Business of the Village Board
Village of Saranac Lake

SUBJECT: Authorize Agreement

DATE: 10-4-2022

DEPT OF ORIGIN: Mayor Williams BILL # 157-2022

DATE SUBMITTED: 9-30-2022 EXHIBITS: _____

APPROVED AS TO FORM:

_____ _____
Village Attorney Village Administration

EXPENDITURE REQUIRED	AMOUNT BUDGETED	APPROPRIATION REQUIRED:

Resolution authorizing the Village Manager to sign a professional services agreement

MOVED BY: Scollin SECONDED BY: Brunette

VOTE ON ROLL CALL:

MAYOR WILLIAMS yes

TRUSTEE BRUNETTE yes

TRUSTEE CATILLAZ absent

TRUSTEE SCOLLIN yes

TRUSTEE SHAPIRO yes

RESOLUTION AUTHORIZING THE VILLAGE MANAGER TO SIGN A PROFESSIONAL SERVICES AGREEMENT

WHO: The Village of Saranac Lake

WHAT: Request to accept a change order to Barton and Loguicide, DPC (B&L) service agreement for engineering and environmental consulting services

WHERE: 680 State Route 3-Village of Saranac Lake Groundwater Wells

WHY: Well Redevelopment/Cleaning and Chlorine Loss System Sampling Project

WHEN: Effective immediately upon board approval

Barton & Loguidice, D.P.C.
Task Order No. 3

The Village of Saranac Lake ("Owner") entered in to a Master Services Agreement with Barton & Loguidice, D.P.C. ("Engineer" or "B&L") with an effective date of March 5, 2019. In accordance with that Master Services Agreement, the following Task Authorization is hereby approved and Engineer is authorized by Owner to proceed with the services as delineated below. This is Engineer's third Task Authorization.

Effective Date of this Task Authorization: _____

B&L Project Name: Well Redevelopment/Cleaning and Chlorine Loss Sampling Program

B&L Project Number: 234.038.001/.004

B&L Project Manager: Chris G. Lawton, P.E.

B&L Officer-in-Charge: Chris Lawton, P.E.

Owner's Project Manager: David Lewis, Operator

Fee Limit for this Task Authorization: $285,000

Payment Method: Time & Expense

Engineer's Scope of Service:

Well Redevelopment & Cleaning:

Task Work Order #1(TWO-1) consisted of a four phases approach to evaluate the groundwater wells for water quality changes that have occurred since their use began in 2010. TWO-1 began in fall of 2021 and culminated with a "Groundwater Water Quality Assessment" by HydroSource Associates & B&L, dated March 30, 2022. One of the many outcome of this assessment was the proposed "test remedial measures" of PW-1, using a procedure that includes cleaning and development of both PW-1 and the test well; with the desired goal of delivering bactericide chemical to as much of the affected surrounding aquifer volume as possible.

B&L will subcontract with both Layne and HydroSource Associates (HAS) for the proposed remedial measures. Layne will conduct the proposed well cleaning sequence (attached) and HydroSource Associated will provide hydrogeologic consulting and onsite observation service, as well as a post-cleaning report (scope of services attached).

The Village assumes all risk and B&L will not be held liable for consequential damages or assume responsibility for any kind of damages to any well or appurtenances resulting from any redevelopment or rehabilitation process. B&L also does not guarantee any specific results, water quality, or production rate improvements from any well rehabilitation or redevelopment work. B&L makes no warranties, either express or implied by oral or written communications, including emails and reports.

Chlorine-Loss Sampling Program:

B&L will also be assisting the Village with investigating another noted change with the groundwater use of PW-1. Chlorine demand is elevated when water from Well PW-1 is being distributed through the distribution system. The water system personnel have expressed difficulty maintaining acceptable minimum chlorine levels at the extremities of the distribution system during use of Well PW-1. This study, assisted by Corona Environmental Consulting (CEC) is intended to further investigate the effects of raw water quality changes on the water quality of treated and distribution system water. The objectives of this study are to identify causes of water quality variability in the Village distribution system and identify potential next steps for evaluation of mitigation alternatives.

Task 1 – Review Historical Water Quality and Operation Data
Task 2 – Develop a Sampling and Analysis Program
Task 3 – Develop Phase 1 Summary Report

Probable Project Cost Estimate:

Village of Saranac Lake		9/30/2022
2022 Well Cleaning and Chlorine Loss Sampling Program		
Funds Anticipated to be used from ARPA Monies		
Well Redeveleopment/Cleaning	$	150,000.00
Inspection	$	45,000.00
Project Administration	$	3,000.00
Redevelopment Report	$	5,000.00
Chlorine-Loss Sampling Program	$	25,000.00
Project contingency (25%)	$	57,000.00
Total Estimated Probable Project Cost	**$**	**285,000.00**

Total Estimated Task Order No.3 = $285,000 (*T&E based*)

It is assumed that monies received from the ARPA will be used for this project.

- B&L will contract with the Village as a professional service and provide project oversight, along with subcontractor administration.

- Layne will provide well redevelopment & cleaning services as a test remedial measure for the problems that PW-1 has been experiencing as identified through previous TWO-1 investigations;
- HydroSource Associates (HAS) will provide well redevelopment & cleaning inspection/observation services; as well as a post-remedial measure (aka. redevelopment) summary report;
- Corona Environmental Consulting (CEC) will assist with developing a Chlorine-Loss Sampling Plan and Analysis Program, as well as summary report to identify proposed mitigation alternatives, if warranted.

Approved by Owner:

_____ _____

Name: Date

_____

Title:

Approved by Engineer:

Chris G. Lawton, P.E. 10-3-2022

Name: Date

Vice President

Title:

Business of the Village Board
Village of Saranac Lake

SUBJECT: Well Redevelopment/Cleaning

DATE: 8-8-2022

DEPT OF ORIGIN: Mayor Williams BILL # 137-2022

DATE SUBMITTED: 8-4-2022 EXHIBITS: _____

APPROVED AS TO FORM:

_____ _____
Village Attorney Village Administration

EXPENDITURE REQUIRED	AMOUNT BUDGETED	APPROPRIATION REQUIRED:
$	$0	

Resolution determining that the Village of Saranac Lake well redevelopment/cleaning and chlorine loss system-sampling project well will continue to use American Rescue Plan Act (ARPA) Monies to proceed with investigations

MOVED BY: Catillaz SECONDED BY: Scollin

VOTE ON ROLL CALL:

MAYOR WILLIAMS	yes
TRUSTEE BRUNETTE	yes
TRUSTEE CATILLAZ	yes
TRUSTEE SCOLLIN	yes
TRUSTEE SHAPIRO	yes

RESOLUTION DETERMINING THAT THE VILLAGE OF SARANAC LAKE WELL REDEVELOPMENT/CLEANING AND CHLORINE LOSS SYSTEM SAMPLING PROJECT WILL CONTINUE TO USE AMERICAN RESCUE PLAN ACT (ARPA) MONIES TO PROCEED WITH INVESTIGATIONS

WHEREAS, the Village of Saranac Lake (Village) is located in Franklin County, New York; and

WHEREAS, the Village installed groundwater wells in 2010 following an EPA filtration avoidance violation in September 2007; and

WHEREAS, the Village and Barton & Loguidice, DPC (B&L) entered into Master Services agreement (MSA) for engineering and environmental consulting services, dated March 5, 2019, and

WHEREAS, recommendations of the Groundwater Quality Assessment dated, 3-30-2022, are to redevelop PW1 (production well one) and TW1 (test well one) with the addition of chemical treatment and camera inspection; and further distribution sampling program to continue investigation of chlorine-loss when using PW-1.

NOW, THEREFORE, BE IT RESOLVED that, the Village authorize the continued use American Rescue Plan Act (ARPA) monies to proceed with wellredevelopment/cleaning and a chlorine-loss system-sampling program.

BE IT FURTHER RESOLVED, that this resolution shall take effect immediately.

Village of Saranac Lake, New York

Proposed Well Cleaning Sequence

July 13, 2022

Introduction/Background

The Village of Saranac Lake is requesting costs to clean some of the wells in their wellfield. Relevant well specifications and a requested list and sequence of well cleaning efforts are provided below.

All the wells to be cleaned are screened sand and gravel wells, and are readily accessible to a truck-mounted rig or crane. One of the wells that is to be cleaned (Well PW-1) is 20 inches in diameter, with a total depth of 150 feet, and an approximate static water level of four feet below ground surface (bgs). The well screen in Well PW-1 is 20-inch diameter telescoping stainless steel, continuous-slot Johnson-type that extends from 85 to 150 feet bgs. The screen is outfitted with a K-packer and riser pipe over the interval from approximately 80 to 85 feet bgs.

Well PW-1 is to be cleaned in conjunction with a nearby six-inch diameter test well (TW-4) located roughly 10 feet away from Well PW-1. Well TW-4 is approximately 148 feet deep, and has a similar static water level. The screen in TW-4 is six-inch diameter telescoping stainless steel, continuous-slot Johnson-type that extends from 130 to 148 feet bgs. The screen is outfitted with a K-packer and riser pipe over the interval from 126 to 128 feet bgs. The screen interval from 128 to 130 feet bgs was not exposed to the aquifer.

The casing of Test Well TW-4 had been cut off below ground surface sometime after the wellfield was developed but was not sealed, and leakage of surface water into the well during past flooding events is assumed to have introduced iron-related bacteria and the nutrients to support their growth into the aquifer, affecting neighboring production Well PW-1. Although Well PW-1 was cleaned in 2019, this occurred before the improper abandonment of the test well had been recognized. A camera survey of Well PW-1 that was conducted at the time showed biological growth, presumed to be iron bacteria, particularly occurring within the depth interval of the screen that coincides with the screen in TW-4. The objective of the cleaning effort to be completed on these two wells is to develop and treat as much of the aquifer volume influenced by bacterial colonization present in the sediments between and around the two well screens as possible.

A third well, Well PW-2, may also undergo cleaning efforts, if deemed warranted based on an initial well camera survey that is to be made of each well prior to performing the well cleaning activities. Well PW-2 is located about 150 feet from Well PW-1. It is 20 inches in diameter, with a total depth of 149.5 feet, and an approximate static water level of six feet below ground

surface (bgs). The well screen in Well PW-2 is 20-inch diameter telescoping stainless steel, continuous-slot Johnson-type that extends from 89 to 149.5 feet bgs. The screen is outfitted with a K-packer and riser pipe from 84 to 89 feet bgs.

Please provide prices for the following.

Requested Well Cleaning Work Items and Sequence

Wells PW-1 and TW-4

1. Remove the submersible pump from Well PW-1, inspect the pump and provide opinions on any maintenance or repairs you would recommend the Village complete on the pump, drop pipe, electrical conduit, etc. Well TW-4 is open and has no pump installed.
2. Conduct camera video inspections of Well PW-1 and Test Well TW-4. Record camera inspections and provide a copy of each to the Village.
3. Use the camera inspection to assess conditions in each well regarding biological/iron bacteria growth, screen encrustation, etc. Identify depth intervals in each well where cleaning efforts should be most focused.
4. Use a wire brush to clean areas of heavy deposits inside the well screens, working on PW-1 and TW-4 first. Airlift both wells to waste to purge and remove detached particulate matter.
5. Introduce a treatment solution of phosphoric acid and QC-21 dispersant in both wells PW-1 and TW-4. Outfit Well TW-4 with a 4-inch diameter nipple at the top of the well casing and pump the treatment chemicals under pressure so as to displace the water in the well column and flood the screen and surrounding sediments with the treatment solution. For Well PW-1, the treatment chemicals are to be pumped via tremie tube that extends to the bottom of the screen.
6. After the treatment solution is introduced in both wells, pump water from Well PW-1 and into Well TW-4 at a rate of roughly 50 gallons per minute (gpm) for one hour. Then pump at the same rate from Well TW-4 into Well PW-1 for one hour. Measure pH of the pumped water every 10 minutes during the two, one-hour pumping periods and adjust treatment chemical concentrations as needed to reach and maintain a pH of no more than 3. Leave the solution in the wells overnight.
7. Install well development tooling in Well TW-4 and surge within the well screen using surge blocks and appropriate equipment to oscillate the blocks within the screen. Concurrently pump Well TW-4 at a rate of at least 50 gpm while surging to remove particulate matter and dissolved precipitants. Continue until the water is sufficiently clear.
8. Install well development tooling in Well PW-1 and surge within the well screen using surge blocks and appropriate equipment to oscillate the blocks within the screen. Concurrently pump Well PW-1 at a rate of at least 500 gpm while surging to remove particulate matter and dissolved precipitants. Measure and monitor pH and turbidity

while pumping and surging and continue until the pumped water is sufficiently clear and the pH of the pumped water is no less than 6.5.

9. All effluent produced after treatment chemicals are introduced should be pumped to a container and appropriately neutralized, whereupon it may be discharged to a nearby sewer receptor.
10. Introduce a disinfectant solution of sodium hypochlorite and Layne Oximate into both wells PW-1 and TW-4. Use the 4-inch diameter nipple at the top of the TW-4 well casing as described above, and pump the treatment chemicals under pressure so as to displace the water in the well column and flood the screen and surrounding sediments with the disinfecting solution For Well PW-1, the disinfectant chemicals are to be pumped (tremied) into the bottom of the well screen using the surge block drop pipe. Disinfection procedures, and the materials used in the disinfection process, must comply with AWWA standards.
11. After the disinfectant solution is introduced in both wells, pump water from Well PW-1 and into Well TW-4 at a rate of roughly 50 gallons per minute (gpm) for one hour. Then pump at the same rate from Well TW-4 into Well PW-1 for one hour. Measure the sodium hypochlorite concentration and pH of the pumped water every 10 minutes during the two, one-hour pumping periods and adjust the chemical concentrations as needed to reach and maintain a sodium hypochlorite concentration of about 350 mg/l and pH of between 6 and 9. Leave the solution in the wells overnight.
12. Use the well development tooling in Well TW-4 and surge within the well screen using surge blocks and appropriate equipment to oscillate the blocks within the screen. Concurrently pump Well TW-4 at a rate of at least 50 gpm while surging to remove particulate matter and dissolved precipitants. Provide a suitable discharge line to direct the pumping effluent to an acceptable nearby location (assume 200 feet linear distance). The effluent is to be dechlorinated before it can be discharged to waste. Continue until the water is sufficiently clear.
13. Use the well development tooling in Well PW-1 and surge within the well screen using surge blocks and appropriate equipment to oscillate the blocks within the screen. Concurrently pump Well PW-1 at a rate of at least 500 gpm while surging to remove particulate matter and dissolved precipitants. Provide a suitable discharge line to direct the pumping effluent to an acceptable nearby location (assume 200 feet linear distance). The effluent is to be dechlorinated before it can be discharged to waste. Measure and monitor turbidity while pumping and surging and continue until the pumped water is sufficiently clear.
14. Conduct a post-cleaning camera inspection of the well. Provide a copy of the video inspection to the Village.
15. Pressure wash and re-install the submersible pump, drop pipe, conduit, etc., disinfect Well PW-1 and its existing pumping system as needed, and make whatever adjustments are needed to resume use of the well as a public drinking water supply.

Well PW-2

1. Conduct camera inspection of Well PW-2. If needed, lift the submersible pump in Well PW-2 enough to allow passage of a well camera past the pitless unit.
2. Assess condition of Well PW-2 relevant to biological/iron bacteria growth, screen encrustation, etc. Provide recommendation on whether Well PW-2 needs cleaning. If it does not require cleaning or the Village opts not to have it cleaned, then re-set the pump in Well PW-2 and make whatever adjustments are necessary to allow the Village to immediately resume use of the well as a public drinking water supply. Provide a copy of the camera inspection video to the Village.
3. If it is decided that Well PW-2 is to be cleaned, remove the submersible pump from Well PW-2, inspect the pump and provide opinions on any maintenance or repairs you would recommend the Village complete on the pump, drop pipe, electrical conduit, etc.
4. Use the camera inspection observations to identify depth intervals in each well where cleaning efforts should be most focused.
5. Use a wire brush to clean areas of heavy deposits inside the well screen. Airlift the well to waste to purge and remove detached particulate matter.
6. Introduce a treatment solution of phosphoric acid and QC-21 dispersant into Well PW-2 via tremie tube that extends to the bottom of the screen. Measure pH of the water and adjust treatment chemical concentrations as needed to reach and maintain a pH of no more than 3. Leave the solution in the well overnight.
7. Install well development tooling in Well PW-2 and surge within the well screen using surge blocks and appropriate equipment to oscillate the blocks within the screen. Concurrently pump the well at a rate of at least 500 gpm while surging to remove particulate matter and dissolved precipitants. Measure and monitor pH and turbidity while pumping and surging and continue until the pumped water is sufficiently clear and the pH of the pumped water is no less than 6.5.
8. All effluent produced after treatment chemicals are introduced should be pumped to a container and appropriately neutralized, whereupon it may be discharged to a nearby sewer receptor.
9. Introduce a disinfectant solution of sodium hypochlorite and Layne Oximate into Well PW-2. The disinfectant chemicals are to be pumped (tremied) into the bottom of the well screen using the surge block drop pipe. Measure the sodium hypochlorite concentration and pH and adjust the chemical concentrations as needed to reach and maintain a sodium hypochlorite concentration of about 350 mg/l and pH of between 6 and 9. Leave the solution in the wells overnight. Disinfection procedures, and the materials used in the disinfection process, must comply with AWWA standards.
10. Use the well development tooling in Well PW-2 and surge within the well screen using surge blocks and appropriate equipment to oscillate the blocks within the screen. Concurrently pump Well PW-1 at a rate of at least 500 gpm while surging to remove particulate matter and dissolved precipitants. Provide a suitable discharge line to direct the pumping effluent to an acceptable nearby location (assume 200 feet linear distance). The effluent is to be dechlorinated before it can be discharged to waste. Measure and

monitor turbidity while pumping and surging and continue until the pumped water is sufficiently clear.

11. Conduct a post-cleaning camera inspection of the well. Provide a copy of the video inspection to the Village.
12. Pressure wash and re-install the submersible pump, drop pipe, conduit, etc., disinfect Well PW-2 and its existing pumping system as needed, and make whatever adjustments are needed to resume use of the well as a public drinking water supply.

Responses/pricing and any questions should be directed to:

Dave Lewis
Chief Water/Wastewater Operator
Village of Saranac Lake
Telephone:518-891-3037
email: wwtp@saranaclakeny.gov

Layne Christensen Co.
134-2 Layne Lane
Schoharie, NY 12157

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August 24, 2022

Dave Lewis
Chief Water/Wastewater Operator
Village of Saranac Lake
39 Main Street. Suite 9.
Saranac Lake, NY 12983

Reference: ***Village of Saranac Lake Well PW-1 and TW-4 Cleaning***

Dear Mr. Lewis,

Layne Christensen Company (Layne) is pleased to offer this proposal for the cleaning and rehabilitation of the above referenced wells located in the Town's well field. We understand, based on reports prepared by HydroSource Associates (HSA), that high levels of iron present in PW-1 could potentially be attributable to an improperly abandoned test well (TW-4) located about 10-feet away. This test well could certainly act as a conduit for surface water getting into the aquifer during high water conditions thus providing oxygen and nutrients to stimulate bacterial growth.

Our cleaning approach to both the production well and test well would be to utilize our 1,000-gallon treatment trailer. This unit would allow us to mix chemicals and mobilize a larger volume of chemicals out into the formation in both the production and test well. Note that we plan to pressurize the test well by welding on a cover with a 4-inch nipple. This would be connected to a valve assembly which in turn would be connected to a 4-inch hose to the treatment trailer. Once the valve is opened, we can introduce chemical batches with higher velocities than we can introduce into the production well. By treating the two wells we feel we stand a good chance of getting the cleaning chemicals out and covering the 10-foot separation distance between the two wells. We will be using our truck mounted crane to pull the pump from PW-1 and to brush both wells.

The cleaning method will includes a series of chemical treatments chosen to be most effective for the iron fouling found in PW-1 and presumably present in TW-4. The first chemical treatment will be a QC-21 and Phosphoric Acid solution (150 gallons of Phosphoric & 30 Gallons of QC-21 per well). The phosphoric acid was chosen as it reacts more slowly than hydrochloric acid and is very effective against iron compounds because of its ability to sequester these metals. The QC-21 is a dispersant polymer which is very effective against iron oxide allowing the acid to more readily dissolve and remove biofilm and mineral encrustation. This solution would be allowed to remain in the well and surrounding aquifer overnight. The last treatment is a pH buffered sodium hypochlorite solution for disinfection of the well and aquifer. We plan to carry out the disinfection at 350ppm and use Layne Oximate for pH control. We also plan to use 14-gallons of sodium hypochlorite and 10-gallons of Oximate per well. Please note that we have deliberately used the same chemical quantities for the test well as for the production well. We feel that by introducing a "stronger" batch in the test well we improve our chances of getting an effective cleaning of the surrounding aquifer. A pre-cleaning and post cleaning TV inspection of the wells will also be performed to help assess the effectiveness of the well cleanings. There will also be a TV inspection of PW-2 during this time to determine whether rehabilitation work on PW-2 would be warranted.

Layne Christensen Co.
134-2 Layne Lane
Schoharie, NY 12157

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The pricing on following page does not include any costs for off-site disposal of neutralized cleaning solution or well discharge water. It is assumed that access and egress for a truck mounted crane, a potable water supply and electric power are available for our use on site.

It should also be noted that the difference in price between this proposal and the one previously submitted by Layne in 2020 for the same work has had a substantial increase due to cost of fuel, materials, and prevailing wage labor rates. We are currently getting chemicals used for the rehabilitation process at approximately 20% increase compared to 2020. Fuel costs, which is one of our largest portions of overhead, has increased over 40% from previous estimate. In addition to the cost of materials and fuel there have also been increases in prevailing wage rates since 2020 and on a rehabilitation project which is labor intensive it has a significant increase on cost.

If this proposal is acceptable, a signed and returned Proposal or a Purchase Order will act to initiate the work. Any applicable taxes are not included. If this is a tax-exempt project, please enclose a tax exemption certificate. The pricing on the attached table is based on our standard rates. Please see attached terms and conditions. With all that factored in

Thank you for the continued opportunity to be of service and to provide this proposal. Should you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,

LAYNE CHRISTENSEN COMPANY

Max Sainsbury
Area Manager

Accepted By: (Name and Title) _____ Date: _____

Layne Christensen Co.
134-2 Layne Lane
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PW-1 and TW-4 Rehab	Est. Quantity	Unit	Unit Price	Total Price
Shop, mobilization & superintendent support	Lump Sum	1	19500	$19,500.00
Set up	Each	2	1075	$2,150.00
Pull PW-1 Pump	Hours	8	550	$4,400.00
TV Well PW-1, TW-4, and PW-2	Each	3	1075	$3,225.00
Tear Down / Move to PW-2	Lump Sum	1	1075	$1,075.00
Unwire/Pickup Pump/Set down/Rewire	Lump Sum	1	4795	$4,795.00
Tear Down/Move to PW-1	Lump Sum	1	1075	$1,075.00
Set up development tools/treatment skid	Hours	8	550	$4,400.00
Wire brush PW-1 and TW-4	Lump Sum	1	3250	$3,250.00
Set Development PW-1 and TW-4	Lump Sum	1	3250	$3,250.00
Surge and pump to waste	Hours	16	550	$8,800.00
Cap and Install Nipple TW-4	Lump Sum	1	2250	$2,250.00
Pump acid/QC-21/pressurize TW-4	Lump Sum	1	2250	$2,250.00
Pump acid/QC-21/surge PW-1	Lump Sum	1	4500	$4,500.00
Circulate between both wells	Lump Sum	1	4500	$4,500.00
Surge and pump to waste PW-1 and TW-4	Lump Sum	1	12250	$12,250.00
Pump chlorine/oximate pressurize TW-4	Lump Sum	1	2250	$2,250.00
Pump chlorine/oximate surge PW-1	Lump Sum	1	4500	$4,500.00
Extra development PW-1 if needed	Hours	16	550	$8,800.00
Pull development both wells	Lump Sum	1	3250	$3,250.00
TV PW-1 and TW-4	Each	2	1075	$2,150.00
Set PW-1/chlorinate	Lump Sum	1	5750	$5,750.00
Test, Tear down and clean up	Lump Sum	1	3250	$3,250.00
Chemicals Pump and Portable Pit	Lump Sum	1	24275	$24,275.00
			Est. Total	**$135,895.00**

Optional PW-2	Unit	Quantity	Unit Price	Amount
Shop, mobilization & superintendent support	Lump Sum	1	5750	$5,750.00
Setup and Pull pump	Lump Sum	1	5750	$5,750.00
Set up development tools/treatment skid	Hours	8	550	$4,400.00
Wire Brush	Lump Sum	1	2150	$2,150.00
Set development	Lump Sum	1	2150	$2,150.00
Development	Hours	32	550	$17,600.00
Extra Development if needed	Hours	16	550	$8,800.00
Pull Development	Lump Sum	1	2150	$2,150.00
TV Well	Lump Sum	1	1075	$1,075.00
Set pump/Chlorinate	Lump Sum	1	5750	$5,750.00
Test, Tear down and clean up	Lump Sum	1	3050	$3,050.00
Chemicals Pump and Portable Pit	Lump Sum	1	12950	$12,950.00
		1	**Est. Total**	**$71,575.00**

Layne Christensen Co.
134-2 Layne Lane
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TERMS AND CONDITIONS

LIABILITY OF CONTRACTOR: *Contractor shall not be liable for any bodily injury, death, or injury to or destruction of tangible property except as the same may have been caused by the negligence of Contractor. In no event shall Contractor be liable for any delays or special, indirect, incidental or consequential damages. Purchaser agrees that the total limit of Contractor's liability (whether based on negligence, warranty, strict liability or otherwise) hereunder, shall not exceed the aggregate amount due Contractor for services rendered under this contract. All claims, including claims for negligence or any other cause whatsoever, shall be deemed waived unless made in writing and received by Contractor within one (1) year after Contractor's completion of work hereunder. Furthermore, Contractor will accept no liability, consequential damages, risk, or responsibility of any kind for damage to Purchaser's well and appurtenances resulting from the rehabilitation process. All liability and risk associated with such work are assumed by Purchaser. Contractor also does not guarantee any specific results or production improvements from a well rehabilitation.*

INSURANCE: Contractor shall provide workers' compensation insurance, public liability and property damage insurance covering its employees and operation. Purchaser, at its option, may maintain such insurance as will protect it against claims arising out of the work.

REIMBURSABLE COST: In addition to the hourly charge provided on the face of this contract, Purchaser will reimburse Contractor for travel and living expenses necessarily incurred by the Contractor in the performance of the work, minor incidental expenses such as overnight mail, telephone and petty cash expenditures necessarily incurred, cost of removal of all debris if so directed by Purchaser, sales, consumer, use and similar taxes required by law and the cost of permits and all licenses necessary for the execution of the work. The foregoing costs shall be billed at actual cost plus fifteen percent (15%) unless otherwise agreed upon.

PRICE ADJUSTMENT: Any cost estimates or time frames stated herein are subject to equitable adjustment in the event of differing or unforeseeable conditions, changes in applicable laws after the date of this contract, unforeseeable delays or difficulties caused by acts of God, Purchaser or any third parties. Prices of goods acquired by Contractor from others shall be adjusted to reflect Contractor's price in effect at time of shipment. The price of Contractor's goods will be adjusted to the price in effect at time of shipment in accordance with Contractor's current escalation policies or as specifically covered in this contract.

TERMS: Thirty (30) days net from date of invoice. For extended projects, Contractor shall submit invoices on a monthly basis for any and all work completed and materials or equipment provided during the previous month. Past due invoices shall be subject to a delinquency charge of one and one-half percent (1-1/2%) per month (eighteen percent (18%) per annum) unless a lower charge is required under applicable law, in which case the lower rate shall apply. Purchaser agrees to pay all collection fees, attorneys' fees and costs incurred in the collection of any past due amounts arising out of this contract. Contractor shall have the right to immediately terminate this contract without further liability if Purchaser fails to make timely payment or otherwise materially breaches this contract.

MATERIAL SHORTAGES AND COST INCREASES: If any portion of materials or equipment which Contractor is required to furnish becomes unavailable, either temporarily or permanently, through causes beyond the control and without the fault of Contractor, then in the case of temporary unavailability any completion time frames shall be extended for such period of time as Contractor shall be delayed by such above-described unavailability, and in the case of permanent unavailability Contractor shall be excused from the requirement of furnishing such materials or equipment. Purchaser agrees to pay Contractor any increase in cost between the cost of the materials or equipment which have become permanently unavailable and the cost of the closest substitute which is then reasonably available.

DELAYS: If Contractor is delayed at any time in the progress of work by labor disputes, fire, unusual delays in transportation, unavoidable casualties, weather, or any cause beyond Contractor's reasonable control, then any completion time frames shall be extended by a reasonable period of time, at least equal to the period of delay.

CHANGED CONDITIONS: The discovery of any hazardous waste, substances, pollutants, contaminants, underground obstructions or utilities on or in the job site which were not brought to the attention of Contractor prior to the date of this contract will constitute a materially different site condition entitling Contractor, at its sole discretion to immediately terminate this contract without further liability.

ESCALATION: This contract is made with the understanding that Contractor will be able to begin and continuously proceed with its work on or before the proposed start date on the reverse side hereof. In the event Contractor is unable to commence its work on or before said date because the project is not ready for Contractor's work, Contractor will charge Purchaser the amount of increase in Contractor's cost attributable to such delay, plus Contractor's normal overhead percentage.

GUARANTEE AND LIABILITY: Contractor warrants that its labor supplied hereunder shall be free from defect and shall conform to the standard of care in effect in its industry at the time of performance of such labor for a period of twelve (12) months after substantial completion of Contractor's work. Contractor agrees, to the extent it is permitted, to pass on any warranties provided by the manufacturers of materials and/or equipment furnished under this contract. Contractor itself provides no warranty, express, implied or otherwise, on any such materials or equipment. Contractor will not be responsible for: work done, material or equipment furnished or repairs or alterations made by others.

Layne Christensen Co.
134-2 Layne Lane
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graniteconstruction.com

For any breach hereunder, Contractor shall be liable only for the value of the installation work or, if it wrongfully fails to install, then its liability is limited to the difference between the contract price herein, and the value of other similar installation work. If Contractor's breach damages any materials or equipment furnished hereunder, Contractor shall only be liable for the value of such materials or equipment. Under no circumstances will Contractor be liable for consequential, special or indirect damages, including without limitation, any crop loss or damage, damage to other equipment, structures or property, nor for any other similar or dissimilar damages or losses whether due to delay, failure to furnish or install, delay in installation, defective material or equipment, defective workmanship, defective installation, delay in replacing, nor for any cause or breach whatsoever. In any event, Contractor's total liability towards Purchaser for alleged faulty performance or nonperformance under this contract shall be limited to the total contract price. No materials, equipment or services contracted herein carries any guarantee not mentioned in this contract. THE ABOVE WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED.

TITLE AND OWNERSHIP: In case of default on Purchaser's part, Contractor shall have the right to enter the premises upon which any material or equipment furnished herein have been installed and retake such goods not then paid for and pursue any further remedy provided by law, including recovery of attorneys' fees and any deficiency to the maximum extent and in the manner provided by law. Such materials and equipment shall retain their character as personal property of Contractor until payment in full is received by Contractor, regardless of their mode of attachment. Unless prior specific written instructions are received to the contrary, surplus and replaced materials and equipment resulting from repair or installation work shall become the property of Contractor.

DELIVERY: Shipment schedules and dates, expressed or implied, are contingent on normal conditions. Contractor will not be responsible for any delays in shipment or completion caused by factors beyond its control such as, but not limited to, suppliers' failures, accidents, work stoppages or operation of or changes in the law. Shipments will be made as promptly as Contractor's ability to obtain materials and/or equipment and scheduling will permit. No delay in shipments or variances from shipping schedule shall be cause of cancellation or any claim for damage. Any changes in layout or design requested after acceptance of this contract will be made at Purchaser's additional cost. Any such change and/or time taken to supply engineering data or to approve drawings will automatically extend shipping schedules. Equipment will be shipped "knocked down" to the extent Contractor considers necessary, with small parts stripped from equipment and crated. On and after delivery to the carrier for transportation to the Purchaser's site, Purchaser shall be responsible for all loss or damage to materials or equipment due to any cause, including but not limited to loss or damage resulting from casualty.

INDEMNIFICATION: *Purchaser agrees to indemnify and hold Contractor, its directors, officers, stockholders, employees, agents and subcontractors, harmless from and against any and all claims, demands, causes of action (including third party claims, demands or causes of action for contribution or indemnification), liability and costs (including attorneys' fees and other costs of defense) asserted and/or filed by Purchaser or any third party(ies), including without limitation Purchaser's employees, and arising out of or as a result of: (i) the presence of Contractor or its subcontractors at the job site, (ii) the work performed by Contractor or its subcontractors, or (iii) any negligent act or omission of Purchaser, its employees, agents, consultants, other contractors or any person or entity under Purchaser's control: except to the extent that such claims, demands, causes of action, liabilities or costs are caused by the negligence of Contractor or its subcontractors.*

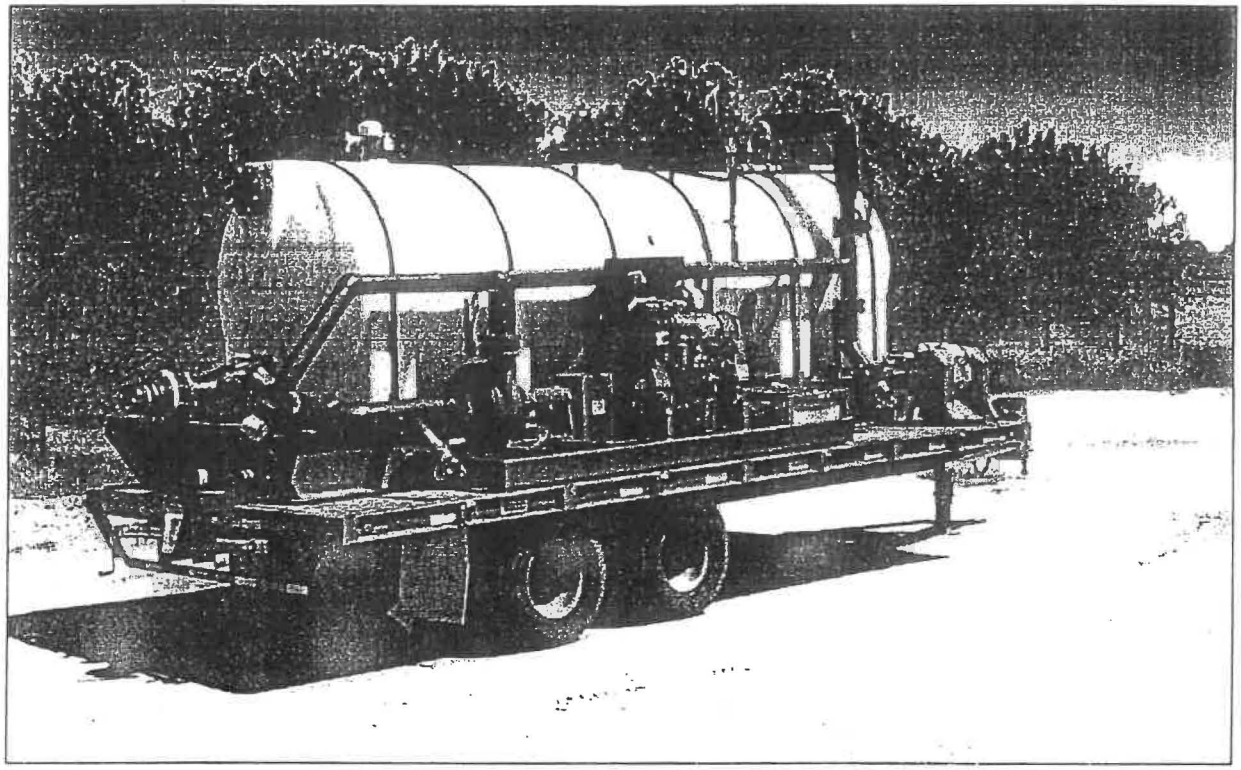
INTERPRETATION: This contract shall be governed by and construed in accordance with the laws of the state of the job site location. If any term, provision or condition contained herein shall, to any extent, be invalid or unenforceable, pursuant to state law or otherwise, the remainder of the terms, provisions and conditions herein (or the application of such term, provision, or condition to persons or circumstances other than those in respect of which it is invalid or unenforceable) shall not be affected thereby, and each term, provision and condition of this contract shall be valid and enforceable to the fullest extent permitted by law.

ASSIGNMENT & SUBLETTING: Purchaser shall not have the right to transfer or assign its rights and/or obligations under this contract to any third party, related or unrelated, without the express written consent of Contractor. Contractor shall have the right to transfer, assign or sublet all or any portion of its rights or obligations hereunder, but such transfer, assignment or subletting shall not relieve Contractor from its full obligations to Purchaser unless such transfer, assignment or subletting is pursuant to the sale of Contractor, or the division of Contractor responsible for this contract, to a third party.

MISCELLANEOUS: The terms and conditions set forth herein constitute the entire understanding of the parties relating to the work to be performed, and materials and equipment to be provided, by Contractor for the Purchaser. All previous proposals, offers, and other communications relative to the provisions of the subject work, oral or written, are hereby superseded, except to the extent that they have been expressly incorporated herein. Any modifications or revisions of any provisions herein or any additional provisions contained in any purchase order, acknowledgment, or other form of the Purchaser are hereby expressly objected to by Contractor and shall not operate to modify this contract. This contract shall take effect upon acceptance and execution by both parties.

ATTACHMENT A

Technical Bulletin



Layne has developed a self-contained treatment trailer that can be transported to your site during a chemical treatment project. This unit will mix chemicals for treatment, cleaning and/or neutralizing.

Self-Contained Mobile Treatment Unit Saves Time & Money, Assures Quality

To better manage the chemistries used in well, pipeline and system cleaning, Layne has designed and built a fleet of chemical treatment trailers for its water resource districts.

Layne's Chemical Treatment Trailer is a cost effective alternative to conventional treatment methods. The self contained unit eliminates the need to set up a tank and valves, attach process piping, pump and meter.

Layne Christensen Company is committed to meeting the requirements of the EPA's Clean Water Discharge Act

This chemical treatment unit demonstrates Layne's commitment to environmental safety, concern for site and operator safety and compliance with the law.

The piping of the unit is designed to handle a variety of treatment methods:

Tank surging using the well pump and tanker to create a back-and-forth washing agitation;

Back flushing the well with the pump contained within the trailer setup;

Airlift pumping into the tank for treatment;

Neutralizing chemicals using the well pump connected to the trailer piping or circulating with the trailer pump.

Features

Self Sufficient, Engine-Driven Onboard Pump provides for the rapid transfer of fluids back to a well or through a pipeline to distant discharge points. The trailer's pump works simultaneously during well pump-off to neutralize fluids for safe discharge. This speeds up the completion of well flushing and chemical removal.

Rugged Construction enables the unit to travel over all kinds of terrain.

2000 Gallon Capacity* tank allows for the treatment and neutralization of large quantities of acidic, basic, chlorinated and turbid solutions used in well and water system treatments. The unit facilitates the use of treatment chemicals and neutralization chemicals in various forms including liquid and granular.

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* A 1000 gallon unit is available for smaller jobs.

ATTACHMENT B

Well Volume WV= gal/ft x depth x B

A = Gallons per foot by well diameter
B = 1.5 for wells with diameter 6" or greater
B = 2.0 for wells with diameter 6" or less

A	B	depth (ft)	Well Vol (gal)
16.32	1.5	97	2374.56
			0

↑ standing water = well depth minus static water level

Gallons of Acid Acid = (WV x 8.33 x %acid/100) / (% active/100 x weight of acid)

Wt of acid (lbs/gal)
HCl = 9.7 32%
Phos=13 75%

Well Vol (gal)	Wt of H_2O (lbs/gal)	% acid desired	% active acid	Wt of acid (lbs/gal)	top	bottom	**Acid** (gal)
2374	8.33	6	75	13	1186.5	9.75	121.69
	8.33				0	0	#DIV/0!

Gallons of Additive Additive = (WV x 8.33 x %desired/100) / (% active/100 x weight of product)

Well Vol (gal)	Wt of H2O (lbs/gal)	% additive desired	% active	Wt of prod. (lbs/gal)	top	bottom	**Additive** (gal)
2374	8.33	1.5	100	10	296.63	10	29.66
	8.33				0	0	#DIV/0!

Chlorination

TWV x 2 TTV TTV x %Cl / Cl%

300 ppm 0.03%
200 ppm 0.02%

Tot Trt Vol	4748
Amt Cl(ppı	0.035
% Cl	12

Amt Cl = TTV x %Cl / Cl% = 13.84833

Redevelopment

1 gal NW- 220 per 500 gals water. Use two times the well volume
Leave in overnight

Oximate

alk / 100 x cl / 200 x ttv / 1000
1 gal. of oximate per 500 gallons of water 9.496

Village of Saranac Lake, New York

Hydrogeologic Consulting and Observation Services

During Well Cleaning

July 28, 2022

The Village of Saranac Lake is planning to clean some of the wells in their wellfield and has requested that HydroSource Associates (HSA) assist by providing hydrogeologic consultation and onsite observation during the process. Following is a proposed scope of services for the Village's consideration. It is designed to conform with the attached Proposed Well Cleaning Sequence, which we understand is the process the Village plans to undertake for the well cleaning effort.

Proposed Scope of Services

Consulting and Assistance with Developing Cleaning Sequence Task List

HSA will assist the Village develop a list of proposed well cleaning tasks that may be used to solicit cost quotations from licensed well contractors. We will confer with the Village, Barton & Loguidice (B&L) and well contractors to define the specific well cleaning efforts to be completed, relying particularly on the proposal the Village most recently received from Layne Christensen dated July 31, 2020. HSA will discuss with Layne Christensen representatives what they specifically recommend based on observations they made during the cleaning process they performed on Well PW-1 in 2019, and provide our suggestions and opinions as to how that process may be improved based on our knowledge of the aquifer, subsurface conditions, and the wells themselves and observations that have been made by Village personnel of their past performance and water quality history. We will then provide consultation and assistance in assessing contractors work scope and cost proposals at the Village's and B&L's request.

Hydrogeologic Observation During Well Cleaning Process -- Wells PW-1 and TW-4

We assume the Village's chosen well contractor can remove and inspect the pump that is in Well PW-1 without HSA's involvement. HSA will coordinate with the well contractor to be present once the pump in Well PW-1 is removed and the well is ready to be inspected with a video camera. HSA will then observe the camera inspections of Well PW-1 and Test Well TW-4. We will consult with the well contractor and the Village as to conditions in each well regarding biological/iron bacteria growth, screen encrustation, etc., and provide our opinions as to depth intervals in each well where cleaning efforts should be focused.

We will record observations of the initial mechanical processes the well contractor uses to clean the well screens (i.e., wire brushing and airlifting) and the amount and nature of particulate material purged from the wells. We assume the camera inspections, wire-brushing and airlifting of the wells will take about two to three days total.

We will record the amounts of the acid and dispersant well cleaning chemicals introduced to the wells, and confirm that the well treatment solution is introduced and circulated between Wells PW-1 and TW-4 as proposed by the well contractor. As the wells are pumped and the cleaning solution is circulated between them, we will monitor water clarity, record pH levels that are observed, and provide opinions on improvements or adjustments to the process that we think could be made, if any. The treatment solution is to be left overnight in the wells at this stage. We assume the process of introducing the cleaning solution and circulating it between the two wells will take about one day.

The following day, the well contractor is to install well development tooling in Well TW-4 and surge within the well screen while concurrently pumping the well at a rate of at least 50 gallons per minute (gpm) to remove particulate matter and dissolved precipitants. This is to continue until the water is substantially clear. This process is then to be repeated on Well PW-1 while pumping at a rate of at least 500 gpm. HSA proposes to record static and pumping water levels, pH, and turbidity levels periodically during the well cleaning effort. We will confirm when the water pumped from each well appears to be substantially clear and the pH of the pumped water is no less than 6.5. The well cleaning process is expected to take two to four days total.

The well contractor will then disinfect the two wells by introducing and circulating a solution of sodium hypochlorite and Layne Oximate and then surging the wells using a similar process as was done for the acid treatment. HSA proposes to record static and pumping water levels, sodium hypochlorite concentration, pH, and turbidity levels periodically during the pumping periods of the disinfection process. The well disinfection efforts are expected to take three to four days total.

We assume the well contractor can perform the post-cleaning well video inspection, pressure wash, disinfect and reinstall the submersible production pump and restore Well PW-1 for normal operations without HSA's involvement.

Hydrogeologic Observation During Well Cleaning Process -- Well PW-2

HSA will coordinate with the well contractor to be present for when the pump in Well PW-2 is lifted and the camera inspection is performed. As was done for Wells PW-1 and TW-4, HSA will observe the camera inspection and confer with the well contractor and the Village as to condition in the well regarding biological/iron bacteria growth, screen encrustation, etc., and provide our opinions as to whether the well should undergo cleaning, and if so, identify depth intervals where cleaning efforts should be focused.

HSA's proposed services for cleaning of Well PW-2, if deemed warranted, would follow the general course described above for Well PW-1, but without the efforts to circulate water between it and a nearby test well. We will record observations of the initial mechanical processes the well contractor uses to clean the well screens (i.e., wire brushing and airlifting) and the amount and nature of particulate material purged from the well. We will record the amounts of the acid and dispersant cleaning chemicals introduced, and confirm that the well treatment solution is

introduced as proposed, record and confirm pH levels, and provide opinions on improvements or adjustments to the process that we think could be made, if any. We assume the camera inspection, mechanical development, and introduction of the well cleaning solution to Well PW-2 will take about two to three days total.

After the cleaning solution is allowed to sit in the idle well overnight, the well contractor is to install well development tooling and surge within the well screen while concurrently pumping the well at a rate of at least 500 gpm until the water is substantially clear. HSA will again record static water level, pumping water levels, pH, and turbidity levels periodically during the well cleaning effort. We will confirm when the water that is pumped from each well appears to be substantially clear and the pH of the pumped water is no less than 6.5. This part of the well cleaning process on Well PW-2 is expected to take two to three days total.

The well contractor will then disinfect Well PW-2 using a solution of sodium hypochlorite and Layne Oximate, letting it sit in the idle well overnight, and then surging the well again. HSA will record static water level, pumping water levels, sodium hypochlorite concentration, pH, and turbidity levels periodically during the pumping periods. The Well PW-2 disinfection efforts are expected to take two to three days total.

As before, we assume the well contractor can perform the post-cleaning well video inspection, pressure wash, disinfect and reinstall the submersible production pump and restore the well for normal operations without HSA's involvement.

Well Cleaning Observations – Hydrogeologic Summary Report

HSA will prepare a report for submission to B&L and the Village that documents the well cleaning efforts. The report will include a summary of observations made from the pre-cleaning video inspections, and relevant onsite observations made during the well cleaning efforts. We will provide commentary on such topics as the degree of biological growth observed in the wells, and the amount of particulate matter purged from them during the well cleaning activities. We will describe the levels of turbidity, pH and chlorine observed in the pumped water after the well cleaning and disinfection solution agents were introduced. The report will provide a review and comparison of the pre- and post-cleaning well video inspection to assess the observable effectiveness of the well cleaning process. To the degree feasible, we will use water level observations recorded during the well cleaning process to determine if there has been a measurable improvement in well performance. The report will also include recommendations on future water quality tests and scheduling that the Village may wish to consider as a means of assessing future trends in Fe, Mn, pH, chlorine residual, etc.

Probable Costs

Consulting and Assistance with Developing Cleaning Sequence Task/Costing List	$ 4,100
Hydrogeologic Observation During Well Cleaning Process -- Wells PW-1 and TW-4	$20,600
Hydrogeologic Observation During Well Cleaning Process -- Well PW-2	
Camera Inspection Review	$ 2,800
If Well PW-2 is Cleaned	$13,700
Well Cleaning Observations – Hydrogeologic Summary Report	$ 5,100
Total	$46,300

HSA assumes the Village's well contractor will be responsible for all effluent containment/control, neutralization, dechlorination and discharge arrangements.