

**Summary of Drilling and Well Installation Program
Chequamegon-Nicolet National Forest
Washburn/Great Divide Unit wells BA-241 and BA-242**

WGNHS monitoring well number: BA-241

USGS site number: 462050091202901

Alternate names: North well, well #1

WGNHS monitoring well number: BA-242

USGS site number: 462047091202901

Alternate names: South well, well #2

BA-241 and BA-242, Pigeon Lake Site: Pigeon Lake Field Camp, southwest of Pigeon Lake Rd. @ North Delta Rd. Bayfield County, WI. Washburn District.

Two drilling locations approximately 300 feet apart, see site sketch.

Site Lithology (based on auger cuttings) Lithology similar at both well locations.

0-4 ft. Dark brown silty sand w/ gravel, moist.

4-36 ft. Dark reddish brown silty sand, moist.

36-40 ft. Dark reddish brown gravelly sand wet @ 38 ft.

40-50.5 ft Dark Reddish brown silty sand, wet.

Set 2 wells @ ~ 47 ft. below grade w/ 10 ft. long screens, see well construction diagrams on following pages.

Prepared by: Peter M. Chase, P.G./WGNHS/ July 15, 2011

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name USFS - CHEQ - N/C	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> S. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name PIGEON LK #1
Facility License, Permit or Monitoring No.	Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/> Lat. 46° 20' 49.95" Long. 91° 20' 29.26"	Wis. Unique Well No. DNR Well ID No.
Facility ID	St. Plane _____ ft. N. _____ ft. E. S/C/N	Date Well Installed 05/25/2011
Type of Well	Section Location of Waste/Source SW 1/4 of SW 1/4 of Sec. 26, T. 45 N. R. 8 E	Well Installed By: Name (first, last) and Firm Pete Chase WGNHS
Well Code _____	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	
Distance from Waste/Source _____ ft.	Gov. Lot Number _____	

- A. Protective pipe, top elevation _____ ft. MSL
- B. Well casing, top elevation _____ ft. MSL
- C. Land surface elevation _____ ft. MSL
- D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

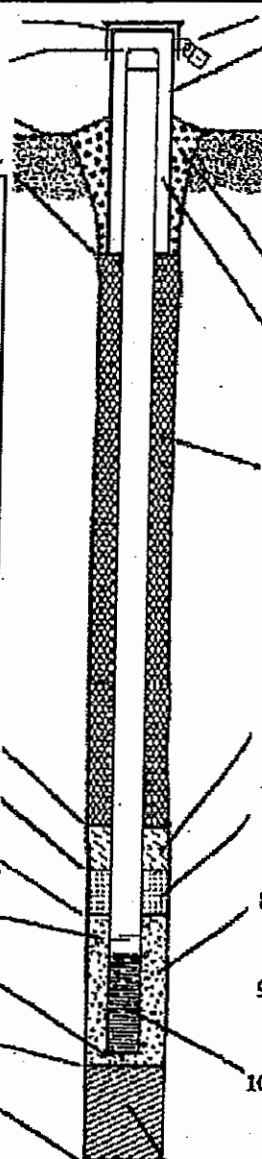
13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☒ 41
Other ☐

15. Drilling fluid used: Water ☐ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: **8 in.**
b. Length: **1.5 ft.**
c. Material: **Flush Mt.** Steel ☒ 04
Other ☐
- d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30
Concrete ☐ 01
Other ☐
4. Material between well casing and protective pipe:
None Bentonite ☐ 30
Other ☐
5. Annular space seal: a. Granular/Chipped Bentonite ☒ 33
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31
d. _____ % Bentonite ... Bentonite-cement grout ☐ 50
e. _____ Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☐ 02
Gravity ☒ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32
c. _____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. **#50 Badger Mining**
b. Volume added _____ ft³
8. Filter pack material: Manufacturer, product name & mesh size
a. **Native & #30 Red Flint**
b. Volume added _____ ft³
9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐
10. Screen material: **PVC**
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
Other ☐
- b. Manufacturer **MOJOFLEX**
c. Slot size: **0.010 in.**
d. Slotted length: **10 ft.**
11. Backfill material (below filter pack): None ☐ 14
Other ☒

- E. Bentonite seal, top _____ ft. MSL or **1.0 ft.**
- F. Fine sand, top _____ ft. MSL or **34 ft.**
- G. Filter pack, top _____ ft. MSL or **35 ft.**
- H. Screen joint, top _____ ft. MSL or **37 ft.**
- I. Well bottom _____ ft. MSL or **47 ft.**
- J. Filter pack, bottom _____ ft. MSL or **49 ft.**
- K. Borehole, bottom _____ ft. MSL or **50.5 ft.**
- L. Borehole, diameter **8.3 in.**
- M. O.D. well casing **2.2 in.**
- N. I.D. well casing **2.0 in.**

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature **Pete Chase** Firm **Wis. Geol. & Nat. History Survey**

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name USFS CHEQ-NIC	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> S. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name PIGEON LK #2
Facility License, Permit or Monitoring No.	Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Well Location <input checked="" type="checkbox"/> Lat. 46° 20' 46.66" Long. 91° 20' 28.63"	Wis. Unique Well No. DNR Well ID No.
Facility ID	St. Plane _____ ft. N. _____ ft. E. S/C/N	Date Well Installed 05/25/2011 m m d d y y y y
Type of Well Well Code 1	Section Location of Waste/Source SW 1/4 of SW 1/4 of Sec. 26, T. 45 N. R. 8 E. W.	Well Installed By: Name (first, last) and Firm Pete Chase WGNHS
Distance from Waste/Source _____ ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	
Enf. Stds. Apply <input type="checkbox"/>	Gov. Lot Number	

A. Protective pipe, top elevation _____ ft. MSL
B. Well casing, top elevation _____ ft. MSL
C. Land surface elevation _____ ft. MSL
D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☒ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☒ 41
Other ☐

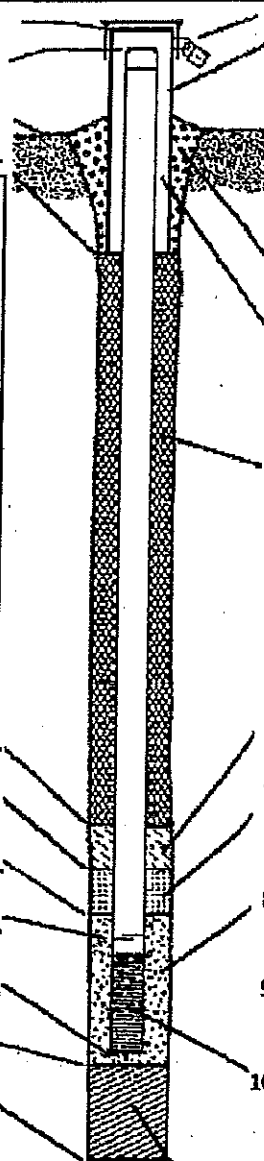
15. Drilling fluid used: Water ☐ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe _____

17. Source of water (attach analysis, if required):

E. Bentonite seal, top _____ ft. MSL or **1.0** ft.
F. Fine sand, top _____ ft. MSL or **35.5** ft.
G. Filter pack, top _____ ft. MSL or **36.5** ft.
H. Screen joint, top _____ ft. MSL or **38.5** ft.
I. Well bottom _____ ft. MSL or **48.5** ft.
J. Filter pack, bottom _____ ft. MSL or **48.5** ft.
K. Borehole, bottom _____ ft. MSL or **50** ft.
L. Borehole, diameter **8.3** in.
M. O.D. well casing **2.2** in.
N. I.D. well casing **2.0** in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: **8** in.
b. Length: **1.5** ft.
c. Material: **Flush Mt.** Steel ☒ 04
Other ☐
d. Additional protection? ☐ Yes ☐ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30
Concrete ☐ 01
Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ 30
Other ☒ **None**
5. Annular space seal: a. Granular/Chipped Bentonite ☒ 33
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight ... Bentonite slurry ☐ 31
d. _____ % Bentonite ... Bentonite-cement grout ☐ 50
e. _____ Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☐ 02
Gravity ☒ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32
c. _____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. **#50 Badger Mining**
b. Volume added _____ ft³
8. Filter pack material: Manufacturer, product name & mesh size
a. **Native & #30 Red Flint**
b. Volume added _____ ft³
9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐
10. Screen material: **PVC**
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
Other ☐
b. Manufacturer **MONOFLEX**
c. Slot size: **0.010** in.
d. Slotted length: **10** ft.
11. Backfill material (below filter pack): None ☐ 14
Other ☒ **Native**

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature **Pete M Chase**

Firm **Wis. Geol. & Nat. History Survey**

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

WELL LOCATIONS Not to Scale

PIGEON LAKE

Pigeon Lk Rd

Pigeon Lk #1

well house

WT

32'

44'

Welcome Sign

Sculpture on metal post

AST

NORTH

SHELTER

CABIN

Mess Hall

OFFICE

33' 45' 52'

Pigeon Lk #2

Cabin #4

PIGEON LK.