TTG TST
CONSULTING ENGINEERS

GREATROCK NORTH WATER AND SANITATION DISTRICT
ENGINEER'S REPORT
August 25, 2014

Concentrate Disposal and Stream Reclassification

A recent water quality sample collected to assess the ability to discharge concentrate to Box Elder Creek has raised some questions about the reverse osmosis unit's performance. Attached are the water quality results from a concentrate sample collected on August 6, 2014.

Cla-Val Units at Pump Stations

iSiWest has executed the agreement to repair the three-inch (3") valve on Pump No. 1 at the Greatrock North Pump Station and is coordinating the service with Ramey Environmental Compliance for the week of September 15.

Fire Hydrant Maintenance and Repairs

One fire hydrant, a 1988 Waterous Hydrant in Greatrock North near 28925 East 160th Place, remains to be repaired. A proposal to replace the hydrant top has been received from Action Fire Hydrant Services LLC. The parts for the hydrant repair were ordered on or about August 19 and are expected to arrive within two to three weeks. The contractor will coordinate the work with Ramey Environmental Compliance.

Relocation of Water Meters in Rocking Horse Farms

Jeff Rabas is working with Redman Pothole Service on a cost to pothole a few lots within the subdivision. I have asked to be notified of the field work to observe the location of each curb stop in relation to the dry utilities within the easement. This is a 2015 budget discussion item.

Other Activities

Blending to Improve Water Quality: On November 11, 2013 TLECC modified the programming code to allow the RO run time to be operator defined. The timer now ranges from 0 to 1,440 minutes (24 hours) and is currently set at 360 minutes (6 hours). Ramey Environmental Compliance periodically samples for total dissolved solids at each tank site. Below are results:

	July 11, 2014	March 5, 2014	January 8, 2014	October 28, 2013
Box Elder Creek Ranch	565 mg/l TDS	586 mg/l TDS	553 mg/l TDS	677 mg/l TDS
Rocking Horse Farms	597 mg/l TDS	543 mg/l TDS	559 mg/l TDS	643 mg/l TDS
Greatrock North	599 mg/l TDS	566 mg/l TDS	575 mg/l TDS	594 mg/l TDS

Ramey Environmental Compliance has also begun monitoring the water hardness, as calcium carbonate, on a more regular basis. Below are results:

	July 11, 2014	May 16, 2014
Box Elder Creek Ranch	221.5 mg/l TDS	165.2 mg/l TDS
Rocking Horse Farms	222.7 mg/l TDS	209.6 mg/l TDS
Greatrock North	220.4 mg/l TDS	198.1 mg/l TDS

Utility Billings and Energy Costs: TST continues to track the United Power utility bills and associated water operations. Summary billing data is tabulated below.

	2012 YTD	2013 YTD	2014 YTD
Alluvial Wells	$4,542.11	$3,511.79	$2,526.54
RO WTP and BECR Pump Station	$19,177.60	$13,134.43	$7,204.04
GN Pump Station	$7,790.23	$4,787.72	$3,969.33
RHF Pump Station	$7,178.84	$6,542.43	$2,871.26
Totals	$38,688.78	$27,976.37	$16,571.17

Monthly Flow Reports: I occasionally monitor the daily SCADA reports for any anomalies, and will enhance the graphs to depict the daily water accounting as a part of this year's budget process. Based upon a year-to-date review, the magnetic flow meter for the Greatrock North Pump Station appears to be out of calibration.

Rocking Horse Farms Pump Station: Ramey Environmental Compliance conducted the 11-month warranty inspection on July 18, 2014. Representatives of the Water Technology Group addressed the warranty items and have been monitoring the station every 3 to 4 days since August 12 to record the motor hours to assure the pumps are alternating as intended.

Box Elder Creek Ranch Pump Station: Ramey Environmental Compliance will schedule the 11-month warranty inspection before March of 2015.

Rocking Horse Farms Tank Repainting: The improvements were inspected and accepted on June 11, 2014. I have asked Jeff Rabas to schedule the 11-month warranty inspection in advance of June 11, 2015.

Greatrock North Pump Station: Options to reconfigure the pump station and type of pumping equipment is a 2015 budget discussion item.

Fire Pumps: This is a 2015 budget discussion item based upon information previously provided.

District Lots and Utilities: I delivered maps to Jeff Rabas on August 13, 2014 to be posted at each pump station location for utility markings.

Upgrade to Reverse Osmosis (RO) Treatment Unit(s): Based upon recent research into concentrate management through additional treatment (i.e. concentrate the concentrate), I have been tasked with researching advancements in the RO technology to determine if more efficient units and/or membranes are available in today's market. Three manufacturers were contacted, and two of those expressed interest in working with the District. One company is evaluating retrofitting the existing system, as well as replacing it entirely.

Water System Interconnect between Rocking Horse Farms and Greatrock North Subdivisions: Based upon a recent inquiry regarding water system redundancy within these subdivisions, I have been tasked with researching the cost to interconnect the water distribution systems and evaluating each pump station's ability to deliver water to the other subdivision. This is a 2015 budget discussion item.

Colorado Analytical
LABORATORIES, INC.

Analytical Results

TASK NO: 140806074

Report To: Wayne Ramey
Company: Ramey Environmental Compliance, Inc.
P.O. Box 99
Firestone CO 80520

Bill To: Wayne Ramey
Company: Ramey Environmental Compliance, In
P.O. Box 99
Firestone CO 80520

Task No.: 140806074
Client PO:
Client Project: Greatrock North W&S District CO
0101063

Date Received: 8/6/14
Date Reported: 8/11/14
Matrix: Water - Ground

Customer Sample ID RO Concentrate
Sample Date/Time: 8/6/14 12:46 PM
Lab Number: 140806074-01

Test	Result	Method	PQL	Date Analyzed	Analyzed By
Chloride	**274.72 mg/L**	EPA 300.0	0.01	8/6/14	DJV
Fluoride	**1.51 mg/L**	EPA 300.0	0.09	8/6/14	DJV
Sulfate	**181.01 mg/L**	EPA 300.0	0.01	8/6/14	DJV
Total Alkalinity	**255.4 mg/L as CaCO3**	SM 2320-B	0.1	8/11/14	DJV
Total Dissolved Solids	**1038 mg/L**	SM 2540-C	5	8/8/14	ISG
Total					
Calcium	**207.5 mg/L**	SM 3111-B	0.1	8/8/14	TES
Iron	**0.011 mg/L**	SM 3111-B	0.005	8/8/14	TES
Magnesium	**35.9 mg/L**	SM 3111-B	0.05	8/8/14	TES
Sodium	**209.9 mg/L**	SM 3111-B	0.1	8/8/14	TES
Total Hardness	**665.8 mg/L as CaCO3**	SM 2340-B	0.1	8/8/14	TES

Abbreviations/ References:

PQL = Practical Quantification Limit
mg/L = Milligrams Per Liter or PPM
ug/L = Micrograms Per Liter or PPB
mpn/100 mls = Most Probable Number Index/ 100 mls
Date Analyzed = Date Test Completed
SM = "Standard Methods for the Examination of Water and Wastewater"; APHA; 19th Edition; 1995
EPA = "Methods of Chemical Analysis of Water and Wastes"; USEPA; EPA-600/4-79-020 Rev 3/83

DATA APPROVED FOR RELEASE BY

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Chain of Custody Form

Colorado Analytical LABORATORIES, INC.

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Brighton, CO 80601
Lakewood Lab
12860 W. Cedar Dr, Suite 100A
Lakewood CO 80228

Phone: 303-659-2313
Fax: 303-659-2315

www.coloradolab.com

Report To Information	Bill To Information (If different from report to)	Project Name
Company Name: Rec Inc	Company Name: Greatrock	RO concentrate
Contact Name: Jeff rabus	Contact Name:	
Address:	Address:	Task Number (Lab Use Only) 140806074 ARF
City State Zip	City State Zip	
Phone: Fax:	Phone: Fax:	
Email: jeff@recinc.net	Email:	Sample Disp. Date(LabUse Only)
Sampler Name: Nick Bruno	PO No.:	

Sample Matrix (Select One Only)

Waste Water ☐	Soil ☐	Plant Tissue ☐
Ground Water ☒	Sludge ☐	Other ☐
Surface Water ☐	Compost ☐	

Date	Time	Sample ID	No. of Containers	Grab or Composite (Check One Only)	Sodium	Calcium	Chloride	Sulfate	Alkalinity	TDS	Total Hardness ($CaCO_3$)	Fluoride	Magnesium	Iron
8-6-14	1246	RO concentrate	1	X	X	X	X	X	X	X	X	X		
"	"	"	1	X									X	X
			2											

Instructions: ph = 7.48 @ 16.7°

C/S Info: Deliver Via: hand

C/S Charge ☐

Seals Present Yes ☐ No ☒

Temp. 15.7 °C/Ice Y

Sample Pres. Yes ☒ No ☐

Relinquished:	Date/Time:	Received By:	Date/Time:	Relinquished By:	Date/Time:	Received By:	Date/Time:
Nick Bruno	8-6-14 1342	[signature]	8/6/14 1343				