APPENDIX B

APPENDIX B

BAINBRIDGE ISLAND

1. DRAINAGE AND TOPOGRAPHY

The topography of the Bainbridge Island subarea is generally of low rolling hills with steeper slopes and greater relief on the southern half of the Island. The topographic high for the Island is about 400 feet. Only four drainage basins on Bainbridge Island have a drainage area of over one square mile (see Volume 1 - Exhibit II-7). The drainage pattern generally radiates from the center of the island toward the surrounding Puget Sound waters. Basins number 434, and 463 show relatively low values of flow per unit area (see Appendix I) indicating possible groundwater discharge to other basins or to aquifers below sea level.

2. GEOLOGY

A. Surficial Geology

till (Qg1)

The surface geologic characteristics of Bainbridge Island (see Exhibit B-1) shows that the Island is mostly covered by ~~Unit 5~~. Outcrops of Unit 1 (bedrock) occur on the southern end of the island. Exposures of this unit on the island consist of the Blakeley Formation. A linear deposit of Unit 7 (gravel) from Fletcher Bay to Lynwood Center, probably ~~indicate~~ is an ancient outwash channel remnant from the Vashon Glaciation.

Qn1?

B. Subsurface Geology

The subsurface geology of Bainbridge Island is shown on cross sections G-G', H-H', I-I', J-J' (see Exhibits B-3 through 7). Exhibit B-2 shows the location of database wells in the subarea. Some of the deepest wells in the entire county are shown on these cross sections (note Well 15J01, Exhibit B-7). The cross sections show that most wells are completed in one of four stratigraphic layers: Qg1a, Qg2, Qg3 and Qg5. Unit Qg1a is a highly variable unit within the study area. It has an extremely high transmissivity of 190,000 gpd/ft in Well 16A01 and a low of 1,700 gpd/ft in Well 27G02 (see Exhibit B-4). Units Qg2 and Qg3 have many wells completed within them. These wells are mainly for domestic supply, but do include a few large public supply wells (see 27K02, G-G', 21G03, J-J'). Unit Qg5 has some very productive wells completed in it. Its transmissivity ranges from 12,000 to 21,000 gpd/ft (see J-J', Exhibit B-7). Note that few wells are completed in Unit Qg4.

Unit Tb, Blakeley Formation, dominates the geology of the southern end of Bainbridge Island. This unit does not produce significant groundwater and limits the groundwater production potential for this part of the subarea.

3. PRINCIPAL AQUIFERS

The Bainbridge Island subarea contains all or part of six delineated principal aquifer systems (see Exhibit B-8) of variable depths: Meadowmere, Wardwell, Bayhead, Creosote, Lynwood Center, and Gilberton-Fletcher. Aquifer characteristics are presented in Table B-2.

The Meadowmere aquifer system (see Exhibit B-8) is noted on cross section G-G' (see Exhibit B-4). This gravel and sand aquifer of Unit Qgla, found at approximately 100 feet above sea level to about sea level, is encountered in several wells (see Table B-1, also note Well 16A01 in Exhibit B-7). The aquifer shows large variability in transmissivity with values ranging from 4,000 to 190,000 gpd/ft. Since the Meadowmere aquifer system is mostly above sea level, it is well defined in all directions by topographic constraints.

The Wardwell aquifer system (see Exhibit B-8) contains two aquifers and is noted on cross sections G-G' and J-J' (see Exhibits B-4 and 7). The Wardwell aquifer system is defined by the very deep aquifer encountered by Wells 15J01 and 21J02 (see Table B-1) from approximately 650 to 975 feet below sea level. This aquifer, located within Unit Qg5 (see Well 15J01, Exhibit B-7), has major groundwater development potential. Also noted in the area is a shallower aquifer indicated by wells 21G03 and 21J02 (see Table B-1) of much less groundwater potential. This shallow aquifer is located between 75 and 175 feet below sea level in Unit Qg3. The boundary of the deep aquifer system is well defined to the southwest by its absence in Well 21G03 (see center of Exhibit B-7) but is poorly defined elsewhere. The boundary of the shallower system is poorly defined.

The Bayhead aquifer system (see Exhibit B-8) is found at the head of Eagle Harbor and is not noted on any cross sections. It occurs northeast of the intersection of cross sections G-G' and H-H' (see Exhibits B-4 and 5). This sand and gravel aquifer is encountered from approximately sea level to 150 feet below sea level and is within Unit Qg3. Well 27E03, displayed on Table B-1, is typical of wells completed in this aquifer and gives a transmissivity value of 12,500 gpd/ft. The aquifer boundaries are defined to the north and east by non-productive wells that penetrated to the same depth or deeper. The aquifer's extent to the west and south is not well defined.

Check again; Ex. B-4

The Creosote aquifer system (see Exhibit B-8) is found along the southern shore of Eagle Harbor and is noted on cross sections G-G' and H-H' (see Exhibits B-4 and 5). This silty, sand and gravel aquifer is encountered in discontinuous zones

from approximately 600 to 800 feet below sea level in Unit Qn5. Very few wells in Kitsap County are completed in Unit Qn5 because of its usually silty nature. The southern boundary of the aquifer is well defined on the eastern end by a "dry" well (35H03, Table B-1). The southern geologic boundary is a bedrock ridge which limits the extent of the glacial sediments in this direction. The aquifer boundary to the west is less clearly defined.

The Lynwood Center aquifer (see Exhibit B-8) extends from Lynwood Center on the south end of Bainbridge Island northward about one mile. The northern fringe of this aquifer is shown on cross section H-H' (see Exhibit B-5). This gravel and sand aquifer is encountered from 25 to 125 feet below sea level within Unit Qg3 (see Well 33C01 in Exhibit B-5). Five wells listed in Table B-1 delineate the aquifer boundaries which are poorly defined in all directions due to the lack of subsurface data.

A portion of the Gilberton-Fletcher aquifer system exists on Bainbridge Island (see Exhibit B-8) as shown on cross section J-J' (see Exhibit B-7). This deep, sand and gravel aquifer system is encountered from approximately 300 to 650 feet below sea level on the Manette Peninsula (see Exhibit C-6) and from 850 to 900 feet below sea level on Bainbridge Island. It is for the most part within Unit Qg5 (see Well 20K01, Exhibit B-7). On Bainbridge Island the boundaries of the aquifer are not well defined. The Kitsap Peninsula extent of this aquifer will be discussed later in Appendix C which covers the Manette Peninsula area.

4. GROUNDWATER FLOW SYSTEM

A groundwater elevation contour map for the shallow aquifer system in the Bainbridge Subarea is presented in Exhibit B-9. This map illustrates the general water level elevations and directions of horizontal groundwater flow in the shallow aquifer system. Areas of groundwater recharge and discharge can also be inferred from the map. → which consists of the ... aquifers (or units)

Due to the size and shape of Bainbridge Island, shallow groundwater flows to Puget Sound in all directions, and discharges via coastal seeps and springs, and numerous small streams.

Bainbridge Island receives recharge in a number of small recharge areas around the Island, as shown on Exhibit B-9, which generally correspond to topographic highlands. In the north portion of the subarea, Madison Bay is flanked by recharge areas in the uplands located to the southeast and northwest. The uplands in the central portion of the Island, including those north of Winslow also are recharge areas. Finally, three small recharge areas appear to exist in the southern part of the subarea. One lies along the southwest coast, a second along the southern shore of Eagle Harbor, and a third is situated on the southern tip of the island.

5. WATER BALANCE AND RECHARGE

Long-term average water balance components for the Bainbridge Island subarea are presented in Table II-14, Volume I. Average precipitation is estimated to range between 35 and 40 inches/year; average evapotranspiration between 14 and 16 inches/year; average runoff between 6 and 7 inches/year; and average direct recharge between 15 and 17 inches/year.

Precipitation estimates are based on the analysis of U. S. Weather Bureau data and the precipitation isohyetal presented in Exhibit II-15, Volume I. Evapotranspiration was estimated using the Thornthwaite method assuming a 3- to 5-inch soil moisture holding capacity. Runoff was estimated to be approximately 15 to 20 percent of total precipitation. The runoff multiplier reflects the moderate to high infiltration potential of the area (Exhibit II-13, Volume I).

6. POTENTIAL DEVELOPABLE YIELD

Estimates of potential developable yield (PDY) for the Bainbridge Island subarea are shown in Table II-15, Volume I. Two sets of PDY estimates are presented within the table. The low end estimate (first four columns) assumes the effective recharge area that contributes to groundwater development is confined to the principal aquifer zones. The aquifer zones include Meadowmere, Wardwell, Bayhead, Creosote, Lynwood Center, and Gilberton-Fletcher (east). The recharge area to these aquifers was assumed to extend approximately 0.5 miles beyond the inferred limits of the aquifers which are shown on Exhibit II-8, Volume I, (exclusive of areas that extend into Puget Sound). The recharge area for many of the aquifers systems coalesce, thus the recharge areas were assessed collectively.

The high end estimate of PDY (column 5 through column 8 of Table II-15, Volume I) assumes that the entire subarea, with the exception of the high relief areas in vicinity of Puget Sound and the bedrock areas that lie near the southern end of the subarea, contributes recharge to groundwater system which can be extracted for development.

Both estimates assume that a percentage of the total long-term average recharge within specified areas can be economically captured for development without imposing ~~significant~~ unacceptable impacts on the hydrologic system (see Volume I, Section II.C.10).

The estimated recharge areas and recharge rates for the principal aquifers within the Bainbridge Island subarea are presented in Volume I, Table II-15. The PDY for these aquifers is estimated to be between 2.1 and 3.4 MGD (i.e. for C1 = 0.3 and C2 = 0.5, respectively).

The PDY for the entire subarea based on a recharge rate of 16 inches/year and a total recharge area of 21 square miles is estimated to be between 4.8 and 8.0 MGD (i.e. for C1 = 0.3 and C2 = 0.5, respectively).

Existing withdrawal (average daily) from the subarea based on a 1985 water use data is approximately 1.48 MGD which is less than the lower bound estimate of the PDY. Groundwater development is projected to increase to approximately 2.46 MGD by the year 2040. This level of development lies near the mid-range of the PDY estimate for the principal aquifers and well below the lower limit of the PDY estimate for the entire subarea.

There are insufficient water level trend data and other hydrologic information to assess whether present levels of development are creating adverse impacts within the subarea.

7. LAND USE AND WATER QUALITY ANALYSIS

A. Land Use Activities

Existing and historical land use in the Bainbridge Island subarea with potential for impacting groundwater quality are depicted in Exhibits B-10 through B-15 and are discussed according to the Office of Technology Assessment's (OTA) categories where appropriate.

(1) Category 1 - Sewered/Unsewered Areas

The currently sewered area on Bainbridge Island include the city of Winslow and the service area for Sewer District No. 7. The population living outside of these areas utilizes on-site sewage disposal systems. Potential future sewered areas are defined as having an urban or semi-urban classification according to the Kitsap County Department of Community Development. Both existing and future sewered areas are depicted on Exhibit B-10.

(2) Category 2 - Landfills/Hazardous Waste Sites/Underground Storage Tanks

The only landfill within the Bainbridge Island subarea was the County-owned municipal disposal site on Vincent Road. This site is no longer in use. There are four regulated hazardous waste sites on Bainbridge Island, one of which is the Wycoff site on Eagle Harbor. The Wycoff site is a wood preserving facility where investigations are underway to evaluate seepage of creosote and other contaminants into Eagle Harbor, and to determine clean-up actions. The Department of Ecology (Ecology) completed a preliminary investigation of Eagle Harbor and found high levels of

polycyclic aromatic hydrocarbons (PAHs) in the sediments in three areas of the harbor, next to the ferry terminal, adjacent to the Wycoff facility, and in the center of the harbor. High metals levels (copper, arsenic, mercury, lead, zinc, and thallium) were also present in the sediments adjacent to the ferry terminal. Few underground storage tanks have been reported on Bainbridge Island, with a total of only six in the Winslow area. The landfills, hazardous waste sites, and numbers of underground storage tanks are shown on Exhibit B-11.

(3) Category 3 - Transportation

The only major transportation corridor running through the Bainbridge Island subarea is State Route (SR) 3. The state Department of Transportation (DOT) reports annually on accident frequency on state roads. The accident figures for transportation corridors indicate the potential for spills along specific sections of road. Values for the number of accidents from 1986 and accident rates for sections of state and federal highways are shown in Exhibit B-13. In addition to materials spills, transportation corridors contain rights-of-way where herbicides and pesticides may have been applied for weed control.

(4) Category 4 - Agricultural/Mining

The Bainbridge Island subarea has a large surface area for potential agricultural and forestry use as can be seen in Exhibit B-12. The areas shown are currently classified as Rural (2.5 acre), meaning that the maximum density allowable will ultimately be only one dwelling unit for every 2.5 acres. Application of herbicides and pesticides on agricultural and forestry lands could potentially affects groundwater quality. Forest plantations throughout the County are normally sprayed with chemical herbicides once or twice during their sixty year life. This spraying occurs either during the winter while the trees are dormant, or during the early spring before the new growth has obtained three-quarters of its growth. Records from the Department of Natural Resources indicated little surface mining activity within this subarea. Only two surface mining sites were located and are also shown on Exhibit B-12.

(5) Category 6 - Wetlands

Wetland areas may indicate an area of groundwater-surface water interaction. Locations of wetland areas were obtained from the

and, so what is the importance - how plan to use this info ?

National Wetlands Survey completed by the Department of Interior's Fish and Wildlife Service. These locations were mapped for Bainbridge Island and are displayed in Exhibit B-14.

(6) Land Use/Zoning

Each of the subareas have land use policies in place which have been prepared by Kitsap County and the cities within each subarea. Exhibit B-15 displays the future land use categories for the Bainbridge Island subarea, according to the Kitsap County Department of Community Development.

B. Water Quality Trends

Water quality trends for the indicator parameters discussed in Volume I, Section II, Approach and Findings, were performed for data within the Bainbridge Island Subarea. The analysis was completed separately for shallow and deep wells, using a 100 foot depth as the cutoff between shallow and deep wells. A total of 158 wells, 61 shallow and 97 deep, were used in the trending analysis. Exhibit B-16 presents the location of wells from which water quality observations above the maximum contaminant level (MCL) were observed.

Data did not exist for the following indicator parameters:

Cyanide
Copper
Methylene Chloride
Tetrachloroethylene
1,1,1-Trichloroethane
Trichloroethylene
Mercury
Boron
Phenols
PCB
Tin
BTX
TOX, TOC
Indicator Pesticides

Trend plots for the remainder of indicator parameters can be seen in Technical Appendix H. Overall, no significant trends were calculated for any of the indicator parameters from either the shallow or the deep wells. Iron and manganese levels were found to be higher than secondary standards in several of the wells.

C. Sensitive Areas

Existing water quality data does not indicate any areas sensitive to land use activity on Bainbridge Island, although the amount of data for trending purposes is limited. The majority of the principal aquifer zones throughout the county are ~~located at~~ relatively deep, ~~depths~~ and are protected from surface contamination sources by low permeability layers. The Meadowmere and Lynwood aquifers lie at shallower depths however, and may be sensitive to the above mentioned land use activities. Ongoing investigations of water quality at the Wycoff Superfund site should continue to be evaluated.

8. WATER USE AND WATER RIGHTS

A. Population

Based on the Puget Sound Council of Governments (PSCOG), June 1988, Population and Employment Forecast, the estimated existing population for the Bainbridge subarea is approximately 14,500 (1989). Future population is estimated to increase from 18,467 in 2010 to 22,169 in 2040. These population figures are summarized on Table B-2 by Forecast Analysis Zones (FAZs). Approximately 75 percent of the population within this subarea is located in the rural area with about 25 percent of the population located in the semi-urban/rural areas.

B. Water Demand

(1) Municipal and Domestic

Average and peak day municipal and domestic water demand projections are population driven. Average day demands were derived based on an assumed average gpcd for three levels of development (i.e., urban, semi-urban/rural, and rural) to reflect varying mixes of residential, commercial, and industrial customers. Average per capita demands of 175, 140, and 100 gpd were assumed for existing conditions for urban, semi-urban/rural, and rural areas, respectively. Peak day demands were derived from average day demands by multiplying by an assumed peak to average day factor of 2.3, 3.0, and 3.0 for urban, semi-urban/rural, and rural areas, respectively. These average and peak day numbers are consistent with existing water demands experienced by utilities in Kitsap County and similar areas of the State.

how assumed? another study? based on present demand on systems divided by population?

Average day water demand is summarized on Table B-3 and peak day demand is summarized on Table B-4. Existing average day and peak day demand is estimated to be approximately 1.6 and 4.8

MGD, respectively. Average day is projected to increase from between approximately 1.8 and 2.0 MGD in 2010 to 2.2 and 2.5 MGD in 2040. Peak day demand is projected to range between 6.5 and 7.4 MGD in 2040.

The higher consumption values assume no change in water use patterns from existing condition. The lower values assume water conservation and an increase in multi-family housing units. Conservation assumes water savings of 5 percent in 1995 and 10 percent in 2000 and thereafter for all areas. An increase in multi-family units in the urban and transitional areas only was assumed to result in a savings of 1.5 and 3.5 percent in 1995 and 3 and 7 percent in 2000 and thereafter, respectively.

(2) Other

Very little other use is estimated for this subarea. As shown on Table B-5, approximately 0.6 MGD of commercial/industrial and irrigation water use is projected. Commercial/industrial water use was based on existing water rights and was estimated to be less than 0.02 MGD. The majority of commercial/industrial supplies are provided by public water supplies within the area. Based on water right records, water use for stock watering is negligible and there is no water used for fish propagation. Irrigation has been assumed to remain at present water use estimated amount of less than 0.2 MGD.

Irrigation water use for 1985 was based on 1982 Bureau of the Census statistics data for numbers of acres irrigated. Irrigation water use in 2040 was based on future land use. Irrigation estimates by subarea were apportioned based on existing water right records from Ecology. The number of acres under irrigation was assumed to be irrigated at an average rate of 1.5 acre-feet per acre per year. Irrigation figures were also based on a 150-day irrigation season rather than a calendar year as with other water uses.

C. Water Rights

The groundwater right information presented on Table B-6 has been primarily derived from the water right printout records of Ecology, dated July 11, 1988. The Table is divided into two parts. The first part contains all water rights for public water supply (i.e., identified on water right records as either "domestic multiple" or "domestic municipal"). The second part includes all the remaining water rights of record. Where a water right authorizes use for public water supply and one or more other uses, the right appears in both parts of the Table.

The Table does not include claims to groundwater rights or groundwater rights that have been established under the permit exemption provisions of the State Ground Water Code.

In this subarea, public water supply groundwater rights comprise approximately 92 percent of the annual authorization (acre-feet per year) under all the recorded rights. The water right authorization of 183 acre-feet per year for commercial and/or industrial use is approximately 55 percent of the authorization for all uses other than public water supply and less than 5 percent of total annual authorization. The annual authorization of 98 acre-feet per year is approximately 2 percent of total authorizations.

Hard to follow

Table B-1 Aquifer Characteristics Data
Bainbridge Island Subarea

Local Well Number	Ground Surface	Elevation in Feet (MSL) Top of Screen (1)	Bottom of Screen (2)	Static Water Level	Trans-missivity in gpd/ft (3)	Storage Coefficient (3)	Specific Capacity in gpm/ft (4)	Potential Well Yield in gpm (5)	Owner Well Name and Number
MEADOWMERE									
25N/02E-09H02	100.00	24.00	19.00	89.00			1.85	80	N. BAINBRIDGE W.C. WELL NO. 1
25N/02E-09H03	100.00	100.00	100.00	87.00			0.00		N. BAINBRIDGE W CO WELL 2
25N/02E-09H04	100.00	72.00	62.00	97.00			2.15	35	N. BAINBRIDGE W C WELL 3
25N/02E-09K02	110.00	8.00	-7.00	87.90	15000	0.0015000	4.00	213	N. BAINBRIDGE WATER CO WELL 4
25N/02E-16A01	260.00	105.80	100.30	143.83	190000				MEADOWMERE COMM. WELL NO. 2
WARDWELL									
25N/02E-15J01	40.00	-1000.00	-1147.00	30.50			3.92	392	WARWELL ROAD SITE
25N/02E-21J02	165.00	-659.00	-850.00	51.00	20000		9.60	640	WINSLOW SANDS ROAD. TEST WELL NO.1
25N/02E-22R02	250.00	59.00	0.00	122.30	30000		3.92	165	BAINBRIDGE SCH. DIST., WELL NO. 2
25N/02E-21G03	300.00	-83.00	-98.50	102.00	3000		1.30	130	KITSAP PUD ISLAND CENTER
BAYHEAD									
25N/02E-27E03	20.00	-101.00	-116.00	37.00			20.00	1840	TOWN OF WINSLOW BAYHEAD WELL NO. 1
25N/02E-34F02	130.00	3.90	-6.40	36.60	12500	0.0001700	1.67	36	OLD MILL ROAD WELL NO. 2
CREOSOTE									
25N/02E-34F03	130.00	-748.00	-803.00	24.00	1300				PORT BLAKELY WELL NO. 1
25N/02E-35G02	15.00	-500.00	-700.00						PORT BLAKELY MILL CO. TEST WELL 2
25N/02E-35H03	10.00	-600.00	-800.00		7500				WYCOFF 800 FT WELL
25N/02E-35H05	100.00								PORT BLAKELY MILL CO. TEST WELL 1
25N/02E-33C01	264.00	-81.00	-111.00	54.20	4400		0.31	27	KITSAP PUD GAZZMAN LK TEST WELL
GILBERTON-FLETCHER									
25N/02E-20K01	85.00	-856.00	-907.00	17.00	20000				FLETCHER BAY
25N/02E-19M01	136.00	-583.00	-634.00	32.00			6.89	689	GILBERTON WELL 1
25N/02E-19M02	136.00	-319.00	-344.00	39.00	8200		3.21	321	GILBERTON WELL 2
25N/01E-25R01	410.00	-392.00	-470.00	77.20			2.28	228	N PERRY AVE WD SUNSET AVE WELL
25N/01E-24P01	300.00	-458.00	-511.00	35.00			0.46	46	GILBERTON WEST TEST WELL

Table B-1 Aquifer Characteristics Data
Bainbridge Island Subarea

Local Well Number	Ground Surface	Elevation in Feet (MSL) Top of Screen (1)	Bottom of Screen (2)	Static Water Level	Trans-missivity in gpd/ft (3)	Storage Coefficient (3)	Specific Capacity in gpm/ft (4)	Potential Well Yield in gpm (5)	Owner Well Name and Number
LYNWOOD CENTER									
24N/02E-04A07	40.00	-66.00	-76.00	2.90	15000		3.75	172	LYNNWOOD WATER CO. WELL 6
24N/02E-04A08	40.00	-26.00	-46.00	12.50			2.67	68	LYNWOOD WATER CO WELL 5
24N/02E-04A04	20.00	-48.00	-63.00	9.00			1.34	50	LYNNWOOD WATER CO. WELL 4
24N/02E-04A05	20.00	-76.00	-85.00	-3.00			0.57	27	LYNNWOOD WATER CO. WELL 3
25N/02E-33C01	264.00	-81.00	-111.00	54.20	4400		0.31	27	KITSAP PUD GAZZMAN LK TEST WELL

NOTES:

(1) Elevation of top of upper most screen or perforated section (some wells have multiple completions).

(2) Elevation of bottom of lower most screen or perforated section.

(3) Transmissivity and storage coefficient values are obtained from relatively extensive testing of the well as part of well development investigations.

(4) Specific capacity is based on bail test or pump test data and is equal to the flow rate divided by the drawdown.

(5) Potential well yields are estimated as the product of 2/3's the available drawdown or 100 feet (whichever is less). Potential well yields of greater than 2,500 gpm are indicated as >2,500 to reflect reasonable well yields. The available drawdown is equal to the difference between the static water level and the top of the screen or perforated section of the well.

Is this reasonable for wells such as #15101 ?
(Ex. B-7)

TABLE B-2

SUBAREA 2 - BAINBRIDGE
POPULATION PROJECTION

FAZ NOS.	% IN SUB-AREA	YEAR 1970	1980	1985 (1)	1990	1995 (1)	2000	2010 (1)	2020	2030 (2)	2040 (2)
9913	100%	2,158	3,055	3,287	3,519	3,827	4,135	4,646	5,157	5,668	6,179
9914	100%	6,336	9,259	10,239	11,218	12,158	13,098	13,821	14,544	15,267	15,990
TOTAL		8,494	12,314	13,526	14,737	15,985	17,233	18,467	19,701	20,935	22,169

(1) Linearly extrapolated.
(2) Straight line projection.

Source: Puget Sound Council of Governments (PSCOG) June 1988 Population and Employment Forecasts

TABLE B-3

SUBAREA 2 - BAINBRIDGE
MUNICIPAL AND DOMESTIC WATER DEMAND
AVERAGE DAY DEMAND (MGD)

SCENARIO	FAZ NOS.	WATER USE CATEGORY	GPCD	YEAR 1980	1985	1990	1995	2000	2010	2020	STRAIGHT-LINE 2030	2040
SCENARIO 1 - EXISTING CONDITION (1)												
	9913	Semi-Urban/Rural	140	0.43	0.46	0.49	0.54	0.58	0.65	0.72	0.79	0.87
	9914	Rural	100	0.93	1.02	1.12	1.22	1.31	1.38	1.45	1.53	1.60
TOTAL				1.35	1.48	1.61	1.75	1.89	2.03	2.18	2.32	2.46
SCENARIO 2 - MULTI-FAMILY INCREASE (2)												
	9913	Semi-Urban/Rural	140	0.43	0.46	0.49	0.52	0.54	0.60	0.67	0.74	0.80
	9914	Rural	100	0.93	1.02	1.12	1.22	1.31	1.38	1.45	1.53	1.60
TOTAL				1.35	1.48	1.61	1.73	1.85	1.99	2.13	2.26	2.40
SCENARIO 3 - WITH WATER CONSERVATION (3)												
	9913	Semi-Urban/Rural	140	0.43	0.46	0.49	0.51	0.52	0.59	0.65	0.71	0.78
	9914	Rural	100	0.93	1.02	1.12	1.16	1.18	1.24	1.31	1.37	1.44
TOTAL				1.35	1.48	1.61	1.66	1.70	1.83	1.96	2.09	2.22
SCENARIO 4 - CONSERVATION AND MULTI-FAMILY INCREASE (4)												
	9913	Semi-Urban/Rural	140	0.43	0.46	0.49	0.49	0.48	0.54	0.60	0.66	0.72
	9914	Rural	100	0.93	1.02	1.12	1.16	1.18	1.24	1.31	1.37	1.44
TOTAL				1.35	1.48	1.61	1.65	1.66	1.78	1.91	2.03	2.16

(1) Assumes the following average gallons per capita per day (gpcd) demand for existing conditions for each area:

Water Use Category	Average GPCD
Rural	100
Semi-Urban/Rural	140
Urban	175

(2) Assumes increase in multi-family units in both the urban, semi-urban and semi-rural areas resulting in gradual reduction in per capita water consumption of 1.5% in the urban area and 3.5% in the semi-urban/rural areas for the year 1995, up to 3% and 7%, respectively, for the year 2000 and thereafter.

(3) Assumes conservation savings in gallons per capita per day (gpcd) of 5% in 1995 up to 10% in 2000 and thereafter for all urban, semi-urban/rural, and rural areas.

(4) Combination of Scenarios 2 and 3.

TABLE B-4

SUBAREA 2 - BAINBRIDGE
MUNICIPAL AND DOMESTIC WATER DEMAND
PEAK DAY DEMAND (MGD)

SUB-AREA	FAZ NOS.	WATER USE CATEGORY	PEAK/AVG: FACTOR	YEAR 1980	1985	1990	1995	2000	2010	2020	STRAIGHT-LINE 2030	2040
SCENARIO 1 - EXISTING CONDITION (1)												
	9913	Semi-Urban/Rural	3.0	1.28	1.38	1.48	1.61	1.74	1.95	2.17	2.38	2.60
	9914	Rural	3.0	2.78	3.07	3.37	3.65	3.93	4.15	4.36	4.58	4.80
TOTAL				4.06	4.45	4.84	5.25	5.67	6.10	6.53	6.96	7.39
SCENARIO 2 - MULTI-FAMILY INCREASE (2)												
	9913	Semi-Urban/Rural	3.0	1.28	1.38	1.48	1.55	1.62	1.81	2.01	2.21	2.41
	9914	Rural	3.0	2.78	3.07	3.37	3.65	3.93	4.15	4.36	4.58	4.80
TOTAL				4.06	4.45	4.84	5.20	5.54	5.96	6.38	6.79	7.21
SCENARIO 3 - WITH WATER CONSERVATION (3)												
	9913	Semi-Urban/Rural	3.0	1.28	1.38	1.48	1.53	1.56	1.76	1.95	2.14	2.34
	9914	Rural	3.0	2.78	3.07	3.37	3.47	3.54	3.73	3.93	4.12	4.32
TOTAL				4.06	4.45	4.84	4.99	5.10	5.49	5.88	6.26	6.65
SCENARIO 4 - CONSERVATION AND MULTI-FAMILY INCREASE (4)												
	9913	Semi-Urban/Rural	3.0	1.28	1.38	1.48	1.47	1.44	1.62	1.80	1.98	2.15
	9914	Rural	3.0	2.78	3.07	3.37	3.47	3.54	3.73	3.93	4.12	4.32
TOTAL				4.06	4.45	4.84	4.94	4.98	5.35	5.72	6.10	6.47

(1) Assumes the following peak gallons per capita per day (gpcd) demand for existing conditions for each area:

Water Use Category	Peak GPCD
Rural	300
Semi-Urban/Rural	420
Urban	402.5

(2) Assumes increase in multi-family units in both the urban, semi-urban and semi-rural areas resulting in gradual reduction in per capita water consumption of 1.5% in the urban area and 3.5% in the semi-urban/rural areas for the year 1995, up to 3% and 7%, respectively, for the year 2000 and thereafter.

(3) Assumes conservation savings in gallons per capita per day (gpcd) of 5% in 1995 up to 10% in 2000 and thereafter for all urban, semi-urban/rural, and rural areas.

(4) Combination of Scenarios 2 and 3.

TABLE 8-5

SUBAREA 2 - BAINBRIDGE
SUMMARY OF WATER DEMAND PROJECTIONS
AVERAGE DAY DURING IRRIGATION SEASON

SUB-AREA	WATER USE CATEGORY		YEAR 1985	1990	1995	2000	2010	2020	STRAIGHT-LINE 2030	2040
SCENARIO 1 - EXISTING CONDITION (1)										
	Municipal	(5)	1.19	1.29	1.40	1.51	1.63	1.74	1.86	1.97
	Domestic/Single Family	(6)	0.30	0.32	0.35	0.38	0.41	0.44	0.46	0.49
	Commerical/Industrial	(7)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	Irrigation	(8)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	Fish Propagation	(9)	0	0	0	0	0	0	0	0
	Stock Watering	(10)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL Scenario 1		1.81	1.94	2.08	2.22	2.36	2.50	2.65	2.79
SCENARIO 2 - WITH MULTI-FAMILY INCREASE (2)										
	Municipal	(5)	1.19	1.29	1.39	1.48	1.59	1.70	1.81	1.92
	Domestic/Single Family	(6)	0.30	0.32	0.35	0.37	0.40	0.43	0.45	0.48
	Commerical/Industrial	(7)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	Irrigation	(8)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	Fish Propagation	(9)	0	0	0	0	0	0	0	0
	Stock Watering	(10)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL Scenario 2		1.81	1.94	2.06	2.18	2.31	2.45	2.59	2.73
SCENARIO 3 - WITH WATER CONSERVATION (3)										
	Municipal	(5)	1.19	1.29	1.33	1.36	1.46	1.57	1.67	1.77
	Domestic/Single Family	(6)	0.30	0.32	0.33	0.34	0.37	0.39	0.42	0.44
	Commerical/Industrial	(7)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	Irrigation	(8)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	Fish Propagation	(9)	0	0	0	0	0	0	0	0
	Stock Watering	(10)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL Scenario 3		1.81	1.94	1.99	2.03	2.16	2.29	2.42	2.54
SCENARIO 4 - WITH CONSERVATION AND MULTI-FAMILY INCREASE (4)										
	Municipal	(5)	1.19	1.29	1.32	1.33	1.43	1.53	1.63	1.73
	Domestic/Single Family	(6)	0.30	0.32	0.33	0.33	0.36	0.38	0.41	0.43
	Commerical/Industrial	(7)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	Irrigation	(8)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	Fish Propagation	(9)	0	0	0	0	0	0	0	0
	Stock Watering	(10)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL Scenario 4		1.81	1.94	1.97	1.99	2.11	2.24	2.36	2.48

(1) Assumes the following average gallons per capita per day (gpcd) demand for existing conditions for each area:

Water Use Category	Average GPCD
Rural	100
Semi-Urban/Rural	140
Urban	175

(2) Assumes increase in multi-family units in both the urban, semi-urban and semi-rural areas resulting in gradual reducation in per capita water consumption of 1.5% in the urban area and 3.5% in the semi-urban /rural areas for the year 1995 up to 3% and 7%, respectively, for the year 2000 and thereafter.
(3) Assumes conservation savings in gallons per capita per day (gpcd) of 5% in 1995 up to 10% in 2000 and thereafter for all urban, semi-urban/rural, and rural areas.
(4) Combination of Scenarios 2 and 3.
(5) Includes all water supplied by public water systems based on estimate of number of persons served by Class 1 - 4 water systems. Approximately 80 percent of population is presently served by public supply.
(6) Assumes remaining population (approximately 20 percent of the County) is served by individual wells.
(7) Based on existing annual water right records from Department of Ecology.
(8) Total for 1985 through 2040 based on 1982 Bureau of the Census agriculture statistic. Proportioned to subareas based on water right records from Department of Ecology. Number of acres assumed to be irrigated at 1.5 acre-feet per acre per year. Also, water use based on a 5 month irrigation period rather than average over 12 month period.
(9) Based on existing annual water right records from Department of Ecology.
(10) Based on existing annual water right records from Department of Ecology.

TABLE B-6

GROUNDWATER RIGHT INFORMATION
KITSAP COUNTY GROUNDWATER MANAGEMENT AREA
BAINBRIDGE ISLAND

PUBLIC WATER SUPPLY (I) WATER RIGHTS

Source I.D. (2)	Location	Control No.	GPM	MGD	AF/YR(s) (3)	Comments (4)
T24N, R02E						
Bainbridge School District 303 (Johnston Blakely)	24N 02E 03C	G1-06977C	14	.02	3	C1.2t-368309
Bainbridge School District 303 (Johnston Blakely)	24N 02E 03C	G1-07735C	16	.02	3 (s)	C1.2t-368309 CU (Inst.) w/I-2
West Port Blakely	24N 02E 03F	G1-09697C	15	.02	14	C1.2-948604
Olson	24N 02E 04	G1-05490C	40	.06	9.9	
White Point Water	24N 02E 04	G1-22339C	60	.09	4	
Lynnwood Water Co. (S. Bainbridge Water)	24N 02E 04A	G1-23438C	50	.07	62.5	C1.1-81451M
Lynnwood Water Co.	24N 02E 04A	G1-23638G	50	.07	67.5	C1.1-81451M
Lynnwood Water Co.	24N 02E 04A	G1-23639C	50	.07	80 (s)	C1.1-81451M
Lynnwood Water Co.	24N 02E 04A	G1-23640C	60	.09	96 (s)	C1.1-81451M
Lynnwood Water Co.	24N 02E 04A	G1-24392C	225	.32	229.6	C1.1-81451M
Subtotal			580	.83	390.5	
T25N, R02E						
Okerman	25N 02E 03L	G1-20291P	20	.03	3	
Seabold Heights Water	25N 02E 04E	G1-20814C	10	.01	10	C1.2-769734
Needham	25N 02E 04	G1-21497C	22	.03	2	CU (Inst.) w/I-1
Hidden Cove West	25N 02E 04F	G1-23498C	30	.04	4.5	C1.4-004412
MacPherson Clan	25N 02E 04F	G1-24164P	30	.04	2	
Johnson	25N 02E 08Q	G1-23654C	20	.03	4	C1.4-10864N

TABLE B-6 continued

Source I.D. (2)	Location	Control No.	GPM	MGD	AF/YR(s) (3)	Comments (4)
T25N, R02E continued						
Koura	25N 02E 09R	G1*06975C	30	.04	26.4	CU w/C&I; I-10
Puget Waters	25N 02E 09G	G1*07000C	150	.22	90	
Sunset Hills Water	25N 02E 09K	G1*11052C	31	.04	16	Cl.2-861209
Olympic Terrace	25N 02E 09M	G1*11410C	15	.02	12	Cl.2-63497U
Manzanita Wtr. Co.	25N 02E 09G	G1-00445C	80	.12	17	Cl.2-510007
Rolling Bay Water	25N 02E 09H	G1-00531C	250	.36	336	
Sunset Hills Water	25N 02E 09K	G1-20239C	60	.09	18	Cl.2-861209
N. Bainbridge Wtr.	25N 02E 09J	G1-23277C	150	.22	200 (s)	Cl.1-599949
N. Bainbridge Wtr.	25N 02E 09G	G1-24155C	200	.29	80	Cl.1-599949
Sanderson & Assoc.	25N 02E 09A	G1-24547C	5	.01	1	
N. Bainbridge Wtr.	25N 02E 11E	G1-24627C	75	.11	90	Cl.1-599949
Fosmo	25N 02E 15Q	G1-24194C	12	.02	1.8	
Meadowmeer	25N 02E 16A	G1-23450C	250	.36	150	Cl.1-532750
Meadowmeer	25N 02E 16A	G1-23643C	247	.36	215	Cl.1-532750
Orr	25N 02E 17K	G1-22979C	30	.04	4	
Peninsula Inv.	25N 02E 17P	G1-23310P	20	.03	4	
Thalberg	25N 02E 17E	G1-23586C	40	.06	3.5	Cl.4-87664
Kitsap Co. PUD #1 (Fletcher Bay PUD #1)	25N 02E 20	G1-20706C	730	1.05	1,168	Cl.4-256150
Barnett (Fox Cove Wtr.)	25N 02E 20F	G1-23072C	75	.11	9	Cl.2-262753
Piller	25N 02E 21	G1-23655B	30	.04	1.8	CU (Inst.) w/S & I-15
Bainbridge Island No. 303	25N 02E 22R	G1*08879C	20	.03	32	Cl.1t-03790D
Waters	25N 02E 22	G1-22888C	15	.02	4	Cl.4-935951
Henshaw	25N 02E 22N	G1-23653G	15	.02	1.5	CU w/I-1
Bainbridge Island No. 303	25N 02E 22R	G1-23678C	120	.17	32 (s)	Cl.1t-03790D
Hepler (Broom-gerrie Water)	25N 02E 23Q	G1-24343C	10	.01	3.5	Cl.4-40316V
Madrona Water Co.	25N 02E 25	G1-20816C	40	.06	14	Cl.2-50220X
Seattle Housing Authority	25N 02E 26	G1*00283C	30	.04	20	
Antoncich	25N 02E 26H	G1*01075S	7	.01	11	
Wing Point Water	25N 02E 26H	G1*04645C	13	.02	21	
Winslow, Town of	25N 02E 26G	G1*06314C	30	.04	48 (s)	Cl.1-97650T

TABLE B-6 continued

Source I.D. (2)	Location	Control No.	GPM	MGD	AF/YR(s) (3)	Comments (4)
T25N, R02E continued						
Winslow, Town of	25N 02E 27K	G1*04780C	100	.14	160	C1.1-97650T
Winslow, Town of	25N 02E 27L	G1*04781C	50	.07	80	C1.1-97650T
Winslow, Town of	25N 02E 27E	G1*08012C	55	.08	88 (s)	C1.1-97650T
Winslow, Town of	25N 02E 27E	G1*08914C	300	.43	336 (s)	C1.1-97650T
Magnano	25N 02E 27	G1-20285C	37	.05	16.2	
Winslow, Town of	25N 02E 27E	G1-22248C	75	.11	160	C1.1-97650T
Peninsula Util.	25N 02E 27C	G1-23388P	10	.01	3.6	C1.4-669332
Winslow, Town of	25N 02E 27E	G1-24349C	200	.29	224	C1.1-97650T
Sanderson & Assoc. (Island Center Water)	25N 02E 28L	G1-22919C	12	.02	8	C1.4-36097D
Molstad	25N 02E 28	G1-23513C	20	.03	2	
Johnston	25N 02E 29B	G1-24657C	20	.03	4.5	C1.4-08661B
Goethals (Emerald Heights Water)	25N 02E 33Q	G1-22966C	80	.12	45	C1.2-23290U
Walberg	25N 02E 34E	G1*08858C	25	.04	6	
Clementz	25N 02E 34E	G1-20410C	8	.01	6	C1.4-136401
Haynes	25N 02E 34J	G1-22563P	20	.03	8	
Rose Avenue Water System	25N 02E 34J	G1-23041C	20	.03	8.4	C1.4-66932J
Sanderson & Assoc. (Harbor Crest)	25N 02E 34C	G1-24249P	60	.09	9	C1.2-01832W
Greco Utilities (Bill Pt. Wtr.)	25N 02E 35J	G1-00315C	42	.06	64.2	C1.2-06790L
Moorings	25N 02E 35G	G1-23801P	7	.01	1.62	
Subtotal			4,053	5.84	3,182.52	
T26N, R02E						
Gen-Don Assoc.	26N 02E 28K	G1-23752C	20	.03	3	C1.4-45453T
Sanderson & Assoc. (Seabold Water)	26N 02E 33E	G1-22920C	20	.03	8	C1.4-980334
Wash. Agencies	26N 02E 33E	G1-23059C	21	.03	4	
Howard Jt. Venture	26N 02E 33D	G1-24529C	26	.04	4.25	

TABLE B-6 continued

Source I.D. (2)	Location	Control No.	GPM	MGD	AF/YR(s) (3)	Comments (4)
T26N, R02E continued						
Wash. State Parks & Recreation (Fay-Bainbridge)	26N 02E 35	G1*08268C	35	.05	6	C1.1t-SP225X
Point Monroe Wtr.	26N 02E 35	G1-20124C	25	.04	11.2	C1.4-68080R
Port Madison Wtr.	26N 02E 35	G1-21643C	30	.04	48	C1.2-68750W
Subtotal			177	.26	84.45	
TOTALS			4,810	6.93	3,657.47	

Footnotes:

(1) Public water supply includes all water rights recorded with a use designation of "domestic multiple" or "domestic municipal" based on Ecology water right printout dated July 11, 1988.

(2) Under Source I.D. column, the entry is generally the original water right holder. The parenthetical entry denotes the public water supply entity from DSHS records.

(3) (s) = Supplemental rights are not included in subtotal or totals.

(4) Under Comments, the class of public supply system and DSHS water facility inventory number is shown; also, CU - Common Usage (i.e. water right quantities are not broken down by use category; and CU (Inst.) - Common Usage (Instantaneous) (i.e., the instantaneous rate of withdrawal is not broken down by use category).

TABLE B-6 continued

ALL OTHER RECORDED GROUNDWATER RIGHTS

Source I.D.	Location	Control No.	Use (1)	GPM	MGD	AF/YR(s) (2)	Comments (3)
T24N, R02E							
Bainbridge Island Sch. Dist. #303	24N 02E 03C	G1*07735C	I-2			4	CU (Inst.) w/DM
Lindstrum	24N 02E 10	G1-00062C	D	4	.01	1	
Williams	24N 02E 14A	G1-22749C	D	5	.01	2	
Brownell	24N 02E 14	G1-24804P	D	10	.01	.3	
Subtotal			I-2	19	.03	7.3	
T25N, R02E							
Thompson	25N 02E 02F	G1-22526C	D	50	.07	22	CU
			I-10				
Green	25N 02E 03P	G1-20366C	C&I	20	.03	15	CU
			FP				
Needham	25N 02E 04	G1-21497C	I-1			2	CU (Inst.) w/DM
Webb	25N 02E 04D	G1-23086G	D	15	.02	1	CU (Inst.)
			I-1.25			2	
Fox	25N 02E 09C	G1-24647C	D	10	.01	.75	
			C&I				
Koura	25N 02E 09R	G1*06975C	I-10				CU w/DM
Claseman	25N 02E 15J	G1-23269C	D	10	.01	1	
Smith	25N 02E 16L	G1*04675C	I-25	55	.08	50	
Barnett	25N 02E 20	G1*00941S	D	2	0	.06	
Owens	25N 02E 21G	G1-20765C	D	5	.01	1	
			I-4	15	.02	8	
Kempbell	22N 02E 21H	G1-23311G	D	8	.01	7.5	CU
			S				
			I-4.5				
Piller	25N 02E 21	G1-23655B	S			.2	CU (Inst.) w/DM
			I-15			15	
Gregg	25N 02E 21P	G1-23421C	D	15	.02	1	
Putman	25N 02E 22P	G1-22602C	D	25	.04	1	CU (Inst.)
			I-2			4	
Henshaw	25N 02E 22N	G1-23653G	I-1				CU w/DM
Coyne	25N 02E 22N	G1-23333C	D	10	.01	1	

TABLE B-6 continued

Source I.D.	Location	Control No.	Use (1)	GPM	MGD	AF/YR(s) (2)	Comments (3)
T25N, R02E continued							
Amis	25N 02E 23	G1*11122C	D	5	.01	2	
Buesser	25N 02E 26F	G1-23124C	D	10	.01	2	
Weavers Concrete	25N 02E 27K	G1*04779C	C&I	10	.01	16	
Northwest Berry	25N 02E 27J	G1*06199C	D C&I	150	.22	157.6	CU
Venneman	25N 02E 28D	G1-21521C	D I-2.5	20	.03	6 (s)	CU
Spoor	25N 02E 28M	G1-23891C	D	2	0	1	
Ugles	25N 02E 28	G1-24233C	D	10	.01	1	
Jonas	25N 02E 29	G1-00106C	D	15	.02	6	
Phillips	25N 02E 32	G1-23540G	D I-2	30	.04	3	CU
USCE	25N 02E 34R	G1*03629C	D	5	.01	8	
Subtotal			I-78.25	497	.69	335.11	
T26N, R02E							
Strom	26N 02E 33K	G1*11088C	D	10	.01	1	
Olsen	26N 02E 34	G1*06990C	D	8	.01	5.6	
Springer	26N 02E 34	G1-21000C	D I-2	10	.01	2	CU
Subtotals			I-2	28	.03	8.6	
TOTALS			82.25	544	.75	351.01	
GRAND TOTALS				5,354	7.68	4,008.48	

Footnotes:

(1) Use abbreviations as follows: D - Domestic Supply; I-____ - Irrigation-(number of acres); C&I - Commercial and/or Industrial; R&B - Recreational and/or Beautification; WP - Wildlife Propagation; FP - Fish Propagation; and S - Stockwatering.

(2) (s) = Supplemental rights are not included in subtotal or totals.

(3) CU - Common Usage (i.e. water right quantities are not broken down by use category); CU (Inst.) - Common Usage (Instantaneous) (i.e. the instantaneous rate of withdrawal is not broken down by use category); and CU w/DM or CU (Inst.) w/DM means common usage with domestic multiple or domestic municipal entry in the public water supply table.

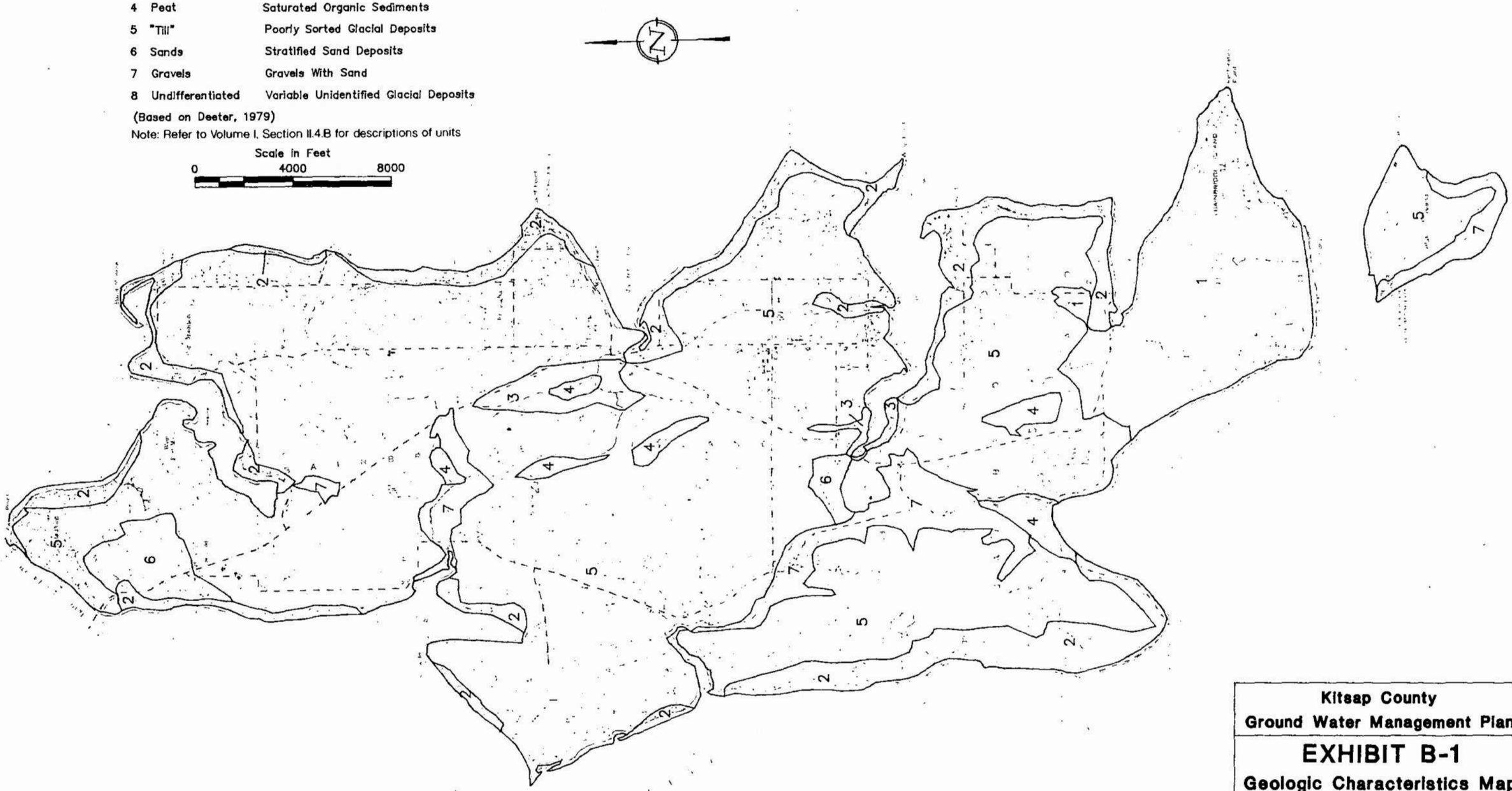
Map Unit	Unit	Unit
Unit	Type	Characteristics
1	Bedrock	Volcanic and Sedimentary Rocks
2	High Slope	Steep Topography/Complex Geology
3	Lacustrine	Lake and Flood Plain Sediments
4	Peat	Saturated Organic Sediments
5	"Till"	Poorly Sorted Glacial Deposits
6	Sands	Stratified Sand Deposits
7	Gravels	Gravels With Sand
8	Undifferentiated	Variable Unidentified Glacial Deposits

(Based on Deeter, 1979)

Note: Refer to Volume I, Section II.4.B for descriptions of units

Scale in Feet

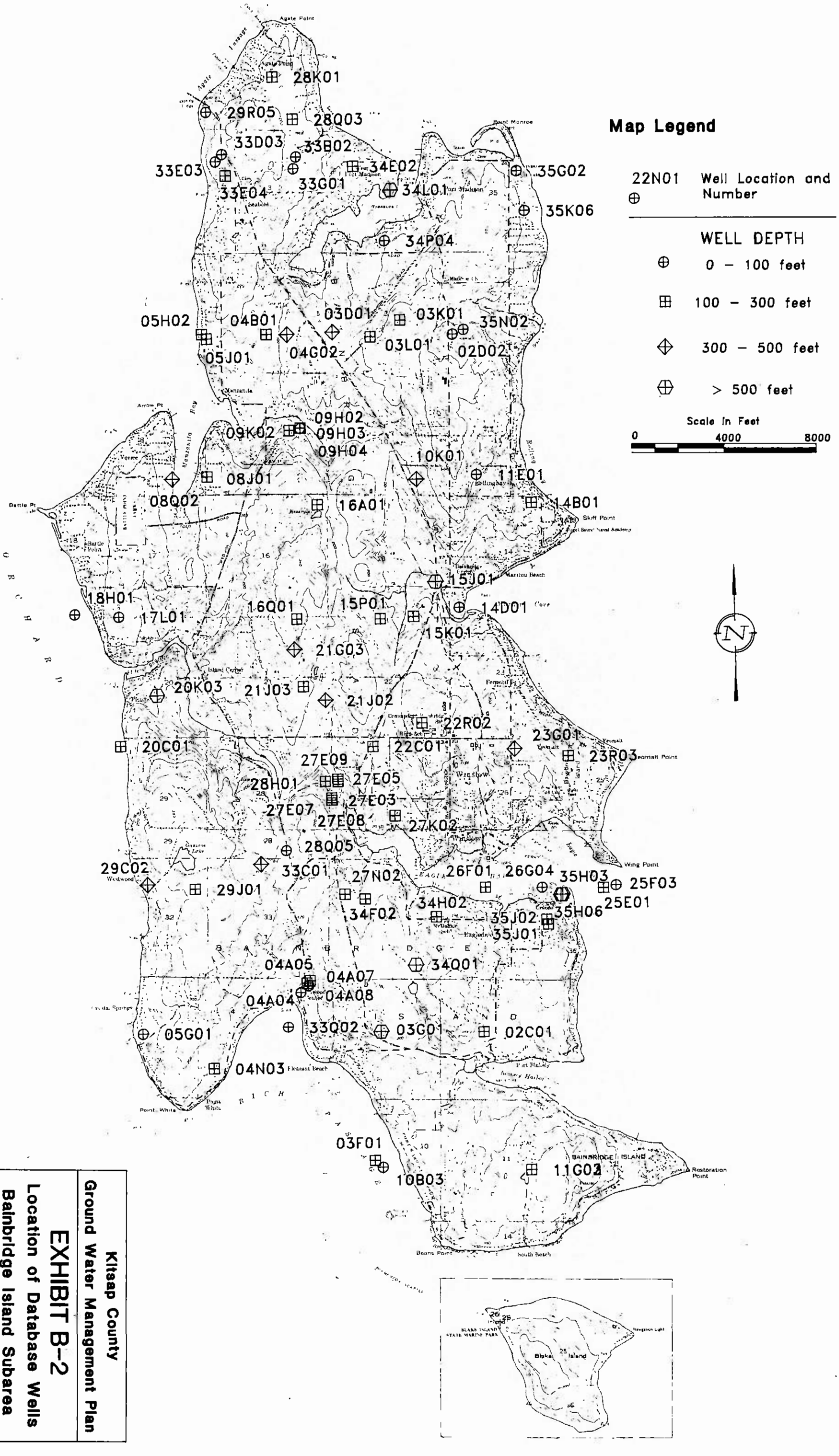
0 4000 8000



Kitsap County
Ground Water Management Plan

EXHIBIT B-1

Geologic Characteristics Map
Bainbridge Island



Kitsap County
Ground Water Management Plan

EXHIBIT B-2

Location of Database Wells
Bainbridge Island Subarea

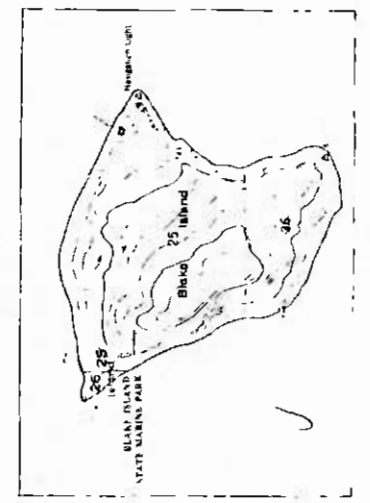
Map Legend

24N01 — Well Location and Local Well Number

A — A' — Subsurface Cross Section Location and Designation

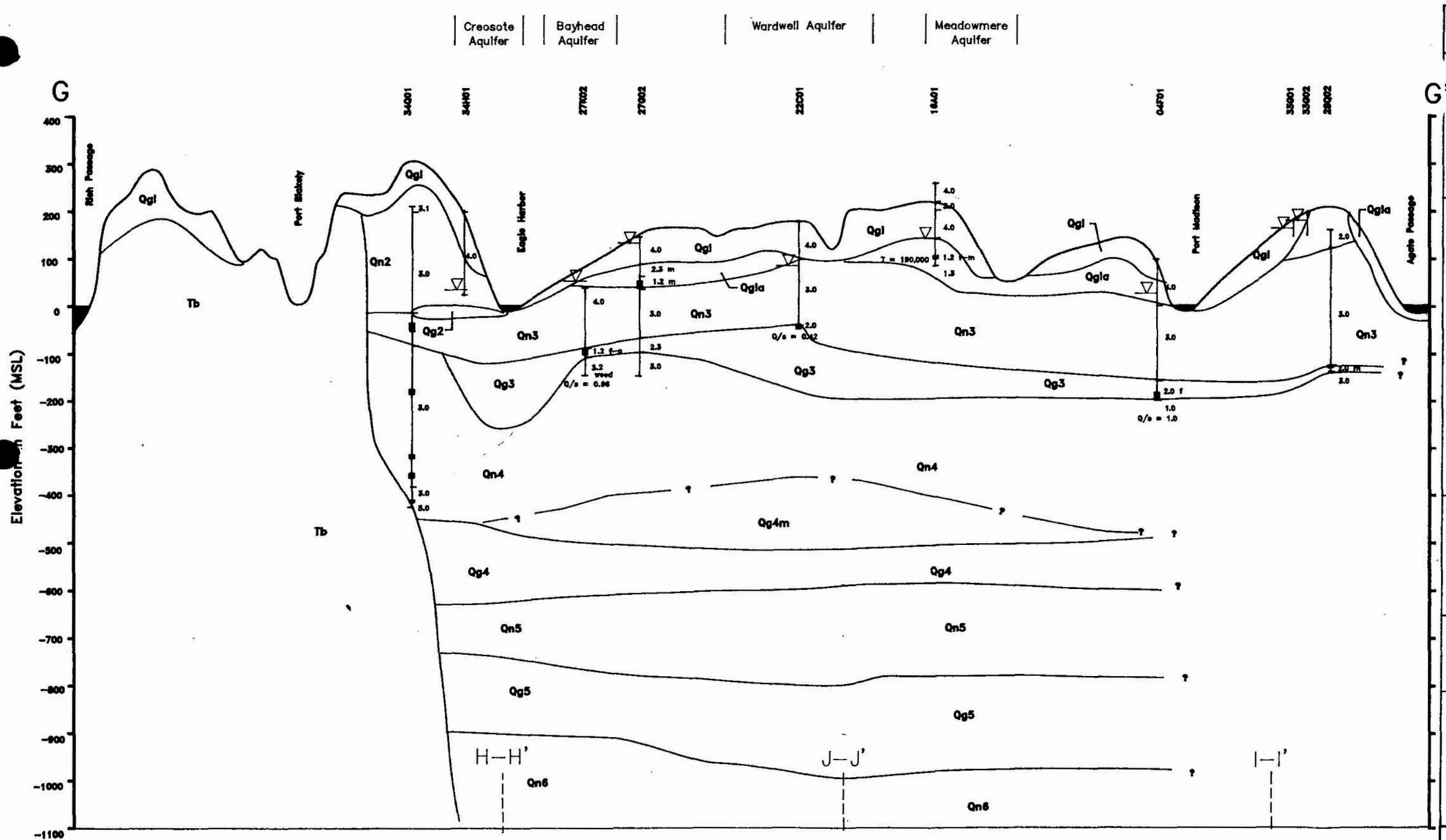
Scale In Feet: 0 — 4000 — 8000

N



Kitsap County
Ground Water Management Plan

EXHIBIT B-3
Cross Section Locations
Bainbridge Island



CROSS SECTION LEGEND

Local Well Number
Static Water Level Elev.
Lithologic Interval and Identifier
Perforated or Screened Interval
Aquifer Zone and Name
G–G'
Cross Section Intersect

LITHOLOGY

1.0 GRAVEL
1.2 Sandy GRAVEL (or GRAVEL and SAND)
1.3 Silty SAND and GRAVEL

2.0 SAND
2.1 Gravelly SAND
2.3 Silty SAND

3.0 SILT/CLAY
3.1 Gravelly SILT/CLAY
3.2 Sandy SILT/CLAY

4.0 GRAVEL with SAND, Silt/Clay Matrix (as Till)

5.0 Bedrock

f,m,c Grain Size of Sand Fraction (Fine, Medium, Coarse)

T Transmissivity (gpd/ft) calculated from controlled pumping tests

Q/s Specific Capacity (gpm/ft of drawdown), usually from drillers' records

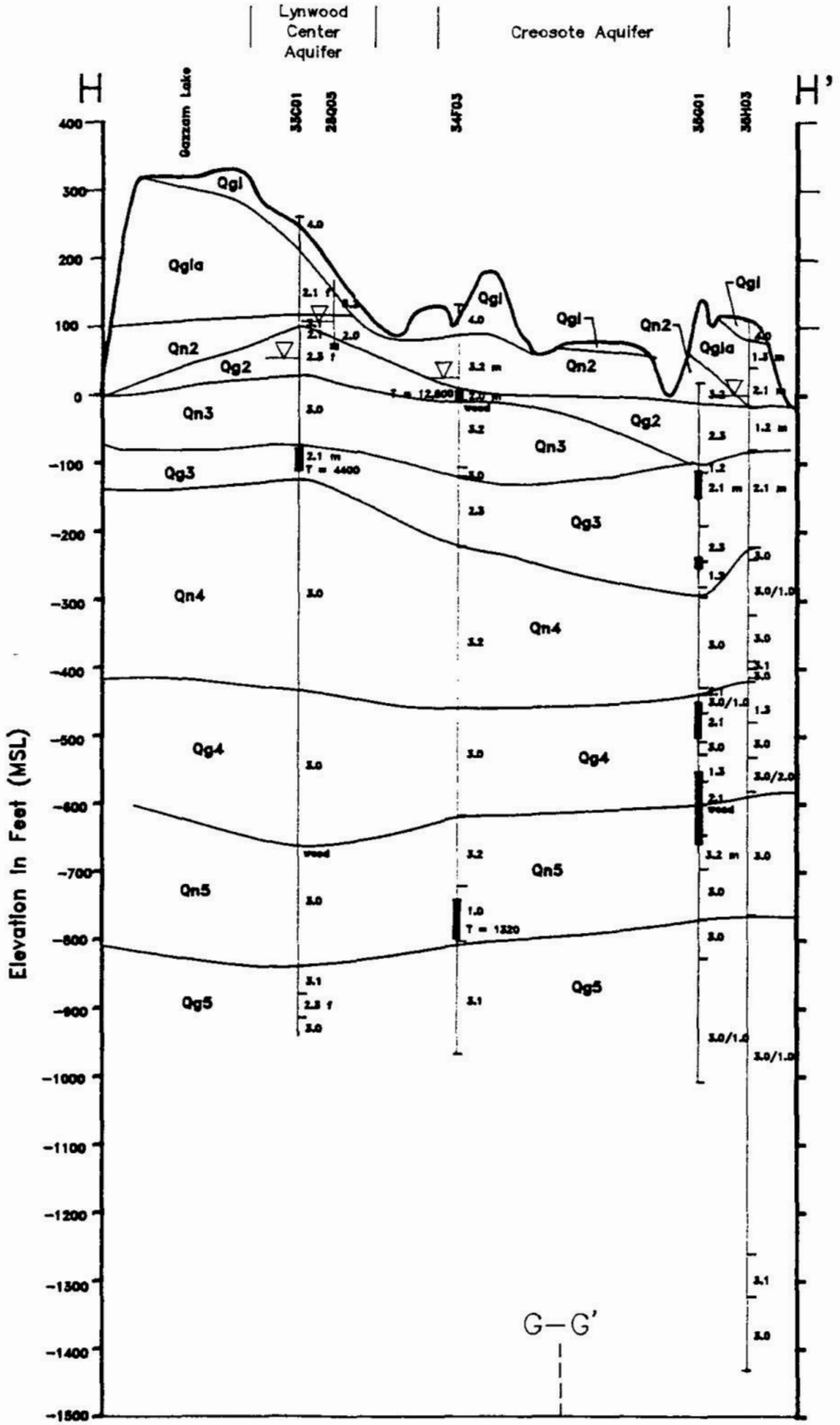
Note: Refer to Table II-12 for descriptions of Stratigraphic Units (e.g., Qg1, Qn1)

Horizontal Scale in Feet
0 4000 8000
0 200 400
Vertical Scale in Feet
Vertical Exaggeration x 20

Kitsap County
Groundwater Management Plan

EXHIBIT B-4

HYDROGEOLOGIC CROSS SECTION G–G'



CROSS SECTION LEGEND

28N02 — Local Well Number
Static Water Level Elev.
2.0 m — Lithologic Interval and Identifier
Perforated or Screened Interval
Aquifer Zone and Name
G—G' — Cross Section Intersect

LITHOLOGY

1.0 GRAVEL
1.2 Sandy GRAVEL (or GRAVEL and SAND)
1.3 Silty SAND and GRAVEL

2.0 SAND
2.1 Gravelly SAND
2.3 Silty SAND

3.0 SILT/CLAY
3.1 Gravelly SILT/CLAY
3.2 Sandy SILT/CLAY

4.0 GRAVEL with SAND, Silt/Clay Matrix (as Till)

5.0 Bedrock

f,m,c Grain Size of Sand Fraction (f=fine, m=medium, c=coarse)

T Transmissivity (gpd/ft) calculated from controlled pumping tests

Q/s Specific Capacity (gpm/ft of drawdown), usually from drillers' records

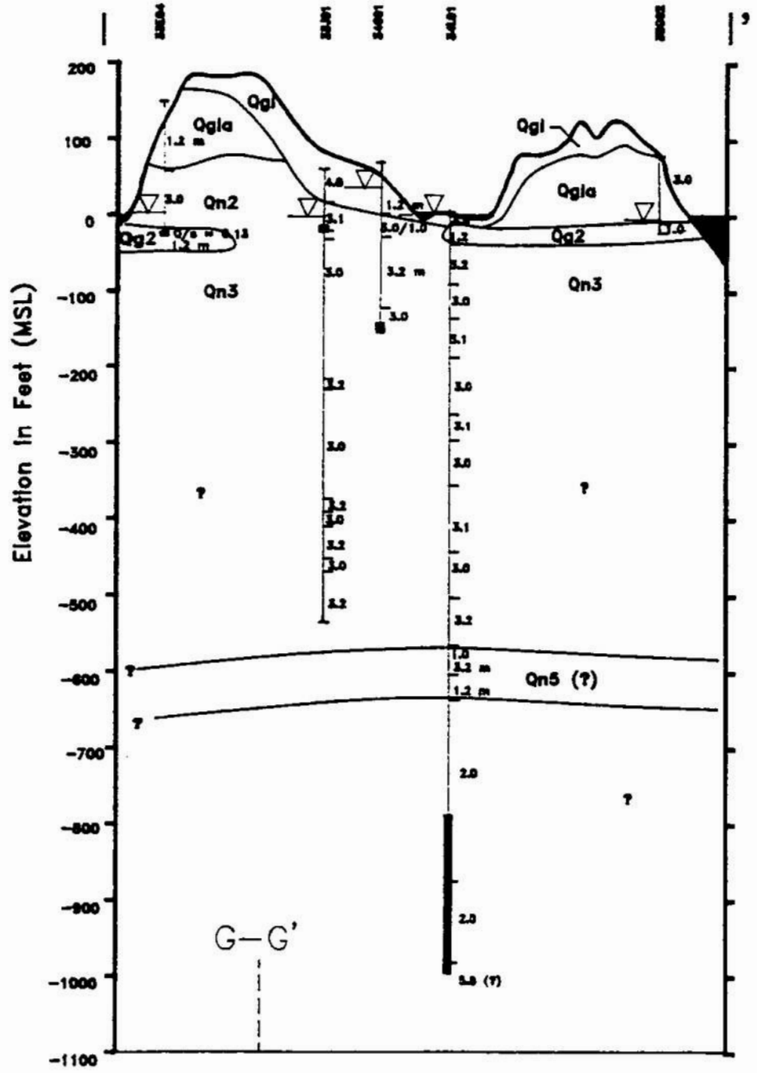
Note: Refer to Table B-12 for descriptions of Stratigraphic Units (e.g., Qg1, Qn1)

Horizontal Scale in Feet
0 4000 8000
0 200 400
Vertical Scale in Feet
Vertical Exaggeration x 20

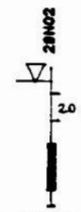
Kitsap County
Groundwater Management Plan

EXHIBIT B-5

HYDROGEOLOGIC
CROSS SECTION H—H'



CROSS SECTION LEGEND



Local Well Number

Static Water Level Elev.

Lithologic Interval and Identifier

Perforated or Screened Interval

Aquifer Zone and Name

G—G'

Cross Section Intersect

LITHOLOGY

1.0	GRAVEL
1.2	Sandy GRAVEL (or GRAVEL and SAND)
1.3	Silty SAND and GRAVEL
2.0	SAND
2.1	Gravelly SAND
2.3	Silty SAND
3.0	SILT/CLAY
3.1	Gravelly SILT/CLAY
3.2	Sandy SILT/CLAY
4.0	GRAVEL with SAND, Silt/Clay Matrix (as Till)
5.0	Bedrock
f,m,c	Grain Size of Sand Fraction (fine, medium, coarse)
T	Transmissivity (gpd/ft) calculated from controlled pumping tests
Q/s	Specific Capacity (gpm/ft of drawdown), usually from drillers' records

Note: Refer to Table B-12 for descriptions of Stratigraphic Units (e.g., Qg1, Qn1)

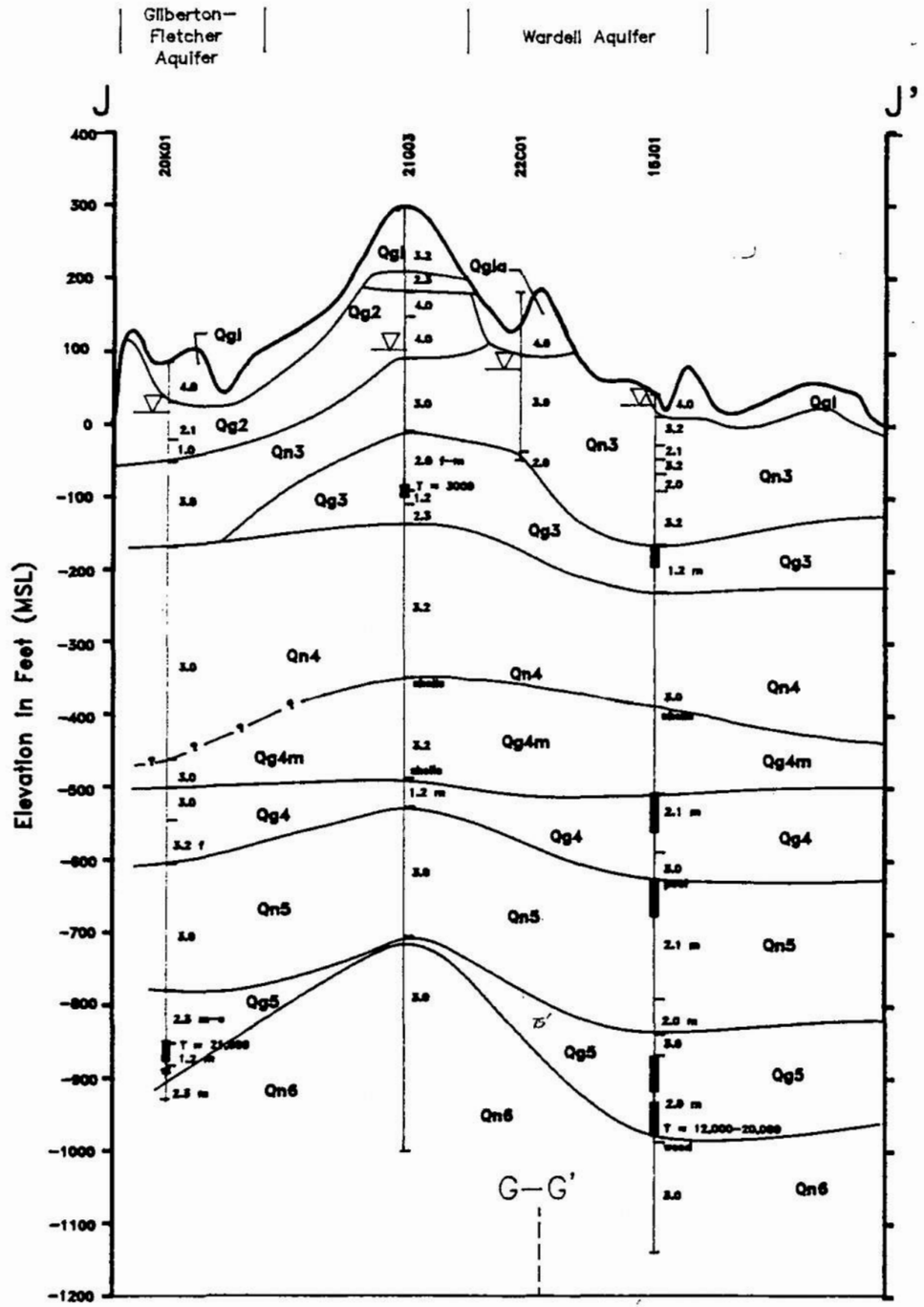
Horizontal Scale in Feet
0 4000 8000

0 200 400
Vertical Scale in Feet
Vertical Exaggeration x 20

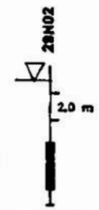
Kitsap County
Groundwater Management Plan

EXHIBIT B-6

HYDROGEOLOGIC
CROSS SECTION I-I'



CROSS SECTION LEGEND



Local Well Number

Static Water Level Elev.

Lithologic Interval and Identifier

Perforated or Screened Interval

Aquifer Zone and Name

G–G'

Cross Section Intersect

LITHOLOGY

1.0	GRAVEL
1.2	Sandy GRAVEL (or GRAVEL and SAND)
1.3	Silty SAND and GRAVEL
2.0	SAND
2.1	Gravelly SAND
2.3	Silty SAND
3.0	SILT/CLAY
3.1	Gravelly SILT/CLAY
3.2	Sandy SILT/CLAY
4.0	(GRAVEL with SAND, Silt/Clay Matrix (as Till)
5.0	Bedrock
f,m,c	Grain Size of Sand Fraction (fine, mmedium, coarse)
T	Transmissivity (gpd/ft) calculated from controlled pumping tests
Q/s	Specific Capacity (gpm/ft of drawdown), usually from drillers' records

Note: Refer to Table B-12 for descriptions of Stratigraphic Units (e.g., Qg1, Qn1)

Horizontal Scale in Feet
0 4000 8000

0 200 400
Vertical Scale in Feet
Vertical Exaggeration x 20

Kitsap County
Groundwater Management Plan

EXHIBIT B-7

HYDROGEOLOGIC CROSS SECTION J–J'

Map Legend

Location of Principal Aquifers. Aquifer boundaries are very approximately defined. Solid lines are shown in areas where there is adequate subsurface control beyond the limits of the aquifer. Dashed lines are shown in areas where there is an absence of subsurface data with which to confirm the boundary location.

34H01 — Location of well used in defining the extent of the principal aquifers. See Appendix F for additional well information as well as aquifer characteristics data.

Scale in Feet
0 4000 8000

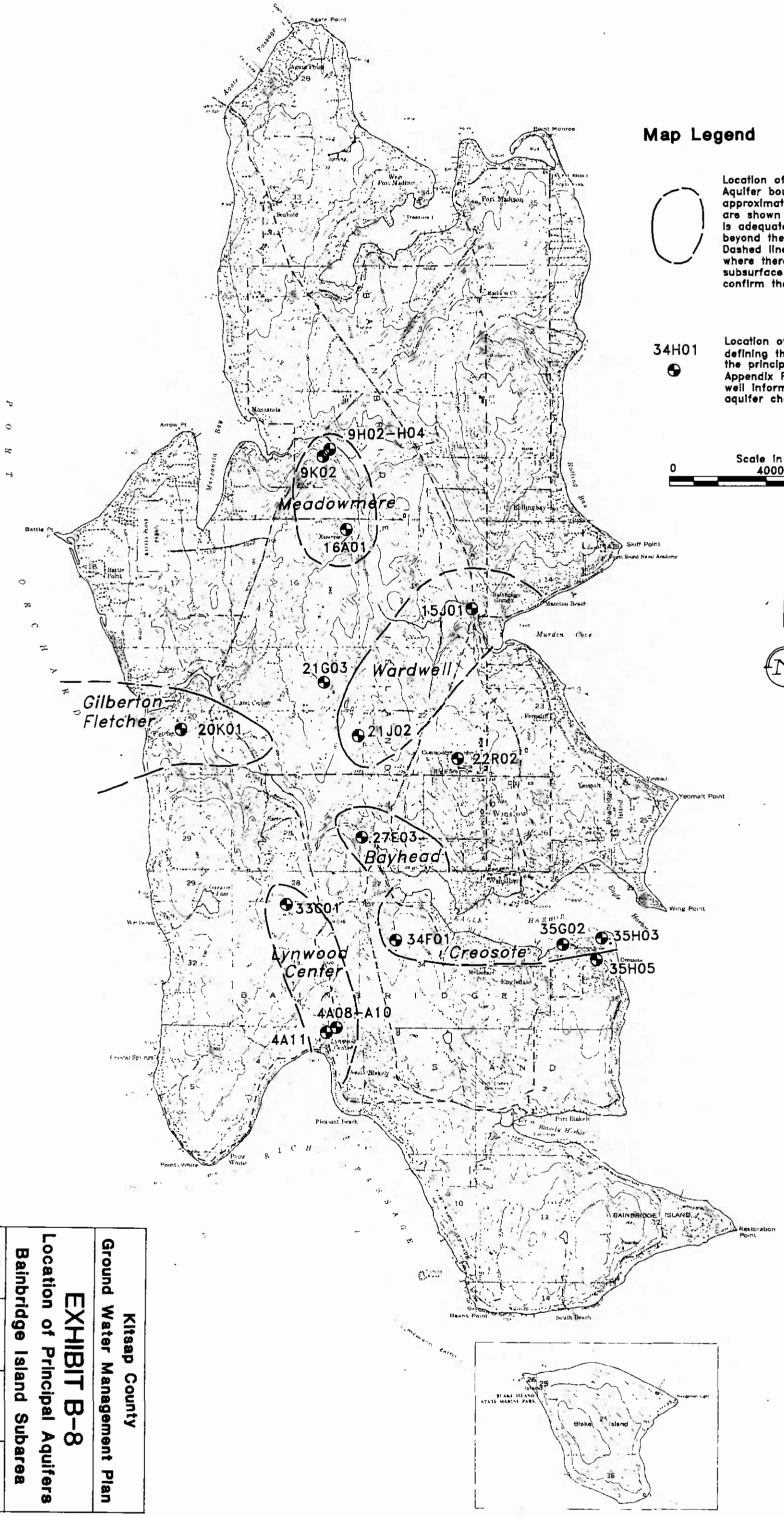


EXHIBIT B-8

Location of Principal Aquifers

Bainbridge Island Subarea

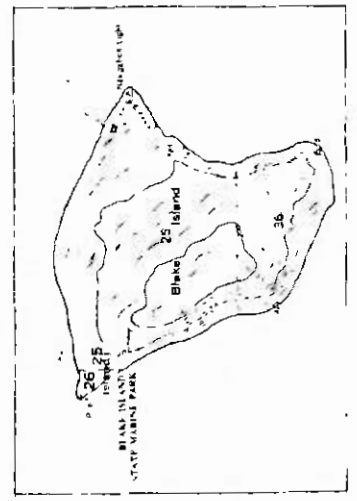
Kitsap County
Ground Water Management Plan

Map Legend

- ● 181 — Static Water Level Spot Elevation In Feet. Data from Kitsap County GWMP Database.
- —100— Static Water Level Elevation Contour in Feet (dashed where inferred).
- Outcrop of Tertiary Bedrock
- Generalized Groundwater Flow Direction

Scale In Feet
0 4000 8000

N



PORT ORCHARD

BAINBRIDGE ISLAND

BLAKE ISLAND STATE MARINE PARK

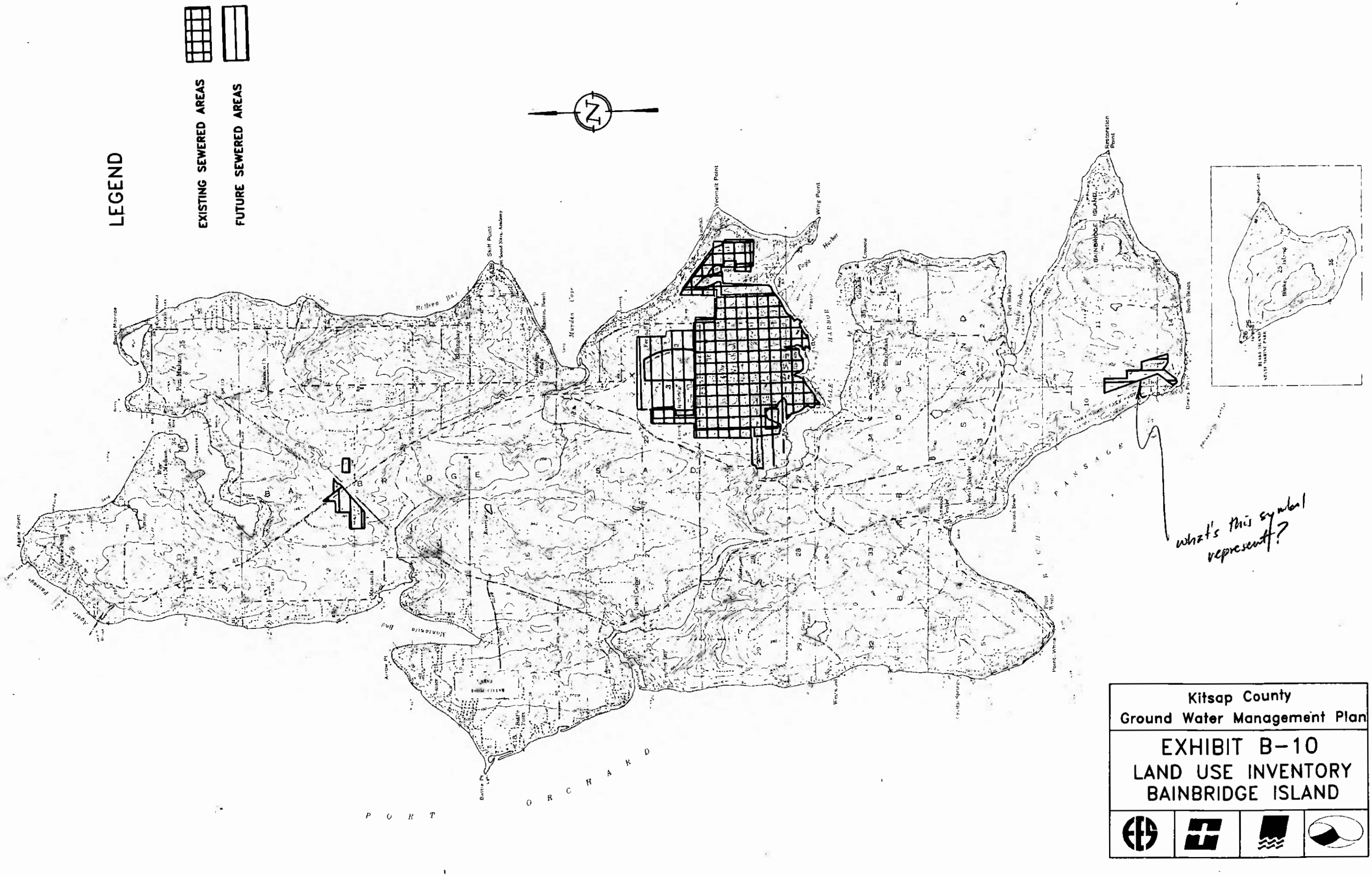
Kitsap County
Ground Water Management Plan

EXHIBIT B-9
Shallow Aquifer Groundwater
Elevation Contours and Flow Directions
Bainbridge Island

LEGEND

EXISTING SEWERED AREAS

FUTURE SEWERED AREAS



what's this symbol represent?

Kitsap County
Ground Water Management Plan

EXHIBIT B-10
LAND USE INVENTORY
BAINBRIDGE ISLAND

LEGEND

REGULATED HAZARDOUS WASTE FACILITIES

LANDFILLS

UNDERGROUND STORAGE TANKS

PORT GAMBLE
2 SITES
5 TANKS

WINSLOW
3 SITES
6 TANKS

BAINBRIDGE
23 SITES
66 TANKS

BAINBRIDGE

P O R T O R C H A R D

B A I N B R I D G E I S L A N D

Kitsap County
Ground Water Management Plan

EXHIBIT B-11

LAND USE INVENTORY
BAINBRIDGE ISLAND

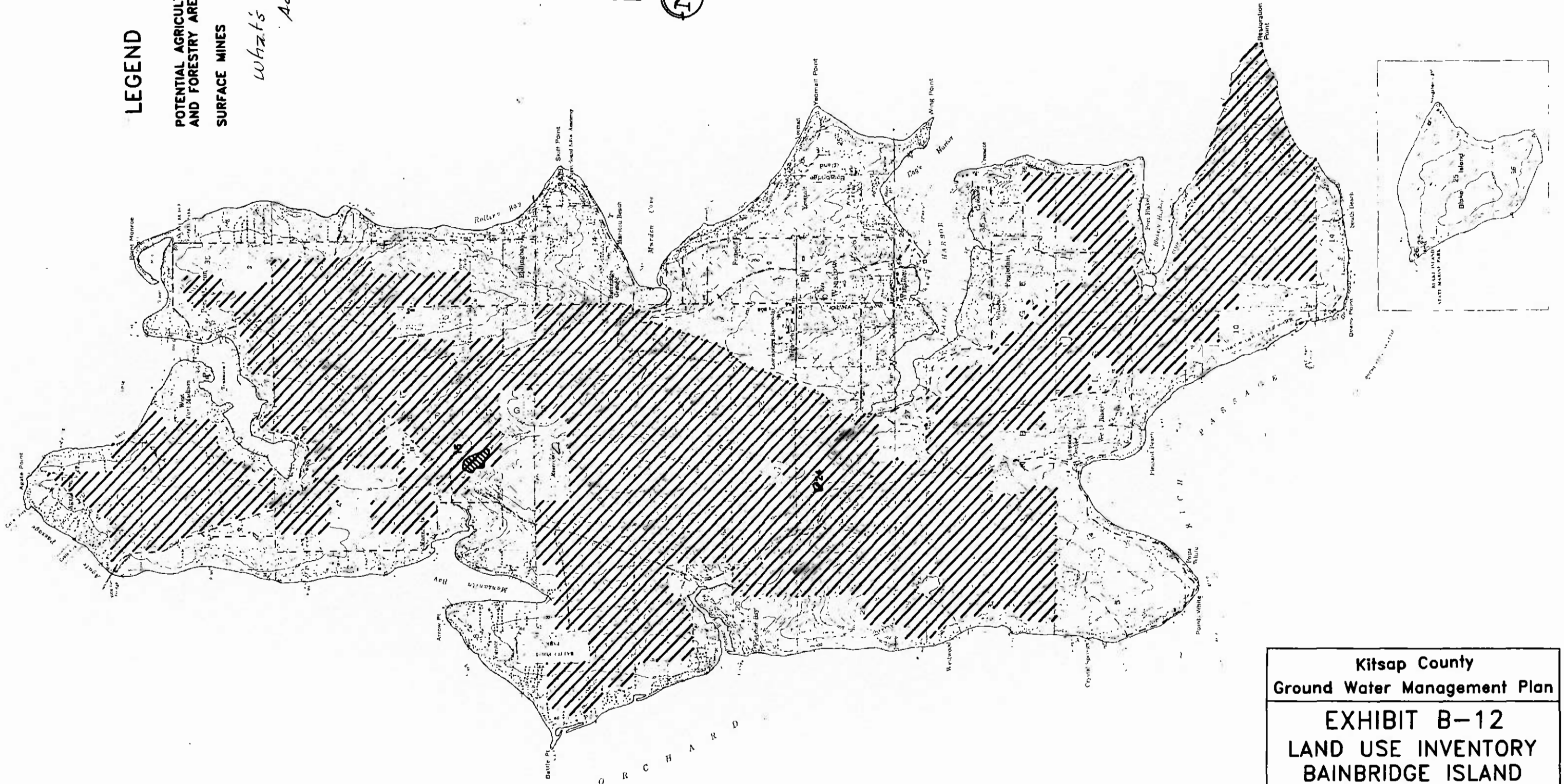
LEGEND

POTENTIAL AGRICULTURAL AND FORESTRY AREAS

SURFACE MINES

20

What's the # ? Acres ?



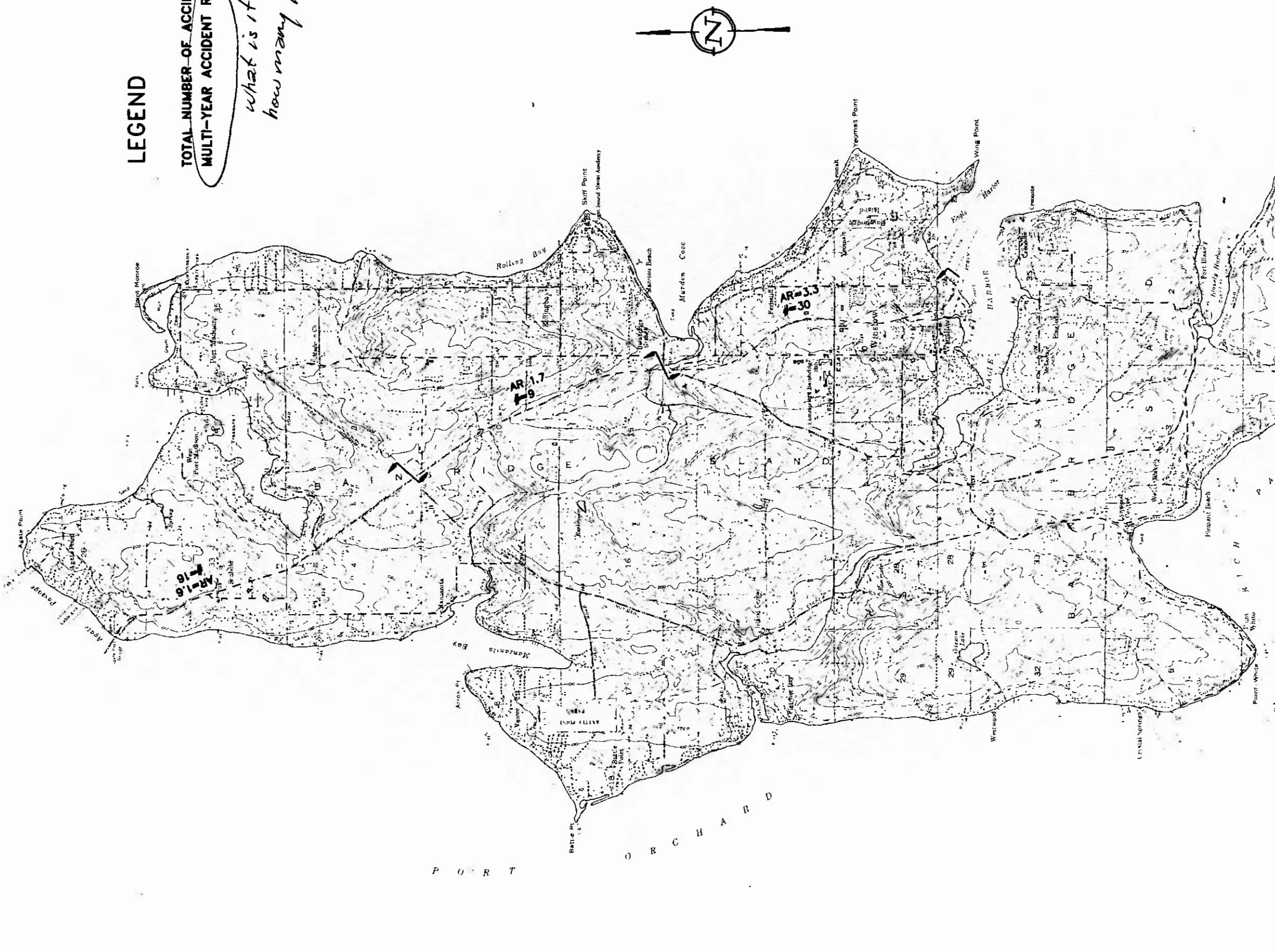
Kitsap County
Ground Water Management Plan

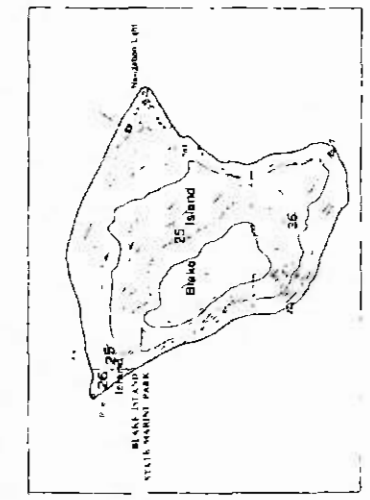
EXHIBIT B–12
LAND USE INVENTORY
BAINBRIDGE ISLAND

LEGEND

TOTAL NUMBER OF ACCIDENTS AR=8.8
MULTI-YEAR ACCIDENT RATE #=11

what is it?
how many years?





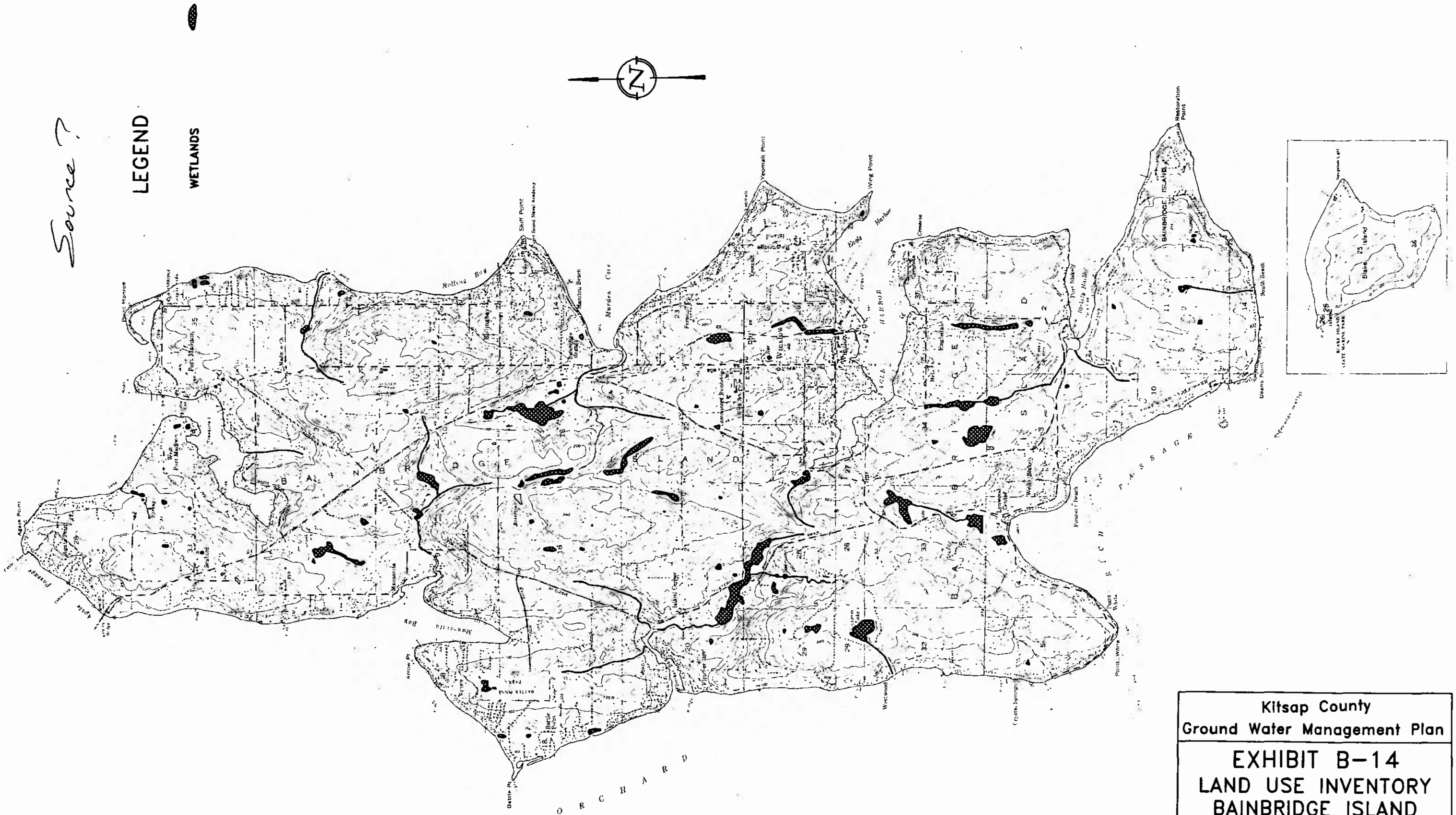
Kitsap County
Ground Water Management Plan

EXHIBIT B-13
LAND USE INVENTORY
BAINBRIDGE ISLAND

Source ?

LEGEND

WETLANDS

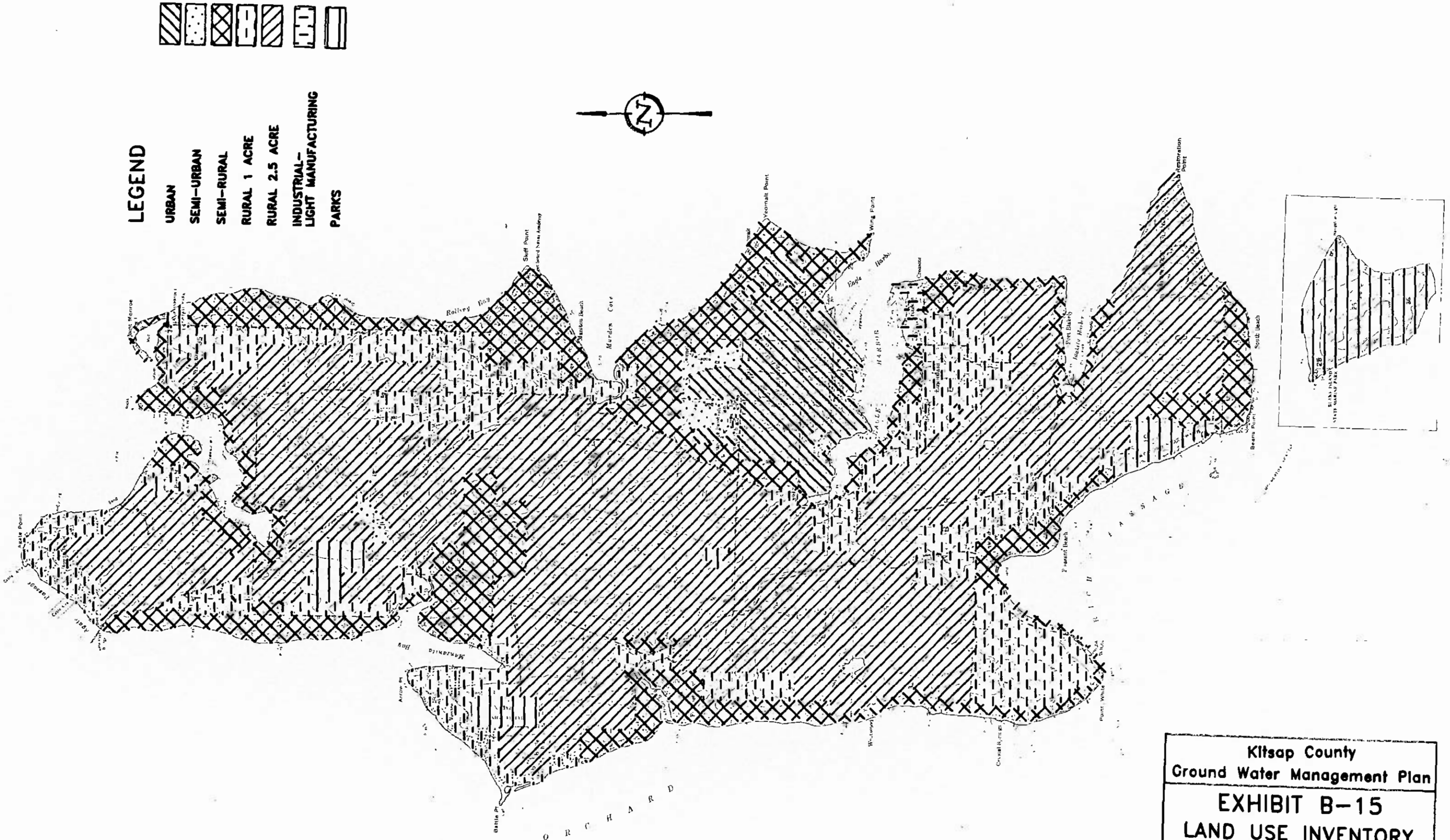


Kitsap County
Ground Water Management Plan

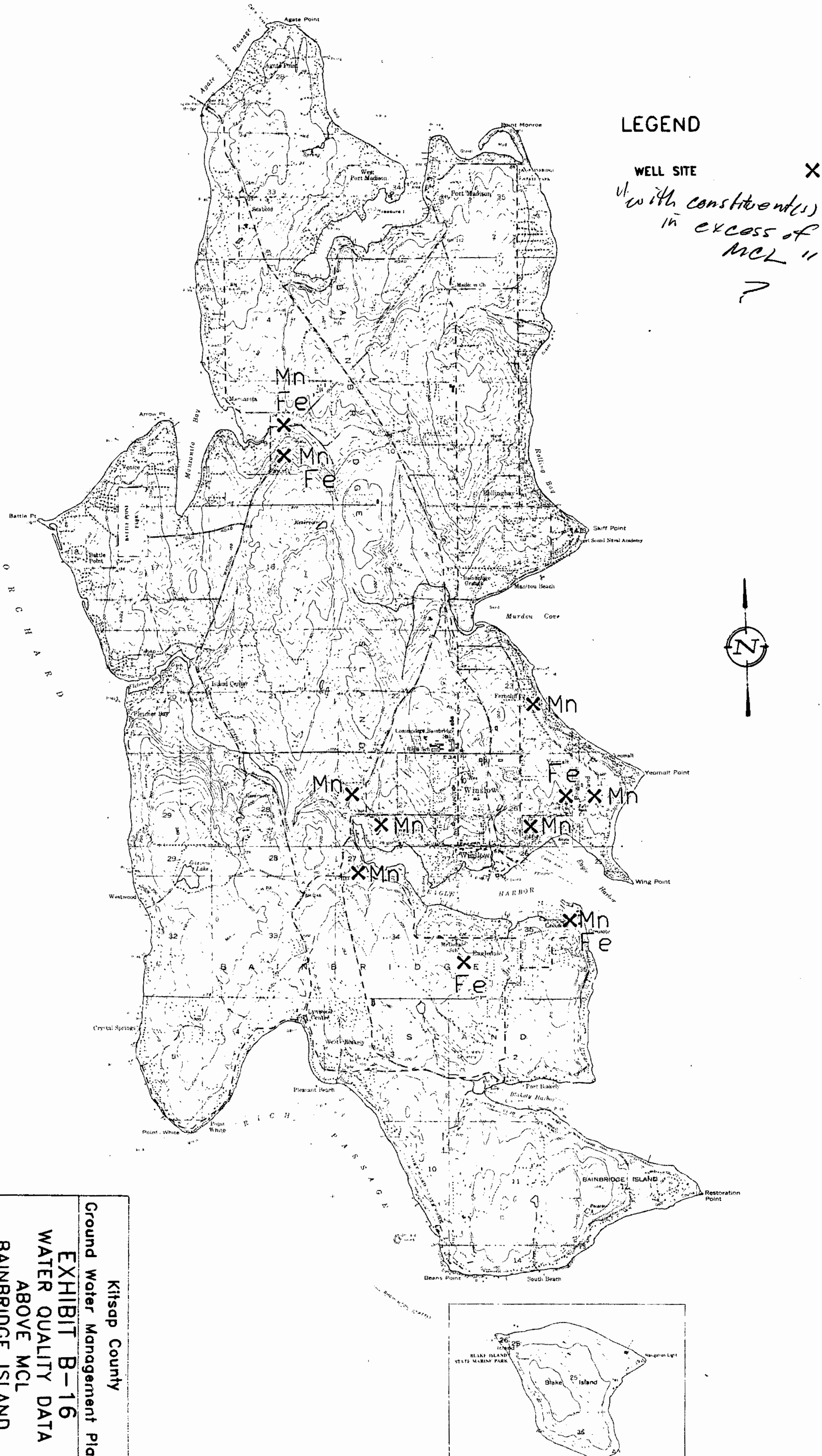
EXHIBIT B–14
LAND USE INVENTORY
BAINBRIDGE ISLAND

LEGEND

- URBAN
- SEMI-URBAN
- SEMI-RURAL
- RURAL 1 ACRE
- RURAL 2.5 ACRE
- INDUSTRIAL-LIGHT MANUFACTURING
- PARKS



Kitsap County Ground Water Management Plan
EXHIBIT B–15 LAND USE INVENTORY BAINBRIDGE ISLAND



Kitsap County
Ground Water Management Plan
EXHIBIT B-16
WATER QUALITY DATA
ABOVE MCL
BAINBRIDGE ISLAND