

Montana Ground-Water Assessment Atlas No. 2, Part B, Map 1 December 2004

**Montana Bureau of Mines and Geology
A Department of Montana Tech of The University of Montana**

Data for Water Wells Visited during the Flathead Lake Area Ground-Water Characterization Study: Flathead, Lake, Sanders, and Missoula Counties

by

Larry Smith, John LaFave, Camela Carstarphan, Donald Mason, and Michael Richter

Note - this map was originally published at a scale of 1:250,000 but the page sizes have been modified to fit the size of the paper in your printer. A full sized 36" X 48" colored print of this map can be ordered from the Office of Publications and Sales of the Montana Bureau of Mines and Geology, 1300 West Park Street, Butte, MT 59701.

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Author’s Note: This map is part of the Montana Bureau of Mines and Geology (MBMG) Ground-Water Assessment Atlas for the Flathead Lake Area ground-water characterization. It is intended to stand alone and describe a single hydrogeologic aspect of the study area, although many of the area’s hydrogeologic features are interrelated. For an integrated view of the hydrogeology of the Flathead Lake Area the reader is referred to Part A (descriptive overview) and Part B (maps) of the Montana Ground-Water Assessment Atlas No. 2.

INTRODUCTION

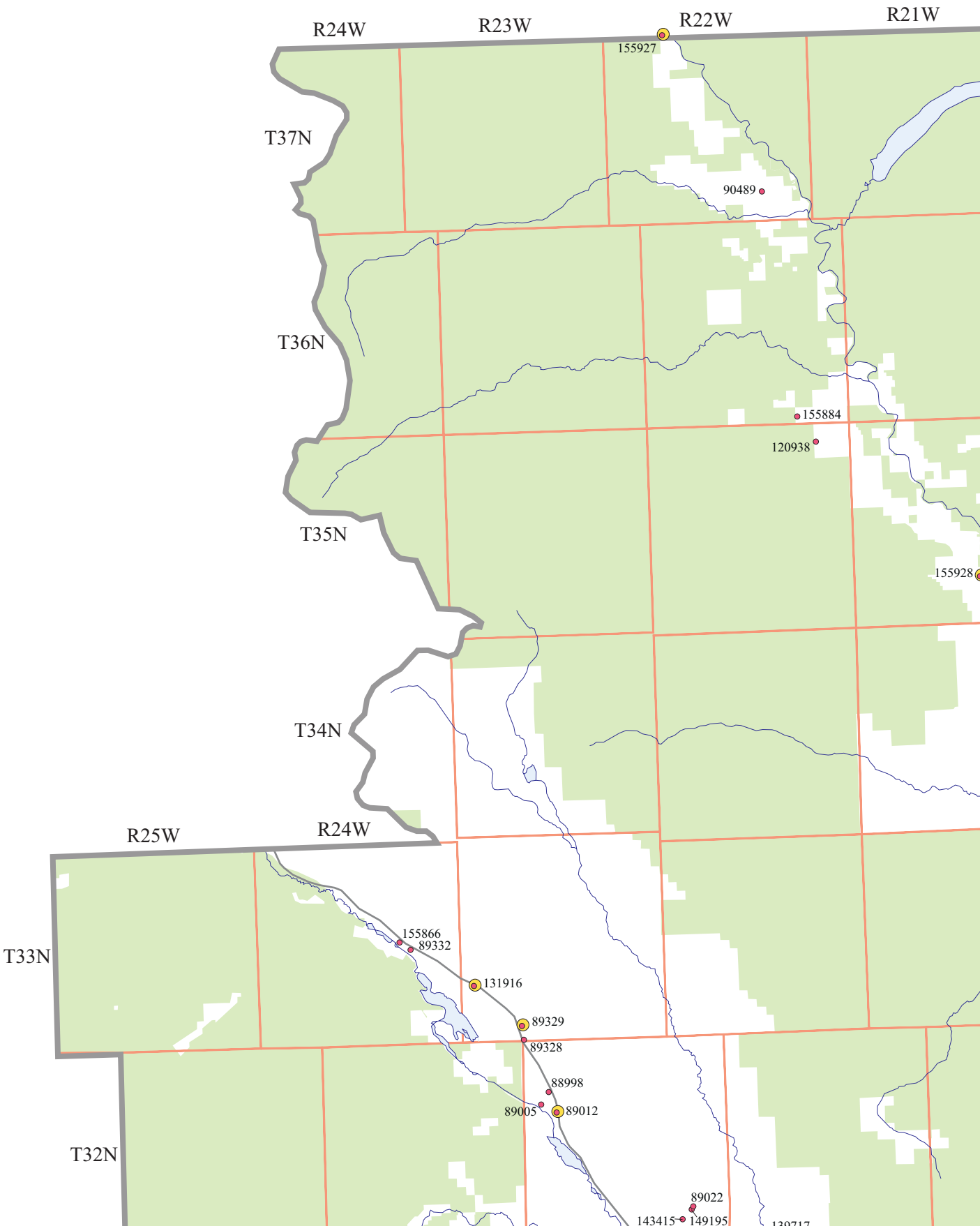
Visits to 984 water wells were completed by program staff as part of the Montana Ground-Water Characterization Program Flathead Lake Area study. The study area includes all of Flathead and Lake Counties and those parts of Sanders and Missoula Counties within the Flathead Indian Reservation. Most wells were visited between March and December 1996.

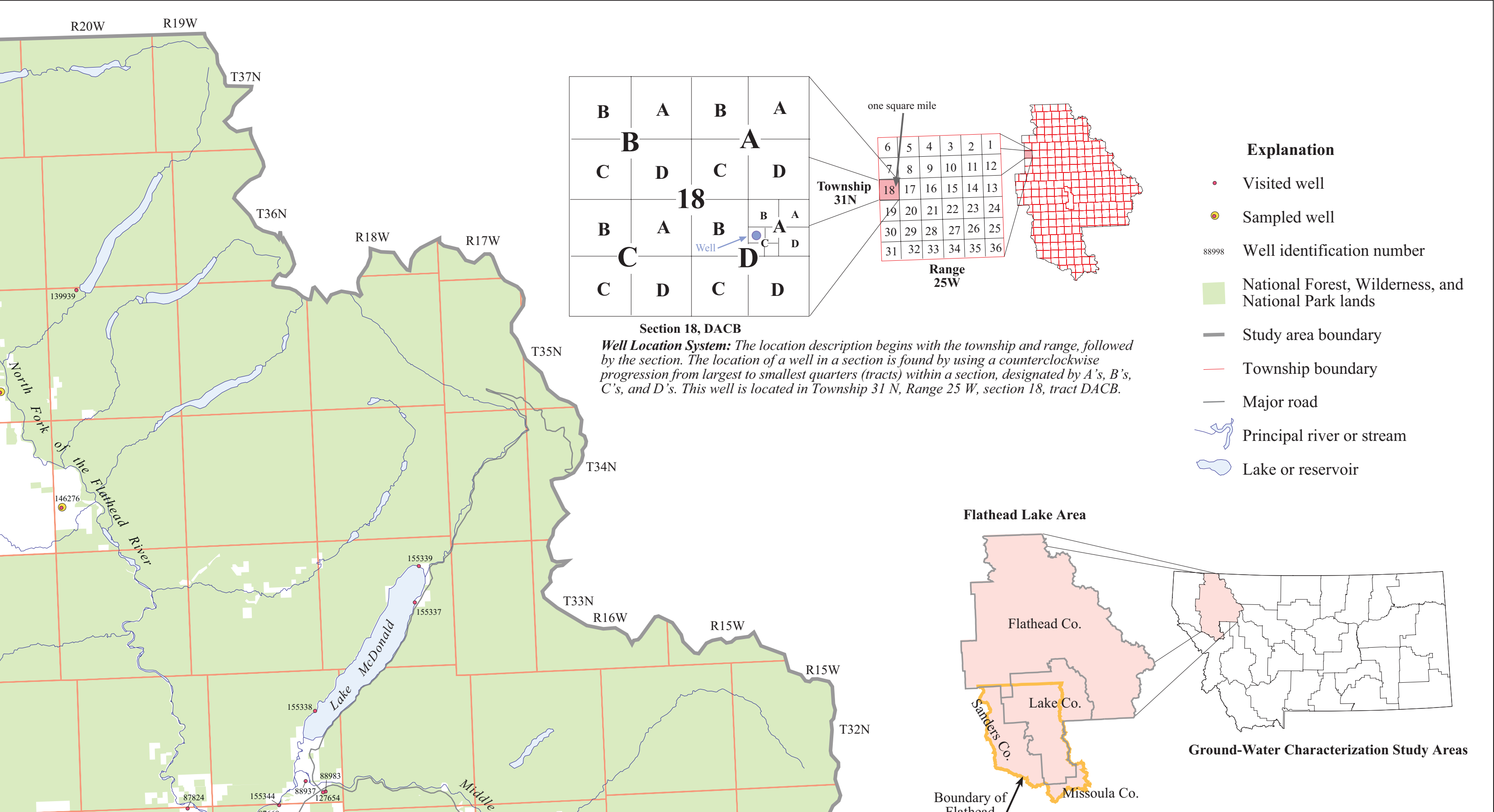
Wells to be visited were chosen from about 16,000 recorded wells to provide a representative geographic distribution across the significant aquifers. More wells completed in deeper geologic units (Pleistocene deep alluvium and stratified drift and Precambrian Belt rocks) were inventoried than were wells completed in shallow units (Holocene sand and gravel and Pleistocene outwash; table 1) because previous work provided substantial coverage for the shallower units (Konizeski and others, 1968; Noble and Stanford, 1986; King, 1988). Additionally, most wells drilled since the previous work was done were completed in the deep alluvial and bedrock units.

Data from more than 60 wells visited in the mid-1990's in the Little Bitterroot valley are also available (Abdo, 1997) but are not shown on this map. Data are sparse for federally owned lands (green areas on map) because few or no wells are located within the national forests, national parks, and wilderness areas that make up these lands.

Table 1. Summary of geologic distribution of wells.

Geologic Unit	Geologic Unit Codes	Inventoried Wells	Median Depth (ft)	Total Wells
Holocene sand and gravel	111ALVM	82	29	2,136
Pleistocene outwash	112OTSH	92	50	855
Pleistocene stratified drift	112DRFT	133	115	1,706
Pleistocene till	112TILL	19	12	153
Pleistocene lake silt and clay	112GLCC	3	162	120
Pleistocene lake deposits of Glacial Lake Missoula	112LKML	81	114	621
Pleistocene deep alluvium	112ALVM, 112LONE	269	208	4,515
Tertiary rocks	120SDMS, 124KSNN	12	158	77
Precambrian Belt Supergroup	400BELT, 400MSSL, 400RVLL, 400MCRB, 400PRCH	286	257	3,285
unknown		7		1,817
Totals		984		15,285





GEOLOGIC UNITS

Geologic units for the completed interval of each well (tables 1, 2) were assigned by comparing the driller's lithologic log to a geologic framework devised for the area. The geologic framework was based on recent geologic mapping, interpretation of selected well logs, and revision of previous work (Konizeski and others, 1968; Boettcher, 1982; Slagle, 1988; Kendy and Tresch, 1996; and others cited therein). Relationships between geologic units and hydrologic units are more completely discussed on other maps in the atlas.

The sequence of geologic units in the area north of Flathead Lake generally includes (from younger/shallower to older/deeper): shallow alluvium (112OTSH and 111ALVM), glacial-lake deposits (112GLCC), till (112TILL), deep alluvium (112ALVM), sedimentary rocks (120SDMS and 124KSNN), and Belt Supergroup rocks (400-series rocks). The alluvial and glacial deposits represent deposition during one or more glacial advance and retreat cycles and during the postglacial time. South and west of Flathead Lake the basin-filling unconsolidated sediments are more heterogeneous than north of the lake. The sequence south and west of the lake includes shallow sand and gravel (111ALVM and 112OTSH), lake-deposited sediments of Glacial Lake Missoula and minor till (112LKML and 112TILL), and deep alluvium and the Lonepine alluvial aquifer (112ALVM and 112LONE).

Holocene sand and gravel (111ALVM) –

Sandy and gravelly alluvium along most river valleys (including the Evergreen aquifer between the Flathead and Whitefish Rivers).

Pleistocene outwash (112OTSH) –

Mostly gravel and some sand at or near the surface, deposited by glacial meltwater streams.

Pleistocene stratified drift (112DRFT) –

Water-transported and washed sand and gravel derived from glaciers and encased above and below by confining units, till (112TILL) and/or glacial-lake silt and clay (112GLCC).

Pleistocene lake-deposited deposits of Glacial Lake Missoula (112LKML) –

Gravel, sand, and clay deposited in Glacial Lake Missoula south and west of the present Flathead Lake. Contains coarse-grained beds that are aquifers at many depths, and fine-grained confining units. Includes the Mud Creek aquifer in the Mission valley (Makepeace and Mladenich, 1995).

Pleistocene till (112TILL) –

Poorly sorted mixture of gravel, sand, silt, and clay transported and deposited by glacial ice; includes few debris-flows deposited on alluvial fans near valley margins.

Pleistocene glacial-lake silt and clay (112GLCC) –

Accumulations of laminated silt and clay, few sand beds, and minor gravel; deposited in glacial lakes that were north of the Polson glacial moraine.

Pleistocene deep alluvium (112ALVM) –

Sandy and gravelly alluvium containing minor silt, mostly buried by confining units of till and glacial-lake silt and clay; deposited as stratified drift, outwash, and pre- or inter-glacial alluvium.

Pleistocene Lonepine alluvial aquifer (112LONE) –

Alluvium above bedrock and below glacial-lake confining unit in the Little Bitterroot River valley. Genetically and lithologically similar to 112ALVM.

Tertiary sedimentary and volcanic rocks (120SDMS, 124KSNN) –

Sandstones, siltstones, and minor volcanic rocks in the lower portions of Little Bitterroot River valley, Camas Prairie Basin, and White Earth Creek area (120SDMS); siltstones, sandstones, and few conglomerates and coals of the Kishenehn Formation in the valleys of the North, South, and Middle Forks of the Flathead River.

Belt Supergroup rocks (400BELT, 400MSSL, 400RVLL, 400MCRB, 400PRCH) –

Metamorphosed limestone, dolomite, siltstone, and sandstone; bedded rocks of the Missoula, Ravalli, Middle Belt carbonate, and Prichard units; these rocks have been folded, faulted, and fractured.

SITE VISITS

Visits to wells involved determining an accurate location, measuring the static water-level, pumping for about 30 minutes, and measuring the temperature, pH, and specific conductance of the water. Selected data for the visited wells are included in table 2; well locations and their Ground-Water Information Center (GWIC) identification numbers are shown on the map. Some wells could either not be pumped or access could not be gained to measure the water level, so some fields in table 2 are blank. Selected wells were sampled for full water-analyses (major ions and trace metals) or only for nitrate, as indicated in table 2.

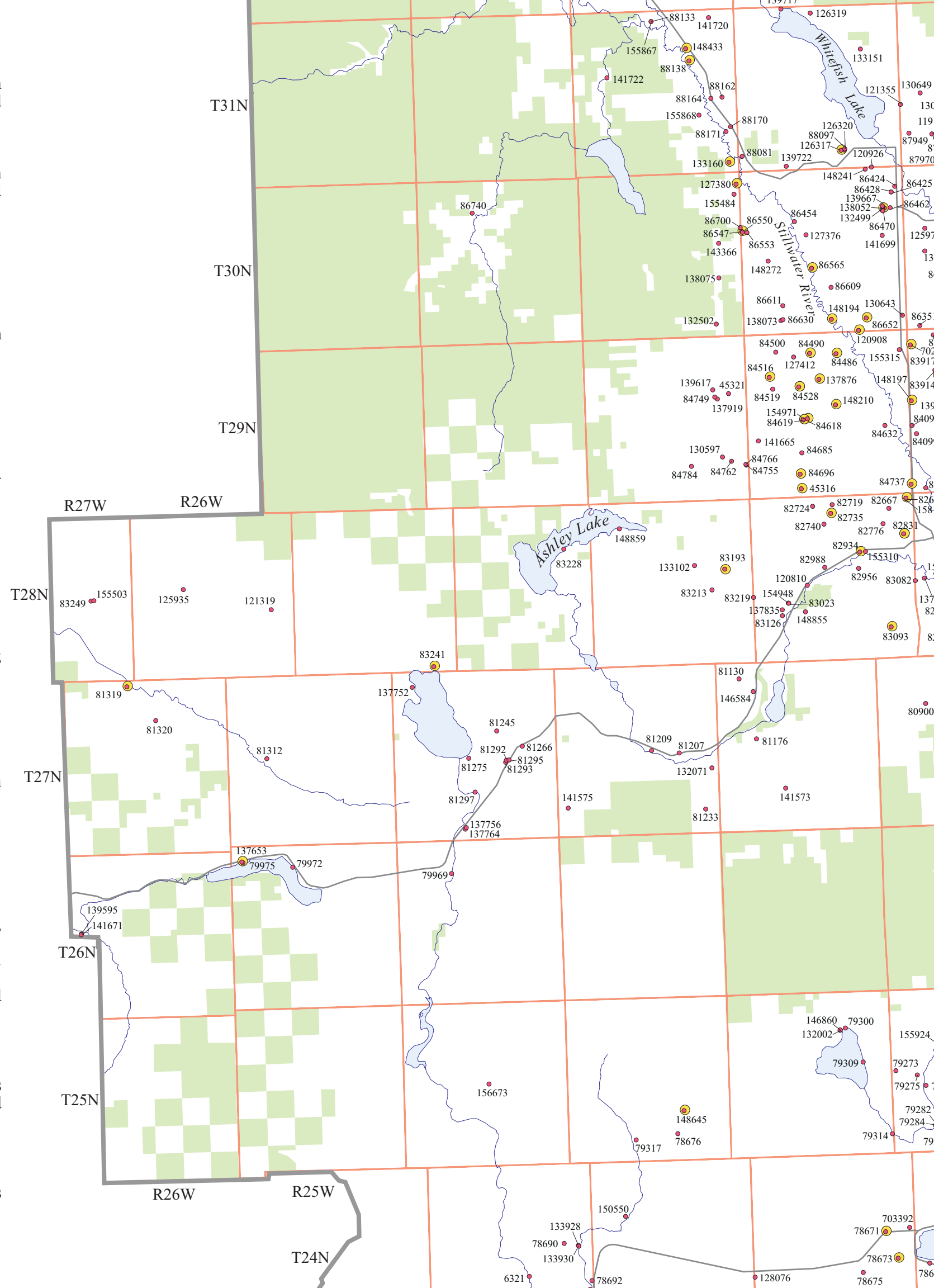
DATA SOURCES

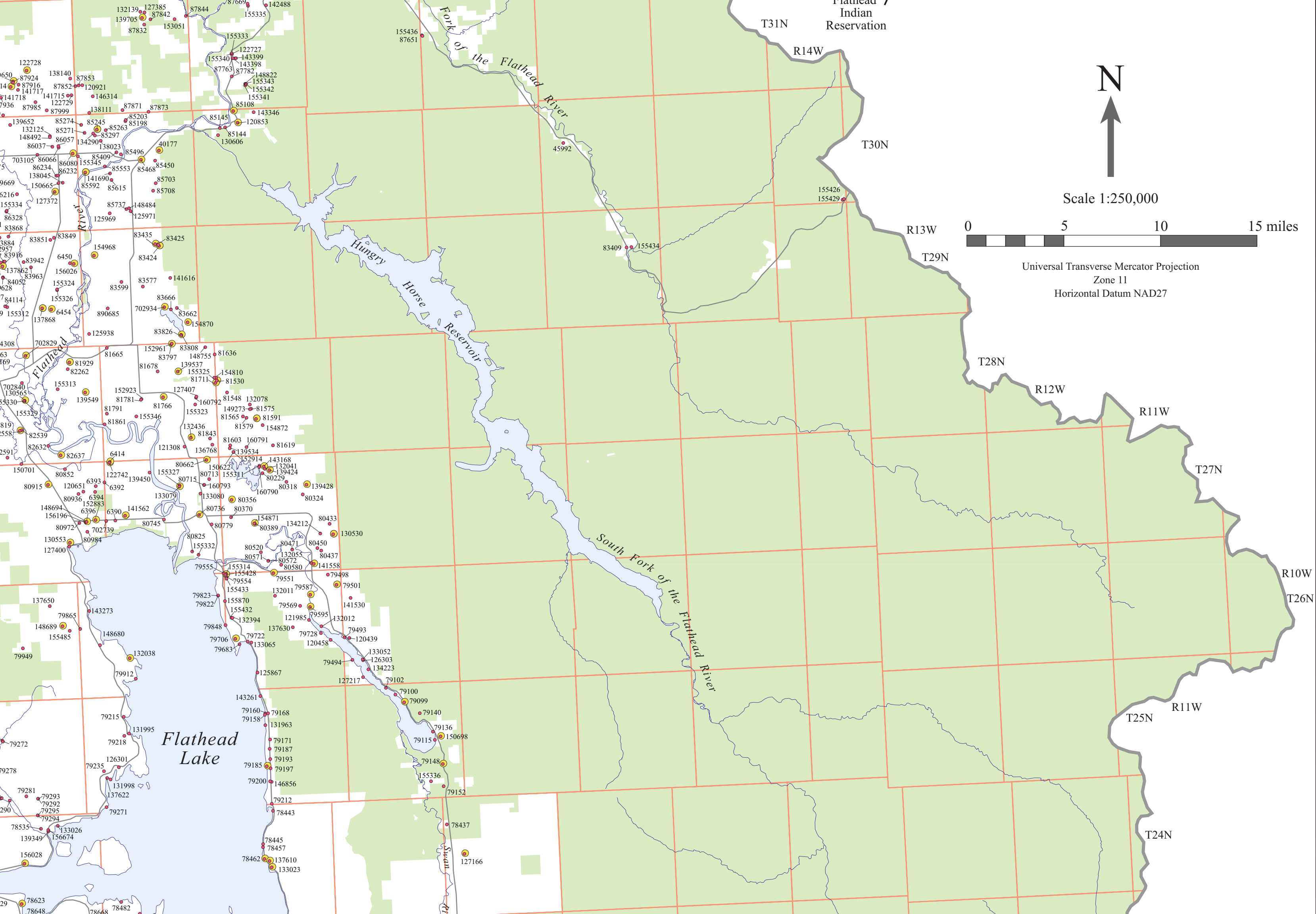
All inventory data and water-quality analysis results are available from the GWIC database at Montana Bureau of Mines and Geology (<http://mbmggwic.mtech.edu>). Land ownership, hydrography, public land survey, and road data were obtained from the Natural Resources Information System, Helena (<http://nris.state.mt.us/>).

ACKNOWLEDGMENTS

Well and property owners graciously gave permission to inventory the wells. In addition to the authors, well inventories were conducted by Carolyn Petrie, Brian Bixby, James Rose, Ginette Abdo, and Natural Resources Department staff of the Confederated Salish and Kootenai Tribe. Reviews of the map by Tom Patton, Edmond Deal, and Wayne Van Voast are appreciated.

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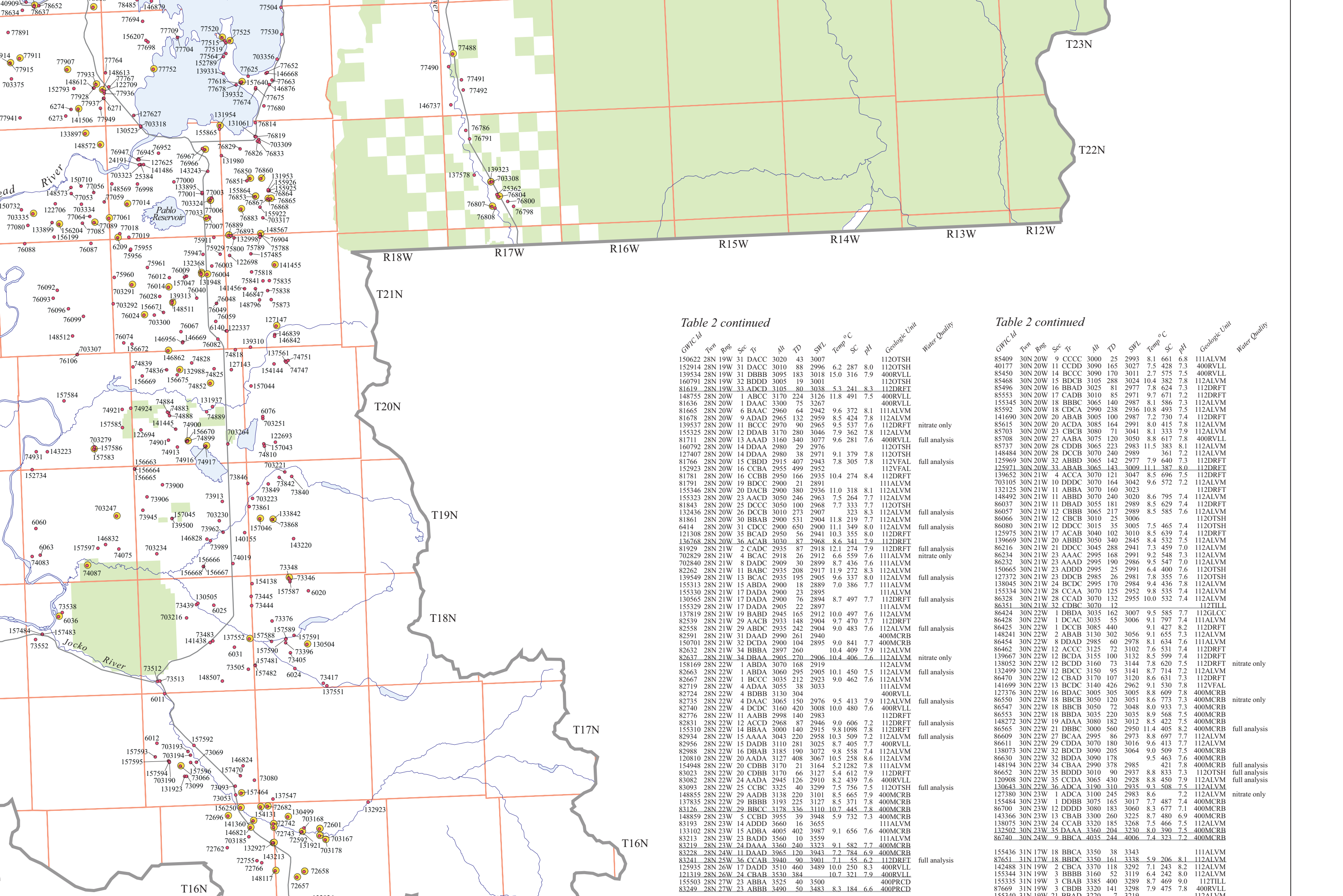
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Table 2. Well inventory data. Data are arranged in ascending township, range, and section order. Blank lines separate townships and gray lines separate ranges within townships; GWIC Id = Ground-Water Information Center identification number; Twn = township; Rng = range; Sec = section; Tr = tract; Alt = land-surface altitude (ft); TD = total depth (ft); SWL alt = static water-level altitude (ft); Temp °C = water temperature (centigrade); SC = specific conductivity (micro mhos); pH = acidity of water; Geologic Unit = geologic-unit code for well completion; Water Quality = type of analysis (blank = sample not collected).

GWIC Id	Twn	Rng	Sec	Tr	Alt	TD	SWL	Temp °C	SC	pH	Geologic Unit	Water Quality
71645	15N	19W	5	BACB	3920	300	3722	9.4	147	6.1	112DRFT	
71646	15N	19W	6	AADC	3740	135	3676	8.5	168	5.7	400MSSL	
121532	15N	20W	11	CDBB	3945	160	3931	8.1	87	7.6	400MSSL	
71664	15N	20W	12	CADC	3950	91	3922	8.7	18	6.8	112DRFT	
149563	15N	20W	13	DABC	4030	120	3957	8.2	7.2	112DRFT		
142301	15N	20W	23	DAAA	3990	58	3964	8.4	517	7.7	112DRFT	
71697	15N	20W	23	DABD	4020	145	3968	8.2	255	7.5	400MSSL	
157598	15N	20W	24	BCCB	3960	48	3925				112ALVM	
5994	15N	20W	24	CBBA	3955	42	3926	7.8		6.8	112ALVM	
132923	16N	19W	1	BBBC	3580	79	3534	8.5	208	6.9	112ALVM	
130499	16N	19W	6	DBDD	3215	200	3095	9.7	241	8.1	112DRFT	nitrate only
703168	16N	19W	8	ACBD	3300	307	3158				120SDMS	
131921	16N	19W	8	CAAB	3210	120	3168	8.4	300	8.2	112DRFT	nitrate only
72592	16N	19W	8	CAAB	3190	70	3139				112OTSH	
72601	16N	19W	9	BDCA	3415	144	3299	10.4	310	8.0	400MCRB	full analysis
703167	16N	19W	9	CDBA	3370	137	3251	8.2	211	8.3	112DRFT	full analysis
703178	16N	19W	16	ABAB	3385	147	3261	10.4	486	7.6	112DRFT	nitrate only
72658	16N	19W	20	CADA	3430	482	3348	10.4	240	7.7	112ALVM	full analysis
72657	16N	19W	20	CCCD	3435	139	3383	9.9	7.0	112DRFT	full analysis	
72672	16N	19W	31	BBDB	3470	34	3464	9.0	7.0	112OTSH		
132926	16N	19W	32	ABAA	3817	220	3789	9.6	7.3	112DRFT		
72682	16N	20W	1	ABDB	3115	102	3046	8.8	239	8.2	112OTSH	nitrate only
154131	16N	20W	1	BACB	3095	140	3033	8.2	236	8.3	112DRFT	nitrate only
156250	16N	20W	2	BACB	3060	508	2988	10.8	471	7.8	400MSSL	nitrate only
141360	16N	20W	2	DDAC	3075	100	3015	11.8	301	7.4	112OTSH	nitrate only
72696	16N	20W	3	DBBC	3190	294	3136	14.8	150	6.4	400MSSL	nitrate only
146821	16N	20W	11	ABDD	3090	154	3035	11.8	7.1	112DRFT	nitrate only	
703185	16N	20W	11	DBDC	3085	66	3045				112OTSH	
72742	16N	20W	12	AAAD	3110	49	3094	8.0	272	8.0	112OTSH	full analysis
72743	16N	20W	12	ADAA	3095	59	3089	9.3	252	6.7	112DRFT	nitrate only
132927	16N	20W	13	AAAC	3180	96	3133	11.0	248	7.2	112DRFT	nitrate only
143213	16N	20W	13	AAAC	3180	78	3135	10.3	245	7.1	112OTSH	full analysis
72755	16N	20W	13	CCCC	3200	50	3161	9.9	451	7.8	112OTSH	
72762	16N	20W	15	BDAA	3585	208	3546	9.4	230	8.5	400MSSL	
72766	16N	20W	24	BABC	3195	40	3190				112OTSH	
148117	16N	20W	24	DAAA	3270	160	3225	9.7	177	7.0	112DRFT	nitrate only
137547	17N	19W	31	DCAA	3085	162	3047	10.8	559	6.4	120SDMS	
6011	17N	20W	5	BBA A	2700	50	2694	9.2	269	7.9	112OTSH	
157592	17N	20W	16	DCAB	2810	27	2795	10.9	382	7.7	112OTSH	
6012	17N	20W	18	DBAD	2915	70	2887	14.0	1130	7.4	400RVLL	
157593	17N	20W	19	ACBA	2960	340	2897				400RVLL	
157595	17N	20W	20	CABB	2985	100	2943	11.6	724	7.2	112OTSH	
157594	17N	20W	20	CABC	2990	100	2942	12.0	830	7.2	112OTSH	
703190	17N	20W	20	CABC	2990	43	2927	11.4	797	5.9	112OTSH	
73066	17N	20W	20	DDAC	2960	200	2870	10.6	565	7.5	400PRCD	full analysis
703193	17N	20W	21	BABC	2810	44	2803				112OTSH	
703194	17N	20W	21	BDAA	2820	41	2814				112OTSH	
157596	17N	20W	21	CADB	2860	120	2819	11.8	459	7.6	112OTSH	
73069	17N	20W	21	DBDA	2835	40	2828	10.3	250	8.0	112OTSH	
146824	17N	20W	24	CCDA	3100	260		13.4	315	7.6	120SDMS	
157470	17N	20W	25	BCCC	2980	85	2931	12.6	338	7.8	112OTSH	
73080	17N	20W	25	DACC	3090	200	3010	12.2	248	7.5	120SDMS	
73093	17N	20W	26	DCDD	2945	59	2936	8.5	232	8.2	112OTSH	
131923	17N	20W	28	BCCA	2970	150	2859				120SDMS	
73099	17N	20W	28	BCDA	2980	216	2831	12.5	401	7.8	400MSSL	
73053	17N	20W	35	ADCC	2985	52	2968	8.5	234	8.2	112OTSH	
157464	17N	20W	36	BCCB	2980	38	2968	8.7	264	8.0	112OTSH	full analysis
73346	18N	19W	4	BBCC	3130	110	3064				112LKML	
157587	18N	19W	4	BCBC	3130	118	3070	11.0	172	8.1	112LKML	
6020	18N	19W	4	DDAD	3300	484	3057	10.2	275	8.0	400RVLL	
73348	18N	19W	5	AADA	3130	140	3064	10.2	228	8.2	112LKML	full analysis
154138	18N	19W	6	BCBC	2920	81		10.5	300	8.0	112LKML	
73376	18N	19W	17	BCCB	3115	251	2939	10.7	281	7.9	112LKML	
157588	18N	19W	19	ADDD	3090	150	3068	9.3	326	8.1	112LKML	
157589	18N	19W	20	ACAD	3155	7	3149				111ALVM	
157590	18N	19W	20	ACAD	3170	120	3104	9.5	511	7.3	112LKML	
73396	18N	19W	20	DBAA	3185	460	3168	11.6	325	7.5	112ALVM	
157591	18N	19W	21	BBDB	3145	3240	305	3182			400RVLL	
130504	18N	19W	21	DACA	3390	160	3388	8.7	328	7.7	400RVLL	full analysis
6024	18N	19W	28	CCDB	3360	147	3259				112OTSH	
73346	18N	19W	4	BBCC	3130	110	3064				112LKML	
73376	18N	19W	17	BCCB	3115	251	2939	10.7	281	7.9	112LKML	
157588	18N	19W	19	ADDD	3090	150	3068	9.3	326	8.1	112LKML	
157589	18N	19W	20	ACAD	3155	7	3149				111ALVM	
157590	18N	19W	20	ACAD	3170	120	3104	9.5	511	7.3	112LKML	
73396	18N	19W	20	DBAA	3185	460	3168	11.6	325	7.5	112ALVM	
157591	18N	19W	21	BBDB	3145	3240	305	3182			400RVLL	
130504	18N	19W	21	DACA	3390	160	3388	8.7	328	7.7	400RVLL	full analysis
6024	18N	19W	28	CCDB	3360	147	3259				112OTSH	
141445	20N	20W	28	BABB	2990	284	2981	11.4	480	8.0	400RVLL	
74900	20N	20W	28	DADC	3005	48	3006				112LKML	
74899	20N	20W	28	DADC	3010	36	3005				112LKML	
156670	20N	20W	28	DADC	3010	387	2867	12.5	368	8.1	400RVLL	nitrate only
74901	20N	20W	29	DADB	2955	452	2831	13.5	873	7.9	112ALVM	
122694	20N	20W	30	BAAA	2980	502	2871	12.9	507	8.1	112ALVM	
74913	20N	20W	33	BABA	2985	446	2864				112LKML	
74917	20N	20W	34	AAAB	3025	91	2946	10.8	1037	7.4	112LKML	nitrate only
74916	20N	20W	34	AABA	3022	400	2912	11.8	261	7.9	112ALVM	
74921	20N	21W	13	CDDD	2980	407	2867	11.2	576	7.9	112ALVM	
74924	20N	21W	13	DDDB	3000	389	2889	11.2	562	7.9	400RVLL	
157584	20N	21W	16	BDAC	2840	460	2631	14.9	727	7.8	400RVLL	
157585	20N	21W	24	CDDA	2985	500	2891				400RVLL	
703279	20N	21W	27	DDAD	2975	90		11.0	365	8.0	112LKML	
157583	20N	21W	27	DDDB	2980	580		16.5	265	7.5	400RVLL	nitrate only
157586	20N	21W	27	DDDD	2975	120	2950	11.0	362	8.1	112LKML	
74931	20N	21W	31	AABA	2675	318	2645	13.3	855	7.8	112ALVM	
152734	20N	21W	31	DCCD	2650	141	2539	12.4	542	7.6	112LKML	
143223	20N	21W	32	BAAA	2705	200	2543	11.3	345	7.8	112LKML	
74947	20N	23W	12	AAAA	2700	280		11.9	332	7.8	112LONE	full analysis
148960	20N	24W	13	BAAB	2850	92	2786	13.0	290	7.9	112ALVM	full analysis
134106	20N	24W	15	ABBA	2840	175	2826				112ALVM	
74959	20N	24W	15	ABBA	2835	43	2813	11.5	305	7.2	111ALVM	full analysis
141447	20N	24W	15	CBBB	2835	500	2794	13.8	191	8.7	120SNGR	full analysis
74961	20N	24W	18	DDAC	3100	285		192	7.2	400RVLL	full analysis	
157042	20N	24W	26	DAAD	2827	60	2796	12.3	489	7.8	112DRFT	
74985	20N	24W	35	DAAA	2820	35	2794	10.2	205	7.6	111ALVM	
75788	21N	19W	5	AAAB	3255	66	3222				112LKML	
75789	21N	19W	5	AAAC	3255	500	3176	12.0	210	8.2	400RVLL	
157485	21N	19W	5	CDDC	3130	130	3116	9.0	292	8.0	112LKML	



															GW															Twp															Rng															Sec															Tr															Alt															TD															SWL															Temp															SC															pH															Geo															Water																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
73405	18N	19W	29	AAAD	3270	90	3253	11.5	512	7.3	1120TSH	122337	21N	20W	25	DDDC	3065	36	3048	111ALVLM	173072	22N	21W	29	BADC	2770	384	2718	112DRFT	78535	24N	21W	4	DDAA	2910	70	2898	10.0	459	7.8	112ALVLM	156028	24N	21W	16	CBBB	2955	352	2894	12.0	599	7.5	400PRCD	78623	24N	21W	29	DAB	2920	298	2905	11.5	620	7.8	400RVLL	78629	24N	21W	30	ABCA	2920	110	2910	10.6	598	7.8	112ALVLM	78634	24N	21W	32	DACD	2990	308	2976	11.5	360	7.5	400RVLL	78652	24N	21W	33	ACAD	2940	178	2873	7.5	385	8.1	112DRFT	140909	24N	21W	33	CBCC	2895	133	2893	10.7	479	8.1	112DRFT	78648	24N	21W	33	BDDC	2950	245	2906	11.3	410	7.5	112ALVLM	78637	24N	21W	33	CAAA	2970	282	2888	11.5	438	7.5	112ALVLM	78668	24N	21W	36	DBCB	3140	767	3010	9.5	543	7.4	400RVLL	703392	24N	22W	13	DBDB	2990	2957	78671	24N	22W	14	DDDD	3110	235	2925	11.7	431	7.8	112ALVLM	78673	24N	22W	24	CDCC	3020	300	2900	11.3	519	7.6	400RVLL	78675	24N	22W	26	BCCA	3440	514	3223	400RVLL	128076	24N	22W	30	BCCD	3150	460	2898	112DRFT	150550	24N	23W	17	BABD	2920	39	2894	12.0	583	7.2	400RVLL	78690	24N	24W	14	DDDD	2900	50	2874	13.7	322	8.0	120SDMS	133928	24N	24W	24	ABBB	2860	69	2850	133930	24N	24W	24	ABBB	2860	14	2850	111ALVLM	78692	24N	24W	25	ADAB	2875	400	6320	24N	24W	25	DADB	2860	328	2779	112ALVLM	6321	24N	24W	27	ABDB	2840	217	2811	120SDMS	150546	24N	24W	35	CDCA	2825	108	2798	13.2	220	7.0	112ALVLM	79099	25N	18W	3	CCCD	3075	166	3061	6.5	455	7.2	400RVLL	79102	25N	18W	4	BBDB	3090	60	3045	8.8	477	7.3	112DRFT	79100	25N	18W	4	DBAB	3080	97	3054	10.0	193	8.3	112ALVLM	79136	25N	18W	14	DBBB	3075	38	3064	7.0	538	7.5	111ALVLM	79115	25N	18W	14	DCDB	3075	37	3072	5.9	1736	8.1	112DRFT	150698	25N	18W	14	DBDA	3215	400	3102	8.7	191	8.1	112DRFT	79140	25N	18W	15	AABD	3100	265	3089	9.2	479	7.2	400MCRB	79148	25N	18W	26	ADAB	3100	170	3150	7.7	504	7.6	112ALVLM	79152	25N	18W	35	ADAC	3095	78	3085	111ALVLM	155336	25N	18W	35	BABC	3080	3079	143261	25N	19W	5	ACAC	2990	702	2942	11.6	440	7.7	400RVLL	79160	25N	19W	8	AADC	2970	50	2968	8.5	8.1	112DRFT	79158	25N	19W	8	ADBA	2920	8	2916	131963	25N	19W	8	DBDB	3120	50	2919	8.4	309	6.8	400RVLL	79168	25N	19W	9	BBCC	3140	60	3128	9.3	268	8.2	400RVLL	79171	25N	19W	16	CBCC	3220	150	3180	8.1	480	7.4	400RVLL	79185	25N	19W	20	DBCD	3220	60	2884	10.1	7.5	112DRFT	79187	25N	19W	21	BBBB	3160	105	3127	8.7	565	7.1	400RVLL	79193	25N	19W	21	CBBC	3160	12	3147	7.9	347	7.5	111ALVLM	79197	25N	19W	28	BBBC	3050	100	2981	10.5	281	7.9	111ALVLM	146856	25N	19W	28	CBCC	3060	167	3059	9.7	541	7.9	400RVLL	79200	25N	19W	29	DDAA	3020	120	2987	112DRFT	79212	25N	19W	33	CCCB	2965	40	2937	6.5	283	7.5	112TILL	79215	25N	20W	4	CCCD	2905	350	2888	11.0	382	7.7	400MCRB	79218	25N	20W	9	CCCD	2980	183	2956	9.2	498	7.5	112ALVLM	79215	25N	20W	9	CDAC	2895	142	2944	9.0	504	7.6	112DRFT	79235	25N	20W	19	DDAA	3060	177	3027	10.0	451	7.4	112DRFT	126301	25N	20W	20	DABC	3020	165	2923	10.9	559	7.7	400MCRB	131998	25N	20W	29	BACC	2900	140	2922	10.2	636	7.3	112ALVLM	137622	25N	20W	29	BBDB	2900	150	2925	9.2	466	7.9	112DRFT	79271	25N	20W	32	CBCC	2910	200	2905	10.0	514	7.5	400RVLL	155924	25N	21W	17	AABB	3550	30	3548	111ALVLM	79272	25N	21W	17	ABAB	3570	280	3400	9.9	453	7.7	112ALVLM	79273	25N	21W	18	CCDB	3540	480	3527	10.5	417	8.2	400RVLL	79275	25N	21W	19	AADA	3450	189	3430	9.6	339	7.6	112ALVLM	79278	25N	21W	20	CABB	3400	262	3077	10.7	7.7	112DRFT	79281	25N	21W	28	DDDC	3170	330	3048	12.0	482	7.1	400RVLL	79284	25N	21W	29	DCDD	3170	300	3224	9.4	354	7.3	400RVLL	79282	25N	21W	29	CCDD	3165	180	3168	10.8	375	7.2	112ALVLM	79290	25N	21W	33	BBCC	3200	343	3096	11.6	340	6.6	400RVLL	79293	25N	21W	34	BAAD	3260	410	3212	400RVLL	79292	25N	21W	34	BAAD	3260	562	3053	13.7	503	7.4	400RVLL	79294	25N	21W	34	CDCC	3040	125	2986	112ALVLM	79295	25N	21W	34	CDCC	3040	150	2984	10.9	755	7.5	112ALVLM	132002	25N	22W	11	BCDA	3740	32	3733	6.8	405	6.9	400RVLL	146860	25N	22W	11	BCDA	3740	385	3682	10.2	319	6.8	400RVLL	79300	25N	22W	11	BDAC	3705	57	8.2	376	7.7	112DRFT	79309	25N	22W	13	CBBB	3700	38	3699	9.1	600	7.5	112ALVLM	79314	25N	22W	36	ADAA	3590	312	3563	9.5	289	7.8	400RVLL	148645	25N	23W	26	BACB	3360	803	3350	13.5	272	7.3	400RVLL	78676	25N	23W	26	CCCC	3160	120	3152	11.3	428	6.7	400RVLL	79317	25N	23W	33	ABCB	3160	262	3111	12.4	308	7.1	400RVLL	156673	25N	24W	15	CCDB	3480	795	3463	10.7	190	7.2	400RVLL	78437	24N	17W	7	BBDD	3110	149	3110	8.3	378	7.6	112ALVLM	127166	24N	17W	17	CBCC	3265	439	3249	10.1	473	7.5	112ALVLM	78443	24N	19W	4	ADAA	2925	200	2923	400RVLL	78445	24N	19W	9	CCDD	2925	75	2883	9.8	715	7.0	400MCRB	78457	24N	19W	16	BADB	2920	60	2909	9.5	7.6	400MCRB	78462	24N	19W	16	CADD	2920	120	2891	9.8	404	7.9	112ALVLM	137610	24N	19W	16	CDAD	3005	360	2980	11.2	580	7.8	400MCRB	133023	24N	19W	21	AACD	3020	565	3093	10.2	7.9	400MCRB	78482	24N	20W	30	DADD	2900	260	2863	10.3	493	7.6	400RVLL	78485	24N	20W	32	ADAC	2910	160	2882	9.4	584	7.3	400MCRB	146879	24N	20W	33	ACDC	2895	540	2885	12.1	422	7.7	400MCRB	139349	24N	21W	3	CDBD	2910	183	2891	11.3	517	7.5	112ALVLM	156674	24N	21W	3	CDCA	2900	40	2887	10.0	824	7.5	111ALVLM	133026	24N	21W	3	DACA	2895	127	2881	11.1	664	7.2	400RVLL	77488	23N	17W	18	DBDC	3245	132	3262	7.1	415	7.5	112ALVLM	77490	23N	17W	19	BDDC	3255	60	3265	8.2	7.2	112DRFT	77491	23N	17W	29	BBBD	3315	60	3288	9.4	7.3	112DRFT	77492	23N	17W	29	CBDB	3365	56	3367	7.5	7.5	112ALVLM	146737	23N	17W	31	BDDA	3350	80	3307	8.0	7.7	1120TSH	77504	23N	19W	3	BAAA	2940	100	2899	400MCRB	77520	23N	19W	7	CABB	2920	324	2893	10.7	352	7.0	400MCRB	77515	23N	19W	7	CADB	2905	126	2896	10.1	223	7.8	112ALVLM	77525	23N	19W	7	DBDC	2920	235	2875	10.7	6.7	400MCRB	77519	23N	19W	7	DCBB	2905	335	2901	11.1	7.8	400MCRB	77530	23N	19W	10	BDDD	2970	123	2911	9.3	411	7.4	400RVLL	703356	23N	19W	15	CCAB	2930	540	2824	12.2	239	8.0	400MCRB	77564	23N	19W	18	BDAD	2955	190	2904	11.0	341	8.0	112DRFT	152789	23N	19W	18	CABA	2980	540	2991	13.7	304	7.9	400MCRB	139331	23N	19W	19	BDCB	2930	698	2883	13.3	247	8.0	400MCRB	139332	23N	19W	20	CCDA	2945	103	2898	9.8	228	7.9	112DRFT	77618	23N	19W	20	CCDB	2945	396	2907	10.1	279	8.0	112ALVLM	157660	23N	19W	20	CDBC	2965	100	2890	10.4	284	7.9	112DRFT	77625	23N	19W	20	DBBD	2895	10	2893	111ALVLM	146668	23N	19W	21	ACCD	2930	113	2881	7.8	839	7.8	112ALVLM	77652	23N	19W	21	ACDB	2925	246	2869	8.2	8.1	400MCRB	77663	23N	19W	21	DBDB	3050	73	3040	112DRFT	146876	23N	19W	28	ABAA	3040	201	3007	10.6	7.7	400MCRB	77675	23N	19W	29	AADD	2955	175	2876	9.9	386	7.9	112DRFT	77674	23N	19W	29	ADAA	2940	236	2904	10.2	334	8.0	112ALVLM	77678	23N	19W	30	AAAA	2895	100	2883	10.0	258	7.9	112ALVLM	77680	23N	19W	33	BADB	3195	340	3057	8.1	8.1	400MCRB	77694	23N	20W	4	CBAB	2990	324	2919	9.1	621	7.2	400MCRB	77698	23N	20W	9	CAAC	3075	105	3046	11.3	483	7.6	400RVLL	156207	23N	20W	9	CABB	3050	260	3021	10.5	594	7.3	400RVLL	77704	23N	20W	10	ADDD	2895	220	2892	11.6	751	7.0	400MCRB	77709	23N	20W	10	ADDD	2895	160	2889	400MCRB	77764	23N	20W	19	BBCA	3395	340	3110	12.5	470	7.6	112ALVLM	77767	23N	20W	19	CCDA	3125	63	3083	10.7	548	7.6	112DRFT	77752	23N	20W	21	ABBD	2930	282	2922	11.5	416	7.6	400RVLL	127627	23N	20W	32	BDDD	2925	360	2901	11.6	392

