ST. LAWRENCE ISLAND
RESTORATION ADVISORY BOARD AND PUBLIC MEETING
Meeting Minutes
December 2, 2009, 2:00 p.m.
IRA Building, Savoonga, Alaska

ATTENDEES

Savoonga	**Affiliation**
Janesse Brewer	The Keystone Center, Facilitator
Carey Cossaboom	Project Manager, Corps of Engineers, Alaska District
Lisa Geist	Environmental Scientist, Corps of Engineers, Alaska District
Curtis Dunkin	Project Manager, Alaska Dept. of Environmental Conservation
John Halverson	Program Manager, Alaska Dept. of Environmental Conservation
Mark Heaston	Senior Project Chemist, AECOM
Molly Welker	Project Manager, Bristol Environmental
Linda Akeya	Kukulget, Inc.
Hogarth Kingeekuk	President, Kukulget, Inc.
Mylon Kingeekuk	Kukulget, Inc.
Merton Milluhook, Sr.	Native Village of Savoonga, IRA
Alvin Noongwook	City of Savoonga
George Noongwook	RAB Community Co-Chair
Perry Pungowiyi	Kukulget, Inc.
Bryan Rookok, Jr.	Kukulget, Inc
Bryan Rookok, Sr.	Kukulget Inc., elder
Paul Rookok, Sr.	RAB member
Eugene Toolie	Savoonga
Gregory Toolie	Native Village of Savoonga, IRA
Morris Toolie, Jr.	Kukulget, Inc.
Morris Toolie, Sr.	Native Village of Savoonga, Elder
Raymond Toolie	City of Savoonga
Fritz Waghiyi	Native Village of Savoonga, NALEMP Project Manager

Via Teleconference from Anchorage

Jerry Reichlin	Fortier and Mikko, RAB member
Pam Miller	RAB member, Alaska Community Action on Toxics
Vi Waghiyi	RAB member, Alaska Community Action on Toxics

Via Teleconference from Florida

Ron Scrudato	TAPP Advisor, R&M Technologies

Via Teleconference from Nome

Kevin Zweifel	RAB member, Norton Sound Health Corporation

GLOSSARY

ACAT	Alaska Community Action on Toxins
ADEC	Alaska Department of Environmental Conservation
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
Bristol	Bristol Environmental Remediation Services, LLC
BTEX	benzene, toluene, ethylbenzene, and xylene
Corps	U.S. Army Corps of Engineers
CSM	conceptual site model
CY	cubic yards
DOD	U.S. Department of Defense
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
FS	feasibility study
FUDS	Formerly Used Defense Site
GIS	geographic information system
GPS	global positioning system
HQ	headquarters
ISCO	in-situ chemical oxidation
IRA	Indian Reorganization Act
MOC	Main Operations Complex
NALEMP	Native American Lands Environmental Mitigation Program
NIEHS	National Institute of Environmental Health Services
NOAA	National Oceanic and Atmospheric Administration
NVG	Native Village of Gambell
NVNC	Native Village of Northeast Cape
NVS	Native Village of Savoonga
PAHs	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
POL	petroleum, oil, or lubricants
ppm	parts per million
ppb	parts per billion
QAR	quality assurance representative
RAB	Restoration Advisory Board
RI	remedial investigation
RRO	residual range organics
SPIP	Strategic Project Implementation Plan
TAPP	Technical Assistance for Public Participation
TOC	total organic carbon
USACE	United States Army Corps of Engineers
UST	underground storage tank

Call to Order and Introductions (3:10 pm)

Janesse Brewer from the Keystone Center facilitated the meeting and welcomed everyone. Raymond Toolie gave the opening prayer. The attendees in Savoonga and on the phone from various places introduced themselves. Janesse outlined the meeting's agenda, which includes addressing old business, a report from the delegation that traveled to Washington DC, Northeast Cape updates from Bristol and AECOM, 2010 planned remedial actions, and status of the Native Village of Savoonga NALEMP project.

Review/Approve RAB Meeting Minutes from March 2009

Janesse asked if there were any comments on the March meeting minutes; Carey replied he had received none.

Review Action items from March meeting

Janesse reviewed the action items from the March 2009 minutes:

(1) Bristol and the island corporations need to draft a new Quarry Agreement. Though this is not really an action item for the RAB, the Corps does need to report back on this item.

Molly Welker said a fully signed agreement was never received. However, Bristol paid both Corporations their gravel fees based on the truckload counts from the borrow source at Northeast Cape. Carey Cossaboom mentioned there were some paperwork issues regarding how the payments were handled. Morris Toolie, Jr. stated that Gambell (Sivuqaq, Inc.) didn't sign the agreement, but Savoonga (Kukulget, Inc.) did.

(2) GPS locations for debris will help the Corps find missed debris items.

Carey Cossaboom recalled talking to someone who said they started marking pole locations for us with their GPS. The Corps of Engineers considers this an open invitation to the community and requests their help finding items of concern and noting the locations for us. Eugene Toolie mentioned the poles stick up several feet and are readily visible.

(3) Confirm seed mix and have the State Ag Center comment on the appropriateness of this seed for St. Lawrence Island.

Carey Cossaboom stated that concerns were raised by the community about grasses being non native to the Island. Stoney Wright from the Plant Materials Center in Palmer made a slight adjustment to the grass seed mixture before last field season. Mr. Wright assured the Corps the grass species are found on St. Lawrence Island. The grasses are supposed to grow quickly, for erosion control, will be replaced by other species as time goes on. Carey will extend an invitation to Mr. Wright again next summer to visit Northeast Cape.

Ron Scrudato asked if the grass species selected were a concern from a competition perspective or exotic species? Carey Cossaboom will follow up with Ron to formulate his question and put it in writing for a response from Stoney Wright.

(4) Carey to get AECOM experience and Chem Ox approach details to Ron Scrudato and Pam and Vi.

Done. Ron Scrudato also talked with AECOM after Carey provided contact information.

(5) Carey to get copy of presentation slides to Ron Scrudato.

Done.

(6) Carey to send a RAB application to Kenneth Kingeekuk.

Done. Carey sent applications to George Noongwook, RAB co-chair. George always encourages new RAB members to join. RAB members have an important role to help convey community concerns to the Corps of Engineers.

(7) Vi Waghiyi to send Carey a copy of the film ACAT made at NE Cape last summer, and also a film copy of the October meeting in Anchorage.

Done.

Report on St. Lawrence Island Delegation Visit to Washington, D.C.

Vi Waghiyi stated that in September 2009, a group of 19 people traveled to Washington, DC. Members of the delegation included 12 elders and youth from St. Lawrence Island, Ron Scrudato, Dr. David Carpenter, Pam Miller, Vi Waghiyi, and Colleen Keen from ACAT. The trip had been in the making for awhile, its purpose was to meet with agencies and bring the community's concerns about the cleanup and their health. The delegation met with:

Linda Birnbaum, Director, National Institute of Environmental Health Sciences
Stacey Hirata, U.S. Army Corps of Engineers, HQ FUDS Program Manager
Phil Hunt, U.S. Army Corps of Engineers, HQ Regional Integration Team Member, Pacific Ocean Division
Georgianne Reynolds, U.S. Army Corps of Engineers, HQ Tribal Liaison
Representative Dale Kildee (D) Michigan
Senator Lisa Murkowski (R) Alaska
Senator Mark Begich (D) Alaska
Mathy Stanislaus, Assist. Administrator, U.S. EPA, Office of Solid Waste and Emergency Response
Michelle J. DePass. Assistant Administrator, U.S. EPA, Office of International Affairs
Charles Lee, U.S. EPA, Office of Environmental Justice
Rudy Gorlee, U.S. Department of State
Rice Snyder, Department of State
John Conger, Assistant Deputy Under Secretary of Defense - Installations and

Environment
Representative Nancy Pelosi (D) California
Senator Tom Udall (D) New Mexico
Representative Bobby Rush (D) Illinois
Representative Tom Cole (R) Oklahoma
Congressional Briefing hosted by Senator's Begich and Murkowski to talk about concerns related to Formerly Used Defense Sites (FUDS) on St. Lawrence Island.

Key issues discussed:

- Urged action for complete removal of the Site 7 Cargo Beach Road Landfill
- Removal of soil/groundwater at the Main Operations Complex and the White Alice Communications Site
- Removal of contamination and ongoing monitoring
- Remediation and long term monitoring of the Suqi River
- Remediation of sediment and surface water impacts from fuels and PCBs
- Complete removal of the Fish Camp
- Restoration of all shallow groundwater and upgradient groundwater
- Safe drinking water source at Northeast Cape
- Complete removal of contamination in Gambell, including upgradient of the City's water supply
- Biannual monitoring of the City of Gambell's water supply
- Safe drinking water source in Gambell
- Tribes as official signatories to the Record of Decision
- Agreement from 3/7/1951 with the Native Village of Savoonga tribal council about provisions of the land withdrawal that no garbage would be dumped in streams or near the beach.

Vi Waghiyi stated they hope the trip to DC will help Alaska with cleanup and the FUDS budget. Linda Akeya stated she hoped they were heard during the trip to DC. She said 2008 was a painful year, 19 people died of cancer from the Island. She believes they need to find out why, and test families, figure out why doctors keep saying people are fine, sending them home from Nome and then later in Anchorage they discover cancer. She is afraid of getting cancer, watched her dad suffer from cancer. She believes that lives matter more than money.

Carey Cossaboom asked if there were any follow up activities planned by the group? Vi Waghiyi replied that ACAT had sent thank-you letters to everyone they met with. The letters summarize their concerns and specific issues to be addressed. Pam Miller stated she expects to receive formal responses very soon. After the meetings in Washington, DC, ACAT was contacted by EPA Region 10. Pam Miller stated that EPA is evaluating Northeast Cape for listing on the National Priorities List (NPL), and it could be designated a Superfund Site. Pam also stated that Northeast Cape ranks high enough based on EPA's evaluation in 2001-2002, however the evaluation is being conducted with information not publically available and EPA is still conducting internal evaluation. Carey commented that ATSDR has committed to do a site assessment for the community if new data is received.

Northeast Cape Update – 2009 Fieldwork Summary

Carey Cossaboom introduced Molly Welker, the Project Manager for Bristol Environmental Remediation Services, LLC (Bristol) from their Anchorage office. Bristol was awarded a $6.03 million contract last April to conduct fieldwork during the summer. Bristol teamed with AECOM to conduct the chemical oxidation pilot study portion of the work.

Molly Welker stated the major tasks for 2009 included:

- Mobilization/Camp Set Up
- Establish Work Sites
- Site 7 Test pits & trenches to locate liquid-filled drums
- Site 7 Drum removal/containerize waste
- Site 7 Landfill Cap
- ISCO at Main Operations Complex
- Demobilization/Camp Teardown

Equipment was mobilized on barges which left Seattle in May, picked up more equipment in Anchorage, and arrived at Northeast Cape in June. Setup of the camp occurred from June 25 – July 8, 2009. Over 25 field personnel were involved in the project, including:

- Site Superintendent
- Foreman
- Administration Assistant
- Operators/Drivers/Oiler/Mechanic
- Laborers
- Contractor Quality Control Site Manager
- Field Sampling Technician
- Bear Guard

Two locals were employed by Bristol; Michael Toolie (laborer) and Eugene Toolie (bear guard). Bristol had an on-site infirmary which was also made available to the community. The medic examined several children during the summer. The mess hall and phone could also be used by locals. In particular, at the end of the field season, the infirmary assisted an ailing Joel Akeya to be medevaced to Nome, saving his life. The community was very thankful and appreciated Bristol's assistance.

Bristol utilized a variety of subcontractors as well, including:

- AECOM - ISCO study
- Bering Air/Security Aviation – Aircraft charters
- Denali Drilling – Drilling services
- Eco-Land, LLC – Surveying
- Emerald Alaska, Inc. – HazWaste management and disposal
- Fairweather, Inc. – Infirmary and emergency medical services
- Global Services, Inc. – Camp services
- Northland Services, Inc. – Marine transportation
- TestAmerica Laboratories, Inc. – Analytical testing laboratory

During mobilization, minor road repairs were made, the camp pad was graded, work sites were setup (mechanic shop, fuel storage area, drum washing area, temporary work camp, borrow pit). A water treatment area was established for drum washing where a high pressure water sprayer was setup inside a connex. Each water impoundment had a scrubber unit for removing petroleum hydrocarbons from the water.

Molly Welker explained that a magnetic survey of the Site 7 Cargo Beach Road Landfill was done by R&M Consultants in 2007. The survey results indicated areas of buried metallic debris or anomalies. The major areas with debris at the Site 7 Landfill are located in the northwest and southeast corners. Bristol constructed a temporary access road, installed several culverts, and silt fencing to protect the ponds surrounding the landfill. Bristol used the geophysical survey as a starting point to locate debris, but felt strongly they needed to do additional testing and over 70 "potholes" were placed across the entire landfill area, not just areas of known anomalies to confirm the presence of buried debris. After these small "potholes" were completed, Bristol dug 11 test pits (100 sq feet by 4 foot depth), and 1 large trench on the southeast side of the landfill to expose and identify buried debris in the magnetic anomaly areas.

Bristol observed a lot of surface debris, and then turned over **all** surface and subsurface debris areas looking for any containers or drums with sludge or liquids, and other potential hazardous debris items such as batteries and light ballasts. If any drums that were encountered contained sludge or liquid, it was cleaned and crushed. Fifty drums were sent off-site for disposal, but the remainder were returned to the landfill after complete processing.

Bristol utilized a variety of equipment during the fieldwork:

- Zaxis 120 Excavator
- Cat 322BL Excavator
- Cat D6T and D8N Dozers
- Cat 160H Grader
- Cat 988B Loader
- Volvo 330L Loader/Forklift
- A-40 Rock Trucks
- 287B Skid Steers
- Arctic Cat Side by Sides
- Ottawa Yard Goat
- 7 Pick-up Trucks
- Water Truck/Mechanic Truck

Drum removal occurred between July 12th and August 3rd. All of the solid waste in the large magnetic anomaly areas were investigated, turned over, and if any drum was filled with liquid it was removed. Bristol dealt with a lot of corroded drums; some were drained in place by pumping out the contents. Overall, 2150 gallons of oil/sludge were recovered from the drums. Over 1000 drums were inspected and 132 drums contained residual oil/sludge and were hauled to the drum processing area for cleaning, 50 of the drums were disposed off-site, and the remainder were cleaned, crushed, and returned to the landfill for reburial. The actual area excavated was larger than the magnetic anomalies to ensure all drums were recovered.

Carey Cossaboom mentioned that USACE had a quality assurance representative (QAR), Valerie Palmer, onsite during the entire field excavation. He recalled a phone conversation with Valerie when she informed him Bristol was excavating the entire landfill, not just trenches as described in the workplan. Carey is confident Bristol dug through all the debris and no drums with contents were left behind.

Molly Welker stated that Bristol did not encounter any bedrock during the excavation activities. Eugene Toolie agreed that he never saw any bedrock, but lots of permafrost. Molly stated that Bristol used open top connexes to containerize over 100 tons of grossly stained soils that were excavated and disposed offsite.

George Noongwook asked about the depth of the excavations – did Bristol encounter permafrost? Molly Welker replied Bristol dug down until they didn't encounter debris anymore, in certain areas the excavations went to 10 feet, others were much shallower. Bristol did not hit groundwater or bedrock, and only a little bit of permafrost.

Pam Miller asked if Bristol conducted any sampling of the contaminated soil and oily sludge? Molly Welker replied everything was tested for waste characterization purposes. They were required to test for PCBs, DRO, metals, and benzene. None of the soil was determined to be hazardous. Some of the oil had a hazardous label, but 99% was non-hazardous. Bristol only detected some minor PCBs, everything was mostly diesel. Data will be presented in the final report. Bristol also collected light ballasts, about 4000 pounds of broken batteries and one 10 gallon bucket with antifreeze; these items were all shipped offsite for proper disposal. The water from the drum washing operation was processed through scrubbers to get rid of any oil sheen. The water was sampled and met ADEC regulations before being discharged to the ground surface.

Molly Welker stated Bristol used 28,824 cubic yards of borrow material, which was 1201 truckloads (24 CY/each). The gravel borrow material was stockpiled at Site 7 areas with no metal anomalies. The gravel was then spread in 6 inch "lifts" to make up the 24 inch cap. The cap thickness was checked to ensure adequate depth. The gravel cap area was then track-walked with heavy equipment to obtain desired compaction. The landfill cover was then fertilized and seeded with grass seed. Molly showed photos of the seed germinated in September. Bristol demobilized from the Island on August 22nd.

The final steps of this project are to request closure of the landfill from the ADEC. Bristol has submitted a technical memo to the ADEC that made a request for closure. A deed notification should also be filed with the Alaska Department of Natural Resources Recorder's Office in Fairbanks, AK. The deed notice will provide information placing an institutional control that limits future groundwater use and prevents construction of buildings on top of the landfill. USACE will visually monitor the capped area for settlement and erosion for the next 5 years. Bristol is currently working on their field season report; the draft report will be submitted to the Corps in late January or early February.

Ron Scrudato asked if the anomalies corresponded to the deepest debris areas? Molly Welker replied the corners of the landfill were the deepest. The majority of drums were recovered from the edges. Other metallic debris encountered included cable, garbage cans, and minor metal debris.

Pam Miller stated she was concerned that over the long term, visual monitoring is not adequate. She believes the contents of the landfill have already leaked out and impacted the subsurface and groundwater. Pam stated there needs to be continued downgradient monitoring, especially for PCBs. She disagrees that ADEC standards are protective and wants the opportunity to review chemical analyses. When the St. Lawrence Island delegation was in Washington, D.C., the leadership also requested the tribes be a formal party to the Record of Decision.

Eugene Toolie stated he thinks Bristol did a good job, a thorough job, had good drivers/operators. Alan Dennis was the excavator operator and took a lot of pride in not leaving anything unturned.

Hogarth Kingeekuk (Kukulget, Inc) stated they rejected the first gravel quarry agreement because of a wording disagreement. He stated that for the record, Kukulget did not agree to drums being placed back in the landfill after they were cleaned and crushed. The Corporation wanted everything removed and shipped offsite for disposal. Carey Cossaboom replied it was a USACE decision that the cleaned and crushed drums were considered solid waste, non-hazardous, and could be safely reburied under the landfill cap. The quarry agreement was simply the method for the Corporations to sell their gravel for use as the cap material. (Note: this statement was actually made later in the meeting, but placed here in the minutes for thematic consistency.)

BREAK (15 minutes)

Northeast Cape Phase 1 In-Situ Chemical Oxidation ("ISCO") Study

Molly Welker introduced Mark Heaston, a senior project chemist with AECOM. Mark traveled from Lincoln, Nebraska to attend today's meeting. Mark thanked everyone for the opportunity to present and spend part of his summer on the Island. Mark explained that AECOM was tasked to evaluate the ability of ISCO to achieve remediation goals for contaminants and media of concern in the Main Operations Complex (MOC) Area. In-situ means treatment done in place, in subsurface, as opposed to digging up the soils and taking them away.

Mark Heaston gave an overview of the history of site impacts. The soils and groundwater at the MOC are impacted with diesel fuel from pipeline leaks, a large AST at Site 11 that was punctured during snow removal, and other fuel releases to the surface and subsurface. The remediation goals are:

Contaminant of Concern	Soil Cleanup Level (mg/kg)	Groundwater Cleanup Level (mg/L)
Diesel Range Organics (DRO)	9,200	1.5
Gasoline Range Organics (GRO)	N/A	1.3
Residual Range Organics (RRO)	N/A	1.1
Naphthalene	120	N/A
Benzene	2	0.005

Notes: N/A – Not Applicable

Mark Heaston explained the main parts of the study:

- Rapid assessment via test pits
- Install injection well and monitoring wells
- Collect soil & groundwater samples that are used for bench scale testing
    - Total Oxidant Demand
    - Treatability Study
- Perform ISCO

- Perform Post – ISCO performance monitoring

The initial test pits were used to understand contaminant location, soil lithology, and groundwater movement. The highest contamination was observed in the shallow areas near Site 13 and 27. AECOM narrowed their focus to the edge of Site 13/27, near the known contamination. The test pits helped them to visualize the subsurface, and clearly see the different soil types. About 12 test pits were dug across the MOC to depth of 10 feet. A map of the test pit locations was presented showing screening results for diesel above and below 1000 mg/kg. The highest screening results for DRO corresponded to historical knowledge. The highest soil contamination corresponded to the high-organic silt and peat layers. AECOM observed a large variety of soil types in the test pits. The top 3-4 feet was usually backfill, non-native materials, then a peat or silt layer of varying thicknesses and alternating layers. At shallow depths near the edge of the MOC, permafrost was usually encountered around 10 feet. Another change to the conceptual site model (CSM) was the discovery of shallow/perched groundwater in addition to a deeper aquifer.

Mark Heaston explained the major challenges they faced in the field was the unexpected layers of highly organic silt and peat. Silt is a tighter material than the presumed sandy soils. Water was also found at different depths than anticipated. In order to implement the ISCO study, a detailed knowledge of where contamination is located and how groundwater moves is necessary. The presence of a second water bearing zone was new information.

AECOM also conducted a laboratory bench scale study using soil and water collected from the site to determine several things:

Oxidant Demand: The amount of oxidant consumed by a unit of soil
- Helps us ensure we don't use <u>too little</u> oxidant
- Estimated value (g/kg)
- Helps us to determine the minimum quantity of selected oxidant(s) needed to overcome the non-target demand for the oxidant
- Helps us calculate quantities for specific treatment volumes

Treatability Study: Bench scale estimate of effectiveness
- Compare different kinds of oxidants for effectiveness treating diesel in site specific soils & water
- Helps us compare different doses of oxidants to learn if we can get acceptable results with less oxidant
- Helps us evaluate cost effectiveness

The ICSO study had 2 parallel tracks – bench scale and well installation. A series of monitoring wells were installed to measure DRO concentrations and field parameters. The highest DRO concentration in the soils was 240,000 mg/kg, indicating the peat soils hold a lot of contamination. Specific concerns related to the ISCO study included: cold groundwater temperatures, existing source of diesel fuel, and the short field season. The oxidant selected by AECOM was hydrogen peroxide and sodium persulfate. Hydrogen peroxide generates heat and is a strong oxidizer. Sodium persulfate degrades more slowly and both compounds react together favorably and quickly. Mark continued showing pictures of the field work in sequence.

Mark Heaston stated that real-time field monitoring showed the groundwater temperature was raised to 120 degrees; the chemical was distributed to most of the study area; temperature and pressure remained in safe range; and there was no breakthrough to the surface of any oxidants. AECOM was unable to fully distribute oxidants to the west side of the study area due to short circuiting of the system and preferential flow to the northeast quadrant.

Mark Heaston gave an overview of the post-ISCO groundwater monitoring results. None of the monitoring wells met cleanup levels after 28 days. The GRO concentrations were relatively low, but on day 3 dramatically increased. A similar trend was observed for DRO, with concentrations increasing immediately. Mark hypothesized that the oxidants dissolved and desorbed contaminants bound to the soil and deposited these into the groundwater. Mark stated that ISCO might work better in an area without such high levels of organics (e.g., peat). The soil results from a couple locations did show some success in reducing contaminants concentrations. Mark stated that the high organics in the peat creates competition for oxygen, and that peat might be treated preferentially to the diesel.

- Target COCs: DRO, GRO, RRO, Benzene
- Immediate increase in Day 3 Post-ISCO concentrations
  - Diesel desorption from soils to groundwater
- Post-ISCO declines evident at Day 7
  - Aqueous phase oxidation effects
- Post-ISCO concentrations at Day 28 return to near baseline
  - Oxidant consumed
  - Ongoing source and return to equilibrium state
  - Under-dosed soil/aquifer system due to day-lighting breakthroughs of oxidants
- Data outliers – ICOMW08:
  - No direct influence from ISCO during active injection
  - But, GRO decreased from 39 mg/L to 0.091 mg/L over 28 days
    - Up-gradient contaminant destruction?

Mark Heaston stated the ongoing bench scale test will help answer other questions. Soil was sent to a laboratory, applied technology the same way, but with other combinations of reagents. The preliminary data indicates the same observations as the field data. Mark stated they are seeing an increase in total organic carbon in the groundwater, a lot of carbon from the peat soil may be breakdown products, indicating peat is being degraded preferentially.

- The bench study utilized a soil with groundwater slurry composite consisting of mostly peat and some silt from the ISCO treatment area
- On the bench, we can ensure target oxidant volumes/concentrations are met
- However, the response to treatment is similar to the field response, and large reductions in target COCs are not obtained.
- It has been observed that the peat has changed from a fiber to fine particles, suggesting that most of the oxidant is reacting with the peat; increasing TOC

The ISCO effectiveness in soils showed the following:

- Target COCs: DRO, Naphthalene, Benzene

- Decreases for Benzene & Naphthalene through Day 7
- Increases in DRO/Naphthalene through Day 28
  - Benzene results were more variable.
- Possible reasons for apparent increases:
  - Variation in the soils types sampled over short horizontal distances
  - Post injection soils had higher starting mass than our baseline samples
  - One sample collected per sample location may not be representative of treated vertical interval
  - Day 28 samples are representative of rebound effects

Mark Heaston summarized the ISCO study results. It will be difficult to reach cleanup level goals using chemical oxidation. The reagents appear to be a poor match for the high organic soils. ISCO could maybe be effective in areas with less peat.

AECOM's preliminary recommendation are to implement Phase 2 in an area south/east of the main complex, upgradient of SB-13B1 or MW88-10, or further from the wetland/tundra boundary.

Ron Scrudato asked if soil samples were collected from the peat layers? Mark Heaston replied most samples were from within the peat horizon or high organic silt. Ron asked if sorbing to the peat was observed? Mark replied they did see some sponge effect; one sample had 25% diesel fuel by weight, a fuel-saturated peat. Ron asked where water was encountered? Mark replied the depths varied in the test pits, but 2 flow zones were encountered, usually in the 4 to 4.5 ft range. Often they observed 3.5 feet of fill overlying 6 inches to 1 foot peat, then grey silt. The concentration of peroxide used was 8 to 12.5%. About 1,725 gallons of reagent was used over the screened interval. Ron agreed with AECOM's recommendation to do further study away from the edge of the main complex. Ron wondered if further south the water depths would be more uniform. Mark Heaston replied that historical data from MW88-5 indicated that well could be in communication with both water zones.

Mark Heaston observed that the say 28 soils were photographed and observed in the bench scale tests – visual changes were observed showing finer materials. Pam Miller asked what implications could be derived from the ISCO study – are the peat soils a continuing source of contamination, are other solutions needed, will the high levels of contamination continue to leach to groundwater? Carey Cossaboom asked if the chemicals tried are the best ones we could have chosen. Mark Heaston agreed. Carey stated we will analyze the report once it is received. It's possible that we may have to revert to a more straightforward technology like excavation.

Ron Scrudato mentioned that W4 had significant reduction and W7 was also in line/down gradient. Ron stated he has done and seen a lot of benefit from infiltration trenches. He wondered if within or below the peat zones trenches with reagent would be beneficial. Mark Heaston replied the estimated groundwater flow direction is regional, not necessarily on a small scale. MW4 and MW7 were not particularly high for field observations. The highest level of oxidation was observed in MW3 and MW6. MWs 5, 3, and 6 appear located in the perched zone, but 5 to10 feet away a much deeper aquifer may exist. Mark stated a technical memorandum on the ISCO study is anticipated to be ready at the end of December.

Northeast Cape – Scheduled work for 2010

Carey Cossaboom stated that the Corps of Engineers just awarded another contract to Bristol worth $7.3 million for the next phase of cleanup work at Northeast Cape during summer 2010. The Decision Document was signed by Department of Defense Headquarters in Washington, DC in September. It took over 6-9 months before final approval of the document was obtained. The estimated cost to implement the remediation, assuming chemical oxidation, is $31 million. The Decision Document has not been released to the public yet because the ADEC hasn't fully reviewed and concurred with the selected remedies since approval by DOD. The Proposed Plan was submitted for public comment, responses to those comments are included in the Decision Document, but the final decision is from USACE, thus it was not necessary to get concurrence from the landowners prior to its approval.

Carey Cossaboom summarized the planned work for 2010.

- Excavation and removal of petroleum soils
  - Site 1 Airstrip, Site 3 Fuel Pumphouse,
  - Site 6 Former Drum Field and Site 32 Lower Tramway

- Excavation and removal of PCB-contaminated soils
  - Site 13 Power Plant, Site 16 Paint/Storage,
  - Site 21 Wastewater Tank and Site 31 White Alice

- Excavation and removal of arsenic-contaminated soils
  - Site 21 Wastewater Treatment Tank

Several innovations were proposed by Bristol during the contract negotiations. Bristol originally proposed using connexes to transport the contaminated soils, which are easy to load but expensive to rent and ship. Bristol will instead utilize bulk bags, essentially large supersacks which hold 9 cubic yards of material (about 10.5 tons of soil), compared to the commonly used 1 CY supersacks. Bristol has successfully demonstrated using these types of supersacks at other locations such as Cape Yakataga. The bags are significantly cheaper to mobilize to the site. In addition, Bristol will be following the ADEC's regulations for processing of oversized materials. Contaminated soils will be excavated and processed prior to removal such that coarse materials (e.g., large rocks and boulders) will be screened out and only 2-inch minus material will be shipped off-site for disposal. The oversize material produced during soil processing will be used to backfill the excavation sites.

Carey continued to describe the planned work which includes capping of the smaller landfill east of the Main Operations Complex, the Site 9 Housing and Operations Landfill. Previous investigations demonstrated no leachate from the area. The Proposed Plan suggested no further action as the appropriate remedy, but the ADEC disagreed and requested USACE cap the landfill according to their regulations. This landfill is ringed by small ponds; the cap will extend into some of the ponds. Batteries and a truck near the surface will be removed. However, USACE will not have Bristol dig into the swampy areas to remove debris. Carey stated that Bristol may do several test pits to be sure that debris is present so they don't cap natural areas.

- Batteries and large debris on the shores of the ponds (e.g., truck) will be removed.
- Metallic and wood debris below the water in the ponds adjacent to the landfill will remain and be covered by the cap.
- Cap will be constructed using granular material obtained from the borrow site
- Revegetated using an approved seed mixture from the Alaska Plant Materials Center.

Jerry Reichlin asked if institutional controls were planned? Carey Cossaboom replied institutional controls would be necessary after completion of the cap. Jerry asked if the landowners would be compensated? Carey replied the Corps would assume the costs to implement the institutional controls. Jerry responded that he feels this action is a taking of private property and the landowners are entitled to compensation. Carey replied this would be highly unusual for the FUDS program to consider compensation; it would be an unprecedented action. Jerry replied there is diminution of the value of the land. Carey suggested making this subject an action item for follow up later.

Pam Miller stated it is unknown what's in the landfill. The approach should be similar to that taken for Site 7; the Corps should dig through the landfill to find potential hazardous materials first and remove them. There is still a potential long-term problem and capping is only a superficial fix. Carey Cossaboom replied that no downgradient impacts have been seen, thus suggesting hazardous items are not present, and no full barrels/drums have been observed like at Site 7. With the area being so wet, barrels would likely disintegrate if excavation were attempted. Carey realizes the community still prefers complete removal of the Site 9 landfill. A community member asked what if batteries are sunk into the ground? Carey replied batteries will only be removed if seen at the surface. This area is much wetter, not a good choice for a landfill or dump area. The Corps's position is that capping is the least damaging way to cover up the solid waste.

Paul Rookuk asked if the Corps can test the water that drains to the Suqi River from the Site 9 landfill area? Carey Cossaboom replied the water has been tested in the past, but it seems logical to confirm again with additional samples.

Ron Scrudato asked if any more geophysics were planned for the Site 9? Carey Cossaboom replied no, just some test pits to confirm the presence of subsurface debris. Ron agreed with Paul Rookuk that the stream which connects to the Suqi River is an obvious point to sample during the landfill capping activity. Carey Cossaboom agreed to look at Bristol's Scope of Work and add sampling of the stream.

Carey Cossaboom continued to describe other planned activities next summer. Bristol will begin to implement Monitored Natural Attenuation of petroleum-contaminated sediment at Site 8 POL Spill Site. The Corps has received a lot of criticism in the past, but this wetland has such good plant growth, we don't want to disturb the healthy vegetation. The intent is to set up a grid, leaning towards a multi-incremental or random sampling approach to get a baseline level of contamination.

At the Site 3 Fuel Pumphouse, we will sample tundra/sediment locations for petroleum hydrocarbons prior to excavation. Sampling will follow ADEC Technical Memorandum

Biogenic Interference and Silica Gel Cleanup. The idea is to make sure we don't excavate peat/organics since these can give similar responses as fuels.

Other debris removals planned include removal of dangerous poles, wires, and other miscellaneous debris from tundra areas site-wide where clearly identified. Bristol will also remove partially submerged debris from streams in the vicinity of Site 9 Housing and Operations Landfill and Site 29 Suqitughneq River. Poles frozen in the ground but have frost jacked-up. Bristol has proposed injecting warm water to loosen the poles.

Paul Rookuk stated the poles contain creosote which has seeped to the bottom of the ground. Carey Cossaboom replied that one pole is not likely to harm the environment chemically. Carey continued that wires are still lying around; still see reindeer getting tangled in them. These wires will be removed. Also, the metal debris in the Suqi River will be removed. Carey believes this meets the intent of the 1951 letter stating no debris would be dumped in the creeks. Carey stated the intent is to remove debris without damaging the Suqi.

The plans for next summer also include cleanout and removal of the culverts/manholes from the Middle and Western Drainages adjacent to the Main Complex to prevent direct outflows of upgradient residual sources of contamination. Since the Corps will not be addressing the source of contamination at the Main Operations Complex, we prefer to deal with the source area first before implementing remedial actions in the Drainage Basin.

NATIVE VILLAGE OF NALEMP

Carey Cossaboom stated that Fritz Waghiyi is the Tribe's project manager. NVS chose Bristol as their consultant to help with paperwork and reports, develop the SPIP and do a survey of the fish camp (Native Village of Northeast Cape) buildings for asbestos and lead-based paint. The concern was the homes were built with materials supplied by the military and since the public was not warmed of the potential harm, they were unknowingly supplied these potentially hazardous materials and the DOD may have some liability. The building survey was conducted last summer by Bristol subcontractor, the Satori Group. They sampled building materials, mapped homes and debris piles.

The building survey concluded that not much painted wood is left. Some asbestos-containing materials are present including transite pipe. The draft report recommends abate, removal, transport, and dispose of the building materials. Carey is recommending the tribe include this request in their pre-proposal for an additional Cooperative Agreement for FY10. He is not sure if headquarters DOD will approve or fund this request, but the tribe should at least make the request. Carey suggested now is the time to get NALEMP funding, since they can share costs while FUDS is doing their remediation work, resulting in significant cost savings.

Carey Cossaboom reported that the NVS is also scheduled to complete a Strategic Project Implementation Plan (SPIP) this year. This document is the first step under NALEMP, basically a wish list of environmental problems from military impacts that the community would like addressed. The challenges are that occupied buildings such as the 3 cabins still in use at Northeast Cape, the owners may not want them demolished but instead abated. Carey stated that if the government agrees to remove the collapsed buildings, what may happen in the future when

the remaining ones fall down? Carey anticipates a concern from Headquarters as to how the government will be protected from future liability if the cabins are allowed to remain. Paul Rookuk stated that most of the fallen down buildings are not fit to be emergency shelters.

Carey Cossaboom stated the NALEMP project in Gambell continues to dig up buried debris. There is less money, declining project, but still a few small areas to be addressed, a few anomalies to investigate. The community still has concerns about debris surfacing near homes and streets. FUDS has been done with Gambell for several years.

Paul Rookuk asked about building materials used at other subsistence camps across the Island? Carey replied be sure to get these concerns listed in the SPIP. Get photos, GPS locations.

Janesse Brewer asked if the next meeting should be held in the Spring, before Bristol heads to the field? George Noongwook responded that April is whaling, May is walrus hunting. Carey asked if the RAB meetings were happening often enough? Vi Waghiyi replied the RAB meetings are important to keep the community updated. Ron Scrudato asked if anymore water sampling was planned for Gambell? Carey replied no.

Community member asked why Bristol only hired 2 locals last summer? Molly Welder replied they attempted to hire 3, but one didn't make it to Anchorage for the medical exam. She anticipates hiring similar numbers for next summers work.

Action Items

1) Frame request to Stoney Wright for grass seed, overgrowth concern
2) Bristol reports are anticipated at the end of December for ISCO, end Jan/Feb for Landfill Cap, end of Feb for full ISCO report
3) Remind community to collect GPS locations for debris – open invitation
4) Jerry Reichlin and Carey Cossaboom to look into legal question about taking /compensation of landowners
5) Add surface water sampling of the stream coming from the Site 9 landfill
6) Contact Fritz Waghiyi with any concerns to be included in NALEMP SPIP
7) NVNC/Fish Camp structures – need rational to keep or abate or remove.

Janesse thanked everyone for attending and staying through a long meeting. She enjoys coming to the Island and is happy to be here.

Carey will send out meeting minutes and encourages everyone to review them. Carey emails the minutes to those with email addresses, otherwise he can send hard copies to RAB members only. George Noongwook also thanked everyone for attending and encouraged people to sign up as RAB members. He appreciates the work being done by the Corps and Bristol.

Adjournment

The meeting was adjourned at 6:45 pm.