STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

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Dear Interested Alaskan:

Per your request, the department is providing you with its Record of Decision (ROD) that was recently issued for the River Terrace Laundromat contaminated site. The department will be sending you other informational documents it develops in the future to keep you informed of the status of the cleanup.

If you have any questions regarding this document or the River Terrace contaminated site, please do not hesitate to contact me at our Anchorage office (269-7578). If you no longer wish to be sent such documents, please contact me and I will remove your name from our mailing list.

Sincerely,

Rich Sundet

Rich Sundet
Project Manager

Enclosure: as stated

Site Location - River Terrace RV Park - Figure 1

Alaska Department of Environmental Conservation
Record of Decision
River Terrace RV Park
August 2000

DATABASE RECORD KEY: 1992230918701

SITE INFORMATION

This Record of Decision (ROD) documents the Department of Environmental Conservation's (DEC) decision for monitoring and treatment of residual contamination for the River Terrace RV Park site (RTRVP). The RTRVP site is located on the north bank of the Kenai River, east of the Sterling Highway in Soldotna, Alaska (Township 5 North, Range 10 West, Section 32 Seward Meridian; approximate Latitude 60°28' N, Longitude 151°05' W). The RTRVP lies on three contiguous parcels of land located at the junction of the Sterling Highway and the Kenai River. The total land area of these parcels is approximately 9.5 acres. The contaminated area is predominantly located on 1 parcel of less than 1 acre. The RTRVP is located immediately east of and adjacent to the Alaska Department of Transportation (DOT) Sterling Highway right-of-way (ROW). Figure 1 is a site location map.

The principal contaminant of concern (COC) at the RTRVP site is the solvent tetrachloroethene (PCE). Besides PCE, other COCs detected at the site include the PCE degradation products trichloroethene (TCE), cis- and trans-1,2-dichloroethene (DCE), 1,1-DCE, and vinyl chloride, as well as benzene, diesel-range organics (DRO), gasoline-range organics (GRO), and other petroleum hydrocarbons. COCs have been detected in RTRVP property soil and groundwater, as well as off-RTRVP property groundwater and Kenai River sediments and surface water.

Interim Cleanup Activities

Three different RTRVP cleanup activities have been completed to-date.

Approximately 600 cubic yards of PCE-contaminated soil were excavated in May 1996 and stockpiled on the property.

Approximately 2,700 cubic yards of contaminated soil were excavated in September and October 1997 and June 1998.

The total volume of excavated soil (3,300 cubic yards) was treated in two soil vapor extraction treatment cells located on the RTRVP property. The vapor extraction system operated from fall 1998 through spring 1999. The soil has already been treated and likely meets the required clean up levels. It remains on-site in the two treatment cells. The U.S. Environmental Protection Agency (EPA) determined that the treated soil is not hazardous waste under federal hazardous

waste laws and can be disposed of on-site, subject to conditions to minimize surface runoff and subsurface leaching. The determination and on-site disposal conditions are detailed in a March 2, 2000 letter from EPA to DEC. On site disposal may commence with DEC approval and consistent with the terms set forth by EPA.

PCE from the RTRVP site has entered the Sterling Highway storm sewer and discharged into the Kenai River from the Kenai River Bridge Outfall (KRBO). In May 2000, an aeration system was installed in the storm sewer to stop contamination from entering the Kenai River at levels above the surface water cleanup level. This interim treatment system will be operated until the department determines that the selected cleanup system for the RTRVP either reduces the contamination on a permanent basis; the storm sewer is reconfigured by DOT so that it no longer transports contamination; or monitoring results indicate the aeration system is no longer necessary.

NATURE AND EXTENT OF CONTAMINATION

Information on the nature and extent of soil, groundwater, surface water, and sediment contamination at the RTRVP is found in the administrative record, including the Proposed Cleanup Plan dated May 26, 2000 and *Remedial Investigation/Feasibility Study Report* (RI/FS), dated May 2000. The nature and extent of contamination is briefly summarized below.

Soil

The maximum PCE concentrations detected on the site were removed during excavations in the fall of 1997 and summer of 1998. The maximum documented PCE concentration remaining after the excavations is 20 milligrams/kilogram (mg/kg) in a sample located below the deepest part of the excavation (30 feet below ground surface) at a point near monitoring well 9 (MW-9) approximately 60 feet from the river. Of post-excavation soil samples, only three samples from the base of the excavation and two later soil boring samples from the same general area (near MW-9; see Figure 2) have exceeded the RTRVP property soil cleanup level (e.g., 11.5 mg/kg for PCE).

No soil samples collected from off-RTRVP property (the Sterling Highway DOT ROW) have exceeded the applicable cleanup levels.

Groundwater

Groundwater in the deep, confined aquifer is not affected by contamination.

There are two areas with shallow groundwater contamination. The "upper plume" is between the former dry cleaning building and the Sterling highway. Groundwater from this area flows towards the highway and into the storm water sewer under the highway to the Kenai River. The "lower plume" is between the building and the Kenai River. Groundwater from this area flows to the river.

State regulations define procedures to evaluate the risk to ecological receptors posed by contaminated sediments in the Risk Assessment Procedures Manual, and the Water Quality Standards outline procedures that must be followed to develop sediment standards. Specific cleanup standards for sediment were not developed because reducing PCE concentrations in the water flowing through the sediments will likely result in a reduction in sediment concentrations over time.

Table 1: Cleanup Levels for RTRVP

Media	Contaminant	Maximum Concentration Detected in June 2000	Maximum Detected Concentration.	Cleanup Levels		
				Concen-tration	Point of Compliance	Basis
On-RTRVP Property Soil (mg/kg)	PCE	NA	* 20	11.5	Throughout RTRVP Property	ACL for chlorinated com pounds, 18 AAC 75 by application of the 10 times rule (18 AAC 75.345(b)(2) for benzene
	TCE	NA	* 0.21	300		
	Cis-DCE	NA	* 0.62	72.1		
	Trans-DCE	NA	ND	87.3		
	1,1 DCE	NA	ND	7.1		
	Vinyl Chloride C	NA	ND	2.1		
	Benzene	NA	*0.09	0.2		
Off-RTRVP Property Soil (mg/kg)	PCE	NA	0.19	0.3	Anywhere off-RTRVP Property	18 AAC 75 by application of the 10 times rule (18 AAC 75.345(b)(2)
	TCE	NA	0.009	0.27		
	Cis-DCE	NA	0.006	2		
	Trans-DCE	NA	ND	4		
	1,1 DCE	NA	ND	0.3		
	Vinyl Chloride	NA	ND	0.09		
	Benzene	NA	ND	0.2		
On-RTRVP Property Shallow (Unconfined) Aquifer (µg/L)	PCE	1,300	5,500	840	Throughout RTRVP Property	ACL for chlorinated compounds, 18 AAC 75 by application of the 10 times rule (18 AAC 75.345(b)(2) for benzene
	TCE	540	970	21,900		
	Cis-DCE	3,000	4,600	11,600		
	Trans-DCE	26	44	11,600		
	1,1 DCE	2.6	3.3	7		
	Vinyl Chloride	4.5	7.6	2		
	Benzene	3.9	7.6	50		
Off-RTRVP Property Shallow (Unconfined) Aquifer (µg/L)	PCE	280	920	50	RTRVP Property boundary	18 AAC 75 by application of the 10 times rule (18 AAC 75.345(b)(2)
	TCE	83	180	50		
	Cis-DCE	480	1,500	700		
	Trans-DCE	ND	24	1,000		
	1,1 DCE	ND	ND	70		

	Vinyl Chloride	ND	ND	20		
	Benzene	ND	0.5	50		
Confined Aquifer (µg/L)	PCE	ND	ND	5	Throughout property	MCL
	TCE	ND	ND	5		
	Cis-DCE	ND	ND	70		
	Trans-DCE	ND	ND	100		
	1,1 DCE	ND	ND	7		
	Vinyl Chloride	ND	ND	2		
	Benzene	ND	ND	5		
Surface Water (µg/L) (Note that TAH and TAqH concentrations of 10 and 15 µg/L respectively must also be met in the Kenai R. water column	PCE	2.3	2.3	5	Surface-Water/Ground-Water Interface	WQC
	TCE	0.6	0.6	5		
	Cis-DCE	0.18	0.18	70		
	Trans-DCE	ND	ND	100		
	1,1 DCE	ND	ND	7		
	Vinyl Chloride	ND	ND	2		
	Benzene	ND	ND	5		

* Areas of highest soil contamination have been removed and treated. The maximum detections remaining in RTRVP property soil are listed in this table.

ACL: Alternative cleanup levels established for the site in an August 1997 letter from the DEC

18 AAC 75: Alaska Oil and Hazardous Substance Pollution Control Regulations

MCL: Maximum contaminant level; from Alaska Drinking Water Regulations (18 AAC 80)

WQC: Water Quality Criteria (18 AAC 70)

SELECTED REMEDIES

The purpose of this decision is to ensure that the public and the environment will be protected from remaining contamination at the RTRVP site. To accomplish this, the decision will include site monitoring and treatment, and provide the framework for future cleanup and maintenance of any necessary long-term remedial actions and institutional controls.

Remedies to address remaining contamination include air sparging in the storm sewer outfall (already in place), institutional controls to prevent use of the shallow groundwater for drinking water, institutional controls to limit human exposure to deeply buried soil contamination, intrinsic remediation of sediments, and intrinsic remediation augmented by *in situ* biological treatment of both the upper and lower groundwater contaminant plumes using Hydrogen Release Compound (HRC™) in proportion to the risk and remaining concentration levels.

Monitoring of contaminants will continue at selected locations to measure concentration levels, attenuation, effectiveness of treatment, attainment of action levels for additional treatment, gauging changes in plume size or configuration, altering monitoring schedules or sampling locations, and determining when no further action is necessary. Monitoring wells, sediment, the groundwater/surface water interface and river water may all be regularly evaluated to determine the following: water quality; treatment system

performance; the need to increase, decrease, terminate or re-start treatment efforts; or to change monitoring point locations and sampling frequency.

A monitor and treat approach is being used to provide treatment to reduce existing "hotspots" and address any possible unknown or increasing concentration of contaminants. Monitoring will be used to provide a safety net for identifying any impacts to surface water, groundwater or other on-site or off-site resources. Action levels will be used to determine when additional treatment would be needed and when site closeout is achieved.

PREFERRED CLEANUP ALTERNATIVE FOR THE UPPER AND LOWER PLUMES

DEC's preferred alternative was outlined in the *Proposed Cleanup Plan*, dated May 26, 2000. HRC application is the preferred cleanup alternative for both the upper and lower contaminant plumes with some modifications. An initial (Phase I) application will commence in early fall 2000. Additional applications will be applied as needed in the future based on the success of the initial application and monitoring data.

After the Phase I application, actual monitoring data from the Kenai River surface water, groundwater, surface water/groundwater interface, sediments, and the sentry wells will all be evaluated together to determine when intrinsic remediation should be augmented with the preferred treatment or alternative. This monitor and treat approach will be used to address any remaining contamination in the upper and lower plume. Treatment selected as a result of the monitoring will be proportional to the risks posed by the level of contamination remaining.

In-situ Biological Treatment (HRC™)

In situ biological treatment was selected because of the potential for cost savings, potential reduced treatment time frame and ability to apply as needed to areas needing treatment. If *in situ* biological treatment does not achieve the clean up goals, an alternative remedy will be evaluated by DEC and implemented. At this or any other time, another technology is shown to be superior, it may be evaluated and used in future treatment efforts.

Site cleanup will be implemented using a phased approach.

- Samples of site soil and groundwater have been submitted to an independent laboratory contracted by the HRC™ vendor for a bench-scale treatability study. Initial indications are that HRC™ is a viable technology for the conditions found at RTRVP.

- The Phase I implementation will involve HRC™ treatment of the most highly

contaminated areas in both the upper contaminant plume and the lower contaminant plume. HRC™ treatment fences will be installed to treat contaminated groundwater before it leaves the site and additional treatment points will be installed in the most highly contaminated areas. The Phase I application will be monitored to evaluate the ability of HRC™ to reduce contaminate concentrations. The extent of additional applications of HRC™ (Phase II) will be dependent upon the outcome of the Phase I results. It is anticipated that the Phase I cleanup result analysis will be performed in the winter of 2001. If the remedy does not perform as anticipated, then the contingent remedies will be considered.

- The treatment timing, density, and locations for Phase II will be based on evaluation of monitoring results from prior treatments and site monitoring data. Additional HRC™ borings would be installed in "hot spots" in both the upper and lower plumes. The goal of these additional borings is to reduce the overall timeframe necessary to complete remediation of the RTRVP site.

Lower Contaminant Plume

The method of liquid HRC™ application for the lower contaminant plume is an HRC™ fence.

This cleanup technology will stop migration of contaminated groundwater off-RTRVP property, resulting in protection of the Kenai River during the restoration period.

An HRC™ fence will be installed across the downgradient edge of the groundwater plume. This HRC™ barrier will be constructed using 4-inch injection wells to allow for frequent reapplication of the HRC™. Due to the potential for increased vinyl chloride (VC) concentrations and the potential for driving the groundwater and Kenai River sediments anaerobic, re-oxygenation of the groundwater may be necessary and would be done via a series of Oxygen Release Compound (ORC™) injection wells between the HRC™ barrier and the Kenai River.

For Phase II, the remaining contaminated plume/soil area would continue to be treated using HRC™ injection points in a fence (or expanded), and possibly in a grid, layout in the most highly contaminated groundwater. Additional HRC™ injection points will be installed as needed for reapplication at any remaining contaminated "hot spots" based upon monitoring results.

HRC™ borings may be installed in the Sterling Highway ROW to address remaining contamination between the RTRVP property and the storm sewer.

Upper Contaminant Plume

The method of HRC™ application for the upper contaminant plume for Phase I consists of an HRC™ fence. Additional HRC™ injection points may be installed as needed, e.g., continuation of the fence and/or a grid layout, for reapplication at remaining

contaminated "hot spots" based on monitoring data. Additional injections of liquid HRC™ to the soils adjacent to or underneath the building may be performed to promote biodegradation of any PCE contamination which monitoring data indicates may be under the building.

This cleanup technology will stop migration of contaminated groundwater off-RTRVP property, resulting in protection of the DOT ROW and the Kenai River during the restoration period.

INSTITUTIONAL CONTROLS

Per the requirements of 18 AAC 75.375, institutional controls will be implemented to ensure protection of human health, safety, or welfare. Institutional controls for RTRVP will include the following:

- The construction of drinking water wells in the shallow unconfined aquifer at RTRVP will be prohibited. The RTRVP landowner has agreed to record a deed restriction establishing this institutional control. This institutional control can be removed upon a showing to DEC's satisfaction that drinking water maximum contaminant levels are no longer exceeded in the aquifer.

- Excavations or other activities that could interfere with the site cleanup, operation and maintenance, or monitoring will require department approval.

- DEC and its designated representatives will be granted the right to enter the property at reasonable times to evaluate compliance with the institutional controls, and to perform necessary monitoring/cleanup, including the right to take samples.

POINTS OF COMPLIANCE

- For the lower contaminant plume, the current line of monitoring wells (or portion thereof) adjacent to the Kenai River (MW-27A, MW 20, MW-13, MW-12, MW-8, MW-7, MW-6, MW-5, and MW-35) will be designated as sentry wells. Some or all of the sentry wells will be used to determine compliance with surface water cleanup levels (as given in Table 1). Alternative points of compliance and sampling methods may be used if they are considered more representative of site conditions, and establish to DEC's satisfaction that cleanup levels are not exceeded at the surface water/groundwater interface. For the lower contaminant plume, monitoring wells near the property boundary (e.g., MW-14) and on the RTRVP property (e.g., MW-4A and MW-9) may also be monitored to determine compliance with cleanup levels.

- For the upper contaminant plume, monitoring wells near the property boundary (near, and possibly including, MW-25) will be monitored. On RTRVP property, selected monitoring wells (e.g., MW-16) may also be monitored to determine compliance with

cleanup levels.

- The compliance point for surface water that is closely hydrologically linked to groundwater, is the surface water/groundwater interface. DEC has established the compliance point for meeting the surface water quality criteria at the sentry wells. Based upon modeling, it has been determined that achieving 15ug/L for PCE at the sentry wells will result in attenuation to achieve the 5 ug/L clean up level for PCE at the surface water/groundwater interface.

Existing monitoring wells, that are outside the two identified plumes, where concentrations have already been demonstrated to be below the clean up levels for 5 or more quarterly monitoring events, may be eliminated from the quarterly monitoring for compliance. In addition to the monitoring wells identified above in this section, other, existing wells may continue to be a part of the monitoring scheme. DEC may make changes in monitoring locations and frequency based upon an evaluation of water quality trends.

ACTION LEVELS FOR TREATMENT

Action levels for additional treatment after Phase I of active remediation (HRC™ applications) will be based on the following:

- For both the upper and lower plumes, monitoring wells on RTRVP property contain more than the on-site ACL concentrations.

- For the upper plume, when monitoring results indicate exceedances of the ten times rule cleanup levels off of RTRVP.

- For the lower plume, when monitoring results in the sentry wells indicate exceedances of three times the WQC (see Table 1). However, further treatment may not be needed if DEC determines that the three-times the WQC levels will be achieved in a reasonable time-frame after contaminant levels in the sentry wells have decreased below the aquatic organism screening levels (as cited in "Ecotox Thresholds; Eco Update III (II; 1-12)" by EPA OSWER (1996). The Ecotox threshold levels for the following COCs are: for PCE at 120 ug/L and for TCE at 350 ug/L. For other degradation products of PCE that do not have an Ecotox value, the action level in the sentry wells to terminate treatment, upon evaluation as described above, will be three times the WQC level, e.g., for VC the WQC is 2.0 ug/l and the action level will be 6.0 ug/l. DEC has selected the Ecotox levels as one of the action thresholds, rather than the WQC of 840 ug/L for PCE for protection of aquatic life, since this newer data indicates that levels greater than 120 ug/L could present a risk to organisms that rely on the sediments and near sediment environment. This is more conservative and provides a higher level of protection for aquatic life than the water quality standards. DEC will consider termination of the treatment if the COC levels

in the sediments are also decreasing and/or if additional treatment is not significantly better than intrinsic remediation.

Actual monitoring data from the Kenai River surface water, surface water/groundwater interface, groundwater, sediments, and the sentry wells will all be evaluated together for clean up decisions.

After temporary suspension of treatment, monitoring will occur for at least five additional quarterly monitoring events to determine whether the treatment action levels are consistently met. If monitoring does not demonstrate that treatment action levels are consistently met during this monitoring period or, in the lower plume, that levels are not timely decreasing to below cleanup levels, then active treatment may be reinstated.

Groundwater sampling events initially will occur on a quarterly basis and may be determined by DEC to be required less frequently, such as on a semi-annual or annual basis, upon review of the data. Other sampling, e.g., sediment sampling, will occur at DEC's discretion to determine if contamination is impacting the environment or whether the contamination is decreasing, is increasing or is stable.

Upon permanent termination of active remediation, intrinsic remediation will be evaluated via monitoring until it is clear that the final cleanup levels have been or will be achieved and the site can be "closed." Monitoring for intrinsic remediation will likely be quarterly for 3 years, then semi-annually for two years, then annually. If at any point during this time, the clean up levels for COCs have been achieved, quarterly monitoring may be reinstated to document action levels for closeout as described below in the "Action Levels for Site Closeout" section.

If found to be more cost effective to continue to treat rather than to monitor for natural attenuation, a decision may be made to continue with active HRC™ remediation even after the action levels for treatment have been achieved.

ACTION LEVELS FOR SITE CLOSEOUT

Site closure will be determined by results from performance monitoring showing that cleanup levels have been achieved or documenting to the satisfaction of DEC that remaining, minor exceedances will be addressed via intrinsic remediation, per the requirements of 18 AAC 75.380; however, institutional controls may have to remain in-place.

Performance monitoring must demonstrate that the clean up levels (or below) have been maintained for five consecutive quarterly monitoring events, and there is a decreasing trend in groundwater contaminant concentrations at all monitoring points or a determination that intrinsic remediation is occurring and will achieve the cleanup levels within a reasonable timeframe at the discretion of DEC.

For the lower plume, surface water/groundwater interface sampling may be instituted when the sentry wells meet action levels for treatment for all COCs (e.g. 120 ug/L for PCE). Five quarterly monitoring results demonstrating that clean up levels for all COCs (e.g. 5 ug/L for PCE) have been achieved at the surface water/groundwater interface may be used as a basis for no further action.

Trend analysis will be based upon a linear regression analysis of the five most recent quarterly sampling event results to determine whether concentrations of COCs are decreasing.

Compliance with the applicable groundwater cleanup levels will be "based on the maximum concentrations of the hazardous substance detected in the final confirmation samples; before closure, the size of the dissolved plume must be steady state or shrinking and concentrations of the hazardous substance must be decreasing."

SUMMARY OF PUBLIC INVOLVEMENT ACTIVITIES

A proposed plan for final site cleanup was distributed to the public on May 26, 2000. Public notices were placed in the Anchorage Daily News and the Peninsula Clarion newspapers. A public meeting was held on June 15, 2000 in Soldotna. Public comments on the Proposed Plan were received through June 26, 2000. Comments on the Proposed Plan and the draft RI/FS report will be addressed in a Responsiveness Summary.

REVIEW OF CLEANUP ACTION

The cleanup decision will be reviewed at least once every five years until all cleanup levels are achieved. All relevant data will be evaluated during the five-year review to determine whether the implemented alternative continues to be both appropriate and sufficiently protective. The review will include consideration of any new toxicological data pertinent to the contaminants of concern, discernable trends in contamination concentrations, concerns of the public, and any other relevant information.

Nothing in this decision modifies or waives DEC's right to enforce any requirements of laws or court orders applicable to the RTRVP site.

This document is the department's final decision. If you wish to appeal this decision to the superior court, any appeal rights you may have must be exercised under Appellate Rule 602(a)(2) by filing an appeal within 30 days of the mailing date of this document.

Lynn J. Tomich Kent 8/31/00

Lynn J. Tomich Kent — Date

Contaminated Sites Remediation Program Manager