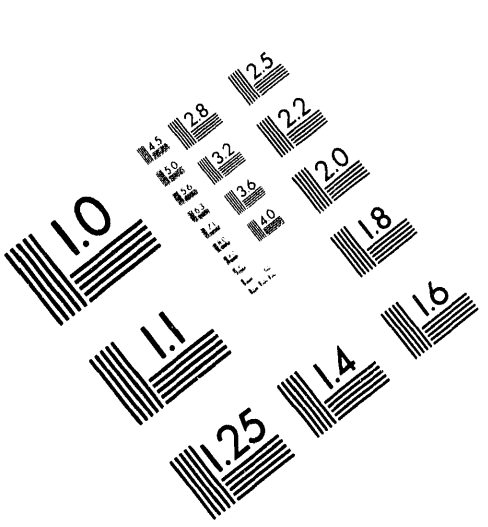

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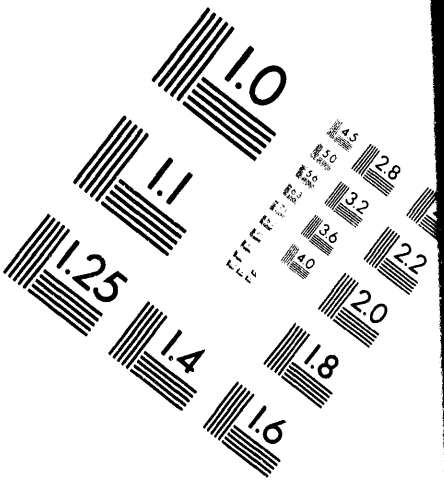

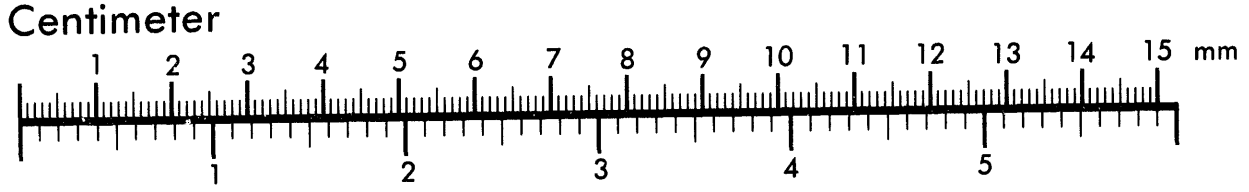

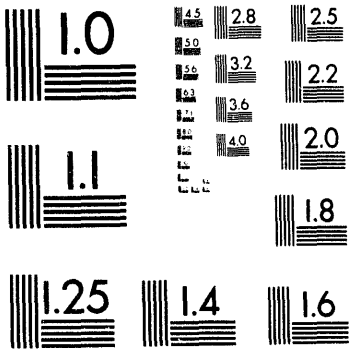

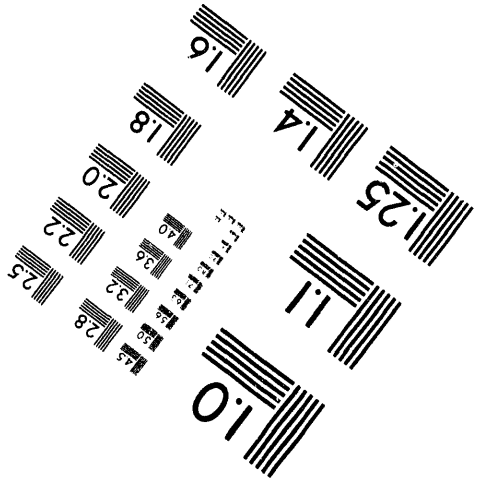

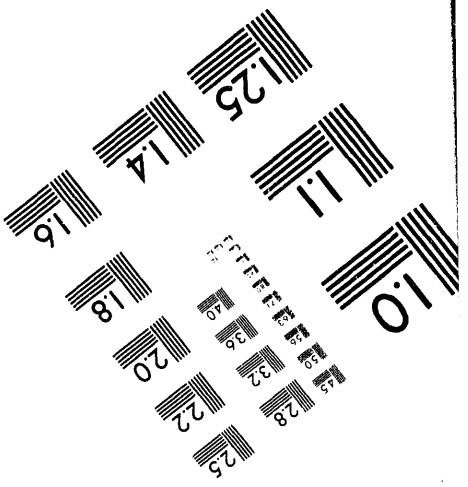

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WHC-EP-0394-8

Groundwater Maps of the Hanford Site, December 1993

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Approved for Public Release

CONTENTS

INTRODUCTION

The *Groundwater Maps of the Hanford Site, December 1993* is an update to of the series of reports that document the configuration of the uppermost unconfined aquifer beneath the Hanford Site (Figure 1). This series presents the latest results of the semiannual water level measurement program and the water table maps generated from these measurements. The reports document the changes in the groundwater level at the Hanford Site during the transition from nuclear material production to environmental restoration and remediation. In addition, these reports provide water level data to support the various site characterization and groundwater monitoring programs currently in progress on the Hanford Site. *Groundwater Maps of the Hanford Site* is prepared for the U.S. Department of Energy, Office of Environmental Restoration and Waste Management, by the Hanford Site Operations and Engineering Contractor, Westinghouse Hanford Company (WHC). This document fulfills reporting requirements specified in WHC (1993), Section 8.0 "Water Quality" and also described in the environmental monitoring plan for the Hanford Site (DOE-RL 1991).

The three major operations areas (the 100, 200 and 300/1100 Areas) where wastes were discharged to the soil are covered in this update. The water level measurements from the wells in these areas are portrayed on a set of maps to illustrate the hydrologic conditions and are also tabulated in an appendix. A summary discussion of the data is included with the well index map, the depth to water map, and the contoured map of the water table surface for each of the three areas. A map depicting the change in water table elevation since 1988 is included for the 200 Area. Appendix A lists the well identification number, depth to water, casing elevation and the water level elevation for each well measured during December 1993. Appendix B lists the 1988 and 1993 water level measurements and the difference between those measurements for the 200 Area. For clarity, the locating prefixes have been omitted from all well numbers shown on the maps. Wells in the 100 Areas have the prefix 199; those in the 200 Areas have the prefix 299; wells in the 300 Area have a 399 prefix; those in the 1100 Area have a 1199 prefix and the wells outside these areas have the prefix 699. An explanation of the Hanford well numbering system and a listing of the survey coordinates for each well drilled prior to 1993 is listed in Chamness and Merz (1993).

The National Geodetic Vertical Datum of 1929 is used as the vertical datum and Hanford Plant coordinates used for horizontal location of the wells. Both datums are in feet.

Water level data collected in June 1993 during the previous Hanford Site semiannual water table measurement field effort are reported in Kasza et al. (1994).

DATA COLLECTION, MANAGEMENT, AND PRESENTATION

During December 1993, the depth to the groundwater was measured in 738 Hanford Site wells by personnel from Subsurface Investigative Support Function, under the direction of the Geohydrologic Engineering Function project leaders. The procedure for measuring the depth to water and recording the data is contained in environmental investigations instruction 10.2, *Environmental Investigation and Site Characterization Manual* (WHC 1988). Field data were collected using the Groundwater Monitoring System, which employs a barcode interface to enter readings that have been taken manually with a steel tape from the reference point at the top of the well casing. The barcode hand-held computer downloads the field data to a supervisory workstation that stores all groundwater level measurements. These data are transferred to the Hanford Environmental Information System (HEIS) data base and were later downloaded to a Paradox (a trademark of Borland International) application program for use by the Geohydrologic Engineering function hydrologists.

The Paradox application was used to classify, locate, and format data points used in creating contours of the water table across the Hanford Site. Data were averaged for wells with multiple measurements in December 1993. The Paradox application was also used to generate the data tables presented in Appendix A.

Contours generated from groundwater data are displayed on the water table elevation maps and were created within Earth Vision (a trademark of Dynamic Graphics, Inc.). Earth Vision is software that calculates a data grid and generates contour lines when given a set of data point locations and values. A 2-D minimum tension gridding algorithm was used to interpolate grid values. Generated contour lines were then imported into an AutoCad (a trademark of Autodesk, Inc.) environment to be overlaid onto existing base maps.

Hydrologists familiar with regional and local groundwater properties reviewed the maps to evaluate data interpolations made by the Earth Vision software. A representative set of wells was illustrated in areas where there are heavy concentrations of wells (e.g., 100-N and 100-H Areas). Hydrographs were plotted for wells with anomalous head values. If the measurement was an outlier, the data point was not included in constructing the maps and its questionable status was noted in Appendix A. Map modifications and corrections were made in AutoCad and the final maps were generated.

HANFORD SITE MAPS

100 AREAS

For the purposes of this report, the 100 Areas comprise the various 100 Area reactor facilities and the surrounding land south of the Columbia River and north of Gable Mountain and Gable Butte. Reactor operations have

ceased in all of the facilities, and environmental restoration activities are in progress. Maps for this area include:

- Figure 2, 100 Areas Index Map
- Figure 3, 100 Areas Depth-to-Water Map
- Figure 4, 100 Areas Water Table Map.

The maps are based on December 1993 field measurements from those wells that are located north of Hanford Site coordinate N 56,000 and completed in the unconsolidated sediments. Wells used are completed within 100 ft of the average water table since vertical gradients are not significant on the scale of the map.

Data were averaged for wells with multiple measurements in December 1994. A representative set of wells from the reactor areas was chosen where there are heavy concentrations of wells (e.g., 100-N and 100-H Areas). Hydrographs were plotted for wells with anomalous head values. If the measurement was an outlier, the data point was not included in constructing the maps.

River stage recorders are located in the 100-B/C, 100-N, 100-H, and 100-F Areas. River stage is measured hourly with pressure transducers. The averages of the December values are plotted on Figure 4 and were used in contouring the water table map.

Throughout most of the map area, groundwater flows from the unconfined aquifer into the Columbia River. West of the 100-B/C Area, water is believed to flow from the river into the aquifer.

The high water levels north of Gable Mountain at wells 699-66-38, 699-66-39, and 699-69-38 are consistent with past measurements. Driller's logs indicate the presence of fine-grained sediments in this area. The high water levels may be remnants of artificial recharge from pre-Hanford irrigation, or may represent perched groundwater (Kasza et al. 1990). The steep groundwater gradient in the southeastern portion of the map area is believed to result from the influence of the fine-grained sediments.

Water level data used to construct the maps are listed in Appendix A. The N 65,000 match line is included on the maps of the 100 and 200 Areas for convenience.

200 AREAS

These maps encompass the 200 East and 200 West Areas and the surrounding vicinity on the Hanford Site that was once referred to as the Separations Area. The semiannual measurement of water levels in the 200 Areas was performed on the more than 180 selected wells that comprise the *Operational Groundwater Monitoring Network* (Serkowski and Jordan, 1989). The Operational Groundwater Monitoring Network provides water level measurements for the determination of the water table configuration and for the water quality sampling of the groundwater beneath and surrounding the chemical processing and waste management facilities in the 200 Areas. Water level data from RCRA program, CERCLA program, and outlying wells are included on the maps to

provide supplemental information for a more complete interpretation. Wells selected for use were reviewed to assure that they were completed in the unconsolidated sediments and screened or perforated in the upper part of the unconfined aquifer.

The 200 Areas set of maps consists of:

- Figure 5, 200 Areas Index Map
- Figure 6, 200 Areas Depth-to-Water Map
- Figure 7, 200 Areas Water Table Elevation
- Figure 8, 200 Areas Change in Water Table Elevation - December 1988 to December 1993.

The "areas where the basalt surface is above the water table" reflects the top of the basalt according to Connelly (1992a, 1992b). Representative wells were selected to portray the water level data on the maps where the concentration of monitoring wells would produce a crowded illustration.

Figure 8 depicts the change in the water table beneath the 200 Areas that occurred between December 1988 and December 1993. December 1988 was selected because at that time, Hanford had not ceased its defense production role and the water table was at the highest elevation in recent years. This map shows the general lowering of the water table in the 200 Areas in response to the decrease in disposal of process water. The location of the greatest decrease in the 200 West Area is the site of the abandoned U-Pond while the greatest decrease in the 200 East Area corresponds to effluent disposal locations for the PUREX Plant. The water table in the area east of 200 East Area has not declined as rapidly due to the continued discharges at B-Pond. Only data from monitoring wells measured during the period late November to Early January 1988 and December 1993 were used to construct the contours. The water level data used for this map are found in Appendix B.

300/1100 AREAS

This section contains a discussion on the December 1993 water table measurements for the 300 Area and the adjacent 1100 Area Horn Rapids Landfill. Wells used for obtaining water level measurements were screened or perforated in the upper part of the unconfined aquifer except in a few cases where the top of the screen was slightly below. The data for this area are presented in Figures 9 and 10, the index and depth-to-water maps, respectively. The 300/1100 Area water table map is shown in Figure 11.

The unconfined aquifer within this area is contained in the Ringold Formation and the Hanford formation (Swanson et al. 1992). The top of the unconfined aquifer is close to the Hanford/Ringold contact. West of an imaginary north-south line near the west boundary of the 300 Area the unconfined aquifer is generally within the Ringold Formation. East of the line it is generally within the Hanford formation.

The major influences on water table elevations in the map area are river fluctuations, irrigation, and river water recharged into the city of Richland well field near the 1100 Area. Water table elevation may also be dependent on recharge from the Yakima River to the west.

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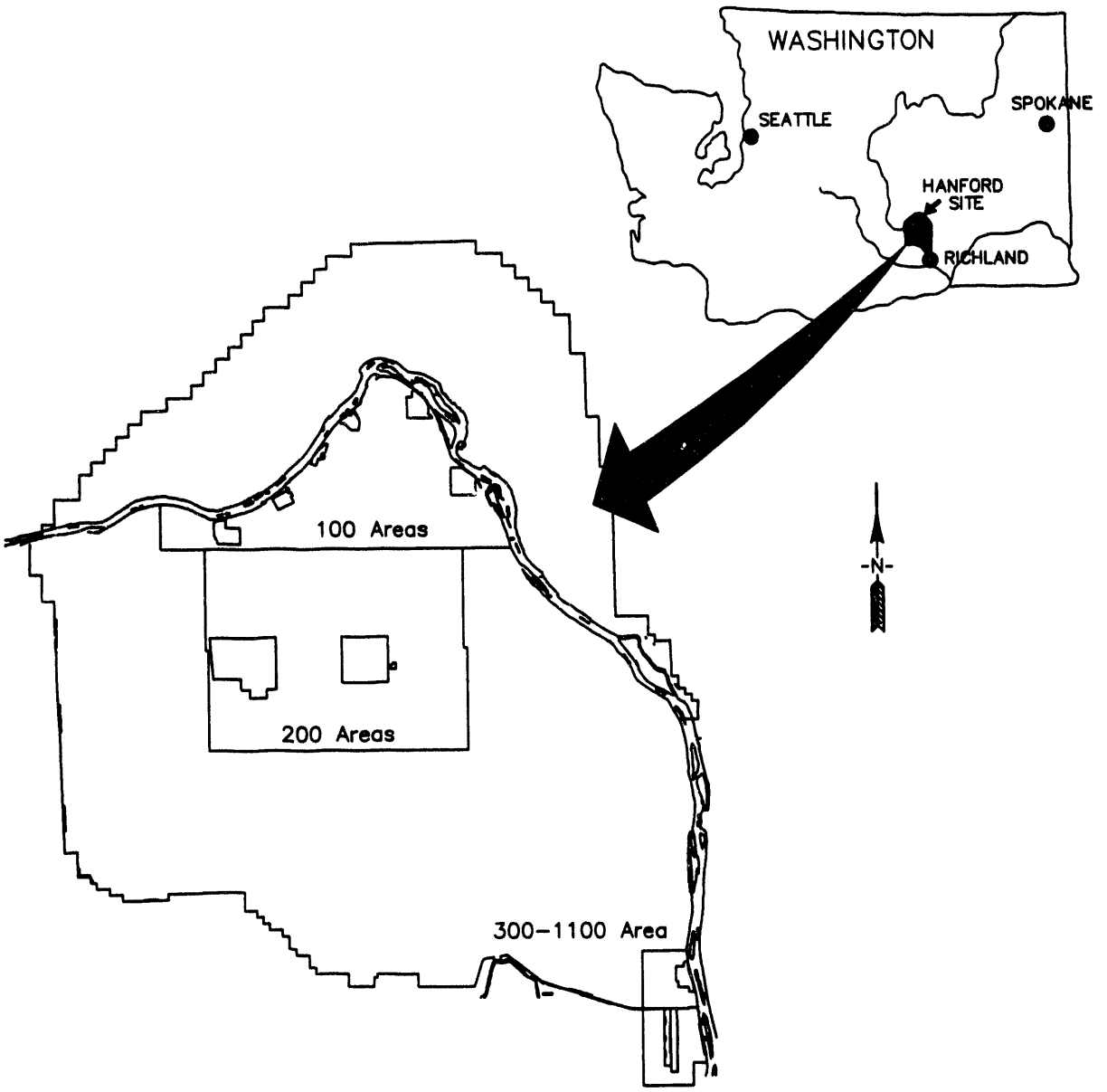
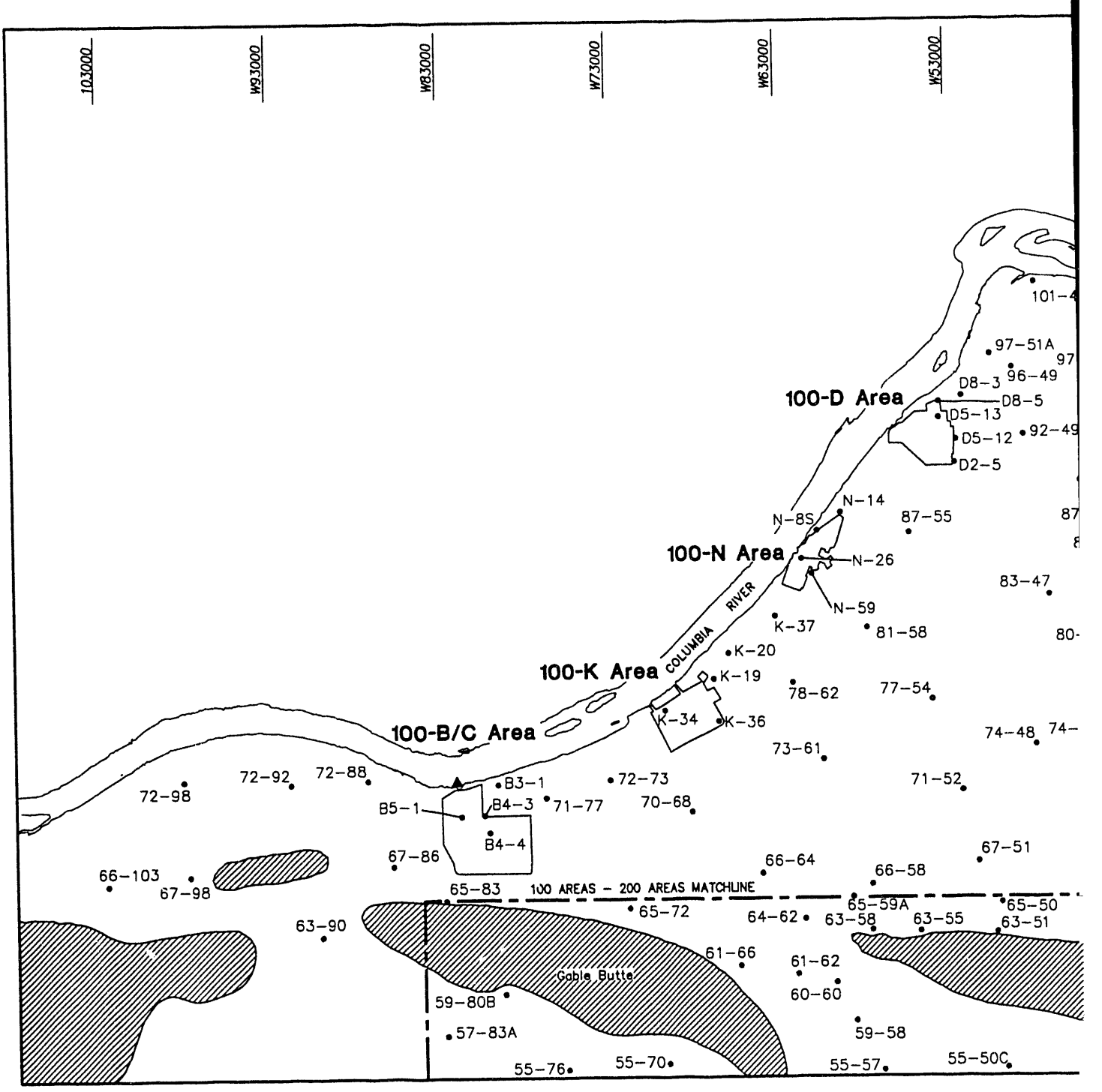


Figure 1. Hanford Site Location Map.


103000
W93000
W83000
W73000
W63000
W53000
100-D Area
100-N Area
100-K Area
100-B/C Area
COLUMBIA RIVER
100 AREAS – 200 AREAS MATCHLINE
Gable Butte
101-4
97-51A
97
96-49
D8-3
D8-5
D5-13
D5-12
92-49
D2-5
N-14
N-8S
87-55
87
N-26
N-59
83-47
K-37
81-58
80-
K-20
K-19
78-62
77-54
K-34
K-36
74-48
74-
73-61
71-52
72-92
72-88
72-98
B3-1
72-73
B5-1
B4-3
71-77
70-68
B4-4
67-86
67-51
66-64
66-58
66-103
67-98
65-83
65-59A
65-50
65-72
64-62
63-58
63-55
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57-83A
59-58
55-76
55-70
55-57
55-50C

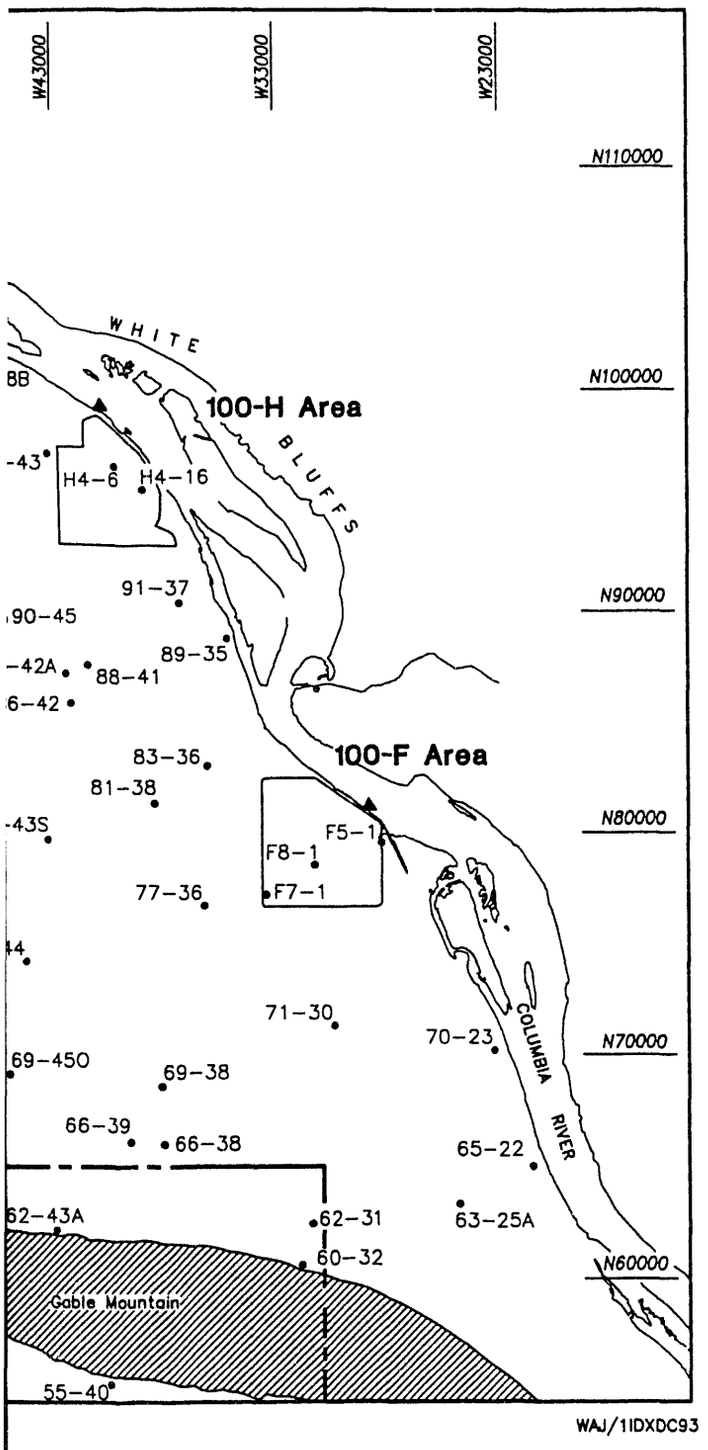


Figure 2

100 Areas Index Map December 1993

77-40 • Identification of Groundwater monitoring Wells Used to Prepare this map. Well numbers beginning with a letter are prefixed with a with a 199- and beginning with a number are prefixed with 699-.

▲ River stage recorder

Areas where the basalt surface is generally above the water table

The 100 Areas Index Map has been prepared by the Geohydrologic Engineering Function, Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile

0 1 Kilometer

-N-

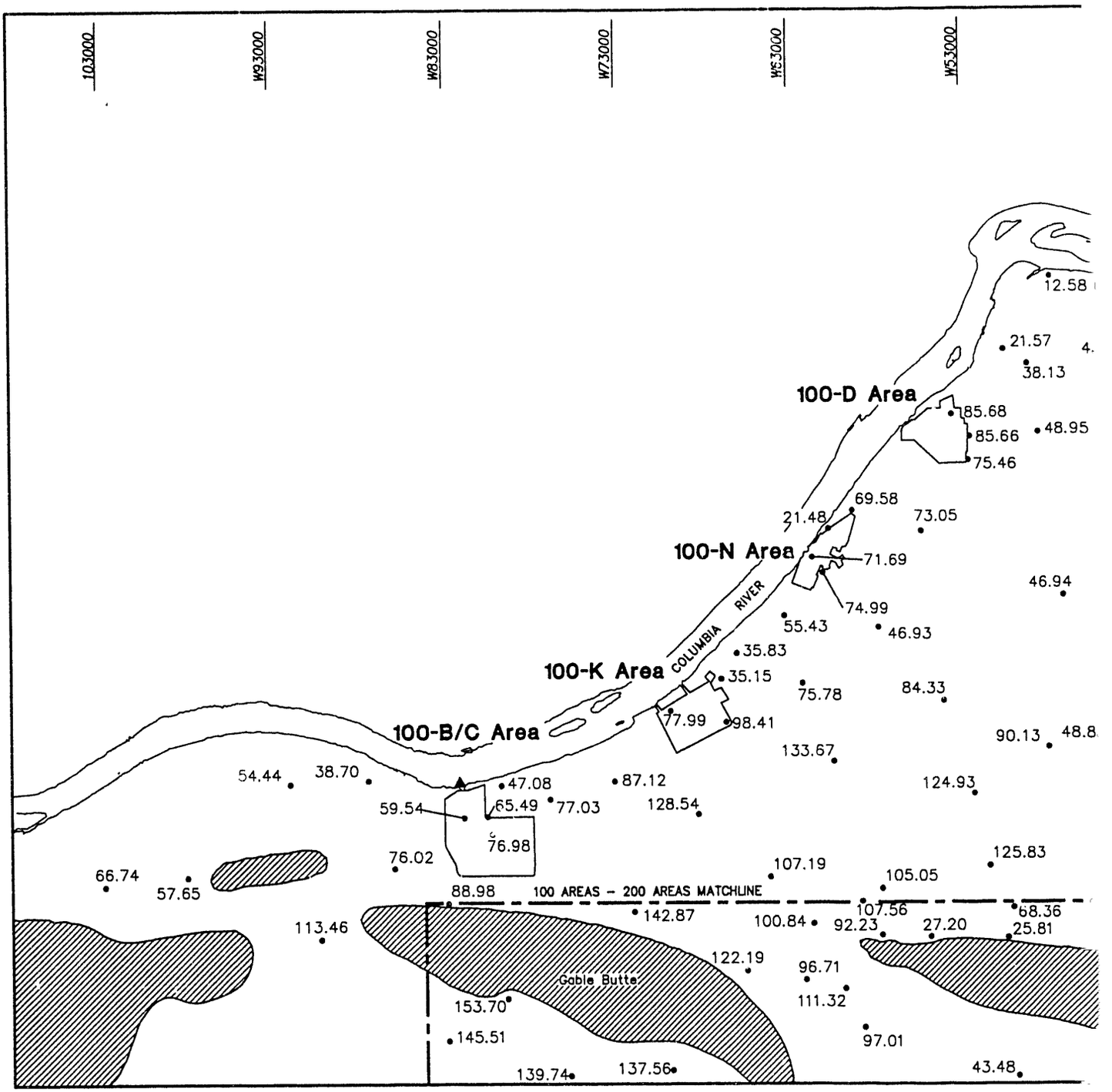
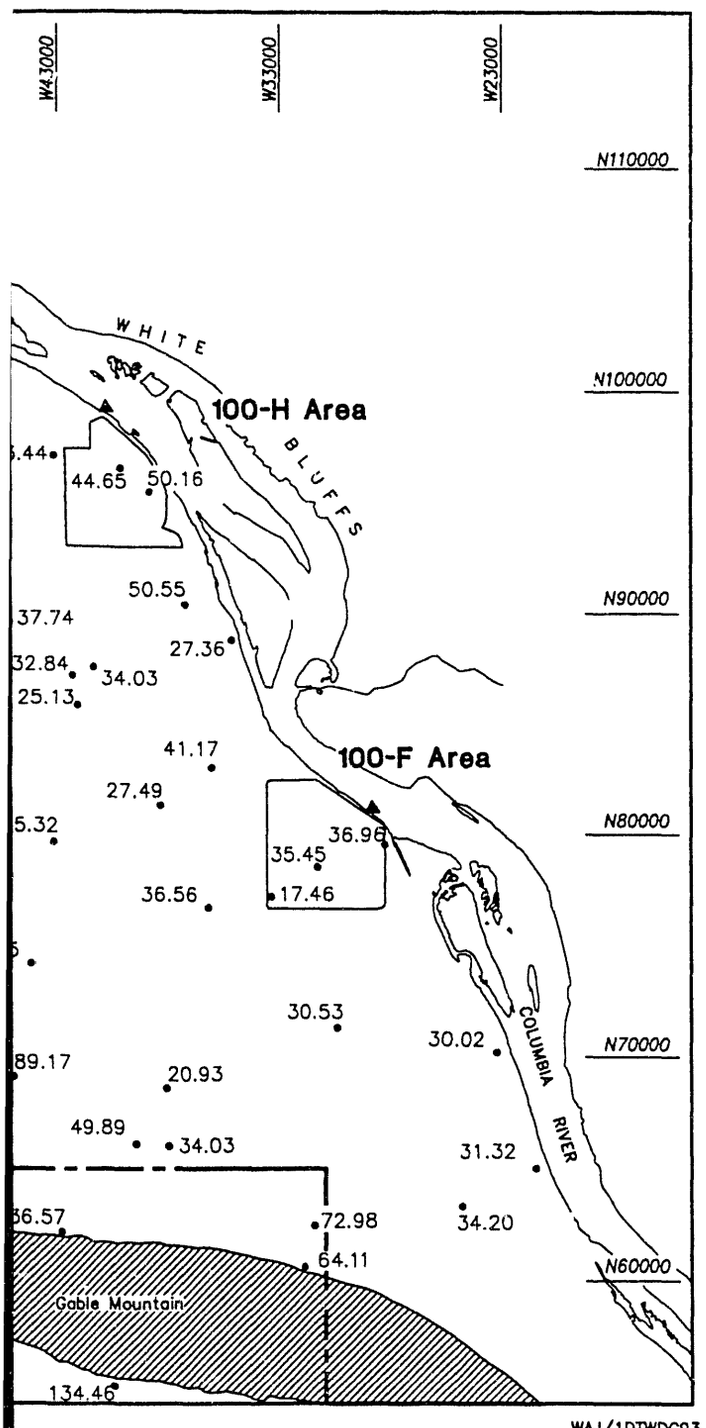

103000
W93000
W83000
W73000
W63000
W53000
100-D Area
100-N Area
100-K Area
100-B/C Area
COLUMBIA RIVER
100 AREAS – 200 AREAS MATCHLINE
Gable Butte
12.58
21.57
38.13
85.68
85.66
48.95
75.46
69.58
21.48
73.05
71.69
46.94
74.99
55.43
46.93
35.83
35.15
75.78
84.33
77.99
98.41
90.13
133.67
54.44
38.70
47.08
87.12
124.93
59.54
65.49
77.03
128.54
76.98
76.02
107.19
125.83
66.74
57.65
88.98
105.05
142.87
107.56
68.36
113.46
100.84
92.23
27.20
25.81
122.19
96.71
153.70
111.32
145.51
97.01
139.74
137.56
43.48

Figure 3

100 Areas Depth-to-Water Map December 1993



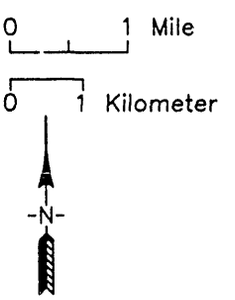
46.79 • Depth to water, as measured from the well reference mark (generally top of casing) to groundwater surface.

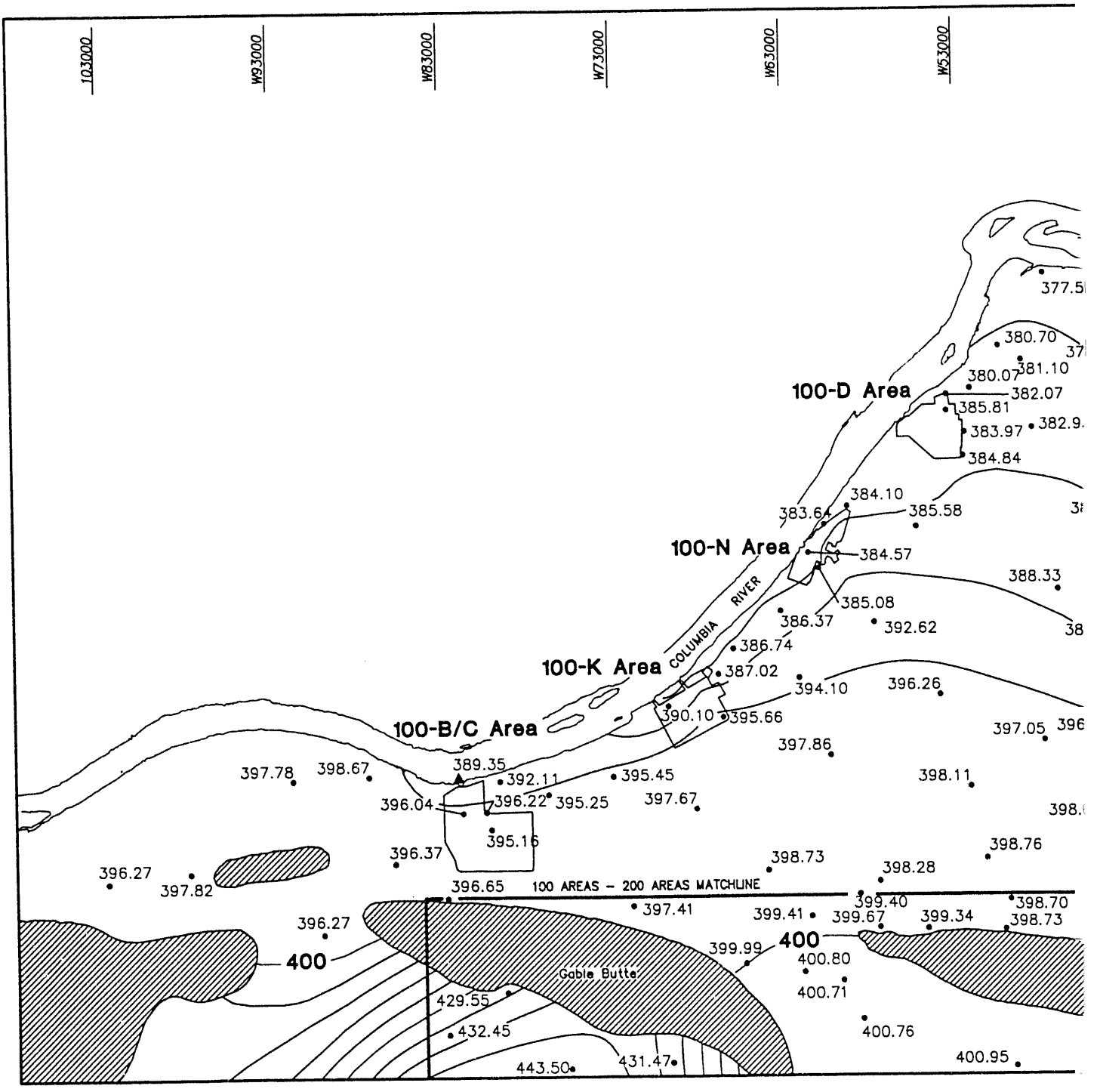
▲ River stage recorder

Areas where the basalt surface is generally above the water table.

The 100 Areas depth-to-water map has been prepared by the Geohydrologic Support Function, Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).




103000
W93000
W83000
W73000
W63000
W53000
100-D Area
100-N Area
100-K Area
100-B/C Area
COLUMBIA RIVER
100 AREAS – 200 AREAS MATCHLINE
Gable Butte
400
377.5
380.70
381.10
380.07
382.07
385.81
383.97
382.9
384.84
384.10
383.64
385.58
384.57
388.33
385.08
386.37
392.62
386.74
387.02
394.10
396.26
390.10
395.66
397.05
397.86
389.35
397.78
398.67
392.11
395.45
398.11
396.04
396.22
395.25
397.67
395.16
396.37
398.76
398.73
396.27
397.82
398.28
396.65
397.41
399.40
398.70
399.41
399.67
399.34
398.73
396.27
399.99
400.80
400.71
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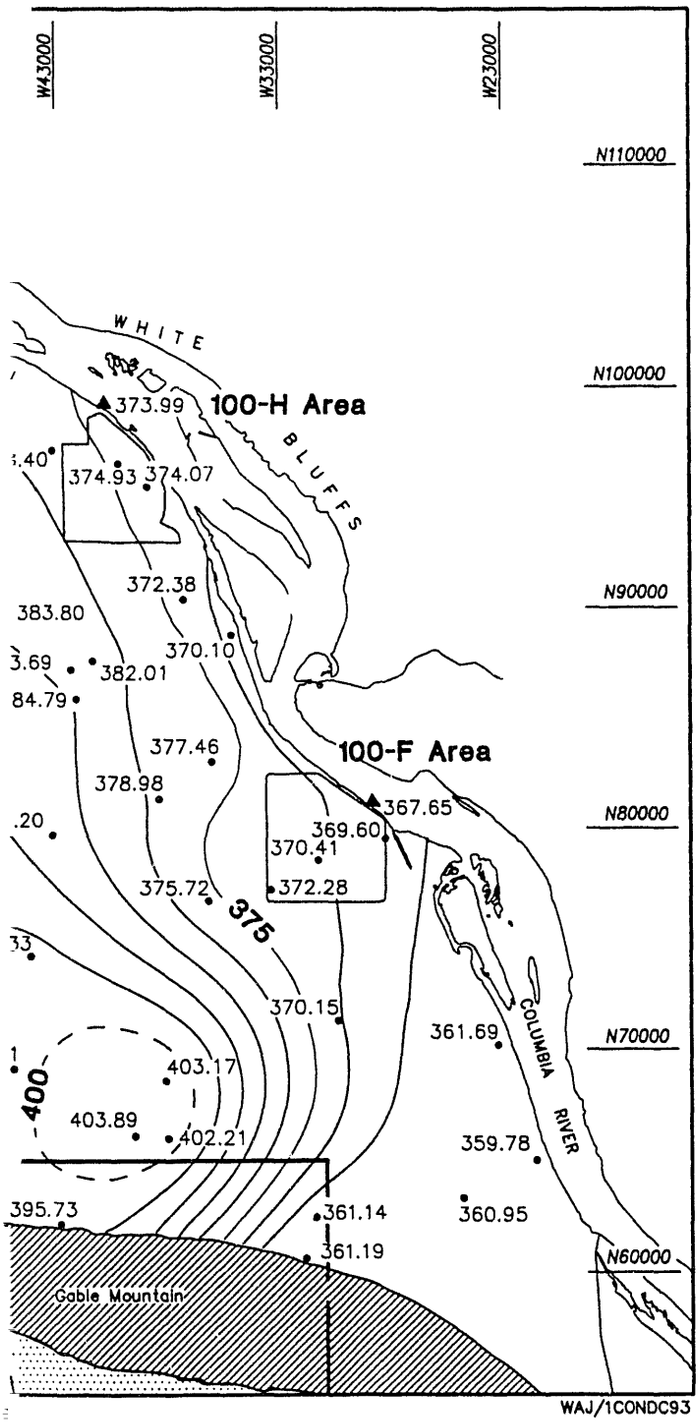
443.50
431.47
400.95

Figure 4

100 Areas Water Table Map December 1993



348.52 • Water table elevation (feet above mean sea level)

348.52 ▲ Average river elevation (feet above mean sea level)

– – – The dashed line indicates a contour line generated due to unusual data. (Kasza 1990)

375 Groundwater table elevation contour interval = 5 ft

Area of conflicting data.

Areas where the basalt surface is generally above the water table

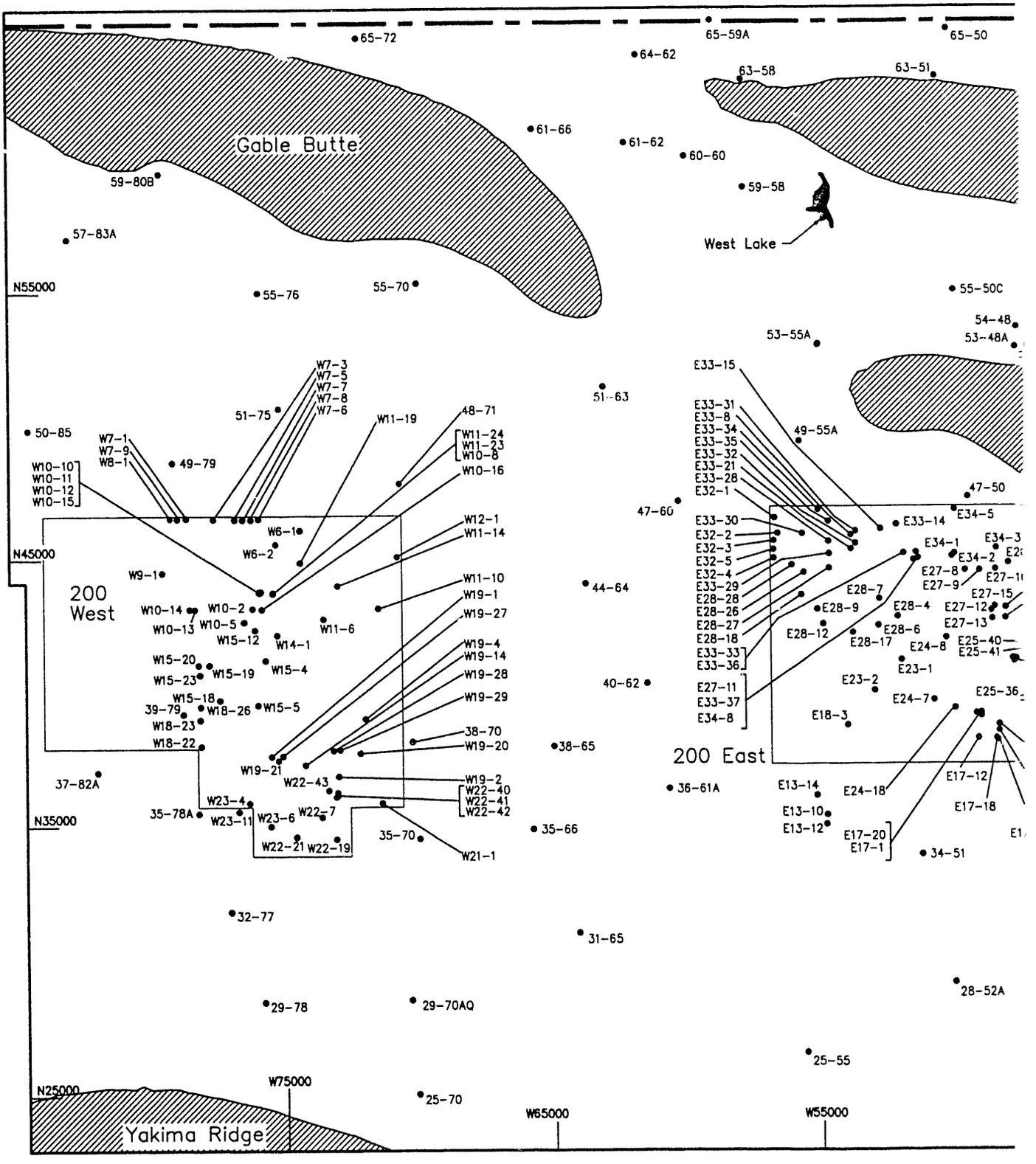
The 100 Areas Index Map has been prepared by the Geohydrologic Engineering Function, Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile

0 1 Kilometer

-N-


65-72
65-59A
65-50
64-62
63-58
63-51
Gable Butte
61-66
61-62
60-60
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West Lake
57-83A
N55000
55-76
55-70
55-50C
54-48
53-55A
53-48A
W7-3
W7-5
W7-7
W7-8
W7-6
51-75
W11-19
48-71
51-63
E33-15
50-85
W7-1
W7-9
W8-1
49-79
W11-24
W11-23
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49-55A
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W18-22
38-70
W19-20
40-62
E27-11
E33-37
E34-8
200 East
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W65000
W55000
Yakima Ridge

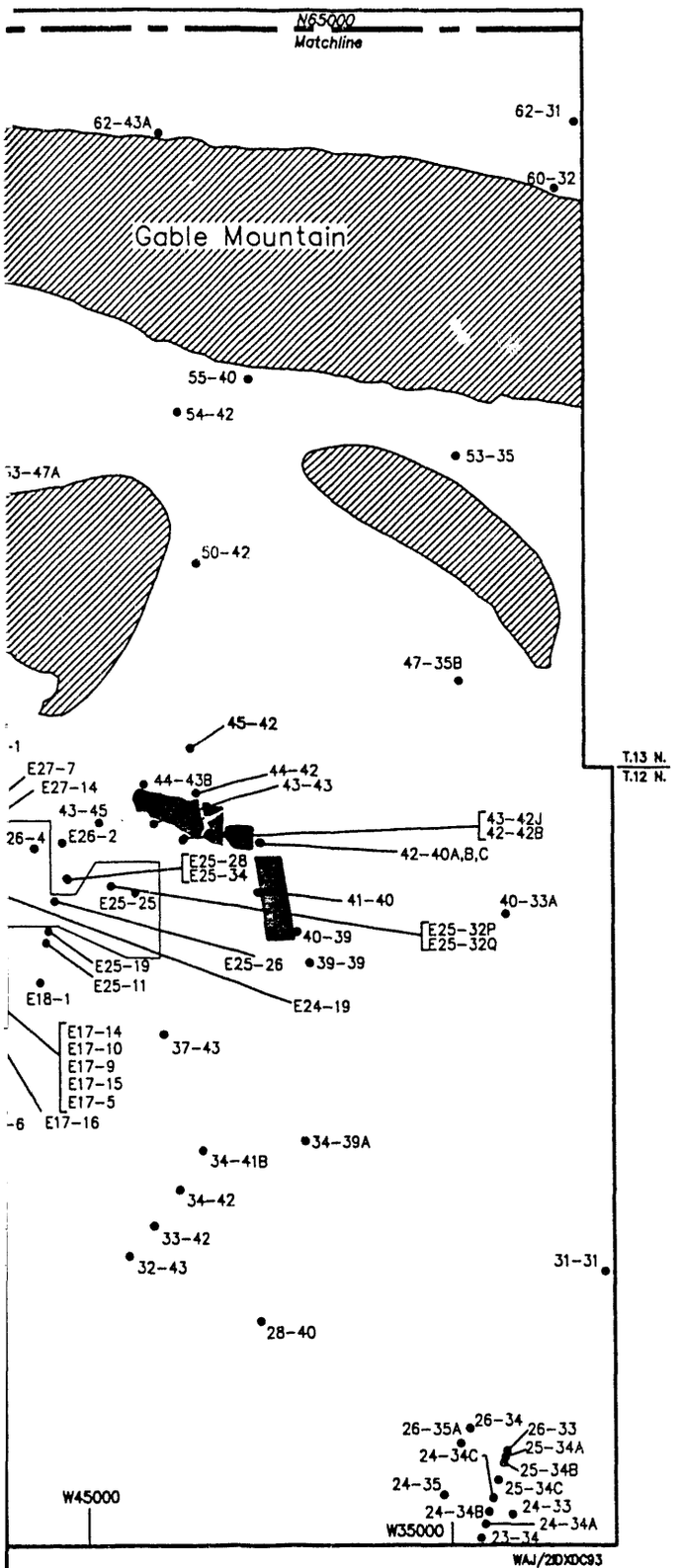


Figure 5

200 Areas Index Map December 1993

W22-26 • Identification of monitoring well used to prepare map. Well Numbers starting with E or W are prefixed by 299- and all others are prefixed by 699-.

Ponds

Areas where the basalt surface is generally above the water table

The 200 Areas index map has been prepared by the Geohydrologic Support Function, Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile

0 1 Kilometer

-N-

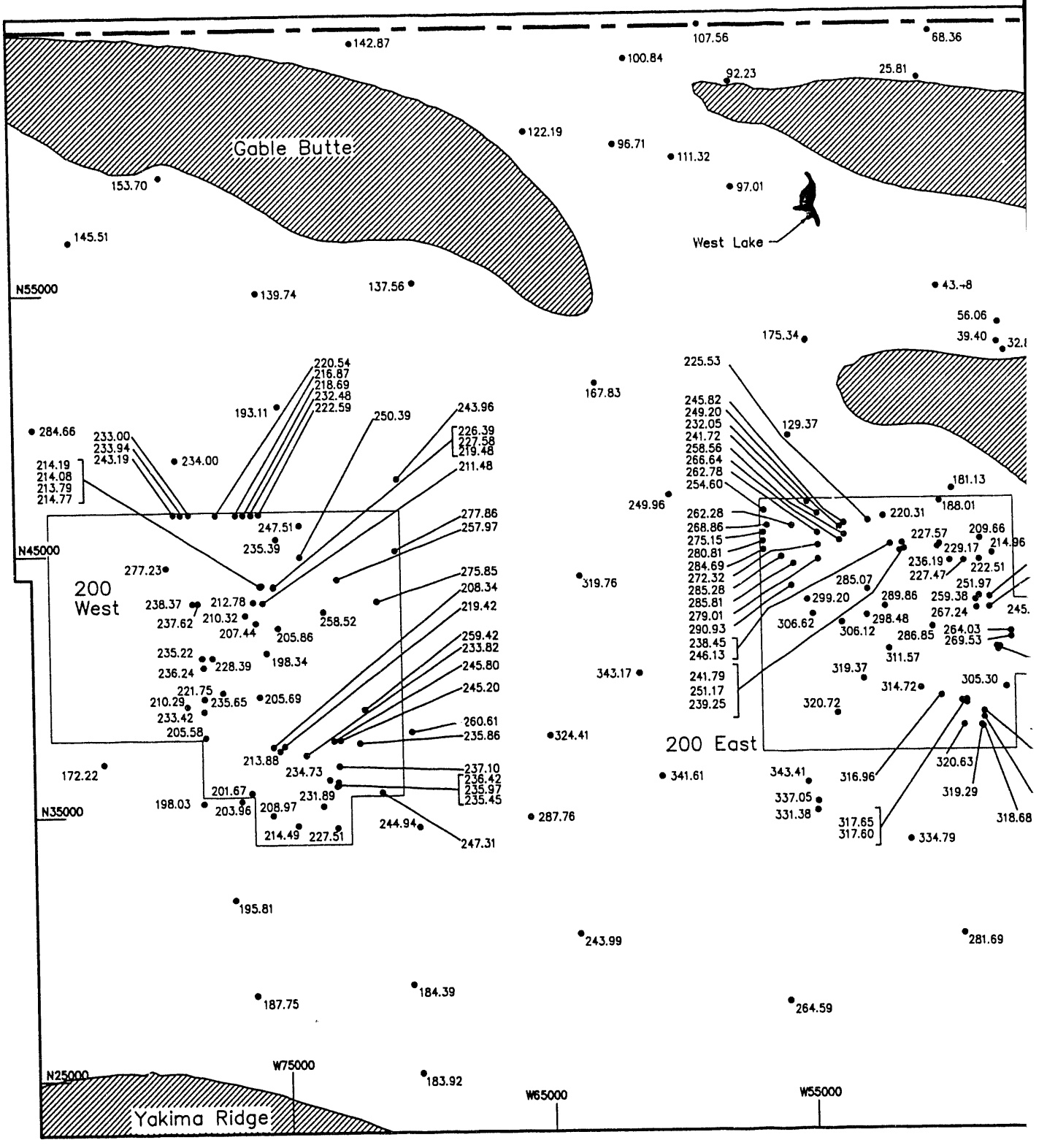
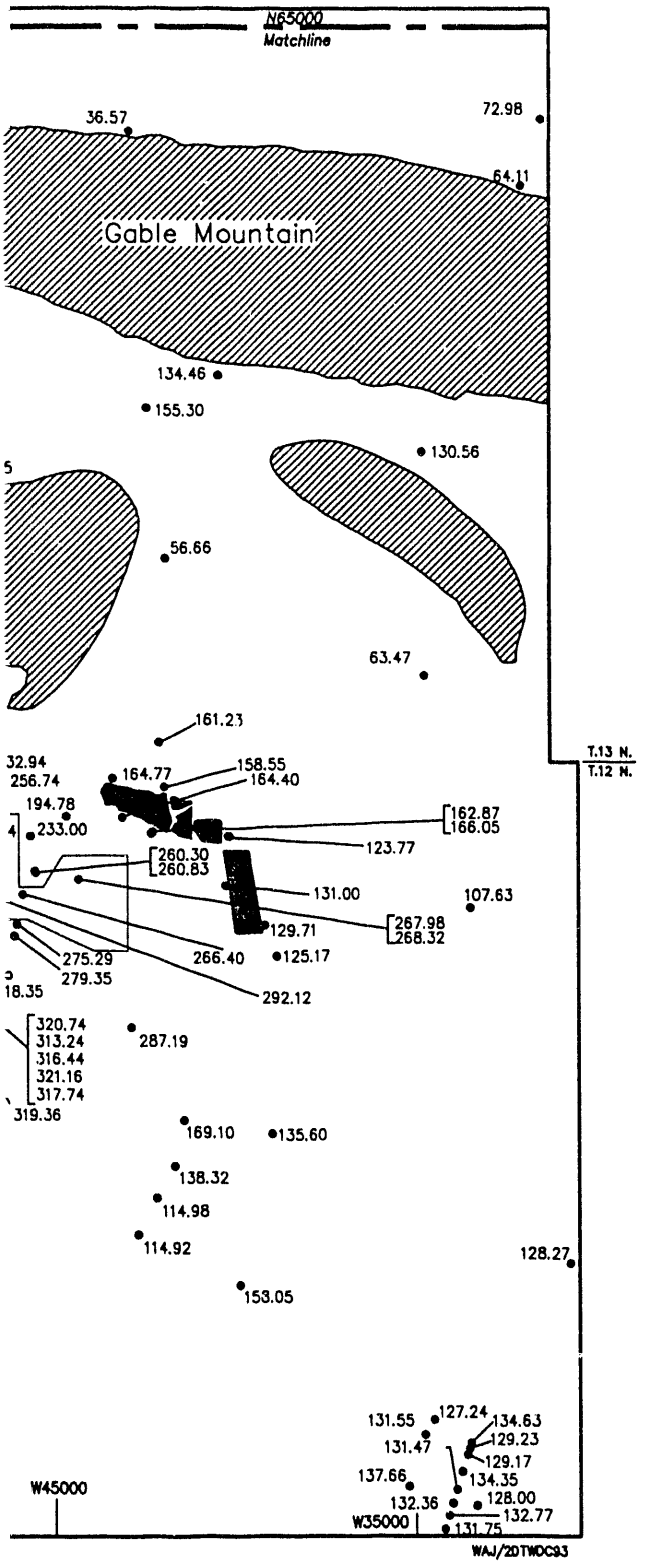

Gable Butte
West Lake
200 West
200 East
Yakima Ridge
N55000
N45000
N35000
N25000
W75000
W65000
W55000
142.87
107.56
68.36
100.84
92.23
25.81
122.19
96.71
111.32
153.70
97.01
145.51
139.74
137.56
43.48
56.06
175.34
39.40
225.53
167.83
129.37
284.66
233.00
233.94
243.19
234.00
214.19
214.08
213.79
214.77
193.11
220.54
216.87
218.69
232.48
222.59
250.39
243.96
226.39
227.58
219.48
211.48
277.86
257.97
247.51
235.39
277.23
275.85
208.34
219.42
238.37
212.78
237.62
210.32
207.44
205.86
258.52
259.42
233.82
245.80
245.20
235.22
228.39
198.34
236.24
221.75
210.29
235.65
205.69
233.42
205.58
260.61
235.86
213.88
234.73
237.10
236.42
235.97
235.45
172.22
201.67
198.03
203.96
208.97
231.89
214.49
227.51
244.94
247.31
195.81
187.75
184.39
183.92
245.82
249.20
232.05
241.72
258.56
266.64
262.78
254.60
249.96
262.28
268.86
275.15
280.81
284.69
272.32
285.28
285.81
279.01
290.93
238.45
246.13
241.79
251.17
239.25
181.13
188.01
220.31
227.57
209.66
229.17
214.96
236.19
222.51
227.47
251.97
285.07
299.20
289.86
259.38
267.24
306.62
298.48
306.12
286.85
264.03
269.53
311.57
319.37
314.72
305.30
320.72
319.76
343.17
324.41
341.61
343.41
316.96
320.63
319.29
337.05
331.38
318.68
317.65
317.60
334.79
287.76
243.99
281.69
264.59

Figure 6

200 Areas Depth-to-Water Map December 1993



206.34 • Deoth to water in feet, as measured from well reference mark (generally top of casing) to groundwater surface.

Ponds

Areas where the basalt surface is generally above the water table

The 200 Areas depth-to-water map has been prepared by the Geohydrologic Support Function, Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile

0 1 Kilometer

-N-

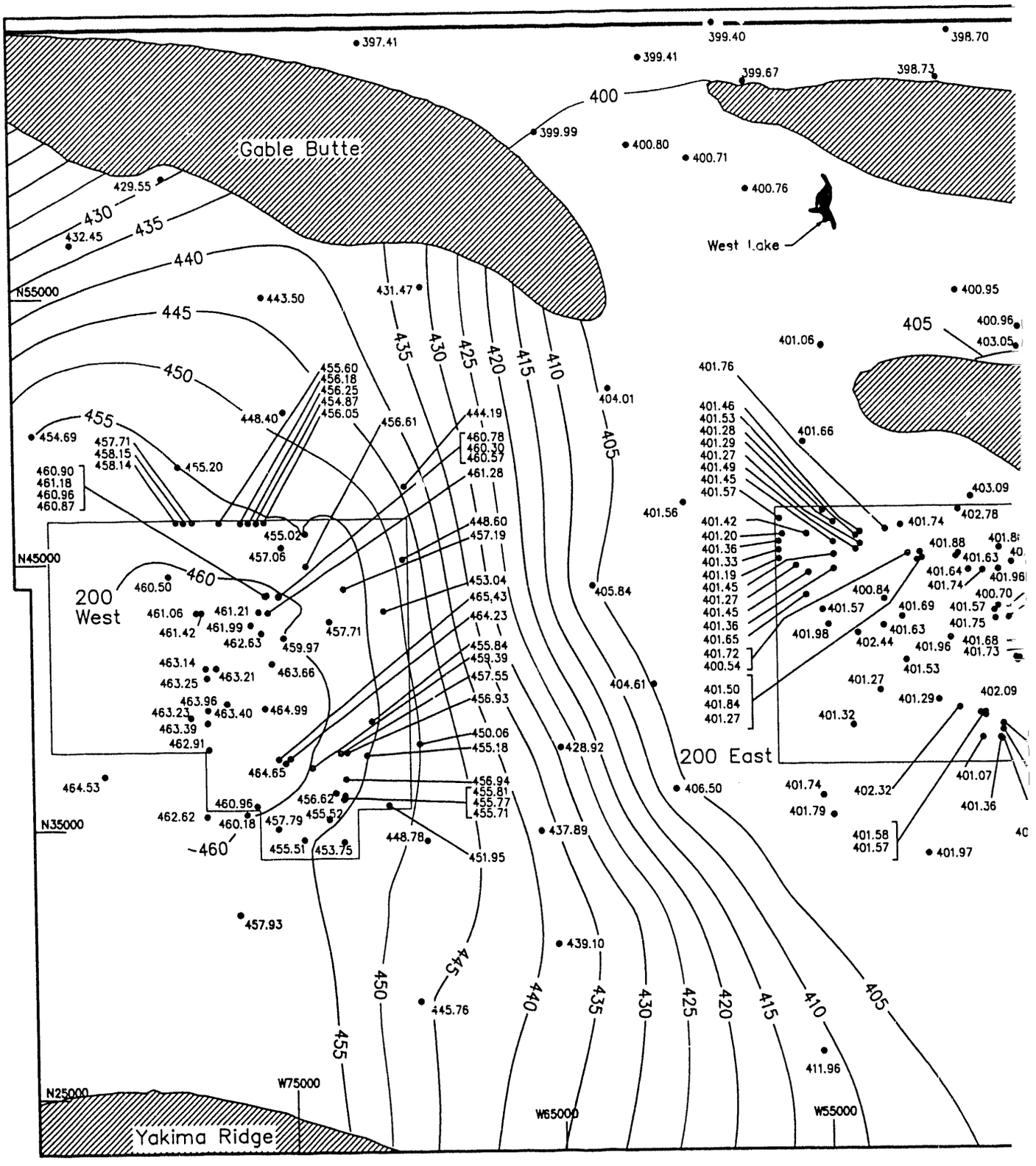
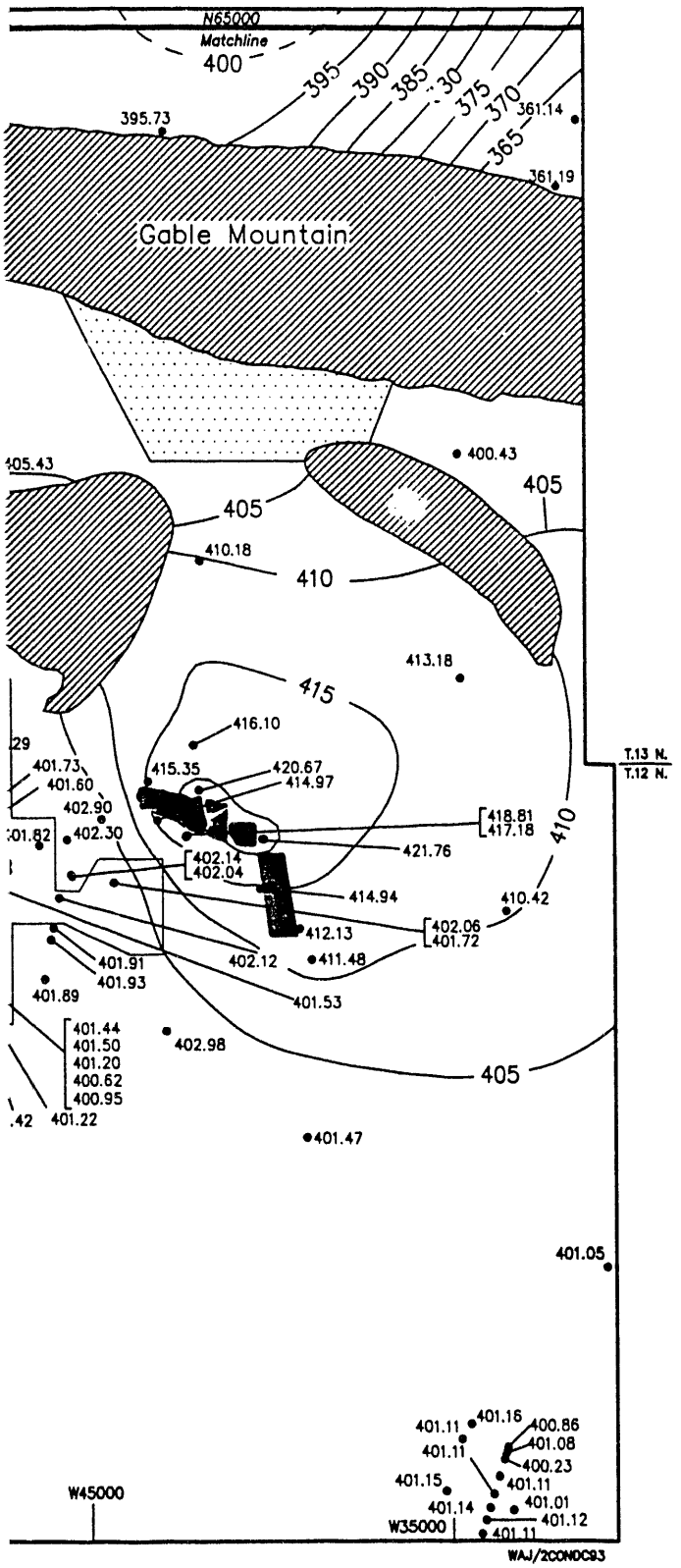

Gable Butte
West Lake
Yakima Ridge
200 West
200 East
N55000
N45000
N35000
N25000
W75000
W65000
W55000
397.41
399.40
398.70
399.41
399.67
398.73
400
399.99
400.80
400.71
400.76
429.55
430
435
432.45
440
445
443.50
431.47
400.95
405
400.96
403.05
401.06
450
455
454.69
455.60
456.18
456.25
454.87
456.05
448.40
456.61
444.19
460.78
460.30
460.57
461.28
457.71
458.15
458.14
455.20
460.90
461.18
460.96
460.87
404.01
401.76
401.46
401.53
401.28
401.29
401.27
401.49
401.45
401.57
401.66
401.56
403.09
402.78
401.74
401.42
401.20
401.36
401.33
401.19
401.45
401.27
401.45
401.36
401.65
401.72
400.54
401.88
401.63
401.64
401.74
401.96
400.84
401.57
401.69
401.57
400.70
401.75
401.98
401.63
402.44
401.96
401.68
401.73
401.53
401.27
401.29
402.09
401.32
401.50
401.84
401.27
448.60
457.19
455.02
457.06
453.04
465.43
464.23
455.84
459.39
457.55
456.93
450.06
455.18
460
460.50
461.06
461.21
461.99
461.42
462.63
459.97
457.71
463.14
463.25
463.21
463.66
463.96
463.23
463.40
464.99
463.39
462.91
464.65
464.53
456.94
455.81
455.77
455.71
456.62
455.52
460.96
462.62
460.18
457.79
455.51
453.75
448.78
451.95
457.93
405.84
404.61
428.92
406.50
437.89
439.10
445.76
411.96
401.74
401.79
402.32
401.07
401.36
401.58
401.57
401.97
455
450
445
440
435
430
425
420
415
410
405

Figure 7

200 Areas Water Table Elevation December 1993



206.34 • Water table elevation (feet above mean sea level)

– – – – The dashed line indicates a contour line generated due to unusual data. (Kasza 1990)

400 Groundwater table elevation contour interval = 5 ft

Ponds

Areas where the basalt surface is generally above the water table

Areas of conflicting data.

The 200 Areas water level elevation map has been prepared by the Geohydrologic Support Function, Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile

0 1 Kilometer

-N-

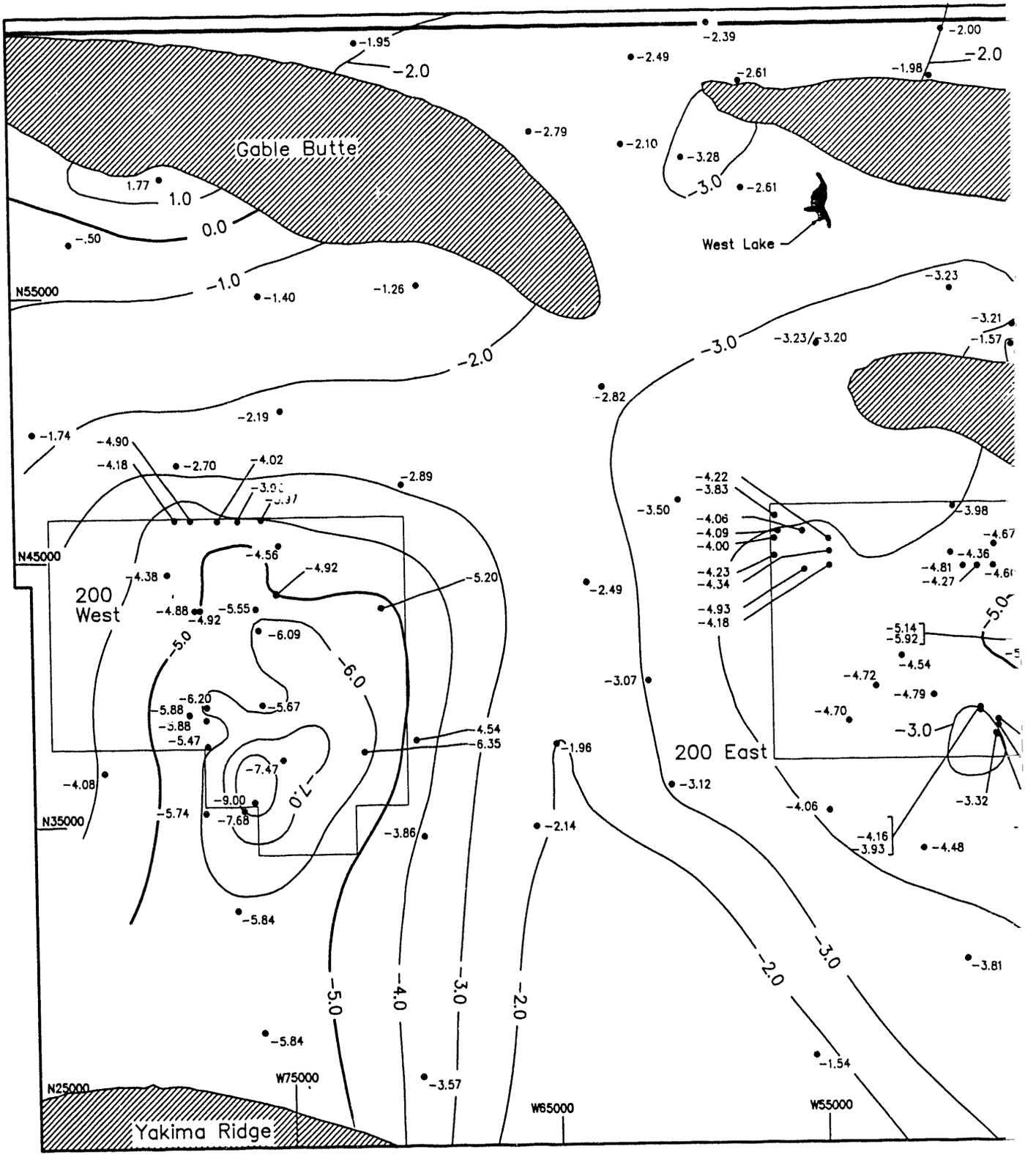
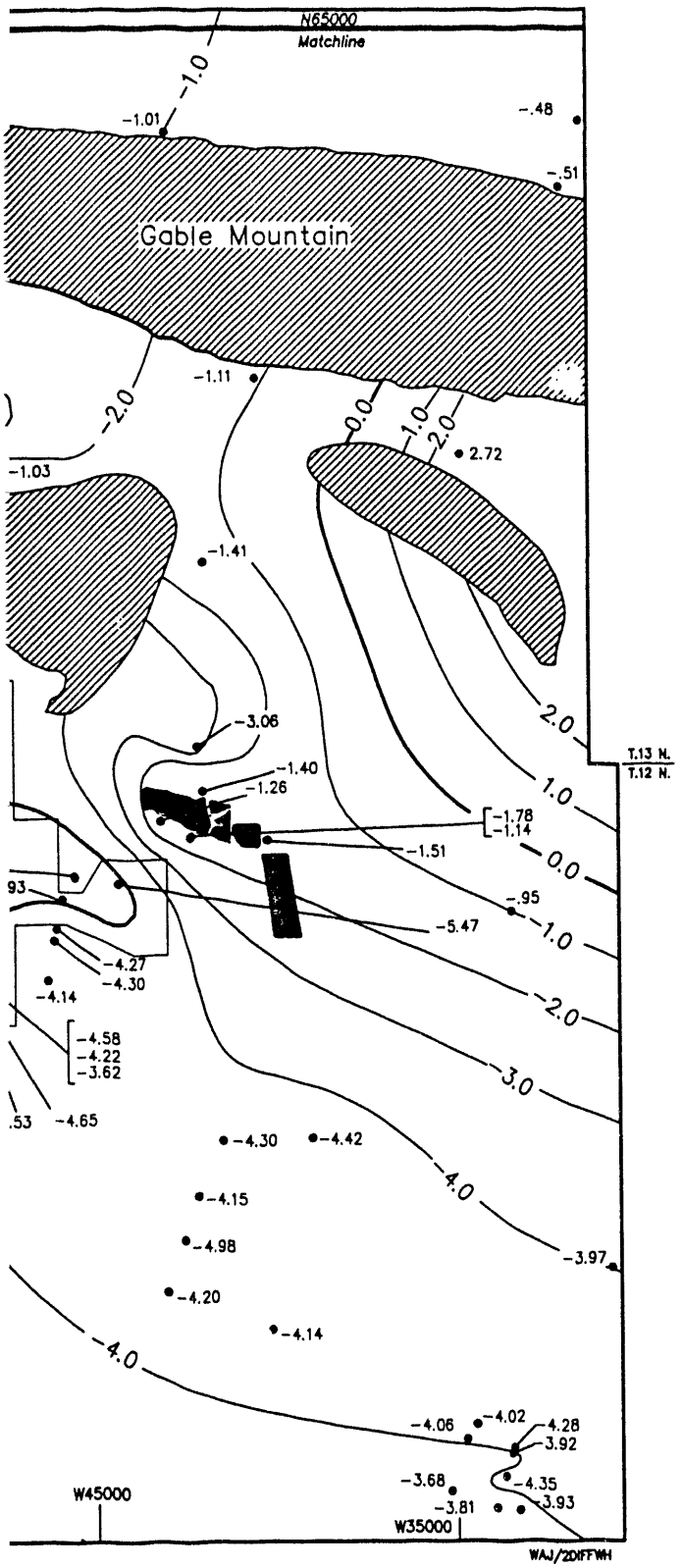

Gable Butte
West Lake
200 West
200 East
Yakima Ridge
N55000
N45000
N35000
N25000
W75000
W65000
W55000
-1.95
-2.0
-2.39
-2.49
-2.61
-1.98
-2.00
-2.79
-2.10
-3.28
-3.0
-2.61
1.77
1.0
0.0
-.50
-1.0
-1.40
-1.26
-3.23
-3.21
-3.23/-3.20
-1.57
-3.0
-2.82
-2.19
-1.74
-4.90
-4.18
-2.70
-4.02
-2.89
-4.22
-3.83
-3.50
-3.98
-4.06
-4.09
-4.00
-4.67
-4.36
-4.38
-4.56
-4.92
-5.20
-4.23
-4.34
-4.81
-4.27
-2.49
-4.88
-4.92
-5.55
-4.93
-4.18
-5.14
-5.92
-5.0
-6.09
-6.0
-4.54
-4.72
-3.07
-6.20
-5.88
-5.67
-4.79
-4.70
-3.0
-5.88
-5.47
4.54
6.35
-1.96
-7.47
-4.08
-9.00
-7.0
-3.12
-4.06
-3.32
-5.74
-7.68
-3.86
-2.14
-4.16
-3.93
-4.48
-5.84
-3.81
-5.0
-4.0
-3.0
-2.0
-5.84
-1.54
-3.57

Figure 8

200 Areas Change in Water Table Elevation 1988-1993



-2.92 • Change in water table elevation in feet measured between December 1988 and December 1993.

-2.0 Groundwater table elevation change contour interval = 1.0 ft.

Ponds

Areas where the basalt surface is generally above the water table

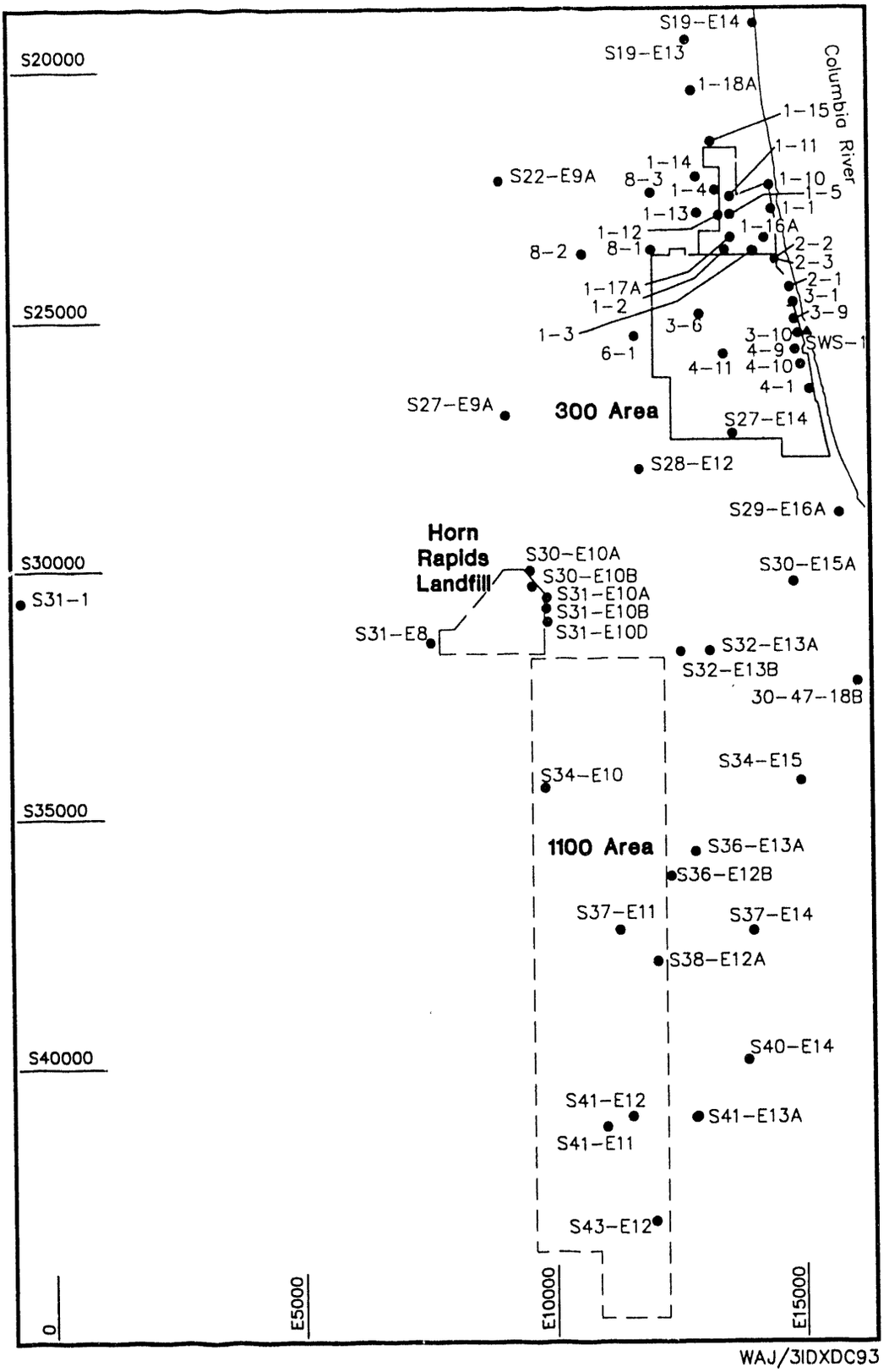
The 200 Areas water level difference map has been prepared by the Geohydrologic Support Function, Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).

0 1 Mile

0 1 Kilometer

-N-



WAJ/3IDXDC93

Figure 9

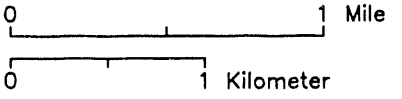
300/1100 Area Index Map December 1993

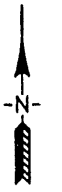
3-1 ● Identification of monitoring well used to prepare map. Well Numbers starting with S are prefixed by 699- and well numbers starting with a single digit are prefixed by 399-.

▲ River stage recorder

The 300 Area index map has been prepared by the Geohydrologic Support Function, Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).





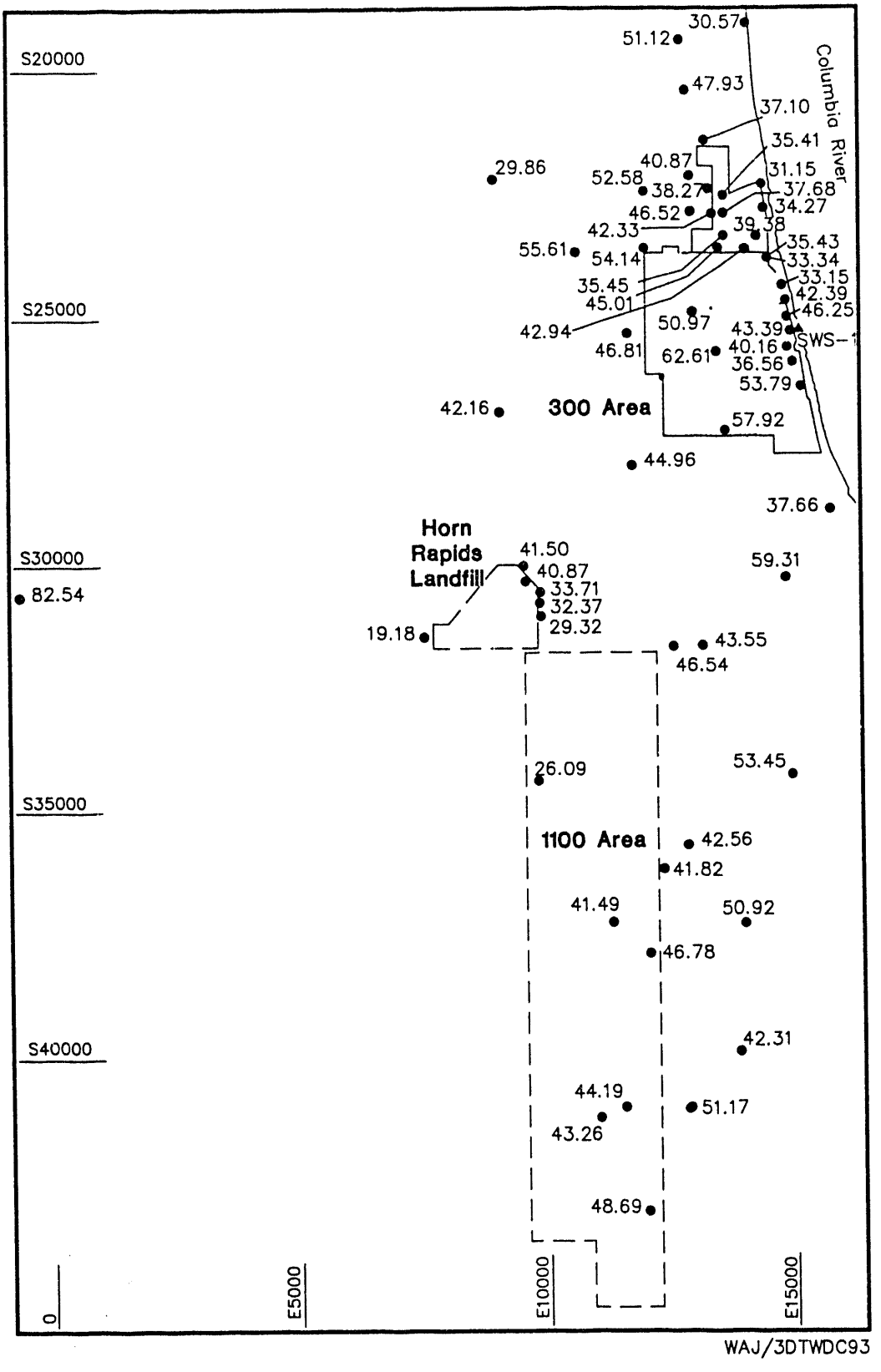

S20000
S25000
S30000
S35000
S40000
E5000
E10000
E15000
0
Columbia River
300 Area
1100 Area
Horn Rapids Landfill
30.57
51.12
47.93
37.10
35.41
29.86
40.87
52.58
38.27
31.15
37.68
46.52
34.27
42.33
39.38
55.61
54.14
35.43
33.34
35.45
33.15
45.01
42.39
46.25
42.94
50.97
43.39
46.81
62.61
40.16
36.56
53.79
42.16
57.92
44.96
37.66
41.50
40.87
33.71
32.37
29.32
59.31
82.54
19.18
43.55
46.54
26.09
53.45
42.56
41.82
41.49
50.92
46.78
42.31
44.19
51.17
43.26
48.69
WAJ/3DTWDC93

Figure 10

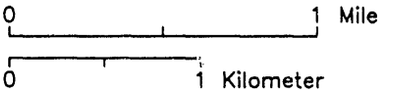
300/1100 Area Depth-to-Water Map December 1993

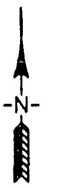
35.56 ● Depth to water in feet, as measured from well reference mark (generally top of casing) to groundwater surface.

▲ River stage recorder

The 300 Area depth-to-water map has been prepared by the Geohyrologic Support Function, Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).





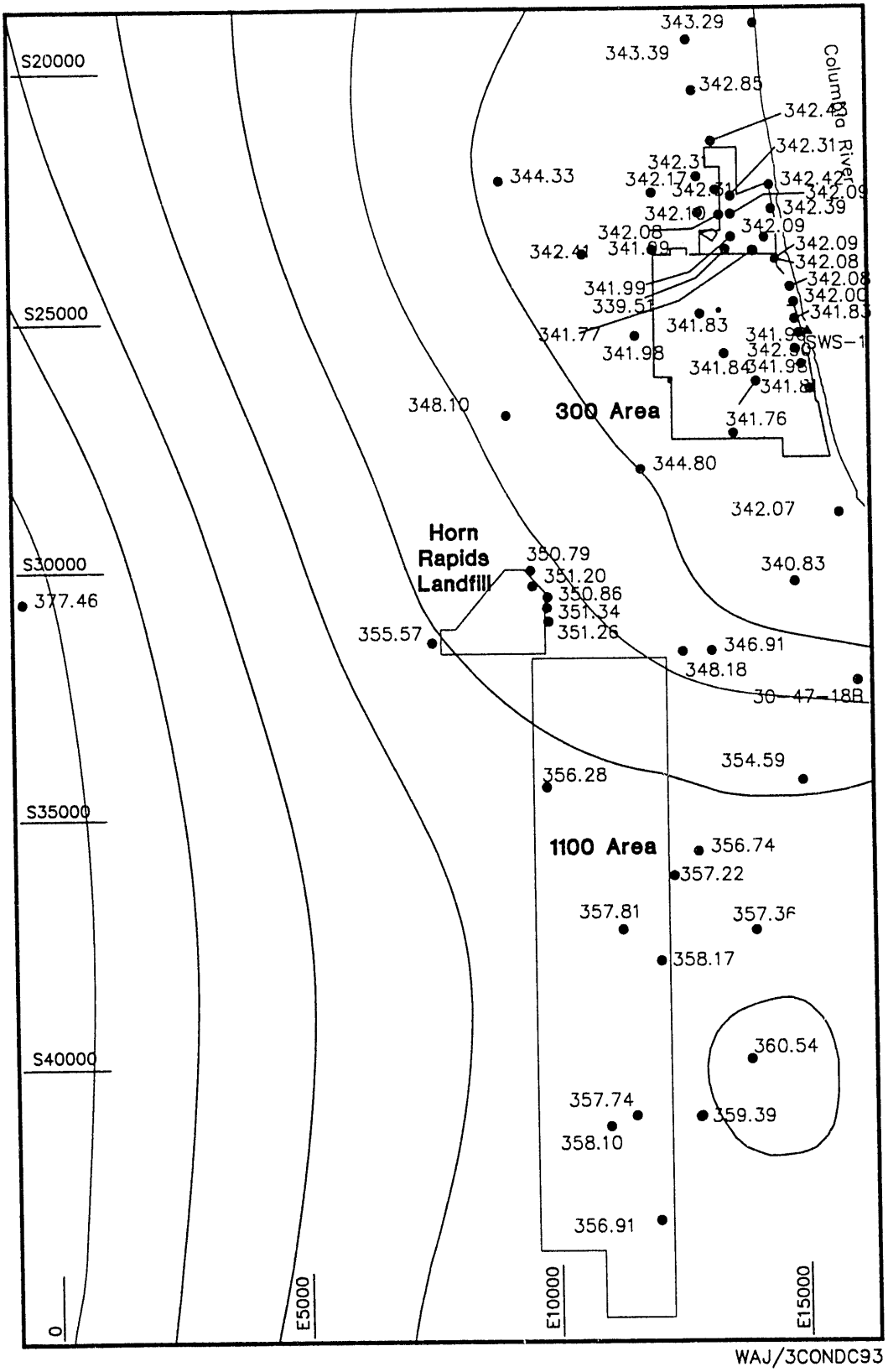

S20000
S25000
S30000
S35000
S40000
E5000
E10000
E15000
0
Columbia River
343.29
343.39
342.85
342.42
342.31
342.31
342.17
342.42
342.09
342.39
342.09
342.08
342.09
342.08
342.08
342.00
341.83
341.83
341.77
341.98
341.84
341.81
341.76
344.33
342.41
341.99
339.51
348.10
300 Area
344.80
342.07
340.83
Horn Rapids Landfill
350.79
351.20
350.86
351.34
351.26
355.57
346.91
348.18
377.46
354.59
356.28
1100 Area
356.74
357.22
357.81
358.17
360.54
357.74
359.39
358.10
356.91
WAJ/3CONDC93

Figure 11

300/1100 Area Water Table Map December 1993

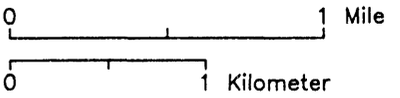
346.39 ● Water table elevation (feet above mean sea level)

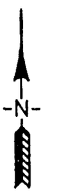
340 Groundwater table elevation contour interval = 5ft

▲ River stage recorder

The 300/1100 Area water table map has been prepared by the Geohydrologic Support Function, Westinghouse Hanford Company.

Note: To convert to metric, multiply elevation (ft) by 0.3048 to obtain elevation (m).





APPENDIX A

WATER LEVEL MEASUREMENT DATA

Appendix A: December 1993 Water Level Measurement Data
(Sheet 1 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
199-B2-12	P	45.60	439.06	393.46
199-B2-13	P	24.63	418.53	393.90
199-B3-1		47.08	439.19	392.11
199-B3-46	N	49.55	441.62	392.07
199-B3-47	N	46.22	438.78	392.56
199-B4-1	N	65.00	461.19	396.19
199-B4-3		65.49	461.71	396.22
199-B4-4		76.98	472.14	395.16
199-B4-6	N	85.41	481.92	396.51
199-B4-8	N	76.01	473.58	397.57
199-B4-9	N	74.95	471.45	396.50
199-B5-1		59.54	455.58	396.04
199-B5-2	N	62.94	458.91	395.97
199-B8-6		78.88	475.38	396.50
199-B9-1	Q	97.86	478.87	381.01
199-B9-2	N	100.85	497.42	396.57
199-B9-3	N	96.48	493.06	396.58
199-D2-5		75.46	460.30	384.84
199-D2-6		85.51	469.28	383.77
199-D5-12		85.66	469.63	383.97
199-D5-13	N	85.68	471.49	385.81
199-D5-14	N	88.03	471.69	383.66
199-D5-15	N	87.58	471.53	383.95
199-D5-16	N	89.25	472.89	383.64
199-D5-17	N	85.00	469.49	384.49
199-D5-18	N	82.49	466.68	384.19
199-D5-19	N	80.25	464.80	384.55
199-D5-20	N	85.25	468.10	382.85
199-D8-3		68.92	448.99	380.07
199-D8-4	N	85.26	468.73	383.47
199-D8-5		70.42	452.49	382.07
199-D8-53	N	54.97	436.03	381.06
199-D8-54A	N	61.69	442.78	381.09
199-D8-54B	P	60.98	442.51	381.53
199-D8-55	N	58.09	439.35	381.26

Appendix A: December 1993 Water Level Measurement Data
(Sheet 2 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
199-D8-6		93.02	476.50	383.48
199-F1-2		28.24	397.95	369.71
199-F5-1		36.96	406.56	369.60
199-F5-3	Q	55.76	408.62	352.86
199-F5-4	N	42.66	412.12	369.46
199-F5-42	N	22.53	391.26	368.73
199-F5-43A	N	26.18	395.35	369.17
199-F5-43B	P	26.13	394.87	368.74
199-F5-44	N	33.48	402.65	369.17
199-F5-45	N	45.56	414.31	368.75
199-F5-46	N	48.49	416.95	368.46
199-F5-47	N	49.23	419.03	369.80
199-F5-48	N	48.15	417.36	369.21
199-F5-6	N	44.69	412.95	368.26
199-F6-1	N	37.70	405.15	367.45
199-F7-1		17.46	389.74	372.28
199-F7-2	Q	23.65	410.72	387.07
199-F7-3	N	22.09	394.84	372.75
199-F8-1		35.45	405.86	370.41
199-F8-2	N	40.52	410.74	370.22
199-F8-3	N	28.27	399.71	371.44
199-F8-4		44.01	410.93	366.92
199-H3-1	N	46.12	421.48	375.36
199-H3-2A	N	42.89	417.83	374.94
199-H3-2B	N	43.48	418.42	374.94
199-H3-2C	P	43.41	418.22	374.81
199-H4-10	N	30.29	404.44	374.15
199-H4-11	N	44.16	416.84	372.68
199-H4-12A	N	40.36	413.50	373.14
199-H4-12B	N	40.38	413.52	373.14
199-H4-12C	P	40.69	413.52	372.83
199-H4-13	N	45.99	418.20	372.21
199-H4-14	N	45.95	420.59	374.64
199-H4-15A	N	33.91	407.21	373.30
199-H4-15B	N	33.62	406.92	373.30

Appendix A: December 1993 Water Level Measurement Data
(Sheet 3 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
199-H4-15CR	P	33.88	407.37	373.49
199-H4-15CS	P	34.27	407.44	373.17
199-H4-16		50.16	424.23	374.07
199-H4-17	N	45.37	419.09	373.72
199-H4-18	N	48.13	421.82	373.69
199-H4-3	N	46.72	420.29	373.57
199-H4-4	N	40.75	413.70	372.95
199-H4-45	N	42.90	416.64	373.74
199-H4-46	N	49.31	424.19	374.88
199-H4-47	N	49.82	424.91	375.09
199-H4-48	N	50.68	426.02	375.34
199-H4-49	N	48.99	424.85	375.86
199-H4-5	N	42.98	416.21	373.23
199-H4-6	N	44.65	419.58	374.93
199-H4-7	N	46.43	420.59	374.16
199-H4-8	N	46.19	420.00	373.81
199-H4-9	N	44.54	418.08	373.54
199-H5-1		44.26	420.16	375.90
199-H6-1		44.36	418.10	373.74
199-K-11		75.51	466.55	391.04
199-K-13	N	74.40	464.00	389.60
199-K-18	N	23.42	409.00	385.58
199-K-19		35.15	422.17	387.02
199-K-20		35.83	422.57	386.74
199-K-21	N	36.38	421.73	385.35
199-K-22	N	38.89	424.51	385.62
199-K-23	Q	75.49	405.00	329.51
199-K-27		74.23	466.67	392.44
199-K-28	N	73.56	465.97	392.41
199-K-30	N	73.59	466.20	392.61
199-K-31	N	26.03	412.40	386.37
199-K-32A	N	55.89	444.02	388.13
199-K-32B	P	48.82	445.27	396.45
199-K-33	N	56.82	443.64	386.82
199-K-34		77.99	468.09	390.10

Appendix A: December 1993 Water Level Measurement Data
(Sheet 4 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
199-K-35	N	99.56	494.55	394.99
199-K-36		98.41	494.07	395.66
199-K-37		55.43	441.80	386.37
199-N-14		69.58	453.68	384.10
199-N-16	N	71.28	457.24	385.96
199-N-17	N	76.68	461.71	385.03
199-N-19	N	69.80	454.44	384.64
199-N-2	N	75.13	459.76	384.63
199-N-20	N	71.40	456.35	384.95
199-N-21	N	72.56	457.47	384.91
199-N-23	N	72.05	456.80	384.75
199-N-25	N	41.85	426.25	384.40
199-N-26		71.69	456.26	384.57
199-N-27	N	62.41	449.60	387.19
199-N-28	N	76.84	464.74	387.90
199-N-29	N	77.80	465.75	387.95
199-N-3	N	75.69	459.39	383.70
199-N-31	N	76.58	462.63	386.05
199-N-32	N	75.87	462.59	386.72
199-N-33	N	75.60	460.37	384.77
199-N-34	N	73.29	460.15	386.86
199-N-41	N	73.49	458.11	384.62
199-N-42	N	70.77	455.64	384.87
199-N-50	N	79.93	463.90	383.97
199-N-51	N	78.95	462.72	383.77
199-N-52	N	76.16	464.20	388.04
199-N-54	N	72.49	458.00	385.51
199-N-55	N	72.81	458.35	385.54
199-N-56	N	73.48	458.59	385.11
199-N-57	N	71.50	458.26	386.76
199-N-59		74.99	460.07	385.08
199-N-62	N	76.21	464.12	387.91
199-N-63	N	79.66	467.23	387.57
199-N-64	N	68.02	455.15	387.13
199-N-65	N	70.34	456.98	386.64

Appendix A: December 1993 Water Level Measurement Data
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Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
199-N-67	N	73.96	458.97	385.01
199-N-69	N	74.45	459.36	384.91
199-N-70	N	69.14	454.70	385.56
199-N-71	N	73.73	463.02	389.29
199-N-72	N	70.60	458.98	388.38
199-N-73	N	75.64	463.26	387.62
199-N-74		68.55	457.64	389.09
199-N-75	N	72.17	456.78	384.61
199-N-76	N	68.94	452.12	383.18
199-N-77	N	71.25	459.44	388.19
199-N-80	P	73.94	457.69	383.75
199-N-81	N	77.00	462.71	385.71
199-N-8S		21.48	405.12	383.64
299-E13-10		337.05	738.84	401.79
299-E13-12	Q	331.38	731.34	399.96
299-E13-14		343.41	745.15	401.74
299-E16-1	Q	290.19	696.44	406.25
299-E17-1		317.60	719.17	401.57
299-E17-10		313.24	714.74	401.50
299-E17-12		320.63	721.70	401.07
299-E17-13		317.92	719.25	401.33
299-E17-14		320.74	722.18	401.44
299-E17-15		321.16	721.78	400.62
299-E17-16		319.36	720.58	401.22
299-E17-17	N	318.58	719.92	401.34
299-E17-18		319.29	720.65	401.36
299-E17-19		318.68	719.33	400.65
299-E17-20		317.65	719.23	401.58
299-E17-5		317.74	718.69	400.95
299-E17-6		318.68	720.10	401.42
299-E17-9		316.44	717.64	401.20
299-E18-1		318.35	720.24	401.89
299-E18-2	N	319.62	721.21	401.59
299-E18-3		320.72	722.04	401.32
299-E18-4	N	319.72	721.57	401.85

Appendix A: December 1993 Water Level Measurement Data
(Sheet 6 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
299-E23-1		311.57	713.10	401.53
299-E23-2		319.37	720.64	401.27
299-E24-18		316.96	719.28	402.32
299-E24-19		292.12	693.65	401.53
299-E24-2	N	315.51	717.47	401.96
299-E24-20	N	287.46	689.28	401.82
299-E24-7		314.72	716.01	401.29
299-E24-8		286.85	688.81	401.96
299-E25-10		253.87	655.84	401.97
299-E25-11		279.35	681.28	401.93
299-E25-18		277.10	679.05	401.95
299-E25-19	N	275.29	677.20	401.91
299-E25-2		273.71	675.45	401.74
299-E25-20		274.43	676.30	401.87
299-E25-21	N	275.56	677.27	401.71
299-E25-26		266.40	668.52	402.12
299-E25-28		260.30	662.44	402.14
299-E25-32P		267.98	670.04	402.06
299-E25-32Q		268.32	670.04	401.72
299-E25-34		260.83	662.87	402.04
299-E25-35		273.02	674.39	401.37
299-E25-36		305.30	707.39	402.09
299-E25-40		264.03	665.71	401.68
299-E25-41		269.53	671.26	401.73
299-E25-42	N	281.47	683.29	401.82
299-E25-43	N	247.85	649.89	402.04
299-E25-46	N	292.92	694.81	401.89
299-E25-47	N	271.66	673.77	402.11
299-E25-48	N	280.25	682.31	402.06
299-E25-6	Q	258.99	658.31	399.32
299-E25-9	Q	255.02	654.86	399.84
299-E26-1		214.96	617.25	402.29
299-E26-10	N	199.28	601.47	402.19
299-E26-12	N	228.28	630.74	402.46
299-E26-13	N	202.59	605.02	402.43

Appendix A: December 1993 Water Level Measurement Data
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Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
299-E26-2		233.00	635.30	402.30
299-E26-4		245.94	647.76	401.82
299-E26-8	Q	217.81	602.76	384.95
299-E26-9	N	200.71	602.89	402.18
299-E27-1	N	280.97	682.55	401.58
299-E27-10		222.51	624.47	401.96
299-E27-11		241.79	643.29	401.50
299-E27-12		259.38	660.95	401.57
299-E27-13		267.24	668.99	401.75
299-E27-14		256.74	658.34	401.60
299-E27-15		251.97	652.67	400.70
299-E27-17	N	232.86	634.72	401.86
299-E27-7		232.94	634.67	401.73
299-E27-8		236.19	637.83	401.64
299-E27-9		227.47	629.21	401.74
299-E28-12		306.62	708.60	401.98
299-E28-17		306.12	708.56	402.44
299-E28-18		290.93	692.58	401.65
299-E28-26		285.81	687.26	401.45
299-E28-27		279.01	680.37	401.36
299-E28-28		285.28	686.55	401.27
299-E28-4		289.86	691.55	401.69
299-E28-6		298.48	700.11	401.63
299-E28-7		285.07	685.91	400.84
299-E28-9		299.20	700.77	401.57
299-E32-1		254.60	656.17	401.57
299-E32-10		236.37	637.88	401.51
299-E32-2		268.86	670.06	401.20
299-E32-3		275.15	676.51	401.36
299-E32-4		284.69	685.88	401.19
299-E32-5		280.81	682.14	401.33
299-E32-6	N	265.88	667.45	401.57
299-E32-7	N	256.87	658.42	401.55
299-E32-8	N	244.13	645.59	401.46
299-E32-9	N	241.78	643.33	401.55

Appendix A: December 1993 Water Level Measurement Data
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Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
299-E33-1	N	230.42	632.11	401.69
299-E33-12	P	221.27	623.45	402.18
299-E33-13	Q	226.63	625.53	398.90
299-E33-14		220.31	622.05	401.74
299-E33-15		225.53	627.29	401.76
299-E33-17	N	230.05	631.65	401.60
299-E33-18	N	250.13	651.86	401.73
299-E33-2	Q	230.02	629.75	399.73
299-E33-21		266.64	668.13	401.49
299-E33-28		262.78	664.23	401.45
299-E33-29		272.32	673.77	401.45
299-E33-3	Q	228.87	625.70	396.83
299-E33-30		262.28	663.70	401.42
299-E33-31		245.82	647.28	401.46
299-E33-32		258.56	659.83	401.27
299-E33-33		238.45	640.17	401.72
299-E33-34		232.05	633.33	401.28
299-E33-35		241.72	643.01	401.29
299-E33-36		246.13	646.67	400.54
299-E33-37		251.17	653.01	401.84
299-E33-38	N	230.42	631.95	401.53
299-E33-39	N	221.93	623.32	401.39
299-E33-4	Q	228.11	627.88	399.77
299-E33-40	N	222.57	624.58	402.01
299-E33-41	N	253.28	654.95	401.67
299-E33-42	N	252.58	654.30	401.72
299-E33-43	N	261.08	662.68	401.60
299-E33-5	N	232.96	634.72	401.76
299-E33-7	N	226.12	626.58	400.46
299-E33-8		249.20	650.73	401.53
299-E34-1		227.57	629.45	401.88
299-E34-10	N	237.96	639.77	401.81
299-E34-11	N	216.14	617.93	401.79
299-E34-12		237.23	638.83	401.60
299-E34-2		229.17	630.80	401.63

Appendix A: December 1993 Water Level Measurement Data
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Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
299-E34-3		209.66	611.52	401.86
299-E34-5		188.01	590.79	402.78
299-E34-6		196.16	597.83	401.67
299-E34-7		202.56	604.25	401.69
299-E34-8		239.25	640.52	401.27
299-E34-9		226.91	628.69	401.78
299-E35-1		195.31	598.30	402.99
299-E35-2	N	199.95	602.10	402.15
299-W10-10		214.19	675.09	460.90
299-W10-11		214.08	675.26	461.18
299-W10-12		213.79	674.75	460.96
299-W10-13		237.62	699.04	461.42
299-W10-14		238.37	699.43	461.06
299-W10-15		214.77	675.64	460.87
299-W10-16		211.48	672.76	461.28
299-W10-17	N	209.22	670.84	461.62
299-W10-18	N	208.41	670.93	462.52
299-W10-19		222.91	682.99	460.08
299-W10-2		212.78	673.99	461.21
299-W10-5		210.32	672.31	461.99
299-W10-8		219.48	680.05	460.57
299-W10-9	N	213.58	674.67	461.09
299-W11-10		275.85	728.89	453.04
299-W11-12	N	218.17	679.26	461.09
299-W11-14		257.97	715.16	457.19
299-W11-19		250.39	707.00	456.61
299-W11-23		227.58	687.88	460.30
299-W11-24		226.39	687.17	460.78
299-W11-27	N	224.49	685.27	460.78
299-W11-6		258.52	716.23	457.71
299-W11-7		249.11	709.11	460.00
299-W12-1		277.86	726.46	448.60
299-W14-1		205.86	665.83	459.97
299-W14-12	N	207.16	670.52	463.36
299-W14-9		226.20		

Appendix A: December 1993 Water Level Measurement Data
(Sheet 10 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
299-W15-10		213.63	676.00	462.37
299-W15-12		207.44	670.07	462.63
299-W15-13	N	207.45	670.12	462.67
299-W15-15	N	234.62	697.96	463.34
299-W15-16	N	221.11	684.89	463.78
299-W15-17	N	220.97	684.64	463.67
299-W15-18		221.75	685.71	463.96
299-W15-19		228.39	691.60	463.21
299-W15-20		235.22	698.36	463.14
299-W15-22	N	206.26	670.77	464.51
299-W15-23		236.24	699.49	463.25
299-W15-24	N	235.94	699.37	463.43
299-W15-4		198.34	662.00	463.66
299-W15-5		205.69	670.68	464.99
299-W18-15	N	197.59	660.76	463.17
299-W18-21	N	205.29	668.62	463.33
299-W18-22		205.58	668.49	462.91
299-W18-23		233.42	696.81	463.39
299-W18-24	N	220.24	684.35	464.11
299-W18-25	N	201.87	666.04	464.17
299-W18-26		235.65	699.05	463.40
299-W18-27	N	226.79	690.25	463.46
299-W18-28	N	216.37	679.99	463.62
299-W18-29	Q	126.62	674.14	547.52
299-W18-30	N	208.43	672.84	464.41
299-W18-31	N	199.88	664.16	464.28
299-W18-32	N	211.93	676.65	464.72
299-W18-33	N	205.23		
299-W19-1		208.34	673.77	465.43
299-W19-12	P	208.81	673.25	464.44
299-W19-14		233.82	693.21	459.39
299-W19-15	N	233.12	693.28	460.16
299-W19-2		237.10	694.04	456.94
299-W19-20		235.86	691.04	455.18
299-W19-21		213.88	678.53	464.65

Appendix A: December 1993 Water Level Measurement Data
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Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
299-W19-27		219.42	683.65	464.23
299-W19-28		245.80	703.35	457.55
299-W19-29		245.20	702.13	456.93
299-W19-31	N	209.77	674.19	464.42
299-W19-32	N	210.33	674.90	464.57
299-W19-4		259.42	715.26	455.84
299-W19-6	N	226.81	686.60	459.79
299-W19-91	N	99.06	677.90	578.84
299-W19-92	N	99.17	677.90	578.73
299-W21-1		247.31	699.26	451.95
299-W22-19		227.51	681.26	453.75
299-W22-21		214.49	670.00	455.51
299-W22-26		222.40	680.30	457.90
299-W22-39	N	210.35	668.26	457.91
299-W22-40		236.42	692.23	455.81
299-W22-41		235.97	691.74	455.77
299-W22-42		235.45	691.16	455.71
299-W22-43		234.73	691.35	456.62
299-W22-45	N	207.58	666.21	458.63
299-W22-46	N	213.51	671.18	457.67
299-W22-7		231.89	687.41	455.52
299-W23-11		203.96	664.14	460.18
299-W23-13	N	205.72	666.33	460.61
299-W23-14	N	204.16	664.00	459.84
299-W23-15	N	196.82	655.44	458.62
299-W23-4		201.67	662.63	460.96
299-W23-6		208.97	666.76	457.79
299-W23-8	N	203.93	663.95	460.02
299-W26-10	N	214.08	670.87	456.79
299-W26-11	Q	138.95	674.40	535.45
299-W26-12		218.62	675.69	457.07
299-W26-6	N	195.74		
299-W26-7		193.47	651.99	458.52
299-W26-8	N	208.87	666.31	457.44
299-W26-9	N	197.01	654.16	457.15

Appendix A: December 1993 Water Level Measurement Data
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Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
299-W27-2		220.33		
299-W6-1		247.51	702.53	455.02
299-W6-10		254.95	712.48	457.53
299-W6-11		248.03	702.86	454.83
299-W6-12		236.60	692.51	455.91
299-W6-2		235.39	692.45	457.06
299-W6-3	N	242.91	699.83	456.92
299-W6-4	N	243.73	701.25	457.52
299-W6-6	N	256.03	710.00	453.97
299-W6-7	N	256.27	710.28	454.01
299-W6-9		238.59	710.00	471.41
299-W7-1		233.00	690.71	457.71
299-W7-10	N	233.28	689.66	456.38
299-W7-11	N	224.01	681.45	457.44
299-W7-12	N	230.18	687.93	457.75
299-W7-2	N	218.94	675.59	456.65
299-W7-3		220.54	676.14	455.60
299-W7-4		213.21	671.69	458.48
299-W7-5		216.87	673.05	456.18
299-W7-6		222.59	678.64	456.05
299-W7-7		218.69	674.94	456.25
299-W7-8		232.48	687.35	454.87
299-W7-9		233.94	692.09	458.15
299-W8-1		243.19	701.33	458.14
299-W9-1		277.23	737.73	460.50
399-1-1		34.27	376.66	342.39
399-1-10A		31.15	373.57	342.42
399-1-11		35.41	377.72	342.31
399-1-12		42.33	384.41	342.08
399-1-13A		46.52	388.62	342.10
399-1-14A		40.87	383.18	342.31
399-1-15		37.10	379.53	342.43
399-1-16A		39.38	381.47	342.09
399-1-16B		38.90	381.08	342.18
399-1-16C		8.09	382.23	374.14

Appendix A: December 1993 Water Level Measurement Data
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Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
399-1-17A		35.45	377.44	341.99
399-1-17B	N	35.72	377.80	342.08
399-1-17C	N	2.18	378.06	375.88
399-1-18A		47.93	390.78	342.85
399-1-18B	N	46.72	389.89	343.17
399-1-18C	N	44.36	388.01	343.65
399-1-19	N	32.52	374.64	342.12
399-1-2		45.01	384.52	339.51
399-1-21A	N	40.34	382.39	342.05
399-1-21B	N	41.30	383.33	342.03
399-1-3		42.94	384.71	341.77
399-1-4		38.27	380.58	342.31
399-1-5		37.68	379.77	342.09
399-1-6	N	31.27	373.81	342.54
399-1-7	N	43.52	385.60	342.08
399-1-8	N	42.81	384.88	342.07
399-1-9	Q	27.63	384.76	357.13
399-2-1		33.15	375.23	342.08
399-2-2		35.43	377.52	342.09
399-2-3		33.34	375.42	342.08
399-3-1		42.39	384.39	342.00
399-3-10		43.39	385.35	341.96
399-3-12	N	46.34	388.04	341.70
399-3-6		50.97	392.80	341.83
399-3-9		46.25	388.08	341.83
399-4-1		53.79	395.60	341.81
399-4-10		36.56	378.54	341.98
399-4-11		62.61	404.45	341.84
399-4-7	N	36.64	378.56	341.92
399-4-9		40.16	382.16	342.00
399-5-1	N	53.63	395.53	341.90
399-6-1		46.81	388.79	341.98
399-8-1		54.14	396.13	341.99
399-8-2		55.61	398.02	342.41
399-8-3		52.58	394.75	342.17

Appendix A: December 1993 Water Level Measurement Data
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Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
399-8-5A		57.95	400.31	342.36
399-8-5B		56.91	399.85	342.94
399-8-5C		32.29	399.91	367.62
3099-47-18B	N	33.57		
699-101-48B		12.58	390.15	377.57
699-20-20		105.92	505.58	399.66
699-20-39		138.58	539.98	401.40
699-20-41P	P	134.13		
699-20-41Q	P	135.16		
699-20-41R	P	137.41		
699-23-34		131.75	532.86	401.11
699-24-33		123.20	524.21	401.01
699-24-34A		132.77	533.89	401.12
699-24-34B		132.36	533.50	401.14
699-24-34C		131.47	532.58	401.11
699-24-35		137.66	538.81	401.15
699-25-33A		128.00	528.97	400.97
699-25-34A		129.23	530.31	401.08
699-25-34B		129.17	529.40	400.23
699-25-34C		134.35	535.46	401.11
699-25-34D		136.78	537.91	401.13
699-25-55		264.59	676.55	411.96
699-25-70		183.92	629.78	445.86
699-26-33		134.63	535.49	400.86
699-26-34		127.24	528.40	401.16
699-26-34B		129.13	530.27	401.14
699-26-35A		131.55	532.66	401.11
699-26-35C	N	131.51	532.68	401.17
699-26-83BP	P	233.49		
699-26-83BQ	P	233.13		
699-26-83BR	P	237.32		
699-28-40		158.05	559.44	401.39
699-28-52A		281.69	684.67	402.98
699-29-70AP	P	191.11	629.75	438.64
699-29-70AQ		184.39	630.15	445.76

Appendix A: December 1993 Water Level Measurement Data
(Sheet 15 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
699-29-70CP	P	229.96	630.94	400.98
699-29-70CQ	P	232.76	630.99	398.23
699-29-70CR	P	231.07	631.15	400.08
699-29-70CS	P	233.73	631.31	397.58
699-29-70CT	P	234.65	631.48	396.83
699-29-70CU	P	235.78	631.64	395.86
699-29-70DP	P	208.56	632.42	423.86
699-29-78		187.75	647.05	459.30
699-31-31		128.27	529.32	401.05
699-31-65		243.99	683.09	439.10
699-31-84B	N	204.47	625.12	420.65
699-32-43		114.92	516.62	401.70
699-32-62		278.82	707.09	428.27
699-32-70B		217.88	666.68	448.80
699-32-72		217.50	668.16	450.66
699-32-77		195.81	653.74	457.93
699-33-42		114.98	516.00	401.02
699-33-56		314.37	717.03	402.66
699-34-39A		135.60	537.07	401.47
699-34-41B		169.10	570.89	401.79
699-34-42		138.32	540.20	401.88
699-34-51		334.79	736.76	401.97
699-35-66		287.76	725.65	437.89
699-35-70		244.94	693.72	448.78
699-35-78A		198.03	660.65	462.62
699-36-61A		341.61	748.11	406.50
699-37-43		287.19	690.17	402.98
699-37-82A		172.22	636.75	464.53
699-38-65		324.41	753.33	428.92
699-38-70		260.61	710.67	450.06
699-39-39		125.17	536.65	411.48
699-39-79		210.29	673.52	463.23
699-40-33A		107.63	518.05	410.42
699-40-36		118.12	528.92	410.80
699-40-39		129.71	541.84	412.13

Appendix A: December 1993 Water Level Measurement Data
(Sheet 16 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
699-40-40A	N	130.16	541.21	411.05
699-40-40B	N	130.81	542.18	411.37
699-40-62		343.17	747.78	404.61
699-41-35		108.63	520.38	411.75
699-41-40		131.00	545.94	414.94
699-41-42		232.72	643.91	411.19
699-42-37		105.09	519.42	414.33
699-42-39A	N	139.77	558.14	418.37
699-42-39B	N	140.27	558.32	418.05
699-42-40A		123.77	545.53	421.76
699-42-40B		124.56	546.46	421.90
699-42-40C	P	133.84	546.16	412.32
699-42-41	N	146.54	567.30	420.76
699-42-42B		166.05	583.23	417.18
699-43-40	N	123.73	542.20	418.47
699-43-42J		162.87	581.68	418.81
699-43-43		164.40	579.37	414.97
699-43-45		194.78	597.68	402.90
699-43-91AP	P	231.68	671.51	439.83
699-43-91AQ	P	231.71	671.94	440.23
699-43-91D	P	262.11	671.99	409.88
699-44-39B		95.34	513.40	418.06
699-44-42		158.55	579.22	420.67
699-44-43B		164.77	580.12	415.35
699-44-64		319.76	725.60	405.84
699-44-91P	P	268.26	672.15	403.89
699-44-91Q	P	268.52	672.33	403.81
699-44-91R	P	267.33	672.49	405.16
699-44-91S	P	274.50	672.68	398.18
699-44-91T	P	275.73	672.84	397.11
699-44-91U	P	276.02	673.01	396.99
699-45-42		161.23	577.33	416.10
699-45-69	Q	279.69		
699-47-35A		63.20	476.36	413.16
699-47-35B		63.47	476.65	413.18

Appendix A: December 1993 Water Level Measurement Data
(Sheet 17 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
699-47-46A	N	176.99	580.14	403.15
699-47-50		181.13	584.22	403.09
699-47-60		249.96	651.52	401.56
699-47-80AP	P	272.42	713.03	440.61
699-47-80AQ	P	262.78	713.51	450.73
699-47-80CP	P	307.99	712.58	404.59
699-47-80CQ	P	309.02	712.75	403.73
699-47-80CR	P	308.97	712.92	403.95
699-47-80CS	P	314.89	713.10	398.21
699-47-80CT	P	315.30	713.25	397.95
699-47-80CU	P	315.45	713.43	397.98
699-47-80DP	P	296.34		
699-48-50	N	170.88	574.06	403.18
699-48-71		243.96	688.15	444.19
699-49-55A		129.37	531.03	401.66
699-49-55B	P	129.39	531.12	401.73
699-49-57A	N	152.04	553.52	401.48
699-49-57B	N	154.41	555.99	401.58
699-49-79		234.00	689.20	455.20
699-50-42		56.66	466.84	410.18
699-50-45		43.73	451.41	407.68
699-50-48B		145.36	550.39	405.03
699-50-53A	N	155.89	557.46	401.57
699-50-53B	N	155.83	557.62	401.79
699-50-85		284.66	739.35	454.69
699-51-46	P	38.22	444.63	406.41
699-51-63		167.83	571.84	404.01
699-51-75		193.11	641.51	448.40
699-52-46A	P	47.78	455.61	407.83
699-52-48	P	62.13	466.06	403.93
699-52-54	N	167.11	568.45	401.34
699-52-57	N	160.71	561.80	401.09
699-53-35		130.56	530.99	400.43
699-53-47A		32.85	438.28	405.43
699-53-47B	P	33.17	438.58	405.41

Appendix A: December 1993 Water Level Measurement Data
(Sheet 18 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
699-53-48A		39.40	442.45	403.05
699-53-48B		38.31	442.71	404.40
699-53-50	P	40.85	444.21	403.36
699-53-55A		175.34	576.56	401.22
699-53-55B	P	176.06	576.84	400.78
699-53-55C	P	175.07	576.13	401.06
699-54-42		115.30	511.49	396.19
699-54-48		56.06	457.02	400.96
699-54-57		175.04	576.24	401.20
699-55-40		134.46	543.13	408.67
699-55-50C		43.48	444.43	400.95
699-55-70		137.56	569.03	431.47
699-55-76		139.74	583.24	443.50
699-56-43	P	132.55	540.42	407.87
699-56-53	P	32.98	434.34	401.36
699-57-25A	N	51.22	414.57	363.35
699-57-29A	N	54.33	408.47	354.14
699-57-29B	N	55.05	416.18	361.13
699-57-59		175.28	576.26	400.98
699-57-83A		145.51	577.96	432.45
699-57-83BP	Q	179.19	578.56	399.37
699-57-83BQ	Q	179.59	578.73	399.14
699-57-83BR	Q	179.61	578.89	399.28
699-57-83C	Q	173.78	579.60	405.82
699-58-24		57.78	418.80	361.02
699-59-32		62.95	424.29	361.34
699-59-58		97.01	497.77	400.76
699-59-80B		153.70	583.25	429.55
699-60-32		64.11	425.30	361.19
699-60-57	N	68.53	469.64	401.11
699-60-59	Q	105.29		
699-60-60		111.32	512.03	400.71
699-61-37	N	61.73	442.94	381.21
699-61-41	N	33.45	428.92	395.47
699-61-62		96.71	497.51	400.80

Appendix A: December 1993 Water Level Measurement Data
(Sheet 19 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
699-61-66		122.19	522.18	399.99
699-62-31		72.98	434.12	361.14
699-62-43A		36.57	432.30	395.73
699-63-25A		34.20	395.15	360.95
699-63-51		25.81	424.54	398.73
699-63-55		27.20	426.54	399.34
699-63-58		92.23	491.90	399.67
699-63-90		113.46	509.73	396.27
699-63-92	N	100.54	497.50	396.96
699-64-27	N	53.16	414.29	361.13
699-64-62		100.84	500.25	399.41
699-65-22		31.32	391.10	359.78
699-65-50		68.36	467.06	398.70
699-65-59A		107.56	506.96	399.40
699-65-72		142.87	540.28	397.41
699-65-83		88.98	485.63	396.65
699-65-95	P	55.63	452.26	396.63
699-66-103		66.74	463.01	396.27
699-66-23	N	28.98	389.01	360.03
699-66-38		34.03	436.24	402.21
699-66-39	Q	49.89	453.78	403.89
699-66-58		105.05	503.33	398.28
699-66-64		107.19	505.92	398.73
699-66-91	N	70.40	467.75	397.35
699-67-51		125.83	524.59	398.76
699-67-86		76.02	472.39	396.37
699-67-98		57.65	455.47	397.82
699-68-105		57.44	451.85	394.41
699-69-38		20.93	424.10	403.17
699-69-450		89.17	487.18	398.01
699-70-23		30.02	391.71	361.69
699-70-68		128.54	526.21	397.67
699-71-30		30.53	400.68	370.15
699-71-52		124.93	523.04	398.11
699-71-77		77.03	472.28	395.25

Appendix A: December 1993 Water Level Measurement Data
(Sheet 20 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
699-72-73		87.12	482.57	395.45
699-72-88		38.70	437.37	398.67
699-72-92		54.44	452.22	397.78
699-73-61		133.67	531.53	397.86
699-74-44		48.85	445.18	396.33
699-74-48		90.13	487.18	397.05
699-77-36		36.56	412.28	375.72
699-77-54		84.33	480.59	396.26
699-78-62		75.78	469.88	394.10
699-80-43S		25.32	412.52	387.20
699-81-38		27.49	406.47	378.98
699-81-58		46.93	439.55	392.62
699-82-45A	N	25.15	413.73	388.58
699-83-36		41.17	418.63	377.46
699-83-47		46.94	435.27	388.33
699-84-35A	P	7.18	400.05	392.87
699-86-42		25.13	409.92	384.79
699-87-42A		32.84	416.53	383.69
699-87-55		73.05	458.63	385.58
699-88-41		34.03	416.04	382.01
699-89-35		27.36	397.46	370.10
699-90-45		37.74	421.54	383.80
699-91-37		50.55	422.93	372.38
699-91-46	N	33.36	417.06	383.70
699-92-49		48.95	431.88	382.93
699-93-48	N	55.33	437.79	382.46
699-96-43	N	42.89	421.84	378.95
699-96-49		38.13	419.23	381.10
699-97-43		43.44	421.84	378.40
699-97-51A		21.57	402.27	380.70
699-98-49A	N	21.31	401.80	380.49
699-S18-E2A		75.49	434.85	359.36
699-S19-E13		51.12	394.51	343.39
699-S19-E14		30.57	373.86	343.29
699-S22-E9A		29.86	374.19	344.33

Appendix A: December 1993 Water Level Measurement Data
(Sheet 21 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
699-S22-E9B		28.69	373.71	345.02
699-S27-E14		57.92	399.68	341.76
699-S27-E9A		42.16	390.26	348.10
699-S27-E9B		41.03	390.42	349.39
699-S27-E9C		6.58	390.56	383.98
699-S28-E12		44.96	389.76	344.80
699-S29-E12		41.26	387.96	346.70
699-S29-E16A		37.66	379.73	342.07
699-S29-E16B		37.80	379.88	342.08
699-S29-E16C		3.69	379.48	375.79
699-S30-E10A		41.50	392.29	350.79
699-S30-E10B		40.87	392.07	351.20
699-S30-E15A		59.31	400.14	340.83
699-S31-1		82.54	460.00	377.46
699-S31-E10A		33.71	384.57	350.86
699-S31-E10B		32.37	383.71	351.34
699-S31-E10C		31.62	382.91	351.29
699-S31-E10D		29.32	380.58	351.26
699-S31-E8		19.18	374.75	355.57
699-S32-E13A		43.55	390.46	346.91
699-S32-E13B		46.54	394.72	348.18
699-S32-E8		14.25	375.50	361.25
699-S34-E10		26.09	382.37	356.28
699-S34-E15		53.45	408.04	354.59
699-S36-E12B		41.82	399.04	357.22
699-S36-E13A		42.56	399.30	356.74
699-S37-E11		41.49	399.30	357.81
699-S37-E14		50.92	408.28	357.36
699-S38-E11		40.33	398.60	358.27
699-S38-E12A		46.78	404.95	358.17
699-S38-E12B		46.80	405.00	358.20
699-S40-E14		42.31	402.85	360.54
699-S41-E11		43.26	401.36	358.10
699-S41-E12		44.19	401.93	357.74
699-S41-E13A		51.17	410.56	359.39

Appendix A: December 1993 Water Level Measurement Data
(Sheet 22 of 22)

Well	Notes	Depth to Water, ft	Elevation, ft above msl	
			Adjusted Casing	Water Level
699-S41-E13B		50.69	410.10	359.41
699-S41-E13C		51.56	410.67	359.11
699-S43-E12		48.69	405.60	356.91

Notes: N = Well not included on map
P = Well in confined aquifer, not included on map
Q = Questionable data, not included on map

APPENDIX B

WATER LEVEL DIFFERENCE, 200 AREAS

Appendix B: Water Level Difference, 200 Areas, December 1988 to December 1993 (Sheet 1 of 5)

Well	12/88 Water level	12/93 Water level	Change
299-E13-10	405.85	401.79	-4.06
299-E17-1	405.50	401.57	-3.93
299-E17-10	406.08	401.50	-4.58
299-E17-14	406.83	401.44	-5.39
299-E17-16	405.87	401.22	-4.65
299-E17-17	404.57	401.34	-3.23
299-E17-18	404.68	401.36	-3.32
299-E17-20	405.74	401.58	-4.16
299-E17-5	404.57	400.95	-3.62
299-E17-6	405.95	401.42	-4.53
299-E17-9	405.42	401.20	-4.22
299-E18-1	406.03	401.89	-4.14
299-E18-3	406.02	401.32	-4.70
299-E23-1	406.07	401.53	-4.54
299-E23-2	405.99	401.27	-4.72
299-E24-2	405.71	401.96	-3.75
299-E24-7	406.08	401.29	-4.79
299-E25-11	406.23	401.93	-4.30
299-E25-19	406.18	401.91	-4.27
299-E25-26	408.05	402.12	-5.93
299-E25-28	407.28	402.14	-5.14
299-E25-32P	407.53	402.06	-5.47
299-E25-34	407.96	402.04	-5.92
299-E25-35	406.39	401.37	-5.02
299-E27-10	406.56	401.96	-4.60
299-E27-8	406.45	401.64	-4.81
299-E27-9	406.01	401.74	-4.27
299-E28-26	406.38	401.45	-4.93
299-E28-27	405.54	401.36	-4.18
299-E32-1	405.40	401.57	-3.83
299-E32-2	405.29	401.20	-4.09
299-E32-3	405.36	401.36	-4.00
299-E32-4	405.42	401.19	-4.23
299-E33-28	405.67	401.45	-4.22
299-E33-29	405.79	401.45	-4.34

Appendix B: Water Level Difference, 200 Areas, December 1988 to December 1993 (Sheet 2 of 5)

Well	12/88 Water level	12/93 Water level	Change
299-E33-30	405.48	401.42	-4.06
299-E33-5	405.39	401.76	-3.63
299-E34-2	405.99	401.63	-4.36
299-E34-3	406.53	401.86	-4.67
299-E34-5	406.76	402.78	-3.98
299-E34-6	405.98	401.67	-4.31
299-W10-13	466.34	461.42	-4.92
299-W10-14	465.94	461.06	-4.88
299-W10-2	466.76	461.21	-5.55
299-W10-8	465.75	460.83	-4.92
299-W11-10	458.24	453.04	-5.20
299-W11-7	465.01	460.00	-5.01
299-W15-12	468.72	462.63	-6.09
299-W15-15	468.94	463.34	-5.60
299-W15-18	470.16	463.96	-6.20
299-W15-5	470.66	464.99	-5.67
299-W18-15	471.56	463.17	-8.39
299-W18-22	468.38	462.91	-5.47
299-W18-23	469.27	463.39	-5.88
299-W18-24	470.44	464.11	-6.33
299-W19-15	467.53	460.16	-7.37
299-W19-20	461.53	455.18	-6.35
299-W19-21	472.12	464.65	-7.47
299-W22-26	464.59	457.90	-6.69
299-W23-11	467.86	460.18	-7.68
299-W23-4	469.96	460.96	-9.00
299-W6-2	461.62	457.06	-4.56
299-W7-1	462.61	457.71	-4.90
299-W7-2	460.89	456.65	-4.24
299-W7-3	459.62	455.60	-4.02
299-W7-4	463.92	458.48	-5.44
299-W7-5	460.10	456.18	-3.92
299-W7-6	460.02	456.05	-3.97
299-W8-1	462.32	458.14	-4.18
299-W9-1	464.88	460.50	-4.38

Appendix B: Water Level Difference, 200 Areas, December 1988 to December 1993 (Sheet 3 of 5)

Well	12/88 Water level	12/93 Water level	Change
699-24-33	404.94	401.01	-3.93
699-24-34B	404.95	401.14	-3.81
699-24-35	404.83	401.15	-3.68
699-25-34A	405.00	401.08	-3.92
699-25-34C	405.46	401.11	-4.35
699-25-55	413.50	411.96	-1.54
699-25-70	449.43	445.86	-3.57
699-26-33	405.14	400.86	-4.28
699-26-34	405.18	401.16	-4.02
699-26-35A	405.17	401.11	-4.06
699-28-40	405.53	401.39	-4.14
699-28-52A	406.79	402.98	-3.81
699-29-78	465.14	459.30	-5.84
699-31-31	405.02	401.05	-3.97
699-32-43	405.90	401.70	-4.20
699-32-62	429.41	428.27	-1.14
699-32-70B	452.66	448.80	-3.86
699-32-72	455.08	450.66	-4.42
699-32-77	463.77	457.93	-5.84
699-33-42	406.00	401.02	-4.98
699-34-39A	405.89	401.47	-4.42
699-34-41B	406.09	401.79	-4.30
699-34-42	406.03	401.88	-4.15
699-34-51	406.45	401.97	-4.48
699-35-66	440.03	437.89	-2.14
699-35-70	452.64	448.78	-3.86
699-35-78A	468.36	462.62	-5.74
699-36-61A	409.62	406.50	-3.12
699-37-82A	468.61	464.53	-4.08
699-38-65	430.88	428.92	-1.96
699-38-70	454.60	450.06	-4.54
699-39-79	469.11	463.23	-5.88
699-40-33A	411.37	410.42	-.95
699-40-62	407.68	404.61	-3.07
699-42-40B	423.41	421.90	-1.51

Appendix B: Water Level Difference, 200 Areas, December 1988 to December 1993 (Sheet 4 of 5)

Well	12/88 Water level	12/93 Water level	Change
699-42-42B	418.32	417.18	-1.14
699-43-42J	420.59	418.81	-1.78
699-43-43	416.23	414.97	-1.26
699-44-42	422.07	420.67	-1.40
699-44-64	408.33	405.84	-2.49
699-45-42	419.16	416.10	-3.06
699-47-46A	407.18	403.15	-4.03
699-47-60	405.06	401.56	-3.50
699-48-71	447.08	444.19	-2.89
699-49-79	457.90	455.20	-2.70
699-50-42	411.59	410.18	-1.41
699-50-85	456.43	454.69	-1.74
699-51-63	406.83	404.01	-2.82
699-51-75	450.59	448.40	-2.19
699-53-35	397.71	400.43	2.72
699-53-47B	406.44	405.41	-1.03
699-53-48A	404.62	403.05	-1.57
699-53-55B	404.01	400.78	-3.23
699-53-55C	404.26	401.06	-3.20
699-54-48	404.17	400.96	-3.21
699-55-40	409.78	408.67	-1.11
699-55-50C	404.18	400.95	-3.23
699-55-70	432.73	431.47	-1.26
699-55-76	444.90	443.50	-1.40
699-57-83A	432.95	432.45	-.50
699-59-32	361.87	361.34	-.53
699-59-58	403.37	400.76	-2.61
699-59-80B	427.78	429.55	1.77
699-60-32	361.70	361.19	-.51
699-60-60	403.99	400.71	-3.28
699-61-37	382.15	381.21	-.94
699-61-41	396.40	395.47	-.93
699-61-62	402.90	400.80	-2.10
699-61-66	402.78	399.99	-2.79
699-62-31	361.62	361.14	-.48

Appendix B: Water Level Difference, 200 Areas, December 1988 to December 1993 (Sheet 5 of 5)

Well	12/88 Water level	12/93 Water level	Change
699-62-43A	396.74	395.73	-1.01
699-63-51	400.71	398.73	-1.98
699-63-58	402.28	399.67	-2.61
699-64-62	401.90	399.41	-2.49
699-65-50	400.70	398.70	-2.00
699-65-59A	401.79	399.40	-2.39
699-65-72	399.36	397.41	-1.95

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