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GREATROCK NORTH WATER AND SANITATION DISTRICT
ENGINEER'S REPORT
AUGUST 24, 2015

Concentrate Management Options

As noted at the April 2015 Board meeting, we have shifted our attention from concentrate disposal to concentrate management and are looking at several options. The GridBee mixing equipment to enhance evaporation has been tabled due to questionable case history and additional cost considerations. The beneficial reuse applications by Industrial Water Permitting and Recycling have been placed on hold in light of limited use of any State approvals. In August of 2015, the Board and Altela, Inc. executed a Letter of Intent for establishing a Charter Customer Relationship with respect to the site development, installation, and related systems integration of an AltelaRain Reserve Osmosis Wastewater Concentrator Asset Recovery Facility.

On August 12, 2015, representatives of Altela observed the Box Elder Creek Ranch WTP and adjacent property (Lot 30) for the purpose of developing a conceptual rendering of the facilities required for the proposed facility. In an August 24, 2015 e-mail, Steve Griggs, of Altela, advised the District the rending would be distributed on August 25.

Matt Bruff, of Altela, has provided a copy of Altela's 2008 General Permit for Minimal Industrial Discharge associated with the Altela Piceance Natural Gas Water Treatment project in Garfield County, Colorado. A copy of the permit (COG-601008) is attached to this report. The permit was terminated by the Water Quality Control Division on January 1, 2014.

As for the evaporation ponds, attached is a memo from Lauren Goecke summarizing the evaporation pond activity, including a graph of documented pond levels in 2014 and 2015.

Greatrock North Pump Station Improvements

I have contracted with a new structural engineer who is working through the structural design issues and have received information from Wayne Cass on the proposed distribution pumps, motors, and drives.

Other Activities

Water Quality and Hardness – TZA is tracking the water production data and water quality results from a series of sampling events. Attached is a memo from Lauren Goecke summarizing the water production data, water quality results, and water treatment plant observations.

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Reverse Osmosis Condition Assessment – Pure Water Solutions conducted a condition assessment on May 27, 2015 and presented its findings and recommendations to the District on June 12. Those recommendations were discussed at the July Board meeting and my recommendation was that we delay any action on their recommendations pending receipt of additional information from Pure Water Solutions. In response to my request for additional information, Pure Water Solutions indicated the following:

- The sensors are the windows into the system and the replacements are a suggestion. However, maintaining the sensor calibrations helps document the overall RO unit operation.
- They do not have confidence in the current anti-scale chemical and dosing system.
- New membranes will make all the difference in the world.
- Accurate process readings, along with correct chemical and dosing, will helps improve on over-all recovery, but the exact percentages are to-be-determined.
- Lead times on membranes vary from in-stock to 8-10 weeks.

Storage Tank Rule – The Water Quality Control Division has adopted a new version of the Colorado Primary Drinking Water Regulations (Regulation 11). Effective April 1, 2016, the District will be required to have a written plan for finished water storage tank inspections. In addition to quarterly periodic (visual) inspections, the District will need comprehensive inspections to be scheduled at least every five years. Jeff Rabas has been securing proposals for the comprehensive inspections.

New Chlorine Residual Requirements – The Water Quality Control Division has adopted a new version of the Colorado Primary Drinking Water Regulations (Regulation 11). Effective April 1, 2016, the District will be required to maintain a minimum of 0.20 milligrams per liter chlorine residual throughout the distribution system. Ramey Environmental Compliance will record chlorine residuals at the extents of the distribution system for each subdivision on a periodic basis throughout 2015.

Warranty Inspections – Ramey Environmental Compliance is tracking the 11-month warranty inspections for the following projects:

- Rocking Horse Farms Pump Station – The warranty inspection was conducted by Jeff Rabas on July 18, 2014.
- Box Elder Creek Ranch Pump Station – The warranty inspection was conducted by Brad Simons on January 26, 2015.
- Rocking Horse Farms Tank Repainting – The improvements were inspected and accepted on June 11, 2014. A preliminary warranty inspection was conducted by Ramey Environmental Compliance on April 24, 2015 and Coblaco addressed some minor surface rust and some isolated coating repairs on August 5, 2015.

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Utility Billings and Energy Costs – TZA is tracking the United Power utility bills and associated water operations on a monthly basis. Attached is a memo from Lauren Goecke summarizing the monthly comparisons for July each year, as well as a summary of the seven-month periods for 2014 and 2015.

Curb Stop Box Specification – The recent issues with curb stop boxes witnessed by Director Wyckoff resulted in a review of the District's Rules and Regulations and the boxes specified. TZA's previous recommendations for a screw-style Buffalo-style box having an arch pattern base and an inside diameter of 2.5 inches has been further reinforced with the recommendation the pending revisions to the Rules and Regulations specify a 6500 Series Screw Type curb box, as manufactured by Castings, Inc. (970-243-3032), having a minimum internal diameter of 2.25 inches, or an approved equal. The part number is "C.I. 95-E" and includes a 30" top section and a 39" bottom section allowing for a bury depth of 41 inches to 64 inches. For deeper installations, Castings Inc. offers extensions in 9" (Item 151), 16" (Item 152), 28" (Item 153), and 30" (Item 154) heights.

Well, Pump, and Motor Replacements – The District has initiated efforts to better understand its well infrastructure and the potential need for replacement of pumps and motors, as well as the well structures themselves. As a part of that effort, TZA Water Engineers will need to work with Bishop-Brogden Associates to compile the historical aspects of the wells constructed, the pumps installed, and any other improvements (i.e. water level measuring devices) integrated at each site. This information will be used to evaluate the benefits of a pump, motor, and well maintenance program to detect changes in well performance. Early detection of deterioration in well performance will allow less expensive repairs, rehabilitation, or treatment procedures in order to maximize production capacity. This preventative maintenance program will be discussed with the District's Manager, and a formal proposal will be brought to the Board if deemed appropriate.

Control Valves Evaluation – During the 3rd Quarter Operational Review Meeting, conducted on August 17, 2015, it was determined the District should develop a control valve evaluation plan. As the Board may recall, the District contracted with iSiWest in 2014 (July 14-15 and September 19), to inspect and service five (5) control valves, including one (1) at the Box Elder Creek Ranch Pump Station, one (1) at Rocking Horse Farms Pump Station, and three (3) at the Greatrock North Pump Station. On March 6, 2015, the District contracted with Ramey Environmental Compliance's Equipment Services Division to service one (1) pressure relief valve at the Box Elder Creek Ranch Water Treatment Plant. Since the District has an assortment of valves in a variety of locations throughout the District, TZA and REC will update the valve inventory in the Allmax software and work with Lisa and the budget committee to prioritize the efforts for 2016 and beyond.

Colorado Discharge Permit System Regulations (Regulation No. 61)

CERTIFICATION

under

GENERAL PERMIT FOR MINIMIAL INDUSTRIAL DISCHARGE (SIC No: 1629)

Category 26, Subcategory 2, General Permits, Current fee $630/long term (CRS 25-8-502)

This certification specifically authorizes: Altela, Inc. and Laramie Energy to discharge as described below and in accordance with the general permit for Minimal Industrial Discharges.
All correspondence relative to this facility should reference the specific facility number, COG-601008.

Permittees
Altela, Inc.
5350 S. Roslyn Street
Englewood, CO 80111

Laramie Energy II, LLC
1512 Larimer Street, Suite 1000
Denver, CO 80202

Contacts
Matthew Bruff, Chief Development Officer, Altela, Inc.
Phone: 303-993-1950

Bob Hea, Vice President
Phone: 303-339-4000

Project Name, Activity and Location
Altela Piceance Natural Gas Water Treatment—The activity consists of treating groundwater from natural gas extraction activities. The treatment process involves heating the groundwater to form steam, and discharging the condensate. The evaporation treatment is designed to remove contaminants and essentially produce distilled water.

Since contaminants that do not evaporate are left behind in the concentrate water, this permit only covers discharges from the treated condensate.

The project is located at 2101 County Road 321 in Rifle (Garfield County), Colorado

Discharge Points
The discharge points (001A and 002A) are located at (001A) Latitude: 39° 30'54"N Longitude: -107° 48' 40" W and (003A) Latitude: 39° 30'22"N Longitude: -107° 48' 21" W. Periods of discharge will be higher during winter months, when re-use demand is low.

Discharge Point	*Description*	*Estimated Flow Rate*
001A	The thermal distillation condensate will flow to an unnamed draw to the Colorado River	Max. = 7 GPM
002A	The thermal distillation condensate will flow to an Helmer Gulch draw prior to reaching the Colorado River	Max. = 7 GPM

Effluent Limitations
The discharges are to Segment 04a of the Lower Colorado River Sub-basin, Lower Colorado River Basin, found in the Classifications and Numeric Standards for the Lower Colorado River Basin (Regulation No. 37 last update effective March 1, 2008). Segment 04a has been designated Reviewable, and is classified for the following beneficial uses: Aquatic Life, Class 2 (Cold); Recreation Class 2; Water Supply; and Agriculture.

Permit Limitations and Monitoring Requirements

Parameter	Discharge Limitations Maximum Concentrations			2-Yr Avg	Monitoring Frequency	Sample Type
	30-Day Average	7-Day Average	Daily Max.			
Flow, MGD	Report	NA	Report	NA	Monthly	Instantaneous or Continuous
Total Suspended Solids, mg/l	30	45	NA	NA	Monthly	Grab
Oil and Grease, mg/l	NA	NA	10*	NA	Monthly	Visual*
pH, s.u. (Minimum-Maximum)	NA	NA	6.5-9.0	NA	Monthly	In-situ
Site-Specific						
Whole Effluent Toxicity, Chronic	Stat Diff and IC25 ≥ IWC			NA	Quarterly	3 Grab/Test
Naphthalene, ug/l	140	NA	2,300	21	Monthly	Grab
Total Dissolved Solids mg/l	Report	NA	Report	NA	Monthly	Grab
Temperature, ° C	20°	NA	NA	NA	Monthly	Instantaneous or Continuous

** There shall be no visible sheen. If a visual sheen is detected, a grab sample must be collected*

Other Conditions

Because the Material Safety Data Sheets (MSDS) sheets for chemicals that Laramie Energy utilizes in production activities do not contain comprehensive studies or specific named chemicals, the WQCD is requiring an annual analysis for the volatiles, base/neutrals, acids, and metals found in Appendix A of the Minimal Industrial General Permit Application, and an analysis for the Hazardous Substances found in Appendix B of the application. This screen shall be conducted after use of the chemicals disclosed in the application, and submitted to the WQCD within 7 days of receiving laboratory results. The first analysis must be conducted prior to October 1, 2008, assuming gas production activities are underway.

Antidegradation – As set out in The Basic Standards and Methodologies of Surface Water, Section 31.8(3)(c)(ii)(C), an antidegradation analysis is required for all waters not designated as Use Protected, except in cases where the regulated activity will result in only temporary or short term changes in water quality, or where the ratio of the low flow to the facility flow is 100:1 or more. These discharges are not temporary or short-term, and to not fall under the flow exemption, thus, these discharges are not exempted from an antidegradation review.

Under this certification, an antidegradation (AD) limit will be calculated as 15% of the chronic Water Quality Standard for naphthalene. An individual permit will be required where the permittee requests consideration of dilution and ambient water quality.

Antidegradation limits apply as the average of all data collected for months in that group during a rolling 24-month period. These limits become effective after data has been collected for all months in the group during the 24 months following permit issuance, and the limit will become effective in the 24th month in which the permit is effective.

Rationale for Site-Specific Parameters

Temperature
Since the treatment process involves adding a significant amount of heat to the water. Heat is a pollutant of concern for this discharge.

Chemicals

Laramie Energy will be using LOSURF-300 SURFACTANT in the production process. According to the MSDS sheet, this formula contains naphthalene. Thus, naphthalene has been added to the permit limitations.

Altela and Laramie Energy have also disclosed several additional chemicals (fracturing agents, etc) which will be used during periods of gas production, and may be introduced to the groundwater. Many of these chemicals do not have toxicology data available. Thus, Whole Effluent Toxicity (WET) testing has been added to this certification.

Whole Effluent Toxicity (WET) Testing

Purpose of WET Testing – The Water Quality Control Division has established the use of WET testing as a method for identifying and controlling toxic discharges from wastewater treatment facilities. WET testing is being utilized as a means to ensure that there are no discharges of pollutants "in amounts, concentrations or combinations which are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life" as required by Section 31.11 (1) of the Basic Standards and Methodologies for Surface Waters.

a. Testing and Reporting Requirements

Tests shall be done at the frequency listed above. Test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the reporting period during which the sample was taken. (i.e., WET testing results for the first calendar quarter ending March 31 shall be reported with the DMR due April 28.) The results shall be submitted on the Chronic Toxicity Test report form, available from the Division. Copies of these reports are to be submitted to both the Division and EPA along with the DMR.

The permittee shall conduct each chronic WET test in general accordance with methods described in Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-89/001 or the most current edition, except as modified by the most current Division guidance document entitled Guidelines for Conducting Whole Effluent Toxicity Tests. The permittee shall conduct such tests using Ceriodaphnia dubia and fathead minnows.

b. Failure of Test and Division Notification

A chronic WET test is failed whenever 1) there is a statistically significant difference in lethality between the control and any effluent concentration less than or equal to the instream waste concentration ("IWC") and, 2) the IC_{25}, which represents an estimate of the effluent concentration at which 25% of the test organisms demonstrate inhibition as reflected by lethality, is at any effluent concentration less than or equal to the IWC. The IWC for this permit has been determined to be **100%**. The permittee must provide written notification of the failure of a WET test to the Division, along with a statement as to whether a Preliminary Toxicity Investigation ("PTI")/Toxicity Identification Evaluation ("TIE") or accelerated testing is being performed (see Part d.). **Notification must be received by the Division within 21 calendar days of the demonstration of chronic WET in the routine required test.** "Demonstration" for the purposes of Parts .b., c., d. and f. means no later than the last day of the laboratory test.

c. Automatic Compliance Schedule Upon Failure of Test

If a routine chronic WET test is failed, the following automatic compliance schedule shall apply. As part of this, the permittee shall either:

i. Proceed to conduct the PTI/TIE investigation as described in Part d, or

ii. Conduct accelerated testing using the single species found to be more sensitive.

If accelerated testing is being performed, the permittee shall provide written notification of the results within 14 calendar days of completion of the "Pattern of Toxicity"/"No Toxicity" demonstration. Testing will be at least once every two weeks for up to five tests until; 1) two

consecutive tests fail or three of five tests fail, in which case a pattern of toxicity has been demonstrated or 2) two consecutive tests pass or three of five tests pass, in which case no pattern of toxicity has been found. If no pattern of toxicity is found the toxicity episode is considered to be ended and routine testing is to resume. If a pattern of toxicity is found, a PTI/TIE investigation is to be performed. If a pattern of toxicity is not demonstrated but a significant level of erratic toxicity is found, the Division may require an increased frequency of routine monitoring or some other modified approach.

d. PTI/TIE

The results of the PTI/TIE investigation are to be received by the Division within 120 days of the demonstration of chronic WET in the routine test, as defined above, or if accelerated testing is performed, the date the pattern of toxicity is demonstrated. A status report is to be provided to the Division at the 30, 60 and 90 day points of the PTI/TIE investigation. The Division may extend the time frame for investigation where reasonable justification exists. A request for an extension must be made in writing and received prior to the 120 day deadline. Such request must include a justification and supporting data for such an extension.

The permittee may use the time for investigation to conduct a PTI or move directly into the TIE. A PTI consists of a brief search for possible sources of WET, which might reveal causes of such toxicity and appropriate corrective actions more simply and cost effectively than a formal TIE. If the PTI allows resolution of the WET incident, the TIE need not necessarily be conducted. If, however, WET is not identified or resolved during the PTI, the TIE must be conducted within the allowed 120 day time frame.

Any permittee that is required to conduct a PTI/TIE investigation shall do so in conformance with procedures identified in the following documents, or as subsequently updated: 1) Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I, EPA/600/6-91/005F May 92, 2) Methods for Aquatic Toxicity Identification Evaluations, Phase I Toxicity Characterization Procedures, EPA/600/6-91/003 Feb. 91 and 3) Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures, EPA/600/3-88/035 Feb. 1989.

A fourth document in this series is Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures, EPA/600/3-88/036 Feb. 1989. As indicated by the title, this procedure is intended to confirm that the suspected toxicant is truly the toxicant. This investigation is optional.

Within 90 days of the determination of the toxicant or no later than 210 days after demonstration of toxicity, whichever is sooner, a control program is to be developed and received by the Division. The program shall set down a method and procedure for elimination of the toxicity to acceptable levels.

e. Request For Relief

The permittee may request relief from further investigation and testing where the toxicant has not been determined and suitable treatment does not appear possible. In requesting such relief, the permittee shall submit material sufficient to establish the following:

i. It has complied with terms and conditions of the permit compliance schedule for the PTI/TIE investigation and other appropriate conditions as may have been required by the WQCD;

ii. During the period of the toxicity incident it has been in compliance with all other permit conditions, including, in the case of a POTW, pretreatment requirements;

iii. During the period of the toxicity incident it has properly maintained and operated all facilities and systems of treatment and control; and

iv. Despite the circumstances described in paragraphs (i) and (iii) above, the source and/or cause of toxicity could not be located or resolved.

If deemed appropriate by the Division, the permit or the compliance schedule may be modified to revise the ongoing monitoring and toxicity investigation requirements to avoid an unproductive expenditure of the permittee's resources, provided that the underlying obligation to eliminate any continuing exceedance of the toxicity limit shall remain.

f. Spontaneous Disappearance

If toxicity spontaneously disappears at any time after a test failure, the permittee shall notify the Division in writing within 14 days of a demonstration of disappearance of the toxicity. The Division may require the permittee to develop and submit additional information, which may include, but is not limited to, the results of additional testing. If no pattern of toxicity is identified or recurring toxicity is not identified, the toxicity incident response is considered closed and normal WET testing shall resume.

g. Toxicity Reopener

This permit may be reopened and modified (following proper administrative procedures) to include new compliance dates, additional or modified numerical permit limitations, a new or different compliance schedule, a change in the whole effluent toxicity testing protocol, or any other conditions related to the control of toxicants if one or more of the following events occur:

i. Toxicity has been demonstrated in the effluent and the permit does not contain a toxicity limitation.

ii. The PTI/TIE results indicate that the identified toxicant(s) represent pollutant(s) that may be controlled with specific numerical limits and the permit issuing authority agrees that the control of such toxicants through numerical limits is the most appropriate course of action.

iii. The PTI/TIE reveals other unique conditions or characteristics, which, in the opinion of the permit issuing authority, justify the incorporation of unanticipated special conditions in the permit.

WET test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the reporting period during which the sample was taken. (i.e., WET testing results for the first calendar quarter ending March 31 shall be reported with the DMR due April 28.) The results shall be submitted on the Chronic Toxicity Test report form, available from the Division. A copy of this report is to be submitted to both the Division along with the DMR.

Best Management Practices
The permittee shall implement and maintain the Best Management Practices (BMP) for the prevention of erosion and the control of solid and liquid pollutants due to the discharge. BMPs include various options, such as: modification of the pipe discharge structure to disperse flows; containment of water by hay bales or other comparable structures; the use of geocloth, filter fabric, or plastic sheeting for protection of containment structures; rip-rap; and/or any other approved methods.

The General Minimal Industrial Discharge Permit is attached. If the permittee has questions related to this certification, contact the permit writer.

Permit Writer
Erin Scott
303.692.3506
April 9, 2008

RATIONALE

MINIMAL DISCHARGE

GENERAL PERMIT IN COLORADO

COLORADO DISCHARGE PERMIT NUMBER COG-600000

The significant changes in this first renewal permit are as follows:

A. *Impacted Stream Segments: For this general permit, any existing or new operation that discharge to a segment that is listed on the Division's 303(d) list of impacted stream segments will be dealt with on a case-by-case basis. The 303(d) segments are segments that are impacted by metals and other pollutants.*

For most, if not all, of the operations that discharge under this permit, there are no monitoring data to verify the expectation that these discharges will not impair the listed segments. Therefore, for those facilities that discharge to segments on the 303(d) list, the permittees will be required to perform a one-time analysis for the listed parameters of concern to confirm that these stream standards are not exceeded in the discharge concentrations.

Because the receiving waters are included on the state's 303(d) list, total maximum daily loads (TMDLs) are being developed in accordance with the Division's schedule for TMDL completion. Once a TMDL has been established, if it is necessary to incorporate limitations for a facility certified under this general permit which are based upon the outcomes of the TMDL or the results of the one-time analysis, an individual permit may be written to regulate discharges from this facility. The facility would continue to be covered under this general permit certification until the individual permit was issued.

B. *Regulation Numbering System: The Colorado Water Quality Control Commission has recently changed the regulation numeration to "achieve a more logical organization and numbering of the regulations, and to make the initial numbering system and that of the Code of Regulations consistent." The changes are reflected in the permit.*

C. *Discharge Monitoring Reports (DMR): It is no longer necessary to send duplicate copies of Discharge Monitoring Reports (DMR) to the Environmental Protection Agency, Region 8. Hence, US EPA, Region 8 has been removed from Part I.D.1. of the general permit.*

D. *Whole Effluent Technology (WET) testing requirements were changed to allow for flexibility of determining monitoring frequency of test based upon the toxicological history of the discharge, see Part I.B.2.l.*

E. *The Division saw the need to provide variance in effluent parameters and monitoring frequencies on a site-specific basis. Currently, these parameters and monitoring frequencies apply routinely for certifications issued under this permit. However, there are certain situations where the Division has determined that there is a justifiable basis to modify the permit requirements for one or more parameters for certain outfalls, but the permit does not provide for such situations. This permit will allow for modifications with proper documentation. The categories to which this permit covered were removed from the permit so that coverage would be determined on a case-by-case basis. The ability to characterize the type of discharge and the magnitude of contamination is necessary to determine the parameter(s) requiring monitoring. The parameters identified, their numeric concentrations, and monitoring frequencies will be determined on a site-specific basis and will be indicated in the certification. The following are categories that include parameters and monitoring frequencies that may be included in the certification specifically tailored to the nature of the discharge.*

a. *Facilities discharging wastewater from washing the exteriors of trucks, cars, airplanes, boats (in dry dock), driveways, parking lots, and roads shall comply with the following limitations unless the Division imposes additional monitoring. See the facility certification for a complete list of parameters and limitations.*

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily Max		
Flow, gpm	Report	NA	Report	Weekly	Instantaneous
Total Suspended Solids, mg/L	30	45	NA	Monthly	Grab
Total BTEX, mg/L	NA	NA	0.1	Monthly	Grab
pH, s.u.	NA	NA	6.5-9.0	Weekly	In-situ
Oil and Grease, mg/L	NA	NA	10	Weekly	Visual.

b. *Facilities discharging wastewater from the washing of bleachers, elevated seating, and grandstands, such as those found at outdoor sporting or entertainment events shall comply with the following limitations unless the Division imposes additional monitoring. See the facility certification for a complete list of parameters and limitations.*

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily Max		
Flow, gpm	Report	NA	Report	Twice per Discharge	Instantaneous
Total Suspended Solids, mg/L	30	45	NA		Grab
Biological Oxygen Demand, mg/L	30	45	Report		Grab
pH, s.u.	NA	NA	6.5-9.0		In-situ
Fecal coliform Bacteria, #/100 ml	NA	NA	**		Grab
E. Coli, #/100 ml	NA	NA	Report		Grab
Oil and Grease, mg/L	NA	NA	10		Visual.

c. *Facilities discharging wastewater from the draining, cleaning, and filter backwash of swimming pools, spas, hot tubs, and similar structures including water slides, and water theme amusements shall comply with the following limitations unless additional monitoring is imposed by the Division. See the facility certification for a complete list of parameters and limitations.*

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily Max		
Flow, gpm	Report	NA	Report	Twice per Discharge	Instantaneous
Total Suspended Solids, mg/L	30	45	NA		Grab
Total Residual Chlorine, mg/L	**	NA	**		Grab
Bromine, mg/L	**	NA	**		Grab
Fecal coliform Bacteria, #/100 ml	NA	NA	**		Grab
pH, s.u.	NA	NA	6.5-9.0		In-situ
Oil and Grease, mg/L	NA	NA	10		Visual

d. *Facilities discharging wastewater from the washing of temporary stables, traveling petting zoos, emergency discharge from unpermitted domestic wastewater treatment facilities that may involve the dewatering of lagoons or any other facility that discharges wash water associated with human/animal wastes, shall comply with the following limitations unless the Division imposes additional monitoring. See the facility certification for a complete list of parameters and limitations.*

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily Max		
Flow, gpm	Report	NA	Report	Twice per Discharge	Instantaneous
Total Suspended Solids, mg/L	30	45	NA		Grab
Biological Oxygen Demand, mg/L	30	45	NA		Grab
Fecal coliform Bacteria, #/100 ml	NA	NA	**		Grab
Nitrate-Nitrogen, mg/L	Report	NA	Report		
pH, s.u.	NA	NA	6.5-9.0		In-situ
Oil and Grease, mg/L	NA	NA	10		Visual

e. *Facilities discharging wastewater groundwater from foundation, basement, underground structure dewatering, or during well water pump tests shall comply with the following limitations unless additional monitoring is imposed by the Division. See the facility certification for a complete list of parameters and limitations.*

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily max		
Flow, gpm	Report	NA	Report	Twice per Discharge	Instantaneous
Total Suspended Solids, mg/L	30	45	NA		Grab
pH, s.u.	NA	NA	6.5-9.0		In-situ
Oil and Grease, mg/L	NA	NA	10		Visual

f. *Facilities discharging non-contact cooling or heating water shall comply with the following limitations unless the Division imposes additional monitoring. See the facility certification for a complete list of parameters and limitations.*

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily max		
Flow, gpm	Report	NA	Report	Weekly	Instantaneous
Total Suspended Solids, mg/L	30	45	NA	Monthly	Grab
Temperature, °C	NA	NA	*	Weekly	In-situ
Total Residual Chlorine, mg/L	**	NA	**	Weekly	Grab
pH, s.u.	NA	NA	6.5-9.0	Weekly	In-situ
Oil and Grease, mg/L	NA	NA	10	Weekly	Visual
***Class 1 Cold**	**Class 1 Warm**			**Class 2 Cold and Warm**	
Maximum 20°C	Maximum 30°C			Monitor	

g. *Facilities discharging hydrostatic test water from the testing of new or used pipes, tanks, or other similar vessels shall comply with the following limitations unless the Division imposes additional monitoring. See the facility certification for a complete list of parameters and limitations.*

(1) New Pipes, tanks, or other similar vessels shall use the following limitations:

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily max		
Flow, gpm	Report	NA	Report	Twice per Discharge	Instantaneous
Total Suspended Solids, mg/L	30	45	NA		Grab
Total Recoverable Iron, mg/L	Report	NA	Report		Grab
Total Residual Chlorine, mg/L	**	NA	**		Grab
pH, s.u.	NA	NA	6.5-9.0		In-situ
Oil and Grease, mg/L	NA	NA	10		Visual

(2) Used Pipes, tanks, or other similar vessels shall use the following limitations:

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily max		
Flow, gpm	Report	NA	Report	Twice per Discharge	Instantaneous
Total Suspended Solids, mg/L	30	45	NA		Grab
Total Recoverable Iron, mg/L	Report	NA	Report		Grab
Chemical Oxygen Demand, mg/L	Report	NA	Report		Grab
Total Residual Chlorine, mg/L	**	NA	**		Grab
Total BTEX, mg/L	NA	NA	0.1		Grab
Benzene, mg/L	0.001	NA	Report		Grab
pH, s.u.	NA	NA	6.5-9.0		In-situ
Oil and Grease, mg/L	NA	NA	10		Visual

h. *Discharges from facilities that employ the super chlorination (50-500 mg/L) of potable water lines for the disinfection of these lines in a routine or planned situation and wish to discharge the effluent shall comply with the following limitations unless the Division imposes additional monitoring. See the facility certification for a complete list of parameters and limitations.*

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily max		
Flow, gpm	Report	NA	Report	Twice per Discharge	Instantaneous
pH, s.u.	NA	NA	6.5-9.0		In-situ
Oil and Grease, mg/L	NA	NA	10		Visual.
Total Residual Chlorine, mg/L	**	NA	**		Grab

i. *Facilities discharging wastewaters other than the types listed above when negligible pollution concerns are present shall comply with the following limitations unless the Division imposes additional monitoring. See the facility certification for a complete list of parameters and limitations.*

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily max		
Flow, gpm	Report	NA	Report	Twice per Discharge	Instantaneous
Total Suspended Solids, mg/L	30	45	NA		Grab
Oil and Grease, mg/L	NA	NA	10		Visual.
Turbidity	NA	NA	Report		Visual

j. *Facilities discharging wastewater from the washing of root crops such as potatoes, onions, sugar beets, or other fruit/vegetable agricultural produce or any other facility that discharges wash water associated with vegetative wastes shall comply with the following limitations unless the Division imposes additional monitoring. See the facility certification for a complete list of parameters and limitations.*

Effluent Parameter	Discharge Limitations			Frequency	Sample Type
	30 Day Ave.	7 Day Ave	Daily Max		
Flow, gpm	Report	NA	Report	Weekly	Instantaneous
Total Suspended Solids, mg/L	30	45	NA	Monthly	Grab
Biological Oxygen Demand, mg/L	30	45	Report	Monthly	Grab
pH, s.u.	NA	NA	6.5-9.0	Weekly	In-situ
Fecal coliform Bacteria, #/100 ml	NA	NA	**	Weekly	Grab
Oil and Grease, mg/L	NA	NA	10	Weekly	Visual

** See Part I.B.2. of the permit.

Christopher L. Gates
March 07, 2001

Comments made by City and County of Denver, Department of Environmental Health, Environmental Health Division: (Note: "EPD" refers to this department making the following comments).

Rational Minimal Discharge General Permit In Colorado

Page 2

E.

b. *"Include discharges of wastewater from the washing of open area patios and malls, and under effluent parameters add Fecal coliform and E. coli bacteria. We believe that some elevated bacteria levels that EPD has seen through our monitoring program may be a result of the washing of open seating patio areas as a result of food stuffs and animal wastes. The timing of the peaks and ebbs as well as surveillance of the area has lead to this preliminary conclusion."*

The Division made the following changes: Fecal coliform and E. Coli were added to the list of parameters in part E. b. of the rationale.

d. *"Under effluent parameters, add nitrate. EPD's monitoring program indicates that temporary animal holding areas may be contributing to elevated nitrate loading at storm sewer outfalls.*

EPD believes our monitoring data is indicative of what could occur throughout the state."

The Division made the following changes: Nitrate-Nitrogen (NO_3) was added to list of parameters in Part E. d. of the rationale.

e. *"EPD does not believe that mobile washers should be permitted to directly discharge to state waters. Out of the 47 Minimal Discharge Certifications that EPD has received, twelve have been for mobile or "pressure washers." These certifications allow for discharge from "a variety of locations" that may be inclusive of the Denver Metro Area or the entire Front Range. EPD has also received various compliance notifications that the Water Quality Control Division (WQCD) has issued to a number of these permit holders ranging from delinquent DMRs (the most common) to an*

issued Notice of Violation. The broad scope of these certifications do not allow for regulatory oversight from the WQCD or any local health agency and the effectiveness of "self monitoring" is suspect.

EPD also recommends that the application for certification include a broader assessment of various environmental factors that could adversely impact groundwater discharges from foundation, basement, underground structure dewatering, or well water pump tests. In addition to the question concerning landfills we would recommend that entities be required to conduct the same "due diligence" review as necessary for a phase I environmental audit."

The Division made the following changes: The inclusion of "power washing" and operations related to it were taken out of the Part E. e. of the rationale.

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h. "EPD recommends the inclusion of fire department hose testing due to the area of high pressure associated with the testing of the equipment, as well as, the chlorine residual that may be present in the water."

The Division made the following comments: This area will be covered in another general permit, COG 380000, Treated Water Distribution Systems."

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j. "Under effluent parameters, add Fecal coliform bacteria. Since agricultural produce is grown in an environment that may utilize animal waste as a fertilizer, it would seem logical to include this for monitoring purposes."

The Division made the following changes: Fecal coliform was added to Part E. j. of the rationale.

CDPS General Permit
Minimal Discharge Under The Colorado Discharge Permit System

Page 3

"Coverage Under This Permit

1. Types of wastewater
a. include open area seating.
h. include fire department hose testing.

2. Criteria
a. include other sources of contamination.
b. clarify the distance of downstream drinking water intakes or fisheries."

The Division made the following changes and comments: Open area seating was added to Part I.A.1.a., of the permit. As stated before, the fire department hose testing (Part I A.1.h.) will be addressed in another general related to treated water distribution, so this item need not be addressed. The language was expanded to include other sources of contamination, and a clarification of a distance of 5 miles for any drinking water or fishery downstream (Part I.A.2.a. and b.).

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3. "Application
i. EPD recommends that the application include a "Proof of Authorization" from the owner of the system. The City and County of Denver prohibit some of the discharges listed under Types of wastewater, and believe that the application and permit should reflect county specific prohibitions."

The Division made the following changes and comments: Language was added to Part I.A.3.i. to include written permission of the authority who owns the storm sewer be provided in the case where the discharge may enter a storm sewer.

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B. "Terms and Conditions

1. General Limitations

b. include; or other material spilled to the ground.

c. The use of biodegradable chemicals elevates the BOD, which can then result in decreased dissolved oxygen levels in the receiving waters. EPD recommends that if the Division approves the use of chemicals, the certification reflect appropriate effluent and insteam monitoring requirements.

g. include portable toilet facilities.

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11. Removed Substances include "and applicable local regulations."

The Division made the following changes and comments: Language was added to Part I.B.1.b. to include "spilled material." In Part I.B.1.c., EPD wanted the approval of certain biodegradable chemicals used. This has always been a condition of the permit as to review Material Safety Data Sheets (MSDS) of chemicals used regardless of their biodegradability. Limits are applied for BOD_5 in the certification, and it is the responsibility of the permit holder to meet those limits. In Part I.B.1.g., portable toilet facilities was added to the paragraph. "Removed Substances" in Part II.A.11. had added language to include local agencies in the procedures for disposing of solids, sludges, and other pollutants.

Christopher L. Gates
March 8, 2001

TZA Water Engineers
a Lamp Rynearson Company

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MEMORANDUM

To: Lisa Johnson, District Manager

From: Lauren Goecke, EI

Date: August 24, 2015

Re: Greatrock North Water and Sanitation District – Concentrate Management

Project No.: 0414018.01-002

CC:

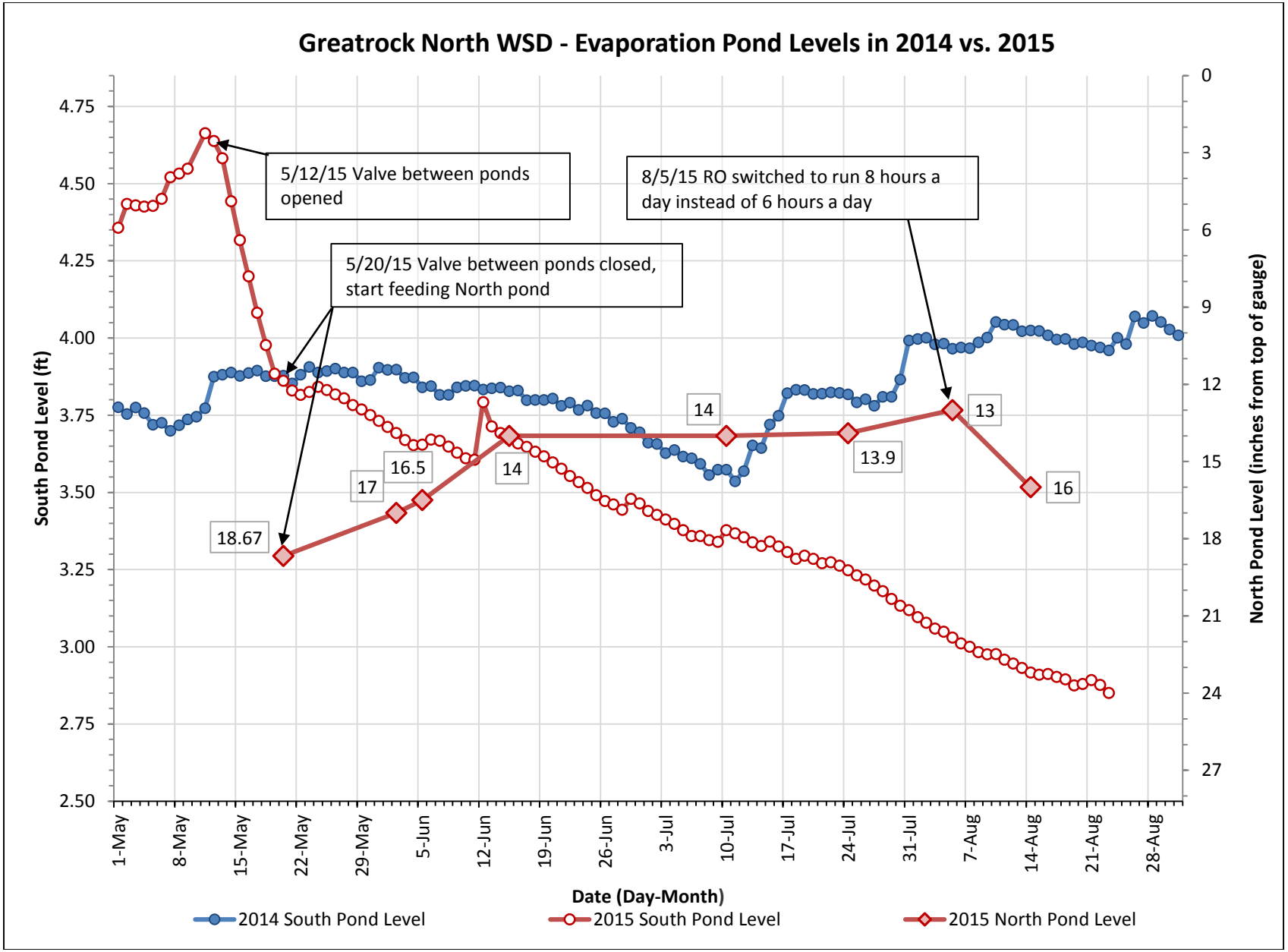
Evaporation Pond Summary: The south pond elevation was at 4.66 feet on May 11, 215 – an estimated 6 inches from overtopping the pond. The valve between the ponds was opened on May 12, 2015 to transfer water from the south pond to the north pond. The south pond was isolated on May 20, 2015 with a water elevation of 3.86 feet and the concentrate flows were directed to the north pond. The elevations in the south pond are tabulated below.

Date	Depth (feet, from daily SCADA report)
May 25, 2015	3.83
June 29, 2015	3.48
July 27, 2015	3.20
August 23, 2015	2.85

Jeff Rabas is providing the north pond elevations from visual observations of a temporary staff gauge:

Date	Measurement (inches, from top of gauge)
May 20, 2015	18”(+)
June 3, 2015	17”
June 8, 2015	16.5”
June 15, 2015	14”
July 10, 2015	14”
July 24, 2015	13.9”
August 5, 2015	13”
August 14, 2015	16”

The following graph shows a comparison of the south pond levels in 2014, the south pond levels in 2015, and the north pond levels in 2015.


Greatrock North WSD - Evaporation Pond Levels in 2014 vs. 2015
5/12/15 Valve between ponds opened
5/20/15 Valve between ponds closed, start feeding North pond
8/5/15 RO switched to run 8 hours a day instead of 6 hours a day
18.67
17
16.5
14
14
13.9
13
16
South Pond Level (ft)
North Pond Level (inches from top of gauge)
Date (Day-Month)
2014 South Pond Level
2015 South Pond Level
2015 North Pond Level

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MEMORANDUM

To: Greatrock North Water and Sanitation District

From: TZA Water Engineers

Date: August 24, 2015

Re: Water Quality and Hardness July Results

Water Quality and Hardness – Below are tables of water quality data from a series of sampling events:

Month	RO Permeate	Unfiltered UKA Water	Unfiltered ALV Wells
August (08/24/15)	10%	33%	57%
July (07/19/15)	17%	35%	48%
June (06/28/15)	23%	37%	40%
May (05/25/15)	39%	42%	19%
April (04/27/15)	37%	39%	24%
March (03/22/15)	41%	40%	19%

Total Dissolved Solids (TDS)			
Date	**BECR Tanks**	**RHF Tank**	**GN Tank**
August 2015	RESULTS PENDING		
07/10/15	417 mg/l	449 mg/l	468 mg/l
06/11/15	369 mg/l	350 mg/l	341 mg/l
05/11/15	401 mg/l	347 mg/l	366 mg/l
04/13/15	386 mg/l	326 mg/l	322 mg/l
March 2015	274 mg/l	324 mg/l	302 mg/l
02/02/15	350 mg/l	394 mg/l	383 mg/l
01/14/15	350 mg/l	394 mg/l	417 mg/l
12/03/14	417 mg/l	552 mg/l	511 mg/l
10/01/14	538 mg/l	603 mg/l	594 mg/l
07/11/14	565 mg/l	597 mg/l	599 mg/l
03/05/14	586 mg/l	543 mg/l	566 mg/l
01/08/14	553 mg/l	559 mg/l	575 mg/l
10/28/13	677 mg/l	643 mg/l	594 mg/l

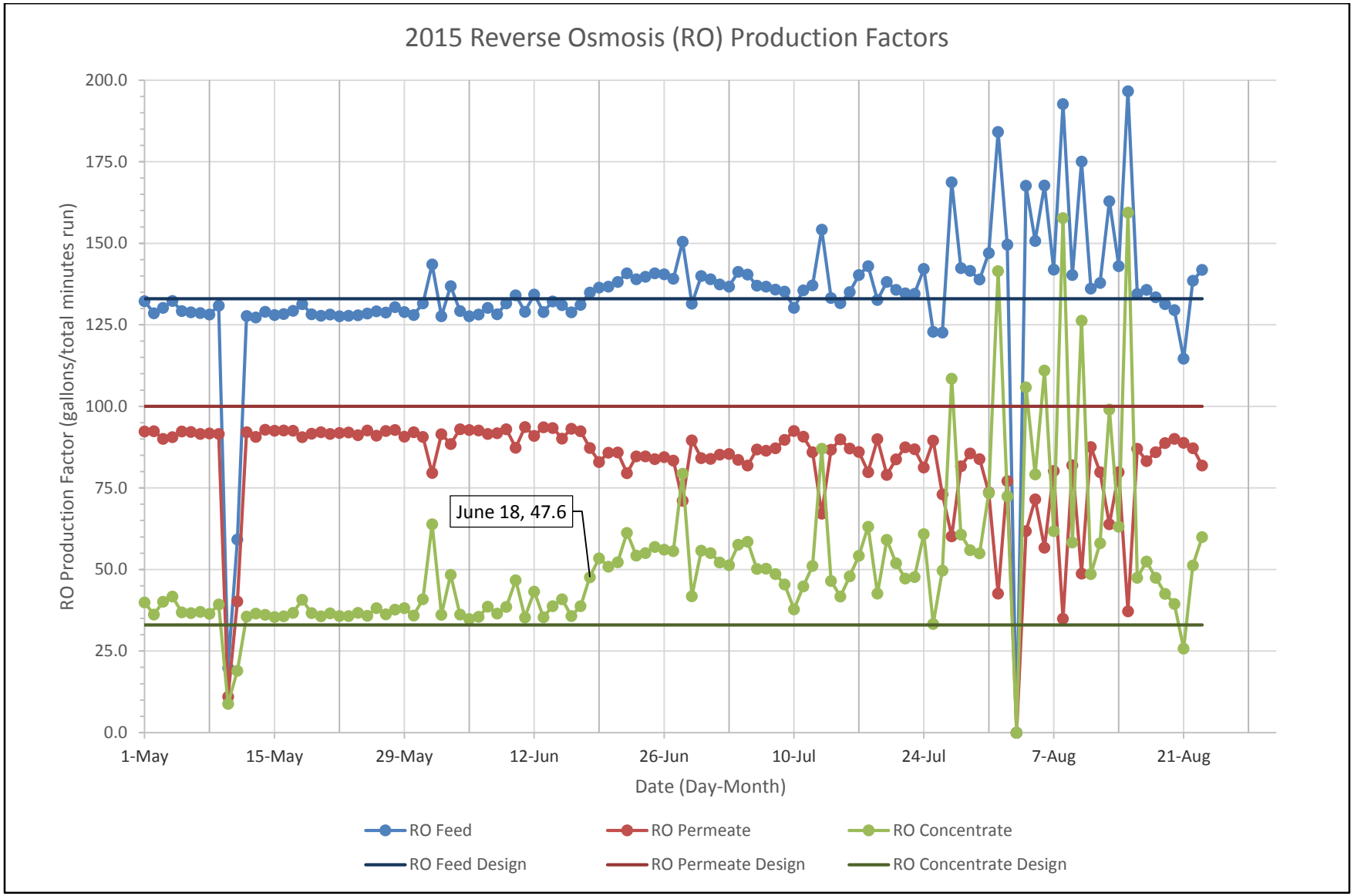
The total hardness results tabulated below reflect a moderately hard water:

Total Hardness (as CaCO3)			
Date	**BECR Tanks**	**RHF Tank**	**GN Tank**
August 2015	RESULTS PENDING		
07/10/15	136.2 mg/l	158.8 mg/l	156.5 mg/l
06/11/15	92.0 mg/l	78.0 mg/l	80.1 mg/l
05/11/15	84.8 mg/l	72.6 mg/l	73.9 mg/l
04/13/15	99.6 mg/l	67.7 mg/l	68.6 mg/l
March 2015	53.7 mg/l	68.3 mg/l	59.1 mg/l
02/02/15	83.4 mg/l	113.8 mg/l	104.6 mg/l
01/14/15	105.2 mg/l	123.0 mg/l	111.7 mg/l
12/03/14	115.3 mg/l	194.5 mg/l	169.8 mg/l
10/01/14	188.8 mg/l	231.7 mg/l	225.6 mg/l
07/11/14	221.5 mg/l	222.7 mg/l	220.4 mg/l
05/16/14	165.2 mg/l	209.6 mg/l	198.1 mg/l

For comparison, hardness values are generally classified as:

Classification	Mg/l
Soft	0 – 60
Moderately hard	61 – 120
Hard	121 – 180
Very hard	GTE 181

The RO production rates since June 18, 2015 have been very inconsistent with the design for the RO system. See the following figure for a graph of the RO feed, permeate, and concentrate so far this summer versus the design points of the system.


2015 Reverse Osmosis (RO) Production Factors
RO Production Factor (gallons/total minutes run)
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
1-May
15-May
29-May
12-Jun
26-Jun
10-Jul
24-Jul
7-Aug
21-Aug
Date (Day-Month)
June 18, 47.6
RO Feed
RO Permeate
RO Concentrate
RO Feed Design
RO Permeate Design
RO Concentrate Design

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MEMORANDUM

To: Lisa Johnson, District Manager

From: Lauren Goecke, EI

Date: August 21, 2015

Re: Greatrock North Water and Sanitation District – Utility Billings and Energy Costs

Project No.: 0414018.01-002

CC:

TZA is tracking the United Power utility bills and associated water operations on a monthly basis. Below are the monthly comparisons for July each year, as well as a summary of the seven-month periods for 2014 and 2015. The 2015 energy consumption for July is 70% of the 2014 energy consumption for the similar period. The 2015 billings for July are 68% of the 2014 billings for the similar period.

	July 2014 Billings				July 2015 Billings			
	On Peak	Off Peak	Total KWH	Billing	On Peak	Off Peak	Total KWH	Billing
Alluvial	5,348		5,348	$613.91	4,380		4,380	$505.68
BECR	4,440	18,840	23,280	$1,830.05	1,560	12,160	13,720	$980.53
GN	3,040	11,000	14,040	$1,159.21	1,920	8,800	10,720	$851.22
RHF	600	2,440	3,040	$258.40	800	2,560	3,360	$297.24
Totals			**45,708**	**$3,861.57**			**32,180**	**$2,634.67**

The 2015 year-to-date energy consumption is 91% of the 2014 energy consumption for the similar period. The 2015 year-to-date billings are 92% of the 2014 billings for the similar period despite the increase in the CTD2 rate from $0.049 per KWH to $0.05858 per KWH (20% increase).

	YTD 2014 Billings (7 months)				YTD 2015 Billings (7 months)			
	On Peak	Off Peak	Total KWH	Billing	On Peak	Off Peak	Total KWH	Billing
Alluvial	21,597		21,597	$2,526.54	19,684		19,684	$2,312.67
BECR	17,160	78,880	96,040	$7,204.04	16,120	80,960	97,080	$7,447.33
GN	9,840	38,760	48,600	$3,969.33	8,800	37,640	46,440	$3,819.53
RHF	8,880	22,760	31,640	$2,871.26	4,800	12,760	17,560	$1,651.14
Totals			**197,877**	**$16,571.17**			**180,764**	**$15,230.67**