THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Environmental Conservation

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

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File No: 2101.38.107

July 27, 2015

Donald R. Aide
AFCEC/OLAJ
6346 Arctic Warrior Drive
JBER, AK 99506-3221

Re: Cleanup Complete Determination with Institutional Controls for JBER-Elmendorf CG702

Dear Mr. Aide:

The Alaska Department of Environmental Conservation (ADEC) has reviewed the environmental records for the referenced site. This decision document memorializes the site history, cleanup actions, cleanup complete determination/institutional controls (ICs), and standard conditions for long-term site management of CS DB Hazard ID 2785 and file number 2101.38.107.

Site Name and Location
JBER-Elmendorf CG702 ST702 Bldg 31562 STMP 495
Located south of 46th Street on the north side of Six Mile Lake
JBER, Alaska 99506

Regulatory Authority for Determination: 18 AAC 75

Site Description and Background
Site CG702 is the former location of a 1,200-gallon underground storage tank (UST) located next to a recreational cabin, approximately 600 feet from the north shore of Six Mile Lake on Joint Base Elmendorf-Richardson (JBER) - Elmendorf (JBER-E), Alaska. The former UST held diesel fuel used as heating oil for the recreational cabin.

Contaminants of Concern
Gasoline Range Organics (GRO), Diesel Range Organics (DRO), benzene, 1-methylnaphthalene and 2-Methylnapthalene.

Cleanup Levels
The cleanup level for soils at CG702 containing GRO contamination is 300 mg/kg in the Under 40-inch Zone based on the migration to groundwater pathway, GRO contaminated groundwater and smear zone soil contamination.

The cleanup level for soils at CG702 containing DRO contamination is 250 mg/kg in the Under 40-inch Zone based on the migration to groundwater pathway, DRO contaminated groundwater and smear zone soil contamination.

The cleanup level for soil containing benzene contamination is 0.025 mg/kg in the Under 40-inch Zone on the migration to groundwater pathway and smear zone soil contamination.

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The cleanup level for soil containing 1-methylnaphthalene contamination is 6.2 mg/kg in the Under 40-inch Zone on the migration to groundwater pathway, contaminated groundwater and smear zone soil contamination.

The cleanup level for soil containing 2-methylnaphthalene contamination is 6.1 mg/kg in the Under 40-inch Zone on the migration to groundwater pathway, contaminated groundwater and smear zone soil contamination.

Characterization and Cleanup Activities

In 1997, during the removal of a 1,200-gallon, single-walled UST, six soil samples were collected from the excavation, which measured approximately 12 feet long by 5 feet wide by 7 feet deep. Samples were analyzed for DRO and benzene, toluene, ethylbenzene, and xylenes (BTEX) only.

In 1998, three soil borings (702BH01 through 702BH03) and eight monitoring wells (702WL-01 through 702WL-08) were installed in two phases of field work to delineate the extent of contamination as part of a State-Elmendorf Environmental Restoration Agreement (SERA) VII investigation. Free product was detected in wells 702WL-02 and 702WL-03 during well development and 702WL-03 during groundwater sampling.

In 1999, during a SERA Phase VIII investigation, four additional borings were completed as monitoring wells (702WL-09 through 702WL-12). This investigation demonstrated that no additional volatile organic compounds (VOCs) concentrations were greater than the ADEC cleanup levels in the soil, beyond what was seen in the SERA VII investigation. Only one soil sample exceeded the ADEC migration to groundwater cleanup level. Results also indicated that, except near the UST location, soil contamination is limited to the zone of seasonal water table fluctuation.

In 2001, as part of the SERA IX Release Investigation an additional seven borings (01702BH11 through 01702BH17) were completed at the site. Five of the borings were completed as monitoring wells (702WL-13 through 702 WL17). Groundwater sample results for DRO, 1-methylnaphthalene and 2-methylnaphthalene exceeded groundwater cleanup criteria. None of the soil samples exceeded ADEC Method Two Table B2 migration to groundwater cleanup levels for GRO, residual-range organics (RRO), BTEX, polycyclic aromatic hydrocarbons (PAH), or VOCs.

In 2013, analytical results indicated groundwater samples exceeded Table C cleanup criteria for DRO in wells 702WL-02, 702WL-07, and 702MW-20. GRO and 1-methylnaphthalene also exceeded their cleanup criteria in well 702WL-07.

In 2014, a site investigation involved drilling three new soil borings and analyzing soil samples for BTEX, GRO, DRO, RRO, PAH, VPH and EPH. Groundwater samples were collected from existing wells and analyzed for BTEX, GRO, DRO, RRO, EPH, VPH, and PAH. DRO was the only exceedance found in groundwater. The average and 95% upper confidence limit (UCL) DRO concentrations within the NAPL

source area are 2,374 and 3,924 mg/kg. The average and 95% UCL GRO concentrations within the NAPL source area are 346 and 545 mg/kg. Soil contamination in the area of the removed UST greater than cleanup levels was treated with chemical oxidation in 2009. The remaining soil contamination at the site is limited to the smear zone.

Two soil gas samples were collected at the site from driven soil gas probes. One sample was collected near the former diesel UST location and one was collected near well 702WL-05, where smear zone soil contamination is relatively shallow. Both samples were analyzed by Method TO-15. There were no exceedances of the shallow or sub-slab soil gas for the commercial target levels or residential target levels related to releases from the former diesel UST. There is no unacceptable risk associated under current land use scenarios.

The depth to groundwater ranges from about 4 feet (at monitoring well 702WL-05) to 17 feet (well 702WL-20) below ground surface (bgs) at the site. The saturated thickness of the upper soil unit is about 5 feet and thickens to the south, towards Six Mile Lake. JBER water supply Well # 46 provides the cabin on the site with drinking water, is located in the immediate vicinity of the location of the former UST. Well # 46 was drilled in 1964 to a depth of 60 feet. This well is located within a confined water bearing zone below the shallow water table aquifer.

In 2015, additional site investigation work was performed to verify that drinking water well # 46 was drawing from a separate and confined water zone and no fuel related constitutes were present. Water samples collected during two sampling events show no detections of fuel related analytes.

Groundwater samples collected from monitoring wells located in the NAPL-contaminated smear zone and screened across the water table remain above ADEC Table C cleanup levels in wells 702WL-02, 702WL-03, 702WL-05, 702WL-07 and 702WL-20.

Mann-Kendall groundwater concentration trend analysis shows that source area wells 702WL-01, 702WL-02, 702WL-03 and 702WL-04 have decreasing total DRO concentration trends over the period of record for the wells (1998 to 2014). Wells 702WL-05 and 702WL-07 have stable concentrations (i.e., there is not significantly increasing or decreasing concentration trend) over the last 16 years (1998 to 2014).

Well 702WL-20 DRO concentrations appears to be trending downward from a high originally measured in 2009 at 14 mg/L downward to 4.07 mg/L in 2014.

Cumulative Risk Evaluation

The Hydrocarbon Risk Calculator (HRC) was used to evaluate risk from petroleum contamination at CG702. The HRC is designed for sites with petroleum contamination—specifically the petroleum fractions, BTEX, PAHs, and other compounds dissolved in petroleum—with the intention and purpose of assessing human health risk from this type of contamination

The estimated rounded cumulative cancer risk at CG702 for the current commercial/industrial and hypothetical residential exposure scenarios, across all exposure pathways, (4 x 10-6 and 7 x 10-6 respectively) is below the regulatory risk standard of 1 x 10-5 for petroleum hydrocarbons. The risk posed by the GRO aromatic and aliphatic surrogate fractions meets the risk standard for each exposure pathway, assuming a residential land use scenario.

The risk posed by DRO aliphatics for groundwater ingestion is 2.2 which does not meet the risk standard of 1, assuming a commercial/industrial land use scenario. The risk posed by DRO aliphatics for groundwater

Standard Conditions

1. Any proposal to transport soil or groundwater off-site from CG702 requires ADEC approval in accordance with 18 AAC 75.325. A "site" [as defined by 18 AAC 75.990 (115)] means an area that is contaminated, including areas contaminated by the migration of hazardous substances from a source area, regardless of property ownership (see figure below).
2. Movement or use of contaminated material in a manner that results in a violation of 18 AAC 70 water quality standards is prohibited.
3. Notations of these requirements shall be made on the Environmental Restoration map/ Base General Plan which will show up during a dig permit review/work clearance request process.

Appeal

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. Informal review requests must be delivered to the Division Director, 555 Cordova Street, Anchorage, Alaska 99501-2617, within 15 days after receiving the department's decision reviewable under this section. Adjudicatory hearing requests must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99811-1800, within 30 days after the date of issuance of this letter, or within 30 days after the department issues a final decision under 18 AAC 15.185. If a hearing is not requested within 30 days, the right to appeal is waived.

If you have questions about this closure decision, please feel free to contact me at (907) 269-7552.

Sincerely,

Louis Howard
Environmental Program Specialist

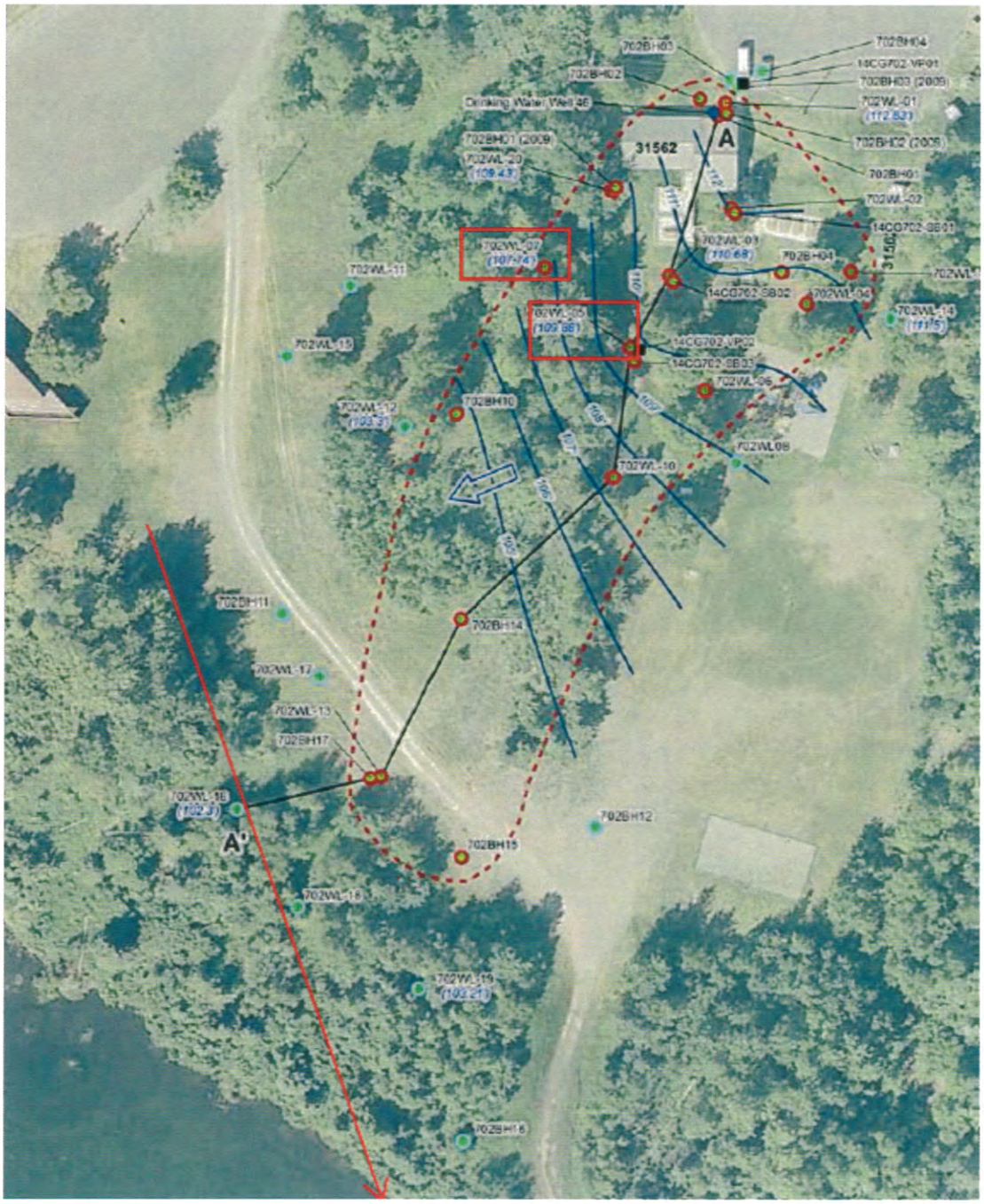
cc: Gary Fink JBER via email

ingestion is 3.1 which does not meet the risk standard of 1, assuming a residential land use scenario. There are no drinking water wells in the shallow water table aquifer where this groundwater contamination is detected. Because of the risks from groundwater ingestion, CG702 does not meet the ADEC risk criteria [18 AAC 75.325(g)] for petroleum hydrocarbons.

An ecoscoping form was completed for CG702 and no observed surface soil staining, no impacted vegetation, no surface water or sediment runoff from the site. The ecoscoping form indicates that a more in-depth risk evaluation is not needed and that the CG702 site conditions are protective of the environment.

Pathway	Result	Explanation
Direct Contact with Surface Soil	Pathway incomplete	No contamination present in surface soil 0-2' bgs.
Direct Contact with Subsurface Soil:	Pathway complete	Contamination remains in the sub-surface soil 3-15' bgs.
Outdoor Air Inhalation:	Pathway incomplete	Contamination remains in the sub-surface, below inhalation cleanup levels.
Groundwater Ingestion:	Pathway potentially complete*	No current use, but groundwater could be used as a drinking water source in the future
Surface Water Ingestion:	Pathway Incomplete	Surface water is not present at the site.
Wild or Farmed Foods Ingestion:	Pathway Incomplete	Contaminants of concern do not have the potential to bioaccumulate in plants or animals.
Indoor Air Inhalation (Vapor Intrusion):	Pathway incomplete	Soil gas sampling shows no unacceptable vapor intrusion risk.
Ecological:	Pathway Incomplete	No visible surface staining, no distressed plants, no sediment transport to surface water.

***"Pathway potentially complete" means contamination has the potential to contact receptors; however, controls are in place to prevent contact.**



ADEC Decision

Based on a review of the environmental records, ADEC has determined that CG702 has been adequately characterized and has achieved the applicable requirements under the site cleanup rules. ADEC is issuing this written determination that cleanup is complete with ICs subject to a future department determination that the cleanup is not protective of human health, safety, welfare, or of the environment [18 AAC 75.380(d)]. A "cleanup complete with ICs" designation will be entered for CG702 in the Contaminated Sites Database, subject to the following standard conditions.