

**Table 6-1. Precipitation Summary Statistics, Water Years 1991 Through 2007
Upper Deschutes Basin, Oregon**

Annual Precipitation, in inches						
Water Year	Bend	Brothers	Madras	Prineville	Redmond	Wickiup Dam
1991		7.35	7.79	8.32	5.49	18.36
1992		9.37	9.26	10.32	6.47	17.5
1993	10.37	14.23	17.82	13.82	12.91	28.12
1994	4.98	6.6	6.55	5.36	5.73	10.14
1995	10.63	9.52	16.64	13.06	9.66	23.3
1996	11.46	10.78	15.27	12.4	2.28	29.28
1997	16.42	12.03	19.32	13.54	4.73	24.41
1998	13.06	9.23	15.66	11.86	11.34	26.32
1999	15.7	2.89	10.37	9.2	8.89	22.94
2000	8.01	2.87	10.41	8.15	6.84	14.83
2001	6.81	4.08	7.38	3.82	1.03	13.19
2002	8.04	1.24	6.43	3.47	5.93	17.07
2003	7.92	2.09	8.95	2.85	7.96	14.6
2004	9.69	1.06	14.13	8.93	9.88	19.16
2005	9.83	8.31	9.78	5.46	10.46	14.58
2006	16.85	7.54	13.21	4.22	11.33	26.05
2007	9.66	5.11	7.82	5.79	5.56	16.15
avg 1993-1995*	8.66	10.12	13.67	10.75	9.43	20.52
avg 2001-2007	9.83	4.20	9.67	4.93	7.45	17.26
difference	-1.17	5.91	4.00	5.81	1.98	3.26
difference as % of USGS period	-13%	58%	29%	54%	21%	16%

* period of study of the USGS groundwater model simulation



**NORTHWEST
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Consulting in Hydrogeology

**Case Study: Thornburgh Resort
Water Resources Impact Evaluation**

Table 6-2. Summary of Monthly and Annual Water Use, In Million Gallons, For Selected Public Supply Wells 1997-2006, Upper Deschutes Basin, Oregon

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1997	48.70	45.37	48.34	74.98	150.47	173.31	277.38	156.22	134.55	88.45	52.27	48.31	1298
1998	110.45	89.89	130.99	177.04	193.39	293.80	477.47	482.26	351.49	172.48	171.10	108.39	2759
1999	185.47	138.73	123.66	201.34	330.61	450.20	564.51	432.68	376.28	191.76	181.71	209.00	3386
2000	171.42	171.36	201.36	280.75	367.84	462.59	488.16	505.27	381.49	238.14	172.95	168.56	3610
2001	145.44	136.48	116.56	177.16	457.69	533.45	582.32	708.38	500.54	285.21	177.16	155.44	3976
2002	89.81	77.05	97.86	285.85	443.74	606.04	676.10	637.15	467.53	227.99	111.88	97.97	3819
2003	151.90	142.21	148.65	203.16	411.10	664.23	840.01	722.86	512.59	205.27	196.41	159.95	4358
2004	129.25	126.13	118.63	127.53	138.60	141.37	156.00	157.35	174.28	138.38	117.83	116.18	1642
2005	109.64	75.42	136.56	110.12	297.08	429.21	683.17	776.10	503.73	216.46	81.19	114.46	3533
2006	76.08	66.56	78.21	113.76	299.47	295.07	478.75	506.94	321.16	147.30	80.72	81.91	2546

Note: Years 2004 and 2006 have small totals due to so much missing data
 If 2003 data were used in place of the missing 2004 data, 2004 Total would be 4796
 If 2005 data were used in place of the missing 2006 data, 2006 Total would be 3891

Table 6-3. Summary of Monthly and Annual Water Use, In Million Gallons, For Selected Private Supply Wells 1997-2006, Upper Deschutes Basin, Oregon

Year	Jan	Feb	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1997	31.00	17.96	15.69	14.62	16.95	19.92	30.50		49.80	62.64	47.51	369
1998	151.71	63.63	52.43	69.91	60.87	61.81	92.06		212.14	275.85	208.69	1429
1999	165.93	63.49	49.62	51.94	56.60	73.26	117.91	183.71	203.01	253.09	212.55	1494
2000	220.84	63.65	63.25	64.26	80.84	104.00	147.87	230.17	337.11	336.95	283.47	2009
2001	200.86	35.78	54.95	47.51	59.50	65.27	118.88	264.46	233.66	237.35	238.19	1614
2002	62.76	30.47	23.93	23.75	31.00	45.59	81.74	4.35	107.52	126.87	108.74	775
2003	382.37	175.92	162.47	154.02	149.85	172.32	282.18	305.86	550.48	686.47	604.77	4093
2004	128.03	93.47	89.36	215.88	202.49	332.06	367.74		351.22	240.12	201.60	2644
2005	71.67	25.10	20.28	20.78	36.04	54.00	62.18	51.96	142.51	156.11	121.62	814
2006	374.04	84.54	63.37	97.24	77.92	102.69	181.66	338.60	376.75	425.63	468.10	2658

Table 6-4. Summary of Annual Water Use, in Million Gallons, For Select Public Supply Wells, Upper Deschutes Basin, Oregon

Public Water Supply Well Name	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
City Bend Rock Bluff No. 2		111.5	111.11	80.62	186.75	119.23	2.73		15.13	
City of Bend Airport Well						3.86	5.91		13.36	
City of Bend Bear Ck Well 1				277.38	216.81	260.55	120.15		247.78	
City of Bend Outback Well 1		72.18	52.97	33.04	76.115	169.71	140.31		74.21	
City of Bend Outback Well 2		83.25	64.5	37.46	102.16	55.74	39.22		115.67	
City of Bend Outback Well 3						146.96	248.35		232.51	
City of Bend Pilot Butte 1 Well		148.8	174.63	196.51	134.73	0	0		105.36	
City of Bend Pilot Butte 2 Well		124.26	131.93	156.02	186.25	208.91	168.26		142.56	
City of Bend Pilot Butte 3 Well					211.49	236.31	187.46		153.76	
City of Bend River 1		50.64	60.74		189.71	328.14	327.2		152.73	274.52
City of Bend River 2		156.84	157.84		69.035	149.76	156.75		63.27	154.36
City of Bend Rock Bluff No. 3		66.41	80.15	222.73	37.614	219.95			53.23	
City of Bend Rock Bluff No.1		136.6	134.8	5.1	0	111.14	42.84		148.67	
City of Bend Westwood Well		32.72	56.85	62.25	86.106	108.55	123.84		42.43	
City of Redmond Well 1	164.08	149.41	168.08	101.41	129.10	111.93	133.04		121.78	102.763
City of Redmond Golf Course Well					1.1834			1.5123	0	72.2752
City of Redmond Sewage Effluent Res..		435.22	441.84	509.02	302.1		299.45	658.69		
City of Redmond Sewage WW Treatment		0	441.84	509.02	523.8		637.4	658.69		
City of Redmond Well 2	198.67	186.79	132.52	80.141	161.22	116.85	162.38		183.96	194.795
City of Redmond Well 3 Ind Complex	474.44	504.04	479.43	241.61	560.24	257.32	405.13		396.69	500.454
City of Redmond Well 4 FK Horned Butte	266.97	350.31	281.94	223.04	284.05	276.75	194.16		537.46	483.093
City of Redmond Well 5		0	224.41	667	289.47	683.37	696.99		430.19	463.56

Table 6-4. Summary of Annual Water Use, in Million Gallons, For Select Public Supply Wells, Upper Deschutes Basin, Oregon

Public Water Supply Well Name	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
City of Sisters City Well Nol 1	10.322	5.986	52.423	40.118	74.595	148.43	131.01	144.65	140.05	114.212
City of Sisters H.S. Well No 2	164.73	101.69	93.758	123.21	100.61	50.74	87.331	126.80	91.045	117.630
Terrebonne Water Dist. Well 1	0	22.577	24.657	21.076	23.822	32.072	9.7633	16.972	33.526	26.5970
Terrebonne Water Dist. Well 3					4.1511	14.207	38.692	34.211	37.752	41.6671
Terrebonne Water Dist. Well 2	19.14	19.543	19.543	23.141	24.718	8.4843	0	0	0	0

Table 6-5. Summary of Annual Water Use, in Million Gallons, For Select Private Supply Wells, Upper Deschutes Basin, Oregon

Private Water Supply Well	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Agate--Agate Water Company				9.99	2.92	30.00	420.19			
Avion--Avion Water Company							1382.14	1598.17		1916.98
Chapparral--Avion Water Company	30.27	28.10	34.67	35.46	32.90	35.10	33.21	32.73		30.14
Chocktaw--Agate Water Company				29.74	2.90	4.12	133.04			
Cinder Butte--Avion Water Company	5.52	7.08	7.08	7.31	7.31	7.76	7.81	7.75		9.32
Conestoga-Avion Water Company		1068.87	1088.28	1321.57	1280.01		1443.20			
Crane Water Wonderland	46.62	39.85	47.16	64.69	66.14	71.78	71.78	87.30		45.98
drw Tuscarora - Avion Water Company	4.23	4.58	4.71	6.99	5.08	6.04	6.13	6.05		4.90
Indian Summer--Agate Water Company				5.45	5.98	5.34	43.13			
Merganser Water Wonderland	1.35		5.49	0.00			3.18	0.00		30.60
Null La Casa Mia Association	1.28	1.21	1.25	1.38	1.35	1.41	1.67		1.67	0.94
Null--Avion Water Company					3.27					
Odin Falls - Avion Water Company	1.93	2.50	3.02	7.31	4.32	4.94	6.04	6.53		10.63
Red Cloud- Avion Water Company	13.38	15.30	20.71	21.10	21.91	24.89	26.45	26.23		0.00
River Bluffs--Agate Water Company				5.27	0.00	0.00	0.00			
School Well Laidlaw Water District		1.39	1.55	0.76		6.87				
SeeversWater Wonderland	13.95	14.26	14.65	14.51	17.92	23.14	21.45	24.28		21.46
Shoshone--Agate Water Company				7.00	0.33	0.37	4.22			
Tetherow Crossing- Avion Water Company	9.03	10.30	12.42	12.96	12.95	14.14	14.73	14.08		13.18
Well 1 Home Roats Water System Inc.	39.75	47.61	47.08	40.33		48.93	29.23	24.13	31.54	0.00
Well 10 Pinebrook Roats Water System	0.08	0.00								0.00
Well 2 Cline Butte Utility Co								106.46	85.77	83.36

Table 6-5. Summary of Annual Water Use, in Million Gallons, For Select Private Supply Wells, Upper Deschutes Basin, Oregon

Private Water Supply Well	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Well 2 Home Roats Water System	15.31	16.63	17.01	19.59		14.67	2.52	2.88	2.62	0.00
Well 3 Cline Butte Utility Co								61.45	63.79	82.54
Well 3 Pinebrook Roats Water System	10.69	11.81	11.94	14.01		17.14	14.92	15.65	14.08	0.00
Well 4 Pinebrook Roats Water System	77.08	67.66	70.49	94.02		100.63	115.82	114.84	112.75	0.00
Well 5 Woodside Roats Water System	45.73	35.97	40.41	35.34		49.30	42.48	42.25	36.97	0.00
Well 6 Cline Butte Utility Co				100.23	115.84	109.76	103.84	113.17	105.21	113.31
Well 6 Woodside Roats Water System								0.00	0.00	0.00
Well 7 Cline Butte Utility Co				0.00	0.00	68.02		21.17	19.70	19.94
Well 7 Woodside Roats Water System	19.26	22.03	19.21	17.09		9.92	7.80	28.36	28.98	0.00
Well 8 Cline Butte Utility Co				67.84	25.57	44.81	75.98	78.58	64.57	69.15
Well 8 Woodside Roats Water System	28.72	29.00	41.51	61.90		69.49	51.84	52.33	41.59	0.00
Well 9 Cline Butte Utility Co								136.81	179.17	196.51
Well 9 Pinebrook Roats Water System							22.53	35.26	25.34	0.00
Wild R Avion Water Co	0.32									
Wild R - Avion Water Company	4.54	4.67	5.56	6.73	7.42	6.77	8.09	7.42		8.63

Table 7-1. Summary of Diminished Streamflow, Model Results for Scenario 1 and Scenario 2

Reach	Diminished Streamflow, cfs			
	Scenario 1	as percent of total pumping	Scenario 2	as percent of total pumping
Bend to River Mile 149	0.68	21%	0.30	9%
Odin Falls to Whychus Creek and Lower Whychus Cree	1.65	51%	1.78	55%
Combined for two reaches	2.33	72%	2.08	64%
Total diminished streamflow for stream system	3.09	95.1%	3.24	99.7%

Notes:

- 1) Total pumping is 3.25 cfs for both Scenarios

Table 8-1.
 Summary of Ground Water Rights Permits and Granted Water Use
 Per Year Since 1/1/1998, Within USGS Study Area,
 Upper Deschutes Basin, Oregon

Year Of Right Date	Number of Permits	Sum of Maximum Granted Use, cfs
1998	14	10.70
1999	10	1.91
2000	4	1.43
2001	3	5.37
2002	7	9.59
2003	3	11.78
2004	16	0.78
2005	19	2.31
2006	2	0.28

Total = 44.13

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Table 8-2.
 Summary of Ground Water Rights Applications and Requested Water
 Use Per Year Since 1/1/1998,
 Within USGS Study Area, Upper Deschutes Basin, Oregon

Year Of Priority Date	Number of Applications	Sum of Maximum Requested Use, cfs
1998	9	26.13
1999	7	27.47
2000	2	0.07
2001	3	0.51
2002	2	1.40
2003	3	0.72
2004	8	2.41
2005	7	32.67
2006	12	13.31
2007	19	71.31

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Table 8-3.
 Summary of Surface Water Rights Permits and Granted Water Use
 Per Year Since 1/1/1998, Within USGS Study Area,
 Upper Deschutes Basin, Oregon

Year Of Right Date	Number of Permits	Sum of Maximum Granted Use, cfs
2005	2	0.14
2007	1	2.64

Table 8-4.
Summary of Surface Water Rights Applications and Requested
Water Use Per Year Since 1/1/1998, Within USGS Study Area,
Upper Deschutes Basin, Oregon

Year Of Priority Date	Number of Applications	Sum of Maximum Requested Use, cfs
2007	10	0.07

Table 9-1**Summary of Number of Wells Deepened since 1980 in the Vicinity of Thornburgh/Redmond
By Township and Range**

Township - Range	2000- present	1995-1999	1990-1994	1985-1989	1980-1984	Totals
T 14 S – R 12 E	8	6	1	3	4	22
T 15 S – R 11 E	8	9	15	5	3	40
T 15 S – R 12 E (Eagle Crest)	17	2	0	4	4	27
T 15 S – R 13 E (Redmond)	23	11	3	0	7	44
T 16 S – R 11 E (East half)	9	6	7	0	4	26
T 16 S – R 12 E	17	13	9	4	8	51
Totals	82	47	35	16	30	210

Source: Oregon Water Resources Department Well Log Database