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TECHNICAL MEMORANDUM

To: John McKenzie (County of San Luis Obispo)

From: Timothy A. Nicely, CHg

Copy: David Gardner, Paul Sorensen (Fugro), Keith Miller (SWCA)

Subject: **Technical Memorandum No. 2, Well Pump Test Analysis and Water Demand Audit, Cold Canyon Landfill Expansion Environmental Impact Report**

Fugro is pleased to submit this consolidated technical memorandum (TM) to the County of San Luis Obispo Planning and Building Department, which documents the methods and results of pumping tests of three on-site wells at the Cold Canyon Landfill as well as an audit of water use at the landfill during the first half of 2010. The pumping tests were designed and performed to address several groundwater-related comments received after the circulation of the draft environmental impact report (DEIR) associated with the proposed expansion of the Cold Canyon Landfill. Generally, the DEIR comments related to further definition of the hydrogeology of the area, the pumping capacity of the existing wells at the landfill, use of the wells, and what effects any anticipated additional use of groundwater at the landfill (i.e., groundwater extractions) would have on other wells in the "basin." The well-testing program was developed based on discussion with County of San Luis Obispo staff, and included pumping tests of the existing three landfill wells for durations of up to 72 hours. This work was performed during the latter half of 2009. The scope of the well testing program was presented in our proposal dated May 22, 2009 (revised June 22, 2009), which is included in Appendix A - Supporting Documents.

The June 22, 2009 proposal also included a task to better quantify and understand how groundwater (and any other sources of water at the landfill) was being used for such things as dust control, composting, odor control, and other landfill activities. An initial draft TM discussing the results of the well testing program and water demand analysis was submitted to County of San Luis Obispo staff in early January 2010. The technical memorandum concluded that the amount of groundwater use and landfill water demand could not be accurately determined, largely due to the relatively short time period during which such records were available, inferred seasonal variations in landfill water use and certain deficiencies in the record keeping of these activities by landfill operations staff. During the period from February to May 2010, landfill operations staff subsequently initiated improved record keeping of daily water demand and groundwater use. Based on these additional records, Fugro was requested to provide further analysis of the landfill groundwater use and water demands. Our proposal dated June 1, 2010 (also included in Appendix A) describes the focus of this supplemental work. In July 2010 we

issued a draft TM that discussed the results of the supplemental landfill water supply and demand analysis. This TM was subsequently updated with several additional months of landfill water use data.

This consolidated TM thus provides information and analysis of groundwater use and water demand at the landfill for the period from about June 2009 through August 2010. A discussion of the well testing program and well capacity/interference analysis is provided first, followed by an analysis of the data of groundwater use at the landfill and how this groundwater (and other sources of water) is used. Landfill composting operations have and are anticipated in the future to comprise a significant part of the landfill water demand. A comparison of green waste tonnage accepted at the landfill and composting operations was used to assess seasonal variations in this water demand and to estimate how expansion of the landfill, and possible expansion of composting operations, would affect future water demand.

BACKGROUND

The well-testing program was designed to refine and support (or refute) a number of assumptions and data contained in the DEIR, specifically the capacity and sustainable yield of the existing landfill wells. Based on a survey of the area, two nearby water wells and four on-site monitoring wells, inferred to share hydraulic connection with the landfill wells were identified and instrumented to determine well interference effects.

To fulfill the objectives of the program, the following scope of work was performed:

1. A pre-test field visit was conducted to meet with the landfill operator, identify the status of the wells to be tested, and the ability of those wells to meet the testing criteria (pumping capacity, ability to measure water levels, ability to meter flow, etc.), and also conduct a survey of nearby wells potentially suitable for inclusion in the monitoring network;
2. A brief TM (TM No. 1, Fugro May 22, 2009) was prepared that identified the wells to be pumped and the wells to be monitored, the methods to be used in the pumping tests, anticipated instrumentation needs (meters and ability to measure water levels), and nearby private wells potentially suitable for monitoring;
3. Well capacity tests were performed to confirm the production capacity of each of the three Weir wells;
4. Water level data in the pumping wells, proximate onsite monitoring wells and proximate off-site wells were monitored to better define aquifer storativity, conductivity, and drawdown;
5. The well drawdown and interference effects on two neighboring wells were analyzed;
6. A draft TM was prepared (TM No. 2 dated February 8, 2010) was prepared summarizing the field work performed and the results. It was anticipated that this TM No. 2 would be incorporated in the revised DEIR (to be prepared by SWCA).

As described in Fugro (March, 2008), landfill water demand is met by using several wells, two of which, the so-called Weir wells, are located near the southeast corner of the landfill expansion area. The wells are referred to as Weir Wells No. 1 and 2. As part of this well testing program, a third Weir Well, No. 3, was fitted with an operational pump and placed into active service. Although California Department of Water Resources (DWR) State Well Completion reports do not exist for these wells, landfill staff believe that Weir Well No. 1 was installed around 1956 and Weir Well No. 2 was installed around 1975. Weir Well No. 3 is more recent, but the exact date of construction is unknown. The wells are between 156 feet (Weir Well No. 2) and 244 feet deep (Weir Well No. 3) and produce water from a sandstone aquifer of the Pismo Formation. This aquifer is well-defined in the area, generally trends east-west and is bounded by well-defined features (refer to Golder, 2007; Fugro, 2008). The hydraulic conductivity of the Edna Member of the Pismo Formation, the only member present below the site, was previously determined based on a constant-discharge test within on-site well P-1B to be approximately 0.65 ft/d. The effective porosity of the formation is estimated to be 25 percent (Golder, 2007).

Prior to September 2009, none of the Weir wells were fitted with meters to record either instantaneous flow (in gallons per minute [gpm]) or how much groundwater was being used. For this testing program, each Weir well was instrumented by Farm Supply of Arroyo Grande with an in-line flow meter, a valve to regulate discharge, and an access tube into which a pressure transducer was placed to monitor water-level variations. Coordination with the landfill operations staff was required to perform the tests so that only a single well was pumping during each test, and to ensure that, to the degree possible, the pumping well could be pumped at a constant discharge rate. The produced groundwater was pumped to an on-site pond. After completion of each pumping test, the rate of recovery of water levels in each well was monitored for a period of at least 72 hours, during which all of the Weir wells remained off. The field activities associated with performance of the pumping tests for the well-testing program were performed between Friday, September 18 and Friday, December 11, 2009.

As mentioned above, a related aspect of the supplemental study conducted in the latter half of 2009 was to generally determine how groundwater was being used at the landfill for dust control, compost irrigation, or other uses. To accomplish this, we provided Mr. Bruce Rizzoli with forms on which he was requested to record this information on a daily basis. The results of this initial attempt to determine landfill water use and demand, as well as follow-up work associated with the analysis of landfill water use and demand activity performed largely in June 2010 is described in a draft technical memorandum dated July 8, 2010 contained in Appendix A. The conclusions of that TM are incorporated in this final TM.

WELL TESTING PROGRAM

On-Site Well Survey

On Friday, September 18, 2009, we met with the landfill operations manager, Mr. Bruce Rizzoli at the landfill to assess our ability to perform the testing. The purpose of the meeting was to determine what was required to: 1) perform the pumping tests, and 2) document current water use at the landfill for each landfill activity that required water (composting, materials

recovery facility [MRF], and dust-control). Additionally, Mr. Rizzoli described his understanding of the location of water wells surrounding the landfill for possible inclusion in the testing program.

During our meeting, we visited and documented the condition of 12 on-site monitoring wells, and each of the three Weir wells. Based on that survey, we determined that all of the on-site monitoring wells were suitable for monitoring during the pumping tests and for the installation of water-level pressure transducers. Four of the nearest monitoring wells were selected for inclusion in the program because of their relative proximity to the pumping wells. For inclusion, it was required that each monitoring well be deep enough for it have water within it. The selected on-site monitoring wells were between 90 and 100 feet deep. A monitoring well located closer to Weir Well No. 3 was too shallow and was dry. The other monitoring wells on-site were farther from the pumping wells than the selected monitoring wells. The locations of the monitoring wells are presented on Plate 1 - Well Testing Program Monitoring Network. Photographs of each of the monitoring wells are presented in Appendix B - Site Photographs.

The wellheads of each of the three Weir wells were also inspected. Each Weir well consists of a 5-inch steel casing fitted with an operational submersible electric pump. Based on the inspection, it was determined that each of the three wells required the installation of a McCrometer or similar in-line 2-inch totalizing flow meter, a valve to regulate discharge, and an access tube for installation of the pressure transducers. In addition to the flow meters to be installed at each well head, it was requested that a meter be installed at the outflow to the on-site pond and at the outflow to the tank adjacent to the MRF. The meter to be installed at the pond outflow was placed to quantify the combined outflow from all of the Weir wells at a point where that water enters the pond. Water from the pond is then subsequently pumped into water trucks for use at the composting facility and for dust control purposes on the roads throughout the site. These requested modifications were coordinated by Mr. Rizzoli and completed by Farm Supply of Arroyo Grande by Monday, October 12, 2009.

Neighboring Wells Survey

During the meeting of Friday, September 18, 2009, Mr. Rizzoli directed us to the locations of several active wells surrounding the landfill. The wells surrounding the landfill determined to be appropriate for inclusion in the monitoring network (i.e., appropriate depth and perforated interval) were generally located to the east and south of the landfill, generally surrounding the Weir property (expansion area). The wells located to the north of the landfill were not considered for inclusion in the monitoring network because these wells are located in the Monterey formation, which is a distinctly different aquifer.

In response to letters sent by the County of San Luis Obispo to adjacent landowners, several landowners expressed interest in having their wells included in the monitoring program. On Tuesday, November 3, 2009, we met with several well owners. These owners and their representatives included Bruce Falkenhagen, Sue Barone, Earl Darway and their hydrogeologist Charlie Katherman, and Pat Clements.

Many of the wells surrounding the landfill, which pump water from the same geologic formation as the Weir wells, were not chosen for inclusion in the monitoring network. Typical reasons that the wells were not included in the monitoring network included lack of access for installation of a pressure transducer, and unknown well design information (i.e., depth and perforated interval.) In several cases, wells were excluded because they were known to pump relatively continually or frequently, which would mask any interference effects from pumping of the Weir wells. Field notes related to the meeting of November 3, 2009 are included in Appendix C - Supporting Hydrogeologic Data.

Based on that meeting, several wells were chosen for inclusion: the so-called Gomez well, located on Earl Darway's property approximately 200 feet south of Weir Well No. 1; and the so-called Clements well, which is located south of the landfill and west of the Weir wells at a distance of approximately 1,900 feet. The two wells are of similar depth; the Gomez well is 120 feet deep and the Clements well is 127 feet deep. The pumps in both wells are set at a depth of 100 feet. Both wells produce groundwater from the Pismo formation. The locations of the wells included in the monitoring network are shown on Plate 1. A State of California Well Completion Report for the Gomez well is presented in Appendix C.

Well Instrumentation

On Tuesday, November 3, and Thursday, November 5, 2009, Weir Wells No. 1, 2, and 3, off-site wells (Gomez and Clements) and each of the on-site monitoring wells (B-1, P-6, and P-10, P-12) were instrumented with water-level pressure transducers. The transducers were programmed to read and record water level data at 5 minute intervals. The water levels in all monitoring wells, Weir pumping wells, and off-site wells were recorded to observe background water-level fluctuations and patterns of on-site and off-site well pumpage for a period of 6 days prior to performing well capacity tests.

Background Water Level Conditions

Between Tuesday, November 3 and Thursday, November 5, 2009 all three Weir wells were pumped to fill the pond and tank prior to testing. In accordance with the typical operational procedure, the three Weir wells were pumping concurrently until Weir Wells No. 1 and 3 were switched off to be instrumented on Thursday, November 5, 2009. Weir Well No. 2 was switched off Friday, November 6, 2009.

In order to determine the pumping rate of each well, drawdown effects, aquifer storativity and hydraulic conductivity, each of the three Weir wells were pumped for a period of 72 hours. The field activities associated with performance of the pumping tests for the three Weir wells was performed for approximately 3 weeks between Monday, November 9 and Sunday, November 29, 2009. To perform the tests so that only a single well was pumping during each test, coordination with the landfill operations staff was required. The produced groundwater was pumped to the on-site pond, which was capable of storing the entire volume from all three pumping tests. After completion of each pumping test, the post-test recovery of water level was monitored for a period of 72 hours, during which all on-site wells remained off. Hydrographs for

each well in the monitoring network for the period-of-record are presented in Appendix D - Water Level Hydrographs.

Weir Well No. 1 Pumping Test

Weir Well No. 1 consists of a 5-inch PVC casing installed to a depth of 186 feet. The pump was installed with the intake at a depth of 158 feet. Prior to initiating the pumping test, the stable static water level was approximately 72.4 feet below the top of the casing (btoc). A transducer was installed within the well to the maximum depth possible, which was limited to a depth of approximately 144 feet btoc, or about 14 feet above the pump intake. Installation of the transducer to this depth did not allow observation of water level declines 144 feet btoc. The DEIR-stated pumping rate, based on the understanding of landfill manager Mr. Bruce Rizzoli, was 40 gpm (Fugro, 2008).

On Monday, November 9, 2009 the pumping test of Weir Well No. 1 was initiated at a rate of about 32 gpm. The pump ran continually for the entire 72 hour period. For the first 100 minutes of the test, the well was pumped at an average rate of approximately 30.5 gpm, during which time the water level was entirely above the depth of our water level transducer of 144 feet btoc (or 72 feet below the static water level.) Between 100 minutes after the test began through the end of the 72 hours period, which ended on Thursday, November 12, 2009, the well pumped continually at a decreased average rate of 25 gpm. During this time, the water level had dropped entirely below the depth of the water level transducer. Because the flow-regulation valve was already partially closed at the time of testing, we were not able to regulate discharge to a lower flow rate to keep the water level above the transducer without potentially damaging the pump. On Thursday, November 12, 2009 the pump was switched off. The average pumping rate was 25.6 gpm. The discharge rate and pumping pattern observed appears to be typical of how the well is pumped at the landfill (Appendix D.)

At the end of the test, the pumping water level was below the transducer installed at a depth of about 144 feet btoc. This pumping level is equal to or greater than 71.3 feet of drawdown, which results in a specific capacity value of less than 0.35 gpm/ft. Assuming the water level within the well continued to decline during pumping to the pump intake, the total theoretical drawdown would have been about 85 feet, which would result in a specific capacity value of about 0.3 gpm per foot. Although the drawdown at this pumping rate may be considered a limitation in aquifer analysis, the100 minutes of pumping suggests a transmissivity value of between 300 and 600 gpd/ft, which is similar to previously determined values (Golder, 2007). Following the end of the pumping test, the well was not pumped for a period extending through the end of the testing program, that is, Sunday, November 29, 2009. A hydrograph of the pumping test is presented as Plate 2 - Weir Well No. 1 Three-day Pumping Test Hydrograph.

Weir Well No. 2 Pumping Test

Weir Well No. 2 consists of a 5-inch PVC casing installed to a depth of 156 feet. The pump was installed with the intake at a depth of 144 feet. Prior to initiating the pumping test, the stable static water level was approximately 43.2 feet below the top of the casing. The DEIR-

stated pumping rate, based on the understanding of landfill manager Mr. Bruce Rizzoli was 22 gpm (Fugro, 2008). A transducer was installed within the well to the maximum depth possible given the existing well pump and internal components, which was limited to a depth of approximately 134 feet btoc. This transducer setting allowed for the observation of water level fluctuations to approximately 10 feet above pump. At no time did the water level drop below the transducer depth.

On Monday, November 6, 2009 the pumping test for Weir Well No. 2 was initiated at a rate of about 10 gpm. After about 10 minutes, the pumping rate climbed to approximately 16 gpm for unknown reasons, then moderated to 13 gpm. Subsequently, the pump then ran continually for a period of approximately 2 hours during which the well pumped at an average rate of approximately 12 gpm. After this time, the pump began a cycle of switching on for 5 to 6 minutes approximately three times per hour. During the times of pumping, the well pumped at approximately 12 to 13 gpm. This cycling continued though the end of the testing period of 72 hours through Thursday, November 19, 2009 at which time it had pumped at an average rate of 5.3 gpm. The average pumping rate for the duration of the test was 5.5 gpm.

At the end of the test, the pumping water level was fluctuating between a depth of about 60 and 90 feet below the top of the casing. This range of pumping levels is equal to between 20 and 50 feet of drawdown, which results in an (non-steady state) estimate of a specific capacity value of 0.11 to 0.28 gpm/ft. The rapid drawdown to the pump at relatively low pumping rates did not allow for analysis of the water level data for determination of aquifer properties. The relatively low pumping rates and rapid drawdown indicate that the aquifer has limited water transmitting properties.

Based on water level data from the period before the pumping tests began, this drawdown does not seem to be typical of the operational pattern for the well (refer to Appendix D.) During the period of pumping, which ended on November 6, 2009 and again during the period between November 30 and December 7, 2009 (to be discussed later) the pumping water level typically pumped down to a depth below 135 feet. It is unknown why the water level during this pumping test only pumped down to a maximum depth of 90 feet.

Following the end of the pumping test, the well was not pumped for a period extending through the end of the testing program, that is, Sunday, November 29, 2009. A hydrograph of the pumping test is presented as Plate 3 - Weir Well No. 2 Three-day Pumping Test Hydrograph.

Weir Well No. 3 Pumping Test

Weir Well No. 3 consists of a 5-inch PVC casing installed to a depth of 244 feet. The pump was installed with the intake at a depth of 237 feet. Prior to initiating the pumping test, the stable static water level was approximately 6.9 feet btoc. The DEIR-stated pumping rate, based on the understanding of landfill manager Mr. Bruce Rizzoli was 16 gpm (Fugro, 2008).

On Sunday, November 22, 2009 the pumping test for Weir Well No. 3 was initiated at an initial rate of about 11 gpm. After approximately 35 minutes of pumping, the water meter

indicated that the pumping rate had increased to 18 gpm, which we decreased by manually closing the valve partially over a period of several minutes. After 43 minutes of pumping, the flow rate was regulated back down to 11 gpm. After 44.5 minutes of pumping, while at a steady pumping rate of 11 gpm, the pump switched off.

For the remainder of the test, the pump switched on and off in short cycles of several minutes each. During this time the pumping rate remained constant at 10 to 11 gpm likely due to the diaphragm pressure-regulation tank installed adjacent to the well head. After approximately 2 days of pumping, the average flow was approximately 10 gpm. At that time, we discovered that the valve, which was partially closed, had been opened fully by someone other than Fugro or landfill staff. The reason the valve was adjusted is unknown. After 3 days of pumping the average pumping rate had declined to 4.5 gpm. The pumping was ended on Wednesday, November 25, 2009 after 3 days of pumping, during which time the average pumping rate was 8.5 gpm. At the end of the test, the pumping water level was 67 feet btoc. This pumping level is equal to approximately 60 feet of drawdown, which results in a (non-steady state) specific capacity value of less than 0.14 gpm/ft. The rapid drawdown to the pump at relatively low pumping rates did not allow for analysis of the water level data for determination of aquifer properties. However, the water level data support the conclusion that the aquifer is of limited transmissivity.

Following the end of the pumping test, the well was not pumped through the end of the testing program, that is, Sunday, November 29, 2009. The well was pumped by landfill staff with the other two Weir wells starting on Monday, November 30, 2009. A hydrograph of the pumping test is presented as Plate 4 - Weir Well No. 3 Three-day pumping Test Hydrograph. Note that the water level data for Weir Well No. 3 are not ideal because the transducer became stuck within the well during installation at a depth and manner which damaged the transducer. The transducer was not able to be removed following the completion of testing. The water level data presented for Weir Well No. 3 were measured principally with an electronic water level sounder.

Simultaneous Pumping

Prior to the pumping tests, between Tuesday, November 3 and Wednesday, November 4, 2009 all three Weir wells were switched on and pumped in unison by landfill staff, during which time the combined volume of water pumped totaled approximately 74,000 gallons per day (gpd). Between Wednesday, November 4 and Thursday, November 5, 2009, when the three wells were pumping simultaneously, the combined volume of water pumped equaled approximately 61,000 gpd.

Following completion of the individual pumping tests, the pressure transducers remained installed within all of the on-site and off-site wells and recorded water level data for a period of approximately 2 weeks, through Friday, December 11, 2009. During that period, the wells were operated by landfill staff in response to site demands. The wells were switched on simultaneously for a period of 1 week between Monday, November 30 and Monday, December 7, 2009. At 11 pm on Monday, December 7, 2009 the wells were switched off by landfill staff in response to a series of rain storms. During this week-long pumping period, the wells pumped

approximately 31,000 gpd. A hydrograph of the 7 day pumping period between November 30 and December 7, 2009 is presented as Plate 5 - Weir Wells Simultaneous Pumping Hydrograph.

From December 7, 2009 to January 11, 2010, the wells were pumped infrequently. Based on a reading from the water meter installed at the outfall to the MRF tank on January 11, 2010, a volume of 10,227 gallons was pumped since December 8, 2009. This volume of water is equal to approximately 8 hours of active pumping during the approximately 5-week period (assuming a combined pumping rate equal to 31,000 gpd.) Based on the meter readings we were provided, no water was pumped through the pond gauge during this period. Presumably, the water needs of the entire landfill during this period were met by "pulls" from the pond by water trucks and by draining of the 68,000 gallon tank, which serves the MRF facility.

INTERFERENCE EFFECTS ANALYSIS

During the pumping test program, water levels in the adjacent monitoring wells, the Weir wells and the proximate off-site wells were measured and recorded at 5-minute intervals to determine the degree of well drawdown and interference effects of the pumping wells on the adjacent wells. Hydrographs of the entire period of record for each of the wells in the monitoring network are presented in Appendix D.

During the pumping of Weir Well No. 1, water levels within the adjacent on-site monitoring wells, the Clements well, and Weir Well No. 3 indicated that no drawdown interference had occurred. However, the water level data from Weir Well No. 2, which is located a distance of 312 feet from the pumping well indicated that the water level was drawn down by approximately 0.33 feet during the pumping of Weir Well No. 1. This drawdown reached its maximum depth approximately 1 day after pumping began and moderated (rose) thereafter. Although the water level data from the Gomez well, located approximately 212 feet south the pumping well, indicated that it was pumped regularly during the pumping test, it may be inferred that the pumping level of the Gomez well was drawn down a maximum of 3 to 4 feet during the pumping test. The water levels in other wells indicated that no drawdown occurred due to the pumping of Weir Well No. 1. A hydrograph of the water levels within the monitoring wells is presented as Plate 6 - Weir Well No. 1 Pumping Test, Monitoring Well Hydrographs. A hydrograph of the Gomez well during testing of the Weir Well No. 1 is presented as Plate 7 - Weir Well No. 1 Pumping Test, Gomez Well Hydrograph.

The acquired pump test data were used to estimate the longer-term affects of pumping Weir Well No. 1 for longer durations, at the same approximate discharge rate. A Theis distance-drawdown analysis was performed in a manner similar to that used in the DEIR (Fugro, 2008). In so doing, the predicted affect of pumping the combined wells at 30 gpm for 1 year, assuming 71 percent pumpage (5 of 7 days), the average combined pumping rate would be 21 gpm or 31,000 gpd. Based on our testing, Weir Well No. 1 could provide roughly 64 percent of the anticipated groundwater pumpage demand, or 14 gpm averaged throughout the year. At this rate, the predicted drawdown at the Gomez well, located 212 feet from Weir Well No. 1, would be less than 5 feet after 1 year. At an increased combined pumping rate of 49 gpm, or 50,000 gpd, Weir Well No. 1 would provide an approximately 22 gpm averaged over the entire

year in the same manner. At this pumping rate, the predicted drawdown would be approximately 8 feet at the Gomez Well after 1 year.

During the pumping of Weir Well No. 2, water levels within the adjacent on-site monitoring wells, Weir wells, and off-site monitoring wells indicated that no drawdown interference had occurred. Although the adjacent Gomez well was pumping regularly during the pumping test of Weir Well No. 2, the water level declines did not appear to coincide with the pumping of Weir Well No. 2 and therefore were likely coincident, but not caused by the pumping of Weir Well No. 2. A hydrograph of the water levels within the monitoring wells is presented as Plate 8 - Weir Well No. 2 Pumping Test, Monitoring Well Hydrographs. A hydrograph of the Gomez well during testing of the Weir Well No. 2 is presented as Plate 9 - Weir Well No. 2 Pumping Test, Gomez Well Hydrograph.

During the pumping of Weir Well No. 3, water levels within the adjacent on-site monitoring wells, Weir wells and off-site monitoring wells indicated that no drawdown interference had occurred. Although the Gomez well was pumped irregularly during the pumping test, the water level declines did not seem to coincide with the pumping of Weir Well No. 3. A hydrograph of the water levels within the monitoring wells is presented as Plate 10 - Weir Well No. 3 Pumping Test, Monitoring Well Hydrographs. A hydrograph of the Gomez well during testing of the Weir Well No. 2 is presented as Plate 11 - Weir Well No. 3 Pumping Test, Gomez Well Hydrograph.

During the simultaneous pumping of the wells operated by landfill staff following the end of the pumping program, water levels within all of the wells were measured and recorded. During this time, the water meters for the individual Weir wells were not recorded, but several water-meter readings at the pond outfall meter were recorded. Based on the infrequent cumulative pond water-meter readings and the continuous water level data from each of the wells, it is surmised that all of the Weir wells were pumping in repeated on/off cycles throughout the 7 day period between November 30 and December 7, 2009. Of the off-site and monitoring wells, only the Gomez well appears to be affected by the pumping. Inspection of Plate 5 - Weir Wells Simultaneous Pumping Hydrograph, which presents the water level in Weir Wells No. 1 and 2 along with the Gomez well, indicates that the Gomez well is affected by some pumping stresses, on the order of several feet.

WELL CAPACITY ANALYSIS

Based on our observations of landfill pumping patterns and the individual well pumping tests, a summary of the pumping capabilities of the wells is presented in Table 1 - Summary of Well Pumping Capacities.

Table 1 - Summary of Well Pumping Capacities

Well or Test Name	Test Date(s)	Depth, feet	Static Water Level, feet	Average Pumping Rate, gpm	DEIR PumpingRate, gpm	Groundwater Production, gpd
Simultaneous	11/3 - 11/4	N/A	N/A	52	N/A	74,409
Simultaneous	11/4 - 11/5	N/A	N/A	42	N/A	61,121
Weir No. 1	11/9-11/12	186	72.4	25	40	36,000
Weir No. 2	11/16-11/19	156	43.97	5.5	22	7,920
Weir No. 3	11/22-11/25	244	8.31	8.5	16	12,240
Simultaneous	11/30-12/7	N/A	N/A	21.5	N/A	31,000

As indicated in Table 1, the pumping rates for each of the individual wells were lower than the rates presented earlier (Fugro, 2008). The previous pumping rate values (DEIR pumping rate) were provided by Mr. Rizzoli prior to installation of water meters on each well, which was performed as part of this project. Based on current testing, the production rates from the individual wells range between 25 percent (Weir Well No. 2) to 62 percent of the rates presented in the DEIR (Weir Well No. 1). Weir Well No. 3 appears to be capable of being pumped at approximately half of the rate presented in the DEIR. During the 72 hour pumping tests, the wells produced between 7,900 and 36,000 gpd, which is equal to approximately 5.5 to 25 gpm, on average. Based on the individual pumping test, the summation of the individual pumping rates indicates that the pumping capacity of the three wells is in the range of 56,000 gpd, or 39 gpm on average.

Given the depth of the wells, pump settings, inferred daily operational use (5 days per week), well specific capacity values, and aquifer properties, the estimated average daily groundwater production is possibly 70 percent of the maximum daily production rate. It may be possible that the maximum daily production rate of approximately 56,000 gpd could be achieved by pumping the wells for longer periods, adjusting the valves, and/or reconfiguring the Pump Savers settings.

Based on the combined pumping performed by landfill staff before and after the individual pumping tests, the wells were pumped simultaneously at rates of between 31,000 gpd and 74,000 gpd. The highest simultaneous pumping rate of 74,000 was achieved for a period of a single day before the start of the pumping tests. The lowest simultaneous pumping rate was achieved for a period of 7 days following the individual 72-hour pumping tests. These values bracket the summation of the pumping rates of individual wells, which total approximately 56,000 gpd.

It should be noted that the pumping test for each individual well was performed at a rate pre-determined by the settings of the valves at each well. At Weir Wells No. 1 and No. 3, the pumps were operated without changing the valves; Weir Well No. 1 was pre-set in a partially-closed position, presumably by Farm Supply, and Weir Well No. 3 was opened completely, as it was prior to the start of our testing. At Weir Well No. 2, the flow rate was adjusted downward

during the early part of the test to approximately 10 to 12 gpm to preclude the water level from drawing down to the pump too rapidly.

Although each test was started at a constant pumping rate, in accordance with standard (ideal) methods of well and aquifer testing, the greatest portion of the pumping tests for Weir Wells No. 2 and 3 consisted of cycle of short periods of pumping followed by short periods of recovery. This condition was controlled by the presence of a properly functioning, industry-standard "Pump Saver" which were installed in the electrical panels to prevent the well motors from pumping the well dry, thereby destroying the motors. Whether the Pump Savers and valves were adjusted to maximize the pumping duration and volume from each well is not known by us or the landfill operator.

Inspection of Table 1 indicates that the combined groundwater production from the wells was decreasing over the period of our observation, from a 1-day high of 74,000 gpd, down to another 1-day total of 61,000 gpd. After the testing, the volume of produced groundwater declined further to approximately 31,000 gpd, which was maintained for each of the following 7 days of pumping. The reasons for this decline are unknown. However, the decline in production after completion of the pumping program may be attributed to many factors, which may include inadvertent changes made during testing to the pumping system such as valves or pump electrical switches.

The current relatively dry hydrologic conditions experienced in California in general over the past several years should be considered as it relates to the production capacity of the wells and the groundwater basin. The current hydrologic condition is associated with generally lower groundwater levels within the basin and potentially decreased production capacity of each well. It is not known whether the production capacity of the Weir wells as tested is lower than the DEIR-stated capacity due to hydrologic conditions or due to incomplete knowledge about the optimal operation of the wells. It should also be noted that the Weir wells are relatively old and likely suffer from low overall well efficiencies relative to flow rate and observed drawdown. These inferred low well efficiencies are related to typical head losses at and immediately surrounding the wells due to aquifer, gravel pack, and well screen clogging and due to scale and incrustation. Regardless of the severity of the losses due to well inefficiencies, the pump tests document an aquifer of limited transmissivity and production capacity due to the semi-consolidated nature of the Pismo Formation, the relatively shallow wells depths and aquifer saturated thickness, and a basin of small size (about 1,600 acres) with well-defined boundary conditions.

During the simultaneous pumping of the three Weir wells, approximately 31,000 to 74,000 gpd was pumped from the wells, which constitutes a reasonable range of production capacity values for the three Weir wells. It can be concluded that since as early as 2002, the three Weir wells have been able to meet the facility water demands. Given the range of daily water usage documented in this study from about 31,000 gpd to as high as 74,000 gpd, we conclude that on-site water demand is presently on the order of about 50,000 gpd and that this demand can be met by the three Weir wells. This inferred average daily water demand, taken over a 5 day per week of landfill operation, equates to a facility groundwater use of about 40

acre-feet per year. None of the landfill water use results in recharge to the basin as a return flow (i.e., deep infiltration of applied water).

SWCA (2009) noted that the future demand for water at the landfill will likely be higher than the estimate presented in the DEIR, and may be as high as 121.5 afy. The maximum future water demand estimate of 121.5 afy is based on the understanding that the compositing operation, the largest component of demand, may expand significantly from the current size, which currently is reported to process approximately 100 to 120 tons of compost, to as much as 450 tons per year. This increase in the tonnage of compost processing would increase the water demand from the current maximum DEIR-stated water demand of 35 afy to a future demand of as much as 121.5 afy. The three Weir wells, as currently configured and based on the results of this testing, are capable of producing about 40 AFY and are not capable of meeting this increased demand.

Again, based on the above we conclude that the existing Weir wells are capable of providing at about 50,000 gpd for 5 of the 7 days per week. Obviously there are daily and seasonal variations in actual groundwater production from the three Weir wells, which vary around this estimated average daily supply capability. A reasonable best estimate of the amount of pumping that will occur during the normal operation of the wells includes pumping patterns similar to those observed during this program appears to range from about 31,000 gpd to as high as 74,000 gpd. The reader should be aware however that, based on this study, the higher level of groundwater pumping appears to be restricted to short-term periods, (i.e., on the order of a day).

ON-SITE WATER DEMAND

To quantify the volume of water supplied to each of the on-site water uses, the operator was requested to maintain records of the on-site water use. To facilitate this data collection, we provided the landfill staff with forms to record the meter readings for each of the three Weir wells, and for a meter installed at the outfall to the pond and another at the 68,000 gallon tank adjacent the MRF Sort Facility. In addition, forms were provided for each of the water trucks to document the number of loads each "pulls" from the pond filling station for use at the landfill and composting site for irrigation and dust control purposes. These forms were provided to the landfill operator in mid-September 2009, data entries began in early November 2009.

Subsequent to the issuance of our draft TM in February 2010, we were provided with additional information compiled by landfill staff for the period from January through July 2010. Relative to groundwater production, these data consist of more or less daily meter readings from each of the Weir wells and the meter at the pond. The data were compiled and then transferred to excel spreadsheets. The manner of data collection, the data entry process, and quality control associated with the collection of these data by landfill operations staff were discussed with Mr. Lacy Ballard at a meeting on June 15, 2010.

A review of the supplied data related to water supply and demand at the Cold Canyon Landfill for the period of January through mid-June 2010 was initially performed based on an interview with Lacy Ballard, site manager for Cold Canyon Landfill of June 9, 2010, and on

electronic and handwritten notes provided to us by the landfill staff. We understand that water supply and demand records do not exist for the period of November and December 2009. Based on the availability of data, we were able to perform our analysis of water supply and demand for the period between January and August 2010. A summary of the water supply and demand on a monthly basis is presented on Table 2. The data table represents a summary of data from water-truck logs, flow meter readings, and handwritten notes from landfill staff not presented here for simplicity.

Table 2 - Summary of On-Site Water Supply and Demand

Cold Canyon Landfill Supply and Demand Summary
January to July 2010

	Groundwater Supply		Surface Water Supply		Water Demand		Total Supply	Total Demand		
Month	Weir Wells Gal/Mo	Shop Well Gal/Mo	Module 8 Gal/Mo	Sediment Pond Gal/Mo	Compost Gal/Mo	Dust Control Gal/Mo	Total Gal/Mo	Total Gal/Mo	ETo, Inches	Precip, Inches
January 2010	Unknown	0	0	0	91,200	15,200	Unknown	122,683	1.96	6.15
February 2010	Unknown	3,800	11,400	0	72200	26600	Unknown	115,997	2.07	4.46
March 2010	33,393	15,200	155,800	0	127,950	151,050	204,393	311,899	3.96	0.66
April 2010	207,142	23,400	76,000	163,400	141,200	231,800	469,942	411,382	4.62	1.90
May 2010	258,013	66,500	209,950	30,400	255,400	287,850	564,863	591,020	5.75	0.20
June 2010	509,214	11,400	216,650	0	448,100	315,450	737,264	763,550	6.11	0.00
July 2010	716,924	0	0	0	400,900	330,600	716,924	731,500	5.58	0.00
Minimum	33,393	0	0	0	72,200	15,200	204,393	115,997	1.96	0.00
Maximum	716,924	66,500	216,650	163,400	448,100	330,600	737,264	763,550	6.11	6.15
Average	344,937	17,186	95,686	27,686	219,564	194,079	538,677	435,433	4.29	1.91

CIMIS 52 Cal Poly

Currently, the sources of groundwater supply at the site are the Weir wells (1, 2 and 3) and the so-called Shop well. The Weir wells are fitted with totalizing flow meters; the Shop well is not. The sources of surface water supply consist of the Main Sediment Pond, constructed in about 1990, and the Module 8 Pond both of which collect runoff from the site. The pond adjacent the compost facility, which has previously been referred to simply as “the pond” is filled principally by the Weir wells and is used as storage for the pumped groundwater from those wells.

On-site water is used to satisfy the following demands: compost use (irrigation, odor control, and dust control), dust control on landfill roads, and evaporation and percolation of water from the pond adjacent the compost facility. Evaporation from the pond was calculated based upon CIMIS evapotranspiration data from a nearby station and the known surface area of the pond. Percolation of water from the unlined pond adjacent to the compost facility is not known but is considered minor relative to total water use and the understanding of the prior landfill manager that the pond bottom is relatively fine-grained and coated with biological growth. Because the pond is located within the Pismo geologic formation, as are the Weir wells, the percolated water would likely return to the groundwater as recharge and result in no net use.

During calendar year 2010 to mid-June, significant rainfall occurred during each month between January and April. Minor rainfall occurred during May 2010 (0.27 inches). June 2010 constituted the first month of the year without rainfall.

Data Analysis

During January 2010, meter records documenting groundwater production from the Weir wells were not available from the landfill staff. However, water use as documented by in-truck logs of water provided by the MRF tank and pond adjacent the composting facility totaled 106,400 gallons. During January 2010, as recorded on the truck-field logs documenting water use, no water was pumped from the Shop well, Module 8 Pond, or the main sedimentation pond. Total site demand during January was 122,700 gallons, which was relatively low for the site, largely due to the approximately 7 inches of rainfall, which fell at the nearby CIMIS rainfall gauge. During the month, approximately 75 percent of the water demand was related to compost uses. The remaining 25 percent of demand was divided relatively evenly between dust control for the landfill roads and evaporation from the pond adjacent the composting facility.

During February 2010, no meter records existed for groundwater supply from the Weir wells. However, water use as documented by in-truck logs indicated that water pulled from the Module 8 pond, the Shop well and pond adjacent the composting facility totaled 98,800 gallons. During February, a total of 3,800 gallons of water was supplied by the shop well (which is not fitted with a flow meter) and a total of 11,400 gallons was supplied by the Module 8 Pond. No water was supplied by the main sedimentation pond. A total of 83,600 gallons was supplied by the Compost pond. Total water supply was not documented due to a lack of records of water meter readings from the Weir wells. Total site demand was 116,000 gallons.

March 2010 was the first month of 2010 with records of meter readings from the Weir wells, the pond adjacent the compost facility, and the MRF tank. During the month the Weir wells pumped a total of 33,000 gallons; the shop well provided an additional 15,000 gallons equaling a total of 48,000 gallons from groundwater. Surface water sources supplied a total of 156,000 gallons from the Module 8 Pond. Water supply totaled 204,000 gallons. Water demand exceeded supply during March by approximately 52 percent, totaling 312,000 gallons. The reasons for the discrepancy between water demand water supply volumes are not known.

During April 2010 groundwater supply totaled just over 250,000 gallons, of which 207,000 gallons was from the combined Weir wells. Surface water supply totaled approximately 239,000 gallons. Water supply totaled 470,000 gallons. During April total water demand was slightly less than supply at approximately 411,000 gallons. The reasons for the discrepancy are not known.

During May 2010 total groundwater supply was equal to approximately 325,000 gallons. Surface water sources, principally the Module 8 and Sedimentation Ponds provided an additional 240,000 gallons, to provide a total supply to the site of 565,000 gallons. During the month water demand was slightly higher than supply at 591,000 gallons.

During June 2010 total groundwater supply was equal to approximately 520,000 gallons. Surface water supply totaled approximately 216,000 gallons entirely from the Moule 8 pond, for a combined water supply of 737,000 gallons. During the same period, site water demand was slightly higher at 763,000 gallons.

Discussion

During July 2010, total groundwater supply was calculated based solely on the Pond meter at 716,000 gallons. No surface water supply was used during July. Total site demand was slightly higher than the supply at 731,000 gallons.

The results of our analysis indicate that during the months between May through July 2010 supply and demand, estimated based on various sources including meter readings and field logs of water-truck usage, were within 5 percent. During the wetter months of March and April 2010, the supply and demand estimates varied more widely; during March supply was 34 percent lower than water demand, and during April supply was 14 percent greater than demand. Because meter data do not exist for January and February 2010, a similar comparison is not available for those months. Based on this, it seems that this estimation of supply and demand is prone to some error during periods of significant precipitation, which acts to capture runoff for reuse at the site. The reasons why supply and demand are disparate during periods of precipitation are not known, but may be associated with operational procedures not accounted for by either the in-truck field logs or meter readings.

Because green waste processing constitutes the largest water use at the site we requested records of daily tonnage of green waste accepted at the site to determine the relationship between green waste acceptance and water use. Records of green waste tonnage were provided to us on a daily basis for the period of March 2005 through May 2010. During that period, monthly averages of green waste tonnage acceptance averaged approximately 100 tons per day. The monthly averages for green waste acceptance varied between 67 and 128 tons per day. These values were compared with the records for water used for green waste processing for the period between January and May of 2010, the period of these records. The results of the analysis, presented on the plates and tables in Appendix E, show the daily water use for compost processing varied between approximately 2,500 (February) and 8,200 (May) gpd during 2010. The final plate shows that for the 5 months with both sets of data there appears to be no obvious relationship between green waste acceptance and associated water use. This analysis is limited by the short period of record for metered water use data, and includes only a single month without significant rainfall (May 2010), which appears to decrease water use related to green waste processing.

Preliminary Comparison with Previous Demand Estimate Data

Estimates of current groundwater demand were estimated to be approximately 35 afy in our previous study of the site (Fugro, 2008.) Those estimates were based solely on the understanding of the landfill manager, and were not supported by actual measurements of water use (water meters). Water meters were installed as documented in our draft technical memorandum dated January 15, 2010. That report documented the data from the in-truck field

logs, which were provided to the water truck drivers to estimate the quantity of on-site water demand. Based on the relatively short timeframe of that study, which included pumping tests of the Weir wells, we concluded that the Weir wells were capable of providing at least 31,000 gpd, or 25 afy.

Based on the 2010 data through July, if we assume that water supply and demand during the months of August and September will be equal to that of July, and assign appropriately tapering values for the remainder of the calendar year, total site demand may be equal to less than 18 afy. This demand obviously reflects site activities and water use for a short period based on the dates we were provided. Of the supply, during May and June of 2010, approximately 66 percent of the demand was met by groundwater supplies. During July, based on our estimations of site demand and groundwater supply for the remainder of calendar year 2010 based on the acquired data, we estimate that approximately 65 percent of the site demand will be satisfied by groundwater supplies. Therefore, it is reasonable to assume that the annual demand can be reduced by the volume of surface water supplies. The result of this calculation indicates that annual groundwater demand may be on the order of 11 afy.

Precipitation during the current water year (September 2009 through August 2010) as measured at the Cal Poly, San Luis Obispo campus has totaled 18.7 inches, which is equal to approximately 90 percent of the normal rainfall. Because this rainfall is roughly equivalent to the long term annual rainfall, it is reasonable to assume that a roughly similar amount of surface water will be available during all but the driest years. Note that the use of surface water in lieu of groundwater at the site has not been documented previously and constitutes a new water source, which has not been considered as part of the Project Description for the EIR.

SUMMARY AND CONCLUSIONS

Based on the above discussion, the following conclusions are provided:

- **Record well yield**. The results of the pumping tests indicate that Weir Well No. 1 pumped on average 36,000 gpd; Weir Well No. 2 pumped 7,920 gpd; and Weir Well No. 3 pumped 12,240 gpd. When pumped together, the wells produced between 31,000 gpd (7 day period) and 74,400 gpd (1 day period). This is our best estimate given the time of year and duration of the study. During the period of March through July 2010, pumping for the Weir wells averaged between 33,000 (March) and 716,000 gallons per month (July). This is equal to an average of between 1,500 (March) and 33,000 gallons per day (July), assuming pumping would be performed during 5 of the 7 days. Our best estimate of average daily groundwater pumped to meet the current landfill water demands is on the order of 50,000 gpd. We further conclude that the three existing Weir wells, as currently configured and operated, can meet this average daily water demand. It should be noted that modification to the pump settings and operation of the Weir wells could result in greater daily groundwater production. However, given the well depths, aquifer properties, and groundwater basin size, significant increases in groundwater production are not considered feasible. Our best estimate of a "significant" increase in production from the wells would be for very short durations (i.e., no more than several days) at

combined rates no greater than about 10 percent of the documented single day combined pumping rate of about 74,000 gpd.

- **Record well drawdown and interference effects.** The pumping of Weir Well No. 1 during a period of 3 days caused a maximum of 4 feet of drawdown in the nearest proximate off-site well, the Gomez well, which is located a distance of 212 feet away. Similar interference effects were apparent during a 7 day period of pumping by landfill staff, during which 3 feet of drawdown were recorded in the Gomez well. Weir Well No. 1 caused 0.33 feet of drawdown in the proximate Weir Well No. 2, which is located 312 feet from Weir Well No. 1. No other interference effects were evident in any well during the pumping tests. It is our opinion that the landfill well production rates, range of drawdown, aquifer properties and distances between the landfill wells and offsite private wells sufficiently mitigates significant interference created by the landfill wells on offsite wells. This is because the landfill well yields simply cannot sufficiently stress the aquifer to create large distance interference effects.
- **Refine and support (or refute) the capacity and sustainable yield of the existing landfill wells.** Based on the pumping tests, landfill-operated pumping before and after our tests, and documented use between March and July of 2010, the wells can likely supply between 31,000 and 56,000 gpd to the landfill. Using 31,000 gpd for 5 days per week as a current estimated average groundwater production, on an annualized basis this equates to a total volume of 25 afy. The existing wells may not supply sufficient water to meet the future demand for this facility as described in the DEIR. Furthermore, as noted above, the aquifer does not appear capable of supplying a greater volume of groundwater than the current supply.
- **Better define the basin aquifer properties and the basin boundaries.** The data from the pumping tests did not generate any new information that can be used to improve or refine our understanding of the basin aquifer properties and basin boundaries. The conceptual hydrogeology of the area, aquifer properties, and general well yield capabilities were confirmed based on the well testing performed as part of this study.
- Water demand for the entire site for the period of January to July 2010 ranged between 116,000 (February) and 763,000 gallons per month (June). The average total site demand was 435,000 gallons per month. During the same period compost-related water use ranged between 72,000 (February) and 448,000 gallons per month (June). Average compost-related water use was 219,000 gallons per month. Absent composting activities, total demand at the site would have ranged between 31,000 and 335,000 gallons per month, and averaged 216,000 gallons per month. The wells, as currently operated, are capable of meeting this demand.

REFERENCES

Fugro West (2008), Water Resources Assessment for the Cold Canyon Landfill Expansion Environmental Impact Report, Dated March.

Golder Associates (2007), Hydrogeologic Characterization, Proposed Expansion Area, Cold Canyon Landfill, Prepared for Shaw Environmental, dated January.

SWCA (2009), Cold Canyon Landfill Expansion Draft EIR - Water Resources Assessment/Response to Comments Update, letter dated April 24.

ATTACHMENTS

Plates
Appendix A - Supporting Documents
Appendix B - Site Photographs
Appendix C - Supporting Hydrogeologic Data
Appendix D - Water Level Hydrographs
Appendix E - Green Waste Data

PLATES

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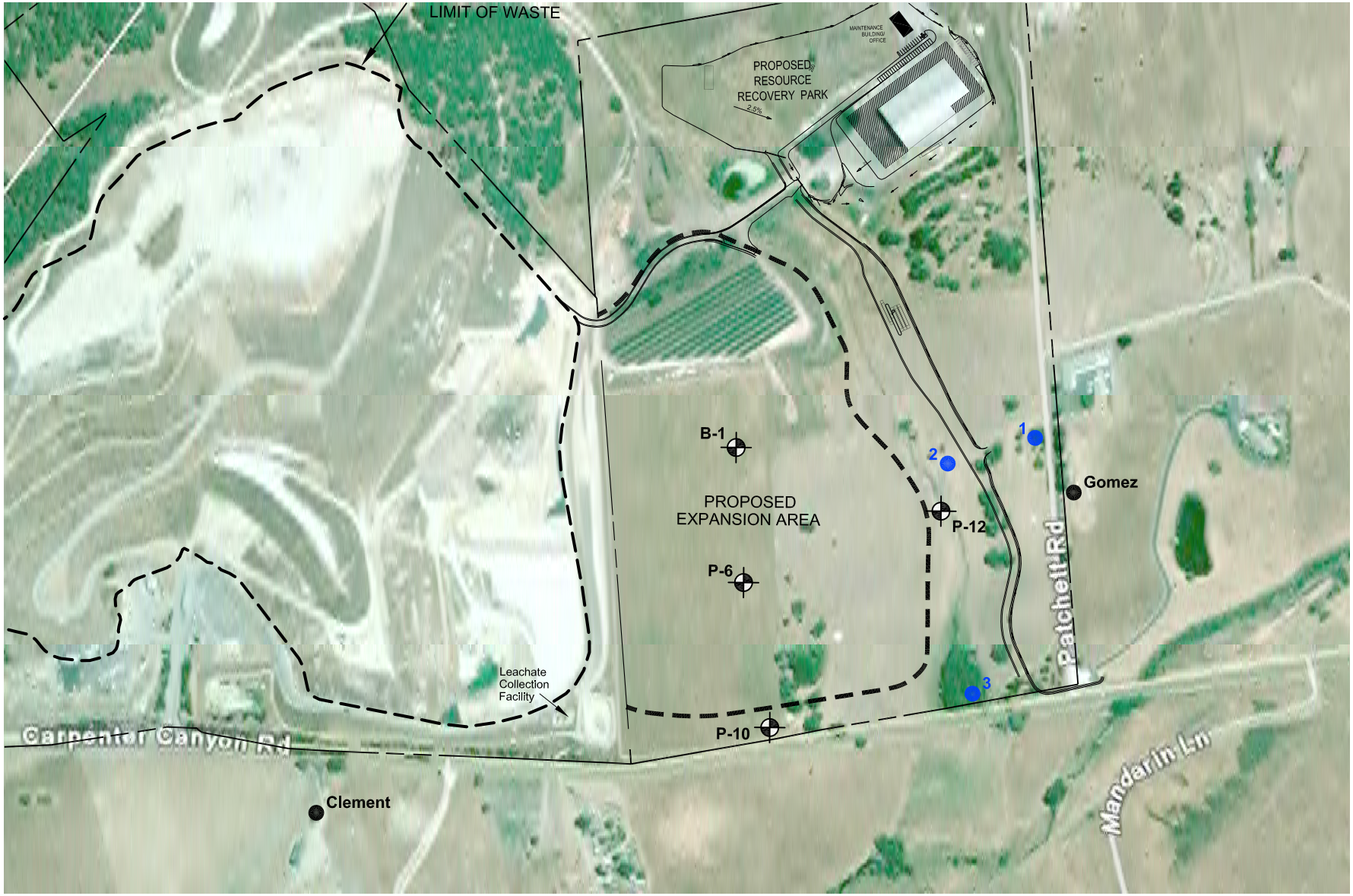


BASE MAP SOURCE: Aerial photograph from Google Earth Pro (2007).

LEGEND

- P-12 — Groundwater monitoring well
- Gomez — Off-site well
- 3 — Weir well

WELL TESTING PROGRAM
MONITORING NETWORK
Cold Canyon Landfill Expansion
San Luis Obispo County, California

NORTH

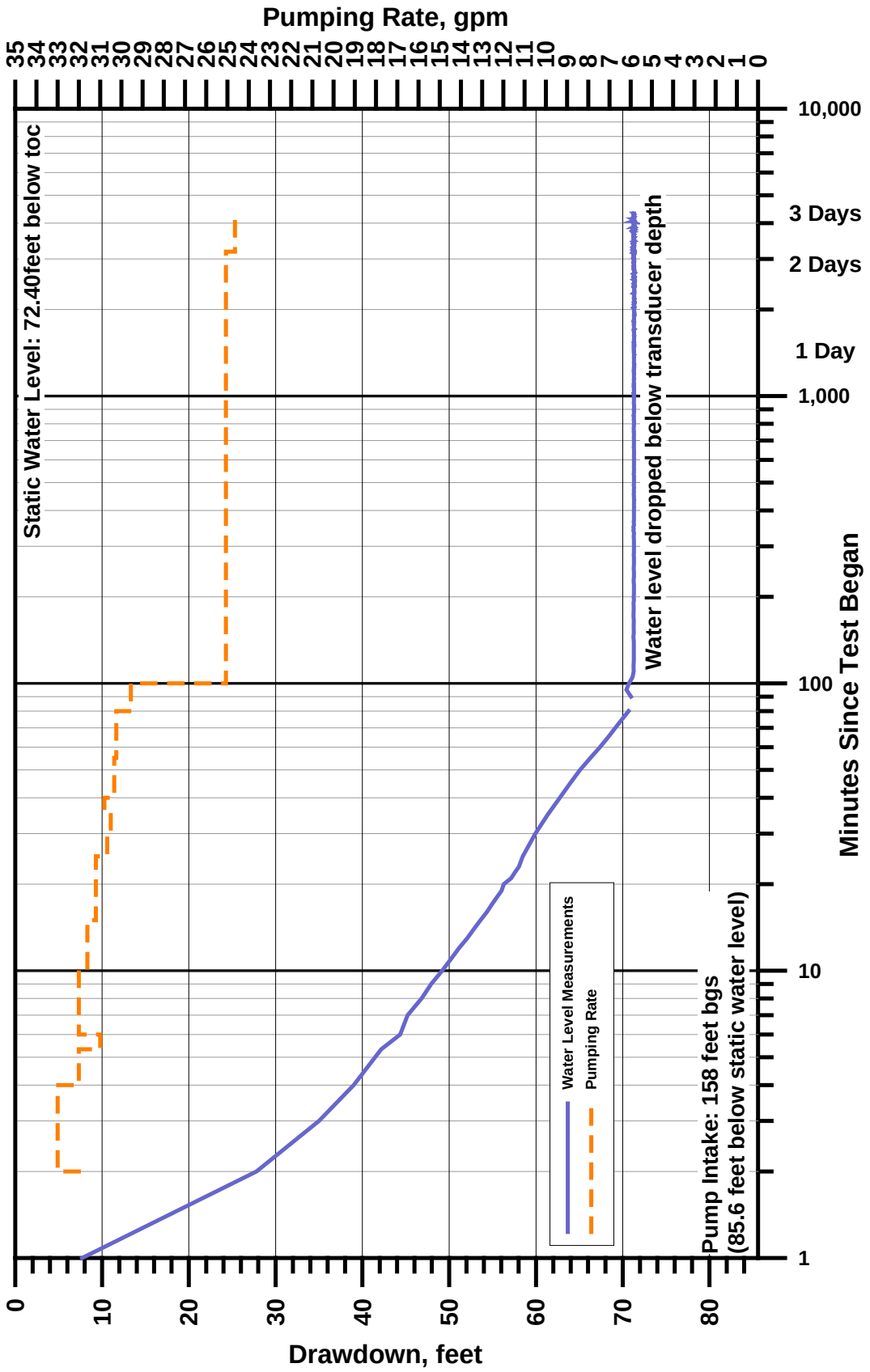
0 500

FEET

PLATE 1

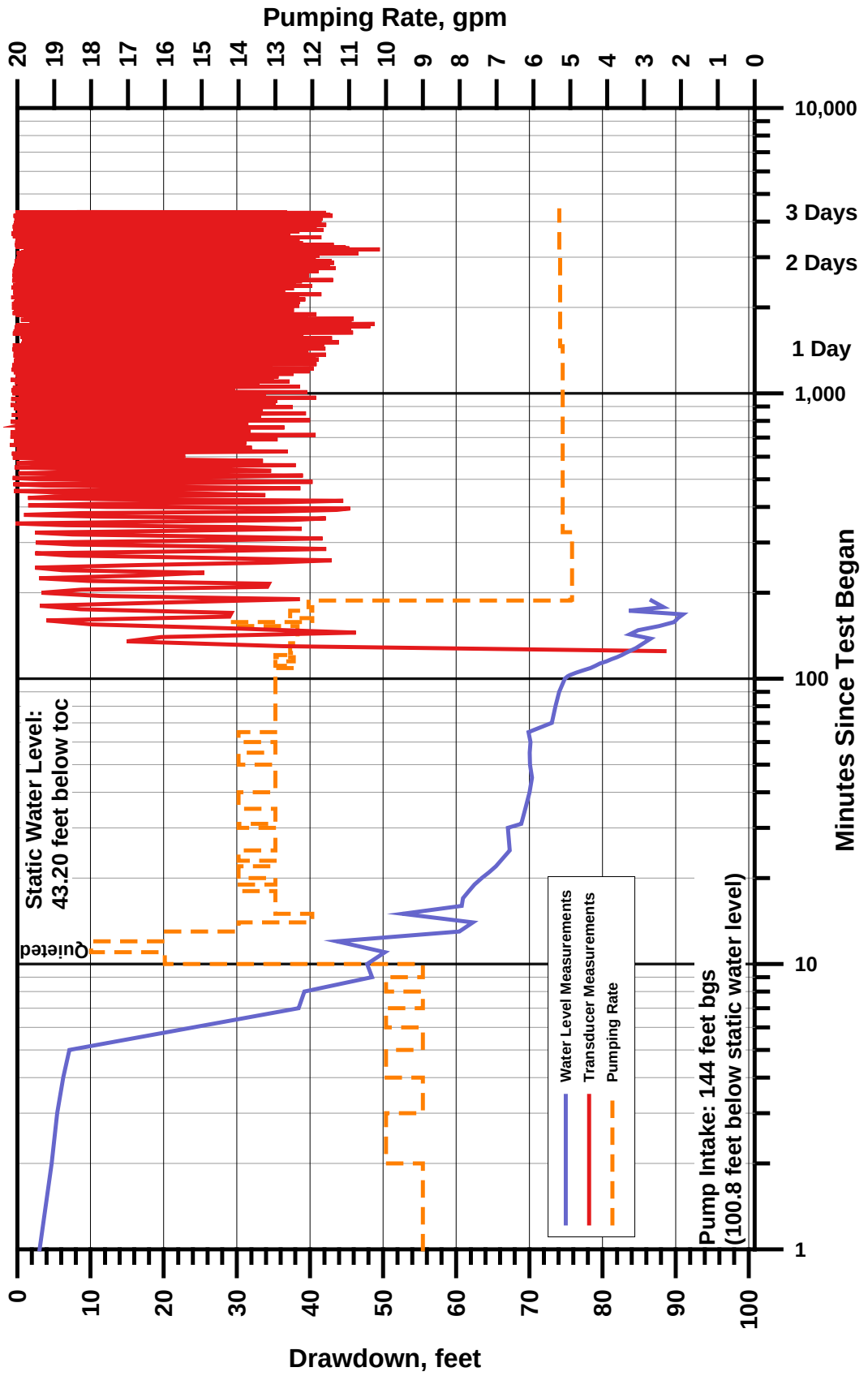
County of San Luis Obispo
Project No. 3014.035

FUGRO



WEIR WELL No.1 THREE-DAY PUMPING TEST HYDROGRAPH
Cold Canyon Landfill Expansion
San Luis Obispo County, California

PLATE 2



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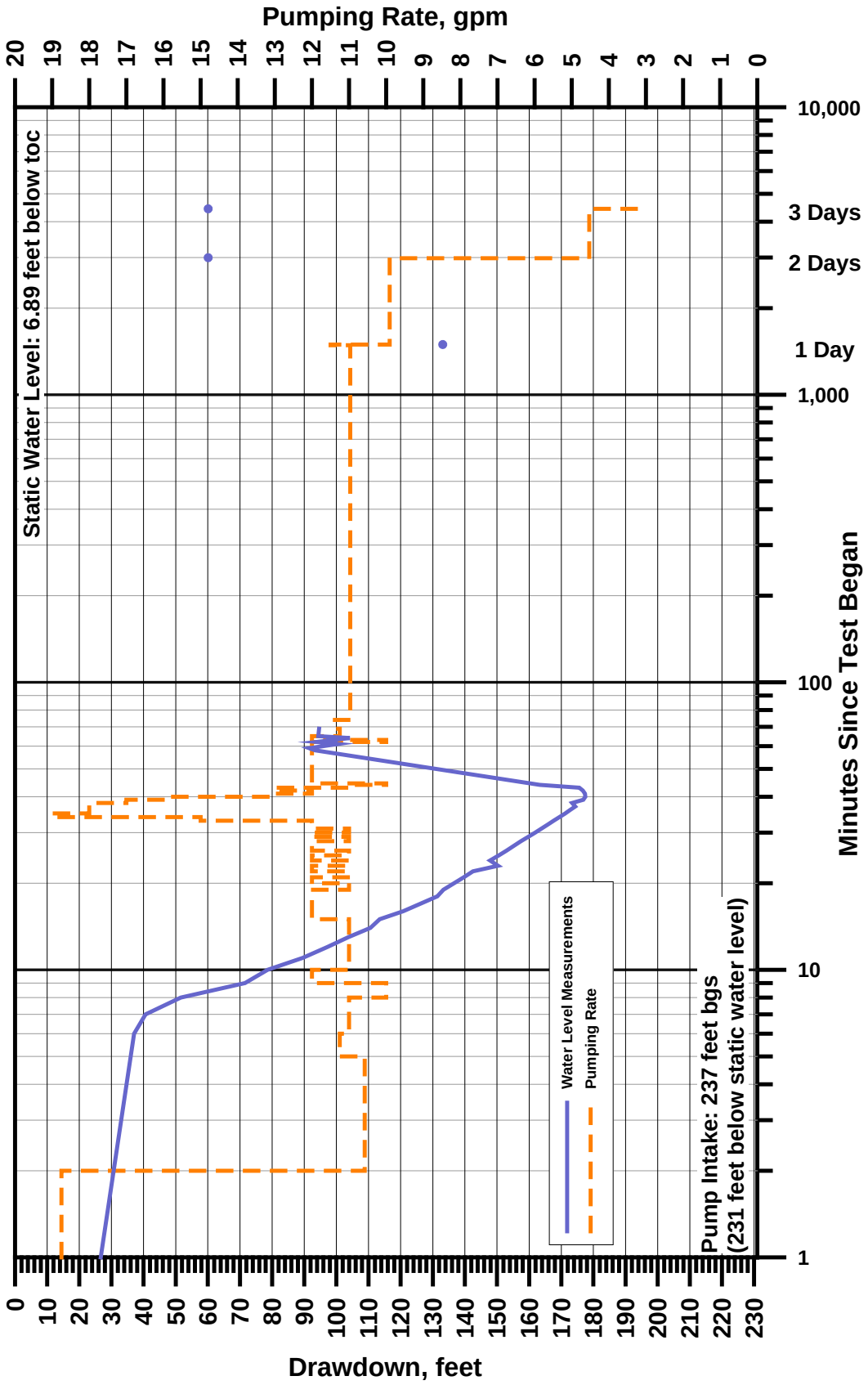
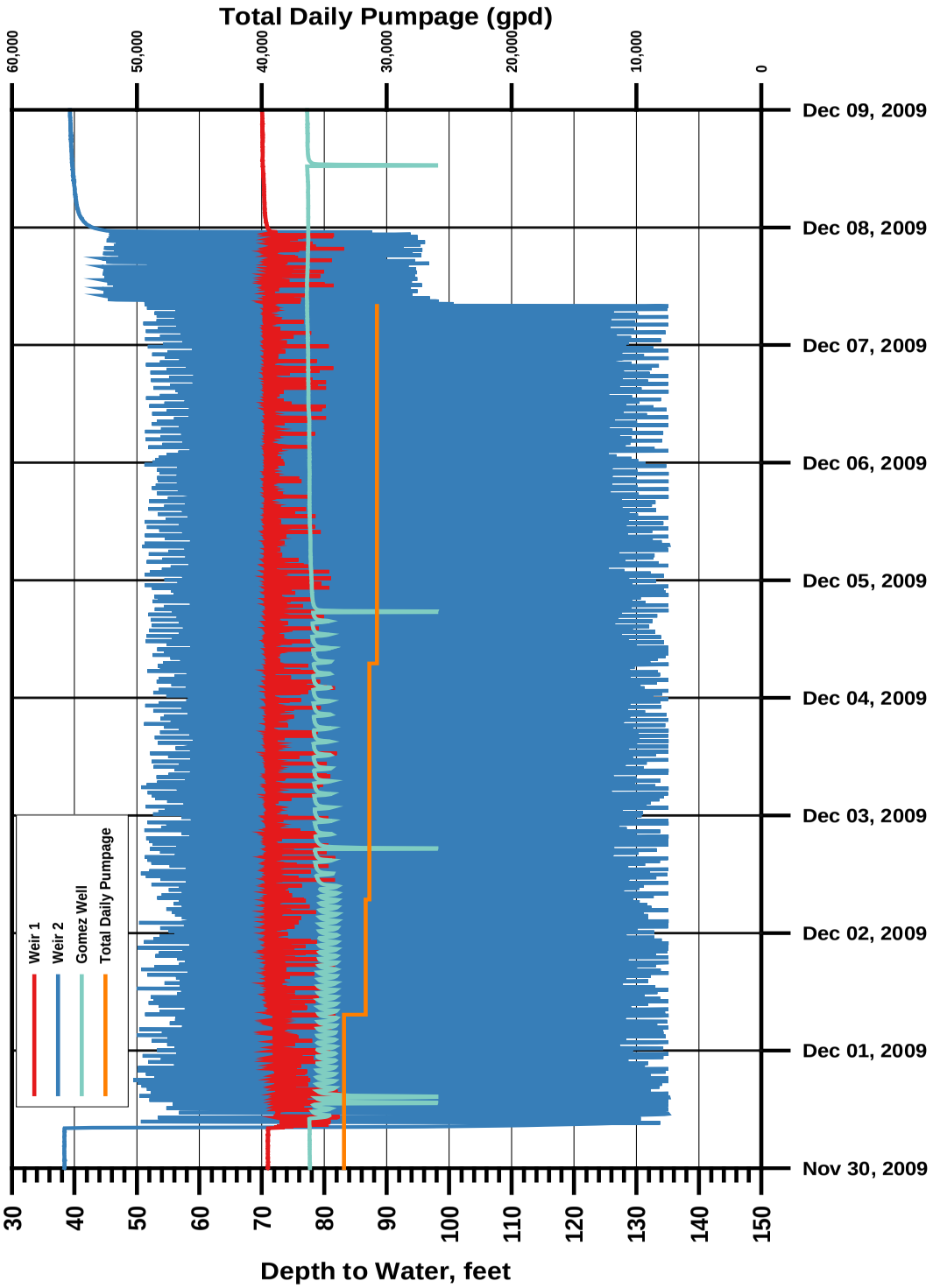
Cold Canyon Landfill Expansion
San Luis Obispo County, California



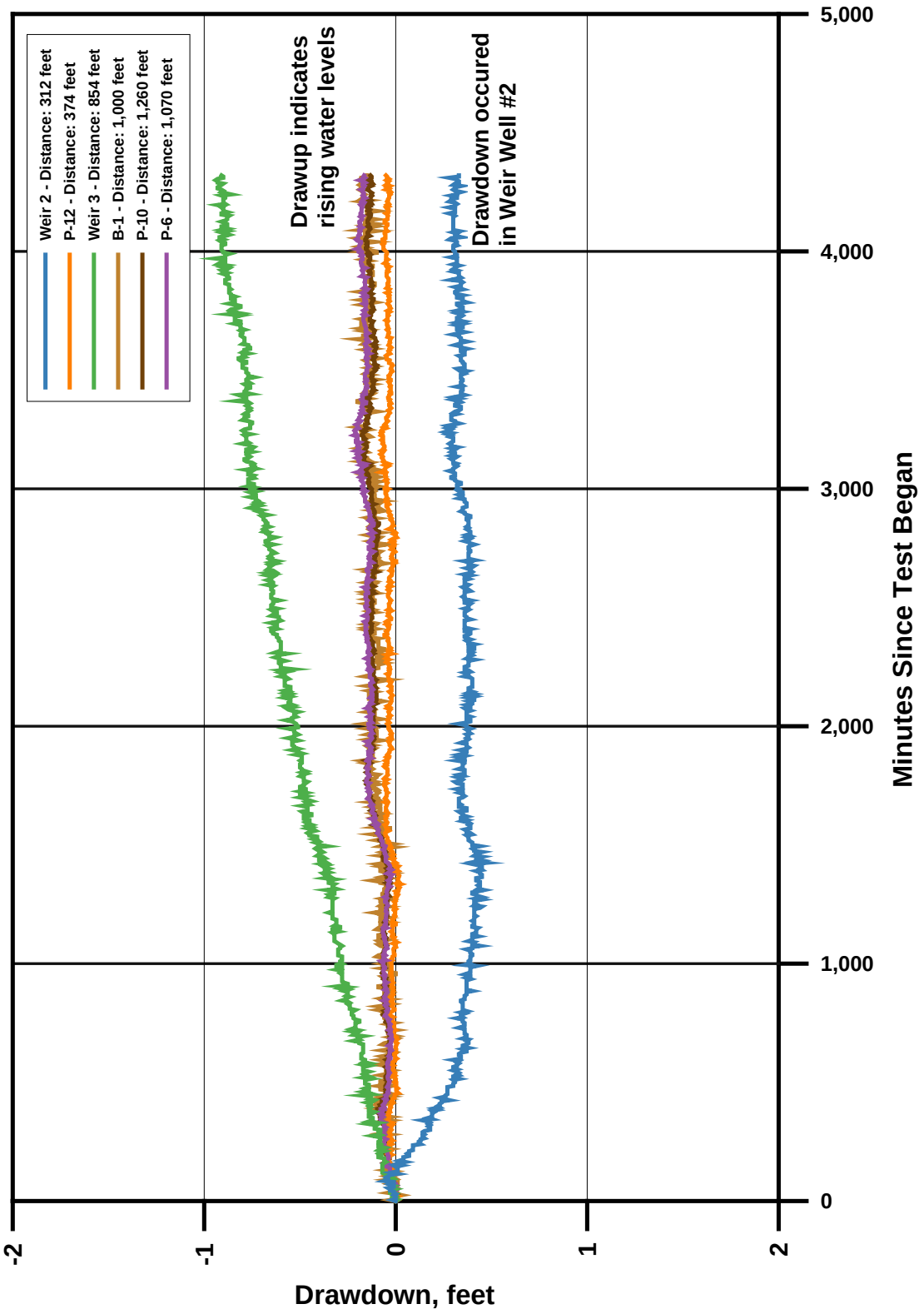
WEIR WELL No.3 THREE-DAY PUPMING TEST HYDROGRAPH
Cold Canyon Landfill Expansion
San Luis Obispo County, California

PLATE 4



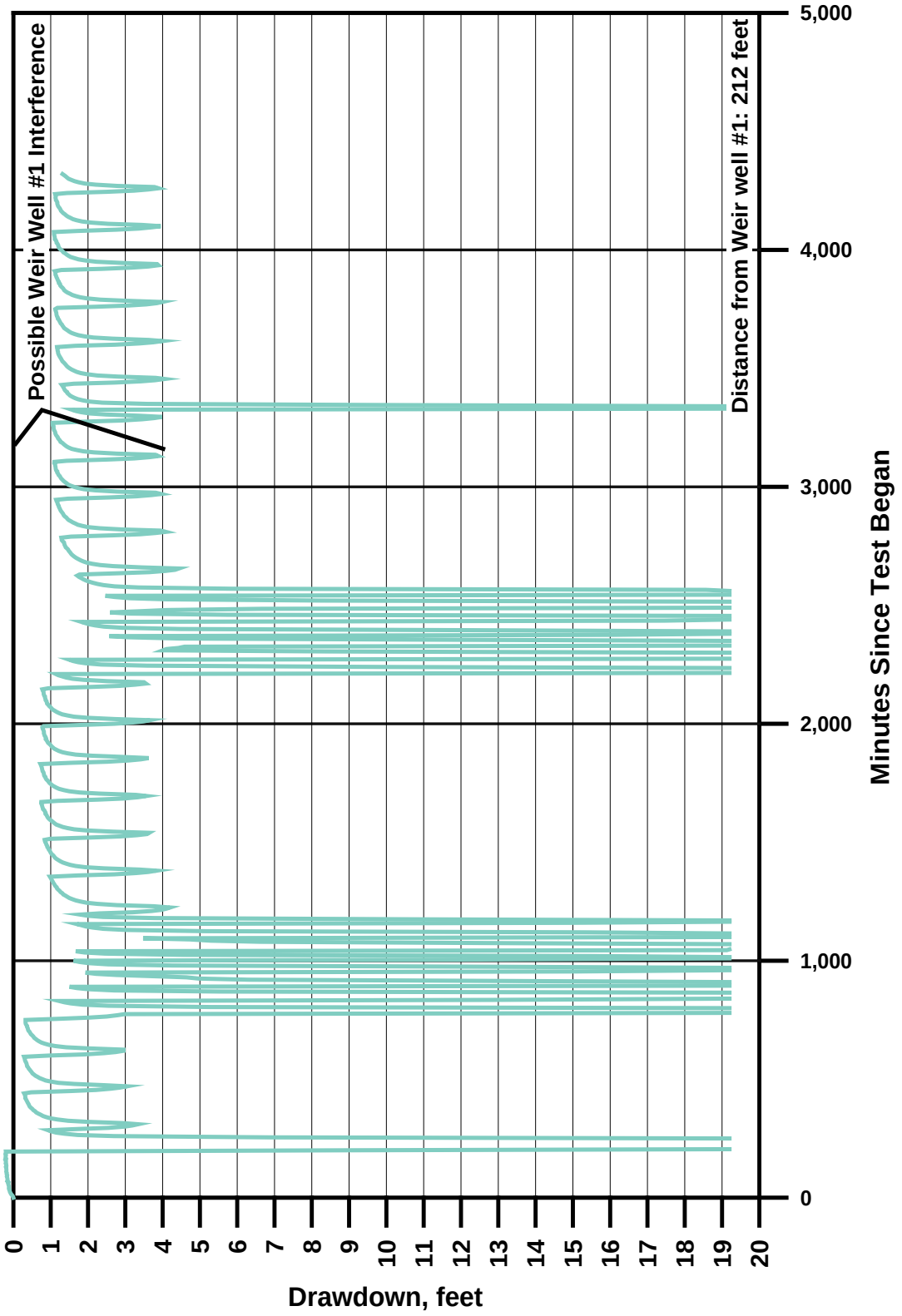
WEIR WELLS SIMULTANEOUS PUMPING HYDROGRAPH
Cold Canyon Landfill Expansion
San Luis Obispo County, California

PLATE 5

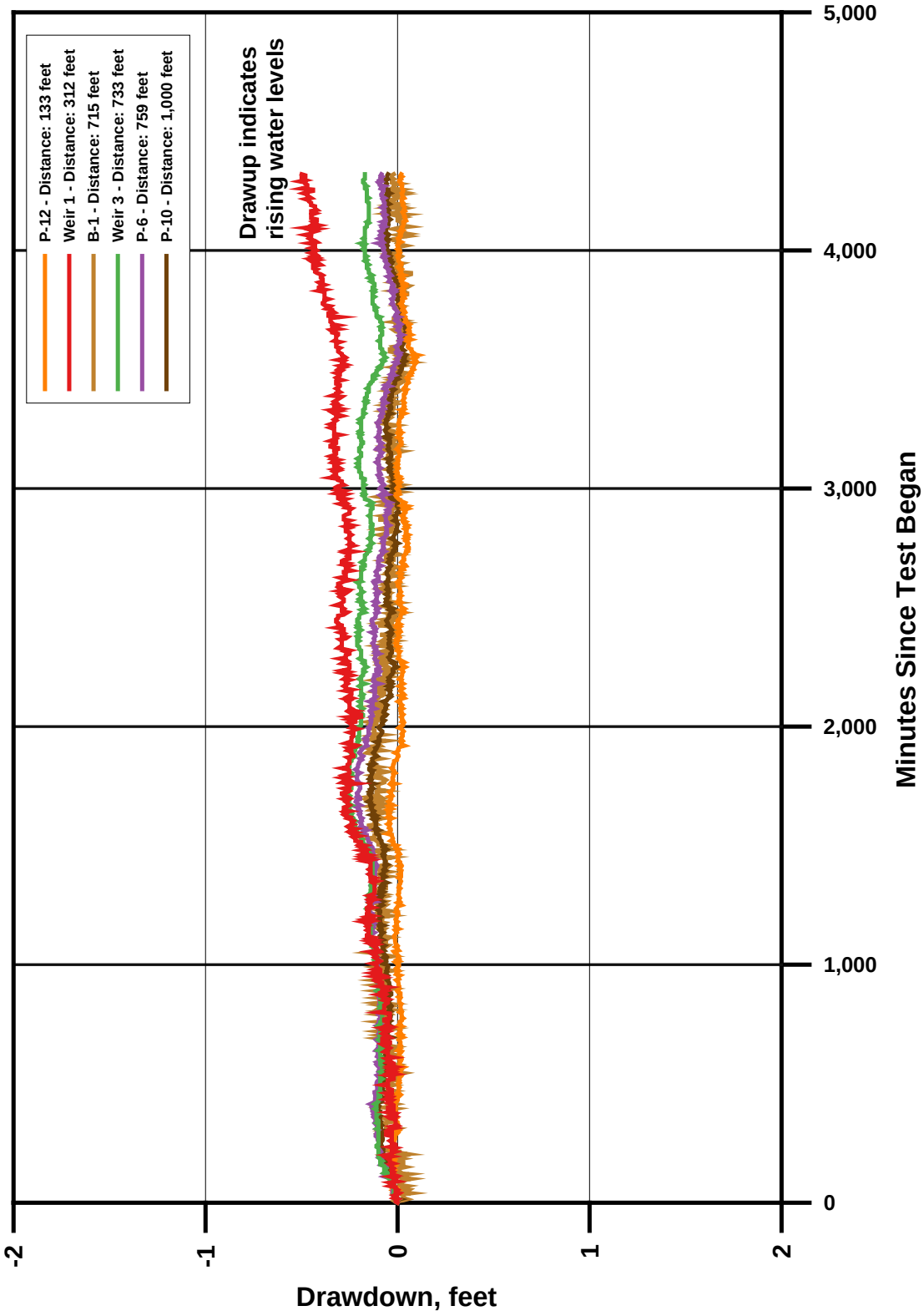


WEIR WELL No.1 PUMPING TEST, MONITORING WELL HYDROGRAPHS
Cold Canyon Landfill Expansion
San Luis Obispo County, California

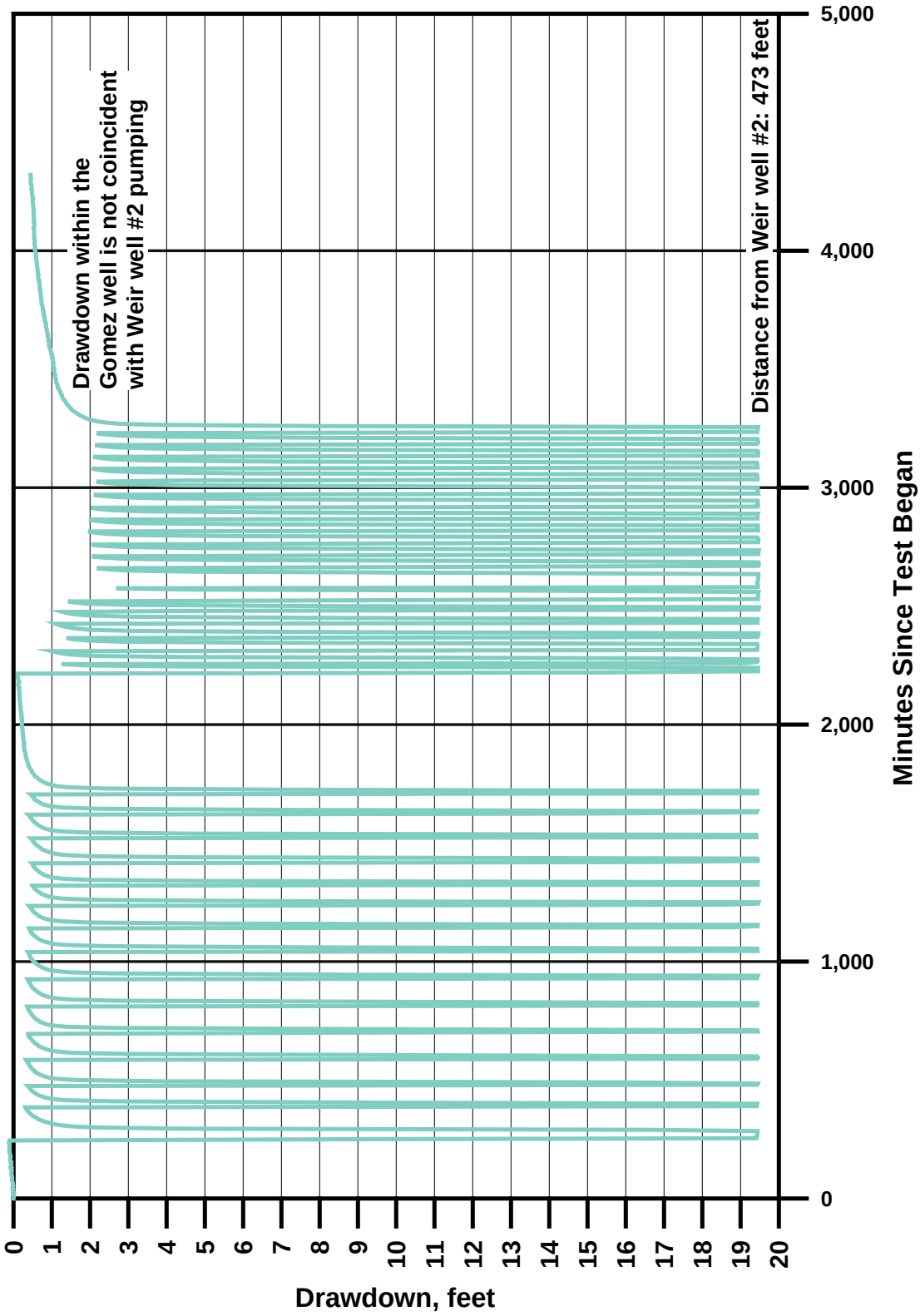
PLATE 6



WEIR WELL No.1 PUMPING TEST, GOMEZ WELL HYDROGRAPH
Cold Canyon Landfill Expansion
San Luis Obispo County, California

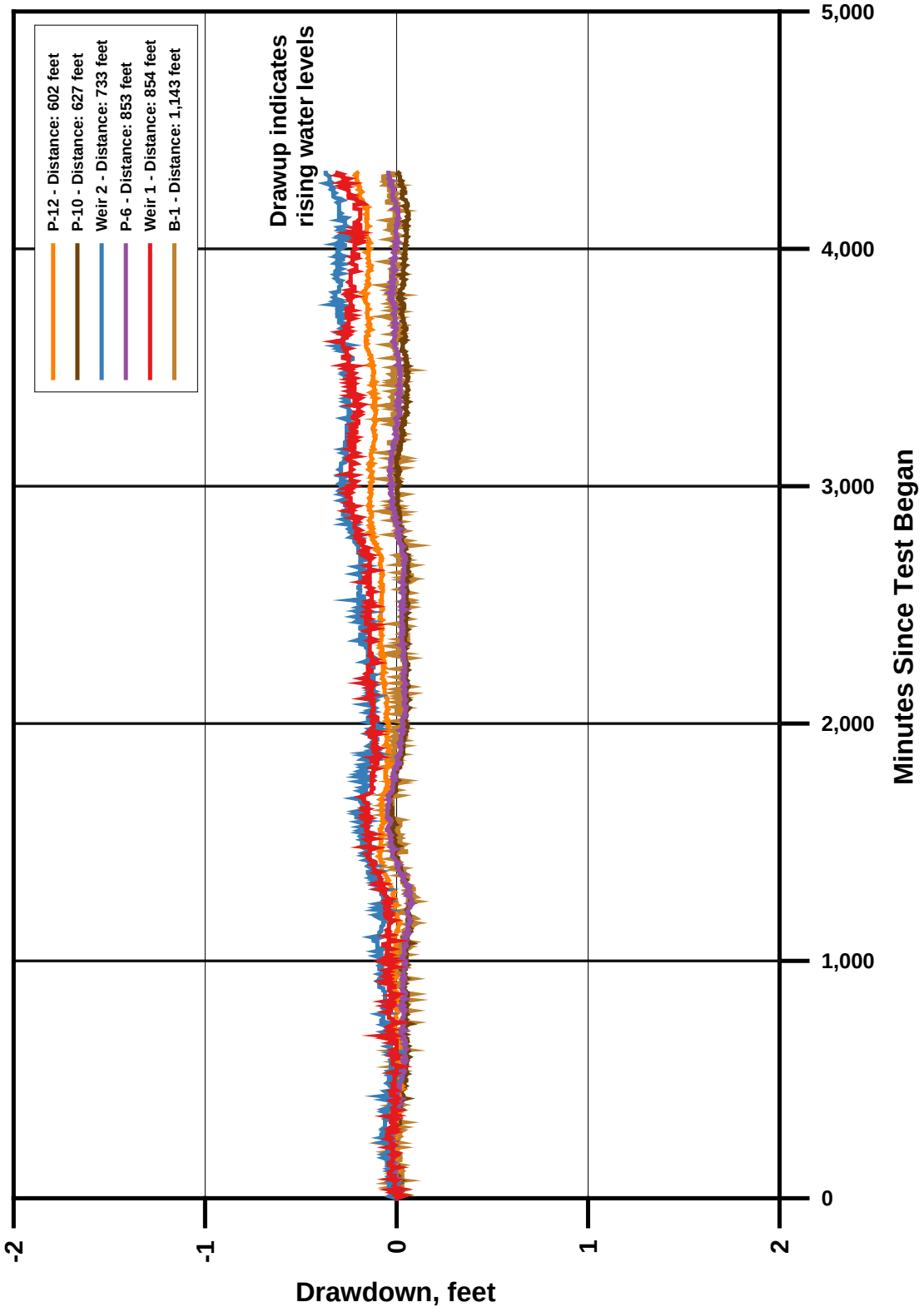


WEIR WELL No.2 PUMPING TEST, MONITORING WELL HYDROGRAPHS
Cold Canyon Landfill Expansion
San Luis Obispo County, California

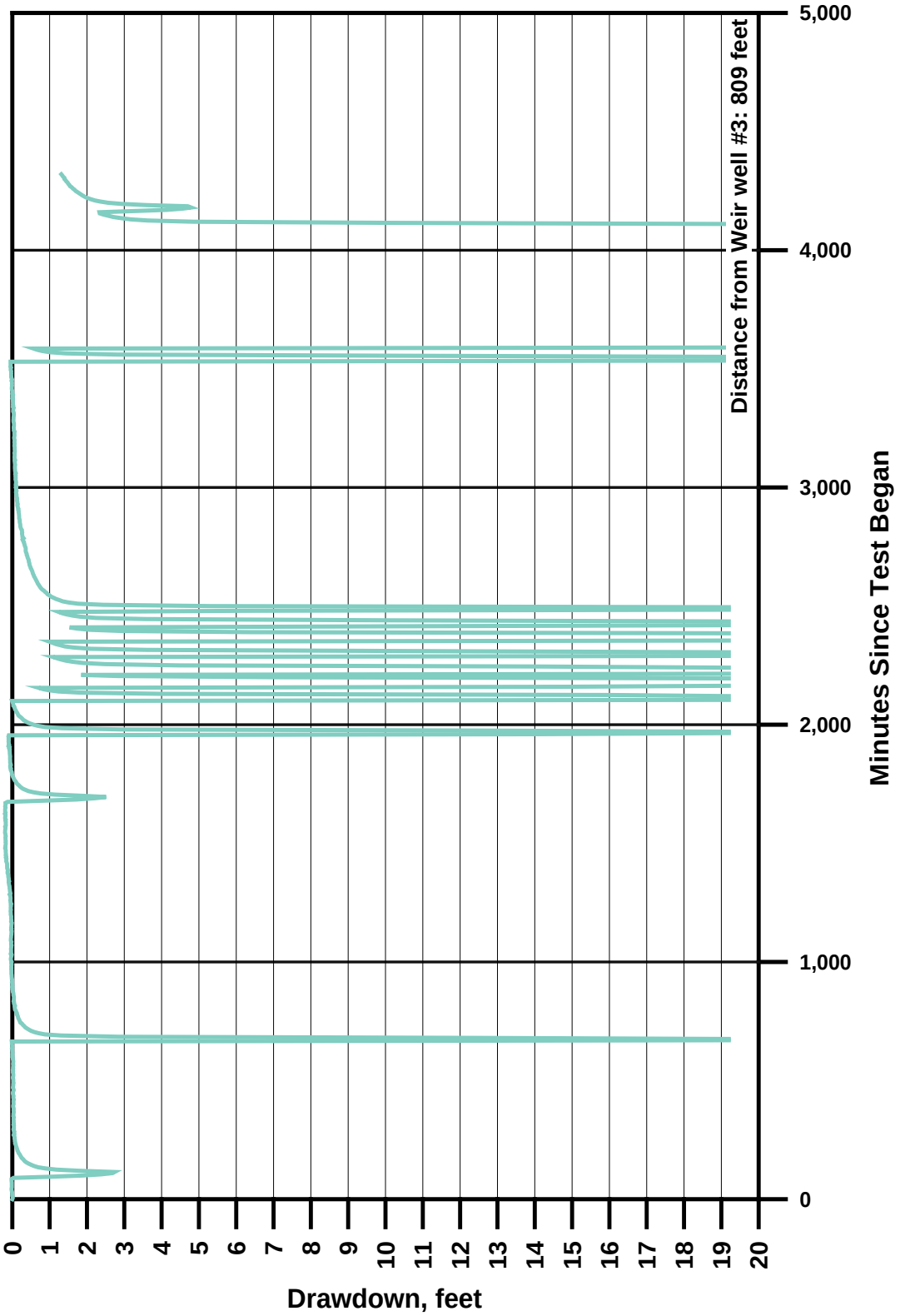


WEIR WELL No.2 PUMPING TEST, GOMEZ WELL HYDROGRAPH

Cold Canyon Landfill Expansion
San Luis Obispo County, California



WEIR WELL No.3 PUMPING TEST, MONITORING WELL HYDROGRAPHS
Cold Canyon Landfill Expansion
San Luis Obispo County, California



WEIR WELL No.3 PUMPING TEST, GOMEZ WELL HYDROGRAPH
Cold Canyon Landfill Expansion
San Luis Obispo County, California

APPENDIX A
SUPPORTING DOCUMENTS

MORRO GROUP
A DIVISION OF SWCA

April 24, 2009

Mr. John McKenzie
Planning and Building Department
County of San Luis Obispo
County Government Center, Room 300
San Luis Obispo, CA 93408

SUBJECT: *Cold Canyon Landfill Expansion Draft EIR – Water Resources Assessment/Response to Comments Update*

Dear Mr. McKenzie;

This memo is intended to update you on our progress responding to comments received on the Cold Canyon Landfill Draft EIR. It focuses on water resources issues, as the responses we will need to prepare may significantly alter the conclusions in the EIR regarding groundwater impacts.

To calculate the potential future water demand of the proposed project, first the existing demand was determined for each project component. Then, increased demand totals resulting from the proposed project were added to the existing demand totals. The net result equaled the potential total future demand associated with the proposed project. The water demand of existing uses was determined by our Water Resources sub-consultant (Fugro) based on their interviews with the Landfill's onsite manager, Mr. Bruce Rizzoli.

To determine the amount of water used by the Compost Operation, Mr. Rizzoli provided an amount of water necessary on a per day and "per windrow" of compost basis. Fugro calculated existing demand to be approximately 27 acre feet per year (afy), and assumed that the Compost Operation was operating at full permitted capacity, which is 300 tons per day (tpd). To calculate future water use, the 27 afy was multiplied by the 50% proposed capacity increase of the Compost Operation (from 300 tpd to 450 tpd). Therefore, the resulting future water use evaluated in the DEIR for the Compost Operation was calculated to be approximately 40 afy.

However, it has come to our attention subsequent to the publishing of the DEIR that the Compost Operation is not currently operating at its full permitted capacity. Based on 2006 receipts provided by the applicant (Table 1 from the applicant-submitted Project Description),

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the Landfill accepted 33,140 tons into the Compost Operation. Assuming a 360 day per year operation schedule, that would equal approximately 92 tpd. Even if the operation accepted increased volumes in 2007, it is not likely it was considerably over 100 tpd. Therefore, given an actual processing rate of approximately 100 tpd versus the 300 tpd estimated in the DEIR, potential future water supply demand associated with the proposed Compost Operation expansion would increase by 450%, not 50%, to approximately 121.5 afy (up from 27.0 afy).

Considering the recharge in the basin from which the Landfill draws water is calculated to be 391 afy, and existing available groundwater from wells utilized by the Landfill was calculated to be approximately 49 afy, we now conclude that the proposed project, specifically the Compost Operation, would result in significant impacts to the groundwater basin. It should be noted that Morro Group has found little evidence that significant water savings can be achieved through alternate composting strategies, such as Aerated Static Piles. It should also be noted that if the Landfill increased the Compost Operation to its existing authorized/permitted 300 tpd limit, the operation would require an additional 54 afy of water, which is also beyond the projected quantity of available groundwater of 49 afy. *In other words, as a means of mitigating groundwater supply impacts, the EIR may be required to be revised to recommend that the capacity of the Compost Operation be limited to less than what is currently permitted.*

We realize that this information has significant ramifications from a project and EIR processing standpoint. At minimum it would result in a new significant impact, which would be unavoidable if the proposed Compost Operation capacity remains at 450 tpd. We also recognize that the Compost Operation is a significant component of the proposed project, provides solid waste reduction and landfill sustainability benefits for the region, and that the applicant may want to pursue the maximum supportable limit given the groundwater limitations.

In order to move forward from this point with the most defensible EIR possible, we would propose that additional testing be performed to confirm or disprove the groundwater characteristics of the identified groundwater basin, subsequent to further conversations with the project applicant. These tests may include a 72-hour pump test of the proposed water supply wells on the project site to measure their capacity and confirm the aquifer's transmissivity. These tests may also assist in refining the limits of the groundwater basin, although this cannot be guaranteed due to the relatively complex local geology.

In addition, because the proposed project demand exceeds the known supply, and because the groundwater basin is known to have significant limitations due to its size and other characteristics, we would also recommend that Fugro expand on the relatively general "water balance" they previously prepared. This may include additional field work or research to

refine the percolation/infiltration rate for the basin, and the precise geologic boundaries of the basin. These factors play a substantial role in determining potential recharge of the groundwater basin. This work, in connection with the testing described above would allow for a more defensible, revised Water Resources section and adequate responses to the comments received on the Draft EIR.

Please contact us if you have any questions in regards to this memo.

Sincerely,

SWCA/MORRO GROUP, INC.

Keith Miller
Project Manager

Table 1

Site Tonnage Summary [1]
Cold Canyon Landfill

Year	Total Inbound Tonnage [2]	Resource Recovery Park	Compost Facility	Soil [3]	Material Recovery Facility	Disposal Tonnage: Incoming Waste	Disposal Tonnage: Residuals	Disposal Tonnage: Total	Total Diverted	Percentage
2001	192,339	2,137 [4]	15,820 [5]	1,870		172,512 [6]		172,512	19,827	10.3%
2002	197,498	4,595 [4]	20,873 [5]	1,845		170,186 [6]		170,186	27,312	13.8%
2003	243,561	6,697 [4]	25,553 [5]	3,977	29,418 [7]	177,917 [6]		177,917	65,644	27.0%
2004	243,251	18,833 [8]	20,924 [5]	5,230	30,431 [7]	166,292 [9]	4,500 [10]	170,792	72,459	29.8%
2005	262,728	22,375 [11]	29,970 [12]	4,961	31,012 [13]	172,759 [14]	6,651 [15]	179,410	83,318	31.7%
2006	255,558	25,997 [11]	33,140 [12]	5,340	31,545 [13]	159,536 [14]	11,221 [15]	170,756	84,801	33.2%

[1] Based on site records.
[2] Total of all inbound tonnage. Does not include residuals from the resource recovery park, compost facilty, or materials recovery facility.
[3] Tonnage of clean soil used as daily/intermediate cover or for other on-site use.
[4] Tonnage of diverted metal and construction and demolition debris
[5] Tonnage of diverted green waste.
[6] Total tonnage disposed, including incoming waste and residuals.
[7] Tonnage of recyclable material recovered at materials recovery facility.
[8] Tonnage of incoming loads directed to the resource recovery park before diversion of recoverable materials.
[9] Tonnage of incoming waste loads directed to the landfill and residuals from the resource recovery park.
[10] Tonnage of residuals from the resource recovery park.
[11] Tonnage of incoming loads directed to the resource recovery park.
[12] Tonnage of incoming loads with green waste.
[13] Tonnage of incoming loads from curbside recycling programs directed to materials recovery facility.
[14] Tonnage of incoming loads directed to the landfill and residuals from the materials recovery facility.
[15] Tonnage of residuals from resource recovery park, compost facility, and wood waste operation.

Table 2

2006 Site Tonnage Data [1]
Cold Canyon Landfill

Average Incoming Tonnage

Day	January	February	March	April	May	June	July	August	September	October	November	December	Average
Sunday	132	118	124	129	124	122	148	152	120	142	115	91	126
Monday	894	803	843	927	923	1,037	1,080	1,023	902	973	846	860	926
Tuesday	904	882	831	934	959	967	889	932	956	952	941	819	914
Wednesday	950	864	794	896	1,027	998	1,011	947	925	891	895	766	914
Thursday	914	822	808	880	905	952	949	986	911	855	798	788	881
Friday	933	846	812	942	945	1,094	1,042	959	953	950	870	823	931
Saturday	228	237	176	217	266	227	246	280	224	279	198	246	235
Weekday Average	919	844	817	916	952	1,010	994	969	929	924	870	811	913
Daily Average	721	653	644	668	758	788	740	774	705	717	678	596	704
Daily Average $_5$	983	915	868	1,002	1,022	1,075	1,092	1,043	1,007	1,011	925	894	987
Peak Day	1,090	917	921	1,108	1,108	1,141	1,169	1,120	1,027	1,113	1,091	923	
Date	1/9/06	2/14/06	3/21/06	4/24/06	5/31/06	6/23/06	7/31/06	8/24/06	9/11/06	10/30/06	11/6/06	12/15/06	

Average Disposal Tonnage

Day	January	February	March	April	May	June	July	August	September	October	November	December	Average
Sunday	77	80	65	66	83	102	92	145	90	99	84	48	86
Monday	651	576	597	640	646	744	784	745	659	673	511	600	652
Tuesday	584	590	529	608	625	646	577	628	652	621	590	557	601
Wednesday	596	587	515	557	671	658	656	637	621	579	560	509	596
Thursday	600	543	521	553	575	614	601	635	628	522	479	465	561
Friday	666	566	539	606	626	778	699	616	645	615	574	571	625
Saturday	166	176	106	128	207	195	193	194	183	173	161	174	171
Weekday Average	619	573	540	593	629	688	663	652	641	602	543	540	607
Daily Average	486	446	421	427	506	545	499	526	491	468	429	396	470
Daily Average $_5$	663	624	568	641	681	743	737	709	702	660	585	595	659
Peak Day	760	645	633	786	807	833	834	792	751	683	764	624	
Date	1/9/06	2/21/06	3/27/06	4/24/06	5/31/06	6/9/06	7/17/06	8/7/06	9/11/06	10/30/06	11/3/06	12/18/06	

[1] Based on site records for 2006

Table 3

Site Vehicle Data [1]
Cold Canyon Landfill

Day	January	February	March	April	May	June	July	August	September	October	November	December	Average
	Average Vehicles per Day [2]												
Sunday	173	188	166	155	178	211	221	213	199	188	174	71	178
Monday	307	266	282	269	271	374	407	363	288	333	319	298	315
Tuesday	327	330	265	302	334	382	312	376	354	340	314	307	329
Wednesday	333	328	292	283	358	401	377	362	338	317	317	284	332
Thursday	327	323	306	300	331	361	380	374	341	322	270	283	326
Friday	374	335	271	317	351	407	399	350	358	345	313	333	346
Saturday	267	261	185	233	282	282	303	283	261	238	213	190	250
	Average Vehicles per Hour [2]												
	January	February	March	April	May	June	July	August	September	October	November	December	Average
6 am - 7 am	0	1	0	0	0	0	0	1	0	0	0	0	0
7 am - 8 am	5	6	5	5	6	6	6	6	5	6	5	5	6
8 am - 9 am	28	28	25	26	30	36	35	32	28	27	27	23	29
9 am - 10 am	31	33	29	27	33	38	35	35	32	31	30	28	32
10 am - 11 am	39	35	30	32	38	44	43	42	41	36	34	30	37
11 am - 12 pm	42	37	31	32	39	46	46	45	41	39	36	33	39
12 pm - 1 pm	40	38	35	36	40	45	47	45	40	39	38	33	40
1 pm - 2 pm	53	51	47	44	49	53	51	53	49	50	47	43	49
2 pm - 3 pm	57	50	45	48	54	64	61	61	58	57	50	43	54
3 pm - 4 pm	11	9	8	11	12	15	14	14	12	11	8	8	11
4 pm - 5 pm	1	1	1	1	1	2	1	1	1	1	1	0	1
5 pm - 6 pm	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	307	289	256	262	302	349	339	335	307	297	276	246	298

[1] Site vehicle data based on records for 2006.

[2] Includes vehicles delivering wastes to site (landfill, resource recovery park, compost facility, materials recovery facility) and vehicles transporting recovered materials from the site.

Table 4

Site Operations Personnel
Cold Canyon Landfill

Area	Position	Existing Number	Proposed Number
Administration			
	Site Manager	1	1
	Site Engineer	0	1
	Office Manager	0	1
	Support Staff	1	2
Scalehouse			
	Attendant	4	6
Landfill			
	Operator	4	5
	Mechanic	1	1
	Spotter/Laborer	2	2
Resource Recover Park			
	Operator/Laborer	7	12
	Mechanic	0	1
HHWCF		2	4
EWPRF		4	6
Compost Facility			
	Operator/Laborer	3	4
	Mechanic	1	1
Materials Recovery Facility			
	Supervisor/Foreman	1	2
	Facility Manager	1	1
	Office Support	1	2
	Operator	4	6
	Mechanic	0	1
	Laborer	15	21
		52	80

HHWCF = Household hazardous waste collection facility
EWPRF = Electronic waste processing and recovery facility

Table 5

Site Operating Hours
Cold Canyon Landfill

Operation	Existing	Proposed
Landfill - Franchise and Contract Haulers	7:00 am - 4:30 pm	7:00 am - 5:00 pm
Landfill - General Public	8:00 am - 3:00 pm	7:00 am - 5:00 pm
Resource Recovery Park	7:30 am - 4:30 pm	7:00 am - 5:00 pm
HHWCF and EWPRF	11:00 am - 3:00 pm	7:00 am - 5:00 pm
Compost Facility - Material Receipt	8:00 am - 3:00 pm	7:00 am - 5:00 pm
Compost Facility - Processing	7:30 am - 4:30 pm	7:00 am - 5:00 pm
Material Recovery Facility - Material Receipt	7:30 am - 4:30 pm	7:00 am - 5:00 pm
Material Recovery Facility - Processing [1]	7:30 am - 4:30 pm	7:00 am - 10:00 pm

HHWCF = Household hazardous waste collection facility
EWPRF = Electronic waste processing and recovery facility
[1] Equipment maintenance can occur 24 hours per day (indoor only).
& material transport limited to 7:00 am to 5 pm.

Table 6

Landfill Capacity, Service Life, and Earthwork
Cold Canyon Landfill

	Currently Remaining [1]	Proposed Expansion [1, 2]
Air Space (cubic yards)	2,721,200	15,828,900
Earthwork (cubic yards)		
Daily and Intermediate Cover [3]	428,300	2,742,700
Final Cover [4]	365,400	604,600
Liner [5]	0	89,800
Earthfill	0	85,100
Total	793,700	3,522,200
Available Soil		
Existing Stockpiles [6]	644,300	644,300
Excavation	0	3,234,300
Total	644,300	3,878,600
Drainage Layer (imported) [7]	0	49,900
Fill Capacity [8]		
Cubic Yards	2,355,800	15,084,600
Tons [9]	1,531,300	9,805,000
Landfill Service Life (years)		
Disposal Tonnage based on Population [10]	9	48
Disposal Tonnage based on Existing Growth [11]	8	26
Disposal Tonnage based on Proposed Project [12]		33

[1] As of January 3, 2007
[2] Includes currently permitted landfill, entrance area, and Weir Ranch.
[3] Based on a 4.5-to-1 waste-to-soil ratio
[4] Assumes an additional 3 feet of final cover over the top deck and sideslope areas.
[5] Assumes use of geosynthetic clay liner for the low-permeabilty layer. Includes 1-foot thick soil operations layer on the base and 2-foot thick soil operations layer on the sideslopes.
[6] Does not include Stockpile 2, which is permanent.
[7] Assumes 12-inch thick granular layer
[8] Fill Capacity = waste + daily and intermediate cover
[9] Assumes a capacity utilization of 0.65 tons per cubic yard
[10] Assumes annual disposal tonnage increase based on population projections from Department of Finance
[11] Assumes disposal tonnage based on 2001 - 2006 average annual increase
[12] Based on annual increase to an $average_5$ of 2,111 in 2031.

Table 7

Landfill Equipment
Cold Canyon Landfill

Model	Description	Quantity	
		Existing	Proposed
Caterpillar 120G	Motor Grader	1	1
Caterpillar D8N	Bulldozer	2	2
Caterpillar D7R	Bulldozer	1	1
Al Jon 81K	Landfill Compactor	1	1
Al Jon 525	Landfill Compactor	1	1
Caterpillar 615C	Scraper	1	1
Caterpillar 627F	Scraper	1	1
Kenworth	Water Truck (4,000 gallons)	1	1
Volvo	Service Truck	1	1

Note: Specific equipment used at Cold Canyon Landfill may vary from that listed above, based on equipment maintenance and replacement, or other factors, such as technological advances in equipment. At all times, sufficient numbers and types of equipment will be provided to operate the landfill in accordance with applicable permits, approvals, and industry standards.

Table 8

Groundwater Monitoring Program Summary
Cold Canyon Landfill

Sample Location	Monitoring Program			VOC [2] Monitoring Frequency	Inorganic Parameter [3] Monitoring Frequency
	Detection	Evaluation	Other [1]		
MW-1 [4]	X	X		Quarterly	Quarterly
MW-2		X		Quarterly	Semi-annually
MW-3	X	X		Quarterly	Semi-annually
MW-5	X			Quarterly	Quarterly
P-1A			X	Annually (alternating between high and low groundwater)	Annually (alternating between high and low groundwater)
P-1B	X			NA [5]	Quarterly
P-2			X	Every 3 years (alternating between high and low groundwater)	Every 3 years (alternating between high and low groundwater)
P-3A	X	X		Quarterly	Semi-annually
P-3B	X			NA	Quarterly
P-4			X	Annually (alternating between high and low groundwater)	Annually (alternating between high and low groundwater)
P-5	X			Quarterly	Quarterly
P-6			X	Annually (alternating between high and low groundwater)	Annually (alternating between high and low groundwater)
P-7	X	X		Quarterly	Quarterly
P-8	X			Quarterly	Quarterly
P-9	X			Quarterly	Quarterly

VOC = Volatile organic compounds

[1] This program is similar to detection monitoring, but is sampled at less frequent intervals.

[2] Volatile Organic Compounds: USEPA Method 8260

[3] Inorganic parameters:

Field: Ph, EC, temperature, turbidity, dissolved oxygen

Laboratory: chloride, sulfate, dissolved arsenic, dissolved manganese

[4] Wells MW-1, MW-3, P-3A, and P-7 are in detection monitoring for VOCs and evaluation monitoring for inorganic parameters.

[5] NA = Not Analyzed

Table 9

Typical Landfill Gas Composition
Cold Canyon Landfill

Landfill Gas Components	Percentage of Gas *
Methane	45
Carbon Dioxide	35
Nitrogen	20
Oxygen	<1

* Based on May 2007 values

Table 10

Current Resource Recovery Park Equipment
Cold Canyon Landfill

Model	Description	Quantity
Caterpillar IT-18B	Loader	1
Caterpillar IT-14G	Loader	1
Caterpillar 312C	Excavator	1
White	Roll-off truck	1
GMC	Roll-off truck	1

Table 11

Compost Facility Equipment
Cold Canyon Landfill

Equipment	Type	Existing Number	Proposed Number
Rubber-tired loader	Cat IT 28	2	2
Roll-off truck	Freightliner	1	1
Roll-off truck	International	1	1
Water truck	Kenworth	2	2
Grinder	Morbark 1200 XL	1	
Grinder	Peterson 2400		1
Trommel screen	Wildcat	1	1
Service truck	GMC	1	1
Compost turner	Scarab 18HYD/450/RT	1	1
Water truck	Volvo	1	1
ASP blower [1]	Electric		TBD

cy = cubic yard
TBD = To be determined
[1] Only needed if ASP technology is used

Table 12

Typical Construction and Demolition Debris Composition
Cold Canyon Landfill

Material Type	Percentage by Weight
Wood Waste	20 - 30
Alternative Daily Cover Fines	10 - 20
Concrete/Asphalt	5 - 15
Green Material/Brush	5 - 10
Cardboard	3 - 7
Scrap Metal	3 - 5
Dry Wall	1 - 5
Plastic	2 - 4
CRV Containers	<1
Residual	25 - 50

Table 13

Construction and Demolition Processing Facility Equipment
Cold Canyon Landfill

Equipment	Type	Number	Function
Rubber-tired loader w/grappling bucket	John Deere 644 with JRB grappler	1	Load C&D material onto feed conveyor and commodity bins
Roll-off bins		30	Store sorted commodities under sort line and commodities before further processing
Portable processing line	Super Ptarmigan, or equivalent	1	Process up to 30 tons per hour of C&D material
Hopper/loader	72" wide x 15'-9" long, double-beaded steel pan	1	Load C&D material
Incline conveyor	72" wide x 29'-6" long	1	Elevate C&D material to the disc screen and sort line
Disc screen	BHS 72" wide x 12" long with 2" opening	1	Screen C&D material to remove 2" minus fines for use as ADC
Electric magnet		1	Remove ferrous metal
ADC conveyor	36" wide x 20' long with magnet	1	Convey ADC from disc screen to roll-off bin and remove ferrous metal
Truck loading bin	CSL 42-Unit 155 cubic yard storage bin	1	Stores ADC in an elevated storage bin for truck load-out
Sort line	72" wide x 82' long sliderbed conveyor with 9 sort bays	1	Sort line with 20 work stations for sorters
Takeaway conveyor	72" wide x 20' long troughing-style sliderbed conveyor	1	Conveys residuals from end of sort line to a transfer trailer
Rubber-tired loads	John Deere, or equivalent	3	Load wood waste into grinder and load wood chips in transfer trailer
Skip loader	John Deere 304, or equivalent	1	Floor sorting

C&D = Construction and demolition debris
ADC = Alternative daily cover

FUGRO WEST, INC.

660 Clarion Court, Suite A
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May 22, 2009 (Revised June 22, 2009)
Project No. 3014.035

County of San Luis Obispo
Department of Planning & Building
County Government Center
976 Osos Street, Room 300
San Luis Obispo, CA 93408

Attention: Mr. John Nall

Revised Proposal for Hydrogeologic Services
Field Activities and Pumping Tests
Cold Canyon Landfill Expansion EIR,

Dear Mr. Nall:

As requested by SWCA, Fugro is pleased to submit this proposal to the County Planning and Building Department to perform hydrogeologic services related to the preparation of the environmental impact report (EIR) associated with the proposed expansion of the Cold Canyon Landfill. We understand that in response to comments received after the circulation of the Draft EIR that additional work is necessary to better define the hydrogeology of the area, including the capacity of the existing wells at the landfill, their current use, and the effects of increased use (i.e., groundwater extractions) on other wells in the "basin." You have apparently discussed with SWCA and the project applicant how such additional work would be performed, at least conceptually, and we understand that the landfill operator will cooperate with Fugro in using their wells to record well yield, drawdown, and interference effects during an extended aquifer test. We anticipate that such testing will need to be performed over several days, possibly for durations of up to 72-hours for each well to be tested. Initial coordination with the operations manager of the landfill will be an important first step in assessing the ability to do this, and how the overall testing program would be accomplished. Elements of the testing program are described below as well as estimated costs to perform and document the work.

A second aspect of work that SWCA has asked that we provide assistance relates to establishing a budget for Fugro to participate in anticipated public hearings associated with the EIR, preparing responses to comments received after circulation of the Draft EIR (specifically those received from Mr. Falkenhagen), and time to respond to a second round of comments related to hydrogeology that will be received after circulation of a revised Draft EIR. Estimated fees to perform these separate but related work tasks are provided below.

Task 1 - Well Testing Program

The goal of the well testing program will be to refine and support (or refute) a number of assumptions and data contained in the DEIR, specifically the capacity and sustainable yield of the existing landfill wells and the anticipated effect of the current and anticipated future use of

the wells on other existing users in the basin. The program is also intended to better define the basin aquifer properties and basin boundaries. We understand, and indeed the program will necessitate, that the project applicant cooperate in the well testing work. To the extent possible and subject to the cooperation of nearby landowner(s) we may instrument several nearby water wells that share an inferred hydraulic connection with the landfill wells (subject to confirmation of well design information) to better determine well interference effects. Although we may be limited to using the existing on-site landfill wells as observation wells throughout the testing program, the effectiveness and credibility of the work would be enhanced if neighboring wells can be enlisted to participate. A survey of active wells in the defined basin will be conducted, again subject to cooperation and assistance of nearby landowners. It should be understood that we do not know at this time if any offsite, private wells will be available for monitoring, or suitable for monitoring. Use of such wells for observation of water levels during the testing of the landfill wells will enhance understanding of the local hydrogeology and, to the extent possible, monitoring of up to three (3) additional private wells (subject to certain limitations as described below) will be included in the field work. To conduct these efforts, it is anticipated that the following scope of work will be performed:

1. Conduct a pre-test field visit to meet with the landfill operator, identify the status of the wells to be tested and the ability of those wells to meet the minimum testing criteria (pumping capacity, ability to measure water levels, ability to meter flow, etc.). At this time, we will also conduct a modified survey of nearby wells that may be suitable candidates for inclusion in the monitoring network;

2. Prepare a brief Technical Memorandum (TM #1) that will include the wells to be pumped and the wells to be monitored, the methods to be used in the pumping tests, anticipated instrumentation needs (meters, pumps, ability to measure water levels, etc.), and nearby private wells potentially suitable for monitoring. If the proposed scope of work needs to be revised based on the results of the pre-test field meeting, those necessary changes will be outlined for review and approval by the County.

3. Conduct well capacity tests, if possible, to confirm the production capacity of the Weir wells to be tested. We understand that only two of the three Weir wells are functional. Should the landfill operator restore functionality to the third well (i.e., ability to pump at a constant rate for up to 72-hours with ability to measure water levels and record discharge), we will also test the third well;

4. Monitor and record water level data in other accessible proximate onsite wells and/or observation wells to confirm aquifer storativity, conductivity, and drawdown;

5. Analyze the potential well drawdown and interference effects on up to three (3) neighboring wells subject to the presence and location of nearby wells, the well depth, and owner cooperation. If neighboring wells can be used, we would instrument the additional wells in the area to document the interference effects from the pumping of such neighboring wells and the landfill wells, and;

6. Prepare a Technical Memorandum (TM #2) summarizing the field work performed and the results. The TM #2 would be suitable for incorporation in the revised Draft EIR (to be prepared by SWCA).

We propose to install pressure transducers in two of the three Weir wells and perform a 72-hour constant discharge pumping test in each well. Prior to performing the tests we would meet with the landfill operations staff to inspect the wells and coordinate the program. Potential offsite well(s) suitable for monitoring would also be identified (again, we have assumed that we would monitor up to three offsite wells). It would be the responsibility of the County to contact the owners of the wells that we identify and mutually agree to include in the monitoring network and obtain permission to use the wells as part of the aquifer test program. These wells will be identified in the TM #1.

Each well will need to be instrumented with an in-line flow meter, a valve to regulate discharge, and possibly an access tube into which a pressure transducer can be placed to monitor water level variations. Coordination with the landfill operations staff is required to perform the tests so that only a single well is pumping during each test, and to ensure that the pumping well can be pumped at a constant discharge rate. We anticipate that the produced groundwater would be pumped to an 86,000-gallon capacity steel tank behind the Sort Facility (65,000 gallons of which are maintained for fire suppression), to a pond adjacent to Well P-14, or to waste. If the produced water is pumped to waste, it is possible that a RWQCB discharge permit may be required. After completion of each pumping test, the rate of recovery of water levels in the well would be monitored for a period of up to 72 hours, during which each well would need to remain off.

The field activities associated with performance of the pumping tests for the well testing program will require at least a week to perform. Following completion of the pumping tests, we will prepare a Technical Memorandum (TM #2) summarizing the field activities, and compare the acquired aquifer parameter and conclusions relative to any refinements to the basin hydrogeologic properties to the results contained in the DEIR. We will issue a draft copy of TM #2 to both the County and SWCA for review. We will, as appropriate, incorporate comments received and then issue a final TM.

We expect our fees to conduct these tests described in Task 1 to be $33,080, to be billed monthly in accordance with our current fee schedule. A detailed breakdown of the costs and our current Fee Schedule, which will form the basis of compensation, is attached. We assume the County will issue a Blanket Purchase Order to authorize the work, subject to the same general terms and conditions for work that Fugro has recently performed associated with the peer reviews for the Oasis Vineyard and Laetitia Agricultural Cluster projects. Please note that the proposed pumping tests are not intended to address groundwater quality issues nor will we will be collecting water samples for chemical analysis. Should such sampling be desired it would be at additional cost.

This work task, assuming full cooperation from the landfill operator as discussed above will require about a month to complete, exclusive of any well head modifications necessary to the wells that will be the responsibility of the landfill operator. It is important to note that the results of the pumping tests may not significantly alter the content of the hydrogeologic analysis contained in the Draft EIR. The pumping test results will likely not change the application of the small-scale drawdown effects to the regional aquifer system, simply because the inferred well yields may not sufficiently stress the aquifer to create large distance drawdown effects. The

proposed program should however verify the production capacities of the existing onsite wells, as well as possible limitations in sustainable supply.

Task 2 – Public Hearings and Responses to DEIR Comments

As requested by SWCA, work under this task will include preparation for and attendance at two public hearings, preparing responses to comments related to hydrogeology received after circulation of the Draft EIR (largely those received from Mr. Falkenhagen), and additional time to respond to comments that will be received after circulation of the revised Draft EIR. It is important to note that we will not respond to comments received on the current Draft EIR until we have completed Task 1, above. Estimated costs to complete the Task 2 efforts are $16,860, and will be billed on a monthly basis in accordance with the attached Fee Schedule. The costs for this task will include time to prepare for and attend a project team meeting in San Luis Obispo (to be attended by Paul Sorensen), and time for up to two (2) public hearings (also attended by Paul Sorensen). Such meetings will be compensated for on a time and materials basis. We assume the Blanket Purchase Order mentioned above will be the basis for conducting work under this task.

Assumptions

Assumptions that we have made in preparing this proposal and cost estimate include:

- It is unknown whether the RWQCB will allow open discharge of the produced water from the pumping tests to the stream or to waste without obtaining a low-threat discharge permit. If such a permit is necessary and if water sampling and laboratory analyses of the produced water are required (one sample from each of the three tested wells), the cost of the laboratory analyses will be additional. Past experience with low-threat discharge water quality analyses are that the lab costs can be as much as $4,000 to $5,000 per sample.

- The cost to install water meters on the landfill wells and any necessary wellhead modification, including hiring a pump contractor for installation of test pumps, if necessary, will be contracted directly by and paid for by the landfill operator. We will work with County staff and the landfill operator to identify specific needs for each well prior to conducting the tests.

- The landfill operator will be responsible for providing temporary piping or hoses to discharge the produced water at a mutually acceptable discharge site.

- The County will contact and prepare right-of-entry agreements with neighbors for access to their wells for monitoring. We will work with County staff and the landfill operator to identify potential wells to monitor. The cost proposal is based on the assumption that we will monitor no more than three neighboring wells, in addition to the on-site Weir wells.

- The landfill operator will, upon installation of meters on the landfill wells, keep a daily log of use for each well with a description of how the water is being used. We will provide

the operator with the daily use report forms. The logs of daily use should be started as soon as possible, and maintained for up to 60 days following termination of the pumping tests.

- As indicated earlier as well as in previous conversations with SWCA, it should be noted that the results of the testing may not be conclusive relative to the long-term basin supply.

- The costs provided on the attached Fee Estimate spreadsheet are estimates, not firm fixed fee costs. The County will be billed on a Time and Expense basis; the cost of the field investigation may be revised up or down, depending on the results of the pre-test field meeting, but the estimated fees will not be exceeded without mutual agreement and prior authorization.

We appreciate the opportunity to continue to work on this project. If you have any questions, please do not hesitate to call.

Sincerely,

FUGRO WEST, INC.

Paul A. Sorensen, PG, CHg.
Principal Hydrogeologist

David A. Gardner, PG, CHg.
Principal Hydrogeologist
Senior Vice-President

Enclosures: Fee Schedule 2009

Copies: (1-Pdf) Addressee
(1-Pdf) Keith Miller, SWCA

FUGRO WEST, INC.

660 Clarion Court, Suite A
San Luis Obispo, California 93401
Tel: (805) 542-0797
Fax: (805) 542-9311

June 1, 2010
Project No. 3014.035.03

County of San Luis Obispo
Department of Planning & Building
County Government Center
976 Osos Street, Room 300
San Luis Obispo, California 93408

Attention: Mr. John McKenzie

Subject: Cold Canyon Landfill Expansion EIR

Dear Mr. McKenzie:

As requested, Fugro is pleased to submit this proposal for hydrogeologic services related to the proposed expansion of the Cold Canyon Landfill. As discussed in a conference call held on May 25, 2010 with San Luis Obispo county staff and representative of the Cold Canyon landfill, we understand that the focus of the hydrogeologic services required will focus on the review of various water demand information that have been compiled over the last three months by operations personnel at the landfill. These water demand data and related well use records appear to be a continuation of the compilation of such water demand data that was initiated at the landfill in the fall of 2009, which were presented in a supplemental report prepared by Fugro dated February 8, 2010. This supplemental report remains in draft form.

The purpose of this additional work will be to compare the recently compiled water demand and well production information with that previously compiled by Fugro to better refine the categories of landfill water demand (i.e., for composting activities, dust control, materials recycling, daily cover, etc.) and the seasonal variations in such water demand. Given that the composting operations at the landfill use a significant amount of water, we understand that the proposed landfill expansion project may consider a cap on the future average daily tonnage that will be accepted (an annual average of 150 tons per day). We understand that daily records of green waste tonnage received at the landfill for composting are available for the last 5 years, and we will review these records relative to providing the current estimated water demand for this activity v. daily tonnage accepted, and estimated past seasonal water demands for this activity. The compilation of water production and demand data at the landfill is to be an ongoing daily activity, and our analysis will include additional data that we will be provided through June 30, 2010. From these data, existing and future potential water demands at the landfill (both daily and annually) will be developed.

We understand that the month of June 2010 will be considered representative of the period of highest water demand at the facility, both with regards to landfill dust control and compost operations. Because the highest portion of water use at the facility is related to

composting, records of daily compost tonnage collected during the last 5 years will be integral to this analysis.

We will also review recently compiled information on the production capacities of the three wells at the landfill. These data have also been more or less compiled by landfill staff over the last several months. As with the water demand information, we will compare these data with information that Fugro compiled previously on wells production capacity to provide, if possible, a better estimate of well production capacities and limitations.

An important aspect of this supplemental work will be to validate the methods and implied accuracy in the data we have been provided. We note that the various data we have been provided have been compiled in various spreadsheets. We will need to visit the landfill, briefly speak to the individuals that have compiled the data, review their field records of the daily tabulations, evaluate the accuracy of the water demand estimates, inspect the wells and other water meters at the landfill, and document other related water demand and well production activities. Several such spot visits to the landfill are anticipated.

The data and our analysis will be presented in report format that will be a final revised version of the draft report submitted on February 8, 2010. We will provide an opinion on landfill water demand (daily and annual amounts by category of water demand), as well as an opinion on our level of confidence in the water demand figures and how such water demands are affected by, for example, different daily tonnages of composting activities. The revised estimated water demand figures will be compared to our prior analysis of how such landfill related water demands could affect offsite wells (interference affects). This supplemental work is not anticipated to include a significantly revised discussion or re-evaluation of the overall water balance and water supply capability of the local groundwater basin, or comparison of that supply availability to future build-out projections. This is because we are not aware of any new data related to this issue that would affect our earlier analysis.

Costs for the work outlined above are $13,500 and will be billed on a monthly basis in accordance with the hourly rates indicated on the attached Fee Schedule. Pending timely authorization for the work by the County of San Luis Obispo and receipt of the data discussed above, we would plan to submit our report the County of San Luis Obispo on or before July 16, 2010.

We appreciate the opportunity to continue work on this project. Should you have any questions, please do not hesitate to call.

Sincerely,

FUGRO WEST, INC.

Paul A. Sorensen, P.G., CH.g.
Principal Hydrogeologist

David Gardner, P.G., C.H.g.
Senior Vice President

Copies Submitted: (Pdf) Addressee

FUGRO WEST, INC.

4820 McGrath Street, Suite 100
Ventura, California 93003-7778
Tel: (805) 650-7000
Fax: (805) 650-7010

July 8, 2010
Project No. 3014.035

PROJECT MEMORANDUM

To: **Mr. John McKenzie**

From: **Timothy Nicely, C. Hg. and David Gardner, C.Hg.**

Subject: **Cold Canyon Landfill Supply and Demand Analysis, January to mid-June 2010**

We have completed our review of the supplied data related to the water supply and demand at the Cold Canyon Landfill for the period of January through mid-June 2010. This summary is based on the results of our interview with Lacy Ballard, site manager for Cold Canyon Landfill of June 9, 2010, and on electronic and handwritten notes provided to us by the landfill staff. We understand that water supply and demand records do not exist for the period following our previous analysis which included November and December 2009. Based on the availability of data, we were able to perform our analysis of water supply and demand for the period between January and June 2010. A summary of the water supply and demand on a monthly basis is presented on the appended table. The data table represents a summary of data from water trucks logs, flow meter readings, and handwritten notes from landfill staff not presented here for simplicity.

Currently, the sources of groundwater supply at the site are the Weir wells (1, 2 and 3) and the so-called Shop Well. The Weir wells are fitted with totalizing flow meters; the shop well is not. The sources of surface water supply, consist of the Main Sediment Pond, constructed in about 1990, and the Module 8 Pond both of which collect runoff from the site. The pond adjacent the compost facility, which has previously been referred to simply as “the pond” is filled principally by the Weir wells and is used as storage for the pumped groundwater from those wells.

On-site water is used to satisfy following the demands: compost use (irrigation, odor control, and dust control), dust control on landfill roads, and evaporation and percolation of water from the pond adjacent the compost facility. Evaporation from the pond was calculated based upon CIMIS evapotranspiration data from a nearby station and the known surface area of the pond. Percolation of water from the unlined pond adjacent to the compost facility is not known but may be considered minor relative to total water use, because of the relatively small size of the pond, the understanding of the prior landfill manager that the pond bottom is relatively fine-grained and coated with biological growth. Because the pond is located within the Pismo geologic formation, as are the Weir wells, the percolated water would likely return to the groundwater as recharge and result in no net use. Note that during calendar year 2010 to mid-June, significant rainfall has occurred during each month between January and April. Minor

rainfall occurred during May 2010 (0.27 inches). June 2010 constituted the first month of the year without rainfall.

Data Analysis

During January 2010, meter records documenting groundwater production from the Weir wells were not able available from the landfill staff. However, water use as documented by in-truck logs of water provided by the MRF tank and pond adjacent the composting facility totaled 106,400 gallons. During January 2010, as recorded on the truck field logs documenting water use, no water was pumped from the Shop Well, Module 8 Pond, or the main sedimentation pond. Total site demand during January was 122,700 gallons, which was relatively low for the site, largely due to the approximately 7 inches of rainfall which fell at the nearby CIMIS rainfall gauge. During the month approximately 75% of the water demand was related to compost uses. The remaining 25% of demand was divided relatively evenly between dust control for the landfill roads and evaporation from the pond adjacent the composting facility.

During February 2010, no meter records existed for groundwater supply from the Weir wells. However, water use as documented by in-truck logs indicated that water pulled from the Materials Recovery Facility (MRF) tank and pond adjacent the composting facility totaled 83,600 gallons. During February, a total of 3,800 gallons of water was supplied by the shop well (which is not fitted with a flow meter) and a total of 11,400 gallons was supplied by the Module 8 Pond. No water was supplied by the main sedimentation pond. Total water supply was not documented due to a lack of records of water meter readings from the Weir wells. Total site demand was 116,000 gallons.

March 2010 was the first month of 2010 with records of meter readings from the Weir wells, the pond adjacent the compost facility, and the MRF tank. During the month the Weir wells pumped a total of 33,000 gallons; the shop well provided an additional 15,000 gallons equaling a total of 48,000 gallons from groundwater. Surface water sources supplied a total of 156,000 gallons from the Module 8 Pond. Water supply totaled 204,000 gallons. Water demand exceeded supply during March by approximately 52 percent, totaling 312,000 gallons. The reasons for the discrepancy between water demand water supply volumes are not known.

During April 2010 groundwater supply totaled just over 250,000 gallons, of which 207,000 gallons was from the combined Weir wells. Surface water supply totaled approximately 239,000 gallons. Water supply totaled 470,000 gallons. During April total water demand was slightly less than supply at approximately 411,000 gallons. The reasons for the discrepancy are not known.

During 2010 total groundwater supply was equal to approximately 325,000 gallons. Surface water sources, principally the Module 8 Pond provided an additional 240,000 gallons, to provide a total supply to the site of 565,000 gallons. During the month water demand was slightly higher than supply at 591,000 gallons.

Based on the partial record through June 14, total groundwater supply was equal to approximately 280,000 gallons. Surface water supply totaled approximately 178,000 gallons,

for combined water supply of 458,000 gallons. During the same period site water demand was equal to 436,000 gallons, slightly less than the estimated supply.

Discussion

The results of our analysis indicate that during the months of May and June 2010 (to date) supply and demand, estimated based on various sources including meter readings and field logs of water truck usage, were within 5 percent. During the wetter months of March and April 2010, the supply and demand estimates varied more widely; during March supply was 34% lower than water demand, and during April supply was 14% greater than demand. Because meter data do not exist for January and February 2010, a similar comparison is not available for those months. Based on this, it seems that this estimation of supply and demand is prone to some error during periods of significant precipitation, which acts to capture runoff for reuse at the site. The reasons why supply and demand are disparate during periods of precipitation are not known, but may be associated with operational procedures not accounted for by either the in-truck field logs or meter readings.

Because green waste processing constitutes the largest water use at the site we requested records of daily tonnage of green waste accepted at the site to determine the relationship between green waste acceptance and water use. Records of green waste tonnage were provided to us on a daily basis for the period of March 2005 through May 2010. During that period, monthly averages of green waste tonnage acceptance averaged approximately 100 tons per day. The monthly averages for green waste acceptance varied between 67 and 128 tons per day. These values were compared with the records for water used for green waste processing for the period between January and May of 2010, the period of these records. The results of the analysis, presented on the appended plates and table show the daily water use for compost processing varied between approximately 2,500 (February) and 8,200 (May) gallons per day during 2010. The final plate shows that for the five months with both sets of data there appears to be no obvious relationship between green waste acceptance and associated water use. This analysis is limited by the short period of record for metered water use data, and includes only a single month without significant rainfall (May 2010), which appears to decrease water use related to green waste processing.

Preliminary Comparison with Previous Demand Estimate Data

Estimates of current groundwater demand were estimated to be approximately 35 acre feet per year (afy) in our previous study of the site (Fugro, 2008.) Those estimates were based solely on the understanding of the landfill manager, and were not supported by actual measurements of water use (water meters.) Water meters were installed as documented in our draft technical memorandum dated January 15, 2010. That report documented the data from the in-truck field logs, which were provided to the water truck drivers to estimate the quantity of on-site water demand. Based on the relatively short timeframe of that study, which included pumping tests of the Weir wells, we concluded that the Weir wells were capable of providing at least 31,000 gpd, or 25 afy annually.

Based on the 2010 data, if we assume that water supply and demand during the months of June, July, August and September will be equal to that of May, and assign appropriately tapering values for the remainder of calendar year, total site demand may be equal to less than 15 afy. This demand obviously reflects site activities and water use for a very short period based on the dates we were provided. Of this supply, during May and June of 2010, approximately 66 percent of the demand was met by groundwater supplies. Based on our estimations of site demand and groundwater supply for the remainder of calendar year 2010 based on the acquired data, we estimate that approximately 55 percent of the site demand will be satisfied by groundwater supplies. Therefore, it is reasonable to assume that the annual demand can be reduced by the volume of surface water supplies. The results of this calculation indicate that annual groundwater demand is on the order of 8 afy.

Precipitation during the current water year (September 2009 to August 2010) has totaled 17.46 inches, which is equal to approximately 84% of the normal rainfall as measured at the Cal Poly, San Luis Obispo. Because this rainfall is roughly equivalent to the normal, it is reasonable to presume that a roughly similar amount of surface water will be available during all but the driest years. Note that the use of surface water in lieu of groundwater at the site has not been documented previously and constitutes a new water source which has not been considered as part of the Project Description for the EIR.

Recommendations

Based on this review, we recommend the following:

1. Because relatively close agreement between supply and demand is only acceptably close during periods without precipitation, and because the records only include one or two such dry months, we suggest that the period of data collection continue for an additional three months, through September 2010, in order to confirm that the estimates of supply and demand are accurate. Based on the data, we cannot conclude whether the agreement between supply and demand during May and June 2010 is actual, or coincidental.

2. Because the so-called shop well currently provides the landfill with a nontrivial volume of water, we recommend that the well be fitted with a flow meter in a manner similar to the other wells.

3. Because a majority of the demand is satisfied by water from the pond adjacent the compost facility, we suggest that a flow meter be installed at the pond filling station to confirm the accuracy of the in-truck field logs.

4. The design capacity and expected operational surface water supply volume related to the Module 8 Pond should be provided by Golder, who designed the pond.

5. Given the uncertainties discussed in this interim analysis, we recommend that another 3 months of water use data be compiled. After compilation of water

supply and demand data through September 2010, we are prepared to revise the February 8, 2010 revised draft report.

References

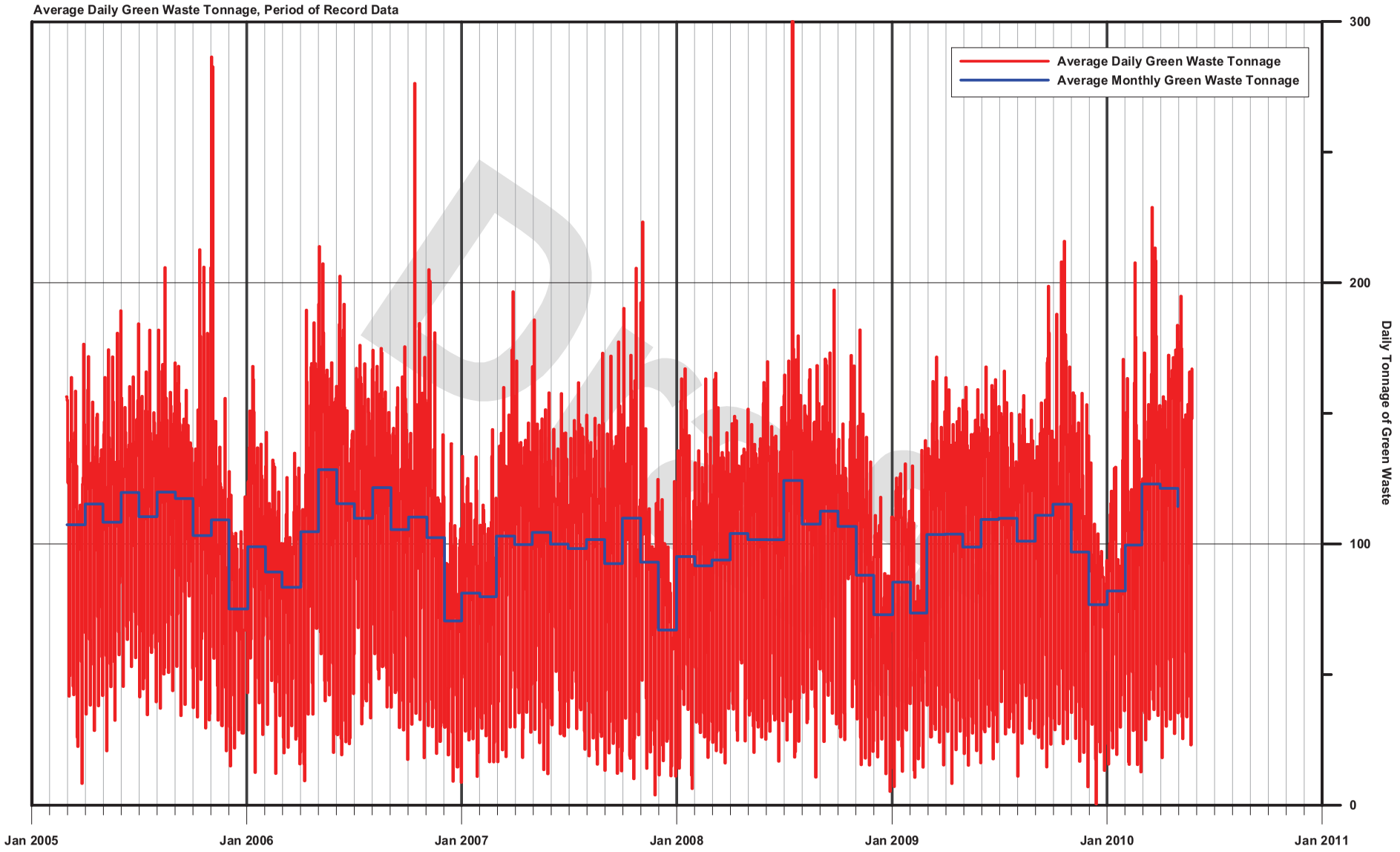
Fugro West (2008), *Water Resources Assessment for the Cold Canyon Landfill Expansion Environmental Impact Report* prepared for the Morro Group, March 4.

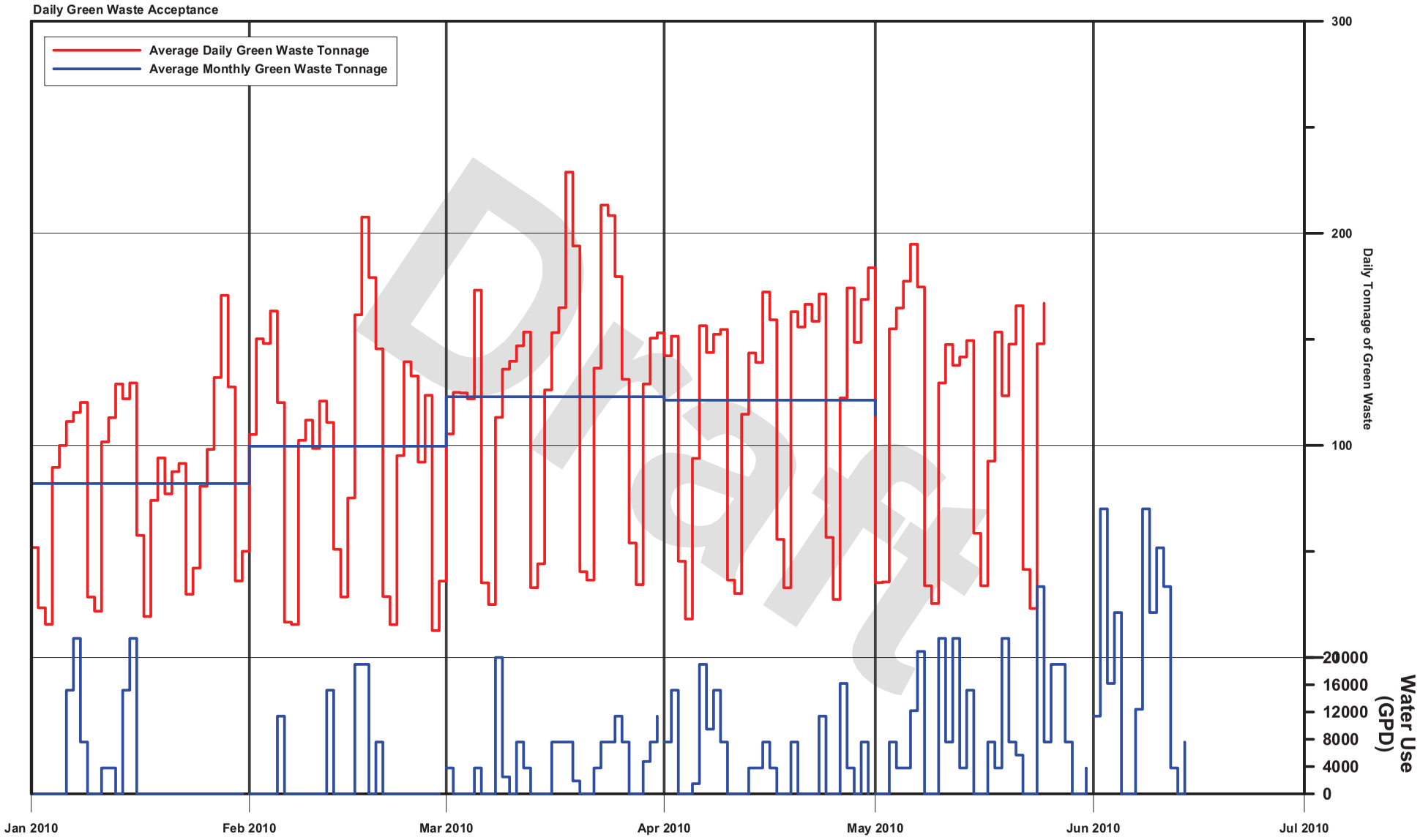
Cold Canyon Landfill Supply and Demand Summary
January to mid-June 2010

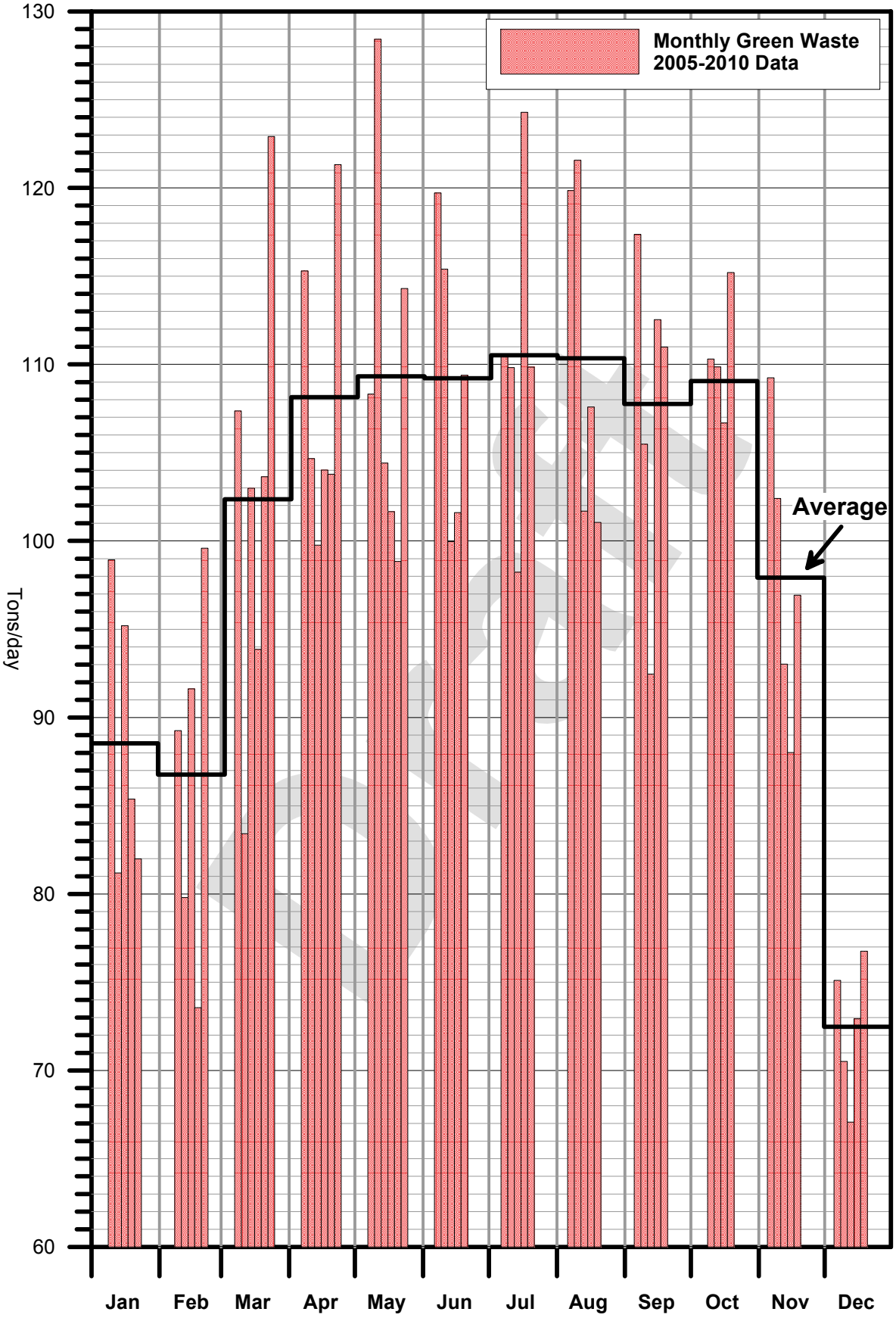
	Groundwater Supply		Surface Water Supply		Water Demand				Total Supply	Total Demand		
Month	Weir Wells Gal/Mo	Shop Well Gal/Mo	Module 8 Gal/Mo	Sediment Pond Gal/Mo	Pond Percolation Gal/Mo	Pond Evaporation Gal/Mo	Compost Gal/Mo	Dust Control Gal/Mo	Total Gal/Mo	Total Gal/Mo	ETo, Inches	Precip, Inches
January 2010	Unknown	0	0	0	Unknown	16,283	91,200	15,200	Unknown	122,683	1.96	6.15
February 2010	Unknown	3,800	11,400	0	Unknown	17,197	72200	26600	Unknown	115,997	2.07	4.46
March 2010	33,393	15,200	155,800	0	Unknown	32,899	127,950	151,050	204,393	311,899	3.96	0.66
April 2010	207,142	23,400	76,000	163,400	Unknown	38,382	141,200	231,800	469,942	411,382	4.62	1.90
May 2010	258,013	66,500	209,950	30,400	Unknown	47,770	255,400	287,850	564,863	591,020	5.75	0.20
June 2010	268,894	11,400	177,650	0	Unknown	Unknown	254,700	181,450	457,944	436,150	--	0.00
Minimum	33,393	0	0	0	Unknown	16,283	72,200	15,200	204,393	115,997	1.96	0.00
Maximum	268,894	66,500	209,950	163,400	Unknown	47,770	255,400	287,850	564,863	591,020	5.75	6.15
Average	191,861	20,050	105,133	32,300	Unknown	30,506	157,108	148,992	424,286	331,522	3.67	2.23

Note: June data is incomplete. Data is for review only

CIMIS 52 Cal Poly

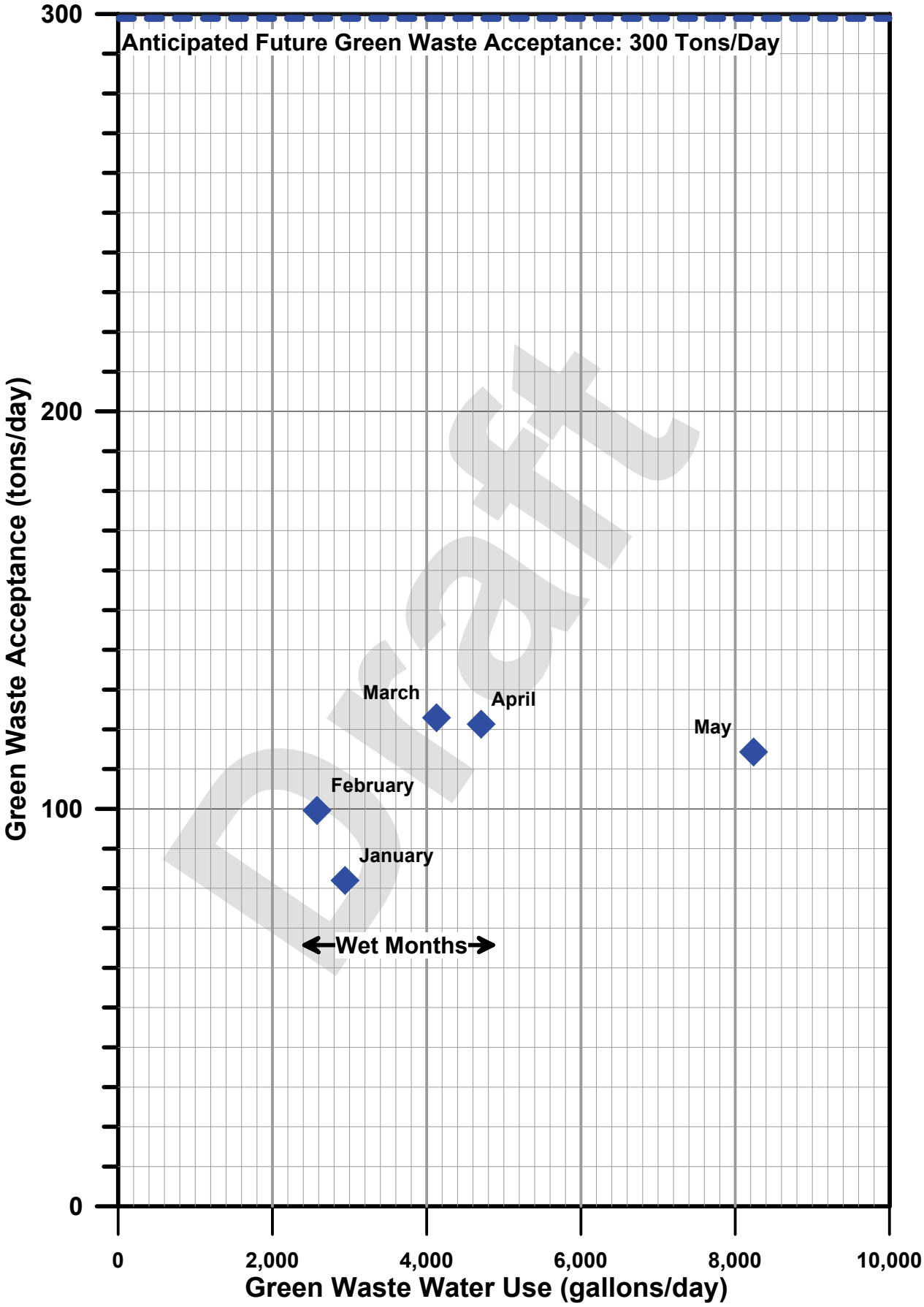

Average Daily Green Waste Tonnage, Period of Record Data
Average Daily Green Waste Tonnage
Average Monthly Green Waste Tonnage
300
200
100
0
Daily Tonnage of Green Waste
Jan 2005
Jan 2006
Jan 2007
Jan 2008
Jan 2009
Jan 2010
Jan 2011


Daily Green Waste Acceptance
Average Daily Green Waste Tonnage
Average Monthly Green Waste Tonnage
300
200
100
0
Daily Tonnage of Green Waste
20000
16000
12000
8000
4000
0
Water Use (GPD)
Jan 2010
Feb 2010
Mar 2010
Apr 2010
May 2010
Jun 2010
Jul 2010


Monthly Green Waste
2005-2010 Data
Average
Tons/day
130
120
110
100
90
80
70
60
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

Cold Canyon Landfill Green Waste and Water Use
January to May 2010

Month	Green Waste Tons/Day	Compost Water Use Gallons/Day
January 2010	82	2,942
February 2010	100	2,579
March 2010	123	4,127
April 2010	121	4,707
May 2010	114	8,239


Anticipated Future Green Waste Acceptance: 300 Tons/Day
300
200
100
0
Green Waste Acceptance (tons/day)
March
April
May
February
January
Wet Months
0
2,000
4,000
6,000
8,000
10,000
Green Waste Water Use (gallons/day)
Draft

APPENDIX B
SITE PHOTOGRAPHS

Weir Well 1 Overview

Weir Well 1 Wellhead

Weir Well 2 Piping

Weir Well 2 Wellhead

Weir Well 3 Wellhead

Weir Well 3 Sounding Hole

Weir Well 3 Piping

Monitoring Well P-1A

Monitoring Well P-1B

Monitoring Well P-1A Wellhead

Monitoring Well P-6

Monitoring Well P-6 Wellhead

Monitoring Well P-8

P-5 and MW-2

Compost Windrows

Monitoring Well P-14

Pond

Pond Filling Station

Pond Outflow

Pond Outflow Valve

Tank Inflow

Monitoring Well P-13

Monitoring Well B-1

Monitoring Well B-1

Monitoring Well P-6 ?

Monitoring Well P-10

Monitoring Well P-11

B-3 or P-12

APPENDIX C
SUPPORTING HYDROGEOLOGIC DATA

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

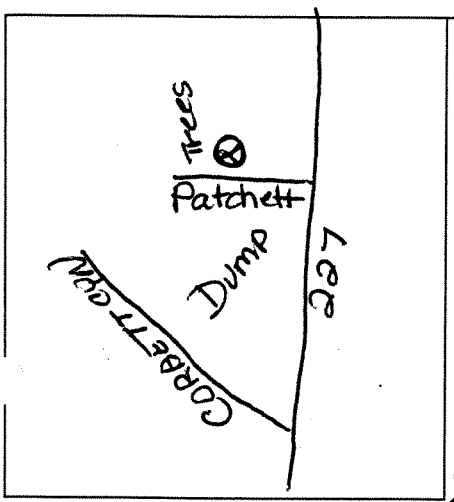
Do not fill in
No. 266376

Notice of Intent No. _____
Local Permit No. or Date _____

State Well No. _____
Other Well No. _____

(1) OWNER: Name Tony Gomez (Derway Property)
Address 475 Corrida Dr.
City San Luis Obispo, CA ZIP 93401

(2) LOCATION OF WELL (See instructions):
County San Luis Obispo Owner's Well Number 1
Well address if different from above _____
Township 31S Range 13E Section 28 33R
Distance from cities, roads, railroads, fences, etc.
APN 044-261-41



WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic ☒
Irrigation ☐
Industrial ☐
Test Well ☐
Municipal ☐
Other ☐
(Describe)

(5) EQUIPMENT:
Rotary ☒ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:
Yes ☒ No ☐ Size Sandpac
Diameter of bore 12 1/4
Packed from 50 to 120 ft.

(7) CASING INSTALLED:
Steel ☐ Plastic ☒ Concrete ☐

From ft.	To ft.	Dia. in.	Gage or Wall
0	120	6	200

(8) PERFORATIONS:
Type of perforation or size of screen

From ft.	To ft.	Slot size
80	120	1/8

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 50 ft.
Were strata sealed against pollution? Yes ☐ No ☒ Interval _____ ft.
Method of sealing Bentonite & Cement

(10) WATER LEVELS:
Depth of first water, if known 80 ft.
Standing level after well completion 80 ft.

(11) WELL TESTS:
Was well test made? Yes ☒ No ☐ If yes, by whom? _____
Type of test Pump ☐ Bailer ☐ Air lift ☒
Depth to water at start of test _____ ft. At end of test _____ ft.
Discharge 25 gal/min after _____ hours Water temperature _____
Chemical analysis made? Yes ☐ No ☒ If yes, by whom? _____
Was electric log made Yes ☐ No ☒ If yes, attach copy to this report

(12) WELL LOG: Total depth 120 ft. Completed depth 120 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	20	Clay, shale, sandstone
20	60	Tan sandstone
60	100	Tan & grey sandstone
100	120	Tan sandstone, soft layers

Work started 3-9 19 89 Completed 3-10 19 89

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Signed _____ (Well Driller)
NAME Rauch Drilling Co. Inc.
(Person, firm, or corporation) (Typed or printed)
Address P.O. Box 524
City Templeton, CA ZIP 93465
License No. 445016 Date of this report 3-15-89

DWR 188 (REV. 12-86) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM 86 96355

FIELD LOG OF EXPLORATORY BORING

EMCON ASSOCIATES

PROJECT No. 0142-001.1R DATE 6-30-93
CLIENT COLD CANYON LANDFILL INC
LOCATION SAN LUIS OBISPO
LOGGED BY D.V.M.

BORING No. P-6
Sheet 1 of 3

Field location of boring: 35' from fence ⊄ fence

P-6

≈650 from P-1A

P-1A
P-1B

MAIN ROAD

Ground Elev. ≈290' MSL Datum

Drilling Co. H·F DRILLING
Drill rig model B-53
Drilling method AIR ROTARY
Hole dia.

Boring completion data DRILLED TO 110 WITH 6.5' TRICONE
CORED TO 110 WITH 4.5 DIAMOND; REAMED TO 111' WITH 9⅞ TRICONE

Depth to ▽	101'	Depth to ▼	92.8'	92.8'
Time	3:25	Time	3:43	10:23
Date	6/30/93	Date	7/1/93	7/2/93

TMC	Pocket Penetrometer (TSF)	Blows/6 in. and/or Pressure (PSI)	Type of Sampler	Recovery (ft/ft)	Sample Number and Container Type	Depth	Sampled Interval	Well Detail	Soil/Rock Symbol	Graphic Log	DESCRIPTION
12:15						0			SS		PISMO FORMATION: Fine to very fine-grained sandstone; 10 to 20 percent silt and clay; Pale yellowish brown (10YR 6/2) poorly consolidated; moist.
						2					
						4					
						6					
						8					
						10					Grab sample @ 10' as above
						12					
						14					
						16					
						18					
						20					
						22					
						24					
						26					
						28					
						30					
						32					
						34					
						36					
						38			SC		Grab sample @ ≈40' As above, dark greenish yellow (10Y 6/4)
12:40						40					

Reviewed by: _____ Date: _____

Form F-9 Rev. 10/90

FIELD LOG OF EXPLORATORY BORING

EMCON ASSOCIATES

PROJECT No. 0142-001.18 DATE 6/30/93
CLIENT Cold Canyon Land Fill Inc
LOCATION San Luis Obispo, Cold Canyon Landfill
LOGGED BY DVM

BORING No. P-6
Sheet 2 of 3

Field location of boring:

Drilling Co. H-F Drilling
Drill rig model B-53
Drilling method AIR ROTARY
Hole dia.

Boring completion data

Ground Elev. 290 Datum MSL

Depth to ▽		Depth to ▼			
Time		Time			
Date		Date			

Pocket Penetrometer (TSF)	Blows/6 in. and/or Pressure (PSI)	Type of Sampler	Recovery (ft/ft)	Sample Number and Container Type	Depth	Sampled Interval	Well Detail	Soil/Rock Symbol	Graphic Log	DESCRIPTION
					40					
					42					
					44			SS		
					46					
					48					Grab sample @ 50' as above
					50					
1:15					52					
					54					
					56					
					58					
					60					
					62					
					64					
					66					
					68					
					70			SS		
					72					
					74					
					76					@ 80' WATER PAUSE, NO FORMATION WATER
					78					CONTINUE ON RUN @ 2:12
2:05					80					light olive to dark greenish yellow (10Y 5/4 10Y 4/4)

Reviewed by: Date:

Form F-9 Rev. 10/90

FIELD LOG OF EXPLORATORY BORING

EMCON ASSOCIATES

PROJECT No. 0142-001.18 DATE 6/30/93
CLIENT COLD CANYON LANDFILL INC.
LOCATION SAN LUIS OBISPO
LOGGED BY DVM

BORING No. P-6
Sheet 3 of 3

Field location of boring:

Drilling Co. H-F DRILLING
Drill rig model 8-53
Drilling method AIR ROTARY ; CORED UNIT 10' split spoon sampler Hole dia.

Boring completion data Reamed hole with 9 7/8 inch-diameter tricone to 111.0 feet BGS

Ground Elev. ±290 MSL Datum

Depth to ▽	101.0'	Depth to ▼	92.8	92.8
Time	3:25	Time	3:43	10:23
Date	6/30/93	Date	7/1/93	7/2/93

Pocket Penetrometer (TSF)	Blows/6 in. and/or Pressure (PSI)	Type of Sampler	Recovery (ft/ft)	Sample Number and Container Type	Depth	Sampled Interval	Well Detail	Soil/Rock Symbol	Graphic Log	DESCRIPTION
					80			93.6		
					82					
					84			SS		
					86					@ 90' ; WATER PAUSE NO WATER 240 COLOR AS ABOVE
					88					
2:22 2:28					90					@ 95 ; WATER PAUSE , NO WATER COLOR AS ABOVE
					92					
					94					
2:35 2:44		7/1/93 92.8	3.43		96			SS		@ 100' ; WATER PAUSE , NO WATER COLOR CHANGE DUSKY YELLOW GREEN (5GY 5/2) DRILLER BELIEVES HE'S "SITING ON WATER" START CORING @ 100'
		6/30/93 FIRST ENCOUNTERED @ ±101'	3.25		98					
2:50 3:06			2.8 of 3.0		100					@ 100' PISMO FORMATION ; Fine to very fine-grained sandstone ; 10 to 15 percent fines (silt and clay) massive ; fracture spacing 0.3 to 1.5 feet apart moderate hard ; saturated ; sharp color changes at 101 ± 101.5 feet ; fractures closed ; filled with calcium carbonate ≈ 0.05 to 0.10 inches thick Color 100 to 101 dusky yellow green (5GY 5/2) 101 to 101.5 ; dark greenish gray (5GY 4/1) and 101.5 to 103 , olive black (5Y 2/1) (Recovered 2.8 of 3.0 runs) (fractures inclined 70 degrees to core axis)
3:21 3:29			0.6 of 1.0		102					
3:45			1.8 of 1.8		104					@ 103 to 104' ; As above ; very hard calcified
4:15					106			SS (lm)		@ 104 to 105.8 ; As above ; very hard calcified
			2.7 of 3.2		108					@ 105.8 to 106.5 ; As above ; very hard calcified
5:10					110					@ 106.5 to 110 ; As above , soft Sandstone interbedded sand layers with layers of silty clay ; silty clay layers are ≈ 0.1 inch thick and spaced 0.3 to 0.4 inches apart
REAMED TO 60' 6/30/93 OFF SITE 7:00 PM					112					Core photographed and sampled every 2 feet Boring terminated @ 110' sufficient information obtained (REAMED TO 111')
REAMED TO 111' 9:12 : 6/31/93					114					
MEASURED DEPTH TO GW @ 4:42 7/1/93 96.6 - 2.8 STICK UP = 92.8'					116					
TAG BOTTOM @ 111.0' - 2.8 = 108.2 2.4' SILT					118					
					120					

WATER PAUSE 1st — 2nd — 3rd — water encountered 4th

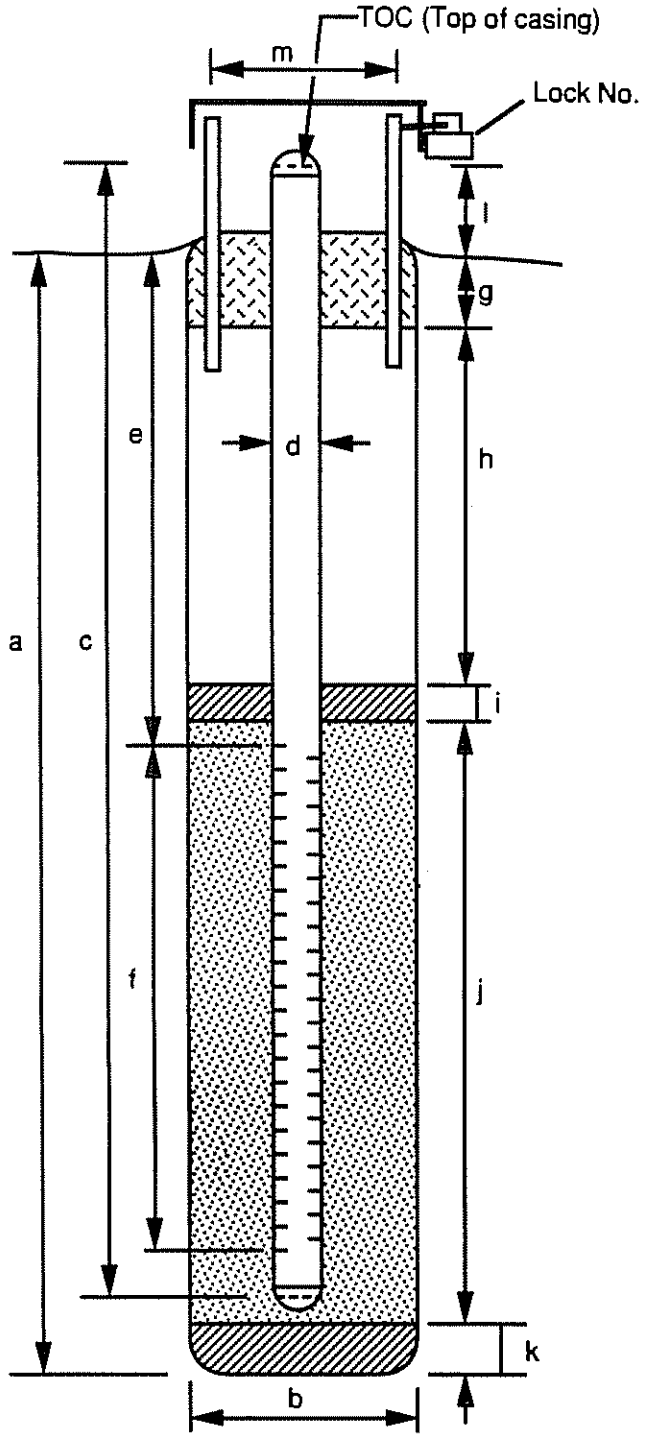
Reviewed by: _____ Date: _____

Form F-9 Rev. 10/90

WELL DETAILS

PROJECT NUMBER 0142-001.18
PROJECT NAME Cold Canyon Landfill
LOCATION San Luis Obispo
WELL PERMIT NO. 93-MW-112

BORING / WELL NO. P-6
TOP OF CASING ELEV. 292.93 ft.
GROUND SURFACE ELEV. 290.34 ft.
DATUM MSL
INSTALLATION DATE 07/01/93



EXPLORATORY BORING

a. Total depth cored 110.0 ft. reamed 111.0 ft.
b. Diameter reamed 10.0 in.
Drilling method Air-rotary with water misting

WELL CONSTRUCTION

c. Total casing length 113.4 ft.
Material Schedule 40 PVC
d. Diameter 4.5 in.
e. Depth to top perforations 94.8 ft.
f. Perforated length 15.0 ft.
Perforated interval from 94.8 to 109.8 ft.
Perforation type Machine-slotted
Perforation size 0.020 in.
g. Surface seal (0-2.0') 2.0 ft.
Material concrete
h. Backfill (2.0'-89.0') 87.0 ft.
Material Volclay grout
i. Seal (89.0' - 92.0') 3.0 ft.
Material Bentonite pellets
j. Sand pack 19 ft.
Sand pack interval from 92.0 to 111.0 ft.
Material #2/12 Lonestar Sand
k. Bottom seal/fill NA ft.
Material NA
l. Casing stickup 2.6 ft.
m. Protective casing diameter 8 in.

Well Constructed by DVM

Golder Associates

Exploratory Boring Log

Boring No. P-10
Well No. P-10
Sheet 1 of 2

Site: Cold Canyon Landfill Weir Parcel
Client: Shaw/EMCON for Waste Connections
Project Number: CCL102 / 0537467
Date(s) Drilled: 6-20-05
Date(s) Installed: 6-20 & 21-05
Drilling Co./Driller: Spectrum Exploration

Ground Elevation: 233.5 ft MSL Pre survey
T.O.C. Elevation: 235.22 ft
Coordinates: N4692.04 E 5379.26
Drilling Method: Air Rotary, HQ3 core
Borehole Total Depth: 89 feet
Final Borehole Diameter: 7-inch nominal.

Drilling Summary: Drill with 4.5" down-hole hammer to 27'. Switched to 6½" claw bit. Begin coring at 68.5' with Longyear HQ3 wire line coring system. Cored 20 feet. Reamed borehole with 6½ inch claw bit to 89'. Installed 25 ft slot, a 0.67 ft thread converter and 65 ft of blank. Tremie washed in 2/12 sand. Tremie one bucket ¼-inch bent pellets. Neat grout (~6 gal/sack type II/V) tremie to surface.

Time		Sample No.	Blows / 6 in	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
12:00							0		SS		PISMO FORMATION: EDNA MEMBER Sandstone, yellowish gray (5Y 7/2), 90% fine to v. fine sand, well sorted, trace silt and clay, friable, iron oxide staining, damp. Primarily qtz+feldspar grains <5% matic minerals. Sand is subrounded to subangular – very little hammering to 9'
							5				
12:20							10				@10: as above, damp
							15				@15: as above, intermittant hammering
12:35							20				@20: as above
							25				@25': yellowish brown, harder layer more hammering
12:55											@27': rock too soft for down-hole hammer, switching to claw tooth bit @28-29': dark gray, friable to low hardness
1:15							30				@33': light to medium gray; increase to ~5-10% matic minerals; damp
							35				
1:20							40				

Logged by: TLV
Date checked: 10/10/05

Golder Associates

Project No.: CCL102 / 0537467
Client: Shaw/EMCON for Waste Connection
Site: Cold Canyon Landfill Weir Parcel

Boring No. P-10
Well No. P-10
Sheet 2 of 2

Time		Sample No.	Blows / 6 inch	RQD	Core Run HQ3	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
		Cuttings							Ss		PISMO FORMATION; SANDSTONE, continued
									6-22		@45': driller notes decrease in dust
							45				
									6/21		
1:30							50				
											@55': driller thinks water-dust gone, some balling of cuttings
							55				Sandstone is fine to very fine grained; matrix very fine to silt size; <1% clay
											@59': water pause - no water
1:48											
1:49							60				
							65				@2:10 water at 68' below collar (~66 ft bgs); no odor
											@2:30 " " 66' " "
		HQ3									
		Coring							6-20	▽	@68': same as above - some balls
1:50											water pause: 5 minutes - wet sand, begin coring
1:55							70				
		68.5-73.5		100%		5/5				Calc	SANDSTONE, medium gray, fine to very fine sand, well sorted, massive (0.3', 1.3', 0.5' 0.8', 0.9' 0.7' 0.6') moderately fractured (frac spacing ↗) low hardness; no HCl reaction
3:05											@71': moderately hard, slight HCl reaction
							75				@73.5-78.5': as above, Fracs (0.3', 0.1', 0.1', 0.4', 0.1', 0.2', 1.1' 0.7', 0.4', 1.2', 0.4'); no HCl reaction, no odor to water
		73.5-78.5				4.7/5					
3:35											
							80				@78.5-83.5: as above; no HCl reaction (Fracs 0.4', 3.5', 1.1')
		78.5-83.5		100%		5/5					
4:00											@83.5-88.5: as above (Fracs 1.5', 1.0' 1.1', 1.1', 0.3') no HCl reaction.
							85				
		83.5-88.5		100%		5/5					
											Bottom of Boring at 89', terminated, target depth reached.

Logged by: TLV

Date checked: 10/10/05

WELL CONSTRUCTION DETAILS

BORING DESIGNATION: P-10

INSTALLATION

DATE: 6/20-21/05 BY: Spectrum Exploration Tom Vercontere

DIMENSIONS

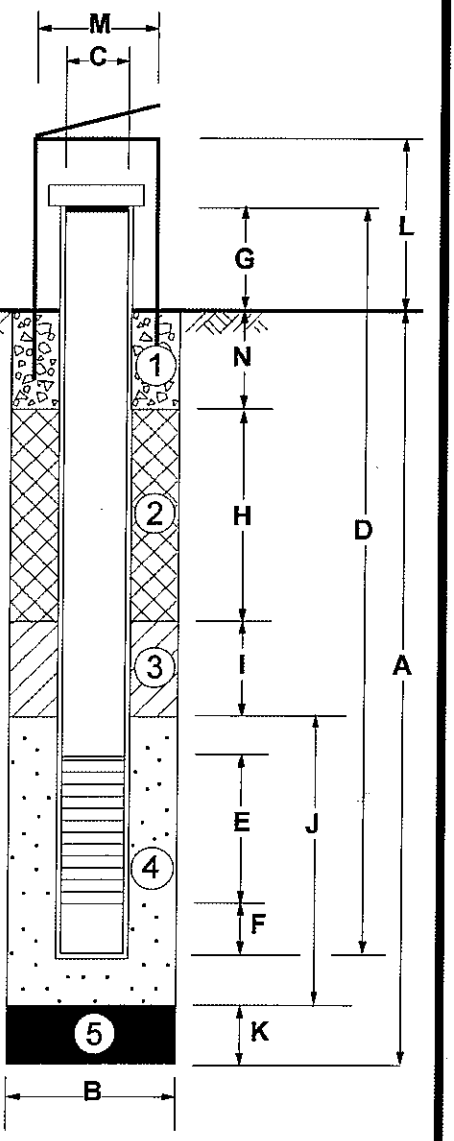
A	Total Depth of Boring (ft.)	89
B	Borehole Diameter (in.)	7
C	Well Casing Diameter (in.)	2
D	Well Casing Length (ft.)	90.7
E	Well Casing Slotted Interval (ft.)	24.15
F	Well Casing End Cap or Sump (ft.)	0.8
G	Well Casing Height (ft.)	1.7
H	Annular Seal Interval (ft.)	59.5
I	Annular Seal Interval (ft.)	1.5
J	Sand Pack Interval (ft.)	27
K	Bottom Material Interval (ft.)	NA
L	Protective Cover Height (ft.)	2.5
M	Protective Cover Diameter (in.)	8
N	Annular Seal Interval (ft.)	1
	Well Centralizer Depth(s) (ft.)	30, 64, 89

MATERIALS DATA

Monument Footing	(1)	Concrete
Annular Seal	(2)	Neat cement
Annular Seal	(3)	Bentonite, 1/4" pellets
Sand Pack	(4)	Lapis Luster #2/12 sand
Bottom Material	(5)	NA
Slotted Casing		0.020-inch
Well Casing		Sch 40 PVC
Well Centralizers		Stainless Steel
Protective Cover		mild steel

WELL DESIGNATION
P-10

DEPTH/HEIGHT (FT)	ELEV. (FT MSL)
2.5	236
1.7	235.2
0	233.5
1	232.5
60.5	170.3
62	171.5
63.6	169.9
88.2	145.3
89	144.5
89	144.5
89	144.5



SECTION VIEW
(not to scale)

NOTES: Sump is end cap (0.3') plus unslotted casing (0.5'). Elevations from survey stakes provided by Cold Canyon Landfill, Inc. Well drilled with air rotary equipment

SITE: Cold Canyon Landfill
PROJ. NO: 053-7467
N. 4286.28 E. 5809.92
WELL PERMIT NO: 2005-MW-184
T.O.C. ELEV: 235.22

Golder Associates

Exploratory Boring Log

Boring No. P-11
Well No. P-11
Sheet 1 of 1

Site: Cold Canyon Landfill Weir Parcel
Client: Shaw/EMCON for Waste Connections
Project Number: CCL102 / 0537467
Date(s) Drilled: 6-21
Date(s) Installed:
Drilling Co./Driller: Spectrum Exploration

Ground Elevation: 194.3 ft
T.O.C. Elevation: 196.14 ft MSL
Coordinates: N4286.28 E 5809.92
Drilling Method: Air Rotary HQ3 core
Borehole Total Depth: 29 ft
Final Borehole Diameter: 6.5 inch Nominal

Drilling Summary: Drilled to 9 ft with 6.5-inch claw tooth bit. Cored from 9 to 28 feet with HQ3 core system. Reamed borehole to 29' with 6.5" claw bit. Lowered 20 ft of 2-inch Sch 40 .020 slot and 10.8 feet of blank. Place 5½ sacks 2/12 sand. Air jet @ ~32 cfm for 10 min. to clean and tighten filter pack.

Time		Sample No.	Blows / 6 in	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
11:10		Grab cuttings					5	bentonite seal, sand pack, slotted casing	SM		SILTY SAND (SM) dark yellowish brown (10YR 4/2) 30-45% non plastic fines; 55-70% fine sand; moist
											PISMO FORMATION, EDNA Member
											SANDSTONE, yellowish gray (5Y 7/2), 5 to 10 percent silt, sand is fine to very fine grained, well sorted; trace mafic, mostly qtz + fldspar.
									6/21		
									SS		
									6/21		@9': wet. switching to core
11:30		HQ3 Core					10				SANDSTONE, mottled yellowish gray (5Y 8/1), moderate greenish yellow (10Y 7/4) and light brown (5YR 5/6); fine to very fine sand, 5-10% silt; moderately fractured; bedded, poorly defined, inclined ~60-70° to core axis; low to moderate hardness. Iron oxide stains add to mottling. Frac spacing 0.4, 0.5, 0.7, 0.5, 0.7, 0.4'). No HCl reaction
1:00		9-13'		>95%		3.1/4					
1:20											
		13-18'		>95%		4.8/5	15				@13 to 14.5': as above
1:30											@14.5 to 18': light gray (N7), massive. No HCl reaction (Frac 0.1, 0.7, 0.6, 1.3, 1.3, 0.5, 0.4')
				>95%							@18-20.2': as above, light gray
		18-23'				4.6/5	20				@20.2-20.9': medium dark gray (N4)
1:45											@20.9-23': as above @14.5-18'. Light gray
		23-28'				5/5	25				@23-28', as above, Light gray Some light brown (5YR 5/6) iron oxide mottling at 24'.
2:00											
							30				BOTTOM OF BORING, TARGET ACHIEVED.
							35				
							40				

Logged by: TLV

Date checked: 10/10/05

Golder Associates

Exploratory Boring Log

Boring No. P-12
Well No. P-12
Sheet 1 of 2

Site: Cold Canyon Landfill Weir Parcel
Client: Shaw/EMCON for Waste Connections
Project Number: CCL102 / 0537467
Date(s) Drilled: 6-21/6-22
Date(s) Installed: 6-22/6-23
Drilling Co./Driller: Spectrum Exploration

Ground Elevation: 212 ft
T.O.C. Elevation: 214.06 ft MSL
Coordinates: N 4660.75 E 6324.81
Drilling Method: Air Rotary
Borehole Total Depth: 55 ft
Final Borehole Diameter: 6 1/2 inch

Drilling Summary: Drilled with 6.5-inch claw bit to 39 feet. Switched to HQ3 core system and cored to 53 feet. Over cored with 5-inch barrels to retrieve HQ3 system. Used 1 sack bentonite in ~75 gal water to hold heaving sand. Casing broken during construct. Redrilled new borehole to 55 feet. Sand sloughed to 43 ft between time rods pulled and casing inserted. Constructed well at 43' bottom.

Time	Sample No.	Blows / 6 in	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
4:15	Cuttings							SM		SILTY SAND (SM), dark yellowish brown (10YR 4/2); 30-40% fines 60-70% fine to medium sand; dry to damp.
								SS		PISMO FORMATION, EDNA MEMBER SANDSTONE, yellowish gray (5Y, 7/2), 5-10% silt; very fine to fine grained with 5-10% medium to coarse; damp.
						5				@ 8': no coarse sand
						10				@ 13': dusky yellow (5Y 6/4); damp
4:30						15				
						20				@ 19': medium light gray (N5)
										@ 20': as above; dusky yellow (5Y 6/4)
						25				@ 24': 6" interval of hard drilling
4:45										@ 29': moist - water pause - 10 min - no water
						30				
								6/23 ▼		
								6/21 ▼		=10 minutes after first fine of water
						35				@ 36': medium dark gray (N4); moist
4:55								6/21 ▽		@ 39': very moist to wet sand - leaves hand wet when squeezed
5:25	Run 1				HQ3	45				switching to core. 5 minute water pause - Water

Logged by: TLV
Date checked: 10/10/08

Golder Associates

Project No.: CCL102 / 0537467
Client: Shaw/EMCON for Waste Connection
Site: Cold Canyon Landfill Weir Parcel

Boring No. P-12
Well No. P-12
Sheet 2 of 2

Time		Sample No.	Blows / 6 inch	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
		39'-43'		0		0.8/4			SS		PISMO FORMATION (Continued) Edna Member Sandstone Driller notes soft material @ 39-43': Medium gray (N-5), trace silt
5:40			HQ3								
			core				45				Driller notes no rotation for core run - material very loose in 43-48' interval - no recovery. Weight of core rods with 0 down pressure
		43-48'				0/5					Driller notes at 48-49 got hard again
6:05											@ 48-49': hard, well cemented, no HCl reaction
		48-53'				1.2/5	50				@ 50-55': cutting as above
6:20											BORING TERMINATED, EQUIPMENT STUCK, OVERDRILLED to RETRIEVE CORE EQUIPMENT TO 55 Feet. BOREHOLE SLOUGHED TO 43 Ft
6:20							55				
							60				
							65				
							70				

Logged by: TV

Date checked: 10/10/03

WELL CONSTRUCTION DETAILS

BORING DESIGNATION: P-12

INSTALLATION
DATE: 6-22-05 BY: Spectrum Explor. Tom Vercouteren

DIMENSIONS

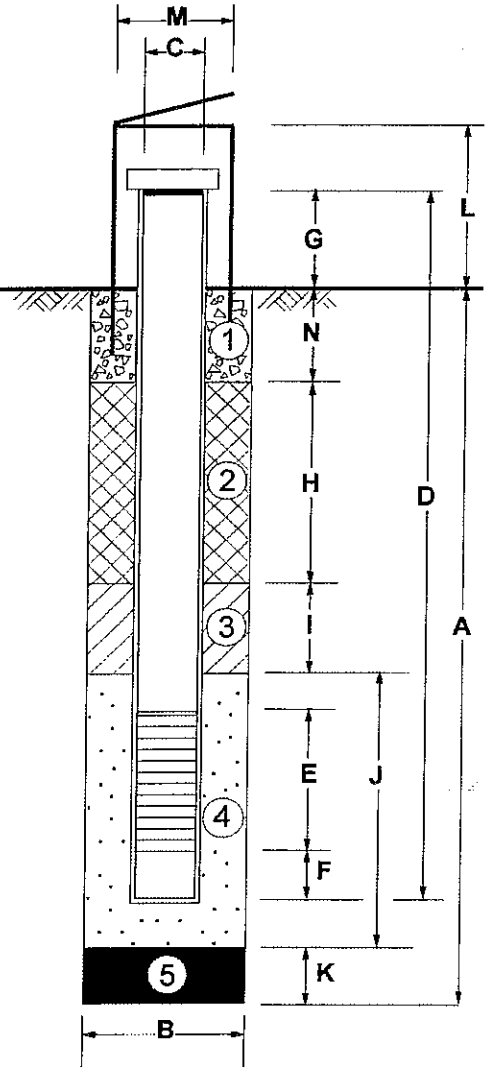
A	Total Depth of Boring (ft.)	55
B	Borehole Diameter (in.)	6½
C	Well Casing Diameter (in.)	2
D	Well Casing Length (ft.)	45.6
E	Well Casing Slotted Interval (ft.)	18.7
F	Well Casing End Cap or Sump (ft.)	0.8
G	Well Casing Height (ft.)	1.9
H	Annular Seal Interval (ft.)	19
I	Annular Seal Interval (ft.)	1
J	Sand Pack Interval (ft.)	21
K	Bottom Material Interval (ft.)	12
L	Protective Cover Height (ft.)	2.5
M	Protective Cover Diameter (in.)	8
N	Annular Seal Interval (ft.)	1
	Well Centralizer Depth(s) (ft.)	12, 23, 43

MATERIALS DATA

Monument Footing	(1)	Concrete
Annular Seal	(2)	Cement-bentonite
Annular Seal	(3)	¼-inch bentonite pel
Sand Pack	(4)	2/12 Lapis Lustre sand
Bottom Material	(5)	Native slough
Slotted Casing		0.020-inch
Well Casing		Sch 40 PVC
Well Centralizers		Stainless Steel
Protective Cover		mild steel pipe.

WELL DESIGNATION
P-12

DEPTH/HEIGHT (FT)	ELEV. (FT MSL)
2.5	214.6
1.9	214.06
0	212.2
1	211.2
20	192.2
22	190.2
24.3	187.9
43.0	169.2
43.7	168.5
43.0	169.2
55	157.2



SECTION VIEW
(not to scale)

NOTES: Bottom sump is end cap plus unslotted pipe. Borehole sloughed from 55 to 43 feet before casing installed. Pushed casing into fill 0.7 feet

SITE: Cold Canyon Landfill
PROJ. NO: 0537467
N. 4660.75 E. 6324.81
WELL PERMIT NO: 2005-MW-187
T.O.C. ELEV: 214.06 ft MSL

Golder Associates

Exploratory Boring Log

Boring No. P-13
Well No. P-13
Sheet 1 of 2

Site: Cold Canyon Landfill Weir Parcel
Client: Shaw/EMCON for Waste Connections
Project Number: CCL102 / 0537467
Date(s) Drilled: 6/23/05
Date(s) Installed: 6/23-24/05
Drilling Co./Driller: Spectrum Exploration

Ground Elevation: 232 ft
T.O.C. Elevation: 233.35 ft MSL
Coordinates: N 5471.20 E 6838.27
Drilling Method: Air Rotary
Borehole Total Depth: 59'
Final Borehole Diameter: 6 ½ inch

Drilling Summary: Drilled upper borehole with 6½-inch claw tooth bit. Encountered wet sand at approximately 36 ft. Cored with HQ3 core system to 58 Ft. Installed 40 feet of blank and 25 feet of screens (5-ft sticks). Tremie washed 2/12 sand, tremied 1 pale ¼-inch bentonite pellets. Neat cement grout (~6 gal/sack type II/IV) tremied to surface.

Time	Sample No.	Blows / 6 in	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
1:30	Cuttings							SM		SILTY SAND (SM) brownish black (5YR 7/1)
						5				
								SS		PISMO FORMATION, EDNA MEMBER SANDSTONE: grayish orange (10YR 7/4) to yellowish gray (5Y, 7/2); 10-15% silt; 85-90% fine to very fine grained, damp
1:40						10				@ 10' as above
						15				
1:50										@ 19' as above, with iron oxide
						20		SS/C		@ 19.5-20': light olive gray (5Y 6/1); hard; carbonate (HCl)
								SS		@ 20': dark greenish gray (5GY 4/1)
										@ 20' - sulfur smell
						25				@ 25: hard layer ~ 6" thick - silty sandstone, as above
								SS		@ 25-27': slight petroleum odor
2:10						30				@ 30: petroleum odor - dark greenish gray as above at 20'
						35				@ 35': moist to wet; fingers show wetness capillary water pause 15 minutes, no free water.
										6/23 2:35 ← water level 5 minutes after reaching 39'
2:30										@ 39': petroleum odor; moist to wet switching to core
2:40		HQ3		T						

Logged by: TV

Date checked: 10/14/05

Golder Associates

Project No.: CCL102 / 0537467
Client: Shaw/EMCON for Waste Connection
Site: Cold Canyon Landfill Weir Parcel

Boring No. P-13
Well No. P-13
Sheet 2 of 2

Time		Sample No.	Blows / 6 inch	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
		@ 41'							SS		PISMO FORMATION (Continued)
		HQ3	39-43			2.5/4					SILTY SANDSTONE, grayish olive green (5GY 3/2), 15-20% silt; 80-85% fine to very fine grained sand, massive bedding; fracture spacing (0.2, 0.6, 0.7, 0.6, 0.4); low hardness fractures closed, may be mechanical; no staining or coatings
2:47				90%							@ 43-47.5 as above w/ increasing silt content
2:57											@ 44.5-47': Sandy Siltstone, grayish olive green; 50-60% silt and some clay; 40-50% very fine sand; gradational contacts; massive to thickly bedded; moderate to insensely fractures with crude oil blebs in fractures, spacing 0.3 to 0.6' inclined ~ 50 to 65° to core axis; moderately hard.
		@ 45'					45		SS		@ 48': SILTY SANDSTONE; 30-40% silt; moderately hard
		oil infra	43-48	90%		4.5/5					@ 53': as above, fracture spacing 0.2, 0.6, 1.0, 0.5, 1.0, 0.6, 0.1 appears to be oil sheen in some fractures in lower half of core.
3:12											@ 53 to 58': as above, no oil sheen; intensely fractured in lower half.
3:22											
		@ 50'		90%		4.6/5	50				
3:40											
3:50											
		@ 56'		<50%		4/5	55				
4:18											BOTTOM OF BORING AT 59 FEET. TERMINATED, ACHIEVED TARGET.
											Reamed borehole with 6½ inch claw bit to 59 ft
							60				
							65				

Logged by: TLV

Date checked: 10/14/05

WELL CONSTRUCTION DETAILS

BORING DESIGNATION: P-13

INSTALLATION

DATE: 6-23-2005 BY: Spectrum Exploration
Tom Vercautere

DIMENSIONS

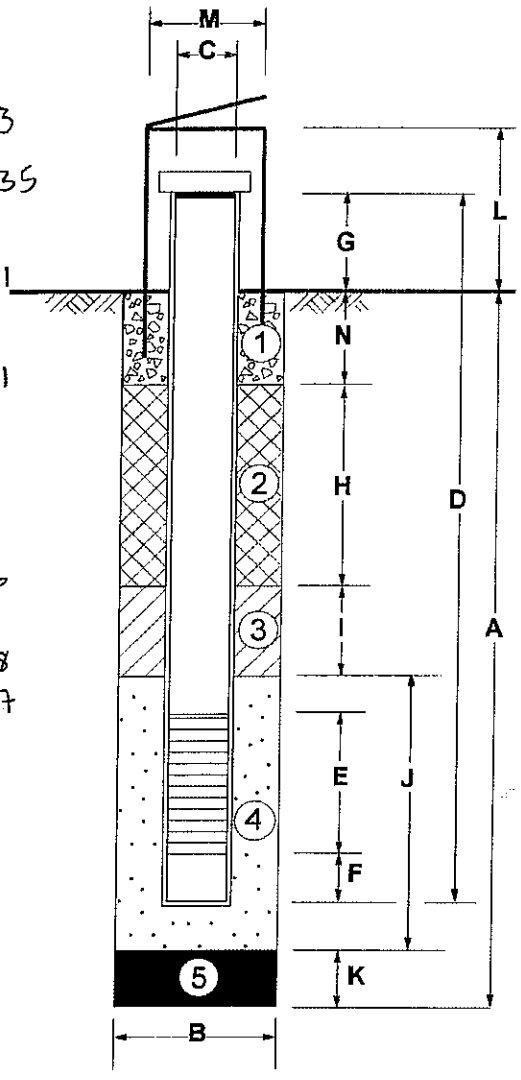
A	Total Depth of Boring (ft.)	59
B	Borehole Diameter (in.)	6 1/2
C	Well Casing Diameter (in.)	2
D	Well Casing Length (ft.)	60.3
E	Well Casing Slotted Interval (ft.)	23.9
F	Well Casing End Cap or Sump (ft.)	0.8
G	Well Casing Height (ft.)	1.3
H	Annular Seal Interval (ft.)	24.5
I	Annular Seal Interval (ft.)	5.8
J	Sand Pack Interval (ft.)	26.7
K	Bottom Material Interval (ft.)	NA
L	Protective Cover Height (ft.)	2.2
M	Protective Cover Diameter (in.)	8
N	Annular Seal Interval (ft.)	2
	Well Centralizer Depth(s) (ft.)	14, 39, 59

MATERIALS DATA

Monument Footing	(1)	Concrete
Annular Seal	(2)	Type II/V neat cement
Annular Seal	(3)	1/4-inch bentonite pellets
Sand Pack	(4)	2/12 Lapis Luster sand
Bottom Material	(5)	NA
Slotted Casing		0.020-inch
Well Casing		Sch 40 PVC
Well Centralizers		Stainless steel
Protective Cover		Mild steel pipe

WELL DESIGNATION
P-13

DEPTH/HEIGHT (FT)	ELEV. (FT MSL)
2.2	234.3
1.3	233.35
0	232.1
2	230.1
26.5	205.6
32.3	197.8
34.4	197.7
58.2	173.9
59	173.1
59	173.1
59	173.1



SECTION VIEW
(not to scale)

NOTES: Sump is end cap plus unslotted casing. Elevation from survey stake provided by Cold Canyon Landfill, Inc. Well drilled with air rotary equipment.

SITE: Cold Canyon Landfill, Inc.
PROJ. NO: 053 7467
N. 5471.20 E. 6838.27
WELL PERMIT NO:
T.O.C. ELEV: 233.35 ft MSL

Golder Associates

Exploratory Boring Log

Boring No. P-14
Well No. P-14
Sheet 1 of 2

Site: Cold Canyon Landfill Weir Parcel
Client: Shaw/EMCON for Waste Connections
Project Number: CCL102 / 0537467
Date(s) Drilled: 12-6-05
Date(s) Installed: 12-7-05
Drilling Co./Driller: Woodward Drilling Company

Ground Elevation: 261.0 ft
T.O.C. Elevation: 262.95 ft msl
Coordinates: 35°11.146N 120°35.456W
Drilling Method: Air Rotary 450 Schram
Borehole Total Depth: 90 ft
Final Borehole Diameter: 7 1/4 inch nominal

Drilling Summary: Drilled upper borehole with 3 7/8-inch tricone roller bit; logged cuttings. Cored from 66 to 86 feet with HQ3 wireline. Reamed borehole with 7 1/4 inch roller bit to 90 feet. Installed 25 ft of 0.010-inch slot. Sanded annulus from 90 to 59 ft with RMC 2/12 sand. Placed bentonite chips 59 to 57.5 ft. Grouted through tremie pipe to ground surface. Set locking stovepipe in concrete.

Time		Sample No.	Blows / 6 in	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
8:00									SM		SILTY SAND (SM), dark yellowish brown (10YR 3/2) damp to dry.
							5		SS		PISMO FORMATION - EDNA MEMBER SANDY SILTSTONE to SILTY SANDSTONE, light olive brown (5Y 5/6); 40-60% very fine to fine sand, 95% quartz + feldspar, 5% mafic, some FeOx staining; damp.
8:15							10				@11': as above w/ increase in sand to 60-70%
		P-14 15'	bag				15				@15': light olive gray (5Y 5/2)
8:30							20				@19': as above
											@22': driller notes slightly harder layer, more dust.
9:00							25				@26': as above, yellowish gray (5Y 7/2)
		P-14 29'	bag				30		SS		SANDY SILTSTONE, grayish olive (10Y 4/2); 25-30% very fine sand; damp.
									SS		SILTY SANDSTONE; olive gray (5Y 3/2); 65-75% very fine sand; damp
9:15							35				
							40				@40': olive gray (5Y 3/2), as above

Logged by: TV
Date checked: 2-20-06

Golder Associates

Project No.: CCL102 / 0537467
Client: Shaw/EMCON for Waste Connection
Site: Cold Canyon Landfill Weir Parcel

Boring No. P-14
Well No. P-14
Sheet 2 of 2

Time		Sample No.	Blows / 6 inch	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
									SS		SILTY SANDSTONE (continued)
9:40							45				@46': 20 minute water pause while driller pull rods because of lost circulation. No water. Began misting to bring cuttings to surface. Total of 70 gallons added between 46 and 66 feet. Appears most came back out during drilling.
									▽ 12-8-2005		
11:00							50				
							55				@56': as above, 15 minute water pause – no water. (Blew borehole dry for 5 minutes before pause)
									▽ 12-6-2005		@57': water rose to 57 ft from 66 ft during 1 hour break. Switched to HQ3 coring at 66 ft.
							60		SS		
11:30							65		▽ 12-6-2005		@66: water appears to be entering borehole (<0.1 gal/min) draining. Lunch break and water pause (see note at 57 ft)
2:00		P-14 67'	bag	0		1.8/2.1			Ss		SANDY SILTSTONE, olive gray (5Y 4/1), 55-65% silt, 35-45% very fine sand; massive bedding; fractured by coring; low hardness, Some fissle partings in lower half of core. No staining, no HCl reaction.
		P-14 71'	bag	59		5/5	70				@68-73': intensely fractured at 70° and 20° angles from core axis. low hardness, few or no coatings or stains on fractures; fracs are closed, smooth surfaces; some fissle bedding in crushed zones. Frac spacing [0.2', 0.3, 0.3, <0.1, 0.2, 0.1, 0.3, 0.4, 0.2].
2:45											
		P-14 76'	bag	79		5/5	75				@73-78': Fracs subparallel to core axis, spacing [0.6, 0.1, 0.3, 0.3 0.2, 0.2, 0.2, 0.7, 0.3, 0.4, 0.3, 0.1, 0.2, 0.3, 0.1, 0.5]
3:05											
				36		5/5	80				@78-83': as above, frac spacing [0.15, 0.2, 0.4, 0.4, 0.3, 0.4, 0.1, 0.2, 0.3, 0.2]
		P-14 83'	bag								@83-86': as above, frac spacing [0.1, 0.2, 0.1, 0.1, 0.3, 0.1, 0.2, 0.4]
				26		2.7/3.3	85				
3:50											Bottom of boring at 86 ft. Terminated, objective achieved. Reamed 90 ft and constructed well
							90				

Logged by: TV

Date checked: 2-20-06

WELL CONSTRUCTION DETAILS

BORING DESIGNATION: P-14

INSTALLATION

DATE: 12-7-05 BY: Woodward Drilling Co
Tom Vercouteren

DIMENSIONS

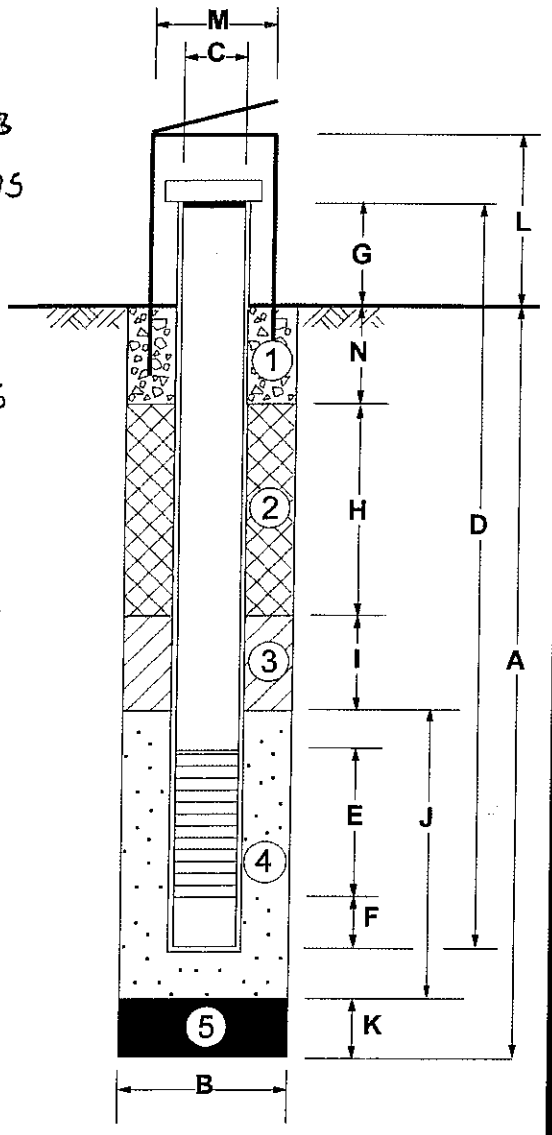
A	Total Depth of Boring (ft.)	90
B	Borehole Diameter (in.)	7 1/4
C	Well Casing Diameter (in.)	2
D	Well Casing Length (ft.)	91.7
E	Well Casing Slotted Interval (ft.)	25
F	Well Casing End Cap or Sump (ft.)	0.8
G	Well Casing Height (ft.)	2
H	Annular Seal Interval (ft.)	56
I	Annular Seal Interval (ft.)	1.5
J	Sand Pack Interval (ft.)	30.7
K	Bottom Material Interval (ft.)	0.3
L	Protective Cover Height (ft.)	2.35
M	Protective Cover Diameter (in.)	6
N	Annular Seal Interval (ft.)	1.5
	Well Centralizer Depth(s) (ft.)	30, 60, 89

MATERIALS DATA

Monument Footing	(1)	Concrete
Annular Seal	(2)	Bentonite Grout
Annular Seal	(3)	Bentonite chips
Sand Pack	(4)	RMC #2/12 sand
Bottom Material	(5)	native
Slotted Casing		0.010-inch
Well Casing		sch 40 PVC
Well Centralizers		Stainless Steel
Protective Cover		mild steel

WELL DESIGNATION
P-14

DEPTH/HEIGHT (FT)	ELEV. (FT MSL)
2.35	263.3
2.0	262.95
0	261.0
1.5	259.5
57.5	203.5
59	202.0
65	196.0
88.9	172.1
89.7	171.3
89.7	171.3
90	171.0



SECTION VIEW
(not to scale)

NOTES: Sump is end cap plus unslotted section of casing. Elevations from survey stakes provided by Cold Canyon Landfill, Inc. Well drilled with air-rotary equipment

SITE: Cold Canyon Landfill
PROJ. NO: 053-7467
N. 6037.66 E. 6750.98
WELL PERMIT NO: 2005-MW-430
T.O.C. ELEV: 262.95 ft MSL

Golder Associates

Exploratory Boring Log

Boring No. B-1
Well No. B-1
Sheet 1 of 3

Site: Cold Canyon Landfill Weir Parcel
Client: Shaw/EMCON for Waste Connections
Project Number: CCL102 / 0537467
Date(s) Drilled: 12-7&8-2005
Date(s) Installed: 12-8-2005
Drilling Co./Driller: Woodward Drilling Company

Ground Elevation: 281 ft
T.O.C. Elevation: 283.3 ft
Coordinates: 35°11.033N 120°35.594W
Drilling Method: Rotary Wash
Borehole Total Depth: 98 feet
Final Borehole Diameter: 7 1/4 inches nominal

Drilling Summary: Drilled to 70 feet with 3 7/8-inch tricone roller bit using approximately 8,000 pounds of hydraulic down pressure. Performed standard penetration tests at 70, 75, and 80 feet with above-ground hydraulic hammer. Reamed borehole to 98 feet with roller bit and constructed PVC well. Borehole logged by cuttings and split-spoon samples.

Time	Sample No.	Blows / 6 in	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
11:00	cuttings					0		SS		PISMO FORMATION - EDNA MEMBER Silty to Clayey Sandstone, yellowish brown (10YR 4/2); 55-65% fine to very fine sand, trace medium sand-sized mafic rock fragments. Fines appear to be mostly silt.
						5				
						10				
						15				@ 15 ft: as above
						20				@ 22 ft: 65-75% very fine sand. Clays flocculate and settle quickly into a partially suspended layer in settling jar. @ 23 ft: driller notes harder layer with slower drilling. @ 24 ft: quicker drilling again.
11:20						25				
						30				@ 33 ft: driller notes harder layer and slower drilling.
						35				@ 36 ft: quicker drilling again.
11:50						40				

Logged by: TV

Date checked: 2/22/06

Golder Associates

Project No.: CCL102 / 0537467
Client: Shaw/EMCON for Waste Connection
Site: Cold Canyon Landfill Weir Parcel

Boring No. B-1
Well No. B-1
Sheet 2 of 3

Time		Sample No.	Blows / 6 inch	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
									SS		SILTY to CLAYEY SANDSTONE (continued)
11:40							45		SS		@ 46': as above
		cuttings					50				
11:50							55				@ 56': as above
12:05							60				
			SPT				65				@ 66': as above; yellowish gray (5Y, 7/2) to grayish yellow (5Y 8/4)
1:00		B-1 70'	50/3.5 inches				70		SS		SWITCHED to SPT at 70 feet.
			SPT								SILTY SANDSTONE, dusky yellow (5Y 6/4), coarse silt to very fine sand, very well sorted, 98% quartz and feldspar, trace to 2% mafics; very little clay; low hardness, not cemented, no staining. Estimate 30% silt and 70% very fine sand. No bedding seen in sample. Almost all material settles in 2" of water in ~4 minutes; 90% in < 10 seconds.
1:30		B-1 75'	50/4 inches				75				@ 75': as above. Mottled yellowish gray (5Y 7/2) and dark yellowish orange (10YR 6/6) iron oxide staining.
			SPT								@ 80': as above; mottled light olive brown (5Y 5/6) and light gray (N7).
3:15			50/4 inches				80				Reamed borehole to 80 ft with 7 1/4 inch tricone roller bit. Quit for day.
5:45		B-1 80'									Lost 20 feet of borehole overnight
		cuttings					85				@ 90': as above. Color change to medium dark gray (N4)
							90				

Logged by: TV

Date checked: 2/22/06

Golder Associates

Project No.: CCL102 / 0537467
Client: Shaw/EMCON for Waste Connection
Site: Cold Canyon Landfill Weir Parcel

Boring No. B-1
Well No. B-1
Sheet 3 of 3

Time		Sample No.	Blows / 6 inch	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
									SS		SILTY SANDSTONE (continued)
9:45		cuttings					95				@95': very hard layer, drilling slows substantially medium dark gray (N4)
8:45											@98': still very hard layer, 1/2 hour for last 8 inches with 12,000 pounds down pressure.
							100				BOTTOM OF BORING AT 98 ft. Terminated Drilling - color suggests water.

Logged by: TU

Date checked: 2/22/06

WELL CONSTRUCTION DETAILS

BORING DESIGNATION: B-1

INSTALLATION

DATE: 12-8-2005 BY: Woodward Drilling Co. Tom Vercautere

DIMENSIONS

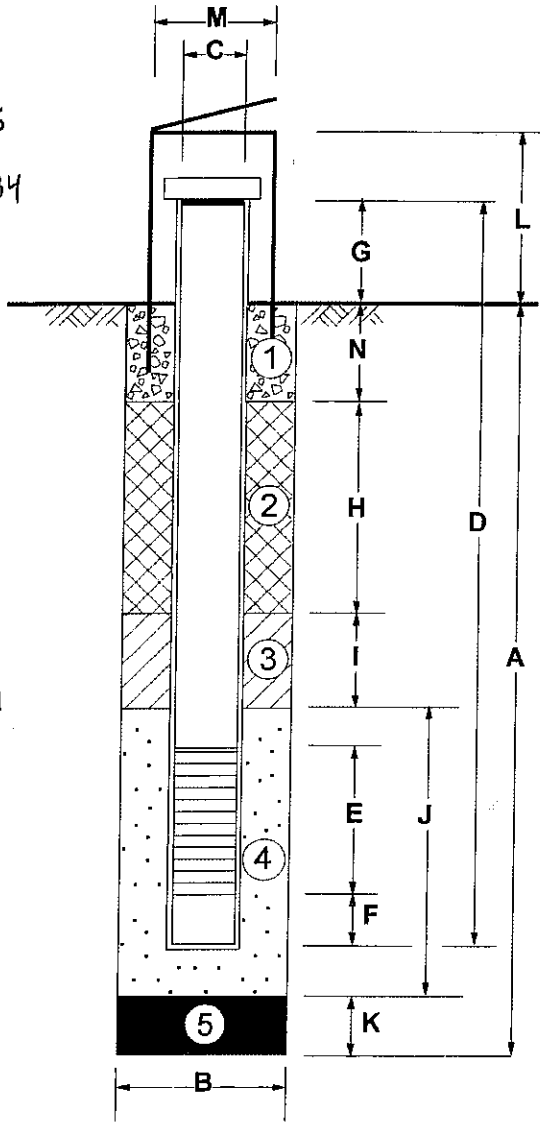
A	Total Depth of Boring (ft.)	98
B	Borehole Diameter (in.)	7 1/4
C	Well Casing Diameter (in.)	2
D	Well Casing Length (ft.)	100.4
E	Well Casing Slotted Interval (ft.)	20
F	Well Casing End Cap or Sump (ft.)	0.65
G	Well Casing Height (ft.)	2.4
H	Annular Seal Interval (ft.)	65.8
I	Annular Seal Interval (ft.)	4.7
J	Sand Pack Interval (ft.)	26
K	Bottom Material Interval (ft.)	NA
L	Protective Cover Height (ft.)	2.6
M	Protective Cover Diameter (in.)	6
N	Annular Seal Interval (ft.)	1.5
	Well Centralizer Depth(s) (ft.)	30, 78, 90

MATERIALS DATA

Monument Footing	(1)	Concrete
Annular Seal	(2)	Bentonite Grout
Annular Seal	(3)	Bentonite chips
Sand Pack	(4)	RMC #2/12 sand
Bottom Material	(5)	NA
Slotted Casing		0.010-inch
Well Casing		Sch 40 PVC
Well Centralizers		Stainless steel
Protective Cover		mild steel

WELL DESIGNATION
B-1

DEPTH/HEIGHT (FT)	ELEV. (FT MSL)
2.6	283.5
2.4	283.34
0	280.9
1.5	279.4
67.3	213.6
72	200.9
78.3	202.6
97.4	183.5
98	182.9
98	182.9
98	182.9



SECTION VIEW
(not to scale)

NOTES: Sump is end cap plus unslotted section of casing. Elevations from survey stake provided by Cold Canyon Landfill, Inc. Well drilled with rotary wash techniques.

SITE: Cold Canyon Landfill
PROJ. NO: 053-7467
N. 5350.62 *E.* 6081.97
WELL PERMIT NO: 2005-MW-428
T.O.C. ELEV: 283.34

Golder Associates

Exploratory Boring Log

Boring No. B-2
Well No. B-2
Sheet 1 of 3

Site: Cold Canyon Landfill Weir Parcel
Client: Shaw/EMCON for Waste Connections
Project Number: CCL102 / 0537467
Date(s) Drilled: 12-8&9-2005
Date(s) Installed: 12-9-2005
Drilling Co./Driller: Woodward Drilling Company

Ground Elevation: 262.9 ft
T.O.C. Elevation: 265.32 ft MSL
Coordinates: N5055.93 E5726.46
Drilling Method: Rotary wash
Borehole Total Depth: 101.2 ft
Final Borehole Diameter: 7½ inch nominal

Drilling Summary: Drilled to 60 feet with 7¼-inch tricone roller bit using approximately 8000 pounds of hydraulic downpressure. Performed standard penetration tests at 60, 65, and 70 feet with above-ground hydraulic hammer. Continued drilling to 102.1 feet. Circulated EZ mud polymer, then finished borehole and constructed well.

Time		Sample No.	Blows / 6 in	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
3:45									SS		PISMO FORMATION - EDNA MEMBER
											SILTY SANDSTONE, yellowish brown (10YR, 4/2)
											60-70% fine to very fine sand, moist. Fines
											mostly silt. Chips harden when sun dried - contains
							5				some clay
											@10': as above
							10				
							15				
4:00							20				@20': as above
							25				
4:10							30				@30': as above
							35				
											@38': harder drilling
4:15							40		SS		

Logged by: TV

Date checked: 2/22/06

Golder Associates

Project No.: CCL102 / 0537467
Client: Shaw/EMCON for Waste Connection
Site: Cold Canyon Landfill Weir Parcel

Boring No. B-2
Well No. B-2
Sheet 2 of 3

Time		Sample No.	Blows / 6 inch	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
									SS		SILTY SANDSTONE (Continued)
											@ 40-60': Driller say material is harder than above
4:20							45				
											@ 50' as above
							50				
		Cuttings									
							55				
5:00		B-2 60'	50/3.5"			SPT	60				SILTY SANDSTONE, dusky yellow (5Y 6/4) to light olive brown (5Y 6/8); 20-35% coarse silt, 65-80% very fine sand, 98% quartz + feldspar, trace to 2% mafic minerals; minor clay; very well sorted, no bedding observed in drive sample
5:55		B-2 65'	50/3"			SPT	65				@ 65': as above, light olive brown (5Y 5/6) with some light brown (5YR 5/6) iron oxide staining. 90% of sample settles in 10 seconds then 2-inch water column, nearly all in 4 minutes.
8:30	12/9	B-2 70'	50/3"			SPT	70				@ 70': as above, no staining
							75				@ 77': medium dark gray (N4)
9:00							80				
		Cuttings									
							85				
							90		SS		

Logged by: [illegible]

Date checked: 1/22/06

Golder Associates

Project No.: CCL102 / 0537467
Client: Shaw/EMCON for Waste Connection
Site: Cold Canyon Landfill Weir Parcel

Boring No. B-2
Well No. B-2
Sheet 3 of 3

Time		Sample No.	Blows / 6 inch	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
									SS		SILTY SANDSTONE (continued)
9:20		Cuttings					95				@95: medium gray (N5)
9:35							100		SS		BOTTOM OF BORING AT 101.2 FEET. Boring Terminated, Objective Achieved.
							105				

Logged by: TV

Date checked: 2/22/06

WELL CONSTRUCTION DETAILS

BORING DESIGNATION: B-2

INSTALLATION

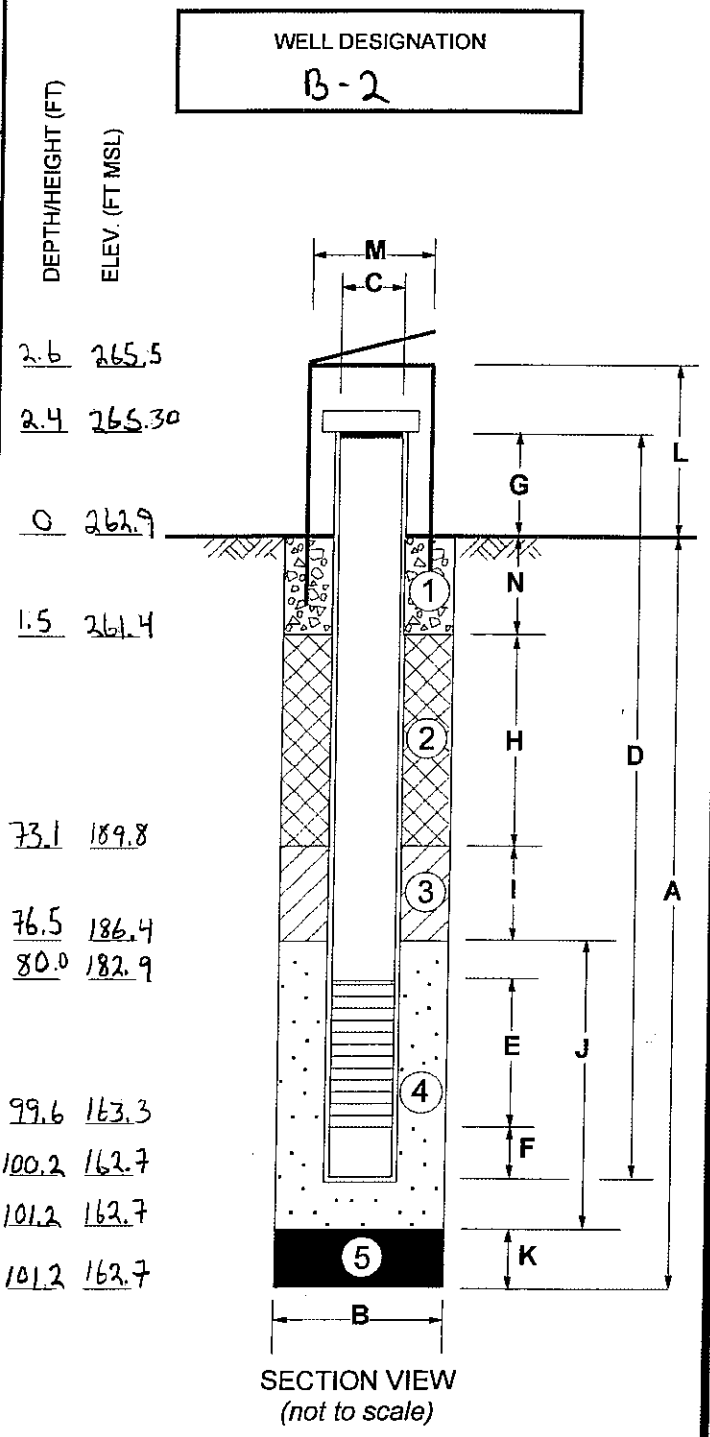
DATE: 12-9-2005 BY: Woodward Drilling Co.
Tom Vercouteren

DIMENSIONS

A	Total Depth of Boring (ft.)	101.2
B	Borehole Diameter (in.)	7 1/4
C	Well Casing Diameter (in.)	2
D	Well Casing Length (ft.)	102.6
E	Well Casing Slotted Interval (ft.)	20
F	Well Casing End Cap or Sump (ft.)	0.65
G	Well Casing Height (ft.)	2.4
H	Annular Seal Interval (ft.)	71.6
I	Annular Seal Interval (ft.)	3.4
J	Sand Pack Interval (ft.)	24.7
K	Bottom Material Interval (ft.)	NA
L	Protective Cover Height (ft.)	2.6
M	Protective Cover Diameter (in.)	6
N	Annular Seal Interval (ft.)	1.5
	Well Centralizer Depth(s) (ft.)	41, 81, 101

MATERIALS DATA

Monument Footing	(1)	Concrete
Annular Seal	(2)	Bentonite grout
Annular Seal	(3)	Bentonite chips
Sand Pack	(4)	RMC #2/12 sand
Bottom Material	(5)	NA
Slotted Casing		0.010-inch
Well Casing		Sch 40 PVC
Well Centralizers		Stainless Steel
Protective Cover		mild steel



SECTION VIEW
(not to scale)

NOTES: Sump is end cap plus unslotted section of casing. Elevations from survey stake provided by Cold Canyon Landfill, Inc. Well drilled with rotary wash techniques

SITE: Cold Canyon Landfill
PROJ. NO: 053 7467
N. 35° 10.990 E. 120° 35.664
WELL PERMIT NO: 2005-MW-429
T.O.C. ELEV: 266.3 feet

Golder Associates

Exploratory Boring Log

Boring No. B-3
Well No. —
Sheet 1 of 2

Site: Cold Canyon Landfill Weir Parcel
Client: Shaw/EMCON for Waste Connections
Project Number: CCL102 / 0537467
Date(s) Drilled: 5-26-06 Friday
Date(s) Installed:
Drilling Co./Driller: ~~Spectrum Exploration~~ Woodward

Ground Elevation: ~ -1.5 of B-12
T.O.C. Elevation: NA
Coordinates: NA
Drilling Method: Auger to 20- rotary wash to
Borehole Total Depth: 60'
Final Borehole Diameter: 3 7/8"

Drilling Summary: Augers to 20 ft switch to mud inside augers. Drove SPT at 5-foot intervals to 160 ft. Pounded with rig-mounted hydraulic hammer. Drilled between SPT runs with 3 7/8-inch tricone roller bit. Mud made with bentonite Quick-Gel. Lowered tremie and grouted borehole to surface with Bentonite grout.

Time		Sample No.	Blows / 6 in	RQD	Core Run	Recovery	Depth (ft)	Well Detail	Soil/Rock Symbol	Graphic Log	LITHOLOGY/REMARKS
									SM		SILTY Sand (SM) dark yellow brown (10YR 4/2)
9:38			17 26 40				5				silty sand yellowish gray 5Y 7/2)
			9 35 50/5"				10				
			20 50/5"				15				mottled dusky yellow 5Y 6/4 and very pale orange 10 YR 8/2 -damp
10:30			21 50/5.5"				20				yellowish gray 5Y 7/2 fine to vf sand, trace silt (water settle), damp switchover to rotary inside auger which are left at 20 ft.
			50 50/0.5"				25				@25 as above
10:50 11:03			50/5"				30				@30' as above
11:25 11:38			50/5"				35				@35.5': driller noted slightly harder layer
11:20							40				

Logged by: TD
Date checked:

Golder Associates

Project No.: 053 7467
Client: Shaw/Ermcon
Site: Cold Canyon

Boring No. B-3
Well No.
Sheet 2 of 2

Well Construction Details	Sample No.	Sample Type	Blows/Run	Recovery	Sampler	Water Level	Depth (ft)	Graphic Log	LITHOLOGY/REMARKS
	11:31		50/4.5"				40		Pismo Edna Sand
									@ 40': color change to dark gray (N 3) f to vf sand - same as above (water test)
	11:34		50/4"				45		@ 45': as above
	11:36								
									switched rig operator - not pushing as hard driller says he thought it was gravelly??
	11:59		50/2"				50		@ 50': as above
	12:21								
	12:23		50/4"				55		@ 55': as above
	12:40								
	12:42		50/5"				60		Boring terminated at 60'

Logged by: BV
Checked by:
Date checked:

REPORT OF FIELD OBSERVATIONS

Job No.: 3014.035	Date: 11/3/2009	M T **X** W T F S S
Client: County of San Luis Obispo	Project: Cold Canyon Landfill Weir Wells Pumping Tests	
Location: CCLF Property (Weir), Darway and Clements Properties	Weather: Clear	
Observer: T. Nicely	Observation Period: Start: Stop:	

Description:

6:45 am. Left office.

Gathered supplies at Lowes for instrumentation of up to 10 wells: 3 Weir wells, 4 on-site MWs, up to 3 off site wells

10:00 am. I met with land owners of properties surrounding landfill at Earl Darway's property. Present were Earl Darway (APNs 044-261-038 though -041), Sue Barone (property further to the southeast), Charlie Katherman, who is their hydrogeologist, and Bruce Falkenhagen. We discussed the planned pumping tests on the Weir wells, which should take up to three weeks (3 days on, 3 days off for each of the three Weir wells, individually.) We inspected several of Earl Darway's wells,

- as close as the so-called Gomez Well (APN 044-261-41, DWR WCR No. 266376, total depth of well: 120 feet, influenced by pumping of Weir wells 1 and 2, difficult to sound due to gel within well, "18 gpm", pump at 100 feet),
- another well about 40 feet east on other side of building of similar construction and depth, did not sound, pump is installed,
- abandoned well "Patchett 45-33", concreted to surface,
- a disused well of unknown depth at 531 Patchett in open field (difficult to sound, perhaps 90 feet deep),
- a well at 541 Patchett (DWR WCR No. 322773, total depth of well: 505 feet, pump depth unknown, serves two residences, has 5,000 gallon tank and can be pumped irregularly, difficult to sound due to gel within well, originally 20 gpm well),
- another well north of Earl Darway's property at the southeast corner of the Cold Canyon Landfill, which seems to pump "all the time" according to Mr. Darway, has a 3-inch drop pipe and was running at the time. Nothing more is known of the well.

We concluded with the understanding that I may instrument up to two of his wells and was given permission to enlarge a hole on the top of those wells to about 1-inch diameter. Earl Darway requested that a test be performed involving the pumping of Weir wells 1 and 2 in unison, as occurs during the summer months, which affects his closest wells. They recommend I call Ben at Farm Supply to discuss the viscous gel and the pump information for Diane Mead's well (see below).

12:00 pm. Earl coordinated with Diane Mead, who owns a well on APN 044-301-016, south of Carpenter Canyon Rd on the equestrian property, for my access to her well for this project. She gave me her permission to instrument her well and faxed her well completion report and a recent well service card from Farm Supply indicating that her well was dry.

12:30 pm. I met with Bruce Rizzoli. He does not understand / like reading meters at the three Weir wells, the pond and the MRF tank daily. I indicated that it is important. We developed a schedule for testing as follows:

- Pump Weir Well 1 between Monday, November 9 and Thursday, November 12. Shut off all wells on Thursday, November 12 through Monday, November 16.
- Pump Weir Well 2 between Monday, November 16 and Thursday, November 19. Shut off all wells on Thursday, November 19 through Monday, November 16.
- Pump Weir Well 3 between Sunday, November 22 and Wednesday, November 25. Shut off all wells on Wednesday, November 25 through at earliest, Saturday November 28.

Bruce gave me a key to the monitoring wells. Bruce plans to pump all wells together, a pumping operation schedule I didn't understand was performed, starting today to fill his tank in anticipation of our testing.

1:30 pm. I met with Mr. Clement, whose well is under an old windmill. His well can be instrumented by enlarging a hole in the top of his casing to 1-inch diameter.

Mileage: miles

COPY SENT TO CLIENT: Yes No	CONTINUED ON NEXT PAGE	SHEET 1 OF 2

REPORT OF FIELD OBSERVATIONS

Job No.: 3014.035	Date: 11/3/2009	M T **X** W T F S S
Client: County of San Luis Obispo	Project: Cold Canyon Landfill Weir Wells Pumping Tests	
Location: CCLF Property (Weir), Darway and Clements Properties	Weather: Clear	
Observer: T. Nicely	Observation Period: Start: Stop:	

Description:

I left site to get a drill bit to enlarge holes in off site wells to 1-inch.

2:30 I returned to site to instrument wells. I started with Weir well 1, the hole in the side of which is not large enough to accommodate our MiniDiver. I install a 50m pressure range transducer on 158 feet or so on stainless steel wire, but will not likely be able to remove it without the help of a pump contractor. Need to call Ben at Farm Supply to determine how to handle this. I may need to install our MicroDivers on 80 meter down-hole cables. This was quite time-consuming.

I installed a 50 m MiniDiver in Weir well 2 to 144 feet through the angled access hole and a 20 meter MiniDiver in the neighboring monitoring well to 46 feet, the total depth.

I measured and created the cable for Weir Well 3 to 236 feet. However, the 50 meter MiniDiver could not be installed past the elbow at the point the angled 1-inch tube meets the casing. The well will need to be modified by a pump contractor to continue.

6:00 pm. Off site.

Mileage: miles

COPY SENT TO CLIENT: Yes No	CONTINUED ON NEXT PAGE	SHEET 2 OF 2

REPORT OF FIELD OBSERVATIONS

Job No.: 3014.035	Date: 11/5/2009	M T W T **X** F S S
Client: County of San Luis Obispo	Project: Cold Canyon Landfill Weir Wells Pumping Tests	
Location: CCLF Property (Weir), Darway and Clements Properties	Weather: Clear	
Observer: T. Nicely	Observation Period: Start: Stop:	

Description:

6:15 am. I left office for CCLF to instrument:

Weir 3, with Farm Supply

Weir 1, with Farm Supply

P-10 or 11, 100 feet

B-6 100 feet

B-1 100 feet

Clement, 100 ft

Darway Gomez, 100 feet

Darway 541 Patchett

8:30 drilled hole in top of Clement well. Recharged battery and left to measure total depth of Weir property monitoring wells. To instrument P-10 instead of P-11, which is too shallow at 30 feet.

10:15 Started 20 meter transducer in Clement at 5 minute intervals. Transducer at 98 feet.

11:30 Started transducer in Darway's Gomez well at 11:15 at 5 minute intervals. Transducer at 98 feet.

12:00 pm Started 20 meter transducer in P-6 (B-2) at 5 minute intervals. Transducer at bottom of hole at 110 feet.

12:15 pm Started 20 meter transducer in P-10 at 5 minute intervals. Transducer at bottom of hole at 90 feet.

1:00 pm Started 100 meter transducer in B-1 at 5 minute intervals. Transducer at bottom of hole at 98 feet.

1:15 pm. At Weir well 3 neither the larger MiniDiver nor the smaller MicroDiver fit in angled 1-inch access tube. Well is still pumping at 14.5 gpm according to new flow meter.

1:30 pm. Weir well 1 is still pumping; rate is 25 gpm. Removed carefully the transducer in the well.

2:05 Switched off well. Meter 80,307 gallons. The meter has four white digits (0080) and two black digits (30). The sing gallon is read by the needle.

Started at 1 minute intervals at 2:30 pm. Under 95-33 (62) feet of water, about 10 feet above 155 feet due to obstruction (pump?). Perhaps pump is shallower than 156 feet? 1/2 inch tube goes to 148.

2:30 met Farm Supply staff, John, at Weir 3. 2:49 switched pump off. Meter: 87,241 gallons.

John drilled hole in side of casing. I installed the transducer to 164 feet (201 feet according to transducer) below 40 feet: 204 feet btoc. Static is higher than anticipated by 40 feet.

3:40 pm. SWL is 37.80 feet btoc and rising. (Recorded value is 200.57, near max pressure of 201.77.) I will keep the transducer where is until Monday.

The Mead Well is too heavily pumped to instrument and the 541 Patchett well is too viscous and deep to instrument. The Patchett wells are known to be viscous by Farm Supply staff, who have significant problems sounding the well with a ¼-inch diameter sounder. Likewise, I decided that I couldn't do it with a ¾-inch transducer. The on-site wells, Gomez and Clement wells are all instrumented.

Mileage: miles

COPY SENT TO CLIENT: Yes No	CONTINUED ON NEXT PAGE	SHEET 1 OF 1

REPORT OF FIELD OBSERVATIONS

Job No.: 3014.035	Date: 11/9/2009	M **X** T W T F S S
Client: County of San Luis Obispo	Project: Cold Canyon Landfill Weir Wells Pumping Tests	
Location: CCLF Property (Weir), Darway and Clements Properties	Weather: Clear	
Observer: T. Nicely	Observation Period: Start: Stop:	

Description:

6:00 am. Left office for Cold Canyon Landfill.

8:00 am. On site at Weir Well 1 to conduct CRT.

Measured water levels in all wells prior to starting testing (Clement, Gomez, Weir wells and four on-site monitoring wells).

10:20 am. Started CRT in Weir well 1. See data sheet. Observed testing through 100 minutes. Pumping rate was initially 32 gpm, which moderated to 25 gpm. The pumping test will not likely continue beyond 300 to 400 minutes, but should cycle on and off thereafter. Per discussion with a colleague (Peter Leffler), the pumping test may provide aquifer parameters (Transmissivity and Storativity) and will provide a feel for the long-term capacity of the well.

Note that the pumping rate as tested so far (30 gpm) is less than the EIR-stated, estimated rate (source: Bruce Rizzoli) of 40 gpm.

Fugro staff, Noah Lehr, will read the meter daily Tuesday through Thursday. He will end the testing on Thursday, November 12.

Left site at noon.

Mileage: miles

COPY SENT TO CLIENT: Yes No	CONTINUED ON NEXT PAGE	SHEET 1 OF 1

REPORT OF FIELD OBSERVATIONS

Job No.: 3014.035	Date: 11/16/2009	M **X** T W T F S S
Client: County of San Luis Obispo	Project: Cold Canyon Landfill Weir Wells Pumping Tests	
Location: CCLF Property (Weir), Darway and Clements Properties	Weather: Clear	
Observer: T. Nicely	Observation Period: Start: Stop:	

Description:

6:00 am. Left office for Cold Canyon Landfill.

8:00 am. On site with Noah Lehr at Weir Well 2 to conduct CRT at planned rate of 20 gpm.

9:35 am. Started Weir well 2 pumping test. See data sheet. Note that the tested rate of 12 to 13 gpm is less than the EIR-stated, estimated rate (source: Bruce Rizzoli) of 22 gpm.

Left at noon. Noah will perform all observation of this test and all but the first day of the following pumping test. The next pumping test will be started within Weir well 3 on Sunday, November 22.

Mileage: miles

COPY SENT TO CLIENT: Yes No	CONTINUED ON NEXT PAGE	SHEET 1 OF 1

REPORT OF FIELD OBSERVATIONS

Job No.: 3014.035	Date: 11/17/2009	M T **X** W T F S S
Client: County of San Luis Obispo	Project: Cold Canyon Landfill Weir Wells Pumping Tests	
Location: CCLF Property (Weir), Darway and Clements Properties	Weather: Clear	
Observer: T. Nicely	Observation Period: Start: Stop:	

Description:

9:20 am. Per Noah Lehr, Weir well 2 is pumping at as low a rate as the valve will allow. As of this morning, the pump was turning on for 5 to 6 minutes at 13 to 14 gpm, then switching off for 14 minutes. When Noah attempted to decrease the pumping rate by closing the valve slightly, the pump would rapidly switch on and off. Noah opened the valve until the current pumping cycles were maintained.

Meter readings are summarized in electronic pumping well data sheet.

Mileage: miles

COPY SENT TO CLIENT: Yes No	CONTINUED ON NEXT PAGE	SHEET 1 OF 1

	Pond	Weir 1	Wier 2	Wier 3	Tank	Time
11/3/2009	184500				7614	1:47P
11/4/2009	244079				7614	9:00A
11/5/2009	305200				7614	9:00A
11/6/2009	330800				7614	1:46 PM
11/7/2009						
11/8/2009						
11/9/2009	330800				7614	7:44A
11/10/2009	369300	116880			7636	8:59A
11/11/2009	405800	151030			7636	7:20A
11/12/2009	444400	186350			7636	7:15A
11/13/2009	449275	191104			7636	7:15A
11/14/2009						
11/15/2009						

COLD CANYON LANDFILL
DAILY COMPOSTING FORM

Truck Route: Composting

Location: Composting

Water Use: Compost Irrigation

Date	Time	Driver	Truck Volume (gallons)	Number of Loads (Tally marks)	Comments
11/9	8:00	TW	3800	1	Dust Control
11/9	10:30	Ruben	3800	1	Dust Control
11/9	2:30	TW	3800	1	Dust control
11/10	8:00	TW	3800	1	Dust Control
11/10	8:30	TW	3800	4	Compost Rows
11/10	11:00	TW	3800	1	Dust Control
11/12	8:00	TW	3800	1	Dust Control
11/12	2:00	Ruben	3800	1	Dust Control
11/13	9:00	TW	3800	1	Dust Control
11/16	8:00	TW	3800	2	Dust Control
11/17	8:00	TW	3800	2	Dust Control
11/18	8:00	TW	3800	2	Dust Control
11/18	8:00	TW	3800	2	Compost
11/19	8:00	TW	3800	2	Dust Control
11/19	9:00	TW	3800	4	Compost

COLD CANYON LANDFILL
DAILY DUST CONTROL FORM

Truck Route: Dust Control

Location: Landfill

Water Use: Dust Control and Daily Cover

Date	Time	Driver	Truck Volume (gallons)	Number of Loads (Tally marks)	Comments
11/17		Joe	3800	3	Dust control/ Pond
11/17		Joe	3800	1	Dust Control/ Shop
11/18		Joe	3800	4	Dust Control/Pond
11/19		Joe	3800	2	Dust Control/Shop
11/19		Joe	3800	2	Dust Control/Pond
11/20		Joe	3800	2	Dust Control/Pond
11/20		Joe	3800	1	Dust Control/Shop
11/21		Joe	3800	2	Dust Control/ Shop
11/22		Joe	3800	1	Dust Control/ Shop
11/23		Joe	3800	1	Dust Control/Pond
11/23		Joe	3800	2	Dust Control/ Shop

COLD CANYON LANDFILL
DAILY POND WATER METER FORM

Meter No: Pond Meter

Location: Outflow to Pond

Water Use: Composting and Dust Control

Date	Time	Observer	Meter Reading (gallons)	Flow Rate (gpm)	Comments
11/3	1:47	Bruce	184500		
11/4	9:00	Bruce	244079		
11/5	9:00	Bruce	305200		
11/6	1:45	Bruce	330800		
11/9	7:44	Bruce	330800		
11/10/09	8:44	Bruce	369300		
11/11	7:14	Bruce	405800		
11/12	7:17	Bruce	444400		
11/13	7:21	Bruce	449275		
11/16	7:15	Bruce	449275		
11/17	9:00	Bruce	459360		
11/18	7:35	Bruce	467970		
11/19	9:00	Bruce	477455		
11/20	7:19	Bruce	477455		
11/23	7:49	Bruce	492150		

COLD CANYON LANDFILL
DAILY POND WATER METER FORM

Meter No: Pond Meter

Location: Outflow to Pond

Water Use: Composting and Dust Control

Date	Time	Observer	Meter Reading (gallons)	Flow Rate (gpm)	Comments
11/24	8:46	Bruce	511220		

COLD CANYON LANDFILL
DAILY WELL MEASUREMENT FORM

Well Name:	Weir Well No. 1
Well Reference Point Elevation:	
Well Depth (feet):	186
Pump Setting (depth in feet)	158
Perforated Interval (depth in feet)	Unknown
Well Location (GPS)	

Date	Time	Observer	Well Status On/Off	Meter Total Reading (gallons)	Flow Rate (gpm)	Water Level (feet)		Comments
						Depth	Elevation	
11/10	0844	BR		116880				
11/11	0714	BR		151030				
11/12	0717	BR		186350				
11/13	0707	BR		191104				
11/16	0710	BR		191104				
11/20	0720	BR		191085				

COLD CANYON LANDFILL
DAILY WELL MEASUREMENT FORM

Well Name:	Weir Well No. 2
Well Reference Point Elevation:	
Well Depth (feet):	156
Pump Setting (depth in feet)	144
Perforated Interval (depth in feet)	Unknown
Well Location (GPS)	

Date	Time	Observer	Well Status On/Off	Meter Total Reading (gallons)	Flow Rate (gpm)	Water Level (feet)		Comments
						Depth	Elevation	
11/17	0840	BR		80610				
11/18	0735	BR		87778				
11/20	0719	BR		96039				
11/30	0810	BR		96029				

COLD CANYON LANDFILL
DAILY WELL MEASUREMENT FORM

Well Name:	Weir Well No. 3
Well Reference Point Elevation:	
Well Depth (feet):	244.5
Pump Setting (depth in feet)	237
Perforated Interval (depth in feet)	Unknown
Well Location (GPS)	

Date	Time	Observer	Well Status On/Off	Meter Total Reading (gallons)	Flow Rate (gpm)	Water Level (feet)		Comments
						Depth	Elevation	
11/23	0815	BR		100250				
11/24	0845	BR		115110				
11/25	0718	BR		123974				
11/27	0800	BR		125039				
11/30	0815	BR		125039				

Bruce Rizzoli's meter data per telephone conversation of January 11, 2010

Pond November 30: 535,420 at 8:30 am

Pond December 1: 567,210 at 7:20 am

Pond December 2: 598,225 at 6:50

Pond December 4: 661,230 at 7:01

Pond December 7: 754,800 at 8:00 am

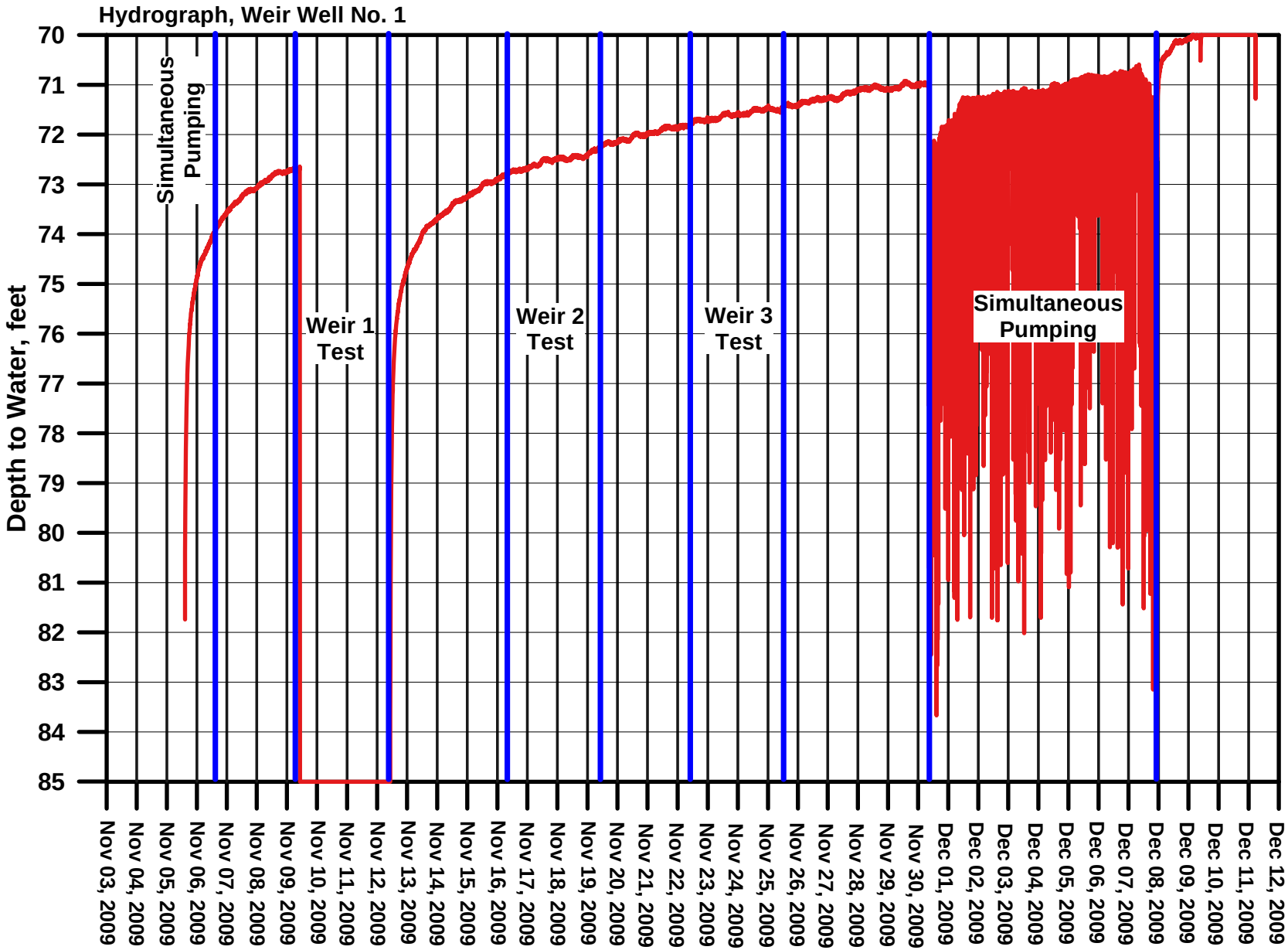
Tank November 20: 7636

Tank on December 8: 24,105 at 9:10

Tank January 11: 34,382 at 9:54 am

Pond January 11: 754,945 at 9:56 am

APPENDIX D
WATER LEVEL HYDROGRAPHS


Hydrograph, Weir Well No. 1
Depth to Water, feet
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
Simultaneous Pumping
Weir 1 Test
Weir 2 Test
Weir 3 Test
Simultaneous Pumping
Nov 03, 2009
Nov 04, 2009
Nov 05, 2009
Nov 06, 2009
Nov 07, 2009
Nov 08, 2009
Nov 09, 2009
Nov 10, 2009
Nov 11, 2009
Nov 12, 2009
Nov 13, 2009
Nov 14, 2009
Nov 15, 2009
Nov 16, 2009
Nov 17, 2009
Nov 18, 2009
Nov 19, 2009
Nov 20, 2009
Nov 21, 2009
Nov 22, 2009
Nov 23, 2009
Nov 24, 2009
Nov 25, 2009
Nov 26, 2009
Nov 27, 2009
Nov 28, 2009
Nov 29, 2009
Nov 30, 2009
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Dec 02, 2009
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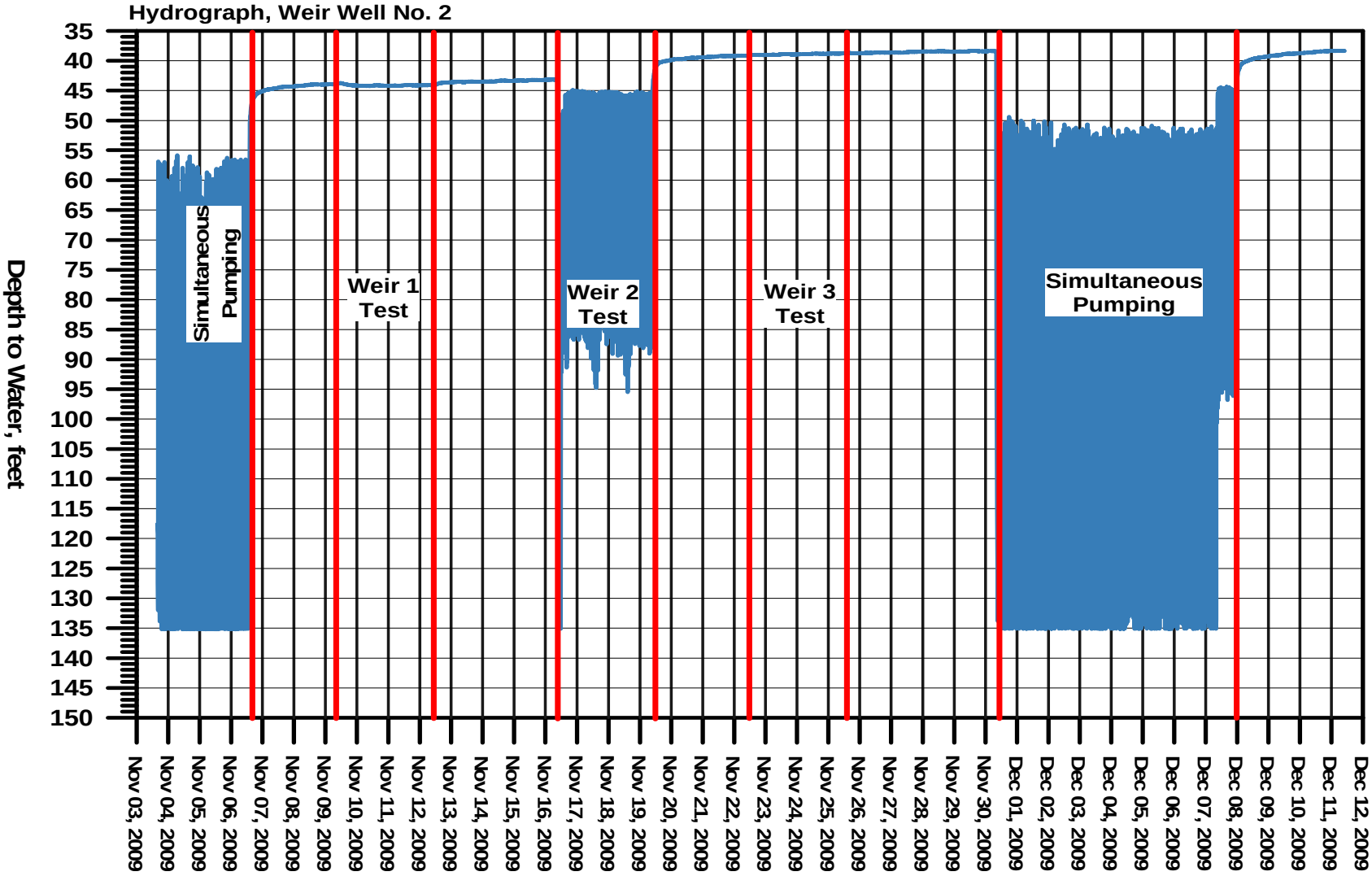
Dec 12, 2009


Hydrograph, Weir Well No. 2
Depth to Water, feet
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
140
145
150
Simultaneous Pumping
Weir 1 Test
Weir 2 Test
Weir 3 Test
Simultaneous Pumping
Nov 03, 2009
Nov 04, 2009
Nov 05, 2009
Nov 06, 2009
Nov 07, 2009
Nov 08, 2009
Nov 09, 2009
Nov 10, 2009
Nov 11, 2009
Nov 12, 2009
Nov 13, 2009
Nov 14, 2009
Nov 15, 2009
Nov 16, 2009
Nov 17, 2009
Nov 18, 2009
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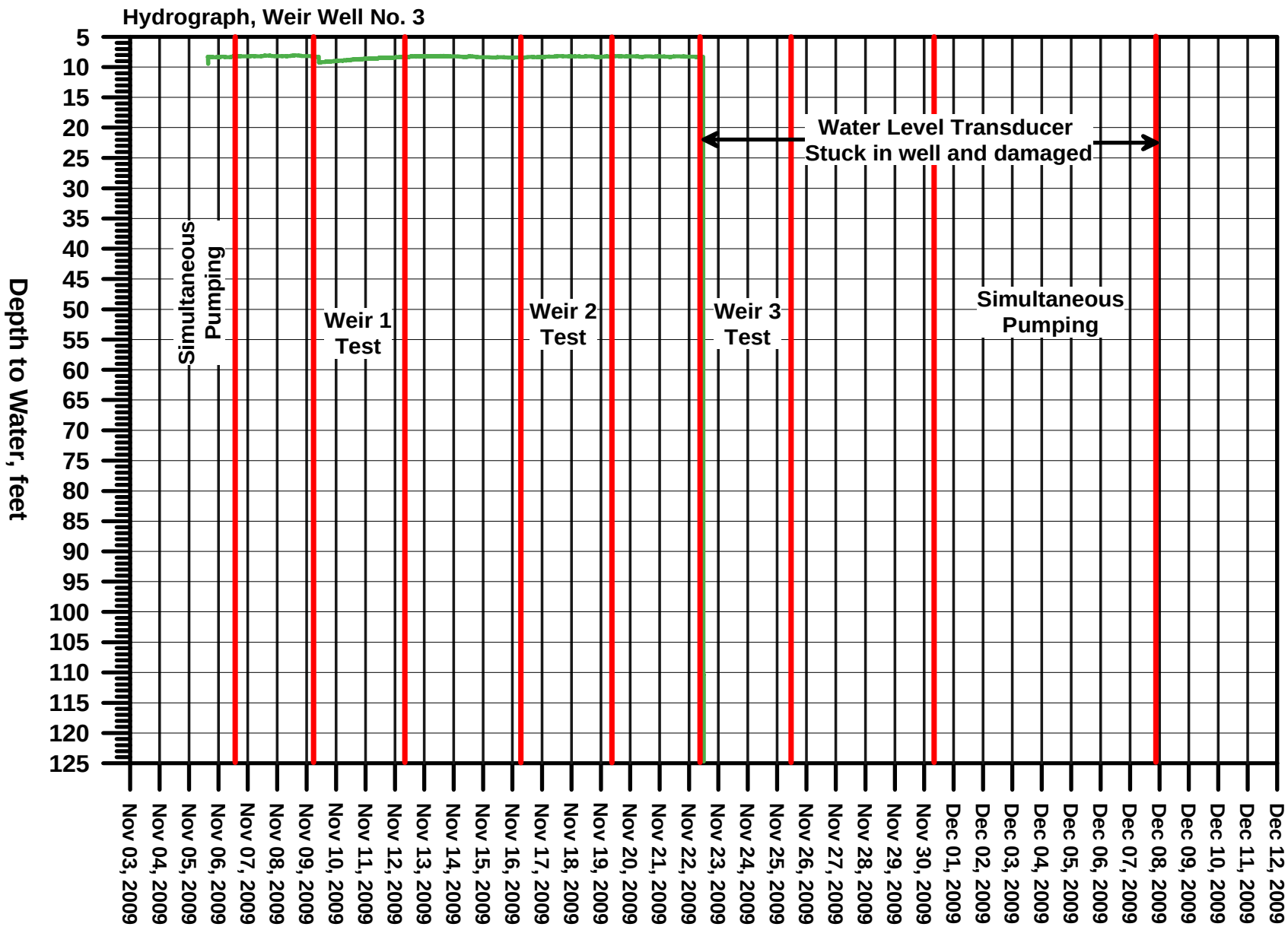
Hydrograph, Weir Well No. 3
Depth to Water, feet
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
Simultaneous Pumping
Weir 1 Test
Weir 2 Test
Weir 3 Test
Water Level Transducer Stuck in well and damaged
Simultaneous Pumping
Nov 03, 2009
Nov 04, 2009
Nov 05, 2009
Nov 06, 2009
Nov 07, 2009
Nov 08, 2009
Nov 09, 2009
Nov 10, 2009
Nov 11, 2009
Nov 12, 2009
Nov 13, 2009
Nov 14, 2009
Nov 15, 2009
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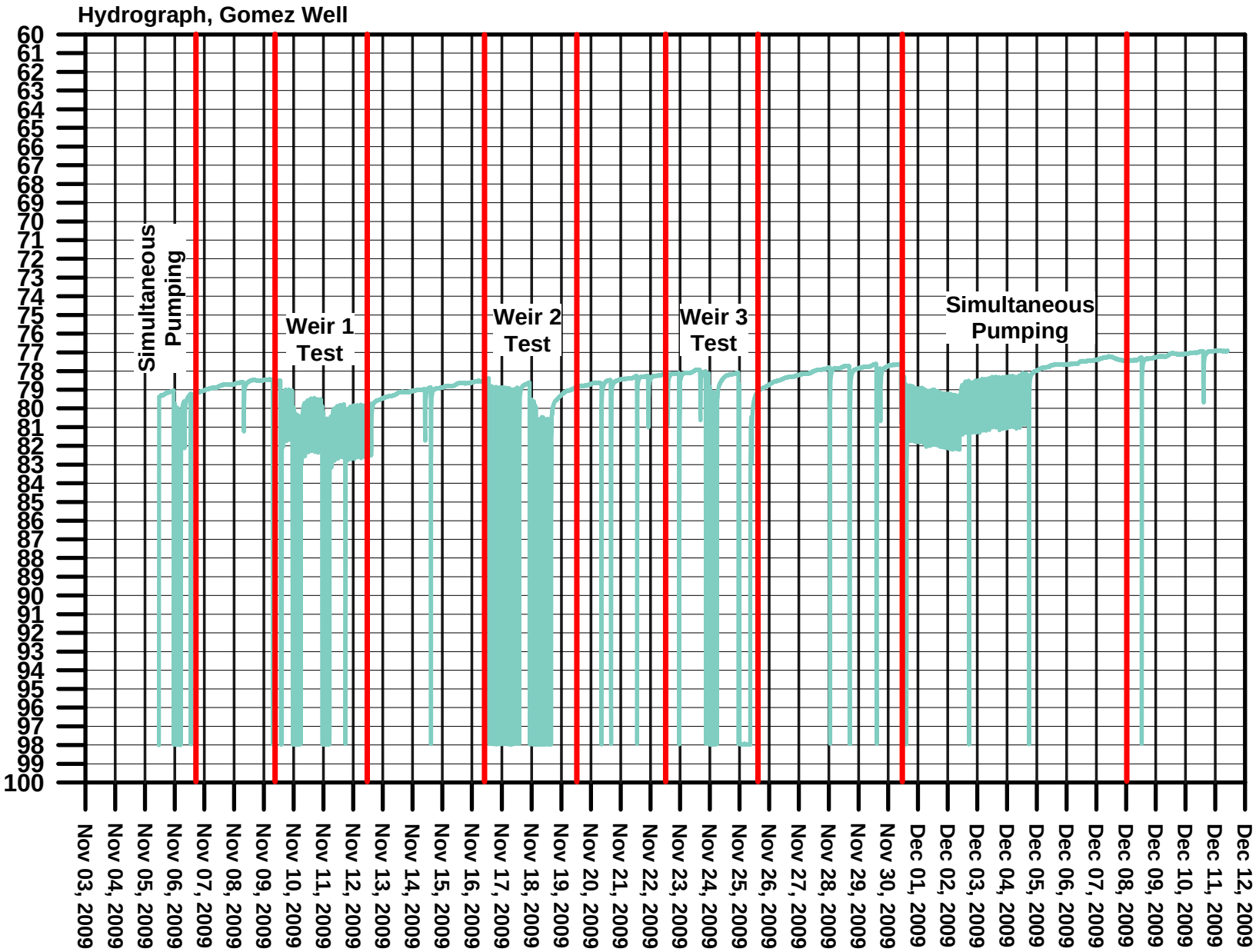
Dec 12, 2009


Hydrograph, Gomez Well
Depth to Water, feet
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
Simultaneous Pumping
Weir 1 Test
Weir 2 Test
Weir 3 Test
Simultaneous Pumping
Nov 03, 2009
Nov 04, 2009
Nov 05, 2009
Nov 06, 2009
Nov 07, 2009
Nov 08, 2009
Nov 09, 2009
Nov 10, 2009
Nov 11, 2009
Nov 12, 2009
Nov 13, 2009
Nov 14, 2009
Nov 15, 2009
Nov 16, 2009
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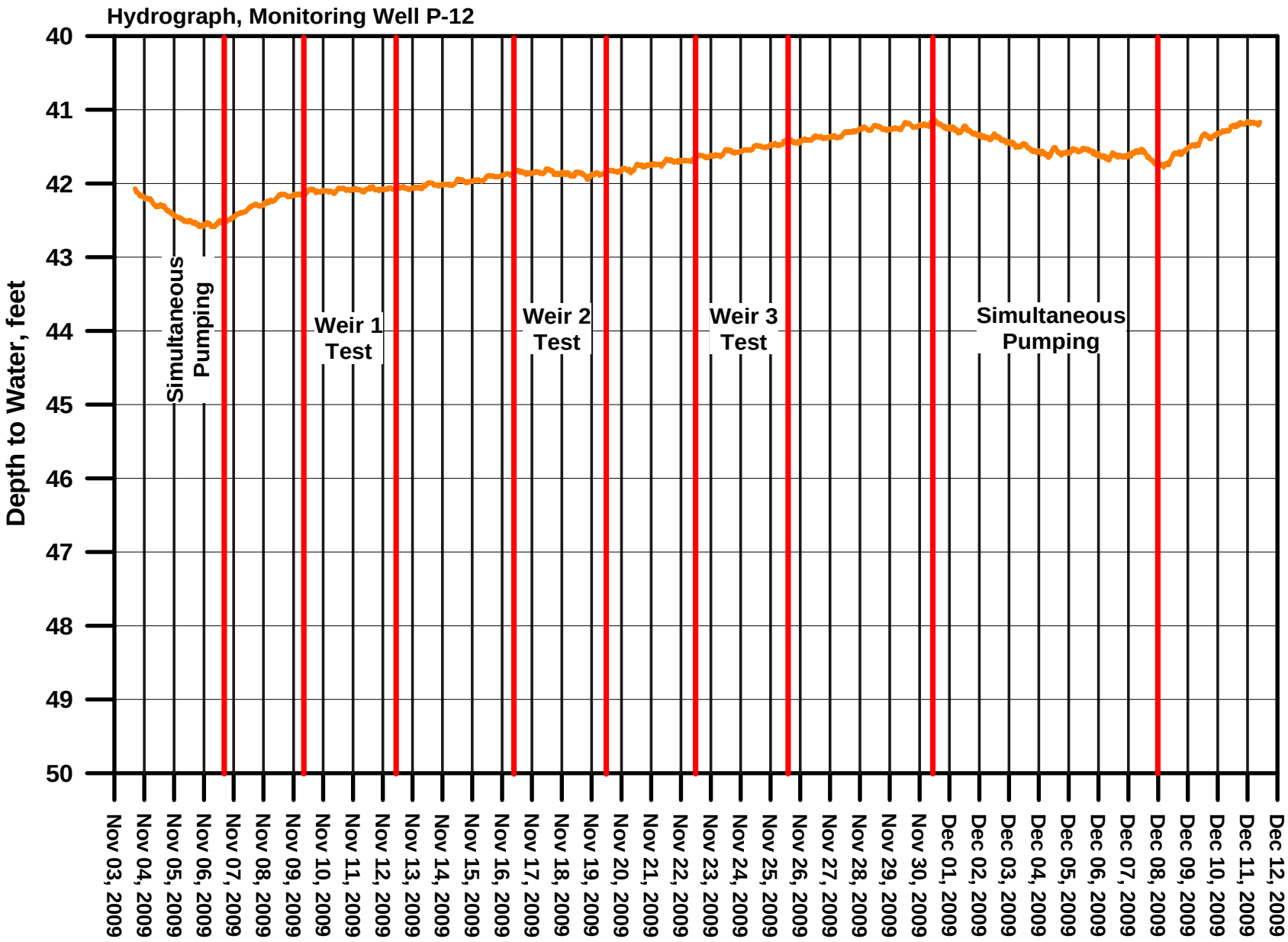
Dec 11, 2009
Dec 12, 2009


Hydrograph, Monitoring Well P-12
Depth to Water, feet
40
41
42
43
44
45
46
47
48
49
50
Simultaneous Pumping
Weir 1 Test
Weir 2 Test
Weir 3 Test
Simultaneous Pumping
Nov 03, 2009
Nov 04, 2009
Nov 05, 2009
Nov 06, 2009
Nov 07, 2009
Nov 08, 2009
Nov 09, 2009
Nov 10, 2009
Nov 11, 2009
Nov 12, 2009
Nov 13, 2009
Nov 14, 2009
Nov 15, 2009
Nov 16, 2009
Nov 17, 2009
Nov 18, 2009
Nov 19, 2009
Nov 20, 2009
Nov 21, 2009
Nov 22, 2009
Nov 23, 2009
Nov 24, 2009
Nov 25, 2009
Nov 26, 2009
Nov 27, 2009
Nov 28, 2009
Nov 29, 2009
Nov 30, 2009
Dec 01, 2009
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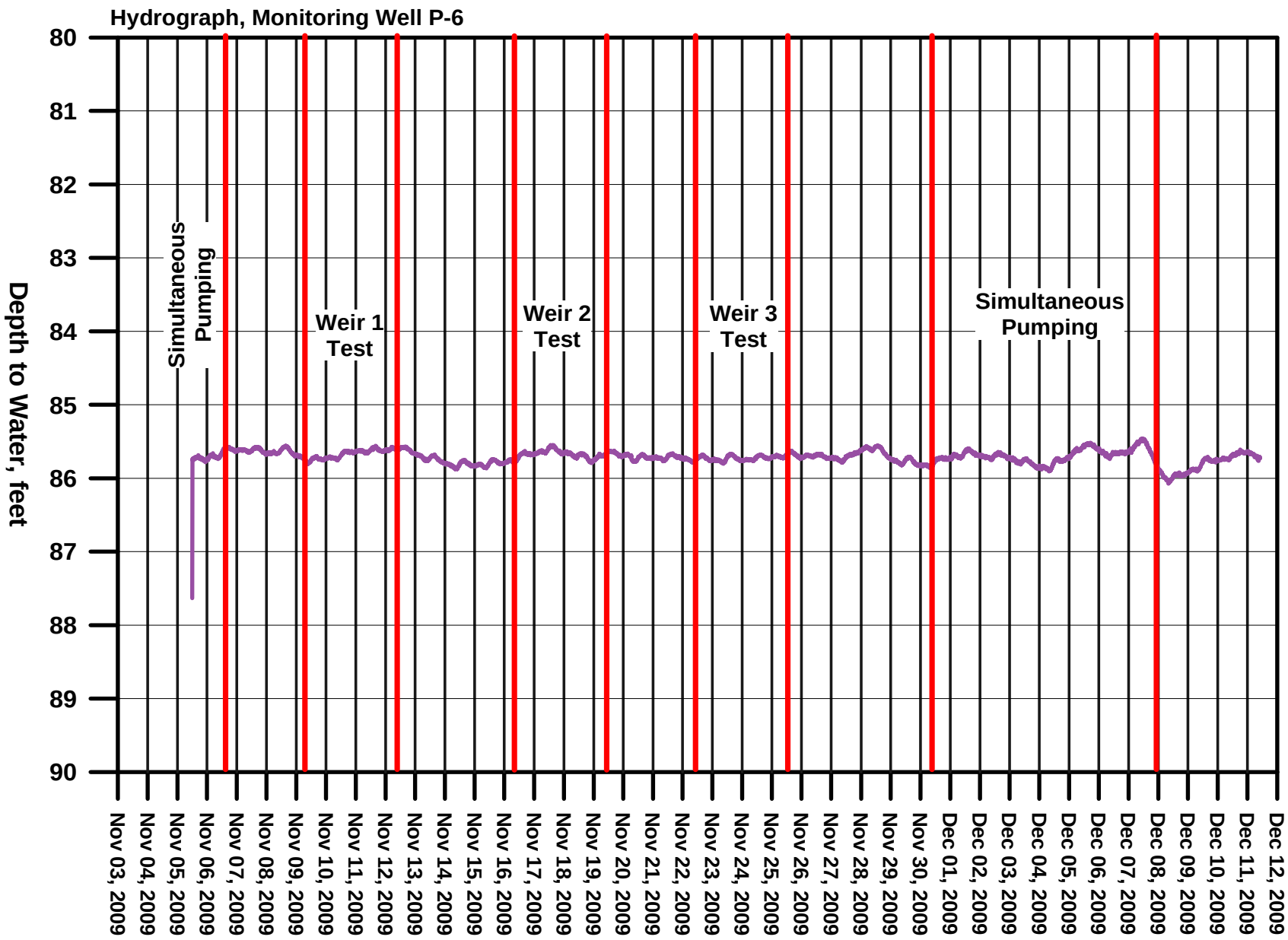
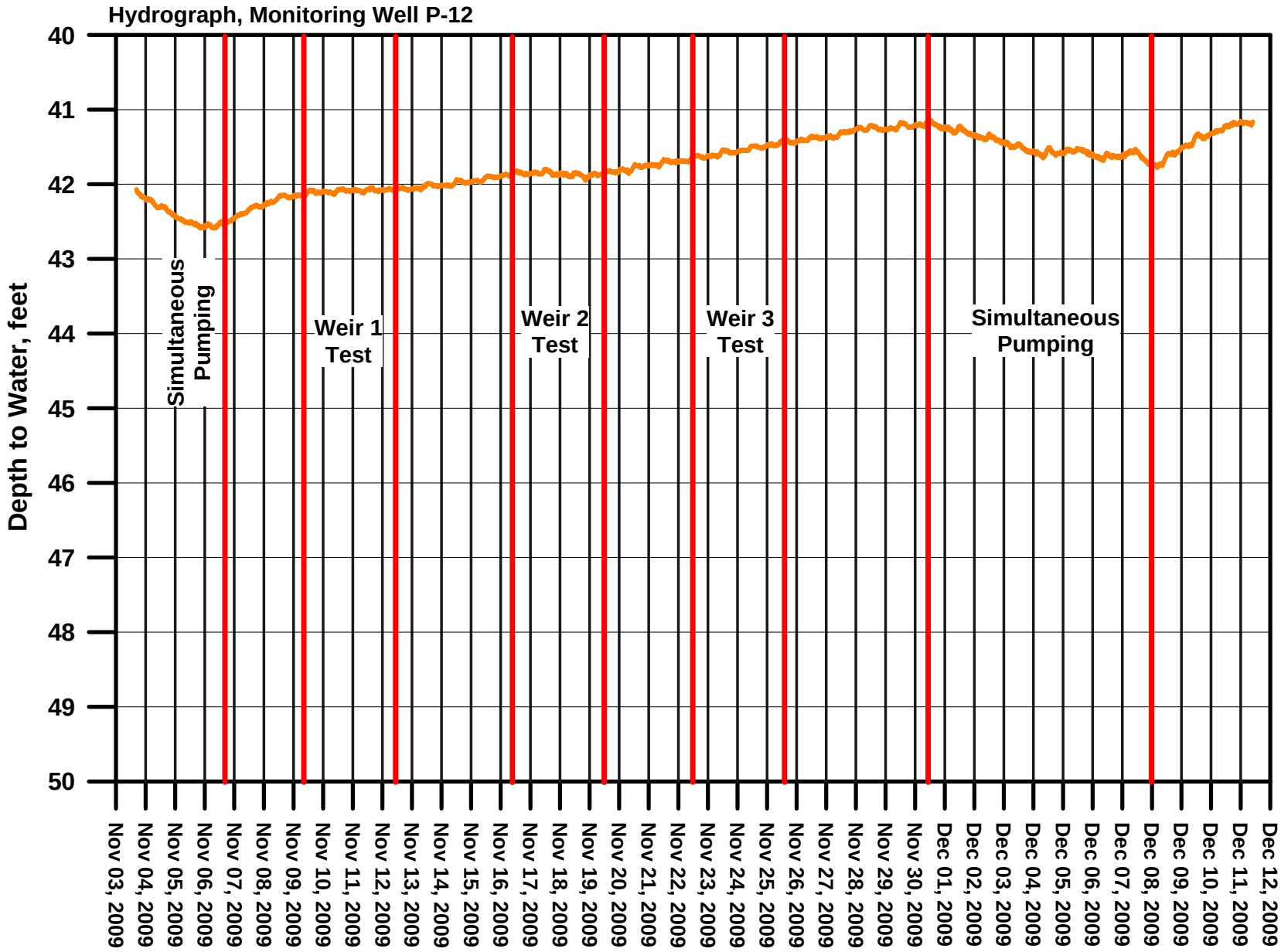
Dec 10, 2009
Dec 11, 2009
Dec 12, 2009


Hydrograph, Monitoring Well P-6
Depth to Water, feet
80
81
82
83
84
85
86
87
88
89
90
Simultaneous Pumping
Weir 1 Test
Weir 2 Test
Weir 3 Test
Simultaneous Pumping
Nov 03, 2009
Nov 04, 2009
Nov 05, 2009
Nov 06, 2009
Nov 07, 2009
Nov 08, 2009
Nov 09, 2009
Nov 10, 2009
Nov 11, 2009
Nov 12, 2009
Nov 13, 2009
Nov 14, 2009
Nov 15, 2009
Nov 16, 2009
Nov 17, 2009
Nov 18, 2009
Nov 19, 2009
Nov 20, 2009
Nov 21, 2009
Nov 22, 2009
Nov 23, 2009
Nov 24, 2009
Nov 25, 2009
Nov 26, 2009
Nov 27, 2009
Nov 28, 2009
Nov 29, 2009
Nov 30, 2009
Dec 01, 2009
Dec 02, 2009
Dec 03, 2009
Dec 04, 2009
Dec 05, 2009
Dec 06, 2009
Dec 07, 2009
Dec 08, 2009
Dec 09, 2009
Dec 10, 2009
Dec 11, 2009
Dec 12, 2009


Hydrograph, Monitoring Well P-12
Depth to Water, feet
40
41
42
43
44
45
46
47
48
49
50
Simultaneous Pumping
Weir 1 Test
Weir 2 Test
Weir 3 Test
Simultaneous Pumping
Nov 03, 2009
Nov 04, 2009
Nov 05, 2009
Nov 06, 2009
Nov 07, 2009
Nov 08, 2009
Nov 09, 2009
Nov 10, 2009
Nov 11, 2009
Nov 12, 2009
Nov 13, 2009
Nov 14, 2009
Nov 15, 2009
Nov 16, 2009
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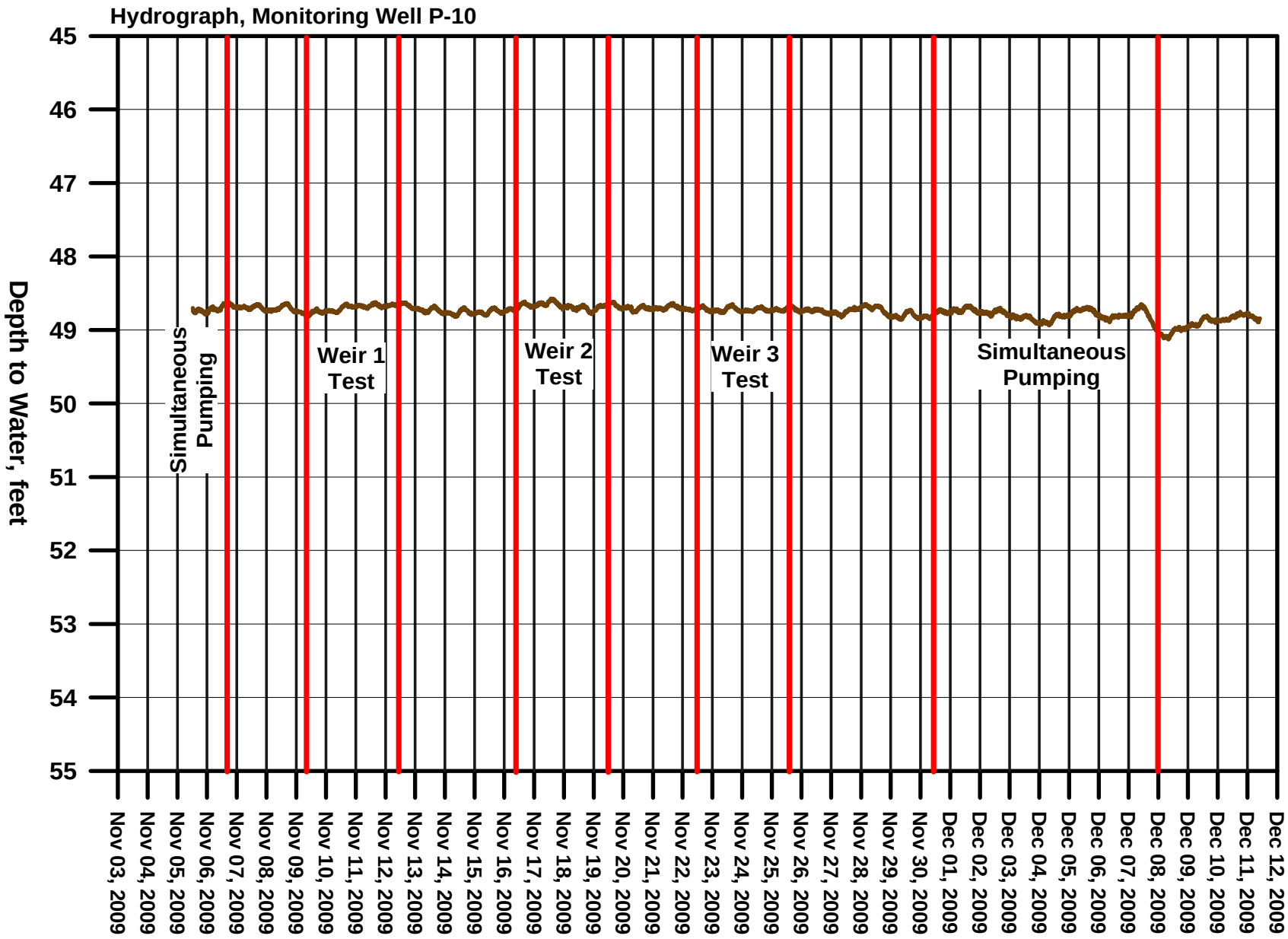
Hydrograph, Monitoring Well P-10
Depth to Water, feet
45
46
47
48
49
50
51
52
53
54
55
Simultaneous Pumping
Weir 1 Test
Weir 2 Test
Weir 3 Test
Simultaneous Pumping
Nov 03, 2009
Nov 04, 2009
Nov 05, 2009
Nov 06, 2009
Nov 07, 2009
Nov 08, 2009
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Nov 11, 2009
Nov 12, 2009
Nov 13, 2009
Nov 14, 2009
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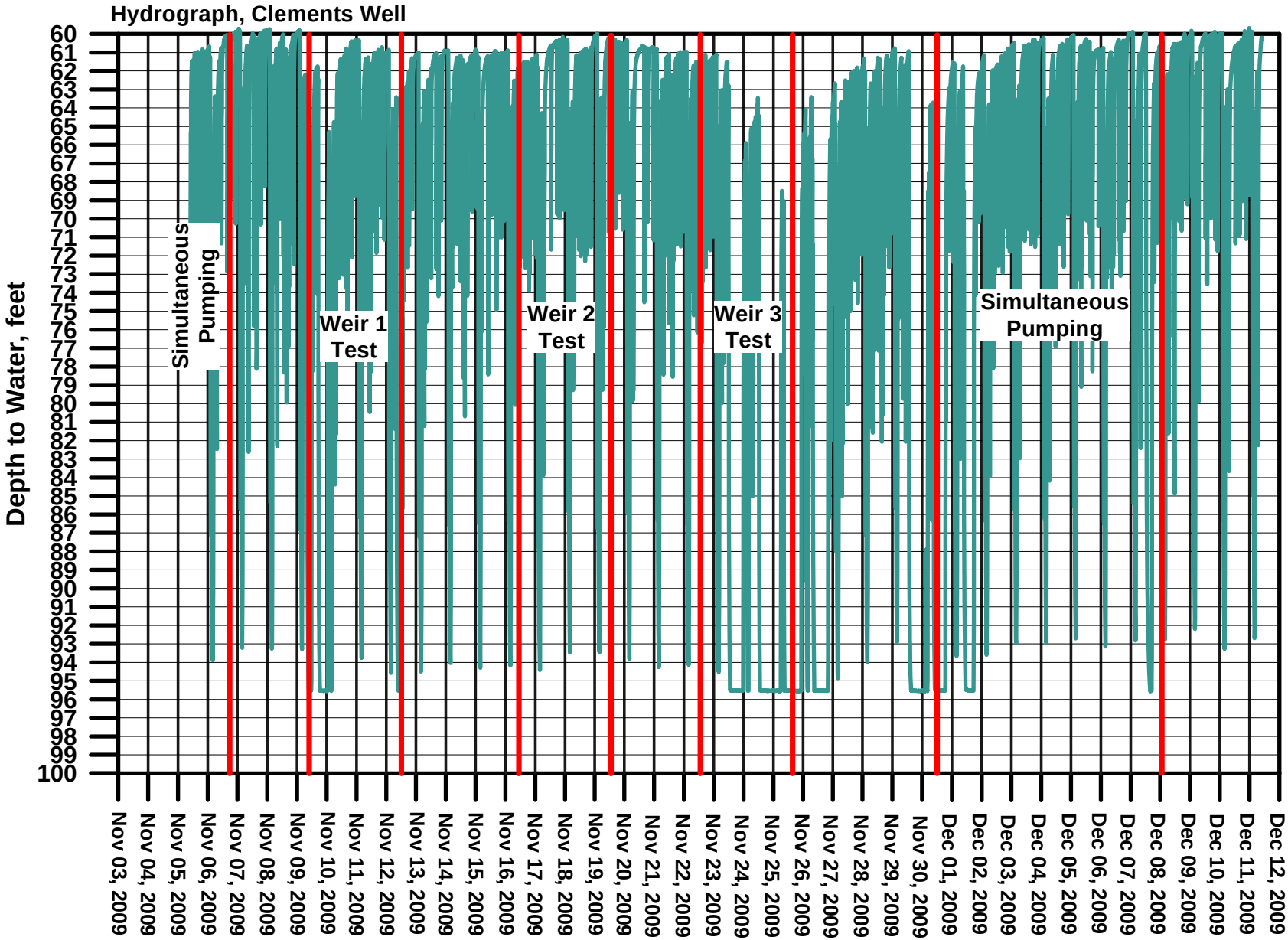
Hydrograph, Clements Well
Depth to Water, feet
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
Simultaneous Pumping
Weir 1 Test
Weir 2 Test
Weir 3 Test
Simultaneous Pumping
Nov 03, 2009
Nov 04, 2009
Nov 05, 2009
Nov 06, 2009
Nov 07, 2009
Nov 08, 2009
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Nov 11, 2009
Nov 12, 2009
Nov 13, 2009
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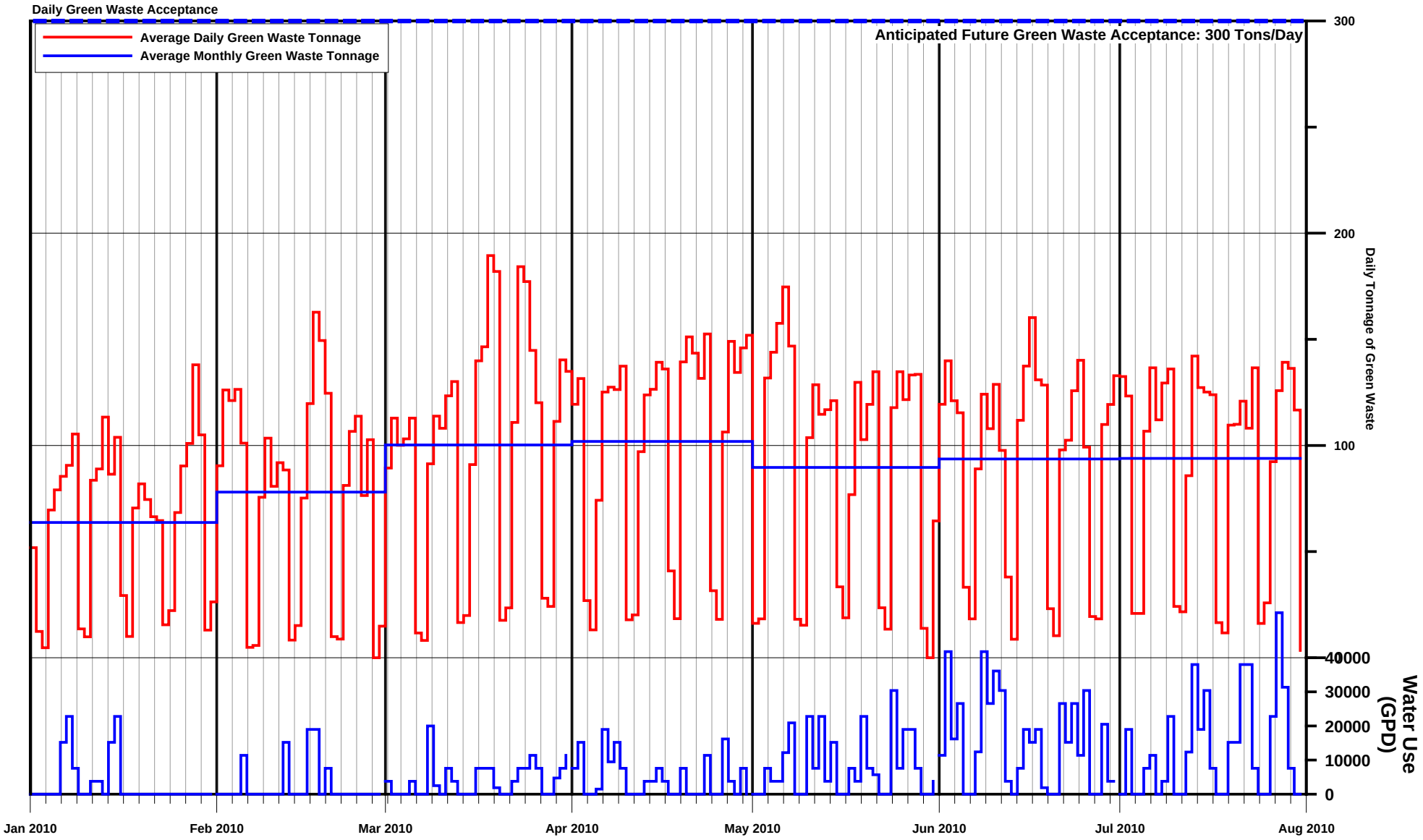
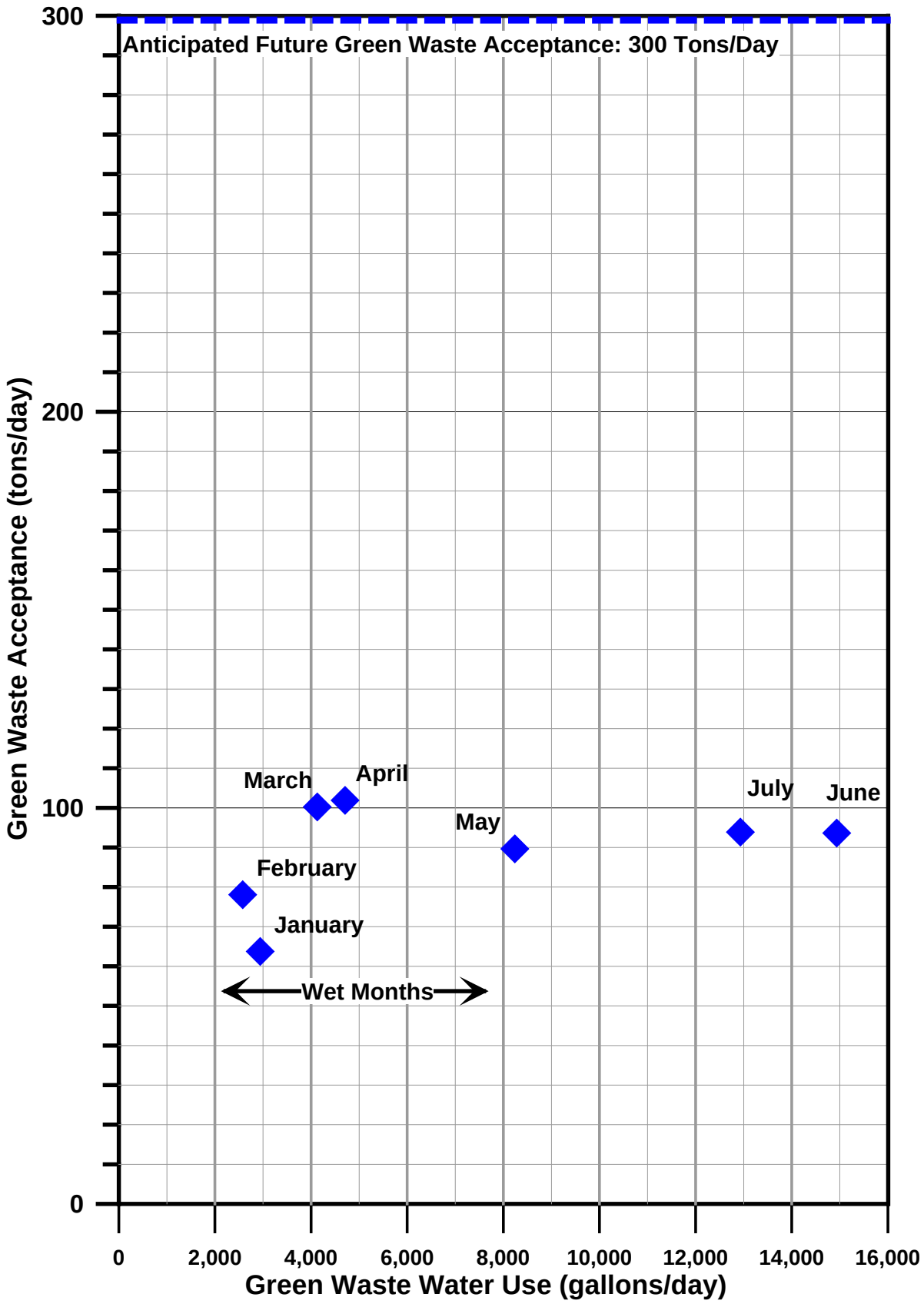
Dec 12, 2009

APPENDIX E
GREEN WASTE DATA

Cold Canyon Landfill Green Waste and Water Use
January to July 2010

Month	Green Waste Tons/Day	Compost Water Use Gallons/Day
January 2010	64	2,942
February 2010	78	2,579
March 2010	100	4,127
April 2010	102	4,707
May 2010	90	8,239
June 2010	94	14,937
July 2010	94	12,932


Daily Green Waste Acceptance
Average Daily Green Waste Tonnage
Average Monthly Green Waste Tonnage
Anticipated Future Green Waste Acceptance: 300 Tons/Day
300
200
100
0
Daily Tonnage of Green Waste
40000
30000
20000
10000
0
Water Use (GPD)
Jan 2010
Feb 2010
Mar 2010
Apr 2010
May 2010
Jun 2010
Jul 2010
Aug 2010


Anticipated Future Green Waste Acceptance: 300 Tons/Day
300
200
100
0
Green Waste Acceptance (tons/day)
March
April
May
July
June
February
January
Wet Months
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
16,000
Green Waste Water Use (gallons/day)