



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program

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Fairbanks, Alaska 99709-3643
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File: 100.38.255

November 2, 2018

Marla Lowder and Bonnie Bruhn
1081 Acorn Circle
North Pole, AK 99705

**Re: Decision Document: Residence - 1081 Acorn Circle
Cleanup Complete Determination – Institutional Controls**

Dear Ms. Lowder and Ms. Bruhn,

The Alaska Department of Environmental Conservation (ADEC), Contaminated Sites Program has completed a review of the environmental records associated with Residence - 1081 Acorn Circle located at 1081 Acorn Circle, North Pole. Based on the information provided to date, it has been determined that the contaminant concentrations remaining on site do not pose an unacceptable risk to human health or the environment, and no further remedial action will be required as long as the institutional controls are maintained and effective and no new information becomes available that indicates residual contamination poses an unacceptable risk.

This Cleanup Complete with Institutional Controls (ICs) determination is based on the administrative record for the Residence – 1081 Acorn Circle site which is located in the offices of the ADEC in Fairbanks, Alaska. This decision letter summarizes the site history, cleanup actions, regulatory decisions, and specific conditions required to effectively manage remaining contamination at this site.

Site Name and Location:

Residence - 1081 Acorn Circle
1081 Acorn Circle
North Pole, AK 99705

Name and Mailing Address of Contact Party:

Marla Lowder
1081 Acorn Circle
North Pole, AK 99705

ADEC Site Identifiers:

File No.: 100.38.255
Hazard ID.: 26320

Regulatory Authority for Determination:

18 AAC 75

Site Description and Background

The release was reported to the ADEC Prevention, Preparedness and Response Program on August 8, 2014. Significant precipitation in the summer of 2014 caused regionally elevated groundwater levels and diesel fuel odor and sheen was observed in water flooding the crawlspace of the residence at 1081 Acorn Circle.

The source of the release was determined to be an adjacent 500-gallon underground heating oil tank. The quantity of fuel released was unknown.

During initial response activities on August 19, 2014, the tank and approximately 8 cubic yards of petroleum-contaminated soil were removed and transported to Organic Incinerations Technologies (OIT) for treatment. Excavation was limited to maintain the structural integrity of the residence. A recovery well was installed in the excavation pit prior to backfilling the excavation. The owner was instructed to recover product from the recovery well. The site was transferred to the Contaminated Sites Program on November 26, 2014.

Contaminants of Concern

During the investigation and cleanup activities at this site, samples were collected from soil, groundwater, and indoor air and analyzed for diesel range organics (DRO), benzene, toluene, ethylbenzene and xylene (BTEX), polyaromatic hydrocarbons (PAH), and volatile organic compounds (VOCs). Based on these analyses, the following contaminants were detected above the applicable cleanup levels and are considered Contaminants of Concern at this site:

- Diesel Range Organics
- Benzene
- Ethylbenzene
- Xylene
- 1-Methylnaphthalene
- 2-Methylnaphthalene
- Naphthalene

Cleanup Levels

Diesel range organics, benzene, ethylbenzene, xylene, 1-methylnaphthalene, 2-methylnaphthalene and naphthalene were detected in soil above the approved Method 2 migration to groundwater cleanup levels for the under 40-inch precipitation zone, established in 18 AAC 75.341(c), Table B1, and 18 AAC 75.341(d), Table B2. Diesel range organics were detected in groundwater above the approved cleanup levels established in 18 AAC 75.345 Table C.

Table 1 – Approved Cleanup Levels

Contaminant	Soil (mg/kg)	Groundwater (µg/L)
DRO	250	1,500
benzene	0.022	4.6
toluene	6.7	1,100
xylene	1.5	190
1-methylnaphthalene	0.41	11
2-methylnaphthalene	1.3	36
naphthalene	0.038	1.7

mg/kg = milligrams per kilogram

ug/L = micrograms per liter

Characterization and Cleanup Activities

Field activities conducted during the excavation work in 2014 included soil screening using a photo-ionization detector (PID) and the collection of four analytical soil samples. Three samples were collected from the excavation pit, one sample and its duplicate were collected from the base at a depth of 4.5 feet below ground surface (bgs) and another from the sidewall at a depth of 2.5 feet bgs.

The highest concentrations at the excavation limits were in the bottom sample with a DRO of 7,800 mg/kg, benzene of 0.036 mg/kg, toluene of 3.6 mg/kg, ethylbenzene of 2.0 mg/kg and total xylenes of 35 mg/kg. Multiple PAH analytes were detected in the bottom sample with three soil cleanup level exceedances; 1-methylnaphthalene (12.8 mg/kg), 2-methylnaphthalene (10.4 mg/kg) and naphthalene (2.65 mg/kg). The fourth sample was collected from soil near the center of the crawlspace approximately 25 feet southeast of the former tank excavation at a depth of 0.1 feet beneath the crawlspace surface and roughly 4 feet beneath the surrounding ground surface. Sample results that exceeded cleanup levels were DRO at 10,000 mg/kg and total xylenes at 6.4 mg/kg.

Site characterization conducted under 18 AAC 75.335 began in 2016 and included installation of two groundwater monitoring wells and a vapor mitigation system. Groundwater samples were collected at the site from the recovery well and from monitoring well MW-1 during two sampling events. The first event was in February 2016, and the second was in May 2018. For the recovery well samples, DRO was measured at a concentration of 8,300 µg/L in 2016 and 650 µg/L in 2018. Other analytes also exhibited decreased concentrations during the 2018 sampling events. Gasoline range organics was 93.7 µg/L in 2016 and non-detect in 2018, benzene went from 0.610 µg/L to non-detect, ethylbenzene from 1.14 µg/L to 1.0 µg/L and xylene from 15.8 µg/L to 4.8 µg/L. Toluene was detected during both sampling events but below the method reporting limit.

MW-1 was sampled for GRO, DRO, BTEX and PAHs during the 2016 event. Toluene was the only compound detected at 1.49 µg/L. MW-1 was sampled for GRO, DRO and volatile organic compounds (VOCs) during the 2018 sampling event. Naphthalene was detected at 0.015 µg/L and DRO at 320 µg/L. Both levels were beneath their respective groundwater cleanup levels. Well MW-2 was installed in October of 2017 to provide another point to confirm dominant groundwater flow direction and act as an additional sampling location if necessary. Groundwater flow at this time was to the northwest. It was determined prior to the May 2018 sampling event that groundwater flow direction was again to the northwest, so the well MW-1 was determined to be the most appropriate downgradient sampling location and MW-2 was not sampled.

To evaluate vapor intrusion, indoor air samples were collected from the kitchen and master bedroom bathroom on January 12, 2015, using the TO-15 method and analyzed for BTEX and naphthalene. The kitchen sample exceeded the ADEC residential target level for naphthalene at a level of 1.1 microgram per cubic meter (µg/m³). In response to this exceedance, a vapor barrier was installed in the crawlspace and air samples using active TO-17 methods were collected on October 24, 2016, from the same locations. Naphthalene was observed at 1.7 µg/m³ and 1.0 µg/m³ in the kitchen and master bedroom bathroom respectively, both exceeding the residential target levels, and benzene measuring 4.7 µg/m³ also exceeded the target level in the kitchen sample. During April of 2017 a radon style mitigation system was installed with perforated piping placed beneath the vapor barrier and the barrier was resealed more securely to the house footing. In March of 2018, after the mitigation system was shut off for more than 24 hours, passive TO-17 air samples were collected from the crawlspace. The crawlspace sample and a duplicate were analyzed and did not exceed residential target levels.

Cumulative Risk Evaluation

Pursuant to 18 AAC 75.325(g), when detectable contamination remains on-site following a cleanup, a cumulative risk determination must be made that the risk from hazardous substances does not exceed a cumulative carcinogenic risk standard of 1 in 100,000 across all exposure pathways, and does not exceed a cumulative non-carcinogenic risk standard at a hazard index of one across all exposure pathways.

Based on a review of the environmental record, ADEC has determined that residual contaminant concentrations meet the cumulative risk criteria for human health.

Exposure Pathway Evaluation

Following investigation and cleanup at the site, exposure to the remaining contaminants was evaluated using ADEC's Exposure Tracking Model (ETM). Exposure pathways are the conduits by which contamination may reach human or ecological receptors. ETM results show all pathways to be one of the following: De-Minimis Exposure, Exposure Controlled, or Pathway Incomplete. A summary of this pathway evaluation is included in Table 2.

Table 2 – Exposure Pathway Evaluation

Pathway	Result	Explanation
Surface Soil Contact	De-Minimis Exposure	Contamination remains in crawlspace soil (0 - 2 feet below ground surface), but is below human health or ingestion cleanup levels.
Sub-Surface Soil Contact	De-Minimis Exposure	Contamination remains in the sub-surface, but is below human health or ingestion cleanup levels.
Inhalation – Outdoor Air	De-Minimis Exposure	Contamination remains in the sub-surface, but is below human health or inhalation cleanup levels.
Inhalation – Indoor Air (vapor intrusion)	Exposure Controlled	Indoor air testing in the crawlspace demonstrates that the vapor barrier controls vapor intrusion. An NEC has been recorded requiring that the vapor barrier be maintained
Groundwater Ingestion	Exposure Controlled	Residual groundwater contamination is still present but decreased beneath cleanup levels in the recovery well in the 2018 sampling event. Additional contamination may be present beneath the house or in the vicinity of the recovery well.
Surface Water Ingestion	Pathway Incomplete	Remaining groundwater contamination in the source area well was beneath cleanup levels and is not expected to migrate to surface water.
Exposure to Ecological Receptors	Pathway Incomplete	Remaining contamination is primarily in the subsurface beneath or close to the house, concentrations are decreasing and are no longer migrating from the source area.

Notes to Table 2: “De-Minimis Exposure” means that in ADEC’s judgment receptors are unlikely to be adversely affected by the minimal volume or concentration of remaining contamination. “Pathway Incomplete” means that in ADEC’s judgment contamination has no potential to contact receptors. “Exposure Controlled” means there is an institutional control in place limiting land or groundwater use and there may be a physical barrier in place that prevents contact with residual contamination.

ADEC Decision

Petroleum contamination remains in sub-surface soil and groundwater above levels suitable for unrestricted future use; however ADEC has approved the use of institutional controls to limit potential future exposure and risk to human health or the environment. A Notice of Environmental Contamination and Institutional Controls (NEC-IC) has been recorded in the land records maintained by the Alaska Department of Natural Resources and a copy is attached to this letter.

The groundwater contaminant plume has been demonstrated to be shrinking and the contaminant concentrations are decreasing. Therefore, ADEC has determined the residual soil contamination does not pose an unacceptable migration to groundwater concern.

Petroleum vapors from soil and groundwater contamination beneath the crawlspace may continue to impact indoor air if the integrity of the vapor barrier in the crawlspace is compromised. In order to limit vapor exposure risk, maintenance of the vapor barrier is necessary until it is demonstrated that vapor intrusion is no longer a risk at the site.

Institutional controls necessary to support this closure determination include:

Institutional Controls:

1. The Landowner agrees to notify ADEC prior to any sale or transfer of the property and shall report to ADEC every 5 year to document the status of compliance with the institutional controls described in this notice. Such notice and the reports should be sent to the ADEC at:

Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program
Attention: IC Unit
P.O. Box 111800
Juneau, AK 99811-1800

or be submitted electronically to CS.Submittals@alaska.gov.

2. Within the building footprint, contaminated soil remains beneath the residence in the crawlspace and possibly under the garage slab. Outside of the building, contaminated soil is estimated to be deeper than two feet below ground surface and extends to the west, north and south from the former underground tank location as noted in the attached photo. When the building is removed and/or the soil becomes accessible, the soil must be evaluated and contamination addressed in accordance with an ADEC approved work plan.
3. The crawlspace vapor barrier should be inspected at least annually prior to the heating season to verify that leaks and tears haven't compromised the integrity of the barrier. Repair with appropriate materials as necessary.
4. If requested, ADEC will be allowed access to the crawlspace on an annual basis to verify vapor barrier integrity. If odors are observed in the crawlspace or elsewhere in the house that may be associated with the heating oil contamination, ADEC should be contacted.
5. No groundwater wells shall be installed in the area covered by the institutional controls without prior ADEC approval.

6. If the use of the building changes, or if other buildings are constructed within 30 feet of the contaminated area, ADEC must be notified and may require a vapor intrusion evaluation to determine if building occupants could be affected by vapors.

Standard site closure conditions that apply to all sites include:

7. ADEC approval is required prior to moving any soil or groundwater off any site that is, or has been, subject to the site cleanup rules (see 18 AAC 75.325(i)). 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. In the future, if soil will be excavated or groundwater will be brought to the surface (for example to dewater in support of construction) from the area of known contamination, it must be characterized and managed following regulations applicable at that time and ADEC approval must be obtained before moving the soil or water off the property.
8. Movement or use of contaminated material in a manner that results in a violation of 18 AAC 70 water quality standards is prohibited.
9. Groundwater throughout Alaska is protected for use as a water supply for drinking, culinary and food processing, agriculture including irrigation and stock watering, aquaculture, and industrial use. Contaminated site cleanup complete determinations are based on groundwater being considered a potential drinking water source. In the event that groundwater from this site is to be used for other purposes in the future, such as aquaculture, additional characterization and treatment may be required to ensure the water is suitable for its intended use.

ADEC has determined the cleanup is complete as long as the institutional controls are properly implemented and no new information becomes available that indicates residual contamination may pose an unacceptable risk. The ADEC Contaminated Sites Database will be updated to reflect the change in site status to “Cleanup Complete with Institutional Controls” and will include a description of the contamination remaining at the site.

The institutional controls will be removed in the future if documentation is provided that shows concentrations of all residual hazardous substances remaining at the site are below the levels that allow for unrestricted exposure to, and use of, the contaminated media and that the site does not pose a potential unacceptable risk to human health, safety or welfare, or to the environment. Standard conditions 7-10 above will remain in effect after ICs are removed.

This determination is in accordance with 18 AAC 75.380 and does not preclude ADEC from requiring additional assessment and/or cleanup action if the institutional controls are determined to be ineffective or if new information indicates that contaminants at this site may pose an unacceptable risk to human health or the environment.

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, P.O. Box 111800, 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) 451-2752 or email at shawn.tisdell@alaska.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Shawn Tisdell", with a large, sweeping flourish extending to the right.

Shawn Tisdell
Project Manager

****Note: This letter is being transmitted to you in electronic format only. If you require a paper copy, let us know and we will be happy to provide one to you. In the interest of reducing file space, the Division of SPAR/Contaminated Sites Program is transitioning to electronic transmission of project correspondence.****

cc (via email): Spill Prevention and Response, Cost Recovery Unit

Notice of Environmental Contamination and Institutional Controls

Grantor: State of Alaska
Department of Environmental Conservation
Contaminated Sites Program

Grantee: Marla Lowder and Bonnie Bruhn,
Residence - 1081 Acorn Circle

Legal Description: Lot 2A, Block 1, Chippendale 2 subdivision

Recording District: 401

Return to: State of Alaska DEC
ATTN: Shawn Tisdell
610 University Avenue
Fairbanks, AK 99709

Marla Lowder and Bonnie Bruhn
1081 Acorn Circle
North Pole, AK, 99705

State Business - No Charge

NOTICE OF ENVIRONMENTAL CONTAMINATION AND INSTITUTIONAL CONTROLS

As required by the Alaska Department of Environmental Conservation, pursuant to 18 AAC 75.375 Marla Lowder and Bonnie Bruhn, the Landowner(s) of the subject property, hereby provides public notice that the property located 1081 Acorn Circle, North Pole, Alaska, 99705, and more particularly described as follows:

Lot 2A, Block 1, Chippendale 2 subdivision, Plat 87-63

has been subject to a discharge or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3. This release and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database at http://www.dec.state.ak.us/spar/csp/db_search.htm under the site name Residence - 1081 Acorn Circle and Hazard ID number 26320.

By signing this notice, ADEC and the Landowner have agreed that the institutional controls described below are necessary and appropriate, and shall be maintained and be binding on the Landowner and its agents, successors and assigns. If the Landowner transfers, sells, assigns, leases or subleases the property or any portion of the property covered by the institutional controls, the Landowner shall incorporate a copy of this notice into the documents of transfer, sale, assignment, lease or sublease.

ADEC has reviewed and approved, subject to the institutional controls described below, the cleanup as protective of human health, safety, welfare, and the environment. No further cleanup is necessary at this site as long as the institutional controls remain in place and effective and no new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare, or the environment.

ADEC determined, in accordance with 18 AAC 75.325 – .390 site cleanup rules, that cleanup has been performed to the maximum extent practicable even though residual fuel-contaminated soil and groundwater exists on-site. Further cleanup was determined to be impracticable because the remaining contaminated soil is beneath a building and further cleanup was not practicable. A vapor barrier will be maintained over the residual contaminants in the crawlspace and institutional controls will prevent exposure.

The following institutional controls and standard conditions shall be maintained:

Institutional Controls

1. The Landowner agrees to notify ADEC prior to any sale or transfer of the property and shall report to ADEC every 5 year to document the status of compliance with the institutional controls described in this notice. Such notice and the reports should be sent to the ADEC at: Alaska Department of Environmental Conservation, Division of Spill Prevention and Response, Contaminated Sites Program, Attention: IC Unit, P.O. Box 111800, Juneau, AK, 99811-1800 or be submitted electronically to CS.Submittals@alaska.gov.
2. Within the building footprint, contaminated soil remains beneath the residence in the crawlspace and possibly under the garage slab. Outside of the building, contaminated soil is estimated to be deeper than two feet below ground surface and extends to the west, north and

south from the former underground tank location as noted in the attached photo. When the building is removed and/or the soil becomes accessible, the soil must be evaluated and contamination addressed in accordance with an ADEC approved work plan.

3. The crawlspace vapor barrier should be inspected at least annually prior to the heating season to verify that leaks and tears haven't compromised the integrity of the barrier. Repair with appropriate materials as necessary.
4. If requested, ADEC will be allowed access to the crawlspace on an annual basis to verify vapor barrier integrity. If odors are observed in the crawlspace or elsewhere in the house that may be associated with the heating oil contamination, ADEC should be contacted.
5. No groundwater wells shall be installed in the area covered by the institutional controls without prior ADEC approval.
6. If the use of the building changes, or if other buildings are constructed within 30 feet of the contaminated area, ADEC must be notified and may require a vapor intrusion evaluation to determine if building occupants could be affected by vapors.

Standard site closure conditions that apply to all sites include:

7. ADEC approval is required prior to moving any soil or groundwater off any site that is, or has been, subject to the site cleanup rules (see 18 AAC 75.325(i)). 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. In the future, if soil will be excavated or groundwater will be brought to the surface (for example to dewater in support of construction) from the area of known contamination, it must be characterized and managed following regulations applicable at that time and ADEC approval must be obtained before moving the soil or water off the property.
8. Movement or use of contaminated material in a manner that results in a violation of 18 AAC 70 water quality standards is prohibited.
9. Groundwater throughout Alaska is protected for use as a water supply for drinking, culinary and food processing, agriculture including irrigation and stock watering, aquaculture, and industrial use. Contaminated site cleanup complete determinations are based on groundwater being considered a potential drinking water source. In the event that groundwater from this site is to be used for other purposes in the future, such as aquaculture, additional characterization and treatment may be required to ensure the water is suitable for its intended use.

An attached diagram drawn to scale shows the property boundaries, locations of existing structures, the area that has been cleaned up, and the approximate location and extent of remaining soil and/or groundwater contamination which is subject to the institutional controls described in this notice.

Failure to comply with the institutional controls described herein may result in ADEC reopening the site and requiring additional site characterization and cleanup.

In the event that new information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, further site characterization and cleanup may be necessary under 18 AAC 75.325-.390.

This notice and the institutional controls remain in effect until a written determination from ADEC is recorded that documents contaminants remaining at the site have been shown to meet the residential use soil cleanup levels defined in 18 AAC 75.340 and groundwater cleanup levels

in Table C within 18 AAC 75.345 and that off-site transportation of soil and/or groundwater are no longer a potential concern.

For more information on the contaminated site in this notice, please see ADEC Contaminated Sites Program file number 100.38.255 for the site named Residence - 1081 Acorn Circle.

Marla Lowder

Signature of Landowner

11/26/18

Date

MARLA LOWDER

Printed Name of Landowner

Shawn Tisdell

Signature of Authorized ADEC Representative

11/27/2018

Date

Shawn Tisdell

Printed Name of Authorized ADEC Representative

Figure: Area subject to institutional control

