How Do I Know Which Aquifer I'm Using?!

A Step-by-Step Guide For Owners of Private Wells

Groundwater Management Program
Water Resources
Public Works Department

How to determine the aquifer from which your private well draws water

The primary source of information about your well is your well's Water Well Report (sometimes referred to as the Driller's Log or Well Log). You can usually obtain a copy either from the driller who drilled your well (if you know) or the Washington State Department of Ecology (see contact information provided in the attached Drinking Water Well FAQ). Most registered wells have a metal plate with an Ecology number stamped on it affixed to the outside of the casing. Use this number (or your address or parcel tax id number) to search for or request documentation from Ecology. Lastly, if your well is part of the City's monitoring network, the City may have this information.

The Island's complex aquifer system is described in the Bainbridge Island groundwater modelling project final report. This document is available in the Groundwater Management Program on-line library at www.ci.bainbridge-isl.wa.us/177/Water-Resources-Libraries. Hard copies can be viewed at the Bainbridge Island Library Reference Desk or the Engineering counter at City Hall.

NOTE! Some wells drilled on the south end of the Island, particularly from around Port Blakely and southward to South Beach are either tapping the very shallow Perched Aquifer which is present in limited areas (see Figures 9 and 10 attached) or are pulling water from fractures in bedrock (Bedrock Aquifer). Bedrock is uplifted to land surface elevation in this area due to faulting, and the overlying glacial sediments have been eroded away.

1	Using the information in the ***Water Levels*** section of your Water Well Report (see the attached example report), determine the land surface elevation at the top of your well.		**feet**
2	Using the information in the ***Constuction Details*** section of your Water Well Report (see the attached example report), determine the screening interval (depth) in your well.	**- to -**	**feet**
3	Subtract the screening interval (depth) from the land surface elevation from Step 1 to determine your screening interval elevation.	**- to -**	**feet**

4 Using the attached figures (taken from the Bainbridge Island groundwater model report, pages 17 - 28), determine which aquifers and confining layers are present at your well location. Note that these layers are listed in the order in which they are found in nature, starting at land surface and working downward.

Aquifers and Confining Layers between Aquifers	Present (yes/no)?	Sediment Description	Elevation of Top of the Aquifer or Confining Layer
Qvt - Perched Aquifer - Figure 9		Till (boulder, sand, gravel, clay)	Land surface
Qva - Perched Aquifer - Figure 10		Sand and gravel with lenses of silt and clay	Sea level to 300 feet *above* sea level
QC1 - Confining Layer - Figure 11		Predominantly silt and clay	80 feet *below* sea level to 300 feet *above* sea level
QC1pi - Semi-perched Aquifer - Figure 12		Interbeds of sand, gravel, and silt	80 feet *below* sea level to 300 feet *above* sea level
QA1 - Sea Level Aquifer - Figure 13		Sand and gravel with silt interbeds	200 feet *below* sea level to 200 feet *above* sea level
QC2 - Confining Layer - Figure 14		Sandy silt and clay	200 feet *below* sea level to sea level
QA2 - Glaciomarine Aquifer - Figure 15		Sand, gravel, and silt with marine shell fragments	500 feet *below* sea level to 300 feet *below* sea level
QC3 - Confining Layer - Figure 16		Clay and silt	800 feet *below* sea level to 400 feet *below* sea level
QA3 - Fletcher Bay Aquifer - Figure 17		Sand and gravel with silt interbeds	900 feet *below* sea level to 600 feet *below* sea level

5 Examine the sediment descriptions in the ***Well Log*** section of your Water Well Report and the depths at which the sediments were found by the driller. Compare these descriptions to the descriptions listed for each aquifer and confining layer in the table above in Step 4. Based upon the aquifers and confining layers present at your location and the sediment descriptions, from which aquifer do you think you are drawing water?

I *think* my aquifer is...

6 Now, compare the screening interval elevation of your well (determined in Step 3) to the elevations of the tops of the aquifers and confining layers present at your well location (refer to table above in Step 4). The aquifer that is present at your screening interval elevation is the aquifer from which your well is drawing water.

My aquifer is...

24/02-03D

- First Copy with Ecology
- Owner's Copy
- Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. 24N2E 03D02
Permit No.

(1) **OWNER:** Name [redacted] Address [redacted] Blakely Heights Dr. N.E. B.I. 98110

(2) **LOCATION OF WELL:** County Kitsap — NW ¼ NW ¼ Sec. 3 T. 24 N., R. 2E W.M.

Bearing and distance from section or subdivision corner "Blakely Heights Drive N.E." [redacted]

(3) **PROPOSED USE:** Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) **TYPE OF WORK:** Owner's number of well (if more than one) ....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) **DIMENSIONS:** Diameter of well 6 inches.
Drilled 157 ft. Depth of completed well 157 ft.

(6) **CONSTRUCTION DETAILS:**

Casing installed: 6 " Diam. from 0 ft. to 152 ft.
Threaded ☐ ...... " Diam. from ...... ft. to ...... ft.
Welded ☒ ...... " Diam. from ...... ft. to ...... ft.

Perforations: Yes ☐ No ☒
Type of perforator used ......
SIZE of perforations ...... in. by ...... in.
...... perforations from ...... ft. to ...... ft.
...... perforations from ...... ft. to ...... ft.
...... perforations from ...... ft. to ...... ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type stainless steel Model No. ......
Diam. 6 Slot size 20 from 152 ft. to 157 ft.
Diam. ...... Slot size ...... from ...... ft. to ...... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: ......
Gravel placed from ...... ft. to ...... ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ...... Depth of strata ......
Method of sealing strata off ......

(7) **PUMP:** Manufacturer's Name Goulds
Type: submersible H.P. 3/4

(8) **WATER LEVELS:** Land-surface elevation above mean sea level.... 200 ft.
Static level 133 ft. below top of well Date 12/7/87
Artesian pressure ...... lbs. per square inch Date ......
Artesian water is controlled by ...... (Cap, valve, etc.)

(9) **WELL TESTS:** Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? ......
Yield: ...... gal./min. with ...... ft. drawdown after ...... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test ......
Bailer test 30+ gal./min. with 4 ft. drawdown after 2 hrs.
Artesian flow ...... g.p.m. Date ......
Temperature of water 50 Was a chemical analysis made? Yes ☐ No ☒

(10) **WELL LOG:**

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Overburden	0	3
Brown gravelly till	3	15
Grey gravelly till	15	21
Blue gravelly till w/boulders	21	38
Blue clay	38	67
Brown gravelly till	67	153
Sand & gravel H20	153	157

RECEIVED
FEB 3 1988
DEPARTMENT OF ECOLOGY
NORTHWEST REGION

Work started 12/3, 19 87 Completed 12/7, 19 87

WELL DRILLER'S STATEMENT:

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

NAME Gresham WEll Drilling
(Person, firm, or corporation) (Type or print)

Address 3105 N.W. Lakeness Rd. Poulsbo 98370

[Signed] [signature] (Well Driller)

License No. 0761 Date 12/14, 19 87

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

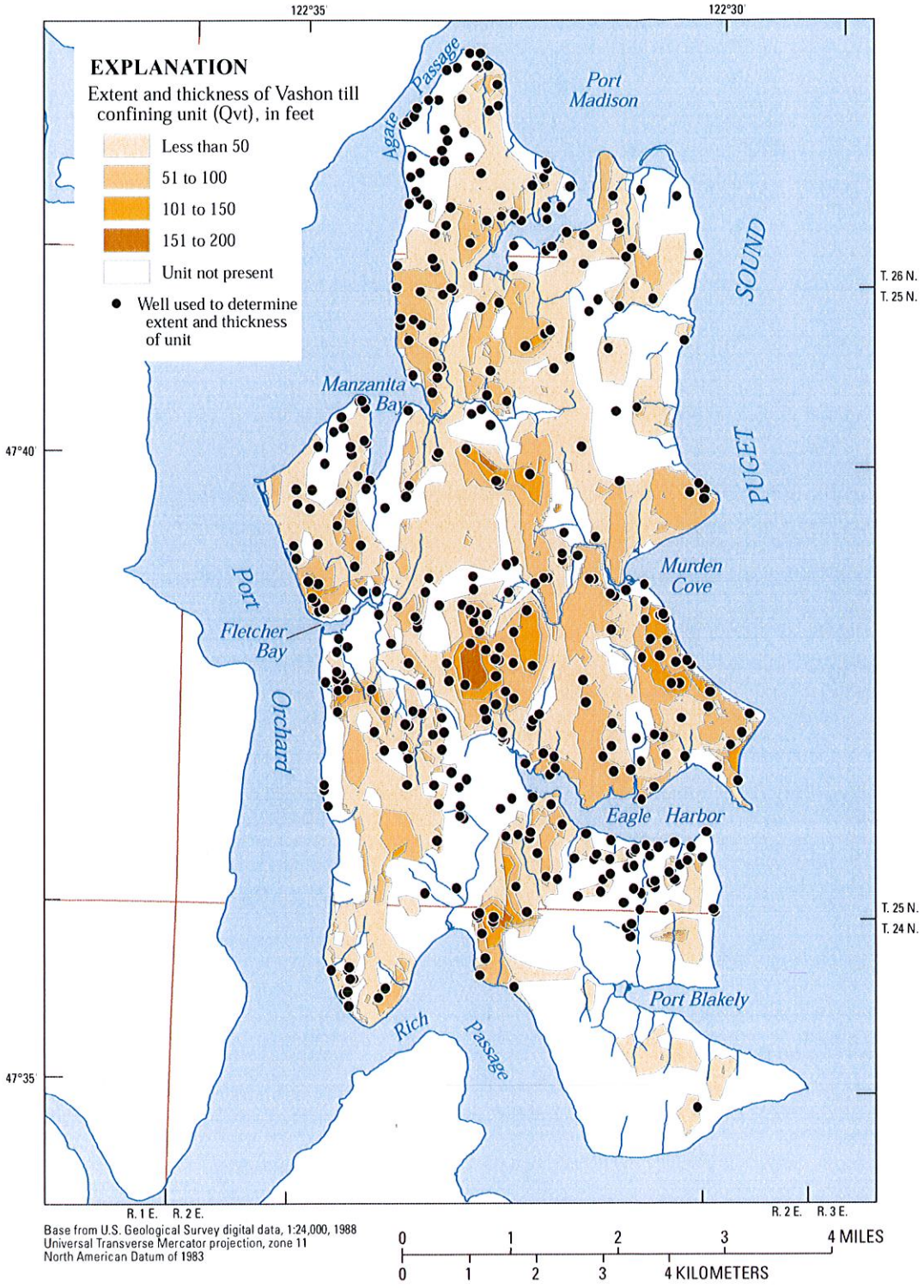

Figure 9. Extent and thickness of Vashon till confining unit (Qvt), Bainbridge Island, Washington.

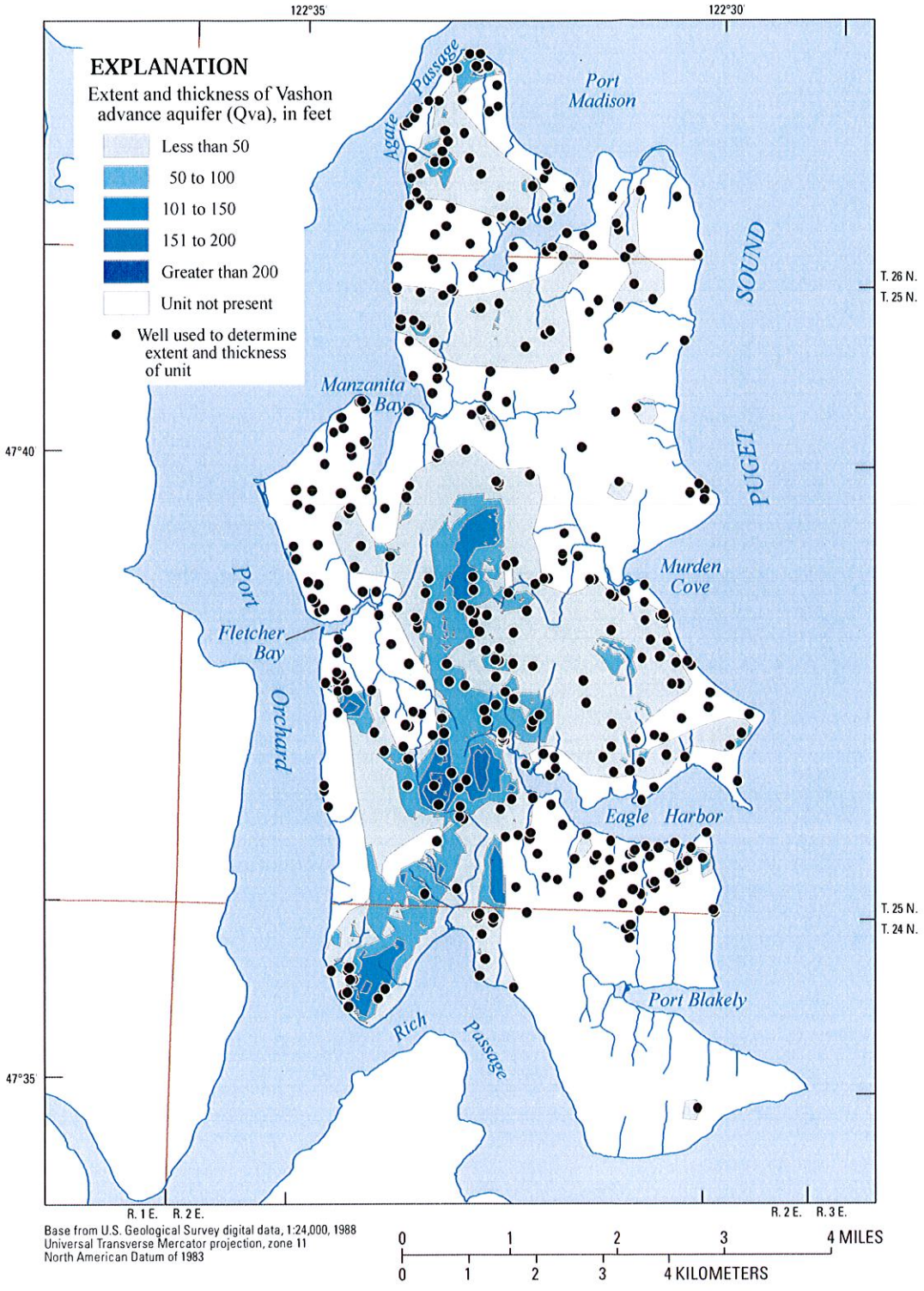

Figure 10. Extent and thickness of Vashon advance aquifer (Qva), Bainbridge Island, Washington.

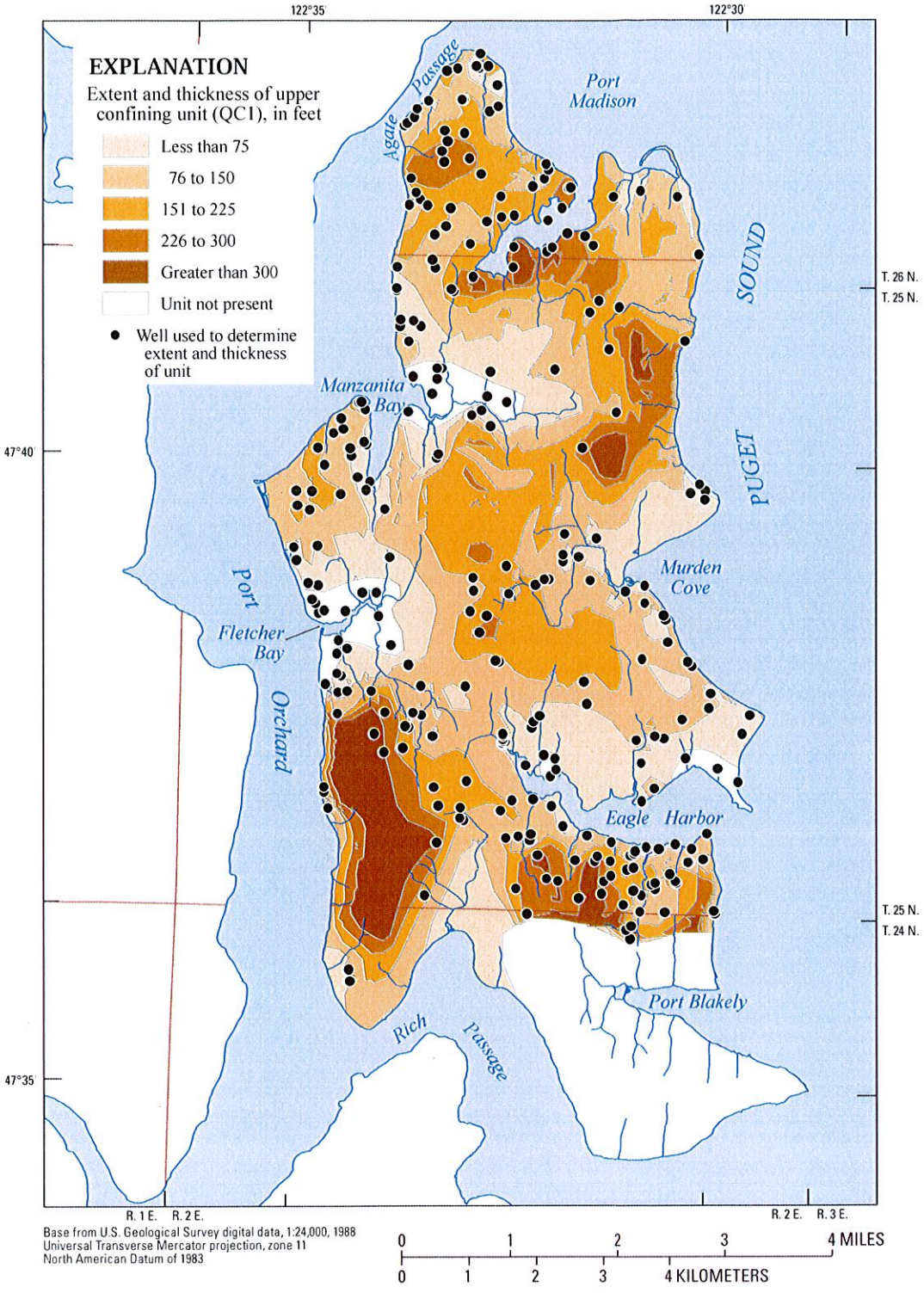

Figure 11. Extent and thickness of the upper confining unit (QC1), Bainbridge Island, Washington.

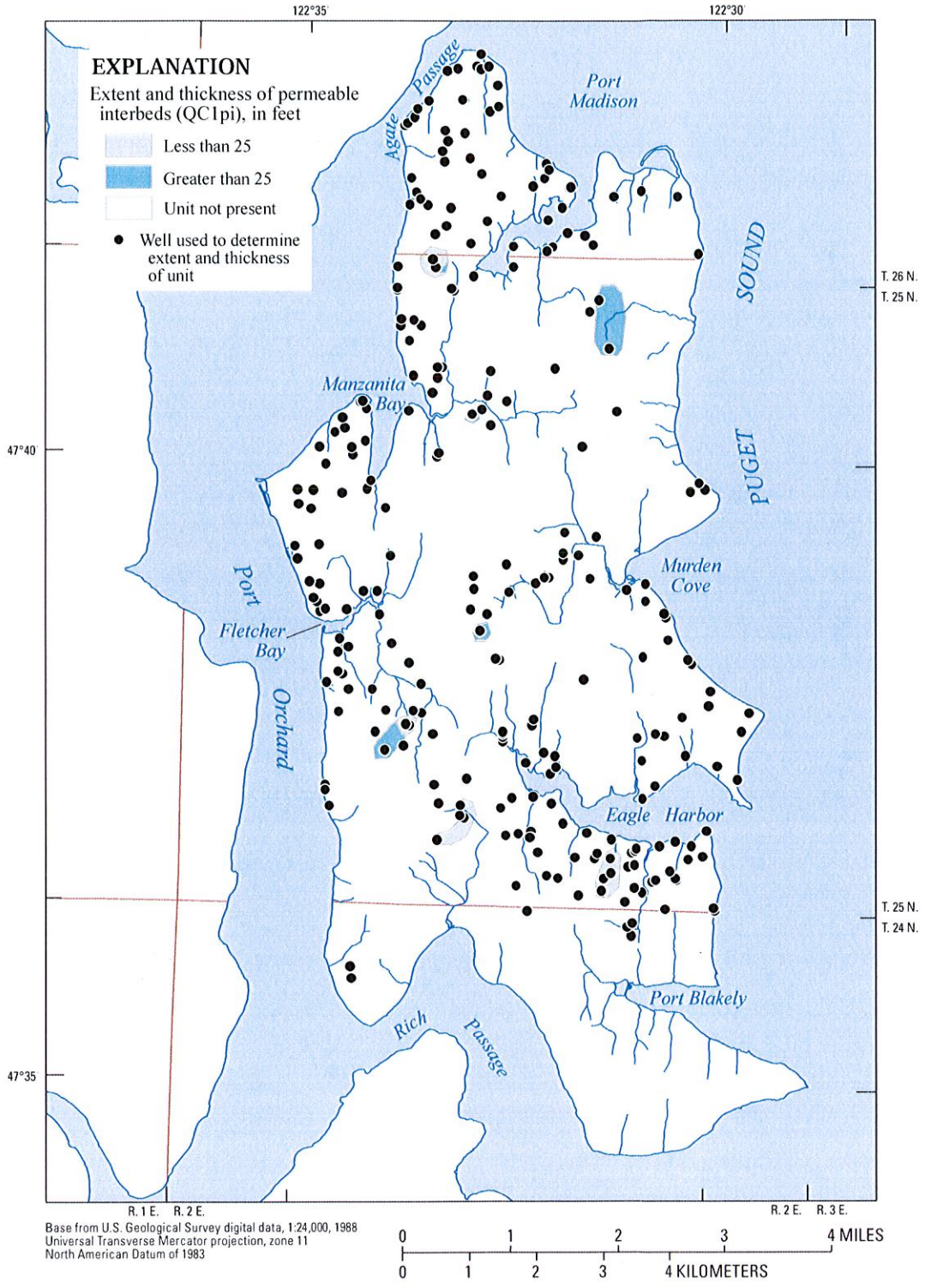

Figure 12. Extent and thickness of the permeable interbeds (QC1pi), Bainbridge Island, Washington.

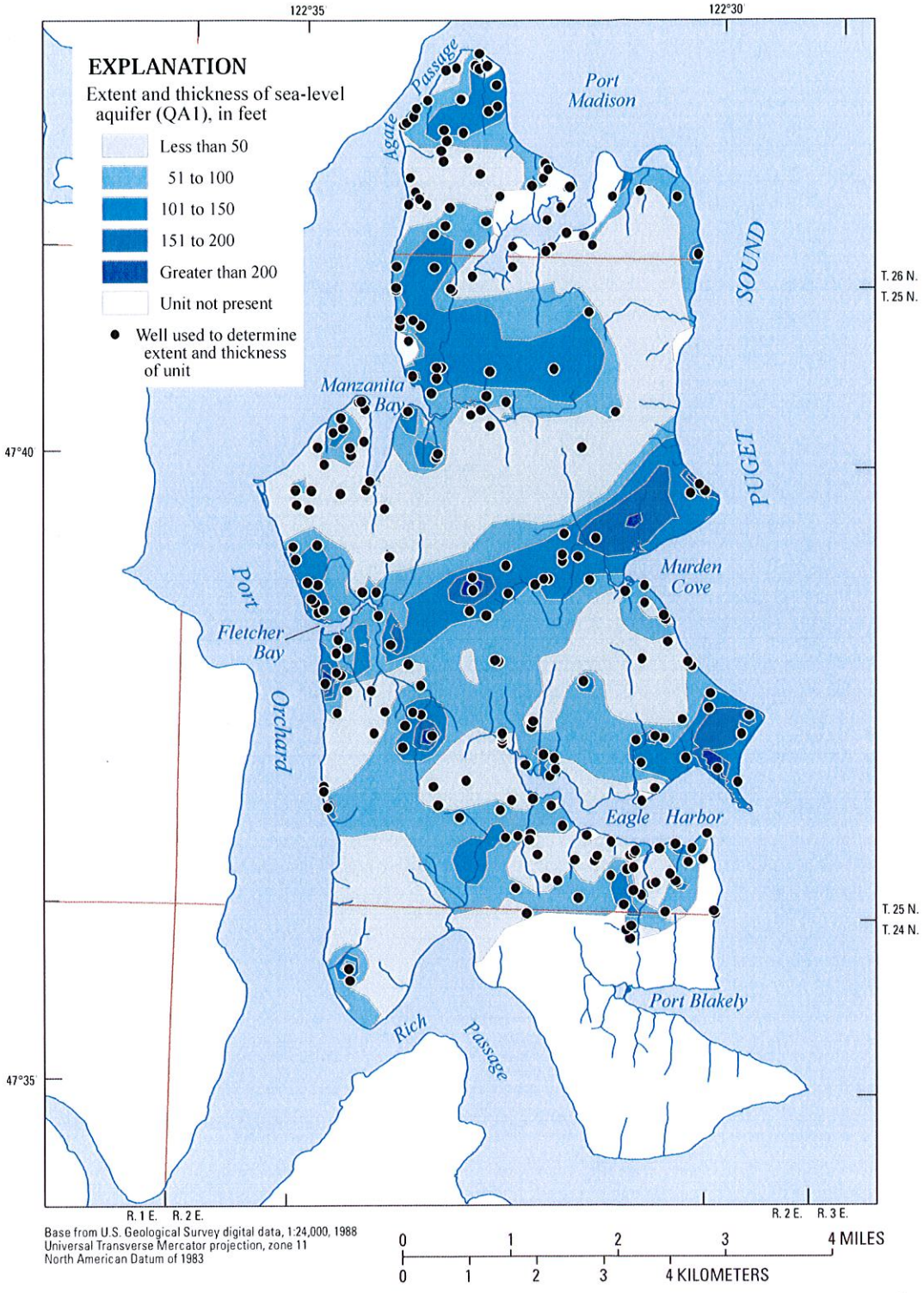

Figure 13. Extent and thickness of the sea-level aquifer (QA1), Bainbridge Island, Washington.

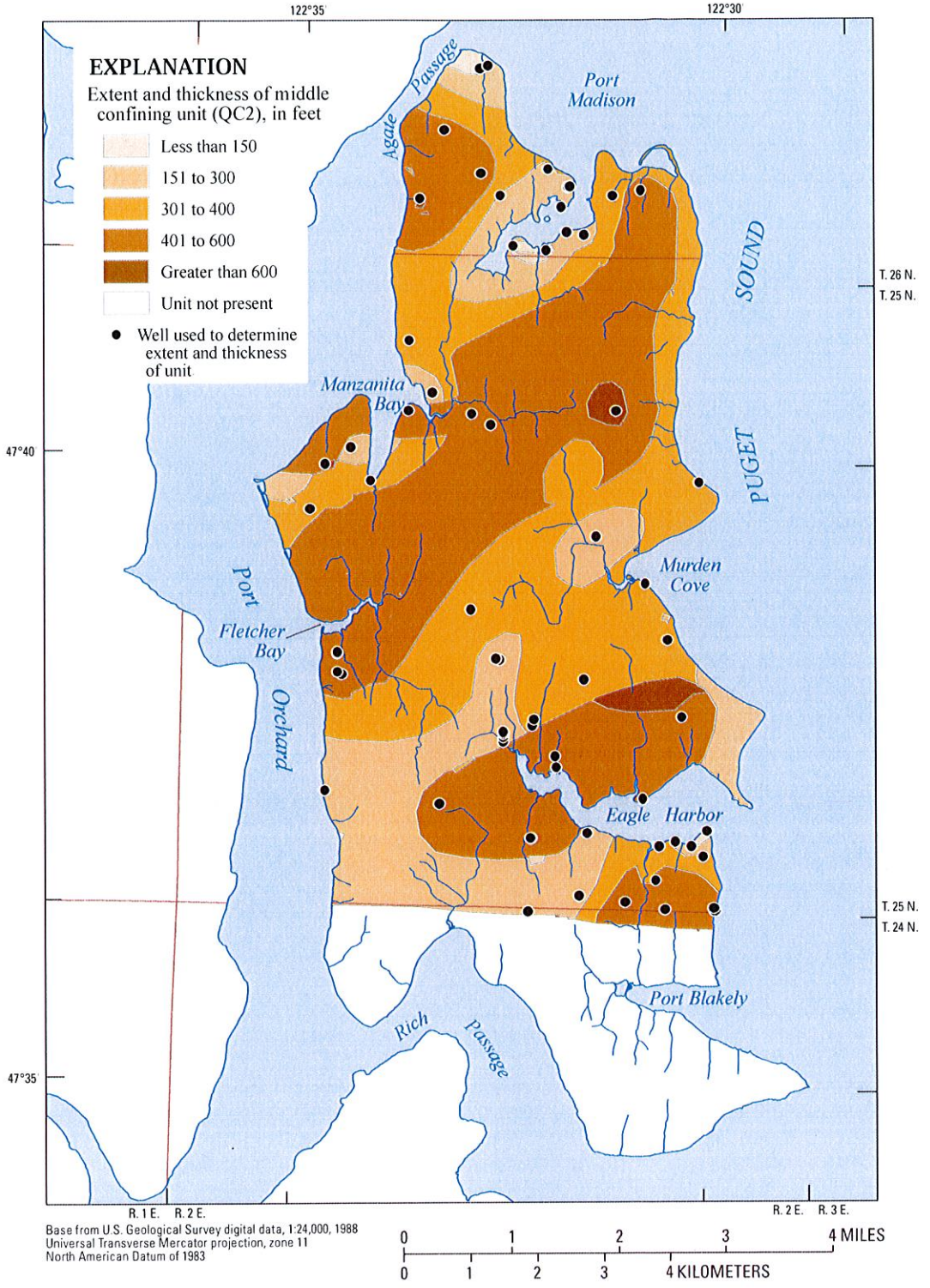

Figure 14. Extent and thickness of the middle confining unit (QC2), Bainbridge Island, Washington.

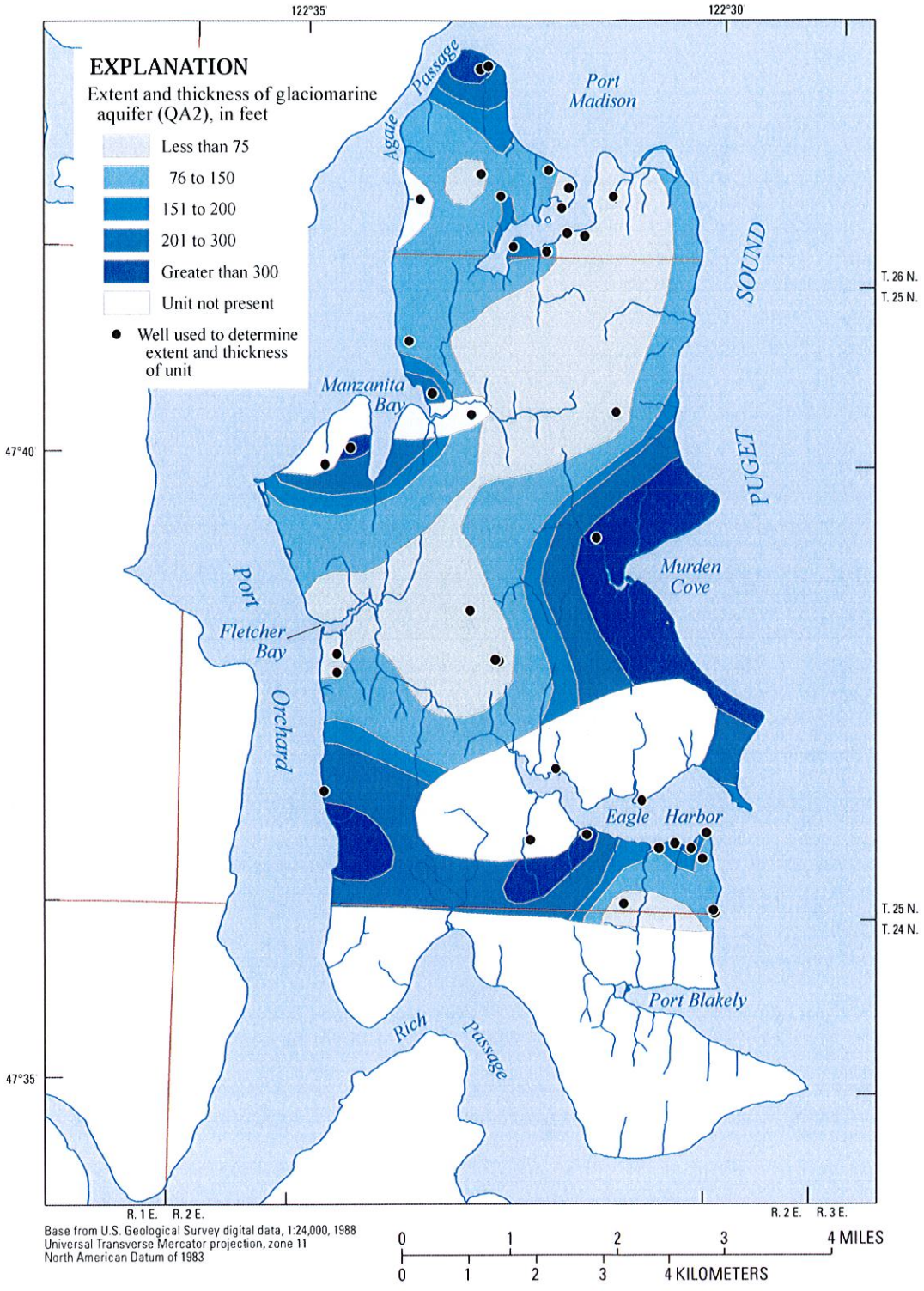

Figure 15. Extent and thickness of the glaciomarine aquifer (QA2), Bainbridge Island, Washington.

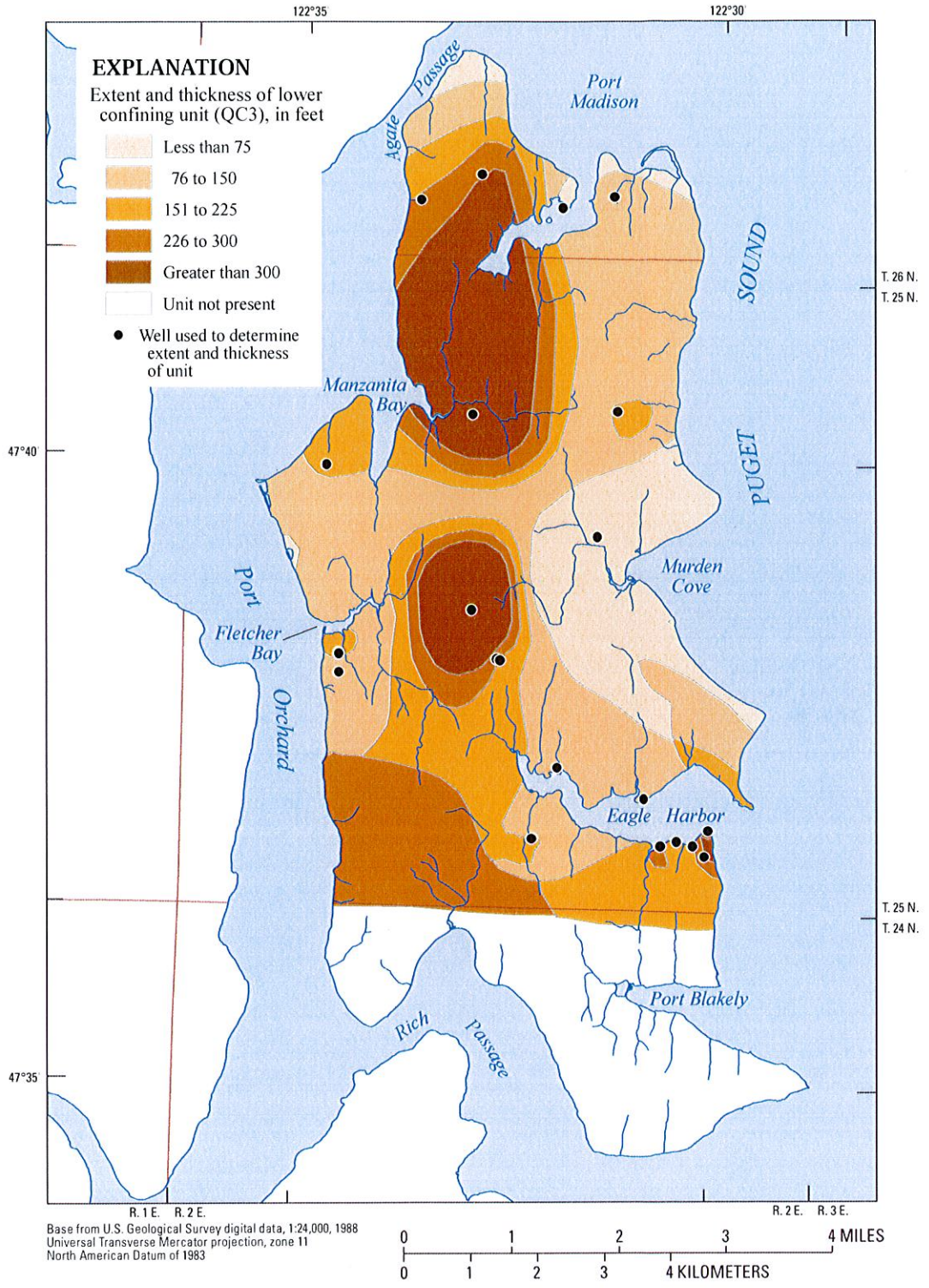

Figure 16. Extent and thickness of the lower confining unit (QC3), Bainbridge Island, Washington.

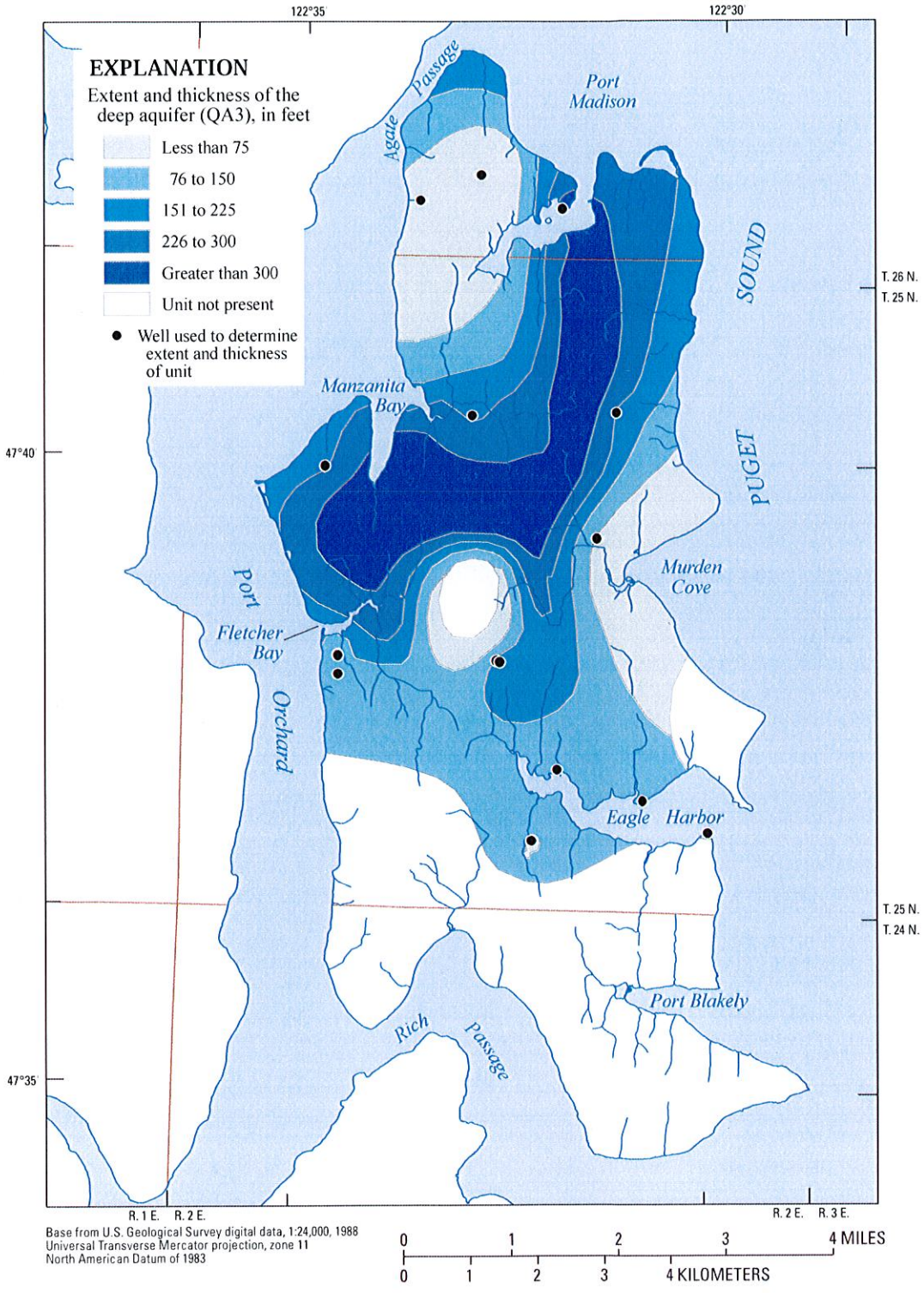

Figure 17. Extent and thickness of the deep aquifer (QA3), Bainbridge Island, Washington.

Drinking Water Well FAQ

Who assigns water rights on the Island and who licenses well construction?
The Washington State Department of Ecology is the governing authority of water rights and well licensing in the state.

WATER RIGHTS:
http://www.ecy.wa.gov/programs/wr/rights/water-right-home.html
Arlene Harris
Office: 425-649-7020
arha461@ecy.wa.gov

WELLS:
http://www.ecy.wa.gov/programs/wr/wells/wellhome.html
Noel Philip
(425) 649-7044
Well Construction
Arlene Harris
(425) 649-7020
Well Report Tracking

Where can I find information about how many wells are on the island and/or information about a particular well?
The Department of Ecology maintains a Well Log Database that is searchable either graphically through the use of a map or by parcel number/site address. The Well Log Database can be found at:

https://fortress.wa.gov/ecy/waterresources/map/WCLSWebMap/default.aspx

If you need assistance, please contact Arlene Harris (info above).

Who do I talk to about the quality of my drinking water?
If you are a City of Bainbridge Island Water Utility customer, please contact the Department of Public Works Water Utility at 206-780-3584, PWOM@bainbridge.gov

If you are a customer of another public water provider on the Island, please call the information number listed on your billing statement.

For small community or private wells, the Kitsap Public Health District is the governing authority of drinking water certification. Contact information is as follows:

http://www.kitsapcountyhealth.com/environment/water.php
John Kiess, Program Manager
360-337-5290

Who do I talk to about the City's Water Utility?
Department of Public Works Water Utility at 206-780-3584, PWOM@bainbridge.gov