MEMORANDUM

State of Alaska

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

TO: Contaminated Sites Staff

DATE: July 24, 2009

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FROM: Steve Bainbridge
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SUBJECT: Site Closure

Purpose

This memorandum identifies how the Contaminated Sites Program (CSP) will make closure determinations for sites regulated under Title 18 Alaska Administrative Code 78 (18 AAC 78), Articles 2 and 6, and 18 AAC 75, Article 3.

Summary

18 AAC 78.276 outlines the final reporting and site closure requirements for leaking underground storage tank (LUST) sites, while 18 AAC 75.380 outlines the final reporting requirements and site closure for non-LUST contaminated sites.

In the past, the CSP used the designation *No Further Remedial Action Planned* (NFRAP) for sites where active remediation was complete but residual contamination remained at LUST and contaminated sites. More recently, the CSP has used the designation *Conditional Closure* for sites in this category. The threshold for a conditional closure versus a "full" closure was meeting the most stringent of the Tables B1 or B2 cleanup levels for soil, and Table C cleanup levels for groundwater. Sites where residual contamination remained above these cleanup levels were designated as conditionally closed.

The terms "closed" or "conditionally closed" will no longer be used. "The most stringent method 1 or method 2 cleanup levels for soil (18 AAC 75.341), or Table C cleanup levels for groundwater (1AAC 75.345), will form only one element of the basis to distinguish between different types of closure determinations. The terms "closed" and "conditionally closed" are now designated as *Cleanup Complete* and *Cleanup Complete with Institutional Controls (ICs). "Cleanup Complete"* determinations and the requirements for any *"Institutional Controls"* will be based on analyses of current and future potential exposure pathways at the site.

Regulatory Basis for Closure

The requirements for site closure are provided in 18 AAC 75.380 *Final reporting requirements and site closure,* and 18 AAC 78.276, *Final corrective action reporting requirements and site*

closure. Under these sections the CSP makes a written determination that *corrective action is complete* (LUST sites), or *cleanup is complete* (under site cleanup rules). The CSP makes this determination if it finds that the site has been adequately characterized and has achieved the applicable requirements of the LUST or contaminated site cleanup rules. The applicable requirements include meeting approved cleanup levels, the general requirements found in 18 AAC 75.325, and, when necessary, implementation of ICs.

For sites to be evaluated for closure (*Cleanup Complete or Cleanup Complete with ICs*), the following conditions must be met unless the CSP makes a determination under 18 AAC 75.325 (d)(1) or 18 AAC 78.270 (b) that the discharge or release does not pose a threat to human health, safety, or welfare, or to the environment. The CSP will also consider other site-specific factors when reviewing a site for closure.

- Free product must be recovered to the maximum extent practicable (18 AAC 75.325(f)(1)(B));
- Surface soil staining must be evaluated and cleaned up (18 AAC 75.325(f)(1)(E));
- Cumulative risk standards must be achieved (18 AAC 75.325(g));
- Approved groundwater cleanup levels must be achieved at the approved point of compliance (18 AAC 75.345(e)), unless DEC makes a determination that residual groundwater contamination cannot be feasibly or practicably addressed and does not pose a threat to human health, safety, or welfare, or to the environment;
- Potential future exposure to residual contamination at levels that do not allow for unrestricted site use must be managed through the use of ICs. (18 AAC 75.375(a)).
- Approved soil cleanup levels must be achieved unless DEC makes a determination that residual soil contamination above approved soil cleanup levels cannot be feasibly or practicably addressed due to the presence of infrastructure or other extenuating factors and does not pose an unacceptable risk to human health, safety, or welfare, or to the environment;
- Groundwater contaminant plumes must be steady state or shrinking, and concentrations of the hazardous substances within the plume must show a decreasing trend (18 AAC 75.380(c)(2)); and
- Residual contamination must not cause a violation of 18 AAC 70 water quality standards.

The determination that cleanup is complete is subject to a potential future determination that the cleanup or applicable ICs are not protective per 18 AAC 75.380(d)(2) and 18 AAC 78.276(f)(2). If the CSP makes a determination that conditions at a site are no longer protective of human health, safety or welfare, or of the environment, additional actions will be necessary to meet the requirements of the site cleanup rules. Examples of conditions under which the CSP may reopen a site include, but are not limited to, the following:

- Information is made available to the CSP that demonstrates that characterization or cleanup was incomplete, resulting in the presence of hazardous substances above applicable cleanup levels;
- The responsible person fails to maintain ICs;

- The responsible person fails to meet other conditions required for cleanup complete determination;
- The responsible person violates any terms of a decision document or agreement with the Department applicable to the site; or
- New toxicological data results in a regulatory update of applicable cleanup levels and hazardous substances are present above those levels.

Site Closure Designation

Cleanup Complete: Sites in this category have met approved cleanup levels that do not require ICs.

Cleanup Complete with Institutional Controls: ICs must be applied to sites where current or potential future exposure to contaminated soil or groundwater does not allow for unrestricted land and groundwater use. If ICs are required, the CSP must validate their effectiveness through periodic reporting by the responsible person or landowner. This includes sites with approved cleanup levels based on a risk assessment (method 4) that assumes a specific land-use.

In some instances the CSP may base a Cleanup Complete determination on the results of an exposure pathway assessment alone if the CSP determines under 18 AAC 75.325 (d)(1) or 18 AAC 78.270 (b) that the discharge or release does not pose a threat to human health, safety, or welfare, or to the environment and requires no [further] cleanup action. This determination requires Unit-Manager approval.

CLOSURE PROCEDURES

Project managers are to use the following procedures when closing a site under 18 AAC 78.276 or 18 AAC 75.380.

1. Review the site for closure per 18 AAC 75.380 or 78.276 to ensure that regulatory requirements have been met and prepare a final Exposure Tracking Model (ETM) evaluation. All potential exposure pathways should be in the ETM categories of "exposure controlled," "pathway incomplete," or "de-minimis exposure." Ensure that other factors, such as stakeholder concerns, free product, vapor intrusion, soil staining, odor and taste, eco-risk, and the potential for surface water quality violations have been addressed.

2. Determine the need for ICs.

Soil above health-based concentrations:

A robust mechanism (e.g., compliance order, servitude, restrictive covenant, or other land use control agreement) should be used when residual soil contamination remains on site above 1) human health risk-based levels (i.e., 18 AAC 75.341 Table B1 & B2 direct contact and outdoor or indoor air inhalation levels or other contaminants not listed in the Tables that are determined to be above human health risk-based levels), or 2) levels that may pose an unacceptable risk to ecological receptors.

Soil below health-based concentrations:

A Cleanup Complete (without ICs) is applicable when migration to groundwater is not a complete pathway as determined by 18 AAC 75.350; or if an approved method 3 or 4 soil cleanup level results in residual soil contamination is between method 2 "Migration to Groundwater" and health-based concentrations. However ICs may be needed if DEC determines that there is a future probable risk for contaminated soil to be placed in an environmentally sensitive area or surface water; or there is potential for migration of contaminants from polluted soil to surface water that could result in a violation of Alaska Water Quality (AWQ) standards.

Groundwater below Table C

Sites in this category can typically be closed without ICs unless there is the potential to violate surface water quality standards or an ecological evaluation identifies risk to a sensitive population. Water quality violations and eco-risks must be resolved prior to closure.

Groundwater above Table C

A *cleanup complete (with or without ICs)* determination with residual groundwater contamination above Table C may be issued when:

a) Concentrations meet applicable cleanup levels at an approved alternative point of compliance;
b) The groundwater contaminant plume is steady state or shrinking;
c) Contaminant concentrations are decreasing;
d) Eco-risk and potential surface water quality issues are resolved; and
e) ICs, if appropriate, have been established.

As previously stated, the CSP may determine under 18 AAC 75.325 (d)(1) or 18 AAC 78.270 (b) that the discharge or release does not pose a threat to human health, safety or welfare, or to the environment and requires no [further] cleanup action; such determinations require Unit Manager approval. If this determination is made and residual contamination above health-based levels remains, ICs or a similar form of effective informational notice will typically be required.

Groundwater a Current or Potential Future Source of Drinking Water

A robust IC mechanism (e.g., compliance order, servitude, restrictive covenant, or other land use control agreement) should be used when groundwater contamination exceeds Table C levels in an aquifer that is a current or reasonably anticipated potential future source of drinking water. Exceptions for sites in this category must be documented in the site file and approved by the appropriate CSP Manager. The mandated use of a public drinking water system not affected by

the contaminated site, for example, may enable the use of a less stringent IC. Periodic reporting must be required to ensure the requirement to use the public drinking water system remains in place over time.

The *cleanup complete* determination letter must cite the potential requirement for non-domestic wastewater discharges permit under18 AAC 72.500 and appropriate treatment if construction de-watering activities are planned.

Groundwater not a Current or Potential Future Source of Drinking Water

In areas where groundwater is not a current or reasonably anticipated future drinking water source, per an 18 AAC 75.350 groundwater use determination, the CSP may determine that ICs are not necessary for residual groundwater contamination above Table C levels.

Examples where groundwater may not be a current or potential future drinking water source include salt water intrusion and low yield groundwater volumes such as groundwater over shallow bedrock or permafrost. However, the need for ICs in these situations depends on factors such as the current or potential future use of the aquifer for purposes other than drinking water (such as aquaculture) to account for potential human and ecological exposure and surface water quality concerns including the potential for dewatering activities. The ETM exposure pathway evaluation(s) conducted during the cleanup process will help identify these situations.

Institutional Controls

Project managers will consult the CSP guidance, *Using Institutional Controls in Oil and Other Hazardous Substance Cleanups* to determine the appropriate IC mechanism, reporting requirements, and enforcement options under various closure scenarios for sites where ICs are necessary to meet regulatory requirements to be protective of human health and the environment.

ICs will typically be accompanied with informational instruments that provide notice of residual contamination to affected or potentially affected parties. Such instruments will re-state conditions presented in the *Cleanup Complete* determination. Information notices may take a number of forms. A notice recorded on the state land record (deed notice) may be appropriate for private sites. Other forms of informational notices, such as a state or federal designation on the land records system or in a Geographical Information System (GIS) used for land management planning, may be appropriate instead of formal institutional controls, or as an institutional control notification mechanism for sites owned by the government.

Enforcement

Failure to comply with ICs or conditions identified in the Cleanup Complete determination letter may result in reopening of the site and enforcement actions.

Removal of Institutional Controls

Requirements for terminating conditions or ICs must be included in the *Cleanup Complete* determination letter. Project managers will archive the IC record in the CSP database when ICs

are removed (this automatically changes site status to "Cleanup Complete"). Site closure information, but not the archived ICs, will still available on the CSP public database web site.