95	<1	Jun-98
Orthophosphate (mg/L-P)	<0.1	Feb-91	0.12	May-95	0.04	Jun-98	<0.1	Feb-91	0.2	May-95	0.04	Jun-98
Phosphate (mg/L-P)	0.16	Sep-82	0.28	May-95	0.02	Jun-98	0.27	Sep-82	0.25	May-95	0.09	Jun-98
Potassium (mg/L)	8.7	Sep-82	11	May-95	10	Jun-98	3	Sep-82	7	May-95	7	Jun-98
Selenium (µg/L)	1.6	Oct-92	<5	May-95	<5	Jun-98	0.8	Oct-92	<5	May-95	<5	Jun-98
Sulfate (mg/L)	45.1	Sep-82	78	May-95	59	Jun-98	19.3	Sep-82	20	May-95	24	Jun-98

	Well D						Well F					
Parameter	Conc.	Date	Conc.	Date	Conc.	Date	Conc.	Date	Conc.	Date	Conc.	Date
Arsenic (µg/L)	4.4	Feb-91	<5	May-95	<5	Jun-98	2.9	Feb-91	5	May-95	5	Jun-98
Cadmium (µg/L)	<2	Sep-82	<1	May-95	<1	Jun-98	2	Jul-83	<1	May-95	<1	Jun-98
Chloride (mg/L)	10.9	Sep-82	12	May-95	13	Jun-98	19.3	Jul-83	10	May-95	19	Jun-98
Chromium (µg/L)	<2	Sep-82	<10	May-95	<10	Jun-98	<2	Jul-83	<10	May-95	<10	Jun-98
Fluoride (mg/L)	0.3	Sep-82	0.29	May-95	0.26	Jun-98	0.3	Jul-83	0.11	May-95	<0.1	Jun-98
Lead (µg/L)	<40	Sep-82	<10	May-95	<10	Jun-98	<40	Jul-83	10	May-95	<10	Jun-98
Manganese (mg/L)	0.009	Sep-82	<0.01	May-95	<0.01	Jun-98	0.024	Jul-83	<0.01	May-95	<0.01	Jun-98
Mercury (µg/L)	0.05	Feb-91	<1	May-95	<1	Jun-98	<0.04	Feb-91	<1	May-95	<1	Jun-98
Orthophosphate (mg/L-P)	<0.1	Feb-91	0.2	May-95	0.1	Jun-98	0.16	Jul-83	1.32	May-95	1.55	Jun-98
Phosphate (mg/L-P)	0.22	Sep-82	0.32	May-95	0.09	Jun-98	<0.1	Feb-91	2.2	May-95	1.66	Jun-98
Potassium (mg/L)	6.8	Sep-82	7	May-95	7	Jun-98	8.3	Jul-83	18	May-95	15	Jun-98
Selenium (µg/L)	<0.8	Oct-92	<5	May-95	<5	Jun-98	<0.8	Oct-92	<5	May-95	<5	Jun-98
Sulfate (mg/L)	15.7	Sep-82	18	May-95	17	Jun-98	42	Jul-83	88	May-95	71	Jun-98

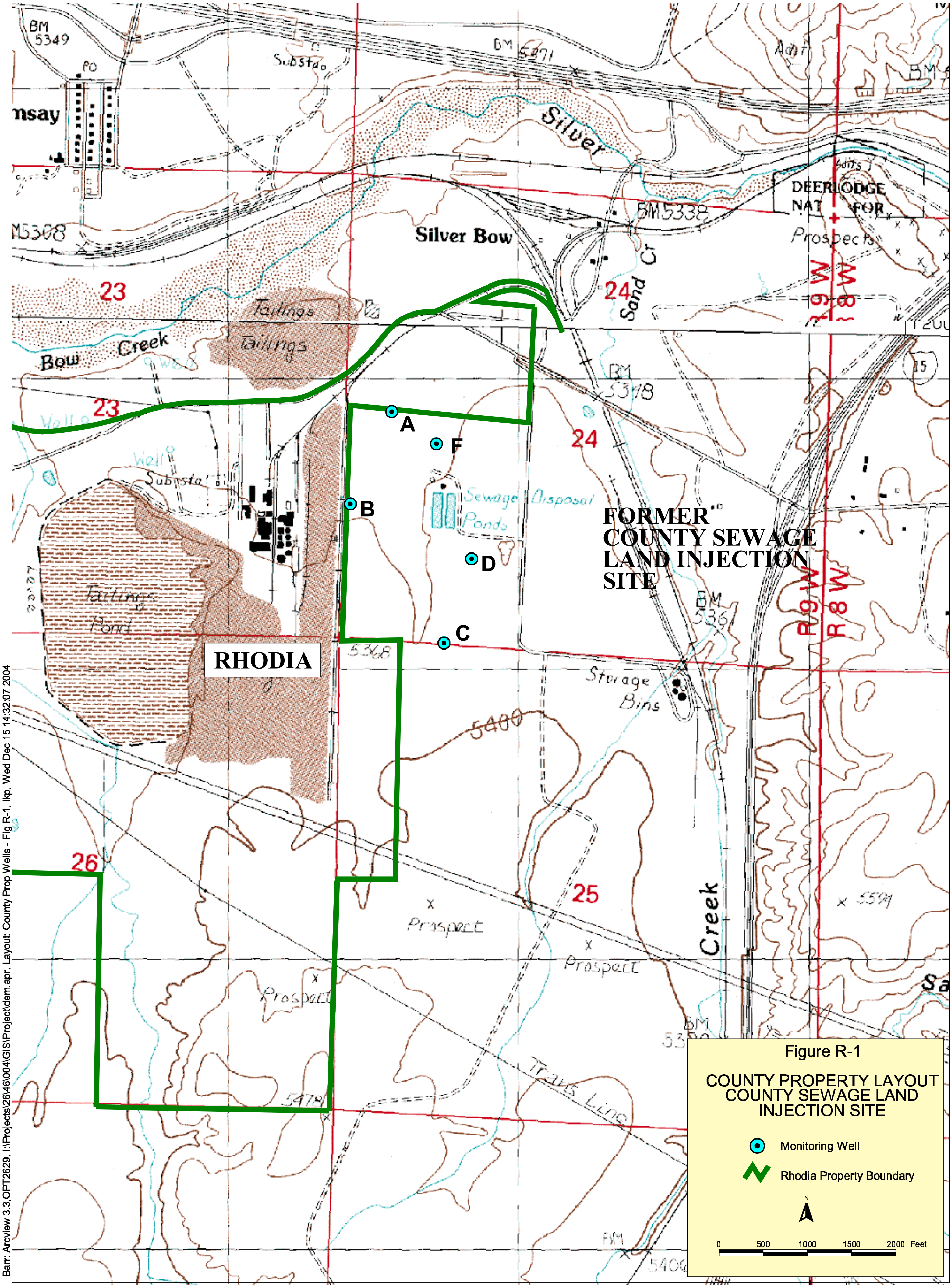
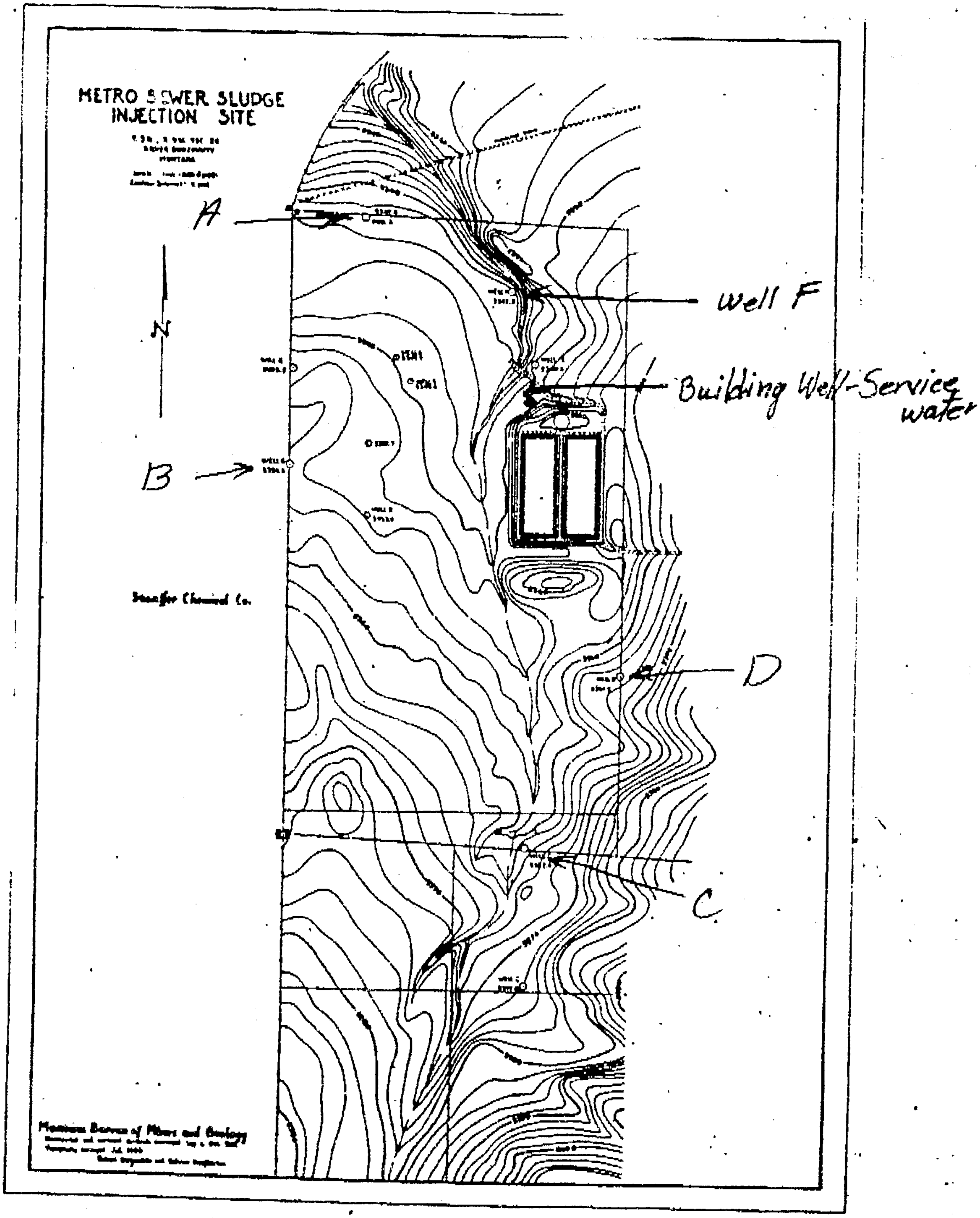


Figure R-1

COUNTY PROPERTY LAYOUT
COUNTY SEWAGE LAND
INJECTION SITE

Barr: Arcview 3.3,OPT2629, I:\Projects\26\46\004\GIS\Project\dem.apr, Layout: County Prop Wells - Fig R-1, lkp, Wed Dec 15 14:32:07 2004

Source: Buxton and Ramsay, Montana, Quadrangles, USGS 1989



Mr. Fred Wendt
406.723.8262
Metro Sewer

Figure R-2
COUNTY SEWAGE LAND INJECTION SITE.
TOPOGRAPHY AND WELL LOCATIONS

Appendix 2-E

MBMG Database – Well Information

GWIC_ID	DNRC_ID	SITE_NAME	LAT	LON	GEOMETHOD	DATUM	TWN	RNG	SEC	Q_SEC	VERIFIED_	TYPE	AQUIFER	TD	SWL	PWL	YIELD	TYPE_1	TIME	DSS	RWL	RTIME	DRILLER	DATE_	USE	STATUS	FROM_	TO	DIA	OPEN	OPEN_1	DESCRIPTIO
5056		MIDDLESTADT ART * RAMSAY MT	46.0013	-112.7136	UNKNOWN	NAD27	03N	09W	22	BBCD	YES	WELL	124LDCK	140.00	85.70	135.0	40.0	AIR	1.0	0	0	0.00	LINDSAY	4/16/1982	DOMESTIC		120.0	140.0	4	0		1/4X4 SAW PERFS
5064		STAUFFER CHEMICAL	45.9972	-112.6841	UNKNOWN	NAD27	03N	09W	23		YES	WELL	120SDMS	300.00	40.00	0.0	450.0		0.0	0	0	0.00			INDUSTRIAL		100.0	300.0	0	0		
5065		STAUFFER CHEMICAL CO * RAMSEY MT	45.9972	-112.6841	UNKNOWN	NAD27	03N	09W	23		NO	WELL	120SDMS	0.00	0.00	0.0	0.0		0.0	0	0	0.00			INDUSTRIAL		0.0	0.0	0	0		
5067		RHONE-POULENC CHEMICALS * WELL 5	45.9983	-112.6819	UNKNOWN	NAD27	03N	09W	23	ACCA	YES	WELL	120SDMS	300.00	16.00	62.0	250.0	PUMP	0.0	0	0	0.00	PRICE & LINDS	8/1/1954	INDUSTRIAL		80.0	290.0	10	0		1/ IN SLOTS
5070		RHONE-POULENC CHEMICALS * WELL 6	45.9972	-112.6847	UNKNOWN	NAD27	03N	09W	23	CAAA	YES	WELL	120SDMS	225.00	20.00	20.5	350.0	PUMP	0.0	0	0	0.00	PRICE & LINDS	9/1/1954	INDUSTRIAL		90.0	200.0	10	0		1/4 IN SLOTS
5073		RHONE-POULENC CHEMICALS * WELL 1	45.9958	-112.6761	UNKNOWN	NAD27	03N	09W	23	DABA	YES	WELL	120SDMS	225.00	40.00	55.0	350.0		8.0	0	0	0.00	RIDDOCK	2/4/1954	INDUSTRIAL		20.0	225.0	10	0		1/4 IN SLOTS
5077		RHONE-POULENC CHEMICALS * WELL 7	45.9941	-112.6738	UNKNOWN	NAD27	03N	09W	23	DDAA	YES	WELL	120SDMS	280.00	44.00	128.0	500.0	PUMP	15.0	0	0	0.00	OKEEFE	7/15/1971	INDUSTRIAL		200.0	280.0	8	0		SLOTS/SS SCREEN
5082		RHONE-POULENC CHEMICALS * WELL 4	45.9955	-112.6797	UNKNOWN	NAD27	03N	09W	23	DBAD	YES	WELL	120SDMS	400.00	35.00	40.5	350.0		0.0	0	0	0.00	PRICE & LINDS	8/1/1954	INDUSTRIAL		46.0	50.0	10	0		1/4 IN SLOTS
5087		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-F	45.9958	-112.6702	UNKNOWN	NAD27	03N	09W	24	CBAC	YES	WELL	120SDMS	43.00	18.74	28.0	2.5		0.0	0	0	0.00		6/10/1983	MONITORING		23.0	43.0	0	0		SAW SLOTS
5092		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-A	45.9938	-112.6730	UNKNOWN	NAD27	03N	09W	24	CBCC	YES	WELL	120SDMS	43.00	26.35	0.0	2.7		0.0	0	0	0.00		9/9/1982	MONITORING		30.0	43.0	0	0		SAW SLOTS
5095		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-E	45.9941	-112.6691	UNKNOWN	NAD27	03N	09W	24	CBDD	YES	WELL	120SDMS	0.00	26.29	0.0	10.9		0.0	0	0	0.00			RESEARCH		0.0	0.0	0	0		
5097		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-D	45.9936	-112.6680	UNKNOWN	NAD27	03N	09W	24	CCAA	YES	WELL	120SDMS	53.00	40.56	45.0	7.1		0.0	0	0	0.00		9/8/1982	MONITORING		38.0	53.0	0	0		SAW SLOTS
5100		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-H	45.9933	-112.6700	UNKNOWN	NAD27	03N	09W	24	CCAB	YES	WELL	120SDMS	46.00	33.66	0.0	5.7		0.0	0	0	0.00			RESEARCH		36.0	46.0	0	0		SAW SLOTS
5102		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-B	45.9933	-112.6730	UNKNOWN	NAD27	03N	09W	24	CCBB	YES	WELL	120SDMS	48.00	37.58	47.0	11.0		0.0	0	0	0.00		9/10/1982	MONITORING		33.0	48.0	4	0		SAW SLOTS
5105		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-C	45.9902	-112.6708	UNKNOWN	NAD27	03N	09W	24	CCDC	YES	WELL	120SDMS	53.00	38.12	45.0	12.0		0.0	0	0	0.00		9/9/1982	MONITORING		38.0	53.0	4	0		SAW SLOTS
5107		BSB SLUDGE INJ SITE * MS-1	45.9927	-112.6525	UNKNOWN	NAD27	03N	09W	24	DDAA	YES	WELL	120SDMS	110.00	40.00	0.0	70.0		0.0	0	0	0.00			IRRIGATION		67.0	71.0	4	0		SAW SLOTS
5109		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-I	45.9886	-112.6697	UNKNOWN	NAD27	03N	09W	25	BBAC	YES	WELL	120SDMS	63.00	44.63	0.0	7.5		0.0	0	0	0.00			RESEARCH		0.0	0.0	0	0		
31067		METRO SEWER *MT91-3	45.9942	-112.6656	TRS-TWN	NAD27	03N	09W	24	CBD	NO	WELL		40.00	21.50	23.4	2.3	PUMP	17.5	0	0	0.00	WEIGHT	7/24/1991	OTHER		25.0	40.0	4	0		.020 TRILOC SRN
50371		YOUNG RONALD	46.0116	-112.6389	TRS-TWN	NAD27	03N	08W	18		NO	WELL		30.00	0.00	14.0	0.0		0.0	0	0	0.00		1/1/1950	DOMESTIC		0.0	0.0	0	0		
50372		UELAND O.M.	46.0179	-112.6353	MAP	NAD27	03N	08W	18	AABA	YES	WELL	120SNGR	188.00	30.00	120.0	125.0	AIR	4.0	0	0	0.00	LINDSAY	1/1/1968	DOMESTIC		50.0	180.0	6	0		1/4X1.5 SLOTS
50373		TAMIETTI MUDGE	46.0076	-112.6337	TRS-TWN	NAD27	03N	08W	18	D	NO	WELL	110ALVM	70.00	20.00	0.0	0.0		0.0	0	0	0.00		1/1/1935	DOMESTIC		0.0	0.0	0	0		
50374		WOLD TERRY	46.0062	-112.6343	TRS-TWN	NAD27	03N	08W	18	DCAD	NO	WELL		55.00	8.00	20.0	30.0	PUMP	2.0	0	0	0.00	OKEEFE	1/1/1973	DOMESTIC		45.0	55.0	5	0	8-Jan	SLOTS
50375		MARSH WILSON J.	46.0072	-112.6292	TRS-TWN	NAD27	03N	08W	18	DDAA	NO	WELL		30.00	14.00	0.0	100.0		0.0	0	0	0.00		1/1/1950	COMMERCIAL		0.0	0.0	0	0		
50376		GARRYOWEN CORP. #1	46.0072	-112.6330	TRS-TWN	NAD27	03N	08W	18	DDBB	NO	WELL		0.00	0.00	0.0	100.0		0.0	0	0	0.00	UNKNOWN	1/1/1937	DOMESTIC		0.0	0.0	0	0		
50377		GARRYOWEN CORP. # 2	46.0062	-112.6330	TRS-TWN	NAD27	03N	08W	18	DDBCD	NO	WELL		0.00	0.00	0.0	100.0		0.0	0	0	0.00	UNKNOWN	1/1/1955	DOMESTIC		0.0	0.0	0	0		
50378		GARRYOWEN CORP. # 3	46.0062	-112.6318	TRS-TWN	NAD27	03N	08W	18	DDBDC	NO	WELL		16.00	0.00	0.0	20.0		0.0	0	0	0.00	UNKNOWN	1/1/1936	FIRE PROTECTION		0.0	0.0	0	0		
50379		GARRYOWEN CORP. # 4	46.0053	-112.6318	TRS-TWN	NAD27	03N	08W	18	DDCAB	NO	WELL		16.00	0.00	0.0	20.0		0.0	0	0	0.00	UNKNOWN	1/1/1936	FIRE PROTECTION		0.0	0.0	0	0		
50380		GARRYOWEN CORP. #7	46.0053	-112.6318	TRS-TWN	NAD27	03N	08W	18	DDCAD	NO	WELL		0.00	0.00	0.0	100.0		0.0	0	0	0.00	UNKNOWN	1/1/1936	FIRE PROTECTION		0.0	0.0	0	0		
50381		GARRYOWEN CORP. # 6	46.0053	-112.6318	TRS-TWN	NAD27	03N	08W	18	DDCAC	NO	WELL		16.00	0.00	0.0	20.0		0.0	0	0	0.00	UNKNOWN	1/1/1936	FIRE PROTECTION		0.0	0.0	0	0		
50382		GARRYOWEN CORP. #5	46.0053	-112.6330	TRS-TWN	NAD27	03N	08W	18	DDCBD	NO	WELL		0.00	0.00	0.0	100.0		0.0	0	0	0.00	UNKNOWN	1/1/1936	DOMESTIC		0.0	0.0	0	0		
50383		RICHARDS JOHN	46.0020	-112.6450	TRS-TWN	NAD27	03N	08W	19	BBDB	NO	WELL		200.00	165.00	190.0	20.0	BAILER	2.0	0	0	0.00	OKEEFE	1/1/1973	DOMESTIC		195.0	200.0	6	0		TORCH CUTS
50384	39451	GORDAN JOHN	45.9959	-112.6418	TRS-TWN	NAD27	03N	08W	19	CAB	NO	WELL		135.00	98.00	0.0	13.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1974	DOMESTIC		128.0	133.0	6	0		SLOTS
50385	32074	NELSON LES	45.9959	-112.6469	TRS-TWN	NAD27	03N	08W	19	CBB	NO	WELL		110.00	70.00	0.0	4.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1978	DOMESTIC		70.0	110.0	4	0		SAW SLOTS
50386	18950	DENNIS KENT	45.9963	-112.6463	TRS-TWN	NAD27	03N	08W	19	CBBA	NO	WELL	110ALVM	120.00	100.00	0.0	25.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1978	DOMESTIC		113.0	118.0	6	0		TORCH CUTS
50387	23079	MORITZ MICHAEL	45.9940	-112.6444	TRS-TWN	NAD27	03N	08W	19	CBD	NO	WELL	110ALVM	124.00	102.00	0.0	30.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1977	DOMESTIC		116.0	124.0	6	0		TORCH CUTS
50388		ROWE JIM	45.9916	-112.6399	TRS-TWN	NAD27	03N	08W	19	CDAC	NO	WELL	110ALVM	200.00	170.00	180.0	25.0	BAILER	0.5	0	0	0.00	BARRUS	1/1/1972	DOMESTIC		195.0	200.0	6	0		TORCH CUTS
50389		REES ROLAND JR	45.9949	-112.6355	TRS-TWN	NAD27	03N	08W	19	DB	NO	WELL		190.00	170.00	180.0	15.0	BAILER	2.0	0	0	0.00	OKEEFE	1/1/1987	DOMESTIC		180.0	189.0	6	0		TORCH CUTS
50390		CROWLEY DENNIS	45.9935	-112.6374	TRS-TWN	NAD27	03N	08W	19	DBCC	NO	WELL	110ALVM	122.00	95.00	100.0	25.0	BAILER	2.0	0	0	0.00	OKEEFE	1/1/1972	DOMESTIC		118.0	122.0	6	0		TORCH CUTS
50391		CROWLEY JOHN	45.9935	-112.6361	TRS-TWN	NAD27	03N	08W	19	DBCD	NO	WELL	110ALVM	138.00	100.00	115.0	25.0	BAILER	2.0	0	0	0.00	BARRUS	1/1/1972	DOMESTIC		133.0	138.0	6	0		TORCH CUTS
50392		BROCK BILL	45.9916	-112.6374	TRS-TWN	NAD27	03N	08W	19	DCBC	NO	WELL	211PLNC	155.00	134.00	0.0	20.0	BAILER	2.0	0	0	0.00	OKEEFE	1/1/1973	DOMESTIC		135.0	155.0	5	0		TORCH CUTS
50393		RICHENS V.	45.9897	-112.6336	TRS-TWN	NAD27	03N	08W	19	DCDD	NO	WELL	110ALVM	150.00	136.00	0.0	25.0	PUMP	0.0	0	0	0.00	OKEEFE	1/1/1973	DOMESTIC		143.0	148.0	6	0		TORCH CUTS
50468		LORENGO GEORGE/PETE	45.9860	-112.6322	TRS-TWN	NAD27	03N	08W	30	A	NO	WELL		45.00	2.00	0.0	10.0		0.0	0	0	0.00		1/1/1940	DOMESTIC		0.0	0.0	0	0		
50469		TRETHAWAY JEAN #1	45.9869	-112.6436	TRS-TWN	NAD27	03N	08W	30	BBD	NO	WELL		30.00	10.00	0.0	24.0		0.0	0	0	0.00		1/1/1900	DOMESTIC		0.0	0.0	0	0		
50470		TRETHAWAY JEAN #2	45.9869	-112.6436	TRS-TWN	NAD27	03N	08W	30	BBD	NO	WELL		30.00	10.00	0.0	24.0		0.0	0	0	0.00		1/1/1900	DOMESTIC		0.0	0.0	0	0		
50480		UELAND DAN AND DON	46.0128	-112.6623	NAV-GPS	NAD27	03N	09W	13	ACBD	YES	WELL	120SNGR	310.00	42.00	136.0	508.0	PUMP	24.0	0	0	0.00	MORELOCK	1/1/1985	IRRIGATION		100.0	164.0	6	0		3/8X2 SLOTS
50481		BMF * WELL GS-03	45.9961	-112.5491	SUR-GPS	NAD27	03N	09W	13	DCB	NO	WELL		23.00	6.17	0.0	7.0		0.0	0	0	0.00	OKEEFE	12/26/1984	MONITORING		13.0	23.0	4	0		.03 FACTRY SLOT
50482		BMF * WELL GS-04	45.9958	-112.5579	SUR-GPS	NAD27	03N	09W	13	DCB	NO	WELL		8.00	8.42	0.0	0.0		0.0	0	0	0.00	OKEEFE	12/26/1984	MONITORING		3.0	8.0	4	0		.03 FACTRY SLOT
50483		MAZZOLINI DAN	46.0180	-112.6803	TRS-TWN	NAD27	03N	09W	14	ABBC	NO	WELL	120VLCC	150.00	32.00	0.0	327.0		0.0	0	0	0.00		1/1/1973	IRRIGATION		40.0	145.0	6	0		TORCH CUTS
50484		GILLISPIE CARL	46.0099	-112.6894	TRS-TWN	NAD27	03N	09W	14	CB	NO	WELL		25.00	0.00	0.0	60.0		0.0	0	0	0.00		1/1/1938	DOMESTIC		0.0	0.0	0	0		
50485		RAMSAY SCHOOL	46.0055	-112.6859	NAV-GPS	NAD27	03N	09W	14	CDCD	YES	WELL	120SDMS	113.00	30.00	64.0	100.0	PUMP	4.0	0	0	0.00	OKEEFE	2/28/1977	PUBLIC WATER SUPPLY		102.0	111.0	6	0	8-Jan	TORCH CUTS
50486		CLARK HOWARD	46.0066	-112.6817	TRS-TWN	NAD27	03N	09W	14	CDAD	NO	WELL	120VLCC	55.00	15.00	36.0	0.0	BAILER	2.5	0	0	0.00	WROBLE	1/1/1966	DOMESTIC		0.0	0.0	0	0		
50487		CRAMER JAMES	46.0048	-112.6831	TRS-TWN	NAD27	03N	09W	14	CDDC	NO	WELL	120VLCC	70.00	20.00	50.0	100.0	PUMP	2.0	0	0	0.00	OKEEFE	1/1/1974	IRRIGATION		53.0	58.0	0	0		SLOTS
50488	21639	TINSLEY MAURICE	46.0144	-112.7130	TRS-TWN	NAD27	03N	09W	15	BCBC	NO	WELL	120VLCC	60.00	25.00	0.0	30.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1979	DOMESTIC		43.0	60.0	4	0		SAW SLOTS
50489		TINSLEY MAURICE #2	46.0135	-112.7130	TRS-TWN	NAD27	03N	09W	15	BCCB	NO	WELL	120VLCC	67.00	30.00	0.0	50.0	BAILER	2.0	0	0	0.00	OKEEFE	1/1/1973	DOMESTIC		60.0	65.0	9	0		SLOTS
50490		TINSLEY MAURICE #1	46.0125	-112.7130	TRS-TWN	NAD27	03N	09W	15	BCCC	NO	WELL		42.00	21.00	0.0	50.0	BAILER	2.0	0	0	0.00	OKEEFE	1/1/1973	IRRIGATION		35.0	40.0	6	0		SLOTS
50491		STANGER GEORGE	46.0064	-112.7109	TRS-TWN	NAD27	03N	09W	15	CC	NO	WELL	110ALVM	28.00	5.00	0.0	30.0		0.0	0	0	0.00		1/1/1952	DOMESTIC		0.0	0.0	0	0		
50492		WADEMEX RALPH	46.0102	-112.6998	TRS-TWN	NAD27	03N	09W	15	DB	NO	WELL	120VLCC	65.00	18.00	25.0	20.0	PUMP	22.0	0	0	0.00	BARRUS	1/1/1974	DOMESTIC		55.0	65.0	4	0		1/8X4 SLOTS
50493		PATCHETT MARY	46.0064	-112.6998	TRS-TWN	NAD27	03N	09W	15	DC	NO	WELL		70.00	10.00	0.0	20.0	BAILER	1.5	0	0	0.00	OKEEFE	1/1/1989	DOMESTIC		68.0	70.0	6	0		TORCH CUTS
50494		MILES JOHN F.	46.0124	-112.7243	TRS-TWN	NAD27	03N	09W	16		NO	WELL		40.00	32.00	0.0	20.0		0.0	0	0	0.00		1/1/1871	DOMESTIC		0.0	0.0	0	0		
50495		BMF * WELL GS-05	46.0132	-112.7311	TRS-TWN	NAD27	03N	09W	16	BCD	NO	WELL		35.00	8.30	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/15/1985	MONITORING		19.0	29.0	4	0		.03 FACTORY SLT
50496		BMF * WELL GS-06	46.0132	-112.7283	TRS-TWN	NAD27	03N	09W	16	BDC	NO	WELL		31.00	8.20	0.0	12.0		0.0	0	0	0.00	OKEEFE	3/15/1985	MONITORING		19.0	29.0	4	0		.03 FACTORY SLT
50497	71120	FARGHER KENT	46.0094	-112.7255	TRS-TWN	NAD27	03N	09W	16	CAD	NO	WELL		117.00	90.00	100.0	60.0		0.0	0	0	0.00		1/1/1987	DOMESTIC		97.0	117.0	0	0		
50498		KING TONY	46.0064	-112.7228	NAV-GPS	NAD27	03N	09W	16	DCDB	YES	WELL	124LDCK	124.00	55.00	0.0	15.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1979	DOMESTIC		85.0	124.0	4	0		SAW SLOTS
50499		TOOMBS ROBERT	46.0066	-112.7213	TRS-TWN	NAD27	03N	09W	16	DC	NO	WELL		102.00	45.00	65.0	25.0	PUMP/BAIL	5.0	0	0	0.00	DYNAMITE	1/1/1980	DOMESTIC		0.0	0.0	0	0		
50500		ELLERMAN EDWARD	46.0066	-112.7213	TRS-TWN	NAD27	03N	09W	16	DC	NO	WELL		175.00	92.00	148.0	50.0	AIR	1.0	0	0	0.00	OKEEFE	1/1/1987	DOMESTIC		155.0	175.0	4	0		SAW SLOTS
50501		HITSHEW K/JACOBSEN D	46.0066	-112.7213	TRS-TWN	NAD27	03N	09W	16	DC	NO	WELL		225.00	0.00	0.0	9.0		2.0	0	0	0.00	OKEEFE	1/1/1989	UNUSED		100.0	225.0	6	0		SAW SLOTS
50502		MILES FRANK	45.9977	-112.7233	TRS-TWN	NAD27	03N	09W	21		NO	WELL		200.00	0.00	0.0	200.0		0.0	0	0	0.00		1/1/1963	IRRIGATION		0.0	0.0	0	0		
50503		SCHLOSSER RON	45.9981	-112.7069	NAV-GPS	NAD27	03N	09W	22	BDDC	YES	WELL	124LDCK	155.00	100.00	0.0	10.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1984	DOMESTIC		100.0	155.0	4	0		SAW SLOTS
50504		FALKOWSKI WALT	45.9975	-112.7018	TRS-TWN	NAD27	03N	09W	22		NO	WELL		127.00	0.00	0.0	25.0		0.0	0	0	0.00		1/1/1986	DOMESTIC		87.0	127.0	4	0		SAW SLOTS
50505		SILVERBOW CREEK * CERCLA TS-01	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		26.50	9.10	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/13/1985	MONITORING		16.0	26.0	4	0		.03 FACTORY SLT
50506		SILVERBOW CREEK * CERCLA TS-02	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		7.60	7.30	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/13/1985	MONITORING		0.0	7.0	4	0		.03 FACTORY SLT
50507		SILVERBOW CREEK * CERCLA TS-03	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		27.00	9.67	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/14/1985	MONITORING		16.5	26.5	2	0		.03 FACTORY SLT
50508		SILVERBOW CREEK * CERCLA TS-04	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		27.00	9.50	15.0	5.0		0.0	0	0	0.00	OKEEFE	3/14/1985	MONITORING		16.0	26.0	2	0		.03 FACTORY SLT
50509		SILVERBOW CREEK * CERCLA TS-05	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		27.00	9.86	0.0	10.0		0.0	0	0	0.00	OKEEFE	3/14/1985	MONITORING		16.0	26.0	2	0		.03 FACTORY SLT
50510		SILVERBOW CREEK * CERCLA TS-06	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		8.00	9.75	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/15/1985	MONITORING		2.0	7.0	2	0		.03 FACTORY SLT
50511		SILVERBOW CREEK * CERCLA TS-07	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		7.50	9.67	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/15/1985	MONITORING		2.0	7.0	2	0		.03 FACTORY SLT
50512		SILVERBOW CREEK * CERCLA TS-08	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		3.50	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/13/1985	MONITORING		3.0	3.5	2	0		LYSIMETER
50513		SILVERBOW CREEK * CERCLA TS-09	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		6.00	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/13/1985	MONITORING		5.0	5.5	0	0		LYSIMETERS
50514		SILVERBOW CREEK * CERCLA TS-10	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		7.50	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/13/1985	MONITORING		7.0	7.5	0	0		LYSIMETER
50515		SILVERBOW CREEK * CERCLA TS-11	46.0021	-112.6919	TRS-TWN	NAD27	03N	09W	22	AAD	NO	WELL		9.50	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/13/1985	MONITORING		9.0	9.5	0	0		LYSIMETER
50516		SAVILLE DUANE	45.9993	-112.6988	TRS-TWN	NAD27	03N	09W	22	AC	NO	WELL		90.00	65.00	0.0	30.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1983	DOMESTIC		80.0	90.0	6	0		TORCH CUTS
50517	28245	DOBB DAVID E.	45.9993	-112.6988	TRS-TWN	NAD27	03N	09W	22	AC	NO	WELL		107.00	67.00	0.0	30.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1980	UNKNOWN		80.0	107.0	4	0		SAW SLOTS
50518		MCLEOD JACK L.	45.9993	-112.6933	TRS-TWN	NAD27	03N	09W	22	AD	NO	WELL		47.00	27.00	30.0	25.0	BAILER	1.5	0	0	0.00	DYNAMITE	1/1/1985	DOMESTIC		0.0	0.0	0	0		
50520		OCONNOR DAN	45.9955	-112.7044	TRS-TWN	NAD27	03N	09W	22	CA	NO	WELL		120.00	60.00	0.0	20.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1982	UNKNOWN		80.0	120.0	4	0		SAW SLOTS
50521		KEYSER DEAN	45.9955	-112.7099	TRS-TWN	NAD27	03N	09W	22	CB	NO	WELL		108.00	88.00	0.0	30.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1983	DOMESTIC		90.0	108.0	6	0		TORCH CUTS
50522	68027	DARLOW MARK	45.9917	-112.7099	TRS-TWN	NAD27	03N	09W	22	CC	NO	WELL		200.00	80.00	196.0	15.0	AIR	2.0	0	0	0.00	LINDSAY	1/1/1988	DOMESTIC		140.0	200.0	4	0	1/4X4	SLOTS
50523	19457	SEVORES JOHN	45.9913	-112.7051	TRS-TWN	NAD27	03N	09W	22	CDCA	NO	WELL	211PLNC	125.00	0.00	0.0	14.0	AIR	0.0	0	0	0.00	OKEEFE	1/1/1978	DOMESTIC		105.0	125.0	4	0		SAW SLOTS
50524		EARHART JERRY	45.9973	-112.6802	TRS-TWN	NAD27	03N	09W	23		NO	WELL		88.00	29.00	0.0	60.0		0.0	0	0	0.00	OKEEFE	1/1/1981	UNKNOWN		0.0	0.0	0	0		
50526		BUTTE-SILVER BOW (I)	46.0014	-112.6878	TRS-TWN	NAD27	03N	09W	23	BBDC	NO	WELL		63.00	0.00	0.0	0.0		0.0	0	0	0.00		1/1/1983	MONITORING		40.0	60.0	0	0		
50527	W049913-00	RHODIA INC *WELL 1A	45.9944	-112.6732	TRS-TWN	NAD27	03N	09W	23	DAC	YES	WELL	120SDMS	275.00	39.00	0.0	600.0	AIR/PUMP	32.0	0	0	0.00	LINDSAY	1/16/1990	INDUSTRIAL		136.0	206.0	12	0		STAINLESS STEEL SC
50529	7055	RAUGH WILLIAM	45.9948	-112.6850	TRS-TWN	NAD27	03N	09W	23	CACB	NO	WELL		49.00	26.00	0.0	45.0	BAILER	0.0	0	0	0.00	OKEEFE	1/1/1975	DOMESTIC		34.0	39.0	6	0		SLOTS
50530		NORTHERN PACIFIC RR	45.9958	-112.6905	TRS-TWN	NAD27	03N	09W	23	CBBC	NO	WELL	120SDMS	59.00	14.00	0.0	10.0		0.0	0	0	0.00		1/1/1955	DOMESTIC		0.0	0.0	0	0		
50532	W049913-00	RHODIA INC * WELL 3	45.9940	-112.6739	TRS-TWN	NAD27	03N	09W	23	DACC	YES	WELL	120SDMS	250.00	53.00	71.0	550.0	PUMP	0.0	0	0	0.00	PRICE AND LIN	3/1/1951	INDUSTRIAL		123.0	128.0	10	0		1/4 IN SLOTS
50535		RHONE-POULENC CHEMICALS * WELL 2	45.9901	-112.6711	TRS-TWN	NAD27	03N	09W	23	DDDC	YES	WELL	120SDMS	226.00	33.00	47.0	500.0		0.0	0	0	0.00	PRICE & LINDS	1/1/1951	INDUSTRIAL		201.0	226.0	10	0	4-Jan	SLOTS
50536		RHONE-POULENC CHEMICALS * WELL 2A	45.9901	-112.6711	TRS-TWN	NAD27	03N	09W	23	DDDC	YES	WELL	120SDMS	257.00	44.00	126.0	500.0	PUMP	21.0	0	0	0.00	OKEEFE	8/30/1971	INDUSTRIAL		200.0	257.0	8	0		TORCH CUTS
50538		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-G	45.9955	-112.6733	UNKNOWN	NAD27	03N	09W	24	CBCB	YES	WELL	120SDMS	53.00	35.82	0.0	12.0	VOLUMETR	0.0	0	0	0.00		1/1/1983	MONITORING		38.0	53.0	4	0		SAW SLOTS
50542		BUTTE-SILVER BOW (H)	45.9918	-112.6677	TRS-TWN	NAD27	03N	09W	24	CCBD	NO	WELL		48.00	40.00	0.0	0.0		0.0	0	0	0.00		1/1/1983	MONITORING		35.0	45.0	0	0		

GWIC_ID	DNRC_ID	SITE_NAME	LAT	LON	GEOMETHOD	DATUM	TWN	RNG	SEC	Q_SEC	VERIFIED_	TYPE	AQUIFER	TD	SWL	PWL	YIELD	TYPE_1	TIME	DSS	RWL	RTIME	DRILLER	DATE_	USE	STATUS	FROM	TO	DIA	OPEN	OPEN_1	DESCRIPTIO
50544		PORT OF MONTANA GRAIN TERMINAL *WELL #2	45.9895	-112.6530	TRS-TWN	NAD27	03N	09W	24	CD	YES	WELL	120SDMS	35.00	19.00	0.0	30.0	BAILER	0.0	0	0	0.00	OKEEFE	7/23/1985	COMMERCIAL		26.0	33.0	6	0	8-Jan	TORCH CUTS
50545	10028	HANSEN MARK	45.9899	-112.6566	TRS-TWN	NAD27	03N	09W	24	DCCD	NO	WELL	120SDMS	47.00	10.00	0.0	30.0		0.0	0	0	0.00		1/1/1976	PUBLIC WATER SUPPLY		40.0	45.0	6	0		SLOTS
50546		BUTTE-SILVER BOW (J)	45.9863	-112.6633	UNKNOWN	NAD27	03N	09W	25	BAD	YES	WELL	120SDMS	78.00	61.58	0.0	0.0		0.0	0	0	0.00		1/1/1989	MONITORING		65.0	78.0	4	0		SAW SLOTS
50547		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-L	45.9850	-112.6716	UNKNOWN	NAD27	03N	09W	25	BCB	YES	WELL	120SDMS	73.00	52.81	0.0	8.0	VOLUMETR	0.0	0	0	0.00		1/1/1989	MONITORING		55.0	70.0	0	0		SAW SLOTS
50548		BUTTE-SILVERBOW METRO SEWER SLUDGE WELL-K	45.9830	-112.6633	UNKNOWN	NAD27	03N	09W	25	BDD	YES	WELL	120SDMS	78.00	69.86	0.0	0.0		0.0	0	0	0.00		1/1/1989	MONITORING		60.0	75.0	4	0		SAW SLOTS
50549		COTTON STANLEY	45.9831	-112.7223	TRS-TWN	NAD27	03N	09W	28		NO	WELL		187.00	40.00	182.0	20.0	AIR	2.0	0	0	0.00	LINDSAY	1/1/1986	DOMESTIC		100.0	180.0	4	0	1/4X4	SLOTS
50550		SCHNADEL OSCAR #1	45.9942	-112.5501	SUR-GPS	NAD27	03N	09W	28		NO	WELL	120SDMS	20.00	15.00	0.0	5.0		0.0	0	0	0.00		1/1/1920	DOMESTIC		0.0	0.0	0	0		
50551		SCHNADEL OSCAR #4	45.9831	-112.7223	TRS-TWN	NAD27	03N	09W	28		NO	WELL		0.00	0.00	0.0	0.0		0.0	0	0	0.00			DOMESTIC		0.0	0.0	0	0		
50552		SCHNADEL OSCAR #2	45.9831	-112.7223	TRS-TWN	NAD27	03N	09W	28		NO	WELL	120SDMS	27.00	20.00	0.0	5.0		0.0	0	0	0.00		1/1/1959	DOMESTIC		0.0	0.0	0	0		
50553		SCHNADEL OSCAR #3	45.9831	-112.7223	TRS-TWN	NAD27	03N	09W	28		NO	WELL	120SDMS	12.00	10.00	0.0	5.0		0.0	0	0	0.00		1/1/1935	DOMESTIC		0.0	0.0	0	0		
50554	16472	BERTRAND GEORGE	45.9891	-112.7159	TRS-TWN	NAD27	03N	09W	28	AABC	NO	WELL	211PLNC	120.00	0.00	0.0	15.0		0.0	0	0	0.00	OKEEFE	1/1/1977	DOMESTIC		100.0	120.0	0	0		
50555		HANCOCK KIM	45.9883	-112.7257	MAP	NAD27	03N	09W	28	ABBC	YES	WELL	124LDCK	50.00	15.00	0.0	25.0	AIR	2.0	0	0	0.00	OKEEFE	1/1/1987	DOMESTIC		30.0	50.0	4	0		SAW SLOTS
50559		ANDERSON PATTY	45.9684	-112.7213	TRS-TWN	NAD27	03N	09W	33		NO	WELL		103.00	0.00	0.0	15.0	AIR	0.0	0	0	0.00	OKEEFE	1/1/1979	DOMESTIC		40.0	103.0	4	0		SAW SLOTS
50560	C069887-00	QUINN HUGH	45.9740	-112.7128	TRS-TWN	NAD27	03N	09W	33	AA	NO	WELL		250.00	78.00	0.0	25.0	AIR	2.0	0	0	0.00	OKEEFE	1/1/1988	DOMESTIC		170.0	250.0	4	0		SAW SLOTS
50561	66055	MASON DAVID	45.9749	-112.7115	TRS-TWN	NAD27	03N	09W	33	AAA	NO	WELL		200.00	50.00	180.0	30.0	AIR	2.0	0	0	0.00	LINDSAY	1/1/1987	DOMESTIC		120.0	200.0	4	0	1/4X4	SLOTS
50562	20834	TINSLEY DALE	45.9738	-112.7233	NAV-GPS	NAD27	03N	09W	33	ABBD	YES	WELL	211BDBT	266.00	15.00	250.0	50.0	AIR	3.0	0	0	0.00	LINDSAY	1/1/1976	DOMESTIC		186.0	266.0	4	0	1/4X4	SLOTS
50563	22989	RONCHETTO RONALD	45.9702	-112.7239	TRS-TWN	NAD27	03N	09W	33	BD	NO	WELL		300.00	40.00	0.0	11.0	AIR	0.0	0	0	0.00	OKEEFE	1/1/1978	DOMESTIC		280.0	300.0	4	0		SAW SLOTS
50564	9890	RONCHETTO RON	45.9707	-112.7260	TRS-TWN	NAD27	03N	09W	33	BDBC	NO	WELL	120PLNC	126.00	20.00	120.0	6.0	AIR	3.0	0	0	0.00	LINDSAY	1/1/1976	DOMESTIC		84.0	126.0	4	0	1/4X4	SLOTS
50565	21646	DEPLAZES JOE	45.9669	-112.7204	TRS-TWN	NAD27	03N	09W	33	DBBC	NO	WELL	211PLNC	80.00	0.00	0.0	20.0	AIR	0.0	0	0	0.00	OKEEFE	1/1/1978	DOMESTIC		60.0	80.0	4	0		SAW SLOTS
50566	21677	JOHNSTON MARIE	45.9621	-112.7149	TRS-TWN	NAD27	03N	09W	33	DDCB	NO	WELL	211PLNC	115.00	0.00	0.0	25.0	AIR	0.0	0	0	0.00	OKEEFE	1/1/1978	DOMESTIC		95.0	115.0	4	0		SAW SLOTS
120324		POYNTER ALBERT	45.9940	-112.6418	TRS-TWN	NAD27	03N	08W	19	CAC	NO	WELL		185.00	140.00	148.0	16.0	AIR	2.0	0	0	0.00	BRAZILL	8/22/1990	DOMESTIC		165.0	185.0	4	0	1/8X4	SAW SLOTS
120709		RICHTER RUDY	46.0066	-112.7324	TRS-TWN	NAD27	03N	09W	16	CC	NO	WELL		98.00	30.00	60.0	20.0	AIR	2.0	0	0	0.00	BRAZILL	10/3/1990	DOMESTIC		78.0	98.0	4	0	1/8X4	SAW SLOTS
124090	81654	SEYMOUR DICK	45.9799	-112.7048	TRS-TWN	NAD27	03N	09W	27	CAC	NO	WELL		180.00	30.00	0.0	20.0	BAILER	1.5	0	0	0.00	OKEEFE	3/29/1991	DOMESTIC		178.0	162.0	6	0		TORCH CUTS
125237		SEYMOUR KEVIN	45.9771	-112.7090	TRS-TWN	NAD27	03N	09W	27	CC	NO	WELL		185.00	23.00	0.0	20.0	AIR	1.0	0	0	0.00	OKEEFE	3/23/1991	DOMESTIC		92.0	98.0	4	0		SAW SLOTS
125257	79744	UELAND RANCHES	46.0094	-112.7025	NAV-GPS	NAD27	03N	09W	15	DBCA	YES	WELL	120SNGR	49.00	17.00	0.0	30.0	BAILER	1.5	0	0	0.00	OKEEFE	9/6/1991	UNUSED		41.0	48.0	6	0		TORCH CUTS
129085		PORT OF MONTANA	46.0007	-112.6698	NAV-GPS	NAD27	03N	09W	24	BBDC	YES	WELL	120SDMS	119.00	12.00	0.0	92.0	BAILER	8.0	0	0	0.00	TRI VALLEY	7/30/1988	PUBLIC WATER SUPPLY		101.0	119.0	8	0	1/4X3	TORCH CUTS
131297		ARCO - STREAMSIDE TAILINGS WELL C-21	46.0033	-112.7005	NAV-GPS	NAD27	03N	09W	22	ABAD	YES	WELL	110ALVM	10.00	5.30	0.0	0.0		0.0	0	0	0.00	OKEEFE	9/15/1992	MONITORING		5.0	10.0	4	0	0.02	SCREEN
131299		ARCO - STREAMSIDE TAILINGS WELL C-22	46.0122	-112.7263	NAV-GPS	NAD27	03N	09W	16	BDDD	YES	WELL	110ALVM	9.50	5.20	0.0	0.0		0.0	0	0	0.00	OKEEFE	9/16/1992	MONITORING		4.5	8.9	4	0		SLOTS
131301		ARCO - STREAMSIDE TAILINGS WELL C-18	46.0058	-112.6625	MAP	NAD27	03N	09W	13	CDDA	YES	WELL	110ALVM	8.10	3.30	0.0	0.0		0.0	0	0	0.00	OKEEFE	9/11/1992	MONITORING		3.0	7.4	4	0		PVC
131579		MBMG FIELD COURSE WELL	45.9884	-112.6685	NAV-GPS	NAD27	03N	09W	25	BBAC	YES	WELL	120SDMS	445.00	0.00	0.0	0.0		0.0	0	0	0.00	POTTS	7/16/1988	MONITORING		0.0	0.0	0	0		
134633		GIBSON DONNA	45.9959	-112.6393	TRS-TWN	NAD27	03N	08W	19	CAA	NO	WELL		200.00	150.00	180.0	35.0	AIR	2.0	0	0	0.00	DYNAMITE	6/8/1993	DOMESTIC		160.0	200.0	4	0		1/8X6IN SAW
136948		BRACKETT GARY	46.0002	-112.7113	TRS-TWN	NAD27	03N	09W	22	BCB	NO	WELL		200.00	122.00	180.0	30.0	AIR	1.0	0	0	0.00	DYNAMITE	8/28/1993	DOMESTIC		160.0	200.0	4	0		1/8X6 SAW PF
137141		DICK JAMES	45.9684	-112.7213	TRS-TWN	NAD27	03N	09W	33		NO	WELL		130.00	0.00	0.0	12.0	AIR	0.0	0	0	0.00	OKEEFE	9/7/1976	DOMESTIC		110.0	130.0	4	0	8-Jan	SLOTS
141259		NISSLER SPILL SITE * MW-1 * NORTH	46.0058	-112.6362	TRS-TWN	NAD27	03N	08W	18	DC	NO	WELL		29.50	21.75	0.0	0.0	BAILER	0.0	0	0	0.00	OKEEFE	2/7/1994	MONITORING		19.0	29.0	4	0	0.01	.01 PVC SCREEN
141262		NISSLER SPILL SITE * MW-2 * SW	46.0058	-112.6362	TRS-TWN	NAD27	03N	08W	18	DC	NO	WELL		25.50	5.07	0.0	0.0	BAILER	0.0	0	0	0.00	OKEEFE	2/11/1994	MONITORING		5.0	25.0	4	0	0.01	SCREEN
141264		NISSLER SPILL SITE * MW-3 * S-SW	46.0058	-112.6362	TRS-TWN	NAD27	03N	08W	18	DC	NO	WELL		25.50	18.79	0.0	0.0	BAILER	0.0	0	0	0.00	OKEEFE	2/11/1994	MONITORING		15.0	25.0	4	0	0.01	.01 PVC SCREEN
141266		NISSLER SPILL SITE * MW-4 * SOUTH	46.0058	-112.6362	TRS-TWN	NAD27	03N	08W	18	DC	NO	WELL		24.50	19.08	0.0	0.0	BAILER	0.0	0	0	0.00	OKEEFE	2/15/1994	MONITORING		14.0	24.0	4	0	0.01	.01 PVC SCREEN
143518	91630	STOLTENBERG CURTIS & ALICE	45.9993	-112.7044	TRS-TWN	NAD27	03N	09W	22	BD	NO	WELL		160.00	87.00	135.0	15.0	AIR	1.0	0	0	0.00	BRAZILL	4/19/1994	DOMESTIC		140.0	160.0	4	0		1/8X4 SAW CUT
144008		UNIVERSITY OF MONTANA MT 94-1	46.0113	-112.7227	TRS-TWN	NAD27	03N	09W	16	DBB	NO	WELL		15.20	0.00	0.0	0.0		0.0	0	0	0.00	WEIGHT	7/14/1994	MONITORING		0.0	0.0	0	0		FACTORY SLOTTED
144009		UNIVERSITY OF MONTANA MT 94-2	46.0113	-112.7227	TRS-TWN	NAD27	03N	09W	16	DBB	NO	WELL		15.50	0.00	0.0	0.0		0.0	0	0	0.00	WEIGHT	7/14/1994	RESEARCH		5.5	15.5	2	0		TRI-LOC SCREEN
144010		UNIVERSITY OF MONTANA MT 94-3	46.0113	-112.7227	TRS-TWN	NAD27	03N	09W	16	DBB	YES	WELL	110ALVM	10.70	0.00	0.0	0.0		0.0	0	0	0.00	WEIGHT	7/14/1994	RESEARCH		5.7	10.7	2	0		TRI-LOC SCREEN
149765		SCOULAR GRAIN * WELL NUMBER 1	45.9895	-112.6557	TRS-TWN	NAD27	03N	09W	25	ABBAB	YES	WELL	120SDMS	78.00	21.65	0.0	15.0	BAILER	0.0	0	0	0.00	OKEEFE	10/9/1984	PUBLIC WATER SUPPLY		71.0	76.0	6	0	8-Jan	TORCH CUTS
149770		INTERSTATE HIGHWAY WELL	45.9895	-112.6502	TRS-TWN	NAD27	03N	09W	25	AABAC	YES	WELL	120SDMS	0.00	20.00	0.0	0.0		0.0	0	0	0.00			UNUSED	ABANDONED	0.0	0.0	0	0		
149879		MONTANA TECH GEOLOGY DEPT.	46.0142	-112.7269	TRS-TWN	NAD27	03N	09W	16	BD	YES	WELL		14.00	4.30	0.0	4.0		0.0	0	0	0.00			RESEARCH		9.0	14.0	2	0		SCREEN
153350		BUTTE-SILVERBOW BSB-01	45.9825	-112.6836	MAP	NAD27	03N	09W	26	DBBB	YES	WELL	120SNGR	218.00	60.00	0.0	60.0	AIRLIFT	1.2	0	0	0.00	OKEEFE	1/26/1996	MONITORING		157.0	217.0	2	0		6 IN SLOTS
153518		HAZLETT BILL	46.0062	-112.6838	TRS-TWN	NAD27	03N	09W	14	CD	NO	WELL		70.00	33.00	0.0	20.0	BAILER	1.0	0	0	0.00	OKEEFE	8/11/1995	DOMESTIC		50.0	70.0	6	0		TORCH CUTS
153519		JENNINGS MARK & SHERRY	45.9975	-112.7018	TRS-TWN	NAD27	03N	09W	22		NO	WELL		340.00	99.00	0.0	8.0	AIR	1.5	0	0	0.00	OKEEFE	6/15/1995	DOMESTIC		200.0	300.0	4	0		SAW SLOTS
153520		WIER GERALD	45.9930	-112.7091	NAV-GPS	NAD27	03N	09W	22	CDBC	YES	WELL	211BDBT	140.00	0.00	0.0	10.0	AIR	1.5	0	0	0.00	OKEEFE	6/26/1995	DOMESTIC		80.0	140.0	4	0		SAW SLOTS
153521	97431	MALONEY KELLEY & CATHY	45.9692	-112.7308	TRS-TWN	NAD27	03N	09W	33	BCC	NO	WELL		400.00	0.00	380.0	10.0	AIR	1.0	0	0	0.00	BRAZILL	5/31/1995	DOMESTIC		160.0	400.0	4	0		1/8X4IN SAW
153816		BUTTE-SILVERBOW BSB-02	45.9755	-112.6799	TRS-TWN	NAD27	03N	09W	26	CDDDD	YES	WELL	120SDMS	180.00	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	2/5/1996	MONITORING		160.0	180.0	2	0		6 IN SLOTS
153820		BUTTE-SILVERBOW BSB-04	45.9821	-112.6786	TRS-TWN	NAD27	03N	09W	26	DBBB	NO	WELL		300.00	11.15	27.0	40.0	PUMPING	1.8	0	0	0.00	OKEEFE	3/7/1996	MONITORING		206.0	226.0	5	0		30 SLOT STEEL
154287		BUTTE-SILVERBOW BSB-03	45.9857	-112.6530	TRS-TWN	NAD27	03N	09W	25	ACAAD	YES	WELL	120SDMS	200.00	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	2/6/1996	MONITORING		140.0	160.0	2	0		6 IN SLOTS
154862		ERICKSON RANCH * TW-1	45.9952	-112.7252	TRS-TWN	NAD27	03N	09W	21	CADBB	NO	WELL		300.00	0.00	0.0	40.0		0.0	0	0	0.00		4/23/1992	MONITORING		0.0	0.0	0	0		
154863		ERICKSON RANCH * TW-2	46.0009	-112.7280	TRS-TWN	NAD27	03N	09W	21	BDBBC	NO	WELL		120.00	0.00	0.0	1.0		0.0	0	0	0.00		4/28/1992			0.0	0.0	0	0		
156149	98738	BREWER KEVIN & VICKY	45.9949	-112.6457	TRS-TWN	NAD27	03N	08W	19	CB	NO	WELL		155.00	115.00	130.0	30.0	PUMP/BAIL	1.0	0	0	0.00	DYNAMITE	4/17/1996	DOMESTIC		125.0	155.0	4	0		1/8X6 SAW CUT
156178		REID ELNA	45.9971	-112.6587	TRS-TWN	NAD27	03N	09W	24		NO	WELL		73.00	19.50	50.0	13.0	BAILER	2.5	0	0	0.00	OKEEFE	10/20/1992	DOMESTIC		50.0	70.0	6	0		TORCH CUTS
158778	100235	MCINTEE THOMAS P	45.9912	-112.6457	TRS-TWN	NAD27	03N	08W	19	CC	NO	WELL		158.00	119.00	0.0	15.0	AIR	1.5	0	0	0.00	OKEEFE	9/18/1996	DOMESTIC		141.0	155.0	6	0		SAW SLOTS
159832	98898	PIONEER CONCRETE	45.9989	-112.6503	TRS-TWN	NAD27	03N	09W	24	AD	NO	WELL		300.00	12.00	0.0	20.0	PUMP	2.0	0	0	0.00	OKEEFE	8/5/1996	PUBLIC WATER SUPPLY		180.0	280.0	4	0		SAW SLOTS
160289	100288	BLOMSTROM KEITH	46.0067	-112.6401	TRS-TWN	NAD27	03N	08W	18	CDA	NO	WELL		300.00	270.00	0.0	4.0	AIR	1.5	0	0	0.00	OKEEFE	10/23/1996	DOMESTIC		260.0	300.0	4	0		SAW SLOTS
163488		UNIVERSITY OF MONTANA M97-4	46.0113	-112.7227	TRS-TWN	NAD27	03N	09W	16	DBB	NO	WELL		7.80	0.00	0.0	0.0		0.0	0	0	0.00	WEIGHT	7/9/1997	MONITORING		7.8	12.8	2	0	0.02	SLOTS
163489		UNIVERSITY OF MONTANA MT97-2	46.0113	-112.7227	TRS-TWN	NAD27	03N	09W	16	DBB	NO	WELL		15.00	0.00	0.0	0.0		0.0	0	0	0.00	WEIGHT	7/9/1997	MONITORING		7.0	12.0	2	0		SIZE20SLOTSCRN
163490		UNIVERSITY OF MONTANA MT97-3	46.0113	-112.7227	TRS-TWN	NAD27	03N	09W	16	DBB	NO	WELL		8.00	0.00	0.0	0.0		0.0	0	0	0.00	WEIGHT	7/9/1997	RESEARCH		8.0	13.0	2	0		SIZE20SLOTSCRN
163491		UNIVERSITY OF MONTANA MT97-1	46.0113	-112.7227	TRS-TWN	NAD27	03N	09W	16	DBB	NO	WELL		10.00	0.00	0.0	0.0		0.0	0	0	0.00	WEIGHT	7/9/1997	MONITORING		10.0	15.0	2	0		SIZE20SLOTSCRNS
163585		HALE JOYCE	45.9860	-112.6322	TRS-TWN	NAD27	03N	08W	30	A	NO	WELL		70.00	10.00	0.0	15.0	BAILER	1.0	0	0	0.00	OKEEFE	4/14/1997	DOMESTIC		60.0	66.0	6	0		TORCH CUTS
163587	102996	HALE JOYCE	45.9860	-112.6322	TRS-TWN	NAD27	03N	08W	30	A	NO	WELL		74.00	12.00	0.0	20.0	BAILER	1.0	0	0	0.00	OKEEFE	4/11/1997	DOMESTIC		64.0	70.0	6	0		TORCH CUTS
163594		EARHART JERRY	46.0062	-112.6782	TRS-TWN	NAD27	03N	09W	14	DC	NO	WELL		70.00	30.00	0.0	20.0	BAILER	1.0	0	0	0.00	OKEEFE	4/18/1997	DOMESTIC		50.0	70.0	4	0		SAW SLOTS
163595	103001	ERICKSON DAVE	45.9922	-112.7357	NAV-GPS	NAD27	03N	09W	21	CCCB	YES	WELL	124LDCK	60.00	26.00	0.0	30.0	AIR	1.5	0	0	0.00	OKEEFE	6/2/1997	DOMESTIC		40.0	60.0	4	0		SAW SLOTS
163962		UELAND RANCH	46.0137	-112.6894	TRS-TWN	NAD27	03N	09W	14	BC	NO	WELL		63.00	20.00	63.0	20.0	BAILER	1.0	0	0	0.00	OKEEFE	8/19/1997	DOMESTIC		43.0	49.0	6	0		TORCH CUTS
164857		HESS TIM	45.9998	-112.6969	NAV-GPS	NAD27	03N	09W	22	ADAC	YES	WELL	120SNGR	59.00	13.00	40.0	20.0	BAILER	1.0	0	0	0.00	OKEEFE	10/1/1997	IRRIGATION		49.0	55.0	6	0	4-Jan	TORCH CUTS
168835		PAFFHAUSEN BOB	46.0099	-112.6782	TRS-TWN	NAD27	03N	09W	14	DB	NO	WELL		94.00	45.00	70.0	80.0	BAILER	1.0	0	0	0.00	OKEEFE	7/22/1998	STOCKWATER		74.0	94.0	6	0	4-Jan	SAW SLOTS
168836		PAFFHAUSEN BOB	46.0099	-112.6782	TRS-TWN	NAD27	03N	09W	14	DB	NO	WELL		127.00	65.00	85.0	30.0	BAILER	1.0	0	0	0.00	OKEEFE	7/20/1998	PUBLIC WATER SUPPLY		87.0	127.0	4	0	4-Jan	SAW SLOTS
168854		MURRAY TY & WENDY	46.0096	-112.7084	NAV-GPS	NAD27	03N	09W	15	CADB	YES	WELL	120SNGR	50.00	20.00	36.0	20.0	BAILER	1.0	0	0	0.00	OKEEFE	6/18/1998	DOMESTIC		40.0	46.0	6	0	4-Jan	TORCH CUTS
169822		DAVIS LINDA	45.9806	-112.5304	TRS-TWN	NAD27	03N	08W	19	CD	NO	WELL		260.00	120.00	255.0	30.0	AIR	1.0	0	0	0.00	LINDSAY	10/1/1998	DOMESTIC		180.0	260.0	4	0		PERFORATED CASING
170880		MURRAY JACK	46.0064	-112.6998	TRS-TWN	NAD27	03N	09W	15	DC	NO	WELL		58.00	20.00	50.0	18.0	BAILER	1.0	0	0	0.00	OKEEFE	11/17/1998	DOMESTIC		38.0	58.0	4	0	4-Jan	SAW SLOTS
170881	C110370-00	HOFFMAN RICHARD	46.0138	-112.6838	TRS-TWN	NAD27	03N	09W	14	BD	NO	WELL		80.00	30.00	50.0	15.0	AIR	1.0	0	0	0.00	BRAZILL	9/15/1998	DOMESTIC		60.0	80.0	4	0	1/8X4	SAW SLOTS
173327		SILVER BOW * MW-97-8	45.9925	-112.6760	TRS-TWN	NAD27	03N	09W	23	DCA	NO	WELL		72.20	54.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	10/24/1997	MONITORING		50.6	70.6	2	0		.010 SLOT PVC
173328		SILVER BOW * MW-97-7	45.9925	-112.6732	TRS-TWN	NAD27	03N	09W	23	DDB	NO	WELL		62.90	50.90	0.0	0.0		0.0	0	0	0.00	OKEEFE	10/23/1997	MONITORING		38.4	62.8	2	0		.010 SLOT PVC
173331		SILVER BOW * MW-97-7	45.9906	-112.6704	TRS-TWN	NAD27	03N	09W	23	DDD	NO	WELL		53.10	40.90	0.0	0.0		0.0	0	0	0.00	OKEEFE	10/21/1997	MONITORING		28.5	53.1	2	0		.010 SLOT PVC
173332		SILVER BOW * MW-97-5	45.9854	-112.6696	TRS-TWN	NAD27	03N	09W	26	ADA	NO	WELL		72.60	62.20	0.0	0.0		0.0	0	0	0.00	OKEEFE	10/20/1997	MONITORING		48.2	72.6	2	0		.010 SLOT PVC
173334		SILVER BOW * MW-97-2	45.9854	-112.6806	TRS-TWN	NAD27	03N	09W	26	BDA	NO	WELL		62.30	17.25	0.0	0.0		0.0	0	0	0.00	OKEEFE	10/17/1997	MONITORING		47.6	62.3	2	0		.010 SLOT PVC
173355		RHONE-POULENC CHEMICALS MW-1-97	45.9854	-112.6806	TRS-TWN	NAD27	03N	09W	26	BDA	NO	WELL		32.70	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	10/18/1997	MONITORING		22.2	32.7	2	0		
173356		RHONE-POULENC CHEMICALS MW-3-97	45.9816	-112.6779	TRS-TWN	NAD27	03N	09W	26	DBB	NO	WELL		33.40	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	10/14/1997	MONITORING		13.8	33.4	2	0		
173357		RHONE-POULENC CHEMICALS MW-4-97	45.9816	-112.6779	TRS-TWN	NAD27	03N	09W	26	DBB	NO	WELL		61.20	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	10/13/1997	MONITORING		50.7	61.2	2	0		
175349		MBMG RESEARCH SITE * C10	45.9987	-112.6869	NAV-GPS	NAD27	03N	09W	23	BDDB	NO	WELL		58.60	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		53.0	58.0	4	0		.020 SLOTTED PVC SC
175350		MBMG RESEARCH SITE * C11	45.9987	-112.6869	NAV-GPS	NAD27	03N	09W	23	BDDB	NO	WELL		30.40	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		35.0	38.0	4	0		.020 SLOTTED PVC SC
175351		MBMG RESEARCH SITE * C12	45.9993	-112.6869	NAV-GPS	NAD27	03N	09W	23	BDAC	NO	WELL		35.20	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		28.0	33.0	4	0		.020 SLOTTED PVC SC
175352		MBMG RESEARCH SITE * C13	46.0004	-112.6865	NAV-GPS	NAD27	03N	09W	23	BDAB	NO	WELL		29.50	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		23.0	28.0	4	0		.020 SLOTTED SCREEN
175353		MBMG RESEARCH SITE * C13 S	46.0003	-112.6866	NAV-GPS	NAD27	03N	09W	23	BDAB	NO	WELL		19.00	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		15.0	17.0	4	0		.020 SLOTTED SCREEN
175355		ARCO - STREAMSIDE TAILINGS WELL C-19	45.9992	-112.6871	NAV-GPS	NAD27	03N	09W	23	BDAC	NO	WELL		15.00	10.80	0.0	0.0		0.0	0	0	0.00	OKEEFE	9/14/1992	MONITORING		10.0	15.0	4	0	0.02	SCREEN
175356		ARCO - STREAMSIDE TAILINGS WELL C-20	45.9993	-112.6871	NAV-GPS	NAD27	03N	09W	23	BDAC	NO	WELL		15.00	10.90	0.0	0.0		0.0	0	0	0.00	OKEEFE	9/14/1992	MONITORING		10.0	15.0	4	0	0.02	SCREEN
175357		MBMG RESEARCH SITE * D31	46.0110	-112.7199	NAV-GPS	NAD27	03N	09W	16	DABA	NO	WELL		4.50	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		0.0	0.0	0	0		
175358		MBMG RESEARCH SITE * D46	46.0108	-112.7221	NAV-GPS	NAD27	03N	09W	16	DBAA	NO	WELL		7.20	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		0.0	0.0	0	0		
175359		MBMG RESEARCH SITE * D56	46.0111	-112.7211	NAV-GPS	NAD27	03N	09W	16	DABB	NO	WELL		7.90	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		0.0	0.0	0	0		
175376		MBMG RESEARCH SITE * P066	46.0058	-112.6649	NAV-GPS	NAD27	03N	09W	13	CDDA	NO	WELL		13.70	7.16	0.0	0.0		0.0	0	0	0.00	DELTA	4/26/1999	MONITORING		3.7	13.7	0	0		.020 SCREENS
175410		MBMG RESEARCH SITE * TS14	46.0025	-112.6967	NAV-GPS	NAD27	03N	09W	22	AADB	NO	WELL		28.85	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		0.0	0.0	0	0		
175411		MBMG RESEARCH SITE * U01	46.0021	-112.6916	NAV-GPS	NAD27	03N	09W	23	BBDB	NO	WELL		6.00	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		0.0	0.0	0	0		
175412		MBMG RESEARCH SITE * U04	46.0017	-112.6998	NAV-GPS	NAD27	03N	09W	22	AACC	NO	WELL		6.60	0.00	0.0	0.0		0.0	0	0	0.00			MONITORING		0.0	0.0	0	0		

GWIC_ID	DNRC_ID	SITE_NAME	LAT	LON	GEOMETHOD	DATUM	TWN	RNG	SEC	Q_SEC	VERIFIED_	TYPE	AQUIFER	TD	SWL	PWL	YIELD	TYPE_1	TIME	DSS	RWL	RTIME	DRILLER	DATE_	USE	STATUS	FROM_	TO	DIA	OPEN	OPEN_1	DESCRIPTIO
178988		MONTANA TECH DEPT GEOL. ENGINEERING MT99-2	46.0133	-112.7339	TRS-TWN	NAD27	03N	09W	16	BCC	NO	WELL		13.50	5.60	0.0	0.0		0.0	0	0	0.00	MBMG	7/6/1999	MONITORING		8.0	13.0	2	0	0.02	SCREEN-PVC
179104		BLOMSTROM KEITH	46.0067	-112.6401	TRS-TWN	NAD27	03N	08W	18	CDA	NO	WELL		0.00	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	8/24/1999	DOMESTIC	DRY HOLE	0.0	0.0	0	0		
179105		BLOMSTROM KEITH	46.0055	-112.6450	MAP	NAD27	03N	08W	18	CDAC	YES	WELL	211BDBT	200.00	26.00	0.0	5.0	AIR	2.0	300	26	2.00	OKEEFE	8/24/1999	DOMESTIC		220.0	280.0	4	0	1/8X6	SAW SLOTS
179113	C107958	HAZLETT JR BILL AND LINDA	46.0062	-112.6838	TRS-TWN	NAD27	03N	09W	14	CD	NO	WELL		70.00	35.00	50.0	20.0	BAILER	1.0	0	35	0.03	OKEEFE	7/31/1998	DOMESTIC		50.0	70.0	4	0		1/4 SAW
179114		MONTANA TECH	46.0132	-112.7338	TRS-TWN	NAD27	03N	09W	16	BCC	NO	WELL		13.00	7.04	0.0	0.0		0.0	0	0	0.00	MBMG	7/6/1999	MONITORING		8.0	13.0	2	0		SCREEN-PVC
179116		HITSHEW KEN	45.9917	-112.7044	TRS-TWN	NAD27	03N	09W	22	CD	NO	WELL		140.00	35.00	135.0	25.0	AIR	1.0	0	35	1.00	LINDSAY	4/21/1999	DOMESTIC		80.0	140.0	4	0		
179117	C109085	DAVIS WAYNE	45.9700	-112.7025	TRS-TWN	NAD27	03N	09W	34	BD	NO	WELL		120.00	35.00	0.0	15.0	AIR	1.0	118	35	0.25	OKEEFE	7/8/1999	DOMESTIC		80.0	100.0	4	0	1/8X6	SAW SLOTS
181443		RHONE-POULENC CHEMICALS * P-99-4	45.9953	-112.6829	TRS-TWN	NAD27	03N	09W	23	CA	NO	WELL		36.60	20.50	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/12/1999	MONITORING		0.0	0.0	0	0		
181444		RHONE-POULENC CHEMICALS * P-99-1	45.9807	-112.6876	TRS-TWN	NAD27	03N	09W	26	CB	NO	WELL		12.40	2.50	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/17/1999	MONITORING		0.0	0.0	0	0		
181445		RHONE-POULENC CHEMICALS * P-99-2	45.9845	-112.6876	TRS-TWN	NAD27	03N	09W	26	BC	NO	WELL		10.40	2.45	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/17/1999	MONITORING		0.0	0.0	0	0		
181446		RHONE-POULENC CHEMICALS * P-99-3	45.9807	-112.6820	TRS-TWN	NAD27	03N	09W	26	CA	NO	WELL		42.60	20.50	0.0	0.0		0.0	0	0	0.00	OKEEFE	3/12/1999	MONITORING		0.0	0.0	0	0		
184336		MBMG RESEARCH SITE * C09	46.0034	-112.7016	SUR-GPS	NAD27	03N	09W	22	ABAC	NO	WELL		25.50	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	11/9/1991	MONITORING		19.0	24.0	4	0		.02 SLOT SCREENS
184337		MBMG RESEARCH SITE * C14	46.0022	-112.6855	SUR-GPS	NAD27	03N	09W	23	BADD	NO	WELL		21.00	0.00	0.0	0.0		0.0	0	0	0.00	OKEEFE	10/12/1991	MONITORING		13.0	18.0	4	0		.02 SLOT SCREENS
184338		MBMG RESEARCH SITE * GMW-01	46.0066	-112.6624	SUR-GPS	NAD27	03N	09W	13	CDD	NO	WELL		13.50	7.37	0.0	0.0	BAILER	1.5	0	0	0.00	WEIGHT	5/18/2000	MONITORING		8.0	13.0	2	0		20 SLOT SCREENS
184339		MBMG RESEARCH SITE * GMW-02	46.0066	-112.6624	SUR-GPS	NAD27	03N	09W	13	CDD	NO	WELL		14.00	7.30	0.0	0.0	BAILER	1.5	0	0	0.00	WEIGHT	5/18/2000	MONITORING		8.0	13.0	2	0		20 SLOT SCREENS
184340		MBMG RESEARCH SITE * GMW-03	46.0065	-112.6624	SUR-GPS	NAD27	03N	09W	13	CDD	NO	WELL		17.00	7.20	0.0	0.0	BAILER	1.0	0	0	0.00	WEIGHT	7/14/2000	MONITORING		12.0	16.0	2	0		20 SLOT SCREENS
184341		MBMG RESEARCH SITE * GMW-04	46.0066	-112.6625	SUR-GPS	NAD27	03N	09W	13	CDD	NO	WELL		17.00	7.22	0.0	0.0	BAILER	1.0	0	0	0.00	WEIGHT	7/14/2000	MONITORING		16.5	20.0	2	0		20 SLOT SCREENS
184510	C110296-00	LAVELLE BILL	46.0076	-112.6337	TRS-TWN	NAD27	03N	08W	18	D	NO	WELL		80.00	38.00	70.0	40.0	AIR	1.0	0	38	0.02	BRAZILL	7/28/1999	DOMESTIC		60.0	80.0	4	0	1/8X4	SAW SLOTS
185824		GORDON JOHN	45.9954	-112.6458	MAP	NAD27	03N	08W	19	CABD	YES	WELL	120SNGR	118.00	90.00	0.0	25.0	AIR	1.0	110	90	1.00	AK	9/6/2000	IRRIGATION		98.0	118.0	6	0	1/4X10	TORCH CUTS
191148	C007055-00	RAUCH BILL	46.0003	-112.6960	MAP	NAD27	03N	09W	34	ABDC	YES	WELL	120SNGR	49.00	26.00	0.0	45.0	BAILER	0.0	0	0	0.00	OKEEFE	9/9/1975	DOMESTIC		34.0	39.0	6	0	8-Jan	SLOTS
191307		ADVANCED SILICON MATERIALS INC	45.9652	-112.6859	NAV-GPS	NAD27	03N	09W	35	CADC	YES	WELL	120SNGR	96.00	51.00	0.0	35.0	AIR	2.0	0	51	1.00	OKEEFE	9/25/1996	PUBLIC WATER SUPPLY		80.0	96.0	6	0		0.04 SLOT SCREEN
192353		HOLTER CLARENCE	45.9912	-112.6457	TRS-TWN	NAD27	03N	08W	19	CC	NO	WELL		155.00	130.00	145.0	20.0	BAILER	2.0	0	130	0.01	OKEEFE	7/31/2001	DOMESTIC		125.0	155.0	4	0	1/8X3	TORCH CUTS
196330		ANDERS BRADY	45.9993	-112.7099	TRS-TWN	NAD27	03N	09W	22	BC	NO	WELL		217.00	121.00	0.0	14.0	AIR	2.0	215	121	1.00	AK	5/18/2002	DOMESTIC		157.0	217.0	0	0		1/8X4IN CHOP SAW PE
198081		ARCO - STREAMSIDE TAILINGS OPERABLE UNIT * C-23	46.0127	-112.7248	TRS-TWN	NAD27	03N	09W	16	BDDD	NO	WELL		12.00	5.40	0.0	0.0		0.0	0	0	0.00	OKEEFE	9/16/1992	MONITORING		4.5	9.5	4	0		.02 SLOT SCREENS
198165	C30003424	MOWRER CARROLL L AND ZONA L	46.0018	-112.6601	TRS-TWN	NAD27	03N	09W	24	BAD	NO	WELL		120.00	15.00	0.0	30.0	AIR	1.0	120	15	1.00	LINDSAY	7/30/2002	DOMESTIC		60.0	120.0	4	0		PERFORATED CASING
202627		CRIPPA LENORE	45.9665	-112.7184	TRS-TWN	NAD27	03N	09W	33	DB	NO	WELL		180.00	60.00	0.0	30.0	AIR	2.0	175	60	1.00	BRIDGER	5/15/2003	DOMESTIC		140.0	180.0	4	0		.025X1.25 FACT SLOT
203981		BLOMSTROM KEITH	46.0061	-112.4783	NAV-GPS	NAD27	03N	08W	18	CDB	NO	WELL		400.00	26.00	0.0	12.0	AIR	2.0	350	26	0.50	AK	5/20/2003	DOMESTIC		340.0	400.0	4	0		1/8X4IN CHOP SAW
206158		DUHAME JOHN AND GLENDA	46.0039	-112.6871	TRS-TWN	NAD27	03N	09W	23	BBA	NO	WELL		76.00	12.00	0.0	20.0	AIR	2.0	60	12	1.50	AK DRILLING	1/26/2003	DOMESTIC		40.0	70.0	6	50	2 X 1/8 IN	MECHANICAL/AIR OPE
207856		DUPONT CORPORATION	46.0128	-112.6769	TRS-TWN	NAD27	03N	09W	14	ACD	NO	WELL		21.00	0.00	0.0	0.0		0.0	0	0	0.00	MAXIM	3/21/2002	OTHER	ABANDONED	10.0	21.0	60	0		OPEN HOLE
211525		SEYMOUR DICK	45.9719	-112.7053	TRS-TWN	NAD27	03N	09W	34	B	NO	WELL		326.00	20.00	0.0	2.0	AIR	1.0	340	20	12.00	O'KEEFE	4/23/2004	DOMESTIC		286.0	326.0	4	54	1/8X6	SKILL SAW

Appendix 2-F

Rhodia’s 1995 State Fluoride in Forage Report

RHÔNE-POULENC

RHÔNE-POULENC BASIC CHEMICALS CO.

P.O. BOX 3146
BUTTE, MT 59702
TEL: (406) 782-1215
FAX: (406) 782-4498

February 9, 1996

Mr. Robert K. Jeffery
Montana Air Quality Division
P.O. Box 200901
Helena, MT 59620-0901

Dear Bob:

Enclosed you will find the Rhône Poulenc 1995 State Fluoride in Forage Report. No exceedances were recorded during the 1995 grazing season. This report satisfies all requirements in Attachment 1 of Permit 1636-03. Rhône Poulenc will continue fluoride in forage sampling in 1996.

In the event operations that contribute to fluoride emissions cease in 1996, Rhône Poulenc will discontinue the monitoring for the 1997 season. Because this is subject to your review and approval, I would appreciate any feedback regarding discontinuing fluoride in vegetation monitoring for 1997.

Please call if you have any questions.

Sincerely,

Rhône Poulenc
North American Chemicals Company

Cam Balentine

F. C. Balentine
HS&E Supervisor

cc: Lisa Palmer
File

RHÔNE-POULENC

RHÔNE-POULENC BASIC CHEMICALS CO.

P.O. BOX 3146
BUTTE, MT 59702
TEL: (406) 782-1215
FAX: (406) 782-4498

July 18, 1995

Patricia D. Hull
U.S. EPA Region VIII
999 18TH Street
Suite 500
Denver, Colorado 80202-2466

Dear Ms. Hull:

In accordance with the National Emission Standards for Radionuclide Emissions for Elemental Phosphorus Plants, Subpart K, item 61.123 (f); Rhône-Poulenc Basic Chemicals Company is furnishing the following written report for the annual radionuclide emission testing at the Silver Bow Plant. The required annual testing was conducted on May 17th and 18th, 1995 on the no. 1 and no. 2 kilns. Each emission test met the requirements of 61.123(d) in Subpart K. As required by 61.123(f), Rhône-Poulenc is providing the following information:

1. Name of Facility:

   Rhône-Poulenc Basic Chemicals Company
   Silver Bow Plant
   Silver Bow, Montana 59750

2. Person responsible for the operation of the Plant:

   Mr. Bruce Pallante - Plant Manager

   Person preparing report:

   Mr. Cam Balentine - HS&E Supervisor

3. Effluent controls for kilns:

   A. No. 1 Kiln

Control Equipment	Estimated Efficiency
Six Buell Cyclones	92%
Calvert Collision Scrubber	99%

B. No. 2 Kiln

Control Equipment	Estimated Efficiency
Six Buell Cyclones	92%
60 ft. X 18 ft. Spray Tower	97%
Calvert Collision Scrubber	99%

4. Testing results:

The Testing results and the results of each sampling run are included in the enclosed EEMC Test Report. The testing results show that the radionuclide emission rates for the no. 1 and no. 2 kilns are 0.0027 curies/year and 0.0089 curies/year, respectively.

5. The values used to calculate the test results are included in the enclosed EEMC Test Report. The production rates used in the calculations were based on the production rates of the kilns during the actual sampling period and then multiplied by 24 hours/day and 365 days/year to calculate the maximum annual emissions.

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Cam Balentine

F.C. Balentine
HS&E Supervisor

Rhône Poulenc Chemicals Company

State Forage Report

Silver Bow Plant

1995

cc: State AQB
✓C. Balentine
File

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See 1991 State Forage Report

for Topographic Map

II 1995 Fluoride Data

The following is a hard copy of sample data along with monthly and grazing season means for fluoride-in-forage per site. Values designated as N/A indicate no monthly average or grazing season average was calculated. N/D designates samples with values below the method detection limit of 0.04 ug/g. The Ueland plots #1, #2, #3 and #13 have no grazing season averages because livestock were not grazing at the plot location long enough to satisfy the specific requirements in the regulation to constitute a grazing season.

RHONE-POULENC CHEMICALS COMPANY
STATE FORAGE SAMPLING PROGRAM
SILVER BOW PLANT
1995

Plot Number	Owner	Sample Date	Sample Number	Fluoride ug/g	Monthly Average	Seasonal Average
#17	ERICKSON	5/30/95	SS001-95	14	N/A	
		6/16/95	SS004-95	11		
		6/26/95	SS009-95	15	13	
		7/17/95	SS014-95	7		
		7/27/95	NS		N/A	
		8/8/95	SS021-95	11		
		8/24/95	SS027-95	22	17	
		9/13/95	NS			
		9/26/95	NS		N/A	13
#6	HILDERMAN	5/30/95	NS		N/A	
		6/16/95	SS005-95	16		
		6/26/95	SS011-95	16	16	
		7/17/95	SS016-95	13		
		7/27/95	SS018-95	16	15	
		8/8/95	SS023-95	16		
		8/24/95	SS028-95	27	22	
		9/13/95	SS032-95	18		
		9/26/95	SS037-95	27	23	19
#7	TAMIETTI	5/30/95	SS002-95	20	N/A	
		6/16/95	SS006-95	16		
		6/26/95	SS010-95	17	17	
		7/17/95	SS015-95	13		
		7/27/95	SS019-95	28	21	
		8/8/95	SS024-95	22		
		8/24/95	SS029-95	42	32	
		9/13/95	SS033-95	47		
		9/26/95	SS038-95	46	47	28
#16	CRADDOCK	5/30/95	SS003-95	27	N/A	
		6/16/95	SS007-95	16		
		6/26/95	SS012-95	21	19	
		7/17/95	NS			
		7/27/95	SS020-95	11	N/A	
		8/8/95	SS025-95	21		
		8/24/95	SS030-95	26	24	
		9/13/95	SS034-95	25		
		9/26/95	SS039-95	34	30	23

Plot Number	Owner	Sample Date	Sample Number	Fluoride ug/g	Monthly Average	Seasonal Average
#15	PETERSON	5/30/95	NS		N/A	
		6/16/95	SS08-95	16		
		~~6/26/95~~	~~SS013-95~~	~~6~~	~~11~~	
		7/17/95	SS017-95	15		
		7/27/95	NS		N/A	
		8/8/95	SS026-95	18		
		8/24/95	SS031-95	16	17	
		9/13/95	SS035-95	20		
		9/26/95	NS		N/A	15
#1	UELAND	*		-	N/A	N/A
#2	UELAND	*		-	N/A	N/A
#3	UELAND	9/26/95	SS036-95	65	N/A	N/A
#13	UELAND	*		-	N/A	N/A

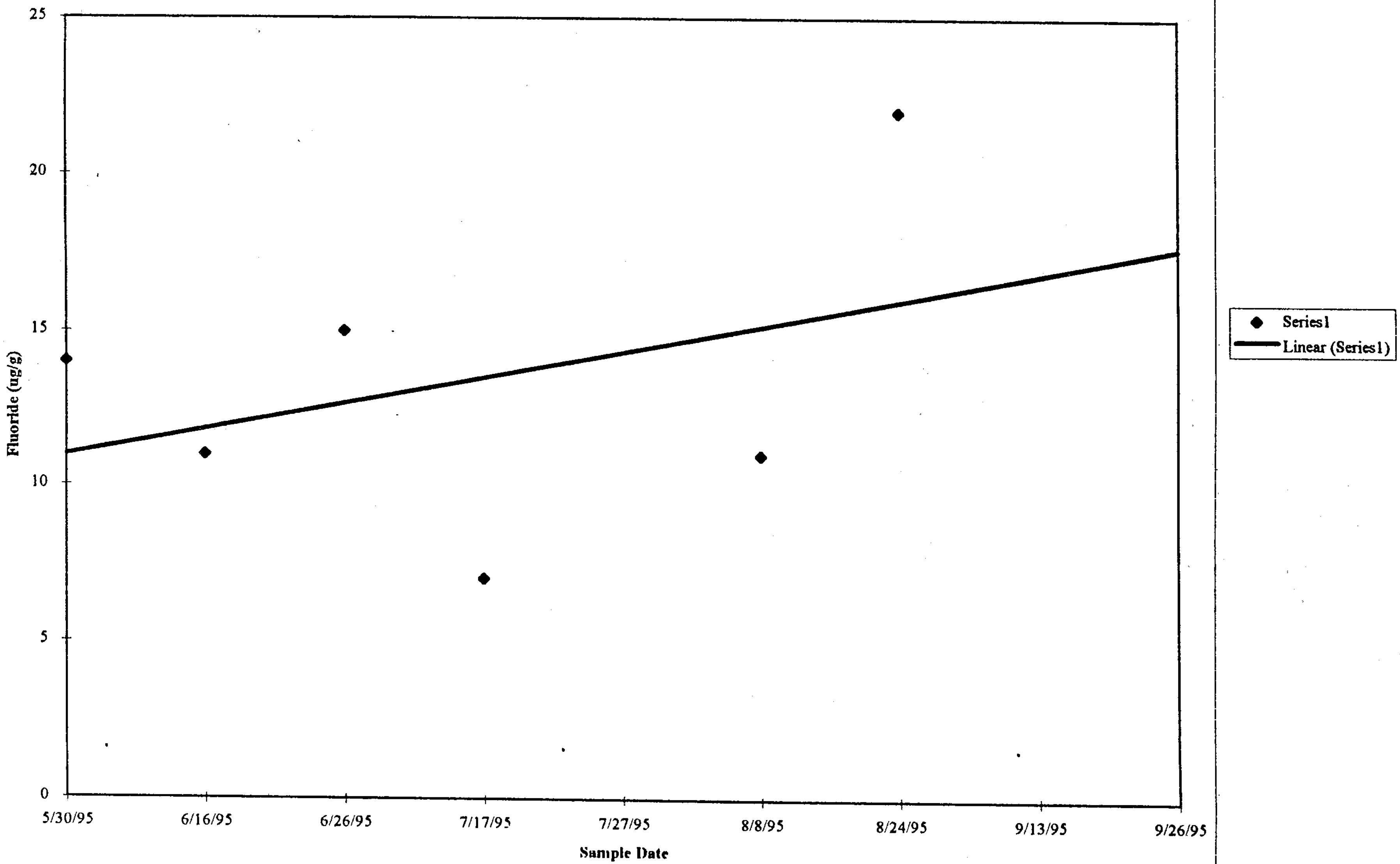
ND: Fluoride value was not detected.
N/A: No average calculated
NS: No sample collected.
*: These sights were not sampled because no grazing occurred at the time of collection.

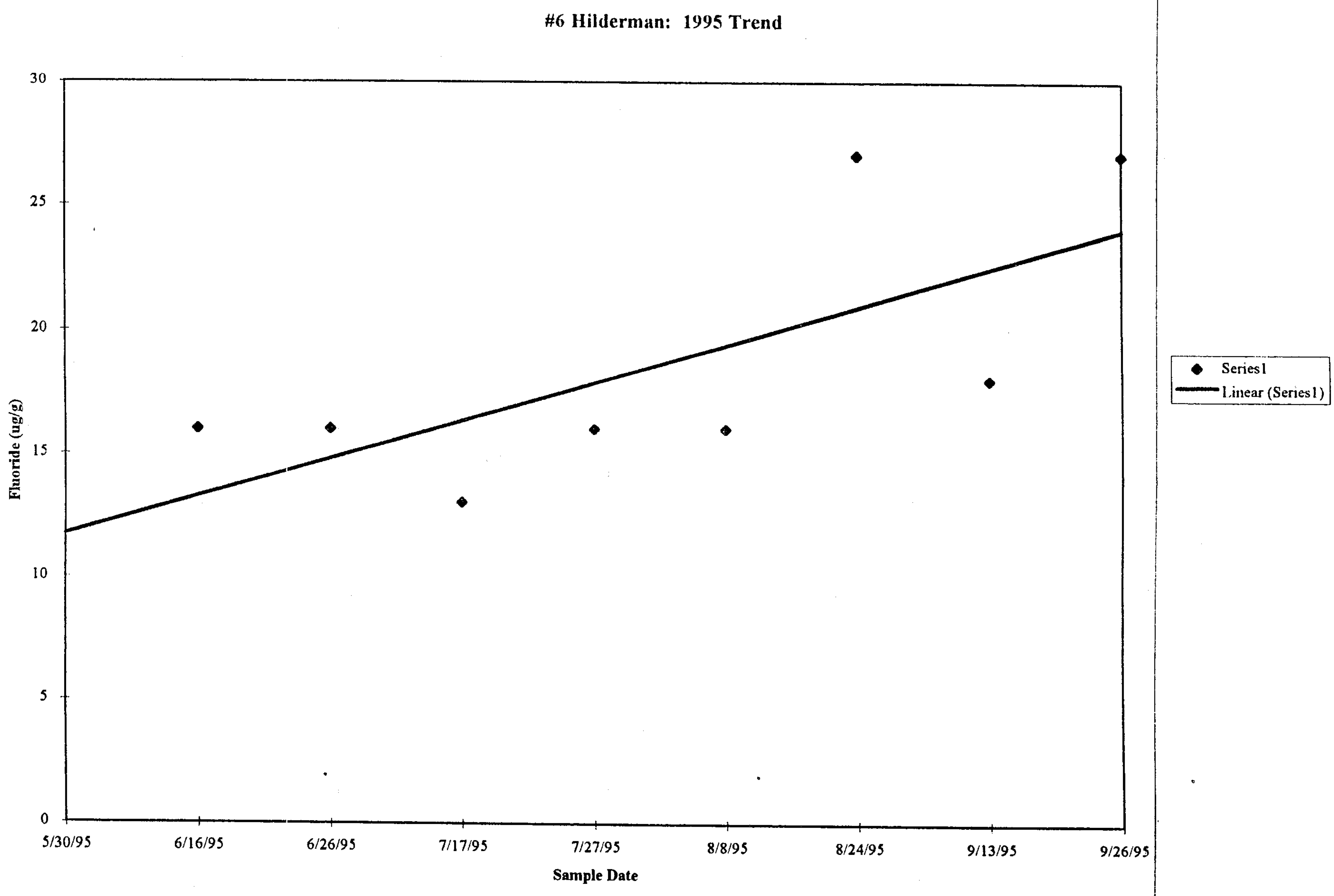
III Pollution Trend Analysis

Each graph shows the trend for every plot on the 1995 sampling schedule. The Ueland plots have no trend analysis due to lack of samples collected over the year because no cattle were grazing in the area or weather conditions prevented sampling.

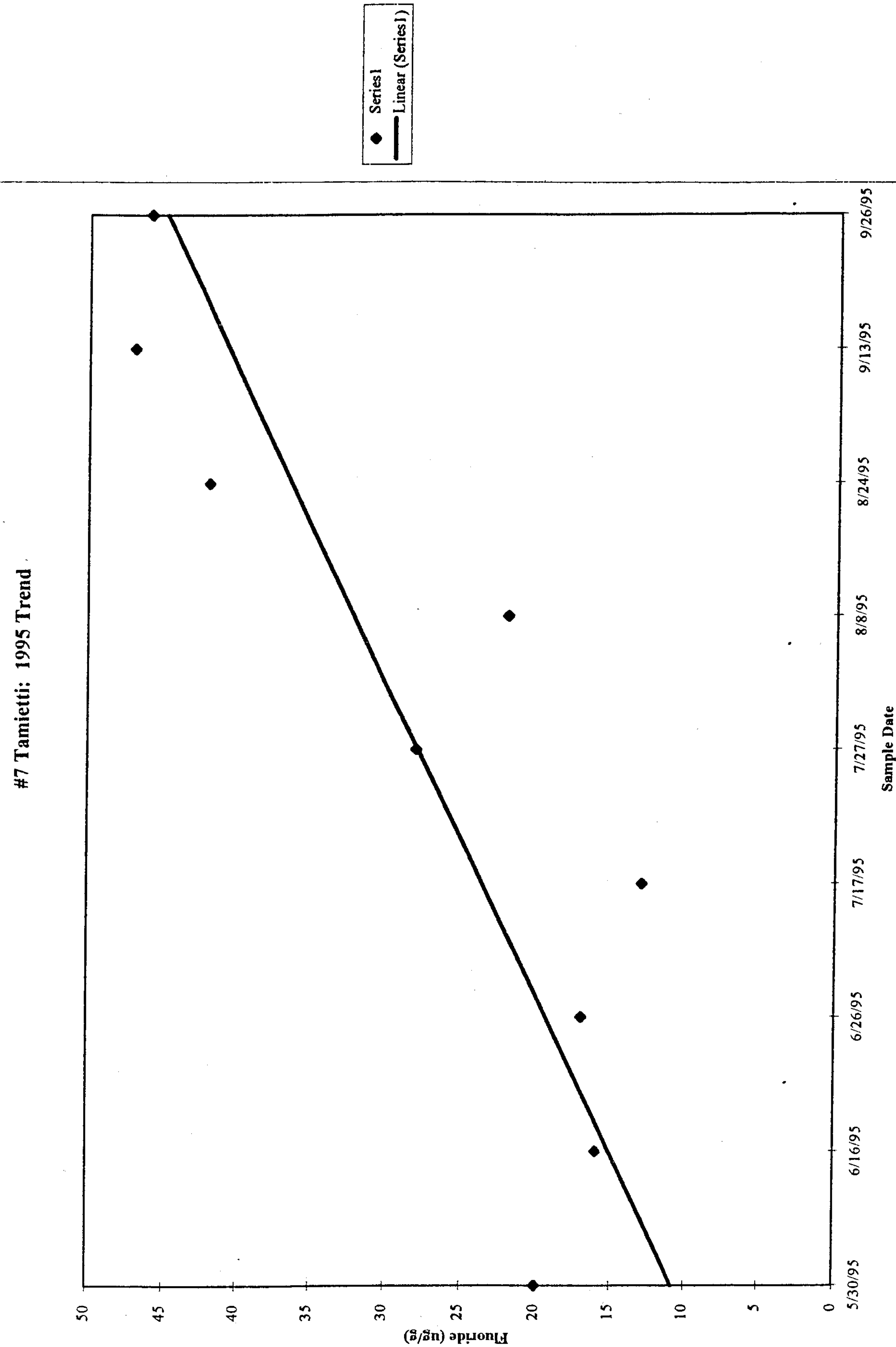
The second set of graphs illustrate a four year trend analysis for each plot. The years included are 1992, 1993, 1994, and 1995. The graphs depict monthly average fluoride in forage concentration versus the month sampled. The months that have no values indicate no monthly average was calculated. Justification is summarized in section II.

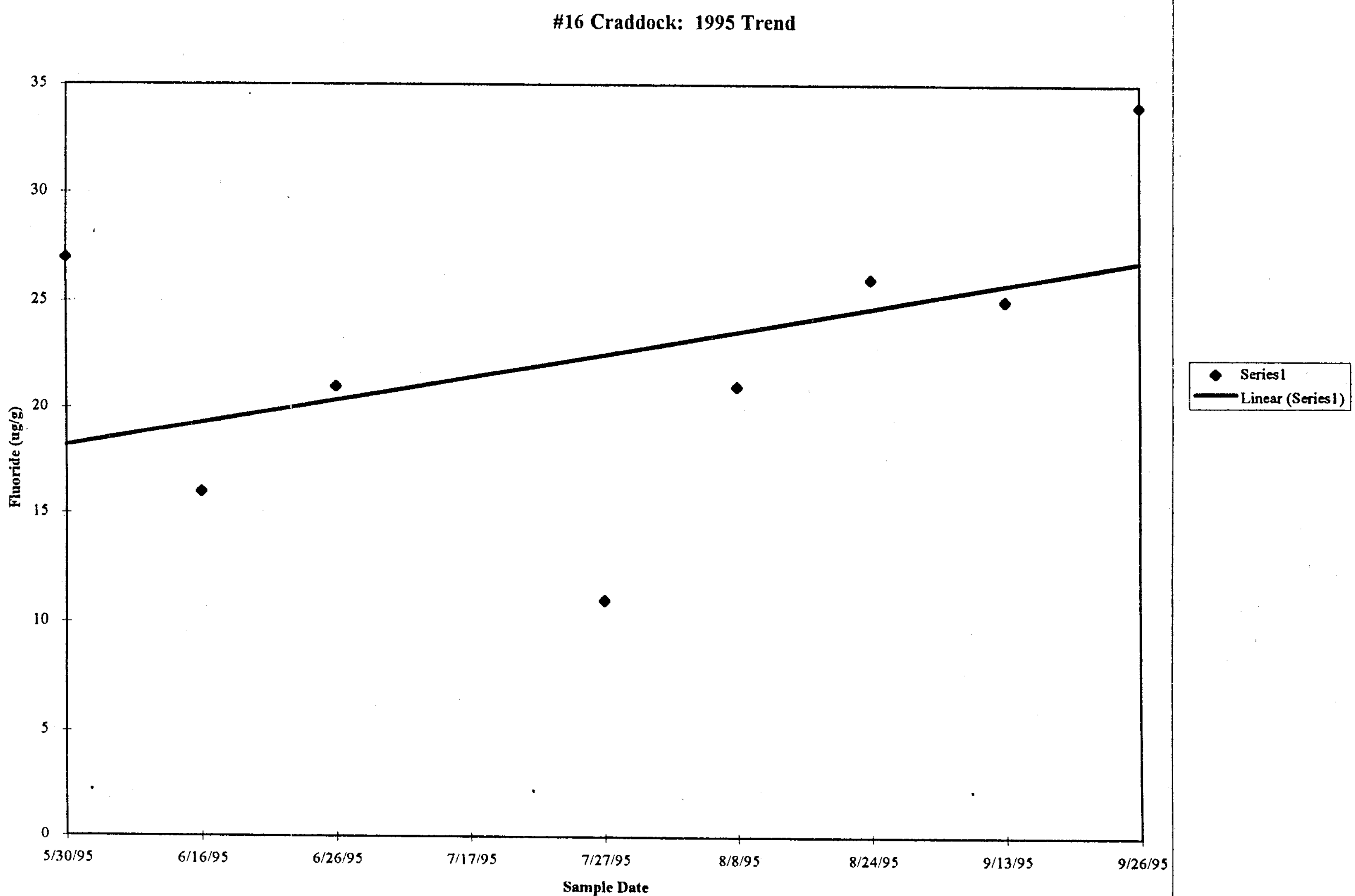
#17 Erickson: 1995 Trend



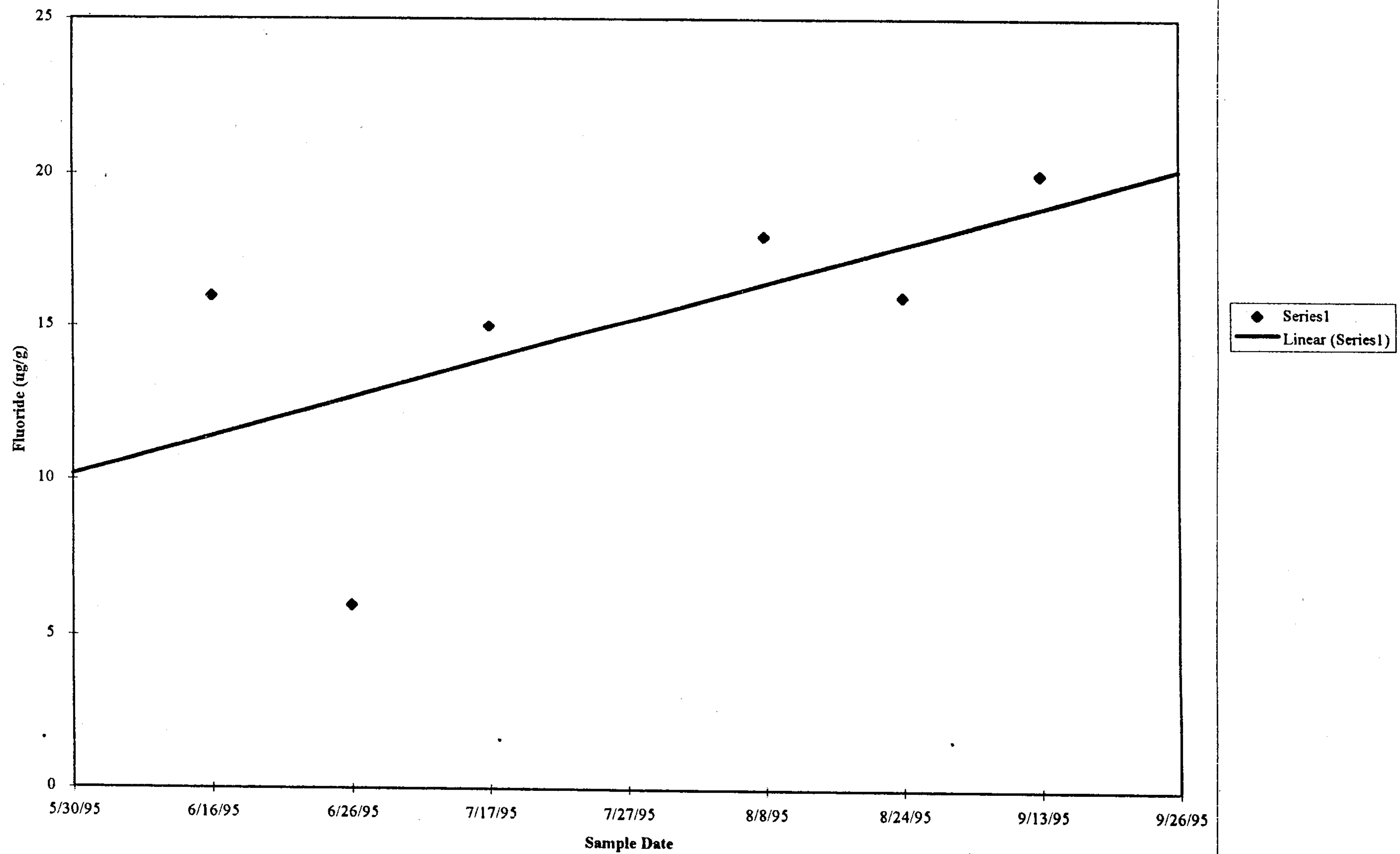


#6 Hilderman: 1995 Trend
30
25
20
15
10
5
0
Fluoride (ug/g)
5/30/95
6/16/95
6/26/95
7/17/95
7/27/95
8/8/95
8/24/95
9/13/95
9/26/95
Sample Date
Series1
Linear (Series1)

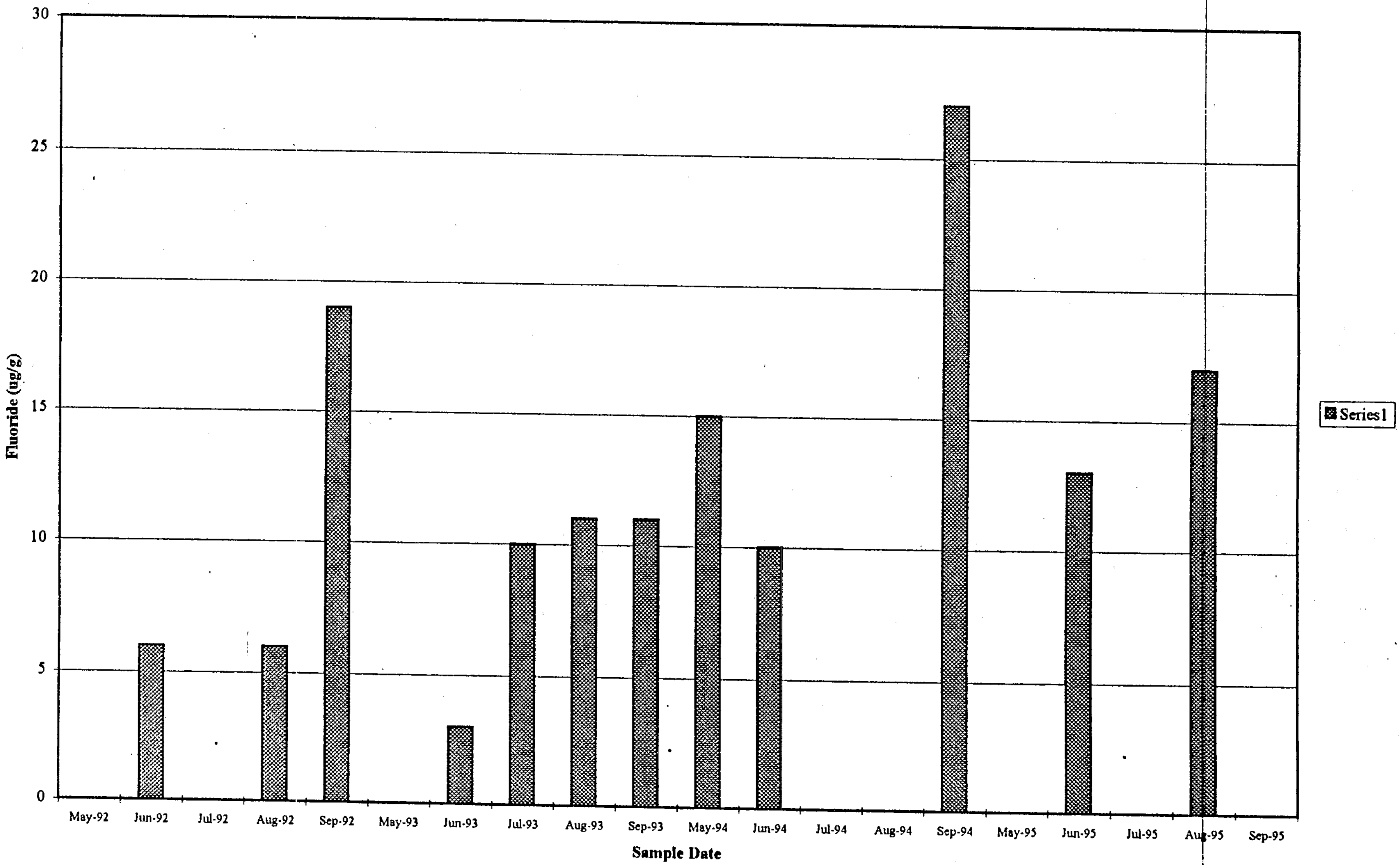

#7 Tamietti: 1995 Trend
Series1
Linear (Series1)
Fluoride (ug/g)
50
45
40
35
30
25
20
15
10
5
0
Sample Date
5/30/95
6/16/95
6/26/95
7/17/95
7/27/95
8/8/95
8/24/95
9/13/95
9/26/95


#16 Craddock: 1995 Trend
35
30
25
20
15
10
5
0
Fluoride (ug/g)
5/30/95
6/16/95
6/26/95
7/17/95
7/27/95
8/8/95
8/24/95
9/13/95
9/26/95
Sample Date
Series1
Linear (Series1)

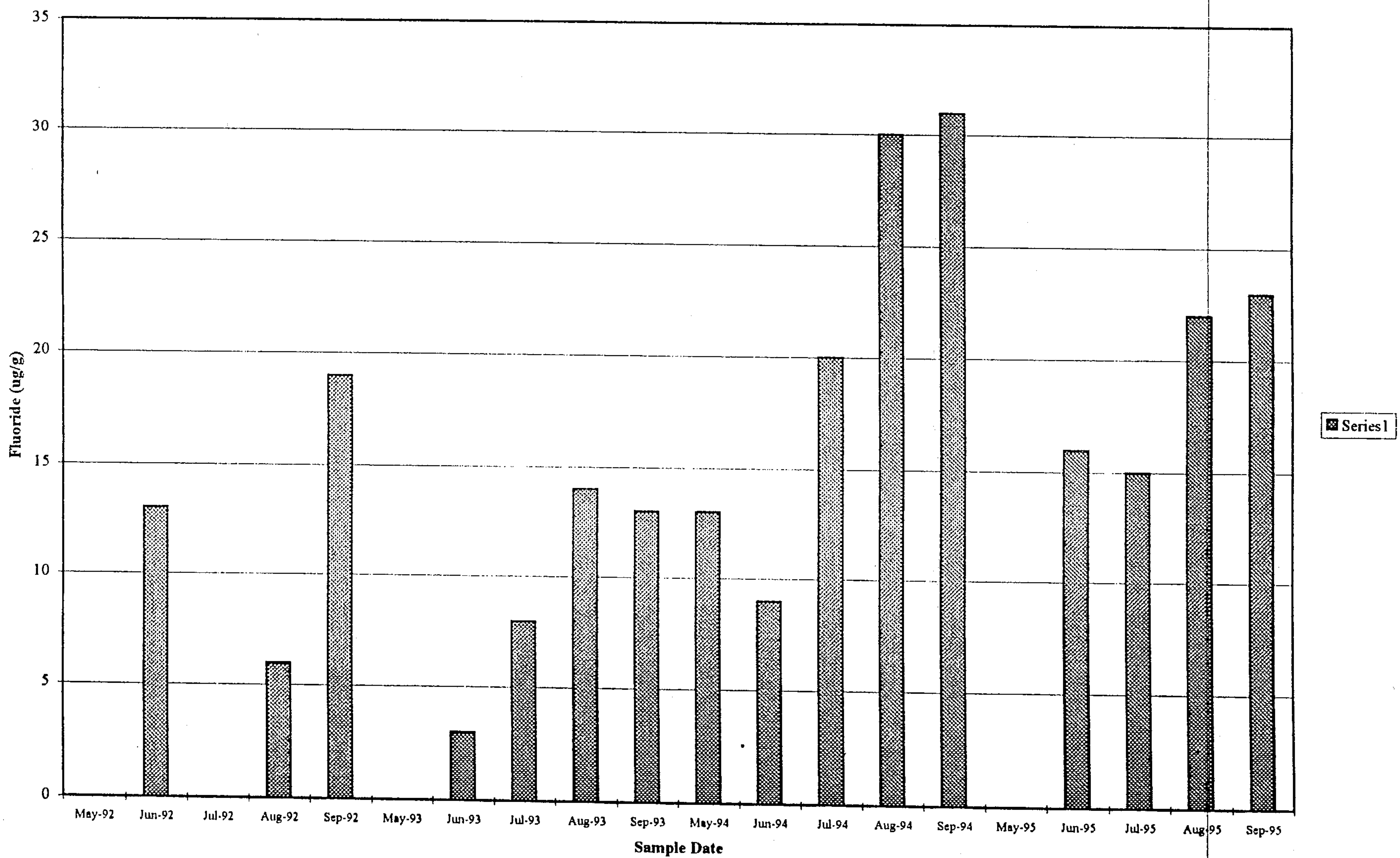
#15 Peterson: 1995 Trend



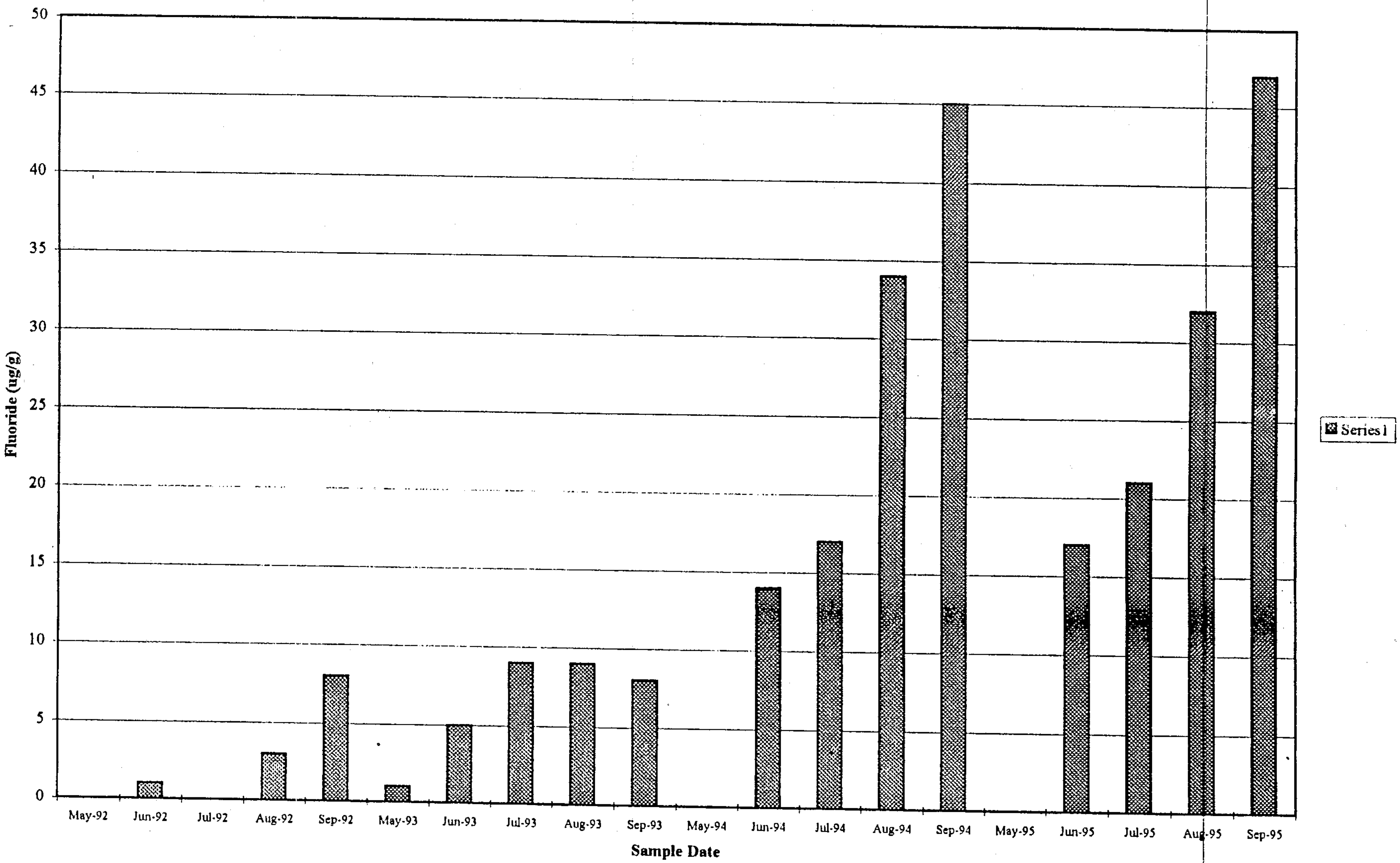
#17 Erickson: 4 Year Trend



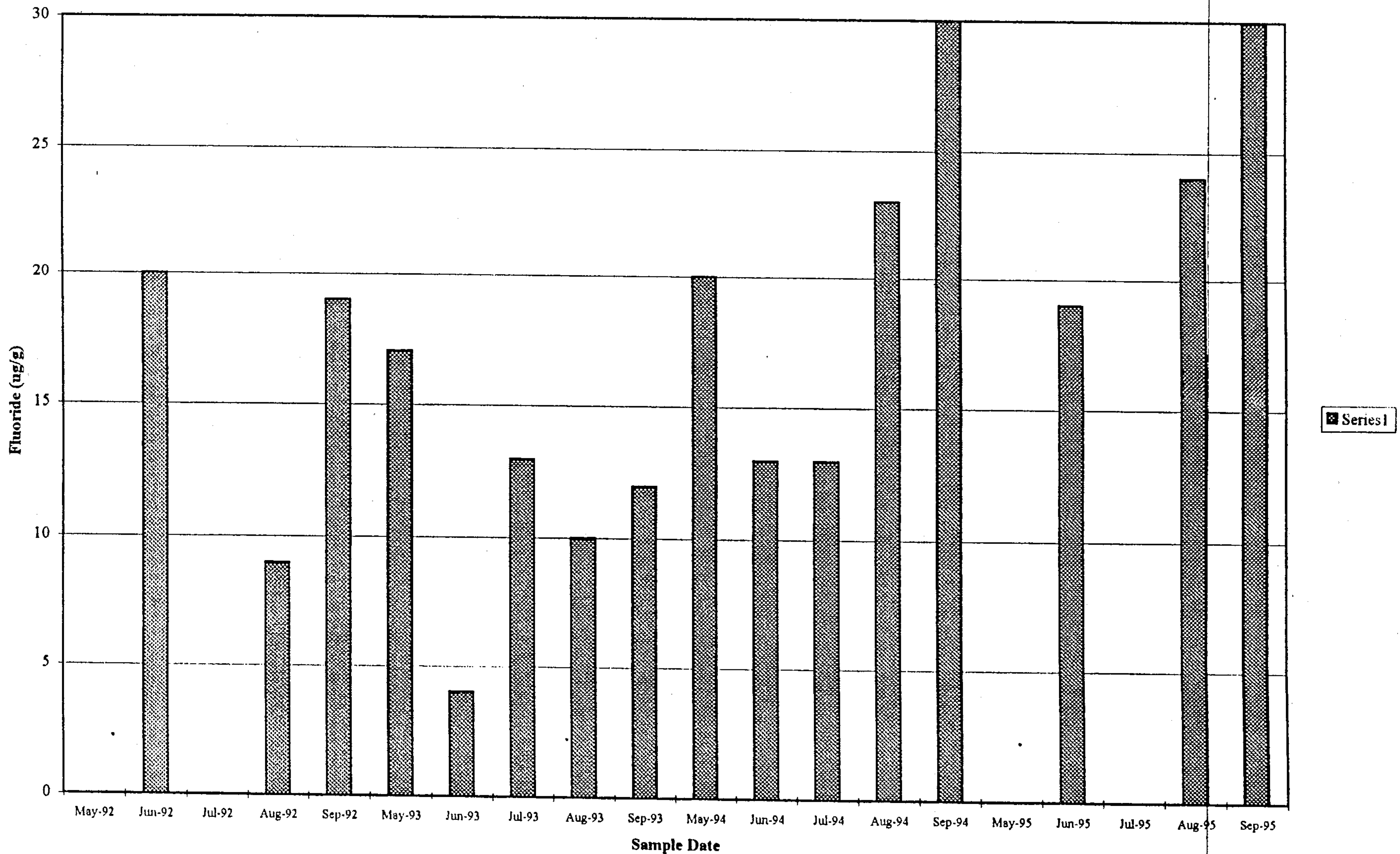
#6 Hilderman: 4 Year Trend



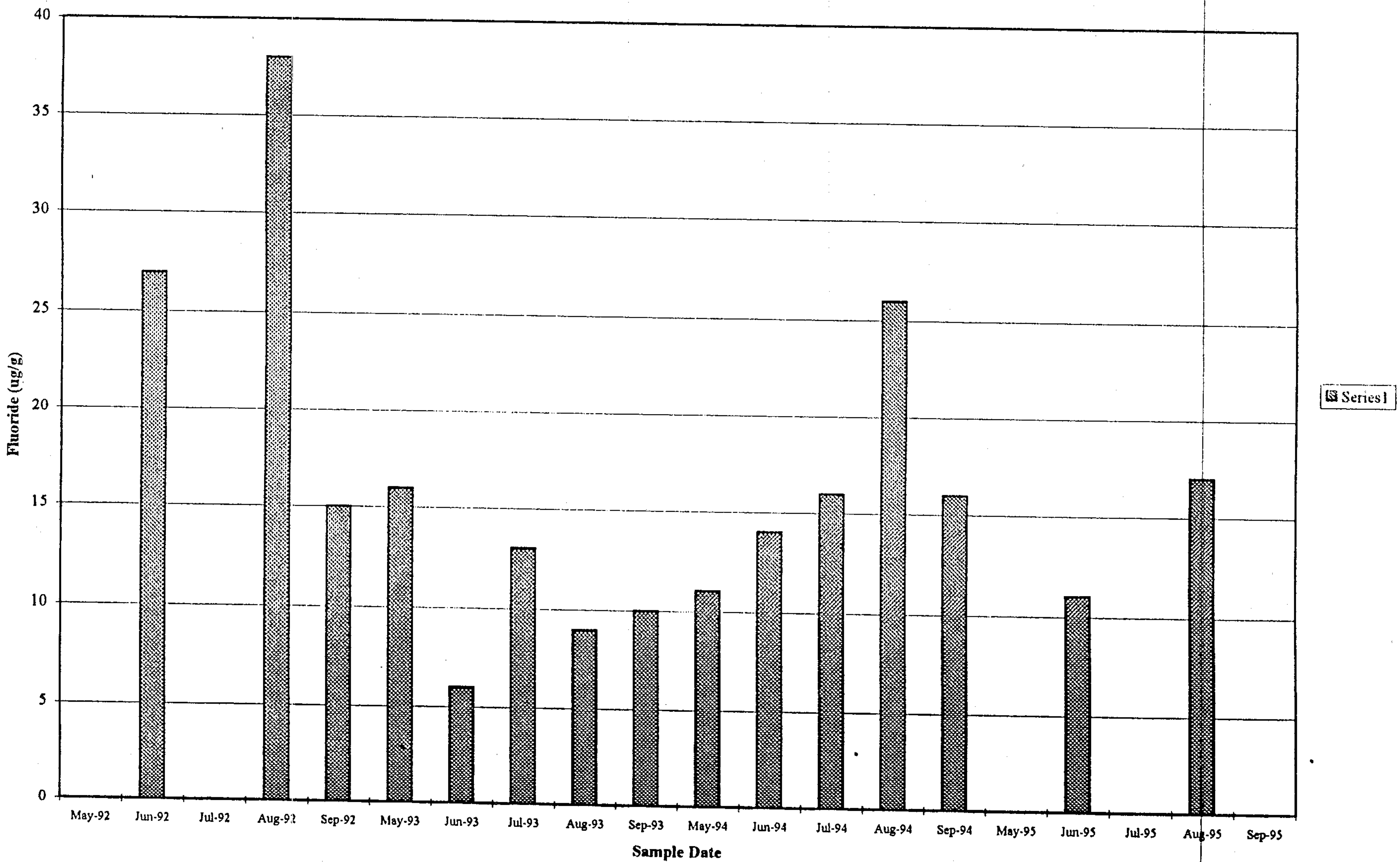
#7 Tamietti: 4 Year Trend



#16 Craddock: 4 Year Trend



#15 Peterson: 4 Year Trend



IV Data Collection Efficiency

During the course of the grazing season no samples were lost. All sites were sampled according to the sampling procedure and no samples were lost on site or in the laboratory. This signifies 100% efficiency for the data collected.

V Missing Data

No data is missing for the year 1995.

VI Precision, Accuracy and Calibration

All analysis sets include the fluoride values for the samples with 100 % duplicates. The internal reference samples are vegetation samples that were collected at various locations and evaluated to determine an average value and standard deviation. A new average and standard deviation are calculated yearly to monitor any fluoride change over time. These samples are analyzed with each run to monitor the reproducibility of the instrument readings. Standard Reference Material 2695 fluoride in vegetation standards are also prepared and analyzed with every sample set. The standards are certified to have concentrations of 277 +/- 27 ppm and 64 +/- 8.4 ppm fluoride concentrations.

Data values are accepted or rejected based on the following criteria:

1. The SRM samples are within one standard deviation from the average.
2. The duplicates are within +/- 10 percent of each other.
3. The reproducibility of the internal reference samples.

VII Exceedances

No exceedances were encountered during the year as stated in section 16.8.813 of the State of Montana Air Quality Rules for monthly or seasonal averages.

Form AIRS-D (11-2-91)

STATE OF MONTANA
DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY BUREAU
AIRS DAILY DATA FORM

Data ID No.: Rhone Poulenc Date Received: ____________

Analyst: Lisa Palmer Date Completed: February 1996

1 2 3	11–15 PARAMETER	18–20 UNIT	21–23 METHOD
230	12202	08A	087

Analyze for:

TSP

PM-10 Method: ____________

Pb As Zn Cu Cd Sn

Other: Fluoride

Comments:

COUNTY SITE (4–10)	POC (16)	INT (17)	YR (24)	MO (26)	DA (28)	ST HR (30)	SF (32)	DP (33)	SAMPLE VALUE (34)	VF (38)	ACT (80)	
0931030	1	7	95	05	30	00		0	14		I	Erickson #17
			95	06	16	00		0	11		I	
			95	06	26	00		0	15		I	
			95	07	17	00		0	07		I	
			95	08	08	00		0	11		I	
			95	08	24	00		0	22		I	
0931023	1	7	95	06	16	00		0	16		I	Hilderman #6
			95	06	26	00		0	16		I	
			95	07	17	00		0	13		I	
			95	07	27	00		0	16		I	
			95	08	08	00		0	16		I	
			95	08	24	00		0	27		I	
			95	09	13	00		0	18		I	
			95	09	26	00		0	27		I	
0931024	1	7	95	05	30	00		0	20		I	Tamietti #7
			95	06	16	00		0	16		I	
			95	06	26	00		0	17		I	
			95	07	17	00		0	13		I	
			95	07	27	00		0	28		I	
			95	08	08	00		0	22		I	
			95	08	24	00		0	42		I	
			95	09	13	00		0	47		I	
			95	09	26	00		0	46		I	

Form AIRS-D (12-2-91)

STATE OF MONTANA
DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY BUREAU
AIRS DAILY DATA FORM

Data ID No.: Rhone Poulenc **Date Received:** ______

Analyst: Lisa Palmer **Date Completed:** February 1996

1 2 3	PARAMETER 11–15	UNIT 18–20	METHOD 21–23
230	12202	084	087

Analyze for:

TSP

PM-10 Method: ______

Pb As Zn Cu Cd Sn

Other: Fluoride

Comments:

COUNTY SITE (4–10)	POC (16)	INT (17)	YR (24)	MO (26)	DA (28)	ST HR (30)	S F (32)	D P (33)	SAMPLE VALUE (34–38)	V F (38)	ACT (80)	
0931029	1	7	95	05	30	00	0	0	27		I	Craddock #16
			95	06	11	00		0	16		I	
			95	06	26	00		0	21		I	
			95	07	27	00		0	11		I	
			95	08	08	00		0	21		I	
			95	08	24	00		0	26		I	
			95	09	13	00		0	25		I	
			95	09	26	00		0	34		I	
0230041	1	7	95	06	11	00		0	16		I	Peterson #15
			95	06	26	00		0	6		I	
			95	07	17	00		0	15		I	
			95	08	08	00		0	18		I	
			95	08	24	00		0	16		I	
			95	09	13	00		0	20		I	
0931020	1	7	95	09	26	00		0	65		I	Ueland #3

RHONE POULENC BASIC CHEMICALS COMPANY
STATE FORAGE
SAMPLING LOCATIONS
SILVER BOW PLANT
1 inch = 1 mile
N
= State Forage Sampling Site
0 = Plot 1
0 = Plot 2
0 = Plot 3
0 = Plot 6
0 = Plot 7
0 = Plot 13
0 = Plot 15
0 = Plot 16
0 = Plot 17
W9 W8 W7 W6 W5 W4 W3 W2 W1 W0 E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12
N8 N7 N6 N5 N4 N3 N2 N1 N0 S1 S2 S3 S4
BUTTE
Walkerville