Appendix 11

Tri-Valley Well Vulnerability Assessment

Tri-Valley Well Vulnerability Assessment

Due to the observed, multi-decadal downward trends in the limited number of monitoring wells in the Benton, Hammil and Chalfant valleys, OVGA staff conducted an initial vulnerability survey to determine if potential impacts were possible to area wells. The purpose of this desk-top survey was to determine whether a data gap exists regarding well vulnerability in the Tri-Valley area and whether future efforts should be considered by the OVGA to address this potential issue.

Based on the results from this survey, OVGA staff suggest that it is possible that impacts could occur to area production wells both in the near future and within the 20-year planning horizon and that further investigation, including potential field event(s), should be considered as part of GSP implementation process.

Data Acquisition

To conduct this vulnerability assessment, staff used DWR's online Well Completion Report Map Application (https://data.cnra.ca.gov/showcase/well-completion-report-map-app). California Water Code Section 13752 allows for the release of copies of well completion reports to governmental agencies and to the public. DWR has redacted the personal information from the approximately 800,000 reports on file. The DWR GIS mapper application allows users to search for well completion reports (WCRs) which contain information about a given well collected during its initial drilling, installation, and development. DWR's GIS based mapper is spatial organized by counties and Township/Range/Section grids.

OVGA staff investigated all available WCRs from the Mount Diablo, Township 01S, Range 31E, Section 06 in the northwest corner to the southeast corner at the Inyo-Mono County line's intersection Mount Diablo, Township 06S, Range 33E, Section 01. This search area overlapped and extended beyond the Tri-Valley portion of the Owens Valley Groundwater Basin itself, but was deemed necessary as many wells are poorly located in the DWR system. Only wells found to be completed within the OVGB were retained.

Individual WCRs were reviewed for location and data content and then downloaded as pdfs if deemed useful. Individual wells were located by varying methods based on the available information in each individual log; these data sources included latitude and longitude, county APN numbers, addresses and other spatial information contained in the driller's site map, etc. The majority of WCRs contain enough information to accurately locate them within at least a 1-mile radius. Essential WCR information included date completed, total depth, screen interval, and initial groundwater level (either first or static water).

Table 1 presents the results from this data collection effort (attached at end). Wells were sorted by valley (Benton, Hammil and Chalfant) and then by approximate region within the given valley. It is very likely that additional wells are physically present in the Tri-Valley area but not captured in Table 1. It is also likely that a portion of the wells in Table 1 are either no longer active or have been abandoned. Field reconnaissance or well verification was beyond the scope of this initial survey.

Well Summary Information

Available well data:

In the Benton area there are 41 wells and more than 90% are domestic (8" or less diameter). In the Hammil area there are 50 wells, mixed between domestic and agricultural wells (10" or greater diameter) with approximately 25% being agricultural wells. In the Chalfant area there are 103 wells and more than 90% are domestic.

Well Age (as of 2020)

Benton has comparatively older wells with more than 50% being older than 30 years; average well age is 31 years, median well age is 30 years old. Hammill has primarily younger wells with only 15% being more than 30 years old; average well age is 22 years, median well age is 21 years old. Chalfant is a mix of ages with 40% younger than 20 years old, 30% between 20-30 years old, and 30% more than 30 years old; average well age is 25 years, median well ag e Is 23 years old.

Well Total Depths

Benton wells are comparatively shallow with 90% of wells less than 300 ft deep and 85% ranging between 100-300 feet deep. Benton wells are an average of 214 ft deep with a median total depth of 207 ft. Hammil wells are significantly deeper than Benton and Chalfant with 70% greater than 300 feet deep and 30% deeper than 400 ft. This is in part due to the greater number of agricultural wells and also due to deeper groundwater levels. Hammil wells are an average of 372 ft deep with a median total depth of 348 ft. Chalfant wells are similar to Benton but shallower with 95% of wells less than 300 ft deep and 90% ranging between 100-300 ft deep. Chalfant wells are an average of 172 ft deep with a median total depth of 160 ft.

Initial Groundwater Levels

Initial groundwater levels in Benton are comparatively shallow with 40% less than 50 ft deep and 80% less than 100 ft deep. In Benton, the average initial groundwater level averaged 82 ft deep with a median depth of 60 ft. Hammil groundwater levels are significantly deeper than Benton and Chalfant with only 20% shallower than 100 ft and 80% between 100 and 200 ft deep. In Hammil the average initial groundwater level averaged 123 ft deep with a median depth of 122 ft. Chalfant groundwater levels are similar but shallower than Benton with 80% less than 50 ft deep and 95% less than 100 ft deep. In Chalfant the average initial groundwater level averaged 47 ft deep with a median depth of 44 ft.

Potential Impacts

Several potential impacts to well owners due to declining groundwater levels were considered for this assessment. Potential impacts include increased lift costs associated with pumping water from greater depth in the well, pump longevity and operability impacts due to increase load/running time to produce an equivalent amount of water, the potential need to lower and/or replace existing pumps with higher horsepower pumps, and finally the need to modify or redrill a well due to lowered in-well water column. Table 2 summarizes these impacts in terms of significance and relative cost.

Table 2

Undesirable Result	Potential Impact	Estimated Expense
Lowered water level in well	Increased lift costs and reduced pump life	Dollars to tens of dollars (per year)
Water level is at or below necessary pumping level	Pump needs to be lowered or replaced with greater hp pump	Hundreds to thousands of dollars (one-time cost)
Water level drops below minimum operability level (within 30' of bottom of well)	Well needs to be deepened or re-drilled	Tens of thousands of dollars (one-time cost)

Vulnerability Method

Due to the lack of available data, several assumptions were made in order to conduct this initial vulnerability survey. General assumptions included the in-well depth of either submersible or vertical turbine pump intakes, the height of water column required to protect existing pumps, the long-term rate of drawdown in the three valleys, and changes in well efficiency/yield based on well age.

Several vulnerability thresholds were considered. The most conversative approach would be to assume the in-well pump is located above the well's screen interval. This is standard practice for medium and large capacity wells (industrial, agricultural, CSD or MWC sized wells) to prevent in-well cascading of groundwater and air-entrainment. Hanging a pump in the water column above the top of the screen also protects the well screen from pressure stress associated with pumping and also decreases the potential amount of subsurface materials that are drawn into the well.

However, based on the review of WCRs, Tri-Valley wells are primarily (more than 85%) smaller diameter wells installed for domestic uses with capacities measured in gallons per minute versus larger wells with capacities measured in cubic feet per second. From the WCRs it is also apparent that local drilling practices place the top of the screen interval within 25 feet of initial water levels in approximately 33% of the domestic wells. Based on previous conversations with local drillers (from the Benton area in the north to Antelope Valley in the south) and first-hand experience with Eastern Sierra domestic wells, it was assumed that pumps were hung near the bottom of the well, inside the screen interval itself. This assumption is likely accurate for the majority of Tri-Valley domestic wells but likely inaccurate for the larger diameter agricultural wells (which are more properly designed with the large capacity turbine pumps hung above the well's screen interval).

Therefore, a less conservative, but more realistic method to determine vulnerability was used instead of comparing water level to top-of-screen. The assumptions for the selected method include the following. A pump hanging at a height of 15 feet above well bottom was used. Data on dynamic drawdown (from in-well pumping) in Tri-Valley wells was not available, so an estimate of 10 feet was used. Maintaining a minimum of 5 feet of water column above the pump at all times was also included to bring the total necessary water column height to 30 ft above the bottom of the well for purposes of well vulnerability. The total depth listed in the WCR was used as the bottom of the well. If the static water column were to fall to within 30' of the total depth of the well it is likely that owners would see pumping impacts and would be force to pay for significant and costly well modifications (deepening, widening, or redrilling).

The rate of groundwater decline used for this vulnerability assessment was based on the average annual rate of groundwater decline from monitoring wells in a given valley over a recent period of time. For Benton, the average rate of decline was based on the past 20 years of water levels from MW-1 at the Benton Landfill. This long-term rate of decline is 0.5 feet/year (ft/yr). For Hammil, the rate is based on observations in one private well from 2007-2019, resulting in an average rate of decline of 1.8 ft/yr. In Chalfant, the rate of decline was based on the past 20 years of water levels from MW-1 at the Chalfant Landfill, resulting in an average rate of decline of 0.5 ft/yr. The rate of decline for each valley was assumed to be constant moving backward and forward in time for the purposes of this assessment.

No data was found on the decline of well yield or specific capacity over time due to lowering water levels, incrustation, bio-fouling, sand influx, or other screen damage or corrosion in Tri-Valley wells. Also no localized or seasonal corrections were used based on proximity to a larger diameter/capacity (agricultural) well's localize and/or seasonal cone of depression as pumping data was not available.

As noted in the descriptions above, this vulnerability rationale does **not** use the most conservative metric of keeping water levels above the top of screen. Using the minimum of 30-feet of water column method, wells failing into the vulnerable category would clearly represent an undesirable result related to lowered groundwater levels. Therefore, this vulnerable category should be interpreted to mean that risk potential does exist and that more investigation should occur in the initial 5-year GSP implementation period to close data gaps and develop a more accurate assessment.

Results

Table 3 presents the results of this assessment. The current year (2020) was used as the starting assessment year. The technical work necessary to meet the 2021 GSP submittal deadline and the future 5-year and 20 year SGMA-mandated GSA/GSP reporting requirements needs to be conducted at east one-year prior to the deadlines. Therefore the vulnerability year-categories are 2020, 2025, and 2040. An additional 30-year prediction was analyzed based on the standard length of a mortgage (2050).

Table 3

Valley	Total Number of Wells*	Total Number of Vulnerable Wells At Year			
		2020	2025	2040	2050
Benton	37	2 5%	3 8%	3 8%	5 14%
Hammil	50	3 6%	3 6%	6 12%	10 20%
Chalfant	102	3 3%	5 5%	7 7%	11 11%
Tri-Valley Totals	189	8 4%	11 6%	16 8%	26 14%

*: Total number of wells with Initial water level and total depth data available to make assessment

The wells that are vulnerable as of 2020 or which become vulnerable within the first 5-year GSP implementation period are primarily older wells constructed prior to 1985. As can be seen from Table 3, domestic wells in the Tri-Valley are potentially vulnerable if the observed multi-decadal declining groundwater levels continue. Additional work is warranted during GSP implementation to close the substantial data gaps that exist in this assessment and develop future actions to protect domestic wells.

Future Actions

The results of this initial well vulnerability survey will be used to inform GSP Sections 3.5.4 "Assessment and Improvement of Monitoring Network" and also Section 4 "Projects and Management Actions to Achieve Sustainability." One of the goals of the proposed management actions will be to close both monitoring and modeling gaps in the Tri-Valley area. The OVGA also distributed a survey to Tri-Valley residents in summer 2021 and planned to conduct additional outreach in fall 2021 to identify potential domestic well owners who are willing to participate in a groundwater level monitoring program. It is anticipated that within the initial 5-year implementation period that there will be field events to measure DTWs in area domestic wells and to match these wells with their WCRs to determine water level change since drilling and actual current water column heights above well total depth and screen intervals.

Comparisons from field results to this assessment can then be made to reduce uncertainties and more accurately assess future vulnerability. Also included in the GSP's Section 4 future actions is development of a numeric groundwater model for the Tri-Valley/Fish Slough area to more accurately quantify the amount of overdraft in the basin and to develop strategies for sustainable groundwater management in this area.

Tri-Valley Well Vulnerability Assessment Table 1

Well Completion Report	Area	General Location	Age as of 2020 (yrs)	Diameter (in)	Total Depth (ft)	Top of Screen (ft)	Bottom Screen (ft)	Initial Water Level* (ft)
01S32E06_0904272.pdf	Benton	Northern	15	8	180	140	180	42
01S32E06_231845.pdf	Benton	Northern	37	14	260	20	260	147
01S32E06_365137.pdf	Benton	Northern	39	8	293	68	293	**ND**
01S32E16_139420.pdf	Benton	Northern	41	6	315	265	315	230
01S32E16_231837.pdf	Benton	Northern	37	6	500	360	500	350
01S32E20_0931704.pdf	Benton	Northern	11	6	262	120	262	127
01S32E20_139452.pdf	Benton	Northern	41	6	200	175	200	138
01S31E25_542596.pdf	Benton	West Central	25	15	305	90	305	**ND**
01S31E31_231853.pdf	Benton	West Central	37	6	135	60	135	60
01S31E35_395742.pdf	Benton	West Central	27	6	260	180	260	180
01S31E36_256664.pdf	Benton	West Central	32	6	330	200	325	215
01S32E31_060655.pdf	Benton	Central	40	6	110	80	110	83
01S32E31_060658.pdf	Benton	Central	40	8	225	68	178	88
01S32E31_0904264.pdf	Benton	Central	15	6	220	180	220	78
01S32E31_317437.pdf	Benton	Central	30	8	284	80	284	65
01S32E32_060659.pdf	Benton	Central	40	10	200	80	180	**ND**
01S32E32_0931699.pdf	Benton	Central	10	6	190	80	190	79
01S32E32_146285.pdf	Benton	Central	42	6	160	120	160	50
01S32E32_146292.pdf	Benton	Central	42	6	155	130	155	90
01S32E32_231283.pdf	Benton	Central	38	6	215	95	215	80
01S32E32_231801.pdf	Benton	Central	39	6	160	30	160	45
01S32E32_231892.pdf	Benton	Central	35	6	146	65	146	59
01S32E32_256622.pdf	Benton	Central	33	6	200	80	180	50
01S32E32_344581.pdf	Benton	Central	30	6	200	80	176	83
01S32E32_401085.pdf	Benton	Central	26	6	220	90	220	75
01S32E32_533075.pdf	Benton	Central	25	2	170	140	170	86
02S31E_27007.pdf	Benton	Central	63	8	112	74	112	50
02S31E05_0912007.pdf	Benton	Central	26	6	205	80	205	25
02S32E05_317457.pdf	Benton	Central	30	6	215	65	215	50
02S32E05_317468.pdf	Benton	Central	30	6	270	76	270	37
02S32E05_452935.pdf	Benton	Central	23	6	140	40	140	20
02S32E06_770228.pdf	Benton	Central	20	6	185	125	185	20
01S32E32_0931743.pdf	Benton	Southern	13	6	215	80	215	75
01S32E32_737102.pdf	Benton	Southern	18	6	207	58	207	54
01S32E32_796510.pdf	Benton	Southern	16	6	225	165	225	37
02S32E05_060648.pdf	Benton	Southern	40	6	373	233	373	28
02S32E05_0904288.pdf	Benton	Southern	14	6	210	140	210	**ND**
02S32E05_256650.pdf	Benton	Southern	32	6	123	63	123	40
02S32E08_486631.pdf	Benton	Southern	28	6	139	79	139	28
02S32E17_0931729.pdf	Benton	Southern	11	8	233	73	233	48
02S33E_8447.pdf	Benton	Southern	64	8	40	ND	40	25
02S32E02_0912031.pdf	Hammil	Northern	15	8	610	200	610	200
02S32E28_E001207.pdf	Hammil	Northern	22	12	200	40	200	10
03S32E11_396043.pdf	Hammil	Northern	25	6	255	189	249	189
03S32E11_542595.pdf	Hammil	Northern	25	14	440	200	440	150
03S32E11_701063.pdf	Hammil	Northern	22	6	346	240	346	238
03S32E11_806916.pdf	Hammil	Northern	17	8	410	210	410	196
03S32E14_060693.pdf	Hammil	Northern	40	8	280	120	280	135
03S32E13_060694.pdf	Hammil	Northern	39	8	440	100	440	135
03S32E13_231287.pdf	Hammil	Northern	38	8	255	90	255	130
03S32E13_317469.pdf	Hammil	Northern	30	6	335	155	355	166

Well Completion Report	Area	General Location	Age as of 2020 (yrs)	Diameter (in)	Total Depth (ft)	Top of Screen (ft)	Bottom Screen (ft)	Initial Water Level* (ft)
03S32E13_422743.pdf	Hammil	Northern	23	15	640	196	640	110
03S32E14_775622.pdf	Hammil	Northern	18	8	350	270	350	143
03S32E11_496977.pdf	Hammil	Northern	15	12	390	ND	390	163
03S32E14_770238--001.pdf	Hammil	Central	20	6	310	240	300	145
03S32E13_396379.pdf	Hammil	Central	27	8	259	199	259	121
03S32E23_350073.pdf	Hammil	Central	28	6	240	120	240	115
03S32E24_0904257.pdf	Hammil	Central	15	6	335	175	335	20
03S32E24_770244.pdf	Hammil	Central	19	8	365	285	365	127
03S32E23_0912032.pdf	Hammil	Central	15	8	420	140	420	130
03S32E23_139403.pdf	Hammil	Central	42	8	200	160	200	70
03S32E23_146267.pdf	Hammil	Central	42	6	150	100	150	84
03S32E23_231839.pdf	Hammil	Central	37	6	215	100	215	100
03S32E23_317449.pdf	Hammil	Central	30	8	320	100	320	100
03S32E23_503238.pdf	Hammil	Central	21	16	597	246	597	40
03S32E23_700777.pdf	Hammil	Central	21	8	420	210	420	117
03S32E23_770233.pdf	Hammil	Central	20	6	350	190	350	125
03S32E23_770246.pdf	Hammil	Central	20	6	340	220	340	125
03S32E23_E0267689.pdf	Hammil	Central	5	16	710	520	700	165
03S32E24_796536.pdf	Hammil	Central	17	6	300	260	300	123
03S33E23_700776.pdf	Hammil	Central	21	6	360	240	360	117
03S32E23_0904285.pdf	Hammil	Central	14	6	315	255	315	110
03S32E23_0904289.pdf	Hammil	Central	14	6	310	230	310	105
03S32E23_1091065.pdf	Hammil	Central	14	6	355	295	355	47
03S32E23_1091095.pdf	Hammil	Central	13	6	255	195	255	112
03S32E23_700784.pdf	Hammil	Central	21	6	400	300	400	117
03S32E24_796531.pdf	Hammil	Central	17	6	315	275	315	140
03S32E23_396201.pdf	Hammil	Central	26	8	359	279	359	123
03S32E23_422745.pdf	Hammil	Central	23	12	400	120	400	126
03S32E23_434205.pdf	Hammil	Central	25	8	350	269	249	113
03S32E24_396381.pdf	Hammil	Central	27	8	265	199	265	114
03S32E24_396382.pdf	Hammil	Central	27	8	257	197	257	130
03S32E25_425681.pdf	Hammil	Southern	20	16	615	150	615	104
03S32E25_775628.pdf	Hammil	Southern	18	6	310	270	310	110
03S32E25_E0221155.pdf	Hammil	Southern	6	16	698	198	698	166
03S32E26_256603.pdf	Hammil	Southern	34	6	178	76	178	100
03S32E26_396165.pdf	Hammil	Southern	26	8	299	199	299	111
03S32E26_491342.pdf	Hammil	Southern	28	16	640	210	640	120
03S32E36_1091064.pdf	Hammil	Southern	14	6	355	295	355	109
04S32E01_WCR2019-004713.pdf	Hammil	Southern	1	16	580	180	580	146
04S32E01_1076829.pdf	Hammil	Southern	16	16	500	260	500	140
04S33E31_0904295.pdf	Chalfant	Northern	14	6	195	155	195	20
05S33E08_317439.pdf	Chalfant	Northern	30	6	305	143	305	145
05S33E04_0931666.pdf	Chalfant	Northern	13	8	415	130	415	130
04S33E31_0912039.pdf	Chalfant	Northern	15	6	235	95	235	118
04S33E31_1091092.pdf	Chalfant	Northern	13	6	196	156	196	135
05S33E05_775632.pdf	Chalfant	Northern	18	6	150	130	150	40
05S33E05_775620.pdf	Chalfant	Northern	18	6	160	120	160	**ND**
05S33E05_231264.pdf	Chalfant	Eastern	39	8	105	40	105	42
05S33E08_231272.pdf	Chalfant	Eastern	38	6	78	30	78	40
05S33E08_231277.pdf	Chalfant	Eastern	38	8	130	60	130	60
05S33E08_256627.pdf	Chalfant	Eastern	33	6	160	40	140	40
05S33E08_452941.pdf	Chalfant	Eastern	22	6	156	60	156	45
05S33E08_737083.pdf	Chalfant	Eastern	19	6	300	120	300	45

Well Completion Report	Area	General Location	Age as of 2020 (yrs)	Diameter (in)	Total Depth (ft)	Top of Screen (ft)	Bottom Screen (ft)	Initial Water Level* (ft)
05S33E08_0931732.pdf	Chalfant	Eastern	11	6	214	114	214	52
05S33E09_139436.pdf	Chalfant	Eastern	41	6	100	60	100	30
05S33E09_146265.pdf	Chalfant	Eastern	42	6	100	70	100	28
05S33E09_146286.pdf	Chalfant	Eastern	42	6	100	70	100	22
05S33E09_146300.pdf	Chalfant	Eastern	42	6	100	75	100	27
05S33E09_231290.pdf	Chalfant	Eastern	38	6	115	40	115	35
05S33E09_231854.pdf	Chalfant	Eastern	37	6	118	40	118	35
05S33E09_231856.pdf	Chalfant	Eastern	36	6	110	50	110	45
05S33E09_231882.pdf	Chalfant	Eastern	35	8	166	35	166	38
05S33E09_401087.pdf	Chalfant	Eastern	26	6	210	100	210	40
05S33E09_452927.pdf	Chalfant	Eastern	23	6	110	60	110	60
05S33E09_770227.pdf	Chalfant	Eastern	21	6	150	90	150	39
05S33E09_796488.pdf	Chalfant	Eastern	17	5	150	110	150	40
05S33E09_0904281.pdf	Chalfant	Eastern	15	6	200	160	200	47
05S33E09_0904293.pdf	Chalfant	Eastern	14	6	175	155	175	45
05S33E09_0931753.pdf	Chalfant	Eastern	16	6	215	100	215	54
05S33E36_256672.pdf	Chalfant	Eastern	32	6	140	126	140	35
04S32E09_256606.pdf	Chalfant	Eastern	33	6	124	47	127	40
04S33E09_700786.pdf	Chalfant	Eastern	21	6	123	80	123	32
05S32E09_452805.pdf	Chalfant	Eastern	24	6	208	100	208	20
05S33E09_139419.pdf	Chalfant	Eastern	41	6	80	50	80	25
05S33E09_231271.pdf	Chalfant	Eastern	38	6	78	35	78	35
05S33E09_231279.pdf	Chalfant	Eastern	38	6	100	40	100	40
05S33E09_231865.pdf	Chalfant	Eastern	36	8	213	90	210	37
05S33E09_231868.pdf	Chalfant	Eastern	35	6	152	50	150	38
05S33E09_231895.pdf	Chalfant	Eastern	35	6	110	20	110	40
05S33E09_256601.pdf	Chalfant	Eastern	34	6	197	97	197	33
05S33E09_256688.pdf	Chalfant	Eastern	31	6	115	55	115	38
05S33E09_344582.pdf	Chalfant	Eastern	30	6	160	80	160	35
05S33E09_350065.pdf	Chalfant	Eastern	28	4	185	125	185	35
05S33E09_401086.pdf	Chalfant	Eastern	26	6	105	75	105	40
05S33E09_452812.pdf	Chalfant	Eastern	24	6	150	65	150	55
05S33E09_701057.pdf	Chalfant	Eastern	21	6	150	90	150	39
05S33E09_775614.pdf	Chalfant	Eastern	18	6	150	130	150	35
05S33E09_775618.pdf	Chalfant	Eastern	18	6	195	135	195	35
05S33E09_775644.pdf	Chalfant	Eastern	19	6	148	128	148	35
05S33E09_796508.pdf	Chalfant	Eastern	17	5	170	130	170	46
05S33E09_806900.pdf	Chalfant	Eastern	18	6	165	20	165	42
05S33E09_806924.pdf	Chalfant	Eastern	17	6	205	105	205	40
05S33E09_0904253.pdf	Chalfant	Eastern	16	6	175	135	175	46
05S33E09_0904254.pdf	Chalfant	Eastern	16	6	175	135	175	42
05S33E09_0904286.pdf	Chalfant	Eastern	14	6	155	135	155	39
05S33E09_0904302.pdf	Chalfant	Eastern	16	6	175	135	175	46
05S33E09_0912025.pdf	Chalfant	Eastern	15	6	155	20	155	48
05S33E09_0912037.pdf	Chalfant	Eastern	15	6	225	125	225	48
05S33E09_0931718.pdf	Chalfant	Eastern	11	6	205	115	205	45
05S33E09_0931741.pdf	Chalfant	Eastern	13	6	212	90	212	46
05S33E09_0931757.pdf	Chalfant	Eastern	9	6	215	110	215	49
05S33E09_343805.pdf	Chalfant	Eastern	30	2	102	72	102	80
05S33E09_343806.pdf	Chalfant	Eastern	30	2	79	49	79	52
05S33E09_343807.pdf	Chalfant	Eastern	30	2	78	48	78	53
05S33E22_054928.pdf	Chalfant	Eastern	40	12	250	50	250	55
05S33E08_139426.pdf	Chalfant	Western	40	12	180	130	180	30

Well Completion Report	Area	General Location	Age as of 2020 (yrs)	Diameter (in)	Total Depth (ft)	Top of Screen (ft)	Bottom Screen (ft)	Initial Water Level* (ft)
05S33E08_231816.pdf	Chalfant	Western	36	6	136	40	136	40
05S33E08_231817.pdf	Chalfant	Western	11	6	134	40	134	40
05S33E08_231840.pdf	Chalfant	Western	37	6	140	40	140	45
05S33E08_256624.pdf	Chalfant	Western	34	6	173	33	173	35
05S33E08_256652.pdf	Chalfant	Western	32	6	142	42	142	40
05S33E08_317425.pdf	Chalfant	Western	31	6	150	50	150	45
05S33E08_317444.pdf	Chalfant	Western	30	6	160	40	160	40
05S33E08_317456.pdf	Chalfant	Western	30	6	210	40	210	45
05S33E08_350066.pdf	Chalfant	Western	28	6	195	50	195	49
05S33E08_350067.pdf	Chalfant	Western	28	6	195	50	195	49
05S33E08_395710.pdf	Chalfant	Western	26	6	170	50	170	50
05S33E08_439236.pdf	Chalfant	Western	22	6	160	100	160	43
05S33E08_439237.pdf	Chalfant	Western	22	6	104	20	104	51
05S33E08_452934.pdf	Chalfant	Western	23	6	105	60	105	44
05S33E08_453011.pdf	Chalfant	Western	19	6	150	70	150	41
05S33E08_701062.pdf	Chalfant	Western	21	6	100	60	100	47
05S33E08_763301.pdf	Chalfant	Western	16	8	360	260	360	46
05S33E08_775606.pdf	Chalfant	Western	18	6	160	140	160	50
05S33E08_775630.pdf	Chalfant	Western	18	6	160	140	160	45
05S33E08_775637.pdf	Chalfant	Western	19	6	180	140	180	40
05S33E08_796500.pdf	Chalfant	Western	17	5	210	170	210	48
05S33E08_796520.pdf	Chalfant	Western	16	8	365	260	365	46
05S33E08_796534.pdf	Chalfant	Western	17	5	220	180	220	51
05S33E09_452939.pdf	Chalfant	Western	23	6	155	60	155	48
05S33E09_796498.pdf	Chalfant	Western	17	5	210	170	210	52
05S33E17_231802.pdf	Chalfant	Western	39	6	117	37	117	38
05S33E17_231832.pdf	Chalfant	Western	4	6	118	35	115	35
05S33E17_344578.pdf	Chalfant	Western	30	6	210	45	210	48
05S33E17_452809.pdf	Chalfant	Western	24	6	195	60	195	45
05S33E17_452991.pdf	Chalfant	Western	20	6	195	100	195	65
05S33E17_796506.pdf	Chalfant	Western	18	6	180	140	180	48
05S33E17_796533.pdf	Chalfant	Western	17	5	215	175	215	62
05S33E17_806917.pdf	Chalfant	Western	17	6	205	105	205	64
05S33E17_85739.pdf	Chalfant	Western	41	6	215	165	215	60
05S33E32_401082.pdf	Chalfant	Southern	26	6	120	40	120	41
05S33E33_452808.pdf	Chalfant	Southern	24	8	256	75	256	35
05S33E34_231826.pdf	Chalfant	Southern	35	10	500	135	490	125

ND: No data

* Initial water level is "Static Water" level from WCR if available, otherwise "First Water" from WCR