SDMS DocID 470812

Superfund Records Center
SITE: SAVAGE MILLING WELL OU 2
BREAK: 1.2
OTHER: 470812

Gradient
CORPORATION

July 24, 2008

Richard Goehlert
Remedial Project Manager
U.S. Environmental Protection Agency (US EPA)
One Congress Street, Suite 1100
Boston, MA 02144-2023

Re: 2007 Annual Groundwater Quality Monitoring Report
Savage Well Superfund Site, Operable Unit 2

Dear Mr. Goehlert:

Attached please find a copy of the 2007 (Year 2) annual groundwater quality monitoring report for the Operable Unit 2 (OU-2) portion of the Savage Well Superfund Site located in Milford, New Hampshire. As you are aware, the OU-2 groundwater remedy has now been operating since September 2005. In addition to routinely monitoring influent quality to the treatment plant, groundwater quality has now been monitored for 8 quarters at up to 70 monitoring wells located within OU-2. These data clearly demonstrate that the groundwater remedy is performing effectively and successfully removing contaminant mass:

- Tetrachloroethene (PCE) mass in OU-2 has declined by approximately 60% since system startup (from 1,830 kg in August 2004 to 770 kg in January 2008) as a result of active remediation and natural attenuation (Figure 1).
- The estimated PCE mass in the aquifer based on measurements is less than the model-predicted mass presented in the Remedial Design Investigation Report (US EPA, 2002), *i.e.* remediation is progressing better than anticipated and remedial objectives are likely to be achieved sooner than previously predicted.
- PCE concentrations have declined sharply in most monitoring wells, especially within the active remediation area, *i.e.*, within the capture zone of the groundwater extraction system (Table 1). PCE concentrations within the natural attenuation portion of the remedy (*i.e.*, downgradient of the active remediation) are also declining, but at a slower rate, as predicted by the groundwater model.
- PCE concentrations in a number of monitoring wells have been consistently less than 5 μg/l (the MCL for PCE) or below the quantitation limit.

Overall, these findings demonstrate that the OU-2 remedy is performing better than envisioned and restoring groundwater quality.

Proposed Modifications to Groundwater Quality Monitoring Frequency

Given these results, the Settling Parties are seeking US EPA's approval to reduce the monitoring frequency at selected wells. This is consistent with the Consent Decree Statement of Work (SOW), which states that modifications to the monitoring program may be proposed upon completion of two full years of environmental monitoring. Based on the data collected for the first two years of monitoring, the following modifications are proposed (Table 1):

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- *Semi-Annual Monitoring of Wells w/ Concentrations > 100 μg/l – total of 18 wells:* These wells are generally located within the active portion of the remedy and are exhibiting relatively rapid temporal changes in concentrations at the Site. Semi-annual monitoring will be sufficient to evaluate remedy progression and aquifer response in this area.
- *Annual Monitoring of Wells w/ Quantifiable Concentrations between 2 μg/L and 100μg/l – total of 27 wells:* These wells exhibit relatively stable concentrations (*e.g.* in the natural attenuation zone where concentrations are expected to decline gradually). Because of the minimal change in concentrations over time, annual monitoring will be sufficient to monitor contaminant reduction in these areas.
- *Removal of Monitoring of Wells w/ Concentrations Not Quantifiable (< 2 μg/L) – total of 25 wells:* These wells are generally located along the fringes of the plume where concentrations have been below the quantitation limit of 2μg/L during the first two years of monitoring. Since this trend is expected to continue with ongoing mass removal, these wells will be removed from the monitoring program. These wells will be sampled later when sitewide performance standards are close to being achieved and system shutdown is imminent.

Given that a significant database already exists for the Site (including the 8 quarters of data from the first two years of remedy operations), this reduced monitoring frequency will cost-effectively generate the information needed to monitor aquifer response and remedy progression. To date, the first quarterly monitoring round for Year 3 has been completed. As such, it is proposed that the semi-annual round be scheduled for July/August of the current monitoring year (Year 3) and the annual round be scheduled for November/December. This would provide a total of three monitoring rounds for the third year of system operations.

Please let me know if you have any questions or need any additional information.

Yours truly,

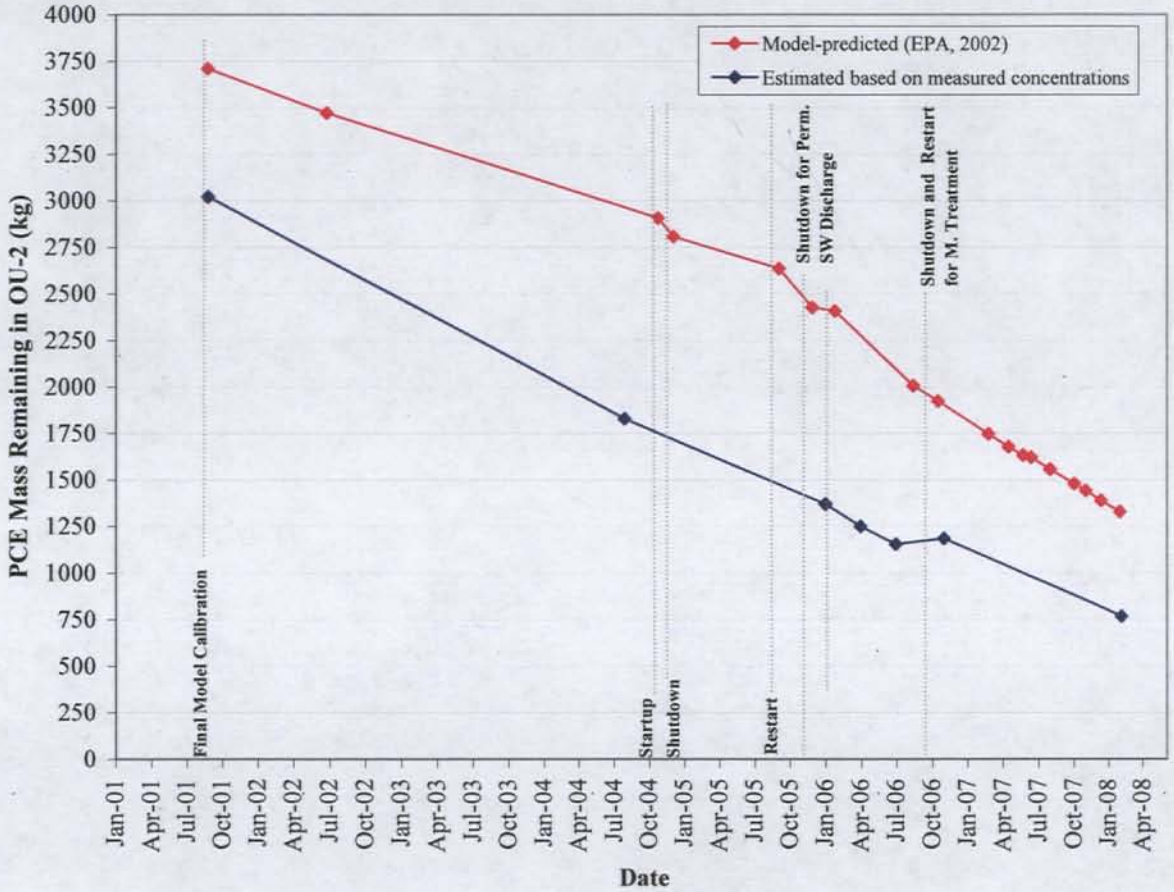
GRADIENT CORPORATION

Manu Sharma, P.E.
Principal

Enclosures

CC: D. Goehlert
R. Mongeon
B. Rand
G. Smith
J. Peltonen
T. Sullivan
O. Chopra

Figure 1
Comparison of Model-Predicted *versus* Estimated PCE Mass Remaining in OU-2
Savage Well Superfund Site, Milford, NH



Notes:

1. The 2001 estimated mass remaining in the aquifer (measurements) was based on plume contour maps presented in Figures 2-5 and 2-6 of the RDIR (EPA, 2002). The 2004 estimated mass was based on contour maps presented in Figures 3-2 through 3-5 of the Baseline GW Monitoring Report (MACTEC and Gradient, 2005). Mass estimates for other events are presented in 2006 quarterly reports 1 through 4 (January 2006 - November 2006) and this 2007 Annual Report. The September 2005 event consisted of a reduced well set that provided insufficient data for estimating mass remaining in the aquifer

Table 1
Groundwater Quality Monitoring Results and Recommended Monitoring Frequency for Year 3
Savage Well Superfund Site, Milford, NH

Model Layer	Well ID	PCE (µg/L)										Monitors	Location Relative to Active Remediation	Average Concentration (Remedy Operation)	Trend	Well ID	Current Monitoring Frequency for Year 2	Recommended Monitoring Frequency for Year 3*
		Baseline		Remedy Operation														
		Aug-04 (8/17/04-9/2/04)	Sep-05 (9/6/05-9/27/05)	Dec-05 (12/20/05-1/10/06)	Apr-06 (4/11/06-4/13/06)	Jul-06 (7/25/06-7/27/06)	Oct-06 (11/7/06-11/9/06)	Apr-07 (4/25/07-4/27/07)	Aug-07 (8/14/07-8/16/07)	Dec-07 (12/4/07-12/5/07)	Jan-08 (1/29/08-2/4/08)							
Layer 1 & 2	FH-4	2/U	-	2/U	2/U	2/U	2/U	2/U	-	-	2/U	NA	North	ND	ND	FH-4	Annual	Remove
	MW-10A	3.6	1.4/J	1.5/J	2/U	2/U	2/U	2/U	-	-	2/U	AR	Within	ND	ND	MW-10A		Remove
	MW-11A	35	16	3.9	1.9/J	2/U	2/U	2/U	-	-	2/U	AR	Within	ND	ND	MW-11A		Remove
	MW-12A	2/U	-	2/U	2/U	2/U	2/U	1.3/J	-	-	2/U	NA	Downgradient	ND	ND	MW-12A		Remove
	MW-19A	1.7	-	1.8/J	1.2/J	2/U	2/U	1.2/J	-	-	2/U	NA	Downgradient	ND	ND	MW-19A		Remove
	MW-20A	1.6	2.1	2.3	1.9/J	2/U	2/U	1.6/J	-	-	1.03/J	AR	Within	ND	ND	MW-20A		Remove
	MW-21B	2/U	-	2/U	2/U	2/U	2/U	2/U	-	-	2/U	NA	Downgradient	ND	ND	MW-21B		Remove
	MW-22A	1.2	-	2/J	2/U	2/U	2/U	2/U	-	-	2/U	NA	Downgradient	ND	ND	MW-22A		Remove
	MW-32B	2/U	-	2/U	2/U	2/U	2/U	2/U	-	-	2/U	NA	Downgradient	ND	ND	MW-32B		Remove
	MW-101A	1.9	2.2	2.2	2/U	2/U	1.5/J	1.1/J	1.5/J	-	2/U	AR	Upgradient	ND	ND	MW-101A		Remove
	MW-112A	2/U	2/U	2/U	2/U	2/U	2/U	2/U	-	-	2/U	AR	Within	ND	ND	MW-112A		Remove
	MW-113A	7.5	-	2/U	1.3/J	1.1/J	3.3	2/U	-	-	2/U	NA	Downgradient	ND	ND	MW-113A		Remove
	MW-118A	2/U	-	1.1/J	2/U	2/U	2/U	2/U	-	-	2/U	NA	Downgradient	ND	ND	MW-118A		Remove
	FH-27	12	-	51	31	19	30	24	14	-	34.7	NA	Downgradient	2-100	Stable	FH-27	Semi-Annual	Annual
	MW-13A	230	230	260	54	83	32	47	17	-	6.24	AR	Within	2-100	Stable	MW-13A		Annual
	MW-24A	150	-	61	20	14	44	3	20	-	59.5	NA	Downgradient	2-100	Stable	MW-24A		Annual
	MW-104A	360	-	300	320	290	230	96	97	-	94.3	AR	Within	>100	Decreasing	MW-104A		Semi-Annual
	MW-105A	15	-	25	26	14	8.4	18	8.9	-	15.8	NA	Downgradient	2-100	Stable	MW-105A		Annual
	MW-109A	400	-	220	270	280	200	82	140	-	145	AR	Within	>100	Stable	MW-109A		Semi-Annual
	MW-115A	3.1	-	3.7	2.7	2.3	2.4	1.9/J	2.1	-	1.38/J	NA	Downgradient	ND	ND	MW-115A		Remove
	PZ-B3	39	-	38	13	2.1	4.8	8.3	1.9/J	-	13.5	NA	Downgradient	2-100	Stable	PZ-B3		Annual
	MW-14A	430	-	560	350	390	320	210	350	460	313	NA	Downgradient	>100	Stable	MW-14A	Quarterly	Semi-Annual
	MW-103A	290	200	62	51	46	14	9.1	6.6	5.3	6.09	AR	Within	2-100	Stable	MW-103A		Annual
	MW-104	450	-	430	360	370	300	190	37	37	56.9	AR	Within	>100	Decreasing	MW-104		Semi-Annual
Layer 3	FH-9	2/U	-	2/U	2/U	2/U	2/U	2/U	-	-	2/U	NA	North	ND	ND	FH-9	Annual	Remove
	MI-4	2/U	-	1.2/J	2/U	2/U	2/U	2/U	-	-	2/U	NA	Downgradient	ND	ND	MI-4		Remove
	MI-10	2/U	-	2/U	2/U	2/U	1.5/J	2/U	-	-	2/U	NA	Downgradient	ND	ND	MI-10		Remove
	MW-10B	10	12	4.2	6.6	6.4	12	2.2	-	-	6.75	AR	Within	2-100	Stable	MW-10B		Annual
	MW-11B	61	41	6.1	13	2/U	16	2.3	-	-	2/U	AR	Within	2-100	Stable	MW-11B		Annual
	MW-21C	5.2	-	3.8	2/U	2.5	2/U	1.4/J	-	-	1.2/J	NA	Downgradient	ND	Stable	MW-21C		Remove
	MW-101B	2/U	2/U	2/U	2/U	2/U	2/U	2/U	-	-	2/U	AR	Upgradient	ND	ND	MW-101B		Remove
	MW-118B	9.7	-	11	4.2	7.6	7	7.8	-	-	7.11	NA	Downgradient	2-100	Stable	MW-118B		Annual
	PZ-B4	70	-	19	3.9	1.2/J	3.5	2.9	-	-	1.3/J	NA	Downgradient	2-100	Stable	PZ-B4		Annual
	MI-11	3.3	-	1.2/J	1.8/J	2/U	1.9/J	2.1	1.9/J	-	1.51/J	NA	Downgradient	ND	ND	MI-11	Semi-Annual	Remove
	MI-31	-	26	22	33	54	110	45	90	-	65.8	AR	Upgradient	2-100	Stable	MI-31		Annual
	MW-12B	2/U	-	1.3/J	2/U	2/U	2/U	2/U	2/U	-	2/U	NA	Downgradient	ND	Stable	MW-12B		Remove
	MW-13B	120	110	99	86	92	87	30	65	-	57.8	AR	Within	2-100	Stable	MW-13B		Annual
	MW-108A	610	460	65	190	120	90	14	16	-	3.92	AR	Within	2-100	Stable	MW-108A		Annual
	MW-109B	530	-	460	470	450	440	910	390	-	510	AR	Within	>100	Stable	MW-109B		Semi-Annual
	MW-110A	760	130	160	30	32	24	22	23	-	18	AR	Within	2-100	Stable	MW-110A		Annual
	MW-111A	6.8	9	17	6	6.5	2.3	10	3.2	-	2.02	AR	Within	2-100	Stable	MW-111A		Annual
	MW-114	41	-	11	5.8	5.3	17	5.9	8	-	6.56	NA	Downgradient	2-100	Stable	MW-114		Annual
	MW-115B	7.9	-	13	9.3	10	12	9.6	11	-	12.3	NA	Downgradient	2-100	Stable	MW-115B		Annual
	MW-14B	360	-	64	240	280	230	160	240	150	256	NA	Downgradient	>100	Stable	MW-14B	Quarterly	Semi-Annual
	MW-20B	390	810	890	280	310	390	330	320	500	387	AR	Within	>100	Decreasing	MW-20B		Semi-Annual
	MW-102B	780	-	320	170	120	48	28	17	22	20.3	AR	Within	2-100	Stable	MW-102B		Annual
	MW-103	960	1100	960	470	600	590	84	350	550	13.4	AR	Within	>100	Decreasing	MW-103		Semi-Annual
	MW-105	550	-	210	160	84	310	160	130	3.7	6.76	AR	Within	>100	Decreasing	MW-105		Semi-Annual
	MW-106	140	85	150	62	160	95	79	88	85	2/U	AR	Within	2-100	Stable	MW-106		Annual
	MW-107A	210	150	72	320	30	28	36	18	23	15.7	AR	Within	2-100	Stable	MW-107A		Annual
	MW-116A	470	-	660	380	270	170	180	200	190	169	NA	Downgradient	>100	Decreasing	MW-116A		Semi-Annual

Legend:
NA - Natural Attenuation
AR - Active Remediation Area (Within Capture Zones)
ND - Non-Detect
J - Compound detected below method quantitation limit, estimated value provided.
U - Compound not detected above method quantitation limit, quantitation limit provided.
E - Compound detected above upper range of instrument calibration, estimated value provided.

General Screening Applied:
Removed
Concentrations = ND (µg/L)
Annual
Concentrations = ND to 100 (µg/L)
Semi-Annual
Concentrations = > 100 (µg/L)

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Savage Well Superfund Site, Milford, NH

Model Layer	Well ID	PCE (µg/L)										Monitors	Location Relative to Active Remediation	Average Concentration (Remedy Operation)	Trend	Well ID	Current Monitoring Frequency for Year 2	Recommended Monitoring Frequency for Year 3*
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Layer 4	MW-102	360	130	150	52	56	32	34	35	-	24.2	AR	Within	2-100	Stable	MW-102	Semi-Annual	Annual
	MW-110B	1300	1400	1000	1000	860	1100	410	1100	-	411	AR	Within	>100	Decreasing	MW-110B		Semi-Annual
	MW-117	2.1	-	3.1	1.2/J	1.7/J	1.4/J	1.4/J	1/J	-	2/U	AR	Downgradient	ND	ND	MW-117		Remove
	MW-120A	840	610	98	130	61	49	18	20	-	14.8	AR	Within	2-100	Stable	MW-120A		Annual
	MW-120B	370	560	21	35	12	10	20	18	-	-	AR	Within	2-100	Stable	MW-120B		Annual
	MW-107B	200	340	200	200	110	180	140	170	85	54	AR	Within	>100	Stable	MW-107B	Quarterly	Semi-Annual
	MW-111B	170	22	90	70	75	85	120	53	61	56.7	AR	Within	2-100	Stable	MW-111B		Annual
Layer 5	MW-9C	1.9	1.3/J	1.4/J	2/U	2/U	2/U	1.8/J	-	-	2.45	AR	Within	ND	ND	MW-9C	Annual	Remove
	MW-10C	51	74	190	48	37	46	47	36	24	18.6	AR	Within	2-100	Stable	MW-10C	Quarterly	Annual
	MW-17C	36	23	32	29	22	7	17	1.6/J	4.2	6.27	AR	Within	2-100	Stable	MW-17C		Annual
	MW-101C	540	470	470	440	460	380	320	280	390	234	AR	Upgradient	>100	Decreasing	MW-101C		Semi-Annual
	MW-107C	380	420	550	50	290	170	170	210/E	250	278/E	AR	Within	>100	Stable	MW-107C		Semi-Annual
	MW-111C	1200	760	740	510	190	130	100	140	140	75.4	AR	Within	>100	Decreasing	MW-111C		Semi-Annual
	MW-120C	1700	2400	2200	1700	1500	1300	690	1400/E	990	996/E	AR	Within	>100	Decreasing	MW-120C		Semi-Annual
Bedrock	MW-31R	1.3/J	-	2/U	2/U	2/U	2/U	1.7/J	-	-	2/U	NA	Downgradient	ND	ND	MW-31R	Annual	Remove
	MW-116R	2/U	-	2/U	2/U	2/U	2/U	2/U	2/U	-	2/U	NA	Downgradient	ND	ND	MW-116R		Remove
	MW-19B	67	-	51	32	39	29	13	44	-	44.7	NA	Downgradient	2-100	Stable	MW-19B	Semi-Annual	Annual
	MW-11R	940	690	480	460	460	420	410	480	540	570	AR	Within	>100	Stable	MW-11R	Quarterly	Semi-Annual
	MW-14R	220	-	440	230	260	220	180	190	180	192	NA	Downgradient	>100	Decreasing	MW-14R		Semi-Annual

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