



225 Bush Street
Suite 1700
San Francisco, CA 94104
415.896.5900 phone
415.896.0332 fax

memorandum

date May 2, 2008
to ALRRF Community Monitor Committee
from Kelly Runyon
subject Summary of Findings Regarding Groundwater Quality Concerns

At the March 12, 2008 Community Monitor Committee meeting, Committee Member Cabanne expressed several concerns regarding groundwater quality and groundwater monitoring at the Altamont Landfill and Resource Recovery Facility (ALRRF). These have been investigated by Treadwell and Rollo, which is part of the Community Monitor team, and their findings are attached. This memo provides a brief summary.

Eric Morita of Treadwell and Rollo is well versed in standard groundwater monitoring procedures. He has reviewed available documentation, and he closely observed monitoring of one groundwater well (E-20B) in early April. However, he has not yet had the opportunity to review the current Site-Specific Groundwater Monitoring Plan, which may allow deviation from standard procedures based on local conditions. That Plan has been requested from Waste Management. Absent that document, he has used the descriptions of monitoring requirements that were available in recent semi-annual groundwater monitoring reports as the basis for evaluation.

General Requirements

By reviewing the facility permits and the Semi-Annual Groundwater Monitoring Reports from 2006 to the present, Treadwell and Rollo has determined that groundwater monitoring activities have been in compliance. The required wells are installed and they are being monitored at the correct frequency.

Purging and Sample Handling

Treadwell and Rollo has examined three issues related to monitoring: the extent of purging, the rate of purging, and the capture and handling of samples. The underlying principle that governs these activities is that *exposure to air can reduce VOC concentrations*. Wells are purged to remove stagnant water that has been exposed to air, and to enable water to flow into the well from the adjacent soil and rock. This fresh water should contain any volatile organic compounds (VOC's) that may be present near the well. However, if the well is purged too quickly, turbulence within the well casing may promote the evaporation of some of these VOC's before they can be withdrawn in a sample. Finally, the samples must completely fill the sample bottle so that no air is in contact with the sample itself.

In brief, Treadwell and Rollo found that at the ALRRF, the extent of purging has been in compliance with known requirements. Also, the observed samples were properly captured and containerized to prevent extended exposure to air. However, the rate of purging may be too high and may cause some reduction in VOC's. We expect to

have a better understanding of the applicable purge rate requirements in time for the May 14 Community Monitor Committee meeting.

Groundwater Interceptor Barrier (GWIB) Shutdown

The GWIB was constructed in 1987 to intercept groundwater that had been found to contain VOC's. Diminished concentrations of VOC's led to a trial shutdown of pumping from the GWIB in February 2004, and subsequent study of groundwater data has indicated that shutting down the GWIB had no adverse effect on groundwater quality. Additional data suggest that the VOC's were reduced by enhancements to the landfill gas extraction system at the site in the mid 1990's. Permanent shutdown of the GWIB is likely to be approved by the RWQCB later in 2008.

Vadose Zone Monitoring

At the March 12 CMC meeting, the following question was raised: Were the high vadose-zone concentrations in the first and second quarters of 2006 one-time events, or part of a trend? Quarterly vadose-zone concentrations for the past seven years are summarized in Table 7 of the *Second Semi-Annual 2007 Groundwater Monitoring Report*. From that table two things are apparent: (1) the high VOC concentrations cited by TechLaw were estimated values, because the concentration was below the reporting limit; and (b) all of the high concentrations cited by TechLaw diminished in subsequent quarters. However, data from 2007 shows some elevated concentrations of ammonia and nitrogen. Concentrations are in the range of 1 to 5 parts per million, which is quite low, but these data should be watched in subsequent quarters to determine if a trend is occurring.



MEMORANDUM

TO: Kelly Runyon

FROM: Eric Morita

DATE: 28 April 2008

PROJECT: Altamont Landfill
Livermore, California
4774.01

SUBJECT: Groundwater Analysis for Community Monitor Progress Report #1 No. of Pages: 5

Treadwell & Rollo, Inc. (Treadwell & Rollo) has reviewed hydrogeologic data for the Altamont Landfill and Resource Recovery Facility in Livermore, California (ALRRF). Treadwell & Rollo performed the following tasks:

- Reviewed available documents
- Investigated the concerns brought up during the last meeting
- Observed groundwater sampling procedures performed at well E-20B

The following memorandum describes the results of the above tasks and our opinion as to whether the represent potential concerns for the Community Monitor Committee.

Document Review

Treadwell & Rollo reviewed the following documents:

- *Solid Waste Facility Permit* (01-AA-0009) issued by the California Integrated Waste Management Board (CIWMB);
- *Waste Discharge Requirements* (R5-2002-0119) issued by the State Water Resources Control Board (SWRCB);
- *Semiannual Groundwater Monitoring Report for the Altamont Landfill and Resource Recovery Facility* by SCS Engineers in 2005, 2006, and 2007; and
- Groundwater Interceptor Barrier (GWIB) Pilot Study Report, Altamont Landfill and Resource Recovery Facility, Near Livermore, California dated August 2005 (WDR Order R5-02-119) dated August 2005.

Groundwater monitoring activities performed by Altamont Landfill, as required by the *Solid Waste Facility Permit* (01-AA-0009) and *Waste Discharge Requirements* (R5-2002-0119), were found to be in compliance during the years of 2005, 2006, and 2007. In addition, these reports were reviewed for issues described in previous meeting minutes and for potential trends in groundwater analytical data over recent years.

Other important documents were identified but were not immediately available for our review. These include:

- *General Industrial Storm Water Discharge Permit* (5S01S000600) by the SWRCB;
- *Expansion Area Site Characterization Altamont Landfill and Resource Recovery Facility* by Rust Environment and Infrastructure, Inc. (RUST) dated 1994;
- *Site-Specific Groundwater Monitoring Plan, Altamont Landfill and Resource Recovery Facility*, by RUST dated June 1996;

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- *Proposed Title 27 Detection Monitoring Program for the Existing Fill Area 1 and Proposed Expansion Area*, by RUST dated June 1998; and
- *Technical Memorandum and Pilot Study Workplan for Terminating Groundwater Interceptor Barrier (GWIB), Altamont Landfill and Resource Recovery Facility*, by SCS dated 5 November 2003

Previous CMC Meeting

A number of questions were asked during the Community Monitor Committee (CMC) meeting on 12 March 2008. Treadwell & Rollo has reviewed and addressed the questions as described below.

Have the groundwater wells required in the Settlement Agreement and CUP been installed? When? Also, the Techlaw report indicated that wells E24 and E25 had not been installed although they were supposed to have been, according to work done by WMAC's consultant, Rust Engineering.

Based on the information provided to us, installation of groundwater wells is not directly required as part of the Settlement Agreement or Conditional Use Permit. The Settlement Agreement and Conditional Use Permit names the *Waste Discharge Requirements* (R5-2002-0119) by the State Water Resources Control Board (SWRCB) as the document which pertains to monitoring wells at the landfill. Although monitoring wells have been installed in the expansion areas, they do not fall under any requirements which we have been able to review.

In discussion of recent and prior inspections, Ms. Cabanne requested greater emphasis on review of groundwater protection. She stated that the prior CM, Techlaw, reported (in May 2006) that there had been insufficient purging during sampling, and that they (Techlaw) had concerns about sampling of the following wells: E06, E05, E07, and E20. Furthermore, in their last report for 2006, Techlaw indicated that there had been insufficient purging of groundwater wells MW-9 and MW-10 immediately prior to sampling, and that there were the following additional concerns: trace volatile organic compounds (VOC's) in E03A, E21, and E23; and an exceedance of vinyl chloride detected in well E20. Ms. Cabanne asked that the Community Monitor review prior groundwater monitoring reports, from 2006 through the present, to determine if the exceedances are due to a temporary shutdown, and if these exceedances / concerns are one-time events or part of a trend.

Purging - Stagnant groundwater can remain within monitoring wells between sampling events for months and may not be representative of water within the formation. In order to sample water from the formation, groundwater is purged before each well is sampled. To verify that formation water has entered the well, physical parameters such as pH, temperature, and electronic conductivity are recorded until all values have stabilized. Specific requirements for stabilization were not listed in the documents available for review; however we discussed the stabilization requirements with Jim Obereiner of Waste Management. According to Mr. Obereiner, purging requirements under the permit requirements are listed in the RUST document dated June 1996. Mr. Obereiner indicated that after sequential readings show a change of ± 0.2 for pH, ± 1 degree Celsius ($^{\circ}\text{C}$), and a percent difference of 5 percent for electrical conductivity, groundwater is considered stabilized and therefore appropriate for sampling.

Treadwell & Rollo reviewed Techlaw's progress reports from early 2006 and associated groundwater monitoring reports. It was verified that there was insufficient documentation of purging during the groundwater monitoring performed in the 4th Quarter of 2005. Insufficient documentation of purging

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does not necessarily indicate that insufficient purging was performed. Wells E-21, E-05, and E-07 were specifically identified as wells which were insufficiently documented as being purged as there were only one documented reading for each well. Techlaw notified Waste Management and the RWQCB of the inadequate purging documentation. Since then Waste Management's groundwater monitoring consultant has documented at least 3 parameter readings before declaring that a well is stabilized. Groundwater analytical data in these wells have remained below background concentrations and detection limits. No significant trends were identified as a result of the change in purge documentation procedure for these wells and currently do not represent a concern for the Community Monitor group.

Groundwater Quality Concerns - The following addresses the groundwater quality concerns in wells E05, E06, E07, and E20B. No volatile organic compounds (VOCs) have been detected above background concentrations in E05, E06, or E07; therefore it is unknown what concerns the Community Monitor Committee may have for groundwater from these wells. They were mentioned in Techlaw's May 2006 report, but Techlaw did not identify any specific problems with these wells.

Specific conductance has been reported in all wells at elevated concentrations, but these values are typical of connate water (natural conditions) and are not the result of landfill operations.

Well E20B is the only well with VOCs (only vinyl chloride) detected above background concentrations in groundwater. Concentrations of vinyl chloride detected in groundwater were above drinking water standards (0.5 micrograms per liter [$\mu\text{g/L}$]) in 2006. SCS Engineers indicated that the vinyl chloride detected in groundwater is from the elevated concentrations in the vadose zone (soil gas) and not from a groundwater source. The RWQCB has concurred with such an assessment and has required that Altamont Landfill increase the amount of soil vapor extraction (methane recovery system) to reduce the concentrations of vinyl chloride in soil gas, and hence, groundwater. Since then, vinyl chloride has steadily decreased from 2.9 $\mu\text{g/L}$ in the 2nd Quarter 2007, to 0.87 $\mu\text{g/L}$ in the 3rd Quarter of 2007, to below laboratory detection limits (less than 0.5 $\mu\text{g/L}$). Based on the current trend, vinyl chloride in groundwater from E20B is not a concern for the Community Monitor Committee.

The previously mentioned "trace" detections of VOCs in all of the other wells do not trigger regulatory action as these concentrations are estimated values reported by the laboratory. Many of the reported numbers have laboratory flags next to them indicating that they are estimated. The concentrations are outside of the range of accuracy based on the analytical method used. All analytical methods have limitations on the range of accuracy that are related to procedures such as dilutions, calibration standards, or protocols. Based on this information, estimated concentrations listed in the groundwater monitoring reports are not a concern of the Community Monitor Committee.

Also: have purging procedures changed?

Purging requirements which are enforceable under the permit are listed in the *Site-Specific Groundwater Monitoring Plan, Altamont landfill and Resource Recovery Facility*, by RUST in June 1996. We have not had the opportunity to review this document yet.

As far as we know, purging requirements have not changed since the RUST document dated June 1993. The *Proposed Title 27 Detection Monitoring Program for the Existing Fill Area 1 and Proposed Expansion Area*, by RUST in June 1998 may be suggesting changes, but we have not yet had the opportunity to review it, nor do we know if has been submitted to the RWQCB. In any event, changes in the monitoring

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program procedures would need to be approved by the RWQCB before they could be officially implemented.

Until we have reviewed these documents, we cannot provide an opinion regarding the compliance of purge activities.

Ms. Cabanne also made the following request: In August 2005 there was a request being prepared for a variance regarding shutdown of the groundwater interception trench. Was that request submitted to the Regional Water Board? Did they approve? What has been the situation since then, with regard to groundwater quality?

A Pilot Study Workplan by SCS Engineers dated 5 November 2003 was submitted to the RWQCB which was conditionally approved in a letter to Jim Obereiner dated 3 February 2004. A GWIB Pilot Study Report by SCS Engineers dated 26 August 2005 was submitted to Waste Management. This report summarized the groundwater data which was collected following the termination of pumping from the GWIB. Results of the GWIB Pilot Study Report indicated that no adverse effects on groundwater have occurred since the cessation of the groundwater extraction. No VOCs have been detected above reporting limits in the GWIB since 1992. According to Mr. Obereiner who is in discussion with the RWQCB, final shutdown of the GWIB is likely to be approved later in 2008.

As part of the cessation of the groundwater pumping within the GWIB in February 2004, Altamont Landfill indicated that the NPDES permit (0083763) was no longer necessary and was rescinded under approval by the RWQCB on 21 May 2007. Discussions with Howard Hold of the RWQCB and Jim Obereiner of Waste Management, Inc., revealed that the NPDES permit was issued for discharge of the groundwater that was pumped from the GWIB to surface waters. Since the GWIB was shut down, discharge to the surface water system was no longer needed, and thus, the NPDES permit was no longer needed.

Groundwater Sampling Procedures Observed at Well E20B

On 9 April 2007, Eric Morita of Treadwell & Rollo observed groundwater sampling procedures performed at monitoring well E-20B. E-20B is the only well with VOCs historically detected in groundwater. Vinyl chloride (a VOC) detected in groundwater from E-20B has historically been above drinking water standards; however, recent data indicate that such concentrations have been trending lower with recent data in the 4th Quarter of 2007 being below laboratory detection limits and below drinking water standards.

Mr. Morita met with Jim Obereiner at the site at 9 am and discussed background information about the Altamont Landfill and previous documents prepared for the Site.

Well E-20B was in excellent condition and had no signs of damage. Groundwater was purged using a bladder pump at a purge rate of 750 milliliters per minute (equivalent to 0.198 gallons per minute [gpm]). All equipment included the use of dedicated tubing which eliminates problems associated with cross-contamination between wells. All equipment was properly calibrated and measurements of pH, temperature, and conductivity were stabilized according to the criteria stated above. Groundwater samples were appropriately sampled (zero headspace), collected in laboratory supplied bottles, labeled, placed in an ice-chilled cooler, and documented under chain-of custody protocols. The groundwater

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sample did not have any odors, discoloration, or oily-sheen. Purge water (750 milliliters) was decanted onto a concrete pad in accordance with RWQCB protocols.

With the exception of the purge rate, all activities were performed in accordance with those described in the groundwater monitoring reports by SCS Engineers from 2005 to 2007. Previous groundwater monitoring reports indicated that the purge rate was to be less than 0.1 gpm, however, the purge rate was nearly twice that value (0.198 gpm). It could not be determined if a purge rate of almost 0.2 gpm violates the permit conditions for the Altamont Landfill as the documents outlining specific groundwater monitoring procedures were not available for review (i.e., *Site-Specific Groundwater Monitoring Plan, Altamont landfill and Resource Recovery Facility*, dated June 1996; *Proposed Title 27 Detection Monitoring Program for the Existing Fill Area 1 and Proposed Expansion Area*, dated June 1998). It should be noted that high purge rates can result in volatilization of VOCs in groundwater and possibly result in lower reported concentrations. This would only be a concern if such purge rates actually violate the permit requirements and will be followed up after the applicable documents are received by ESA and Treadwell & Rollo.