Mille Lacs Band of Ojibwe
28510 MN-123
Sandstone, MN 55072
Well Investigation

IHS Project BE-21-L42
January 2024

Introduction:

The Mille Lacs Band of Ojibwe is soliciting bids by qualified well drillers to perform a well investigation on a 4-inch, steel cased, open hole residential well. Work will take place in Sandstone, MN in Pine County. The well has been in service since 1990 and currently producing a low yield.

Sealed bids are to be mailed to the Mille Lacs Band at the address listed below by **Friday, January 19, 2024**.

- Mille Lacs Band of Ojibwe
  Commissioner of Community Development
  PO Box 509
  Onamia, MN 56359

Project Administration:

The Mille Lacs band of Ojibwe is the Owner's Representative. The selected Contractor will contract directly with the Owner's Representative for the services to be rendered. The Tribal Coordinator can be contacted for any information related to the well investigation. Engineering services are provided by Indian Health Service (IHS) and will be coordinated through the Project Engineer.

Tribal Contact
Brian Scheinost
Director of Public Works
Mille Lacs Band Publis Works
43188 Timber Trail Road
Onamia, MN 56359
brian.scheinost@millelacsband.com
320-532-7437

Project Engineer
Matthew Chosa
Environmental Engineer
Indian Health Service
Minnesota District Office
705 5th Street NW, Suite E
Bemidji, MN 56601
matthew.chosa@ihs.gov
218-444-0526

Scope of Service:

The scope of work is to investigate a low producing 4-inch, open hole, steel cased well located in Sandstone, MN and repair as necessary with the Project Engineer's approval including:

- Inspection of all well components including but not limited to the well cap, drop pipe, well pump electrical cable, pitless adapter, well pump and motor, as well as inspection of the water pressure system inside the home.
- Report static water level and perform test pumping for yield and drawdown.
- Bacteriological and chemical analysis.
- Note deficiencies and submit recommendations for repair to the Project Engineer.

Full details, including the Well Record, can be found in the project specifications.

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Bid Schedule
Mille Lacs Band of Ojibwe
Individual Well Investigation/Rehabilitation
28510 MN-123
Sandstone, MN 55072

Schedule: Well Investigation/Rehabilitation

ITEM NO.	Description	EST. QTY	UNIT	UNIT COST	TOTAL COST
1	**Inspection of 4-inch steel cased well, including:** Well Cap Pitless Adapter Well Casing Drop Pipe Electrical Cable Well Pump and motor	1	LS	$	$
With prior approval from the Project Engineer, replace the following as necessary:					
2	Well Cap	1	EA	$	$
3	Pitless Adapter	1	EA	$	$
4	1-inch PE Drop Pipe	90	LF	$	$
5	1/2 Horsepower Submersible Pump	1	EA	$	$
6	Submersible Pump Cable	100	LF	$	$
7	Pressure Tank	1	EA	$	$
After repairs have been made:					
8	Test Pump for Yield and Drawdown	1	HR	$	$
9	Chemical and Bacteriological Analysis	1	EA	$	$
				TOTAL	**$**

Completed items of work shall be measured and paid for in accordance with the requirements listed in the Bid Schedule. Payment shall be based on the actual quantities completed and shall represent full compensation under the contract. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, tools, equipment, and performing all work required by the provisions of the Contract. In all cases, the finished product shall be a complete and operational system or component. The price for the complete item of work shall include all applicable taxes.

The Bid Schedule is based on estimated quantities required to meet the specifications. The total extended prices shall be used for quote evaluation purposes only. The actual amount to be paid under the contract shall be computed based on the actual quantities approved and installed at the bid price awarded. Bidder must provide prices for all items to be considered a responsive, award will be for the aggregate of all the items.

Bidder's Signature

Date

Site Location

Table of Contents

January 2024 Specifications:

Mille Lacs Project

BE-21-L42: HPS Scattered Tribal Procurement Well Investigation

Indian Health Service

Bemidji Area

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SECTION 01100
SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

A. The work to be performed under this contract shall consist of furnishing the following to perform the work outlined in these specifications and as indicated by Project Drawings:

1. tools
2. equipment
3. materials
4. labor
5. supplies
6. manufactured articles
7. all transportation to complete the work
8. temporary facilities

B. Location of Work: 28510 State Hwy 123, Sandstone, MN 55072

C. Incidentals Items: All work, materials, and services not expressly listed as being provided by others or not expressly called for in the contract but are necessary for the completion of the work in good faith, shall be furnished, installed, and performed by the contractor.

1.02 SUMMARY OF WORK TO BE DONE BY CONTRACTOR

A. Inspection and repair services are needed for an existing 4-inch, steel cased, open hole well that serves a single family home in Sandstone, MN. The homeowner reports inconsistent water supply to the home when multiple water sinks, faucets, and/or showers are in use with water coming out rusty and then shutting off. All work is to be completed in accordance with MN Rules Ch. 4725. The following services are requested:

1. Report static water level
2. Test pump for yield and drawdown
3. Inspect well components. Repair/replace as necessary after receiving approval from the Project Engineer
   a. Well cap
   b. Well casing
   c. Drop pipe
   d. Electrical cable
   e. Well pump and motor
   f. Pitless adapter

g. Pressure tank
4. Bacteriological and chemical analyses
5. Note deficiencies and recommend repairs and feasibility of continued use of well.

1.03 ADDITIONAL INFORMATION

A. For information regarding the technical aspects of the project, contact the Engineer:

Matt Chosa
Project Engineer
Indian Health Service
705 5th Street NW, Suite E
Bemidji, MN 56601
Telephone: 218-444-0526

B. For information regarding contracting information, contact the Owner's Representative for this project:

Brian Scheinost
Director of Public Works
43188 Timber Trail Road
Onamia, MN 56359
Telephone: 320-532-7437

END OF SECTION

SECTION 01270
PRICE AND PAYMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Work covered by this section includes method of measurement and basis of payment for all divisions included.

B. Payment for the various items of the Bid Schedule, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, materials, labor, supplies, manufactured articles, transportation, and temporary facilities required to complete the work in accordance with contract documents including incidentals.

C. Respective prices and payment shall constitute full compensation for all work completed including incidentals.

D. All items not expressly listed as being provided by others that are necessary for the completion of work shall be furnished and installed by the Contractor.

E. No payment shall be made for mobilization and demobilization of equipment.

1.02 ESTIMATED QUANTITIES

A. All quantities stipulated in the bid schedule or other contract documents are approximate and are to be used: (1) as a basis for estimating the probable cost of the work and (2) for the purpose of comparing the bids submitted.

B. The Contractor shall be paid for actual quantities installed based on the quantities measured in the field. The actual amounts of work completed and materials furnished may differ from estimated quantities. The Contractor shall make no claim for damages, anticipated profits, or otherwise, on account of differences between the estimated amounts and the actual amount of work performed and materials furnished.

1.03 SURVEY AND MEASUREMENTS

A. All quantity measurements shall be the responsibility of the Contractor and will be verified by the Engineer.

B. All measurements and subsequent payments will be based on completed and accepted work performed in strict accordance with the drawings, specifications, and other contract documents.

PART 2 – BID SCHEDULE ITEMS

2.01 GENERAL

A. Payment shall be full compensation to complete the work items in good faith, including incidental work.

B. In addition to the those things listed under each item, the unit price bid shall be full compensation for all of the following:

1. General requirements in Division 01, but not limited to the following.

a. Submittals
b. Record drawings

2. Specific requirements in Division 02, including but not limited to the following (unless otherwise expressly defined as a line item in the bid schedule):

a. Erosion control
b. Clearing and grubbing
c. Removal and replacement of obstructions
d. Associated trenching, excavation and backfill including the removal of any nuisance water, bedding, haunching, and compaction.
e. Disposal of any excess material
f. Rough grading
g. Finish work, where called for, including finish grading, topsoiling, and landscaping

2.02 BID ITEMS

1. Inspection of 4-inch steel cased well

a. Measurement: Lump Sum.
b. Basis for Payment: Includes all labor, materials, tools, mobilization, and equipment to inspect the Well Cap, Pitless Adapter, Well Casing, Drop Pipe, Electrical Cable, and Well Pump and Motor for proper operation. Also includes well disinfection in accordance with MN Rules Ch. 4725. Any deficiencies will be noted and communicated to the Project Engineer along with recommendations for repair.

2. Well Cap

a. Measurement: Each unit installed
b. Basis for Payment: Payment shall be for full compensation for each new well cap installed including necessary appurtenances and disposal of old unit.

3. Pitless Adapter

a. Measurement: Each unit installed
b. Basis for Payment: Payment shall be for full compensation for each new pitless adapter installed including necessary appurtenances and disposal of old unit.

4. 1-inch PE Drop Pipe

    a. Measurement: Linear foot
    b. Basis for Payment: Payment shall be for full compensation of all equipment, material, fittings, disposal of old drop pipe, and all other necessary appurtenances to complete the work as specified.

5. ½ Horsepower Submersible Pump

    a. Measurement: Each unit installed
    b. Basis for Payment: Payment shall be for full compensation of all equipment, material, fittings, check valve, disposal of old pump, and all other necessary appurtenances to complete the work as specified.

6. Submersible Pump Cable

    a. Measurement: Linear foot
    b. Basis for Payment: Payment shall be for full compensation of cable, materials, and splices.

7. Pressure Tank

    a. Measurement: Each unit installed
    b. Basis for Payment: Payment shall be full compensation for pipe, fittings, connections, pressure tank, pressure switch, and pump controller.

8. Test Pump for Yield and Drawdown

    a. Measurement: By the hour
    b. Basis for Payment: Payment shall be full compensation for test pumping, collection of drawdown measurements, and all other appurtenances required to complete the work as specified. Contractor shall furnish pump and provide generator and all other equipment. Payment will only be made after test pump results have been provide to the Project Engineer.

9. Chemical and Bacteriological Analysis

    a. Measurement: Each
    b. Basis for Payment: Payment shall be full compensation for collection of samples and completion of chemical analyses including Temperature, pH, Nitrate, Arsenic, Iron, Manganese, and Hardness as well as Total Coliform Bacteria from a laboratory certified under MN Rules 4740.2010 to 4740.2120. Payment will only be made after the chemical analyses and negative bacteriological test results have been submitted to the Project Engineer. See Section 02523 Well Analyses for additional details.

PART 3 – EXECUTION (N/A)

END OF SECTION

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SECTION 01300
ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes the administrative notes and requirements for this contract.

1.02 For all contracts:

A. The Indian Health Service (IHS) is the engineer for this project; however, this is not a federal contract. IHS reserves the right to inspect the work performed by the Contractor or any of its Subcontractors. IHS does not represent the Tribe and the Tribe does not represent IHS regarding any matter related to administration of this Contract.

B. IHS Indian preference requirements apply to the solicitation and award of this contract. If the tribe has enacted an Indian preference ordinance, it may apply in lieu of the IHS requirements.

C. SUSPENSION AND TERMINATION OF WORK

1. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any change proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

2. If the Contractor fails to perform the work in accordance with the Contract Documents, Owner may declare the Contractor to be in default and give Contractor notice that the Contract is terminated. The termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor.

3. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for completed and acceptable work executed in accordance with the Contract Documents prior to the effective date of termination. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

D. Contractor shall comply with 41 CFR 60-1.4(b) in accordance with Executive Order 11246, “Equal Employment Opportunity,” as amended by Executive Order 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity.

E. Debarment and Suspension (Executive Orders 12549 and 12689)—A contract award (see 2 CFR 180.220) must not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR part 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

F. Contractor is required to perform thirty-three and one-third percent of the total amount of the Work using its own employees and equipment. Copies of subcontract agreements may be requested to verify the amount of Work performed.

1.03 For Contracts Exceeding $2,000:

A. The Contractor shall comply with wage and provisions of the Davis-Bacon Act (40 U.S.C. 3141-3148) as supplemented by Department of Labor regulations (29 CFR part 5). In accordance with the statute, Contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor.

B. The Contractor shall comply with the Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR part 3). The Act provides that each Contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled.

1.04 For Contracts Exceeding $10,000:

A. Contractor shall comply with the requirements of 41 CFR 60-4 regarding required notices and procedures to be followed in soliciting for federally assisted construction contracts (including subcontracts). Compliance with Executive Order 11246 and 41 CFR part 60-4 shall be based on implementation of the Equal Opportunity Clause, specific affirmative active obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4.3(a) and efforts to meet the goals established for the geographical area where the Contract is to be performed.

1.05 For Contracts Exceeding $100,000:

A. The Contractor shall comply with the provisions of the Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Under 40 U.S.C. 3702 of the Act, each Contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous.

B. The Contractor shall comply with the provisions of the Byrd Anti-Lobbying Amendment (31 U.S.C. 1352), certifying that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award.

END OF SECTION

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SECTION 01310
PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes the preconstruction conference, construction scheduling and coordination requirements.

1.02 PRE-CONSTRUCTION CONFERENCE

A. Required after award of contract and prior to start of construction.

B. Representatives from the following shall attend.

1. Prime Contractor
2. Subcontractors
3. Engineer and Technical Representative
4. Owner's Representative

C. Engineer will arrange a date that is mutually acceptable to all parties planning to attend.

D. Contractor shall notify subcontractors of time and date of meeting.

1.03 CONSTRUCTION SCHEDULE

A. Present Owner and Engineer with a written preliminary construction schedule containing start and completion dates of the major items at the preconstruction meeting.

B. Notify the Owner and Engineer seven (7) days in advance of any construction.

C. Communicate major changes to the schedule to the Owner and Engineer in writing.

1.04 WORKING HOURS/DAYS

A. Except as required for safety purposes, all work shall be performed during regularly scheduled working hours. The Contractor shall not work on Saturday, Sunday, or a Federal holiday without the Owner and Engineer's consent.

1.05 COORDINATION WITH OTHER CONTRACTORS/UTILITIES

A. Coordinate work with other contractors (i.e. roads, building, etc) in the area as necessary to complete the work specified.

B. Coordinate work with local utilities (i.e. water and sewer, power, telephone). Note: all buried utilities may not be shown on the plans. Contractor's responsibility for having utilities marked prior to construction.

END OF SECTION

SECTION 01330
SUBMITTAL PROCEDURE

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes information on submittal procedures. Materials requiring submittal are listed in the appropriate specification section.

1.02 SUBMITTAL PROCEDURES

A. Submit copies of submittals to the Engineer, unless requested otherwise.

1. Contractor's option:
    i. Two (2) hard copies.
    ii. An electronic copy in pdf format delivered to Engineer via email or other means as approved by the Engineer.

B. Identify each cut sheet or shop drawing with the following information:

1. Contract number.
2. Supplier.
3. Specification section to which the submittal pertains.

C. Submit the following information, as applicable:

1. Manufacturer's cut sheets indicating compliance with references (e.g. applicable ASTM, AWWA standards).
2. Laboratory results, as applicable.
3. Dimensional drawings or shop drawings, as applicable.
4. Other information necessary for the Engineer to determine compliance with the specifications.
5. Clearly identify brand, manufacturer, model number, sizes, and all other information on each cut sheet to identify the exact product being submitted for approval.

D. Identify variations from the contract documents and product or system limitations that may be detrimental to successful performance of the completed work.

E. Revise and resubmit submittals as required and identify all changes made since previous submittal.

F. Distribute copies of reviewed submittals to concerned parties, (i.e. suppliers, sub-contractors).

G. Submit written communication of any inability to comply with the Engineer's comments.

H. Submit information to the Engineer at least three weeks in advance of the work to be performed.

I. Approval of submittals must be provided by the Engineer prior to installation of materials.

END OF SECTION

SECTION 01420
REFERENCES

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes a list of common organizations, associations or appropriate agencies with jurisdiction that have references, standards, laws or regulations cited in these specifications. This list is not all-inclusive. Other agencies (county, local, tribal) with jurisdiction might not be listed here.

B. Use latest revision of all references, standards, laws or regulations.

1.02 LIST OF ORGANIZATIONS, ASSOCIATIONS & AGENCIES

A. National Standards Organizations & Associations

American Association of State Highway and Transportation Officials (AASHTO)
444 North Capital Street NW, Suite 249
Washington DC, 20001
(202) 624-5800
www.aashto.org

American Concrete Institute (ACI)
ACI International
PO Box 9094
Farmington Hills, Michigan 48333-9094
(810) 848-3700
www.aci-int.org

American Society for Testing and Materials (ASTM)
100 bar Harbor Drive
West Conshohocken, Pa 19428-2959
(610) 832-9585
www.astm.org

American Water Works Association AWWA
6666 West Quincy Avenue
Denver, CO 80235
(303) 794-7711
www.awwa.org

National Electric Code (NEC)
National Fire and Protection Association
1 Batterymarch Park
Quincy, MA 02269-9959
1 888 632-2633
www.nec.com

National Electrical Manufacturer's Association
NEMA
1300 North 17th Street
Rosslyn, VA 22209
(703) 841-3200
www.nema.org

Underwriters' Laboratories, Inc. UL
333 Pfingston Road
Northbrook, IL 60062
(847) 272-8800
www.ul.com

B. Federal Agencies

Environmental Protection Agency (EPA)
Region 5
77 West Jackson
Chicago, IL 60604-3507
http://www.epa.gov/r5water/

Occupational Health and Safety Administration
Region 5 (OSHA)
238 South Dearborn Street , Room 3244
Chicago, IL 60604
www.osha.gov

C. State Agencies

Minnesota Department of Transportation
(MNDOT)
Transportation Building
395 John Ireland Boulevard
St. Paul, MN 55155
1 800 651-3774
www.dot.state.mn.us

Minnesota Pollution Control Agency (MPCA)
Individual Sewage Treatment System Standard
520 Lafayette Road
St Paul, MN 55155
1 800 657-3864
www.pca.state.mn.us

Minnesota Department of Health
717 Delaware Street South East
Minneapolis, MN 55440-9441
(651) 201-5000
www.health.state.mn.us

D. Local Agencies

1. Contractor shall review other local agency requirements to determine applicability with this project.

E. Tribal Organizations

1. See Section 01100 for appropriate tribal contact regarding tribal laws.

PART 2 – PRODUCTS (N/A)

PART 3 – EXECUTION (N/A)

END OF SECTION

SECTION 01430
QUALITY ASSURANCE

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes prerequisites and procedures to assure the quality of construction.

1.02 SUBMITTALS

A. Contractor Name and License Number

1.03 INSTALLER QUALIFICATIONS

A. Work shall be performed under the direction of personnel licensed in the state/reservation where the project is proposed and where licensing of the trade is regulated by the state/reservation including, but not limited to, plumbing, well drilling, septic system installation, HVAC, and electrical work.

1.04 CONTROL OF INSTALLATION

A. Review materials for acceptability when delivered to the site.

B. Store and handle materials to prevent damage.

C. Review materials, services, and workmanship to ensure that work is performed in accordance with the specifications.

D. Comply fully with manufacturers' instructions.

E. Should manufacturers' instructions conflict with contract documents, request clarification from Engineer before proceeding.

F. Correct defective work to the satisfaction of the Project Engineer.

1.05 MANUFACTURER'S FIELD SERVICES

A. Provide reports on observations and documentation of workmanship to the Engineer within 30 days of visit for review where manufacturers' field services are provided.

1.06 WARRANTY

A. Provide a minimum one (1) year warranty for all materials and labor, covering defects in the materials or deficiencies resulting from contractor installation.

B. Provide additional warranties as required under other sections.

END OF SECTION

SECTION 01770
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes information on closeout procedures and final cleaning.

1.02 RELATED WORK

A. Section 01780 – Closeout Submittals

1.03 CLOSEOUT PROCEDURES

A. Submit written certification that work is complete in accordance with contract documents and ready for final inspection at least three (3) working days prior to final inspection.

B. Provide warranties and record documents (e.g. as-built drawings) to the Engineer that are required within ten (10) days after date of first beneficial use. Refer to Section 01780.

1.04 FINAL CLEANING

A. Complete final clean-up prior to final inspection.

B. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.05 FINAL INSPECTION

A. A final inspection of the facilities shall be conducted in the presence of the Owner, the Engineer, and the Contractor, at a minimum.

B. Final inspection shall include inspection of all facilities installed under the project.

1.06 PUNCH LIST

A. Any deficiencies noted at the Final Inspection will be communicated to the Contractor through a letter from the Engineer.

B. All deficiencies will need to be completed before full payment is made.

C. Retainage for punch list items shall be based on the estimated cost to retain another contractor to finish the deficient work items.

END OF SECTION

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SECTION 01780
CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. This section describes the requirements for closeout submittals including, record drawings, warranty information and general operation and maintenance information.

1.02 RELATED WORK

A. Section 01430 – Quality Assurance
B. Section 01770 – Closeout Procedures
C. Section 01785 – Operation and Maintenance Manuals (If applicable)

1.03 DELIVERY

A. Provide all closeout submittals meeting these requirements and any specific requirements of each section.

B. Closeout submittals must be received before payment is requested for the work that the drawings describe or illustrate.

C. All closeout submittals must be received in a correct and complete manner before final payment can be made. If material is deficient, the deficiencies will be indicated in punch lists (Section 01770).

1.04 DEFINITIONS

A. Record Drawing: A drawing showing the actual installation of facilities, showing changes from the plans, and showing detail enough that future persons can readily locate all objects.

B. Ties: Measurements from permanent easily located objects to an installed object.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 RECORD DRAWINGS

A. Provide record data in one of the following manners:

1. On a set of project drawings, neatly draw tie measurements and changes.
2. On separate 8½ X 11 sheets (see 01780D – Closeout Submittal Drawings), neatly draw site sketches, structure sketches, etc., indicating the necessary information.

B. Provide three (3) swing tie measurements to all buried utility objects that may need to be located in the future, including, but not limited to:

1. Gate valves
2. Corporation stops
3. Curb stops
4. Water main fittings
5. Couplings to existing water systems.
6. Cleanouts
7. Sewer wyes.
8. Utility crossings.
9. Septic tank manholes and access covers.
10. Corners of drainfields
11. Tracer Wire Boxes

C. Provide offset measurements for buried utilities (e.g. water main) installed parallel to roads.

D. Provide revised elevation data for all items that have elevations shown on the plan drawings, including, but not limited to, the following:

1. Manhole inverts (inlet and outlet)
2. Manhole rims
3. Lift station invert
4. Lift station top
5. Lift station pipe penetrations
6. Float elevations
7. Septic tank elevations
8. Elevations of pipe entering and leaving structures
9. Elevation of sewer service line stub (if terminated at right of way)
10. Other elevations indicated on profiles.

E. Provide installed bid schedule items quantities for individual facilities on 8½ X 11 sheets.

1. Engineer may supply standard forms for use by the Contractor.

3.02 WARRANTIES

A. Submit all warranty information regarding the materials installed.

B. Minimum warranty information is listed in Section 01430.

3.03 OPERATION AND MAINTENANCE INFORMATION

A. Submit all operation and maintenance information as included in the packaging from the manufacturer regarding the materials installed.

B. Additional project specific operation and maintenance requirements are listed in Section 01785.

END OF SECTION

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SECTION 01781
SITE INSPECTIONS

PART 1 - GENERAL

1.01 SUMMARY

A. This section describes the requirements for inspection and documentation of the services installed at the sites.

1.02 RELATED WORK

A. Section 02500-series – Water and Sewer Construction Specifications

1.03 REFERENCES

A. Minnesota State Rules Chapter 7080 - Minnesota Pollution Control Agency Design Standards for Individual Subsurface Sewage Treatment Systems

B. Minnesota State Rules Chapter 4725 – Department of Health Wells and Borings

1.04 SUBMITTALS

A. "MPCA Compliance Inspection Form" - available from the University of Minnesota Onsite Sewage Treatment Program - http://septic.umn.edu/realtor/compliance/index.html

B. Site Drawing – Use attached form

1.05 QUALITY ASSURANCE

A. All inspections must be performed and signed by a licensed ISTS Inspector in accordance with Minnesota State Rules Chapter 7080 and applicable local statutes.

B. All inspections should be documented on the latest forms available from the University of Minnesota Onsite Sewage Treatment Program. Designs submitted using forms which are not the latest revision will not be accepted.

C. All inspections must be done by a third-party. Inspections by the owner or the installer will not be accepted.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 SITE EVALUATION

A. Coordinate with Tribal Public Works to receive a list of home sites which need inspection services and the design specifications for each site.

B. Coordinate with property owner and Tribal Public Works department to gather information necessary to complete the Inspection Forms and arrange opportunity to review each site.

C. Inspection of water service lines, sewer service lines, wells, and individual sewer treatment system all require submittal of a site drawing.

D. Inspection of an individual sewer treatment system requires submittal of the MPCA Compliance Inspection Form. Verification methods used in the inspection must be noted on the forms.

E. Soil separation compliance shall be performed by conducting new, independent soil observations.

3.01 SITE DRAWINGS

A. Provide site drawing on the attached form.

B. One drawing per sheet is adequate, unless the services installed render the drawing too complicated to be legible. In that case, additional pages will be accepted.

C. All drawings should be neatly drawn.

1. On a set of project drawings, neatly draw tie measurements and changes.
2. On separate 8½ X 11 sheets, neatly draw site sketches, structure sketches, etc., indicating the necessary information.

D. Provide three (3) swing tie measurements to all visible components of the system and inspection, including:

1. Well heads
2. Cleanouts
3. Septic tank manholes and access covers.
4. Inspection pipes
5. Structure corners
6. Soil borings

END OF SECTION

SECTION 02512
INDIVIDUAL HOUSEHOLD WATER SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the installation of submersible pumps, drop pipe, electrical cable and controls, pressure tanks, service lines, and pitless units from the well to the household.

1.02 RELATED WORK (as applicable)

A. Section 02315 – Excavation, Trenching and Backfill
B. Section 02525 – Individual Well Drilling

1.03 REFERENCES

A. ASTM A 53 – Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

B. ASTM D 1785 – Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120

C. AWWA C901 – Polyethylene (PE) Pressure Pipe and Tubing, 1/2 Inch Through 3 Inch, for Water Service

D. National Electric Code (NEC)

1.04 SUBMITTALS

A. Heavy Duty Brass Check Valve
B. Submersible Cable
C. Submersible Pumps
D. Drop Pipe
E. Buried Cable
F. Water Service Line and Fittings
G. Pressure Tank and Switches
H. Freezeless Risers
I. Service Line Risers
J. Lightning Arrestor (if not built into motor)
K. Tubing/Pipe and Fittings
L. Heat Tape and Pipe Insulation
M. Flow Control Valve

N. Pitless Adapter and Well Cap
O. CLOSEOUT SUBMITTAL – Copy of Drinking Water Notice provided to each individual served

PART 2 - PRODUCTS

2.01 SUBMERSIBLE PUMPS

A. Submersible pumps shall be sealed and constructed of all corrosion resistant materials including all exposed parts of both the pump and motor.

1. Impellers and diffusers shall be constructed of bronze, stainless steel or plastic.
2. Pump shaft shall be hexagonal or splined stainless steel and connected to the motor shaft with a splined coupling.
3. Pump casing shall be bronze, brass or stainless steel.
4. Motor adapter and pump discharge head shall be bronze, brass or other corrosion resistant material.
5. Motor casing and end caps shall be stainless steel, brass, bronze or other corrosion resistant material.

B. Pump Requirements:

1. Pump Design for 3 Wire Installation unless specified otherwise in Section 01119
2. High Torque Motor
3. 230 Volt Operation
4. Overload Protection
5. Solid State Starting Switch
6. NEMA Standard for Universal Motor Replacement
7. 1/3 horsepower pumps shall have a pumping capacity of 8 gpm against a total head of 150 feet.
8. 1/2 horsepower pumps shall have a pumping capacity of 8 gpm against a total head of 200 feet.
9. 3/4 horsepower pumps shall have a pumping capacity of 8 gpm against a total head of 280 feet.
10. 1 horsepower pumps shall have a pumping capacity of 8 gpm against a total head of 360 feet
11. A check valve shall be installed in the pump.

C. Size the pump to be installed based on test pump data and well log.

D. Lightning protection shall be built into the pump motor or a submittal for the arrestor and installation method shall be provided.

2.02 SUBMERSIBLE PUMP CABLE

A. Use RHW insulated and jacketed, U.L. approved, rated at 600 volts, manufactured in accordance with the NEC and be a minimum size of No. 12.

1. Submersible pump cable shall be Essex CPE, MilSpec Milpreme double insulated or approved equal.
2. THW insulated and jacketed pump cable meeting the above requirements such as Centriline HILO Supreme or approved equal may be substituted for the RHW standard.

B. Allowable voltage drop through the cable, from the electrical service to the pump motor, shall be in accordance with pump manufacturer's recommendation.

C. Waterproof splice shall be in accordance with pump manufacturer's recommendation.

2.03 DROP PIPE AND FITTINGS

A. Steel Drop Pipe

1. Conform to ASTM A 53
2. Pipe shall be Schedule 40 galvanized steel with a nominal size of 1-inch.
3. Galvanized steel couplings shall be used to connect pipe sections.

B. PVC Drop Pipe

1. Conform to ASTM D 1785
2. Pipe shall be threaded Schedule 80 with a nominal size of 1-inch.
3. Couplings shall be machined from extruded, not molded, PVC.

C. PE Drop Pipe

1. Conform to AWWA C901
2. Pipe shall be ultra-high molecular weight, IDR 7, 1-inch IPS with a minimum pressure rating of 160 psi.
3. Torque arrestor shall be equal to Merril No. STA-48.
4. Cable protector centering device shall be equal to Merril No. CG-46.

D. Check valves shall be equal to Clayton Mark No. 6300.

E. Flow control valves shall be equal to a Merrill Dole Valve, G series flow regulator.

2.04 WATER SERVICE LINE

A. Conform to AWWA C901.

B. Ultra-high molecular weight, PE 3406, 3408, 3608, or 4710, IDR of 7 or 9 with a minimum pressure rating of 160 psi, and suitable for use with potable water.

2.05 PIPING AND FITTINGS

A. Copper tubing: ¾ inch seamless, thick-wall type L with a minimum wall thickness of 0.045 inches.

1. Only copper tubing is allowed for installations under mobile homes and other homes without a basement where piping is located in an unheated space.

B. PEX tubing: ¾ inch cross linked polyethylene tubing, ASTM F876 and F877, and approved for use with potable water.

C. Copper tubing fittings: Compression type connections or adapter with union used for copper pipe equal to those manufactured by Hays Manufacturing Company, A.Y. McDonald, Mueller Company or Ford Meter Company.

D. PEX tubing fittings: Crimp fittings specifically manufactured for use on PEX tubing.

E. No galvanized fittings are allowed.

2.06 HEAT TAPE AND PIPE INSULATION

A. Heat tape: Non-thermostatically controlled heat tape with stainless steel braiding equal to Easyheat Freeze or Frotex Wintergard.

B. Pipe insulation: Preformed foam pipe insulation. Thickness shall be in accordance with manufacturer’s recommendation.

2.07 PIPE HANGERS

A. Shall be made of a material compatible with piping material.

B. Shall be of sufficient strength to support the pipe at full capacity.

C. Shall not affect pipe integrity by either abrading, cutting or bending of pipe.

2.08 PRESSURE TANK

A. Supply pressure tanks precharged in accordance with the manufacturers recommendations, for a 30 to 50 psi operating range, having a sealed container or diaphragm that prevents contact of water with air.

B. Tanks shall be lined with a noncorrosive material that does not impart taste or odor to the water and provide a minimum of 8.9 useable gallons of draw down.

C. Tanks shall be equal to Well-X-Trol Model WX-203 or Champion Model CM-8003.

D. Pressure switches shall be equal to Square D Model FSG2.

2.09 PLUMBING TREE

A. The plumbing tree in front of the pressure tank includes the following:

1. ¼ turn brass lever ball valve
2. Metal sample faucet with smooth bore hole or a hose bibb with vacuum breaker. Minimum diameter ¼ inch.
3. Pressure switch
4. Pressure gauge
5. Dielectric union

2.10 BURIED CABLE

A. Underground wiring shall be type UF for direct burial with a minimum size of No. 12.

B. Size underground wiring to limit the total voltage drop from the electrical service to the pump motor in accordance with manufacturer's recommendations.

2.11 FREEZELESS RISERS

A. No galvanized fittings are allowed when connecting the freezeless riser.

B. Risers must be provided with a swing joint and be equal to True–Temp Positive Purge Model 7PPDB with copper riser pipe or Thermaline model 15.

C. Freezeless riser manufacturer shall supply the thermostatically controlled heat tape unless riser shut off valve is installed above floor grade.

D. Use compression type or an adapter with union connections for copper pipe.

1. Acceptable manufacturers are Hays Manufacturing Company, A.Y. McDonald, Mueller Company or Ford Meter.

2.12 SERVICE LINE RISERS

A. Riser pipe: 4-inch Schedule 35 PVC pipe.

B. Heat tape: Non-thermostatically controlled heat tape with stainless steel braiding equal to Easyheat Freeze or Frotex Wintergard.

C. Preformed foam pipe insulation 1-1/2 thick and pre-slit.

2.13 PITLESS ADAPTER AND CAP

A. Steel Cased Wells: Weld-on type, equal to Maass Model J, with 1-inch size water outlet.

B. PVC Cased Wells: Equal to Safe-T-Seal, with a 1-inch water outlet.

C. Cap

1. Vented, weather and vermin proof cap with gasket. All nuts and bolts shall be made of non-corrodible material.
2. Screened downward facing vent not less than ¼-inch in diameter.
   a. Screen shall be made of non-corrodible material.

PART 3 - EXECUTION

3.01 GENERAL

A. Obtain Engineer's approval to install water system if well yields less than 5 gpm.

B. Install water system in accordance with state and local codes.

3.02 PITLESS ADAPTER

A. Steel Cased Wells

1. Weld onto casing 8 feet below grade.
2. Seal with neoprene o-ring.
3. Conform to state and local codes.

B. PVC Cased Wells

1. Install onto casing 8 feet below grade.
2. Connection shall be watertight.

3.03 WELL CAP

A. Install well cap tightly to top of well casing to provide sanitary seal.

B. Seal any unscreened openings until conduits are connected.

3.04 PUMP AND DROP PIPE

A. Install pump a minimum of 5 feet to a maximum of 20 feet below the drawdown level measured from the top of pump unless otherwise directed by the Engineer.

B. Do not install pump in well screen unless otherwise directed by the Engineer.

C. Set and install drop pipe and submersible pump in accordance with state and local codes.

1. If a change in pump size is required, the Contractor and contracting officer shall negotiate a new pump price.

D. Install a check valve midway between the pump and pitless adapter in drop pipe greater than 200 feet.

E. Use tape or approved joint compound on all threaded connections.

F. The depth limitation for using Schedule 80 PVC is 400 feet.

G. PE Pipe

1. Install PE pipe in one single length (no couplings) from the pitless unit to the submersible pump.
2. Install an approved torque arrestor at the pump.
3. Install cable protector devices every 50 feet above the pump to center the PE pipe in the casing.
4. The depth limitation for PE pipe is 300 feet and the maximum pump size is 1 horsepower.

H. If required by the Engineer, install flow control valve between the pitless spool and the drop pipe unless specified otherwise in Section 01119.

3.05 SUBMERSIBLE CABLE

A. Securely attach submersible pump cable to the drop pipe every 10 feet, using tape or other method approved by the Engineer.

B. Provide an extra 12 inches of cable under the well cap.

C. The only splice allowed in the pump cable will be at the motor and the splices shall be made using taped, mechanical or resin splices.

D. Test cables for leakage or shorts using an ohmmeter or megger.

3.06 TRENCH EXCAVATION AND BACKFILLING

A. Refer to Section 02315 for excavation and backfilling requirements.

3.07 WATER SERVICE LINE

A. Bury water service lines 8 feet deep unless otherwise noted in section 01119.

B. Connect water service line to the pitless adapter with a brass or bronze swing joint connection as shown on the plans.

C. If the water from the house has been installed, connect the water line to the stubbed out line from the house, otherwise extend into the house and connect into the plumbing for the hydropneumatic tank.

1. Provide a watertight seal on the penetration through the wall.

2. For connecting beneath the home, install pipe hangers at a maximum spacing of 6 feet apart for all horizontal copper tubing and 2 feet apart for all horizontal PE pipe inside the home.

D. Make connections with brass insert adapters and two stainless steel hose clamps or non-flare brass compression fittings.

E. Where designated by the Engineer, terminate the water service line 5 feet from the house and cap.

1. Mark the end with a 2 by 4-inch stake painted blue extending 1-foot above grade and 4 feet below grade.

3.08 UNDERGROUND UTILITY CONFLICTS

A. Refer to Section 02315.

3.09 BURIED CABLE

A. Install underground cable in accordance with local utility regulations, the NEC, applicable state and local codes and the attached drawings.

B. No underground splices are allowed.

C. Control power to each unit with a fused disconnect switch or manually reset circuit breakers placed in the home, where possible, or otherwise on a power pole near the well.

D. Provide disconnecting means located in site of controller location.

E. Connect underground wiring to the pump cable under the well cap. Provide an extra 12 inches of slack cable under the well cap.

F. Securely attach the ground wire to the casing with a threaded metal screw tapped into or drilled through the casing.

G. Ground the submersible pump and well casing to the panel in accordance with the NEC.

H. Install wiring in a rigid galvanized steel or Schedule 80 PVC conduit at the electrical entrance and the wellhead to 2 feet below ground.

1. Conduit end shall be smooth and free of sharp edges
2. Snuggly fit the conduit end into the well cap. Maintain sanitary seal.
3. Bushings are required as shown on the detailed drawing.

I. Provide sufficient slack in the wire to prevent separation of the cable.

J. Underground wire may be placed in the same trench and located at the same depth as the water service line.

K. For mobile homes and houses without basements, install underground wire in rigid conduit when placed below the structure.

3.10 FREEZELESS RISER

A. Install freezeless risers below each mobile home and other homes where required at the locations established by the Engineer.

B. Install directly below the point of connection to the house plumbing, whenever possible.

C. Set risers vertical except for mobile homes.

1. Set mobile home risers at an angle that will allow for the removal of the interior components of the riser without moving the mobile home or excavating the freezeless riser.

D. For homes requiring freezeless risers install copper tubing from the riser to the house plumbing.

1. Install pipe hangers at a maximum spacing of 6 feet apart for all horizontal copper tubing inside the home.

E. At 90 degree bends install elbows or make long radius bends.

F. No kinks in the copper tubing will be permitted.

G. Make solder joints with lead free solder.

H. Risers with shut off valves installed above floor grade shall be equipped with non-thermostatically controlled heat tape.

3.11 SERVICE LINE RISER

A. Install service line riser below each mobile home and other homes without a basement.

B. Install directly below the point of connection to the house plumbing whenever possible.

C. Install 4-inch PVC riser around water service line from a depth of 5-feet below grade to 2-4 inches above grade.

1. Riser shall be set vertical.

D. Install non-thermostatic heat tape straight along the service line with preformed foam pipe insulation inside the PVC riser.

1. Heat tape shall be against water service line.

2. Water service line and heat tape shall be completely wrapped with preformed pipe insulation.

3. Heat tape and preformed insulation shall be placed to the bottom of the PVC riser.

E. Place 6-inches of fiberglass batt insulation in the top of the 4-inch PVC riser to prevent debris from entering the riser.

F. Install copper tubing from the riser to house plumbing.

3.12 CONNECTION OF WATER SERVICE LINE TO HOME

A. Install only copper tubing for installations under mobile homes and other homes without a basement where piping is located in an unheated space.

1. Install copper tubing/pipe from freezeless riser or service line riser to connection to the home.

2. Utilize fittings to change direction of piping or make long radius bends. Kinks in the copper tubing are not allowed.

3. Solder joints with lead free solder.

4. Heat tape shall be installed along the copper tubing/pipe from the end of the freezeless riser or service line riser in accordance with the manufacturer's recommendations.

5. Preformed foam pipe insulation shall be installed from the end of the freezeless riser or service line riser to the connection to the home in accordance with the manufacturer's recommendations.

    i. Heat tape and copper tubing/pipe shall be wrapped completely with the performed foam pipe insulation.

6. Contractor shall verify there is adequate wraps of heat tape around the copper tubing/pipe and that the supplied preformed pipe insulation is of adequate thickness to prevent freezing of the copper tubing/pipe.

7. Plug heat tape into dedicated outlet underneath the home. If there is no outlet, the homeowner is responsible for installation of an outlet for the heat tape. Extension cords are not allowed. Contractor shall notify the engineer and homeowner if there is not an electrical outlet to plug in the heat tape.

8. If service line riser is installed, use one run of heat tape for entire length of service line riser and tubing/piping for connection of water service line to the home.

9. Connection of the water service line to the home within a heated space shall be done with similar pipe material as the house plumbing with either copper or PEX tubing as specified.

3.13 BACTERIOLOGICAL SAMPLE/DRINKING WATER NOTICE

A. Provide bacteriological sample for water system after system has been installed and flushed.

B. Contractor shall inform the homeowner(s) not to consume any water until a safe bacteriological and chemical analysis result has been received by using the "Drinking Water Notice" form attached to this specification.

C. Provide a copy of the “Drinking Water Notice” to the Engineer. No payment will be made for water system until the bacteriological sample result and “Drinking Water Notice” has been received.

3.14 PRESSURE TANK AND FITTINGS

A. Place tanks inside home as located by the Engineer and the homeowner.

B. Install tanks as shown on the attached drawings, including pressure gauge, pressure switch, brass tank cross, sample faucet, ball valve and all miscellaneous fittings and adapters.

1. Install sample faucet a minimum of 12-inches above finished floor elevation.

C. Use leveling blocks or hangers when installing tanks.

D. Connect tank to existing plumbing if available.

E. Install tank so that it can be connected to house plumbing.

F. For tanks with a steel inlet fitting use a dielectric union, installed between the inlet pipe and the brass cross.

G. Install tank and cross such that the tank can be easily removed.

H. Install pressure relief valve if required.

3.12 AS-BUILTS

A. Provide as-built information on each system in accordance with Section 01780 and Section 02525. Use IHS forms (if supplied) by the Engineer.

B. Provide Engineer with the pump setting depth.

END OF SECTION

SECTION 02523

WELL ANALYSES

PART 1 - GENERAL

1.01 BACTERIOLOGICAL ANALYSIS

A. Submit water samples to an EPA certified lab to analyze drinking water samples for compliance monitoring of contaminants 8-13 listed below.

1. Provide copy of results within 10 days of receipt of the report.

2. If a bacteriological tests are positive, notify Engineer immediately and chlorinate the well until a sample tests negative.

1.02 CHEMICAL ANALYSIS

B. The Contractor shall furnish to the project Engineer a chemical analysis of the water for each well. Copies of the results must be provided within 10 days of receipt.

C. The Contractor shall be responsible for furnishing the required size, preservative and number of containers, collecting the water sample, arranging for the chemical analysis to be performed at a laboratory that is EPA certified and furnishing the results to the Engineer. In addition, the lab must be certified in each of the specified EPA methods for the chemicals being tested.

D. The following is a list of all of the parameters to be analyzed, samples must meet the current National Primary Drinking Water Standards list determined by the U.S. E.P.A. and the minimum detection level (MDL) for each parameter shall be less than the maximum contaminant level (MCL).

PRIMARY CONTAMINANTS

Inorganic Chemicals

1. Arsenic
2. Nitrate (measured as Nitrogen)

SECONDARY CONTAMINANTS

3. Iron
4. Manganese
5. pH

OTHER PARAMETERS

6. Temperature*
7. Total Hardness

Microorganisms

8. Cryptosporidium
9. Heterotrophic plate count (HPC)
10. Legionella
11. Total Coliforms
12. E. coli
13. Turbidity

*Labs are not typically certified to measure this parameter

SECTION 16050
BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the furnishing and installing of basic electrical materials and methods.

1.02 RELATED WORK

A. Section 15400 – Plumbing Fixtures and Equipment
B. Section 16401 – Electrical Power, Service, and Distribution

1.03 REFERENCES

A. National Electric Code (NEC)
B. Underwriters Laboratories, Inc. (UL)

1.04 SUBMITTALS

A. Conductors and Cables
B. Conduit, Raceways, and Boxes
C. Wiring Devices
D. Buried Electrical Cable for Wells with Sizing Calculations

PART 2 – PRODUCTS

2.01 GENERAL

A. Meet UL standards and are UL labeled.

B. New and unused.

2.02 ENCLOSURES

A. NEMA 4X

2.03 CONDUCTORS AND CABLES

A. THWN or THW – in conduit.

B. USE or UF – direct burial underground.

C. Minimum 600 volt rating.

D. Copper conductors.

2.04 CONDUIT, RACEWAYS, AND BOXES

A. Rigid Non-metallic Conduit and Raceways.

1. Interior/underground - PVC Schedule 40.
2. Exterior/above ground – PVC Schedule 80.

B. Fittings, Boxes, Clamps, and Straps – PVC to match conduit and raceway.

C. Corrosion-proof or corrosion-resistant hardware.

D. Suitable for wet location.

2.05 WIRING DEVICES

A. Commercial grade quality.

B. Suitable for wet location.

C. Rated for minimum of 20 amps.

D. GFI duplex receptacles.

E. Provide outlets to match twist-lock plugs installed on the chemical feed pumps.

PART 3 - EXECUTION

3.01 PREPERATION

A. A new transfer/disconnect switch and breaker panel shall be installed in accordance with Section 16401.

B. A new control system shall be installed in accordance with Section 13451.

1. Existing control panel shall be removed for installation of the new control panel.
2. Existing breaker panel is incorporated into the existing control panel.
3. Ancillary components for the control system including electrical supply outlets for the chemical feed shall be supplied through the control panel in accordance with Section 13451.

3.02 GENERAL

A. Complete work in accordance with NEC.

B. Grounding of system shall be in accordance with NEC.

C. Minimum No. 12 AWG branch circuits.

D. Minimum No 14 AWG control circuits.

E. Color code and number conductors.

F. Surface mount conduit, raceways and boxes.

G. Conduit bends shall be formed with a bending machine.

H. Provide support clamps and straps to ensure a rigid installation.

I. Complete installation suitable for wet location.

J. Install power supply wiring and data input/output (4-20 mA) wiring in separate conduits for all devices that have such wiring.

END OF SECTION

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Appendix

Minnesota Unique Well Number: 472007

County: Pine
Quad: Sandstone
Quad ID: 188A

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031

Entry Date: 06/11/1991
Update Date: 02/14/2014
Received Date:

Well Name	Township	Range	Dir	Section	Subsection
PHALLER, DON	42	20	W	15	AABBCB

Elevation: 1072 Elev. Method: 7.5 minute topographic map (+/- 5 feet)

Address
C/W RR 2 BOX 9 SANDSTONE MN 55072

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
CLAY & ROCKS	0	14	BROWN	HARD
SANDSTONE	14	105		HARD

Remarks:

Well Depth: 105 ft. Depth Completed: 105 ft. Date Well Completed: 10/31/1990
Drill Method: Non-specified Rotary Drill Fluid: Bentonite
Use: domestic Status: Active
Well Hydrofractured? Yes ☐ No ☐ From To
Casing Type: Single casing Joint
Drive Shoe? Yes ☒ No ☐ Above/Below: 1 ft.

Casing Diameter	Weight	Hole Diameter
4 in. To 82 ft.	lbs./ft.	9 in. To 82 ft.
		4 in. To 105 ft.

Open Hole From 82 ft. To 105 ft.
Screen? ☐ Type Make

Static Water Level
68 ft. land surface Measure 10/31/1990

Pumping Level (below land surface)
70 ft. hrs. Pumping at 9 g.p.m.

Wellhead Completion
Pitless adapter manufacturer: MAASS Model: J
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information: Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
neat cement		10 ft.	30 ft.

Nearest Known Source of Contamination
100 feet Direction: Septic tank/drain field Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed: 11/01/1990
Manufacturer's name: AERMOTOR
Model Number: SD12-50 HP: 0.5 Volt: 230
Length of drop pipe: 70 ft Capacity: 9 g.p. Typ: Submersible

Abandoned
Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance
Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Miscellaneous
First Bedrock: Hinckley Sandstone Aquifer: Hinckley
Last Strat: Hinckley Sandstone Depth to Bedrock: 14 ft
Located by: Minnesota Geological Survey
Locate Method: Digitized - scale 1:24,000 or larger (Digitizing Table)
System: UTM - NAD83, Zone 15, Meters X: 511561 Y: 5108309
Unique Number Verification: Information from: Input Date: 09/01/1998

Angled Drill Hole

Well Contractor
A & M Drilling 48589
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Well Index Report | 472007 | Printed on 01/03/2024
HE-01205-15

WATER WELL RECORD

Minnesota Statutes 156A.01-.08

MINNESOTA UNIQUE WELL NO. for Water Sample **472007**

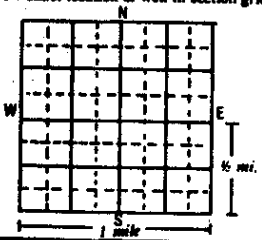
1. LOCATION OF WELL

County Name: **Pine**

Township Name: **Sandstone** | Township Number: **42N** N/S | Range Number: **20W** E/W | Section No.: **15** | Fraction: NE¼ NE¼

Numerical Street Address and City of Well Location or Distance from Road Intersection.

Show exact location of well in section grid with "X." Sketch map of well location.



Addition Name:

Block Number:

Lot Number:

2. PROPERTY OWNER'S NAME

Don Phaller

Mailing Address if different than property address indicated above.

Rt. 2, Box 9
Sandstone, MN 55072

3. FORMATION LOG	COLOR	HARDNESS OF FORMATION	FROM	TO
Clay & Rocks	Brown	Hard	0	14
Sandstone		Hard	14	105

Use a second sheet, if needed

ADDITIONAL DATA ADDED TO THIS DOCUMENT
JUN 24 1991
DATA RECEIVED By:
From:

4. WELL DEPTH (completed) 105 ft. | **Date of Completion** 10-31-90

5. DRILLING METHOD

☐ Cable Tool ☐ Reverse ☐ Driven ☐ Dug
☐ Hollow Rod ☐ Air ☐ Bored ☐ _____
☒ Rotary ☐ Jetted ☐ Power Auger

6. DRILLING FLUID Water & Bentonite

7. USE

☒ Domestic ☐ Monitoring ☐ Heat Pump
☐ Irrigation ☐ Public ☐ Industry
☐ Test Well ☐ Municipal ☐ Commercial
☐ Air Conditioning ☐ _____

8. CASING

☒ Black ☐ Threaded
☐ Galv. ☐ Welded
☐ Plastic ☐

HEIGHT: Above/Below Surface 1 ft. Drive Shoe? Yes X No

4 in. to 82 ft. Weight 10.89 lbs./ft.
_____ in. to _____ ft. Weight _____ lbs./ft.
_____ in. to _____ ft. Weight _____ lbs./ft.

HOLE DIAM.
8⅝ in. to 82 ft.
3⅞ in. to 105 ft.
_____ in. to _____ ft.

9. SCREEN Or open hole from 82 ft. to 105 ft.

Make _____
Type _____ Diam. _____
Slot/Gauze _____ Length _____
Set between _____ ft. and _____ ft. FITTINGS:

10. STATIC WATER LEVEL

68 ft. ☒ below ☐ above land surface Date Measured 10-31-90

11. PUMPING LEVEL (below land surface)

70 ft. after 1 hrs. pumping 8-10 g.p.m.
_____ ft. after _____ hrs. pumping _____ g.p.m.

12. HEAD WELL COMPLETION

☒ ☐ Pitless adapter manufacturer Maass Model J
☐ Basement, offset ☐ At least 12" above ground
☐ Plastic casing protection

13. WELL GROUTED? ☒ Yes ☐ No

☒ Neat Cement ☐ Bentonite ☐ _____
Grout material Cement from 30 to 10 ft. or yds.

14. NEAREST SOURCES OF POSSIBLE CONTAMINATION

100 feet _____ direction Septic type
Well disinfected upon completion? ☒ Yes ☐ No

15. PUMP

Date installed 11-1-90 ☐ Not installed
Manufacturer's name Aermotor
Model number SD12-50 HP ½ Volts 230
Length of drop pipe 70 ft. Capacity 8-10 g.p.m.
Material of drop pipe Plst.
Type: ☒ Submersible ☐ L.S. Turbine ☐ Reciprocating
☐ Jet ☐ Centrifugal ☐ _____

16. ABANDONED WELLS

Unused well on property? ☐ Yes ☒ No
Sealed ☐ Permanent ☐ Temporary ☐ Not sealed

17. REMARKS, ELEVATION, SOURCE OF DATA, etc.

JAN 1991 RECEIVED WELL MGT.

18. WATER WELL CONTRACTOR CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

A & M Drilling 48589
Licensee Business Name *License No.*
Address Box 23 Isle, MN 56342
Signed Harvey R. Ryan Date 12-31-90
Authorized Representative
Dana Robb Date 10-31-90
Name of Driller

MINN. DEPT. OF HEALTH COPY 472007

5/74 30M
7/76 30M
7/78 30M

1. LOCATION OF WELL

County Name: Pine

WATER WELL RECORD

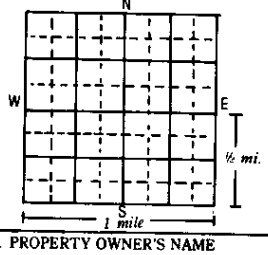
Minnesota Statutes 156A.01-.08

MINNESOTA UNIQUE WELL NO. for Water Sample: 472007

Township Name	Township Number	Range Number	Section No.	Fraction
Sandstone	42N (N or S)	20W (E or W)	15	¼ NE¼ NW¼

Numerical Street Address and City of Well Location or Distance from Road Intersection.

Show exact location of well in section grid with "X." Sketch map of well location.



Addition Name

Block Number

Lot Number

2. PROPERTY OWNER'S NAME: Don Phaller

Mailing Address if different than property address indicated above.: Rt. 2, Box 9, Sandstone, MN 55072

3. FORMATION LOG	COLOR	HARDNESS OF FORMATION	FROM	TO
Clay & Rocks	Brown	Hard	0	14
Sandstone		Hard	14	105

Use a second sheet, if needed

4. WELL DEPTH (completed): 105 ft. Date of Completion: 10-31-90

5. DRILLING METHOD
- ☐ Cable Tool ☐ Reverse ☐ Driven ☐ Dug
- ☐ Hollow Rod ☐ Air ☐ Bored ☐ _____
- ☒ Rotary ☐ Jetted ☐ Power Auger

6. DRILLING FLUID: Water & Bentonite

7. USE
- ☒ Domestic ☐ Monitoring ☐ Heat Pump
- ☐ Irrigation ☐ Public ☐ Industry
- ☐ Test Well ☐ Municipal ☐ Commercial
- ☐ Air Conditioning ☐ _____

8. CASING
- ☒ Black ☐ Threaded
- ☐ Galv. ☐ Welded
- ☐ Plastic ☐

HEIGHT: Above/Below Surface 1 ft.

Drive Shoe? Yes ___ No. X

4 in. to 82 ft. Weight 10.89 lbs./ft.

_____ in. to _____ ft. Weight _____ lbs./ft.

_____ in. to _____ ft. Weight _____ lbs./ft.

HOLE DIAM.: ___ in. to ___ ft.; ___ in. to ___ ft.; ___ in. to ___ ft.

9. SCREEN
Make _____
Or open hole from 82 ft. to 105 ft.
Type _____ Diam. _____
Slot/Gauze _____ Length _____
Set between _____ ft. and _____ ft. FITTINGS:

10. STATIC WATER LEVEL
68 ft. ☒ below ☐ above land surface Date Measured 10-31-90

11. PUMPING LEVEL (below land surface)
70 ft. after 1 hrs. pumping 8-10 g.p.m.
_____ ft. after _____ hrs. pumping _____ g.p.m.

12. HEAD WELL COMPLETION
- ☒ Pitless adapter manufacturer Maass Model J
- ☐ Basement, offset ☐ At least 12" above ground
- ☐ Plastic casing protection

13. WELL GROUTED? ☒ Yes ☐ No
- ☒ Neat Cement ☐ Bentonite ☐ _____
- Grout material Cement from 30 to 10 ft. cu. yds.

14. NEAREST SOURCES OF POSSIBLE CONTAMINATION
100 feet _____ direction Septic type
Well disinfected upon completion? ☒ Yes ☐ No

15. PUMP
Date installed 11-1-90 ☐ Not installed
Manufacturer's name Aermotor
Model number SD12-50 HP ½ Volts 230
Length of drop pipe 70 ft. Capacity 8-10 g.p.m.
Material of drop pipe Plst.
Type: ☒ Submersible ☐ L.S. Turbine ☐ Reciprocating
☐ Jet ☐ Centrifugal ☐ _____

16. ABANDONED WELLS
Unused well on property? ☐ Yes ☒ No
Sealed ☐ Permanent ☐ Temporary ☐ Not sealed

17. REMARKS, ELEVATION, SOURCE OF DATA, etc.

JAN 1991 RECEIVED WELL MGT.

18. WATER WELL CONTRACTOR CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

A & M Drilling (Licensee Business Name) 48589 (License No.)

Address: Box 23 Isle, MN 56342

Signed: Harvey R. Exsted (Authorized Representative) Date 12-31-90

Dana Robb (Name of Driller) Date 10-31-90

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HE-01205-03(Rev. 9/88)

5/74 30M
7/76 30M
7/78 30M
2/82 10M