Final
Meeting Minutes
Restoration Advisory Board (RAB) Meeting
Former Galena Forward Operating Location (FOL), Alaska
Galena, Alaska
11 April 2018

Time/Place: 8:30 pm, 11 April 2018 – Larson Charlie Hall, Galena, Alaska

Attendees:

Approximately twenty-six (26) people attended the meeting including representatives from the Air Force Civil Engineer Center (AFCEC), the Alaska Department of Environmental Conservation (ADEC), and the Galena Restoration Advisory Board (RAB). The following is a list of people attending the meeting.

Christiana Hewitt, AFCEC
Donna Kozak, Booz Allen Hamilton (BAH)
Bruce Henry, Parsons
Ed Heyse, Parsons
Win Westervelt, CH2M
Dennis Shepard, ADEC
Jamie McKellar, ADEC
Sam Myers, Alaska Department of Transportation (ADOT)
Tim Bodony, Community RAB Member (Chairman)
John Stam, Community RAB Member
Shanda Huntington, Galena City Manager
Nolan Aloysius, City of Galena
Kenton Moos, US Fish & Wildlife Service
Betty Huntington, Gana-A'Yoo
Susie Sam, Louden Tribal Council
Ranch Burgett, Community Member
Dick Evans, Community Member
Fred Huntington, Community Member
Russ Sweetsir, Community Member
David Billings, Community Member
Ed Pitka, Community Member
Shirley Cleaver, Community Member
Cynthea Rickson, Tanana Commerce
Deborah Vo, Alaska State Government
Shayla Marshall, General Public
LaDonna Lindley, Court Reporter

Agenda: See Attachment 1

Introduction:

Bruce Henry (Parsons) opened the RAB meeting and introduced a presentation on Performance-Based Remediation (PBR) Cleanup efforts.

Presentations

Performance-Based Remediation

Bruce Henry gave a presentation (Attachment 2) with an update of the PBR contract. The PBR contract is for the cleanup of 32 sites at the Former Galena FOL. To date five sites have been closed. Installation of remedial systems started in 2015 and will continue until 2019. Operation of the remedial systems under the PBR will continue through the summer of 2020.

Bruce described remedial system operations that occurred over the winter of 2017/2018 and showed the locations of the remedial systems on a map of the Former Galena FOL. Bioventing and soil vapor extraction (SVE) systems were running and monitored monthly at 11 sites. Vertical and horizontal air sparging systems were running and monitored monthly at 8 sites (3 with SVE). The 19 operating systems will be shut down in April and May of 2018 for annual soil vapor sampling to track cleanup progress.

Bruce introduced Win Westervelt (CH2M) to describe the startup and operation of two large horizontal well air sparging systems. Win described the two systems installed at Million Gallon Hill/Missile Storage Area (Sites CG001/CG002) and the Petroleum, Oil and Lubricant (POL) Tank Farm Area/Galena Aviation Vocational Technical Center (GAVTC) (Sites ST005/CB001). Win showed pictures and plan views of the horizontal well air sparge systems installed in 2017. Startup occurred in October 2017, and the distance of influence during injection of air was up to 200 feet from a single well. Win explained that the systems run over the winter when the water table is low and are shut down during the summer months when the water table is high. Vapor intrusion mitigation systems are in place at the GAVTC and Airport terminal buildings. The remediation systems are anticipated to operate for about 10 years.

Bruce proceeded to describe the PBR field schedule for 2018, which includes the following:

Vertical Air Sparge Systems

- Complete installation of a small subsurface aeration (vertical well) air sparging system at Million Gallon Hill (Site CG001).

Soil Vapor Extraction

- Complete SVE installation at Former South Apron Maintenance Area (Site SS015)
- Install system at Former Fuel Storage Tank Area (Site ST005 Area C)
- Install system at Trichloroethene (TCE) Spill Site/Building 1700 (Sites SS006/SS019)

Bioventing

- Install a bioventing system at Former Fire Protection Training Area (Site FT001)

Enhanced Anaerobic Bioremediation Injections

- Injection at TCE Spill Site (Site SS006)
- Injection at Former South Apron Maintenance Area (Site SS015)

Excavation

- Former Waste Accumulation Area South of Building 1499 (Site SS018)
- Surface soil excavation at Building 1845 TCE Area (Sites SS006)
- Complete small excavation at Former Birchwood Hangar (Site SS014)

In Situ Chemical Oxidation (ISCO)

- Injection at Old Abandoned Pipeline Area 2 (Site CPL006)

Bruce mentioned other activities that will occur in 2018, including system modifications, installation of new groundwater monitoring wells, annual groundwater monitoring, and landfarm reconstruction and operation. A map was presented showing the locations of the sites where field work is planned for 2018.

Bruce discussed the soil excavation at Site SS018, which is to remove approximately 1,000 cubic yards of soil contaminated with petroleum hydrocarbons from a fuel line leak. Soil around the fuel line would be carefully removed, and the pipe line cut and replaced if need be. Contaminated soil will be treated at the Galena Landfarm.

A map was presented showing the location of the bioventing system at Site FT001. Bioventing will be used to treat soil contaminated with petroleum hydrocarbons from fire training activities. Twelve (12) shallow and 2 deep vent wells will be installed to inject air to stimulate biodegradation of fuel hydrocarbons. A cover will also be installed to limit infiltration of rain water and enhance the influence of the bioventing system.

The site is also contaminated with per- and polyfluoroalkyl substances (PFAS) which are present in soil and groundwater. PFAS will be addressed separately because they are considered emerging contaminants and the extent of PFAS contamination in soil and groundwater has not been fully delineated.

Tim Bodony (RAB co-chair) asked what the current methods are for treating PFAS in soil and groundwater. Bruce replied that the bioventing system at FT001 is not intended to treat PFAS, only fuel hydrocarbons. Christiana Hewitt explained that the Air Force was addressing the issue and that the Air Force was preparing a Site Investigation (SI) report for PFAS at Galena. After the SI, sources of PFAS at Galena would be delineated in a process like the Remedial Investigation process used for other contaminants. In the meantime, a lot of research is being performed to find treatment alternatives. Tim Bodony asked about using activated charcoal to remove PFAS from drinking water. Christiana confirmed that currently PFAS are typically removed by granular activated carbon (GAC) at the well head for drinking water supplies. Sam Myers interjected that charcoal filters in household Brita water filters are not effective for PFAS, it requires a specially designed GAC filter. The Air Force concurred that PFAS require a special GAC filter.

Tim Bodony pointed out that unless there was a release of PFAS that no one knew about, the fire training area would not have a groundwater plume that would be close to any of the wells that the town uses.

Dennis Shepard mentioned that the Air Force has been proactive in sampling for PFAS and moving forward with the Site Inspection at Galena. Dennis mentioned they have identified a couple sites in Fairbanks with PFAS and have had to extend the city water supply into the affected areas. Dennis said that the water supply in the Galena triangle was upgradient of the areas of PFAS in groundwater and should not be impacted. Dennis also mentioned that he thought ADEC has additional sampling to do for the drinking water supply wells in New Town.

Bruce described how SVE works for TCE in unsaturated soil, and that systems will be installed at Site SS015 and Sites SS006/SS019. Air quality will be monitored to ensure ADEC permissible exposure levels are not exceeded.

An explanation was provided of how amendments would be injected at two sites in 2018 to treat TCE in groundwater, and that the injections would take a couple months to complete. TCE degrades in groundwater biologically by anaerobic microorganisms (Enhanced Anaerobic Bioremediation, or EAB) and abiotically by reactions with reduced iron sulfide minerals (Enhanced Biogeochemical Transformation, or EBT). End products of degradation include

ethene, which is unstable in groundwater and further degrades to carbon dioxide and water. Injected amendments include emulsified vegetable oil to stimulate anaerobic conditions for biological degradation of TCE, a bioaugmentation culture that is capable of complete degradation of TCE to ethene, and sulfate which is reduced to form reactive iron sulfide minerals.

A photo of how amendments are mixed and injected using direct-push methods was shown; a similar method will be used for EAB/EBT injections in 2018. Emulsified vegetable oil, sulfate amendment, and bioaugmentation culture will be injected into three rows of injection points to form permeable reactive barriers (PRBs) oriented perpendicular to groundwater flow. A plan view and cross-section view of the planned injection at Site SS015 was shown to illustrate the configuration of the PRBs.

Susie Sam asked if Parsons was planning to hire subcontractors or local people to help with the remediation activities. Bruce responded that Parsons has been working with Gana-A'Yoo to subcontract local equipment and operators and would continue to do so.

Bruce provided an overview of remaining work to be completed in 2019 and 2020, including the following:

- Implement remaining remedies in 2019 which includes completing the excavation of Site DP023 (Disposal Site West of Dike).
- Operate remedies and prepare close out reports, as appropriate (through 2020).
- Operate Landfarm in 2019 and 2020.

The current PBR contract ends September 2020, after which a new contract will be issued by the Air Force to continue cleanup operations.

Closing Remarks

Dennis Shepard spoke on behalf of ADEC saying he was pleased progress is being made on cleanup activities at the Former Galena FOL, and that ADEC would continue to support the cleanup efforts. Dennis stated that DEC's authority is based in cleanup levels and for sites like SS006 the Air Force has chosen the most conservative cleanup levels for soil, groundwater, and air.

Christiana Hewitt on behalf of the Air Force thanked everyone for attending.

Next RAB Meeting

The next RAB meeting is tentatively scheduled for October 2018.

Meeting Adjourned at 9:00 pm

Attachments:

1. RAB Meeting Agenda
2. Presentation: Performance Based Remediation at Former Galena FOL

Attachment 1
RAB Meeting Agenda

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Galena Restoration Advisory Board (RAB)

RAB Meeting Agenda
April 11, 2018
8:00 p.m. – 9:00 p.m.
Larsen Charlie Community Hall
Galena, Alaska

Welcome — **Christiana Hewitt, AFCEC**

- Introductions

Overview of Environmental Restoration

- Performance-Based Remediation (PBR) Contract — **Bruce Henry, PARSONS**
  - Summary of Winter 2017/2018 Field Operations — **Win Westervelt, CH2M**
  - Activities Planned for 2018 Field Season

Remarks from ADEC — **Dennis Shepard, ADEC**

Remarks from ADOT — **Sam Myers, ADOT**

Questions from the Public — **Bruce Henry/Win Westervelt (Facilitators)**

Schedule for Next RAB and Closing Remarks — **Christiana Hewitt**

For more information about the Galena Environmental Cleanup program, please contact the AFCEC Public Affairs hotline at 1-866-725-7617 or via email at AFCEC.PA@us.af.mil.

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Attachment 2

Performance Based Remediation at Former Galena FOL

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Air Force Civil Engineer Center

Performance-Based Remediation (PBR) at the Former Galena Forward Operating Location (FOL), Alaska

Restoration Advisory Board (RAB) Meeting
11 April 2018

Battle Ready…Built Right!

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Former Galena FOL Performance Based Contract

- **Parsons - Prime Contractor**
- **Partnering Team – CH2M and Ahtna Engineering Services**
- **Remediation of 32 sites contaminated primarily with fuels and solvents**
- **To date, five sites have achieved Cleanup Complete**
- **Installation of remediation systems from 2015 to 2019**
- **Operations and monitoring through Summer 2020**

Horizontal well installation in 2017

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Winter 2017 to Spring 2018 Activities

- Bioventing and soil vapor extraction (SVE) running and monitored monthly at 11 sites
- Vertical and horizontal air sparging systems running and monitored monthly at 8 sites (3 with SVE)
- April/May 2018 – The 19 operating systems will be shut down for annual soil vapor sampling to track cleanup progress
- Eighteen (18) of the systems will be started back up in the fall and operated over the winter of 2018/2019 when water levels are lower
- One system (Site SS025) operates during the summer

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Horizontal Well System at Million Gallon Hill/Missile Storage Area

- Four aeration wells ranging from 1,013 to 1,180 feet in length.
- Screened beneath the petroleum-contaminated soil area (red boundary) that is the contaminant source for groundwater.
- Startup testing in October included "distance of influence" measurements, and air pressure was observed greater than 200 feet from a single horizontal well, creating a very large aerated treatment zone.

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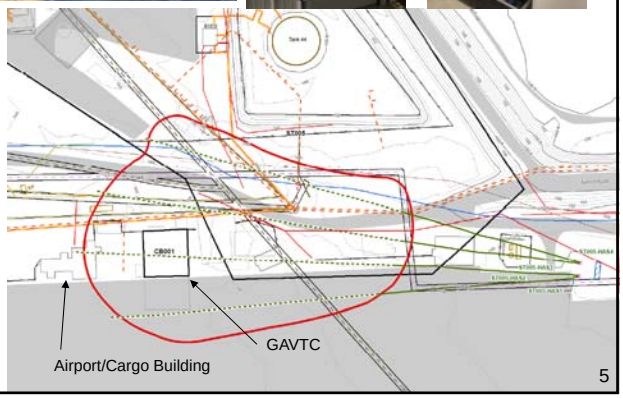
Horizontal Well System at POL Tank Farm and GAVTC

- Another 4 horizontal wells ranging from 777 to 868 feet in length.
- Similar distance of influence testing showed air pressure greater than 200 feet from a single well.
- The air is cycled through the 4 wells at both sites on 6-hour intervals.
- Vapor intrusion mitigation systems (VIMS) are installed and operate at the GAVTC and Airport terminal/ cargo building.



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Planned 2018 Galena PBR Schedule

Subsurface Aeration (Vertical Well) Air Sparging

- Complete small system at Million Gallon Hill/Missile Storage (Sites CG001/CG002)

Soil Vapor Extraction

- Complete system at Former South Apron Maintenance Area (Site SS015)
- Install small system POL Yard (Site ST005 Area C)
- Install system at Building 1845 TCE Area/Building 1700 Refueler Maintenance Shop (Sites SS006/SS019)

Bioventing

- Install system at Former Fire Protection Training Area (Site FT001)

Enhanced Anaerobic Bioremediation/Enhanced Biogeochemical Transformation (EAB/EBT) Injections

- Former South Apron Maintenance Area (Site SS015)
- Building 1845 TCE Area (Site SS006)

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Galena PBR 2018 Field Work (continued)

Excavations

- Former Waste Accumulation Area South of Building 1499 (Site SS018)
- Surface soil excavation at Building 1845 TCE Area (Site SS006)
- Complete small excavation at former Birchwood Hangar (Site SS014)

In Situ Chemical Oxidation (ISCO) Injection

- Old Abandoned Pipeline (CPL006 Area 2 – along ski strip)

Other Field Work

- System modifications (e.g., expand or replace vent wells)
- Install new groundwater monitoring wells
- Annual groundwater monitoring

Galena Landfarm

- Landfarm reconstruction and operation

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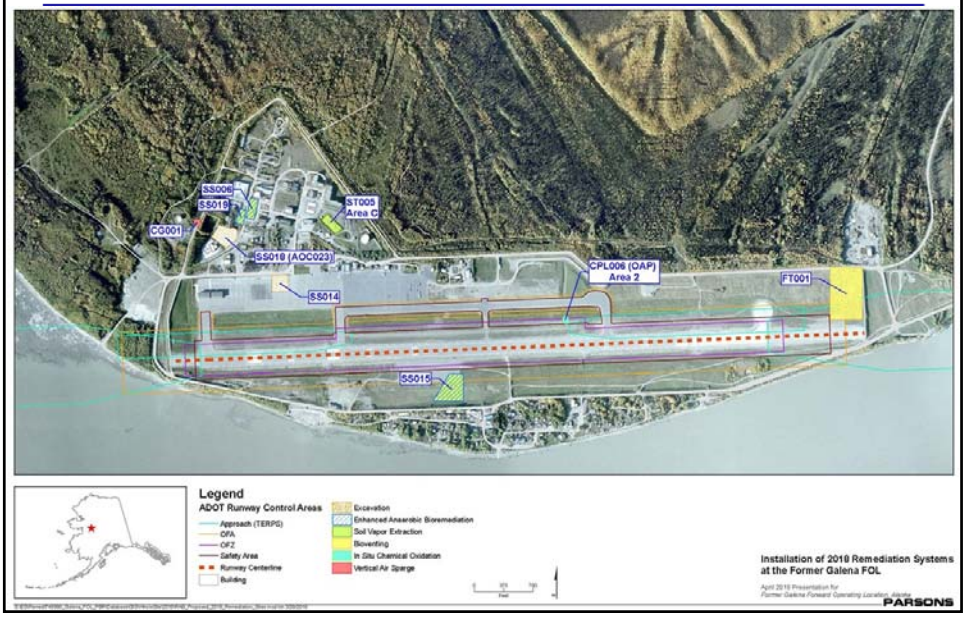
2018 Field Work Locations



Excavation at Site SS018

- **Site SS018 was a waste accumulation area south of the steam plant**
- **Fuel pipeline leak contaminated approximately 1000 cy of soil**
- **Soil around pipeline will be removed by a vacuum truck, or the pipeline will be cut and replaced.**
- **Soil will be excavated and treated at the landfarm**

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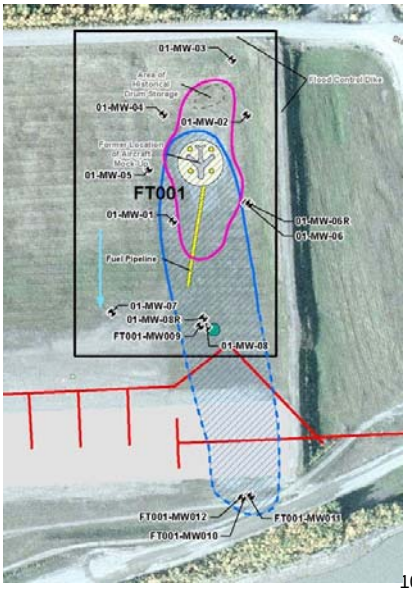
Bioventing System at FT001

- **Soil and groundwater contaminated with petroleum hydrocarbons from fire training exercises**
- **Per- and polyfluoroalkyl substances (PFAS) are also present in soil and groundwater but will be addressed separately**
- **Bioventing selected to treat petroleum hydrocarbons in unsaturated soil as an interim remedy**

Magenta outline is extent of soil contamination above cleanup levels

Blue hatch is extent of benzene in groundwater



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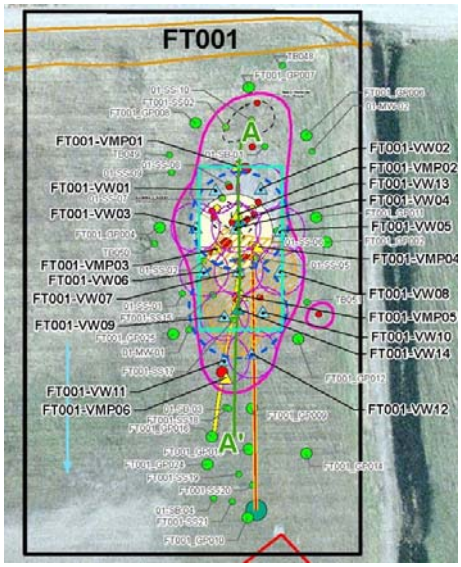
Bioventing System at FT001

- 12 shallow and 2 deep vent wells will be installed under an impermeable cover
- Cover will limit infiltration and enhance influence of bioventing
- Benzene and DRO in groundwater will attenuate as soil bioventing removes petroleum hydrocarbons from soil



Circles show extent of bioventing influence

Light blue line is extent of cover

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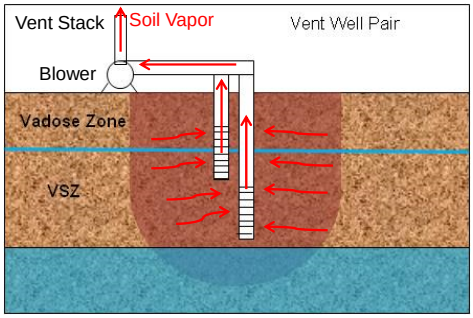
Soil Vapor Extraction (SVE) for TCE

- SVE will be completed at Site SS015 (started in 2017) and installed at Site SS006 in 2018 (SS019 system was installed in 2015 as pilot test)
- SVE removes volatile TCE in unsaturated soil and vents it to the atmosphere
- Ultra-violet light from sun degrades TCE quickly in the atmosphere
- Air quality is monitored to ensure ADEC exposure levels are not exceeded



Note: VSZ = variably saturated zone

SVE blower shed at Site SS015

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Enhanced Anaerobic Bioremediation/ Enhanced Biogeochemical Transformation (EAB/EBT)

- TCE degrades in groundwater:
  - Biologically by anaerobic microorganisms (EAB)
  - Abiotically by reactions with reduced iron sulfide minerals (EBT)
- End products of degradation products (e.g., ethene) are unstable in groundwater and further degrade to carbon dioxide and water
- Injected chemicals/cultures:
  - Emulsified vegetable oil to stimulate anaerobic conditions for biological degradation of TCE
  - Bioaugmentation culture that is capable of complete degradation of TCE to ethene
  - Sulfate which is reduced to sulfide that precipitates with iron to form reactive iron sulfide minerals

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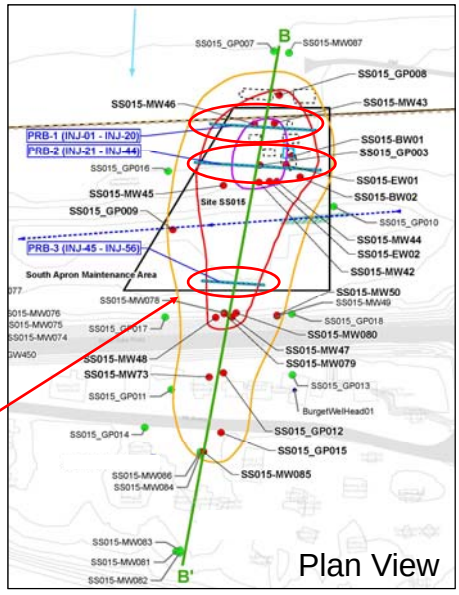
Direct-Push Injection for EAB/EBT

Amendments are mixed with water at the surface

Amendments injected directly into groundwater through direct-push rods and tools

EAB/EBT at Site SS015

- **Emulsified vegetable oil, sulfate amendment, and bioaugmentation culture will be injected into three rows of injection points to form permeable reactive barriers (PRBs) oriented perpendicular to groundwater flow**



PRBs intercept TCE in groundwater above 50 micrograms per liter

Plan View

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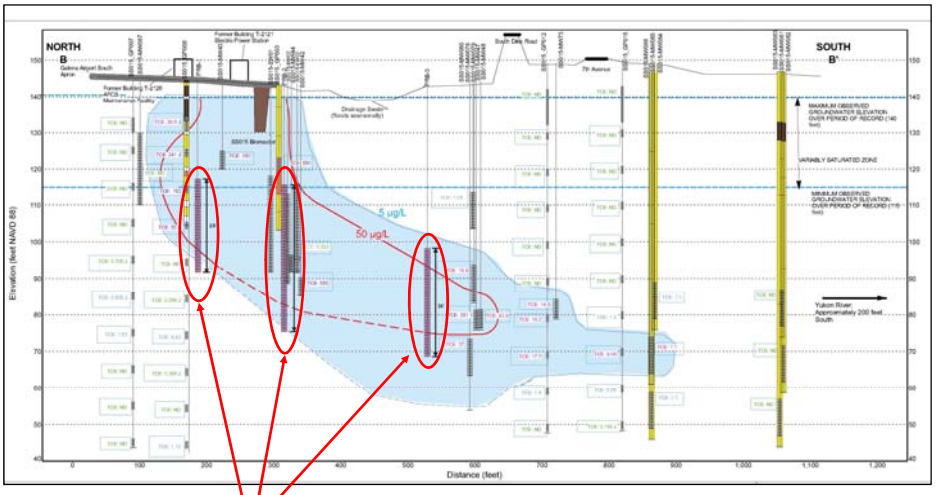
Injection into Permeable Reactive Barriers at Site SS015



PRBs intercept TCE in groundwater

Cross Section View

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Galena PBR 2019-2020 Schedule Overview

- 2019 – Implement remaining remedies
  - DP023 (Disposal Site West of Dike) complete excavation
- Operate remedies and prepare close out reports, as appropriate (through 2020)
- Operate Landfarm
- Current PBR Contract ends September 2020

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Communications

- Public Review of Proposed Plan for remaining CERCLA sites
  - Sites SS006/SS019 in April/May of 2018
  - DP023 in October of 2018
- Notices will be published when RODs are finalized for public review
- Semi-annual RAB Meetings (April/October)
- Air Force maintains Administrative Record for Final Documents at:

  http://afcec.publicadmin-record.us.af.mil/

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Questions?

Air Force Installation and Mission Support Central (AFIMSC) Public Affairs

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