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September 26, 2013

Mr. Jose L. Angel,
Assistant Executive Officer
Water Quality Control Board
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 1000
Palm Desert, CA 92260

RE: Request for Technical Information dated June 27, 2013
National Beef, Brawley, California

Dear Mr. Angel,

National Beef Company received an Order for Technical Information dated June 27, 2013 from the RWQCB. The order specified additional information is required to determine the potential threat to groundwater quality from three wastewater pre-treatment ponds. The additional information required characterization of the liquid in each of the ponds, characterization of the soils and groundwater in the vicinity of the ponds, and determination of the groundwater flow gradient.

National Beef directed HR Green, Inc. consultants to develop a work plan to address the requested information. The work plan, including the installation of groundwater monitoring wells and analysis of groundwater quality, was developed and presented as a draft to RWQCB in a meeting on July 11, 2013, which was also attended by National Beef, the City of Brawley, and HR Green. The final work plan, dated July 12, 2013, incorporated the points covered in the July 11 meeting and points raised in the July 12 letter correspondence from RWQCB.

Subsequently, the groundwater study was completed in accordance with the approved work plan. This report presents the methods and procedures, the supporting data, and a discussion of findings of the groundwater study.

If you have any questions, please contact Andrew Marsh at (319) 841-4393, or me at (319) 841-4383.

Sincerely,
HR Green, Inc.

Greg Brennan

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8710 Earhart Lane SW, Cedar Rapids, IA 52404

GROUNDWATER STUDY
WASTEWATER PRE-TREATMENT SYSTEM

NATIONAL BEEF
BRAWLEY, CALIFORNIA

September 26, 2013

OWNERSHIP OF DOCUMENTS

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EXECUTIVE SUMMARY

National Beef operates an on-site wastewater pre-treatment system at its Brawley, California facility. On June 28, 2011 National Beef submitted a Report of Waste Discharge (ROWD) to the Colorado River Basin Regional Water Quality Control Board (RWQCB) to establish Waste Discharge Requirements for the ponds that are part of the pre-treatment system. On June 27, 2013 in connection with the ROWD, the RWQCB issued an Order for Technical Information for the purpose of determining the potential threat to groundwater quality from the three ponds in the wastewater pre-treatment facility. On July 12, 2013, Landmark Consultants provided the RWQCB the work plan for the investigations necessary to provide the requested technical information. This report provides the results of implementation of the work plan.

The technical information gathered demonstrates that:

(1) Water is moving through the pond bottoms at a low rate of approximately 0.0012% per day of the total pond volume or approximately 59 gallons per acre per day;
(2) The water moving through the pond bottoms is causing a localized groundwater mounding effect and associated localized influence on the regional groundwater flow in the area immediate to the ponds; and
(3) Water seeping from the ponds does not appear to be impacting groundwater quality as evidenced by analyses of the pond water, monitoring wells adjacent to the ponds, and background groundwater analyses.

Key aspects of the above demonstrations are summarized below.

A. HYDROLOGIC IMPACT

Water in the wastewater pre-treatment ponds is moving through native pond bottom materials to groundwater as evidenced by hydrologic observations.

The groundwater flow pattern beneath the plant site is shaped both by the regional flow and localized impact from the three wastewater pre-treatment ponds. Water from the pre-treatment ponds is causing groundwater mounding in low permeability sediments in the vicinity of the ponds. This is evidenced by the water table contours and a measured downward (recharge) hydraulic gradient. The downward gradient is 0.35, which is 23 times greater than the horizontal gradient.

B. GROUNDWATER QUALITY IMPACT

Water moving through the ponds does not appear to be a source for groundwater quality degradation. This conclusion is based on a comparison of pond water quality data to groundwater quality data from 12 groundwater monitoring wells arrayed around the perimeter of the ponds.

I. INTRODUCTION

The focus of this report is a *groundwater study* conducted at National Beef's processing facility located at 57 E Shank Road in Brawley, California. The facility is situated on an approximate 80 acre property in the Northwest Quarter of Section 27 in Township 13 South, Range 14 East (Latitude 32º 59' 40", Longitude -115º 31' 10").

National Beef operates an on-site wastewater pre-treatment system that discharges to the City of Brawley's sewer system. The system consists of, among other elements, an anaerobic lagoon (Pond #1), an aerobic lagoon (Pond #2), and a polishing pond (Pond #3).

On June 28, 2011 National Beef submitted a Report of Waste Discharge (ROWD) to the Colorado River Basin Regional Water Quality Control Board (RWQCB) to establish Waste Discharge Requirements for the ponds that are part of the pre-treatment system. National Beef Company received an Order for Technical Information dated June 27, 2013 from the RWQCB. The order specified additional information is required to determine the potential threat to groundwater quality from the three ponds. In general, the additional information required the characterization of the liquid in each of the ponds, characterization of the soils and groundwater in the vicinity of the ponds, and determination of the groundwater flow gradient.

A work plan for the installation of groundwater monitoring wells and analysis of groundwater was developed using information from previous geotechnical work at the site (Landmark, 2012). A draft work plan was presented in a meeting on July 11, 2013 attended by RWQCB and the City of Brawley. The final work plan, dated July 12, 2013, incorporated the points covered in the July 11 meeting and the July 12 letter correspondence from RWQCB.

Subsequently, a groundwater study was completed which included a background literature search, on site and of site drilling and groundwater monitoring well installation, soil sampling and testing, and groundwater quality testing. Landmark Consultants, Inc. (hereafter Landmark) of El Centro, California coordinated the field activities for this project.

This report presents the field methods and procedures, regional and local conditions, and a discussion of findings.

II. FIELD METHODS

This section summarizes the methods used in the study. Figure II-1 is a site map showing the locations of the monitoring wells (Appendix A). Table II-1 provides a summary of the monitoring well information (Appendix B). The boring/well construction logs and soils permeability and grain size test results are included for reference (Appendix C). The water quality analytical reports are included for reference (Appendix D). Additional details about methods and procedures employed and documentation can be found in the full report by Landmark (Appendix E).

A. DRILLING, SOIL SAMPLING, AND WELL INSTALLATION

Landmark coordinated the drilling and installation of 14 monitoring wells on July 15-16, 2013. A professional geologist from Landmark observed and logged the drilling and soil sampling operations.

The drilling contractor was 2R Drilling (C57 License No. 709029). Borings were advanced to depths of 20 to 55 feet below existing ground surface using a truck-mounted, CME 75 drill rig using 8-inch diameter, hollow-stem, continuous-flight augers.

Soils were visually classified during drilling according to the Unified Soil Classification System. Samples were collected within 3 feet of the pond bottom elevation or, as warranted, slightly deeper from a zone of coarser grained composition. Samples were submitted to Keantan Laboratories of Diamond Bar, California for permeability and grain size distribution testing. Soil samples were retrieved using a 3-inch OD Modified California Split-Barrel (ring) sampler. In addition, Standard Penetration Tests (SPT) were performed in accordance with ASTM D1586.

Monitoring wells were constructed with 10-foot long, 2-inch diameter PVC well screen (0.010-inch slot screen size) set at the bottom of the boring and solid PVC riser pipe from the top of the screen to the ground surface. The annular space around the well was filled with clean filter pack sand from the bottom to 2-3 feet above the well screen and then a bentonite grout seal/backfill was placed from the top of the filter pack to the ground surface. The wells were completed with a ground mounted steel manhole and concrete apron. Wells were developed with a well development tool and purged of groundwater. Development continued until the purged groundwater appeared relatively clear, or the wells were purged dry. Monitoring wells MW-9 and MW-11 required multiple purge events to obtain clear water due to high silt content.

After well installation, the top casing elevation of each well was surveyed for lateral and vertical control. Vertical control was to the 0.01 foot.

The encountered stratigraphy will be discussed in further detail later in this report but is generally summarized as follows:

- 0 to 20 feet: silty clay
- 20 to 25 feet: sandy clayey silt
- 25 to 47 feet: silty clay
- 47 to 55+ feet: sandy silt to silty sand

B. GROUNDWATER STABILIZATION

Several water level measurement (±0.01 foot) events tracked groundwater recovery to stabilization, including July 22, 25, and 31 and August 12, and 19, 2013. Stabilization occurred during the period of July 25-31. The August 19 measurements were used to generate the water table map discussed herein.

C. GROUNDWATER AND POND SAMPLING

Prior to groundwater sampling, the depth to water was measured to 0.01 foot using an electronic water level sensor. Groundwater samples obtained from the wells were collected using disposable bailers. During sampling, groundwater was monitored for pH, temperature, specific conductivity, and turbidity.

The initial sampling event for the ponds and several monitoring wells was performed on July 25, 2013 and the remaining monitoring wells were sampled on July 30, 2013. Pond #1 was resampled on August 15, 2013 at the request of National Beef due to an anomalous pH value during the initial sampling event.

The groundwater samples were transported by Landmark personnel the same day to Enviro-Chem, Inc. in Pomona, California for analysis under chain-of-custody protocol. Environ-Chem is accredited by the State Health Department in California. The full laboratory reports with analytical results and quality control/quality assurance (QA/QC) results are included herein (Appendix D). The QA/QC program completed for this monitoring event included duplicate samples, trip blanks, field blanks, and laboratory method blanks. QA/QC test samples accompanied the primary sample submittals to the laboratory.

Water samples were also collected from the three (3) ponds comprising the wastewater pre-treatment system. Pond #1 (anaerobic) is covered and Ponds #2 and #3 are uncovered. The water from Pond #1 was collected from a valve in the piping extending from Pond #1 to the DAF unit. The water samples from Ponds #2 and #3 were collected at edge of the water using a bailer.

III. SITE CONDITIONS

The following summarizes the regional and local conditions determined through the study.

A. REGION

The City of Brawley is located in the central portion of the Imperial Valley in southeast California. Topographically, this area is broad and flat with an average land-surface gradient sloping north-northwest at about 1.7 feet per mile. This area lies within an ancient lake depression with surface elevation below mean sea level. Brawley spans an elevation range of about -100 to -135 feet, AMSL. The west edge of the city is defined by the incised New River channel, where elevation falls to about -160 feet, AMSL. The Salton Sea, which is located about 13 miles northwest of Brawley, occupies the lowest elevation in the valley at about -275 feet, AMSL.

The Salton Sea is the main surface water feature in the Imperial Valley. This water body is actually a 52 foot deep (maximum) lake covering an area of about 525 square miles and a total volume of about 7,500,000 acre-feet. Other major hydrologic features include the New River and the Alamo River, which flow north to the Salton Sea.

In geologic history, the valley was an inland sea connected to the Pacific Ocean. The present-day valley is an extension of the Gulf of California which has been cut off from the Pacific Ocean by the delta deposits of the Colorado River where it enters the Gulf of California in Mexico. The valley fill deposit is more than 20,000 feet thick. At the surface, soils of the central valley area are derived from the ancient lakebed materials and are dominantly composed of clays and silts.

Precipitation is low with an average annual amount of 2.65 inches in the valley (NWS-NOAA, 2013). The roughly half million acres of agriculture in the central part of the valley is thus comprised of irrigated and drained cropland surrounded by natural desert. The irrigated portions, including the Brawley area, contain an extensive network of drainage canals and subsurface field tile drains. The tile drains were installed to prevent waterlogging and salt buildup in the clay rich soils. Tile drains are typically at a depth of 5 to 6 feet and carry subsurface water to sumps at the tail end of selected fields, or as discharge directly to drainage canals. The drainage canals receive both tail water and tile drainage. All drained water ultimately is discharged to the Salton Sea, either directly from drainage ditches or by way of the New and Alamo Rivers (Schroeder, 1993). The majority of the flow in the drain system, including the Brawley area, is agricultural runoff (Loeltz et al. 1975).

The physical groundwater basin is classified as the Imperial Valley Groundwater Basin and extends across the border into Baja California where it underlies a contiguous part of the Mexicali Valley (DWR, Bulletin 118, 2003). The groundwater basin is bounded on the east by the Sand Hills and on the west by the impermeable rocks of the Fish Creek and Coyote Mountains. To the north the basin is bounded by the Salton Sea. The Salton Sea is the discharge point for groundwater in the basin; that is, groundwater flow within the basin is generally toward the axis of the valley and then northwest toward the Salton Sea (Figure III-1).

Groundwater recharge within the basin is primarily from irrigation return. Recharge also occurs, to a lesser degree, via percolation of rainfall and surface water runoff, underflow into the basin, and seepage from drainage canals which traverse the valley. Groundwater levels within a majority of the basin have remained stable because of relatively constant recharge and an extensive network of subsurface drains (DWR, Bulletin 118, 2003).

The groundwater basin has three major hydrogeologic units as follows:

1. Regional upper aquifer: an upper unconfined aquifer consisting of coarser grained alluvial deposits (i.e., higher permeability water-bearing units). This aquifer is variable in thickness with an average value of 200 feet. This aquifer exhibits the following typical hydrologic properties: (1) transmissivity of 1,337 feet per day, (2) hydraulic conductivity of 13 feet per day, and (3) coefficient of storage of 0.01 (unitless) (GEI, 2012).

   In the central valley area this aquifer transitions to confined conditions where as much as 80 feet (0 to 80 feet deep) of fine-grained, low permeability ancient lake deposits overlie the aquifer (Montgomery Watson 1995).

2. Regional aquitard: a semi-permeable aquitard (i.e., a lower permeability water-limiting unit). The average thickness of this aquitard is 60 feet.

3. Regional lower aquifer: a lower semi-confined aquifer also consisting of coarser grained alluvial deposits (i.e., higher permeability water-bearing units). The average thickness of this lower aquifer is 380 feet.

In general, groundwater in the basin is unusable for domestic and irrigation purposes without treatment, a primary reason being total dissolved solids (TDS) values that typically exceed 2,000 mg/L.

In the central valley, where the low permeability ancient lakebed deposits are present, groundwater flow velocity is estimated to be about 10 feet per year using a regional gradient of 0.004, a hydraulic conductivity value of 0.5 foot per day, and an effective porosity of 8 percent (IID, 2009).

B. PROJECT SITE

The National Beef facility is in the northeast part of Brawley about ¾-mile east of the New River (see inset, Figure II-1). The surface elevation at the site varies approximately from -130 to -135 feet, AMSL, or 865 to 870 feet on the local Imperial Irrigation District Datum, where sea level elevation is set equal to 1000.00. Thus, subtract 1000 from the Imperial Irrigation District Datum to obtain true sea level. All site elevations presented from this point forward use the Imperial Irrigation District Datum in order to avoid use of negative elevations.

Adjacent to the east property boundary of the site are two north-south drainage features, including the concrete-lined Oakley Canal which brings fresh water from the Colorado River into the area, and the unlined McNeale Drain irrigation drainage ditch. The bottom of the concrete Oakley Canal is measured at 3 feet deep (865 feet). The bottom of the McNeale Drain is measured at 8.3 feet deep (860 feet). Field tile drains from the east can be seen to outfall in the drainage ditch.

B.1 Wastewater Pre-Treatment System

The wastewater pre-treatment system consists of, among other elements, an anaerobic lagoon (Pond #1), an aerobic lagoon (Pond #2), and a polishing pond (Pond #3).

The approximate total volume of liquid in the three ponds is 26.5 million gallons (MG) distributed as 9.5 MG in Pond #1, 4.3 MG in Pond #2, and 12.7 MG in Pond #3. All volume estimates are based on National Beef drawings where the depth, dimensions, and slopes of Pond #2 are extrapolated to the other ponds. For this study, the water line elevation in the ponds is 868 feet, which is the midpoint of the typical 867-869 foot range. The ponds bottom elevations are a typical 856 feet.

B.2 Geology

The shallow subsurface stratigraphy was anticipated by reviewing five 50-foot deep logs of previously completed electronic cone penetrometer tests (CPT) conducted at the National Beef facility in 2012 by Landmark Consultants, Inc. (Landmark, 2012). Two of these, CPT-1 and CPT-5, were in relative close proximity to the ponds and were used to target well depths and soil and groundwater sample intervals. The CPT logs are included herein for reference (Appendix C) and shown on Figure II-1.

Two soils units are mapped by the Natural Resources Conservation Services (NRCS), including (1) Imperial-Glenbar silty clay loams, wet, 0 to 2 percent slopes, and (2) Imperial silty clay, wet (NRCS, 2013). The Imperial-Glenbar covers all but the extreme southeast corner of Pond #1. The soil series map and reports are included in Appendix C for reference.

The boring logs and soil samples confirm the site is underlain by low permeability deposits that exhibit near-surface variation in permeability (Table III-1). More specifically:

- The average depth of the samples was 15.6 feet (854.2 feet) for the silty clay material and 17.3 feet (851.7 feet) for the sandy clayey silt material.

- The lab permeability results indicate an average value of 1.8E-07 centimeters per second for silty clay (CL) and 2.2E-07 cm/sec for sandy clayey silt (ML).

- The sieve/hydrometer results show that all well locations have fine particles as their dominant portion, with silt-sized particles (<0.075 mm, or <200 sieve size) on average comprising >96% of each sample; and with clay-sized particles (<0.053 mm) comprising on average >77% of each sample of silty clay (CL) and >47% of each sample of sandy clayey silt (ML).

- Additional characteristics such as dry density, moisture content, and total porosity are provided on Table III-1.

Shallow geology consists of a surficial confining material composed of silty clay over a zone of sandy clayey silt. The conceptual hydrogeologic model is that of an upper confined to semi-confined alluvial aquifer. The project site is depicted in geologic section in Figure III-2 and the geologic sequence is generally described as:

- 0 to 20 feet: very stiff silty clay (CL) – surficial confining unit
- 20 to 25 feet: medium dense sandy clayey silt (ML) – local upper aquifer
- 25 to 47 feet: very stiff silty clay (CL) – local confining unit
- 47 to 55+ feet: sandy silt to silty sand (ML) – local deeper aquifer

B.3 Groundwater Flow and Gradient

Review of Figure III-2 and Figure III-3 indicates that plant site area groundwater flow is toward the north-northwest across the plant site with a horizontal groundwater gradient of 0.0036. This gradient is consistent with the regional horizontal gradient value of 0.004 cited above.

The elevation of the groundwater table beneath the plant site is estimated at 851 feet. This elevation is increased in the immediate area of the ponds by the mounding effect from pond seepage.

The groundwater flow pattern around the ponds is thus shaped both by the regional flow direction and by seepage from the three ponds (Figure III-3). Based on review of groundwater contours, the lateral influence of pond seepage extends outward approximately 400 feet toward the south (i.e., the regional upgradient direction) and 600 feet toward the north (i.e., the regional downgradient direction).

Vertical flow is characterized by hydraulic gradient and a unit-area flow rate. The hydraulic gradient represents the relative magnitude and direction of vertical groundwater movement. The unit-area flow rate is an expression of the quantity of flow per unit time per unit area, which can be either a discharge component or a recharge component depending on the direction of the hydraulic gradient. These are evaluated using site data below.

Evaluation of the flow gradients under the influence of water moving through the bottom of the ponds is as follows:

- Vertical gradient: beneath and directly adjacent to the ponds a downward (recharge) gradient dominates. The water levels in MW7S and MW7D are used to calculate a vertical gradient of 0.35.

- Horizontal gradient: further away from the ponds and still under the influence of ponds seepage the horizontal gradient is estimated using contour lines at 0.015.

- The vertical to horizontal ratio (0.35/0.015) is 23 meaning the dominant movement of water that has seeped from the ponds beneath and in close vicinity to the ponds is downward (recharge component).

Using the downward vertical gradient of 0.35 allows an estimate of the vertical unit-area flow rate (Table III-2):

- The unit-area flow rate is estimated at 5.52E-05 cubic meters per day per square meter. The pond bottom area of 21,980 square meters (5.43 acres) is then used to estimate a total seepage rate of about 1.21 cubic meters per day (320 gallons per day) over the entire pond bottom area; or 59 gallons per acre per day. This represents about 0.0012% per day of the total 26.5 million gallons of water in the ponds.

C. WATER QUALITY

National Beef provided a comprehensive chemical inventory of all chemicals that have a connection or pathway to the wastewater pre-treatment system. Most commercial chemicals listed in the inventory cannot be analyzed directly by the laboratory so associated MSDS sheets were used to develop a comprehensive list of indicator parameters (i.e., disassociated elements) that will manifest in water and provide a basis for evaluating whether groundwater impact is present. Also included were the CAM 17 metals and volatile organic compounds, which were not anticipated to be significant but included as part of the comprehensive assessment of quality. The analytical data demonstrates that water leaving the pond bottoms has not impacted groundwater.

Table III-3 gives a summary of analytical results and the following is a brief interpretation of findings. The laboratory analytical reports are included in Appendix D for reference.

C.1 Potential Source Evaluation

Parameters expected to be present in the pre-treatment system are labeled as *wastewater parameters* on Table III-3. As expected BOD, fecal coliforms, TPH, oil and grease, phosphorus, ammonia-N are in higher concentration in Pond #1 relative to downstream Ponds #2 and #3. Comparison of the parameters and parameter concentrations in the ponds to the groundwater monitoring wells and to background groundwater points shows no evidence of groundwater quality degradation due to pond seepage.

Parameters that are considered to be more *general indicators*, as disassociated elements, include fluoride, sulfate, TDS, chloride, calcium, sodium, and potassium. All of these, with the exception of potassium are in lower concentrations in the pre-treatment ponds than in groundwater that is outside the area of pond influence. Potassium levels in pre-treatment pond water are comparable in concentration to that in groundwater outside the area of pond influence.

Metal detections in the pre-treatment ponds were limited in relation to groundwater. Of those that were detected the concentrations of copper and lead are comparable to concentrations in groundwater that is outside the area of pond influence. Barium and zinc are slightly elevated in the ponds relative to groundwater. Overall, metals do not appear to be impacting groundwater.

Only one volatile organic compound was detected in analyses of pre-treatment pond water (acetone in Pond #1 at a low concentration) indicating that volatile organic compounds are not a source issue.

C.2 Background (Ambient) Groundwater Quality Comparison

Originally, monitoring wells MW1 and MW2 were sited with the intention that they would be upgradient from the ponds and representative of background groundwater quality. The results of groundwater flow investigation demonstrate that under natural hydrologic conditions these two wells would be upgradient. However, due to the influence of groundwater mounding in the area of the pre-treatment ponds the wells actually are downgradient of the ponds and thus were not used to establish background groundwater quality.

Background groundwater quality was established using study wells MW12 and MW13. These wells were drilled off site on an irrigated crop field east of the wastewater pre-treatment system (Figure III-3). Hydrologically, these wells are near the outer influence of mounding and marginally side-gradient of Pond #1. The monitored interval in each well is deeper than the bottoms of the drainage ditch and irrigation canal that separate the wells from Pond #1. Thus, groundwater quality data from these wells provides a reasonable depiction of background quality in an irrigated crop land area. The suitability of MW12 and MW13 to establish groundwater quality background is based on two pivotal factors:

- First, there is no apparent pre-treatment pond water quality impact at these wells based on a comparison of pond water quality with the water quality of MW12 and MW13, particularly noting the wastewater parameters at Pond #1 which is closest to MW12 and MW13.

- Second, the quality of MW12 and MW13 groundwater appears comparable to the other monitoring wells, which are downgradient of the ponds. There is no indication that background groundwater quality is substantially different than that observed in the other monitoring wells.

An extensive search for additional background groundwater quality data resulted in the identification of three other possible comparison points, which are summarized as follows.

- A USGS report (Schroeder, 1993) contains chemical data associated with irrigation drainage in the Salton Sea area. One of the monitoring points in that report is S-154 located 8.1 miles south of the plant site (see inset Figure II-1). This point is considered useful for background groundwater quality comparison because (1) the well is upgradient according to regional groundwater flow (see Figure III-1), (2) the monitored depth and lithology are similar (i.e., 23 to 28 feet deep across very fine sand, clay and silt at S-154 versus 15 to 25 feet deep across silty clay/sandy silt at the facility), and (3) the monitored quality is considered indicative of irrigated cropland which is similar to the land use in the vicinity of the plant.

  The quality data from S-154 is included in Table III-3 and Appendix D for comparison. This background quality is similar to that observed in MW12 and MW13. In fact, calcium, sodium, and chloride concentrations at S-154 are slightly elevated relative to the project site.

- Brawley Solid Waste Site (Landfill)

  This site is located on the east bank of the New River about 0.8 miles west of the project site. Monitoring well B-WW-3/3R is 19 feet deep and the designated upgradient well in the detection monitoring program at the Brawley Solid Waste Disposal Landfill (see inset Figure II-1). A north-northwest groundwater flow direction and hydraulic gradient value of 0.004 were developed for the landfill site. This flow direction and gradient are consistent with those at the National Beef facility and with regional groundwater flow and gradient. A map and analytical summary are provided for reference (Appendix D).

Some evaluated parameters are common to both sites. Table III-3 gives a summary of the statistical mean values calculated over a sampling period of May 1989 through September 2012 (Geo-Logic Associates, 2012).

However, the validity of this well as a quality comparison point is suspect based on the following observations. Many of the general parameters and metals are elevated with respect to results at the project site. Several volatile organic compounds, including gasoline by-products, have had sufficient detections (not shown on Table III-3) to support statistical analysis. This well should not be considered a strong indicator of background conditions for water comparison purposes.

- USGS well

A well identified as a USGS water supply well was located using the water board's Geotracker interactive mapping service. The well is 152 feet deep and presumed completed in the Regional Upper Aquifer. RWQCB was not able to locate the investigative report so the exact location, well construction details, and sampling interval are not known. After consultation with Liann Chavez, P.G. at RWQCB this well should not be considered further for water quality comparison purposes.

- Analytical Profile of the Soil

Landmark provided an analytical report of metals for soil at a location about 10 miles north of the project site (Appendix D). This data simply indicates that native soil may be a possible source for the low concentrations of metals detected at the project site.

The exact location of this sample is not disclosed because it is a confidential client. What is known about the sample location is that it is similar to the project site in that it was obtained from the shallow subsurface in the central portion of the Imperial Valley. Results indicate that metals are prevalent in soil, including arsenic, barium, beryllium, chromium, copper, lead, nickel vanadium, and zinc. Metals in soil are susceptible to leaching to groundwater but no direct correlation is possible.

IV. CONCLUSIONS

No contaminated groundwater conditions were encountered in the investigations. The investigations demonstrate that the pre-treatment ponds at the National Beef plant site are not adversely impacting groundwater quality.

V. REFERENCES CITED

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