

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE CONTAMINATED SITES PROGRAM

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File # 300.38.002

September 2, 2004

James R. Chatham, Environmental Manager, BP GEM
BP Exploration (Alaska) Inc.
P.O. Box 196612
Anchorage, Alaska 99519-6612

Re: Former Service City Pad
No Further Remedial Action Planned Decision Document
File No. 300.38.002

FILE COPY

Dear Mr. Chatham:

The Department of Environmental Conservation, Contaminated Sites Program, (DEC) reviewed the Final Corrective Action Report and the results of the final sampling of the land farm cells for the former Service City Pad conducted during the summer of 2003. This site was identified as an Orphan on the Charter for the Development of the Alaska North Slope (Charter) and this letter summarizes the decision process to determine the environmental status of this site. These determinations are based on the information submitted in the above report and other pertinent site documentation.

Background:

The Service City site is an abandoned, gravel pad on the east bank of the Kuparuk River located on the Arctic Coastal Plain. The gravel pad, which varies in thickness from two feet to eight feet, was built on native tundra for oil field development purposes and has been expanded over the years to its present size of approximately 60 acres.

The initial use of the Service City pad, formerly called Rivers Camp, began in the late 1960's and was used for staging, servicing, and storing equipment and supplies for production activities on the North Slope. The landowner, the Alaska Department of Natural Resources (DNR), platted Service City land in 1968 and leased the site for commercial industrial activities in 1972. It was actively used for oil field development support operations until 1985.

The lease for Service City was reportedly revoked between 1989 and 1990 but a large amount of material remained on the site including abandoned structures, mobile camp trailers, liquid storage tanks, tires, wood, and metal scrap. There was no responsible party and/or company willing or able to conduct cleanup activities until 1990. That is when a voluntary cleanup effort by the major oil companies removed large volumes of solid and hazardous waste materials from the site and the vacant pad has not been used since that time. The Charter agreement identified the Service City pad as an "orphan" site and provided the funding necessary to assess and/or remediate it.

In 2001 source areas with significant volumes of petroleum contaminated soil in excess of DEC's Method One cleanup level for the Arctic Zone, and areas of petroleum-stained soil were identified in a Phase II Site Assessment conducted by BNCI/SLR as follows:

- The former bulk fuel storage area adjacent to the ponded area on the east side of the pad.
- The area below the former maintenance shop on the southeast portion of the pad.
- The former location of the aboveground storage tanks (ASTs) on the southeast corner of the pad.
- Two locations on the pad where visible surface staining was evident (west excavation areas.)

The shallow seasonal groundwater, or suprapermafrost groundwater, is present in the gravel pad and perched above the frozen tundra. Since the shallow groundwater is not considered a drinking water resource on the North Slope, it is evaluated for its potential as a contaminant transport medium. There is surface water present in areas surrounding the pad and the impacted groundwater was evaluated as a potential source of surface water contamination.

The contaminated soil was targeted for removal since it served as possible source areas that might impact the suprapermafrost groundwater and subsequently migrate to adjacent surface water.

Soil Excavation:

Approximately 16,300 cubic yards (cy) of contaminated soil was excavated from the source areas at the Service City Pad during 2002. To the extent practical, the DEC Method One cleanup levels (500 mg/kg DRO) were used as target levels to define the limits of soil excavation in all areas except the former maintenance shop. The target cleanup levels at the former maintenance shop area were 2,000 mg/kg DRO. This level was determined to be protective of the surrounding surface water bodies, while avoiding excessive soil excavation.

The excavation samples indicated the target cleanup levels were achieved except in the following areas:

- Soil sample EX-707-07, collected from the west side of the former bulk fuel area/maintenance shop excavation with a GRO concentration of 883 mg/kg, a benzene concentration of 4.4 mg/kg, and a BTEX concentration of 18.83 mg/kg.
- Soil sample EX-708-02, collected from the south side of the small AST area located on the south edge of the pad with a DRO concentration of 2,470 mg/kg and an RRO concentration of 5,960 mg/kg.
- Soil sample EX-703-05, collected from the east side of the former maintenance shop which contained RRO at a concentration of 3,050 mg/kg.
- The following samples contained GRO or DRO concentrations which slightly exceeded the Method One cleanup levels for the Arctic Zone:

- Sample EX-629-01, collected from the northeast corner of the former bulk fuel area excavation with a DRO concentration of 512 mg/kg.
- Soil sample EX-707-01, collected from the northwest side of the former bulk fuel area with a GRO concentration of 118 mg/kg.
- Soil sample EX-707-06 collected from the west side of the former bulk fuel area/maintenance shop excavation with a GRO concentration of 123 mg/kg.
- Soil sample EX-708-06, collected from the north side of the small AST area on the south edge of the pad with a DRO concentration of 594 mg/kg.

The soil samples from the former ramp area did not exceed Method One cleanup levels for the Arctic Zone. The highest detections of petroleum-range hydrocarbons were found in sample SC-717-03, which contained 36.4 mg/kg GRO, 307 mg/kg DRO and 366 RRO.

Soil Treatment:

Various remedial technologies to treat petroleum impacted soil source areas were evaluated by DEC and British Petroleum (BP) and it was decided to land farm/land spread the impacted soil and treat it on site. The corrective action was selected to treat the impacted soil and evaluate various bioremediation methods that might be applicable at other site in the Arctic Zone. The treatment was designed to compare four biological land farming methods that incorporated various tilling and/or enhanced nutrient and/or enzyme applications. The excavated soils were blended and separated into eight treatment cells and tilled/aerated for 56 days beginning July 17, 2002. The 18 AAC 75.341 Method One cleanup levels for the Arctic Zone were established as the target treatment concentrations.

The treatment cell analytical results generally showed a decrease in petroleum-range hydrocarbon concentrations over the duration of the remediation effort in all treatment cells and the Control cell. The petroleum hydrocarbon range data were collected to provide sufficient information to compare the effectiveness of the different treatment methods, and to calculate the upper confidence limits of the final sampling event concentrations. When sampled at the end of the 56 day treatment period during September 2002, the concentrations of GRO did not exceed 100 mg/kg across all treatments. DRO concentrations did not exceed 1160 mg/kg, and RRO concentrations did not exceed 2020 mg/kg.

A final round of sampling was conducted 420 days after initial inoculation during September 2003. Sampling results for GRO and RRO did not exceed Method One levels, and the DRO concentrations had also decreased, and ranged from 200 to 1110 mg/kg.

Surface Water Sampling Results:

Surface water samples were collected from the ponded area on the east side of the pad, as well as at a seep north of the ponded area. The analytical results from the surface water samples collected from the ponded area adjacent to the former bulk fuel area after soil excavation, did not exceed the Alaska water quality criteria for TAH and TAqH. The final analytical results from the samples collected from the surface water station SC-SW-05, located adjacent to the water with surface sheen, exceeded Alaska Water Quality Standards (18 AAC 70) for both TAH and TAqH. However, TAH and TAqH levels in post-excavation surface water samples were

significantly lower than those collected prior to excavation activities to remove the contaminant source.

Cleanup Levels

The cleanup levels for petroleum hydrocarbon-contaminated soil on Arctic Zone manmade gravel pads and roads are established in 18 AAC 75.341 Method One, Table A2. There are also petroleum cleanup levels for the Arctic Zone in 18 AAC 75.341 Method Two Tables B1 and B2.

A number of factors are considered by DEC when evaluating site specific cleanup levels such as human health (ingestion/inhalation); ecological impacts (contamination impacting ecological species other than humans); water (ground and surface) quality; presence of free phase product; and any other factors that might cause a deleterious impact to the environment. In the Arctic Zone the migration to surface water pathway must be evaluated since the migration to groundwater pathway is not considered applicable due to the continuous permafrost.

The cleanup regulations also limit soil hydrocarbon concentrations to a “maximum allowable concentration” or a concentration below which hydrocarbon product is mobile as a separate phase, and will not migrate in the soil. If a hydrocarbon product exceeds a soil saturation limit, there is an increased risk of migration off the gravel pad to surface water or tundra. Therefore, a site-specific soil type must be evaluated to determine when a carbon range in the petroleum contaminated soil becomes saturated, or exceeds the residual concentration (saturation.)

The 18 AAC 75.341 Method Two Arctic Zone cleanup levels (maximum allowable) were calculated based on a saturation in a coarse to fine sandy silt soil type. However, the majority of contaminated sites in the Arctic Zone occur on a gravel pad or substrate that does not have the same soil type used in the default calculation. American Petroleum Institute (API) document 1628 references studies that established ranges when gasoline; diesel; and residual range organics typically reach saturation. In a coarse gravel soil type, which is more similar to the soil type found on the North Slope gravel pads, the diesel range saturation point established by API is 2200 mg/kg; the gasoline range saturation point is 950 mg/kg with residual range being 4800 mg/kg.

DEC Decision

Based on the information presented above, DEC has determined that no further remedial action is required for the former Service City Pad. This decision is based on the information that indicates the contaminant concentrations remaining on site do not pose a risk to human health or the environment. It should be noted that this “no further remedial action planned” (NFRAP) status applies to the petroleum contaminated source areas (identified in this letter), and the impacted soil which was treated on site at the former Service City Pad.

Even though information to date indicates the contaminant concentrations do not currently pose a risk to human health or the environment, the NFRAP determination is subject to the following conditions:

1. A surface water monitoring plan will be required to periodically sample surface water to ensure any areas of contamination do not pose a risk in the future. Sampling for TAH and TAqH

of the surface water at station SC-SW-05 will be required on an annual basis since the most recent sample collected in 2002 exceeded Alaska Water Quality Standards (18 AAC 70) for both TAH and TAqH. Annual sampling will be required until results of surface water samples at this location do not exceed the Alaska Water Quality Standards for TAH and TAqH.

2. An institutional control will be recorded in the DEC database to identify areas on the pad where hazardous substance contamination may remain above 18 AAC 75.341 Method One Table A2 cleanup levels for the following areas:

- Soil sample EX-707-07, collected from the west side of the former bulk fuel area/maintenance shop excavation with a GRO concentration of 883 mg/kg, a benzene concentration of 4.4 mg/kg, and a BTEX concentration of 18.83.
- Soil sample ex-708-02, collected from the south side of the small AST area located on the south edge of the pad with a DRO concentration of 2,470 mg/kg and an RRO concentration of 5,960 mg/kg.
- Soil sample EX-703-05, collected from the east side of the former maintenance shop which contained RRO at a concentration of 3,050 mg/kg.

3. Any proposal to transport soil off site requires DEC approval in accordance with 18 AAC 75.325(i).

4. The site will be designated as "No Further Remedial Action Planned" in the Department's database, and it will be removed from the North Slope Charter Orphan site list.

This determination is based on information presented to date but does not preclude the Department from requiring additional assessment and/or cleanup action if future information indicates that this site may pose an unacceptable risk to human health or the environment. If you have questions about this letter, please contact Linda Nuechterlein at (907) 269-7530.

Sincerely,



Jim Frechione
Environmental Manager

Sincerely,



Linda Nuechterlein
Environmental Specialist

cc: Gary Schultz, DNR