

**DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM**

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October 5, 2004

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Re: No Further Remedial Action Determination
Icy Bay-West Camp # 1
Database ID Number 1993110111001

The Alaska Department of Environmental Conservation (DEC) has reviewed the findings and recommendations presented in the DMC Technologies report entitled *Icy Bay West Camp # 1 Final Cleanup Report*, dated May 24, 2004. This letter presents DEC's decision regarding site closure under 18 AAC 75.380.

Background

Icy Bay is located on the Alaska mainland along the coastal margin of the Gulf of Alaska and the Wrangell-St.Elias Mountains near the foot of Mt. St. Elias.

The Icy Bay-West Camp #1 facilities have been used in connection with timber harvest activities since 1968. The facilities include camp buildings, vehicle and heavy equipment maintenance shop, road, airport, fuel storage and dispensing, log sort yard and storage, and related facilities.

Until 1993, these facilities were used by several different purchasers of timber from the State of Alaska Department of Natural Resources (DNR) to support their logging activities on State of Alaska lands (including lands conveyed to Alaska pursuant to the Alaska Mental Health Enabling Act). The facilities were used exclusively by the University's Timber Purchaser between 1993 and 1996. Beginning in 1996, the site was jointly occupied by purchasers of timber from the University of Alaska ("University"), and from the Mental Health Trust Land Office (TLO), acting by and on behalf of the Alaska Mental Health Trust Authority, in support of their timber operations. The University's timber purchaser was Wasser & Winters Company and Wasser & Winters Alaska Company ("Wasser & Winters"); the TLO's timber purchaser was Citifor, Inc. Both purchasers employed Browning Timber of Alaska, Inc. ("Browning"), and Ben A. Thomas, Inc. ("Thomas") as logging contractors to harvest the timber and conduct other operations for them.

From 1996-2000, Wasser & Winters and Citifor jointly used the Icy Bay-West Camp #1 facilities under agreements providing for such joint use. In 2000, the TLO's purchaser Citifor moved to a newly constructed separate camp and shop facilities ("Icy Bay-West Camp #2") located near Camp #1, while the University's timber purchaser Wasser & Winters continued its use and occupancy of the Icy Bay-West Camp #1 camp and shop facilities. In the spring of 2000, Citifor moved to newly constructed and expanded sort yard and log storage facilities. Wasser & Winters continued to use the original sort yard and log storage facilities. In 2000, the TLO's purchaser Citifor began to use newly constructed, separate fuel storage facilities located at the airport. After 2000, both companies continued joint use of the Log Transfer facilities, the airport, the roads and other similar facilities (under agreements providing for such joint use) until the termination of Citifor's operations in 2002.

Incidents of contamination occurred at the Icy Bay-West Camp #1 facility throughout its history. Inspections of the Icy Bay-West Camp #1 facilities performed under the Forest Practices Act by the landowners and regulatory agencies documented contamination that eventually resulted in the environmental remediation of the Icy Bay-West Camp #1. Several specific contamination events were observed. In April 2001, oil sheens and antifreeze were noted in roadside ditches during a Forest Practices Act inspection. In September 2001, another incident occurred during an agency

visit to the Icy Bay-West Camp #1 facility in which equipment and petroleum were burned and releases of petroleum products occurred.

An extensive environmental site assessment was eventually requested and completed by Southeast Management Services on behalf of the University of Alaska, with the agreement of the land owners and timber operators. Mr. Hanna produced reports entitled “5/13/02-6/6/02 Site Assessment: Icy Bay-West Logging Camp #1 and Its Related Facilities and “6/7/02 Soil Sample Results Along the Icy Bay – West 5-Mile Logging Road Ditch Lines, Icy Bay, Alaska, October 2002.”

A “Settlement Agreement Resolving Environmental Contamination at the West Icy Bay Camp Facility” (Settlement Agreement) was signed by stakeholders in December 2002 and January 2003. Signatories included the Alaska Departments of Environmental Conservation, Law, and Natural Resources; Trust Land Office; University of Alaska Anchorage; Wasser and Winters; Citifor; Browning Timber; and Ben A. Thomas Logging.

The purpose of the Settlement Agreement was to provide an efficient mechanism to finance and complete environmental cleanup at Camp # 1 without litigation. The basis for the Settlement Agreement was the information provided in the Southeast Management Services reports cited above. The Settlement Agreement capped the cleanup at 8,000 cubic yards, the volume of contaminated soil estimated in the reports. The agreement was amended in late 2003 to address approximately 7,000 cubic yards of contaminated soil beyond the original 8,000 cubic yard cap.

Under a follow-up Remediation Agreement, Wasser & Winters hired the cleanup contractor and supplied heavy equipment and manpower to conduct the cleanup. The costs incurred by Wasser and Winters were partially reimbursed under the Settlement Agreement.

Approved Soil Cleanup Levels

On February 14, 2003, DEC approved a site-specific alternative cleanup level for diesel range organics (DRO) based on the site characterization results in the Southeast Management Services reports. Gasoline range – and residual range organics (GRO and RRO) were set at the default migration to groundwater levels found in 18 AAC 75.341, Table B2. Approved petroleum cleanup levels are summarized below.

Area	GRO	DRO	RRO
Residential and shops	260	843	8,300
Fuel Depots	260	718	8,300
Sortyard and LTF	260	1,420	8,300

Chemicals other than the petroleum ranges noted above were required to meet 18 AAC 75.341 method two, Table B1 levels for soils, and 18 AAC 75.345 Table C levels for groundwater.

Soil Cleanup Summary

The workplan submitted by the cleanup contractor, DMC Technologies, was approved in May 2003. Camp # 1 cleanup began July 2003. Excavations were completed by mid-September.

Petroleum-contaminated soil totaling nearly 15,000 cubic yards from 16 source areas was excavated and transported to the Camp # 1 stockpile areas. The source areas, volumes excavated, and numbers of clean confirmation samples are summarized below.

Location	Excavated Soil Volume (CY)	No. Of Confirmation Samples
Generator	1,102	39
Truck Washdown	1,088	31
Oil Shed	2,054	70
Oil Shed Solvents	408	7
Saw Shop	1,700	82
Maintenance Shop	1,240	18
South Equipment Parking	150	12
Boneyard	231	9
5-Mile Ditch	14	2
Bunk House	122	5
School	95	4
TLO	326	7
TLO Solvents	22	2
Fuel Depot # 1	2,557	22
Camp Fuel Depot	3,767	22
Incinerator	100	5
Total Volume	14,976	

All excavations were confirmed clean and cleared for backfilling between late August and late September 2003. However, residual “smear band” contamination remains beneath the maintenance shop floor.

Groundwater

Camp # 1 obtains its drinking water from a well located near Camp Creek to the southeast of the camp. Water tested from this well did not indicate the presence of petroleum hydrocarbons.

Concentrations of several metals including arsenic, beryllium, chromium, lead and nickel were found above groundwater cleanup levels at both camps. In the Camp # 2 workplan, approved March 20, 2003, DEC did not require background sampling to delineate the concentration of heavy metals in groundwater due to the documented mineralogy in the area. This decision, although not explicitly stated in the Camp # 1 workplan approval, also applies to Camp # 1. Metals have been documented infrequently at other logging camps throughout Southeast Alaska; however, it is unlikely that the suite of metals present in groundwater monitoring wells throughout the Icy Bay site would be from anthropogenic sources.

Groundwater samples collected from wells in and around contaminant sources on both the upgradient and downgradient sides of the shop (Boneyard and North Equipment Storage Area) and at the Fuel Depot did not indicate the presence of petroleum hydrocarbons.

On September 12, 2003, DMC Technologies requested DEC to exclude long-term groundwater monitoring as a condition of the site cleanup decision. In addition to the dissolved metals discussed above, DMC argued that the major sources of petroleum contamination in the “smear band” near the Camp # 1 shop had been removed. Daily observations were made to ensure that petroleum was not leaking into open excavations from underlying soils. Areas identified as potential problems were re-excavated until no smear band or leakage was observed.

On September 15, 2003 DEC concurred with the arguments presented in DMC’s “Petition for No Groundwater Monitoring.” DEC did not require the installation of long-term groundwater monitoring wells based upon the conclusion that petroleum hydrocarbons had not been detected initially, and would not likely be present after the site returned to a stable condition following cleanup activities.

Surface Water

Camp Creek, in the immediate vicinity of Camp # 1, was not tested because the groundwater sample taken from the nearby drinking water well showed no presence of hydrocarbons. No other surface water bodies are located in the vicinity of Camp # 1.

In June 2002 a surface water grab sample was collected approximately 160 feet downstream from the outlet of the impoundment known as “Leachate Lake”, located at the sort yard 4.5 miles from the main camp. The water from this impoundment is subject to the Alaska Water Quality Standards (18 AAC 70) at an appropriate downgradient point of compliance (in this case the terminal end of the drainage into Icy Bay). Applicable petroleum water quality criteria include total aqueous hydrocarbons (TAqH) at 15 micrograms per liter, and total aromatic hydrocarbons at 10 micrograms per liter.*

The 2002 sample exceeded surface water criteria for total aqueous hydrocarbons (15 micrograms per liter) by nearly four times. Copper was also detected slightly higher than surface water criteria. Sampling in 2003 documented that neither petroleum hydrocarbons nor metals were impacting Icy Bay at the terminal discharge point.

Soil Treatment Results

Overview

The bioremediation system used at West Icy Bay Camp # 1 is a natural blend of nine, non-genetically engineered bacterial strains cultured from petroleum contaminated environments. This “bioaugmentation” process achieves clean-up goals at a fast rate, an important consideration at remote sites where it may be difficult and expensive to monitor treatment results over longer periods of time. The addition of a specially formulated fertilizer base that won’t quickly leach away with heavy rain helps stimulate microbial activity. Cultured microbe populations die after their petroleum hydrocarbon energy source no longer exists.

* 18 AAC 70.990(62) defines TAH as the sum of benzene, toluene, ethylbenzene, and xylenes isomers (BTEX). TAqH is defined in Note 8 to the table of cleanup criteria presented in 18 AAC 70.020(b) essentially as the sum of BTEX and PAH.

Treatment Cell Cleanup Levels

The off-site transport cleanup levels for the contaminated soil stockpiles are method 2 migration to groundwater (230 mg/kg for DRO). However, continued active treatment is required only if the primary indicator contaminant, DRO, exceeds the most stringent approved alternative cleanup level applicable to the source area excavations (718 mg/kg).

It is expected that attenuation will continue over time until the more restrictive cleanup level has been met. Additional sampling to confirm that the more restrictive cleanup level has been met is required for all contaminants of concern, including benzene, toluene, ethylbenzene, total xylenes, GRO, DRO, and RRO **only** if off-site soil transport is proposed.

Treatment Cell Volumes

The Camp # 1 treatment cell contains 8,134 cubic yards of petroleum-contaminated soil from two adjacent stockpiles. Active treatment occurred between July and September 2003.

The Camp # 1 solvent treatment cell, constructed at one end of the main Camp # 1 cell, contains 430 cubic yards of soil. Active treatment occurred during August 2003.

The treatment cell located near the runway contains 6,424 cubic yards of petroleum-contaminated soil. Active treatment occurred from mid- to late September 2003. Confirmation samples were collected October 1, 2003. Samples were collected under the approved sampling plan noted above.



Treatment Cell Results

By mid-September 2003 a number of factors indicated that bioremediation was occurring as expected at the Camp # treatment cell, solvent-contaminated treatment cell, and airstrip treatment cell.

1. Holes excavated into the treatment stockpiles to collect samples were venting steam, indicative of higher core temperatures related to biological activity.
2. Photoionization detector readings inside the stockpiles varied from 1 – 20 parts per million. These low readings suggested that treatment had progressed substantially.
3. Odor and sheen tests varied from none to slight.
4. Run-off water did not exhibit sheen.

5. Soil had a characteristic sour odor indicative of high biological activity.

The treatment cells were not seeded. However, visual monitoring a year later showed that naturally occurring grasses and other pioneer species were becoming established (see photo).

The confirmation sampling procedures approved early in the summer of 2003 for the Camp # 2 treatment cell were modified with DEC's September 10, 2003 approval of DMC's "*Sampling and Analyses Plan for Treated Soils.*" The three treated stockpiles were gridded prior to sampling. Twenty horizontal and vertical sample locations in each stockpile were then determined randomly. Samples were collected using a track hoe and, as needed depending on depth, a hand-held stainless steel grab bucket that can reach to depths of 12 feet.

The data sets were checked for "best fit" and calculations made to determine normal or log normal distribution. The data sets were determined to be log normally distributed. A student H-test was performed and upper confidence limits calculated for DRO. The upper limits for the Camp # 1 and airstrip treatment cells were less than the most restrictive alternative cleanup level for the excavations (718 mg/kg), meaning that active treatment was complete. The upper confidence limits for RRO were less than the applicable cleanup level (8,300 mg/kg). The solvent stockpile was not evaluated statistically because no contaminants were detected in the samples submitted for laboratory analyses.

According to 18 AAC 75.370, Soil Storage and Disposal, contaminated soil stockpiles are to remain covered with a 6-mil, reinforced polyethylene liner or its equivalent. On September 22, 2003 DEC determined that the stockpiles could remain uncovered because:

1. method 2 cleanup levels had nearly been met for all contaminants;
2. contaminant migration would be unlikely at the low concentrations present;
3. the treatment cell cores would remain relatively warm during the winter due to biological activity, even without top covers;
4. covers would not enhance treatment by warming the soil because radiant solar energy is minimal during the fall and winter months;
5. covered piles would be difficult to maintain with the strong winter winds at Icy Bay;
6. placing and maintaining top covers would generate an additional and unnecessary project expense; and
7. top covers would generate additional solid waste.

Other Areas of Concern

Uplands Fuel Depot and Former Sortyard Saw Shack

The uplands fuel depot, located on State of Alaska land, was constructed on a bench above the sort yard about 4.5 miles east of Camp # 1 and used for a period of about 20 years in the 70's and 80's to dispense fuel for the logging operations at Icy Bay. The former saw shack was located at the base of the southwest corner of the depot. Aerial photos from 1993 identify three large tanks still present. Sometime after 1993 the tanks were removed and the area was not used for any further logging-related activities.

At the direction of DEC, and with the concurrence of Settlement Agreement signatories, DMC Technologies conducted a limited site assessment at the uplands fuel depot in July 2003. The work performed included the excavation of 33 trenches, field screening, and sample collection for laboratory analyses. High concentrations of gasoline and diesel were noted in the west half of the site and appear to have migrated. DMC Technologies estimated the contaminated soil volume at approximately 7,300 cubic yards.

The uplands fuel depot/former saw shack will be separated from Camp # 1 and listed independently on DEC's contaminated sites database. Unless further information is received indicating the need for immediate action, cleanup at this site will be postponed indefinitely. The site poses minimal risk to human health and the environment because:

1. it is remote;
2. petroleum contamination is old, stable, and at depth;
3. water quality data from a downgradient point of compliance from the constructed "Leachate Lake" impoundment, which may receive runoff from the uplands fuel depot, shows minimal impacts;
4. the closest surface waters of concern are Carson Creek and Icy Bay, several hundred feet away and unlikely to be within the influence of any potentially contaminated groundwater.

Remote Maintenance Shop

The remote maintenance shop, located 32.5 miles west of camp near Cape Yakataga, has been used by Wasser and Winters since the 2000 harvest season for remote, temporary equipment maintenance. Excavation of petroleum stained soils was performed in early 2003. Excavated soils were placed in a supersack and delivered to camp for storage and disposal by treatment. The shop was re-inspected in 2004. Continued housekeeping of this site will be performed, and the need to excavate additional soils will be evaluated when logging operations have permanently ceased. This site will not be listed on DEC's contaminated sites database until such time that more definitive information is available to confirm if any contaminated soil above cleanup criteria remains at the site.

Residential Trailers

Fuel tanks at three of 23 trailers in the camp residential area were found to have leaked. Contaminated soils are located under the trailers and within the confines of associated utility lines (power, water, etc.). Excavation of these soils will be performed when logging operations have permanently ceased and the trailers are moved.

Cumulative Human Health Risk

For contamination that remains on-site above cleanup levels, a chemical that is detected at one-tenth or more of the Table B1 inhalation or ingestion values set out in 18 AAC 75.341(c), the Table B2 values set out in 18 AAC 75.341(d) or the Table C values set out in 18 AAC 75.345 must be included when calculating cumulative risk under 18 AAC 75.325(g). A number of specific indicator chemicals, such as benzene, are used to determine cumulative risk from petroleum contamination. Petroleum fractions (gasoline-, diesel- and residual range hydrocarbons), which may consist of hundreds of individual chemicals, are not considered in cumulative risk calculations.

No remaining petroleum indicator contaminants are above the 1/10th threshold at any of the Camp # 1 cleanup sites. Therefore, cumulative risk calculations were not performed.

Ecological Risks

Contaminant migration is not expected to impact any streams, wetlands or other sensitive environments. Wildlife will occasionally encounter the treated stockpiled soils but the risks are minimal considering the short-term exposure at the low remaining contaminant concentrations. Moreover, the treated stockpiled soils will naturally revegetate with indigenous species over time. This will effectively remove any surface exposure to terrestrial wildlife.

Institutional Controls

The conditions specified below will be noted on DEC's contaminated sites database until such time that petroleum concentrations are shown to meet the most stringent cleanup criteria. These conditions are accessible to the public through the on-line database search engine.

1. Residual "smear band" petroleum contamination remains beneath the southeast corner of the concrete shop slab. If any soil above the approved cleanup levels becomes accessible in the future, or if new information indicates the contamination poses a risk to human health or the environment, then additional investigative or cleanup action may be required.
2. Treatment cell soils must remain undisturbed in their present locations until such time that DEC is provided with documentation that the most stringent cleanup levels in Tables B1 and B2 of 18 AAC 75.341 for the applicable zone of precipitation have been met.
3. Visual treatment cell monitoring is requested for a period of 3-5 years following the date of this determination. Digital photos of the treatment cells may be obtained by any of the parties to the Settlement Agreement. Monitoring is preferable, although not absolute, during the summer months when vegetation is at its peak. DEC will

communicate with Settlement Agreement parties by the end of April each year to determine who is in the best position to conduct the monitoring that field season. Following the monitoring event, photos will be submitted electronically to DEC's Contaminated Sites Program Juneau office. DEC will forward the photos to all other Settlement Agreement parties immediately upon receipt. DEC may terminate the monitoring program after the third year if the treatment cells are making adequate progress toward natural revegetation. DEC may request continuation of the program beyond five years, or request that additional measures be taken by Settlement Agreement parties, if the treatment cells appear to be significantly eroding. This decision will be made in consultation with all Settlement Agreement parties.

4. DEC's Contaminated Sites Program must be notified immediately by either the landowner or the operator if contaminated soil is exposed during any future excavations.
5. Off-site contaminated soil transport requires prior DEC approval in accordance with 18 AAC 75.325 (i) (1) and (2). Approval for disposal will be based on a determination that placement of soil in an off-site location does not pose a current or future threat to human health, safety, or welfare or to the environment. The department will approve disposal at an off-site location if:
 - i. the off-site disposal location is not an environmentally sensitive area;
 - ii. soil is not placed within 100 feet of water wells, surface waters, and drainage ditches;
 - iii. hazardous substances in the soil meet the most stringent soil cleanup levels (migration to groundwater) in Tables B1 and B2 of 18 AAC 75.341 for the applicable zone of precipitation; and
 - iv. written approval is obtained from the off-site disposal location landowner.

Determination

The investigation and cleanup of Icy Bay-West Camp # 1 has met all requirements specified in 18 AAC 75 Article 3 - Discharge, Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances. No further remedial action is required. This decision will be noted on DEC's contaminated sites database following expiration of the right to an adjudicatory hearing as set forth herein.

In accordance with 18 AAC 75.380(d)(1), additional investigation and cleanup may be required if new information is discovered which leads DEC to make a determination that the cleanup described in this decision is not protective of human health, safety, and welfare or the environment. If the conditions in this decision are not met, additional requirements may be imposed and/or enforcement action initiated by DEC.

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, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801 within 15 days of the decision date.

Adjudicatory hearing requests must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 30 days of the decision date. The right to appeal is waived if a hearing is not requested within 30 days.

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