

April 13th 2020

The month of march has been a trying time period for all of us.

Staff have been working on maintenance projects of equipment and buildings, along with maintenance and painting of the water treatment facility as well as filling pot holes.

I have directives in place to reduce the exposure of covid-19 to staff. They include utilizing all necessary PPE when entering lift stations, and disinfecting vehicles and work space after use, along with riding one employee per vehicle unless circumstances deem otherwise.

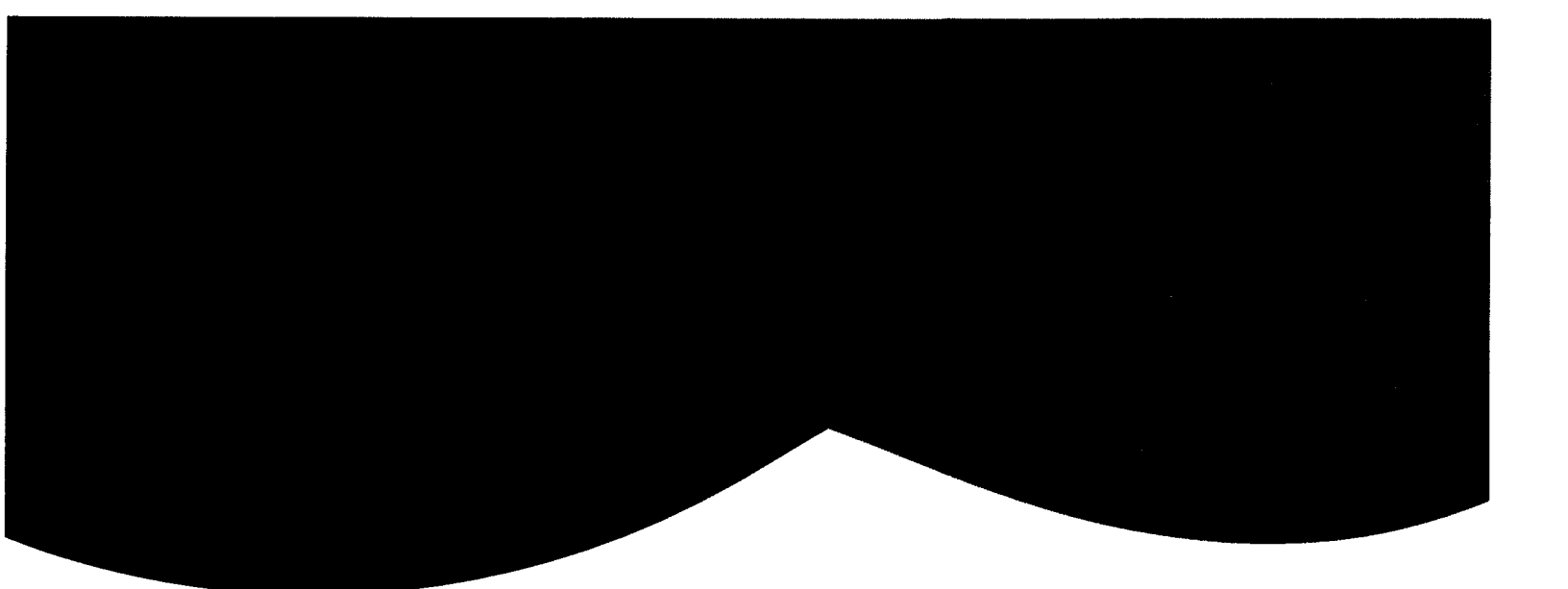
We have placed Covid-19 awareness signs around city parks, also have stung up caution tape. We have replaced the tape twice and they keep tearing it down. The signs are up and all we needed to do was make people aware.

On March 30th and 31st I met with John Thom, we took samples of our City Potable water supply to come up with a determination of what is happening with our system.

The storage tank is scheduled to be taken out of service for repairs on April 21st and is still on schedule.

Wednesday, April 1st I Received a call about the roof leaking at the old fire hall. I was out of the office, so I contacted my staff to go investigate. They informed me that there were a number of roof vents that apparently had been broken off by the contractor that was hired this spring to remove snow load from the building. The staff repaired and sealed up the areas in question. I had phone conversation with Briana and stopped to look at the building later in the day and also spoke with League of Minnesota Representative Chris Otto and made an appointment to meet the following day. I also spoke with Gene at serv pro to set up an appointment for him and his staff to look at the building.

As of Today April, 13th I received a call from serve pro who stated they had finished up with there removal and drying of the building. And I have received one quote for the roof repairs.



I have included Correspondence for Quotes skid steers as requested, along with the quote I received for repair of the old fire hall roof. I did get a response from a second contractor who stated they would be able to meet Friday April, 17th to look at the roof and supply a second quote.

Please review all attached Quotes and if there are any questions please give me a call.

I would like permission to get the remainder of the work done on the loader. MC coy has special labor pricing for the remainder of April and included is a quote for additional repairs.

I have had a conversation with Mr. Hagen. When Jim was Mayor Him and I drove around and looked at street lights he had suggested turning every other light off to save cost. Well in order to do that Minnesota would have to remove the entire pole and not just turn out the light.

He asked if we could remove the bulb from the pole in front of his house because it shines in their bedroom window. We did remove the bulb and when approached by residents in that area because of a rash of vehicle and garage burglaries. I spoke with council person Stish over the matter and he had stated if more then one resident was complaining of the light being out it needs to be re-energized so we lit it back up. I spoke with Minnesota Power who stated they had put in the lowest wattage bulb.

Mr. Hagen stated he would like to have something done with the light so it does not shine on his house if possible. Open to suggestions from the council.

I also have a verbal quote for Street Sweeping from Commercial asphalt. \$125.00 Per hour per piece of equipment. He states they use two brooms at a time first a mechanical broom followed by a Vacuum sweeper. The cost would be \$250.00 per hour for the initial round of sweeping.

Public Works Supervisor

Harry Bertram

Harry Bertram

From: Harry Bertram
Sent: Monday, April 06, 2020 2:02 PM
To: Daniel Mandich - City of Coleraine
Cc: Joseph Pollard - City of Coleraine; Ryan Stish; Jeff Troumbly; Thomas Sutherland - City of Coleraine
Subject: storage tank
Importance: High

Good morning,

I would like to update all of you on the status of our storage tank on Autumn Ln.

The tank is scheduled for repairs on April 21st with KLM engineering.

The process will take about a week. During the time needed for the repairs, we will be operating our water treatment plant on pressure.

There is also a shared cross connection located between the City of Coleraine and the City of Bovey.

If a situation should arise during the scheduled down time for the repairs, We would have the option to open the valve and be fed water by Bovey.

I have been in steady contact with the Minnesota Department of Health in regards to the Covid19 Pandemic.

There are municipalities in Minnesota who have suspended hydrant flushing along with tower repairs at this time.

In conversation with the State representative MDH for our area, he stated he does not recommend any work be done on the potable water supply at this time.

Although he stated this is only his recommendation, and there is Correspondence from the state prohibiting the necessary maintenance as of this time.

I have also been in contact with KLM engineering, they have said there are some municipalities that have cancelled and others have continued with necessary repairs.

The staff at KLM are highly trained, and feel the policies, procedures and precautions that they take will be more than sufficient.

I believe we should go forward with our scheduled repair date, but I would

like your thoughts, concerns and an Recommendation over this mater. If the council chooses to postpone all repairs at this time I Certainly will.

On a separate topic, I wanted to give you a update on our water treatment plant and potable water supply.

I have met with John Thom from SEH. We have tested the media in the filter bed, and have taken water samples and have tested the different areas

of distribution throughout the city. The media and filter bed checked out, he also took some samples beck to their lab for analysis.

I received a call from Mr. Thom wo stated several years ago that the chemical LPC 5 poly phosphate which is 100% poly was introduced into our water system to help with run times on the filter bed.

The poly phosphate works as a preventative coating so particles will not adhere to it, and out in the distribution we have iron ductile lines.

And particles from the pipes are causing the issues we are experiencing. He believes that we need to discontinue LPC 5 and start another chemical

With a blend of Ortho Phosphate which will let particles adhere to the pipes.

If we would proceed with a different chemical we should expect to see a change in water color possibly in early winter but it is going to take time.

I will update you to the findings of the sampling.

I would like to start hydrant flushing tomorrow March 7th to exhaust some of the rusty water from sitting all winter, but as I stated earlier it was not recommended by the state for different reasons, first you always run the risk of a water line ruptures while flushing and to get replacement parts along with contractors could be a issue.

Second Covid19 the unknowns.

But he stated it was not prohibited and is up to the city.

I would like a Recommendation from the council how you would like me to proceed at this time.

Thank you

Harry

Proposal



PO Box 480
212 SE 10th Street
Grand Rapids, MN 55744
Phone: (218) 326-9637
Fax: (218) 326-9638
Email: estimates@caspercon.com

Date: 4/13/2020

Proposal No.: 20016

To: City of Coleraine

Project Name: Trout Lake storm pond sediment removal

Below are the details of included items:

SCOPE OF WORK:

- Excavation of sediment at bottom of stormwater pond adjacent to Trout Lake.
- Pond size is approximately 80' x 40'
- It is assumed that there is approximately 4'-5' of sediment on the bottom of the pond to be removed.

BUDGETARY COST ESTIMATE ≈ \$8,500.00

HOURLY RATES:

- 350 Excavator w/operator - \$200.00/hour
- ASV w/operator - \$130.00/hour
- Foreman w/pickup - \$115.00/hour
- Laborer - \$74.00/hour
- Side dump truck w/driver - \$120.00/hour
- Quad axel dump truck w/driver - \$115.00/hour
- Lowboy tractor/trailer - \$150/hour

NOTES:

- Casper Construction is not responsible for damage or repair to unmarked private underground utilities.
- This quote is for budgetary purposes. The work will be billed out hourly with the rates listed above.
- Perimeter fence around storm pond will be salvaged by Casper for access to pond.
- Mobilization of equipment and swamp mats (if needed) are included in the budgetary estimate.
- This quote does not include removal or replacement of any concrete and/or bituminous roadways or sidewalks. If required, additional costs will apply.
- If floating silt curtain or any other erosion control items are required, additional costs will apply.
- Excavated material to be disposed of at City dump site

Tom Alverson

Senior Estimator / Project Manager

Proposal

Terms & Conditions

*** Payment Terms:** Full payment due within 20 days upon completion of work.

*Note: This proposal may be withdrawn by us if not accepted within 10 days.

All material is guaranteed to be as specified. All work to be completed in a substantial workmanlike manner according to specifications submitted, per standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents, or delays beyond our control. Owner to carry fire, tornado, and other necessary insurance. Our workers are fully covered by Workers Compensation Insurance.

Indemnity: To the fullest extent permitted by law Casper Construction, Inc., its subcontractors, whether employed directly or indirectly, shall defend, indemnify and hold harmless (CLIENT), its owners, their agents, consultants, and employees, from all claims arising out of Casper Construction, Inc.'s negligent acts or omissions for bodily injury and property damage which occur while Casper Construction, Inc. is physically on (CLIENT) premises during work performance.

Indemnity: To the fullest extent permitted by law, (CLIENT) shall defend, indemnify, and hold harmless Casper Construction, Inc., its owners, agents, consultants, employees, and subcontractors, from all claims for bodily injury and property damage that may arise from (CLIENT) premises including any acts or omissions by (CLIENT) or (CLIENT)'s subcontractors whether employed directly or indirectly, which occur while Casper Construction, Inc. is not physically on premises.

COVID-19 Delays. The Owner [General Contractor] agrees that causes of excusable and compensable delay beyond the Contractor's [Subcontractor's] control include any delays related to the COVID-19 pandemic that prevents the Work from proceeding, including, but not limited to, a shelter at home order that does not exempt construction work on the Project, an outbreak of COVID-19 at the Project, inability to obtain governmental inspections or approvals as a result of governmental staffing decisions, and any shortage or unavailability of labor or materials caused by the pandemic.

Acceptance of Proposal: The above prices, specifications, and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above. In accepting this proposal, I am agreeing to any mechanics liens resulting from non-payment. **Please sign, date, & return to Casper Construction at the above address.**

Date of Acceptance: _____ Signature: _____



Customer Quote Form

Customer:	City of Coleraine	Date:	3/4/2020
Contact Name:	Steve	Phone:	
Make:	Model Number:	Serial Number:	DWTC54H578559
Hours:			

QTY	PROPOSED WORK	PARTS	LABOR	TOTAL
	Replace front crank seal	\$60.00	\$1,625.00	\$1,685.00
	Replace leaking engine oil fill gasket	\$50.00	\$125.00	\$175.00
	Replace leaking pilot hose in center of machine	\$250.00	\$250.00	\$500.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
	Misc./Env.	\$100.00		\$100.00
	Freight			\$0.00

Environmental Charges & Shop Supplies		\$0.00
Comments:		Subtotal: Overall Total: \$2,460.00
Does not include Tax or Freight		
Prepared by:	Date Authorized:	
Date Prepared:	Purchase Order:	
Valid Until:		

Nortrax Representative _____
 Customer Signature: _____

Date: _____



RANGE CORNICE & ROOFING COMPANY
ROOFING & ARCHITECTURAL SHEET METAL CONTRACTOR

PHONE: (218) 263-8812
Fax: (218) 263-8185
510 W. 41st Street
Hibbing, MN 55746

TO: City of Coleraine
ATTN: Harry Bertram
EMAIL: harryb@cityofcoleraine.com

DATE: April 8, 2020
QUOTE NO.: 20-72
SUBJECT: Reroof of the Old Firehall Building
Approx. 4,500 S.F.

BID PROPOSAL

We are pleased to submit this proposal on our interpretation of your requirements, subject to the attached terms and conditions.

A)

We propose to furnish all labor, equipment, and material to install a new adhered EPDM roof system as follows:

1. Set up all necessary equipment and material to meet or exceed OSHA standards.
2. Remove existing roofing down to the existing deck and dispose of as per state and county codes.
3. Inspect deck and replace any deteriorated with like kind and thickness.
4. Install 1 layer of 1" ISO insulation, as per manufacturer's specifications, and mechanically fasten to wood deck.
5. Install new wood nailer, to accommodate new insulation height, as needed.
6. Adhere new .060 membrane over new insulation, as per manufacturer's specifications.
7. Flash all walls/penetrations watertight, as per manufacturer's specifications.
8. Fabricate and install all new prefinished metal coping and counter flashings, scuppers and downspouts. (color to be selected by owner from standard color chart).
9. Clean up roof and grounds to pre-existing conditions or better.
10. Furnish a 20 year manufacturer's roof system warranty.

For the Sum of:

THIRTY-FIVE THOUSAND FIVE HUNDRED SIXTY-FIVE AND NO/100 (\$35,565.00) DOLLARS

B)

Pricing to repair all holes in roof that are visible including the 4 plastic roof vents for the sum of:

TWO THOUSAND SEVEN AND NO/100 (\$2,007.00) DOLLARS

Note: No warranty on repairs because of the age and shape of the existing membrane.

C)

Pricing to replace and reflash the 4 vents that were damaged from snow removal for the sum of:

EIGHT HUNDRED NINETY-FIVE AND NO/100 (\$895.00) DOLLARS



RANGE CORNICE & ROOFING COMPANY
Terrance E. Marty/President
TEM/hjg



EQUAL OPPORTUNITY EMPLOYER

Harry Bertram

From: John Thom <jthom@sehinc.com>
Sent: Monday, April 13, 2020 11:16 AM
To: Harry Bertram
Subject: Fwd: Coleraine
Attachments: 2527- Coleraine, MN Finished.pdf; 2527- Coleraine, MN Raw #4.pdf; 2527- Coleraine, MN Raw #1.pdf

Sent from my iPhone

Begin forwarded message:

From: Mark Oberhelman <Mark.Oberhelman@HawkinsInc.com>
Date: April 13, 2020 at 11:04:40 AM CDT
To: "jthom@sehinc.com" <jthom@sehinc.com>
Subject: Coleraine

John, attached are the results for Coleraine. There are two raw samples and a finished water. There is about 0.5 ppm of iron in the finished water. Is this an anomaly? I would recommend LPC-31 at 6 ppm if iron isn't an issue or LPC-AM at 7.5 ppm as product if it is representative of the current conditions.



WatSim

WATER CHEMISTRY INPUT

Coleraine, MN
Raw #4

Superior Branch
Ryan Hanson

Report Date: 04-02-2020
Sample #: 2527

Sampled: 04-02-2020
at 1233

CATIONS

Calcium (as Ca)	117.00
Magnesium (as Mg)	33.48
Sodium (as Na)	10.33
Potassium (as K)	4.40
Ammonia (as NH ₃)	0.00200
Iron (as Fe)	1.19
Manganese (as Mn)	0.893
Aluminum (as Al)	0.0200
Zinc (as Zn)	0.00500
Boron (as B)	0.0500

ANIONS

Chloride (as Cl)	27.80
Sulfate (as SO ₄)	180.44
"M" Alkalinity (as CaCO ₃)	233.00
"P" Alkalinity (as CaCO ₃)	< 0.001
Phosphate (as PO ₄)	< 0.001
Pyrophosphate (as PO ₄)	0.00
Silica (as SiO ₂)	9.46
Nitrate (as NO ₃)	< 0.001

PARAMETERS

pH	7.21
Temperature (°F)	55.00
Calculated T.D.S.	711.56
Calculated Cond.	795.01

COMMENTS

Hawkins, Inc.
3100 East Hennepin Avenue, Minneapolis, MN 55413



WatSim

RAW WATER DEPOSITION POTENTIAL INDICATORS

Coleraine, MN
Raw #4

Superior Branch
Ryan Hanson

Report Date: 04-02-2020 Sampled: 04-02-2020
Sample #: 2527 at 1233

SATURATION LEVEL

Calcite (CaCO ₃)	0.707
Aragonite (CaCO ₃)	0.626
Anhydrite (CaSO ₄)	0.0335
Gypsum (CaSO ₄ *2H ₂ O)	0.0600
Calcium phosphate	< 0.001
Hydroxyapatite	< 0.001
Fluorite (CaF ₂)	0.00
Silica (SiO ₂)	0.111
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	< 0.001
Iron hydroxide (Fe(OH) ₃)	66.71
Siderite (FeCO ₃)	10.75
Strengite (FePO ₄ *2H ₂ O)	< 0.001
Calcium oxalate (CaC ₂ O ₄)	0.00
Ca pyrophosphate (CaP ₂ O ₇)	0.00
Zinc phosphate (Zn ₃ (PO ₄) ₂)	< 0.001

FREE ION MOMENTARY EXCESS (ppm)

Calcite (CaCO ₃)	-0.151
Aragonite (CaCO ₃)	-0.217
Anhydrite (CaSO ₄)	-1179.4
Gypsum (CaSO ₄ *2H ₂ O)	-920.82
Calcium phosphate	>-0.001
Hydroxyapatite	-389.77
Fluorite (CaF ₂)	-28.74
Silica (SiO ₂)	-77.70
Brucite (Mg(OH) ₂)	-2.75
Magnesium silicate	-178.44
Iron hydroxide (Fe(OH) ₃)	< 0.001
Siderite (FeCO ₃)	0.374
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Calcium oxalate (CaC ₂ O ₄)	-0.209
Ca pyrophosphate (CaP ₂ O ₇)	-0.00165
Zinc phosphate (Zn ₃ (PO ₄) ₂)	-0.0133

SIMPLE INDICES

Langelier	-0.0800
Ryznar	7.37
Puckorius	6.57
Larson-Skold Index	0.977
C.C.P.P.	3.70

BOUND IONS

Calcium	117.00	102.13
Carbonate	0.792	0.218
Phosphate	< 0.001	< 0.001

TOTAL

FREE

CHEMICAL PROPERTIES

D.I.C. (mg/L C)	63.08
Pb solubility(ug/L)	4.64
Cu solubility(mg/L)	8.29
Zn solubility(mg/L)	13.72
PPO ₄ solubility(mg/L)	2.59
PO ₄ solubility(mg/L)	16.59

OPERATING CONDITIONS

Temperature (°F)	55.00
Time(mins)	3.00

Hawkins, Inc.
3100 East Hennepin Avenue, Minneapolis, MN 55413



WatSim

WATER CHEMISTRY INPUT

Coleraine, MN
Finished

Superior Branch
Ryan Hanson

Report Date: 04-02-2020
Sample #: 2527

Sampled: 04-02-2020
at 1233

CATIONS

Calcium (as Ca)	104.58
Magnesium (as Mg)	35.82
Sodium (as Na)	11.55
Potassium (as K)	4.44
Ammonia (as NH ₃)	0.00500
Iron (as Fe)	0.511
Manganese (as Mn)	0.00500
Aluminum (as Al)	0.0200
Zinc (as Zn)	0.00300
Boron (as B)	0.0500

ANIONS

Chloride (as Cl)	25.70
Sulfate (as SO ₄)	165.57
"M" Alkalinity (as CaCO ₃)	230.00
"P" Alkalinity (as CaCO ₃)	< 0.001
Phosphate (as PO ₄)	2.00
Pyrophosphate (as PO ₄)	0.00
Silica (as SiO ₂)	8.30
Nitrate (as NO ₃)	< 0.001

PARAMETERS

pH	7.50
Temperature (°F)	55.00
Calculated T.D.S.	662.24
Calculated Cond.	762.52

COMMENTS

Hawkins, Inc.
3100 East Hennepin Avenue, Minneapolis, MN 55413



WatSim

RAW WATER DEPOSITION POTENTIAL INDICATORS

Coleraine, MN
Finished

Superior Branch
Ryan Hanson

Report Date: 04-02-2020
Sample #: 2527

Sampled: 04-02-2020
at 1233

SATURATION LEVEL

Calcite (CaCO ₃)	1.22
Aragonite (CaCO ₃)	1.08
Anhydrite (CaSO ₄)	0.0283
Gypsum (CaSO ₄ *2H ₂ O)	0.0507
Calcium phosphate	0.322
Hydroxyapatite	< 0.001
Fluorite (CaF ₂)	0.00
Silica (SiO ₂)	0.0975
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	< 0.001
Iron hydroxide (Fe(OH) ₃)	103.59
Siderite (FeCO ₃)	8.41
Strengite (FePO ₄ *2H ₂ O)	3.70
Calcium oxalate (CaC ₂ O ₄)	0.00
Ca pyrophosphate (CaP ₂ O ₇)	0.00
Zinc phosphate (Zn ₃ (PO ₄) ₂)	< 0.001

FREE ION MOMENTARY EXCESS (ppm)

Calcite (CaCO ₃)	0.126
Aragonite (CaCO ₃)	0.0536
Anhydrite (CaSO ₄)	-1191.9
Gypsum (CaSO ₄ *2H ₂ O)	-938.35
Calcium phosphate	>-0.001
Hydroxyapatite	-387.22
Fluorite (CaF ₂)	-29.86
Silica (SiO ₂)	-78.91
Brucite (Mg(OH) ₂)	-2.64
Magnesium silicate	-177.86
Iron hydroxide (Fe(OH) ₃)	< 0.001
Siderite (FeCO ₃)	0.553
Strengite (FePO ₄ *2H ₂ O)	< 0.001
Calcium oxalate (CaC ₂ O ₄)	-0.229
Ca pyrophosphate (CaP ₂ O ₇)	-0.00192
Zinc phosphate (Zn ₃ (PO ₄) ₂)	-0.0148

SIMPLE INDICES

Langelier	0.159
Ryznar	7.18
Puckorius	6.68
Larson-Skold Index	0.912
C.C.P.P.	16.60

BOUND IONS

Calcium	104.58	91.54
Carbonate	1.50	0.415
Phosphate	2.00	< 0.001

TOTAL

FREE

CHEMICAL PROPERTIES

D.I.C. (mg/L C)	58.61
Pb solubility(ug/L)	2.42
Cu solubility(mg/L)	7.61
Zn solubility(mg/L)	1.01
PPO ₄ solubility(mg/L)	3.07
PO ₄ solubility(mg/L)	8.50

OPERATING CONDITIONS

Temperature (°F)	55.00
Time(mins)	3.00

Hawkins, Inc.
3100 East Hennepin Avenue, Minneapolis, MN 55413



WatSim

WATER CHEMISTRY INPUT

Coleraine, MN
Raw #1

Superior Branch
Ryan Hanson

Report Date: 04-02-2020
Sample #: 2527

Sampled: 04-02-2020
at 1233

CATIONS

Calcium (as Ca)	84.90
Magnesium (as Mg)	35.82
Sodium (as Na)	12.10
Potassium (as K)	4.00
Ammonia (as NH ₃)	0.0160
Iron (as Fe)	1.35
Manganese (as Mn)	0.659
Aluminum (as Al)	0.0200
Zinc (as Zn)	0.01000
Boron (as B)	0.0600

ANIONS

Chloride (as Cl)	16.40
Sulfate (as SO ₄)	146.96
"M" Alkalinity (as CaCO ₃)	217.00
"P" Alkalinity (as CaCO ₃)	< 0.001
Phosphate (as PO ₄)	< 0.001
Pyrophosphate (as PO ₄)	0.00
Silica (as SiO ₂)	5.40
Nitrate (as NO ₃)	< 0.001

PARAMETERS

pH	7.48
Temperature (°F)	55.00
Calculated T.D.S.	593.93
Calculated Cond.	688.95

COMMENTS

Hawkins, Inc.
3100 East Hennepin Avenue, Minneapolis, MN 55413



WatSim

RAW WATER DEPOSITION POTENTIAL INDICATORS

Coleraine, MN
Raw #1

Superior Branch
Ryan Hanson

Report Date: 04-02-2020
Sample #: 2527

Sampled: 04-02-2020
at 1233

SATURATION LEVEL

Calcite (CaCO ₃)	0.930
Aragonite (CaCO ₃)	0.824
Anhydrite (CaSO ₄)	0.0218
Gypsum (CaSO ₄ *2H ₂ O)	0.0390
Calcium phosphate	< 0.001
Hydroxyapatite	< 0.001
Fluorite (CaF ₂)	0.00
Silica (SiO ₂)	0.0634
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	< 0.001
Iron hydroxide (Fe(OH) ₃)	260.43
Siderite (FeCO ₃)	21.11
Strengite (FePO ₄ *2H ₂ O)	< 0.001
Calcium oxalate (CaC ₂ O ₄)	0.00
Ca pyrophosphate (CaP ₂ O ₇)	0.00
Zinc phosphate (Zn ₃ (PO ₄) ₂)	< 0.001

FREE ION MOMENTARY EXCESS (ppm)

Calcite (CaCO ₃)	-0.0462
Aragonite (CaCO ₃)	-0.132
Anhydrite (CaSO ₄)	-1200.9
Gypsum (CaSO ₄ *2H ₂ O)	-956.21
Calcium phosphate	>-0.001
Hydroxyapatite	-381.61
Fluorite (CaF ₂)	-31.83
Silica (SiO ₂)	-81.89
Brucite (Mg(OH) ₂)	-2.60
Magnesium silicate	-176.57
Iron hydroxide (Fe(OH) ₃)	< 0.001
Siderite (FeCO ₃)	0.669
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Calcium oxalate (CaC ₂ O ₄)	-0.269
Ca pyrophosphate (CaP ₂ O ₇)	-0.00247
Zinc phosphate (Zn ₃ (PO ₄) ₂)	-0.0103

SIMPLE INDICES

Langelier	0.0343
Ryznar	7.41
Puckorius	6.93
Larson-Skold Index	0.814
C.C.P.P.	8.06

BOUND IONS

Calcium	84.90
Carbonate	1.30
Phosphate	< 0.001

TOTAL

FREE

CHEMICAL PROPERTIES

D.I.C. (mg/L C)	55.64
Pb solubility(ug/L)	2.66
Cu solubility(mg/L)	4.01
Zn solubility(mg/L)	8.87
PPO ₄ solubility(mg/L)	4.03
PO ₄ solubility(mg/L)	10.60

OPERATING CONDITIONS

Temperature (°F)	55.00
Time(mins)	3.00

Hawkins, Inc.
3100 East Hennepin Avenue, Minneapolis, MN 55413