FIVE-YEAR REVIEW REPORT

Second Five-Year Review Report for the Idaho Pole Company Site Bozeman, Gallatin County, Montana

September 2005

Prepared by:

Region 8
United States Environmental Protection Agency
Montana Office
Helena, Montana

FIVE-YEAR REVIEW REPORT

Second Five-Year Review Report
for the
Idaho Pole Company Site
Bozeman,
Gallatin County, Montana

September 2005

Prepared by:

Region 8
United States Environmental Protection Agency
Montana Office
Helena, Montana

Approved by: Date:

John F. Wardell
Director, Montana Office
US E.P.A. Region 8

Second Five-Year Review Report 2005

Idaho Pole Company Site

Table of Contents

Appendices

Executive Summary

The second five-year review of the Idaho Pole Company Site, located in Bozeman, Montana, was completed in August 2005. The results of the second five-year review indicate that the remedies for soil and ground water continue to be protective of human health and the environment. The soil component of the remedy has achieved the remediation levels specified in the 1992 Record of Decision (ROD) and the Land Treatment Unit (LTU) was dismantled and closed in 2003. The ground water treatment system continues to operate as designed, and the 2004 evaluation report indicates that the contaminant plume has stabilized.

No deficiencies in the design, operation and maintenance of the remedy were noted during this second five-year review.

The protection of human health and the environment by each component of the remedial action at the Idaho Pole Company site is discussed below:

Soil Component

Contaminated soil excavated from the site was successfully treated and the treated soil was placed as backfill in several areas on Idaho Pole Company property. Treated soil was placed above historic high groundwater levels and was covered with several feet of soil on the surface. The LTU was subsequently decommissioned and closed in accordance with an EPA-approved closure plan. The soil component of the remedy at the Idaho Pole Company Site is protective of human health and the environment.

Ground Water Component

The ground water component of the remedy at the Idaho Pole Company site consists of an extraction/injection system with carbon treatment and an *in-situ* bioremediation component. A downgradient product recovery trench is used to recover oil from under Interstate 90. Both systems are operating as designed and continue to remove contaminants from the ground water. The dissolved contaminant plume associated with the site has stabilized and has decreased slightly in concentration. Test results from the residential well monitoring program indicate that contaminants have not been detected in residential wells. A Controlled Groundwater Use Area was created in 2001 under State law that includes the Idaho Pole Company site and the nearby neighborhood (Attachment H). The purpose of the Controlled Groundwater Use Area designation is to prevent construction of new wells that may pose a threat to human health and to protect the groundwater remedy. The ground water component of the remedy at the Idaho Pole Company Site is protective of human health and the environment.

Monitoring data collected over the operational period of the remedy demonstrates that contaminant levels are decreasing in both the soil and groundwater indicating that the remedy is effective and that site remediation is being accomplished.

Five-Year Review Summary Form

☐

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Idaho Pole Company		
EPA ID *(from WasteLAN)*: MTD006232276		
Region: 8	**State:** MT	**City/County:** Bozeman/Gallatin

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:** 03 / 26 / 98
Has site been put into reuse? ☐ YES **X** NO	

REVIEW STATUS	
Reviewing agency: **X** EPA ☐ State ☐ Tribe ☐ Other Federal Agency	
Author name: Jim Harris	
Author title: RPM	**Author affiliation:** EPA Region 8
Review period:** 10/01/2000 to 09/30/2005	
Date(s) of site inspection: 08/04/2005	
Type of review:*** **X** Statutory ☐ Policy (☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion)	
Review number: ☐ 1 (first) **X (second)** ☐ 3 (third) ☐ Other (specify)	
Triggering action:**** ☐ Actual RA Onsite Construction ☐ Construction Completion ☐ Other (specify)	☐ Actual RA Start at OU#____ **X** Previous Five-Year Review Report
Triggering action date *(from WasteLAN)*: 09/30/2000	
Due date *(five years after triggering action date)*: 09/30/2005	

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the five-year review in WasteLAN.]
*** [see page A-18 and Chapter 1 for further explanation.]
**** [see page A-19 and Chapter 1 for further explanation.]

Five-Year Review Summary Form

Deficiencies:

- No deficiencies in the Remedial Action implementation at the Idaho Pole Company Site were identified during the second five-year review.

Recommendations and Follow-up Actions:

- Review of additional institutional controls is currently underway to assure that future use of the Idaho Pole Company property does not compromise the soil and groundwater components of the remedy. Integrity of the groundwater treatment system and security of the treated soil are the focus of this effort.

- The Montana ***WQB-7 Numeric Water Quality Standards*** should be evaluated for inclusion as site remediation levels.

Protectiveness Statement(s):

The five-year review of the remedial actions for soil and ground water at the Idaho Pole Company Site has resulted in the determination that the remedial actions are protective of human health and the environment.

Other Comments:

A Controlled Groundwater Use Area was established in 2001 that includes the Idaho Pole Company site and nearby neighborhood. The conditions of the controlled area include a prohibition on the construction of new wells to protect public health and to protect the groundwater remedy. See Attachment H.

Idaho Pole Company Site

Second Five-Year Review Report

I. Introduction

EPA Region 8 has conducted a second five-year review of the remedial actions implemented at the Idaho Pole Company Site located in Bozeman, Montana. The review was conducted during August 2005. This report documents the results of the review.

The purpose of five-year reviews is to determine whether the remedy at a site is 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 identify recommendations to address them.

This review is required by statute. EPA must implement five-year reviews that are 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 Idaho Pole Company Site. The triggering action for this review is the first five-year review report dated September 30, 2000. Due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unrestricted use and unlimited 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

Chronology of Site Events

Date	Event
1978	Initial discovery of the problem
06/10/86	NPL listing
09/28/92	ROD signature
09/08/93	Remedial Design Start, Soils Component
09/08/93	Remedial Design Start, Ground Water Component
06/29/95	Remedial Design Completion, Soils Component
07/17/95	Soils Remedy Start
05/21/96	Explanation of Significant Differences
08/22/96	Remedial Design Completion, Ground Water Component
08/23/96	Ground Water Remedy Start
03/26/98	Construction Completion
11/27/98	Explanation of Significant Differences
03/03/99	Additional Remedial Design Start
06/08/99	Additional Remedial Design Completion
10/21/99	Additional Remedial Action Completed (Site remediation ongoing)
09/30/2000	5 Year Review
11/30/2001	Controlled Groundwater Use Area Established
09/2002	Land Treatment Unit (LTU) Decommissioned
03/04/2003	Remedial Action Completion (Soils Component)
04/13/2005	Groundwater Quality Assessment Report
09/30/2005	Second 5 Year review

III. Background

Location

The Idaho Pole Company Site (the Site) is located near the northern limits of Bozeman, Montana (approximately 30,753 inhabitants, 2003) and occupies approximately 50 acres in the east half of Section 6 and the west half of Section 5, Township 2S, Range 6E of Gallatin County. The Site, illustrated in Figure 1 (Site Location Map), is located in a light industrial use area. The Site is bounded by the Montana Rail Link railroad tracks to the south. Commercial property is west of the Site. Rocky and Mill Creeks are to the north and east. North of the former pole plant is a semirural neighborhood of twelve residences with a population of about 30 individuals. Most residences have a few acres of land used for pasture, hay or grass production and vegetable gardens. Eight of the residences continue to use ground water for domestic purposes.

Rocky Creek flows along the northern edge of the Site. It combines with Bozeman Creek about ½ mile from the Site to form the East Gallatin River. Wetlands exist within the Site, generally near Rocky Creek; the 100 year floodplain is close in towards Rocky and Mill Creeks and is within Site boundaries.

Significant features of the Site include the Idaho Pole Company (IPC) office and water treatment building. The IPC facility is currently closed with demolition of the plant structures having taken place in 1999. The Site also includes Burlington Northern Santa Fe Railway (BNSF) property, Montana Rail Link property, land owned by Northwestern Energy (formerly Montana Power Company), including the East Gallatin substation, privately-owned land west and east of Rocky Creek, and a portion of U.S. Interstate 90 (I-90).

Facility Description

The IPC wood treating facility began operation in 1945 using creosote to preserve wood. In 1952, the company switched to pentachlorophenol in carrier oil (similar to fuel oil) for the wood treating solution. IPC wood treating equipment has included butt and pole length treating vats. In 1975, a pressurized heated retort was added for treating full length poles. The pole length vats were removed in the early 1980's. There was also a drying area where treated poles were stored prior to shipment. IPC continued wood treating with a pressurized heated retort and butt dipping vat until September 1997 when IPC ceased wood-treating operations.

The following description of the facility is taken from the 1992 ROD:

> The Site is located near Rocky Creek. The Rocky Creek floodplain lies in the Upper East Gallatin subarea. There are only a few delineated horizons at the Site: a surficial clay, an intermediate silt at 25 feet below ground surface (bgs), a silty clay at 35 feet bgs and a second silty clay at 50 feet bgs.
>
> Several feet of fill material have been placed in the pole plant area overlying the surficial

clay. Horizontal and vertical variations in the subsurface units play an important role in ground water and contaminant movement. The horizons are of variable thickness and permeability and are generally continuous but probably not over the entire Site. Aquifers are associated with each of the permeable zones. Bedrock depth has not been established. The principal surface water features are Rocky Creek and Mill Creek on the northern and eastern edges of the Site. There are also several intermittently flowing ditches that carry surface runoff from rain or snow melt and high ground water. Bozeman Creek is about 1/4 mile to the west of the Site but is not in the direction of ground water flow from the Site.

In addition to the plant area, the site includes property to the north of Interstate 90, the "pasture area", where the contaminated ground water plume has migrated. Surface soil in the pasture area was contaminated by shallow ground water transporting wood-treating fluid upward to the ground surface during high water table years.

Subsequent to plant closure in 1997, EPA issued an Explanation of Significant Differences (ESD) requiring IPC to demolish plant structures and to excavate contaminated soil that remained in inaccessible areas while the treating plant was operating. The additional cleanup took place in 1999 and contaminated soil was placed on the existing land treatment unit (LTU) where soil from earlier excavation has been treated successfully to the prescribed remediation levels.

Contamination History

In 1978, the Montana Department of Fish, Wildlife and Parks notified the Montana Department of Environmental Quality (MDEQ, formerly the Montana Department of Health & Environmental Sciences (MDHES)) of a suspected release of oily wood treating fluid from the plant. MDEQ found evidence of a release in ditches near the facility and near Rocky Creek. Consequently, MDEQ issued a compliance order on September 29, 1978, notifying IPC of statutory violations and directing the company to stop uncontrolled releases and to clean up spilled treating fluid.

To slow or eliminate movement of the oily wood treating fluid through ground and surface water and into private wells, IPC installed and operated an interceptor drain with a sump and an interceptor trench adjacent to I-90. Absorbent pads were also used in the culverts and ditches to intercept and collect oily wood treating fluid. Culverts under I-90 were dammed to prevent runoff of contaminated surface water to Rocky Creek.

In 1984, IPC conducted a remedial investigation without MDEQ or EPA oversight to identify the sources and extent of contamination at the Site. IPC drilled monitoring wells to collect ground water samples and also collected soil and surface water samples. MDEQ and EPA concluded that IPC's remedial investigation report was not sufficient to identify contaminant sources and to characterize the nature and extent of contamination.

EPA proposed the facility for the National Priorities List of Superfund sites in 1984. The

listing was final in 1986, making the site eligible for federal funds for enforcement, investigation and remediation.

In 1989, MDEQ assumed the lead agency role through a cooperative agreement with EPA and began the Remedial Investigation and Feasibility Study (RI/FS) following the EPA-approved Work Plan and EPA guidance. The RI defined the nature and extent of contamination and provided data to complete the baseline health and Ecological Risk Assessments. The FS included the development, screening and evaluation of potential site remedies.

Enforcement History

EPA issued general notice letters and information requests to the potentially responsible parties (PRPs), IPC and BNSF, in February 1988. The PRPs responded with general information about their activities at the Site: IPC described treatment plant operations and BN outlined historic railroad and roundhouse activities.

In June 1988, EPA issued special notice letters to IPC and BN to initiate RI/FS negotiations between the PRPs, EPA and MDEQ. Issuance of the special notice letters triggered a 60-day moratorium during which EPA would take no action to proceed with the RI/FS. Both PRPs responded with good faith offers to conduct the RI/FS and the moratorium was extended an additional 30 days. IPC prepared a draft RI/FS Work Plan and offered comments on EPA's draft Administrative Order on Consent. BNSF assumed a secondary role in the negotiations.

Negotiations ended unsuccessfully in January 1989. In March 1989, MDEQ requested and received the lead agency role for a Fund-financed RI/FS for the Site.

MDEQ conducted the required community participation activities through presentation of the Proposed Plan, a 60-day public comment period, a public hearing and presentation of the selected remedy in the Record of Decision. Specifically included in the Record of Decision is a Responsiveness Summary that summarizes public comments and MDEQ and EPA responses. The Record of Decision documents changes, if any, to the preferred remedy set forth in the Proposed Plan as a result of public comments.

The Proposed Plan for the Site was released for public comment on April 16, 1992. The Proposed Plan was made available to the public in both the administrative record located at the Bozeman Public Library and at MDEQ offices in Helena, MT, and information repositories maintained at MDEQ offices in Helena, the Bozeman Public Library, the Gallatin County Environmental Health office and the State Library in Helena. The Proposed Plan was distributed to the IPC Site mailing list. The notice of availability of the Proposed Plan was published in the Bozeman Chronicle on April 16, 1992. A public comment period was initially designated from April 16, 1992 through May 16, 1992, but requests from the PRPs resulted in a 30 day extension to June 16, 1992.

A public hearing was held in Bozeman, MT on April 30, 1992. At this hearing, representatives from EPA and the MDEQ answered questions about contamination at the Site

and the remedial alternatives under consideration as well as the preferred remedy. A portion of the hearing was dedicated to accepting oral comments from the public. A court reporter transcribed the entire hearing and MDEQ made the transcript available to the public on May 22, 1992. EPA's response to the comments received during the public comment period is included in the Responsiveness Summary, which is part of the Record of Decision (ROD). Also, community acceptance of the selected remedy is discussed in section VII, Summary of Comparative Analysis of Alternatives, of the Decision Summary in the ROD.

EPA initiated negotiations for implementation of the remedy including Remedial Design (RD) and Remedial Action (RA) after issuance of the ROD. The negotiations were unsuccessful and consequently EPA issued a Unilateral Administrative Order on August 26, 1993, requiring that the PRPs implement the RD/RA process. EPA became the lead Agency for the RD/RA at that time. Subsequent to issuance of the ROD in 1992, two Explanation of Significant Differences (ESDs) to the selected remedy have been issued. The first ESD was issued in 1996 and addressed modifications to the soil and ground water components of the remedy. The second ESD was issued in 1998 and required additional Remedial Action after the plant closed. Each ESD will be discussed in detail in the following section of the report.

IV. Remedial Actions

Remedy Selection

SUMMARY OF THE 1992 RECORD OF DECISION

The contaminants of concern at the Site are pentachlorophenol (PCP), polynuclear aromatic hydrocarbons (PAHs), polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans. The Record of Decision established cleanup levels for those contaminants of concern at the Site. The major components of the selected remedy include:

Soil Component

- Excavation and surface land biological treatment of approximately 19,000 cubic yards of contaminated soils from the pasture area and the area between Cedar Street and U.S. Interstate Highway 90 (I-90) including ditch sediments or bottoms, and the former roundhouse area;
- Hot water and steam flushing of soils underlying the pole plant facility and I-90 in order to recover hazardous substances;
- Separation and disposal of oily wood treating fluid extracted from soils;
- Closure of onsite treatment units in compliance with RCRA Subtitle C.

Ground Water Component

- Ground water cleanup using extraction and biological treatment and return of water to the ground water aquifer to enhance *in situ* biological degradation and to control potential migration of contaminants;

- Treatment of contaminated residential wells exceeding maximum contaminant levels (MCLs) or risk based concentrations of the contaminants of concern at the distribution point in addition to institutional controls preventing new access to contaminated ground water; and

- Continued residential and ground water monitoring to determine movement of contaminants and compliance with remedial action requirements.

The ROD states:

> Both soils and ground water will be remediated as one operable unit at the Site. Soils will be excavated from three general areas: the area between Cedar Street and I-90 (includes Cedar Street ditch) and the pasture (includes the substation ditch) and the former roundhouse area. Biological treatment will take place in land treatment units located to the East of the IPC office. Soil will be treated in one foot lifts added to the units one lift at a time. When the soil cleanup levels are reached, the units will be closed by covering them with an engineered Resource Conservation and Recovery Act (RCRA) "cap". The former roundhouse area soils are predominantly PAH contaminated while the other soils are predominantly PCP contaminated.
>
> Ground water treatment will focus in the area underneath the oily wood treating fluid plume. Extraction wells will be centrally located within the contaminated ground water and injection wells will be placed along the perimeter of the oily wood treating fluid plume. Extracted ground water will be biologically treated. Treated ground water will be injected in order to deliver oxygen and nutrients back to the aquifer. Ideally this will create a hydraulic barrier to reduce or eliminate continued transfer of hazardous substances from the oily wood treating fluid plume to ground water. Additionally, nutrients will diffuse downgradient, providing for biodegradation of the downgradient contaminated ground water plume. If it is not possible to reinject all of the treated ground water, discharge to the publicly owned treatment works or treatment and discharge to surface water under a Montana Pollutant Discharge Elimination System (MPDES) permit may be required.

SUMMARY OF THE 1996 ESD

An ESD was issued in 1996, as the result of additional studies at the IPC site, that modified the 1992 remedy. The significant differences between the remedy described in the 1992 ROD and in the 1996 ESD were described in the ESD as follows:

Soils Component

1. EPA and the Montana Department of Environmental Quality (MDEQ), formerly the Montana Department of Health and Environmental Sciences (MDHES), approved an RD/RA Work Plan for the IPC site that included additional studies for both soils and ground Water. The results of the additional studies for the soils component of the remedy are contained in the ***Additional Studies and Design Basis Report I*** and were used in the design process for the Hot Water/Steam Flushing system. The determination was made that the system as envisioned in the ROD could not be designed. The ***Hot Water/Steam Flushing Technical Memorandum*** contains the design discussion.

2. The agencies have approved an alternative plan that increases the area within which soils were excavated by adding the accessible plant area soils and Cedar Street soils that exceeded the PCP cleanup level of 48 mg/kg. Soil flushing with ambient temperature water underneath the plant structures and I-90 will be designed as part of the ground water remedy as will the in-situ component.

3. Because closer evaluation of the existing and additional data indicated that the ROD cleanup levels were not exceeded in the Substation ditch, no ditch sediments were excavated.

4. A land treatment unit (LTU) of approximately 4 acres (4.25 acres) has been constructed in the southeast corner of the pole storage yard and the excavated soil from all targeted areas of the site were screened to remove rocks and were placed directly on the LTU. The total soil depth on the LTU is less than two feet. The LTU will be operated to treat the surface soils to approximately one foot in depth and the soils will be removed when the cleanup levels for PCP and PAHs are met. The RCRA Subtitle C closure of the LTU identified in the ROD will not be implemented.

5. The treated soils may be used for fill material on the plant site. If the soil contains other contaminants (e.g., dioxins/furans) that exceed the ROD levels, the soil will be isolated from ground water, will be covered at the surface to prevent direct contact and institutional controls on future land use will be required. A detailed closure plan for the LTU will be developed when soil monitoring results indicate that the cleanup levels for PCP and PAHs have been achieved. The closure plan will identify the areas to be backfilled with the treated soil and will specify separation from ground water and the depth of cover required. The plan will also identify the specific institutional controls to be implemented on the pole plant facility.

Ground Water Component

Several modifications to the system described in the ROD have been made:

1. The primary change to the ROD remedy has been the selection of a granulated activated carbon (GAC) system instead of a biological reactor to treat extracted ground

water. There are several reasons why the change was made: 1) carbon is now less expensive to use and regenerate than it was when the ROD was written, 2) a GAC system is less prone to upset than a biological system and 3) much lower contaminant concentrations in the discharge (in many cases non-detect) are possible with GAC .

The Feasibility Study (FS) indicated a concern with carbon management because the contaminants are transferred from the water column to the GAC media. This concern was unfounded because the regeneration process for the carbon destroys the contaminants through incineration.

2. The ground water extraction system will be designed in at least two phases rather than in one phase as contemplated in the ROD. The first phase will include the extraction and treatment of ground water on the south side of I-90 in the bark-fill and pole plant areas and *in-situ* treatment of the dissolved plume by injection of treated ground water. The second phase of the design will evaluate the results of the first phase and may include modifications to the treatment system as necessary to achieve the ROD goals.

3. Phase I of the ground water design/remedy will include flushing of contaminants from under the plant structures and I-90. Ambient temperature water rather than hot water or steam will be used for flushing. A detailed discussion can be found in the ***Additional Studies and Design Basis Report II***.

SUMMARY OF THE 1998 ESD

The final component of the remedy is contained in an ESD issued in 1998 after the IPC plant ceased wood treatment operations. The significant difference between the remedy described in the 1992 ROD as modified by the 1996 ESD and the remedy in this ESD is that the plant structures including concrete pads, piping, vaults, etc., preventing access to contaminated soil will be demolished and disposed of in accordance with State of Montana and EPA requirements and that contaminated soils underlying these areas will be excavated and treated like the accessible plant soils have been to date. The 1998 ESD states:

> Idaho Pole Company discontinued active wood treating operations at the Site in 1997, and has indicated to EPA that it has no intention of restarting operations at this location. Since 1997, Idaho Pole Company has transferred some of its equipment off-site and is continuing to decommission the pole plant.
>
> EPA's selection of the remedy for the contaminated soils at the Site was influenced, in large part, by the fact that an active wood treating operation existed on the Site, above contaminated soils. In the Feasibility Study, EPA and the State of Montana evaluated cleanup options including the destruction of the buildings and excavation of underlying soils. The fact that soils immediately surrounding and perhaps underneath many of the existing structures are contaminated is supported by Site operational history which includes boil overs of wood treating fluids in 1981 and 1987. The known spills were associated with the retort building and the butt vat. Soil sampling during the RI adjacent

to and underneath the plant structures confirmed that soil contamination is present.

When selecting the soils remedy, EPA determined that the direct and indirect costs of requiring the demolition of the active wood treating operation and excavation of underlying soils made this option impracticable. EPA understood from IPC that the closing of the facility would severely compromise IPC's financial viability, and could potentially result in IPC's bankruptcy. EPA sought a comparable remedy which would allow IPC to continue in business and continue earning money which could be dedicated to the cleanup of the facility. At the time of the ROD, IPC had no plans to close the facility, thus the plant structures were viewed as a *de facto* cap over the underlying contaminated soils which, for the foreseeable future, mitigated risks of exposure. The selected remedy called for excavation and treatment of contaminated soils that were accessible, and identified soil flushing/in situ biological treatment as the appropriate remedy to address soils beneath the plant and the nearby interstate highway (I-90). The ROD contemplated that institutional controls would be used in conjunction with this remedy to ensure its protectiveness, since soil flushing/in situ biological treatment as a stand alone alternative would possibly not achieve the 1×10^{-4} risk level. Soil flushing/in situ biological treatment was estimated to have a range of removal of contamination of from 40% to 80% - in other words, the selected remedy under the pole plant would not completely clean up all of the soil contamination.

With the closing of the pole plant, the relative certainty about the continued inaccessibility of soils underlying the plant has diminished markedly. It is unlikely that another wood treating operation would move onto the property and continue operations. A more likely scenario is that the property will be sold and ultimately used for another purpose. Some, if not all, of the buildings will be demolished under this scenario, and the underlying contamination will need to be addressed. By leaving contamination under the closed pole plant until some point in the future when new construction is planned, the cleanup is prolonged, issues involving the control of access to the property under new ownership arise, and the prospect arises that a new LTU would have to be constructed at significant cost. In light of these considerations, EPA has reevaluated the soils remedy at the Site and determined that it is more appropriate to demolish and dismantle the pole plant structures now and excavate and treat the underlying contaminated soils. Additional soil sampling, excavation and treatment would proceed in accordance with the procedures established in the selected remedy for accessible soils (Soil Alternative 4), as amended by the May 21, 1996 ESD.

There is no change in the remedy selected for soils underlying I-90; soil flushing will continue in this area.

Community members and City of Bozeman representatives requested, prior to the issuance of the ROD, that the cleanup be expedited. This change to the ROD will expedite the completion of the remedy. Buildings can be demolished and the underlying soils accessed, sampled, and excavated as necessary in relatively short order, as compared to the continuous soil flushing process which is estimated to achieve the necessary results in a 5 to 10 year time frame.

This change will also reduce the reliance that will be placed on institutional controls such as land use restrictions. At present, there is negligible risk to on-site workers associated with soils underlying the pole plant. However, any future disturbance of the contaminated soils underlying the plant has the potential to recontaminate clean areas of the site and to create an unacceptable risk to human health and the environment. This potential threat would remain while the contamination remains beneath the structures. To provide more certainty, EPA is modifying the remedy to require the demolition of these vacant buildings and the removal of underlying soils that exceed the action levels set forth in the ROD.

Remedial Objectives

The objective of the response actions implemented at the site is to alleviate the primary threats to human health and the environment posed by contaminant sources and contaminant migration. Specifically, the response actions proposed by EPA and MDEQ for the site were designed to prevent the exposure to contaminated groundwater. In addition, the potential for exposure to contaminated soils is to be eliminated through the treatment and ultimate disposal of contaminated soils in a lined LTU. The protection of the environment is intended to be accomplished through contaminant source removal as well as the cleanup of contaminated media through enhanced biodegradation processes designed exclusively for the contaminated soils and groundwater at the Idaho Pole Company site.

Status of Remedial Action

The components of the remedy selected for the IPC Site have been summarized above. Since the 1992 ROD was signed, IPC has designed, constructed and commenced operation on all portions of the remedy. EPA has filed a Construction Completion notice for the site in the form of a ***Superfund Preliminary Site Close Out Report (EPA 1998)***. However, since the remedy consists of innovative technologies (*in situ* and *ex situ* bioremediation techniques), the specific remedial design components are subject to design modifications as warranted. These modifications are first reviewed and approved by EPA and MDEQ prior to implementation by IPC. A summary of the current status of the remedial components is presented below.

Soil Component

The sitewide remedy identified in the ROD and supplemented in the 1996 ESD was implemented between July 1995 and January 1997. The soil portion of the remedy including construction of the LTU and retention pond (Figure 3, LTU Details), excavation of soils in the accessible areas of the plant, derocking and transportation of excavated soils to the LTU was completed between July 1995 and November 1995 (Figure 2, Site Layout Map). Soil placed on the LTU was managed by tilling, irrigation and nutrient addition.

A letter from IPC was requested by and submitted to EPA on June 11, 1998, reporting the past LTU operations through the1997operating season. ThermoRetec prepared annual LTU operating reports from1998 until the soils component of the remedy was completed and the LTU was decommissioned in 2002.

On November 27, 1998, EPA issued an ESD that presented additional changes to the ROD for the Idaho Pole Company Site. The ESD described differences to the ROD that included the demolition activities of plant structures to enable excavation access to soils underlying those areas. In January 1999, ThermoRetec presented a ***Workplan to Remove Upper Lift from Idaho Pole Company Land Treatment Unit*** to EPA. This plan was approved by EPA on March 2, 1999. LTU soil removal was commenced in May 1999 and completed in June 1999. A letter for ***Completion of Soil Removal from the LTU*** (ThermoRetec, October 5, 1999) was sent to EPA summarizing soil removal activities.

Once soil application was completed, treatment of LTU soils was initiated in August 1999. Additional information regarding the demolition activities, LTU soil application and total volume of excavated soils applied to the LTU are discussed in the Construction Completion Report submitted by IPC (Maul Foster and Alongi,1999).

LTU operations continued through October 2000. September 2000 LTU soil sample results were below the ROD cleanup levels for PCP and PAHs for both the upper and lower LTU lifts. LTU operations ceased in October 2000, having met cleanup goals and plans were made for LTU closure. LTU activities in 2001 consisted of irrigation and tilling of LTU soil while the LTU closure work plan was in the approval process.

An LTU Closure Work Plan was submitted to the EPA in February 2002 and was approved in July 2002. LTU closure activities were conducted in accordance with the RAO and the approved ***LTU Closure Work Plan***. Closure activities were based on the September 2000 soil data meeting the ROD soil treatment goals for PCP and PAHs. Dioxin/furan levels remained above the ROD remediation levels. Sample results ranged from 1.0 to 5.0 ug/kg TCDD TEQ.

The LTU closure activities included irrigation system removal, fence removal, LTU treated soil removal, treated soil placement and clean cover, liner removal and decontamination, site restoration and post-closure compliance.

LTU closure activities commenced with heavy equipment mobilization on October 1, 2002. A kick-off meeting and site walk were performed on the same day to review the scheduled closure activities. The LTU soil removal and placement activities were completed on November 6, 2002 and site restoration activities were completed on November 22, 2002. The LTU closure activities were finalized with equipment demobilization on November 25, 2002.

The irrigation system was decontaminated, dismantled and removed from the LTU during closure. On August 27, 2002, the irrigation system was flushed with clean municipal water and decontaminated with a pressure washer. The irrigation system was completely drained in the LTU and moved outside of the LTU for dismantling. The system was dismantled in sections, and sold . Irrigation system removal was complete by August 28, 2002.

The welded wire fence along the perimeter of the LTU berms was disassembled on October 8, 2002. The wooden fence posts, the 16-foot tube-gate and the wire fence were removed from the LTU and sold locally.

The chain link fence around the retention pond was disassembled on November 6, 2002. The chain link fence was removed from the retention pond area, and was sold locally. The 16-foot chain link rolling gate was reused on-site to replace the gate in front of the Groundwater Remediation System (GRS) building.

In order for treated soil to be removed from the LTU, an area (pit) needed to be excavated to accommodate the treated soil. After soil placement, a minimum of 12-inches of clean fill needed to be placed over the treated soil to prevent direct contact.

The area south of the pressure plant injection gallery was excavated for placement of treated soil. (Figure 1, Treated Soil Areas). Approximately 19,250 cy of soil were excavated from two areas, Pits 5 and 6, to accommodate the volume of treated soil and drainage sand from the LTU. Excavation of Pits 5 and 6 commenced on October 2, 2002. A track-hoe excavator was used to remove clean soil and stockpile the soil near the excavation. The excavated soils were stockpiled for use as clean cover and to level off low-lying areas on the Site. The area between the Pits contains active city water and electrical piping, which were left in-place.

A laser level was used to measure the bottom of the excavation; depths ranged from 5 to 7 feet below ground surface depending on the topography of the area. The elevation of the bottom of the excavation ranged from 4,752 feet above mean sea level (FTMSL) to 4,754 FTMSL, which is at least one-foot above the historic high groundwater level at the site. This excavation depth, one foot above the saturation zone, was designated to prevent soil contact with the groundwater in that area. The final excavation area of the Pits was 76,711 square feet. Approximately 10,717 cy of soil were excavated from Pit 5 and 8,533 cy of soil from Pit 6. The Peeler building was located in the middle of the Pit Area before LTU closure activities commenced (Figure 1, Treated Soil Areas). In order to use the area beneath the structure, the Peeler building was dismantled, removed and sold locally. The concrete foundation was left in place, covered with LTU soil and a 12-inch clean soil cover and brought to final grade.

Envirocon, Inc. started removing treated soil from the LTU on October 2, 2002. Treated soil was pushed into piles on the LTU using a dozer. The dozer cut away the soils on the LTU in layers until the geotextile fabric and liner were uncovered. The treated soil stockpiles were then transferred to haul trucks with loaders to be brought to the Pit Area.

Placement of LTU soil into the Pits began on October 8, 2002. The Pits were continually being excavated and filled with treated soil to prevent over excavation of clean soil. Soil was placed in the bottom of the excavation via ramps into and out of the excavation. A dozer inside the excavation was used to compact and level the soil in approximately one-foot lifts. A fence was assembled around the perimeter of the open excavation at the end of each shift to provide security and a safety precaution.

The haul trucks followed a designated haul route to the backfill area. A water truck was used to control dust along the haul route. The haul route was scraped after completion of treated soil placement, and material placed in the Pits with the treated soil. The loaders and haul trucks were decontaminated with a high-pressure washer or steam cleaner prior to switching tasks and after completion of the soil activities.

Treated LTU soil removal and backfill activities were complete on November 6, 2002. Approximately 19,250 cy of treated soil and drainage sands were removed from the LTU and placed in the Pit Area. An as-built drawing showing locations of the Pit Areas is provided as Figure 1 (Treated Soil Areas).

Random air monitoring was performed during soil excavation and placement activities. Air monitoring was conducted along the perimeter of the LTU for respirable particulates less than 10 micrometers (PM-10) using a hand held MIE personal/DATARAM. Particulate concentrations detected during LTU soil removal activities ranged between 0.012 mg/m^3 and 0.092 mg/m^3, which were below the health criteria of 150 $\mu g/m^3$ established in the Remedial Action Objectives (RAOs) set forth in the ROD. Photoionozation detector (PID) readings for volatile organic compounds were taken in the first week of soil removal activities. No concentrations were detected with the PID during soil removal, therefore the PID monitoring was discontinued.

During soil removal from the LTU, the leachate collection system, liner and geotextile filter fabric were exposed. Approximately 48 tons of liner, leachate collection piping and miscellaneous debris were disposed at the Valley View Landfill (City-County Sanitation Services, Inc) in East Helena, Montana. The LTU berms were then graded flat for reuse of the property.

The leachate collection system consisted of the leachate collection system sump, pump and piping. The sump and pump were removed, decontaminated and remain on site for possible reuse. The piping was removed, decontaminated with a pressure-washer and disposed of at the Valley View Landfill in East Helena.

The entire 5.25 acre LTU (including the retention pond) was lined with 60 mil thick HDPE. During construction of the LTU, the liner was placed on top of a silt/clay layer to prevent migration of hazardous constituents to the underlying soils and groundwater. During LTU operations, only the top surface of the liner was exposed to the impacted soils, whereas the bottom surface was in contact with the silt/clay layer.

Once the LTU soils were removed, the LTU liner was cut into strips, to facilitate removal, and stockpiled. To confirm that only the top surface of the liner required decontamination, samples of the underlying silt/clay were analyzed for PCP and PAH compounds. The composite soil samples were non-detect for PAH and PCP compounds (Table 1). On November 14, 2002, based on sample data, EPA approved decontamination of only the top surface of the liner before disposal. The top surface of the LTU liner was decontaminated using high-pressure washers to meet BDAT requirements.

The liner was loaded into a semi-truck trailer with a belt-driven bottom and hauled to the Valley View Landfill in East Helena for disposal beginning on November 20, 2002. Liner disposal was complete by November 25, 2002.

The geo-textile filter fabric was exposed during treated soil and drainage sand removal activities with the dozer. The filter fabric appeared to be unsoiled from the treatment of LTU soils. Three composite soil samples were collected from the sand layer above the filter fabric, and were analyzed for PCP and PAH compounds to evaluate the potential leaching of hazardous constituents during soil treatment. Analytical results indicated PCP concentrations below the performance standard of 48 mg/kg, and non-detect for PAH compounds.

As a result, a request was made to the EPA on October 18, 2002, to place the filter fabric in the Pit Area in layers on top of treated soil. Based on EPA approval on October 24, 2002, the filter fabric was placed in layers on top of the treated soil in the Pit Area, prior to placement of 12-inches of clean fill.

Surface water samples were collected from standing water on the LTU and the retention pond in June 2002. The samples were analyzed for PCP and PAH compounds. The results shown in Table 3 indicated no PAH compounds detected and PCP was detected in one sample from the LTU retention pond (15 µg/L). Based on analytical data, EPA approved pumping the water to the french drain near the former pressure plant, in preparation of LTU closure activities in August 2002.

During closure activities, the retention pond liner was brushed clean of soil and algae. The brushed soils were combined with the treated LTU soils prior to removal of the liner. The liner was cut into strips and decontaminated with a pressure washer. The liner was stockpiled, loaded into a truck trailer and disposed of at the Valley View Landfill in East Helena on November 25, 2002.

The soil berms around the LTU and retention pond were graded flat upon removal of leachate collection system, filter fabric and liner. 15,000 cy of clean berm soils were placed across the LTU area and re-contoured for drainage control, and reuse of the location.

After treated soil, sand and filter fabric were placed in the Pit Area and compacted, a 12 to 15-inch cover of clean fill material was placed over the Pit Area (Figure 8). Approximately 4,440 cy of clean fill material excavated originally from the Pit Area, were placed as the final soil cover. The soil cover was placed to prevent direct contact risk with the treated soil as described in the RAO. Cap thickness was verified with a pre and post excavation survey of the Pit Area.

The soil cover was compacted to prevent soil subsidence using heavy equipment and water trucks. The soil cover was seeded to prevent erosion of the newly placed soils. A broadcast application dispersed 250 pounds of grass seed across the area, south and east of the pressure plant gallery, over all of the disturbed soil areas. The grass seed mixture purchased in Conrad, Montana included 50% Hard fescue, 20% Sheep fescue, 20% Western and 10% Blue bunch. The seed was left to vegetate naturally requiring no further maintenance.

The extra stockpiled Pit soil was placed over the area where the LTU berms had been graded flat to cover the clay material used for berm construction. Extra soil was also placed in low-lying areas around the site to provide adequate drainage. Drainage ditches were contoured

into the final grade to control run-off water into the natural drainage. Figure 8 shows the grading and drainage flows from the site. Also, extra soil was placed around the extraction wells to provide improved access for the GRS operator. Aerial photos were taken upon completion of the final site grade. IPC filed a deed notification with the Gallatin County Clerk and Recorder that certified completion of the soil component of the remedy. The notification was recorded on July 27, 2004 by the county.

Ground Water Component

In September 1992, the EPA Region 8 issued the ROD for the site which identified the contaminants of concern (COC) and discussed the conceptual design for the ground water remedy system (GRS). The conceptual design envisioned a bioreactor treatment system. In May 1996, EPA issued an Explanation of Significant Differences (ESD) describing the remedy that was to be implemented and the conceptual design discussed in the ROD. The ESD was approved by the EPA based on additional studies conducted at the Site since the ROD was developed. The ESD identified that the GRS would use granular activated carbon (GAC) to remove contaminants from the groundwater instead of the biological system.

Construction of the GRS began in August 1996 and was completed in January 1997. The ***Construction Completion Report*** (Geraghty & Miller, 1998) describes the design and construction of the system. The ***Operation and Maintenance Manual*** (Geraghty & Miller, 1998) details the operation of the GRS. The GRS began treating groundwater on February 5, 1997. The system pumps contaminated groundwater to a holding tank, filters the water through particulate filters and two carbon vessels, and then injects the water back into the aquifer. Nutrients are added to the treated water before injection to promote the growth of microorganisms that enhance the degradation of the contaminants.

In addition to the GRS, a site-wide groundwater monitoring program was implemented in 1996. The program incorporates routine sampling and analysis of groundwater collected from on-site and off-site monitoring wells and residential wells. Appendix B presents analysis of PCP and polycyclic aromatic hydrocarbon (PAH) compounds in the groundwater prior to installation of the GRS. Concentration maps of the PCP plume prior to GRS operations are illustrated in Appendix C. After installation of the GRS, groundwater quality indicates that the monitoring program meets ROD performance and compliance requirements.

A residential well monitoring program has been conducted at the site since 1989. The monitoring has been conducted semi-annually in coordination with site-wide groundwater monitoring to evaluate the presence of PCP concentrations in wells down-gradient of the site. Eight of ten residential wells have consistently been below ROD levels for PCP. PCP has only been detected in two residential wells (Res-8 and Res-10). These properties were purchased by IPC to prevent human health risks. Appendix D presents results of residential groundwater monitoring.

In April of 1998, ThermoRetec (currently the RETEC Group or RETEC) became the oversite contractor for the Site. RETEC has implemented the monitoring programs and has provided EPA with annual program evaluations at the end of each operating season

(*Groundwater Quality Assessment Report, 1999-2004*).

Systems Operations

Land Treatment Unit Operations

As discussed above, the LTU was decommissioned in 2003, having achieved the ROD cleanup goals for contaminated site soils. No further discussion of the LTU activities is included in this review.

Ground Water Treatment System Operations 2004

Site-wide groundwater elevations were measured quarterly from 1999 through 2004 and potentiometric surface maps were created to illustrate groundwater flow in the area surrounding the Site. Figure 2-1 identifies the well locations for the Site. Groundwater elevations were measured in 41 wells quarterly in March, June, September and December 2004. Figure 2-5 is the potentiometric surface map for December 2004.

The potentiometric surface maps illustrate that groundwater flows to the northeast throughout the year. The groundwater elevation around the Site was observed to be the highest in March while the lowest elevations were observed in December 2004.

Monitoring Program

The ROD requires that the groundwater beneath and surrounding the site be monitored routinely to evaluate the performance of the GRS and establish compliance with the ROD cleanup standards. Performance monitoring includes 14 compliance monitoring wells (1-A, 7-A, 9-A, 9-C, 10-A, 23-A, 25-A, 25-B, 26-A, 26-C, 28-B, GM-4, GM-6 and GM-8) and the following 10 performance monitoring wells: 4-A, 5-A, 5-C, 11-A, 12-A, 15-A, 22, 24-A1, 27-A and GM-7. Performance monitoring was conducted concurrent with compliance monitoring activities. Performance wells are sampled to evaluate remediation progress while compliance monitoring ensures that performance standards meet remediation goals. In addition, performance monitoring includes a composite sample from each extraction gallery (pressure plant extraction gallery (PPEG) and the barkfill extraction gallery (BFEG)) to assist in evaluating the performance of the GRS.

Well 1-A is located up-gradient of the Site. Since September 1999, this well has not contained a sufficient volume of water to allow for sampling. Well 19-A is located east of Well 1-A (also up-gradient of the Site) and was previously used as the background well for LTU groundwater monitoring. When a water sample is not available from Well 1-A, Well 19-A is sampled as the background well. Table 2-1 presents the list of monitoring wells used for performance and compliance monitoring during 2004.

Sampling Program

Groundwater quality samples are collected at the Site for performance and compliance

monitoring during March (April 2004) and September.

Each well was unlocked and the water level was measured using a decontaminated electronic water measuring probe. The measured water level, total depth of the well and well diameter were used to determine the well volume. Prior to sampling, a minimum of three well casing volumes were purged from the well. Wells were purged and sampled using a disposable polyethylene bailer. A new bailer and rope were used at each well to avoid the potential for cross contamination. Conductivity, pH and temperature readings were taken throughout the purging process. If the readings were stable after removal of three casing volumes the samples were collected, otherwise purging continued until the readings stabilized. The final pH, conductivity, and temperature readings were recorded and are representative of the groundwater samples collected for laboratory analysis.

One field blank, two blind duplicate samples and a daily equipment blank were collected and analyzed during each sampling event. Field blanks were collected by pouring newly opened deionized water directly into sample bottles. Duplicate samples were required at a minimum of one per ten samples. They were collected by filling two sets of sample bottles from a chosen well. Equipment blanks were collected one per day from one of the polyethylene bailers used to sample the wells (prior to sampling). They were collected by pouring a newly opened bottle of deionized water into the bailer and then into the sample container. All samples were iced after collection. All quality control samples (field blanks, equipment blanks and duplicates) were sent blind to the laboratory by labeling the sample bottles with false well numbers.

Analytical Program

Table 2-1 presents the sampling schedule and analytical parameters for the groundwater monitoring conducted at the Site. Both the performance and compliance monitoring well networks are sampled and analyzed for:

- PCP by EPA Method 8040
- PAH by EPA Method 8310
- Biological parameters:
  - ammonia by EPA Method 350.1
  - nitrate by EPA Method 353.2
  - nitrite by EPA Method 353.2
  - total alkalinity by EPA Method 310.1
  - bicarbonate alkalinity by EPA Method 310.1
  - sulfate by EPA Method 375.2
  - sulfite by EPA Method 377.1
  - total organic carbon (TOC) by EPA Method 415.1
  - orthophosphate by EPA Method 365.2

First quarter sampling required collection of PCP and biological parameters. PCP, biological parameters and PAH samples were collected during third quarter sampling.

Performance wells PPEG and BFEG were sampled and analyzed for PCP each quarter in conjunction with the monthly GRS sampling.

Residential Well Sampling

Residential well monitoring for the presence of PCP has been conducted since 1989. Groundwater concentrations in residential wells are compared to the drinking water standards presented in Table 13 of the ROD (Appendix E). According to Section 4.0 of Appendix B in the Operations and Maintenance Manual (Geraghty & Miller, 1998), PCP has been detected at concentrations above drinking water standards in only two wells (Wells Res-8 and Res-10).

The monitoring program originally included 10 wells identified as Wells Res-1 through Res-10. To prevent use of water supply wells, the land associated with Residential Wells Res-8 and Res-10 was purchased by IPC. Upon installation of the GRS, Well Res-8 was sampled quarterly to aid in defining the leading edge of the PCP plume (northern boundary of the Site). Well Res-10 (located near center of PCP plume) was initially sampled as part of the resident well network and sampling continued until March 1991. In December 1990, three wells (Wells 26-A, 26-B and 26-C) were installed adjacent to Well Res-10 for performance and compliance monitoring. Sampling of Well Res-10 was discontinued after sampling of the new wells was initiated.

Past residential well monitoring data indicates that PCP levels have remained below detection limits except in Well Res-8. In March 2002, EPA approved a reduction of sampling frequency from semi-annual to annual sampling. Well Res-8 sampling frequency was decreased from quarterly to semi-annually. Residential sampling has been completed in conjunction with the site-wide groundwater sampling in March and September. Table 3-1 located in Section 3 (Appendix B) of the ***Groundwater Remedy Operations and Maintenance Manual*** (Arcadis Geraghty & Miller, 1998) was revised to reflect the reduction in residential well sampling effective in March 2002.

In 2004, residential wells were sampled in September. In addition, Well Res-8 was sampled in April, coinciding with site-wide monitoring events to monitor PCP concentrations down-gradient of the Site.

All analysis were conducted in accordance with EPA guidelines contained in ***Sampling and Analysis Plan*** (Geraghty & Miller, Inc., 1998). Analytical Resources Inc. (ARI), Tuckwila, Washington, conducted the associated analysis for the site-wide groundwater monitoring wells, residential wells and GRS performance samples.

Analytical Results

PCP

April 2004

Twenty-four monitoring wells were sampled for PCP in April 2004. Well 1-A did not have enough water to collect a sample and Well 19-A was sampled as the replacement background well.

Pentachlorophenol was detected in 14 of 24 monitoring wells (Table 2-2). The observed concentrations of PCP ranged from <0.25 micrograms per liter (µg/L) to 2,300 µg/L. The highest concentration of PCP was detected in Well 5-A (2,300 µg/L) located up-gradient of the BFEG. The PCP concentrations were below the detection limit in 10 wells (Wells 4-A, 5-C, 7-A, 10-A, 12-A, 19-A, 24-A1, 27-A, GM-7 and GM-8).

One field blank was collected at Well 4-A (labeled 4-F) during the April 2004 event and analyzed for PCP. Pentachlorophenol was not detected (<0.25 µg/L) in the sample. A sample and duplicate were collected at Well 9-A and Well 27-A . The PCP concentrations for the sample and duplicate from Well 9-A were 71 and 68 µg/L, respectively. PCP concentrations were <0.25 µg/L in both the sample and duplicate from Well 27-A. PCP was detected in the April composite GRS samples, BFEG (SP-2) and PPEG (SP-1), 7.5 µg/L and 10 µg/L, respectively.

September 2004

Twenty-four monitoring wells were sampled for PCP in September 2004 (Table 2-3). Well 1-A did not have enough water to collect a sample and Well 19-A was sampled as the replacement background well.

Pentachlorophenol was detected in 14 of the 24 wells. The observed concentrations of PCP ranged from <0.25 µg/L to 6,900 µg/L. Well 5-A (located up-gradient of the BFEG) had the highest concentration of PCP (6,900 µg/L). Pentachlorophenol concentrations were below the detection limit in 10 wells (Wells 4-A, 5-C, 7-A, 10-A, 12-A, 19-A, 24-A1, 27-A, GM-7 and GM-8) during the September sampling event. A PCP concentration plume map for the September sampling event is presented in Figure 2-8.

One field blank was collected at Well 4-A (labeled 4-F) and the concentration was below the detection limit for PCP. A sample and duplicate were collected from Well 9-A and Well 27-A. The sample and duplicate from Well 9-A had concentrations of 110 and 94 µg/L, respectively. The sample and duplicate from Well 27-A were below the detection limit for PCP. PCP was detected in the September composite GRS samples, BFEG (SP-2) and PPEG (SP-1), at 7.1 µg/L and 20 µg/L, respectively.

Well 28-B

Historic analytical results from Well 28-B were reviewed to aid in the explanation of possible causes for recent elevated PCP levels. The first elevated PCP level was identified in September 2000, a few months after beaver activity was observed in the East Gallatin River. The highest PCP concentration was measured during the March 2001 event and subsequent sampling events have indicated a downward trend.

IPC has reviewed Site potentiometric groundwater maps and hydrographs for Well 28-B and neighboring monitoring wells. A direct correlation between historic Site groundwater conditions and the PCP levels at Well 28-B can not be identified. It appears that there may be a correlation between beaver activity in the area (damming of the East Gallatin River) and elevated PCP levels at Well 28-B. The PCP levels have continued to decline since the March 2001 monitoring event.

The beaver dams were removed in March 2003. The PCP concentrations decreased in Well 28-B from observed levels of 8.2 µg/L in September 2002 to 1.8 µg/L in April 2003 and down to 0.72 µg/L in September 2003. Beaver activity has been continually monitored to ensure damming of the East Gallatin River is prevented north of the IPC Site.

PAH Compounds

Eight wells (Wells 5-A, 9-A, 15-A, 19-A, 22, 25-A, 25-B and 26-C) were sampled for PAH compounds during the September 2004 groundwater monitoring event. All eight wells were below the ROD levels for Total D PAH compounds (2 and 3 ringed PAHs) (146 µg/L) with the exception of Well 5-A. Well 5-A is located up-gradient of the BFEG and had a Total D PAH concentration of 17,730 µg/L. As discussed in the Data Validation section below, the PAH analysis from Well 5-A was qualified as estimated ("J" qualifier). The sample was extracted 13 days over the 5 day extraction time before analysis. The estimated concentrations are similar to, or high than previous concentrations. The PAH cleanup levels for the Site are presented in Table 13 of the ROD (Appendix E).

Five of eight wells were below the ROD levels for B2 PAH (4 and 5 ringed PAHs) compounds. Wells 5-A, 15-A and 22 had exceedences for B2 PAH compounds including Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene and Indeno(1,2,3-cd)pyrene. Table 2-3 presents the data for the September 2004 event. A sample and duplicate were collected at Well 9-A and analyzed for PAH compounds. The duplicate results were similar to the results observed in the Well 9-A sample.

The composite GRS samples from the BFEG and the PPEG were analyzed for PAH compounds during the September groundwater sampling event. Both of the BFEG and PPEG samples were below cleanup levels for Total D PAH compounds and all B2 PAH compounds.

V. Five-Year Review Process

The Idaho Pole Company Site five-year review was led by Jim Harris, Remedial Project Manager for the IPC site. The following team members assisted in the review:

- Lisa DeWitt, Project Officer, Montana DEQ
- Les L. Lonning, Manager, Technical and Environmental Affairs, IPC

- Dan Stremcha, P.E., Project Manager, Hydrometrics, Inc.
- John Wardell, Superfund Branch Chief, USEPA
- Kathy Chiotti, Environmental Protection Specialist, USEPA
- Suzanne Bohan, Site Attorney, USEPA

Components of this five-year review included: a review of relevant documents and a site inspection. This report will be available in the information repository upon completion. Notice of its completion will be placed in the local newspaper and local contacts will be notified by letter. A brief summary of this report will be distributed to community members.

VI. Five-Year Review Findings

Interviews

Interviews were not conducted during this five-year review. EPA has not received complaints about Site activities since the ROD was issued in 1992. Local interest in the Site has been primarily limited to the Site's redevelopment potential.

Site Inspection

An inspection of the Idaho Pole Company Site was performed on August 4, 2005 by EPA and IPC representatives. During the Site inspection, areas visited included the Water Treatment Plant, injection and extraction well galleries, the interceptor trench/pasture and the former location of the Land Treatment Unit (LTU) and Retention Pond. A summary of the inspection findings is presented below and the detailed inspection check list is attached as Appendix A.

Site Security

The Idaho Pole Company Site has been an operating wood-treating facility until ceasing operations in 1997. A full time operating crew was on-site during daytime hours until plant closure. Prior to decommissioning in 2002, the LTU had a perimeter fence with a locking gate and the retention pond was also enclosed by a fence with 3 strand barbed wire on top. The water treatment plant is located inside of a metal building that is kept locked when the operator is not at the Site. The water treatment plant is located inside of a fenced, lockable enclosure and a part-time operator is employed by IPC. No damage to any of the fences or the water treatment plant building was noted during the inspection. There was no evidence of trespass at the IPC Site.

Land Treatment Unit and Retention Pond

Normal LTU operations continued through October 2000. September 2000 LTU soil

sample results were below the ROD cleanup levels for PCP and PAHs for both the upper and lower LTU lifts. LTU operations ceased in October 2000, having met cleanup goals and plans were made for LTU closure. LTU activities in 2001 consisted of irrigation and tilling of LTU soil while the LTU closure work plan was in the approval process.

An LTU Closure Work Plan was submitted to the EPA in February 2002 and was approved in July 2002. LTU closure activities were conducted in accordance with the RAO and the approved LTU Closure Work Plan. Closure activities were based on the September 2000 soil data meeting the ROD soil treatment goals for PCP and PAHs.

The LTU closure activities were completed in 2003 and included irrigation system removal, fence removal, LTU treated soil removal, treated soil placement and clean cover, liner removal and decontamination, site restoration and post-closure compliance .

Groundwater Treatment System

The ROD required that a pump and treat groundwater remediation system be installed to accelerate the removal of dissolved phase PCP and PAH compounds from the aquifer beneath the Site. Construction of the GRS began in August 1996 and was completed in January of 1997. A detailed summary of construction of the GRS can be found in the ***Construction Completion Report*** (Geraghty & Miller, Inc., 1998). The components of the GRS include two groundwater extraction galleries, bag filters, sequestering agent, GAC adsorption unit, a nutrient addition process, two injection galleries, and an interceptor trench (Figure 2, Site Layout Map).

Treatment of contaminated groundwater is initiated by extracting water from a gallery of five wells located up-gradient to the GRS, the PPEG. Groundwater is also extracted from a gallery of five wells located down-gradient of the GRS, the BFEG. The extracted water from both galleries is pumped to an influent equalization tank inside the water treatment building. Water is then pumped from the equalization tank through a series of bag filters that remove particulates greater than 10 microns from the water flow. After filtration, the water is sent to a lead-lag GAC unit where dissolved PCP and PAH compounds are removed from the water. Oxygen is added to the treated water as it enters the effluent equalization tank. Nutrients are added to the treated water as it is pumped from the effluent tank to the injection galleries. From the effluent equalization tank, the water is sent to both the pressure plant injection gallery (PPIG) and the barkfill injection gallery (BFIG).

The PPIG consists of fifteen wells located up-gradient of the pressure plant. Injection of water into the PPIG is intended to flush contaminants from beneath the pressure plant toward the PPEG. Nutrients added to the injected water enhance biological remediation of dissolved phase PCP and PAH compounds in the groundwater. The BFIG consists of twenty wells located downgradient of the BFEG and southwest of I-90. Water injected into the BFIG flushes contaminants from beneath I-90 towards the pasture area down-gradient of the interstate. An interceptor trench was constructed just north of I-90 to recover the free product that is flushed from beneath the interstate by the BFIG. Product that accumulates in the trench is manually removed from the trench every two weeks if needed. The product and pads removed from the

trench are placed into barrels for appropriate disposal.

The ground water remediation system at the IPC site continues to function as designed and provides protection of human health and the environment.

The inspection performed on August 4, 2005, verified that the remedial systems at the Idaho Pole Company Site were operating as designed and in compliance with the conditions specified in the 1992 ROD and subsequent ESDs.

Risk Information Review

A review of the ***Montana Numeric Water Quality Standards Circular WQB-7*** during the First Five-Year Review revealed that the State of Montana has promulgated human health standards for two carcinogenic PAH compounds in ground water, benzo(a)pyrene and dibenzo(a,h)anthracene, that are lower than the respective MCLs which were used as remediation levels in the 1992 ROD.

The MCL for benzo(a)pyrene is 0.2 μg/L and the WQB-7 human health standard for benzo(a)pyrene in groundwater is 0.048 μg/L. The required reporting value, which is defined as the State's "best determination of a level of analysis that can be achieved in routine sampling", for benzo(a)pyrene is 0.2 μg/L.

The MCL for dibenzo(a,h)anthracene is currently 0.3 μg/L and the WQB-7 human health standard for dibenzo(a,h)anthracene in ground water is 0.048 μg/L. The required reporting value for dibenzo(a,h)anthracene is 0.5 μgL. Neither of the WQB-7 standards are measurable using current analytical techniques.

There are currently no exposures to contaminated ground water from the Idaho Pole Company Site and future exposures are not anticipated because of the existing remediaton efforts. IPC currently owns 2 residential properties where PCP has been detected in the wells. Both properties are currently unoccupied and the wells are not being used. The ongoing Residential Monitoring Program continues to demonstrate that contaminants above the drinking water standards are not detected in the residential wells.

A petition for establishment of a controlled ground water use area for the Idaho Pole Company Site was approved on November 30, 2001 by the Montana Department of Natural Resources and Conservation (DNRC). The petition identifies an area within which restrictions on ground water are established. DNRC is the enforcement authority for the controlled ground water use area.

The WQB-7 standards will not effect the on-going remedial action since groundwater is treated to below detection limits. However, the WQB-7 human health standards for ground water are acknowledged as the applicable ground water standard and a modification to the site remediation levels will be evaluated. As indicated in the First Five-Year Review, conducted in

2000, an Explanation of Significant Differences may be used to incorporate the state standards.

Although significant changes have occurred in the regulation of certain hazardous wastes found at the IPC Site, no changes in action or location specific requirements have been promulgated that would affect the remedial action since remedy implementation.

Data Review

The Idaho Pole Company is required to submit an annual report on both the ground water component and the soil component of the remedy. A review of the ***Groundwater Quality Assessment Report*** and the ***LTU Operations Report*** has taken place on an annual basis since the remedies were implemented, however because the LTU operations ceased in 2002, subsequent reports were not required.

Table 4-1 contains groundwater remediation system (GRS) data from the December 2004 sampling event. The GRS continues to remove contaminants to below detection limits.

VII. Assessment

The following conclusions support the determination that the remedy at the Idaho Pole Company Site is currently functioning as designed and is expected to remain protective of human health and the environment.

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

- ***HASP/Contingency Plan:*** Both the HASP and the Contingency Plan are in place, sufficient to control risks, and properly implemented.

- ***Implementation of Institutional Controls and Other Measures:*** Restrictions on ground water use are currently being implemented through a controlled ground water use area designation. DNRC enforces this control measure.

- ***Remedial Action Performance:*** The soil component of the remedy is complete. The ground water treatment system is performing as designed with reductions in source area loadings and with dissolved plume stabilization.

- ***System Operations/O&M:*** System operations procedures are consistent with site requirements and no deficiencies were identified.

- ***Cost of System Operations/O&M:*** Costs have been within an acceptable range.

- ***Opportunities for Optimization:*** IPC has had numerous inquiries concerning future beneficial use of the former treating plant property. Because the soil cleanup has been completed and plant structures have been demolished, future industrial use of the

property should be feasible.

- ***Early Indicators of Potential Remedy Failure:*** No early indicators of potential remedy failure were noted during this review.

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

- ***Changes in Standards and To Be Considereds:*** WQB-7 standards were identified that do not effect the protectiveness of the remedy.

- ***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 Toxicity and Other Contaminant Characteristics:*** Toxicity and other factors for contaminants of concern have not changed.

- ***Changes in Risk Assessment Methodologies:*** Changes in risk assessment methodologies since the time of the ROD do not call into question the protectiveness of the remedy.

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 continue to be evaluated to reflect the State standards.

IX. Recommendations

1. The Montana ***WQB-7 Numeric Water Quality Standards*** should be evaluated for inclusion as site remediation levels.

2. Review of additional institutional controls is currently underway to assure that future use of the Idaho Pole Company property does not compromise the soil and groundwater components of the remedy. Integrity of the groundwater treatment system and security of the treated soil are the focus of this effort.

X. Protectiveness Statements

The protection of human health and the environment by the remedial actions for soil and groundwater are discussed below. Both the HASP and the Contingency Plan are in place, sufficient to control risks, and properly implemented. The remedial action for the soil has been completed and groundwater components of the remedy are functioning effectively as anticipated; therefore, the remedy for the site is expected to be protective of human health and the environment.

Soil Component

The soil component of the remedy at the IPC Site has been completed.

Ground Water Component

The ground water component of the remedy is functioning effectively as anticipated and is therefore protective of human health and the environment. Levels of contaminants continue to decrease and migration of the groundwater plume has been stabilized. Although downgradient residential wells are not contaminated, institutional controls have been implemented to prevent groundwater use downgradient of the plume.

XI. Next Review

This is a 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. Documents Reviewed and References

ARCADIS Geraghty & Miller, 1995. *Final Design Report Soil Remedy for the Idaho Pole Site, Bozeman, Montana.*

ARCADIS Geraghty & Miller, 1996. *Resident and Groundwater Well Monitoring Plan Groundwater Remedy Plan for the Idaho Pole Site, Bozeman, Montana.*

ARCADIS Geraghty & Miller, 1997. *Sampling and Analysis Plan Remedial Actions Operations Groundwater Remedy for the Idaho Pole Site, Bozeman, Montana.*

ARCADIS Geraghty & Miller, 1998. *Construction Completion Report for the Idaho Pole Site, Bozeman, Montana.*

ARCADIS Geraghty & Miller, 1998. *Operation and Maintenance Manual Groundwater Remedy for the Idaho Pole Site, Bozeman, Montana.*

BioTrol, Inc., December 14, 1995, *Pentachlorophenol Adsorption from Water onto Granular Activated Carbon for the Idaho Pole Company Site, Bozeman, Montana.*

Geraghty & Miller, Inc., February 23, 1994, *Final Remedial Design Work Plan for the Idaho Pole Company Site, Bozeman, Montana.*

Geraghty & Miller, Inc., March 24, 1994, *Expedited Sampling Plan Report for the Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, Inc., May 27, 1994, *Additional Studies Work Plan I - Land Treatment Unit, Remedial Design/Remedial Action, Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, Inc., June 23, 1994, *Additional Studies Work Plan II - Remedial Design/Remedial Action, Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, Inc., August 1, 1994, *Land Treatment Demonstration Remedial Design/Remedial Action for the Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, Inc., September 23, 1994, *Pasture Remediation, Interim Action Work Plan and Design Report, Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, Inc., February 1995, *Additional Studies and Design Basis Report I for the Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, May 19, 1995, *Final Design Report, Soil Remedy, Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, Inc., June 1, 1995, *Hot Water/Steam Flushing Technical Memorandum, Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, June 23, 1995, *Remedial Actions Operations Plan, Soil Remedy, Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, June 28, 1995, *Construction Quality Assurance Plan, Soil Remedy, Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, Inc., January 22, 1996, *Additional Studies and Design Report II for the Idaho Pole Company Site, Bozeman, Montana.*

Geraghty & Miller, Inc., April 4, 1996, *Carbon Testing Results, Addendum No. 1 to ASDBR II, Granular Activated Carbon System Groundwater Remedy, Idaho Pole Company Site, Bozeman, Montana.*

Geraghty & Miller, July 29, 1996, *Construction Quality Assurance Plan, Groundwater Remedy, Idaho Pole Company, Bozeman, Montana.*

Geraghty & Miller, August 5, 1996. *Final Design Report, Groundwater Remedy, Idaho Pole Company, Bozeman, Montana* .

Geraghty & Miller, November 18, 1996. *Remedial Actions Operations Plan, Groundwater Remedy, Idaho Pole Company, Bozeman, Montana.*

Maul Foster & Alongi, Inc.1999. *Construction Completion Report, Idaho Pole Company Site, Bozeman, Montana.* Prepared for the Idaho Pole Company Group and the Burlington Northern Santa Fe Railway. November 19, 1999.

Maul Foster & Alongi, Inc.1999. *Draft Additional Remedial Design/ Remedial Action Work Plan, Idaho Pole Company Site, Bozeman, Montana:* Prepared for the Idaho Pole Company Group and the Burlington Northern Santa Fe Rail Way. April 29, 1999.

Montana Numeric Water Quality Standards Circular WQB-7, November 1998 and updates.

RETEC Group, Inc., 2001, 2002, 2003 and 2004. *2001, 2002, 2003 and 2004 Groundwater Quality Assessment Report for the Idaho Pole Company (IPC) Site, Bozeman, Montana.*

RETEC Group, Inc., 2003. *Land Treatment Unit (LTU) Closure Completion Report Idaho Pole Company (IPC) Bozeman, Montana.*

ThermoRetec, 1999. *Idaho Pole Land Treatment Unit- 1998 LTU Operations Report, Bozeman, Montana.*

ThermoRetec, 1999. *Workplan to Remove Upper Lift From the Idaho Pole Company Land Treatment Unit, Bozeman, Montana.*

ThermoRetec Consulting Corporation, 1998, 1999 and 2000. *1998, 1999, 2000 Groundwater Quality Assessment Report for the Idaho Pole Company (IPC) Site, Bozeman, Montana.*

ThermoRetec Consulting Corporation, 1998. *First, Second, Third and Fourth Quarterly Progress Reports for the Idaho Pole Site, Bozeman, Montana.*

ThermoRetec Consulting Corporation, 1999. *First, Second, Third and Fourth Quarterly Progress Reports for the Idaho Pole Site, Bozeman, Montana.*

USEPA, May 1996. *Explanation of Significant Differences, Idaho Pole Company Superfund Site, Bozeman, Montana.*

USEPA, 1998. *Explanation of Significant Differences for the Idaho Pole Site, Bozeman, Montana.*

USEPA, June 14, 1995. *Hot Water/Steam Flushing Technical Memorandum for Idaho Pole*

Company NPL Site.

USEPA, September 1992, *Record of Decision: Idaho Pole Site, Bozeman, Montana.*

USEPA, 1993. *Unilateral Administrative Order (UAO) for the Idaho Pole Company, Bozeman, Montana. Region VIII: Denver, Colorado.*

APPENDICES

Appendix A

Inspection Report Form
Second Five-Year Review
September 2005

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: Idaho Pole Company	**Date of inspection:** August 4, 2005
Location and Region: Bozeman, Montana, Region 8	**EPA ID:** MTD 006232276
Agency, office, or company leading the five-year review: EPA Region 8, Montana Office	**Weather/temperature:** Clear 80 F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- X Access controls
- X Institutional controls
- X Groundwater pump and treatment
- ☐ Surface water collection and treatment
- X Other - Land Treatment Unit

_____

_____

Attachments: X Inspection team roster attached X Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Les D. Lonning (Name) Manager Technical and Environmental Affairs (Title)
   Interviewed X at site X at office ☐ by phone Phone no. 253 572-3033
   Problems, suggestions: ☐ Report attached _____

2. **O&M staff** Dan Stremcha (Name) Treatment Plant Engineer (Title)
   Interviewed X at site X at office ☐ by phone Phone no. _406 656-1172 X207
   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**
   ☐ State in-house ☐ Contractor for State
   X 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 ground water control area

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 ☐ 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 Oil/water separation Bioremediation
☐ Air stripping X Carbon adsorbers
☐ Filters_____
☐ Additive (e.g., chelation agent, flocculent)_____
☐ Others_____
☐ 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

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Both the soil and ground water components of the remedy were 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. that suggest that the protectiveness of the remedy may be compromised in the future. None
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. A TI waiver would allow Idaho Pole Company to modify operations of the ground Water treatment system that will result in dollar savings.

Appendix B
Groundwater Data

Table 2-1
Performance and Compliance Monitoring Schedule
IPC - Bozeman, MT

Well No.	Performance Wells	Compliance Wells	1st Qtr			3rd Qtr			
			Field Screening	PCP	Bio	Field Screening	PCP	Bio	PAH
Wells									
1-A or 19-A	x	x	x	x	x	x	x	x	x
4-A	x		x	x	x	x	x	x	
5-A	x			x			x		x
5-C	x			x		x	x		
7-A	x	x	x	x	x	x	x	x	
9-A	x	x		x			x		x
9-C	x	x	x	x	x	x	x	x	
10-A	x	x	x	x	x	x	x	x	
11-A	x		x	x	x	x	x	x	
12-A	x			x			x		
15-A	x			x		x	x		x
22	x			x	x	x	x	x	x
23-A	x	x	x	x	x	x	x	x	
24-A1	x			x	x		x	x	
25-A	x	x		x	x	x	x	x	x
25-B	x	x		x	x	x	x	x	x
26-A	x	x		x	x	x	x	x	
26-C	x	x		x	x	x	x	x	x
27-A	x			x			x		
28-B (28)	x	x	x	x	x	x	x	x	
GM-4	x	x	x	x		x	x		
GM-6	x	x	x	x		x	x		
GM-7	x		x	x	x	x	x	x	
GM-8	x	x		x	x	x	x	x	
PPEG	x		x	x	x	x	x	x	x
BFEG	x		x	x	x	x	x	x	x
RES-1 to 9							x		
RES - 8				x			x		

Note:As of EPA approval on 4-6-01, Well 11-A replaced 14-A, Wells 12-A, 24-A and 27-A were added to the performance schedule. As of EPA approval on 3-6-02, Residential Well-8 will be sampled semi-annually in March and September while Res-1 through Res-9 will be sampled annually in September.

If well 1-A does not have enough water fro sampling, 19-A should be used as the bacground well.

BFEG - Barkfill Extraction Gallery are composite samples and PCP samples are collected in conjunction with monthly GRS samples. The Bioremediation samples are collected in the 1st and 3rd quarters.

PPEG - Pressure Plant Extration Gallery are composite samples and PCP samples are collected in conjunction with monthly GRS samples. The Bioremediation samples are collected in 1st and 3rd quarters.

PAH - Polycyclic aromatic hydrocarbons (EPA Method 8310)

PCP - Pentachlorophenol (EPA Method 8040)

Field Screening - Redox, DO, pH, Temperature, Conductivity

BIO - ammonia, nitrate, nitrite, total alkalinity, bicarbonate alkalinity, sulfate, sulfite, TOC and orthophosphate

Table 2-2
Groundwater Analytical Data
April 2004
IPC - Bozeman, Montana

Sample ID: / Sample Date:	4-A 4/6/2004	5-A 4/6/2004	5-C 4/6/2004	7-A 4/6/2004	9-A 4/6/2004	(9-D) 9-A Dup 4/6/2004	9-C 4/7/2004	10-A 4/7/2004	11-A 4/7/2004	12-A 4/6/2004
PCP-Method 8040 (ug/L)										
Pentachlorophenol	< 0.25	**2300**	< 0.25	< 0.25	**71**	**68**	**45**	< 0.25	**20**	< 0.25
Alkalinity (mg/L CaCO3)	518.0	NA	NA	890.0	NA	NA	356.0	306.0	363.0	NA
Carbonate (Alkalinity) (mg/L CaCO3)	< 1	NA	NA	< 1	NA	NA	< 1	< 1	< 1	NA
Bicarbonate (Alkalinity) (mg/L CaCO3)	518.000	NA	NA	890.000	NA	NA	356.000	306.000	363.000	NA
N-Ammonia (mg-N/L)	0.1	NA	NA	0.027	NA	NA	< 0.01	< 0.01	< 0.01	NA
N-Nitrate (mg-N/L)	< 0.010	NA	NA	< 0.010	NA	NA	4.560	2.950	1.660	NA
N-Nitrite (mg-N/L)	< 0.01	NA	NA	0.043	NA	NA	0.02	0.016	0.025	NA
Nitrate + Nitrite (mg-N/L)	< 0.01	NA	NA	< 0.010	NA	NA	4.580	2.970	1.690	NA
Ortho-Phosphorous (mg-P/L)	< 0.004	NA	NA	< 0.004	NA	NA	0.027	0.057	0.133	NA
Sulfate (mg/L)	7.1	NA	NA	68.3	NA	NA	30.4	26.5	145.0	NA
Sulfite (mg/L)	< 1.5	NA	NA	< 1.5	NA	NA	< 1.5	< 1.5	< 1.5	NA
Total Organic Carbon (mg/L)	19.7	NA	NA	8.34	NA	NA	2.57	5.81	6.65	NA

Sample ID: / Sample Date:	15-A 4/6/2004	19-A 4/6/2004	22 4/6/2004	23-A 4/6/2004	24-A1 4/7/2004	25-A 4/7/2004	25-B 4/7/2004	26-A 4/7/2004	26-C 4/7/2004	27-A 4/6/2004
PCP-Method 8040 (ug/L)										
Pentachlorophenol	**78**	< 0.25	0.46	**62**	< 0.25	**70**	**100**	**4.2**	**64**	< 0.25
Alkalinity (mg/L CaCO3)	NA	NA	333.0	422.0	357.0	381.0	381.0	360.0	332.0	NA
Carbonate (Alkalinity) (mg/L CaCO3)	NA	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	NA
Bicarbonate (Alkalinity) (mg/L CaCO3)	NA	NA	333.000	422.00	357.000	381.000	381.000	360.000	332.000	NA
N-Ammonia (mg-N/L)	NA	NA	< 0.01	0.211	0.038	< 0.01	< 0.01	0.18	0.011	NA
N-Nitrate (mg-N/L)	NA	NA	2.89	0.205	< 0.010	1.850	2.680	0.289	5.090	NA
N-Nitrite (mg-N/L)	NA	NA	0.02	0.021	< 0.010	0.02	0.044	< 0.01	0.043	NA
Nitrate + Nitrite (mg-N/L)	NA	NA	2.91	0.226	< 0.010	1.870	2.720	0.289	5.130	NA
Ortho-Phosphorous (mg-P/L)	NA	NA	1.42	< 0.004	0.005	0.04	< 0.004	< 0.004	0.026	NA
Sulfate (mg/L)	NA	NA	38.5	32.5	61.2	34.1	31.2	61.1	30.9	NA
Sulfite (mg/L)	NA	NA	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	NA
Total Organic Carbon (mg/L)	NA	NA	5.34	19.6	11.6	11.40	3.75	9.45	2.61	NA

Sample ID: / Sample Date:	(27-D) 27-A Dup 4/6/2004	28-B 4/6/2004	GM-4 4/6/2004	GM-6 4/6/2004	GM-7 4/6/2004	GM-8 4/6/2004	BFEG 4/6/2004	PPEG 4/6/2004	(4-F) Field Blank 38083	Method Blank
PCP-Method 8040 (ug/L)										
Pentachlorophenol	< 0.25	**0.96**	**400**	**9.9**	< 0.25	< 0.25	**7.5**	**10**	< 0.25	< 0.25
Alkalinity (mg/L CaCO3)	NA	239.0	NA	NA	264.0	322.0	305.0	344.0	< 1.0	< 1.0
Carbonate (Alkalinity) (mg/L CaCO3)	NA	< 1	NA	NA	< 1	< 1	< 1	< 1	< 1.0	< 1.0
Bicarbonate (Alkalinity) (mg/L CaCO3)	NA	239.000	NA	NA	264.000	322.000	305.000	344.000	< 1.000	< 1.000
N-Ammonia (mg-N/L)	NA	< 0.010	NA	NA	< 0.01	< 0.01	< 0.0	< 0.01	0.013	< 0.010
N-Nitrate (mg-N/L)	NA	0.077	NA	NA	5.790	2.500	2.440	2.280	< 0.010	< 0.010
N-Nitrite (mg-N/L)	NA	< 0.010	NA	NA	0.03	0.017	0.019	0.018	< 0.010	< 0.010
Nitrate + Nitrite (mg-N/L)	NA	0.077	NA	NA	5.82	2.520	2.5	2.3	< 0.010	< 0.010
Ortho-Phosphorous (mg-P/L)	NA	0.032	NA	NA	0.08	0.049	0.518	1.01	< 0.004	< 0.004
Sulfate (mg/L)	NA	73.2	NA	NA	30.6	36.8	31.4	37.0	< 2.0	< 2.0
Sulfite (mg/L)	NA	< 1.5	NA	NA	< 1.5	< 1.5	< 1.5	< 1.5	1.5	< 1.5
Total Organic Carbon (mg/L)	NA	1.84	NA	NA	6.02	3.22	3.96	3.97	< 1.5	< 1.5

Note: Bolded concentration indicates exceedence of treatment level.
PPEG -Pressure Plant Extraction Gallery
BFEG -Bark Fill Extraction Gallery

Table 2-3
Summary of Groundwater Analytical Data
September 2004
IPC - Bozeman, Montana

Sample ID: / Sample Date:	4-A 9/28/2004	5-A 9/28/2004	5-C 9/28/2004	7-A 9/29/2004	9-A 9/29/2004	(9-D) 9-ADup 9/29/2004	9-C 9/29/2004	10-A 9/29/2004	11-A 9/29/2004	12-A 9/29/2004	15-A 9/28/2004	19-A 9/28/2004	22 9/28/2004	23-A 9/29/2004	24-A1 9/29/2004
PCP-Method 8040 (ug/L)															
Pentachlorophenol	< 0.25	**D 6,900**	< 0.25	< 0.25	**110**	**94**	**39**	< 0.25	**7.2**	< 0.25	**46**	< 0.25	**6.8**	**D 28**	< 0.25
PAH-Method 8310 (ug/L)															
Naphthalene	NA	**J 330**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	1.2	< 0.10	0.2	NA	NA
Acenaphthylene	NA	< 100	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	< 0.1	< 0.10	< 0.10	NA	NA
Acenaphthene	NA	**J 3700**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	3.8	< 0.10	< 0.10	NA	NA
Fluorene	NA	**J 3800**	NA	NA	**0.99**	**1.1**	NA	NA	NA	NA	9.5	< 0.10	< 0.10	NA	NA
Phenanthrene	NA	**J 5600**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	D 17	< 0.10	< 0.10	NA	NA
Anthracene	NA	**J 1300**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	1.9	< 0.10	0.80	NA	NA
Fluoranthene	NA	**J 3900**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	2.1	< 0.10	3.3	NA	NA
Pyrene	NA	**J 2800**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	3.2	< 0.10	2.4	NA	NA
Benzo(a)anthracene	NA	**J 1000**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	**0.62**	< 0.10	**0.14**	NA	NA
Chrysene	NA	**J 1100**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	**0.66**	< 0.10	< 0.10	NA	NA
Benzo(b)fluoranthene	NA	**J 660**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	**0.31**	< 0.10	0.14	NA	NA
Benzo(k)fluoranthene	NA	**J 510**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	**0.31**	< 0.10	< 0.10	NA	NA
Benzo(a)pyrene	NA	**J 550**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	**0.19**	< 0.10	0.12	NA	NA
Dibenzo(a,h)anthracene	NA	< 100	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	< 0.10	< 0.10	< 0.10	NA	NA
Benzo(g,h,i)perylene	NA	**J 180**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	0.10	< 0.10	< 0.10	NA	NA
Indeno(1,2,3-cd)pyrene	NA	**J 240**	NA	NA	< 0.10	< 0.10	NA	NA	NA	NA	0.13	< 0.10	< 0.10	NA	NA
Alkalinity -Method SM2320 (mg/L CaCO3)	513	NA	NA	1250	NA	NA	351	310	329	NA	NA	434	314	415	416
Carbonate (Alkalinity) -SM2320 (mg/L CaCO3)	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	< 1.0	< 1.0	NA	NA	< 1.0	< 1.0	< 1.0	< 1.0
Bicarbonate (Alkalinity) -SM2320 (mg/L CaCO3)	513	NA	NA	1250	NA	NA	351	310	329	NA	NA	434	314	415	416
N-Ammonia -Method 350.1M (mg-N/L)	U 0.103	NA	NA	0.069	NA	NA	< 0.010	0.012	0.019	NA	NA	U 0.012	U 0.078	0.216	0.055
N-Nitrate -Calculated (mg-N/L)	U 0.014	NA	NA	0.020	NA	NA	3.99	4.66	3.40	NA	NA	2.62	7.39	1.50	0.012
N-Nitrite -Method 353.2 (mg-N/L)	< 0.010	NA	NA	< 0.010	NA	NA	< 0.010	0.011	0.028	NA	NA	0.013	0.029	0.047	< 0.010
Nitrate + Nitrite -Method 353.2 (mg-N/L)	U 0.014	NA	NA	0.020	NA	NA	3.99	4.67	3.43	NA	NA	2.63	7.42	1.55	0.012
Ortho-Phosphorous -Method 365.2 (mg-P/L)	< 0.004	NA	NA	0.026	NA	NA	0.030	0.063	0.169	NA	NA	0.027	2.76	0.029	0.012
Sulfate -Method 375.2 (mg/L)	10.6	NA	NA	68.2	NA	NA	33.0	38.6	39.3	NA	NA	37.3	35.9	36.7	44.6
Sulfite -Method 377.1 (mg/L)	< 1.5	NA	NA	< 1.5	NA	NA	< 1.5	< 1.5	< 1.5	NA	NA	< 1.5	< 1.5	< 1.5	< 1.5
Total Organic Carbon -Method 415.1 (mg/L)	7.88	NA	NA	3.92	NA	NA	< 1.50	1.74	3.41	NA	NA	2.42	2.92	11.3	5.64

(#) Indicates blind duplicate number assignment on chain of custody.
Note. Well 1 A did not have enough water to collect sample.
Note. Well 19 A was sampled for background data to replace well 1 A that did not have enough water for sample collection.
D - Indicates the surrogate was diluted.
J - Indicates an estimated concentration due to holding time exceedence. See validation report.
U - Indicates analyte as undetected at the reported concentration due to a comparable concentration detected in the associated field blank, evidence of field contamination. See validation report.
Y - Indicates a raised reporting limit due to matrix interferences
PPEG -Pressure Plant Extraction Gallery
BFEG Bark Fill Extraction Gallery

Table 2-3 (Continued)
Summary of Groundwater Analytical Data
September 2004
IPC - Bozeman, Montana

Sample ID: / Sample Date:	25-A 9/29/2004	25-B 9/29/2004	26-A 9/29/2004	26-C 9/29/2004	27-A 9/28/2004	(27-D) 27-A Dup 9/28/2004	28-B 9/28/2004	GM-4 9/27/2004	GM-6 9/27/2004	GM-7 9/28/2004	GM-8 9/28/2004	BFEG 9/28/2004	PPEG 9/28/2004	(4-F) Field Blank 9/28/2004	Method Blank
PCP-Method 8040 (ug/L)															
Pentachlorophenol	**63**	**76**	**3.7**	**44**	< 0.25	< 0.25	0.69	**300**	**D 21**	< 0.25	< 0.25	**7.1**	**20**	< 0.25	< 0.25
PAH-Method 8310 (ug/L)															
Naphthalene	**0.10**	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	0.77	NA	< 0.10
Acenaphthylene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.10	NA	< 0.10
Acenaphthene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	0.31	0.86	NA	< 0.10
Fluorene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	0.80	NA	< 0.10
Phenanthrene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	0.30	NA	< 0.10
Anthracene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	0.44	NA	< 0.10
Fluoranthene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	0.25	1.1	NA	< 0.10
Pyrene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	0.23	1.2	NA	< 0.10
Benzo(a)anthracene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.10	NA	< 0.10
Chrysene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.10	NA	< 0.10
Benzo(b)fluoranthene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.10	NA	< 0.10
Benzo(k)fluoranthene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.10	NA	< 0.10
Benzo(a)pyrene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.10	NA	< 0.10
Dibenzo(a,h)anthracene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.10	NA	< 0.10
Benzo(g,h,i)perylene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.10	NA	< 0.10
Indeno(1,2,3-cd)pyrene	< 0.10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.10	NA	< 0.10
Alkalinity -Method SM2320 (mg/L CaCO3)	374	357	352	338	NA	NA	240	NA	NA	353	321	317	317	1.2	< 1.0
Carbonate (Alkalinity) -SM2320 (mg/L CaCO3)	< 1.0	< 1.0	< 1.0	< 1.0	NA	NA	< 1.0	NA	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bicarbonate (Alkalinity) -SM2320 (mg/L CaCO3)	374	357	352	338	NA	NA	240	NA	NA	353	321	317	317	1.2	< 1.0
N-Ammonia -Method 350.1M (mg-N/L)	0.020	0.038	0.037	0.017	NA	NA	< 0.010	NA	NA	U 0.015	U 0.014	U 0.01	U 0.068	0.022	< 0.010
N-Nitrate -Calculated (mg-N/L)	1.24	1.54	0.222	4.55	NA	NA	U 0.040	NA	NA	4.02	2.57	4.32	7.64	0.011	< 0.010
N-Nitrite -Method 353.2 (mg-N/L)	0.015	0.024	< 0.010	0.034	NA	NA	< 0.010	NA	NA	0.022	0.014	0.033	0.055	< 0.010	< 0.010
Nitrate + Nitrite -Method 353.2 (mg-N/L)	1.25	1.56	0.222	4.58	NA	NA	U 0.040	NA	NA	4.04	2.58	4.35	7.70	0.011	< 0.010
Ortho-Phosphorous -Method 365.2 (mg-P/L)	0.035	< 0.004	0.005	0.029	NA	NA	0.032	NA	NA	0.148	0.054	0.337	1.83	< 0.004	< 0.004
Sulfate -Method 375.2 (mg/L)	38.0	34.9	47.2	34.5	NA	NA	67.0	NA	NA	28.2	37.0	28.2	35.7	< 2.0	< 2.0
Sulfite -Method 377.1 (mg/L)	< 1.5	< 1.5	< 1.5	< 1.5	NA	NA	< 1.5	NA	NA	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Total Organic Carbon -Method 415.1 (mg/L)	3.61	1.92	3.34	< 1.50	NA	NA	< 1.50	NA	NA	< 1.50	< 1.50	< 1.50	1.60	< 1.50	< 1.5

(#) - Indicates blind duplicate number assignment on chain of custody.
Note: Well 1-A did not have enough water to collect sample.
Note: Well 19-A was sampled for background data to replace well 1-A that did not have enough water for sample collection.

D - Indicates the surrogate was diluted.

J - Indicates an estimated concentration due to the outlier between field duplicate samples. See validation report.

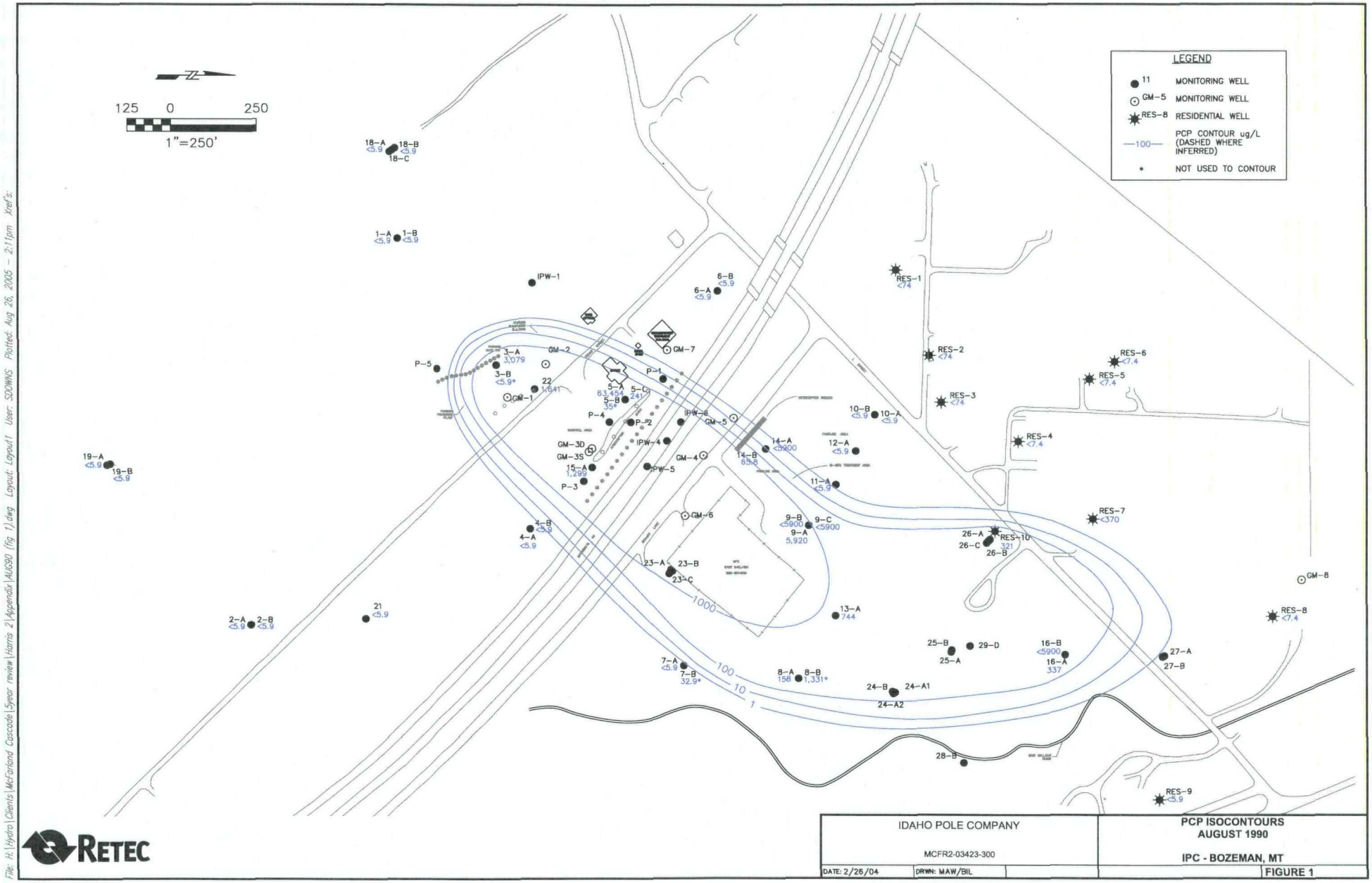
U - Indicates analyte as undetected at the reported concentration due to a comparable concentration detected in the associated field blank, evidence of field contamination. See validation report.

Y - Indicates a raised reporting limit due to matrix interferences.

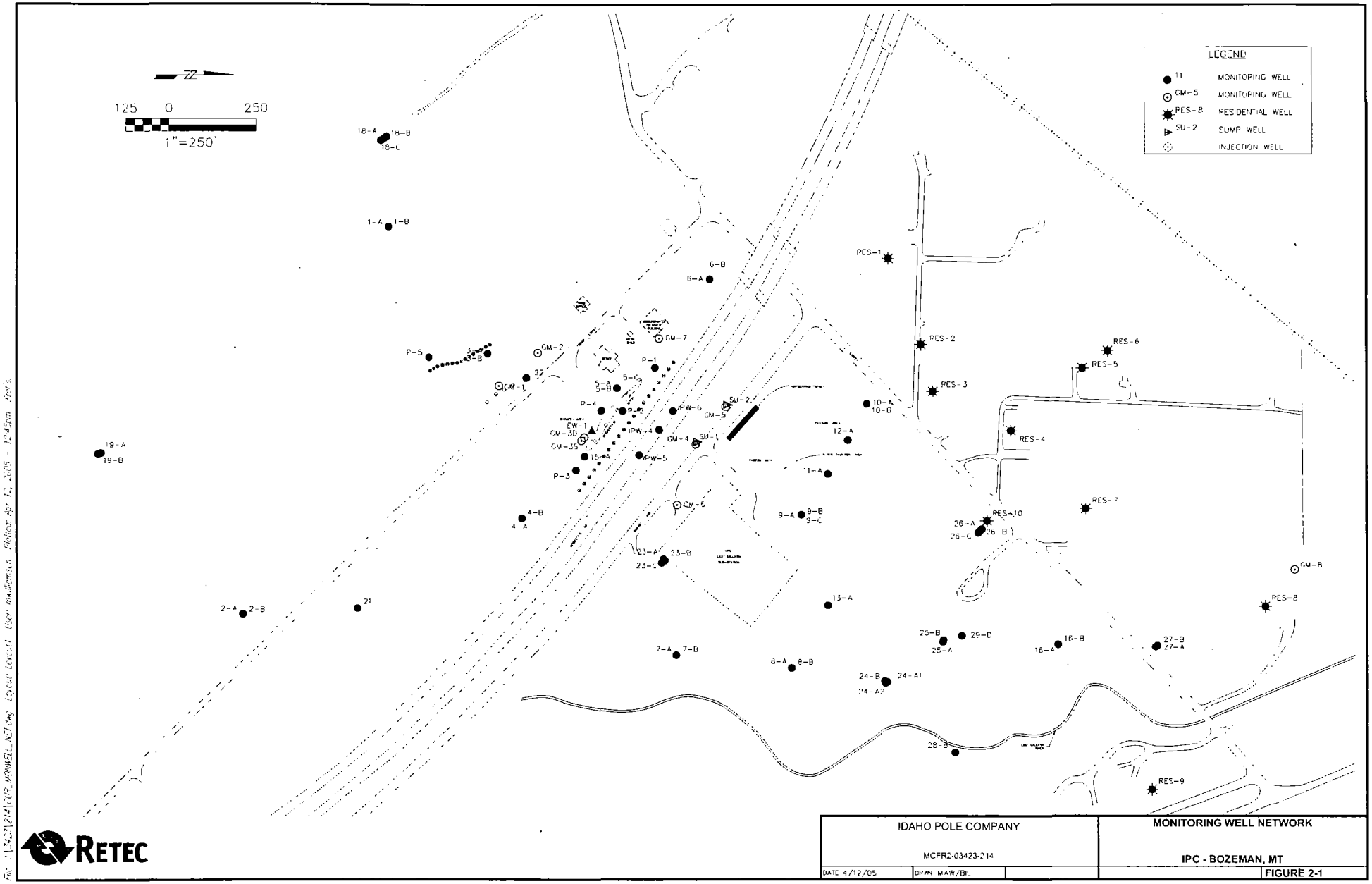
PPEG -Pressure Plant Extraction Gallery

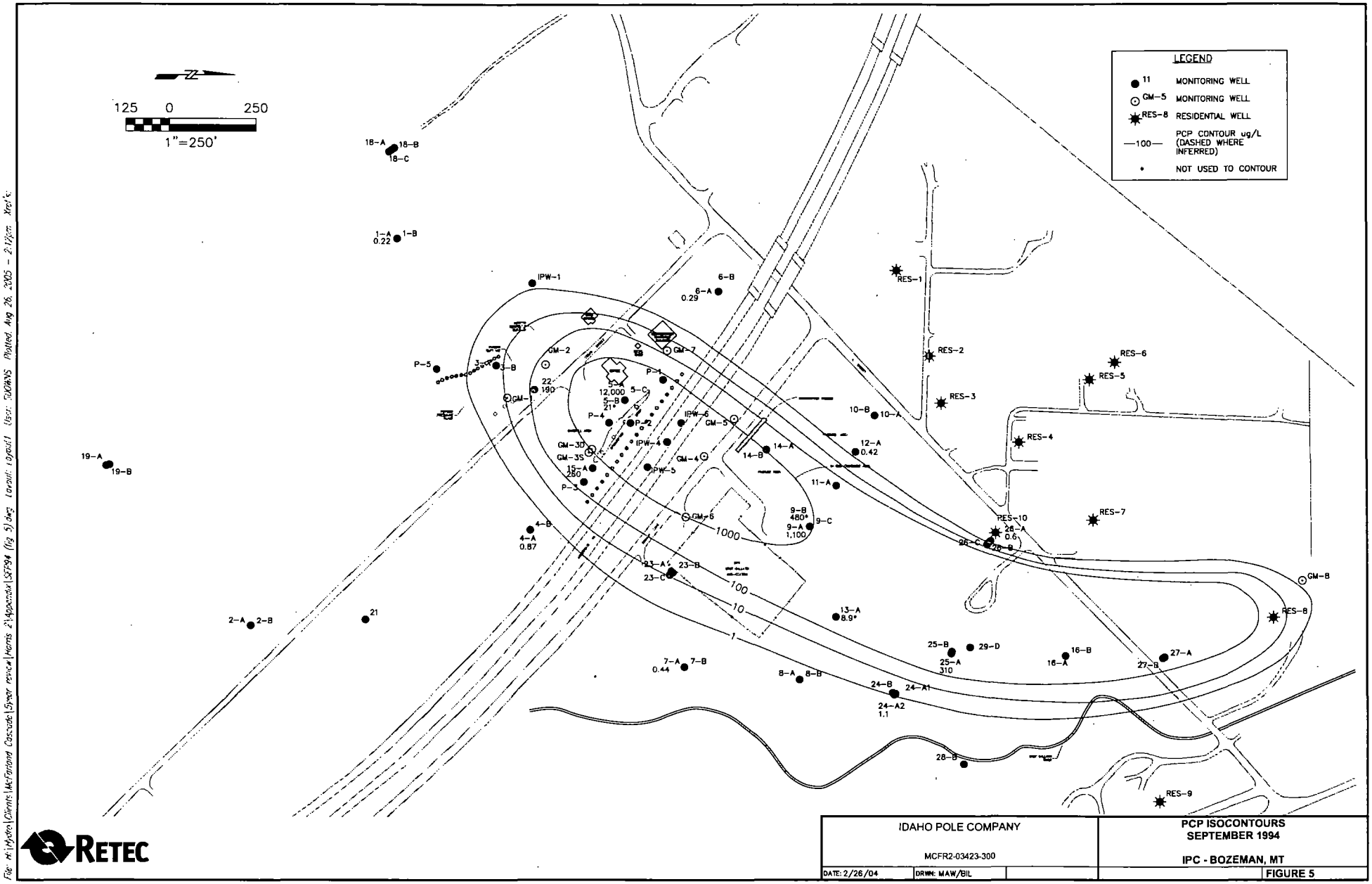
BFEG -Bark Fill Extraction Gallery

Appendix C
PCP Isocontours



File: H:\Hydro\Clients\McFarland Cascade\5year review\Harris 2\Appendix\AUG90 (fig 1).dwg Layout: Layout1 User: SDOWNS Plotted: Aug 26, 2005 - 2:11pm Xref's:

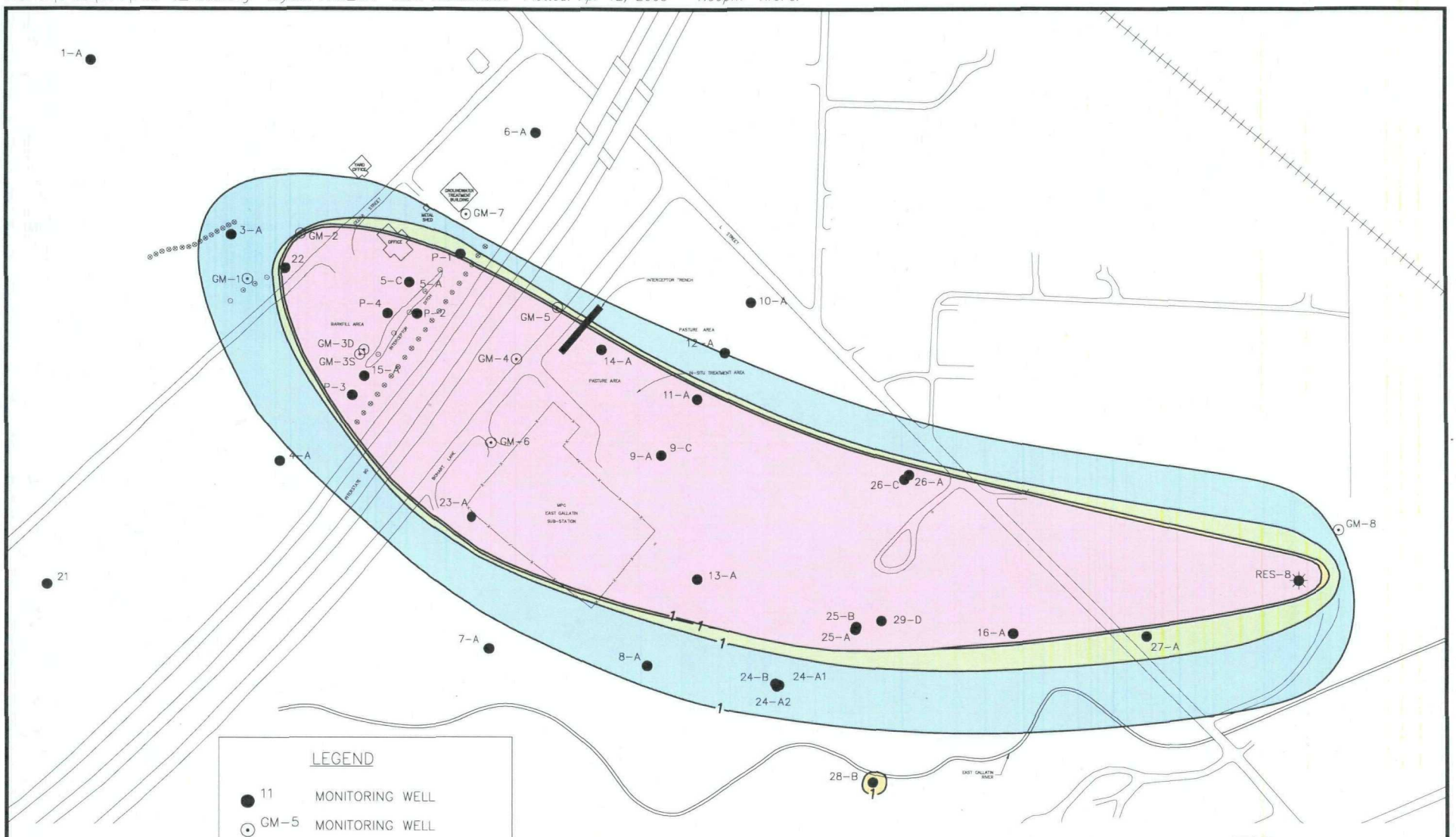

125 0 250
1"=250'
LEGEND
11 MONITORING WELL
GM-5 MONITORING WELL
RES-8 RESIDENTIAL WELL
SU-2 SUMP WELL
INJECTION WELL
RETEC
IDAHO POLE COMPANY
MCFR2-03423-214
DATE 4/12/05
DRAWN MAW/BIL
MONITORING WELL NETWORK
IPC - BOZEMAN, MT
FIGURE 2-1



RETEC

IDAHO POLE COMPANY			PCP ISOCONTOURS SEPTEMBER 1994
MCFR2-03423-300			IPC - BOZEMAN, MT
DATE: 2/26/04	DRWN: MAW/BIL		FIGURE 5

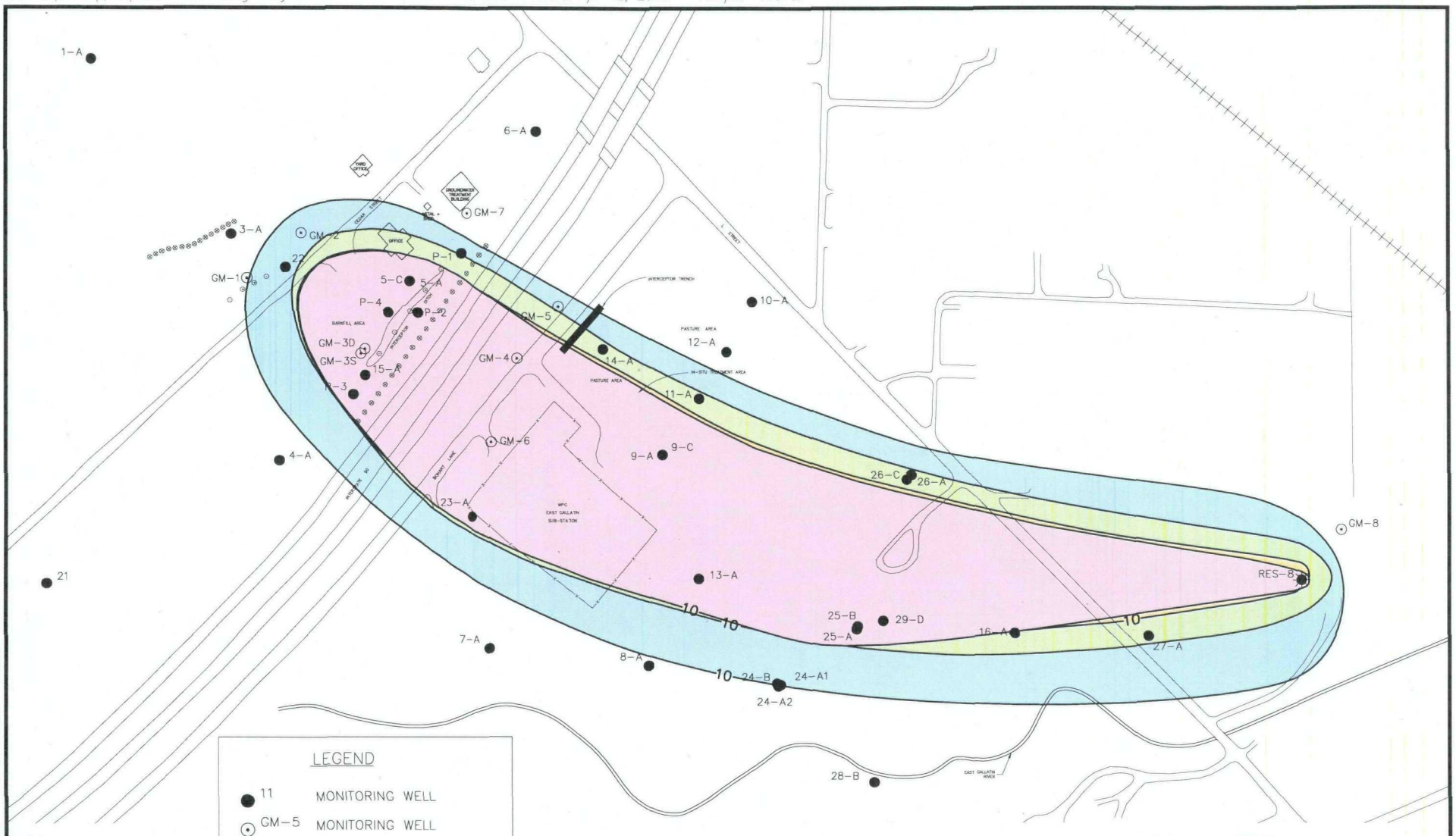
File: H:\Hydro\Clients\McFarland Cascade\Spear review\Items 2\Appendix\SF794 (fig 5).dgn Default: Layout1 User: TJOHNS Plotted: Aug 26, 2005 - 2:12pm Xref's:



RETEC

IDAHO POLE COMPANY			PCP ISOCONTOURS 1 µg/L SEPTEMBER 1998, 2000, 2002 AND 2004
MCFR2-03423-214			IPC - BOZEMAN, MT
DATE: 4/12/05	DRWN: DCM/BIL		FIGURE 5-5

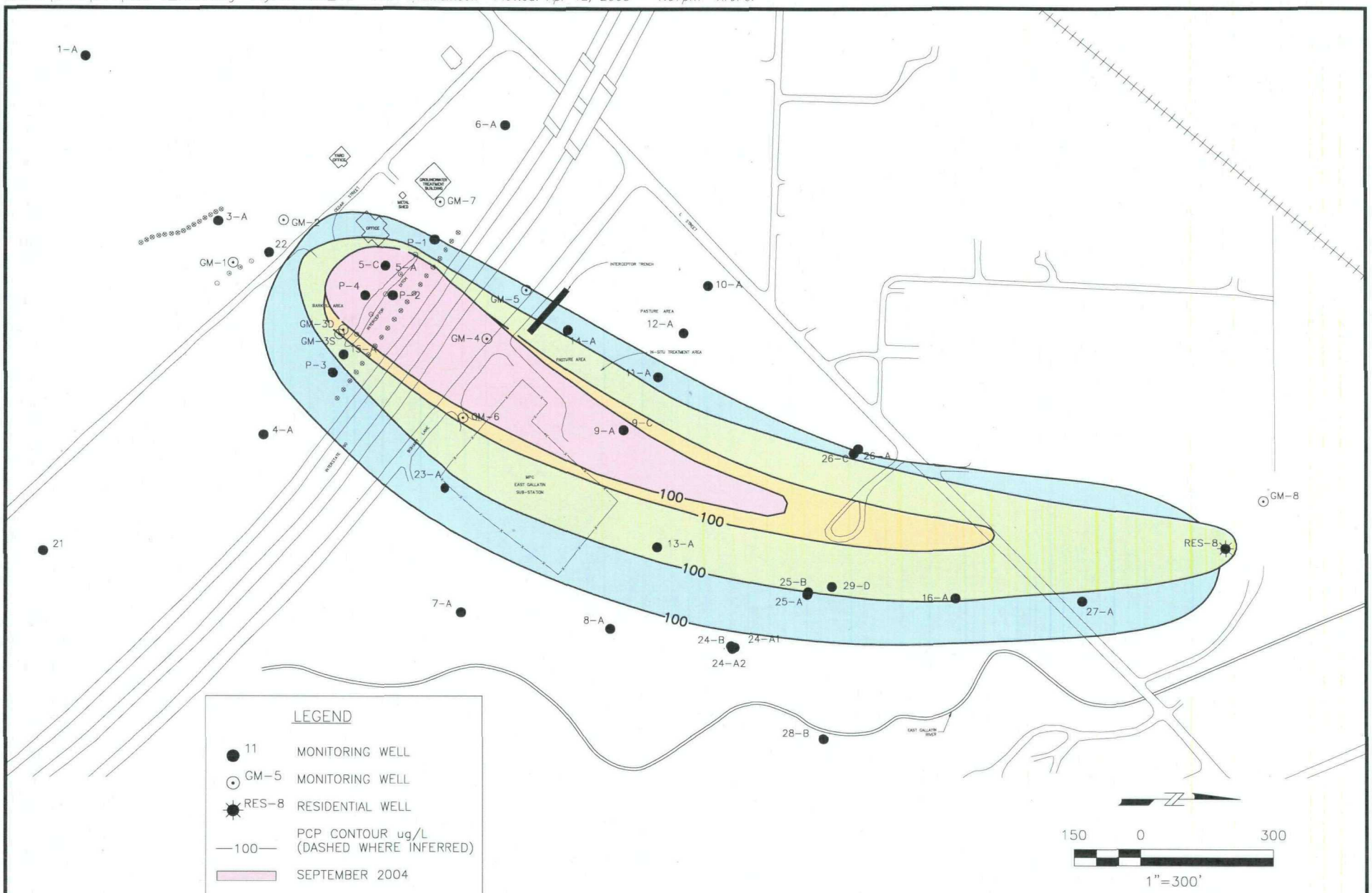
File: J:\3423\214\FIG5-6_2005.dwg Layout: ANSI_BVI User: mwilliamson Plotted: Apr 12, 2005 - 1:08pm Xref's:



RETEC

IDAHO POLE COMPANY			PCP ISOCONTOURS 10 µg/L SEPTEMBER 1998, 2000, 2002 AND 2004
MCFR2-03423-214			IPC - BOZEMAN, MT
DATE: 4/12/05	DRWN: DCM/BIL		FIGURE 5-6

File: J:\3423\214\FIG5-7_2005.dwg Layout: ANSI_BVI User: mwilliamson Plotted: Apr 12, 2005 - 1:07pm Xref's:



RETEC

IDAHO POLE COMPANY

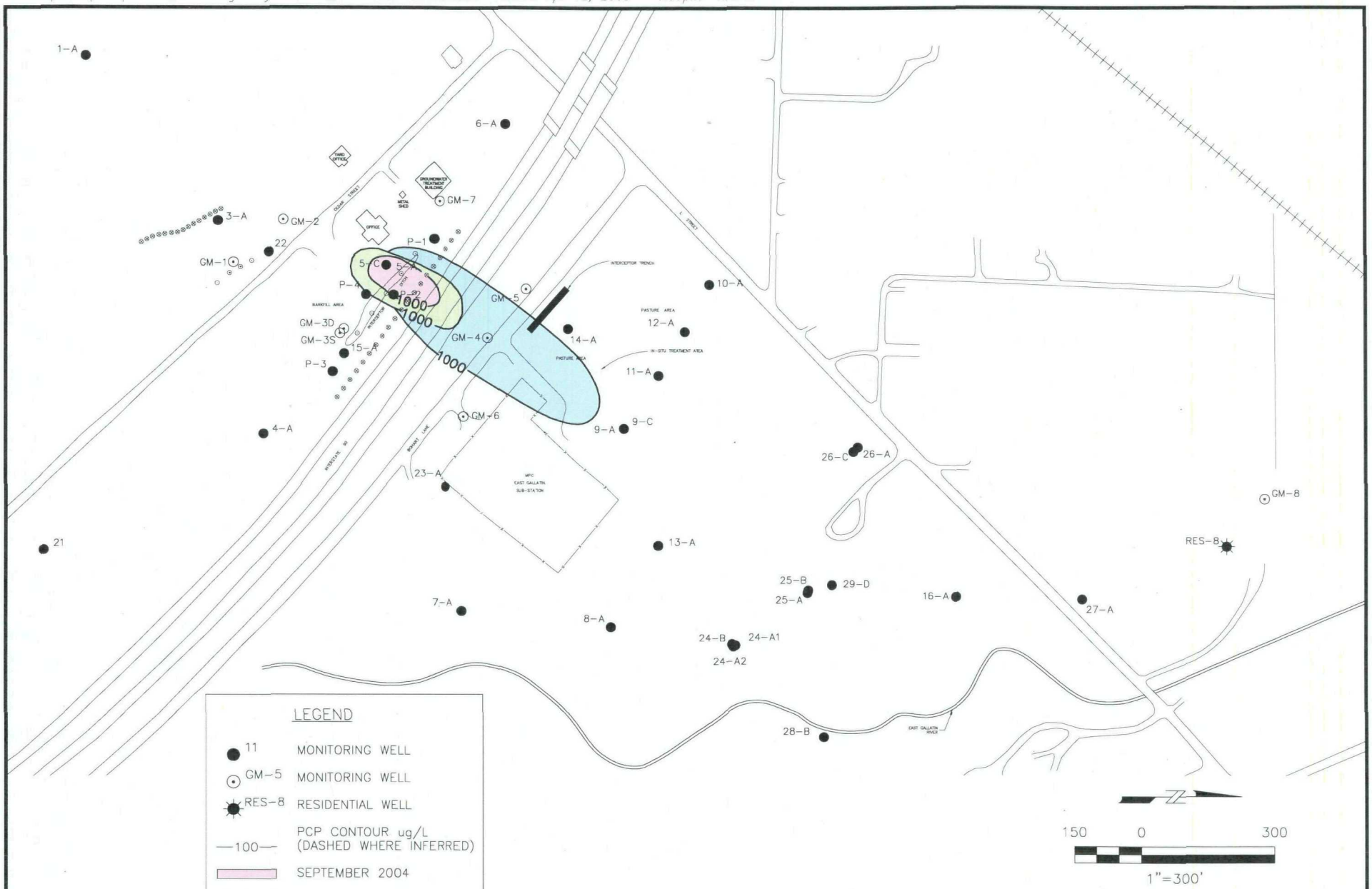
MCFR2-03423-214

DATE: 4/12/05 | DRWN: DCM/BIL

PCP ISOCONTOURS 100 µg/L SEPTEMBER 1998, 2000, 2002 AND 2004

IPC - BOZEMAN, MT

FIGURE 5-7



RETEC

IDAHO POLE COMPANY			PCP ISOCONTOURS 1000 µg/L SEPTEMBER 1998, 2000, 2002 AND 2004
MCFR2-03423-214			IPC - BOZEMAN, MT
DATE: 4/12/05	DRWN: DCM/BIL		FIGURE 5-8

Appendix D
Residential Well Summary Data

Table 3-2
Residential Well Analytical
April and September 2004
IPC - Bozeman, MT

April 2004

Sample Location:	Res-1	Res-2	Res-3	Res-4	Res-5	Res-6	Res-7	Res-8	Res-8 Dup	Res-9
Sample ID:	-	-	-	-	-	-	-	IP-0403-338	-	-
Sample Date:	-	-	-	-	-	-	-	4/6/2004	-	-
PCP-Method 8040 (ug/L)										
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	**15**	NA	NA

September 2004

Sample Location:	Res-1	(Irrigation Well) Res-1	Res-2	Res-3	Res-4	Res-5	Res-6	Res-7	Res-8	Res-8 Dup	Res-9
Sample ID:	IP-0409-331	IP-0409-341	IP-0409-332	IP-0409-333	IP-0409-334	IP-0409-335	IP-0409-336	IP-0409-337	IP-0409-338	IP-0409-340	IP-0409-339
Sample Date:	9/27/2004	9/27/2004	9/27/2004	9/27/2004	9/27/2004	9/27/2004	9/27/2004	9/27/2004	9/27/2004	9/27/2004	9/27/2004
PCP-Method 8040 (ug/L)											
Pentachlorophenol	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	**37**	**44**	< 0.05

Res - Resident Well
NA - Not Analyzed (Res-8 sampled semi-annually, other wells sampled annually)
Dup - Duplicate sample

Appendix E
ROD Table 13 Remediation Levels

TABLE 13
CLEANUP LEVELS AND CORRESPONDING RISKS

Medium	Contaminant	Cleanup level	Basis	Cancer Risk (industrial use for soil, residential use for ground water)	Noncancer health hazard quotient
Soils and sediments (mg/kg)	PCP	48.0	risk	1.0×10^{-6}	ND[b]
	Total B2 PAHs	15.0[a]	risk	1.0×10^{-6}	ND
	Total D PAHs	145	hazard quotient	NA	0.1
	TCDD TE	.001	risk	1×10^{-6}	ND
Ground water (µg/L)	PCP	1.0	MCL	3×10^{-6}	ND
	B2 PAHs				
	Benzo(a)pyrene	0.2	MCL	2.7×10^{-5}	ND
	Benz(a)anthracene	0.1	MCL	5.5×10^{-5}	NA[c]
	Benzo(b)fluoranthene	0.2	MCL	5.5×10^{-5}	NA
	Benzo(k)fluoranthene	0.2	MCL	5.5×10^{-5}	NA
	Chrysene	0.2	MCL	5.5×10^{-5}	NA
	Dibenz(a,h)anthracene	0.3	MCL	5.5×10^{-5}	NA
	Indeno(1,2,3-CD)pyrene	0.4	MCL	5.5×10^{-5}	NA
	D PAHs	146	hazard quotient	NA	.9
	2,3,7,8-TCDD (Dioxin)[d]	3.0×10^{-5}	MCL	1.3×10^{-4}	NA

Notes:
[a] Adjusted for recently identified cancer slope factor of 5.79 $(mg/kg/day)^{-1}$.
[b] ND - Not determined, cleanup level for carcinogenic effects results in noncarcinogenic health hazard of <1.0.
[c] NA - Not available, cleanup level established from proposed MCLs 54 Fed. Reg. 22062, 22155-57 (May 22, 1989), 55 Fed. Reg. 30370, 30445 (July 25, 1990) and promulgated MCLs 57 Fed. Reg. 31816 (July 17, 1992).
[d] This contaminant has not been identified in ground water. If identified, the risk level achieved by compliance with the MCL would be higher (for this contaminant) than the risk level specified in the ROD for ground water cleanup.

Source: Defined by MDHES and EPA based on preliminary remediation goals presented in Feasibility Study, MSE, April 1992.

Appendix F
Tables

Table 1
Soil Sample from LTU Liner
November 2002
IPC - Bozeman, Montana

Sample ID: / Sample Date:	BLClay-1 11/7/02	Method Blank
PAH-Method 8270 (µg/kg)		
Naphthalene	< 76	< 67
2-Methylnaphthalene	< 76	< 67
Acenaphthylene	< 76	< 67
Acenaphthene	< 76	< 67
Dibenzofuran	< 76	< 67
Fluorene	< 76	< 67
Pentachlorophenol	< 380	< 330
Phenanthrene	< 76	< 67
Anthracene	< 76	< 67
Fluoranthene	< 76	< 67
Pyrene	< 76	< 67
Benzo (a) anthracene	< 76	< 67
Chrysene	< 76	< 67
Benzo (b) fluoranthene	< 76	< 67
Benzo (k) fluoranthene	< 76	< 67
Benzo (a) pyrene	< 76	< 67
Indeno (1,2,3-cd) pyrene	< 76	< 67
Dibenzo (a,h) anthracene	< 76	< 67
Benzo (g,h,i) perylene	< 76	< 67

BLClay - Indicates clay soil sample below liner.

Table 2
Soil Samples for Geotextile Filter Fabric Disposal
October 2002
IPC - Bozeman, Montana

Sample ID: / Sample Date:	LTU Sand-1 10/8/02	LTU Sand-2 10/8/02	LTU Sand-3 10/8/02	Method Blank	Level
PCP-Method 8040 (mg/kg)					
Pentachlorophenol	19	14	< 6.8	< 6.2	**48**
PAH-Method 8270 (mg/kg)					
Acenaphthylene	< 83	< 83	< 82	< 75	
Acenaphthene	< 50	< 50	< 49	< 45	
D PAH Compounds					
Naphthalene	< 50	< 50	< 49	< 45	
Fluorene	< 8.3	< 8.3	< 8.2	< 7.5	
Phenanthrene	< 12	< 12	< 11	< 10	
Anthracene	< 12	< 12	< 11	< 10	
Fluoranthene	< 8.9	< 8.9	< 8.8	< 8.0	
Pyrene	< 5.0	< 5.0	< 4.9	< 4.5	
Benzo (g,h,i) perylene	< 2.8	< 2.8	< 2.7	< 2.5	
Total D PAHs (non-carcinogenic)	0	0	0	0	**145**
B2 PAH Compounds					
Benzo (a) anthracene	< 0.94	< 0.94	< 0.93	< 0.85	
Chrysene	< 3.3	< 3.3	< 3.3	< 3.0	
Benzo (b) fluoranthene	< 0.72	< 0.72	< 0.71	< 0.65	
Benzo (k) fluoranthene	< 1.1	< 1.1	< 1.1	< 1.0	
Benzo (a) pyrene	< 1.3	< 1.3	< 1.3	< 1.2	
Indeno (1,2,3-cd) pyrene	< 1.4	< 1.4	< 1.4	< 1.2	
Dibenzo (a,h) anthracene	< 1.7	< 1.7	< 1.6	< 1.5	
Total B2 PAHs (carcinogenic)	0	0	0	0	**15**

NOTE: Cleanup levels are based on Table 13 of the ROD

Table 3
Retention Pond Surface Water Sample
June 2002
IPC - Bozeman, Montana

Sample ID: Sample Date:	LTU 1 6/21/2002	LTU 2 6/21/2002	LTU 1-4 6/21/2002	Retention Basin 1-2 6/21/2002	Retention Basin 1-4 6/21/2002
PCP-Method 8040 (µg/L)					
Pentachlorophenol	NA	NA	0.84	NA	15
PAH-Method 8270 (µg/L)					
Acenaphthylene	< 5.3	< 5.3	NA	< 5.3	NA
Acenaphthene	< 1.8	< 1.8	NA	< 1.8	NA
D PAHs - Non Carcinogenic (µg/L)					
Naphthalene	< 2.5	< 2.5	NA	< 2.5	NA
Fluorene	< 0.46	< 0.46	NA	< 0.46	NA
Phenanthrene	< 0.64	< 0.64	NA	< 0.64	NA
Anthracene	< 0.66	< 0.66	NA	< 0.66	NA
Fluoranthene	< 0.49	< 0.49	NA	< 0.49	NA
Pyrene	< 0.27	< 0.27	NA	< 0.27	NA
Benzo (g,h,i) perylene	< 0.11	< 0.11	NA	< 0.11	NA
Total D PAHs	0	0	NA	0	NA
B2 PAHs - Carcinogenic (µg/L)					
Benzo (a) anthracene	< 0.05	< 0.05	NA	< 0.05	NA
Chrysene	< 0.15	< 0.15	NA	< 0.15	NA
Benzo (b) fluoranthene	< 0.04	< 0.04	NA	< 0.04	NA
Benzo (k) fluoranthene	< 0.06	< 0.06	NA	< 0.06	NA
Benzo (a) pyrene	< 0.07	< 0.07	NA	< 0.07	NA
Indeno (1,2,3-cd) pyrene	< 0.07	< 0.07	NA	< 0.07	NA
Dibenz (a,h) anthracene	< 0.10	< 0.10	NA	< 0.10	NA

NOTE: Cleanup levels are based on Table 13 of the ROD

Table 4-1 (Continued)
GRS Analytical Data
December 2004
IPC - Bozeman, Montana

Sample ID:	SP-1	SP-2	SP-7
Sample Location:	Inlet PPEG	Inlet BFEG	Post GAC
Sample Date:	1/6/2005	1/6/2005	1/6/2005
PAH Method:	8270SIM	8270SIM	8270SIM
PAH-Method (µg/L)			
Acenaphthylene	< 0.10	0.16	< 0.10
Acenapthene	< 0.10	4.2	< 0.10
D PAH compounds			
Naphthalene	< 0.10	0.58	< 0.10
Fluorene	< 0.10	3.8	< 0.10
Phenanthrene	< 0.10	9.7	< 0.10
Anthracene	< 0.10	2.7	< 0.10
Fluoranthene	< 0.10	D 13	< 0.10
Pyrene	0.20	D 10	< 0.10
Benzo (g,h,i) perylene	< 0.10	0.53	< 0.10
Total D PAH	0.20	40.31	0.0
B2 PAH compounds			
Benzo (a) anthracene	< 0.10	**2.8**	< 0.10
Chrysene	< 0.10	**1.4**	< 0.10
Benzo (b) fluoranthene	< 0.10	**1.4**	< 0.10
Benzo (k) fluoranthene	< 0.10	**1.8**	< 0.10
Benzo (a) pyrene	< 0.10	**1.6**	< 0.10
Dibenzo (a,h) anthracene	< 0.10	0.19	< 0.10
Indeno (1,2,3-cd) pyrene	< 0.10	**0.53**	< 0.10
PCP - Method 8270SIM (µg/L)			
Pentachlorophenol	NA	NA	< 0.50
PCP-Method 8040 (µg/L)			
Pentachlorophenol	**9.8**	**44**	NA

Note: Carbon changed in PV-1 on October 9, 2002. Currently, PV-2 is lead GAC and PV-1 is lag GA

Note: Bolded concentration indicates exceedence of treatment level.

PPEG - Pressure Plant Extraction Gallery

BFEG - Bark Fill Extraction Gallery

GAC - Granular Activated Carbon

Table 4-2
Constituent Mass Removed during Carbon Filtration
Dissolved Total PAH and Dissolved PCP (pounds)
IPC - Bozeman, MT

Dissolved Total PAH Compounds

Date 2004	Volume of water pumped* (gallons)	GRS influent** Total PAH (ug/L)	GRS effluent** Total PAH (ug/L)	Mass Removed (pounds)
January	3,360,800	ND	ND	0.0
February	3,360,800	0.1	ND	0.0
March	3,360,800	0.1	ND	0.0
April	2,669,967	0.1	ND	0.0
May	2,669,967	23	ND	0.5
June	2,669,967	1.7	ND	0.0
July	2,694,300	2.2	ND	0.0
August	2,694,300	1.5	ND	0.0
September	2,694,300	2.5	ND	0.1
October	2,542,567	0.79	ND	0.0
November	2,542,567	1.7	ND	0.0
December	2,542,567	20.3	ND	0.4
Total amout removed	**33,802,901**			**1**

Dissolved PCP

Date 2004	Volume of water pumped* (gallons)	GRS influent** PCP (ug/L)	GRS effluent** PCP (ug/L)	Mass Removed (pounds)
January	3,360,800	4	ND	0.1
February	3,360,800	12	ND	0.3
March	3,360,800	11	ND	0.3
April	2,669,967	11	ND	0.2
May	2,669,967	19	ND	0.4
June	2,669,967	30	ND	0.7
July	2,694,300	24	ND	0.5
August	2,694,300	14	ND	0.3
September	2,694,300	14	ND	0.3
October	2,542,567	14	ND	0.3
November	2,542,567	10	ND	0.2
December	2,542,567	27	ND	0.6
Total amout removed	**33,802,901**			**4**

ND - Indicates no detection of analyte

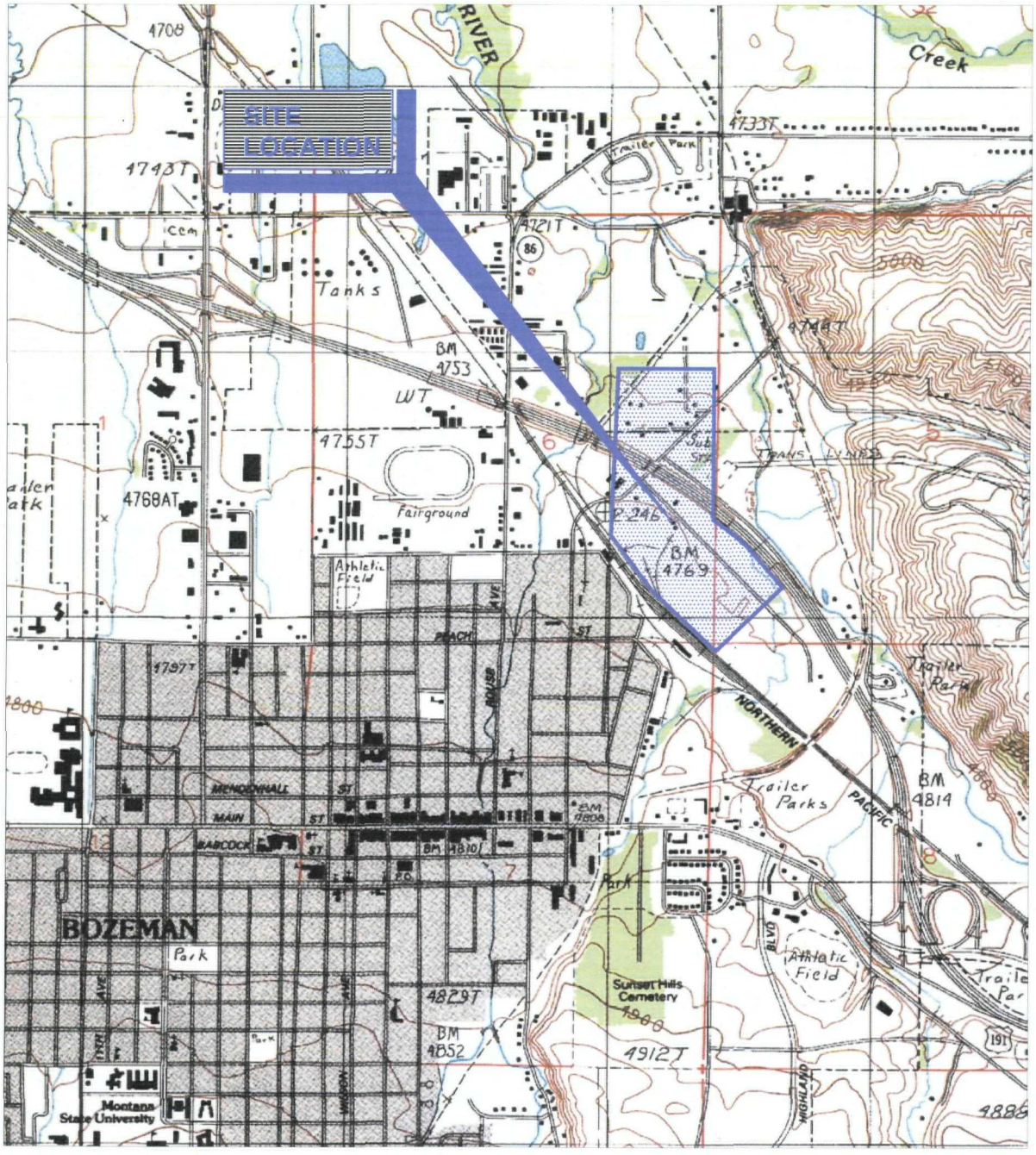
PAH - Poly aromatic hydrocarbons

PCP - Pentachlorophenol

* - Values are derived from quarterly totals divided by three months.

** - Values for GRS influent and GRS effluent are from sample port SP-5 and SP-6, respectively in the months of January

Appendix G
Figures



UNITED STATES GEOLOGIC SURVEY
BOZEMAN QUADRANGLE
BOZEMAN, MONTANA

1987
7.5 MINUTE SERIES (TOPOGRAPHIC)

SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

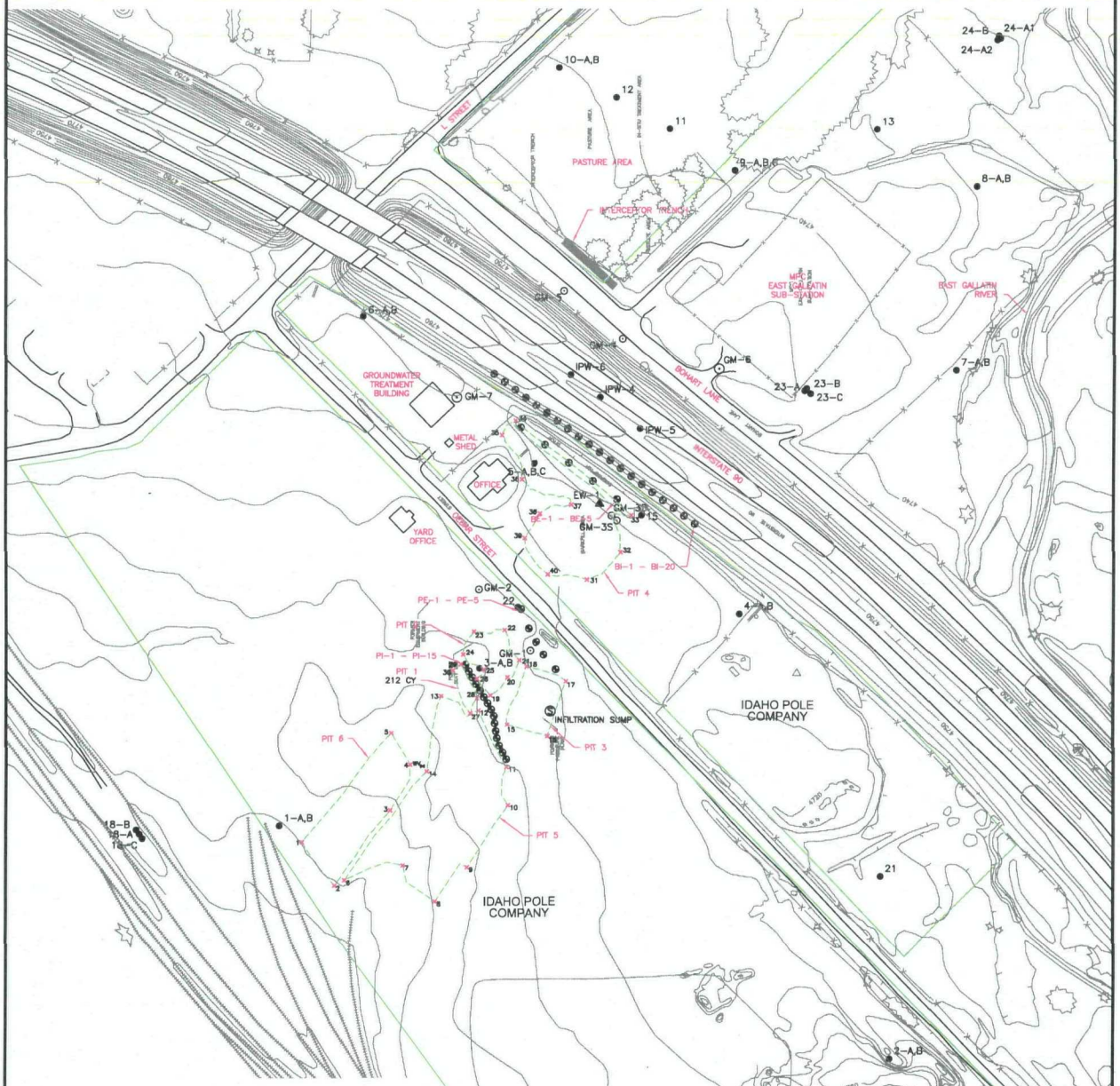
N

RETEC

IDAHO POLE COMPANY	SITE LOCATION MAP
MCFR2-03423-300	IPC - BOZEMAN, MT
DATE: 5/27/03 DRWN: MAW/BIL	FIGURE 1

File: H:\Hydro\Clients\McFarland Cascade\5year review\Harris\Figures\SITE (fig 1).DWG Layout: Layout1 User: SDOWNS Plotted: Aug 26, 2005 - 2:04pm Xref's:

File: H:\Hydro\Clients\McFarland Cascade\5year review\Harris\Figures\SITE_TOPO_MOD (fig 8).dwg Layout: ANSI_B(V)-LJ User: SDOWNS Plotted: Aug 26, 2005 - 2:06pm Xref's:



POINT ID	NORTHING	EASTING
1	619348.6724	1610608.5488
2	619267.5177	1610669.8390
3	619407.3325	1610773.7795
4	619492.5660	1610810.8340
5	619551.7154	1610776.3290
6	619276.5910	1610688.4712
7	619304.6729	1610797.6941
8	619237.9787	1610857.9884
9	619301.5612	1610917.8786
10	619417.6764	1610994.1785
11	619488.5966	1610991.3477
12	619594.6918	1610939.0252
13	619621.2029	1610868.7594
14	619480.1838	1610841.9567
15	619568.2464	1610992.6069
16	619545.5523	1611068.1824
17	619648.9643	1611102.4004
18	619677.6461	1611028.7031
19	619622.8936	1610961.3254
20	619657.2697	1610992.8696
21	619688.8695	1611015.1033
22	619745.0492	1610987.2036
23	619741.9957	1610929.9581
24	619699.3410	1610909.8977
25	619671.6836	1610948.6988
26	619654.3461	1610936.1248
27	619589.3355	1610923.7723
28	619617.6786	1610936.2733
29	619680.9034	1610906.0073
30	619669.5978	1610890.8295
31	619837.9805	1611140.6035
32	619888.8314	1611203.7767
33	619957.4897	1611224.1318
34	620134.2030	1611007.1577
35	620107.2854	1610981.2063
36	620024.6120	1611019.1541
37	619977.2467	1611111.6911
38	619960.6002	1611052.3842
39	619916.1782	1611024.9397
40	619847.4836	1611067.3356

LEGEND

- GROUNDWATER MONITORING WELL
- EXTRACTION/INJECTION WELL
- EXTRACTION WELL
- WV CITY WATER SUPPLY VALVE
- BOUNDARY OF TREATED SOIL AREAS
- IPC PROPERTY BOUNDARY

N

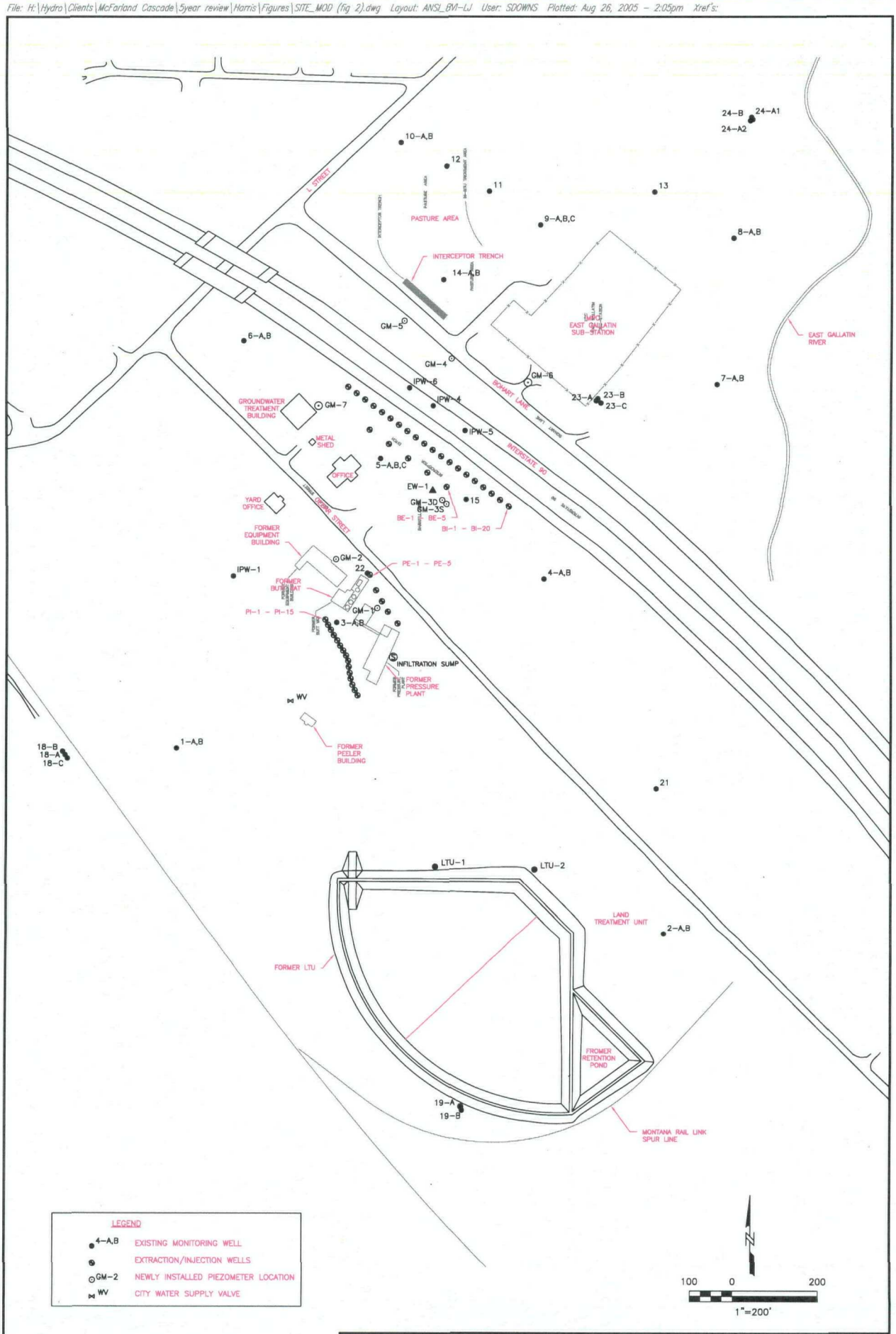
100 0 200

1"=200'

RETEC

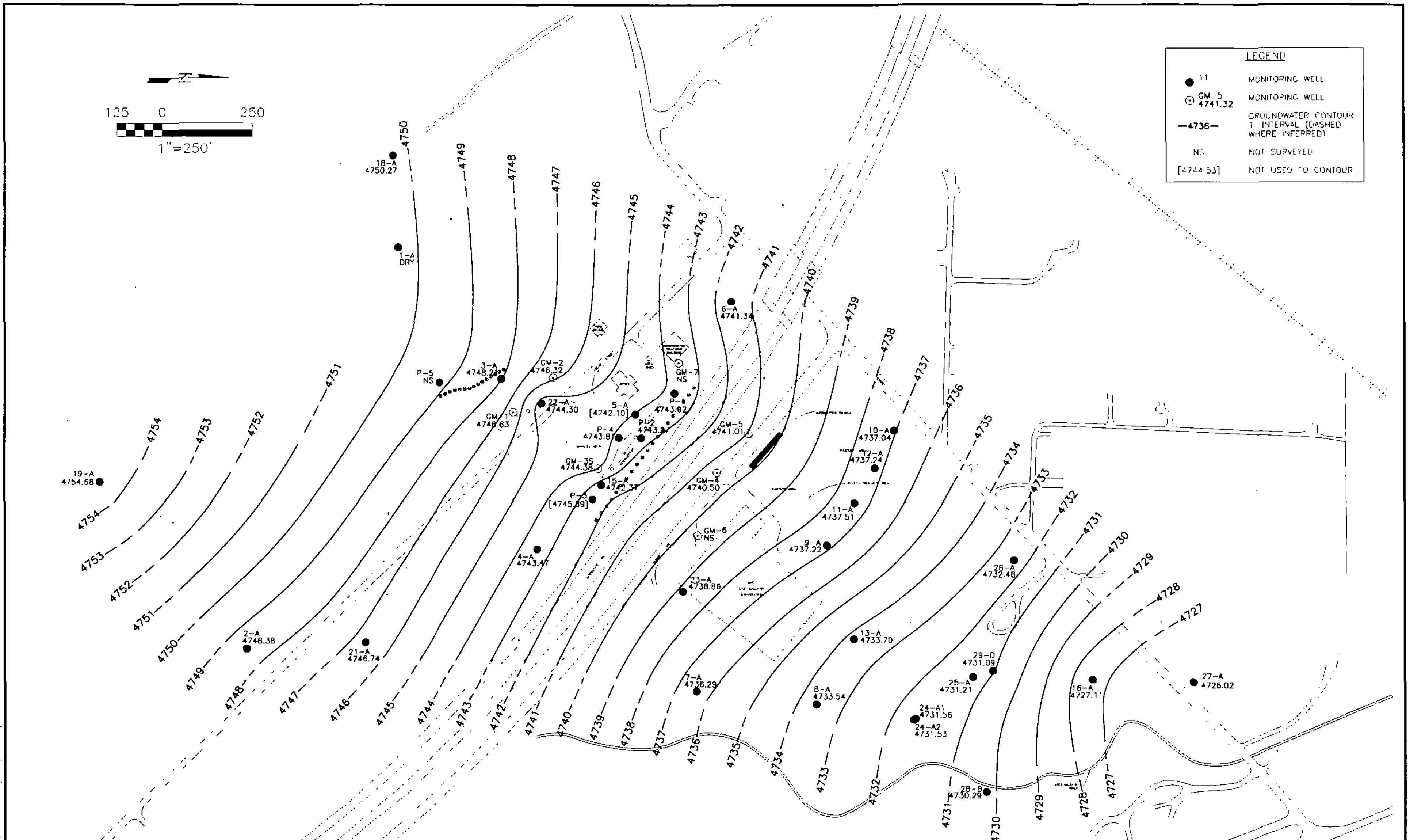
IDAHO POLE COMPANY			TREATED SOIL AREAS
MCFR2-03423-400			IPC - BOZEMAN, MT
DATE: 7/13/04	DRWN: MAW/BIL		FIGURE 1

File: H:\Hydro\Clients\McFarland Cascade\5year review\Harris\Figures\SITE_MOD (fig 2).dwg Layout: ANSI_BVI-LJ User: SDOWNS Plotted: Aug 26, 2005 - 2:05pm Xref's:



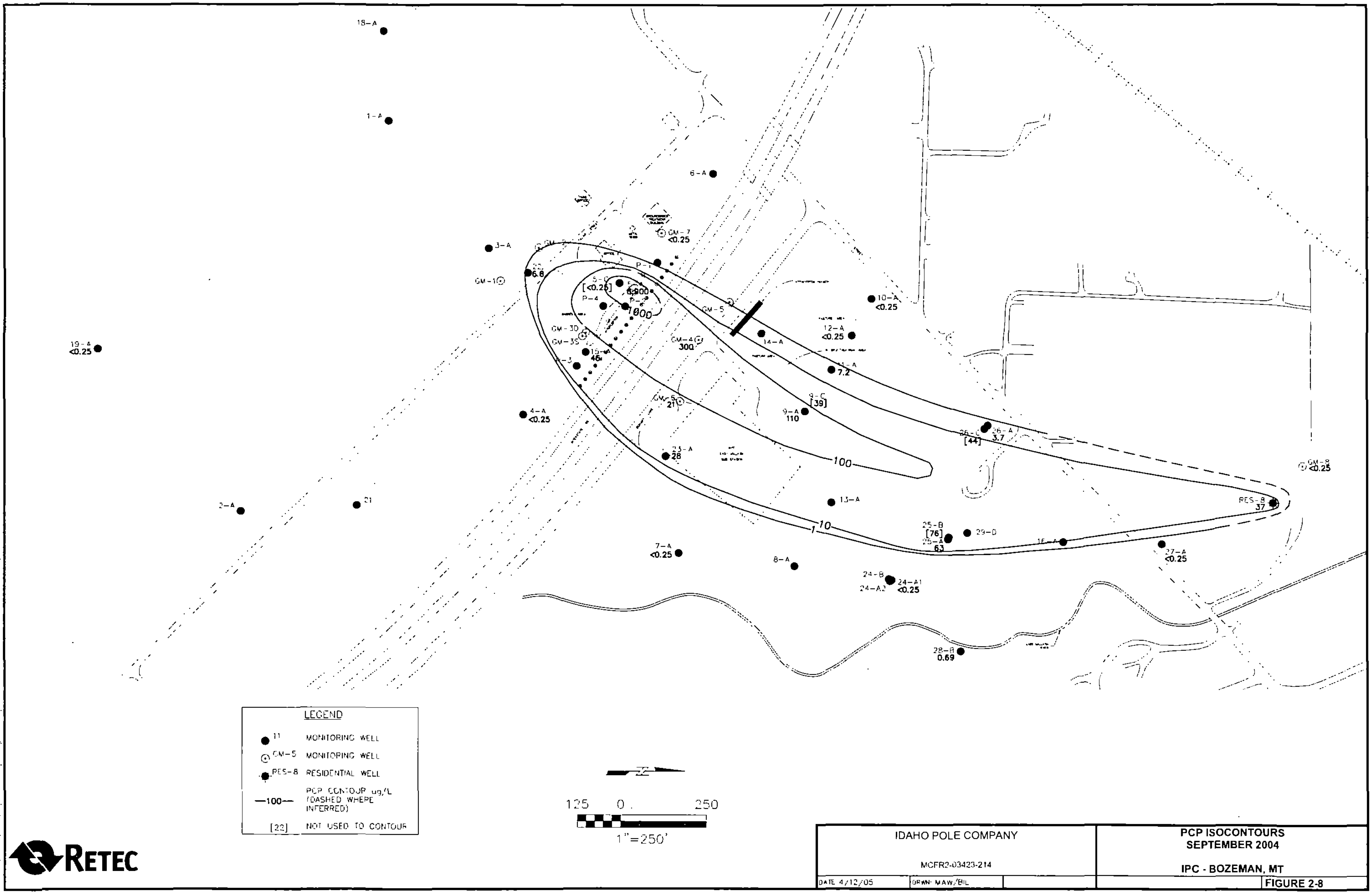
RETEC

IDAHO POLE COMPANY	SITE LAYOUT MAP
MCFR2-03423-400	IPC - BOZEMAN, MT
DATE: 2/13/03 DRWN: MAW/BIL	FIGURE 2

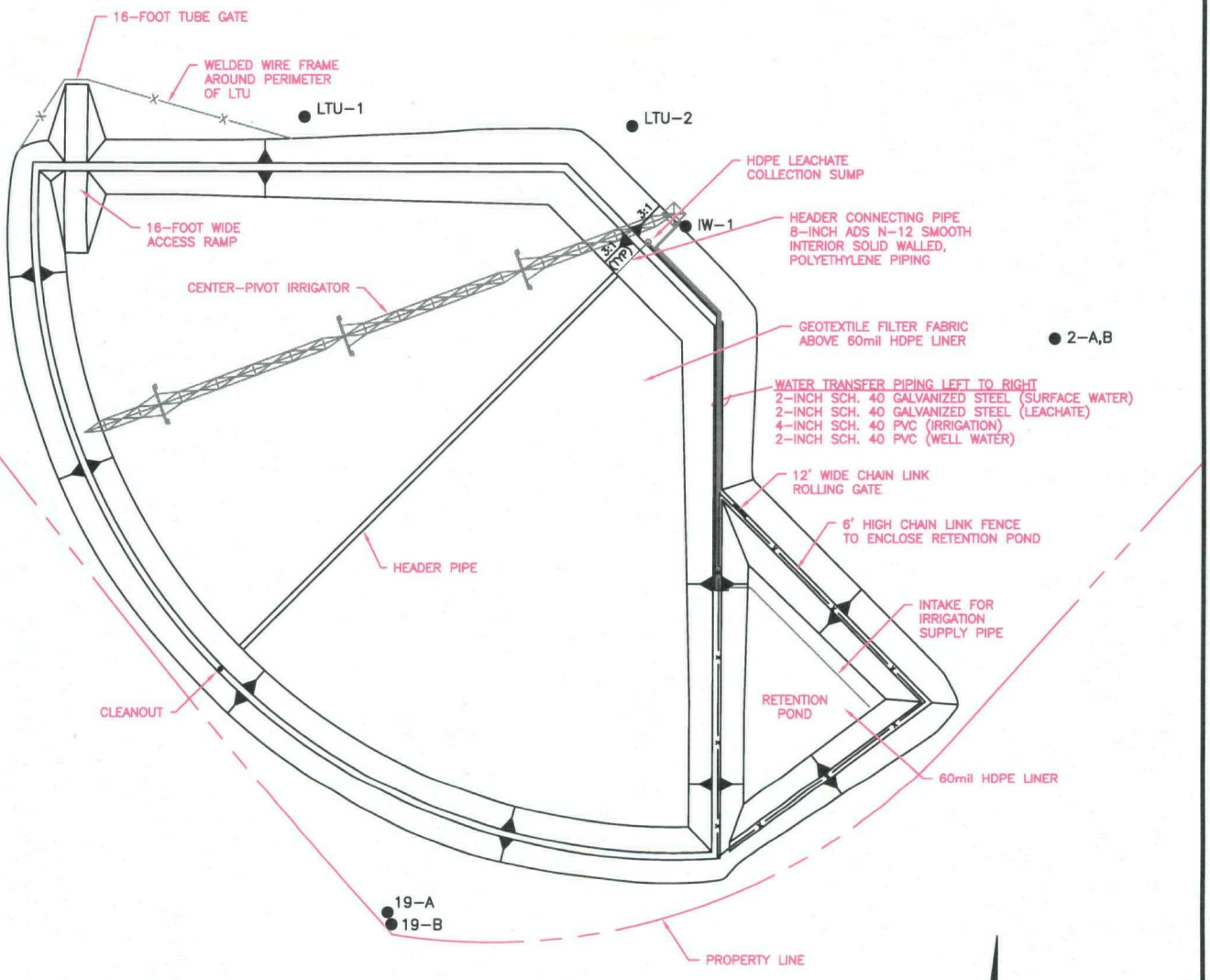


IDAHO POLE COMPANY	POTENTIOMETRIC SURFACE MAP DECEMBER 2004
MCFR2 03423-214	IPC - BOZEMAN, MT
DATE: 4/12/05 DRWN: MAW/BIL	FIGURE 2-5

RETEC



IDAHO POLE COMPANY	PCP ISOCONTOURS SEPTEMBER 2004
MCFR2-03423-214	IPC - BOZEMAN, MT
DATE 4/12/05 DRWN: MAW/BIL	FIGURE 2-8

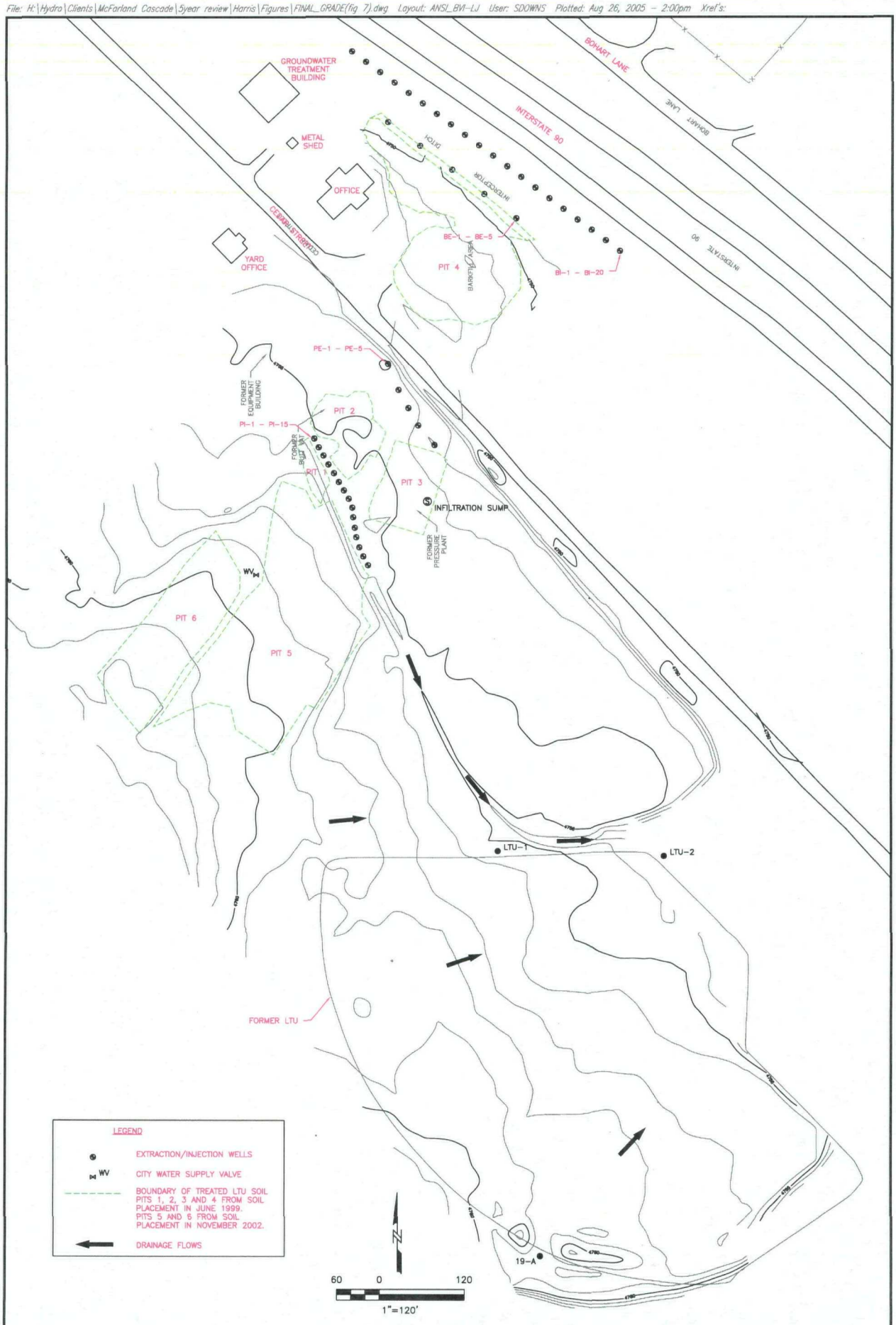


IDAHO POLE COMPANY		**LTU DETAILS**
MCFR2-03423-400		**IPC - BOZEMAN, MT**
DATE: 2/13/03	DRWN: MAW/BIL	**FIGURE 3**

RETEC

File: H:\Hydro\Clients\McFarland Cascade\5year review\Harris\Figures\LTU_DETAIL (fig 3).DWG Layout: ANSI_AVI-LJ User: SDOWNS Plotted: Aug 26, 2005 - 2:01pm Xref's:

File: H:\Hydro\Clients\McFarland Cascade\5year review\Harris\Figures\FINAL_GRADE(fig 7).dwg Layout: ANSI_BVI-LJ User: SDOWNS Plotted: Aug 26, 2005 - 2:00pm Xref's:



RETEC

IDAHO POLE COMPANY		FINAL GRADE AFTER LTU CLOSURE COMPLETION
MCFR2-03423-400		IPC - BOZEMAN, MT
DATE: 4/30/03	DRWN: MAW/BIL	FIGURE 8

Appendix H
Controlled Groundwater Area Order

DEC - 4 2001

BEFORE THE DEPARTMENT OF
NATURAL RESOURCES AND CONSERVATION
OF THE STATE OF MONTANA

* * * * * * * *

IN THE MATTER OF PETITION NO. 41H-114172 TO THE DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION FOR DESIGNATION OF A CONTROLLED GROUNDWATER AREA IN GALLATIN COUNTY	)	FINAL ORDER

* * * * * * * *

An Amended Proposal for Decision in the above matter was issued March 13, 2001. Copies of the Proposal were mailed to all interested parties. The Amended Proposal recommended designation of the Idaho Pole Company Site as a controlled ground water area.

No objections to the Amended Proposal were received by the Department of Natural Resources and Conservation. Therefore, the Director of the Department of Natural Resources and Conservation, having given the matter full consideration, finds, concludes, and orders as follows:

FINDINGS OF FACT

1. A Petition for Controlled Groundwater Area (Petition) was filed with the Department on September 28, 2000. The Petition was submitted by the Gallatin City-County Board of Health and signed by the Chairperson, Dr. Warren Jones. The Petition alleges water quality within the alluvial aquifer underlying the proposed controlled groundwater area is not suitable for domestic or municipal use insofar as groundwater would be used as a drinking water supply and groundwater withdrawals for industrial or agricultural use from the proposed area may cause contaminant migration.

2. Pentachlorophenol (PCP) is the primary contaminant of concern to human health at the Idaho Pole Company site. The plume of dissolved PCP extends several hundred feet laterally downgradient of the Idaho Pole Company site. (Petition)

3. A Notice to Groundwater Users was published in the *Bozeman Chronicle* on December 6, December 13, and December 20, 2000, setting forth the Petitioner, the alleged cause for the Petition, the legal description of the proposed controlled groundwater area, and the time, place, and purpose of the hearing. Additionally, the Department served notice by first-class mail on approximately 38 individuals

and public agencies which the Department determined might be interested in or affected by the proposed controlled groundwater area. The notice also stated any interested person could appear, either in person or by attorney, file written objections to the granting of the proposal, and be fully heard. (Department file.)

4. The proposed controlled groundwater area is described as follows: the W½SW¼, W½NW¼ of Section 5 and the SE¼NE¼, SE¼ of Section 6, both in Township 2 South, Range 6 East in Gallatin County, Montana. The proposed controlled area includes all underlying aquifers. (See attached map) (Department file.)

5. The Petitioner proposes total closure for groundwater wells in the proposed controlled groundwater area with exceptions for remediation/monitoring wells and replacement wells for existing appropriations as authorized by the Department.

6. The boundary includes all of the Idaho Pole Company property and a buffer zone extending 320 feet from the contaminate plume. The buffer zone is based on a capture zone analysis using 500 gpm as a conservative maximum amount available from the aquifer.

7. Based on the information in the Petition and the evidence presented at the hearing, the Department finds water underlying the PCP plume as shown on the attached map is not suitable for domestic or municipal use and groundwater withdrawals for industrial or agricultural uses may cause contamination migration.

Based upon the foregoing Findings of Fact, the Hearings Examiner makes the following:

CONCLUSIONS OF LAW

1. The Department has jurisdiction over the parties and over the subject matter herein. Mont. Code Ann. §§ 85-2-113, 85-2-506 (1999).

2. The Department gave proper notice of the hearing and all substantive procedural requirements of law or rule have been fulfilled. *See* Findings of Fact 1, 2, and 3.

3. There is sufficient evidence to designate a controlled groundwater which includes all aquifers underlying approximately 62 acres described as follows: the W½SW¼, W½NW¼ of Section 5 and the SE¼NE¼, SE¼ of Section 6, both in Township 2 South, Range 6 East in Gallatin County, Montana. *See* Findings of Fact 1, 2, 4, 5 and 6.

WHEREFORE, based upon the record, the Director makes the following:

ORDER

A controlled groundwater area is designated for the Idaho Pole Company Site generally described as approximately 62 acres in the east half of Section 6 and the west half of Section 5, both in Township 2 South Range 6 East, Gallatin County and more specifically in the W½SW¼, W½NW¼ of Section 5 and the SE¼NE¼, SE¼ of Section 6, both in Township 2 South, Range 6 East in Gallatin County, Montana.

1. Wells for new appropriations are prohibited. Replacement wells for existing appropriations will be allowed as authorized by the Department.

2. This controlled groundwater area does not apply to wells for remedial, response, or restoration actions authorized or undertaken by the United States Environmental Protection Agency or the State of Montana.

3. All new monitoring wells drilled within Controlled Groundwater Area, 41H-114172, shall be installed in accordance with the EPA-approved Standard Operating Procedure (SOP GROUNDWATER-3) for monitoring well design and construction.

4. Upon a showing by **clear and convincing evidence** that any part of the controlled groundwater area is not contaminated and will most likely never be contaminated the designation for that area may be lifted.

NOTICE FROM THE STATE OF MONTANA NATURAL RESOURCES DAMAGES PROGRAM

1. The granting of this petition for a controlled groundwater area does not constitute an irreversible and irretrievable commitment of the groundwater resource, nor does it serve as a permit for the release of hazardous substances into the groundwater aquifer.

2. The controlled groundwater area and groundwater closure is being issued in recognition of existing contaminated conditions and does not relieve any person from liability for contamination of the groundwater.

3. A grant of a controlled groundwater area is not an indication of a finding that the groundwater aquifer should not be remediated or restored.

APPEALS

The Department's Final Order may be appealed in accordance with the Montana Administrative Procedure Act by filing a petition in the appropriate court within 30 days after service of the Final Order. If a petition for judicial review is filed, the Department will transmit a copy of the tape(s) of the oral proceedings to the district court along with documentary evidence in the file. If a party to the proceeding elects to have a written transcription prepared, that party may purchase the tapes and have a transcript prepared.

Dated this 22 day of November, 2001.

Arthur Clinch, Director
Department of Natural Resources
and Conservation
1625 Eleventh Avenue
Helena, Montana 59620
(406) 444-2074

CERTIFICATE OF SERVICE

This certifies that a true and correct copy of the Final Order was served upon all parties on file for this case, listed at the Water Resources Division on this 30th day of November, 2001.

Jennifer L. Kenaley
Water Rights Bureau
Hearings Unit
406-444-6615

ATTACHMENT TO FINAL ORDER FOR 41H-114172

Montana Department of Natural Resources and Conservation

Proposed Idaho Pole Company Controlled Groundwater Area, Bozeman, MT NOVEMBER 2001