Wisconsin Geological
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Evaluation and Modification of Ground-Water-Level Observation Network in Wisconsin

Progress Report, December 1995

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EVALUATION AND MODIFICATION OF GROUND-WATER-LEVEL OBSERVATION NETWORK IN WISCONSIN

Progress Report

Phase II - Evaluation of usefulness of observation wells for meeting observation network goals and objectives

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In April 1980 a joint committee of the U.S. Geological Survey (USGS) and Wisconsin Geological and Natural History Survey (WGNHS) staff was formed to evaluate the observation well network in Wisconsin and to recommend how the network might be improved. The committee, consisting of Dale Cotter, Robert Erickson, and Alexander Zaporozec, established the concept and objectives of the water-level monitoring network and criteria for network design (hydrogeologic setting, spatial distribution of wells, length and continuity of record, frequency and accuracy of measurements, and well construction); evaluated all wells according to the criteria during 1980-1982; and recommended network revisions and future activities.

The work and findings of the committee were summarized in the memorandum of May 1982 called "Evaluation and modification of ground-water-level observation network in Wisconsin--Phase I. Evaluation of existing opbservation wells." The recommended revisions were carried out during 1982-1984. The committee continued to meet on a regular basis to monitor the regularity and accuracy of water-level measurements and to continually reevaluate and revise the network as necessary. In 1994 measurements were taken in 187 observation wells in all counties except Dunn, Menominee, and Washington (Figure 1).

In April 1994 the committee, consisting of Bernie Ellefson and Jim Krohelski of USGS and Ron Hennings and Alexander Zaporozec of WGNHS, decided to start reevaluation of the usefulness of individual wells for meeting the network goals and objectives. First, the committee prepared a list of attributes of the ideal observation well (Appendix A). Each well in the network was evaluated according to these 15 attributes (Appendix B). The final evaluation included the inspection of a well hydrograph for the period of record and comparison of the hydrograph to hydrographs from the nearest observation wells. Table 1 summarizes the recommended revisions to be implemented starting January 1, 1996.

Table 1. Summary of recommended revisions of Wisconsin ground-water-level observation network, 1995.

WELLS TO BE KEPT (in bold = key wells)

Ad 76
Ad 128
As 6
As 54
Ba 124
Bf 119
Bf 120
Bn 13
Bn 76
Bn 80
Bn 109
Bn 154
Bn 890
Br 48
Br 115
Br 153
Bt 2
Ca 62
Ck 1
Ck 509
Co 134
Dg 81
Dg 109
Dn 5
Dn 64
Dn 83
Dn 105
Dn 146
Dn 441
Dn 880
Dn 927
Dn 1134
Dn 1136
Dn 1289
Dn 1297
Dn 1355
Dr 265
Ds 1
Ds 329
EC 211
Fc 4
Fr 2
Fr 87
GL 32
GL 47
Gn 2 (or Gn 1)
Gn 74
Gr 5
Gr 29
Gr 72
Ir 121
Iw 32
Iw 110
Ja 5
Ja 38
Ja 85
Je 144
Je 303
Ju 98
Ke 46
Kw 30
La 27
La 64
La 200
La 334
La 537
LC 76
Lf 57
Lf 294
Ln 60
Ml 94
Ml 118
Ml 120
Ml 148
Ml 540
Mn 28
Mo 17
Mq 9
Mr 27
Mr 28
Mr 100
Mt 7
Mt 31
Oc 20
Oc 179
On 22
On 23
On 24
Ou 326
Oz 42
Pi 151
Pk 40
Pp 39
Pp 40
Pr 65
Pt 15
Pt 36
Pt 59
Pt 276
Pt 376
Ra 62
Ri 23
Ro 3
Ro 8
Ro 491
Ru 89
Sb 84
Sh 1
Sh 78
Sk 3
Sk 230
Sw 7
Ta 1
Tr 1
Tr 9
Tr 71
Ve 8
Ve 52
Ve 71
Ve 117
Vi 3
Vi 33
Vi 959
Wb 42
Wb 48
Wd 66
Wi 1
Wi 6
Wi 48
Wk 20
Wk 31
Wp 2
Wp 13
Wp 771
Ws 8
Ws 53
Ws 105
Ww 9
Ww 37
Ww 83

Change Frequency

As 178(M) - Q (replace)
Ca 6(R) - Q
Ch 120(W) - M
Ch 142(W) - M
Ke 6(M) - A
Ke 21(M) - A
Lf 11(M) - Q
Ml 85(R) - Q
Pk 75(M) - Q

Reassess Later

Ba 262
Br 46
Co 620 (needs cleaning)
Ln 92
Mo 2 (needs cleaning)
Mq 26
Wi 594
Wk 1301

Table 1. - continued

DISCONTINUE	ABANDONED WELLS TO BE REPLACED
Bf 118	
Bn 1265	
Br 402	
Ch 284	Du 113
Dn 143	FL 374
Dn 1094	FL 391
Fc 33	**Pi 51**
Fr 9	**Pr 6**
Fr 56	**Wk 14**
Gn 1 (or Gn 2)	
Ja 15	
Ju 94	
Lf 78	
Pk 93	
Pt 82	
Wp 688	

POSSIBLE TO DROP (if problems develop)

Cr 59
Dr 7 (needs cleaning)
Dr 317
Ds 327
Je 849
Ke 288
Mn 493 (replace)
Mo 10
Mt 27 (replace)
Ou 380 (replace)
Ro 40
SC 13 (replace)
Sh 27
Ta 9

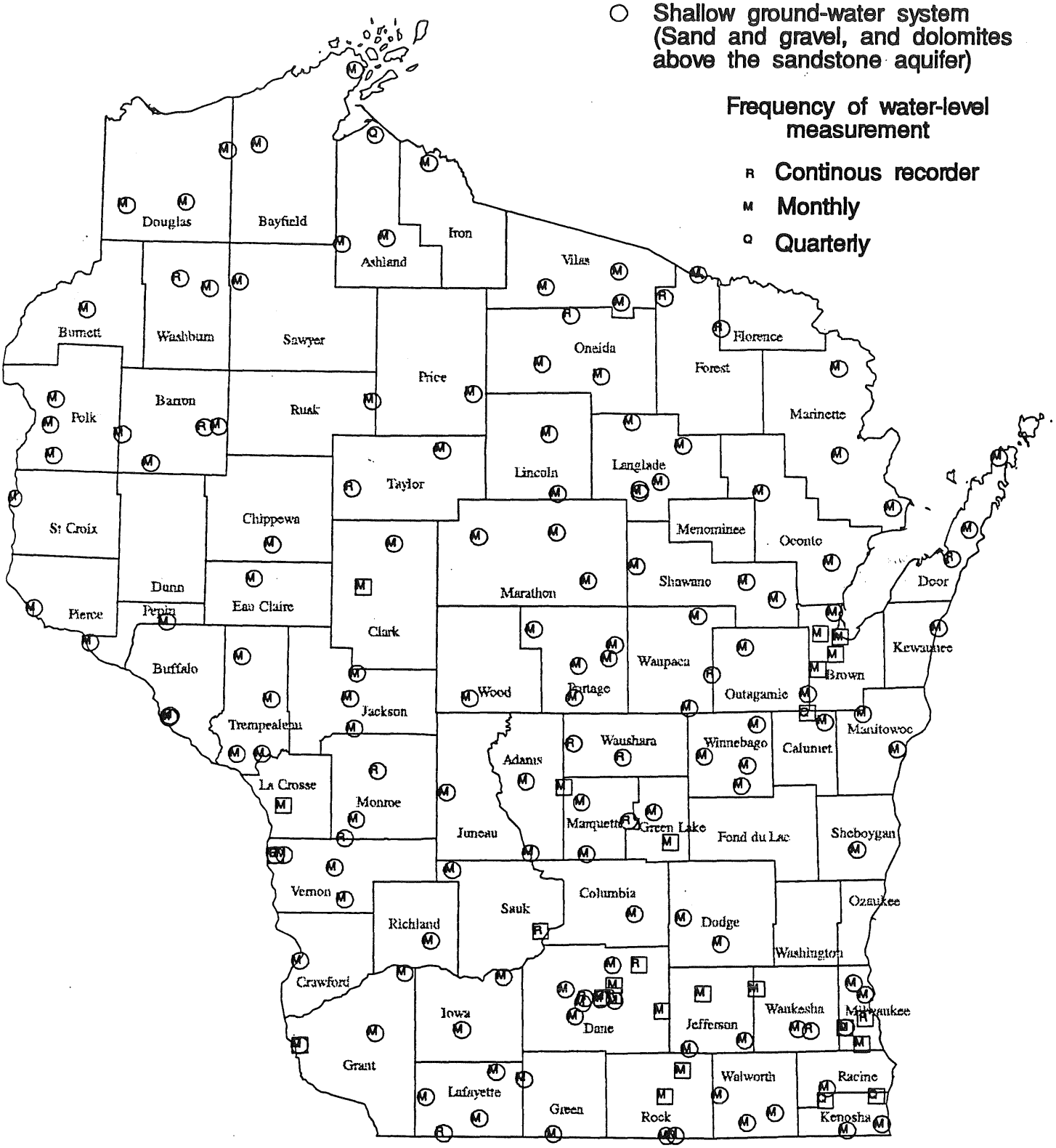

Figure - Location of wells, ground-water system and frequency of water-level measurement for state-wide network of observaton wells monitored by the U.S. Geological Survey and the Wisconsin Geological and Natural History Survey.

ATTRIBUTES OF THE IDEAL OBSERVATION WELL

	Multiplier
I. WELL DATA	
A geologic, driller's log, or geophysical log is available.	3
Hydraulic information (aquifer tests) is available.	
Some water chemistry data are available.	
Water levels show good response to recharge/drought events.	3
Response to continuing withdrawal is measured.	3
II. WELL LOCATION	
The well is not in an isolated, difficult to reach area.	
The well is in a secure area.	
The well is not affected by pumping from nearby wells. *)	
III. WELL CONSTRUCTION	
The well is open to the formation that contains the water table.	
The well is screened or open to a single formation.	3
The well is open (no pump or obstructions) and accessible so that hydraulic and geophysical tests may be conducted.	3
The well is easily instrumented with a recorder (3-4" diameter).	
IV. OTHER	
The well is used only for monitoring or is unused.	
Ownership of the well is by local, state, or federal agency.	
Measurements provided by other agencies free of charge.	

RANKING SYSTEM

1 - No or bad information.
2 - Yes or good information.

*) Not applicable when the purpose is to measure the continuously declining levels; enter 2.

A.045

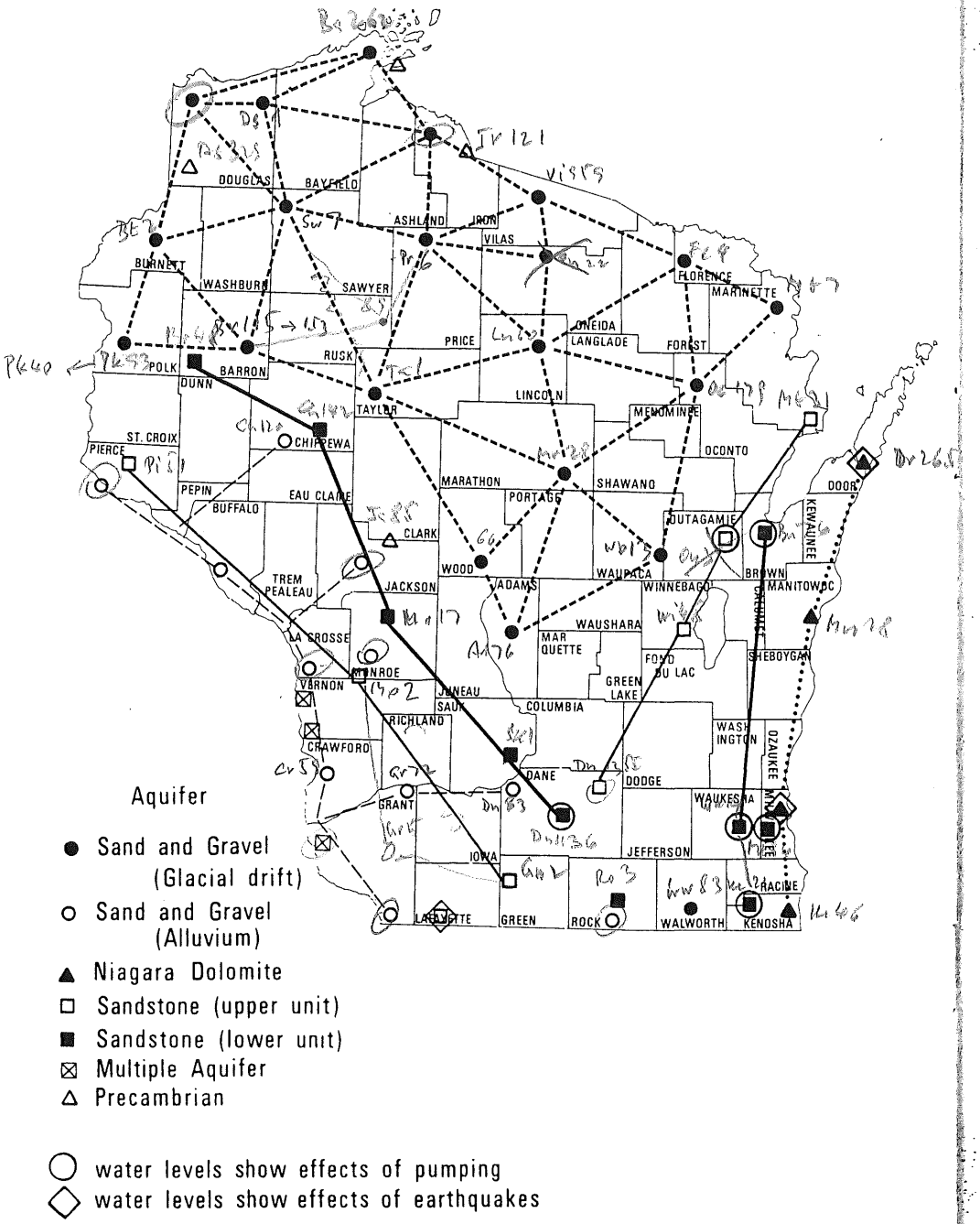

Figure 4. Proposed key observation wells.