# SECOND FIVE-YEAR REVIEW REPORT

## Montana Pole and Treating Plant Site
## Butte, Montana

**June 2006**

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Date: 6/28/2006

## Executive Summary

The Department of Environmental Quality (DEQ) of the State of Montana has conducted the second five-year review of the remedial actions implemented at the Montana Pole and Treating Plant (MPTP) site in Butte, Montana. DEQ is the lead agency for this site and is therefore responsible for conducting the review. This review covers the period from June 2001 through June 2006. The purpose of this review is to determine whether the remedy at the site, as selected and implemented subsequent to the Record of Decision (ROD), is expected to be protective of human health and the environment. The methods, findings, and conclusions of the review are documented in this five-year review report. In addition, this five-year review report describes additional issues for evaluation identified during the review.

This is the second five-year review for the Montana Pole and Treating Plant site. The triggering action for this review is the first five-year review report dated June 2001. Due to the fact that hazardous substances, pollutants, or contaminants will be left onsite above levels that allow for unlimited use and unrestricted exposure, this second five-year review is required. The following items summarize the findings of this five-year review:

The site fence is well maintained and prevents trespassing.

Operation of the water treatment plant and associated recovery systems has been effective in capturing site groundwater and LNAPL and has provided successful treatment of plant influent.

State Risk Action Levels have been promulgated for the contaminants of concern that are less conservative, and in some instances more conservative, than levels identified in the ROD. DEQ does not recommend increasing the discharge to surface water cleanup levels for arsenic, copper, or zinc because the ROD cleanup levels are more conservative, and therefore more protective. DEQ and EPA will evaluate changing the cleanup standard for dioxins in groundwater to 2 pg/L, because this standard may be more protective than the ROD cleanup level of 30 pg/L. DEQ and EPA will also evaluate changing the cleanup standard for cadmium in groundwater to .755 from 1.1 ppb, as this standard may be more protective than the ROD cleanup level. DEQ and EPA will pursue development and implementation of a controlled groundwater area to prevent installation of wells that could draw groundwater from or affect groundwater flow within the plume area.

Due to changes in EPA-published toxicity equivalency factors (TEFs) for certain PAHs, DEQ, in consultation with EPA, will evaluate the need to lower the groundwater cleanup levels for both Benzo(a)anthracene and Indeno(1,2,3-CD)pyrene to 0.2 ppb. DEQ and EPA will also continue to evaluate the cleanup level for PCP in soils.

No deficiencies were identified that warrant a finding of "not protective."

# Five-Year Review Summary Form

| SITE IDENTIFICATION | | |
|---|---|---|
| **Site name** *(from WasteLAN)*: **Montana Pole and Treating Plant Site** | | |
| **EPA ID** *(from WasteLAN)*: **MTD986073583** | | |
| **Region: 8** | **State: MT** | **City/County: Butte/Silver Bow County** |

| SITE STATUS | |
|---|---|
| **NPL status:** X Final ☐ Deleted ☐ Other (specify) | |
| **Remediation status** (choose all that apply): ☐ Under Construction X Operating ☐ Complete | |
| **Multiple OUs?*** ☐YES X NO | **Construction completion date:** _09_ / _27_ / _2001_ |
| **Has site been put into reuse?** ☐ YES X NO | |

| REVIEW STATUS | |
|---|---|
| **Reviewing agency:** ☐ EPA X State ☐ Tribe ☐ Other Federal Agency | |
| **Author name: Lisa M. DeWitt** | |
| **Author title: Project Manager** | **Author affiliation: State of Montana, DEQ** |
| **Review period:**** 6/30/01 to 6/29/06 | |
| **Date(s) of site inspection:** 5/ 16 / 06 | |
| **Type of review:***** X Statutory<br>☐ Policy (☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only<br>☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead<br>☐ Regional Discretion) | |
| **Review number:** ☐1 (first) X 2 (second) 3 (third) ☐ Other (specify) | |
| **Triggering action:****** ☐ Actual RA Onsite Construction at OU #____ ☐ Actual RA Start<br>☐ Construction Completion X Previous Five-Year Review Report<br>☐ Other (specify) | |
| **Triggering action date** *(from WasteLAN)*: 6/29/01 | |
| **Due date** *(five years after triggering action date)*: 06/29/06 | |

* [OU refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the five-year review in WasteLAN.]

# Five-Year Review Summary Form

**Deficiencies:**

No deficiencies in the Remedial Action implementation at the Montana Pole and Treating Plant Site were identified during the five-year review.

**Recommendations and Follow-up Actions**:

Due to changes in DEQ-7 human health standards, DEQ and EPA will evaluate changing the cleanup standards for dioxins in groundwater and in discharge to surface water to 2 pg/L and 0.13 pg/L respectively. DEQ and EPA will also evaluate changing the cleanup standard for cadmium in discharge to surface water from 1.1 ppb to 0.755 ppb.

Due to changes in EPA-published TEFs for certain PAHs, DEQ and EPA will evaluate the need to lower the groundwater cleanup levels for both Benzo(a)anthracene and Indeno (1,2,3-CD)pyrene to 0.2 μg/L.

DEQ and EPA will continue to evaluate the cleanup level for PCP in soils.

DEQ and EPA will initiate the process to development and implement a Controlled Groundwater Area for the Montana Pole and Treating Plant Site.

**Protectiveness Statement(s):**

The remedy at the Montana Pole and Treating Plant is expected to be protective of human health and the environment upon completion, and immediate threats have been addressed. Excavation of soils and subsequent treatment is reducing concentrations of contaminants to ROD cleanup levels for PCP and B2PAHs. ROD cleanup levels for dioxins in soils have not yet been achieved through biological treatment. To protect surface or groundwater contact with backfilled soils that still contain elevated levels of dioxins/furans, soils are backfilled on clean fill extending at least one foot above the historic high groundwater mark (based on over 15 years of monitoring), and are covered by at least one foot of clean soil. Backfilled areas that will be accessible for future use that might result in human exposure to these soils may be paved. Groundwater capture analysis will continue to make certain that adjustments are made as necessary to ensure capture of the contaminant plume. Groundwater will be captured and treated for decades until cleanup levels for groundwater are met. A Controlled Groundwater Area and other institutional controls, as appropriate, will be developed and implemented to prevent installation of wells that could draw groundwater from or affect groundwater flow within the plume area.

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# I. Introduction

The Department of Environmental Quality of the State of Montana has conducted a five-year review of the remedial actions implemented at the Montana Pole and Treating Plant site in Butte, Montana (Figure 1). This review covers the period from June 2001 through June 2006. This report documents the results of the review. The purpose of five-year reviews is to determine whether the remedy at a site is expected to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies found during the review, if any, and recommendations to address them.

This review is required by statute. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121(c), as amended, states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the second five-year review for the Montana Pole and Treating Plant site. The triggering action for this review is the first five-year review report dated June 2001. Due to the fact that hazardous substances, pollutants, or contaminants will be left onsite above levels that allow for unlimited use and unrestricted exposure, this second five-year review is required. This review contains many components of the first five-year review, as well as new and updated information.

## II. Site Chronology

A chronology of events for the Montana Pole and Treating Plant follows:

**Table 1. Chronology of Site Events**

| Event | Date |
|---|---|
| Initial discovery of problem or contamination | March 1983 |
| PA/SI | July 1985 |
| NPL listing | July 22, 1987 |
| Administrative Order on Consent | April 1990 |
| Cooperative Agreement | March 1988 |
| Removal actions | 1985 and 1992 |
| RI/FS complete | February 1993 |
| ROD signature | September 22, 1993 |
| ROD Amendments or ESDs | None to date |
| Phase 1 Remedial Design complete | June 1996 |
| Phase 1 Remedial Action (start - finish) | May 1996 - November 1997 |
| Phase 2 Remedial Design complete | December 1998 |
| Phase 2 Remedial Action (start - finish) | March 1999 - May 1999 |
| Phase 3 Remedial Design complete | July 1999 |
| Phase 3 Remedial Action (start - finish) | October 1999 - December 2000 |
| Phase 4 Remedial Design complete | March 2001 and ongoing |
| Phase 4 Remedial Action (start - finish) | April 2001 - ongoing |
| Phase 5 Remedial Action | Scheduled to begin in 2007 |
| Phase 6 Remedial Action | Estimated to be 2015 |
| Construction Completion date | September 2001 |
| Final Close Out Report | NA |
| Previous Five-Year Review | June 2001 |

# III. Background

### Site Name, Location and Description

The Montana Pole and Treating Plant (MPTP) site is located at 220 West Greenwood Avenue, on the western edge of Butte, Montana, in portions of the southeast quarter of Section 23 and the southwest quarter of Section 24, T3N, R8W (see Figures 1 and 2). Generally, the site is bordered on the north by Silver Bow Creek, on the south by Greenwood Avenue, on the west by a former smelter site and on the east by a railroad right-of-way. U.S. Interstate 15/90 runs across the site in an east-west direction and partitions the site into a northern and a southern section. The Lower Area One (LAO) Operable Unit of the Butte/Silver Bow Creek Superfund site overlaps the Site on the north. The Site is located in a mixed land use area. Much of the land in the vicinity of the Site has been used industrially, usually associated with past and present mining activities, though commercial and residential areas are immediately adjacent to the Site. Two neighborhoods are within a quarter mile of the site.

### Site History

The Montana Pole and Treating Plant operated as a wood treating facility from 1946 to 1984 (EPA and DEQ, 1993). During most of this period, a solution of about five percent pentachlorophenol (PCP) mixed with petroleum carrier oil similar to diesel was used to preserve poles, posts and bridge timbers. The PCP solution was applied to wood products in butt vats and pressure cylinders (retorts). Creosote was used as a wood preservative for a brief period in 1969.

The plant initially included a pole peeling machine, two butt treating vats, and related ancillary facilities. In April 1947, the first load of treated timbers was shipped off-site. Major modifications to the plant occurred between 1949 and 1951, and again around 1956. Sometime between 1949 and 1951, a 73-foot-long, 6-foot-diameter retort was installed to increase timber treatment production efficiency. A second retort, which was 66 feet long and 7 feet in diameter, was installed around 1956. The retorts were used both to dry green timber using the Boulton process, and to pressure treat timber with a petroleum/pentachlorophenol (PCP or penta) mixture. Drying timber by the Boulton process generated steam which was condensed. The condensate was discharged to two hot wells where the condensate partially separated into an oil and water phase. The water phase from the hot wells was reportedly discharged into an on-site unlined drainage ditch that flowed northward toward Silver Bow Creek. On-site sedimentation ponds were also apparently used for waste disposal purposes.

The retorts and butt treatment vats were in continuous operation until May 1969. On May 5, 1969, an explosion occurred while a charge of poles was being treated in the east butt treating vat. The explosion generated a fire that destroyed the east vat, boiler room, and retort building. Although the boiler, retorts, and auxiliary equipment were damaged, the plant was rebuilt and functional by December 1969. The west butt treatment vat was not destroyed by the fire and was thereafter used for some timber treatment and mixing the petroleum/PCP product used in the retorts. Petroleum/PCP product reportedly spilled from the east butt treating vat as a result of the explosion and fire. Additional seepage of product occurred from

both retorts as a result of broken pipes and valves damaged by the fire. Reportedly, on-site tanks were not ruptured as a result of the fire.

A small on-site sawmill was constructed in the fall of 1978 and was fully operational by the fall of 1979. Additionally, in response to implementation of the Resource Conservation and Recovery Act (RCRA), a closed-loop process water system was constructed in 1980. The primary function of this system was to eliminate overland discharges of Boultonizing water (generated from the drying of green timber). The closed-loop water recovery system operated by collecting wastewater in storage tanks, recirculating this water through the condensing system, and evaporating excess water using aeration sprays.

On May 17, 1984, the Montana Pole and Treating Plant ceased operations.

**Enforcement Actions**

In March 1983, a citizen filed a complaint concerning oil seeping into Silver Bow Creek near the Montana Pole facility. The Montana Department of Health and Environmental Services (MDHES) which is now the Department of Environmental Quality (DEQ), investigated the complaint and discovered an oil seep on the south side of Silver Bow Creek directly downgradient from the Montana Pole facility. Further investigation of the site revealed oil-saturated soils adjacent to the creek and on Montana Pole property. Subsequent sampling confirmed the presence of PCP, polycyclic aromatic hydrocarbons (PAHs), and dioxins/furans in site soils and oil samples. MDHES and EPA completed a preliminary assessment and site inspection (PA/SI) followed by a Hazard Ranking Score in July 1985. The Montana Pole facility was included on the National Priority List for Superfund sites on July 22, 1987 (Fed. Reg. Vol. 52, 140 Pg. 17623).

In July 1985, the EPA Emergency Response Branch began conducting a removal action on the site to minimize impacts to Silver Bow Creek and to stabilize the site. EPA excavated approximately 6,000 cubic yards of highly contaminated soils, bagged them and placed them in storage buildings (pole barns) constructed on site. Tanks, retorts, pipes and other hardware were dismantled and stored on site in a former sawmill building. Two groundwater interception/oil recovery systems were installed to alleviate oil seepage into the creek. Contaminated areas of the site and features of the groundwater recovery system were fenced to restrict public access.

In October 1989 EPA granted MDHES the initial enforcement funding to conduct potentially responsible party (PRP) noticing and administrative order negotiations and issuance. In April 1990 MDHES signed an administrative order on consent with ARCO under which ARCO agreed to conduct a remedial investigation and feasibility study (RI/FS) at the site. In June 1990, ARCO began the RI/FS following the MDHES and EPA approved RI/FS work plan. The remedial investigation complied with federal Superfund law, defined the nature and extent of contamination and provided information to complete the baseline human health and ecological risk assessments. The feasibility study included the development, screening and evaluation of potential site remedies.

In June 1992, the USEPA proposed an additional removal action to control and recover the light non-aqueous phase liquid (LNAPL) (floating oils) identified during the RI. The action included the installation of an 890-foot sheet piling on the south side of Silver Bow Creek. The sheet piling was approximately 50 feet south of the creek. Ten recovery wells were installed on site. Eight of the wells were located south of Silver Bow Creek in a north/south line running perpendicular to the creek. Two wells were installed parallel to the creek; one on each end of the sheet piling. The wells were approximately 25 feet deep. Each well had two pumps: one to collect free-floating oil and pump it to an on-site storage tank and the other to pump contaminated groundwater to an on-site granular activated carbon treatment facility built by EPA. The water treatment facility went into operation January 22, 1993, at which time the system installed in 1985 was shut down.

Under the terms of a consent decree, entered by the U.S. District Court on July 16, 1996, the parties responsible for the cleanup of the Montana Pole site settled their liability and provided approximately $35 million for EPA and DEQ to conduct the site cleanup. Under the EPA/DEQ Site-Specific Superfund Memorandum of Agreement, DEQ, with assistance from EPA, is conducting the cleanup at the site with funds from the MPTP Settlement Fund.

## IV. Remedial Actions

### Remedy Selection

Based upon consideration of CERCLA requirements, the detailed analysis of alternatives, and public comments, MDHES and EPA determined which alternative was the appropriate remedy for the site. The alternative selected, which is well underway, will provide maximum source reduction, remediate groundwater to the extent practicable and limit releases to Silver Bow Creek to allowable levels. All accessible contaminated soils and LNAPL will be excavated to the extent practicable and treated, preventing this material from continuing to contaminate groundwater. The long-term effectiveness and degree of permanence of the selected remedy is high. DEQ does not expect any unmanageable short-term risks associated with this alternative. This remedy will comply with all applicable or relevant and appropriate requirements. This remedy uses treatment technologies and permanent solutions to the maximum extent practicable and will be cost effective. The selected remedy will also satisfy the preference for treatment as a principal element of the remedy and for on-site remedies established in CERCLA. While certain other alternatives may better satisfy certain individual selection criteria, the selected remedy best meets the entire range of the selection criteria and achieves, in the determination of both EPA and DEQ, the appropriate balance, considering site-specific conditions and the criteria identified in CERCLA and the NCP. The Record of Decision (ROD) which documents the remedy selection was finalized in September 1993 (EPA and MDHES, 1993).

### Components of Selected Remedy

The contaminants of concern at the site are pentachlorophenol (PCP) and other chlorinated phenols, polynuclear aromatic hydrocarbons (PAHs), polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans. The Record of Decision established cleanup levels for contaminants of concern at the site,

as well as for other compounds (Tables 2 through 5). The major components of the selected remedy as described in the ROD included the following:

1. Excavation of contaminated soils from accessible areas of the site, to the extent practicable. The volume of soils is estimated to be approximately 208,000 cubic yards;

2. Treatment of excavated soils (208,000 cubic yards approximately) and previously removed soils (6,000 cubic yards approximately) by above-ground biological treatment;

3. In-place biological treatment of contaminated soils below the depth of excavation before backfilling;

4. Backfill of excavated and treated soils into excavated areas if possible, surface grading and revegetation;

5. Soil flushing of inaccessible soils areas (principally underlying Interstate 15/90) to recover hazardous substances;

6. Containment of contaminated groundwater and LNAPL using physical and/or hydraulic barriers (as determined during remedial design) to prevent the spread of contaminated groundwater and LNAPL and to limit releases of contamination into Silver Bow Creek;

7. Treatment of extracted groundwater using the water treatment plant (which consists of oil/water separation followed by granulated activated carbon treatment). The ultimate design of the groundwater treatment system (as determined during remedial design) may include the addition of biological means or ultraviolet oxidation (UV/oxidation) to maximize cost effectiveness of the treatment system. Treatment will meet standards for discharge or reinjection, as appropriate;

8. Discharge of extracted, treated groundwater into Silver Bow Creek and/or reinjection of extracted, treated groundwater into the aquifer (as determined during remedial design);

9. Enhanced *in-situ* biological treatment of contaminated groundwater, inaccessible contaminated soils areas and contaminated soils not recovered by excavation;

10. Treatment of contaminated site debris and equipment by decontamination followed by disposal of these materials in a licensed off-site landfill;

11. Treatment of contaminated oils and sludges in a licensed off-site incinerator;

12. Additional institutional controls preventing access to contaminated soils and groundwater; and

13. Groundwater monitoring to determine movement of contaminants and compliance with remedial action requirements.

The ROD states:

> Once site remediation has effectively contained the contaminated groundwater and LNAPL, and releases to Silver Bow Creek have been effectively reduced or eliminated, it is expected that natural biodegradation and attenuation will effectively reduce the levels of organic contaminants in Silver Bow Creek, stream sediments and groundwater downstream of the site. These natural mechanisms will be relied upon to address the low level contamination found in this area.

**TABLE 2. SOIL CLEANUP LEVELS AND CORRESPONDING RISKS**

| Media | Contaminant | Cleanup level *(µg/kg)* | Basis | Cancer Risk (recreational use for soil) | Noncancer health hazard |
|---|---|---|---|---|---|
| Soils | Pentachlorophenol[a] | 34,000 | risk | $1.0 X10^{-6}$ | <1 |
| | B2 PAHs (TEF)[bc] | 4,200 | risk | $1.0 X10^{-6}$ | <1 |
| | Dioxin TCDD (TEF)[bd] | 0.20 | risk | $1.0 X10^{-6}$ | <1 |

a Levels correspond to an excess cancer risk of $1 \times 10^{-6}$ and are based on data for the dermal exposure pathway as presented in the Baseline Risk Assessment Report (CDM, 1993).

b Levels correspond to an excess cancer risk of $1 \times 10^{-6}$ and are based on data for the soil ingestion exposure pathway as presented in the Baseline Risk Assessment Report (CDM, 1993).

c Sum of individual B2 PAH (benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, and indeno( 1,2,3-cd)pyrene) concentrations multiplied by their corresponding toxicity equivalence factor (TEFs).

d Sum of individual chlorinated dibenzo-p-dioxins and -dibenzofurans concentrations multiplied by their corresponding toxicity equivalence factor (TEF).

## TABLE 3. GROUNDWATER CLEANUP LEVELS AND CORRESPONDING RISKS

| Media | Contaminant | Cleanup level (µg/l) | Basis | Cancer Risk (drinking use for ground water) | Noncancer health hazard quotient |
|---|---|---|---|---|---|
| Groundwater | Pentachlorophenol | 1.0 | MCL | $1.7 \times 10^{-6}$ | NA |
| | Benzo(a)pyrene | 0.2 | MCL | $2.1 \times 10^{-5}$ | NA |
| | Benzo(a)anthracene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Benzo(b)fluoranthene | 0.2 | risk | $2.1 \times 10^{-5}$ | NA |
| | Benzo(k)fluoranthene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Chrysene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Dibenzo(a,h)anthracene | 0.2 | risk | $2.1 \times 10^{-5}$ | NA |
| | lndeno(1,2,3-CD)pyrene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Benzo(g,h,i)perylene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Total D PAHs[a] | 360 | hazard quotient | NA | 0.9 |
| | Dioxin TCDD (TEF)[b] | $3.0 \times 10^{-5}$ | MCL | $6.2 \times 10^{-5}$ | <1 |
| | 2,4,6-trichiorophenol | 6.5 | risk | $1.0 \times 10^{-6}$ | NA |
| | 2-chlorophenol | 45 | hazard quotient | NA | 0.9 |
| | 2,4-dichiorophenol | 27 | hazard quotient | NA | 0.9 |
| | 2,3,5,6-tetrachlorophenol | 267 | hazard quotient | NA | 0.9 |

NA - Not applicable

A Sum of individual D PAH (acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene) concentrations.

B Sum of individual chlorinated dibenzo-p-dioxins and -dibenzofurans concentrations multiplied by their corresponding toxicity equivalence factor (TEF).

## TABLE 4. SURFACE WATER CLEANUP LEVELS AND CORRESPONDING RISKS

| Media | Contaminant | Cleanup level (µg/l) | Basis | Cancer Risk (drinking use for ground water) | Noncancer health hazard quotient |
|---|---|---|---|---|---|
| Surface Water | Pentachlorophenol | 1.0 | MCL | $1.7 \times 10^{-6}$ | <1 |
| | Benzo(a)pyrene | 0.2 | MCL | $2.1 \times 10^{-5}$ | NA |
| | Benzo(a)anthracene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Benzo(b)fluoranthene | 0.2 | risk | $2.1 \times 10^{-5}$ | NA |
| | Benzo(k)fluoranthene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Chrysene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Dibenzo(a,h)anthracene | 0.2 | risk | $2.1 \times 10^{-5}$ | NA |
| | lndeno(1,2,3-CD)pyrene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Benzo(g,h,i)perylene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Total D PAHs[a] | 360 | Hazard quotient | NA | 0.9 |
| | Dioxin TCDD (TEF)[b] | $1.0 \times 10^{-5}$ | aquatic criteria | $2.0 \times 10^{-5}$ | <1 |
| | 2,4,6-trichiorophenol | 6.5 | risk | $1.0 \times 10^{-6}$ | NA |
| | 2-chlorophenol | 45 | Hazard quotient | NA | 0.9 |
| | 2,4-dichiorophenol | 27 | Hazard quotient | NA | 0.9 |
| | 2,3,5,6-tetrachlorophenol | 267 | Hazard quotient | NA | 0.9 |

NA - Not applicable

a Sum of individual D PAH (acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene) concentrations.

b Sum of individual chlorinated dibenzo-p-dioxins and -dibenzofurans concentrations multiplied by their corresponding toxicity equivalence factor (TEF).

**TABLE 5. DISCHARGE TO SURFACE WATER CLEANUP LEVELS AND CORRESPONDING RISKS**

| Media | Contaminant | Cleanup level (µg/l) | Basis | Cancer Risk (drinking use for surface water) | Noncancer health hazard quotient |
|---|---|---|---|---|---|
| Discharge to Surface Water | Pentachlorophenol | 1.0 | MCL | $1.7 \times 10^{-6}$ | <1 |
| | Benzo(a)pyrene | 0.2 | MCL | $2.1 \times 10^{-5}$ | NA |
| | Benzo(a)anthracene | 1.0 | risk | $1.0 \times 10^{-7}$ | NA |
| | Benzo(b)fluoranthene | 0.2 | risk | $2.1 \times 10^{-5}$ | NA |
| | Benzo(k)fluoranthene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Chrysene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Dibenzo(a,h)anthracene | 0.2 | risk | $2.1 \times 10^{-5}$ | NA |
| | lndeno(1,2,3-CD)pyrene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Benzo(g,h,i)perylene | 1.0 | risk | $1.0 \times 10^{-6}$ | NA |
| | Total D PAHs[a] | 360 | hazard quotient | NA | 0.9 |
| | Dioxin TCDD (TEF)[b] | $1.0 \times 10^{-5}$ | Aquatic criteria | $2.0 \times 10^{-5}$ | <1 |
| | 2,4,6-trichlorophenol | 6.5 | risk | $1.0 \times 10^{-6}$ | NA |
| | 2-chlorophenol | 45 | hazard quotient | NA | 0.9 |
| | 2,4-dichloropheno1 | 27 | hazard quotient | NA | 0.9 |
| | 2,3,5,6-tetrachlorophenol | 267 | hazard quotient | NA | 0.9 |
| | Arsenic | 48 | Aquatic criteria | NA | NA |
| | Cadmium | 1.1 | Aquatic criteria | NA | NA |
| | Chromium | 11 | Aquatic criteria | NA | NA |
| | Copper | 12 | Aquatic criteria | NA | NA |
| | Lead | 3.2 | Aquatic criteria | NA | NA |
| | Zinc | 110 | Aquatic criteria | NA | NA |

NA - Not applicable

a Sum of individual D PAH (acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene) concentrations.

b Sum of individual chlorinated dibenzo-p-dioxins and -dibenzofurans concentrations multiplied by their corresponding toxicity equivalence factor (TEF).

## Remedy Implementation/Status

The MPTP cleanup is being implemented in a number of phases. The design for **Phase 1** of the Remedial Action was finalized in June 1996 (CDM, 1996). Construction occurred from May 1996 to November 1997. The primary remedy components completed during Phase 1 of the remedial action consisted of construction of the land treatment unit and 13 soil staging and pretreatment piles (SSPs), building an addition to the water treatment plant, construction of two contaminated groundwater recovery trenches, and excavation of the north-side contaminated soils. The Phase 1 construction activities are summarized in the *Phase 1 Construction Report* dated August 2001.

The design for **Phase 2** of the Remedial Action was finalized in December 1998 (CDM, 1998). Construction occurred from March 1999 to May 1999. Phase 2 of the remedial action consisted of the removal and disposal of hazardous and non-hazardous waste debris remaining on site. Off-site disposal methods included incineration and/or placement in hazardous and non-hazardous waste landfills. Metal debris was pressure washed and recycled. Phase 2 remedial actions are summarized in the *Remedial Action Report, Montana Pole and Treatment Plant Site Phase 2 – Debris Removal* dated September 26, 2000.

The design for **Phase 3** of the Remedial Action was finalized in July 1999 (CDM, 1999). Construction occurred from October 1999 to December 2000. Phase 3 of the remedial action consisted of the south-side contaminated soils excavation, off-loading Phase 1 treated soils from the land treatment unit, placing an approximate 132,000 cubic yards of contaminated soil on the land treatment unit, installing the north and south *in situ* treatment systems, and the relocating sewer and potable water lines.

The *in situ* treatment system was operated through November 2002, when a pump required extensive repair. While the pump was out for repairs, analytical data from samples subsequently collected from Silver Bow Creek, a ROD-defined point of compliance, showed significant decrease in PCP concentrations. Since that time, the PCP concentrations in surface water samples from Silver Bow Creek have remained below the ROD cleanup standard. For this reason, the *in situ* system has not been reactivated. DEQ and EPA will evaluate the data collected over the last five years, and assess further uses of the *in situ* treatment system.

**Phase 4** of this project is a continuation of Phase 3 activities, and entails off-loading the land treatment unit as surface soil lifts are remediated to below the action limits set for the site. These treated soils will be placed on-site. SSPs meeting the cleanup criteria will also be dismantled and the treated soils backfilled on-site. Phase 4 Remedial Action construction began in April 2001 with the offload of approximately 27,000 cubic yards of treated soils from the LTU.

In response to the complaints of nearby residents, an odor study was commissioned. Results were inconclusive as to the compound or compounds responsible for the odors experienced. To respond to the Boulevard neighborhood concerns regarding dust emanating from the LTU, in 2003 DEQ implemented several of the suggestions described in the CDM's *LTU Odor and Dust Control* (CDM, 2002) report by contracting JM Management, Inc. to plant 481 evergreen trees on the north and south sides of the LTU, install a drip irrigation system for the 481 trees, install a pump start relay and appurtenances to connect the drip irrigation system to the existing site water well, install wind fencing, and install a windsock and mast.

A concern during ongoing remedial activities is release of chemical contaminants as fugitive dust or vapors. Target levels were developed for the chemicals and chemical groups identified in the ROD and the Final Remedial Action Plan. As part of a study to address odor complaints from soil treatment and movement activities at the site, samples were collected from flux-chamber samples placed directly on the LTU soils. The flux chamber analyses represent worst case concentrations of chemicals that may be released from the LTU. Concentrations of the chemicals detected did not exceed their odor threshold. Additionally, benzene was detected only at low concentrations. Given the dilution of benzene in air that would occur after release from LTU soils to the air, exceedance of the benzene target level resulting from contaminants in LTU soils is unlikely. Fenceline monitors adequately represent possible air concentrations of contaminants of potential concern for the site. Contaminants of potential concern for the site are unlikely to cause discernable odors at the target levels developed. Further, chemicals actually detected in air in the flux chambers were not present in concentrations sufficiently high to cause odor problems.

To address adjacent community concerns regarding activities at the site, DEQ has worked to improve community relations. Notices are distributed door-to-door to each household in the Boulevard neighborhood prior to any activities that take place on the LTU, and contact information is provided in each notice. Work activities on the LTU are limited to the hours between 8 a.m. and 5 p.m. to limit the noise and potential dust impacts to the neighboring residents, and great emphasis is given to dust control activities. Air is monitored on a monthly basis, as well as during any earth-moving or disturbance activities on the LTU.

In 2004, eight of the thirteen SSPs were determined to have met the cleanup standard for the site, were dismantled, and the treated soils were placed over the south-side in situ system. The covers, liners, piping, and associated equipment were removed from each of the eight SSPs, cleaned, and disposed in either a solid waste landfill or segregated and sized appropriately for shipment to a hazardous waste incinerator.

In 2005, approximately 28,000 cubic yards of treated soils were offloaded from the LTU and backfilled on site. Once the offload was complete, the LTU was regraded to meet design specifications. All work was carried out with special regard to limiting dust and mitigating odor. MBMG staff collected air samples during both the offloading and regarding activities. A water truck was used to keep all excavation and travel areas damp, thus minimizing the generation of dust and odors.

To date, a total in excess of 200,000 cubic yards of contaminated soils have been excavated, and approximately 120,000 cubic yards of these soils have been treated on the Land Treatment Unit and backfilled with an additional 16,000 cubic yards of SSP soils treated and backfilled.

**Phase 5** will address the contaminated soils beneath Interstate 15/90 that divides the site. In 2001, a preliminary remedial alternatives report was prepared to evaluate various potential remediation methods including surfactant flushing, soil vapor extraction, and hydraulic manipulation (CDM, 2001).

On March 25, 2002, DEQ received EPA's concurrence to pursue modification of the selected remedy for the Montana Pole and Treating Plant through evaluation of excavation and remediation of additional contaminated soil in conjunction with the MDT interstate bridge removal project. Since that time, DEQ, MDT, and EPA have extensively evaluated the technical and economic feasibility of excavating and remediating the remaining contaminated soils. Based on the results of these evaluations, DEQ has concluded that it is not economically or technically reasonable to pursue excavation of these soils during MDT's interstate bridge removal project. DEQ will pursue remediation of these soils through the remedy as currently defined in the Record of Decision.

MDT's construction activities associated with the bridge replacement are currently anticipated to begin in 2008.

**Phase 6** will consist of removal and disposal of the soil treatment facilities on the south side of the site and final revegetation of all disturbed areas. At that time, DEQ expects to turn the site over to Butte/Silver Bow City/County government. It is expected that the final land use at the site will be determined in conjunction with Butte/Silver Bow, with certain constraints on land use specified by EPA and DEQ consistent with the Montana Pole and Treating Plant Record of Decision.

**System Operations/O&M**

The Montana Bureau of Mines and Geology (MBMG), under contract to DEQ, provides site services in accordance with the approved *Operations and Maintenance (O&M) Plan* (CDM, Draft – 2003 revised) and at the direction of the DEQ project manager. MBMG also assists with Remedial Action construction activities and provides additional project support as requested by DEQ.

Site Services Support activities include operation and maintenance of the water treatment facility, including carbon changes; maintenance of groundwater and soil treatment facilities; drilling and installing

additional monitoring wells as determined necessary for monitoring and determination of groundwater capture; operating and managing bioremediation units, the LTU and SSPs; operation, maintenance, and monitoring both the north side and south side in-situ bioremediation systems as required ; managing data; providing technical assistance to DEQ as requested; maintaining site facilities; providing for site security; site health and safety for MBMG staff and; escorting contractors and visitors; providing site information when requested by DEQ; managing the decontamination facility; managing on-site oily waste and off-site disposal; weed control; and additional activities at the direction of DEQ.

Water, soil, and air monitoring are conducted as required in the *Site-Wide Operations and Maintenance Manual.* Modifications are made as appropriate to address changing site conditions in consultation with the DEQ project manager and EPA. Monitoring requires regular collection of samples of groundwater, surface water, water treatment plant discharge, soil (from LTU and SSPs), and air. Samples are collected as needed to ensure compliance with the ROD at cleanup levels to meet or exceed those stipulated in the ROD. The current frequency and methods for collecting samples is specified in Tables 6 and 7 below and in the *Site-Wide Operations and Maintenance Manual* and may be altered depending upon results and site-specific conditions. Groundwater elevation monitoring and determination of NAPL thickness are conducted as well. Groundwater flow and capture at the site are evaluated on a monthly basis. DEQ, EPA and MBMG review the overall site sampling requirements on an annual or more frequent basis to determine if sampling points, sampling frequency, or required analyses should be altered.

The water treatment plant has treated approximately 1.2 billion gallons of contaminated water and has removed approximately 1,880 kg of dissolved PCP from the groundwater in addition to PCP removed in oil recovery operations since the facility went into operation January 22, 1993. More than 60,000 gallons of free oil have also been recovered and disposed of since this date. Groundwater recovery and treatment systems will continue to operate until ROD cleanup levels are met in the groundwater for the site.

**Construction Completion**

The DEQ and EPA conducted a pre-final inspection of the Site on July 26, 2001 and determined that the site remedy had been constructed in accordance with the Remedial Design specifications. DEQ and EPA have thus initiated the activities necessary to achieve performance standards and site completion. This inspection was documented in the *Superfund Preliminary Site Close Out Report (Long Term Remedial Action), Montana Pole and Treating Plant,* dated September 27, 2001.

**Table 6. Air and Soil Data Collection Requirements**

| FREQUENCY | SAMPLE LOCATION | DATA LOGGED |
|---|---|---|
| **Bi-Weekly** | LTU | Moisture, Temperature, CO2, O2 |
| **Monthly** | Air 4, Air 4A, Air 5, Air 10 | VOCs (summa-canisters) |
| | Air 10 | PCP, PAH |
| | Air 4, Air 4A, Air 11 | PM-10 |
| | Meteorological Station | Weather Conditions |
| **Bi-Annually** *(generally June and September)* | LTU | PCP, TPH, Nutrients, Chloride |
| **End of Treatment/Final Compliance** | LTU | PCP,PAH, TPH, Dioxins/Furans |
| **As-Needed Basis (Air Monitoring)** | Any location necessary | VOC library search (mini-canisters) |
| | Air 4, Air 4A, Air10 | Dioxin/Furans, BAP |
| | Stations around excavation and construction, LTU tilling, loading and offloading | Any of the following: VOCs, PCP, PAH, Dust, etc. |

Note:

Frequency of sampling may change during winter months; PM-10 will be suspended from November to April.

Sampling only occurs during treatment season, generally May through October.

**Table 7. All Water Data Collection Requirements (during normal operation)**

| FREQUENCY | SAMPLE LOCATION | DATA COLLECTED |
|---|---|---|
| **Weekly** | Plant samples: IN, EFF, BA, BB (or BABB). | PCP |
| **Monthly** | CT-01, CT-02, GS-22, GW-05, GW-08, GW-12, GW-14R, GW-21, GW-22R, MW-01, MW-03, MW-09, MW-14, MW-87-3, MWS1, MW-A-95, MW-A-96 through MW-D-96, MW-A-98, MW-A-99, MW-B-95, MW-B-98, MW-B-99, MW-H-95, MW-H-96 through MW-J-96, MP-04; NCRTPZ01 through NCRTPZ04; MW-A-01 through MW-Y-01; INF-1 through INF-18; North and South side cell piezometers. | Water levels |
| | AW-02, MW-A-04 through MW-C-04, MW-D-95, MW-F-95, NHRTPZ-01, NHRTPZ-04, NHRTMH#1, NHRTMH#4. | Water levels and NAPL thickness |
| | Plant samples: IN, EFF, BA, BB (or BABB), NHRTEFF, NCRTEFF. | PCP |
| | Monitoring wells: GW-09, GW-14R-98, MP04, MW-01, MW-09, MW-14, MW-87-03, MW-A-95, MW-I-96, MW-J-96, MW-A-98, MW-A-99; MW-A-01, B-01, MW-E through L-01, Q-01, S-01 and W-01; NCPZ-04, INF 7&8. | PCP |
| | Surface water samples: SW-01, SW-02, SW-03, SW-05, SW-06 and SW-09. | PCP |
| **Quarterly** | All monitoring points. | Water levels and NAPL thickness |
| | Plant sample: EFF | PCP, Metals, Anions, Physical Parameters, Total Recoverable |
| | Plant samples: IN, NHRTEFF, NCRTEFF. | PCP, Metals, Anions, Physical Parameters |
| | Plant samples: BA and BB (or BABB). | PCP |
| | Monitoring wells: GW-09, GW-14R-98, MP04, MW-01, MW-09, MW-14, MW-87-03, MW-A-95, MW-I-96, MW-J-96, MW-A-98, MW-A-99, INF 10-12; MW-A-01, B-01, MW-E through L-01, Q-01, S-01 and W-01; NCPZ-04, INF 7&8. | PCP |
| | Surface water samples: SW-01 and SW-02. | PCP, Metals, Anions, Physical Parameters |
| | Surface water samples: SW-03, SW-05, SW-06 and SW-09. | PCP |
| **Semi-Annually** | Plant sample: EFF | PCP, Metals, Anions, Physical Parameters, Total Recoverable |
| | Plant samples: IN, NHRTEFF, NCRTEFF. | PCP, Metals, Anions, Physical Parameters |
| | Plant samples: BA and BB (or BABB). | PCP |

| | | |
|---|---|---|
| | Monitoring wells: GS-22, GW-09, GW-10, GW-12, GW-13, GW-14R-98, GW-17, MP-04, MW-01, MW-09, MW-14, MW-87-03, MW-A-95, MW-D-96, MW-I-96 through MW-M-96; MW-A-98, MW-B-98, MW-A-99; All INF wells; MW-A through X-01; NCPZ-04. | PCP |
| | Surface water samples: SW-01 and SW-02. | PCP, Metals, Anions, Physical Parameters |
| | Surface water samples: SW-03, SW-05, SW-06 and SW-09. | PCP |
| **Annually** | Plant sample: EFF | PCP, Metals, Anions, Physical Parameters, Total Recoverable, PAH, Dioxins/furans, Chlorophenols, TPH |
| | Plant samples: IN, NHRTEFF, NCRTEFF. | PCP, Metals, Anions, Physical Parameters, PAH, Dioxins/furans, Chlorophenols, TPH |
| | Plant samples: BA and BB (or BABB). | PCP |
| | Monitoring wells: GS-22, GW-09, GW-10, GW-13, GW-14R-98, GW-17, MW-01, MW-09, MW-14, MW-87-03, MW-A-95, MW-B-95, MW-I-96, MW-J-96, MW-K-96, MW-M-96, MW-A-98, MW-A-99; INF 1-3 and 7-18, and MW-A through MW-D-01, MW-F-01, MW-G-01, MW-I-01, MW-N through X-01; PZ-N5-03 and PZ-N9-03. | PCP |
| | Monitoring wells: MW-H,J,K,L,M-01. | PCP, Metals, Anions, Physical Parameters |
| | Monitoring wells: MW-E-01, GW-12, MW-D-96, INF-04, INF-05, INF-06. | PCP, PAH, Dioxins/furans, Chlorophenols, TPH |
| | Monitoring wells: MW-L-96 and MW-B-98. | PCP, Metals, Anions, Physical Parameters, PAH, Dioxins/furans, Chlorophenols, TPH |
| | Surface water samples: SW-01, SW-02, SW-05 and SW-09. | PCP, Metals, Anions, Physical Parameters, PAH, Dioxins/furans, Chlorophenols, TPH |
| | Surface water samples: SW-03 and SW-06. | PCP, PAH, Dioxins/furans, Chlorophenols, TPH |
| | All Domestic Wells, NWW and RETPND | PCP, Metals, Anions, Physical Parameters |
| | All remaining monitoring sites (except MWS1, CT-01 and CT-02) | PCP |

Notes:

All sampling and data collection will vary as operational parameters require or per DEQ request.

Field parameters collected at each sample site will include pH, Eh, SC, T, DO and %DO

## V. Five-Year Review Process

The Montana Pole and Treating Plant Site five-year review was led by Lisa DeWitt, DEQ's Project Manager for the MPTP site. The following team members assisted in the review:

Tom Bowler, Field Remediation Engineer, MBMG
Pam Reed, Field Remediation Engineer, MBMG
Kevin Kirley, DEQ Federal Superfund Section Manager
C. Bradley Smith, DEQ Legal Counsel
Jim Harris, P.E., EPA Remedial Project Manager

This five-year review consisted of the following activities: document review; site inspection; review of changes in standards; review of changes in exposure pathways, toxicity, and other contaminant characteristics; risk assessment; and data review.

## VI. Five-Year Review Findings

**Interviews**

Interviews were not specifically conducted for the five-year review. DEQ is actively involved with the site on a continuing basis and is therefore already aware of site issues and views of nearby residents.

**Site Inspection**

DEQ last inspected the Site on May 16, 2006. DEQ's presence at the site varies from as little as a few days per month to as many as five days per week, and DEQ is therefore continually aware of the Site's status.

Site Security

Site access and the perimeter fence are maintained by the Site Services Contractor. Site Security procedures are described in the Site Health & Safety Plan (MBMG, 2001). These three measures together have been effective in preventing access of unauthorized visitors onto the site.

Land Treatment Unit and SSPs
Soils loaded on the LTU during Phase 1 met treatment standards for PCP and B2 PAHs within one treatment season, and an 18-inch lift of soils was offloaded in 1999 (a 24-inch lift had been placed on the LTU; however, only 18 inches were removed to prevent damage to the LTU liner and drainage system). During Phase 3, eight to ten feet of soils were loaded on the LTU. Treatment goals for PCP and B2 PAHs were reached within one treatment season for the top 30-inch lift of soils and approximately 24 inches of soil were removed from the LTU in the fall of 2000. An additional 24 inches of soil were removed from the LTU in the fall of 2001 after reaching the clean-up levels for site soils; cleanup levels for B2 PAHs were reached by the first sampling event of the season. B2 PAHs have typically been found to be below levels set in the ROD in most soils prior to any treatment activities.

Eight of the thirteen Soil Storage Piles (SSPs) met the PCP and B2PAH clean up criteria for site soils in

2004 and were decommissioned and backfilled on-site. The remaining five piles no longer appear to have enhanced rates of contaminant degradation and may require further treatment by other processes to reach the clean up goals for the site. The most recent analytical data for the SSPs is summarized in Appendix G.

In 2005, an approximate 28,000 cubic yards (an approximate 24-inch lift) of treated soils were removed from the LTU and backfilled on-site. The most recent analytical data for soils being treated on the LTU are summarized in Appendix G.

Because the cleanup level for dioxins has not yet been achieved on the LTU or in the SSPs by biological treatment nor by mixing of more highly contaminated soils with less highly contaminated soils, DEQ and EPA have determined that the best way to handle treated soils is to backfill them within the excavated area (as contemplated in the ROD) on top of clean fill extending at least one foot above the historical high groundwater mark, and to cover treated backfilled soils with at least one foot of clean fill. Results of an investigation conducted by CDM for DEQ (CDM, 2000) indicate that for a 100-year timeframe, dioxins would not significantly leach, thus groundwater dioxin concentrations would not be above the ROD cleanup level for dioxins in groundwater.

The Center Pivot Unit (CPU) on the LTU adequately controls dust in the vast majority of cases. Modifications in irrigation, tilling, material handling practices and treatment scheduling along with additional dust mitigation measures of wind fencing and living wind breaks (trees) have all been implemented to further manage potential dust and odor migration from the facility.

Ongoing air monitoring to date has indicated that the concentrations of volatile and semi-volatile organic contaminants of concern that would be expected to be associated with air in the vicinity of the Montana Pole Site are below EPA Region 9 Preliminary Remediation Goals. Not all of the monitored contaminants of concern can be directly attributable to contaminated soils at the facility. Levels of dust at the perimeter fencing have also been well within the established standards as determined by site monitoring activities.

Groundwater Treatment System

The groundwater capture systems have maintained control of the contaminated site plume and the Water Treatment Plant has been effective in treating the captured water to ROD cleanup levels for discharge into Silver Bow Creek. Contaminated soil removal and onsite soil treatment along with the associated oil recovery operations during soil excavation have greatly reduced contaminant impact on the site groundwater and subsequently have reduced the contaminant loading to the treatment plant. Residual oils in contact with the aquifer are effectively captured in the Near Highway Recovery Trench (NHRT), separated through various pumping and skimming processes, and stored for incineration at an approved offsite facility. Soil treatment activities and ongoing oil recovery have resulted in declining volumes of recoverable oil as treatment activities proceed. Dissolved contaminants are effectively removed from the contaminated plume of the site via the granulated activated carbon (GAC) process employed in the treatment plant and this process appears to be the most efficient and cost effective treatment option for removing contaminants from the site groundwater.

The NHRT and NCRT, along with their associated pumps, have been effective in capturing site groundwater. Historically, capture has been evaluated by verifying gradients from guard wells toward the trenches and numerous other well level readings as the most available method of monitoring plume containment. However, additional assessment of the monitoring data using various data plotting and modeling methods, such as SURFER and MODFLOW to evaluate capture, is employed to further refine

and illustrate the measurement data.

Groundwater contaminant isocontour maps (Appendix D) show the reduction in size of the groundwater plume from 2001 to the present with the caveat that variations to the monitoring network have resulted in different sources of monitoring data being collected in that time period. The present monitoring network is more complete and provides a more accurate evaluation of site conditions but this difference in data points over time will cause some discrepancies in directly comparing plume extent and contaminant levels over the years examined in this report. The area north of the Near Creek Recovery Trench overlaps with Lower Area One (part of an adjacent mine-waste Superfund site). Soils were excavated in this area, but residual contamination beyond the reach of the recovery systems may still contribute to levels of PCP in this area. It is believed that naturally occurring biodegradation will be effective in reducing these levels to below ROD groundwater cleanup levels in conjunction with effective plume capture on the Montana Pole Site.

The present monitoring schedule and network, along with the data evaluation methods, appear to be effective in adequately and accurately evaluating groundwater plume capture and remediation.

Excavations and LNAPL Recovery from Excavations

The remedy calls for excavation to remove all accessible soils contaminated above the cleanup goals. Excavation has been effective in removing contaminated soils to a depth of 18 inches below the groundwater surface. The remedy also called for recovery of LNAPL off the surface of the groundwater after excavation. The use of vacuum skimmers, drum skimmers, and air injection into soils below the groundwater has enabled removal of LNAPL from excavation areas, such that only sheen remains on the groundwater. The last site soil removal activities took place in 2000 and the remedy calls for some manner of enhanced in-situ treatment of inaccessible soils (i.e., beneath I-15/90).

**Risk Information Review**

All ARARs listed in the ROD were reviewed for changes that could affect protectiveness. Upon review of the ARARs, DEQ does not believe there have been any changes in location-specific or action-specific ARARs that would bear on protectiveness and that would thus require analysis in this five-year review report. While there have been some recodifications and revisions of ARARs, these would not fall within the "protectiveness" standard which would bring the change into application in the five-year review process.

A review of the February 2006 Montana Numeric Water Quality Standards Circular DEQ-7 reveals that the State of Montana has promulgated standards that are different from the respective human health standards or aquatic life standards which were used as remediation levels in the 1993 ROD as shown in Table 8. The current DEQ-7 aquatic life standard for arsenic is higher than the WQB-7 aquatic life standard for this element in 1993. The cleanup level for arsenic must be met in discharge to surface water from the water treatment plant. The ROD is therefore protective of aquatic life, since the ROD cleanup level is more stringent. The current DEQ-7 aquatic criteria for copper and zinc are 2.85 and 37 ppb respectively at 25 mg/L hardness; however, water at Montana Pole exceeds 400 mg/L hardness, bringing the DEQ-7 aquatic criteria to 30.49 ppb and 387 ppb for copper and zinc respectively. ROD cleanup levels for copper and zinc are 12 and 110 ppb respectively, and are therefore more protective than current DEQ-7 levels. Therefore, DEQ does not recommend changing cleanup levels for arsenic, copper, or zinc. Samples collected by MBMG from the discharge have had concentrations below ROD cleanup levels.

**Table 8. Changes in Chemical-Specific Standards**

| Contaminant | Media | Cleanup Level | Standard (µg/L) | | Source/Year |
|---|---|---|---|---|---|
| Arsenic | Discharge to Surface Water | 48 | Previous | 48 | WQB-7 1993 |
| | | | New | 150* | DEQ-7 2006 |
| Cadmium | Discharge to Surface Water | 1.1 | Previous | 1.1 | WQB-7 1993 |
| | | | New | 0.097* | DEQ-7 2006 |
| Copper | Discharge to Surface Water | 12 | Previous | 12 | WQB-7 1993 |
| | | | New | 2.85* | DEQ-7 2006 |
| Zinc | Discharge to Surface Water | 110 | Previous | 110 | WQB-7 1993 |
| | | | New | 37* | DEQ-7 2006 |
| Total TCDD Equiv. | Groundwater | $3x10^{-5}$ | Previous | $3x10^{-5}$ | WQB-7 1993 |
| | | | New | $2x10^{-6}$ | DEQ-7 2006 |

*Based on 25 mg/L hardness. Montana Pole groundwater harness exceeds 400 mg/L.

The DEQ standard for cadmium has been revised since the last five-year review. The current aquatic DEQ-7 criteria for cadmium is 0.097 ppb at 25 mg/L hardness; however, water at Montana Pole exceeds 400 mg/L hardness, bringing the DEQ-7 aquatic criteria to 0.755 ppb. The ROD cleanup level for cadmium is 1.1 ppb. During the most recent plant effluent sampling (August 2005), cadmium was not detected; during the last five years, concentrations of cadmium in plant effluent water did not exceed 0.15 ppb, which is below the adjusted DEQ-7 criteria of 0.755 ppb. DEQ and EPA will evaluate the need to lower the cleanup level for cadmium in discharge to surface water.

DEQ-7 standards for dioxins have also changed since the ROD was written. The ROD cleanup criteria for Total TCDD Equivalents in discharge to surface water is 10 pg/L (picograms per liter); the most recent plant effluent concentration was taken in August 2005. The concentration in the plant discharge was 1.28 pg/L, well below the ROD aquatic criteria cleanup level. The ROD cleanup criterion for Total TCDD Equivalents in groundwater based on the 1993 MCL is 30 pg/L ($3x10^{-5}$ µg/L); the most recent plant influent concentration taken in August 2005 had a Total TCDD Equivalents concentration of 19.46 pg/L, below the ROD cleanup level. However, treatment by the GAC beds reduced this concentration to below the 2 pg/L DEQ-7 human health standard, as described above. The average Total TCDD Equivalents concentration in plant effluent over the reporting period is 0.518 pg/L. Currently, there are no aquatic criteria for Total TCDD Equivalents in DEQ-7, but there is a human health surface water standard of 0.13 pg/L due to a high bioconcentration factor for dioxins. DEQ and EPA will re-evaluate the need to lower the cleanup level for Total TCDD Equivalents in groundwater and in discharge to surface water.

The assumptions used to estimate health risks and cleanup levels for the Montana Pole ROD were compared to assumptions that would currently be used. The assumptions that would currently be used have not changed since the last five-year review; most of the exposure parameters and toxicity values had not changed at that time. Two key changes that could impact the cleanup levels were the Toxicity Equivalency Factors (TEFs) for carcinogenic PAHs and the dermal adherence factor used to estimate risk from dermal contact with soil.

For PAHs in groundwater, Table 9 below compares the previous TEFs with those currently recommended by EPA, and provides the corresponding groundwater cleanup levels. As shown, using the current TEFs, the cleanup levels would increase for chrysene and decrease for benzo(a)anthracene and indeno(1,2,3-cd)pyrene. DEQ and EPA will re-evaluate the need for lowering the cleanup levels for both Benzo(a)anthracene and Indeno(1,2,3-cd)pyrene to 0.2 ppb as the revised risk-based levels may be more protective.

**Table 9. Potential Changes to Groundwater Cleanup Levels Based on PAH Toxicity Equivalency Factors**

| Carcinogenic PAHs | TEFs used in 1993 Risk Assessment | Current TEFs (a) | 1993 Cleanup Levels (µg/L) | Cleanup Levels using current TEFs (µg/L) |
|---|---|---|---|---|
| Benzo(a)anthracene | 0.01 | 0.1 | 1 | 0.2 b |
| Benzo(b)fluoranthene | 1 | 0.1 | 0.2 | 0.2 b |
| Benzo(k)fluoranthene | 0.01 | 0.01 | 1 | 1 |
| Benzo(a)pyrene | 1 | 1 | 0.2 | 0.2 b |
| Benzo(g,h,i)perylene | 0.01 | NA | 1 | NA c |
| Chrysene | 0.01 | 0.001 | 1 | 10 |
| Dibenzo(a,h)anthracene | 1 | 1 | 0.2 | 0.2b |
| Indeno(1,2,3-cd)pyrene | 0.01 | 0.1 | 1 | 0.2 b |

(a) Current Toxic Equivalency Factors (TEFs) for carcinogenic PAHs are from: USEPA. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. EPA/600/R-93/089

(b) The cleanup level associated with a $10^{-6}$ cancer risk from drinking water would be lower than the value shown. The cleanup level of 0.2 ug/L is based on the MCL for benzo(a)pyrene.

(c) NA = Not applicable. Benzo(g,h,i)perylene is a Group D PAH, not classifiable as to carcinogenicity.

For pentachlorophenol in soil, the risk assessment assumed that the dermal adherence factor was 1.45 mg of soil per cm of exposed skin (mg/cm$^2$) (CDM 1993). The value currently recommended by EPA (e.g., Region 9 PRG tables) is 0.2 mg/cm$^2$. The only chemical with cleanup levels based on dermal exposure was pentachlorophenol. These cleanup levels increase significantly (by a factor of 7.25) when the new dermal adherence factor is used. Table 10 summarizes the soil cleanup levels for pentachlorophenol based on the previous assumptions and based on the new adherence factor. As shown, for residential and industrial receptors, the new cleanup levels for pentachlorophenol would be based on ingestion exposure rather than dermal exposure (i.e., the estimated risks from ingestion are now higher than the estimated risks from dermal exposure).

**Table 10. Estimated Soil Cleanup Levels for Pentachlorophenol (mg/kg)**

| 1993 Assumptions | Residential Land Use | Industrial Land Use | Trespasser or Recreational Land Use |
|---|---|---|---|
| Dermal Exposure | **3** | **9** | **34** |
| Ingestion Exposure | 14 | 40 | 255 |
| | | | |
| **Current Assumptions (a)** | | | |
| Dermal Exposure | 22 | 65 | **247** |
| Ingestion Exposure | **14** | **40** | 255 |

**Bold** values indicate the soil cleanup level for pentachlorophenol for each land use.

(a) The only exposure assumption that changed is the dermal adherence factor
1993 dermal adherence factor: 1.45 $mg/cm^2$
Current dermal adherence factor: 0.2 $mg/cm^2$

Using current assumptions, ingestion exposures would result in higher risks than dermal exposures for residential and industrial land use. Dermal exposure would still result in higher risks for recreational land use.

In March 2000, DEQ published a Tier 1 Risk-Based Corrective Action Guidance Document. This document provides risk-based screening levels for petroleum compounds in soils and groundwater. EPA has not developed screening levels for diesel (which is very similar in composition to the fuel oil used to dissolve the PCP at Montana Pole) in soil or groundwater. However, MBMG has sampled soils and plant influent and effluent for Total Petroleum Hydrocarbons (TPH by EPA Method 418.1). Levels of TPH in soil backfilled after treatment have never exceeded the RBCA ceiling concentration of 5,000 ppm for Total Extractable Hydrocarbons (EPA Method 8015 mod). Some soils removed during the 1985 EPA Removal Action exceeded this value initially; however, these soils are still undergoing treatment and TPH concentrations are now well below 5,000 ppm. Since March 1998 (earliest data reviewed), levels of TPH in plant effluent to Silver Bow Creek have only once exceeded the RBCA ceiling concentration of 1,000 ppb for Total Petroleum Hydrocarbons. Influent TPH concentrations (which in some cases have exceeded 1,000 ppb) appear to be effectively reduced to acceptable concentrations by GAC treatment.

**Data Review**

A review of records and monitoring reports through January 1, 2006, indicates that the water treatment plant has treated approximately 1.2 billion gallons of contaminated water and has removed approximately 1,880 kg of PCP from the groundwater since the facility went into operation January 22, 1993 (MBMG, 2006). A total in excess of 200,000 cubic yards of contaminated soils have been excavated, while approximately 120,000 cubic yards of these soils have been treated on the LTU and backfilled with approximately an additional 16,000 yards of SSP soils having been treated and backfilled. Over 5,000 tons of debris have been removed and over 60,000 gallons of LNAPL have been recovered off the surface of the groundwater through capture system operations and excavation activities.

Routine site monitoring shows typical influent contaminant levels of 40 to 50 ppb of PCP. This equates to a typical loading rate on the carbon of 0.090 kg/day of PCP. These levels are roughly a ten-fold reduction of the levels entering the plant before soil removal activities on the south side of the site in 2000 combined with the intervening treatment activities. Prior to soil removal and the subsequent treatment typical levels

of PCP entering the plant were 700 to 800 ppb and loading levels ranged from 0.8 to 1 kg/day PCP. The vast majority of the contaminant reports to the plant from the NHRT, currently a nominal 70 to 100 ppb PCP, or 0.08 to 0.1 kg/day. PCP reporting from the NCRT has recently been at levels around 3 ppb, or 0.003 kg/day. Many years of sampling have shown that no other significant levels of chlorophenol compounds that were listed as contaminants of concern in the ROD are found in the site groundwater. The same statement can be made for the B2PAHs that are called out as contaminants of concern in the ROD. Measurable levels of dioxins are monitored in the site groundwater, typically under 5 parts per quadrillion but with infrequent occurrences up to an order of magnitude higher in select sampling locations. These levels are effectively removed in the groundwater treatment system. Levels of Diesel Range Organics entering the plant range from 700 ppb to below detection limits during sampling events. An additional 5,300 gallons of free oil have been recovered for disposal since 2000. The Water Treatment Plant has treated the present levels of contaminants to levels that meet the discharge standards for Silver Bow Creek (1 ppb). Water Treatment Plant data are summarized in Appendix F.

In addition to the lower loading of contaminants reporting to the treatment plant in recent years, a general downward trend in contaminant levels has been noted in site monitoring wells as well as reduction in the areal extent of the contamination plume, as shown in the PCP isocontour maps provided in Appendix D. Monitoring wells located within the most contaminated areas of the site have rarely exceeded 1,000 ppb PCP in recent sampling events, a significant decline over historic levels. Sampling of wells on the periphery of the contaminant plume indicates that the overall area of the plume is contracting over time and wells screened at deeper intervals in the aquifer indicate that contaminant levels at depth are diminishing as well. As with the plant sampling data, well monitoring data indicates that PCP is the only significant contaminant of concern routinely found in well sampling with measurable levels of dioxin found in wells in the most highly impacted portion of the aquifer. Only a few wells located in the area of the interstate highway and in the NHRT routinely have physically measurable (dual-phase level indicator method) thicknesses of free oil. All wells with these levels of measurable free oil are in the area that has not been excavated on the site or in the NHRT where oil is designed to be recovered.

Over the last three years, no PCP levels over the standard called for in the ROD (1 ppb) have been detected in any sample locations of Silver Bow Creek, a ROD-designated point of compliance. As with the on site locations no other contaminants of concern have been detected in significant quantities during the scheduled monitoring of Silver Bow Creek. Analytical results for surface water samples are summarized in Appendix C.

Contaminated site soils have routinely been treated to levels below the PCP and PAH standards called for in the ROD (34 ppm). Four lifts of treated soils with varying initial concentrations of PCP have been removed and replaced as backfill on the site to date as well as eight of the original thirteen SSPs. Typically no B2PAH values above the ROD final treatment standards have been encountered in the site soils. Dioxin levels in the majority of site soils generally range from just above the clean up standard for the site, (0.25 ppt 2,3,7,8 –TCDD equivalent) to approximately 2 ppt.

Site air monitoring results have never detected PCP, the primary contaminant of concern and the only monitored compound unique to the Site, in either the particulate collected or as a vapor. Low levels of PAH and BTEX compounds have been measured in some sampling events but always at levels. The PAH and BTEX compounds that have been detected cannot be solely attributed to the Site due to numerous other potential outside sources that could contribute to the overall mass that is measured in the routine site monitoring for Montana Pole. Site air monitoring data are summarized in Appendix H.

## VII. Assessment

The following conclusions support the determination that the remedy at the Montana Pole and Treating Plant site is expected to be protective of human health and the environment upon completion.

### *Question A: Is the remedy functioning as intended by the decision documents?*

- Health and Safety Plan (HASP)/Contingency Plan: The HASP and Contingency Plan are in place, and are sufficient to control risks.
- Implementation of Institutional Controls and Other Measures: The site fence is well maintained and prevents trespassing. DEQ prepared a revised draft Groundwater Control Area technical memorandum and has implemented other institutional controls in accordance with requirements of the 1996 consent decree.
- Remedial Action Performance: Excavation has been demonstrated to be effective in removing soils contaminated above the cleanup levels, and has enabled effective removal of LNAPL from the surface of the groundwater in the areas of excavation. Biological treatment has proven effective in treating PCP and B2 PAHs in soils to below cleanup levels. ROD cleanup levels for dioxins in soils have not yet been achieved. To protect surface or groundwater contact with backfilled soils that still contain elevated levels of dioxins/furans, soils are backfilled on clean fill extending at least one foot above the historic high groundwater mark (based on 15 years of monitoring), and are covered by at least one foot of clean soil.
- System Operations/O&M: Operation of the water treatment plant and associated recovery systems has been effective in capturing site groundwater and LNAPL and has provided successful treatment of plant influent.
- Opportunities for Optimization: The current monitoring schedule is shown above in Tables 6 and 7. DEQ, EPA, and MBMG annually review and revise this monitoring schedule, as appropriate.
- Early Indicators of Potential Remedy Failure: No early indicators of potential remedy failure were noted during the review. Review of the budget indicates that adequate monies remain to take this site through to final cleanup.

### *Question B: Are the assumptions used at the time of remedy selection still valid?*

- Changes in Standards: This five-year review identified State Risk Action Levels that have been changed since the ROD was signed. These parameters were identified in Table 8 above. DEQ does not recommend increasing cleanup levels for the discharge to surface water for arsenic, copper, or zinc because the ROD cleanup levels are more conservative, and therefore more protective.
- DEQ and EPA will evaluate changing the cleanup standard for cadmium in surface water from 1.1 ppb to 0.755 ppb.
- DEQ and EPA will re-evaluate changing the cleanup standard for dioxins in groundwater and in discharge to surface water to 2 pg/L and 0.13 pg/L respectively. A controlled groundwater area will be developed and implemented to prevent installation of wells that could draw groundwater from or affect groundwater flow within the plume area.
- Changes in Exposure Pathways: No changes in the site conditions that affect exposure pathways were identified as part of the five-year review.

- Changes in Risk Assessment Methodologies: Due to changes in EPA-published TEFs for certain PAHs, DEQ and EPA will re-evaluate the need to lower the groundwater cleanup levels for both Benzo(a)anthracene and Indeno(1,2,3-CD)pyrene to 0.2 µg/L.

***Question C: Has any other information come to light that could call into question the protectiveness of the remedy?***

No additional information has been identified that would call into question the protectiveness of the remedy.

## VIII. Deficiencies

As noted and documented above, there were no deficiencies; however, changes to the remediation levels will be evaluated to reflect state standards and current EPA-published TEFs.

## IX. Recommendations and Follow-up Actions

There are four recommendations relating to this five-year review:

1) Due to February 2006 changes in DEQ-7 human health standards, DEQ and EPA will evaluate changing the cleanup standards for dioxins in groundwater and in discharge to surface water to 2 pg/L and 0.13 pg/L respectively. DEQ and EPA will also evaluate changing the cleanup standard for cadmium in groundwater from 1.1 µg/L to .755 µg/L.

2) Due to changes in EPA-published TEFs for certain PAHs, DEQ and EPA will evaluate the need to lower the groundwater cleanup levels for both benzo(a)anthracene and indeno (1,2,3-CD)pyrene to 0.2 µg/L.

3) DEQ and EPA will continue to evaluate the cleanup level for PCP in soils.

4) DEQ and EPA will initiate the process to develop and implement a Controlled Groundwater Area for the Site.

## X. Protectiveness Statement(s)

The remedy at the Montana Pole and Treating Plant is expected to be protective of human health and the environment upon completion, and immediate threats have been addressed. Excavation of soils and subsequent treatment is reducing concentrations of contaminants to ROD cleanup levels for PCP and B2 PAHs. To protect surface or groundwater contact with backfilled soils that still contain elevated levels of dioxins/furans, soils are backfilled on clean fill extending at least one foot above the historic high groundwater mark and are covered by at least one foot of clean soil. Where access to backfilled areas might result in human exposure to these contaminated soils, the soils may be paved. Groundwater capture analysis will continue and adjustments made as necessary to ensure capture of the plume. Groundwater will be captured and treated until cleanup levels for groundwater are met. A controlled groundwater area and other institutional controls be developed and implemented to prevent installation of wells that could draw water from or affect groundwater flow within the plume area.

## XI. Next Review

This is a statutory site that requires ongoing five-year reviews. The next review will be conducted within five years of the completion of this five-year review report. The completion date is the date of the signature shown on the cover attached to the front of this report.

## XII. References


Camp Dresser and McKee. 1993. *Baseline Risk Assessment for the Montana Pole NPL Site.*

Camp Dresser and McKee. 1996. *Phase 1 Remedial Action Final Design Report.*

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Camp Dresser and McKee. 2000. *Vadose Zone Soils Dioxin/Furan Mobility Evaluation.*

Camp Dresser and McKee, April 26, 2000. *Basis for Recommendation of Groundwater Control Area for the Montana Pole and Treating Plant Superfund Site, Draft Technical Memorandum.*

Camp Dresser & McKee, September 2000. *Remedial Action Report, Montana Pole and Treating Plant Site, Phase 2 – Debris Removal.*

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Camp Dresser and McKee, September 27, 2001. *Vadose Zone Soils Dioxin/Furan Mobility Evaluation, Technical Memorandum.*

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Camp Dresser and McKee, 2004. *Butte Area Structures Interstate 15/90 Bridge Replacement Environmental and Geotechnical Data Report.*

Environmental Protection Agency and Montana Department of Health and Environmental Sciences. 1993.

*Record of Decision, Montana Pole and Treating Plant National Priorities List Site.*

U.S. EPA, September 2001. *Superfund Preliminary Site Close Out Report (Long Term Remedial Action), Montana Pole and Treating Plant, Butte, Montana.*

Montana Bureau of Mines and Geology. 2001. *Montana Pole Monthly Report for March 2001.*

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Montana Department of Environmental Quality. 2000. *Tier 1 Risk-Based Corrective Action Guidance Document.*

Montana Department of Environmental Quality. February 2006. *Circular DEQ-7. Montana Numeric Water Quality Standards.*

Tetra Tech EM Inc., November 2005. *Construction Report for the Montana Pole and Treating Plant Site Phase 4 Remedial Action LTU Offload and Regrade Project.*

# Appendix A. Inspection Report Form

## Five-Year Review Site Inspection Checklist

| I. SITE INFORMATION | |
|---|---|
| **Site name:** Montana Pole and Treating Plant site | **Date of inspection:** May 16, 2006 |
| **Location and Region:** Butte, Montana, Region 8 | **EPA ID:** MTD 006232276 |
| **Agency, office, or company leading the five-year review:** Montana Department of Environmental Quality | **Weather/temperature:** Clear 55 F |
| **Remedy Includes:** (Check all that apply)<br>□ Landfill cover/containment<br>X Access controls<br>X Institutional controls<br>X Groundwater pump and treatment<br>□ Surface water collection and treatment<br>X Other - Land Treatment Unit<br>_____<br>_____ | |
| **Attachments:** X Inspection team roster attached X Site map attached | |
| **II. INTERVIEWS** (Check all that apply) | |
| 1. **O&M site manager** Tom Bowler, Name — MBMG, Site Operations Manager, Title<br>Interviewed X at site X at office □ by phone Phone no. 406-723-7247<br>Problems, suggestions; □ Report attached _____<br>_____ | |

2. **O&M staff** Pam Reed (Name) Treatment Plant Engineer (Title)

Interviewed X at site X at office ☐ by phone Phone no. _406 723-7247

Problems, suggestions; ☐ Report attached _____

_____

## III. ONSITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

| | | | | |
|---|---|---|---|---|
| ☐ | O&M manual | X Readily available | X Up to date | ☐ N/A |
| ☐ | As-built drawings | X Readily available | X Up to date | ☐ N/A |
| ☐ | Maintenance logs | X Readily available | X Up to date | ☐ N/A |

Remarks _____

_____

2. **Site-Specific Health and Safety Plan** X Readily available X Up to date ☐ N/A

☐ Contingency plan/emergency response plan X Readily available X Up to date ☐ N/A

Remarks _____

_____

3. **O&M and OSHA Training Records** X Readily available X Up to date ☐ N/A

Remarks _____

_____

4. **Permits and Service Agreements**

| | | | | |
|---|---|---|---|---|
| ☐ | Air discharge permit | ☐ Readily available | ☐ Up to date | X N/A |
| ☐ | Effluent discharge | ☐ Readily available | ☐ Up to date | X N/A |
| ☐ | Waste disposal, POTW | ☐ Readily available | ☐ Up to date | X N/A |
| ☐ | Other permits_____ | ☐ Readily available | ☐ Up to date | X N/A |

Remarks _____

_____

5. **Gas Generation Records** ☐ Readily available ☐ Up to date X N/A

Remarks _____

_____

| | | | | |
|---|---|---|---|---|
| 6. | **Settlement Monument Records** | □ Readily available | □ Up to date | X N/A |
| | Remarks | | | |
| 7. | **Groundwater Monitoring Records** | X Readily available | X Up to date | □ N/A |
| | Remarks | | | |
| 8. | **Leachate Extraction Records** | X Readily available | X Up to date | □ N/A |
| | Remarks | | | |
| 9. | **Discharge Compliance Records** | | | |
| | □ Air | □ Readily available | □ Up to date | X N/A |
| | □ Water (effluent) | □ Readily available | □ Up to date | X N/A |
| | Remarks | | | |
| 10. | **Daily Access/Security Logs** | X Readily available | X Up to date | □ N/A |
| | Remarks | | | |

**IV. O&M COSTS**

1. **O&M Organization**

X State in-house □ Contractor for State

□ PRP in-house X Contractor for PRP

□ Other___Documents on O&M not submitted or required by PRP settlement.

**V. ACCESS AND INSTITUTIONAL CONTROLS** X Applicable □ N/A

**A. Fencing**

| | | | | |
|---|---|---|---|---|
| 1. | **Fencing damaged** | □ Location shown on site map | X Gates secured | □ N/A |
| | Remarks | | | |

**B. Other Access Restrictions**

1. **Signs and other security measures** □ Location shown on site map □ N/A
   Remarks: Part time security for site.

**C. Institutional Controls**

1. **Implementation and enforcement**
   Site conditions imply ICs not properly implemented □ Yes □ No X N/A
   Site conditions imply ICs not being fully enforced □ Yes □ No X N/A

   Type of monitoring (e.g., self-reporting, drive by) _____
   Frequency _____
   Responsible party/agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone no.

   Reporting is up-to-date □ Yes □ No X N/A
   Reports are verified by the lead agency □ Yes □ No X N/A

   Specific requirements in deed or decision documents have been met □ Yes □ No X N/A

   Violations have been reported □ Yes X No □ N/A
   Other problems or suggestions: □ Report attached

   _____
   _____
   _____
   _____

2. **Adequacy** □ ICs are adequate □ ICs are inadequate X N/A
   Remarks_Additional ICs will be implemented in the form of a ground water control area and deed restrictions, as appropriate

**D. General**

1. **Vandalism/trespassing** □ Location shown on site map X No vandalism evident
   Remarks_____
   _____

2. **Land use changes onsite** X N/A
   Remarks_____
   _____

3. **Land use changes offsite** X N/A
   Remarks_____
   _____

## VI. GENERAL SITE CONDITIONS

**A. Roads** □ Applicable X N/A

1. **Roads damaged** □ Location shown on site map □ Roads adequate □ N/A
   Remarks_____

**B. Other Site Conditions**

Remarks

## VII. LANDFILL COVERS □ Applicable X N/A

**A. Landfill Surface**

1. **Settlement** (Low spots) □ Location shown on site map □ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** □ Location shown on site map □ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** □ Location shown on site map □ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** □ Location shown on site map □ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** □ Grass □ Cover properly established □ No signs of stress
   □ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** □ N/A
   Remarks_____

7. **Bulges** □ Location shown on site map □ Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
   - ☐ Wet areas ☐ Location shown on site map Areal extent_____
   - ☐ Ponding ☐ Location shown on site map Areal extent_____
   - ☐ Seeps ☐ Location shown on site map Areal extent_____
   - ☐ Soft subgrade ☐ Location shown on site map Areal extent_____

   Remarks_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
   Areal extent_____
   Remarks_____

**B. Benches** ☐ Applicable X N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
   Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
   Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
   Remarks_____

**C. Letdown Channels** ☐ Applicable X N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
   Areal extent_____ Depth_____
   Remarks_____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
   Material type_____ Areal extent_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
   Areal extent_____ Depth_____
   Remarks_____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
   Areal extent_____ Depth_____
   Remarks_____

5. **Obstructions** Type_____ □ No obstructions
□ Location shown on site map Areal extent_____
Size_____
Remarks_____
_____

6. **Excessive Vegetative Growth** Type_____
□ No evidence of excessive growth
□ Vegetation in channels does not obstruct flow
□ Location shown on site map Areal extent_____
Remarks_____
_____

**D. Cover Penetrations** □ Applicable X N/A

1. **Gas Vents** □ Active □ Passive
□ Properly secured/locked □ Functioning □ Routinely sampled □ Good condition
□ Evidence of leakage at penetration □ Needs O&M □ N/A
Remarks_____
_____

2. **Gas Monitoring Probes**
□ Properly secured/locked □ Functioning □ Routinely sampled □ Good condition
□ Evidence of leakage at penetration □ Needs O&M □ N/A
Remarks_____
_____

3. **Monitoring Wells** (within surface area of landfill)
□ Properly secured/locked □ Functioning □ Routinely sampled □ Good condition
□ Evidence of leakage at penetration □ Needs O&M □ N/A
Remarks_____
_____

4. **Leachate Extraction Wells**
□ Properly secured/locked □ Functioning □ Routinely sampled □ Good condition
□ Evidence of leakage at penetration □ Needs O&M □ N/A
Remarks_____
_____

5. **Settlement Monuments** □ Located □ Routinely surveyed □ N/A
Remarks_____
_____

**E. Gas Collection and Treatment** □ Applicable X N/A

1. **Gas Treatment Facilities**
□ Flaring □ Thermal destruction G Collection for reuse
□ Good condition □ Needs O&M
Remarks_____
_____

2. **Gas Collection Wells, Manifolds and Piping**
□ Good condition □ Needs O&M
Remarks_____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)
□ Good condition □ Needs O&M □ N/A
Remarks_____

**F. Cover Drainage Layer** □ Applicable X N/A

1. **Outlet Pipes Inspected** □ Functioning □ N/A
Remarks_____

2. **Outlet Rock Inspected** □ Functioning □ N/A
Remarks_____

**G. Detention/Sedimentation Ponds** ☐ Applicable X N/A

1. **Siltation** Areal extent____1 Ac_____ Depth_____ □ N/A
X Siltation not evident
Remarks_____

2. **Erosion** Areal extent_____ Depth_____
X Erosion not evident
Remarks_____

3. **Outlet Works** □ Functioning X N/A
Remarks_____

4. **Dam** □ Functioning X N/A
Remarks_____

**H. Retaining Walls** □ Applicable X N/A

1. **Deformations** □ Location shown on site map □ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** □ Location shown on site map □ Degradation not evident
   Remarks_____

**I. Perimeter Ditches/Off-Site Discharge** □ Applicable X N/A

1. **Siltation** □ Location shown on site map □ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** □ Location shown on site map □ N/A
   □ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** □ Location shown on site map □ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** □ Functioning □ N/A
   Remarks_____

**VIII. VERTICAL BARRIER WALLS** □ Applicable X N/A

1. **Settlement** □ Location shown on site map □ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   □ Performance not monitored
   Frequency_____ □ Evidence of breaching
   Head differential_____
   Remarks_____

| IX. GROUNDWATER/SURFACE WATER REMEDIES | X Applicable | □ N/A |
|---|---|---|

**A. Groundwater Extraction Wells, Pumps, and Pipelines** X Applicable □ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   X Good condition X All required wells located □ Needs O&M □ N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   X Good condition □ Needs O&M
   Remarks_____

3. **Spare Parts and Equipment**
   X Readily available □ Good condition □ Requires upgrade □ Needs to be provided
   Remarks_____

**B. Surface Water Collection Structures, Pumps, and Pipelines** X Applicable □ N/A

1. **Collection Structures, Pumps, and Electrical**
   X Good condition □ Needs O&M
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   X Good condition □ Needs O&M
   Remarks_____

3. **Spare Parts and Equipment**
X Readily available □ Good condition □ Requires upgrade □ Needs to be provided
Remarks_____

**C. Treatment System** X Applicable □ N/A

1. **Treatment Train** (Check components that apply)
□ Metals removal X Oil/water separation Bioremediation
□ Air stripping X Carbon adsorbers
□ Filters_____
□ Additive (e.g., chelation agent, flocculent)_____
□ Others_____
X Good condition □ Needs O&M
X Sampling ports properly marked and functional
X Sampling/maintenance log displayed and up to date
X Equipment properly identified
□ Quantity of groundwater treated annually__5M gal_____
□ Quantity of surface water treated annually_____
Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
□ N/A X Good condition □ Needs O&M
Remarks_____

3. **Tanks, Vaults, Storage Vessels**
□ N/A X Good condition □ Proper secondary containment □ Needs O&M
Remarks_____

4. **Discharge Structure and Appurtenances**
X N/A □ Good condition □ Needs O&M
Remarks_____

5. **Treatment Building(s)**
□ N/A X Good condition (esp. roof and doorways) □ Needs repair
□ Chemicals and equipment properly stored
Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
X Properly secured/locked X Functioning X Routinely sampled X Good condition
X All required wells located □ Needs O&M □ N/A
Remarks_____

**D. Monitored Natural Attenuation**

1. **Monitoring Wells** (natural attenuation remedy)

□ Properly secured/locked □ Functioning □ Routinely sampled □ Good condition
□ All required wells located □ Needs O&M □ N/A
Remarks_____

## X. OTHER REMEDIES

N/A

## XI. OVERALL OBSERVATIONS

**A. Implementation of the Remedy**

Both the soil and ground water components of the remedy are functioning as designed. The LTU is reducing contaminant levels in soil to the required levels and the ground water treatment system is removing product, reducing dissolved contaminant concentrations and providing plume capture.

**B. Adequacy of O&M**

O&M activities are being implemented as required by the site O&M manual and are providing assurances that the site remedy will continue to be protective.

| C. | Early Indicators of Potential Remedy Failure |
|---|---|
| | Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, which suggest that the protectiveness of the remedy may be compromised in the future.<br><br>None |
| **D.** | **Opportunities for Optimization** |
| | Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. |

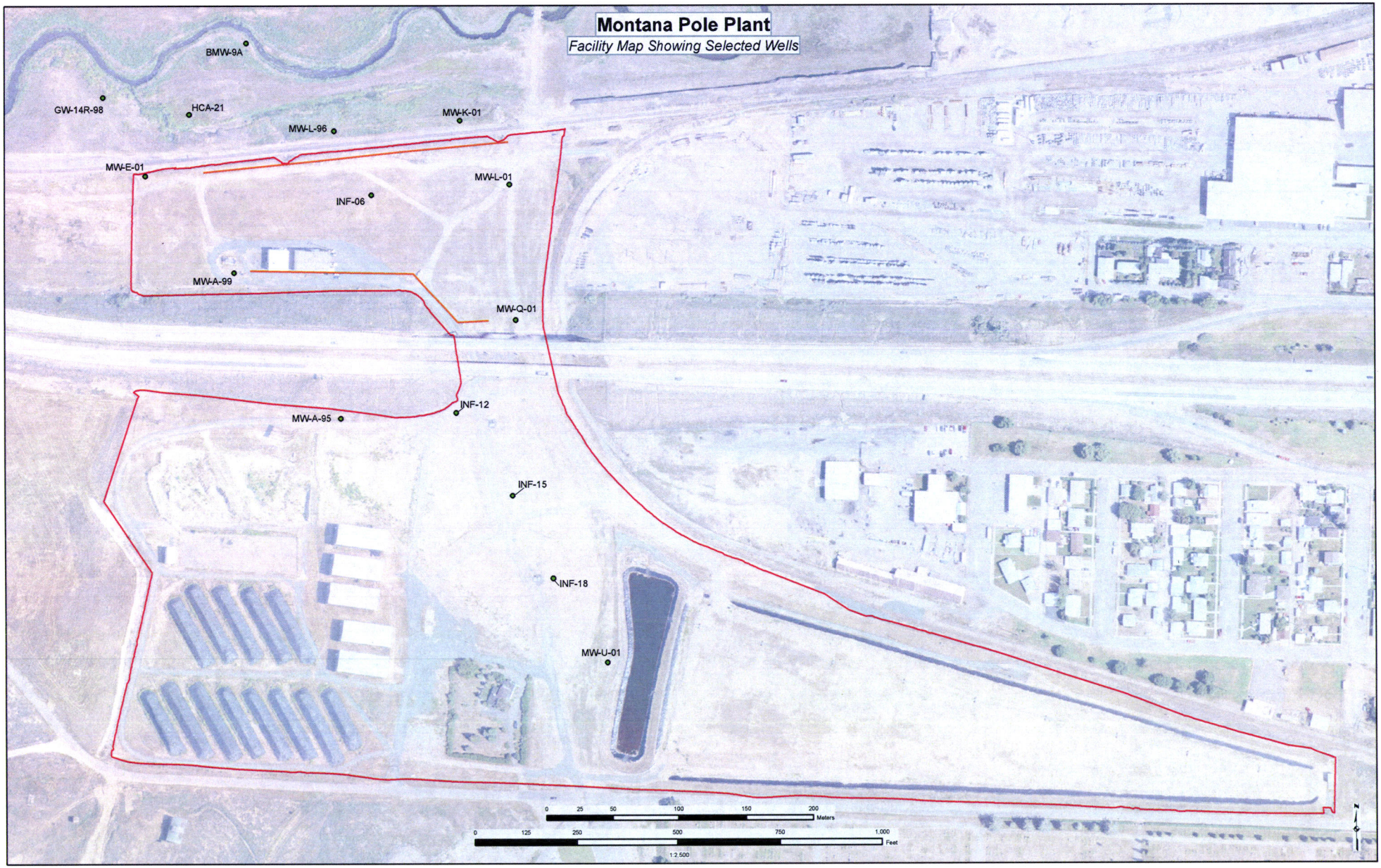
# Appendix B. Groundwater Data

# Montana Pole and Treating Plant Site Plume Control Monitoring Wells Data

| DATE | Monitoring Wells Upgradient of Contaminant Plume | | | Monitoring Wells at Down Gradient Periphery of Contaminant Plume | | | | | | | Monitoring Wells Down Gradient of Recovery System within Footprint of Historic Contaminant Plume | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW-U-01 | MW-Q-01 | MW-L-01 | MW-A-95 | MW-A-99 | MW-E-01 | | | | | MW-K-01 | BMW-9A | HCA-21 | GW-14R-98 |
| | PCP ( ug/L ) | PCP ( ug/L ) | PCP ( ug/L ) | PCP ( ug/L ) | PCP ( ug/L ) | PCP ( ug/L ) | Chlorophenols ( ug/L ) | PAH ( ug/L ) | DRO ( ug/L ) | Dioxin/Furans *( pg/L )* | PCP ( ug/L ) | PCP ( ug/L ) | PCP ( ug/L ) | PCP ( ug/L ) |
| 2/12/2001 | | | | 385 | | | | | | | | | | 13.1 |
| 4/2/2001 | | | | 214 | 2.08 | | | | | | | | | 16.1 |
| 6/4/2001 | | | | 263 | 0.243 | | | | | | | | | 14.3 |
| 8/13/2001 | 0.16 | <0.1 | 0.33 | 204 | 0.14 | 0.36 | <10 | <10 | | 0.077 | 2.7 | | 253 | 4.4 |
| 10/8/2001 | <0.2 | <0.2 | 0.631 | 113 | 0.911 | 1.55 | | | | | 29.6 | | | 26.8 |
| 12/10/2001 | <0.1 | <0.1 | 0.17 | 149 | 1.4 | 0.28 | | | | | 2.7 | | | 2.1 |
| 2/4/2002 | <0.1 | <0.1 | <0.1 | 146 | 1.2 | 0.76 | <10 | <0.1 | <300 | 0.59 | 1.4 | | | 1.6 |
| 4/1/2002 | <0.2 | <0.2 | 0.2 | 114 | 0.349 | 0.9 | | | | | 15.1 | | | 32.5 |
| 6/3/2002 | <0.2 | <0.2 | 0.471 | 126 | 0.83 | 4.25 | | | | | 17.4 | | | 21.1 |
| 8/12/2002 | <0.2 | <0.2 | <0.2 | 96 | 0.293 | 0.608 | | | | 0.21 | 23.4 | | 165 | 35.4 |
| 10/7/2002 | <0.2 | <0.2 | <0.2 | 105 | 0.424 | 0.558 | | | | | 17.2 | | | 11.8 |
| 12/2/2002 | 0.4 | 0.231 | 0.471 | 96.5 | 0.51 | 0.628 | | | | | 14.2 | | | 24.4 |
| 2/3/2003 | <0.04 | <0.04 | <0.2 | 62 | 0.08 | 0.074 | <10 | <0.1 | <300 | 0.083 | 1.7 | | | 2.1 |
| 4/7/2003 | <0.040 | <0.040 | 0.1 | 46 | 0.21 | 0.087 | | | | | 4.7 | | | 2.6 |
| 6/2/2003 | <0.040 | <0.040 | 0.052 | 41 | 0.25 | 0.15 | | | | | 2.2 | | | 3.3 |
| 8/4/2003 | 0.043 | <0.040 | 0.2 | 30 | 0.12 | 0.054 | <10 | <10 | <300 | 0.11 | 1 | 0.2 | 171 | 3.1 |
| 10/6/2003 | <0.040 | <0.040 | 0.086 | 21 | 0.12 | 0.44 | | | | | 0.86 | | | 7 |
| 12/1/2003 | <0.040 | 0.039 | 0.12 | 14 | 0.053 | 0.11 | | | | | 1.3 | | | 3 |
| 2/2/2004 | <0.040 | <0.040 | <0.040 | 12 | 0.049 | 0.072 | <10 | <10 | <300 | 0.53 | 3.5 | | | 3.3 |
| 4/5/2004 | 0.042 | 0.18 | 0.14 | 8.8 | 0.15 | 0.21 | | | | | 1.5 | | | 3.2 |
| 6/7/2004 | <0.04 | 0.042 | <0.04 | 7.4 | 0.13 | 0.24 | | | | | 0.52 | | | 2.2 |
| 8/2/2004 | <0.04 | 0.24 | 0.36 | 3.9 | 0.18 | 0.16 | <10 | <0.2 | <310 | 43.45 | 1.2 | 0.15 | 84 | 4.6 |
| 10/4/2004 | | 0.4 | 0.29 | 3 | 0.3 | 0.33 | | | | | 1 | | | 1.6 |
| 12/6/2004 | | 0.092 | 0.2 | 2.6 | 0.19 | 1.1 | | | | | 1.4 | | | 1.3 |
| 2/7/2005 | <0.040 | <0.040 | <0.040 | 1.2 | 0.17 | <0.040 | | | | | 1.1 | | | 1.6 |
| 4/4/2005 | | 0.26 | 0.32 | 0.6 | 0.4 | 0.59 | | | | | 0.95 | | | 1.1 |
| 6/6/2005 | | 0.19 | 0.14 | 0.39 | 0.53 | 0.34 | | | | | 1.1 | | | 1.4 |
| 8/1/2005 | <0.040 | <0.040 | <0.040 | 0.3 | 0.2 | 0.11 | <10 | <10 | <300 | 2.695 | 0.82 | 0.26 | 57 | 4.2 |
| 10/3/2005 | | <0.040 | <0.040 | 0.21 | 0.19 | 0.25 | | | | | 0.88 | | | 2.2 |
| 12/5/2005 | | <0.1 | <0.1 | 0.233 | | | | | | | 5.7 | | | 37.5 |
| 2/6/2006 | <0.1 | <0.1 | <0.1 | 0.308 | | 0.043 | | | | | 9.3 | 0.136 | 37.8 | 34.4 |

# Montana Pole and Treating Plant Site Plume Control Monitoring Wells Data

| DATE | Monitoring Wells Beneath Contaminant Plume Impact Area | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **INF-18** | **INF-15** | **INF-12** | **INF-06** | | | | | **MW-L-96** | | | | |
| | PCP ( ug/L ) | PCP ( ug/L ) | PCP ( ug/L ) | PCP ( ug/L ) | Chlorophenols ( ug/L ) | PAH ( ug/L ) | DRO ( ug/L ) | Dioxin/Furans *( pg/L )* | PCP ( ug/L ) | Chlorophenols ( ug/L ) | PAH ( ug/L ) | DRO ( ug/L ) | Dioxin/Furans *( pg/L )* |
| 2/12/2001 | | | | 20.1 | | | | | 1.39 | | | | |
| 4/2/2001 | | | | 12.1 | | | | | 0.611 | | | | |
| 6/4/2001 | | | | 7.1 | | | | | <0.2 | | | | |
| 8/13/2001 | | | | 9.9 | <10 | <10 | | 3.831 | 2.3 | <10 | <10 | | 0.021 |
| 10/8/2001 | 0.926 | 0.379 | 40 | 22.5 | | | | | <0.2 | | | | |
| 12/10/2001 | 0.15 | 33 | 44 | 6.1 | | | | | 0.19 | | | | |
| 2/4/2002 | 0.17 | <0.1 | 62 | 5.1 | <10 | <0.1 | <300 | 0.15 | <0.1 | <10 | <0.1 | <300 | ND |
| 4/1/2002 | <0.2 | <0.2 | 39.7 | | | | | | | | | | |
| 6/3/2002 | | | 106 | | | | | | | | | | |
| 8/12/2002 | 0.289 | 0.674 | 42.4 | 3.05 | | | | 0.2 | <0.2 | | | | 0.17 |
| 10/7/2002 | | | | | | | | | | | | | |
| 12/2/2002 | | | | | | | | | | | | | |
| 2/3/2003 | <0.04 | 0.12 | 0.9 | 1.3 | <10 | <0.1 | <300 | ND | <0.04 | <10 | <0.1 | <300 | ND |
| 4/7/2003 | | | | | | | | | | | | | |
| 6/2/2003 | | | | | | | | | | | | | |
| 8/4/2003 | <0.040 | 0.19 | 0.53 | 0.69 | <10 | <10 | <300 | 0.049 | <0.040 | <10 | <10 | <300 | ND |
| 10/6/2003 | | | | | | | | | | | | | |
| 12/1/2003 | | | | | | | | | | | | | |
| 2/2/2004 | 0.044 | 0.077 | 0.85 | 0.95 | <10 | <10 | <300 | ND | 0.044 | <10 | <10 | <300 | ND |
| 4/5/2004 | | | | | | | | | | | | | |
| 6/7/2004 | | | | | | | | | | | | | |
| 8/2/2004 | <0.04 | <0.040 | 0.069 | 0.58 | <10 | <0.2 | <310 | 0.7 | 0.049 | <10 | <0.2 | <310 | ND |
| 10/4/2004 | | | | | | | | | | | | | |
| 12/6/2004 | | | | | | | | | | | | | |
| 2/7/2005 | <0.040 | <0.040 | 0.1 | 0.15 | | | | | <0.040 | | | | |
| 4/4/2005 | | | | | | | | | | | | | |
| 6/6/2005 | | | | | | | | | | | | | |
| 8/1/2005 | <0.040 | 0.068 | 0.15 | 0.22 | <10 | <10 | <300 | 0.092 | <0.040 | <10 | <10 | <300 | 0.53 |
| 10/3/2005 | | | | | | | | | | | | | |
| 12/5/2005 | | | | | | | | | | | | | |
| 2/6/2006 | <0.1 | 0.057 | 0.119 | 0.135 | | | | | 0.09 | | | | |


Montana Pole Plant
Facility Map Showing Selected Wells
BMW-9A
GW-14R-98
HCA-21
MW-L-96
MW-K-01
MW-E-01
MW-L-01
INF-06
MW-A-99
MW-Q-01
INF-12
MW-A-95
INF-15
INF-18
MW-U-01
0 25 50 100 150 200
Meters
0 125 250 500 750 1,000
Feet
1:2,500
N

# Appendix C. Surface Water Data

# Montana Pole and Treating Plant Surface Water Quality Data

| Date | SW-01 (upstream (background)-residual SBC channel) | | | | SW-02 (west end contaminant plume) | | | | SW-03 (SS-07 USGS Gaging Station -12323250) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PCP (ug/L) | Chlorophenols (ug/L) | PAH (ug/L) | Dioxin/Furans (pg/L) | PCP (ug/L) | Chlorophenols (ug/L) | PAH (ug/L) | Dioxin/Furans (pg/L) | PCP (ug/L) | QUAL | Chlorophenols (ug/L) | PAH (ug/L) | Dioxin/Furans (pg/L) |
| 2/12/2001 | | | | | | | | | 0.472 | | | | |
| 4/2/2001 | 0.677 | | | | 0.551 | | | | 1.38 | | | | |
| 6/4/2001 | 0.821 | | | | 1.91 | | | | 2.44 | | | | |
| 8/13/2001 | 0.12 | <10 | <0.33 | 3.994 | | <10 | <0.33 | 0.85 | 0.097 | | <10 | <0.33 | 0.026 |
| 10/8/2001 | 0.796 | | | | 0.512 | | | | <0.2 | U | | | |
| 12/10/2001 | Dry | | | | Dry | | | | 0.09 | | | | |
| 2/4/2002 | Dry | | | | Dry | | | | <0.1 | U | <10 | <0.1 | ND |
| 4/1/2002 | Dry | | | | Dry | | | | 0.559 | | | | |
| 6/3/2002 | Dry | | | | Dry | | | | 1.4 | | | | |
| 8/12/2002 | Dry | | | | Dry | | | | 2.07 | | <10 | <0.1 | ND |
| 10/7/2002 | Dry | | | | Dry | | | | 0.367 | | | | |
| 12/2/2002 | Dry | | | | Dry | | | | 2.15 | | | | |
| 2/3/2003 | Dry | | | | Dry | | | | 0.044 | | <10 | <0.1 | ND |
| 4/7/2003 | 0.065 | | | | 0.076 | | | | <0.040 | U | | | |
| 6/2/2003 | <0.04 | | | | 0.08 | | | | 0.059 | | | | |
| 8/4/2003 | Dry | | | | Dry | | | | 0.059 | | <10 | <10 | 0.090 |
| 10/6/2003 | Dry | | | | Dry | | | | <0.040 | U | | | |
| 12/1/2003 | Dry | | | | Dry | | | | <0.040 | U | | | |
| 2/2/2004 | Dry | | | | Dry | | | | <0.040 | U | <10 | <10 | ND |
| 4/5/2004 | Dry | | | | Dry | | | | <0.040 | U | | | |
| 6/7/2004 | Dry | | | | Dry | | | | <0.040 | U | | | |
| 8/2/2004 | Dry | | | | Dry | | | | <0.040 | U | <10 | <0.2 | ND |
| 10/4/2004 | Dry | | | | Dry | | | | <0.040 | U | | | |
| 12/6/2004 | Dry | | | | Dry | | | | <0.040 | U | | | |
| 2/7/2005 | Dry | | | | Dry | | | | <0.040 | U | | | |
| 4/4/2005 | Dry | | | | Dry | | | | 0.25 | | | | |
| 6/6/2005 | Dry | | | | Dry | | | | <0.040 | U | | | |
| 8/1/2005 | Dry | | | | Dry | | | | <0.040 | U | <10 | <10 | 0.170 |
| 10/3/2005 | Dry | | | | Dry | | | | <0.040 | U | | | |
| 12/5/2005 | Dry | | | | Dry | | | | <0.1 | U | | | |

**Qualifier Explanations**

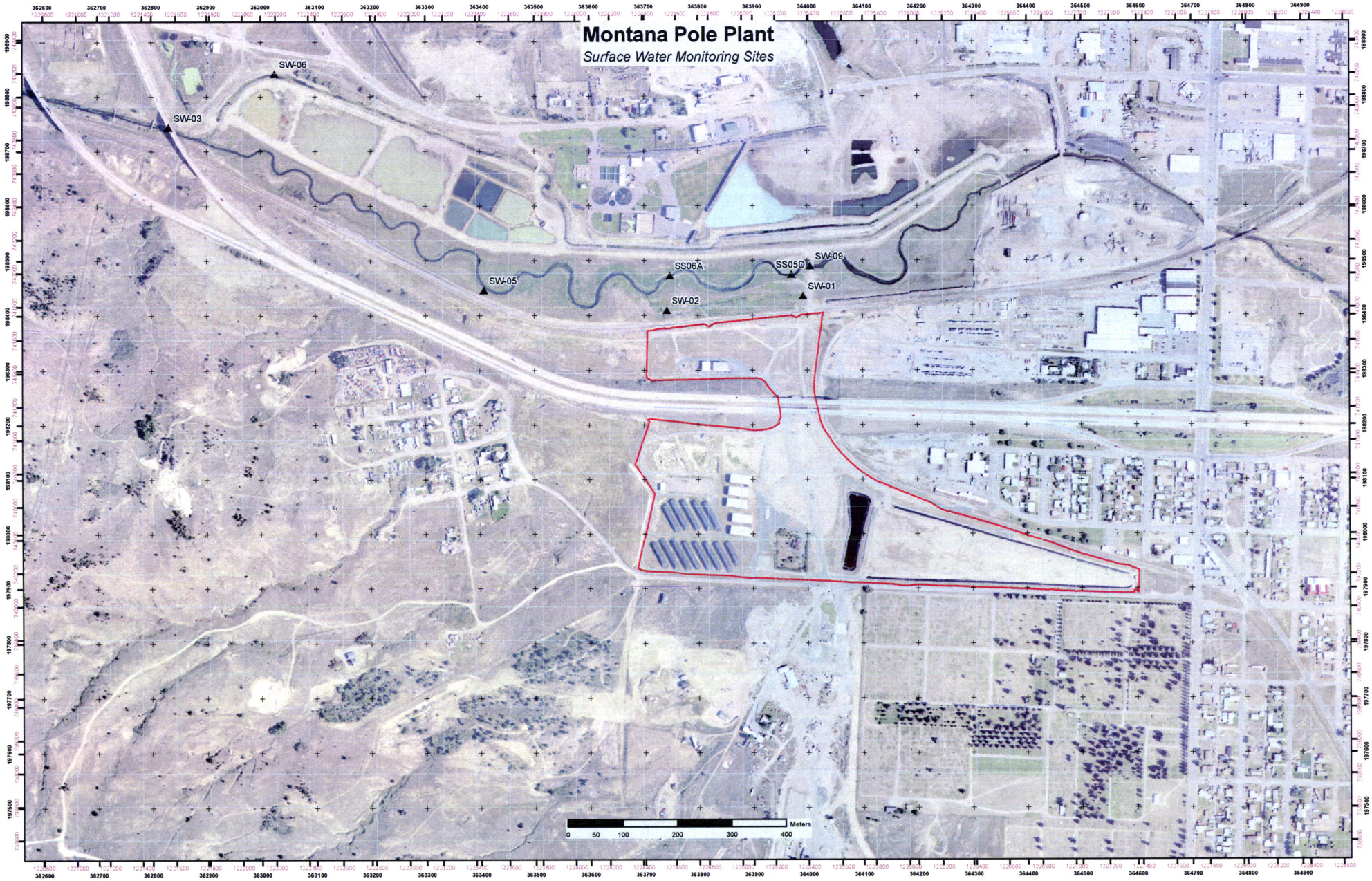
U = Indicates compound was analyzed for but not detected.

J = Estimated Value. Present, but less than the limit of quantitation.

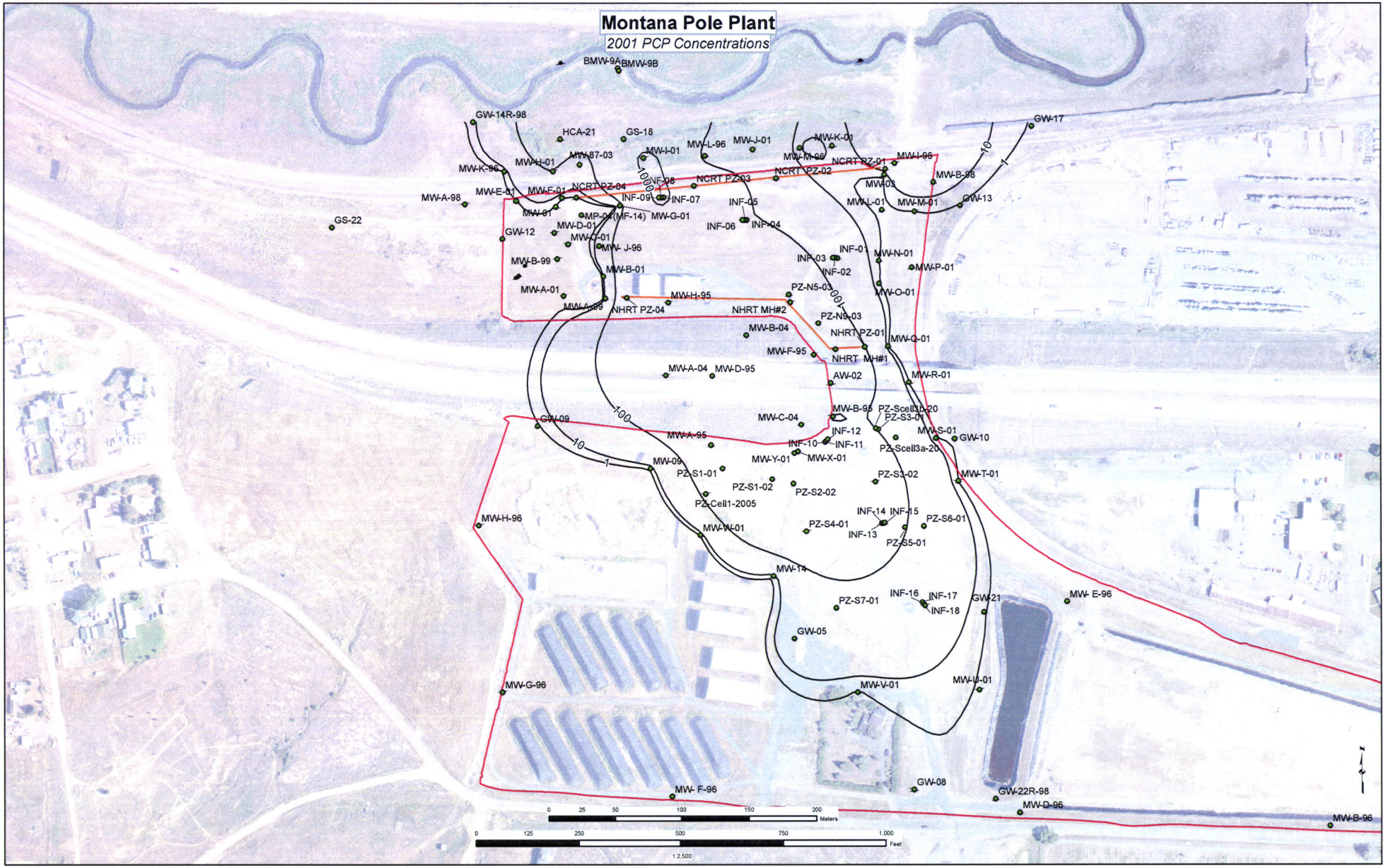
** Lab unable to quantify

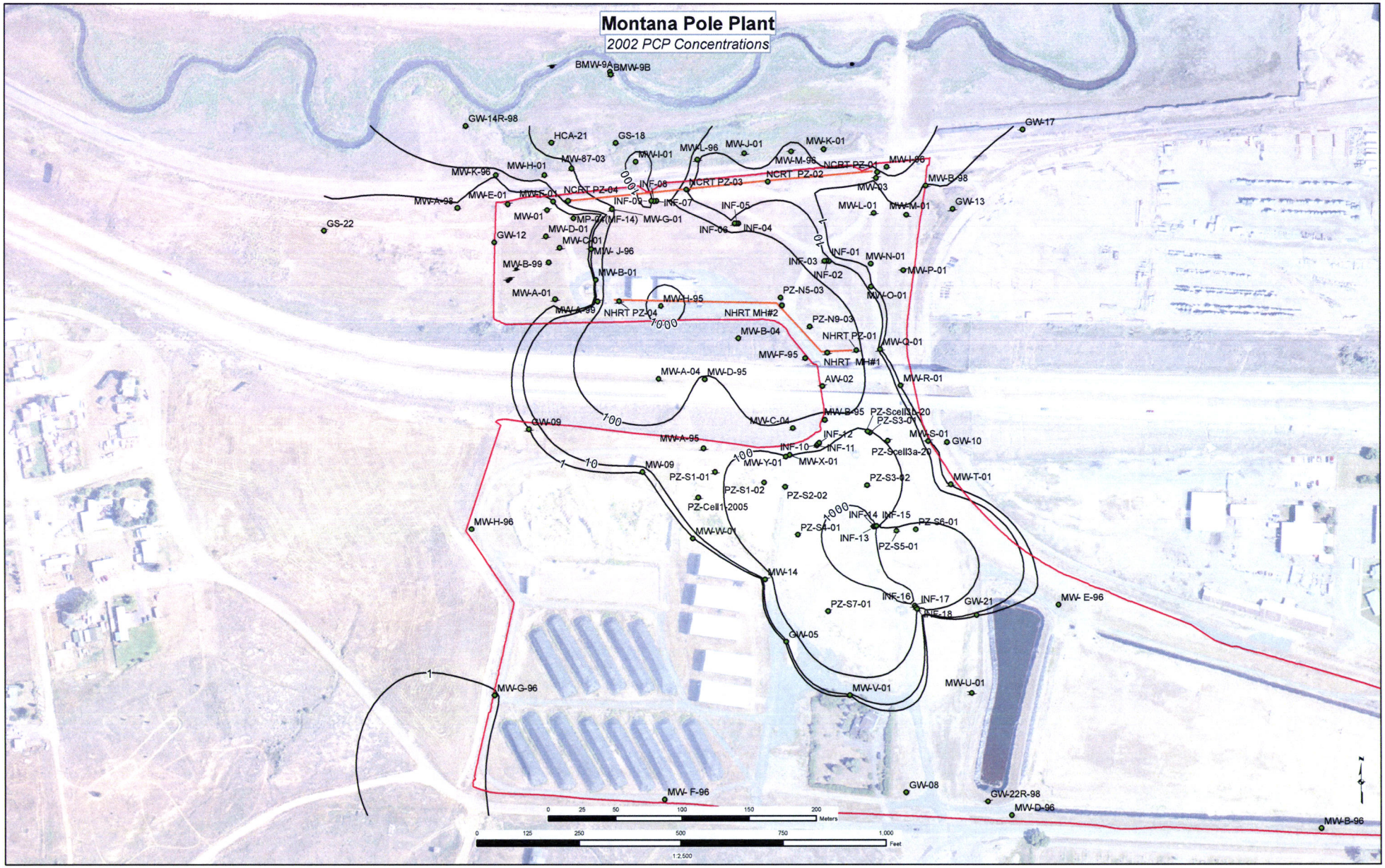
# Montana Pole and Treating Plant Surface Water Quality Data

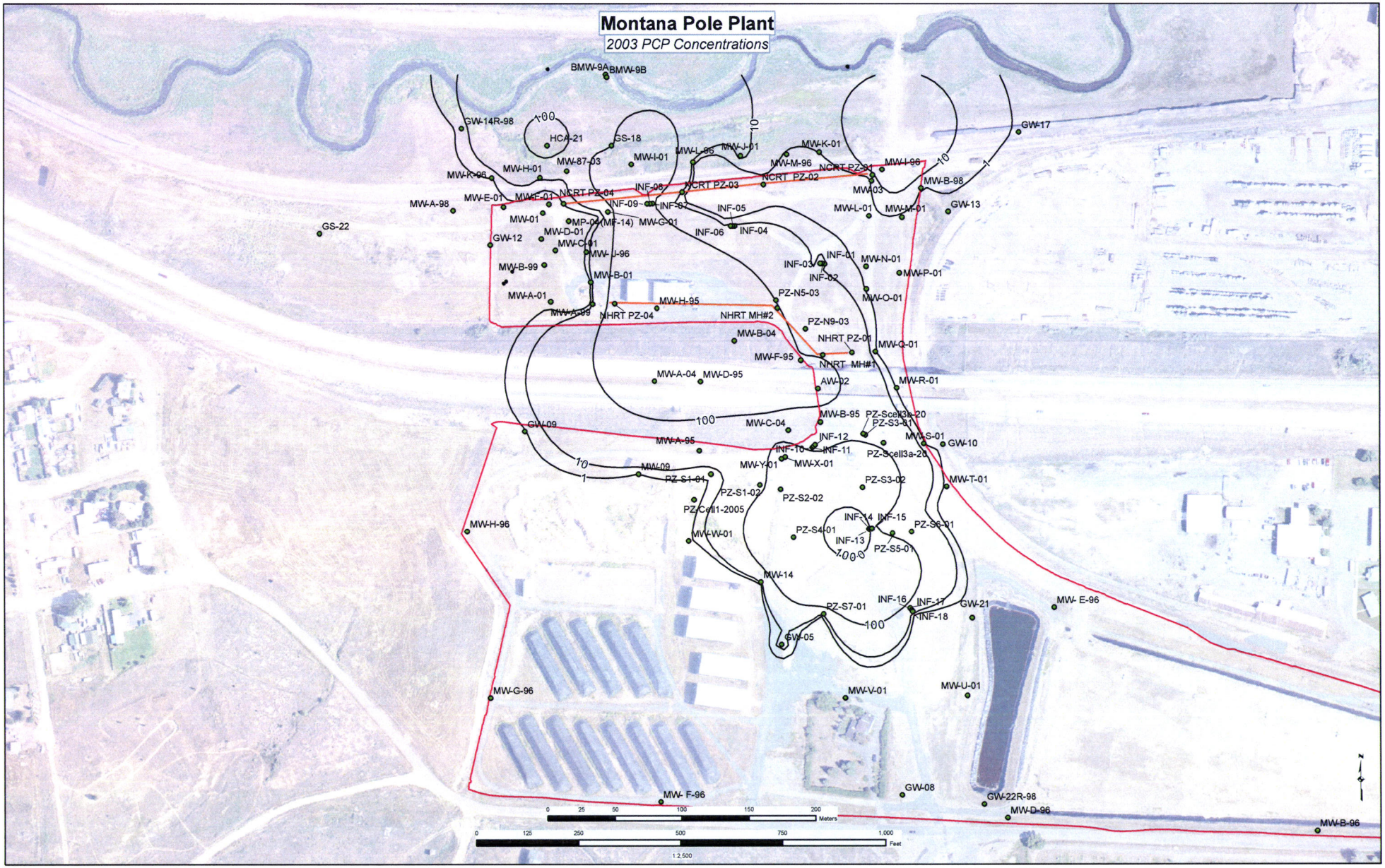
| Date | SW-05 (new SBC Channel, midway Colorado Tailings Removal Area) | | | | | SW-06 (Residual SBC Channel, west end LAO) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PCP (ug/L) | QUAL | Chlorophenols (ug/L) | PAH (ug/L) | Dioxin/Furans (pg/L) | PCP (ug/L) | QUAL | Chlorophenols (ug/L) | PAH (ug/L) | Dioxin/Furans (pg/L) |
| 2/12/2001 | <0.2 | U | | | | 2.7 | | | | |
| 4/2/2001 | 0.262 | | | | | 2.23 | | | | |
| 6/4/2001 | 0.42 | | | | | 1.96 | | | | |
| 8/13/2001 | 1.8 | | <10 | <0.33 | 0.076 | 0.61 | | <10 | <0.33 | |
| 10/8/2001 | 0.204 | | | | | 1.36 | | | | |
| 12/10/2001 | <0.1 | U | | | | 0.4 | | | | |
| 2/4/2002 | <0.1 | U | <10 | <0.1 | 0.089 | 0.25 | | <10 | <0.1 | 0.1 |
| 4/1/2002 | 0.91 | | | | | 1.78 | | | | |
| 6/3/2002 | <0.2 | U | | | | 1.15 | | | | |
| 8/12/2002 | <0.2 | U | <10 | <0.1 | ND | 1.42 | | <10 | <0.1 | ND |
| 10/7/2002 | <0.2 | U | | | | 0.589 | | | | |
| 12/2/2002 | 0.509 | | | | | 0.6 | | | | |
| 2/3/2003 | 0.071 | | <10 | <0.1 | 0.13 | 0.18 | | <10 | <0.1 | 0.76 |
| 4/7/2003 | 0.15 | | | | | 0.18 | | | | |
| 6/2/2003 | <0.04 | U | | | | 0.16 | | | | |
| 8/4/2003 | 0.069 | | <10 | <10 | 0.25 | 0.28 | | <10 | <10 | ND |
| 10/6/2003 | <0.040 | U | | | | 0.2 | | | | |
| 12/1/2003 | <0.040 | U | | | | 0.24 | | | | |
| 2/2/2004 | <0.040 | U | <10 | <10 | 0.083 | 0.37 | | <10 | <10 | 0.19 |
| 4/5/2004 | <0.040 | U | | | | 0.23 | | | | |
| 6/7/2004 | <0.040 | U | | | | 0.32 | | | | |
| 8/2/2004 | <0.040 | U | <10 | <0.2 | ND | 0.27 | | <10 | <0.2 | ND |
| 10/4/2004 | <0.040 | U | | | | <0.040 | U | | | |
| 12/6/2004 | <0.040 | U | | | | 0.19 | | | | |
| 2/7/2005 | <0.040 | U | | | | 0.16 | | | | |
| 4/4/2005 | <0.040 | U | | | | 0.29 | | | | |
| 6/6/2005 | 0.063 | | | | | 0.19 | | | | |
| 8/1/2005 | 0.045 | | <10 | <10 | 0.57 | 0.34 | | <10 | <10 | 2.007 |
| 10/3/2005 | 0.055 | | | | | 0.16 | | | | |
| 12/5/2005 | 0.071 | J | | | | 1.32 | | | | |


Montana Pole Plant
Surface Water Monitoring Sites
SW-06
SW-03
SW-05
SS06A
SS05D
SW-09
SW-01
SW-02
0 50 100 200 300 400
Meters

# Appendix D. PCP Isocontours and Static Water Levels


Montana Pole Plant
2001 PCP Concentrations
BMW-9A
BMW-9B
GW-14R-98
HCA-21
GS-18
MW-87-03
MW-I-01
MW-L-96
MW-J-01
MW-K-01
MW-M-96
NCRT PZ-01
MW-I-96
GW-17
MW-K-96
MW-H-01
NCRT PZ-02
MW-B-98
MW-A-98
MW-E-01
MW-F-01
NCRT PZ-04
NCRT PZ-03
INF-08
INF-09
INF-07
INF-05
MW-03
MW-L-01
MW-M-01
GW-13
GS-22
MW-01
MP-04 (MF-14)
MW-G-01
INF-06
INF-04
GW-12
MW-D-01
MW-C-01
MW- J-96
INF-01
MW-N-01
MW-B-99
INF-03
MW-P-01
MW-B-01
INF-02
MW-A-01
PZ-N5-03
MW-O-01
MW-H-95
MW-A-99
NHRT PZ-04
NHRT MH#2
PZ-N5-03
MW-B-04
NHRT PZ-01
MW-Q-01
MW-F-95
NHRT MH#1
MW-A-04
MW-D-95
AW-02
MW-R-01
MW-B-95
PZ-Scell3b-20
PZ-S3-01
GW-09
MW-C-04
INF-12
MW-S-01
GW-10
MW-A-95
INF-10
INF-11
PZ-Scell3a-20
MW-09
MW-Y-01
MW-X-01
PZ-S1-01
PZ-S3-02
MW-T-01
PZ-S1-02
PZ-S2-02
PZ-Cell1-2005
INF-14
INF-15
PZ-S6-01
MW-H-96
PZ-S4-01
MW-W-01
INF-13
PZ-S5-01
MW-14
INF-16
INF-17
GW-21
MW- E-96
PZ-S7-01
INF-18
GW-05
MW-G-96
MW-V-01
MW-U-01
GW-08
MW- F-96
GW-22R-98
MW-D-96
MW-B-96
100
10
1
0 25 50 100 150 200
Meters
0 125 250 500 750 1,000
Feet
1:2,500


Montana Pole Plant
2002 PCP Concentrations
BMW-9A
BMW-9B
GW-14R-98
HCA-21
GS-18
MW-87-03
MW-I-01
MW-L-96
MW-J-01
MW-K-01
MW-M-96
NCRT PZ-01
MW-I-96
GW-17
MW-K-96
MW-H-01
NCRT PZ-02
MW-B-98
MW-03
MW-A-98
MW-E-01
MW-F-01
NCRT PZ-04
INF-08
NCRT PZ-03
INF-09
INF-07
INF-05
MW-L-01
MW-M-01
GW-13
GS-22
MW-01
MP-04(MF-14)
MW-G-01
INF-06
INF-04
MW-D-01
GW-12
MW-C-01
MW- J-96
INF-01
MW-N-01
INF-03
MW-P-01
MW-B-99
MW-B-01
INF-02
MW-A-01
PZ-N5-03
MW-O-01
MW-H-95
MW-A-99
NHRT PZ-04
NHRT MH#2
PZ-N9-03
MW-B-04
NHRT PZ-01
MW-Q-01
MW-F-95
NHRT MH#1
MW-A-04
MW-D-95
AW-02
MW-R-01
MW-B-95
PZ-Cell3b-20
PZ-S3-01
GW-09
MW-C-04
INF-12
MW-S-01
GW-10
MW-A-95
INF-10
INF-11
PZ-Cell3a-20
MW-09
MW-Y-01
MW-X-01
PZ-S1-01
PZ-S3-02
MW-T-01
PZ-S1-02
PZ-S2-02
PZ-Cell1-2005
MW-H-96
INF-14
INF-15
PZ-S6-01
PZ-S4-01
MW-W-01
INF-13
PZ-S5-01
MW-14
INF-16
INF-17
GW-21
MW- E-96
PZ-S7-01
INF-18
GW-05
MW-G-96
MW-V-01
MW-U-01
MW- F-96
GW-08
GW-22R-98
MW-D-96
MW-B-96
0 25 50 100 150 200 Meters
0 125 250 500 750 1,000 Feet
1:2,500


Montana Pole Plant
2003 PCP Concentrations
BMW-9A
BMW-9B
GW-14R-98
HCA-21
GS-18
MW-87-03
MW-I-01
MW-L-96
MW-J-01
MW-K-01
MW-M-96
NCRT PZ-01
MW-I-96
GW-17
MW-H-01
MW-K-96
NCRT PZ-02
MW-03
MW-B-98
MW-A-98
MW-E-01
MW-F-01
NCRT PZ-04
INF-08
NCRT PZ-03
INF-09
INF-07
INF-05
MW-L-01
MW-M-01
GW-13
GS-22
MW-01
MP-04 (MF-14)
MW-G-01
INF-06
INF-04
GW-12
MW-D-01
MW-C-01
MW-J-96
INF-01
MW-N-01
MW-B-99
MW-B-01
INF-03
INF-02
MW-P-01
MW-A-01
PZ-N5-03
MW-O-01
MW-H-95
MW-A-99
NHRT PZ-04
NHRT MH#2
PZ-N9-03
MW-B-04
NHRT PZ-01
MW-Q-01
MW-F-95
NHRT MH#1
MW-A-04
MW-D-95
AW-02
MW-R-01
MW-B-95
PZ-Scell3a-20
PZ-S3-01
GW-09
MW-C-04
INF-12
MW-S-01
GW-10
MW-A-95
INF-10
INF-11
PZ-Scell3a-20
MW-09
MW-Y-01
MW-X-01
PZ-S1-01
PZ-S3-02
MW-T-01
PZ-S1-02
PZ-S2-02
PZ-Cell1-2005
INF-14
INF-15
PZ-S6-01
MW-H-96
PZ-S4-01
MW-W-01
INF-13
PZ-S5-01
MW-14
INF-16
INF-17
GW-21
MW-E-96
PZ-S7-01
INF-18
GW-05
MW-G-96
MW-V-01
MW-U-01
MW-F-96
GW-08
GW-22R-98
MW-D-96
MW-B-96
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0 125 250 500 750 1,000 Feet
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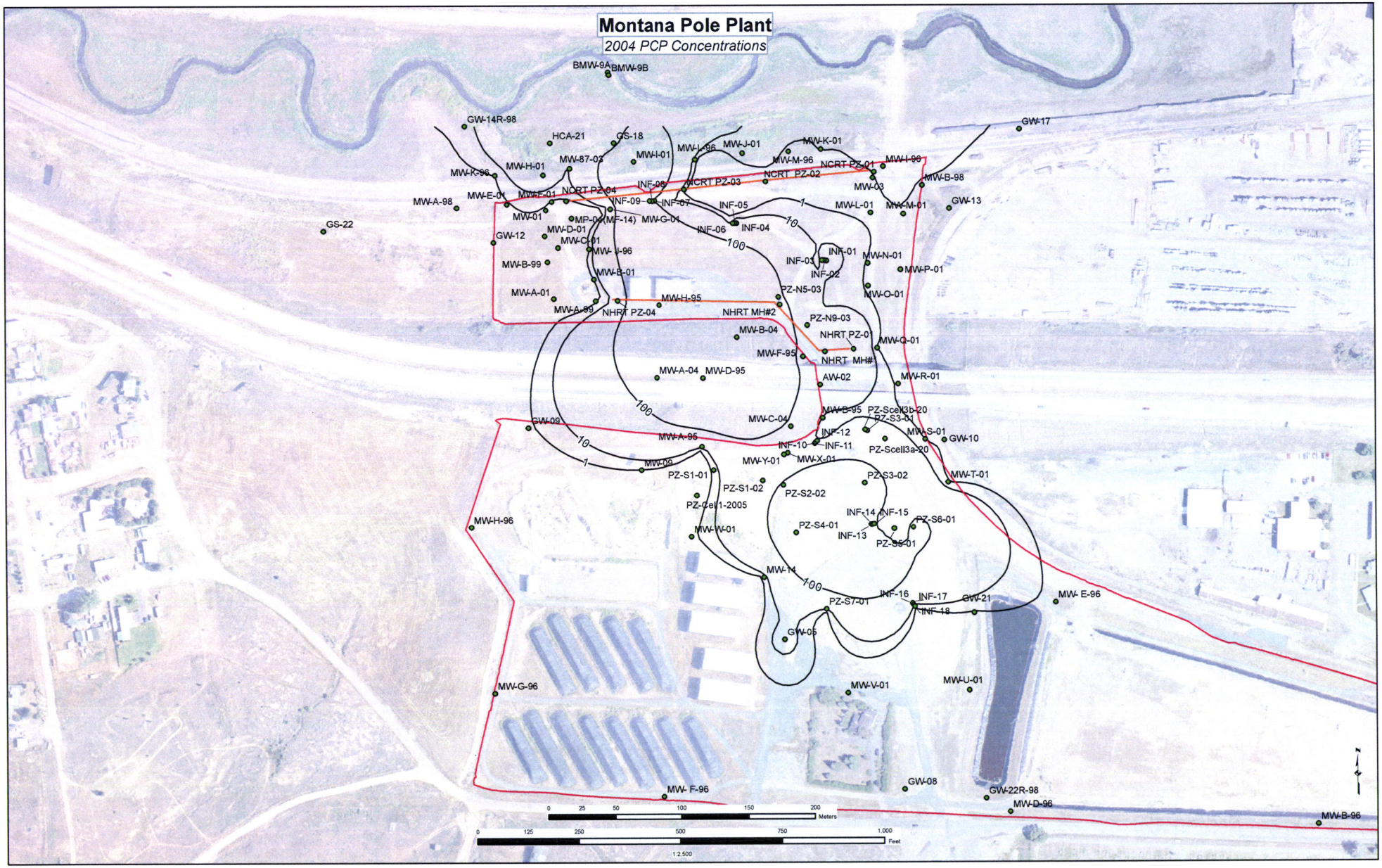
Montana Pole Plant
2004 PCP Concentrations
BMW-9A
BMW-9B
GW-14R-98
HCA-21
GS-18
MW-87-03
MW-I-01
MW-I-96
MW-J-01
MW-K-01
MW-M-96
NCRT PZ-01
MW-I-96
GW-17
MW-H-01
MW-K-96
NCRT PZ-02
MW-B-98
MW-03
NCRT PZ-03
INF-08
NCRT PZ-04
MW-E-01
MW-E-01
MW-A-98
INF-09
INF-07
INF-05
MW-L-01
MW-M-01
GW-13
MW-01
GS-22
MP-04(MF-14)
MW-G-01
INF-06
INF-04
GW-12
MW-D-01
MW-C-01
MW-I-96
MW-B-99
MW-B-01
INF-01
INF-03
INF-02
MW-N-01
MW-P-01
MW-A-01
MW-A-99
NHRT PZ-04
MW-H-95
PZ-N5-03
MW-O-01
NHRT MH#2
PZ-N9-03
MW-B-04
NHRT PZ-01
MW-Q-01
MW-F-95
NHRT MH#
MW-A-04
MW-D-95
AW-02
MW-R-01
MW-B-95
PZ-SceII3b-20
PZ-S3-03
MW-C-04
GW-09
MW-A-95
INF-12
MW-S-01
GW-10
INF-10
INF-11
PZ-SceII3a-20
MW-09
MW-Y-01
MW-X-01
PZ-S1-01
PZ-S3-02
MW-T-01
PZ-S1-02
PZ-S2-02
PZ-SceII1-2005
INF-14
INF-15
PZ-S6-01
MW-H-96
PZ-S4-01
MW-W-01
INF-13
PZ-S5-01
MW-14
INF-16
INF-17
GW-21
MW-E-96
PZ-S7-01
INF-18
GW-05
MW-G-96
MW-V-01
MW-U-01
MW-F-96
GW-08
GW-22R-98
MW-D-96
MW-B-96
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1
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Meters
0 125 250 500 750 1,000
Feet
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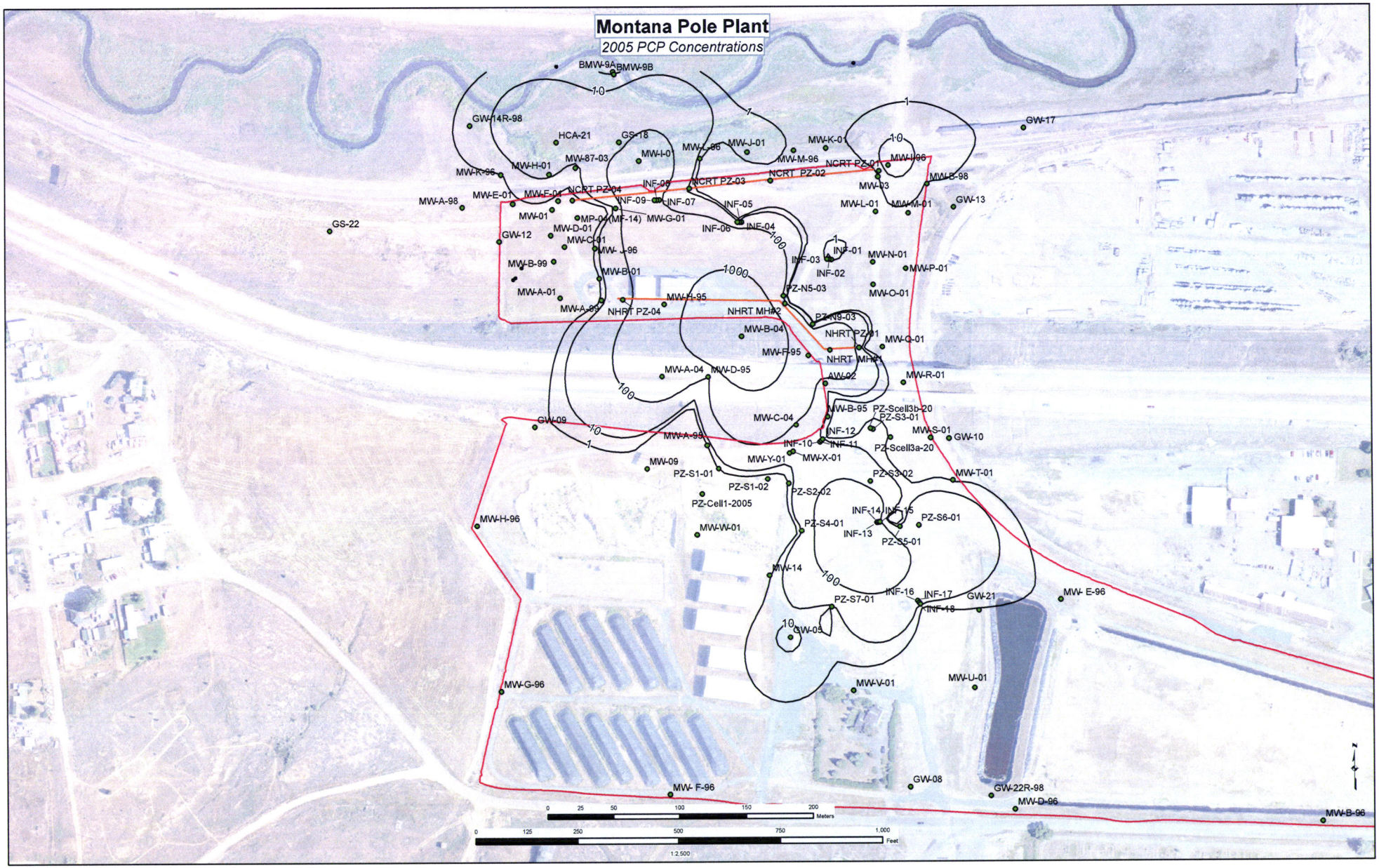
Montana Pole Plant
2005 PCP Concentrations
BMW-9A
BMW-9B
GW-14R-98
HCA-21
GS-18
MW-87-03
MW-I-01
MW-L-96
MW-J-01
MW-K-01
MW-M-96
NCRT PZ-01
MW-U-96
GW-17
MW-H-01
MW-K-96
NCRT PZ-02
MW-B-98
MW-03
INF-06
NCRT PZ-03
NCRT PZ-04
MW-A-98
MW-E-01
MW-F-01
INF-09
INF-07
INF-05
MW-L-01
MW-M-01
GW-13
MW-01
MP-01 (MF-14)
MW-G-01
GS-22
MW-D-01
INF-06
INF-04
GW-12
MW-C-01
MW-J-96
INF-01
MW-N-01
MW-B-99
INF-03
MW-P-01
INF-02
MW-B-01
PZ-N5-03
MW-A-01
MW-H-95
MW-O-01
MW-A-95
NHRT PZ-04
NHRT MH-2
PZ-N9-03
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NHRT PZ-01
MW-Q-01
MW-F-95
NHRT MH-1
MW-A-04
MW-D-95
AW-02
MW-R-01
MW-B-95
PZ-Scell3b-20
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PZ-S3-01
GW-09
MW-A-95
INF-12
MW-S-01
GW-10
INF-10
INF-11
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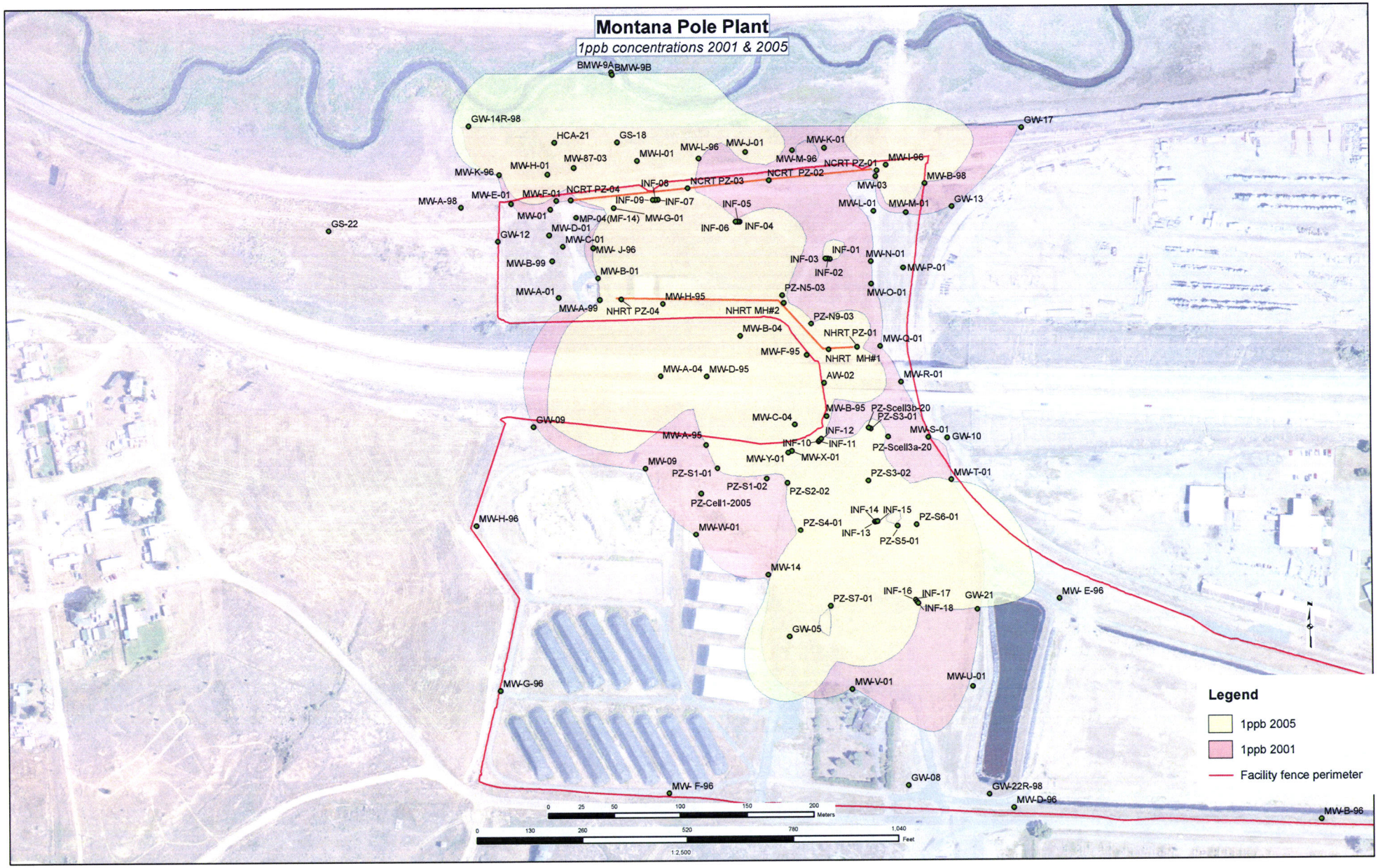
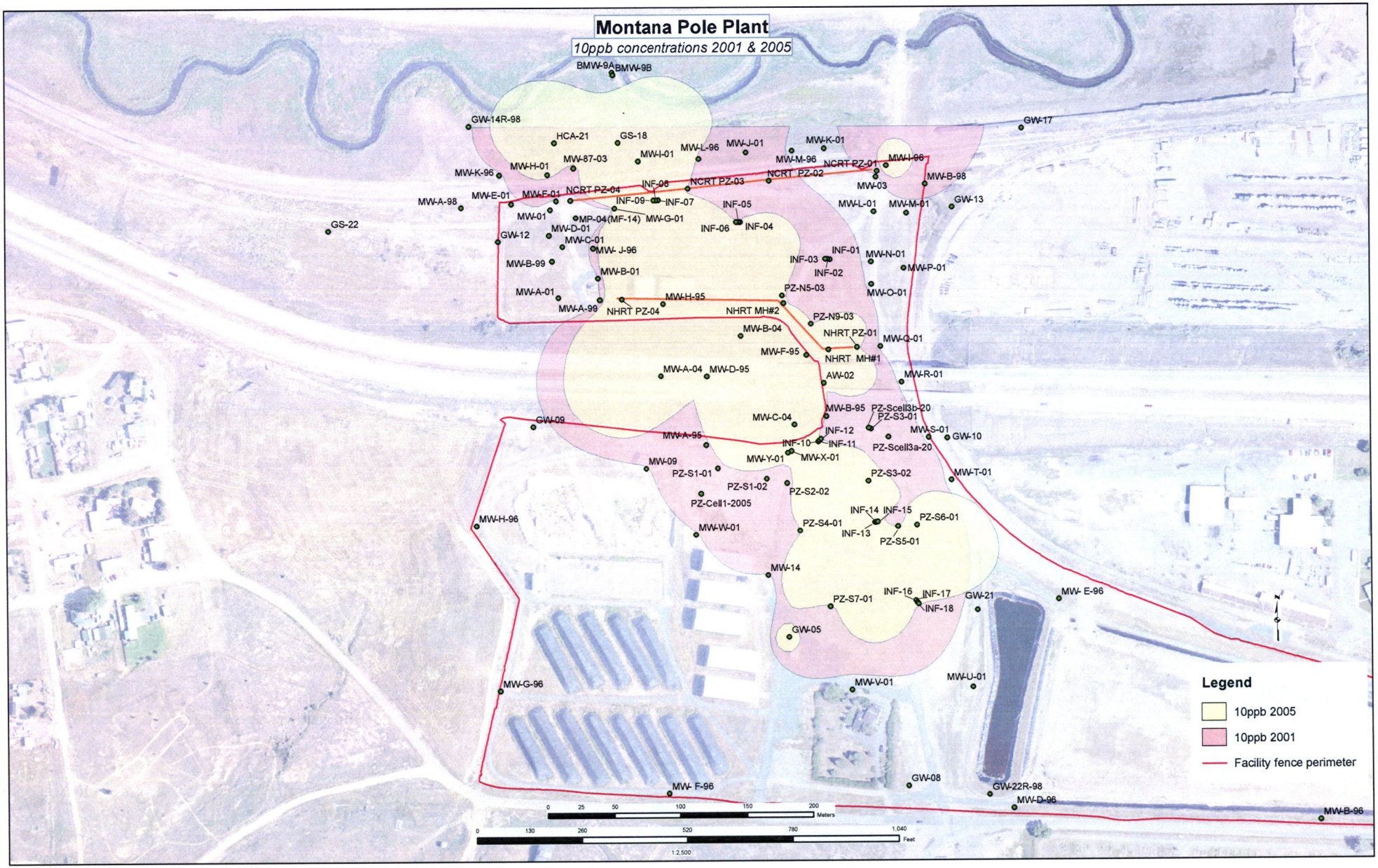
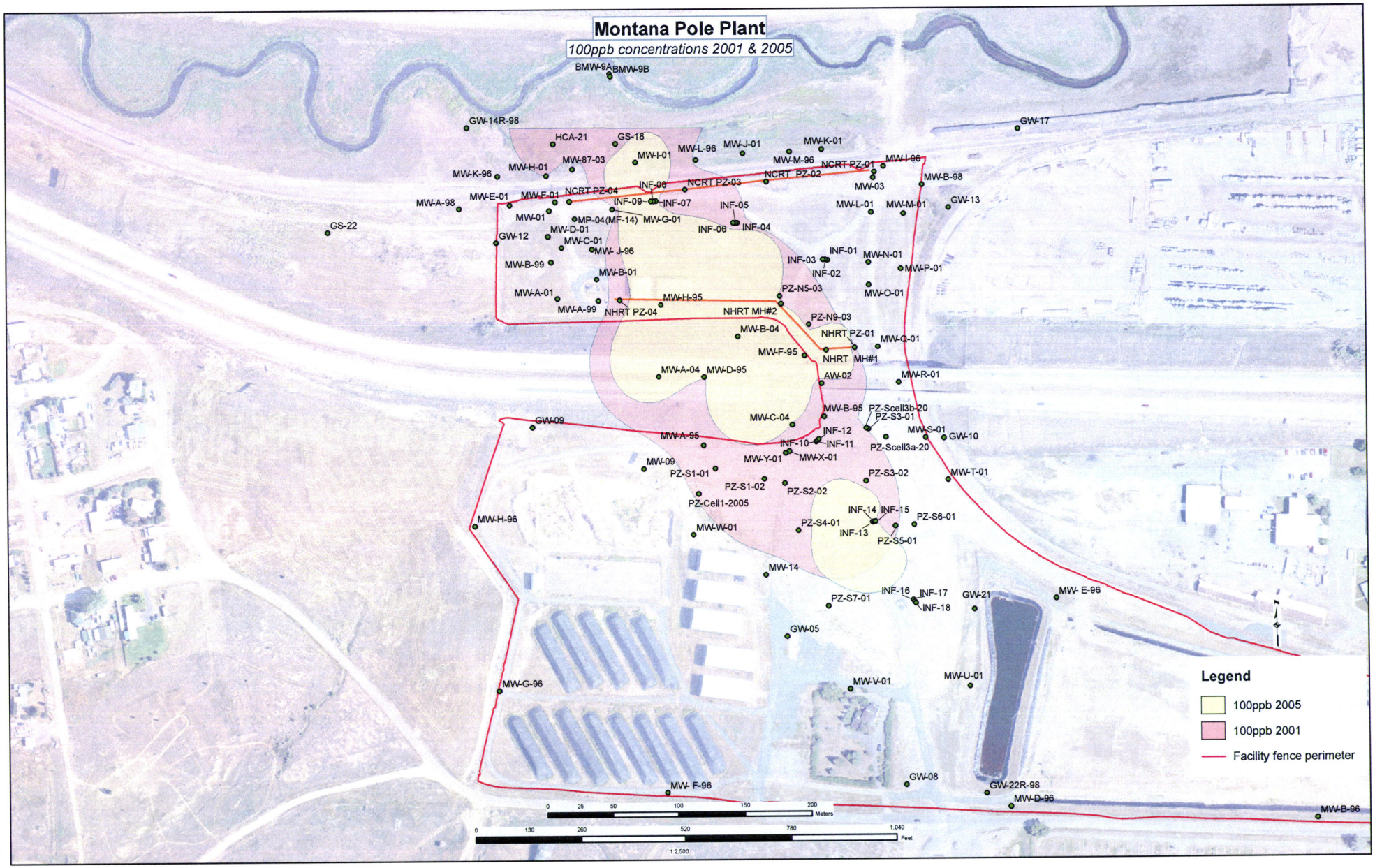
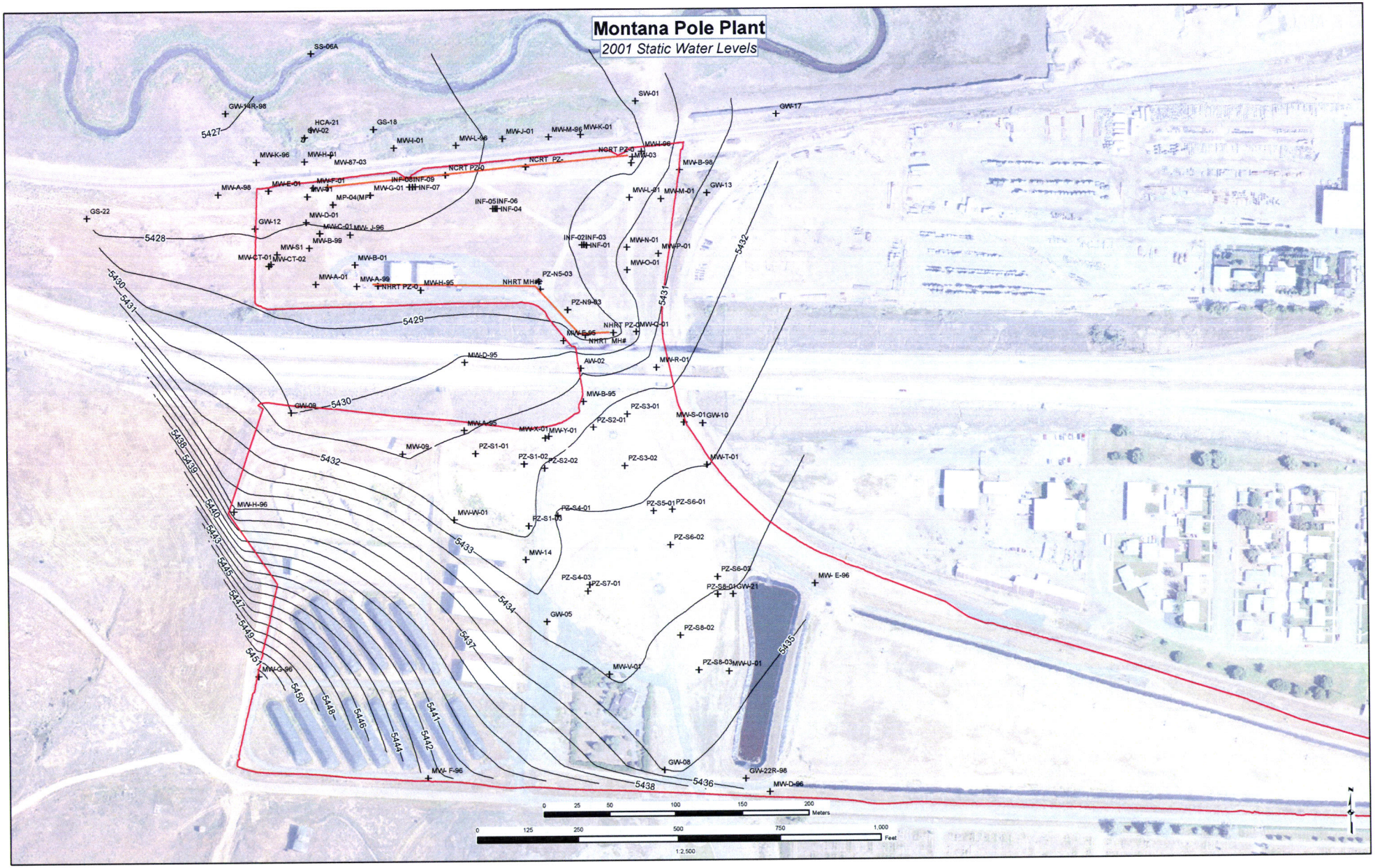
MW-09
MW-Y-01
MW-X-01
PZ-S3-02
MW-T-01
PZ-S1-01
PZ-S1-02
PZ-S2-02
PZ-Cell1-2005
INF-14
INF-15
PZ-S6-01
MW-H-96
PZ-S4-01
MW-W-01
INF-13
PZ-S5-01
MW-14
INF-16
INF-17
GW-21
MW- E-96
PZ-S7-01
INF-18
GW-05
MW-G-96
MW-V-01
MW-U-01
MW- F-96
GW-08
GW-22R-98
MW-D-96
MW-B-96
1
10
100
1000
0 25 50 100 150 200 Meters
0 125 250 500 750 1,000 Feet
1:2,500


Montana Pole Plant
1ppb concentrations 2001 & 2005
BMW-9A
BMW-9B
GW-14R-98
HCA-21
GS-18
MW-87-03
MW-I-01
MW-L-96
MW-J-01
MW-K-01
GW-17
MW-H-01
MW-K-96
MW-M-96
NCRT PZ-01
MW-I-96
NCRT PZ-02
MW-B-98
MW-03
INF-08
NCRT PZ-03
MW-E-01
MW-F-01
NCRT PZ-04
INF-09
INF-07
INF-05
MW-A-98
MW-L-01
MW-M-01
GW-13
MW-01
MP-04 (MF-14)
MW-G-01
GS-22
MW-D-01
INF-06
INF-04
GW-12
MW-C-01
MW- J-96
INF-01
MW-N-01
INF-03
MW-B-99
INF-02
MW-P-01
MW-B-01
PZ-N5-03
MW-O-01
MW-A-01
MW-H-95
MW-A-99
NHRT PZ-04
NHRT MH#2
PZ-N9-03
MW-B-04
NHRT PZ-01
MW-Q-01
MW-F-95
NHRT MH#1
MW-A-04
MW-D-95
AW-02
MW-R-01
MW-B-95
PZ-Scell3b-20
MW-C-04
PZ-S3-01
GW-09
INF-12
MW-S-01
GW-10
MW-A-95
INF-10
INF-11
PZ-Scell3a-20
MW-Y-01
MW-X-01
MW-09
PZ-S1-01
PZ-S3-02
MW-T-01
PZ-S1-02
PZ-S2-02
PZ-Cell1-2005
INF-14
INF-15
PZ-S6-01
MW-H-96
PZ-S4-01
INF-13
MW-W-01
PZ-S5-01
MW-14
INF-16
INF-17
GW-21
MW- E-96
PZ-S7-01
INF-18
GW-05
MW-G-96
MW-V-01
MW-U-01
GW-08
MW- F-96
GW-22R-98
MW-D-96
MW-B-96
0 25 50 100 150 200 Meters
0 130 260 520 780 1,040 Feet
1:2,500
Legend
1ppb 2005
1ppb 2001
Facility fence perimeter


Montana Pole Plant
10ppb concentrations 2001 & 2005
BMW-9A
BMW-9B
GW-14R-98
HCA-21
GS-18
MW-87-03
MW-I-01
MW-L-96
MW-J-01
MW-K-01
MW-M-96
NCRT PZ-01
MW-I-96
GW-17
MW-H-01
MW-K-96
NCRT PZ-02
MW-B-98
MW-03
INF-08
NCRT PZ-03
MW-E-01
MW-F-01
NCRT PZ-04
MW-A-98
INF-09
INF-07
INF-05
MW-L-01
MW-M-01
GW-13
MW-01
MP-04 (MF-14)
MW-G-01
GS-22
MW-D-01
INF-06
INF-04
GW-12
MW-C-01
MW- J-96
INF-01
MW-N-01
INF-03
MW-B-99
INF-02
MW-P-01
MW-B-01
MW-A-01
PZ-N5-03
MW-O-01
MW-H-95
MW-A-99
NHRT PZ-04
NHRT MH#2
PZ-N9-03
MW-B-04
NHRT PZ-01
MW-Q-01
MW-F-95
NHRT MH#1
MW-A-04
MW-D-95
AW-02
MW-R-01
MW-B-95
PZ-Scell3b-20
GW-09
MW-C-04
PZ-S3-01
INF-12
MW-S-01
GW-10
MW-A-95
INF-10
INF-11
PZ-Scell3a-20
MW-09
MW-Y-01
MW-X-01
PZ-S1-01
PZ-S3-02
MW-T-01
PZ-S1-02
PZ-S2-02
PZ-Cell1-2005
INF-14
INF-15
PZ-S6-01
MW-H-96
PZ-S4-01
MW-W-01
INF-13
PZ-S5-01
MW-14
INF-16
INF-17
GW-21
MW- E-96
PZ-S7-01
INF-18
GW-05
MW-U-01
MW-V-01
MW-G-96
GW-08
MW- F-96
GW-22R-98
MW-D-96
MW-B-96
Legend
10ppb 2005
10ppb 2001
Facility fence perimeter
0 25 50 100 150 200 Meters
0 130 260 520 780 1,040 Feet
1:2,500


Montana Pole Plant
100ppb concentrations 2001 & 2005
BMW-9A
BMW-9B
GW-14R-98
HCA-21
GS-18
MW-L-96
MW-J-01
MW-K-01
GW-17
MW-I-01
MW-87-03
MW-M-96
NCRT PZ-01
MW-I-96
MW-K-96
MW-H-01
NCRT PZ-02
MW-B-98
INF-08
NCRT PZ-03
MW-03
MW-E-01
MW-F-01
NCRT PZ-04
MW-A-98
INF-09
INF-07
INF-05
MW-L-01
MW-M-01
GW-13
MW-01
MP-04 (MF-14)
MW-G-01
GS-22
MW-D-01
INF-06
INF-04
GW-12
MW-C-01
MW-J-96
INF-01
MW-N-01
INF-03
MW-B-99
INF-02
MW-P-01
MW-B-01
PZ-N5-03
MW-A-01
MW-H-95
MW-O-01
MW-A-99
NHRT PZ-04
NHRT MH#2
PZ-N9-03
MW-B-04
NHRT PZ-01
MW-Q-01
MW-F-95
NHRT MH#1
MW-A-04
MW-D-95
AW-02
MW-R-01
MW-B-95
PZ-Scell3b-20
MW-C-04
PZ-S3-01
GW-09
INF-12
MW-S-01
GW-10
MW-A-95
INF-10
INF-11
PZ-Scell3a-20
MW-09
MW-Y-01
MW-X-01
PZ-S1-01
PZ-S3-02
MW-T-01
PZ-S1-02
PZ-S2-02
PZ-Cell1-2005
INF-14
INF-15
PZ-S6-01
MW-H-96
PZ-S4-01
MW-W-01
INF-13
PZ-S5-01
MW-14
INF-16
INF-17
GW-21
MW-E-96
PZ-S7-01
INF-18
GW-05
MW-G-96
MW-V-01
MW-U-01
GW-08
GW-22R-98
MW-F-96
MW-D-96
MW-B-96
Legend
100ppb 2005
100ppb 2001
Facility fence perimeter
0 25 50 100 150 200 Meters
0 130 260 520 780 1,040 Feet
1:2,500


Montana Pole Plant
2001 Static Water Levels
SS-06A
GW-14R-98
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HCA-21
SW-02
GS-18
MW-I-01
MW-L-96
MW-J-01
MW-M-96
MW-K-01
SW-01
GW-17
MW-K-96
MW-H-01
MW-87-03
NCRT PZ-0
MW-I-96
MW-03
MW-B-96
NCRT PZ-0
NCRT PZ-
MW-A-96
MW-E-01
MW-F-01
MW-01
INF-08
INF-07
MW-G-01
MP-04(MP)
INF-05
INF-06
INF-04
MW-L-01
MW-M-01
GW-13
GS-22
GW-12
MW-D-01
MW-C-01
MW-J-96
MW-B-99
5428
INF-02
INF-03
INF-01
MW-N-01
MW-P-01
MW-S1
MW-CT-01
MW-CT-02
MW-B-01
MW-O-01
5432
MW-A-01
MW-A-99
NHRT PZ-0
MW-H-95
NHRT MH#
PZ-N5-03
5430
5431
PZ-N9-03
5429
NHRT PZ-0
MW-C-01
MW-E-95
NHRT MH#
5431
MW-D-95
AW-02
MW-R-01
MW-B-95
GW-09
5430
PZ-S3-01
PZ-S2-01
MW-S-01
GW-10
MW-A-95
MW-X-01
MW-Y-01
5438
5439
MW-09
PZ-S1-01
PZ-S1-02
PZ-S2-02
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MW-W-01
PZ-S4-01
PZ-S5-01
PZ-S6-01
PZ-S1-03
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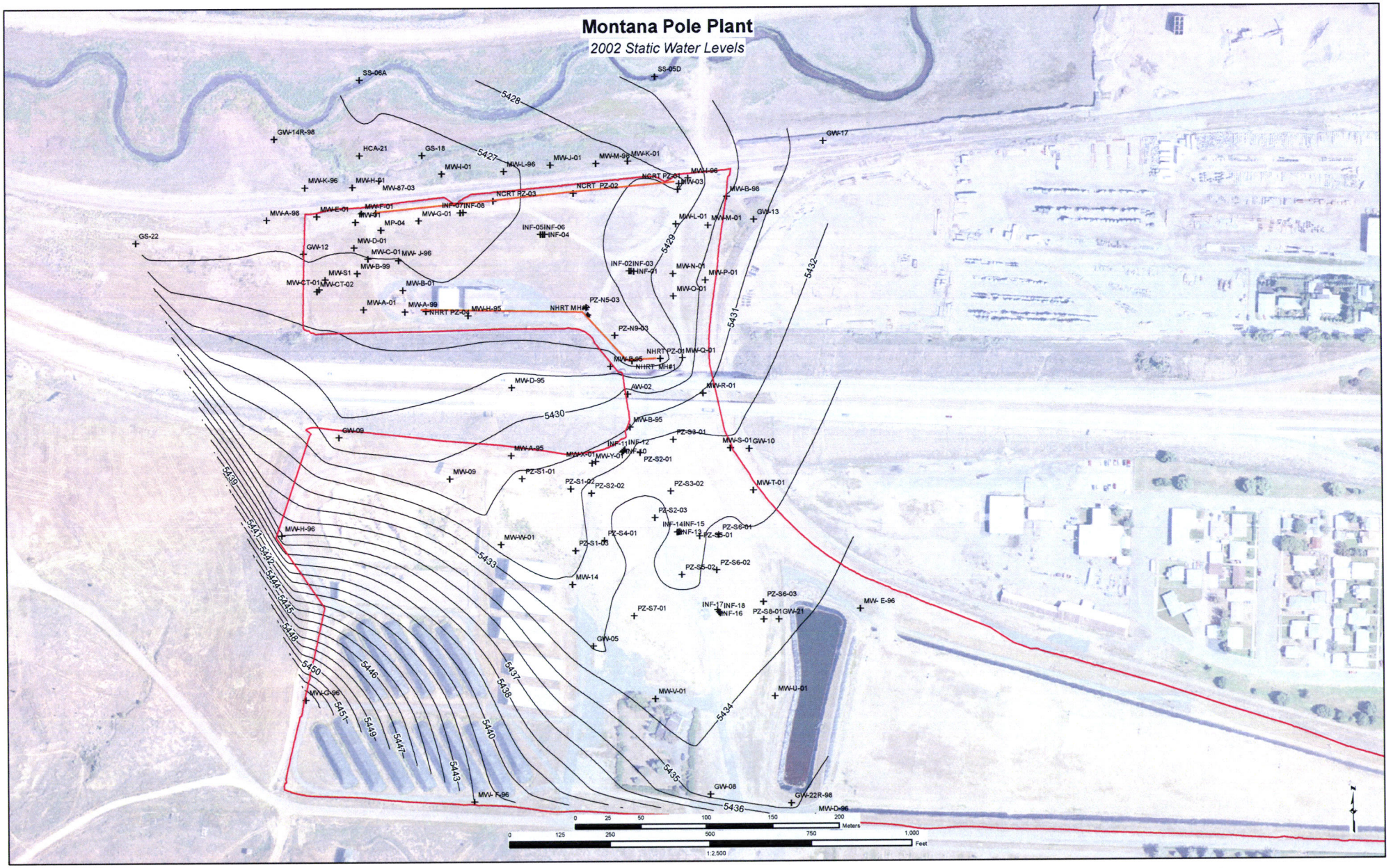
5435
5433
PZ-S6-02
MW-14
5447
PZ-S4-03
PZ-S7-01
PZ-S6-03
MW- E-96
PZ-S8-01
GW-21
5434
GW-05
5449
5451
PZ-S8-02
5437
MW-V-01
PZ-S8-03
MW-U-01
5435
MW-C-96
5450
5448
5446
5441
5444
5442
GW-08
GW-22R-98
MW-F-96
5438
5436
MW-D-96
0 25 50 100 150 200 Meters
0 125 250 500 750 1,000 Feet
1:2,500
N


Montana Pole Plant
2002 Static Water Levels
SS-06A
SS-05D
GW-14R-98
HCA-21
GS-18
GW-17
MW-I-01
MW-L-96
MW-J-01
MW-M-96
MW-K-01
MW-K-96
MW-H-01
MW-87-03
NCRT PZ-01
MW-I-96
MW-03
MW-B-98
NCRT PZ-02
NCRT PZ-03
MW-A-98
MW-E-01
MW-F-01
MW-01
MW-G-01
INF-07
INF-08
MW-L-01
MW-M-01
GW-13
MP-04
INF-05
INF-06
INF-04
GS-22
MW-D-01
GW-12
MW-C-01
MW- J-96
MW-B-99
INF-02
INF-03
INF-01
MW-N-01
MW-P-01
MW-S1
MW-CT-01
MW-CT-02
MW-B-01
MW-O-01
MW-A-01
MW-A-99
NHRT PZ-04
MW-H-95
NHRT MH-2
PZ-N5-03
PZ-N9-03
NHRT PZ-01
MW-Q-01
MW-B-95
NHRT MH-1
MW-D-95
AW-02
MW-R-01
GW-09
MW-B-95
PZ-S3-01
MW-A-95
INF-11
INF-12
INF-10
MW-X-01
MW-Y-01
PZ-S2-01
MW-S-01
GW-10
MW-09
PZ-S1-01
PZ-S1-02
PZ-S2-02
PZ-S3-02
MW-T-01
PZ-S2-03
MW-H-96
INF-14
INF-15
INF-13
PZ-S5-01
PZ-S6-01
MW-W-01
PZ-S4-01
PZ-S1-03
PZ-S5-02
PZ-S6-02
MW-14
PZ-S6-03
MW- E-96
PZ-S7-01
INF-17
INF-18
INF-16
PZ-S8-01
GW-21
GW-05
MW-V-01
MW-U-01
MW-G-96
MW- K-96
GW-08
GW-22R-98
MW-D-96
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5428
5429
5430
5431
5432
5433
5434
5435
5436
5437
5438
5439
5440
5441
5442
5443
5444
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5451
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0 125 250 500 750 1,000 Feet
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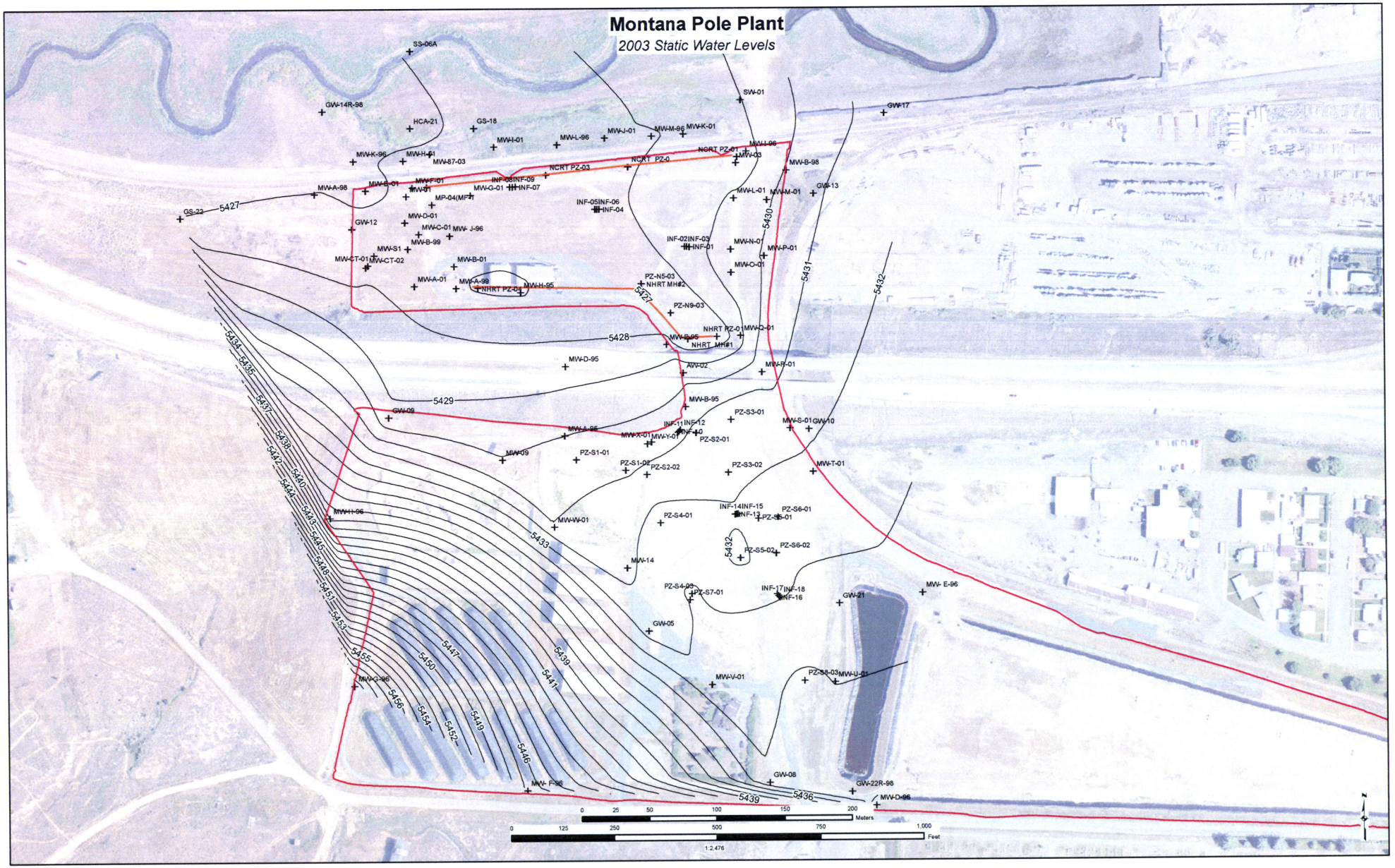
Montana Pole Plant
2003 Static Water Levels
SS-06A
GW-14R-98
HCA-21
GS-18
SW-01
GW-17
MW-I-01
MW-L-96
MW-J-01
MW-M-96
MW-K-01
MW-K-96
MW-H-01
MW-87-03
NCRT PZ-01
MW-I-96
MW-03
MW-B-98
NCRT PZ-03
NCRT PZ-0
MW-A-98
MW-E-01
MW-F-01
INF-08INF-09
MW-01
MW-G-01
INF-07
MW-L-01
MW-M-01
GW-13
MP-04(MP-1)
INF-05INF-06
INF-04
GS-22
5427
MW-D-01
GW-12
MW-C-01
MW- J-96
MW-B-99
INF-02INF-03
INF-01
MW-N-01
MW-P-01
MW-S1
MW-CT-01
MW-CT-02
MW-B-01
MW-O-01
5430
5431
5432
PZ-N5-03
NHRT MH#2
MW-A-01
MW-A-99
NHRT PZ-04
MW-H-95
5427
PZ-N9-03
NHRT PZ-01
MW-Q-01
5428
MW-B-95
NHRT MH#1
MW-D-95
AW-02
MW-R-01
5429
MW-B-95
GW-09
PZ-S3-01
MW-S-01
GW-10
MW-A-95
INF-11INF-12
INF-10
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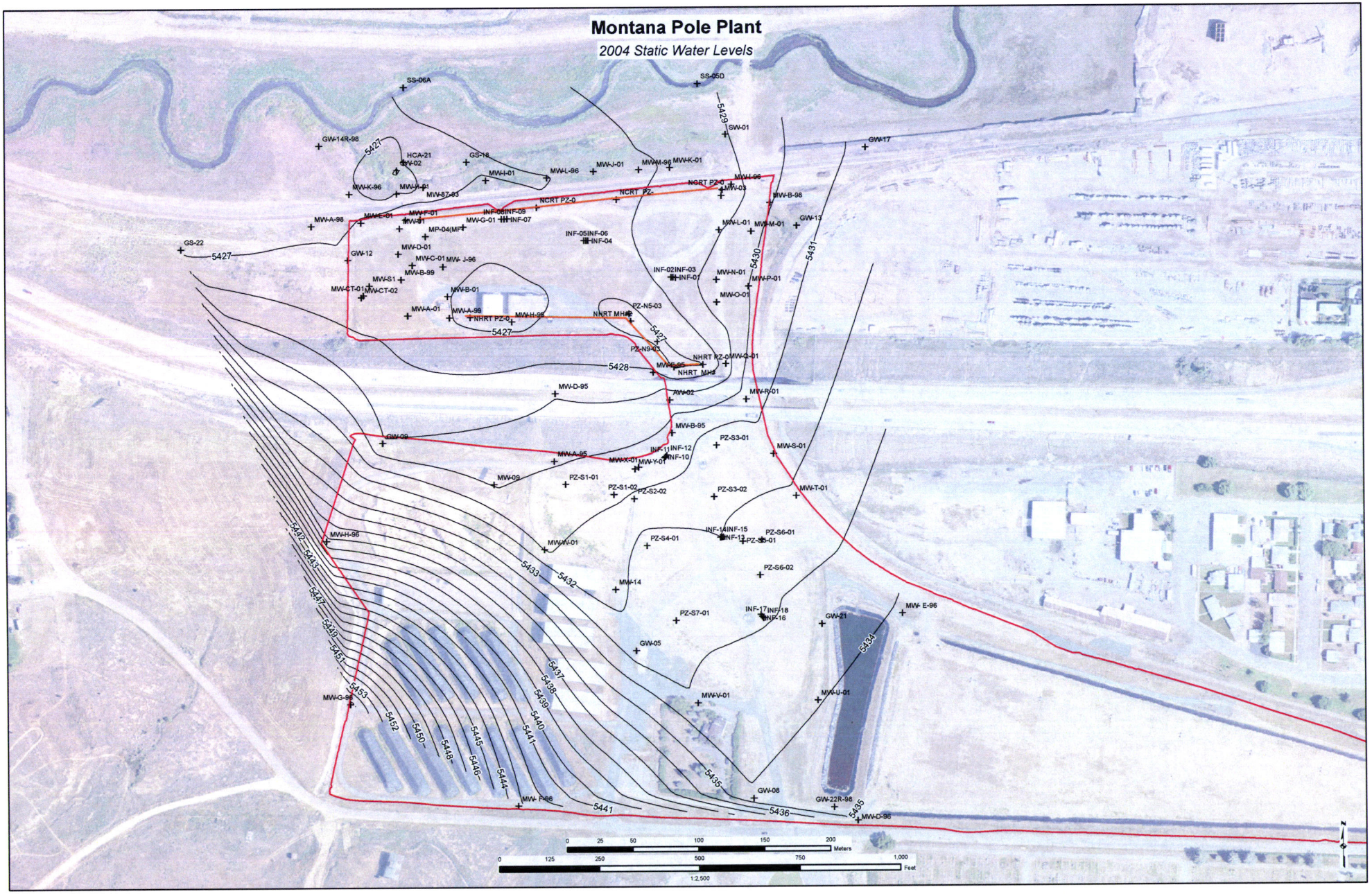
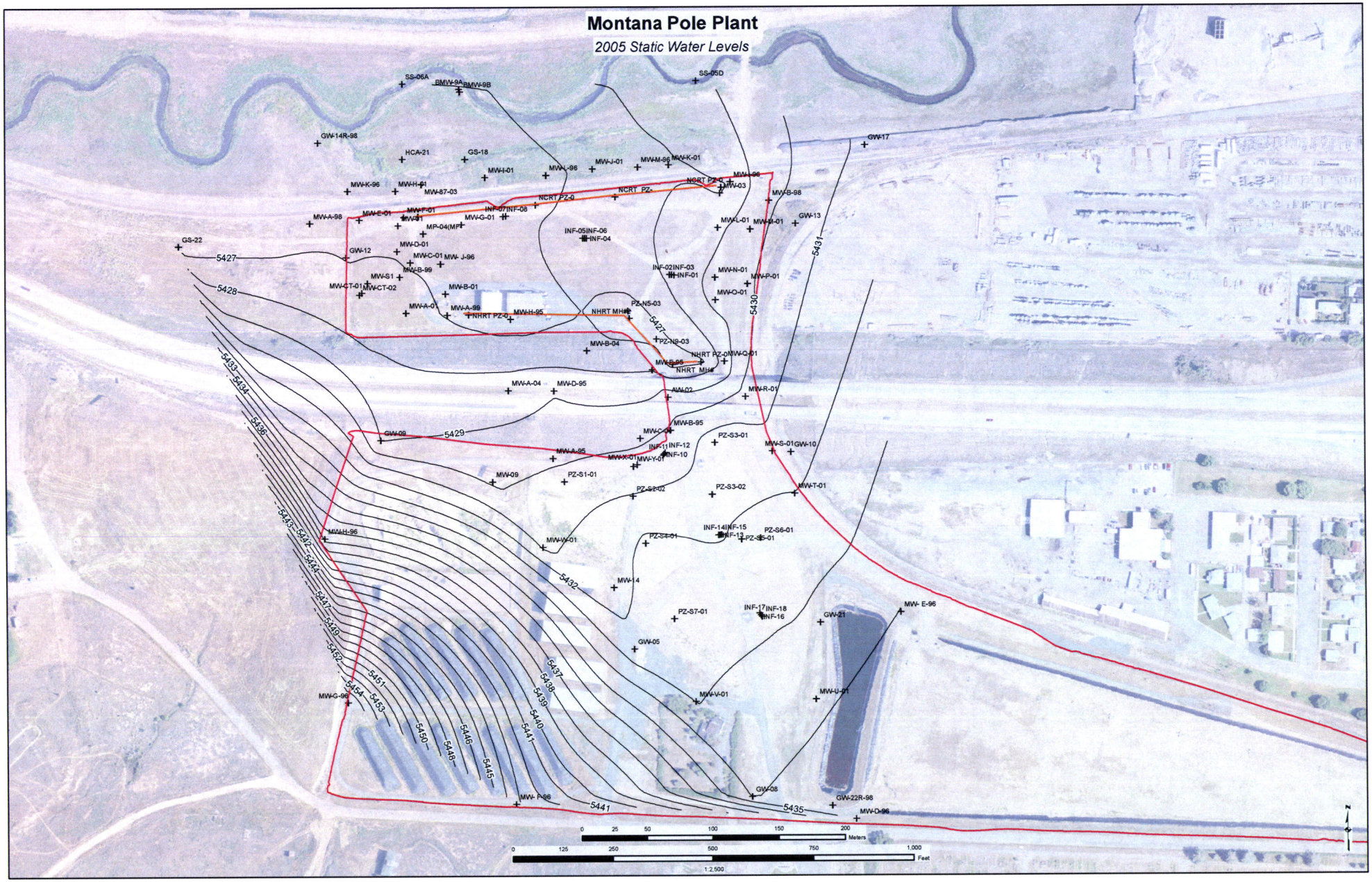
MW-Y-01
PZ-S2-01
MW-09
PZ-S1-01
PZ-S1-02
PZ-S2-02
PZ-S3-02
MW-T-01
INF-14INF-15
PZ-S6-01
INF-13
PZ-S5-01
MW-H-96
MW-W-01
PZ-S4-01
5433
5432
PZ-S5-02
PZ-S6-02
MW-14
PZ-S4-02
PZ-S7-01
INF-17INF-18
INF-16
MW- E-96
GW-21
GW-05
MW-V-01
PZ-S8-03
MW-U-01
MW-G-96
5447
5450
5439
5441
5455
5456
5454
5452
5449
5446
MW- F-96
GW-08
GW-22R-98
MW-D-96
5439
5436
5434
5435
5437
5438
5442
5444
5440
5443
5445
5448
5451
5453
0 25 50 100 150 200 Meters
0 125 250 500 750 1,000 Feet
1:2,476
N

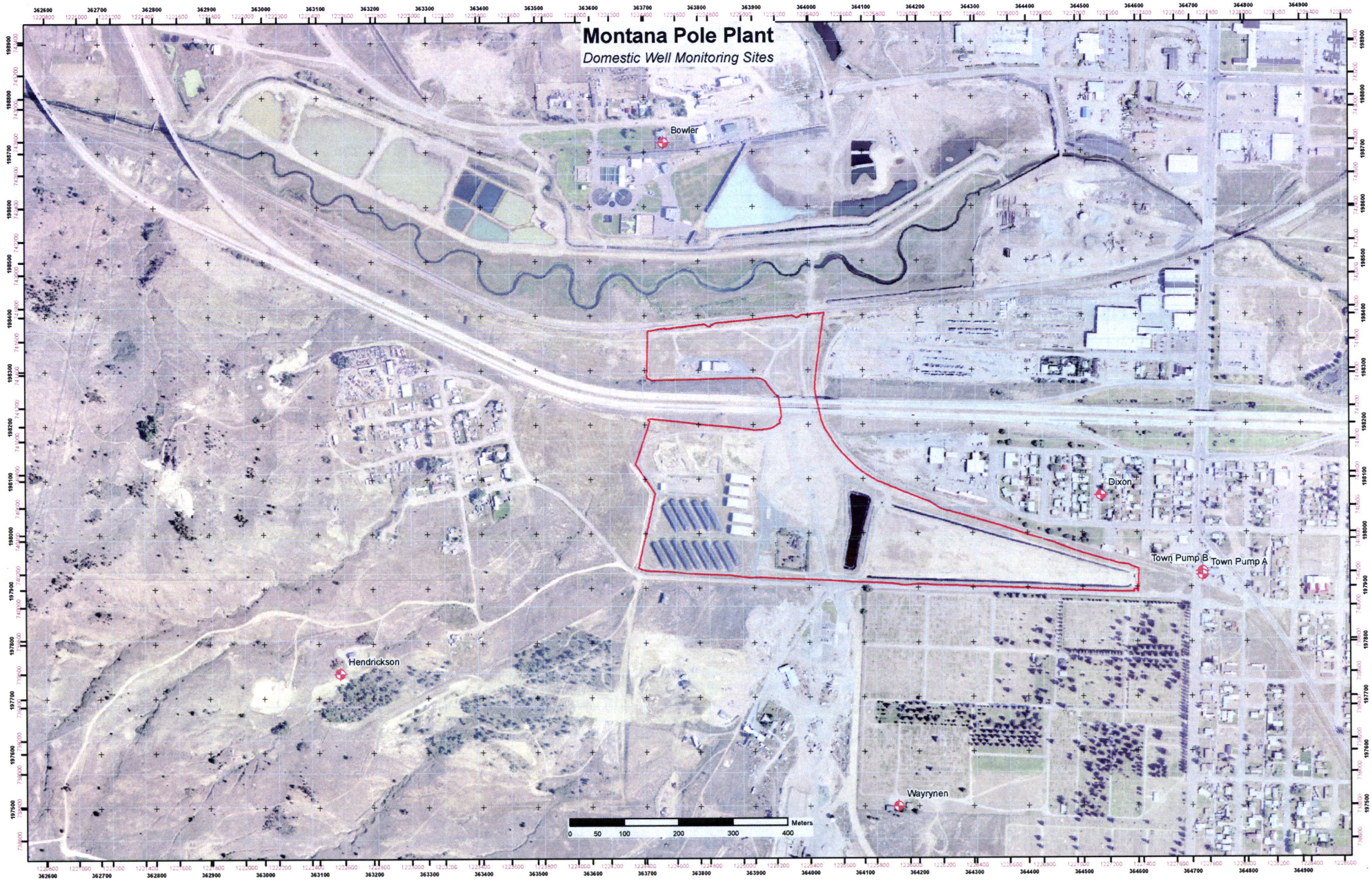

Montana Pole Plant
2004 Static Water Levels
SS-06A
SS-05D
SW-01
GW-14R-98
GW-17
HCA-21
AW-02
GS-18
MW-I-01
MW-L-96
MW-J-01
MW-M-96
MW-K-01
MW-K-96
MW-A-01
MW-87-03
MW-L-96
MW-03
NCRT PZ-0
MW-B-98
MW-A-98
MW-E-01
MW-F-01
MW-91
MW-G-01
INF-08INF-07
INF-06
MP-04(MP
MW-L-01
MW-M-01
GW-13
INF-05INF-06
INF-04
GS-22
MW-D-01
GW-12
MW-C-01
MW- J-96
MW-B-99
MW-S1
MW-CT-01
MW-CT-02
MW-B-01
INF-02INF-03
INF-01
MW-N-01
MW-P-01
MW-O-01
MW-A-01
MW-A-98
NHRT PZ-0
MW-H-98
NHRT MH#
PZ-N5-03
PZ-N9-02
NHRT PZ-0
MW-Q-01
MW-C-95
NHRT MH#
AW-02
MW-D-95
MW-R-01
MW-B-95
GW-09
PZ-S3-01
MW-S-01
MW-A-95
INF-11INF-12
INF-10
MW-X-01
MW-Y-01
MW-09
PZ-S1-01
PZ-S1-02
PZ-S2-02
PZ-S3-02
MW-T-01
MW-H-96
MW-N-01
PZ-S4-01
INF-14INF-15
INF-13
PZ-S5-01
PZ-S6-01
PZ-S6-02
MW-14
PZ-S7-01
INF-17INF-18
INF-16
GW-21
MW- E-96
GW-05
MW-V-01
MW-U-01
MW-G-96
MW- F-96
GW-08
GW-22R-98
MW-D-96
5427
5428
5429
5430
5431
5432
5433
5434
5435
5436
5437
5438
5439
5440
5441
5442
5443
5444
5445
5446
5447
5448
5449
5450
5451
5452
5453
0 25 50 100 150 200 Meters
0 125 250 500 750 1,000 Feet
1:2,500
N


Montana Pole Plant
2005 Static Water Levels
SS-06A
BMW-9A
BMW-9B
SS-05D
GW-14R-98
HCA-21
GS-18
GW-17
MW-I-01
MW-L-96
MW-J-01
MW-M-96
MW-K-01
MW-K-96
MW-H-01
MW-87-03
NCRT PZ-0
MW-03
MW-B-98
NCRT PZ-
MW-A-98
MW-E-01
MW-F-01
MW-31
INF-07
INF-08
MW-G-01
MW-L-01
MW-N-01
GW-13
MP-04(MP
INF-05
INF-06
INF-04
GS-22
5427
GW-12
MW-D-01
MW-C-01
MW- J-96
INF-02
INF-03
INF-01
MW-P-01
MW-B-99
MW-S1
MW-CT-01
MW-CT-02
MW-B-01
MW-O-01
5428
MW-A-01
MW-A-99
NHRT PZ-0
MW-H-95
NHRT MH#
PZ-N5-03
5427
PZ-N8-03
MW-B-04
NHRT PZ-0
MW-Q-01
MW-B-95
NHRT MH#
5433
5434
MW-A-04
MW-D-95
AM-02
MW-R-01
5436
GW-09
5429
MW-B-95
MW-C-01
PZ-S3-01
MW-S-01
GW-10
INF-11
INF-12
INF-10
MW-A-95
MW-X-01
MW-Y-01
MW-09
PZ-S1-01
PZ-S2-02
PZ-S3-02
MW-T-01
5443
5442
5444
MW-H-96
INF-14
INF-15
INF-13
PZ-S6-01
PZ-S4-01
PZ-S5-01
MW-V-01
5447
5449
5452
5432
MW-14
PZ-S7-01
INF-17
INF-18
INF-16
MW- E-96
GW-21
GW-05
5437
5438
5439
5440
5441
5451
5454
5453
MW-G-96
MW-V-01
MW-U-01
5450
5446
5448
5445
GW-08
GW-22R-98
MW- P-96
5441
5435
MW-D-96
0 25 50 100 150 200 Meters
0 125 250 500 750 1,000 Feet
1:2,500
N

# Appendix E. Residential Well Data

# Montana Pole and Treating Plant Site Domestic Well Monitoring
# Pentachlorophenol (ug/L)

| Date | Wayrnernens<br>Upgradient Business Well - South of Contaminant Plume<br>value | Town Pump #1<br>Upgradient Business Well - East Of Land Treatment Unit<br>value | Town Pump #2<br>Upgradient Business Well - East Of Land Treatment Unit<br>value | Bowler<br>Domestic Irrigation Well - North of Contaminant Plume<br>value | Hendrickson<br>Domestic Potable Water well -South East of Contaminant Plume<br>value | Dixon (Rongstad)<br>Domestic Irrigation Well - North of Land Treatment Unit<br>value |
|---|---|---|---|---|---|---|
| 2001 | 0.13 | 0.14 | 0.2 | 0.12 | 0.11 | <0.1 |
| 2002 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 2002 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 2003 | <0.040 | <0.040 | | <0.040 | <0.040 | 0.071 |
| 2004 | <0.040 | <0.040 | | <0.040 | <0.040 | <0.040 |
| 2005 | <0.040 | <0.040 | | <0.040 | <0.040 | <0.040 |


Montana Pole Plant
Domestic Well Monitoring Sites
Bowler
Dixon
Town Pump B
Town Pump A
Hendrickson
Wayrynen
Meters
0 50 100 200 300 400

# Appendix F. Water Treatment Plant Data

## Montana Pole and Treating Plant Groundwater Treatment System Summary Data, Annual

| Year | Average **Near Creek Trench Effluent** PCP [C] (ug/L) | Average **Near Highway Trench Effluent** PCP [C] (ug/L) | Average **Influent** PCP [C] (ug/L) | Average **Retention Pond** PCP (ug/L) | Average **Plant Loading** PCP kg/day | Total **Volume Treated** gallons | Total **Dissolved PCP removed** kg | Total **Free Product Recovered** gallons |
|---|---|---|---|---|---|---|---|---|
| 2001 | 32.83 | 755 | 387 | 12.5 | 0.529 | 136,591,200 | 193.1 | 1367 |
| 2002 | 18.6 | 543 | 263 | 213 | 0.415 | 155,052,000 | 151.5 | 2376 |
| 2003 | 6 | 226 | 106 | 523 | 0.183 | 160,308,000 | 66.8 | 574 |
| 2004 | 4 | 138 | 68 | 757 | 0.113 | 224,284,200 | 41.2 | 548 |
| 2005 | 3.2 | 103 | 49 | 35 | 0.089 | 421,400,800 | 32.5 | 511 |

## Montana Pole and Treating Plant Groundwater Treatment Monitoring Sample Results

| Date | Plant Influent | | | | NCRT Effluent | | | | NHRT Effluent | | | | Combined Effluent | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PCP (ug/L) | Chlorophenols (ug/L) | PAH (ug/L) | Dioxin/Furans (pg/L) | PCP (ug/L) | Chlorophenols (ug/L) | PAH (ug/L) | Dioxin/Furans (pg/L) | PCP (ug/L) | Chlorophenols (ug/L) | PAH (ug/L) | Dioxin/Furans (pg/L) | PCP (ug/L) | Chlorophenols (ug/L) | PAH (ug/L) | Dioxin/Furans (pg/L) |
| 1/8/2001 | 571 | | | | 55.2 | | | | 1185 | | | | <0.2 | | | |
| 2/12/2001 | 600 | | | | 47.6 | | | | 1132 | | | | <0.2 | | | |
| 3/5/2001 | 530 | | | | 6.76 | | | | 1066 | | | | <0.2 | | | |
| 4/2/2001 | 385 | | | | 44.8 | | | | 749 | | | | 0.343 | | | |
| 5/7/2001 | 487 | | | | 43.4 | | | | 1027 | | | | 1.12 | | | |
| 6/4/2001 | 336 | | | | 30.2 | | | | 790 | | | | 0.061 | | | |
| 7/9/2001 | 380 | | | | 31 | | | | 781 | | | | <0.1 | | | |
| 8/13/2001 | 323 | <10 | <10 | 2.029 | 28 | <10 | <10 | 0.92 | 727 | <10 | <10 | 0.46 | <0.1 | <10 | <10 | 0.24 |
| 8/27/2001 | 254 | | | 1.96 | 24 | | | | 622 | | | | <0.1 | | | |
| 9/4/2001 | 350 | | | | 31 | | | | 500 | | | | 0.083 | | | |
| 10/1/2001 | 254 | | | | 35 | | | | 596 | | | | <0.2 | | | |
| 11/5/2001 | 130 | | | | 22.7 | | | | 646 | | | | 0.723 | | | |
| 12/3/2001 | 350 | | | | 21.8 | | | | 781 | | | | <0.2 | | | |
| 1/7/2002 | 378 | | | | 21 | | | | 842 | | | | <0.1 | | | |
| 2/4/2002 | 374 | <10 | <10 | 3.207 | 24 | <10 | <10 | 0.16 | 792 | 20 | <10 | 0.46 | <0.1 | <10 | <0.1 | 0.13 |
| 3/4/2002 | 318 | | | | 22.9 | | | | 722 | | | | 0.223 | | | |
| 4/1/2002 | 291 | | | | 20.9 | | | | 552 | | | | 0.238 | | | |
| 5/6/2002 | 332 | 10.18 | 0.55 | | 21.4 | 0.65 | <0.2 | | 461 | 14.49 | 0.44 | | 0.218 | <0.2 | 0.0355 | |
| 6/3/2002 | 374 | | | | 22.5 | | | | 738 | | | | <0.2 | | | |
| 7/8/2002 | 281 | | | | 20.1 | | | | 596 | | | | 0.273 | | | |
| 8/12/2002 | 154 | 5.99 | <0.2 | 1.53 | 14.9 | 16.46 | <0.2 | 1.19 | 344 | 17.77 | <0.2 | 0.55 | <0.2 | 0.87 | <0.2 | 0.21 |
| 9/9/2002 | 239 | | | | 11.5 | | | | 471 | | | | 4.48 | | | |
| 10/7/2002 | 183 | | | | 16.1 | | | | 405 | | | | 0.737 | | | |
| 11/12/2002 | 231 | | | | 12.1 | | | | 318 | | | | 1.02 | | | |
| 12/2/2002 | 179 | | | | 15.7 | | | | 272 | | | | 0.965 | | | |
| 1/6/2003 | 144 | | | | 8.8 | | | | 293 | | | | 0.1 | | | |
| 2/3/2003 | 147 | <10 | <0.1 | 2.158 | 6.9 | <10 | <0.1 | 4.17 | 304 | <10 | <0.1 | 0.27 | 0.092 | <10 | <0.1 | 0.69 |
| 3/3/2003 | 142 | | | | 8 | | | | 289 | | | | 0.073 | | | |
| 4/7/2003 | 178 | | | | 5.2 | | | | 268 | | | | 1.7 | | | |
| 5/5/2003 | 157 | | | | 5.5 | | | | 285 | | | | 0.23 | | | |
| 6/2/2003 | 130 | | | | 4.8 | | | | 221 | | | | 0.13 | | | |
| 7/7/2003 | 94 | | | | 6.1 | | | | 177 | | | | 0.13 | | | |
| 8/4/2003 | 104 | 4.9 | <10 | 1.57 | 4.3 | <10 | <10 | 2.157 | 167 | 11 | <10 | 0.23 | 0.084 | <10 | <10 | 0.3 |
| 9/8/2003 | 70 | | | | 5 | | | | 167 | | | | 0.099 | | | |
| 10/6/2003 | 126 | | | | 5.1 | | | | 260 | | | | 0.37 | | | |
| 11/3/2003 | 55 | | | | 5.7 | | | | 146 | | | | 0.12 | | | |
| 12/1/2003 | 66 | | | | 6.6 | | | | 140 | | | | 0.097 | | | |
| 1/5/2004 | 63 | | | | 6.7 | | | | 152 | | | | 0.08 | | | |
| 1/26/2004 | 65 | | | | 4.6 | | | | 145 | | | | 0.081 | | | |
| 2/2/2004 | 63 | <10 | <10 | 0.85 | 5.3 | <10 | <10 | 0.83 | 147 | 6.8 | <10 | 0.15 | 0.082 | <10 | <10 | 0.14 |
| 3/1/2004 | 73 | | | | 4.9 | | | | 137 | | | | 0.12 | | | |
| 4/5/2004 | 79 | | | | 5 | | | | 192 | | | | 0.22 | | | |
| 5/3/2004 | 73 | | | | 4.1 | | | | 138 | | | | 0.11 | | | |
| 6/7/2004 | 68 | | | | 4.3 | | | | 130 | | | | 0.15 | | | |
| 7/6/2004 | 57 | | | | 4.4 | | | | 181 | | | | 0.074 | | | |
| 8/2/2004 | 58 | <10 | <1 | 1.4 | 3.4 | <10 | <1 | 3.09 | 100 | 2.6 | <1 | 0.22 | 0.096 | <10 | <1 | 0.56 |
| 9/7/2004 | 80 | | | | 2.8 | | | | 133 | | | | 0.074 | | | |
| 10/4/2004 | 66 | | | | 4.1 | | | | 122 | | | | 0.11 | | | |
| 11/3/2004 | 48 | | | | 2.4 | | | | 119 | | | | 0.067 | | | |
| 12/6/2004 | 56 | | | | 2.8 | | | | 97 | | | | 0.086 | | | |
| 1/3/2005 | 52 | | | | 2.1 | | | | 76 | | | | 0.07 | | | |
| 2/7/2005 | 56 | | | | 2 | | | | 112 | | | | 0.088 | | | |

## Montana Pole and Treating Plant Groundwater Treatment Monitoring Sample Results

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2/28/2005 | 56 | | | | 3.1 | | | | 92 | | | | 0.12 | | | |
| 4/4/2005 | 40 | | | | 3.6 | | | | 85 | | | | 0.09 | | | |
| 5/9/2005 | 50 | | | | 3.8 | | | | 60 | | | | 0.094 | | | |
| 6/6/2005 | 48 | | | | 5.8 | | | | 87 | | | | 0.077 | | | |
| 7/5/2005 | 54 | | | | 4 | | | | 86 | | | | 0.13 | | | |
| 8/1/2005 | 43 | <10 | <10 | 19.46 | | <10 | <10 | 1.29 | | <10 | <10 | 0.76 | 0.14 | <10 | <10 | 1.28 |
| 8/8/2005 | 42 | | | | 3.1 | | | | 74 | | | | 0.14 | | | |
| 9/6/2005 | 39.5 | | | | 3.15 | | | | 112.6 | | | | 0.16 | | | |
| 10/3/2005 | 53 | | | | 3.5 | | | | 76 | | | | <0.1 | | | |
| 10/31/2005 | 38.9 | | | | 2.2 | | | | 62.5 | | | | 0.05 | | | |
| 12/5/2005 | 73.5 | | | | 1.1 | | | | 149 | | | | <0.1 | | | |

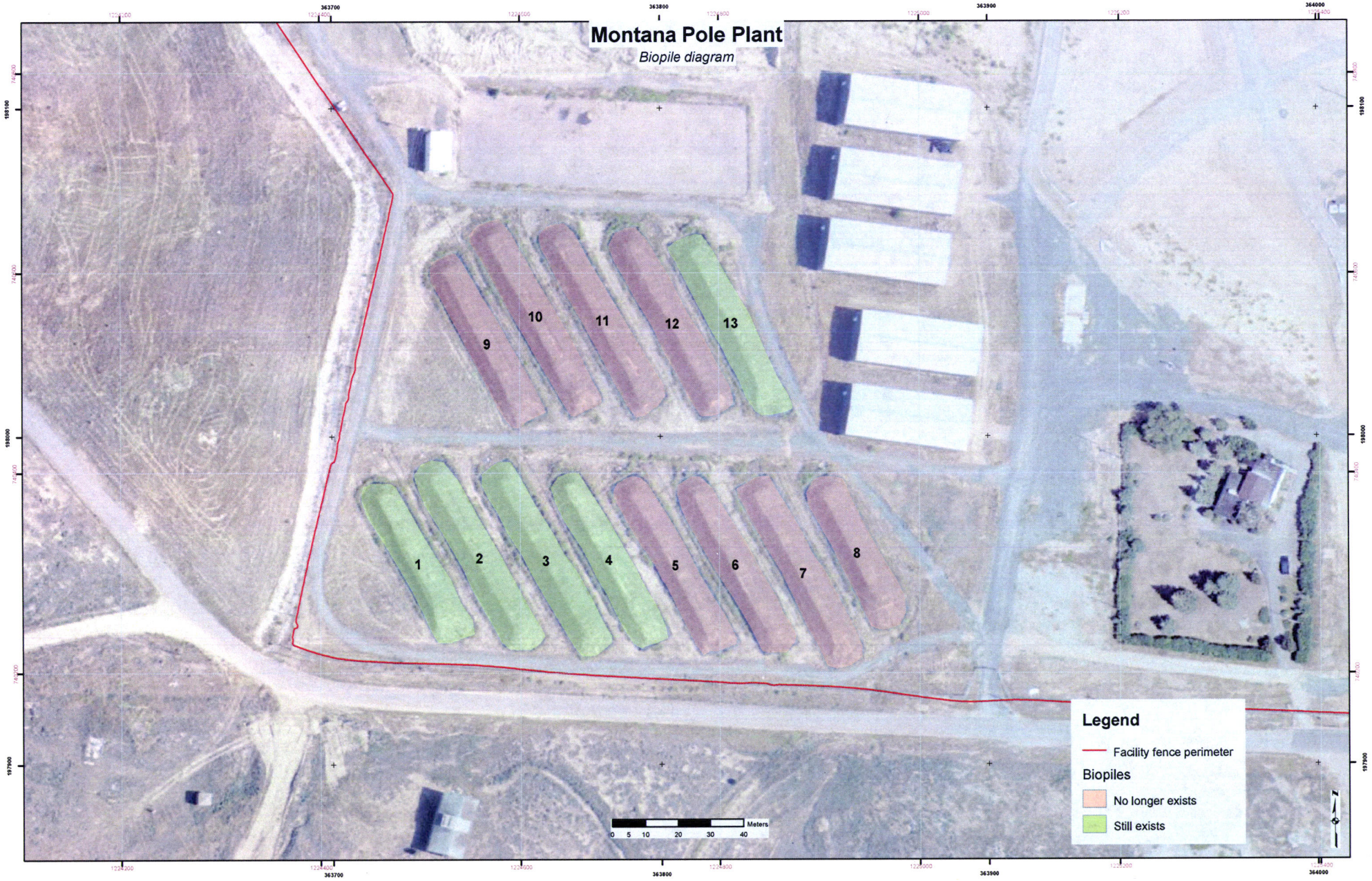
# Appendix G. Soils Data

# Montana Pole and Treating Plant Site Soil Storage and Pre-Treatment Piles Sampling Data

| Sample interval | 2001 PCP mg/Kg | 2001 DRO mg/Kg | 2002 PCP mg/kg | 2002 DRO mg/Kg | 2003 PCP mg/kg | 2003 DRO mg/Kg | 2004 PCP mg/kg | 2004 DRO mg/Kg | 1997 Dioxin(TEQ) pg/g | 1997 PAH(TEQ) mg/Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| **SSP 1** | | | | | | | | | | |
| Section1 1-3' | 102 | 2598 | 82 | 1500 | 50 | 1780 | 37 | 1490 | | |
| Section1 5-8' | 121 | 2390 | 120 | 1800 | 82 | 1990 | 154 | 3510 | | |
| Section2 1-3' | 65.6 | 3081 | 68 | 1200 | 52 | 1610 | 45 | 1580 | | |
| Section2 5-8' | 90 | 1256 | 143 | 1800 | 76 | 2020 | 132 | 3360 | | |
| Section3 1-3' | 32.1 | 986 | 15 | 590 | 4.7 | 638 | 16 | 785 | | |
| Section3 5-8' | 25.7 | 1589 | 89 | 1600 | 82 | 2120 | 124 | 3400 | | |
| Composite | | | | | | | | | 2024 | <3.4 |
| **SSP 2** | | | | | | | | | | |
| Section1 1-3' | 245 | 3695 | 44 | 1015 | 57 | 1720 | 135 | 2480 | | |
| Section1 5-8' | 131 | 2509 | 180 | 1249 | 94 | 2370 | 183 | 3270 | | |
| Section2 1-3' | 186 | 1605 | 36 | 987 | 44 | 1950 | 85 | 2490 | | |
| Section2 5-8' | 96 | 2722 | 46 | 1026 | 51 | 2410 | 133 | 2360 | | |
| Section3 1-3' | 138 | 2178 | 34 | 986 | 49 | 2290 | 67 | 2560 | | |
| Section3 5-8' | 153 | 2046 | 30 | 830 | 94 | 1965 | 83 | 2810 | | |
| Section4 1-3' | 53 | 1263 | 43 | 703 | 338 | 3200 | 172 | 3140 | | |
| Section4 5-8' | 45 | 1192 | 113 | 1906 | 242 | 2300 | 98 | 2580 | | |
| Composite | | | | | | | | | 5815 | <3.4 |
| **SSP 3** | | | | | | | | | | |
| Section1 1-3' | 482 | 3558 | 143 | 1578 | 540 | 3260 | 177 | 2820 | | |
| Section1 5-8' | 328 | 1639 | 306 | 2446 | 548 | 3230 | 297 | 3190 | | |
| Section2 1-3' | 123 | 2281 | 85 | 1196 | 52 | 1430 | 120 | 2740 | | |
| Section2 5-8' | 121 | 1000 | 366 | 3480 | 476 | 2800 | 299 | 3560 | | |
| Section3 1-3' | 261 | 1320 | 159 | 1979 | 106 | 1580 | 73 | 2170 | | |
| Section3 5-8' | 322 | 1327 | 229 | 1861 | 121 | 2125 | 33 | 1560 | | |
| Section4 1-3' | 468 | 1702 | 360 | 2607 | 482 | 3790 | 316 | 3380 | | |
| Section4 5-8' | 581 | 3085 | 365 | 2531 | 380 | 4010 | 363 | 2630 | | |
| Composite | | | | | | | | | 5691 | <3.4 |
| **SSP 4** | | | | | | | | | | |
| Section1 1-3' | 30.6 | 1036 | 20 | 720 | 11 | 739 | 20 | 822 | | |
| Section1 5-8' | 86.3 | 2235 | 74 | 1500 | 70 | 1590 | 142 | 3090 | | |
| Section2 1-3' | 37.9 | 1329 | 10 | 1200 | 39 | 2140 | 17 | 639 | | |
| Section2 5-8' | 70.7 | 2091 | 121 | 1600 | 89 | 2710 | 43 | 2320 | | |
| Section3 1-3' | 48 | 1366 | 12 | 770 | 42 | 1950 | 22 | 699 | | |
| Section3 5-8' | 85.3 | 1757 | 109 | 1700 | 100 | 2240 | 118 | 3190 | | |
| Section4 1-3' | 31.8 | 1529 | 18 | 550 | 5.1 | 558 | 19 | 829 | | |
| Section4 5-8' | 15.3 | 731 | 9.9 | 600 | 5.4 | 551 | 118 | 3250 | | |
| Composite | | | | | | | | | 1649 | <3.4 |
| **SSP 13** | | | | | | | | | | |
| Section1 1-3' | 245 | 2527 | 180 | 2106 | 102 | 220 | 300 | 2640 | | |
| Section1 5-8' | 149 | 1151 | 179 | 1478 | 78 | 1700 | 224 | 2740 | | |
| Section2 1-3' | 190 | 1383 | 194 | 2139 | 142 | 2800 | 387 | 2910 | | |
| Section2 5-8' | 130 | 1040 | 205 | 1026 | 192 | 2160 | 160 | 2540 | | |
| Section3 1-3' | 103 | 1586 | 161 | 2406 | 80 | 2460 | 132 | 3350 | | |
| Section3 5-8' | 218 | 3450 | 224 | 1706 | 176 | 3770 | 108 | 3130 | | |
| Section4 1-3' | 290 | 2629 | 135 | 1348 | 352 | 3850 | 254 | 3110 | | |
| Section4 5-8' | 113 | 1699 | 157 | 1402 | 115 | 3040 | 125 | 2835 | | |
| Composite | | | | | | | | | 5783 | <3.4 |

PCP - Pentachlorophenol
DRO- Diesel Range Organics
Dioxin (TEQ) - 2,3,7,8 TCDD equivalent
PAH -TEQ BaP equivalent

mg/Kg = milligrams per kilogram
pg/g = pico grams per gram

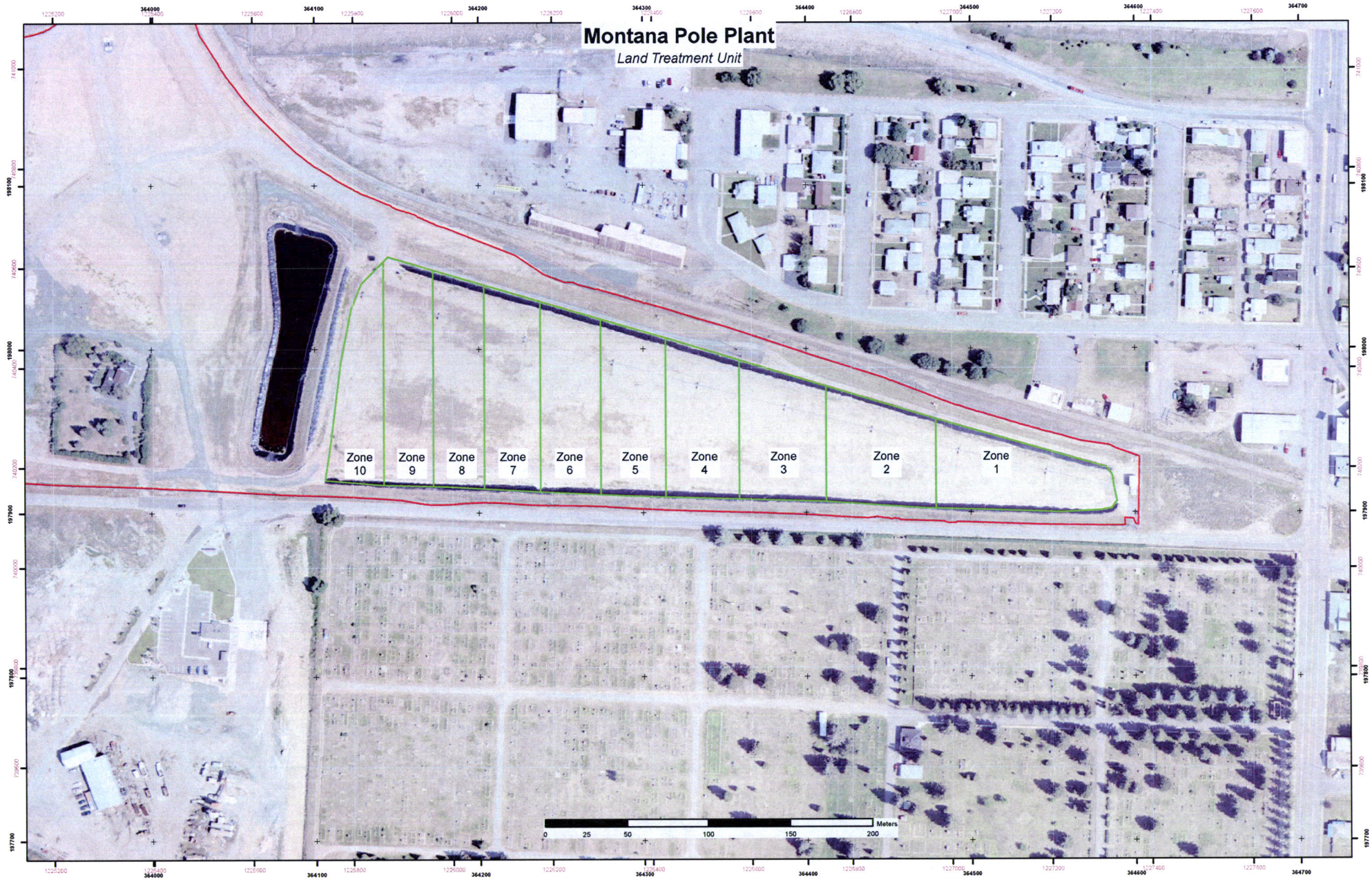

Montana Pole Plant
Biopile diagram
9
10
11
12
13
1
2
3
4
5
6
7
8
Legend
Facility fence perimeter
Biopiles
No longer exists
Still exists
Meters
0 5 10 20 30 40
N

**Montana Pole and Treating Plant Site Land Treatment Unit 2005 Sampling Results**

| | LTU Section 1 | LTU Section 2 | LTU Section 3 | LTU Section 4 | LTU Section 5 | LTU Section 6 | LTU Section 7 | LTU Section 8 | LTU Section 9 | LTU Section 10 | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample interval | PCP (mg/kg) | PCP (mg/kg) | PCP (mg/kg) | PCP (mg/kg) | PCP (mg/kg) | PCP (mg/kg) | PCP (mg/kg) | PCP (mg/kg) | PCP (mg/kg) | PCP (mg/kg) | PCP (mg/kg) |
| 0-18" depth | 66 | 124 | 29 | 62 | 22 | 46 | 51 | 28 | 6.8 | 32 | 46.68 |
| 18"-30" depth | 51 | 143 | 20 | 46 | 25 | 47 | 91 | 42 | 11 | 49 | 52.5 |
| | DRO (mg/kg) | DRO (mg/kg) | DRO (mg/kg) | DRO (mg/kg) | DRO (mg/kg) | DRO (mg/kg) | DRO (mg/kg) | DRO (mg/kg) | DRO (mg/kg) | DRO (mg/kg) | DRO (mg/kg) |
| 0-18" depth | 973 | 2440 | 632 | 1160 | 603 | 2050 | 1715 | 1850 | 233 | 1930 | 1358.6 |
| 18"-30" depth | 718 | 3200 | 499 | 1310 | 1110 | 1590 | 1990 | 2150 | 497 | 1880 | 1494.4 |
| | PAH(TEQ) (mg/kg) | PAH(TEQ) (mg/kg) | PAH(TEQ) (mg/kg) | PAH(TEQ) (mg/kg) | PAH(TEQ) (mg/kg) | PAH(TEQ) (mg/kg) | PAH(TEQ) (mg/kg) | PAH(TEQ) (mg/kg) | PAH(TEQ) (mg/kg) | PAH(TEQ) (mg/kg) | PAH(TEQ) (mg/kg) |
| 0-18" depth | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 |
| 18"-30" depth | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 | <0.33 |
| | Dioxin(TEQ) (pg/g) | Dioxin(TEQ) (pg/g) | Dioxin(TEQ) (pg/g) | Dioxin(TEQ) (pg/g) | Dioxin(TEQ) (pg/g) | Dioxin(TEQ) (pg/g) | Dioxin(TEQ) (pg/g) | Dioxin(TEQ) (pg/g) | Dioxin(TEQ) (pg/g) | Dioxin(TEQ) (pg/g) | Dioxin(TEQ) (pg/g) |
| Composite Depth | 1643 | 996 | 572 | 670 | 960 | 1018 | 804 | 642 | 385 | 984 | 867.4 |

PCP - Pentachlorophenol
DRO- Diesel Range Organics
Dioxin (TEQ) - 2,3,7,8 TCDD equivalent
PAH -TEQ BaP equivalent

mg/Kg = milligrams per kilogram
pg/g = pico grams per gram


Montana Pole Plant
Land Treatment Unit
Zone 10
Zone 9
Zone 8
Zone 7
Zone 6
Zone 5
Zone 4
Zone 3
Zone 2
Zone 1
0 25 50 100 150 200
Meters

# Appendix H. Air Data

# Montana Pole and Treating Plant Air Quality Data

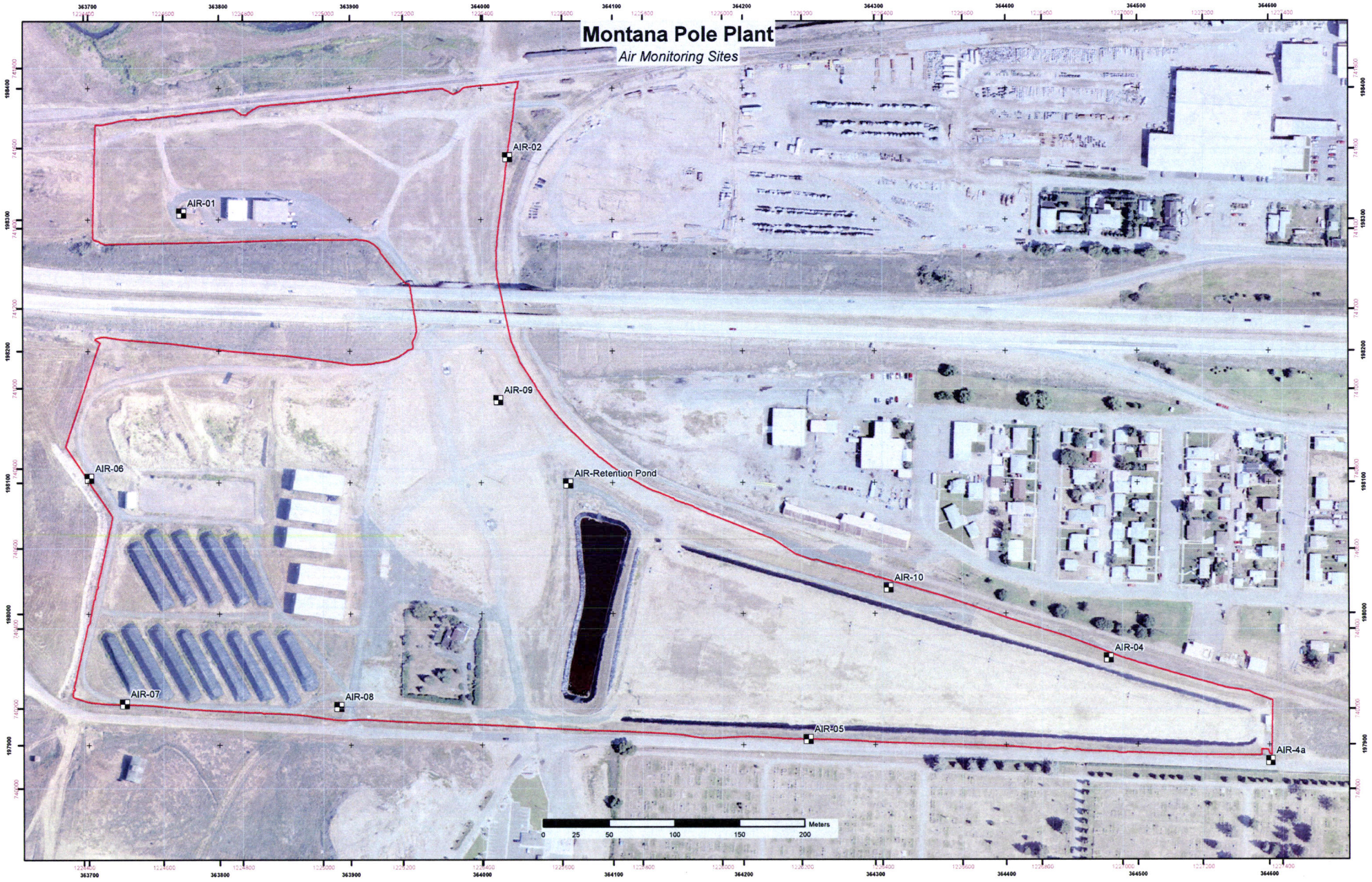
| Date | Air 4 Center PCP mg/m^3 (sorbent tube or PUF XAD Media) | Benzene mg/m^3 (badges/cans) | Toluene mg/m^3 (badges/cans) | Ethylbenzene mg/m^3 (badges/cans) | Xylenes mg/m^3 (badges/cans) |
|---|---|---|---|---|---|
| 4/19/2001 | | <0.005 | 0.0066 | <0.0066 | <0.013 |
| 5/5/2001 | <0.000069 | <0.010 | 0.012 | <0.013 | <0.026 |
| 6/4/2001 | <0.000023 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 7/2/2001 | <0.000023 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 8/3/2001 | <0.000023 | <0.0034 | 0.0041 | <0.0044 | <0.0087 |
| 9/7/2001 | <0.000023 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 10/2/2001 | <0.000021 | <0.0034 | 0.0045 | <0.0044 | <0.0087 |
| 11/2/2001 | | 0.0028 | 0.0054 | <0.0044 | <0.0087 |
| 12/7/2001 | | <0.0034 | 0.0045 | <0.0044 | <0.0087 |
| 1/9/2002 | <0.000014 | <0.0034 | 0.0058 | <0.0044 | <0.0087 |
| 2/12/2002 | <0.000014 | <0.0032 | <0.0035 | <0.0042 | <0.0084 |
| 3/26/2002 | <0.000014 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 4/16/2002 | <0.000014 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 5/28/2002 | <0.000014 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 6/7/2002 | <0.000014 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 7/1/2002 | | 0.00034 | 0.0039 | <0.0087 | <0.0087 |
| 8/6/2002 | | <0.0034 | 0.008 | <0.0044 | <0.0087 |
| 9/4/2002 | | 0.00051 | <.0075 | <0.0087 | <0.0087 |
| 10/14/2002 | | 0.0015 | 0.0025 | <0.0087 | <0.0087 |
| 11/4/2002 | | 0.0012 | 0.0021 | <0.0087 | <0.0087 |
| 12/16/2002 | | 0.00039 | <.0075 | <0.0087 | <0.0087 |
| 1/14/2003 | | 0.0018 | 0.0036 | <0.0087 | <0.0087 |
| 2/10/2003 | | 0.00095 | <.0075 | <0.0087 | <0.0087 |
| 3/13/2003 | | 0.00068 | <.0075 | <0.0087 | <0.0087 |
| 4/10/2003 | | 0.00092 | 0.0026 | <0.0087 | <0.0087 |
| 5/7/2003 | | 0.00044 | <.0076 | <0.0087 | <0.0087 |
| 6/3/2003 | | 0.00036 | <.0075 | <0.0087 | <0.0087 |
| 7/9/2003 | | 0.00041 | <.0075 | <0.0087 | <0.0087 |
| 8/5/2003 | | 0.00043 | <.0075 | <0.0087 | <0.0087 |
| 9/9/2003 | | 0.00021 | <.0075 | <0.0087 | <0.0087 |
| 10/13/2003 | <0.000072 | 0.00078 | <.0076 | <0.0087 | <0.0087 |
| 11/17/2003 | | 0.0003 | <.0076 | <0.0087 | <0.0087 |
| 12/11/2003 | | 0.0018 | 0.0035 | <0.0087 | <0.0087 |
| 1/14/2004 | | 0.0043 | 0.0077 | <0.0087 | <0.0087 |
| 2/18/2004 | | 0.00069 | <.0076 | <0.0087 | <0.0087 |
| 3/15/2004 | | 0.00039 | <.0076 | <0.0087 | <0.0087 |
| 4/12/2004 | | 0.00095 | 0.0023 | <0.0087 | <0.0087 |
| 5/10/2004 | | 0.00024 | <.0076 | <0.0087 | <0.0087 |
| 6/14/2004 | | 0.0024 | 0.0074 | <0.0087 | 0.0048 |
| 7/7/2004 | | 0.00034 | <.0076 | <0.0087 | <0.0087 |
| 8/18/2004 | | 0.00069 | <.0076 | <0.0087 | <0.0087 |
| 10/19/2004 | | 0.00044 | <.0076 | <0.0087 | <0.0087 |
| 11/16/2004 | | 0.0013 | 0.0024 | <0.0087 | <0.0087 |
| 1/11/2005 | | 0.00093 | <.0076 | <0.0087 | <0.0087 |
| 2/15/2005 | | 0.00072 | <.0076 | <0.0087 | <0.0087 |
| 2/15/2005 | | 0.00044 | <.0076 | <0.0087 | <0.0087 |
| 3/21/2005 | | 0.00098 | <.0076 | <0.0087 | <0.0087 |
| 4/21/2005 | | 0.0004 | <.0076 | <0.0087 | <0.0087 |
| 5/24/2005 | | 0.00028 | <.0076 | <0.0087 | <0.0087 |
| 6/20/2005 | | 0.00081 | 0.002 | <0.0087 | <0.0087 |
| 7/19/2005 | <0.0000408497 | 0.00039 | <.0076 | <0.0087 | <0.0087 |
| 7/26/2005 | <0.0000408497 | 0.00047 | <.0076 | <0.0087 | <0.0087 |
| 8/2/2005 | <0.0000408497 | 0.00052 | <.0076 | <0.0087 | <0.0087 |
| 9/20/2005 | | 0.0012 | 0.0026 | <0.0087 | <0.0087 |
| 9/26/2005 | | 0.001 | <.0076 | <0.0087 | <0.0087 |
| 10/18/2005 | | 0.0011 | <.0076 | <0.0087 | <0.0087 |
| 11/16/2005 | | 0.0008 | <.0076 | <0.0087 | <0.0087 |
| 12/20/2005 | | 0.0072 | 0.01 | <0.0087 | 0.0068 |

# Montana Pole and Treating Plant Air Quality Data

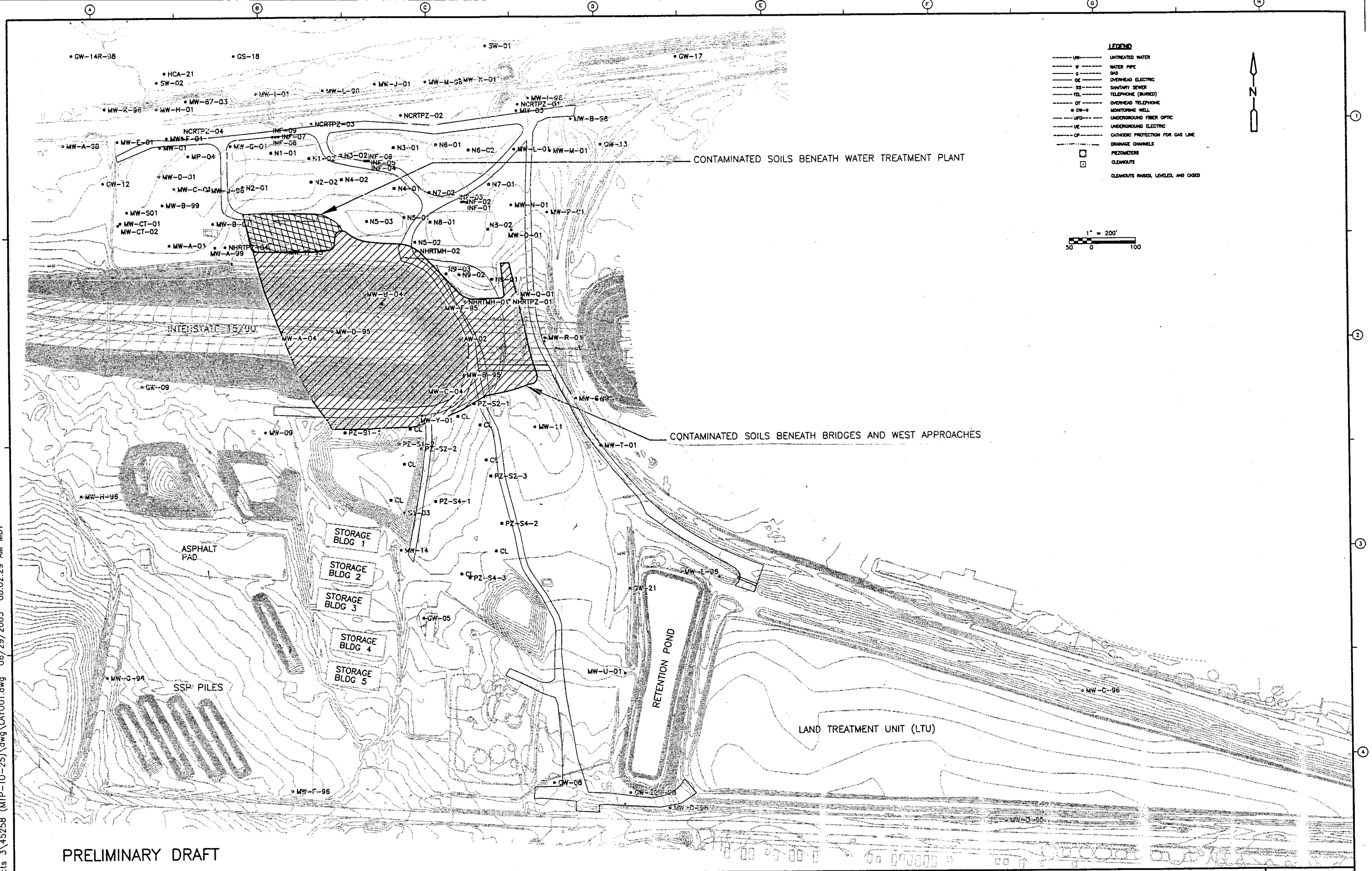
| Date | Air 4A fence at CPU PCP mg/m^3 (sorbent tube or PUF XAD Media) | Air 4A Benzene mg/m^3 (badges/cans) | Air 4A Toluene mg/m^3 (badges/cans) | Air 4A Ethylbenzene mg/m^3 (badges/cans) | Air 4A Xylenes mg/m^3 (badges/cans) | Air 5 Along Greenwood Ave Benzene mg/m^3 (badges/cans) | Air 5 Along Greenwood Ave Toluene mg/m^3 (badges/cans) | Air 5 Along Greenwood Ave Ethylbenzene mg/m^3 (badges/cans) | Air 5 Along Greenwood Ave Xylenes mg/m^3 (badges/cans) |
|---|---|---|---|---|---|---|---|---|---|
| 4/19/2001 | <0.000035 | <0.0050 | <0.0055 | <0.0066 | <0.013 | <0.0050 | <0.00055 | <0.0066 | <0.013 |
| 5/5/2001 | | <0.010 | 0.011 | <0.013 | <0.026 | <0.010 | <0.011 | <0.013 | <0.026 |
| 6/4/2001 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 | <0.0034 | <0.0037 | 0.0002 | <0.0087 |
| 7/2/2001 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 8/3/2001 | | <0.0034 | 0.006 | <0.0044 | <0.0087 | <0.0034 | <0.0037 | 0.0088 | <0.0087 |
| 9/7/2001 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 10/2/2001 | | <0.0034 | 0.0052 | <0.0044 | <0.0087 | <0.0034 | 0.0039 | <0.0044 | <0.0087 |
| 11/2/2001 | | 0.004 | 0.0066 | <0.0044 | <0.0087 | 0.0036 | 0.0057 | <0.0044 | <0.0087 |
| 12/7/2001 | | <0.0034 | 0.0044 | <0.0044 | <0.0087 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 1/9/2002 | | 0.0038 | 0.0077 | <0.0044 | <0.0087 | 0.0035 | 0.0059 | <0.0044 | <0.0087 |
| 2/12/2002 | | <0.0032 | 0.0067 | <0.0042 | <0.0084 | <0.0032 | <0.0035 | <0.0042 | <0.0084 |
| 3/26/2002 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 4/16/2002 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 5/28/2002 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 | <0.0034 | 0.0037 | <0.0044 | <0.0087 |
| 6/7/2002 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 7/1/2002 | | 0.00037 | 0.0021 | <0.0087 | <0.0087 | 0.0003 | 0.0021 | <0.0087 | <0.0087 |
| 8/6/2002 | | <0.0034 | 0.0059 | <0.0044 | <0.0087 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 9/4/2002 | | 0.00055 | 0.002 | <0.0087 | <0.0087 | 0.00058 | 0.0019 | <0.0087 | <0.0087 |
| 10/14/2002 | | 0.0022 | 0.0043 | <0.0087 | 0.0051 | 0.0013 | 0.002 | <0.0087 | <0.0087 |
| 11/4/2002 | | 0.0017 | 0.0032 | <0.0087 | <0.0087 | 0.0011 | <0.0075 | <0.0087 | <0.0087 |
| 12/16/2002 | | 0.0006 | <0.0075 | <0.0087 | <0.0087 | 0.00039 | <0.0075 | <0.0087 | <0.0087 |
| 1/14/2003 | | 0.0017 | 0.0034 | <0.0087 | <0.0087 | 0.0014 | 0.0029 | <0.0087 | <0.0087 |
| 2/10/2003 | | 0.00099 | <0.0075 | <0.0087 | <0.0087 | 0.001 | <0.0075 | <0.0087 | <0.0087 |
| 3/13/2003 | | 0.00087 | 0.0021 | <0.0087 | <0.0087 | 0.00055 | <0.0075 | <0.0087 | <0.0087 |
| 4/10/2003 | | 0.0011 | 0.003 | <0.0087 | <0.0087 | 0.00093 | 0.0022 | <0.0087 | <0.0087 |
| 5/7/2003 | | 0.00036 | <0.0075 | <0.0087 | <0.0087 | 0.00034 | <0.0075 | <0.0087 | <0.0087 |
| 6/3/2003 | | 0.00049 | <0.0075 | <0.0087 | <0.0087 | 0.00035 | <0.0075 | <0.0087 | <0.0087 |
| 7/9/2003 | | 0.00069 | 0.0019 | <0.0087 | <0.0087 | 0.00052 | <0.0075 | <0.0087 | <0.0087 |
| 8/5/2003 | | 0.00075 | 0.0021 | <0.0087 | <0.0087 | 0.00048 | <0.0075 | <0.0087 | <0.0087 |
| 9/9/2003 | | 0.00027 | <0.0075 | <0.0087 | <0.0087 | 0.0003 | <0.0075 | <0.0087 | <0.0087 |
| 10/13/2003 | <0.000072 | 0.00084 | <0.0075 | <0.0087 | <0.0087 | 0.00045 | <0.0075 | <0.0087 | <0.0087 |
| 11/17/2003 | | 0.00033 | <0.0075 | <0.0087 | <0.0087 | 0.00033 | <0.0075 | <0.0087 | <0.0087 |
| 12/11/2003 | | 0.0019 | 0.0034 | <0.0087 | <0.0087 | 0.0018 | 0.0031 | <0.0087 | <0.0087 |
| 1/14/2004 | | 0.0051 | 0.0092 | <0.0087 | 0.0048 | 0.0039 | 0.0068 | <0.0087 | <0.0087 |
| 2/18/2004 | | 0.00071 | <0.0075 | <0.0087 | <0.0087 | 0.00057 | <0.0075 | <0.0087 | <0.0087 |
| 3/15/2004 | | 0.00048 | <0.0075 | <0.0087 | <0.0087 | 0.00044 | <0.0075 | <0.0087 | <0.0087 |
| 4/12/2004 | | 0.00094 | 0.0019 | <0.0087 | <0.0087 | 0.0013 | 0.0028 | <0.0087 | <0.0087 |
| 5/10/2004 | | 0.00026 | <0.0075 | <0.0087 | <0.0087 | 0.0006 | <0.0075 | <0.0087 | <0.0087 |
| 6/14/2004 | | 0.00042 | <0.0075 | <0.0087 | <0.0087 | 0.00049 | <0.0075 | <0.0087 | <0.0087 |
| 7/7/2004 | | 0.00023 | <0.0075 | <0.0087 | <0.0087 | 0.00039 | <0.0075 | <0.0087 | <0.0087 |
| 8/18/2004 | | 0.001 | 0.0021 | <0.0087 | <0.0087 | 0.0044 | 0.014 | 0.0027 | 0.013 |
| 10/19/2004 | | 0.00077 | <0.0075 | <0.0087 | <0.0087 | 0.00048 | <0.0075 | <0.0087 | <0.0087 |
| 11/16/2004 | | 0.0014 | 0.0029 | <0.0087 | <0.0087 | 0.0022 | 0.0069 | <0.0087 | <0.0087 |
| 1/11/2005 | | 0.0012 | 0.0021 | <0.0087 | <0.0087 | 0.001 | <0.0075 | <0.0087 | <0.0087 |
| 2/15/2005 | | 0.00078 | <0.0075 | <0.0087 | <0.0087 | 0.0011 | <0.0075 | <0.0087 | <0.0087 |
| 2/15/2005 | | 0.00067 | <0.0075 | <0.0087 | <0.0087 | | | | |
| 3/21/2005 | | 0.00069 | <0.0075 | <0.0087 | <0.0087 | 0.00088 | <0.0075 | <0.0087 | <0.0087 |
| 4/21/2005 | | 0.00068 | <0.0075 | <0.0087 | <0.0087 | 0.00067 | <0.0075 | <0.0087 | <0.0087 |
| 5/24/2005 | | 0.00046 | <0.0075 | <0.0087 | <0.0087 | | | | |
| 6/20/2005 | | 0.0004 | <0.0075 | <0.0087 | <0.0087 | 0.00069 | 0.0022 | <0.0087 | <0.0087 |
| 7/19/2005 | | 0.00063 | <0.0075 | <0.0087 | <0.0087 | 0.00024 | <0.0075 | <0.0087 | <0.0087 |
| 7/26/2005 | | 0.00058 | <0.0075 | <0.0087 | <0.0087 | 0.00058 | 0.0027 | <0.0087 | <0.0087 |
| 8/2/2005 | | 0.00048 | <0.0075 | <0.0087 | <0.0087 | 0.00058 | <0.0075 | <0.0087 | <0.0087 |
| 9/20/2005 | | 0.0014 | 0.0024 | <0.0087 | <0.0087 | 0.0012 | <0.0075 | <0.0087 | <0.0087 |
| 9/26/2005 | | 0.0012 | 0.0019 | <0.0087 | <0.0087 | 0.001 | 0.0021 | <0.0087 | 0.013 |
| 10/18/2005 | | 0.0014 | 0.0024 | <0.0087 | <0.0087 | 0.0011 | <0.0075 | <0.0087 | <0.0087 |
| 11/16/2005 | | 0.00081 | <0.0075 | <0.0087 | <0.0087 | 0.00064 | <0.0075 | <0.0087 | <0.0087 |
| 12/20/2005 | | 0.0063 | 0.0092 | <0.0087 | 0.0055 | 0.0056 | 0.0088 | <0.0087 | 0.0054 |

## Montana Pole and Treating Plant Air Quality Data

| Date | Air 10 Ave PCP mg/m^3 (sorbent tube or PUF XAD Media) | Benzene mg/m^3 (badges/cans) | Toluene mg/m^3 (badges/cans) | Ethylbenzene mg/m^3 (badges/cans) | Xylenes mg/m^3 (badges/cans) |
|---|---|---|---|---|---|
| 4/19/2001 | | | | | |
| 5/5/2001 | | | | | |
| 6/4/2001 | | | | | |
| 7/2/2001 | | | | | |
| 8/3/2001 | | | | | |
| 9/7/2001 | | | | | |
| 10/2/2001 | | | | | |
| 11/2/2001 | | | | | |
| 12/7/2001 | | | | | |
| 1/9/2002 | | 0.0032 | 0.0071 | <0.0044 | <0.0087 |
| 2/12/2002 | | <0.0032 | <0.0035 | <0.0042 | <0.0084 |
| 3/26/2002 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 4/16/2002 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 5/28/2002 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 6/7/2002 | | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 7/1/2002 | <0.000014 | 0.00032 | 0.0024 | 0.0025 | <0.0087 |
| 8/6/2002 | <0.000014 | <0.0034 | <0.0037 | <0.0044 | <0.0087 |
| 9/4/2002 | <0.000014 | 0.0005 | <0.0075 | <0.0087 | <0.0087 |
| 10/14/2002 | <0.000014 | 0.0017 | 0.0035 | <0.0087 | <0.0087 |
| 11/4/2002 | <0.000014 | 0.00097 | <0.0075 | <0.0087 | <0.0087 |
| 12/16/2002 | <0.000014 | 0.00041 | <0.0075 | <0.0087 | <0.0087 |
| 1/14/2003 | <0.000014 | 0.0026 | 0.0056 | <0.0087 | 0.0043 |
| 2/10/2003 | | 0.00067 | <0.0075 | <0.0087 | <0.0087 |
| 3/13/2003 | <0.000014 | 0.00054 | <0.0075 | <0.0087 | <0.0087 |
| 4/10/2003 | <0.000014 | 0.00087 | 0.0024 | <0.0087 | <0.0087 |
| 5/7/2003 | <0.000014 | 0.00033 | <0.0075 | <0.0087 | <0.0087 |
| 6/3/2003 | <0.000014 | 0.00032 | <0.0075 | <0.0087 | <0.0087 |
| 7/9/2003 | | 0.00047 | <0.0075 | <0.0087 | <0.0087 |
| 8/5/2003 | <0.000014 | 0.00043 | <0.0075 | <0.0087 | <0.0087 |
| 9/9/2003 | <0.000014 | 0.00034 | <0.0075 | <0.0087 | <0.0087 |
| 10/13/2003 | <0.000014 | 0.0043 | 0.012 | 0.0024 | 0.012 |
| 11/17/2003 | <0.000014 | 0.00023 | <0.0075 | <0.0087 | <0.0087 |
| 12/11/2003 | <0.000014 | 0.0018 | 0.003 | <0.0087 | <0.0087 |
| 1/14/2004 | <0.000014 | 0.004 | 0.0071 | <0.0087 | <0.0087 |
| 2/18/2004 | <0.000014 | 0.00055 | <0.0075 | <0.0087 | <0.0087 |
| 3/15/2004 | <0.000014 | 0.00034 | <0.0075 | <0.0087 | <0.0087 |
| 4/12/2004 | <0.000014 | 0.00082 | <0.0075 | <0.0087 | <0.0087 |
| 5/10/2004 | <0.000014 | 0.00023 | <0.0075 | <0.0087 | <0.0087 |
| 6/14/2004 | <0.000014 | 0.0004 | 0.0019 | <0.0087 | <0.0087 |
| 7/7/2004 | <0.000014 | 0.00032 | <0.0075 | <0.0087 | <0.0087 |
| 8/18/2004 | <0.000014 | 0.00073 | <0.0075 | <0.0087 | <0.0087 |
| 10/19/2004 | <0.000014 | 0.00038 | <0.0075 | <0.0087 | <0.0087 |
| 11/16/2004 | <0.000014 | 0.0012 | 0.0023 | <0.0087 | <0.0087 |
| 1/11/2005 | | 0.00087 | <0.0075 | <0.0087 | <0.0087 |
| 2/15/2005 | <0.000014 | 0.00059 | <0.0075 | <0.0087 | <0.0087 |
| 2/15/2005 | | 0.00045 | <0.0075 | <0.0087 | <0.0087 |
| 3/21/2005 | <0.000014 | 0.00082 | <0.0075 | <0.0087 | <0.0087 |
| 4/21/2005 | <0.000014 | 0.00041 | <0.0075 | <0.0087 | <0.0087 |
| 5/24/2005 | <0.000014 | 0.00029 | <0.0075 | <0.0087 | <0.0087 |
| 6/20/2005 | <0.000014 | 0.00067 | 0.0021 | <0.0087 | <0.0087 |
| 7/19/2005 | <0.0000408497 | 0.00056 | 0.01 | <0.0087 | 0.0048 |
| 7/26/2005 | <0.0000408497 | 0.0026 | 0.0095 | <0.0087 | <0.0087 |
| 8/2/2005 | <0.0000408497 | 0.00031 | <0.0075 | <0.0087 | <0.0087 |
| 9/20/2005 | <0.000014 | 0.0012 | <0.0075 | <0.0087 | <0.0087 |
| 9/26/2005 | <0.000014 | 0.00034 | <0.0075 | <0.0087 | <0.0087 |
| 10/18/2005 | <0.000014 | 0.0011 | <0.0075 | <0.0087 | <0.0087 |
| 11/16/2005 | <0.000014 | 0.00057 | <0.0075 | <0.0087 | <0.0087 |
| 12/20/2005 | <0.000014 | 0.006 | 0.0088 | <0.0087 | 0.0047 |


Montana Pole Plant
Air Monitoring Sites
AIR-01
AIR-02
AIR-04
AIR-05
AIR-06
AIR-07
AIR-08
AIR-09
AIR-10
AIR-4a
AIR-Retention Pond
Meters
0 25 50 100 150 200

# Appendix I. Figures




PRELIMINARY DRAFT

| REV. NO. | DATE | DRWN | CHKD | REMARKS |
|---|---|---|---|---|

DESIGNED BY: J.KOTSON
DRAWN BY: J.KOTSON
SHEET CHK'D BY: D. STORDAHL
CROSS CHK'D BY: R. HUFFSMITH
APPROVED BY: D. STORDAHL
DATE: APRIL 2002

CDM Camp Dresser & McKee Inc.
consulting engineering construction operations
34 NORTH LAST CHANCE GULCH
SUITE 104
HELENA MONTANA 59601
406-449-2121

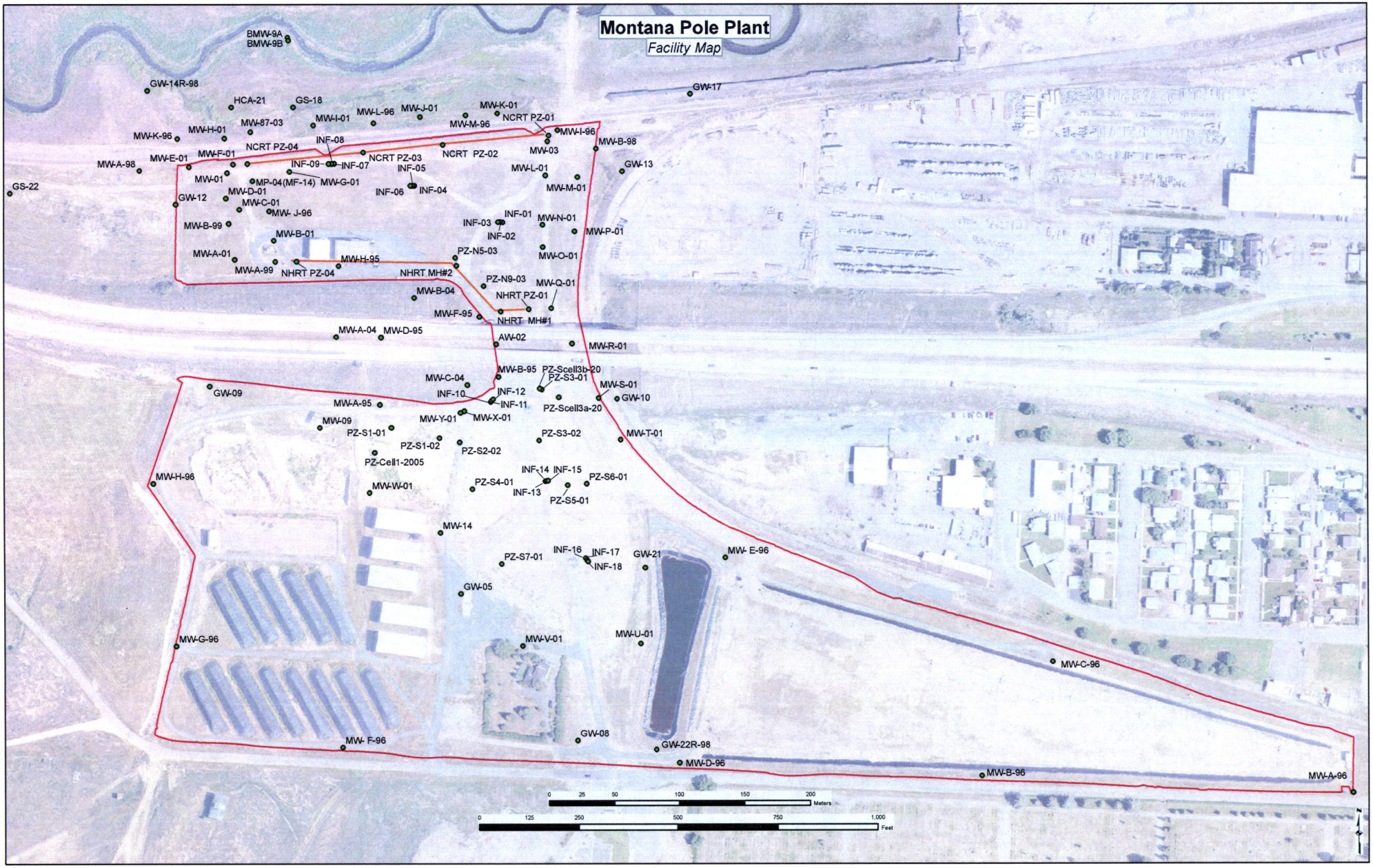
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
MONTANA POLE AND TREATING PLANT SITE
BUTTE MONTANA
PHASE 5 REMEDIAL ACTION

# MONTANA POLE SITE LAYOUT

PROJECT NO. 8469-32277
FILE NAME: PH4-SITEPLAN

SHEET NO. 1

Z:\Land Projects 3\45258 (MTP-TO-25)\dwg\LAYOUT.dwg 06/29/2005 08:02:29 AM MDT


Montana Pole Plant
Facility Map
BMW-9A
BMW-9B
GW-14R-98
HCA-21
GS-18
MW-I-01
MW-L-96
MW-J-01
MW-K-01
NCRT PZ-01
MW-M-96
MW-87-03
MW-H-01
MW-K-96
MW-I-96
MW-B-98
NCRT PZ-04
INF-08
MW-F-01
MW-E-01
NCRT PZ-03
NCRT PZ-02
MW-03
MW-A-98
INF-09
INF-07
INF-05
MW-L-01
GW-13
MW-01
MP-04(MF-14)
MW-G-01
INF-06
INF-04
MW-M-01
GS-22
MW-D-01
GW-12
MW-C-01
MW- J-96
INF-01
MW-N-01
INF-03
MW-B-99
MW-P-01
INF-02
MW-B-01
PZ-N5-03
MW-O-01
MW-A-01
MW-H-95
MW-A-99
NHRT PZ-04
NHRT MH#2
PZ-N9-03
MW-Q-01
MW-B-04
NHRT PZ-01
MW-F-95
NHRT MH#1
MW-A-04
MW-D-95
AW-02
MW-R-01
MW-B-95
PZ-Scell3b-20
MW-C-04
PZ-S3-01
MW-S-01
GW-09
INF-10
INF-12
GW-10
MW-A-95
INF-11
PZ-Scell3a-20
MW-09
MW-Y-01
MW-X-01
PZ-S1-01
PZ-S3-02
MW-T-01
PZ-S1-02
PZ-S2-02
PZ-Cell1-2005
INF-14
INF-15
MW-H-96
PZ-S6-01
PZ-S4-01
MW-W-01
INF-13
PZ-S5-01
MW-14
PZ-S7-01
INF-16
INF-17
GW-21
MW- E-96
INF-18
GW-05
MW-G-96
MW-V-01
MW-U-01
MW-C-96
GW-08
MW- F-96
GW-22R-98
MW-D-96
MW-B-96
MW-A-96
0 25 50 100 150 200
Meters
0 125 250 500 750 1,000
Feet
N