

North Pole Refinery Technical Project Team

July 25, 2012

Alaska Department of Environmental Conservation, Fairbanks Office

Fairbanks, Alaska

Technical Project Team Members in attendance

Dr. Dave Barnes	UAF, Civil and Environmental Engineering, Department Chair
Cindy Christian	DEC, Drinking Water Program, Compliance Program Manager
Ann Farris	DEC, Contaminated Sites Program, Project Manager
Loren Garner	FHRA Project Manager
Nim Ha	DHSS, Health Educator
Lee Johnson	DEC, Drinking Water Program
Elizabeth Page	Koch Remediation & Environmental Services, Director
Jeanne Swartz	DEC, Spill Prevention and Response Program, Program Manager

Support Personnel in Attendance

Rebecca Andresen	Arcadis
Brian Angerman	Barr Engineering (via telecon)
Steve Bainbridge	DEC, DEC Contaminated Sites Program, Director
Cody Black	ERM/OASIS Environmental
Robert Burgess	DEC Intern
Stephanie Buss	SPB Consulting, Toxicologist
Todd Dejournett	Barr Engineering (via telecon)
John Elliot	Johnson and Wright (via telecon)
Denise Elston	DEC, SPR-Contaminated Sites, Program Specialist (via telecon)
Jim Fish	DEC, SPR-Contaminated Sites, Program Specialist
Mark Gebbia	Williams, Inc.
JoAnn Grady	Grady and Associates, Team Facilitator
Patrick Haas	P.E. Haas and Associates (via telecon)
Ali Hamade	DHSS, Toxicologist (via telecon)
Brad Koons	Arcadis (via telecon)
Kimberly Lake	Johnson and Wright (via telecon)
Paul Lhotka	DEC, Prevention Emergency Response Program
Michael Lilly	GW Scientific
Andrew Ohrt	Arcadis (via telecon)
Shannon Price	Flint Hills
Gary Remple	Barr Engineering (via telecon)
Phil Roberts	Williams, Inc.
Max Schwenne	OASIS Environmental, Project Manager
Eric Zentner	Boreal Communications Strategies

INTRODUCTIONS AND ACTION ITEM REVIEW

The meeting began at 9:00 Alaska time as team members introduced themselves and reviewed the action items from the previous meeting. The team determined that all of the action items had been completed. The team reviewed and approved the agenda for the meeting.

SITE CHARACTERIZATION AND REMEDIATION SUBGROUP

Mr. Ohrt gave a brief update on the status of field work that is being conducted at the site. He said that unexpected recent results from the ongoing soil investigation have prompted his team to expand the investigation within Lagoon B and west of the Fire Training Area. Mr. Ohrt pointed out the new sampling locations that have been proposed and briefly discussed how these samples will allow his team to further delineate the boundaries of the soil contamination that has been indicated by the results of recent sampling. The team discussed various historical sources that may account for the origin of the soil contamination. Representatives of Williams agreed to review their records and determine if they have documentation that indicates the presence of historical sumps, piping, or containment lines that may help the origin of the soil contamination in the new areas.

ACTION ITEM: Representatives of Williams agreed to review their records and determine if they have documentation that indicates the presence of historical sumps, piping, or containment lines that may help the origin of the soil contamination recently discovered in the Fire Training Area and around Lagoon B.

Mr. Ohrt continued his presentation on the status of ongoing field work. He provided an update on the progress of activities proposed in the 2012 Site Characterization Work Plan including installation of planned monitoring wells and transducers. Additional hydro-punch sampling locations were proposed to further clarify the results of the field sampling that has been conducted over the summer. Mr. Ohrt presented a slide showing the locations and depths of the monitoring wells that have been installed over the summer field season. He pointed out the areas where permafrost had prevented the installation of certain proposed wells. The team discussed how it would coordinate the development of the project database to ensure that the project data is distributed quickly and efficiently among team members. Mr. Garner agreed to schedule technical meetings to allow the project's database managers to discuss how to best incorporate the sharing of data into the database upgrade project.

ACTION ITEM: Mr. Garner will schedule technical meetings to allow the project's database managers to discuss how to best incorporate the sharing of data into the database upgrade project.

The team considered various suggestions from its members concerning its evaluation of field parameters associated with the ongoing summer fieldwork. Mr. Lilly offered to provide information from the United States Geological Survey (USGS) to assist the project team in its evaluation of the role of stage measurements in understanding ground water - surface water interactions in the vicinity of the Tanana and Chena rivers.

ACTION ITEM: Mr. Lilly will provide to Mr. Lockwood and Mr. Garner information from certain USGS studies to assist the team in its evaluation of ground water-surface water interactions in the vicinity of the Tanana and Chena rivers.

Mr. Ohrt described a proposal to use Laser Induced Florescence (LIF) to delineate Light Non-Aqueous Phase Liquid (LNAPL) contamination found in the vicinity of observation well O-27. The team engaged in a lengthy discussion about the possibility of using LIF technology to assess the location, the amount, and the recoverability of LNAPL contamination more generally throughout the site. Mr. Schwenne agreed to schedule meetings among the teams LNAPL experts to further discuss the possibility of expanding the use of LIF technology to delineate LNAPL contamination at the site.

ACTION ITEM: Mr. Schwenne agreed to schedule meetings among the teams LNAPL experts to further discuss the possibility of expanding the use of LIF technology to delineate LNAPL contamination at the site.

STATUS OF THE ARCADIS BIO-STUDIES

Mr. Ohrt updated the team on the status of the studies that are being conducted by Arcadis Environmental to evaluate the biodegradation of sulfolane at the project site. He said that recent samples taken from the groundwater extraction system and other elements of the Pilot Studies have been sent to research partners at the University of Oklahoma for their analysis. Mr. Ohrt said that biotrap traps that were proposed to evaluate the site's microbiological community have been successfully deployed and will be recovered sometime between mid to late September.

STATUS OF THE AIR SPARGE STUDIES

Mr. Angerman updated the team on the status of ongoing testing that is being conducted to determine the extent to which air sparge technology can be applied to remediate on-site sulfolane contamination in impacted groundwater. He explained that the objectives of the test are to ascertain the degree to which air sparging contributes to the removal of sulfolane from groundwater and to establish the optimal parameters for operating an air sparge system in the on-site project area. Mr. Angerman described various control measures, such as using pulsed and continuously operating sparge lines, to evaluate their effect on the rates of sulfolane removal in the system and to determine whether there are certain mechanical issues associated with them. He said that the results to date have demonstrated the efficacy of both the pulsed and continuously operated lines in removing sulfolane from their down-gradient areas. He added that his team has observed the complete removal of sulfolane from all monitoring wells located near the pilot system. Mr. Angerman commented that the results are promising and his team believes that air sparging can be considered a viable technology for application in the development of the site's remediation options.

Mr. Angerman described additional control measures, such as reducing the flow rates of the system, to further establish its optimal operating parameters. The team discussed various considerations associated with the test such as its monitoring regimen and the extent to which it accounts for background changes in the concentration of sulfolane within the test area. Mr. Lilly commented that it

is important to consider mechanisms such as changes in the gradient of the water table that alter the level of dissolved oxygen in a given area. He remarked that it is difficult to ascertain many of these changes without taking discrete measurements within the water table and without evaluating long-term data sets. The team discussed various assumptions regarding patterns in the gradient of the water table in local areas at the site and in the general region. Ms. Farris commented that the team should establish a new subgroup that is specifically dedicated to discussing issues related to the degradation of sulfolane.

THE UAF BIODEGRADATION STUDY

Mr. Burgess presented an update on the microbial studies that are currently underway at the University of Alaska at Fairbanks (UAF). He said that the objective of these studies is to isolate, identify, and characterize any sulfolane degrading microbes that may be present in the ground water at the site or in various components of the refinery's waste water treatment system. He added that the studies will evaluate how the site's geochemistry affects its microbial communities and that they will attempt to determine the degradation rates and metabolic pathways associated with sulfolane degraders found in the project area. Mr. Burgess described how UAF researchers will employ various microbial culturing and DNA sequencing techniques to identify and isolate sulfolane degraders present at the site. He explained how they will use geochemical data to predict how the microbial community at the site might change in the future.

Mr. Burgess noted that the results of preliminary genetic sequencing efforts have shown significant differences in the patterns of the relative abundance of terminal length restriction fragments generated from samples taken in areas with and without sulfolane contamination. He noted that the patterns of replicates are notably distinct in areas where the concentration of sulfolane is relatively high such as Monitoring Well 130. Mr. Burgess said that these results, along with observations of notable similarities between the relative abundance of fragments taken from particular components such as the air sparge units suggest that the presence of sulfolane may affect the composition of local microbial communities and that it may be enhancing the populations of microbial degraders. He reiterated that that these results are preliminary and that additional sampling, sequencing, and formal statistical analysis will be required to bear out the possibility.

MR. HAAS PRESENTATION ON PERFLUOROCARBOXYLATES (PFOA) AND PERFLUOROSULFONATES (PFOS)

Mr. Haas gave a brief presentation on the historical and current uses of PFOS and PFOA in a wide variety of applications. He identified growing concerns among scientists and regulators worldwide regarding their environmentally persistent, bioaccumulative, and toxicological properties of these compounds. Mr. Haas commented that these compounds were widely used in the manufacture of fire suppressants and there have been numerous instances of these compounds being inadvertently released at sites throughout the country in fire training exercises. The team discussed steps that it would take to attempt to determine whether fire suppressants containing PFOA or PFOS have ever been used at the refinery.

ACTION ITEM: Ms. Buss will contact the Alaska Department of Fish and Game and ask if a PFOA fish study is underway in Alaska.

ACTION ITEM: Mr. Garner and Mr. Roberts will review historical refinery records and determine whether class B fire retardants have ever been used at the refinery.

THE DRINKING WATER SUBGROUP

Mr. Price gave a brief update on recent developments within the Drinking Water subgroup. He said that, to date, there have been roughly 300 detections on properties outside of the city limits that do not have access to city water. FHRA is currently providing a permanent alternative water supply to the owners of 250 of these residences and they are providing bottled at the remaining 50 residences whose owners have not yet chosen a final alternative. Mr. Price said that FHRA is providing bottled water to roughly 200 residences, the majority of which have non-detect wells but which are located within the safety zone that FHRA has established, out of an abundance of caution, just outside of the plume area. Mr. Price said that FHRA has identified six new detections among the 186 wells that were resampled this season. He added that they have added some additional sampling areas and another 46 locations along the southern edge of the plume. He added that the all of these 46 wells showed non-detect results.

THE RISK COMMUNICATION SUBGROUP

Ms. Grady updated the team on recent developments within the Risk Communication subgroup. She said the subgroup met after the last TPT meeting to discuss various suggestions made by the group regarding the upcoming project newsletter. Ms. Grady said that FHRA is working on a story on air sparging, bio-sparging and other remediation technologies that are currently under development. She said that the newsletter will also feature an article on an interview of UAF researchers on bioremediation that was conducted by ERM's Chris Shock. She said that the team is collaborating to develop a cover story regarding the status of the plume. This article is in answer to the questions received about the plume by the public at the Open House of May 1. The newsletter will also contain an updated project outline.

The meeting ended at 3:30 Alaska Time.