



↖ FLUME

MEMO

To: File, 9320.02
From: Ray Dunn
Subject: Flume Installation - Farmers Korner Pond
Date: June 1, 2000

On May 30, 2000 I met Jerry Hall (Colorado Water Well) at the Farmers Korner Augmentation Pond at about 10 a.m. We scouted the section of creek between the road and pond for the best flume location. Ultimately we selected a narrow section of the stream about 10 feet downstream from the road, as shown in the attached location map.

Bud Henriksen was on site and stopped by to greet us. We showed him where we were planning to install the flume and he didn't object to the location.

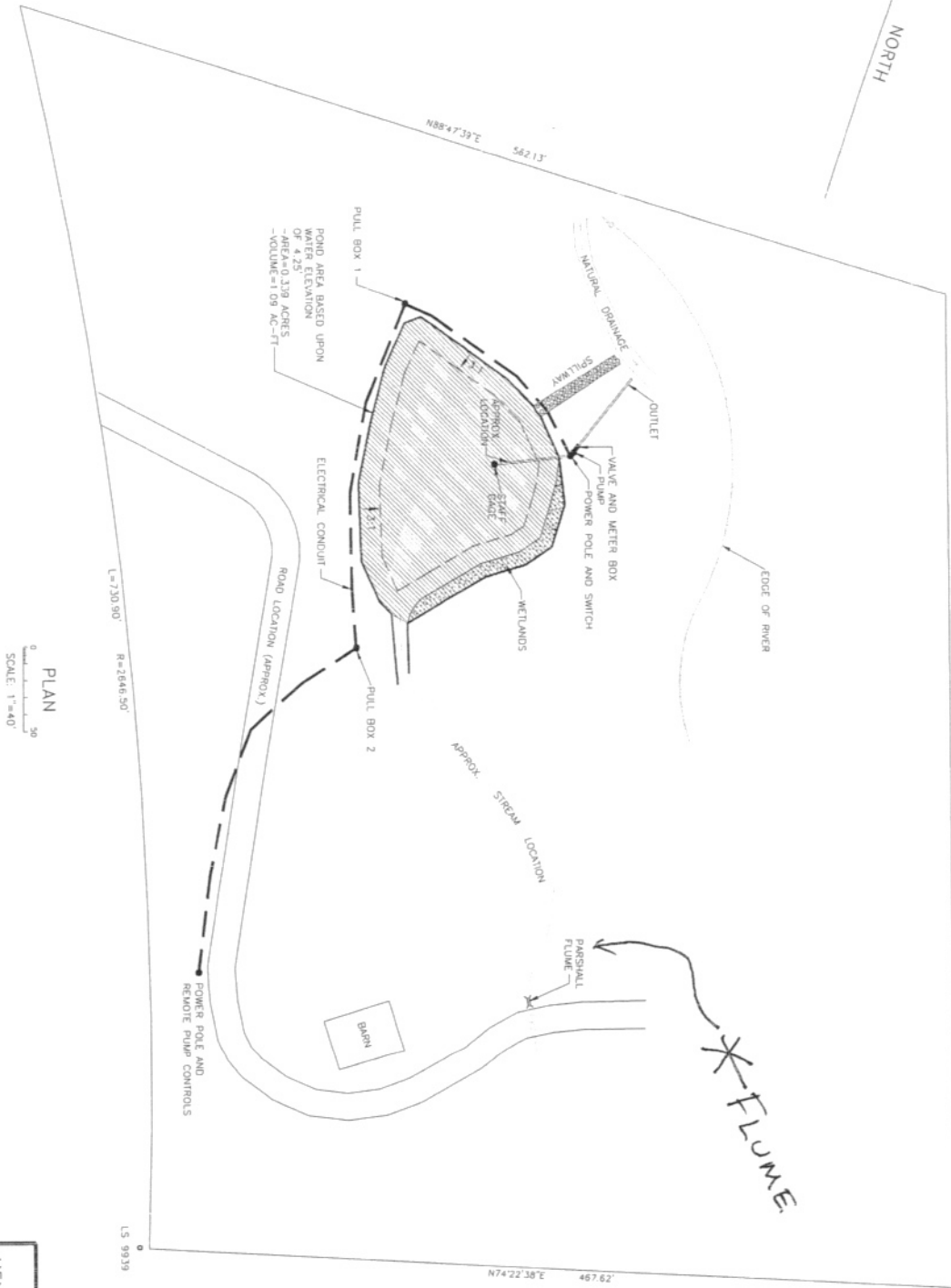
The installation effort was initiated by trenching one side of the stream to allow the majority of the flow to be routed along the side of the channel. The middle of the channel was cleared of rocks and the flume was positioned at an elevation slightly above the existing water level. The flume was leveled and temporarily held in place with several small rocks. Next, Jerry and his assistant mixed up four bags of concrete and poured a wing-wall and base around the flume. The concrete was allowed to set for about an hour, and then the water was re-routed through the flume. A levy was constructed out of dirt and used to keep water away from the side of the flume that still needed concrete. About 6 more bags of concrete were mixed up and used to create another wing-wall and base for the flume. We rechecked the level of the flume and then placed rocks on top of the concrete for cover. An old tree root was placed downstream of the structure and used to block view of the flume from the new house planned on the property. The finished product appeared water tight and relatively sturdy with respect to the low flows expected in the stream.

The water level in the 3-inch flume was 0.32 feet, which corresponds to a flow rate of about 0.17 cfs, as referenced from the attached rating table.

The staff gage structure for the pond was not available at the time of this effort, but I spoke with Dave Bomhoff (Colorado Water Well) and he expects to have it finished and installed early next week. I asked Dave to call me after installation and to note the water level and depth of flow over the spillway. Based upon the previous spillway elevation we should be able to correlate the staff gage to the previously developed rating curve. The next time were in the area we should survey the existing water level and compare it to the benchmark established during the construction process, to ensure that the existing spillway elevation hasn't shifted from our previous work.

Pictures of the installed flume are on file.

NORTH



PLAN
 0 30
 SCALE: 1"=40'

932002FN

REFERENCE: LEGAL BOUNDARIES BASED UPON ROB ANDREWS LAND SURVEYING-SHEET 1 OF 1, DATED 8/3/90.

FARMERS KORNER
 HENRIKSEN POND ENLARGEMENT
 AS CONSTRUCTED

11/7/99

BISHOP-BROCKEN ASSOCIATED, INC.

Parshall Flumes

Free flow discharge

9

Post-It® Fax Note 7671

Date 6-1-00 # of pages 3

FROM Alan Bezyot

Co. PLASTI-FAB

Phone # 503-692-5460

Fax #

To KAY ANN

Co./Dept Bishop Brouder

Phone # 311 PARSHALL

Fax # 303-806-8953

HEAD feet	3 INCH			6 INCH			9 INCH		
	GPM	CFS	MGD	GPM	CFS	MGD	GPM	CFS	MGD
0.01									
0.02									
0.03									
0.04									
0.05									
0.06									
0.07									
0.08									
0.09									
0.10	12.548	0.0280	0.0180	24.318	0.0542	0.0350	40.662	0.0906	0.0585
0.11	14.545	0.0324	0.0209	28.270	0.0630	0.0406	47.046	0.1048	0.0676
0.12	16.645	0.0371	0.0239	32.436	0.0723	0.0466	53.745	0.1198	0.0773
0.13	18.844	0.0420	0.0271	36.809	0.0820	0.0529	60.747	0.1354	0.0873
0.14	21.138	0.0471	0.0304	41.381	0.0922	0.0595	68.040	0.1516	0.0978
0.15	23.524	0.0524	0.0338	46.147	0.1028	0.0663	75.616	0.1685	0.1087
0.16	25.999	0.0579	0.0374	51.101	0.1139	0.0735	83.463	0.1860	0.1200
0.17	28.560	0.0636	0.0411	56.238	0.1253	0.0808	91.575	0.2040	0.1316
0.18	31.206	0.0695	0.0449	61.553	0.1372	0.0885	99.944	0.2227	0.1437
0.19	33.934	0.0756	0.0488	67.043	0.1494	0.0964	108.56	0.2419	0.1561
0.20	36.742	0.0819	0.0528	72.702	0.1620	0.1045	117.43	0.2616	0.1688
0.21	39.628	0.0883	0.0570	78.528	0.1750	0.1129	126.53	0.2819	0.1819
0.22	42.591	0.0949	0.0612	84.518	0.1883	0.1215	135.86	0.3027	0.1953
0.23	45.629	0.1017	0.0656	90.667	0.2020	0.1303	145.42	0.3240	0.2091
0.24	48.741	0.1086	0.0701	96.974	0.2161	0.1394	155.21	0.3458	0.2231
0.25	51.924	0.1157	0.0746	103.43	0.2305	0.1487	165.21	0.3681	0.2375
0.26	55.179	0.1229	0.0793	110.05	0.2452	0.1582	175.43	0.3909	0.2522
0.27	58.503	0.1304	0.0841	116.81	0.2603	0.1679	185.86	0.4141	0.2672
0.28	61.896	0.1379	0.0890	123.72	0.2757	0.1778	196.49	0.4378	0.2825
0.29	65.355	0.1456	0.0940	130.77	0.2914	0.1880	207.33	0.4620	0.2980
0.30	68.881	0.1535	0.0990	137.97	0.3074	0.1983	218.37	0.4866	0.3139
0.31	72.473	0.1615	0.1042	145.30	0.3238	0.2089	229.60	0.5116	0.3301
0.32	76.128	0.1696	0.1094	152.78	0.3404	0.2196	241.03	0.5371	0.3465
0.33	79.847	0.1779	0.1148	160.39	0.3574	0.2306	252.65	0.5629	0.3632
0.34	83.629	0.1863	0.1202	168.13	0.3746	0.2417	264.46	0.5893	0.3802
0.35	87.472	0.1949	0.1257	176.01	0.3922	0.2530	276.45	0.6160	0.3974
0.36	91.376	0.2036	0.1314	184.03	0.4100	0.2645	288.63	0.6431	0.4149
0.37	95.340	0.2124	0.1371	192.17	0.4282	0.2762	300.98	0.6706	0.4327
0.38	99.364	0.2214	0.1428	200.44	0.4466	0.2881	313.52	0.6986	0.4507
0.39	103.45	0.2305	0.1487	208.83	0.4653	0.3002	326.23	0.7269	0.4690
0.40	107.59	0.2397	0.1547	217.36	0.4843	0.3125	339.11	0.7556	0.4875
0.41	111.78	0.2491	0.1607	226.01	0.5036	0.3249	352.17	0.7847	0.5063
0.42	116.04	0.2586	0.1668	234.78	0.5231	0.3375	365.40	0.8142	0.5253
0.43	120.35	0.2682	0.1730	243.67	0.5429	0.3503	378.79	0.8440	0.5445
0.44	124.71	0.2779	0.1793	252.68	0.5630	0.3632	392.35	0.8742	0.5640
0.45	129.13	0.2877	0.1856	261.82	0.5834	0.3764	406.08	0.9048	0.5837
0.46	133.61	0.2977	0.1921	271.07	0.6040	0.3897	419.96	0.9357	0.6037
0.47	138.14	0.3078	0.1986	280.44	0.6249	0.4031	434.01	0.9670	0.6239
0.48	142.72	0.3180	0.2052	289.92	0.6460	0.4168	448.22	0.9987	0.6443
0.49	147.36	0.3283	0.2118	299.52	0.6674	0.4306	462.58	1.0307	0.6650
0.50	152.04	0.3388	0.2186	309.24	0.6890	0.4445	477.11	1.0631	0.6859

Plasti-Fab[®] Inc.

10

Parshall Flumes

Free flow discharge

HEAD feet	3 INCH			6 INCH			9 INCH		
	GPM	CFS	MGD	GPM	CFS	MGD	GPM	CFS	MGD
0.51	156.78	0.3493	0.2254	319.07	0.7109	0.4587	491.78	1.0958	0.7070
0.52	161.57	0.3600	0.2323	329.01	0.7331	0.4730	506.61	1.1288	0.7283
0.53	166.41	0.3708	0.2392	339.06	0.7555	0.4874	521.59	1.1622	0.7498
0.54	171.31	0.3817	0.2463	349.22	0.7781	0.5020	536.73	1.1959	0.7716
0.55	176.25	0.3927	0.2534	359.50	0.8010	0.5168	552.01	1.2300	0.7935
0.56	181.24	0.4038	0.2605	369.88	0.8241	0.5317	567.44	1.2643	0.8157
0.57	186.28	0.4151	0.2678	380.37	0.8475	0.5468	583.02	1.2991	0.8381
0.58	191.37	0.4264	0.2751	390.96	0.8711	0.5620	598.74	1.3341	0.8607
0.59	196.51	0.4379	0.2825	401.67	0.8950	0.5774	614.60	1.3694	0.8835
0.60	201.70	0.4494	0.2899	412.48	0.9191	0.5929	630.61	1.4051	0.9065
0.61	206.93	0.4611	0.2975	423.39	0.9434	0.6086	646.76	1.4411	0.9297
0.62	212.21	0.4728	0.3051	434.41	0.9679	0.6245	663.06	1.4774	0.9532
0.63	217.54	0.4847	0.3127	445.53	0.9927	0.6405	679.49	1.5140	0.9768
0.64	222.92	0.4967	0.3204	456.76	1.0177	0.6566	696.06	1.5509	1.0006
0.65	228.34	0.5088	0.3282	468.08	1.0430	0.6729	712.77	1.5882	1.0246
0.66	233.81	0.5210	0.3361	479.51	1.0684	0.6893	729.61	1.6257	1.0488
0.67	239.32	0.5332	0.3440	491.04	1.0941	0.7059	746.60	1.6635	1.0733
0.68	244.88	0.5456	0.3520	502.67	1.1200	0.7226	763.71	1.7017	1.0979
0.69	250.48	0.5581	0.3601	514.40	1.1462	0.7395	780.96	1.7401	1.1227
0.70	256.13	0.5707	0.3682	526.23	1.1725	0.7565	798.35	1.7788	1.1476
0.71	261.83	0.5834	0.3764	538.16	1.1991	0.7736	815.86	1.8179	1.1728
0.72	267.57	0.5962	0.3846	550.18	1.2259	0.7909	833.51	1.8572	1.1982
0.73	273.35	0.6091	0.3929	562.30	1.2529	0.8083	851.29	1.8968	1.2237
0.74	279.17	0.6220	0.4013	574.52	1.2801	0.8259	869.19	1.9367	1.2495
0.75	285.04	0.6351	0.4098	586.84	1.3076	0.8436	887.23	1.9769	1.2754
0.76	290.95	0.6483	0.4183	599.25	1.3352	0.8614	905.39	2.0174	1.3015
0.77	296.91	0.6616	0.4268	611.75	1.3631	0.8794	923.68	2.0581	1.3278
0.78	302.91	0.6749	0.4354	624.35	1.3912	0.8975	942.10	2.0991	1.3543
0.79	308.95	0.6884	0.4441	637.05	1.4194	0.9158	960.64	2.1405	1.3809
0.80	315.03	0.7019	0.4529	649.83	1.4479	0.9342	979.31	2.1821	1.4078
0.81	321.16	0.7156	0.4617	662.71	1.4766	0.9527	998.10	2.2239	1.4348
0.82	327.32	0.7293	0.4705	675.69	1.5055	0.9713	1017.0	2.2661	1.4620
0.83	333.53	0.7432	0.4795	688.75	1.5347	0.9901	1036.0	2.3085	1.4893
0.84	339.78	0.7571	0.4884	701.91	1.5640	1.0090	1055.2	2.3512	1.5169
0.85	346.07	0.7711	0.4975	715.16	1.5935	1.0281	1074.5	2.3941	1.5446
0.86	352.40	0.7852	0.5066	728.50	1.6232	1.0472	1093.9	2.4374	1.5725
0.87	358.77	0.7994	0.5157	741.93	1.6531	1.0665	1113.4	2.4809	1.6006
0.88	365.18	0.8137	0.5250	755.44	1.6833	1.0860	1133.1	2.5246	1.6288
0.89	371.64	0.8281	0.5342	769.05	1.7136	1.1055	1152.8	2.5687	1.6572
0.90	378.13	0.8425	0.5436	782.75	1.7441	1.1252	1172.7	2.6129	1.6858
0.91	384.66	0.8571	0.5530	796.54	1.7748	1.1450	1192.7	2.6575	1.7145
0.92	391.23	0.8717	0.5624	810.41	1.8057	1.1650	1212.8	2.7023	1.7434
0.93	397.84	0.8865	0.5719	824.37	1.8368	1.1851	1233.0	2.7474	1.7725
0.94	404.49	0.9013	0.5815	838.42	1.8681	1.2053	1253.4	2.7927	1.8017
0.95	411.18	0.9162	0.5911	852.56	1.8996	1.2256	1273.8	2.8383	1.8311
0.96	417.91	0.9312	0.6008	866.78	1.9313	1.2460	1294.4	2.8841	1.8607
0.97	424.68	0.9463	0.6105	881.09	1.9632	1.2666	1315.1	2.9302	1.8905
0.98	431.48	0.9614	0.6203	895.48	1.9953	1.2873	1335.9	2.9766	1.9204
0.99	438.33	0.9767	0.6301	909.96	2.0275	1.3081	1356.8	3.0232	1.9504
1.00	445.21	0.9920	0.6400	924.53	2.0600	1.3290	1377.8	3.0700	1.9806

Parshall Flumes

Free flow discharge

11

HEAD feet	3 INCH			6 INCH			9 INCH		
	GPM	CFS	MGD	GPM	CFS	MGD	GPM	CFS	MGD
1.01	452.13	1.0074	0.6499	939.18	2.0926	1.3501	1399.0	3.1171	2.0110
1.02	459.09	1.0229	0.6599	953.91	2.1255	1.3713	1420.2	3.1644	2.0416
1.03	466.08	1.0385	0.6700	968.73	2.1585	1.3926	1441.6	3.2120	2.0723
1.04	473.11	1.0542	0.6801	983.63	2.1917	1.4140	1463.0	3.2599	2.1031
1.05	480.18	1.0699	0.6903	998.62	2.2251	1.4355	1484.6	3.3079	2.1342
1.06	487.29	1.0858	0.7005	1013.7	2.2587	1.4572	1506.3	3.3563	2.1653
1.07	494.44	1.1017	0.7108	1028.8	2.2924	1.4790	1528.1	3.4048	2.1967
1.08	501.62	1.1177	0.7211	1044.1	2.3264	1.5009	1550.0	3.4536	2.2282
1.09	508.83	1.1338	0.7315	1059.4	2.3605	1.5229	1572.0	3.5027	2.2598
1.10	516.09	1.1499	0.7419	1074.8	2.3948	1.5450	1594.1	3.5520	2.2916
1.11	523.38	1.1662	0.7524	1090.3	2.4293	1.5673	1616.3	3.6015	2.3235
1.12	530.70	1.1825	0.7629	1105.8	2.4639	1.5896	1638.7	3.6513	2.3556
1.13	538.07	1.1989	0.7735	1121.5	2.4988	1.6121	1661.1	3.7012	2.3879
1.14	545.47	1.2154	0.7841	1137.2	2.5338	1.6347	1683.7	3.7515	2.4203
1.15	552.90	1.2320	0.7948	1153.0	2.5690	1.6574	1706.3	3.8019	2.4529
1.16	560.37	1.2486	0.8055	1168.9	2.6044	1.6803	1729.1	3.8526	2.4856
1.17	567.87	1.2653	0.8163	1184.8	2.6400	1.7032	1751.9	3.9036	2.5184
1.18	575.42	1.2821	0.8272	1200.9	2.6757	1.7263	1774.9	3.9547	2.5514
1.19	582.99	1.2990	0.8381	1217.0	2.7116	1.7494	1798.0	4.0061	2.5846
1.20	590.60	1.3160	0.8490	1233.2	2.7477	1.7727	1821.1	4.0578	2.6179
1.21	598.25	1.3330	0.8600	1249.5	2.7840	1.7961	1844.4	4.1096	2.6514
1.22	605.93	1.3501	0.8710	1265.8	2.8204	1.8196	1867.8	4.1617	2.6850
1.23	613.65	1.3673	0.8821	1282.2	2.8570	1.8433	1891.2	4.2140	2.7187
1.24	621.40	1.3846	0.8933	1298.8	2.8938	1.8670	1914.8	4.2665	2.7526
1.25	629.18	1.4019	0.9045	1315.3	2.9308	1.8908	1938.5	4.3193	2.7866
1.26	637.00	1.4193	0.9157	1332.0	2.9679	1.9148	1962.3	4.3723	2.8208
1.27	644.85	1.4368	0.9270	1348.7	3.0052	1.9389	1986.1	4.4255	2.8551
1.28	652.74	1.4544	0.9383	1365.6	3.0427	1.9630	2010.1	4.4789	2.8896
1.29	660.66	1.4721	0.9497	1382.5	3.0803	1.9873	2034.2	4.5325	2.9242
1.30	668.62	1.4898	0.9612	1399.4	3.1182	2.0117	2058.4	4.5864	2.9590
1.31	676.60	1.5076	0.9726	1416.5	3.1561	2.0362	2082.7	4.6405	2.9939
1.32	684.63	1.5255	0.9842	1433.6	3.1943	2.0608	2107.0	4.6948	3.0289
1.33	692.68	1.5434	0.9957	1450.8	3.2326	2.0856	2131.5	4.7493	3.0641
1.34	700.77	1.5614	1.0074	1468.1	3.2711	2.1104	2156.1	4.8041	3.0994
1.35	708.89	1.5795	1.0191	1485.4	3.3097	2.1353	2180.7	4.8590	3.1349
1.36	717.05	1.5977	1.0308	1502.8	3.3486	2.1604	2205.5	4.9142	3.1705
1.37	725.24	1.6160	1.0425	1520.3	3.3876	2.1855	2230.4	4.9696	3.2062
1.38	733.46	1.6343	1.0544	1537.9	3.4267	2.2108	2255.3	5.0252	3.2421
1.39	741.72	1.6527	1.0662	1555.5	3.4660	2.2361	2280.4	5.0810	3.2781
1.40	750.00	1.6711	1.0781	1573.3	3.5055	2.2616	2305.5	5.1371	3.3142
1.41	758.32	1.6897	1.0901	1591.1	3.5451	2.2872	2330.8	5.1933	3.3505
1.42	766.68	1.7083	1.1021	1608.9	3.5849	2.3129	2356.1	5.2498	3.3869
1.43	775.06	1.7270	1.1142	1626.9	3.6249	2.3387	2381.5	5.3064	3.4235
1.44	783.48	1.7457	1.1263	1644.9	3.6651	2.3645	2407.1	5.3633	3.4602
1.45	791.93	1.7645	1.1384	1663.0	3.7053	2.3905	2432.7	5.4204	3.4970
1.46	800.41	1.7834	1.1506	1681.1	3.7458	2.4166	2458.4	5.4777	3.5340
1.47	808.92	1.8024	1.1628	1699.3	3.7864	2.4429	2484.2	5.5352	3.5711
1.48	817.47	1.8215	1.1751	1717.6	3.8272	2.4692	2510.1	5.5929	3.6083
1.49	826.04	1.8406	1.1875	1736.0	3.8681	2.4956	2536.1	5.6508	3.6457
1.50	834.65	1.8597	1.1998	1754.5	3.9092	2.5221	2562.2	5.7090	3.6832