

**Alaska Department of Environmental Conservation (DEC)**

**Contaminated Sites Program**

**River Terrace RV Park (RTRVP)**

**Summary**

**5 Year Review of the Record of Decision**

**April 7, 2006**

DEC issued its Record of Decision (ROD) for the River Terrace RV Park (RTRVP) contaminated site in August 2000 and in September 2000 entered a Consent Decree with the RTRVP property owners. Since September 2000, DEC has implemented the cleanup approach dictated by the ROD using Hydrogen Release Compound (HRC™) to enhance natural attenuation (primarily bioremediation) of tetrachloroethylene (PCE) and its degradation products to treat groundwater prior to it migrating off RTRVP property. Monitoring data has shown that HRC™ has successfully enhanced the attenuation of PCE, and at much of the site, PCE has degraded to below established cleanup levels. During the cleanup process, DEC has continually evaluated monitoring data and modifies its plans to best treat/monitor the site to protect the adjacent Kenai River and its ecological receptors.

Because past sampling demonstrates that the HRC™ method has indeed enhanced natural attenuation of PCE and its degradation products to treat groundwater, DEC at this time has no intent to depart from this treatment/monitoring strategy as described in the ROD.

Note that this review document was delayed from the time line established in the ROD in order to evaluate and incorporate the conclusions derived from October 2005 groundwater sampling results, deemed important to assessing the success of the HRC™ method.

Note also that, because this 5-year review is essentially a summarized review and conclusion regarding the efficacy of the of the HRC™ method, only summary data are listed herein. However, a bibliography is provided at the conclusion of this review, listing the comprehensive data sources for the conclusions reached. Subject to any applicable restrictions under the Alaska Public Records Act at AS 40.25.120, all monitoring/analytical data underlying the Tables and/or basic conclusions reached in this document are subject to public inspection, available upon proper request made pursuant to procedures set forth in AS 40.25.

**Purpose**

In accordance with the August 2000 ROD issued by DEC for the RTRVP site, DEC is required to review its cleanup decision every five years until all cleanup levels are achieved. The five-year review requires:

- An evaluation of all relevant data to determine whether the implemented cleanup alternative continues to be both appropriate and sufficiently protective.
- Consideration of any new toxicological data pertinent to the contaminants of concern.

- A discussion of any discernable trends in contamination concentrations.
- Concerns of the public.
- Any other relevant information.

It should be noted that DEC (in consultation with the RTRVP site owners' consultant), has continually evaluated the effectiveness of the site remediation and groundwater monitoring since the ROD and the 2000 Consent Decree.

**The issues in the 5 year review were evaluated and are discussed below in further detail. In addition, the following provides a conclusion regarding the overall findings of the review. This summary is based primarily upon findings that DEC and its contractors, and the property owners consultants have performed. A listing of the primary reports that this summary is based upon since the ROD was issued is listed at the end of this summary.**

**I. Whether the Implemented Cleanup Alternative Continues to be Both Appropriate and Sufficiently Protective.**

The remedial method established in the ROD was bioremediation using Hydrogen Release Compound (HRC™) to enhance biological treatment of the groundwater prior to it migrating off site. DEC's management of the site has been focused on meeting site cleanup objectives by treating groundwater prior to it migrating off RTRVP property. HRC™ has been injected into selected locations in the upper and lower contaminant plumes since October 2000. Subsequent injections occurred in June 2001; November 2003; and the summer 2005.

Monitoring data, and exhaustive analyses thereof, leads DEC to conclude that the HRC™ treatment has been an effective method in reducing the contaminants of concern and is appropriately and sufficiently protective in terms of preventing off-site migration of untreated groundwater.

**II. New Toxicological Data Pertinent to the Contaminants of Concern**

During the five years since the signing of the ROD, DEC has continued to review toxicological data for PCE and its degradation products to evaluate whether the cleanup plans should be adjusted to ensure that all offsite ecological receptors are protected, and whether there is any new toxicological data that is pertinent and relevant. Since the ROD was signed, DEC has not changed its Water Quality Standards (WQSs) or its contaminated sites risk-based "Soil Cleanup Levels" Method Two for PCE (see (18 AAC 75.341), or its degradation products.

DEC thus has concluded that there is no new toxicological data pertinent to the RTRVP contaminants of concern.

**III. Discernable Trends in Contamination Concentrations**

Below is a summary of trends observed in both the lower and upper contaminant groundwater plume areas. Table 1 (page 4) provides cleanup levels established at the site. Table 2 (pages 5-6) provides findings of contaminant levels in comparison to those cleanup levels at the site. Cleanup levels were established for the primary site contaminant PCE as well as its degradation

products. Cleanup levels were also established for benzene a petroleum contaminant, which is also detected at the site, but concentrations are much lesser than for PCE and its degradation products.

#### Lower Plume Summary:

- The HRC™ injections were successful at rapidly degrading PCE to trichloroethylene (TCE) to cis-1,2-dichloroethylene (cis-DCE)
- The bioaugmentation pilot test indicated accelerated degradation of the cis-DCE to vinyl chloride (VC) and ethene.
- Outside of the bioaugmentation pilot test area, contaminant concentrations are generally stable; although they have declined from levels detected prior to 2002 (the decrease in contaminant concentrations since 1998 is likely due to the removal of the contaminated soil source area by the fall 1997 excavation).
- The source area in the till around monitor well (MW) 44 is a continuing source of dissolved PCE contamination to the unconfined aquifer. The HRC™ in the unconfined aquifer is effectively dechlorinating the PCE. It is too early to evaluate the effectiveness of the August 2005 HRC™ treatment of the till in the MW-44 source area.
- The principal findings of the U.S. Geological Survey (USGS)/DEC study were that the addition of HRC™ (or a similar substrate) was necessary for reductive dechlorination to occur at RTRVP, and, interestingly, a different degradation mechanism (e.g., aerobic and anaerobic oxidation to nontoxic carbon dioxide, instead of reductive dechlorination to nontoxic ethene) may be degrading cis-DCE and vinyl chloride (VC) in portions of the aquifer sediments and in the Kenai River sediments.
- Exceedances of site cleanup levels were more widespread in the 1997 sampling than in subsequent sampling, suggesting decreasing sediment impact. However, 2004 sediment and pore water results suggested that the areas of greatest impact are located further out in the river than the 1997 through 2002 sediment sample locations (which were generally located near the ordinary high water line). Exceedances recording the highest contaminant concentrations in groundwater during all years were in areas downgradient from MWs 6, 7 and 20.

#### Upper Plume Summary:

- Although somewhat slower than in the lower plume, the HRC™ injections were successful at rapidly degrading PCE to TCE to cis-DCE.
- Only low levels of VC are occasionally detected in upper plume monitoring wells, suggesting that only minor reductive dechlorination of cis-DCE is occurring. Similar to the lower plume outside of the bioaugmentation pilot test area, contaminant concentrations are generally stable, although they have declined from levels detected prior to 2002.

**Table 1: Cleanup Levels for RTRVP**

Media	Contaminant	Maximum Concentration Detected in June 2000	Maximum Detected Concentration.	Cleanup Levels		
				Concentration	Point of Compliance	Basis
On-RTRVP Property Soil (mg/kg)	PCE	NA	* 20	11.5	Throughout RTRVP Property	ACL for chlorinated compounds, 18 AAC 75 by application of the 10 times rule (18 AAC 75.75.345(b)(2) for benzene
	TCE	NA	* 0.21	300		
	Cis-DCE	NA	* 0.62	72.1		
	Trans-1,2 DCE	NA	ND	87.3		
	1,1 DCE	NA	ND	7.1		
	VC	NA	ND	2.1		
	Benzene	NA		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 75.75.345(b)(2)
	TCE	NA	0.009	0.27		
	Cis-DCE	NA	0.006	2		
	Trans-1,2 DCE	NA	ND	4		
	1,1 DCE	NA	ND	0.3		
	VC	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 75.75.345(b)(2) for benzene
	TCE	540	970	21,900		
	Cis-DCE	3,000	4,600	11,600		
	Trans-1,2 DCE	26	44	11,600		
	1,1 DCE	2.6	3.3	7		
	VC	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 75.75.345(b)(2)
	TCE	83	180	50		
	Cis-DCE	480	1,500	700		
	Trans-1,2 DCE	ND	24	1,000		
	1,1 DCE	ND	ND	70		
	VC	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-1,2 DCE	ND	ND	100		
	1,1 DCE	ND	ND	7		
	VC	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 water column	PCE	2.5	2.5	5	Surface-Water/Ground-Water Interface	WQC
	TCE	0.6	0.6	5		
	Cis-DCE	0.18	0.18	70		
	Trans-1,2 DCE	ND	ND	100		
	1,1 DCE	ND	ND	7		
	VC	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)

Trans-1,2-DCE: Trans-1,2-dichloroethylene

1,1, DCE: 1,1-Dichloroethylene

## Table 2: Groundwater Cleanup Findings for RTRVP from the June 2005 Event

The following bullets summarize the findings from the June 2005 quarterly monitoring in relation to established cleanup levels.

### *Upper Plume*

- PCE concentrations were **below** the 840 µg/L on-RTRVP property cleanup level in all upper plume samples.
- PCE concentrations were **below** the 50 µg/L off-RTRVP property cleanup level in all samples from upper plume monitoring wells located off-RTRVP property or within approximately ten feet of the property boundary (MW-16, MW-21, MW-25, and MW-38).
- TCE concentrations were **below** the 21,900 µg/L on-RTRVP property cleanup level in all upper plume samples.
- TCE concentrations were **below** the 50 µg/L off-RTRVP property cleanup level in all samples from upper plume monitoring wells located off-RTRVP property or within approximately ten feet of the property boundary (MW-16, MW-21, MW-25, and MW-38).
- Cis-DCE concentrations were **below** the 11,600 µg/L on-RTRVP property cleanup level in all upper plume samples.
- The cis-DCE concentration was **above** the 700 µg/L off-RTRVP property cleanup level in the sample from MW-16, which is located within approximately ten feet of the property boundary.
- Trans-1,2-DCE and 1,1-DCE concentrations were **below** applicable cleanup levels or action levels.
- Vinyl chloride was **not detected** in any upper plume groundwater samples.
- Benzene concentrations were **below** applicable cleanup levels.

### *Lower Plume*

- PCE concentrations detected in lower plume monitoring wells are summarized with respect to applicable cleanup levels in the bulleted list below.
  - The PCE concentration of 9,240 µg/L in MW-44 (completed in a semi-confined water-bearing zone) was **above** the 840 µg/L on-RTRVP property cleanup level. The PCE concentrations in all lower plume monitoring wells completed in the upper aquifer were **below** the 840 µg/L on-RTRVP property cleanup level.
  - PCE concentrations were **below** the 50 µg/L off-RTRVP property cleanup level in all lower plume samples located off-RTRVP property or within approximately ten feet of the property boundary (MW-10).

- PCE was **not detected** in any of the sentry monitoring wells located adjacent to the Kenai River.
- TCE concentrations detected in lower plume monitoring wells are summarized with respect to applicable cleanup levels in the bulleted list below.
  - All TCE concentrations were **below** the 21,900 µg/L on-RTRVP property cleanup level.
  - TCE concentrations were **below** the 50 µg/L off-RTRVP property cleanup level in all samples from lower plume monitoring wells located off-RTRVP property or within approximately ten feet of the property boundary.
  - TCE was **not detected** in any of the sentry monitoring wells located adjacent to the Kenai River.
- Cis-DCE concentrations detected in lower plume monitoring wells are summarized with respect to applicable cleanup levels in the bulleted list below.
  - All cis-DCE concentrations were **below** the 11,600 µg/L on-RTRVP property cleanup level.
  - The cis-DCE concentrations were **below** the 700 µg/L off-RTRVP property cleanup level in all monitoring wells located off-RTRVP property or within approximately ten feet of the RTRVP property boundary (MW-10).
  - Cis-DCE concentrations were **above** both the 210 µg/L modeled cleanup level and the 210 µg/L action level in the following sentry monitoring wells located adjacent to the Kenai River: MW-6 (212 µg/L), MW-7 (367 µg/L), and MW-20 (582 µg/L).
- Trans-1,2-DCE and 1,1-DCE concentrations in lower plume monitoring wells did not exceed any applicable cleanup levels or action levels.
- VC concentrations were **above** the 2 µg/L on-RTRVP property cleanup level in MW-6 (204 µg/L), MW-7 (77.7 µg/L), MW-9 (135 µg/L), MW-20 (211 µg/L), MW-39 (460 µg/L), MW-40 (140 µg/L), and MW-44 (9.16 µg/L).
- The VC concentration was **above** the 6 µg/L modeled cleanup level and action level in MW-6 (204 µg/L), MW-7 (77.7 µg/L), and MW-20 (211 µg/L), which are located adjacent to the Kenai River.
- Benzene was not detected above its cleanup level in any of the lower plume monitoring wells.

#### IV. Concerns of the Public

Prior to and since the Consent Decree was signed, DEC has maintained close communication with the interested public by copying stakeholders with reports, informing them of events, and updating the Kenai River Special Management Area (KRSMA) board during their public meetings. DEC provides published reports to the Kenai River Center in Soldotna, which acts as a repository for RTRVP documents that are available to the public. During these discussions, DEC has received comments regarding various aspects of the cleanup work. DEC has also worked closely with the RTRVP owner's environmental consultant in the planning phase of work proposed for the site and discussed the findings with the consultant. DEC has also worked closely with the Alaska Department of Transportation and Public Facilities (DOT&PF) representatives regarding contamination at the site that may impact upgrade work by DOT&PF to the adjacent Sterling Highway and Kenai River bridge. DEC duly considers input from the public, RTRVP owner's consultant, and DOT&PF while developing plans to perform further assessment/monitoring/cleanup activities. DEC continues to consider such comments by stakeholders and the public at large during this five-year review. Four interested parties have expressed specific concerns, and DEC has responded to those concerns in the manner described below.<sup>1</sup>

##### 1. KRSMA Board Concerns

As noted above, since 2000, DEC has received comments during the KRSMA meetings by board members. Usually they request DEC to provide an update to the board on the status of the cleanup. Board members have primarily focused their concerns on whether the selected treatment system is meeting established cleanup levels and the timeframe to meet those cleanup levels. Below is a bulleted list of Board concerns, followed by DEC's responses, each of which was conveyed to the Board:

- In a letter dated February 27, 2002 (attached), the KRSMA Board noted that it was concerned that: 1) the breakdown of PCE had stalled at the cis-DCE stage; 2) DEC had not performed sediment sampling since 1999 and the KRSMA Board was concerned whether contaminant concentrations in the sediment had changed since then; they furthermore requested a benthic invertebrate study, and 3) high contaminant levels still existed in the upper plume indicating a source under the former dry cleaner.

DEC replied by letter dated March 29, 2002 (attached) that addressed each of these issues. First, DEC acknowledged concern about the degradation of PCE stalling at cis-DCE, that it had had contracted its consultant to evaluate what next steps need to occur, and that it would provide the KRSMA Board with that report when finalized (which DEC did and later implemented a procedure in fall 2002 to inject a consortium of

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<sup>1</sup> In addition to those four noted in this section, the City of Soldotna, the Environmental Protection Agency, the Kenai River Center and the U.S. Fish & Wildlife Service have also requested copies of all information pertinent to the cleanup. In addition, the Kenai River Center also acts as a repository for the cleanup documents in the Soldotna area. DEC will therefore treat these entities as "interested parties," copying them with all relevant documents throughout the remediation process. However, since none have raised specific concerns or questions, they are not described in detail in this section.

microbes, KB-1, in a pilot project to bioaugment a portion of the lower contaminant plume-as discussed on page 3 of this document). Second, DEC indicated intent to implement another sediment sampling program in spring 2002, which it did and provided the report to the KRSMA Board through the Kenai River Center, but that it did not intend to perform a benthic organism study because the contaminant levels in the sediment were not considered extreme. Third, after review of public comments of its Proposed Plan, DEC implemented its selected remedy of injecting HRC™ to treat contaminated groundwater on the RTRVP property prior to it migrating off RTRVP property and posing a risk to the environment. Therefore, this method of treatment would address contamination emanating from the former dry cleaner building.

- Whether the biodegradation is meeting DEC's expectations.

In response, DEC has verbally informed the Board that DEC is overall satisfied with the selected remedy. Although the bioremediation remedy has successfully reduced PCE, it has taken a bit longer than anticipated. However, to address the concern that cis-DCE was not timely degrading, DEC initiated a pilot bioaugmentation program in fall 2002. In addition, DEC has informed the Board that contaminant concentrations are generally decreasing throughout the site.

- When will the site meet cleanup levels established by DEC, and how is DEC speeding up the time to meet cleanup levels.

In response, DEC has continually modified the cleanup project based upon current data and trend data. DEC has injected HRC™ periodically to treat the contaminant plume and pockets of contamination such as around MW-44. DEC continues to assess the site to locate problem source areas such as around MW-44 and develop strategies to address those areas. All of these issues factor into DEC's goal to meet all contaminant cleanup levels and reduce the time to meet cleanup levels. While progress is being made, because of the uncertainty involved, DEC is unclear exactly when the cleanup levels will be consistently met throughout the site.

- Whether VC has been detected in the Kenai River as VC is the most toxic of the PCE degradation products.

In response, DEC has collected surface water samples from the adjacent Kenai River during groundwater sampling events during the open water season. Samples collected since 2000 have not shown any detection of PCE or its degradation products (including VC).

- Whether the remediation would negatively impact the upgrade by DOT&PF on the adjacent Sterling Highway/Kenai River bridge upgrade project.

In response, DEC has verbally informed the Board that since 1996 it has continually informed and provided DOT&PF staff with its RTRVP findings. DOT&PF has taken the information DEC has provided to design the bridge so there would be no impact to delaying the upgrade project.

## 2. DOT&PF Concerns

In addition to comments raised by KRSMA board members, staff from DOT&PF has discussed with DEC staff the cleanup work performed at the site. These comments have been primarily focused on the extent of the contamination in a certain area of the site for planning reasons, because DOT&PF is upgrading the adjacent Sterling Highway and Kenai Bridge. DEC has worked with DOT&PF in decommissioning monitoring wells in the right-of-way and providing data so that the upgrade work would minimize or not impact DEC's monitoring wells or groundwater treatment system. DOT&PF staff has also discussed with DEC staff the management of soils and groundwater generated at the construction site to ensure compliance with applicable state and federal hazardous waste regulations and state contaminated site regulations. Below is a bulleted list of DOT&PF concerns, followed by DEC's responses, each of which was conveyed to the Board:

- What assistance will DEC provide to DOT&PF to ensure that the upgrade project will continue on a timely basis such as providing assistance during plans to design the upgrade project or when DOT&PF encounters any contaminated soil/water that may be considered hazardous waste?

In response, DEC worked with DOT&PF to address these issues, and in September 2000 the agencies jointly signed a Memorandum of Agreement (MOA) that described what actions the two agencies are responsible for and how to assist each other such as DOT&PF minimizing the generation of any waste soil and wastewater, and DEC agreeing to re-depositing of contaminated soil in construction trenches. Since the issuance of the MOA, DEC has provided DOT&PF with technical data on the contamination, met with DOT&PF staff and provided comments on DOT&PF draft design plans and draft procedures to be provided to its contractor(s) when contamination is encountered. As a result of these meetings and transfer of contamination reports, DOT&PF designed and installed a temporary bridge that did not impact DEC's groundwater treatment system and minimized impact to the existing monitoring wells.

### 3. RTRVP Property Owners (and their Consultants') Concerns

As required by the Consent Decree, DEC has consistently provided the RTRVP property owner (usually through their environmental consultants) information that DEC has collected during its assessment/cleanup work. In addition, DEC has briefed the property owners' consultants on the findings and has consistently sought the consultants' input/opinion on the findings. DEC and its consultants have also met with the property owner while onsite during work such as HRC™ injections or completion of monitoring wells. Specific concerns expressed by the RTRVP property owners or their consultants, and DEC's responses, are listed below:

- What is the timeline when DEC will be done at the site?

DEC has responded by informing the property owner that it will continue to perform cleanup and monitoring in accordance to the ROD and Consent Decree until the site meets the ROD's objectives, such as cleanup levels. DEC has responded to this concern by constantly evaluating the data and modifying the treatment system such as bioaugmentation to decrease the time until the site will meet cleanup levels.

- The RTRVP owner expressed his opinion that DEC does not need to include in its long-term plan for replacing the existing bioremediation system with a permeable reactive wall (PRW).

DEC has included in its long-term plan options that have consisted of a likely cleanup approach by periodically injecting HRC™ and monitoring the performance of treatment, an Option 2 in supplementing the HRC™ with a full scale bioaugmentation in both contaminant plume areas, and a “worst-case scenario” where it replaces the existing HRC™ injection system with another treatment system if data shows that cleanup is not adequately working to meet cleanup objectives. In response to the concern, DEC has informed the RTRVP consultant that a PRW is not discussed in the ROD as the ROD only states that upon evaluation that DEC determines that if in-situ biological treatment does not achieve the cleanup goals, DEC will evaluate and implement an alternative remedy. Also in February 2005 DEC informed the RTRVP’s consultant that it was eliminating the “worst-case scenario” from its options based upon favorable data obtained by the U.S. Geological Survey (USGS) study performed in 2003-2004, groundwater trend information and pore water data from fall 2004.

- Whether DEC needs to bioaugment the upper contaminant plume.

In response, DEC has not made a commitment to perform full scale bioaugmentation of either the lower or the upper contaminant plume at this time. DEC is continually evaluating recent and past data to determine what further actions are necessary at the site for assessment and/or cleanup.

#### 4. Mr. Robert Ruffner’s, Executive Director of the Kenai Watershed Forum, Concerns

Mr. Ruffner has expressed concern to DEC regarding the cleanup activities at RTRVP several times, even prior to the Consent Decree being signed. Since the Consent Decree was signed, Mr. Ruffner’s comments focused on the progress of the cleanup and potential exposure of the contamination to the Kenai River and its ecological receptors created by the DOT&PF bridge construction. Specific concerns by Mr. Ruffner, and DEC’s responses thereto, are listed below:

- Whether the soil removed from the Kenai River within a piling during the construction of the temporary bridge in spring 2005 was contaminated. (The individual conveyed this information to DEC via e-mail in April 2005 and provided photographs of the sediment (enclosed). This sediment was contained in the hollow piling and fell out of the piling after it was removed from the river).

DEC responded by contacting and requesting DOT&PF to properly manage and sample the approximate 1.5-2.0 cubic yards of sediment that was temporarily stored at the site. The soils were placed on a liner and covered and sampled. After review of the laboratory data, the soils were transported off site and properly disposed of. The sediment contained low levels of cis-DCE (one of two samples measured a maximum of 0.106 mg/Kg cis-DCE).

- How DOT&PF and its contractor were going to manage water during dewatering of a coffer dam constructed to remove the existing support of the old bridge nearest the

RTRVP property and not spread contamination from the RTRVP site to other portions of the Kenai River.

In response, DEC contacted DOT&PF regarding this proposed construction technique since this procedure was being used to remove the center bridge support and required that about five (5) million gallons of water would be removed from the coffer dam and placed back into the Kenai River down-river of the support. Upon discussion, DOT&PF informed DEC that it modified its approach to remove the support closest to the RTRVP property and will remove the support by mechanical means in March 2006 when the Kenai River was at its lowest water stage. Thus, little or no dewatering would be performed. Whatever wastewater and soil generated will be placed in containers, and properly managed and disposed of off site.

DEC provides copies of its consultants' reports to all four of these interested parties as well as to several other interested parties such as the City of Soldotna.

#### **V. Other Relevant Information**

The only new information relevant to the cleanup decision since the signing of the ROD is the discovery of the deep source area near MW-44. DEC is treating this source area with HRC™ but it is too early to evaluate the effectiveness of this treatment (the first HRC™ injection of the source area occurred in late August 2005).

#### **Conclusion of 5 Year Review of RTRVP ROD**

Two processes to reduce PCE and its degradation products are occurring at the site: reductive dechlorination (the process optimized by the HRC™ injections), and oxidation (suggested by the USGS study). The data shows that the HRC™ treatment has successfully reduced PCE and its degradation products prior to their having migrating off site. Groundwater trend data shows that complete dechlorination (to the final nontoxic end product, ethene) is occurring in the lower plume in the area where the pilot bioaugmentation study occurred around MW-9.

DEC will continue its site monitoring activities to evaluate trends in contaminant levels, and there is no anticipated change in strategy to treat the contaminants of concern. DEC will continue to maintain close communication with the interested public by copying stakeholders with reports, informing them of events, and updating the KRSMA board during their public meetings.

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- USGS (Bradley and Chapelle, 2005) “Chloroethene Biodegradation Potential in the “Lower” Contaminant Plume, River Terrace RV Park, Soldotna, Alaska” dated 2005 (Report 2004-1427).