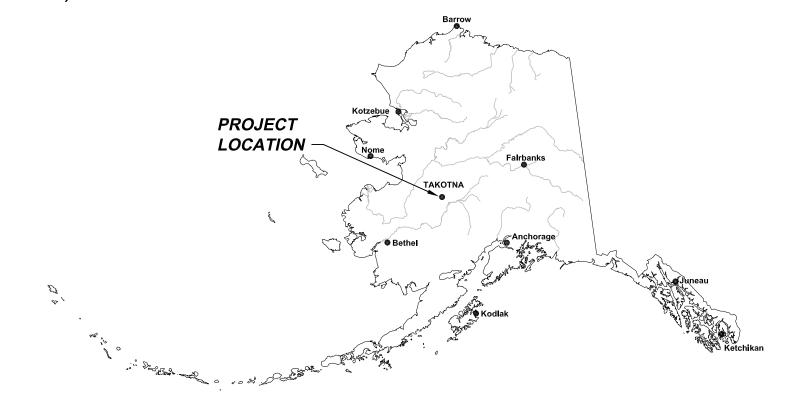
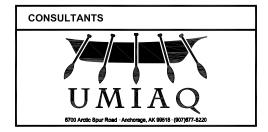
# TAKOTNA TRIBAL COUNCIL

TAKOTNA WATER TREATMENT PLANT UPGRADE AND SEPTIC DRAINFIELD REPLACEMENT TAKOTNA, ALASKA

95% DESIGN DRAWINGS MAY 22, 2014 (IN PROGRESS)





## **INDEX TO DRAWINGS**

COVER SHEET

G-1 PROJECT NOTES, LEGEND, ARVIATIONS, AND PROCESS FLOW DIAGRAM CIVIL

C-1 WASHETERIA DEMOLITION PLAN

C-2 WASHETERIA PIPING PLAN AND PIPING SCHEMATIC

C-3 SEPTIC SITE PLAN

C-4 DRAIN FIELD LAYOUT AND DETAILS

C-5 DOSING TANK DETAILS

FILE: C: \Users\margaret.hinz—neason\appdata\tocal\temp\AcPublish\_6980\70108.13 \_Cover Shee! PRINTED: 05/22/2014 17:16 margaret.hinz—neason \_\_LAYQUT: Lavout\_1

CLIENT: VSM/TAKOTNA TRIBAL COUNCIL
PROJECT THEE TAKOTNA WASHTERIA FILTER AND SE
LOCATION: TAKOTNA, ALSKA
DOCUMENT TYPE: 95% DESIGN DOCUMENTS
ISSUE DATE: MAY 22, 2014
PROJECT NO: 70108.13

- 1. OWNER: TAKOTNA COMMUNITY ASSOCIATION CONTACT: 888-856-6186
- 2. ELECTRIC UTILITY: TAKOTNA COMMUNITY ASSOCIATION INCORPORATED CONTACT: 888-856-6186
- 3. ALL ADDITIVES AND MATERIALS USED FOR THE POTABLE WATER SYSTEM SHALL BE APPROVED FOR USE BY THE NATIONAL SANITATION FOUNDATION (NSF) STANDARDS, NSF 61, NSF 53, AS APPLICABLE..
- ALL MATERIALS FOR THE POTABLE WATER SYSTEM SHALL BE LEAD-FREE. ONLY LEAD FREE PIPE, FLUX, AND SOLDER SHALL BE
- 5. DESIGN DRAWINGS ARE SCHEMATIC IN NATURE, THEY ARE NOT INTENDED TO BE DETAILED DRAWINGS.
- 6. PROVIDE BACKFLOW AND CROSS CONNECTION CONTROL PER 18AAC80.
- 7. ALL PIPING MATERIALS TO BE SCHEDULE 40 PVC.

#### SCOPE OF WORK

- DEMOLISH EXISTING GIARDIA FILTER AND CARBON FILTERS AS SHOWN ON SHEET C-1.
- 2. INSTALL STAGE ONE AND STAGE TWO FILTERS AND ASSOCIATED VALVES AND PIPING.
- 3. DISINFECT SYSTEMS AND DISPOSE OF NEUTRALIZED WATER PER THE REQUIREMENTS OF ANSI/AWWA C651, C652, C653. PRESSURE TESTING MAY BE CONDUCTED AT THE SAME TIME AS DISINFECTION PER ASNI/AWWA C605.
- UPON COMPLETION OF WORK, PERFORM TOTAL COLIFORM TESTING PER ADEC REQUIREMENTS PRIOR TO ESTABLISHMENT OF SERVICE TO WATER SYSTEM.

### **DOSING TANK**

- 1. DOSING TANK TO BE 4,000 GALLON BAFFLED TANK. MANUFACTURED BY GREER TANK. TANK MUST SUITABLE FOR BURY WITH APPROPRIATE PAINT SYSTEMS AND THICKNESS OF STEEL TO SUPPORT UP TO 12' OF BURIAL DEPTH.
- 2. DOSING TANK EFFLUENT TANK AND PANEL SEE SHEET C-5 NOTES.

### **DESIGN CRITERIA**

WATER SOURCE: SURFACE

POPULATION\*: CURRENT:

DESIGN:

PER CAPITA WATER USE\*: WATERING POINT: 19 GPCPD (RECENT) WATER DISTRIBUTION: 25 GPCPD (RECOMMENDED)

AVERAGE DAILY DEMAND\*:
CURRENT:

950 GPD 627 GPD 1,577 GPD WASHFTFRIA: SCHOOL: TOTAL:

MAXIMUM DAILY DEMAND\*: CURRENT: 3,154 GPD

PEAK HOURLY DEMAND\*:

CURRENT: 5.9 GPM (CURRENT MAXIMUM FILTRATION RATE: 7 GPM)

PEAK WATER DEMAND\*\*: CURRENT: 41.5 GPM

SOURCE PUMPING RATE\*: 37 GPM

<u>CT TREATMENT:</u>
THE SYSTEM CAN MEET THE CT REQUIREMENTS FOR NORMAL AVERAGE AND PEAK FLOW THE SYSTEM CAN MEET THE CT REQUIREMENTS FOR NORMAL AVERAGE AND PEAR FLOW RATES (12 GPM AND 45 GPM RESPECTIVELY). ASSUMING A WATER TEMPERATURE OF 5 DEGREES CELSIUS, BAFFLE FACTOR OF 10%, 0.5 LOG TREATMENT, pH OF 6.5, AND A MINIMUM WATER STORAGE CAPACITY OF 7,800 GALLONS, THE SYSTEM CAN ADJUST FREE CHLORINE RESIDUAL LEVELS TO MEET CT REQUIREMENTS. AT 5.5 GPM FLOW RATE, THE SYSTEM WOULD HAVE TO MAINTAIN 0.3 MG/L FREE CHLORINE RESIDUAL. AT 41.5 GPM FLOW RATES, THE SYSTEM WOULD HAVE TO MAINTAIN 1.2 MG/L FREE CHLORINE.

SAND FILTERS ARE INSTALLED BEFORE THE PROPOSED STAGE 1 FILTERS TO REMOVE SILT AND LARGE PARTICLES PRIOR TO THE TREATMENT UNITS.

PROPOSED FILTERS: STAGE 1:

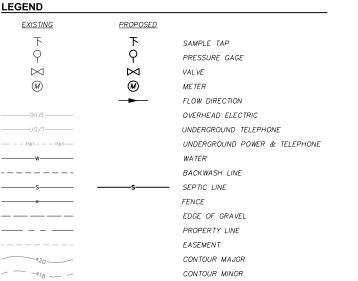
TWO (2) MUNI-1-2FL-304 MUNICIPAL HURRICANE FILTRATION SYSTEM CARTRIDGES WITH HC/170-5 HURRICANE HIGH PERFORMANCE FILTERS MANUFACTURED BY HARMSCO MUNICIPAL, OR APPROVED EQUAL.

STAGE 2

TWO (2) MUNI-1-2FL-304 MUNICIPAL HURRICANE FILTRATION SYSTEM CARTRIDGES WITH HC/170-LT2 HURRICANE ABSOLUTE RATED FILTERS MANUFACTURED BY HARMSCO MUNICIPAL OR APPROVED EQUAL.

- \* DATA FROM G.V. JONES WATER PLANT UPGRADE DESIGN 1/6/2004 \*\* DATA FROM FIXTURE COUNT CONDUCTED IN DECEMBER, 2013

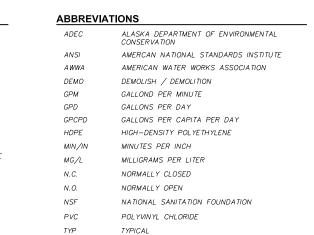
TARGET PATHOGEN	SYSTEM AS DESIGNED				
	PRE-FILTERS (SAND FILTERS)	STAGE 1 & 2 FILTRATION	INACTIVATION (CHLORINATION)	TOTAL	REQUIRED
GIARDIA LAMBLIA	0.0-LOG	2.5-LOG	0.5-LOG	3.0-LOG	3.0-LOG
CRYPTOSPORIDIUM	0.0-LOG	2.0-LOG	0.0-LOG	2.0-L0G	2.0-LOG
VIRUSES	0.0-LOG	0.0-LOG	4.0-LOG	4.0-LOG	4.0-LOG



BUILDING

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95% DESIGN DRAWINGS REVISIONS:

DRAWN BY: DBH CHECKED BY: MEW

DATE: 05/22/2014 JOB NUMBER: 70108.13 SCALE: AS SHOWN DRAWING TITLE: PROJECT NOTES, LEGEND ABBREVIATIONS AND FLOW DIAGRAM

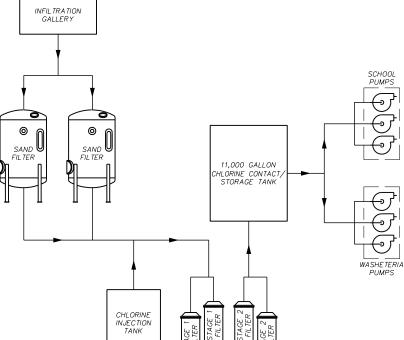
TREATMENT PLANT UPGRADE AND TIC DRAINFIELD REPLACEMENT TAKOTNA, ALASKA

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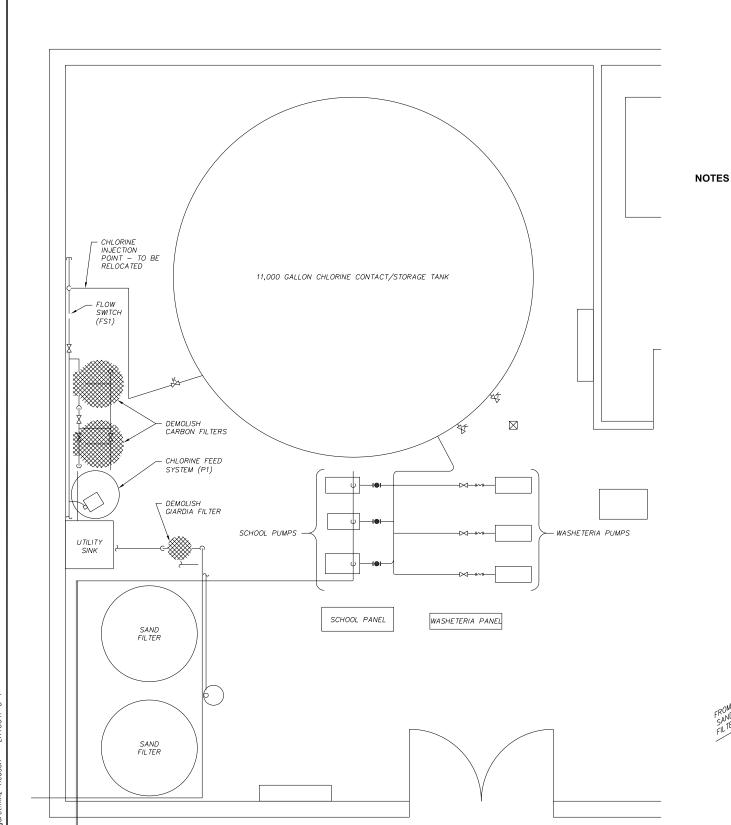
PROCESS FLOW DIAGRAM

SHEET: 2 OF 7 **G-1** 

DRAWING TITLE: WASHETERIA DEMOLITION PLAN

SHEET: 3 OF 7

C-1



1. OWNER: TAKOTNA COMMUNITY ASSOCIATION CONTACT: 888-856-6186

2. ELECTRIC UTILITY: TAKOTNA COMMUNITY ASSOCIATION INCORPORATED CONTACT: 888-856-6186

3. REMOVE EXISTING GIARDIA FILTER AND PRESSURE GAUGE.

4. REMOVE TWO EXISTING CARBON FILTER AND ASSOCIATED HARDWARE. VALVES FROM RAW WATER LINE TO REMAIN.

5. DO NOT REMOVE OR DAMAGE BACKWASH LINES OR VALVES.

CHLORINE
FEED
OFFINITE
TO BE
DEMOLISHED

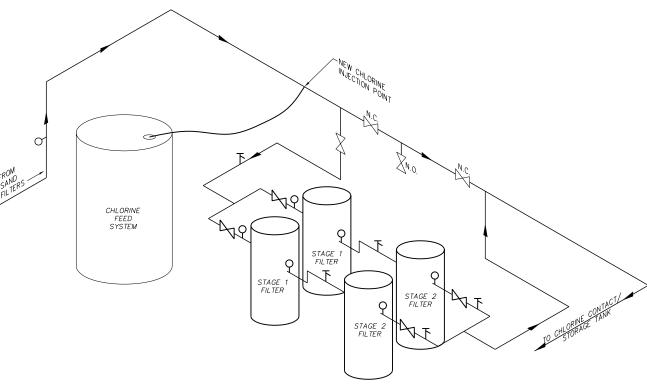
CARBON
FILTER
TO BE
D

**DEMOLITION PLAN** 

**DEMOLITION SCHEMATIC** 

C-1 SCALE: N.T.S.

 $\begin{pmatrix} 2 \\ C=1 \end{pmatrix}$  SC



**WASHETERIA PLAN** 

WASHETERIA PIPING SCHEMATIC
SCALE: N.T.S.

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WATER TREATMENT PLANT UPGRADE AND SEPTIC DRAINFIELD REPLACEMENT TAKOTNA, ALASKA

95% DESIGN DRAWINGS

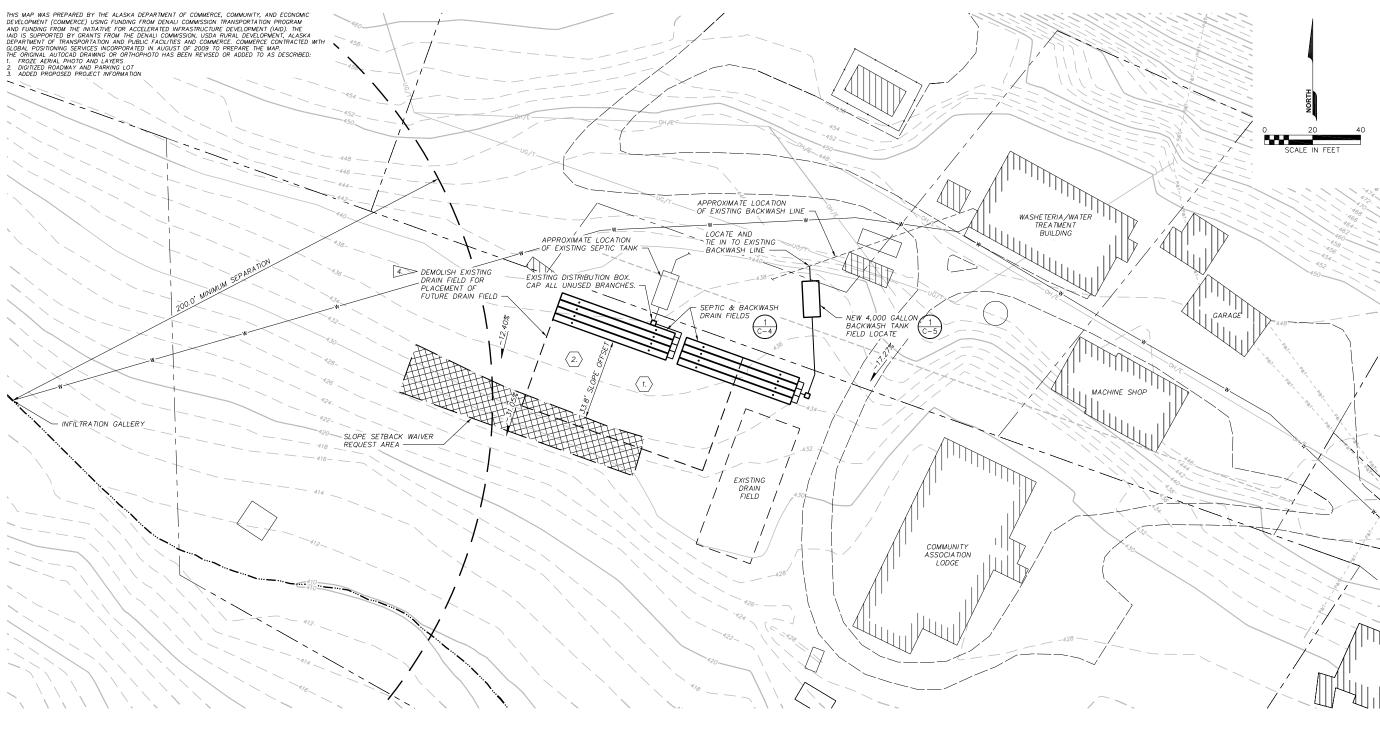
DRAWN BY: DBH

CHECKED BY: MEW DATE: 05/21/2014 JOB NUMBER: 70108.13 SCALE: AS SHOWN

DRAWING TITLE: WASHETERIA PIPING PLAN AND PIPING SCHEMATIC

SHEET: 4 OF 7

**C-2** 



NOTES

1. FIELD PERCOLATION TEST #1. PERCOLATION RATE = 0.5 MIN/IN AT DEPTH OF APPROXIMATELY 9'.

2.) FIELD PERCOLATION TEST #2. PERCOLATION RATE = 41 MIN/IN AT DEPTH OF APPROXIMATELY 8'.

3. LOCATE EXTENTS OF EXISTING FAILED DRAIN FIELD FOR PLACEMENT OF NEW DRAIN FIELD. VERIFY SEPARATION DISTANCES WITH THE FOLLOWING PARAMETERS:

NEW DRAIN FIELD SEPARATION DISTANCES
CLASS A PUBLIC WATER SYSTEM 200'
RIVER, LAKE OR STREAM 100'
FOUNDATION 10'
OTHER ABSORPTION FIELDS 6'
SEASONAL HIGH WATER TABLE 4'
BEDROCK, CLAY 6'
SLOPES GRATER THAN 25%\* 50'
\*\* IF SLOPE EXCEEDS 10' IN ELEVATION CHANGE\*

4. DRAIN CONTAMINATED SOIL SURROUNDING THE EXISTING INFILTRATOR CHAMBERS AND HAUL TO THE LANDFILL OR OTHER APPROVED DISPOSAL SITE. DISINFECT SOIL WITH LIME PRIOR TO BURIAL.

- 5. AN ON-SITE ENGINEER IS REQUIRED FOR INSPECTIONS AND VERIFICATION OF PERCOLATION RATES AT THE FINAL DEPTH OF THE SOIL ABSORPTION SYSTEM.
- 6. UTILITIES SHOWN ARE IN APPROXIMATE LOCATIONS. LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION ACTIVITIES.
- 7. PROPERTY LINES SHOWN ARE IN APPROXIMATE LOCATIONS. VERIFY LOCATIONS OF PROPERTY LINES AND OFFSETS TO PROPOSED DRAIN FIELD.

# ABSORBTION SYSTEM DESIGN CRITERIA

- 1. AVERAGE WASTEWATER FLOW = 500 GPD
- 2. WATER SYSTEM BACKWASH:
  A 3,500 GALLON SURGE TANK WILL BE PROVIDED TO COLLECT THE BACKWASH FROM THE SAND FILTERS AND EMPTY IN 7 DAYS.
  BACKWASH OUANTITY = 3,000 GAL ONCE A MONTH FLOW RATE FROM SURGE TANK = 430 GPD
- TOTAL WASTEWATER FLOW = 930 GPD
- 4. MAXIMUM WASTEWATER APPLICATION RATE = 1.2 GAL/SQ FT/DAY

1.2 GAL/SQ FT/DAY

5. SOIL ABSORPTION SIZING WITH 1.2 FACTOR OF SAFETY:

SEPTIC DRAIN FIELD AREA = 500 GPD = 417 SQ FT \* 1.2 = 500 SQ FT REQUIRED 1.2 GAL/SQ FT/DAY

BACKWASH DRAIN FIELD AREA = 430 GPD = 358 SQ FT \* 1.2 = 430 SQ FT REQUIRED

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CHECKED BY: MEW
DATE: 05/22/2014
JOB NUMBER: 70108
SCALE: AS SHOWN

95% DESIGN DRAWINGS REVISIONS:

WATER TREATMENT PLANT UPGRADE AND SEPTIC DRAINFIELD REPLACEMENT TAKOTNA, ALASKA

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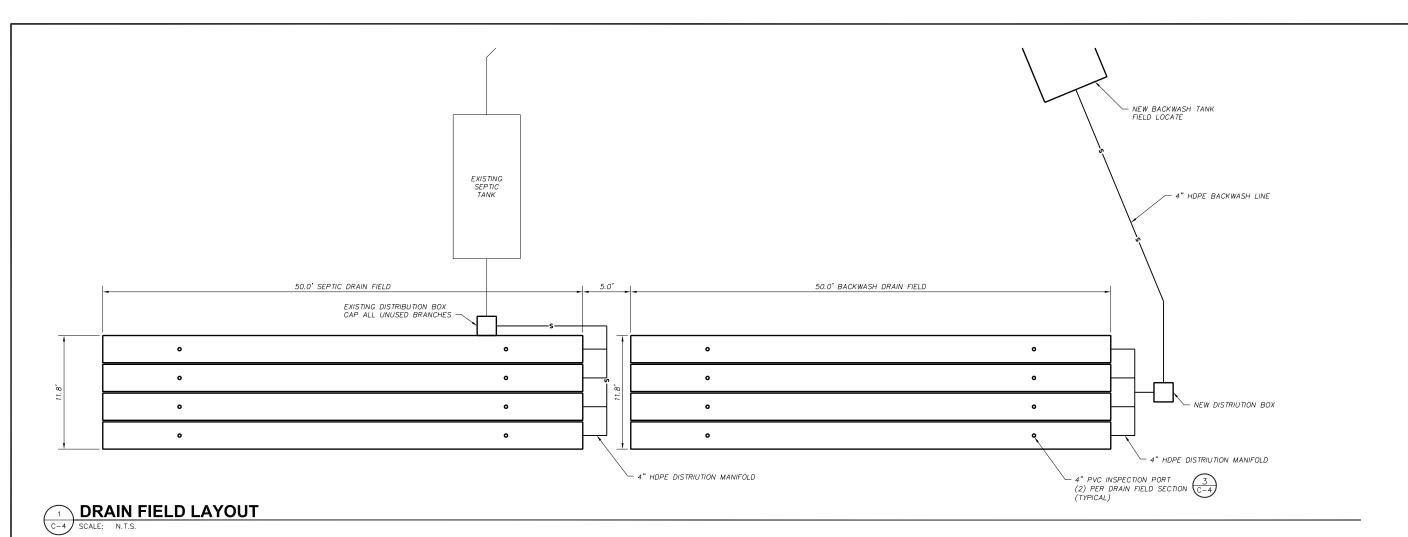
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**TAKOTNA** 

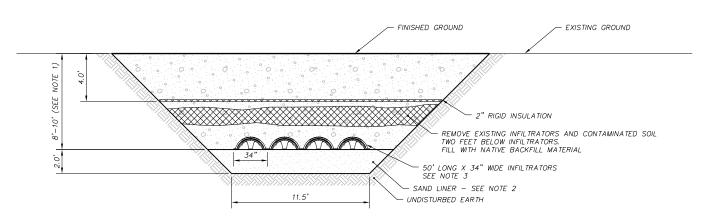
DRAWING TITLE: SEPTIC SITE PLAN

SHEET: 5 OF 7

**C-3** 

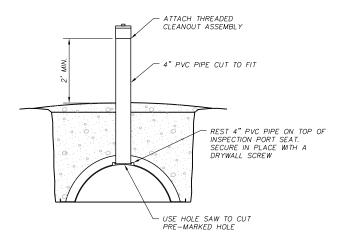


- 1. FINAL DEPTH BASED ON DEPTH OF CONTAMINATED SOIL
- 2. VERIFY PERCOLATION RATES AT FINAL DEPTH. SAND LINER REQUIRED WHEN PERCOLATION RATES ARE LESS THAN 1 MINUTE PER INCH.
- 3. PROVIDE QUICK4 PLUS INFILTRATORS MANUFACTURED BY INFILTRATOR SYSTEMS INC. OR APPROVED EQUAL. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
- 4. INSTALL ONE INSPECTION PORT PER INFILTRATOR. SEE DETAIL 2/C-4
- NO GROUNDWATER OR BEDROCK WAS ENCOUNTERED DURING EXCAVATION OF TEST PITS. NOTIFY ENGINEER IF GROUNDWATER OR BEDROCK IS ENCOUNTERED DURING CONSTRUCTION.
- 6. MOUND FINISHED GRADE 4"-6" TO ALLOW FOR SETTLEMENT AND TO PROVIDE SURFACE DRAINAGE AWAY FROM ABSORPTION BED.



**DRAIN FIELD SECTION** C-4 SCALE: N.T.S.

NOTE: 1. PROVIDE CLEANOUT AT BOTH ENDS OF INFILTRATORS — 16 TOTAL.



**INSPECTION PORT DETAIL** C-4 SCALE: N.T.S.

WATER TREATMENT PLANT UPGRADE AND SEPTIC DRAINFIELD REPLACEMENT TAKOTNA, ALASKA

TAKOTNA TRIBAL COUNCIL

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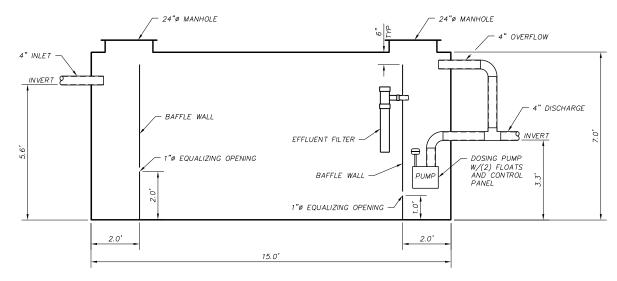
DRAWN BY: DBH CHECKED BY: MEW DATE: 05/22/2014 JOB NUMBER: 70108 SCALE: AS SHOWN

DRAWING TITLE: DRAIN FIELD LAYOUT AND DETAILS

SHEET: 6 OF 7

### NOTES:

- 1. PUMP LITTLE GIANT 2E-38NT WITH 502286 CABLE, 115V, 1/40 HP, 300 GPH ⊕ 1 FT HEAD, 3/8" FNTP INLET, 1/4" MNTP DISCHARGE.
- 2. PANEL SJE RHOMBUS EZ SERIES SINGLE PHASE SIMPLEX DEMAND/TIMED DOSE PANEL, NEMA 4X ENCLOSURE. PROGRAM PANEL TO TIME DOSE 215 GALLON AT 12 HOUR INCREMENTS. ORDER WITH ON/OFF TIMER OVERRIDE FLOATS.



 $\begin{pmatrix} 1 \\ C-5 \end{pmatrix}$ 

4,000 GALLON DOSING TANK DETAILS

SCALE: 1" = 2

TAKOTNA TRIBAL COUNCIL

WATER TREATMENT PLANT UPGRADE AND SEPTIC DRAINFIELD REPLACEMENT TAKOTNA, ALASKA

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95% DESIGN DRAWINGS REVISIONS:

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CHECKED BY: MEW
DATE: 05/22/2014
JOB NUMBER: 70108
SCALE: AS SHOWN

DRAWING TITLE: DOSING TANK DETAILS

SHEET: 7 OF 7

**C-5**