PUMP TEST - DRAWDOWN DATA

PROJECT: BOWERS
LOCATION: 1803190001301
DATUM POINT:
PUMPING RATE: 5 USGPM
AQUIFER THICKNESS: 100
CONDITIONS: CONFINED

FILE NO.: BOWERS
WELL NO.: 1
ELEV. OF DATUM POINT: 1100
STATIC WATER LEVEL: 61.2
R = ----- FROM
SCREEN INTERVAL: 30 TO 160

TIME			ELAPSED TIME	WATER LEVEL	DRAWDOWN
DY	HR	MN	t (MIN)	(ft)	s (ft)
28	14	20	195.00	74.083	13.083
28	15	20	255.00	77.083	16.083
28	16	20	315.00	79.000	18.000
28	17	20	375.00	80.000	19.000
28	18	20	435.00	82.000	21.000
28	19	20	495.00	83.000	22.000
28	20	10	545.00	84.000	23.000

LANE COUNTY MANAGEMENT

PUMP TEST - RECOVERY DATA

PROJECT: BOWERS
LOCATION: 1803190001301
DATUM POINT:
PUMPING RATE: 5 USGPM
AQUIFER THICKNESS: 100
CONDITIONS: CONFINED

FILE NO.: BOWERS
WELL NO.: 1
ELEV. OF DATUM POINT: 1100
STATIC WATER LEVEL: 61.2
R = ----- FROM
SCREEN INTERVAL: 30 TO 160

TIME			PUMPING STARTED	PUMPING ENDED	RATIO	WATER LEVEL	RESIDUAL DRAWDOWN
DY	HR	MN	t (MIN)	t' (MIN)	t/t'	(ft)	(ft)
28	20	10	545.00	0.00	0.00	84.000	23.000
28	20	11	546.00	1.00	546.00	82.100	21.100
28	20	12	547.00	2.00	273.50	82.100	21.100
28	20	13	548.00	3.00	182.67	82.100	21.100
28	20	14	549.00	4.00	137.25	82.100	21.100
28	20	15	550.00	5.00	110.00	82.000	21.000
28	20	20	555.00	10.00	55.50	82.000	21.000
28	20	25	560.00	15.00	37.33	82.000	21.000
28	20	30	565.00	20.00	28.25	82.000	21.000
28	20	35	570.00	25.00	22.80	82.000	21.000
28	20	50	585.00	40.00	14.63	81.000	20.000
28	20	55	590.00	45.00	13.11	81.000	20.000
28	21	0	595.00	50.00	11.90	81.000	20.000
28	21	5	600.00	55.00	10.91	81.000	20.000
28	21	10	605.00	60.00	10.08	81.000	20.000
28	22	10	665.00	120.00	5.54	80.000	19.000
28	23	10	725.00	180.00	4.03	80.000	19.000
29	0	10	785.00	240.00	3.27	79.000	18.000
29	1	10	845.00	300.00	2.82	78.000	17.000
29	7	10	1205.00	660.00	1.83	72.000	11.000

LANE COUNTY MANAGEMENT

PUMPING TEST COEFFICIENTS

PROJECT: BOWERS FILE NO.: BOWERS
LOCATION: 1803190001301

WELL # 1

DRAWDOWN:

delta s = 21.71525 FT T = 60.78677 USGPD/FT S = 0

RECOVERY:

delta s = 24.06801 FT T = 54.84458 USGPD/FT S = 0

LANE COUNTY MANAGEMENT

EGR & Associates, Inc.

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Fax (541) 688-8087

December 19, 2003

Mr. Steve Cornacchia, esq.
Herschner, Hunter, LLP
180 E. 11th Ave.
Eugene, OR 97401

RE: Karen Dahlen property
water supply

Dear Mr. Cornacchia:

As you requested, I have reviewed the letters and other written testimony supplied by area residents regarding water supply and my aquifer analysis, which concluded there was sufficient water supply for the proposed development. Specifically, problems these residents have had with their water supply and wells that have reportedly failed over time. There are only 3 modes of failure for wells: 1) the equipment in the well fails so the homeowner can no longer extract water from the well; 2) the well bore itself becomes damaged in some way which prevents or restricts water from the aquifer entering the well, and finally; 3) the aquifer into which the well is drilled is mined of water (dewatered or significantly "dried up"). It is my conclusion and opinion, based upon my earlier analysis and the attached tables and charts, that there is sufficient water for this proposed development and little chance of significant adverse impact between neighboring wells.

Fortunately, there is very effective and simple ways to test which of the above modes of failure is prevalent in any given area. But first a few facts, and definitions are important:

1. An AQUIFER is any geologic unit from which usable quantities of water can be removed. Usable quantities is defined by the user:
    a. Since a dwelling, on average only uses about 450 gallons per day (gpd) or less (excluding irrigation, most dwellings will use less than 250 gpd), then the flow for a domestic well need only average about 1/3 gallon per minute (gpm) for every 24 your period.
    b. Irrigation requires far more water than household use, so an aquifer that may readily support homes will not support irrigation.
2. Static water level is the level to which water will rise in a well when no pumping or disturbance to the water in the well is occurring. Pumping level is the water level when the pump is running and it constantly changes over time and in response to different pumping rates.
3. Yield, or well flow, is the maximum amount of water which can be extracted from a well.

4. Pumping rate is the amount of water per unit time which is being removed from a well. Usually expressed in gallons per minute(gpm) but can be expressed in gallons per day (gpd). It can for limited periods of time exceed the well yield.
5. Today's homes with multiple bathrooms and washing machines commonly will have instantaneous water demands that exceed 5 gpm and often exceed 10 gpm. Thus, the instantaneous demand (5 to >10 gpm) is far greater than the average demand (~1/3 gpm).
6. Aquifers have two basic characteristics which dictate their usability: 1) how quickly water moves through the aquifer, and 2) how much water is stored in them.
7. Aquifers come in all types: large flow with little storage (basalts), low flow with lots of storage (silt and clay dominated aquifers), large flow and large storage (open large gravels), and low flow with low storage (fractured rock aquifers).
8. The bedrock areas of Lane County, like this area, are fractured rock aquifers.
9. All groundwater in bedrock in Lane County moves and is stored in cracks and fractures in the rock. There is no such thing as an underground river or lake in this part of Lane County.

So how do we test what caused a well to fail? First we test whether the well had equipment failure. When people report their wells "go dry" and it is an equipment related problem they simply replace the equipment. But if either the well is damaged or the aquifer goes dry then people re-drill the old well or drill another well. Of the 199 wells drilled in the area 29 are <u>known</u> to be replacement wells (second well on the same property), re-drills, or deepenings of existing wells. Since nobody drills unless necessary, we can safely assume that a second well on a property was to replace a previous well that no longer is working, and not from simple equipment failures.

The attached table, listing those properties with verifiably more than one well drilled on the property, shows the wells with duplicate names and locations but excludes wells drilled within a few days of each other, monitoring wells, and wells where static water was not reported (dry holes). That table demonstrates that second wells generally have static water levels above the static water level of the previous well as often as they have the static water level below the previous well. This indicates the water table is not falling in any consistent manner.

Secondly, testing for either well bore damage or the aquifer going dry is the same test since the two methods are generally mutually exclusive. For example, if the aquifer as a whole is significantly being depleted of water from storage, or is being "dried up", then the static water level for new wells must over time fall; we would also expect to see newly drilled wells showing diminished initial yields over time; the depth at which water was first found would increase over time; and over time the depth of newly drilled wells would increase as people seek water deeper and deeper. If these characteristics are NOT seen, then we know the aquifer is still relatively full of water and the issue must be at the well bore or local to the wells themselves.

A series of charts is provided which shows static water levels, yields, depths to first water, and well completion depths plotted over time. From the static water level chart, two things are readily apparent: 1) static water levels are highly variable, and 2) over time neither the variability nor the range of those static water levels below ground surface have significantly changed or shown general declines. Thus, I conclude that since static water levels are not falling over time, the aquifer is not being depleted. Similarly, and in support of that conclusion, the charts for yield, depth at which water is first found, and the depth of completed wells all show the same characteristics of variability, and a consistency within that variability that clearly indicates the aquifer is not being depleted.

If the problem is not the aquifer, then what is the problem at the well bore that causes well failure. First a well is a mechanical system (with no moving parts, but lots of moving water). All wells require maintenance, occasional repair, and eventually, replacement. What then is the damage that causes wells to go dry or loose production. First, wells can collapse due to spalling, sloughing, and processes of weathering. The material from the wall of the well can accumulate around the pump, or within the well bore, and plug the well. Wells in bedrock areas are often lined to reduce the impact of this action. The most likely cause of severe well problems in Lane County, however, is the accumulation of iron oxides at the well bore.

Iron is dissolved in varying amounts in all groundwater found in the bedrock areas of Lane County. As the aquifer water approaches the well bore it rapidly speeds up and looses pressure. The action of drawing the water level down in the well also pulls outside air into the well thus introducing oxygen into the well. These two changes cause the iron to chemically precipitate in a form that is very insoluble. The greater the pressure change and draw down the greater the chemical precipitation potential. Since the small cracks that supply water are limited in size and number, a relatively modest amount of precipitation can begin to seal off those cracks. As more and more cracks are sealed, the water flows faster through the remaining cracks thus, accelerating the plugging of the well.

How is this action prevented? It cannot be stopped, but it can be slowed significantly. By installing pumps that only pump a fraction of the well's potential yield limits draw down, and thus slows the entrance velocity of the water and oxygen introduction into the well bore. Usually this requires installing a storage tank, and pumping the well for much longer periods at low production. Then the storage tank is pumped for all the much higher flow rates for instantaneous demand necessary to run the dwelling. It also means that irrigation of any significant amount must be avoided.

As an example, a well that produces 7 gallons per minute should only be pumped at about 2 to 4 gallons per minute maximum (less than the instantaneous demand of the household!). A storage tank would be used. The result is a well that might normally need to be replaced in anything between 10 to 40 years may last for 40 to 100 years. Reducing water use is not a protection for the aquifer or the neighbors water supply, it is protective of the well itself and the water supply it provides.

Therefore I conclude that based upon my earlier analysis, and reviewing the data and statistic which were gleaned from these tables and charts, my analysis strongly supports that there is sufficient water supply for the proposed development, with little probability that adverse impacts will occur between neighboring wells.

If I can be of any further assistance in clarifying this matter please let me know.

Sincerely,

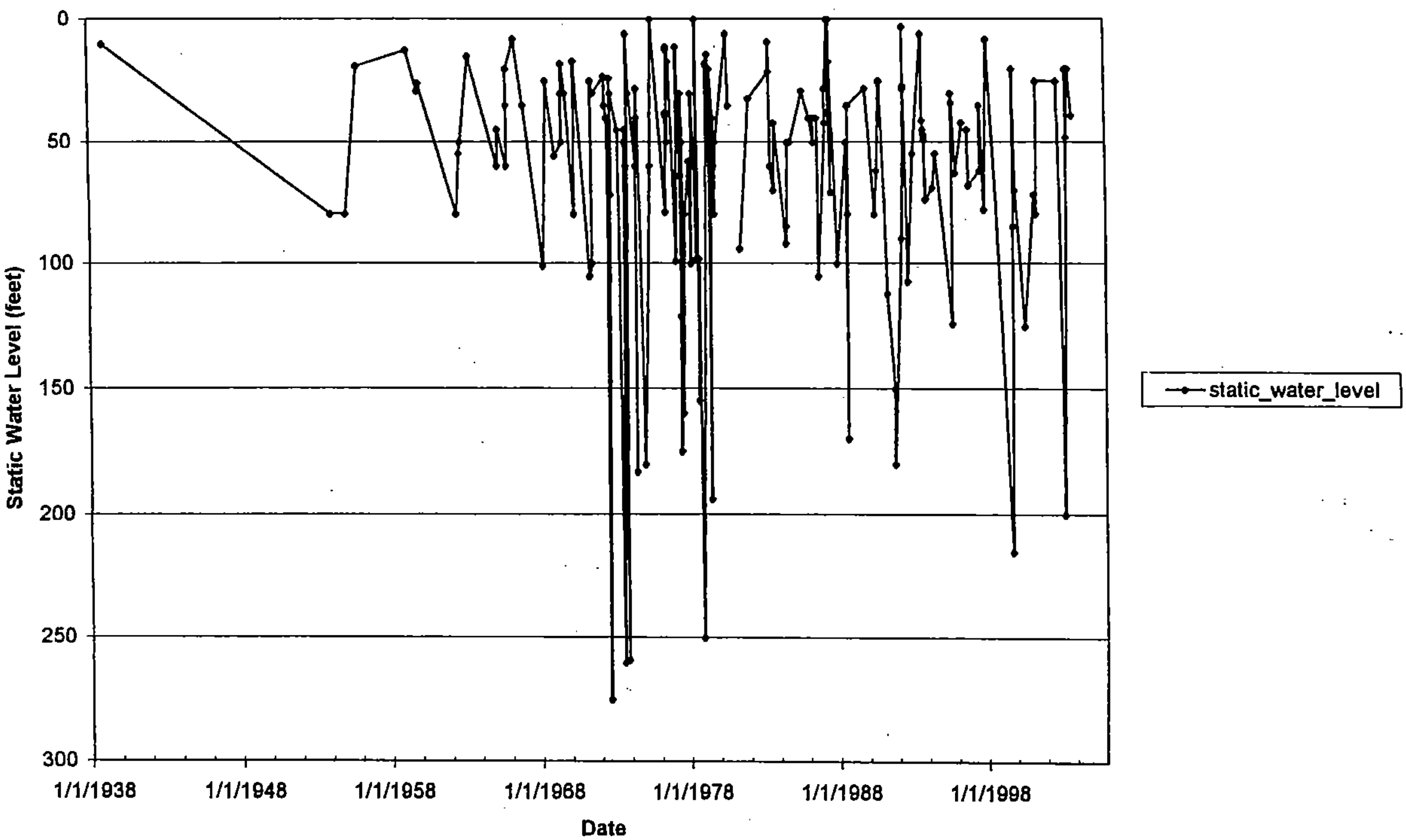
Ralph Christensen
Senior Geologist
EGR & Associates, Inc.

REGISTERED PROFESSIONAL
OREGON
RALPH W. CHRISTENSEN
G570
GEOLOGIST

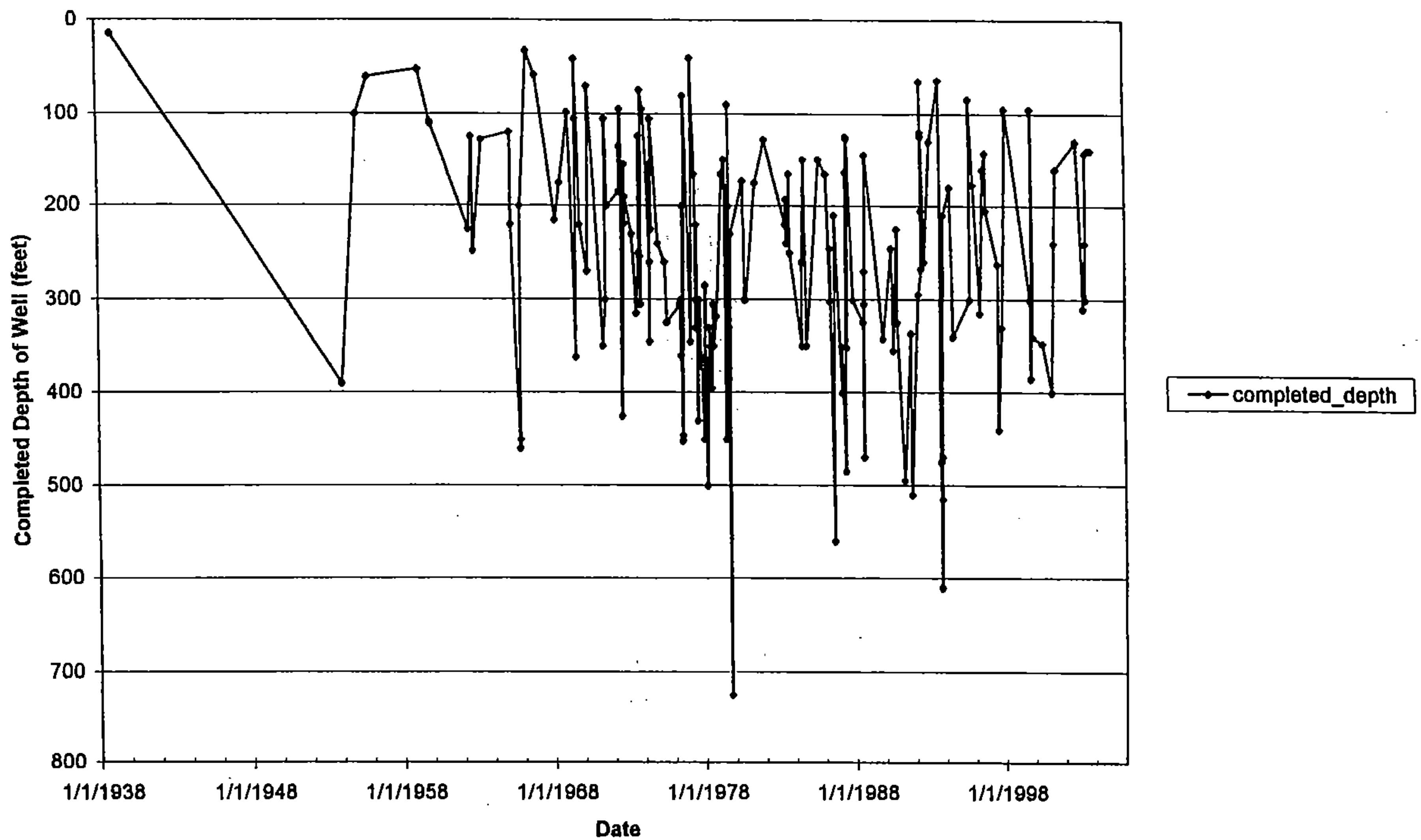
TABLE 1 - Multiple wells identified on single property

well log id	twp	twp char	rng	rng char	sec	qtr 40	qtr 160	tax_lot	name_last	name_first	first water	completed depth	complete date	street	type of log	static water level	yield	alter	deep	new	dom	irrig		Total # all dup. wells	Wells # drilled deeper	New 2nd wells #
2978	18	S	4	W	13	NE	NW	1407	MCKENZIE	BARRY	35	85	8/3/1992	1089 BROOKSI	W	28	20			X	X					
2977	18	S	4	W	13	NE	NW	1407	MCKENZIE	BARRY	35	205	8/4/1992	1089 BROOKSI	W	3	3			X	X			16	5	11
24189	18	S	4	W	13	NW	SW	1407	MCKENZIE	BARRY	40	84	8/25/1995	4998 BLANTON	W	30	2			X	X			SWL Lower		
24242	18	S	4	W	13	NW	SW	140700000	MCKENZIE	BARRY	41	84	8/28/1995		W	34	4			X	X					
18344	18	S	3	W	18	SW	NE		EUGENE MEMORIAL GARDENS, INC		0	390	12/31/1953		W	80	20			X		X		2		2
18345	18	S	3	W	18	SW	NE		EUGENE MEMORIAL GARDENS, INC		0	100	12/31/1954		W	80	17			X		X		SWL Same		
18361	18	S	3	W	19	NW	SW		JOHNSON	BOB A	0	120	3/8/1985		W	80	20			X	X					
18380	18	S	3	W	19	NW	SW		JOHNSON	BEN A	0	215	3/1/1988		W	101	30		X		X			11	1	10
18358	18	S	3	W	19		SW		ROBBINS	HARRY	130	225	7/17/1974		W	40	5			X	X			SWL Higher		
18352	18	S	3	W	19		SW		ROBBINS	HARRY	0	260	5/28/1975		W	80	6		X		X					
1334	18	S	3	W	19				SHOEMAKER	R L	298	345	6/12/1974	535 KINGSWO	W	183	7			X	X					
18348	18	S	3	W	19		SW	350700000	SHOEMAKER	RICHARD	70	300	9/12/1980		W	35	5			X	X					
18354	18	S	3	W	19				TEAGUE	TOM	48	105	7/18/1974		W	28	9.5			X	X					
18350	18	S	3	W	19				TEAGUE	TOM	147	380	7/2/1978		W	38	5		X							
18351	18	S	3	W	19				TEAGUE	TOM	110	300	7/8/1978		W	39	4.5			X	X					
17382	18	S	4	W	25				BUDMAN	L W		98	1/13/1989		W	58	8.3		X		X					
17383	18	S	4	W	25				HUDMAN	L W		58	12/15/1988		W	35	10			X	X					
16858	18	S	3	W	30				BALL	JOHN		128	4/28/1983		W	15	8.7			X	X					
16833	18	S	3	W	30				BALL	JOHN	87	254	10/20/1973		W	80	1.5			X	X					
16842	18	S	3	W	30				CARPENTER	SCOTT	298	305	6/9/1978		W	78	20			X	X					
16840	18	S	3	W	30				CARPENTER	SCOTT	280	318	11/3/1978		W	250	10			X	X					
16810	18	S	3	W	30	NE	SE		GROAT	JIM		163	5/26/1987		W	38	10			X	X					
62328	18	S	3	W	30	NE	SE	1800	GROAT	JIM	200	240	4/25/2003	85150 SPENCE	W	20	2			X	X					
62506	18	S	3	W	30			2800	GROAT	JIM	40	140	7/7/2003	85150 SPENCE	W	20	6			X	X					
4409	18	S	3	W	30	SE	NE	304	HAGAN	MIKE	183	210	11/18/1993	GLENFIDDICH	W	74	10			X	X					
51583	18	S	3	W	30	SE	NE	305	HAGAN	MIKE	190	205	9/28/1998	GLENFIDDICH	W	88	15			X	X					
1355	18	S	3	W	30				HENNINGSGAARD	LARRY	97	219	10/12/1972	1413 SANTA R	W	72	15			X	X					
16885	18	S	3	W	30	SW	NE		HENNINGSGAARD	L B	190	305	8/23/1978		W	155	8			X	X					
16872	18	S	3	W	30	SE	SE		JACKSON	BOB		300	8/22/1977		W	80	200	X			X					
16823	18	S	3	W	30		SE		JACKSON	BOB	30	173	8/9/1980		W	8	6			X	X					
16831	18	S	3	W	30				KING	CURTIS	45	150	5/15/1979		W	14	6.5			X	X					
16829	18	S	3	W	30				KING	CURTIS	45	180	6/27/1979		W	20	6.5			X	X					
61608	18	S	3	W	30	SW	SW	305	KING	CURTIS	80	130	9/23/2002	31810 GLENFI	W	25	12			X	X					
16889	18	S	3	W	30		NW		KING	KYLE	105	250	9/13/1973		W	50	3			X	X					
16886	18	S	3	W	30		NW		KING	KYLE	112	124	9/18/1973		W	45	15			X	X					
16815	18	S	3	W	30				KING	KYLE	0	302	5/14/1986		W	50	6.5			X	X					
16814	18	S	3	W	30				KING	KYLE	0	245	5/19/1986		W	40	4.5			X	X					
62882	18	S	3	W	30	NW	SW	801	KING	KYLE	43	140	9/24/2003	85192 S WILLA	W	39	15			X	X					
16852	18	S	3	W	30				KINNEY	JOSEPH WALTER	0	41	7/17/1968		W	18	2			X	X					
16838	18	S	3	W	30				KINNEY	J W	49	190	10/27/1972		W	30	15			X	X					
16821	18	S	3	W	30	SE	SE		KINNEY	WALT	70	220	8/5/1983		W	21	1.5			X	X					
1358	18	S	3	W	30	SE	NW		LEWIS	GEO	55	135	6/6/1972	RR 4 BOX 119	W	35	15			X	X					
3180	18	S	3	W	30	SW	NW		LEWIS	GEORGE	230	280	8/19/1992	85213 SO WILL	W	107	2.5		X		X					
16835	18	S	3	W	30				MCCORNACK	GEORGIA	95	230	4/3/1973		W	45	15			X	X					
16834	18	S	3	W	30				MCCORNACK	MRS ROD	0	240	12/27/1974		W	180	5	X			X					
16873	18	S	3	W	30		SW		MINSHALL	ROBERT	137	350	6/14/1978		W	98				X	X					
16863	18	S	3	W	30		SW		MINSHALL	ROBERT	0	350	9/8/1978		W	98		X			X					
16880	18	S	3	W	30				MOONEY	MR RICHARD	84	185	8/1/1977		W	84	15			X	X					
16813	18	S	3	W	30				MOONEY	RICHARD	0	210	8/28/1988		W	105	25			X	X					
16881	18	S	3	W	30				RANKIN	LEWIS	0	248	9/17/1982		W	50	300			X	X					
24157	18	S	3	W	30	SW	NW	400	RANKIN	LEWIS	147	300	8/24/1995	85263 S WILLA	W	124	2			X	X					
16830	18	S	3	W	30				SEUBERT	MR CHRIS	200	450	6/8/1979		W	194				X	X					
16819	18	S	3	W	30				SEUBERT	CHRISTOPHER	110	280	7/8/1984		W	85	2			X	X					
1354	18	S	3	W	30	NE	SW		SHEETS	JOHN	140	185	3/16/1979	820 1ST ST	W	18	10			X	X					
16822	18	S	3	W	30	NW	SE		SHEETS	JOHN	130	240	8/28/1983		W	80	7			X	X					
16882	18	S	3	W	30				STEINMULLER	J M	0	110	12/16/1959		W	28	7.5			X	X					
16884	18	S	3	W	30				STEINMULLER	G M	0	225	5/30/1962		W	80	16.7		X		X					
1356	18	S	3	W	30				WARD	GARY	80	95	7/12/1972	325 DELLWOO	W	40	5			X	X					
16837	18	S	3	W	30				WARD	GARY	98	450	12/30/1977		W	58				X	X					
16836	18	S	3	W	30				WOOD	ERSKIN	370	425	7/28/1972		W	275	3			X	X					
2408	18	S	3	W	30	SE	SE	2100	WOOD	ERSKIN		338	10/2/1991	85107 SPENCE	W	150	10			X	X					
57887	18	S	3	W	30			2100	WOOD	ERSKIN	180	340	11/3/1999	85107 SPENCE	W	70	3			X	X					

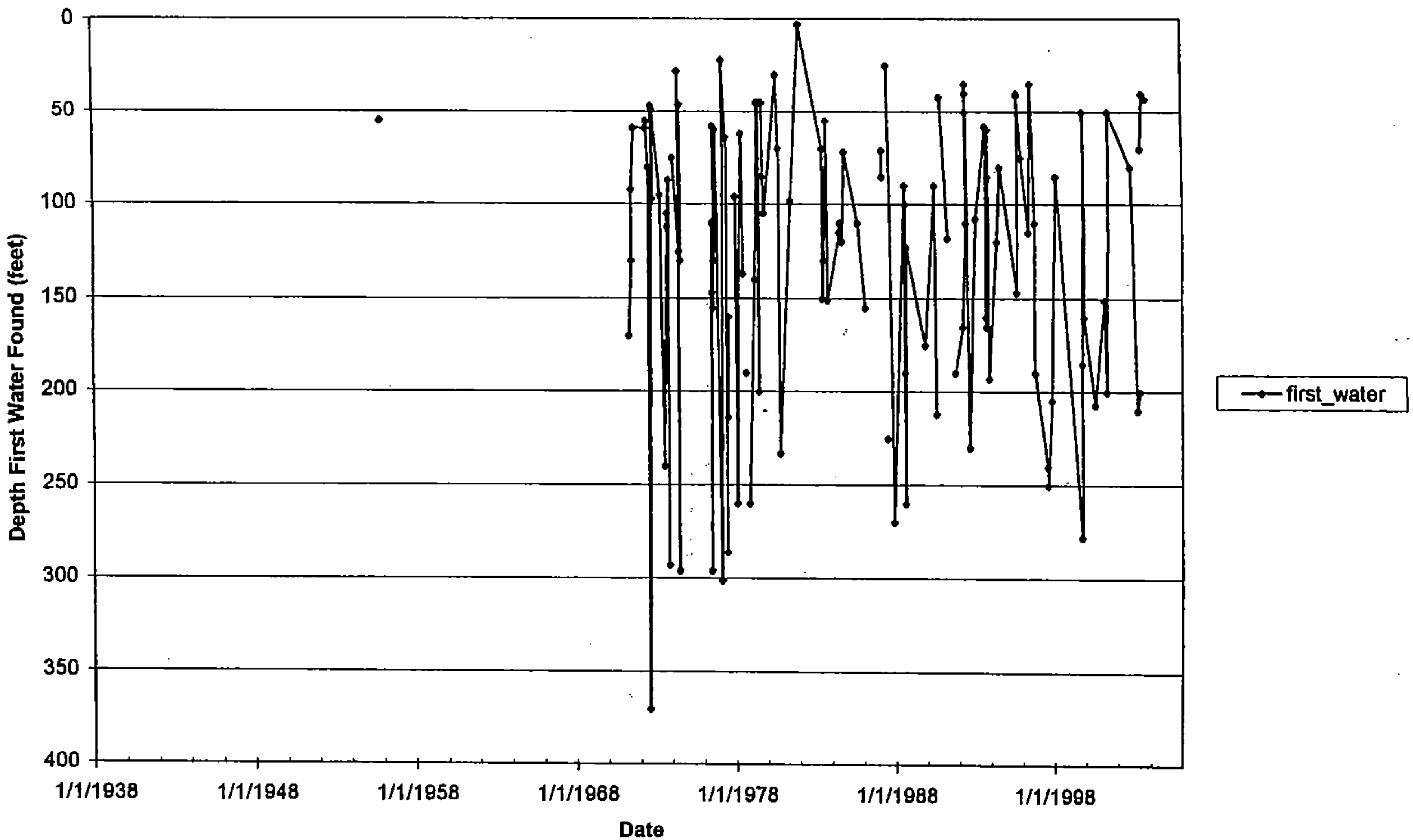
STATIC WATER LEVEL OVER TIME



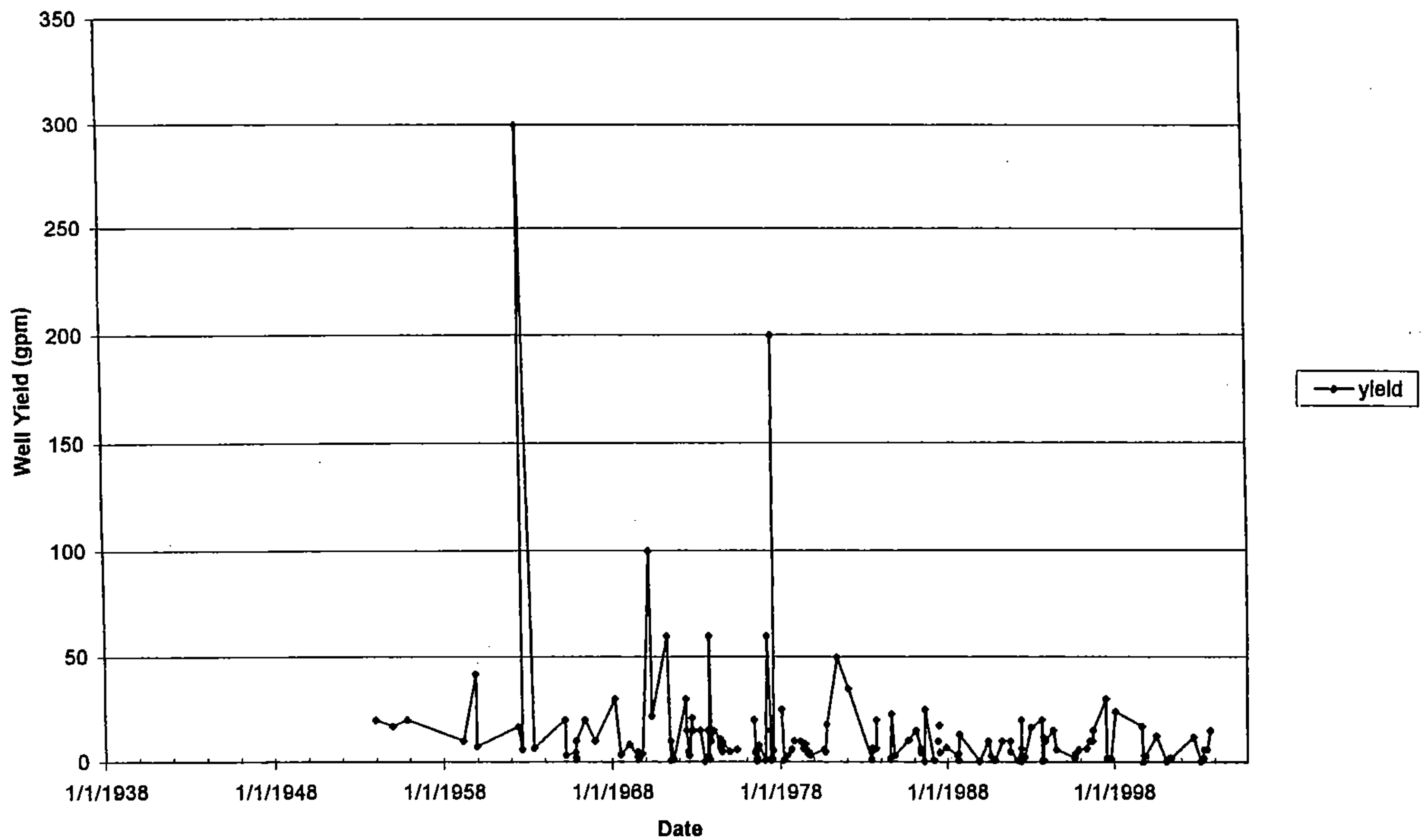
DEPTH OF WELLS OVER TIME



DEPTH TO FIRST WATER OVER TIME



WELL YIELD OVER TIME



200	50	-5.000000
40	40	1.750000
50	40	1.750000
60	40	1.750000
70	40	1.750000
50	50	1.750000
40	50	1.750000
50	50	1.750000
60	50	1.750000

LANE COUNTY MANAGEMENT

DRAWDOWN

COMPUTED DRAWDOWN (ft) AFTER 5 years OF PUMPING.
THE COMBINED CAPACITY OF 10 WELL(S) IS 1 usgpm.

Y-COORD	0	10	20	30	40	50	60	70	80	90
100 –	2.96	3.93	4.78	5.39	5.61	5.33	4.52	3.24	1.60	-0.27
90 –	6.51	8.06	9.54	10.70	11.29	11.11	10.11	8.37	6.13	3.62
80 –	9.98	12.27	14.59	16.59	17.77	17.76	16.44	14.01	10.92	7.59
70 –	13.23	16.41	19.95	23.31	25.50	25.78	23.91	20.31	15.93	11.50
60 –	15.99	20.11	25.36	31.26	35.25	36.05	33.23	27.33	20.91	15.10
50 –	17.90	22.63	29.42	43.00	49.60	51.33	47.66	34.30	23.17	17.88
40 –	18.75	23.35	29.51	37.55	49.82	52.41	49.58	41.87	27.15	19.19
30 –	18.60	22.55	27.30	32.68	37.53	39.28	37.39	32.28	25.21	18.73
20 –	17.75	20.91	24.37	27.77	30.35	31.19	29.83	25.50	21.95	17.16
10 –	16.50	18.95	21.41	23.59	25.07	25.40	24.34	22.02	18.82	15.22
0 –	15.08	16.94	18.69	20.13	20.99	21.04	20.17	18.44	16.05	13.27

X-COORD

Y-COORD	
100 –	-2.25
90 –	1.03
80 –	4.27
70 –	7.35
60 –	10.06
50 –	12.11
40 –	13.23
30 –	13.34
20 –	[illegible]

DRAWDOWN

PROJECT: CHET BOWERS FILE #: 1
LOCATION: SPENCER BUTTE

CROSS SECTION. THE AQUIFER IS NONLEAKY CONFINED.

```
---------------- | -----GROUND ELEVATION (ft asl): 1000
---------------- | -----WATER LEVEL (ft asl): 950
/ / / / / / / / / / / / /
/ / / / / / / / / / / / /
---------------- | -----TOP OF AQUIFER (ft asl): 900
+ + + + + + + + + + + + +
+ + + + + + + + + + + + +
-------------------------BOTTOM OF AQUIFER (ft asl): 500
```

PERMEABILITY (usgpd/ft2): .35 STORAGE COEFFICIENT: .000005

WELL DATA

X-COORDINATE (ft)	Y-COORDINATE (ft)	PUMPING RATE (usgpm)
50	200	10.000000
200	50	-5.000000
40	40	1.750000
50	40	1.750000
60	40	1.750000
70	40	1.750000
30	50	1.750000
40	50	1.750000
[illegible]	[illegible]	1.750000

Bowers.

DRAWDOWN

COMPUTED DRAWDOWN (ft) AFTER 25 years OF PUMPING.
THE COMBINED CAPACITY OF 10 WELL(S) IS-1 usgpm.

Y-COORD	0	10	20	30	40	50	60	70	80	90
100 -	1.64	2.61	3.47	4.07	4.29	4.01	3.20	1.92	0.28	-1.59
90 -	5.19	6.75	8.22	9.38	9.98	9.80	8.79	7.06	4.81	2.31
80 -	8.67	10.95	13.28	15.27	16.46	16.44	15.12	12.70	[illegible]	6.27
70 -	11.92	15.09	18.63	21.99	24.19	24.46	22.59	19.00	[illegible]	10.18
60 -	14.67	18.79	24.05	29.95	33.94	34.74	31.91	26.01	[illegible]	13.78
50 -	16.59	21.32	28.10	41.68	48.28	50.02	46.35	32.99	[illegible]	16.57
40 -	17.43	22.04	28.20	36.23	48.51	51.09	48.26	40.55	25.83	17.87
30 -	17.28	21.24	25.99	31.36	36.21	37.97	36.07	30.96	23.89	17.42
20 -	16.43	19.60	23.05	26.45	29.04	29.87	28.52	25.18	20.64	15.85
10 -	15.18	17.63	20.09	22.28	23.76	24.08	23.03	20.70	17.50	13.90
0 -	13.76	15.62	17.38	18.81	19.67	19.72	18.86	17.13	[illegible]	11.95

X-COORD

Y-COORD	100
100 -	-3.56
90 -	-0.28
80 -	2.95
70 -	6.03
60 -	8.74
50 -	10.80
40 -	11.92
30 -	12.03
20 -	11.36
10 -	10.27
0 -	9.01

X-COORD

****** - WATER LEVEL HAS DROPPED BELOW BOTTOM OF AQUIFER.

LANE COUNTY MANAGEMENT

X-COORD

****** - WATER LEVEL HAS DROPPED BELOW BOTTOM OF AQUIFER.

LANE COUNTY MANAGEMENT

DRAWDOWN

COMPUTED DRAWDOWN (ft) AFTER 15 years OF PUMPING.
THE COMBINED CAPACITY OF 10 WELL(S) IS 1 usgpm.

Y-COORD	0	10	20	30	40	50	60	70	80	90
100 -	2.06	3.03	3.88	4.49	4.71	4.43	3.62	2.34	0.70	-1.17
90 -	5.61	7.17	8.64	9.80	10.39	10.22	9.21	7.47	5.23	2.72
80 -	9.09	11.37	13.69	15.69	16.88	16.86	15.54	[illegible]	[illegible]	[illegible]
70 -	13.34	15.51	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
60 -	15.09	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
50 -	17.01	21.73	28.52	42.10	48.70	50.44	46.76	33.41	24.27	16.98
40 -	17.85	22.45	28.61	36.65	48.92	51.51	48.68	40.97	28.25	18.29
30 -	17.70	21.65	26.41	31.78	36.63	38.38	36.49	31.38	24.31	17.83
20 -	16.85	20.01	23.47	26.87	29.46	30.29	28.93	25.60	21.05	16.26
10 -	15.60	18.05	20.51	22.70	24.17	24.50	23.44	21.12	17.92	14.32
0 -	14.18	16.04	17.79	19.23	20.09	20.14	19.27	17.54	15.15	12.37

X-COORD

Y-COORD
90 = 0.15
60 = 6.43
50 = 9.15
Y-COORD = 11.22

LANE COUNTY MANAGEMENT
X-COORD
****** - WATER LEVEL HAS DROPPED BELOW BOTTOM OF AQUIFER.

Y-COORD X-COORD

****** - WATER LEVEL HAS DROPPED BELOW BOTTOM OF AQUIFER

LANE COUNTY MANAGEMENT

DRAWDOWN

PROJECT: CHET BOWERS FILE #: 1
LOCATION: SPENCE BUTTE

400

180

CROSS SECTION. THE AQUIFER IS NONLEAKY CONFINED.

GROUND ELEVATION (ft asl): 1000

400 X .175 70 gpd/ft.

WATER LEVEL (ft asl): 950

TOP OF AQUIFER (ft asl): 900

BOTTOM OF AQUIFER (ft asl): 500

PERMEABILITY (usgpd/ft2): 175 STORAGE COEFFICIENT: .000005

WELL DATA

X-COORDINATE	Y-COORDINATE	PUMPING RATE

1250	[illegible]	-4.000000
5000	1250	1.750000
1000	1000	1.750000
1000	1250	1.750000
1000	1500	1.750000
1000	1750	1.750000
1250	750	1.750000
1250	1000	1.750000
1250	1250	1.750000
1250	1500	1.750000

LANE COUNTY MANAGEMENT

DRAWDOWN

COMPUTED DRAWDOWN (ft) AFTER 3 years OF PUMPING.
THE COMBINED CAPACITY OF 10 WELL(S) IS 0 usgpm.

Y-COORD	0	250	500	750	1000	1250	1500	1750	2000	2250
2500 -	31.58	34.43	37.09	39.07	39.70	38.53	35.71	31.81	27.39	22.86
2250 -	38.94	43.28	47.76	51.64	53.47	51.99	47.74	42.08	[illegible]	30.02
2000 -	45.86	51.93	58.87	66.20	71.07	68.27	61.11	52.70	[illegible]	36.82
1750 -	51.90	59.66	69.35	81.78	120.42	88.06	75.49	63.02	[illegible]	42.88
1500 -	56.50	65.50	77.26	93.29	137.15	134.54	88.65	71.57	[illegible]	47.70
1250 -	59.26	68.68	81.09	98.22	143.98	143.06	95.46	76.48	62.19	50.84
1000 -	60.09	69.00	80.41	95.71	139.82	140.59	94.87	76.91	63.16	52.11
750 -	59.20	66.90	76.10	86.89	97.72	128.27	87.73	73.32	61.55	51.62
500 -	57.08	63.28	70.06	76.90	82.39	83.40	76.61	67.24	58.14	49.80
250 -	54.23	59.02	63.81	68.04	70.70	70.42	66.65	60.66	[illegible]	47.18
0 -	51.08	54.70	58.04	60.68	62.01	61.45	58.85	54.68	[illegible]	44.25

X-COORD

Y-COORD

2500 -	18.43
2250 -	24.39
2000 -	29.93
1750 -	34.81
1500 -	38.72
1250 -	41.44
1000 -	42.86
750 -	43[illegible]

200	50	-5.000000
40	40	1.750000
50	40	1.750000
60	40	1.750000
70	40	1.750000
50	50	1.750000
40	50	1.750000
50	50	1.750000
60	50	1.750000

LANE COUNTY MANAGEMENT

DRAWDOWN

COMPUTED DRAWDOWN (ft) AFTER 5 years OF PUMPING.
THE COMBINED CAPACITY OF 10 WELL(S) IS 1 usgpm.

Y-COORD \ X-COORD	0	10	20	30	40	50	60	70	80	90
100 -	2.96	3.93	4.78	5.39	5.61	5.33	4.52	3.24	1.60	-0.27
90 -	6.51	8.06	9.54	10.70	11.29	11.11	10.11	8.37	6.13	3.62
80 -	9.98	12.27	14.59	16.59	17.77	17.76	16.44	14.01	10.92	7.59
70 -	13.23	16.41	19.95	23.31	25.50	25.78	23.91	20.31	[illegible]	11.50
60 -	15.99	20.11	25.36	31.26	35.25	36.05	33.23	27.33	[illegible]	15.10
50 -	17.90	22.63	29.42	43.00	49.60	51.33	47.66	34.30	25.17	17.88
40 -	18.75	23.35	29.51	37.55	49.82	52.41	49.58	41.87	27.15	19.19
30 -	18.60	22.55	27.30	32.68	37.53	39.28	37.39	32.28	25.21	18.73
20 -	17.75	20.91	24.37	27.77	30.35	31.19	29.83	25.50	21.95	17.16
10 -	16.50	18.95	21.41	23.59	25.07	25.40	24.34	22.02	18.82	15.22
0 -	15.08	16.94	18.69	20.13	20.99	21.04	20.17	18.44	16.05	13.27

100 -	-2.25
90 -	1.03
80 -	4.27
70 -	7.35
60 -	10.06
50 -	12.11
40 -	13.23
30 -	13.34
20 -	[illegible]

DRAWDOWN

PROJECT: CHET BOWERS   FILE #: 1
LOCATION: SPENCER BUTTE

CROSS SECTION. THE AQUIFER IS NONLEAKY CONFINED.

```
---------------  |-----GROUND ELEVATION (ft asl): 1000
                 |
---------------  |-----WATER LEVEL (ft asl): 950
/ / / / / / / / /|/ / /
/ / / / / / / / /|/ / /-----TOP OF AQUIFER (ft asl): 900
+ + + + + + + + +|+ + +
+ + + + + + + + + + + + +
-----------------------BOTTOM OF AQUIFER (ft asl): 500
```

PERMEABILITY (usgpd/ft2): .35   STORAGE COEFFICIENT: .000005

WELL DATA

X-COORDINATE (ft)	Y-COORDINATE (ft)	PUMPING RATE (usgpm)
50	200	10.000000
200	50	-5.000000
40	40	1.750000
50	40	1.750000
60	40	1.750000
70	40	1.750000
30	50	1.750000
40	50	1.750000
[illegible]	[illegible]	1.750000

EXHIBIT "F"

AFFIDAVIT

STATE OF OREGON)
) ss.
County of Lane)

I, Art Moshofsky, after being duly sworn, depose and say:

1. I owned property located in Lane County, Oregon, described as Assessor's Map No. 18-04-24, tax lot 0300, during the period from January 1, 1978 through January 1, 1983.

2. At no time during the period stated in paragraph 1. above was the above described property managed as part of a farming operation. By "farm operation" I mean the employment of the subject property for the primary purpose of obtaining a profit in money. By "farm operation" I also mean all uses and activities defined as "farm use" and "current employment" of land in ORS 215.203(2).

3. This affidavit is consistent with and further clarifies that affidavit of mine, dated April15, 1997, a copy of which is attached hereto and by this reference incorporated herein.

Art Moshofsky (signature)
Art Moshofsky

SIGNED AND SWORN to before me this 17 day of December, 2003, by Art Moshofsky.

OFFICIAL SEAL
SHAUN BOYLAN
NOTARY PUBLIC-OREGON
COMMISSION NO. 364541
MY COMMISSION EXPIRES JAN 9, 2007

Notary Public for Oregon
My commission expires: 1/9/07

AFFIDAVIT

State of Oregon
County of Lane

Before me this day personally appeared Art Moshofsky, who, first being duly sworn, deposes and says:

I owned property located in Lane County, Oregon described as Assessor's Map Number 18-04-24, tax lot 00300, during the period from January 1, 1978 through January 1, 1983. Said property is shown on attached Exhibit A which is made a part of this affidavit.

At no time during that period was the above described property managed as part of a farm operation. By "farm operation" I mean the raising, harvesting or processing of any crop or livestock with the intent of making a profit in money. Farm operation also means land which is laying fallow as part of any farm-related government program.

The property was not assessed as farm land for ad valorem property tax purposes during the above described time period.

Art Moshofsky

Sworn to and subscribed before me this 15th day of April 1997

Patricia A. Breese

Notary Public
State of Oregon
My commission expires 1/20/2001

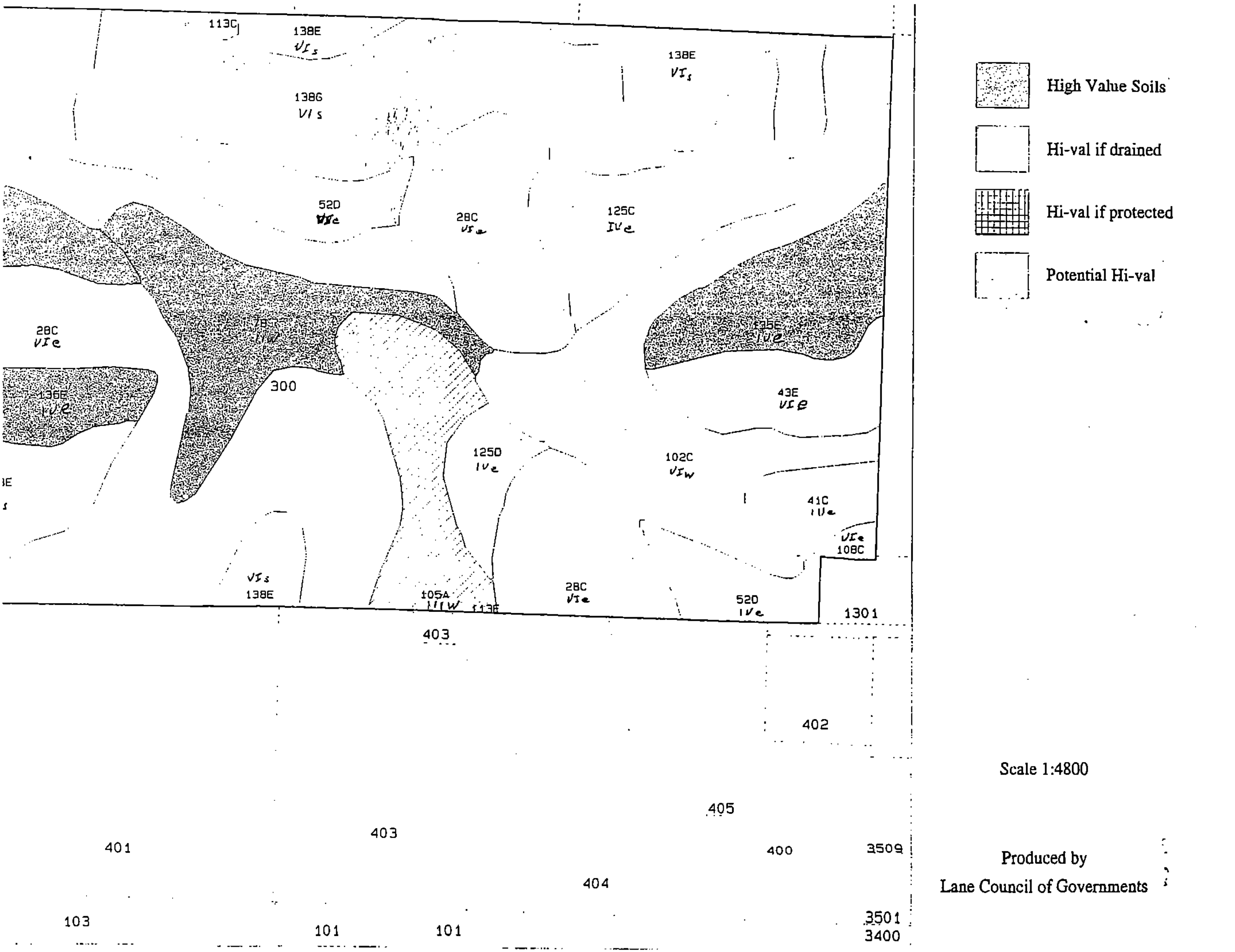
OFFICIAL SEAL
PATRICIA A. BREESE
NOTARY PUBLIC - OREGON
COMMISSION NO. 060995
MY COMMISSION EXPIRES JANUARY 20, 2001

OFFICIAL SEAL
PATRICIA A. BREESE
NOTARY PUBLIC - OREGON
COMMISSION NO. 060995
MY COMMISSION EXPIRES JANUARY 20, 2001

EXHIBIT "G"
SOI AP UNITS IN ACRES
FOR (18042400 LOT 00300

AP NIT YMBOL	AREA IN ACRES	PERCENT	SOIL NAME	COMPONENT NAME	AGRICULTURAL CAPABILITY CLASS
3E	28.514	8.897	DIXONVILLE-PHILOMATH-HAZELAIR COMPLEX, 12 TO 35 PERCENT SLOPES		
				DIXONVILLE	4
				PHILOMATH	6
				HAZELAIR	4
.8C	79.842	24.912	CHEHULPUM SILT LOAM, 3 TO 12 PERCENT SLOPES		
				CHEHULPUM	6
.38G	37.011	11.548	WITZEL VERY COBBLY LOAM, 30 TO 75 PERCENT SLOPES		
				WITZEL	6
.13C	0.371	0.116	RITNER COBBLY SILTY CLAY LOAM, 2 TO 12 PERCENT SLOPES		
				RITNER	4
.38E	27.256	8.504	WITZEL VERY COBBLY LOAM, 3 TO 30 PERCENT SLOPES		
				WITZEL	6
i3C	10.161	3.171	DIXONVILLE-PHILOMATH-HAZELAIR COMPLEX, 3 TO 12 PERCENT SLOPES		
				DIXONVILLE	3
				PHILOMATH	6
				HAZELAIR	4
;2D	13.864	4.326	HAZELAIR SILTY CLAY LOAM, 7 TO 20 PERCENT SLOPES		
				HAZELAIR	4
.02C	34.574	10.788	PANTHER SILTY CLAY LOAM, 2 TO 12 PERCENT SLOPES		
				PANTHER	6
.25C	9.042	2.821	STEIWER LOAM, 3 TO 12 PERCENT SLOPES		
				STEIWER	3
l1C	12.157	3.793	DIXONVILLE SILTY CLAY LOAM, 3 TO 12 PERCENT SLOPES		
				DIXONVILLE	3
l35E	27.358	8.536	WILLAKENZIE CLAY LOAM, 20 TO 30 PERCENT SLOPES		
				WILLAKENZIE	4
78	15.009	4.683	MCALPIN SILTY CLAY LOAM		
				MCALPIN	2
l05A	11.637	3.631	PENGRA SILT LOAM, 1 TO 4 PERCENT SLOPES		

108C	9.746	3.041	PHILOMATH COBBLY SILTY CLAY, 3 TO 12 PERCENT SLOPES		
				PHILOMATH	6
125D	3.950	1.233	STEIWER LOAM, 12 TO 20 PERCENT SLOPES		
				STEIWER	4
113E	0.000	0.000	RITNER COBBLY SILTY CLAY LOAM, 12 TO 30 PERCENT SLOPES		
				RITNER	6



High Value Soils
Hi-val if drained
Hi-val if protected
Potential Hi-val
113C
138E
VIs
138G
VIs
52D
28C
125C
IVe
28C
VIe
300
43E
VIe
125D
IVe
102C
VIw
41C
IVe
108C
138E
105A
IIIw
52D
1301
403
402
Scale 1:4800
405
401
403
400
3509
404
103
101
101
3501
3400
Produced by
Lane Council of Governments

Marc E. Setchko
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April 8, 2004

Lane County Planning Commission

RE: Lane County File #PA 03-5657, Dahlen; Response to Goal One Coalition Letter dated February 5, 2004

Members of the Planning Commission:

In December, 2003, I submitted a Forest Productivity Analysis on the Dahlen Trust South Willamette Parcel. On page three of that report I erroneously used the wrong Site Class Index. I pulled these Site Class numbers from the Lane County Soil Ratings for Forestry and Agriculture. Some of the ratings are given using 50-year Site Index numbers; some of the ratings are given using 100-year Site Index numbers. This can create some confusion when using the data; I mistakenly converted three Site Indexes from 100 year to 50 year. The numbers I converted were **already** 50 year Site Index numbers. Therefore, I have recalculated the figures used in my income calculations to reflect the correct numbers (see page 3 of my original analysis).

CALCULATIONS:

Site Index Ratings from Tables (see Exhibit 1)

	Acres	50 Year Site Index
Dixonville silty clay loam	12.157	109
Ritner cobbly silty clay loam	.371	107
Willakenzie clay loam	27.358	110

The remaining soil types have no Site Index given. However, there is one soil type, the Dixonville-Philomath-hazelair complex, which is assigned a cu.ft./ac./yr. growth figure (see Exhibit 1). Type 43C has a growth figure of 54 cu.ft./ac./yr. and 43E has a growth figure of 63 cu.ft./ac./yr. Taking these figures and dividing by 154 cu.ft./ac./yr. (the growth that the Willakenzie clay loam is capable of acheiving) gives a ratio that can be applied to the board feet per acre shown below. This gives a volume figure for the Dixonville-Philomath-hazelair complex.

Dixonville silty clay loam - 12.157 acres @ 23,872 bd.ft./ac.*	290,212 bd.ft.
Ritner cobbly silty clay loam - .371 acres @ 23,005 bd.ft./ac.*	8,535 bd.ft.
Willakenzie clay loam - 27.358 acres @ 24,305 bd.ft./ac.*	664,937 bd.ft.
Dixonville-Philomath-hazelair complex 43C -10.161ac. @ 8,522 bd.ft./ac.	86,597 bd.ft.
Dixonville-Philomath-hazelair complex 43E -28.514ac. @ 9,943 bd.ft./ac.	283,513 bd.ft.
Total - 78.561 acres of conifer producing forestland	1,333,794 bd.ft.

*See Exhibit 3.

From Page 4 and 5 of my original analysis.

Remaining soil types - ±138 acres @ 20% of 19,972 bd.ft./ac.	551,227 bd.ft.
TOTAL VOLUME FOR ENTIRE PARCEL	1,885,021 bd.ft.

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A 50 year old stand on this site should have approximately 40% 2 SAW, 50% 3 SAW and 10% 4 SAW. If anything, these grade estimates err on the high side. In all probability there would be less 2 SAW and more 4 SAW. However, these figures are used to represent the highest possible log price scenario for the applicant.

Total Volume - 1,885.02 MBF (thousand board feet)

754.01 MBF of 2 SAW @ $255/MBF**	$192,273
942.51 MBF of 3 SAW @ $215/MBF**	202,640
55.12 MBF of 4 SAW @ $200/MBF**	37,700
Total Projected Gross Revenue	$432,613

**See Exhibit 4.

TOTAL AVERAGE GROSS INCOME -- $432,613 ÷ 50 YEARS = $8,652/YEAR

IV. CONCLUSION

The analysis presented shows conclusively that this property will not support a merchantable stand of timber, of sufficient production capability, to meet or exceed the Marginal Lands Income test. The estimated gross income based on a 50 year rotation for the 320.492 acre site would have been $432,612 in 1983. The average annual gross income would have been $8,652/year. Because $8,652 is less than $10,000/year, the property meets the following statutory test for Marginal Lands: ORS 197.247 (1)(a) "The proposed marginal land was not managed during three of the five calendar years preceding January 1, 1983, as part of a ... forest operation capable of producing an average, over the growth cycle, of $10,000 in annual gross income."

In summary, I find from the specific site conditions present, empirical yield tables, SCS data, Lane County Data and experience with similar lands, that this property is ill suited to the production of timber and use as land for forestry purposes. It is my opinion that this parcel meets the criteria for marginal land status.

Sincerely,

Marc E. Setchko

Marc E. Setchko
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FOREST PRODUCTIVITY ANALYSIS
for
Dahlen Trust

SUBJECT PARCEL: ASSESSORS MAP NO. 18-04-24
Tax Lot 300, totalling ±320.492 acres.

I. INTRODUCTION

An evaluation of the site, as described above, from a timber productivity and income producing standpoint is reviewed in this analysis. The analysis will determine if:
1) The subject property produces less than 85 cu. ft./ac./yr. of conifer timber volume. This has been determined by Lane County, and the State of Oregon, to be the measuring parameter for marginal soils.
2) The income generated averages less than $10,000/year, based on 1978 through 1983 log prices. If this is the case, the property meets the following statutory test for Marginal Lands: ORS 197.247 (1)(a) "The proposed marginal land was not managed during three of the five calendar years preceding January 1, 1983, as part of a ... forest operation capable of producing an average, over the growth cycle, of $10,000 in annual gross income."

The above figures can be calculated by:
1. Using actual cutout data from when any logging was done on the parcel.
2. Using a combination of the 1) Lane County Soil Ratings for Forestry & Agriculture (August, 1997), 2) U.S. Dept. of Agriculture SCS Data, as presented in the Soil Survey of Lane County Area, 3) Lane County Soil Ratings taken from the Office of the State Forester Memorandum (Feb. 8, 1990 General File 7-1-1) and 4) estimates of growth from the CMAI (Culmination of Mean Annual Increment) FOR DOUGLAS-FIR Table and the Empirical Yield Tables for the Douglas-fir Zone, Washington Department of Natural Resources by Charles Chambers and Franklin Wilson.

II. SITE INFORMATION

The subject parcel is 320.492 acres in size. Terrain throughout the site is rolling with knolls and swales on either side of a valley running from the southeast portion of the parcel up through the northwest portion, with Spencer Creek running through the middle of this valley. Slopes throughout the property range from 10-35%, with a few steeper pitches in places. The parcel has all aspects from north to south, west to east and every combination in between. Grasses, blackberry, poison oak, scrub white oak and other hardwoods cover most of the property, with bedrock just beneath the surface or exposed in places. Broken rock and cobbly soils, with high concentrations of clay, are prevalent throughout the parcel. There are also scattered Douglas-fir, ponderosa pine and incense cedar, left from previous logging activities. An LCOG soil survey confirms SCS map data, which shows the parcel is composed of twelve different soil types (see Soils Map included with Jim Belknap's report). Over half of the property (≈188.429 acres) is underlaid with Chehulpum silt loam (Soil Type 28C), Panther silty clay loam (Soil Type 102C), Philomath cobbly silty clay (Soil Type 108C) and Witzell very cobbly loam (Soil Type 138E & G). These soil types are extremely poor for growing conifers. The remaining portions of the parcel are underlaid with Dixonville silty clay loam (Soil Type 41C), Dixonville-Philomath-Hazelair complex (Soil Types 43C and E), Hazelair silty clay loam (Soil Type 52D), McAlpin silty clay loam (Soil Type 78), Pengra silt loam (Soil Type 105A), Ritner cobbly silty clay loam (Soil Type 113C), Steiwer loam (Soil Type 125C) and Willakenzie clay loam (Soil Type 135E).

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Of these soil types, only the Ritner cobbly silty clay loam, the Dixonville silty clay loam and the Willakenzie clay loam are good soils for growing conifer, and these particular soil types only cover approximately 40 acres of the entire parcel. The Dixonville-Philomath-hazelair complex is marginally suited for conifer growth, but covers only ±39 acres of the property. The other soil types are primarily suited for grassland and noncommercial hardwood species.

The Lane County Soil Ratings for Forestry and Agriculture (see Exhibit 1) show a 100 year site class rating for only three of these soil types, the Dixonville silty clay loam, the Ritner cobbly silty clay loam and the Willakenzie clay loam. A cu.ft./ac./yr. growth figure is shown for the Dixonville-Philomath-Hazelair complex, but not a site class rating. The remaining soil types are very poor conifer growing soils and have no forestland site class rating or cu.ft./ac./yr. growth figure shown in the Lane County Soil Ratings.

III. RESULTS OF PRODUCTIVITY AND INCOME CALCULATIONS

CUBIC FEET PER YEAR PER ACRE GROWTH

The Land Management Division of Lane County has agreed that the above described parcel does not produce more than 85 cu.ft./ac./yr., the standard used to determine if the land meets the criteria for marginal lands status (see letter to Jim Belknap from Jerry Kendall dated October 14, 2003).

AVERAGE GROSS ANNUAL INCOME GENERATED PER YEAR THROUGH A COMPLETE ROTATION

The property was logged in 1990. Since no cutout records are available, the Empirical Yield Tables were used to obtain total volume per acre in scribner board feet volume, the measurement needed in order to calculate income potential. These yield tables are calculated using King's 50 year site class index. Since the Lane County Soil Ratings for Forestry and Agriculture are based on McArdle's 100 year site index rating, these ratings must be converted first. Using the 50 year Site Index ratings, for each different soil type, the volume per acre for each soil type can be calculated. Adding all the soil types together will give a total for the entire parcel. A fifty year rotation (growth cycle to final harvest) was used, as this is the rotation age accepted by Lane County (Issue 5: Supplement to Marginal Lands Information Sheet, 1997). The State of Oregon also accepts this rotation.

Once a total volume at harvest age has been calculated, the average gross annual income can be found by dividing the total revenue at the time of harvest by the number of years in the rotation. Since the Empirical Yield Tables are based on Douglas-fir volumes, Douglas-fir log prices were used, as this is the predominant commercial species in western Oregon. This should also give the highest figure because Ponderosa pine has historically never been worth as much as Douglas-fir, and incense cedar was worth very little in 1978-83.

Using industry-recognized price information from the Oregon State Department of Forestry Quarterly Report of Douglas-fir log prices for 1983, the gross worth of a fully stocked stand on this parcel can be calculated, for the time period required by the Marginal Lands Statute ORS 197.247 (1)(a). By calculating a gross worth based on a fully stocked stand of Douglas-fir, a maximum gross worth scenario for the applicant can be shown.

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CALCULATIONS:

Site Index Ratings from Tables (see Exhibit 2)

	Acres	100 Year Site Index	50 Year Site Index
Dixonville silty clay loam	12.157	109	96
Ritner cobbly silty clay loam	.371	107	95
Willakenzie clay loam	27.358	110	97

The remaining soil types have no Site Index given. However, there is one soil type, the Dixonville-Philomath-hazelair complex, which is assigned a cu.ft./ac./yr. growth figure (see Exhibit). Type 43C has a growth figure of 54 cu.ft./ac./yr. and 43E has a growth figure of 63 cu.ft./ac./yr. Taking these figures and dividing by 154 cu.ft./ac./yr. (the growth that the Willakenzie clay loam is capable of acheiving) gives a ratio that can be applied to the board feet per acre shown below. This gives a volume figure for the Dixonville-Philomath-hazelair complex.

Dixonville silty clay loam - 12.157 acres @ 18,067 bd.ft./ac.*	219,641 bd.ft.
Ritner cobbly silty clay loam - .371 acres @ 17,591 bd.ft./ac.*	6,526 bd.ft.
Willakenzie clay loam - 27.358 acres @ 18,543 bd.ft./ac.*	507,299 bd.ft.
Dixonville-Philomath-hazelair complex 43C - 10.161ac. @ 6,502 bd.ft./ac.	66,067 bd.ft.
Dixonville-Philomath-hazelair complex 43E - 28.514ac. @ 7,586 bd.ft./ac.	216,307 bd.ft.
Total - 78.561 acres of conifer producing forestland	1,015,840 bd.ft.

*See Exhibit 3.

A 50 year old stand on this site should have approximately 40% 2 SAW, 50% 3 SAW and 10% 4 SAW. If anything, these grade estimates err on the high side. In all probability there would be less 2 SAW and more 4 SAW. However, these figures are used to represent the highest possible log price scenario for the applicant.

Total Volume - 1,015.84 MBF (thousand board feet)

406.34 MBF of 2 SAW @ <u>$255/MBF</u>**	$103,617
507.92 MBF of 3 SAW @ <u>$215/MBF</u>**	109,203
101.58 MBF of 4 SAW @ <u>$200/MBF</u>**	20,316
Total Projected Gross Revenue	$233,136

**See Exhibit 4.

AVERAGE GROSS INCOME -- $233,136 ÷ 50 YEARS = <u>$4,663/YEAR</u>

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The volume calculations shown exclude ±242 acres, some of which has grown timber in the past and/or has timber on it at the present time. Of these acres, approximately 104 acres are grassland or areas with widely scattered small scrub white oak and poison oak, with blackberry creeping in. Due to shallow or nonexistent soils, rock and wet areas, these areas will not even support hardwood stands and have never had conifer growing on them. They are natural grassland meadows. The remaining ±138 acres are, or were in the recent past (before logging), poorly stocked stands of hardwoods and conifers mixed together. The soils in these areas are shallow, rocky and in some areas too wet to support a fully stocked stand of conifers. The conifers growing are scattered and/or clumped in pockets of soil capable of sustaining growth. These pockets are scattered throughout areas which are too wet for conifers to grow, too rocky to allow any trees a foothold or too shallow to allow for root growth. All of these factors are evident on the ground or within the existing stands of trees growing in areas classified as nonproductive. Plots taken within these stands or areas, to determine the number of conifers per acre growing (or the number that were there prior to logging activities), show that 48.5 conifer trees (primarily Douglas-fir) per acre are growing or were growing before logging activities. Further observations show that in areas which were logged, then planted to more than this number of trees per acre, that the seedling mortality is extremely high and the native noncommercial hardwoods, brush and invasive species (primarily blackberry) continue to encroach upon the areas. The end result is poorly stocked stands, similar to what existed in the past. And, due to the soil conditions and hardwood competition discussed above, it is extremely unlikely that new, fully stocked stands of conifer will ever become established.

The remaining ±138 acres will support some timber; this can be shown by historical evidence and existing stands. Using the figure of 48.5 merchantable conifers per acre (from plots taken in the field) and comparing this number to the number of merchantable trees in a fully stocked stand of Douglas-fir, on Site IV ground, a ratio can be obtained. This ratio can then be used to obtain an approximate volume per acre figure for the above mentioned acres. Site IV is used because that is the lowest site ground generally accepted as forestland (Site V being considered nonproductive from a forestry standpoint) and the other soils on the property are Site IV and V as well. The number of merchantable trees per acre at 60 years, in a fully stocked stand, on Site IV ground is 246 per acre (see Exhibit 5). The remaining trees per acre shown are not of merchantable size and are not counted. Sixty years is used because no numbers are shown for a 50 year old stand. Since stands will self thin over time, and the number of trees per acre will decrease over time, this number will actually be lower than the number of trees at 50 years, even though the volume will be greater due to ten years of growth. The table shows this, as there are many more trees per acre at 40 years of age than 60 years. Taking the above numbers shown for 60 years show the stocking level of the stands on the parcel to be approximately 20% of a fully stocked stand at this age on this site ground (48.5 from field plots ÷ 246 from table). If a higher number of trees per acre is used the stocking percentage will actually be even lower than 20%. Using 20% will actually result in a higher volume figure being used, which will result in a higher potential income being projected. This volume figure can then be added to the volume figures shown above, to obtain a gross revenue figure for the entire parcel.

Remaining soil types - ±138 acres @ 20% of 19,972 bd.ft./ac.*	551,227 bd.ft.

*See Exhibit 3.

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A 50 year old stand on this site should have approximately 40% 2 SAW, 50% 3 SAW and 10% 4 SAW. If anything, these grade estimates err on the high side. In all probability there would be less 2 SAW and more 4 SAW. However, these figures are used to represent the highest possible log price scenario for the applicant.

Total Volume - 551.23 MBF (thousand board feet)

220.49 MBF of 2 SAW @ $255/MBF**	$56,225
275.62 MBF of 3 SAW @ $215/MBF**	59,258
55.12 MBF of 4 SAW @ $200/MBF**	11,024
Total Projected Gross Revenue	$126,507

**See Exhibit 4.

TOTAL VOLUME FOR ENTIRE PARCEL 1,567,067 bd.ft.

TOTAL AVERAGE GROSS INCOME -- $359,643 ÷ 50 YEARS = $7,193/YEAR

IV. CONCLUSION

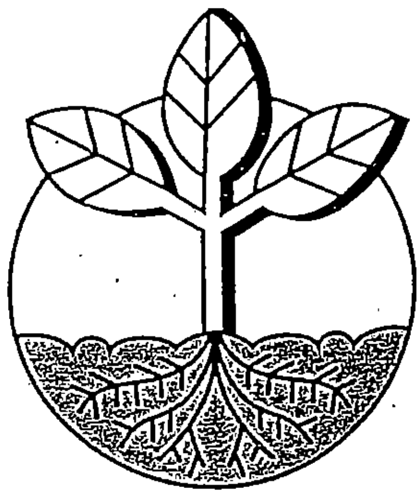
The analysis presented shows conclusively that this property will not support a merchantable stand of timber, of sufficient production capability, to meet or exceed the Marginal Lands Income test. The estimated gross income based on a 50 year rotation for the 320.492 acre site would have been $359,643 in 1983. The average annual gross income would have been $7,193/year. Because $7,193 is less than $10,000/year, the property meets the following statutory test for Marginal Lands: ORS 197.247 (1)(a) "The proposed marginal land was not managed during three of the five calendar years preceding January 1, 1983, as part of a ... forest operation capable of producing an average, over the growth cycle, of $10,000 in annual gross income."

In summary, I find from the specific site conditions present, empirical yield tables, SCS data, Lane County Data and experience with similar lands, that this property is ill suited to the production of timber and use as land for forestry purposes. It is my opinion that this parcel meets the criteria for marginal land status.

Sincerely,

Marc E Setchko

Lane County Soil Ratings for Forestry and Agriculture



Lane County

Lane County Land Management Division

August 1997

Prepared by
Lane Council of Governments

Exhibit 2

Lane County Soil Ratings for Forestry and Agriculture

Lane County

Lane County
Land Management Division

August 1997

Prepared by
Lane Council of Governments

Lane County Soil Ratings for Forestry and Agriculture

The Lane County Land Management Division, with technical assistance from Lane Council of Governments, compiled this data to assist the public in preparing land use applications. The Natural Resources Conservation Service (NRCS) reviewed the data and methodology.

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
01A	Abiqua silty clay loam, 0 - 3% slopes	135	203	1	X
01B	Abiqua silty clay loam, 3 - 5% slopes	135	203	2	X
02E	Astoria silt loam, 5 - 30% slopes	130	193	6	
03E	Astoria Variant silt loam, 3 - 30% slopes	none		6	
03G	Astoria Variant silt loam, 30 - 60% slopes	none		6	
04G	Atring-Rock outcrop complex, 30 - 60% slopes	***	81	6	
05	Awbrig silty clay loam	none		4	X
06	Awbrig-Urban land complex	none		4	
07B	Bandon sandy loam, 0 - 7% slopes	105	145	3	
07C	Bandon sandy loam, 7 - 12% slopes	105	145	3	
07F	Bandon sandy loam, 12 - 50% slopes	105	145	6	
08	Bashaw clay	none		4	X
09	Bashaw-Urban land complex	none		4	
10	Beaches	none		8	
11C	Bellpine silty clay loam, 3 - 12% slopes	115	163	3	X
11D	Bellpine silty clay loam, 12 - 20% slopes	115	163	3	X
11E	Bellpine silty clay loam, 20 - 30% slopes	115	163	4	X
11F	Bellpine silty clay loam, 30 - 50% slopes	115	163	6	
12E	Bellpine cobbly silty clay loam, 2 - 30% slopes	115	163	4	
13F	Blachly clay loam, 30 - 50% slopes	119	173	6	
13G	Blachly clay loam, 50 - 70% slopes	119	173	7	
14E	Blachly silty clay loam, 3 - 30% slopes	125	184	6	
14F	Blachly silty clay loam, 30 - 50% slopes	125	184	6	
15E	Blachly-McCully clay loam, 3 - 30% slopes	***	172	6	
16D	Bohannon gravelly loam, 3 - 25% slopes	118	171	6	
16F	Bohannon gravelly loam, 25 - 50% slopes	118	171	6	
16H	Bohannon gravelly loam, 50 - 90% slopes	118	171	7	
17	Brallier muck, drained	none		4	
18	Brallier Variant muck	none		5	
19	Brenner silty clay loam	none		3	X
20B	Briedwell cobbly loam, 0 - 7% slopes	103	141	3	X
21B	Bullards-Ferrelo loams, 0 - 7% slopes	***	84	3	
21C	Bullards-Ferrelo loams, 7 - 12% slopes	***	84	3	
21E	Bullards-Ferrelo loams, 12 - 30% slopes	***	76	4	
21G	Bullards-Ferrelo loams, 30 - 60% slopes	***	76	6	

Lane County Soil Ratings for Forestry and Agriculture

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
22	Camas gravelly sandy loam, occasionally flooded	none		4	
23	Camas-Urban land complex	none		4	
24	Chapman loam	none		1	X
25	Chapman-Urban land complex	none		1	X
26	Chehalis silty clay loam, occasionally flooded	none		2	X
27	Chehalis-Urban land complex	none		2	X
28C	Chehulpum silt loam, 3 - 12% slopes	none		6 *	
28E	Chehulpum silt loam, 12 - 40% slopes	none		6	
29	Cloquato silt loam	none		2	X
30	Cloquato-Urban land complex	none		2	X
31	Coburg silty clay loam	none		2	X
32	Coburg-Urban land complex	none		2	X
33	Conser silty clay loam	none		3	X
34	Courtney gravelly silty clay loam	none		4	X
35D	Cruiser gravelly clay loam, 3 - 25% slopes	140**	145	6	
35F	Cruiser gravelly clay loam, 25 - 50% slopes	140**	145	6	
35G	Cruiser gravelly clay loam, 35 - 70% slopes	140**	145	7	
36D	Cumley silty clay loam, 2 - 20% slopes	114	162	6	
37C	Cupola cobbly loam, 3 - 12% slopes	100	136	6	
37E	Cupola cobbly loam, 12 - 30% slopes	100	136	6	
38	Dayton silt loam, clay substratum	none		4	X
39E	Digger gravelly loam, 10 - 30% slopes	102	140	6	
39F	Digger gravelly loam, 30 - 50% slopes	102	140	6	
40H	Digger-Rock outcrop complex, 50 - 85% slopes	***	114	7	
41C	Dixonville silty clay loam, 3 - 12% slopes	109	152	3	
41E	Dixonville silty clay loam, 12 - 30% slopes	109	152	4	
41F	Dixonville silty clay loam, 30 - 50% slopes	109	152	6	
42E	Dixonville-Hazelair-Urban land complex, 12 - 35% slopes	***	89	4	
43C	Dixonville-Philomath-Hazelair complex, 3 - 12% slopes	***	54	3	
43E	Dixonville-Philomath-Hazelair complex, 12 - 35% slopes	***	63	4	
44	Dune land	none		8	
45C	Dupee silt loam, 3 - 20% slopes	none		3	
46	Eilertsen silt loam	133	199	2	X
47E	Fendall silt loam, 3 - 30% slopes	125	184	6	
48	Fluvents, nearly level	none		--	
49E	Formader loam, 3 - 30% slopes	121	176	6	
49G	Formader loam, 30 - 60% slopes	121	176	6	
50G	Formader-Hembre-Klickitat complex, 50 - 80% slopes	***	176	7	

Lane County Soil Ratings for Forestry and Agriculture

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
51B	Haflinger-Jimbo complex, 0 - 5% slopes	***	165	6	X
52B	Hazelair silty clay loam, 2 - 7% slopes	none		3	
52D	Hazelair silty clay loam, 7 - 20% slopes	none		4	
53	Heceta fine sand	none		4	
54D	Hembre silt loam, 5 - 25% slopes	127	188	6	
54G	Hembre silt loam, 25-60% slopes	127	188	6	
55E	Hembre-Klickitat complex, 3 - 30% slopes	***	177	6	
55G	Hembre-Klickitat complex, 30 - 60% slopes	***	176	6	
56	Holcomb silty clay loam	none		3	X[1]
57D	Holderman extremely cobbly loam, 5 - 25% slopes	119**	113	6	
57F	Holderman extremely cobbly loam, 25 - 50% slopes	119**	113	6	
57G	Holderman extremely cobbly loam, 50 - 75% slopes	119**	113	7	
58D	Honeygrove silty clay loam, 3 - 25% slopes	122	178	6	
58F	Honeygrove silty clay loam, 25 - 50% slopes	122	178	6	
59E	Hullt loam, 2 - 30% slopes	121	176	3	X
59G	Hullt loam, 30 - 60% slopes	121	176	6	
60D	Hummington gravelly loam, 5 - 25% slopes	131**	131	6	
60F	Hummington gravelly loam, 25 - 50% slopes	131**	131	6	
60G	Hummington gravelly loam, 50 - 75% slopes	131**	131	7	
61	Jimbo silt loam	121	176	1	X
62B	Jimbo-Haflinger complex, 0 - 5% slopes	***	171	1	X
63C	Jory silty clay loam, 2 - 12% slopes	122	178	2	X
63D	Jory silty clay loam, 12 - 20% slopes	122	178	3	X
63E	Jory silty clay loam, 20 - 30% slopes	122	178	4	X
64D	Keel cobbly clay loam, 3 - 25% slopes	132**	133	6	
64F	Keel cobbly clay loam, 25 - 45% slopes	132**	133	6	
64G	Keel cobbly clay loam, 45 - 75% slopes	132**	133	7	
65G	Kilchis stony loam, 30 - 60% slopes	90	116	6	
65H	Kilchis stony loam, 60 - 90% slopes	90	116	7	
66D	Kinney cobbly loam, 3 - 20% slopes	122	178	6	
67F	Kinney cobbly loam, 20 - 50% north slopes	122	178	6	
67G	Kinney cobbly loam, 50 - 70% north slopes	122	178	7	
68F	Kinney cobbly loam, 20 - 50% south slopes	122	178	6	
68G	Kinney cobbly loam, 50 - 70% south slopes	122	178	7	
69E	Kinney cobbly loam, slump, 3 - 30% slopes	122	178	6	
70E	Klickitat stony loam, 3 - 30% slopes	112	158	6	
71F	Klickitat stony loam, 30 - 50% north slopes	112	158	6	
71G	Klickitat stony loam, 50 - 75% north slopes	112	158	7	

Lane County Soil Ratings for Forestry and Agriculture

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
72F	Klickitat stony loam, 30 - 50% south slopes	112	158	6	
72G	Klickitat stony loam, 50 - 75% south slopes	112	158	7	
73	Linslaw loam	none		3	X[1]
74B	Lint silt loam, 0 - 7% slopes	117	169	3	
74C	Lint silt loam, 7 - 12% slopes	117	169	3	
74D	Lint silt loam, 12 - 20% slopes	117	169	3	
74E	Lint silt loam, 20 - 40% slopes	117	169	4	
75	Malabon silty clay loam	none		1	X
76	Malabon-Urban land complex	none		1	X
77B	Marcola cobbly silty clay loam, 2 - 7% slopes	none		4	
78	McAlpin silty clay loam	none		2	X
79	McBee silty clay loam	none		3	X[2]
80F	McCully clay loam, 30 - 35% slopes	118	171	6	
80G	McCully clay loam, 50 - 70% slopes	118	171	7	
81D	McDuff clay loam, 3 - 25% slopes	112	158	6	
81F	McDuff clay loam, 25 - 50% slopes	112	158	6	
81G	McDuff clay loam, 50 - 70% slopes	112	158	7	
82C	Meda loam, 2 - 12% slopes	none		3	X
83B	Minniece silty clay loam, 0 - 8% slopes	none		6	
84D	Mulkey loam, 5 - 25% slopes	none		6	
85	Natroy silty clay loam	none		4	X
86	Natroy silty clay	none		4	X
87	Natroy-Urban land complex	none		4	X
88	Nehalem silt loam	none		2	X
89C	Nekia silty clay loam, 2 - 12% slopes	113	160	3	X
89D	Nekia silty clay loam, 12 - 20% slopes	113	160	3	X
89E	Nekia silty clay loam, 20 - 30% slopes	113	160	4	
89F	Nekia silty clay loam, 30 - 50% slopes	113	160	6	
90	Nekoma silt loam	none		3	
91D	Neskowin silt loam, 12 - 20% slopes	none		6	
91E	Neskowin silt loam, 20 - 40% slopes	none		6	
92G	Neskowin-Salander silt loams, 40 - 60% slopes	none		6	
93	Nestucca silt loam	none		3	
94C	Netarts fine sand, 3 - 12% slopes	none		6	
94E	Netarts fine sand, 12 - 30% slopes	none		6	
95	Newberg fine sandy loam	none		2	X
96	Newberg loam	none		2	X

Lane County Soil Ratings for Forestry and Agriculture

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
97	Newberg-Urban land complex	none		2	X
98	Noti loam	none		4	X
99H	Ochrepts & Umbrepts, very steep	none		–	
100	Oxley gravelly silt loam	none		3	
101	Oxley-Urban land complex	none		3	
102C	Panther silty clay loam, 2 - 12% slopes	none		6	
103C	Panther-Urban land complex, 2 - 12% slopes	none		6	
104E	Peavine silty clay loam, 3 - 30% slopes	125	184	6	
104G	Peavine silty clay loam, 30 - 60% slopes	125	184	6	
105A	Pengra silt loam, 1 - 4% slopes	none		3	X[1]
106A	Pengra-Urban land complex, 1 - 4% slopes	none		3	
107C	Philomath silty clay, 3 - 12% slopes	none		6	
108C	Philomath cobbly silty clay, 3 - 12% slopes	none		6	
108F	Philomath cobbly silty clay, 12 - 45% slopes	none		6	
109F	Philomath-Urban land complex, 12 - 45% slopes	none		6	
110	Pits	none		8	
111D	Preacher loam,. 0 - 25% slopes	128	190	6	
111F	Preacher loam, 25 - 50% slopes	128	190	6	
112G	Preacher-Bohannon-Slickrock complex, 50 - 75% slopes	***	188	7	
113C	Ritner cobbly silty clay loam, 2 - 12% slopes	107	149	4	
113E	Ritner cobbly silty clay loam, 12 - 30% slopes	107	149	6	
113G	Ritner cobbly silty clay loam, 30 - 60% slopes	107	149	7	
114	Riverwash	none		8	
115H	Rock outcrop-Kilchis complex, 30 - 90% slopes	***	27	8	
116G	Rock outcrop-Witzel complex, 10 - 70% slopes	***	none	8	
117E	Salander silt loam, 12 - 30% slopes	125	184	6	
118	Salem gravelly silt loam	none		2	X
119	Salem-Urban land complex	none		2	X
120B	Salkum silt loam, 2 - 6% slopes	116	167	2	X
121B	Salkum silty clay loam, 2 - 8% slopes	116	167	2	X
121C	Salkum silty clay loam, 8 - 16% slopes	116	167	3	X
122	Saturn clay loam	123	180	3	
123	Sifton gravelly loam	124	182	3	X
124D	Slickrock gravelly loam, 3 - 25% slopes	137	209	6	
124F	Slickrock gravelly loam, 25 - 50% slopes	137	209	6	
125C	Steiwer loam, 3 - 12% slopes	none		3	
125D	Steiwer loam, 12 - 20% slopes	none		4*	

Lane County Soil Ratings for Forestry and Agriculture

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
125F	Steiwer loam, 20 - 50% slopes	none		6	
126F	Tahkenitch loam, 20 - 45% slopes	124	182	6	
126G	Tahkenitch loam, 45 - 75% slopes	124	182	7	
127C	Urban land-Hazelair-Dixonville complex, 3 - 12% slopes	***	68	8	
128B	Veneta loam, 0 - 7% slopes	108	150	2	X
129B	Veneta Variant silt loam, 0 - 7% slopes	124	182	2	X
130	Waldo silty clay loam	none		3	
131C	Waldport fine sand, 0 - 12% slopes	none		6	
131E	Waldport fine sand, 12 - 30% slopes	none		7	
131G	Waldport fine sand, 30 - 70% slopes	none		7	
132E	Waldport fine sand, thin surface, 0 - 30% slopes	none		7	
133C	Waldport-Urban land complex, 0 - 12% slopes	none		6	
134	Wapato silty clay loam	none		3	X3
135C	Willakenzie clay loam, 2 - 12% slopes	110	154	3	X
135D	Willakenzie clay loam, 12 - 20% slopes	110	154	3	X
135E	Willakenzie clay loam, 20 - 30% slopes	110	154	4	X
135F	Willakenzie clay loam, 30 - 50% slopes	110	154	6	
136	Willanch fine sandy loam	none		3	
137F	Winberry very gravelly loam, 10 - 45% slopes	none		7	
138E	Witzel very cobbly loam, 3 - 30% slopes	none		6	
138G	Witzel very cobbly loam, 30 - 75% slopes	none		6	
139	Woodburn silt loam	none		2	X
140	Yaquina loamy fine sand	none		4	
141	Yaquina-Urban land complex	none		4	
142G	Yellowstone-Rock outcrop, 10 - 60% slopes	none		7	

* Indicates soils which have an irrigated capability class which is different from the non-irrigated capability class.

** Indicates productivity calculated using 100-year Douglas fir data.

*** Indicates soil complexes with multiple site indices, refer to the CuFt/Acre/Year column for a composite volume rating for the complex.

"none" Indicates soil map units that lack site index information on Douglas fir. The soil map unit may have the capability to produce Douglas fir, but this productivity may be very low to very high. No site index has been collected by the NRCS due to lack of suitable sites or lack of time and or funds.

X1 Only drained areas are high value farmland.

X2 Only areas protected from flooding or not frequently flooded during the growing season are high value farmland.

X3 Only drained areas that are either protected from flooding or not frequently flooded during the growing season are high value farmland.

SOURCE AND DESCRIPTION OF THE DATA

Map Symbol

Data Source

USDA-Soil Conservation Service, September 1987. *Soil Survey of Lane County Area, Oregon.*

Soil Map Unit

Data Source

USDA-Soil Conservation Service, September 1987. *Soil Survey of Lane County Area, Oregon.*

Site Index

Data Source

USDA-Natural Resources Conservation Service, August 1997 printout from the National Soils Information System (NASIS). *Soils Database for Lane County, Woodland Management and Productivity* table.

Description

These site indices indicate the average height, in feet, that dominant and codominant Douglas fir trees attain in 50 years. The site index applies to fully stocked, even-aged, unmanaged stands. This table lists only site indices for Douglas fir and does not list site indices for soil complexes. The Description under Cubic Feet/Acre/Year explains the composite volume rating in this table for soil complexes.

Cubic feet/acre/year

Data Source

USDA-Soil Conservation Service, June 1986. *Technical Note No. 2 Revised, Culmination of Mean Annual Increment for Commercial Forest Trees of Oregon.*

Description

Converting site index to cubic feet/acre/year expresses productivity as a volume of wood fiber produced. For map units that are predominantly one soil type, it is straightforward to use the tables in Technical Note No. 2 to look up the cubic feet/acre/year that a soil could potentially produce based on the site index in the State Soils Database. Calculating a volume rating for a complex is more problematic. The NRCS reports site index data for each component of a soil complex but does not calculate a composite volume for the entire complex. A complex is a soil map unit which has two or more kinds of soil in such an intricate pattern or so small in area that the soils cannot be delineated separately at the scale of mapping.

The methodology used in this table to calculate forest productivity volume ratings for soil complexes involves applying a weighted average to each component of the complex and then normalizing to base it on 100% excluding the inclusions. The following example illustrates this calculation for a soil complex which has a site index for only one of the two components.

43 C	*Dixonville-Philomath-Hazelair complex 3-12%*				
Component	*Actual %*	*Normalized %**	*Site Index*	*CuFt / Ac / Yr*	*Normalized % x Cu.F.t / Ac. / Year*
Dixonville	30%	35%	97	130	46
Philomath	30%	35%	-	-	-
Hazelair	25%	29%			
Total	85%	100%			46

$$* \quad \text{Normalized \%} = \frac{\textit{\% of Individual Component}}{100 - (\textit{\% Inclusions} + \textit{\% Urban Land})}$$

Agricultural Capability Class

Data Source

USDA-Natural Resources Conservation Service, August 1997 printout from the National Soils Information System (NASIS). *Soils Database for Lane County, Land Capability and Yields Per Acre of Crops and Pasture* table.

Description

Land capability class, often called agricultural capability class, generally shows the suitability of soils for most kinds of field crops. The Soil Survey describes capability class: "The soils are grouped according to their limitations for field crops, the risk of damage if they are used for field crops, and the way they respond to management." There are eight capability classes, I through VIII (sometimes written as 1 through 8), indicating progressively greater limitations for use as cropland. The land capability classification is discussed in USDA Agriculture Handbook No. 210, issued September 1961 and reprinted January 1973.

The NRCS reports both irrigated and non-irrigated capability classes. In Lane County, because of adequate rainfall, the ratings are the same for irrigated and non-irrigated except for all but two map units (28C, Chehulpum silt loam, 3-12%, and 125D, Steiwer loam, 3-12%). This table lists the non-irrigated capability class. For soil complexes, this table lists only the capability class of the most predominant soil in the complex (which is the first soil in the name of the map unit).

High Value Soils

Data Source

Land Conservation and Development Commission, adopted February 18, 1994. *Oregon Administrative Rules, Chapter 660, Division 33* (OAR 660-33).

Description

The Agricultural Land Rule (OAR 660-33) defines "high value farmland" as land in a tract composed predominantly of soils that are prime, unique, Class I or II, and other soils as specified in the rule. These other soils include the wet clay soils on valley terraces that are generally used for grass seed production, and moderately sloping soils on low foothills.

NRCS is the agency responsible for classifying soils as prime, unique, or land capability class I through VIII (1 through 8). The names 'prime' and 'unique' are what they imply. Prime soils are the best soils from a national perspective—easy to farm, suitable for a wide variety of crops, producing the highest yields. NRCS designates unique soils in conjunction with the state and county so as to recognize soils suited for growing a specialty crop of state or local importance, e.g., the soils on the southern Oregon coast used for growing cranberries and the organic soils in the Willamette Valley used for growing onions. Lane County has not requested the designation of any unique soils. Class I and II are land capability classes—the soils in them have the fewest limitations for crop growth. Refer to the description of Agricultural Capability Class (immediately above) for more information.

Note: The Soil Conservation Service and Natural Resources Conservation Service are the same USDA agency. A name change to Natural Resources Conservation Service was approved in 1994.

DOUGLAS FIR EMPIRICAL YIELD TABLE

TABLE 5

SITE 100

Total Age	Normal Basal Area	Mean Diameter	CVTS	CV4	SV6(32')	C/SCR Ratio
20	17	8.53	85	85	335	.254
26	70	9.33	1,324	1,236	2,561	.483
30	97	9.85	2,130	1,913	4,601	.416
40	146	11.14	4,071	3,703	11,450	.323
41	150	11.27	4,259	3,886	12,248	.317
50	181	12.39	5,909	5,541	19,972	.277
60	209	13.59	7,643	7,325	29,247	.250
70	232	14.71	9,273	8,982	38,528	.233
80	252	15.75	10,799	10,468	47,294	.221
90	269	16.69	12,222	11,750	55,131	.213
100	284	17.53	13,541	12,805	61,760	.207
110	297	18.24	14,756	13,624	66,922	.204
120	310	18.81	15,867	14,190	70,448	.201
130	321	19.24	16,875	14,502	72,234	.201

SITE 107 23,005

SITE 109 23,872

TABLE 6

SITE 110

Total Age	Normal Basal Area	Mean Diameter	CVTS	CV4	SV6(32')	C/SCR Ratio
20	30	8.74	327	327	666	.491
26	83	9.63	1,688	1,494	3,299	.453
30	109	10.23	2,574	2,253	5,812	.388
40	158	11.69	4,717	4,275	14,125	.303
41	162	11.83	4,926	4,482	15,074	.297
50	194	13.11	6,757	6,345	24,305 *	.261
60	222	14.47	8,693	8,344	35,244	.237
70	245	15.76	10,525	10,200	46,141	.221
80	264	16.97	12,253	11,863	56,425	.210
90	281	18.09	13,878	13,304	65,675	.203
100	296	19.09	15,398	14,503	73,549	.197
110	310	19.97	16,815	15,448	79,836	.193
120	322	20.72	18,129	16,126	84,358	.191
130	333	21.31	19,338	16,528	86,957	.190

TABLE 7

SITE 120

Total Age	Normal Basal Area	Mean Diameter	CVTS	CV4	SV6(32')	C/SCR Ratio
20	51	9.11	819	770	1,355	.568
26	101	10.10	2,294	1,961	4,810	.408
30	126	10.77	3,257	2,821	7,992	.353
40	173	12.39	5,592	5,093	18,116	.281
41	177	12.55	5,820	5,324	19,255	.277
50	208	13.98	7,823	7,389	30,132	.245
60	235	15.50	9,951	9,588	42,783	.224
70	258	16.96	11,974	11,611	55,265	.210
80	277	18.33	13,894	13,424	66,954	.200
90	294	19.60	15,710	14,992	77,437	.194
100	309	20.76	17,423	16,297	86,410	.189
110	322	21.80	19,031	17,334	93,643	.185
120	334	22.70	20,536	18,091	98,946	.183
130	345	23.45	21,937	18,561	102,187	.182

EXHIBIT 3

LOG PRICES - 3rd Quarter 1983

WEST OREGON, SANTIAM, LANE, FOREST GROVE, TILLAMOOK AND ASTORIA UNITS

Douglas-Fir

#1P	$505
#2P	425
#3P	340
SM	285
#2S	255
#3S	215
#4S	200
SC	140
Utility	75
CR	240

Hemlock

P	$375
SM	260
#2S	220
#3S	190
#4S	175
Utility	65
CR	190

Spruce

SM	$255
#2S	230
#3S	180
#4S	160
Utility	45

W. R. Cedar

#1S	$390
#2S	380
#3S	310
#4S	230
CR	330
Wormy	135

Alder

Sawlogs CR	$190
Pulp	125

EXHIBIT 4

Marc E. Setchko
CONSULTING FORESTER

870 Fox Glenn Avenue
Eugene, Oregon 97405
Phone: (541) 344-0473
FAX: (541) 344-7791

February 23, 2004

Lane County Planning Commission

RE: Lane County File #PA 03-5657, Dahlen; Response to Goal One Coalition Letter dated February 5, 2004

Members of the Planning Commission:

In conjunction with my Forest Productivity Analysis, completed in December, 2003, I have enclosed the following written response to a letter written by Jim Just of Goal One Coalition. I have addressed each issue as presented in the letter, most of which I have already addressed in my analysis. I am answering these questions as a qualified, Society of American Foresters Certified Professional Forester (#2953), with 27 years of experience including 17 years as a consultant, with Bachelor of Science (Cal Poly, SLO) and Master of Forestry (Oregon State) Degrees. As a consultant I have extensive experience in drawing up forest management plans, handling the administration of these plans and the merchandising of logs to maximize the return to my clients.

Following are responses to questions raised in Goal One Letter:

Mr. Just states that my report does not assert that NRCS data are not available for soils on the subject parcel, and does not assert or show that NRCS data are inaccurate. Therefore no alternative method for determining productivity, including income potential, can be used.

I did not make either of these assertions in my report; Jim Belknap did all of the cu.ft./ac./yr. calculations using only the data from the 1997 Lane County Soil Ratings for Forestry and Agriculture. No alternative methodology was used.

Mr. Just then presents a table of his own to show the parcel in question is capable of producing 155.40 cf/ac/yr. I have compiled six separate tables for comparison, all using SCS/NRCS data (the NRCS is the new name for the SCS; same entity). I have also included ponderosa pine figures for the soil types Jim Just provides site index figures for; even though he provides no exhibits showing where these site indexes come from. Before introducing these tables some clarification on data used by Jim Just must be presented.

1) KMX as a "merchantable" species (see ORS 197.247(1)(b)(C)). KMX is a hybrid cross between knobcone pine and Monterey pine. It would grow well on this site. However, knobcone pine is small and slow growing, it is valuable as a ground cover to shelter more valuable trees after a forest fire. It has no commercial value. Monterey pine is a taller tree used as ornamentals or for windbreaks. It has no commercial value. The cross between the two is used primarily to grow trees on marginal sites where trees are desired for ornamental, aesthetic or other reasons. There is no current commercial market for this species.

2) Hybrid poplar as a "merchantable" species. There currently is no market for poplar. In the past there was a market for the chips; that has ceased to exist. The other argument which could be raised is that you can buy "poplar" boards at several locations in the area. The poplar being sold is called yellow poplar and comes from the tulip tree grown in the southeast portion of the country. Poplar would also not grow on the site in question due to moisture constraints.

3) After stating that an alternative method (to NRCS data and/or Dept. of Forestry methodology) for determining productivity cannot be used, Mr. Just presents estimates of cf/ac/yr data with no supporting tables or exhibits.

4) Mr. Just has compiled his table from multiple sources, including figures from the 1990 Office of State Forester Memorandum, General File 7-1-1. He has used these figures after stating in an earlier rebuttal letter to Lane County (see Lane County File #PA 02-5838, Ogle), that this file does not exist.

Using 1997 Lane County Soil Ratings for Forestry and Agriculture (NRCS Data).

Soil Unit	Acres	Species	Site Index	Cf/Ac/Yr	Total Cu.Ft. Productivity
28C	79.842	DF	NA	none	0
41C	12.157	DF	109	152	1,847.864
43C	10.161	DF	NA	54	548.694
43E	28.514	DF	NA	63	1,796.382
52D	13.864	DF	NA	none	0
78	15.009	DF	NA	none	0
102C	34.574	DF	NA	none	0
105A	11.637	DF	NA	none	0
108C	9.746	DF	NA	none	0
113C	0.371	DF	107	149	55.279
125C	9.042	DF	NA	none	0
125D	3.950	DF	NA	none	0
135E	27.358	DF	110	154	4,213.132
138E	27.256	DF	NA	none	0
138G	37.011	DF	NA	none	0
	320.492				8,461.351

Total - 8,461.351 cu.ft. ÷ 320.492 ac. = 26.401 cf./ac./yr.

Using Lane County "Green Sheet" Soil Ratings (SCS Data).

Soil Unit	Acres	Species	Site Index	Cf/Ac/Yr	Total Cu.Ft. Productivity
28C	79.842	DF	NA	40	3,193.680
41C	12.157	DF	97	130	1,580.410
43C	10.161	DF	NA	45	457.245
43E	28.514	DF	NA	45	1,283.130
52D	13.864	DF	NA	40	554.560
78	15.009	DF	125	184	2,761.656
102C	34.574	DF	NA	45	1,555.830
105A	11.637	DF	NA	45	523.665
108C	9.746	DF	NA	45	438.570
113C	0.371	DF	102	140	51.940
125C	9.042	DF	NA	30	271.260
125D	3.950	DF	NA	30	118.500
135E	27.358	DF	110	154	4,213.132
138E	27.256	DF	NA	70	1,907.920
138G	37.011	DF	NA	70	2,590.770
	320.492				21,502.268

Total - 21,502.268 cu.ft. ÷ 320.492 ac. = 67.091 cf./ac./yr.

Using Office of State Forester Forest Soil Ratings Memorandum (SCS Data).

Soil Unit	Acres	Species	Site Index	Cf/Ac/Yr	Total Cu.Ft. Productivity
28C	79.842	DF	NA	40	3,193.680
41C	12.157	DF	120	115	1,398.055
43C	10.161	DF	NA	45	457.245
43E	28.514	DF	NA	45	1,283.130
52D	13.864	DF	NA	40	554.560
78	15.009	DF	159	169	2,536.521
102C	34.574	DF	NA	45	1,555.830
105A	11.637	DF	NA	45	523.665
108C	9.746	DF	NA	45	438.570
113C	0.371	DF	131	131	48.601
125C	9.042	DF	NA	30	271.260
125D	3.950	DF	NA	30	118.500
135E	27.358	DF	160	170	4,650.860
138E	27.256	DF	90	70	1,907.920
138G	37.011	DF	90	70	2,590.770
	320.492				21,529.167

Total - 21,529.167 cu.ft. ÷ 320.492 ac. = 67.175 cf./ac./yr.

Selecting the highest productivity figures from the three tables presented.

Soil Unit	Acres	Species	Site Index	Cf/Ac/Yr	Total Cu.Ft. Productivity
28C	79.842	DF	NA	40	3,193.680
41C	12.157	DF	109	152	1,847.864
43C	10.161	DF	NA	54	548.694
43E	28.514	DF	NA	63	1,796.382
52D	13.864	DF	NA	40	554.560
78	15.009	DF	125	184	2,761.656
102C	34.574	DF	NA	45	1,555.830
105A	11.637	DF	NA	45	523.665
108C	9.746	DF	NA	45	438.570
113C	0.371	DF	107	149	55.279
125C	9.042	DF	NA	30	271.260
125D	3.950	DF	NA	30	118.500
135E	27.358	DF	160	170	4,650.860
138E	27.256	DF	90	70	1,907.920
138G	37.011	DF	90	70	2,590.770
	320.492				22,815.490

Total - 22,815.490 cu.ft. ÷ 320.492 ac. = 71.189 cf./ac./yr.

Selecting the highest productivity figures from all tables, then including ponderosa pine figures (with no exhibits to show where this figures came from) as presented by Mr. Just.

Soil Unit	Acres	Species	Site Index	Cf/Ac/Yr	Total Cu.Ft. Productivity
28C	79.842	DF	NA	40	3,193.680
41C	12.157	DF	109	152	1,847.864
43C	10.161	DF	NA	54	548.694
43E	28.514	DF	NA	63	1,796.382
52D	13.864	PP	92	113	1,566.632
78	15.009	DF	125	184	2,761.656
102C	34.574	DF	NA	45	1,555.830
105A	11.637	DF	NA	45	523.665
108C	9.746	PP	104	141	1,374.186
113C	0.371	DF	107	149	55.279
125C	9.042	DF	NA	30	271.260
125D	3.950	DF	NA	30	118.500
135E	27.358	DF	160	170	4,650.860
138E	27.256	DF	90	70	1,907.920
138G	37.011	DF	90	70	2,590.770
	320.492				24,763.178

Total - 24,763.178 cu.ft. ÷ 320.492 ac. = 77.266 cf./ac./yr.

Selecting the highest productivity figures from all tables, then including ponderosa pine figures from the Office of State Forester Forest Soil Ratings Memorandum (SCS Data).

Soil Unit	Acres	Species	Site Index	Cf/Ac/Yr	Total Cu.Ft. Productivity
28C	79.842	DF	NA	40	3,193.680
41C	12.157	DF	109	152	1,847.864
43C	10.161	DF	NA	54	548.694
43E	28.514	DF	NA	63	1,796.382
52D	13.864	PP	92	88	1,220.032
78	15.009	DF	125	184	2,761.656
102C	34.574	DF	NA	45	1,555.830
105A	11.637	DF	NA	45	523.665
108C	9.746	PP	104	110	1,072.060
113C	0.371	DF	107	149	55.279
125C	9.042	DF	NA	30	271.260
125D	3.950	DF	NA	30	118.500
135E	27.358	DF	160	170	4,650.860
138E	27.256	DF	90	70	1,907.920
138G	37.011	DF	90	70	2,590.770
	320.492				24,114.452

Total - 24,114.452 cu.ft. ÷ 320.492 ac. = 75.242 cf./ac./yr.

All of these tables presented show the subject property produces less than 85 cu. ft./ac./yr. of "merchantable" timber volume. This has been determined by Lane County, and the State of Oregon, to be the measuring parameter for marginal soils.

Mr. Just states that my analysis uses data other than NRCS data to assess the productivity and income potential of the subject property. He then states that the methodology used does not provide equivalent data and is not approved the Department of Forestry.

The NRCS does not publish volume per acre tables for timber species. I have used industry accepted volume tables, compiled from extensive collected data and published by government, private industry and/or university/state college entities. From these tables I have calculated productivity; for income potential I have used 1983 log prices as presented by the Oregon State Dept. of Forestry. I have used 1983 prices because Lane County requires these prices to be used for analysis of productivity and income.

Mr. Just states that the methodology used for my analysis did not identify site clumps or site trees on the non-NRCS rated soils. The areas in question were clearcut within the last 15 years and at the present time there are no site trees left to measure. He further states that no attempt was made to measure productivity or to calculate site indexes for the soils. I cannot do this because I am not a soil scientist. Mr. Just states that 104 acres were excluded from consideration altogether. There are no trees growing on these acres at the present time and no stumps to indicate that trees ever grew on these acres. The majority of this property has been grassland and/or oak savannah for decades. Mr. Just states that the number of conifers per acre were estimated; I took tenth acre plots on the ground and counted stumps. The number of trees per acre were calculated from these plots and compared to the number of trees per acre that are in a fully stocked stand. From this ratio the volume in a partially stocked stand was calculated.

Mr. Just states that my analysis considers productivity for Douglas-fir only. I have used Douglas-fir because that is the most valuable species; the only other species even close in value is red alder and red cedar, neither tree will grow on this site. As for the other species mentioned by Mr. Just, specifically black cottonwood, Oregon ash, Oregon white oak, red alder, bigleaf maple and hybrid poplar. There is no market for cottonwood, ash and poplar. Alder will not grow on this site. Oak is extremely slow growing, with the "merchantable" yield per acre very low. Bigleaf maple has a low value and low "merchantable" yield per acre. Merchantable conifers mentioned by Mr. Just include ponderosa pine, grand fir, western red cedar, western hemlock and KMX. Ponderosa pine has been included in my cu.ft./ac./yr. tables; for an income calculation it would be worth substantially less than Douglas-fir. Grand fir and hemlock are also worth substantially less than Douglas-fir; therefore, they were not used for the income test. Cedar will not grow on this site; however, if it could be grown, the growth is so slow that at 50 years the volume per acre would be substantially less than the volume per acre produced by Douglas-fir. The final tree, KMX, as stated earlier, is not a merchantable species. A final point brought up by Mr. Just concerning "merchantibility". He states that a tree is merchantable if it can be used for firewood. Firewood is worth little when compared to boards, sheeting, etc., and no company buys firewood on the open market. Companies will sell it as a by product, but no company buys it with a purchase order similar to purchase orders used for buying merchantable logs.

Mr. Just states that "reasonable management practices" would include selecting species best suited to the particular soils and site conditions found on the subject property, including non-native species. I would agree with this statement; however, all other species will yield considerably less money. Mr. Just again mentions poplar. First, poplar is not currently a "merchantable" species. Second, the growth rates shown require far more moisture than occurs on the site in question; the sited (from the Journal of Forestry) plantations are much further north in an area of higher rainfall and the high end of the cubic foot production figures are from irrigated plantations.

Mr. Just states that it is well established that lack of a soil productivity rating does not mean that a soil has no capability for forest production. I do not dispute this and am not sure what this has to do with my analysis.

Mr. Just presents site indexes and productivity for the McAlpin soils and Willamette valley ponderosa pine. I have included these figures in the tables presented.

On page 6 of the Goal One Coalition letter Mr. Just again brings up the subject of "reasonable forest management practices over the growth cycle" and states that other species should be planted. The analysis which I have presented does not consider the "best management practices"; it is looking at what is the maximum potential productivity and income could be. Therefore, I have used Douglas-fir, the highest value species. Mr. Just then brings up, again, the subject of planting ponderosa pine, KMX and poplar, as well as Douglas-fir, on the site. As discussed earlier in my response, KMX and poplar are not "merchantable" species and I have included ponderosa pine in my cubic foot productivity calculations. To substitute ponderosa pine in my income calculations would only lower the final dollar amount shown. In fact, the dollar amount would be significantly reduced.

In Goal One's final conclusions Mr. Just states I have not used acceptable methodology, that I have not used NRCS data and that I have not used current timber prices. I have used SCS/NRCS data for all the soils on the parcel and have followed all of the criteria and methodology as required by Lane County. I have not used current prices because I am not supposed to under the Marginal Lands guidelines. Mr. Just further states that the "income" test cannot be completed without using multiple forest tree species being cultivated on the property; using any species other than Douglas-fir will only reduce the dollar amount calculated for the income test.

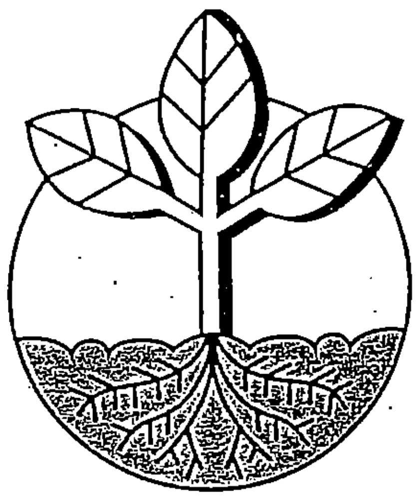
I hope this answers all of the questions brought up by Mr. Just of Goal One coalition. I have also included copies of all three soil ratings publications which are used in my analysis.

Sincerely,

Marc E. Setchko

EXHIBIT "J"

Lane County Soil Ratings for Forestry and Agriculture



Lane County

Lane County Land Management Division

August 1997

Prepared by
Lane Council of Governments

Lane County Soil Ratings for Forestry and Agriculture

Lane County

Lane County
Land Management Division

August 1997

Prepared by
Lane Council of Governments

Lane County Soil Ratings for Forestry and Agriculture

The Lane County Land Management Division, with technical assistance from Lane Council of Governments, compiled this data to assist the public in preparing land use applications. The Natural Resources Conservation Service (NRCS) reviewed the data and methodology.

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
01A	Abiqua silty clay loam, 0 - 3% slopes	135	203	1	X
01B	Abiqua silty clay loam, 3 - 5% slopes	135	203	2	X
02E	Astoria silt loam, 5 - 30% slopes	130	193	6	
03E	Astoria Variant silt loam, 3 - 30% slopes	none		6	
03G	Astoria Variant silt loam, 30 - 60% slopes	none		6	
04G	Atring-Rock outcrop complex, 30 - 60% slopes	***	81	6	
05	Awbrig silty clay loam	none		4	X
06	Awbrig-Urban land complex	none		4	
07B	Bandon sandy loam, 0 - 7% slopes	105	145	3	
07C	Bandon sandy loam, 7 - 12% slopes	105	145	3	
07F	Bandon sandy loam, 12 - 50% slopes	105	145	6	
08	Bashaw clay	none		4	X
09	Bashaw-Urban land complex	none		4	
10	Beaches	none		8	
11C	Bellpine silty clay loam, 3 - 12% slopes	115	163	3	X
11D	Bellpine silty clay loam, 12 - 20% slopes	115	163	3	X
11E	Bellpine silty clay loam, 20 - 30% slopes	115	163	4	X
11F	Bellpine silty clay loam, 30 - 50% slopes	115	163	6	
12E	Bellpine cobbly silty clay loam, 2 - 30% slopes	115	163	4	
13F	Blachly clay loam, 30 - 50% slopes	119	173	6	
13G	Blachly clay loam, 50 - 70% slopes	119	173	7	
14E	Blachly silty clay loam, 3 - 30% slopes	125	184	6	
14F	Blachly silty clay loam, 30 - 50% slopes	125	184	6	
15E	Blachly-McCully clay loam, 3 - 30% slopes	***	172	6	
16D	Bohannon gravelly loam, 3 - 25% slopes	118	171	6	
16F	Bohannon gravelly loam, 25 - 50% slopes	118	171	6	
16H	Bohannon gravelly, loam, 50 - 90% slopes	118	171	7	
17	Brallier muck, drained	none		4	
18	Brallier Variant muck	none		5	
19	Brenner silty clay loam	none		3	X
20B	Briedwell cobbly loam, 0 - 7% slopes	103	141	3	X
21B	Bullards-Ferrelo loams, 0 - 7% slopes	***	84	3	
21C	Bullards-Ferrelo loams, 7 - 12% slopes	***	84	3	
21E	Bullards-Ferrelo loams, 12 - 30% slopes	***	76	4	
21G	Bullards-Ferrelo loams, 30 - 60% slopes	***	76	6	

Lane County Soil Ratings for Forestry and Agriculture

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
22	Camas gravelly sandy loam, occasionally flooded	none		4	
23	Camas-Urban land complex	none		4	
24	Chapman loam	none		1	X
25	Chapman-Urban land complex	none		1	X
26	Chehalis silty clay loam, occasionally flooded	none		2	X
27	Chehalis-Urban land complex	none		2	X
28C	Chehulpum silt loam, 3 - 12% slopes	none		6 *	
28E	Chehulpum silt loam, 12 - 40% slopes	none		6	
29	Cloquato silt loam	none		2	X
30	Cloquato-Urban land complex	none		2	X
31	Coburg silty clay loam	none		2	X
32	Coburg-Urban land complex	none		2	X
33	Conser silty clay loam	none		3	X
34	Courtney gravelly silty clay loam	none		4	X
35D	Cruiser gravelly clay loam, 3 - 25% slopes	140**	145	6	
35F	Cruiser gravelly clay loam, 25 - 50% slopes	140**	145	6	
35G	Cruiser gravelly clay loam, 35 - 70% slopes	140**	145	7	
36D	Cumley silty clay loam, 2 - 20% slopes	114	162	6	
37C	Cupola cobbly loam, 3 - 12% slopes	100	136	6	
37E	Cupola cobbly loam, 12 - 30% slopes	100	136	6	
38	Dayton silt loam, clay substratum	none		4	X
39E	Digger gravelly loam, 10 - 30% slopes	102	140	6	
39F	Digger gravelly loam, 30 - 50% slopes	102	140	6	
40H	Digger-Rock outcrop complex, 50 - 85% slopes	***	114	7	
41C	Dixonville silty clay loam, 3 - 12% slopes	109	152	3	
41E	Dixonville silty clay loam, 12 - 30% slopes	109	152	4	
41F	Dixonville silty clay loam, 30 - 50% slopes	109	152	6	
42E	Dixonville-Hazelair-Urban land complex, 12 - 35% slopes	***	89	4	
43C	Dixonville-Philomath-Hazelair complex, 3 - 12% slopes	***	54	3	
43E	Dixonville-Philomath-Hazelair complex, 12 - 35% slopes	***	63	4	
44	Dune land	none		8	
45C	Dupee silt loam, 3 - 20% slopes	none		3	
46	Eilertsen silt loam	133	199	2	X
47E	Fendall silt loam, 3 - 30% slopes	125	184	6	
48	Fluvents, nearly level	none		--	
49E	Formader loam, 3 - 30% slopes	121	176	6	
49G	Formader loam, 30 - 60% slopes	121	176	6	
50G	Formader-Hembre-Klickitat complex, 50 - 80% slopes	***	176	7	

Lane County Soil Ratings for Forestry and Agriculture

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
51B	Haflinger-Jimbo complex, 0 - 5% slopes	***	165	6	X
52B	Hazelair silty clay loam, 2 - 7% slopes	none		3	
52D	Hazelair silty clay loam, 7 - 20% slopes	none		4	
53	Heceta fine sand	none		4	
54D	Hembre silt loam, 5 - 25% slopes	127	188	6	
54G	Hembre silt loam, 25-60% slopes	127	188	6	
55E	Hembre-Klickitat complex, 3 - 30% slopes	***	177	6	
55G	Hembre-Klickitat complex, 30 - 60% slopes	***	176	6	
56	Holcomb silty clay loam	none		3	X[1]
57D	Holderman extremely cobbly loam, 5 - 25% slopes	119**	113	6	
57F	Holderman extremely cobbly loam, 25 - 50% slopes	119**	113	6	
57G	Holderman extremely cobbly loam, 50 - 75% slopes	119**	113	7	
58D	Honeygrove silty clay loam, 3 - 25% slopes	122	178	6	
58F	Honeygrove silty clay loam, 25 - 50% slopes	122	178	6	
59E	Hullt loam, 2 - 30% slopes	121	176	3	X
59G	Hullt loam, 30 - 60% slopes	121	176	6	
60D	Hummington gravelly loam, 5 - 25% slopes	131**	131	6	
60F	Hummington gravelly loam, 25 - 50% slopes	131**	131	6	
60G	Hummington gravelly loam, 50 - 75% slopes	131**	131	7	
61	Jimbo silt loam	121	176	1	X
62B	Jimbo-Haflinger complex, 0 - 5% slopes	***	171	1	X
63C	Jory silty clay loam, 2 - 12% slopes	122	178	2	X
63D	Jory silty clay loam, 12 - 20% slopes	122	178	3	X
63E	Jory silty clay loam, 20 - 30% slopes	122	178	4	X
64D	Keel cobbly clay loam, 3 - 25% slopes	132**	133	6	
64F	Keel cobbly clay loam, 25 - 45% slopes	132**	133	6	
64G	Keel cobbly clay loam, 45 - 75% slopes	132**	133	7	
65G	Kilchis stony loam, 30 - 60% slopes	90	116	6	
65H	Kilchis stony loam, 60 - 90% slopes	90	116	7	
66D	Kinney cobbly loam, 3 - 20% slopes	122	178	6	
67F	Kinney cobbly loam, 20 - 50% north slopes	122	178	6	
67G	Kinney cobbly loam, 50 - 70% north slopes	122	178	7	
68F	Kinney cobbly loam, 20 - 50% south slopes	122	178	6	
68G	Kinney cobbly loam, 50 - 70% south slopes	122	178	7	
69E	Kinney cobbly loam, slump, 3 - 30% slopes	122	178	6	
70E	Klickitat stony loam, 3 - 30% slopes	112	158	6	
71F	Klickitat stony loam, 30 - 50% north slopes	112	158	6	
71G	Klickitat stony loam, 50 - 75% north slopes	112	158	7	

Lane County Soil Ratings for Forestry and Agriculture

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
72F	Klickitat stony loam, 30 - 50% south slopes	112	158	6	
72G	Klickitat stony loam, 50 - 75% south slopes	112	158	7	
73	Linslaw loam	none		3	X[1]
74B	Lint silt loam, 0 - 7% slopes	117	169	3	
74C	Lint silt loam, 7 - 12% slopes	117	169	3	
74D	Lint silt loam, 12 - 20% slopes	117	169	3	
74E	Lint silt loam, 20 - 40% slopes	117	169	4	
75	Malabon silty clay loam	none		1	X
76	Malabon-Urban land complex	none		1	X
77B	Marcola cobbly silty clay loam, 2 - 7% slopes	none		4	
78	McAlpin silty clay loam	none		2	X
79	McBee silty clay loam	none		3	X[2]
80F	McCully clay loam, 30 - 35% slopes	118	171	6	
80G	McCully clay loam, 50 - 70% slopes	118	171	7	
81D	McDuff clay loam, 3 - 25% slopes	112	158	6	
81F	McDuff clay loam, 25 - 50% slopes	112	158	6	
81G	McDuff clay loam, 50 - 70% slopes	112	158	7	
82C	Meda loam, 2 - 12% slopes	none		3	X
83B	Minniece silty clay loam, 0 - 8% slopes	none		6	
84D	Mulkey loam, 5 - 25% slopes	none		6	
85	Natroy silty clay loam	none		4	X
86	Natroy silty clay	none		4	X
87	Natroy-Urban land complex	none		4	X
88	Nehalem silt loam	none		2	X
89C	Nekia silty clay loam, 2 - 12% slopes	113	160	3	X
89D	Nekia silty clay loam, 12 - 20% slopes	113	160	3	X
89E	Nekia silty clay loam, 20 - 30% slopes	113	160	4	
89F	Nekia silty clay loam, 30 - 50% slopes	113	160	6	
90	Nekoma silt loam	none		3	
91D	Neskowin silt loam, 12 - 20% slopes	none		6	
91E	Neskowin silt loam, 20 - 40% slopes	none		6	
92G	Neskowin-Salander silt loams, 40 - 60% slopes	none		6	
93	Nestucca silt loam	none		3	
94C	Netarts fine sand, 3 - 12% slopes	none		6	
94E	Netarts fine sand, 12 - 30% slopes	none		6	
95	Newberg fine sandy loam	none		2	X
96	Newberg loam	none		2	X

Lane County Soil Ratings for Forestry and Agriculture

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
97	Newberg-Urban land complex	none		2	X
98	Noti loam	none		4	X
99H	Ochrepts & Umbrepts, very steep	none		–	
100	Oxley gravelly silt loam	none		3	
101	Oxley-Urban land complex	none		3	
102C	Panther silty clay loam, 2 - 12% slopes	none		6	
103C	Panther-Urban land complex, 2 - 12% slopes	none		6	
104E	Peavine silty clay loam, 3 - 30% slopes	125	184	6	
104G	Peavine silty clay loam, 30 - 60% slopes	125	184	6	
105A	Pengra silt loam, 1 - 4% slopes	none		3	X[1]
106A	Pengra-Urban land complex, 1 - 4% slopes	none		3	
107C	Philomath silty clay, 3 - 12% slopes	none		6	
108C	Philomath cobbly silty clay, 3 - 12% slopes	none		6	
108F	Philomath cobbly silty clay, 12 - 45% slopes	none		6	
109F	Philomath-Urban land complex, 12 - 45% slopes	none		6	
110	Pits	none		8	
111D	Preacher loam, 0 - 25% slopes	128	190	6	
111F	Preacher loam, 25 - 50% slopes	128	190	6	
112G	Preacher-Bohannon-Slickrock complex, 50 - 75% slopes	***	188	7	
113C	Ritner cobbly silty clay loam, 2 - 12% slopes	107	149	4	
113E	Ritner cobbly silty clay loam, 12 - 30% slopes	107	149	6	
113G	Ritner cobbly silty clay loam, 30 - 60% slopes	107	149	7	
114	Riverwash	none		8	
115H	Rock outcrop-Kilchis complex, 30 - 90% slopes	***	27	8	
116G	Rock outcrop-Witzel complex, 10 - 70% slopes	***	none	8	
117E	Salander silt loam, 12 - 30% slopes	125	184	6	
118	Salem gravelly silt loam	none		2	X
119	Salem-Urban land complex	none		2	X
120B	Salkum silt loam, 2 - 6% slopes	116	167	2	X
121B	Salkum silty clay loam, 2 - 8% slopes	116	167	2	X
121C	Salkum silty clay loam, 8 - 16% slopes	116	167	3	X
122	Saturn clay loam	123	180	3	
123	Sifton gravelly loam	124	182	3	X
124D	Slickrock gravelly loam, 3 - 25% slopes	137	209	6	
124F	Slickrock gravelly loam, 25 - 50% slopes	137	209	6	
125C	Steiwer loam, 3 - 12% slopes	none		3	
125D	Steiwer loam, 12 - 20% slopes	none		4*	

Lane County Soil Ratings for Forestry and Agriculture

Map Symbol	Lane County Soil Map Unit	Douglas Fir Site Index	Cu. Ft./ Acre/ Year	Agricultural Capability Class	High Value Farmland
125F	Steiwer loam, 20 - 50% slopes	none		6	
126F	Tahkenitch loam, 20 - 45% slopes	124	182	6	
126G	Tahkenitch loam, 45 - 75% slopes	124	182	7	
127C	Urban land-Hazelair-Dixonville complex, 3 - 12% slopes	***	68	8	
128B	Veneta loam, 0 - 7% slopes	108	150	2	X
129B	Veneta Variant silt loam, 0 - 7% slopes	124	182	2	X
130	Waldo silty clay loam	none		3	
131C	Waldport fine sand, 0 - 12% slopes	none		6	
131E	Waldport fine sand, 12 - 30% slopes	none		7	
131G	Waldport fine sand, 30 - 70% slopes	none		7	
132E	Waldport fine sand, thin surface, 0 - 30% slopes	none		7	
133C	Waldport-Urban land complex, 0 - 12% slopes	none		6	
134	Wapato silty clay loam	none		3	X3
135C	Willakenzie clay loam, 2 - 12% slopes	110	154	3	X
135D	Willakenzie clay loam, 12 - 20% slopes	110	154	3	X
135E	Willakenzie clay loam, 20 - 30% slopes	110	154	4	X
135F	Willakenzie clay loam, 30 - 50% slopes	110	154	6	
136	Willanch fine sandy loam	none		3	
137F	Winberry very gravelly loam, 10 - 45% slopes	none		7	
138E	Witzel very cobbly loam, 3 - 30% slopes	none		6	
138G	Witzel very cobbly loam, 30 - 75% slopes	none		6	
139	Woodburn silt loam	none		2	X
140	Yaquina loamy fine sand	none		4	
141	Yaquina-Urban land complex	none		4	
142G	Yellowstone-Rock outcrop, 10 - 60% slopes	none		7	

* Indicates soils which have an irrigated capability class which is different from the non-irrigated capability class.

** Indicates productivity calculated using 100-year Douglas fir data.

*** Indicates soil complexes with multiple site indices, refer to the CuFt/Acre/Year column for a composite volume rating for the complex.

"none" Indicates soil map units that lack site index information on Douglas fir. The soil map unit may have the capability to produce Douglas fir, but this productivity may be very low to very high. No site index has been collected by the NRCS due to lack of suitable sites or lack of time and or funds.

X1 Only drained areas are high value farmland.

X2 Only areas protected from flooding or not frequently flooded during the growing season are high value farmland.

X3 Only drained areas that are either protected from flooding or not frequently flooded during the growing season are high value farmland.

SOURCE AND DESCRIPTION OF THE DATA

Map Symbol

Data Source

USDA-Soil Conservation Service, September 1987. *Soil Survey of Lane County Area, Oregon.*

Soil Map Unit

Data Source

USDA-Soil Conservation Service, September 1987. *Soil Survey of Lane County Area, Oregon.*

Site Index

Data Source

USDA-Natural Resources Conservation Service, August 1997 printout from the National Soils Information System (NASIS). *Soils Database for Lane County, Woodland Management and Productivity* table.

Description

These site indices indicate the average height, in feet, that dominant and codominant Douglas fir trees attain in 50 years. The site index applies to fully stocked, even-aged, unmanaged stands. This table lists only site indices for Douglas fir and does not list site indices for soil complexes. The Description under Cubic Feet/Acre/Year explains the composite volume rating in this table for soil complexes.

Cubic feet/acre/year

Data Source

USDA-Soil Conservation Service, June 1986. *Technical Note No. 2 Revised, Culmination of Mean Annual Increment for Commercial Forest Trees of Oregon.*

Description

Converting site index to cubic feet/acre/year expresses productivity as a volume of wood fiber produced. For map units that are predominantly one soil type, it is straightforward to use the tables in Technical Note No. 2 to look up the cubic feet/acre/year that a soil could potentially produce based on the site index in the State Soils Database. Calculating a volume rating for a complex is more problematic. The NRCS reports site index data for each component of a soil complex but does not calculate a composite volume for the entire complex. A complex is a soil map unit which has two or more kinds of soil in such an intricate pattern or so small in area that the soils cannot be delineated separately at the scale of mapping.

The methodology used in this table to calculate forest productivity volume ratings for soil complexes involves applying a weighted average to each component of the complex and then normalizing to base it on 100% excluding the inclusions. The following example illustrates this calculation for a soil complex which has a site index for only one of the two components.

43 C	*Dixonville-Philomath-Hazelair complex 3-12%*				
Component	*Actual %*	*Normalized %**	*Site Index*	*CuFt / Ac / Yr*	*Normalized % x Cu.F.t / Ac. / Year*
Dixonville	30%	35%	97	130	46
Philomath	30%	35%	-	-	-
Hazelair	25%	29%			
Total	85%	100%			46

$$* \quad \text{Normalized \%} = \frac{\%\ of\ Individual\ Component}{100 - (\%\ Inclusions + \%\ Urban\ Land)}$$

Agricultural Capability Class

Data Source

USDA-Natural Resources Conservation Service, August 1997 printout from the National Soils Information System (NASIS). *Soils Database for Lane County, Land Capability and Yields Per Acre of Crops and Pasture* table.

Description

Land capability class, often called agricultural capability class, generally shows the suitability of soils for most kinds of field crops. The Soil Survey describes capability class: "The soils are grouped according to their limitations for field crops, the risk of damage if they are used for field crops, and the way they respond to management." There are eight capability classes, I through VIII (sometimes written as 1 through 8), indicating progressively greater limitations for use as cropland. The land capability classification is discussed in USDA Agriculture Handbook No. 210, issued September 1961 and reprinted January 1973.

The NRCS reports both irrigated and non-irrigated capability classes. In Lane County, because of adequate rainfall, the ratings are the same for irrigated and non-irrigated except for all but two map units (28C, Chehulpum silt loam, 3-12%, and 125D, Steiwer loam, 3-12%). This table lists the non-irrigated capability class. For soil complexes, this table lists only the capability class of the most predominant soil in the complex (which is the first soil in the name of the map unit).

High Value Soils

Data Source

Land Conservation and Development Commission, adopted February 18, 1994. *Oregon Administrative Rules, Chapter 660, Division 33* (OAR 660-33).

Description

The Agricultural Land Rule (OAR 660-33) defines "high value farmland" as land in a tract composed predominantly of soils that are prime, unique, Class I or II, and other soils as specified in the rule. These other soils include the wet clay soils on valley terraces that are generally used for grass seed production, and moderately sloping soils on low foothills.

NRCS is the agency responsible for classifying soils as prime, unique, or land capability class I through VIII (1 through 8). The names 'prime' and 'unique' are what they imply. Prime soils are the best soils from a national perspective—easy to farm, suitable for a wide variety of crops, producing the highest yields. NRCS designates unique soils in conjunction with the state and county so as to recognize soils suited for growing a specialty crop of state or local importance, e.g., the soils on the southern Oregon coast used for growing cranberries and the organic soils in the Willamette Valley used for growing onions. Lane County has not requested the designation of any unique soils. Class I and II are land capability classes—the soils in them have the fewest limitations for crop growth. Refer to the description of Agricultural Capability Class (immediately above) for more information.

Note: The Soil Conservation Service and Natural Resources Conservation Service are the same USDA agency. A name change to Natural Resources Conservation Service was approved in 1994.

Page 5: Mr. Just states that virtually all of the Valley ponderosa pine was harvested in the years following settlement. This is true; along with every other conifer species in the valley.

Mr. Just then states a site index of 104 from *Establishing and Managing Ponderosa Pine in the Willamette Valley*. In this paper it **repeatedly** states that this data is from a **very small sample** and **should not be used** at this time, until more long term data can be collected. He then makes a quatuam leap to a site index of 150 (without showing where this comes from) and states this site would have a growth productivity of 210 cf/ac/yr. This type of growth can only be obtained on the **very best (Site I ground)** ponderosa pine sites. These sites for pine are, **generally speaking**, in eastern Oregon. On high site ground in western Oregon, Douglas-fir will easily out grow and outproduce ponderosa pine. The primary example of this is coastal ground where ponderosa pine would be very difficult to find, if it could be found at all.

Mr. Just points out that I challenge the capability of the Panther soil to support hybrid poplar. I stated that hybrid poplar will not grow in the Panther soil on **this site, not that it would not grow in the Panther soil.** Hybrid poplars attain the best growth on deep, fertile, alluvial soils that have adequate moisture (see Exhibit 7). This site has very shallow soils (or none at all on the exposed rock), a south to southwest aspect (hot and dry summers, harsh tree growing conditions) and does not have adequate water.

Hybrid poplar plantations are established in the same manner as an agricultural crop. In fact the state of Oregon considers it an agricultural crop through the age of 12 years, because it was originally intended that the trees would be harvested between 8 to 10 years old. To establish a poplar plantation, all old stumps must be removed, the soil tilled by plowing or ripping, competing vegetation must be controlled and drainage must be improved by using either surface ditches or subsurface tile (see Exhibit 7). These are agricultural practices which are done using machinery; **plowing and improving drainage are not forestry practices.** The use of such machinery means the slope of the land should not be steep, preferably under a 5% slope. The Ogle parcel is considerably steeper than 5%, in places it exceeds 35%. This is far to steep for agricultural machinery to operate on. For hybrid poplar stands to approach the productivity figures cited by Mr. Just the landowner must carry out intensive weed control, fertilize, thin, prune and protect the stand from animals, insects and diseases (see Exhibit 7). Especially important is weed control. If not controlled the hybrids will grow slowly and may not survive (see Exhibit 7). The majority this of these activities are done with machinery. The poplar stands cited by Mr. Just, with the accompanying growth figures, are only capable of these growth figures because all of the above activities have been carried out.

Mr. Just cites plantations growing west of the Cascades in areas of "ample rainfall". These are plantations, on flat ground, on the western slopes of the Cascades, where rainfall is higher than the rainfall in the Willamette Valley. Rainfall in Oregon is highest on the western slopes of the coast range and second highest on the western slopes of the Cascades. The east slopes of the coast range and Cascades are in a rain shadow and are considerably drier. This is why vineyards do so well on the east slopes of the coast range. Rainfall amounts incease as you go from the coast range rain shadow to the west slopes or the Cascades. Mr. Just then states that the Panther soils are found in areas of ample rainfall and that the soil units characteristics match those of soils supporting hybrid poplar. This could be stated for dozens of soils; I am truly confused as to what this is supposed to prove. If site conditions are conducive to the growth of hybrid poplar, the tree will grow. On the Ogle parcel the on site conditions, i.e. slope, aspect, actual soil conditions, etc., will not support the growth of hybrid poplar regardless of soil type.

Page 6: Mr. Just states that a tree species is "merchantable timber" if it can possibly be marketable in the foreseeable future. This is the definition for determining whether or not a tree species can be used for reforestation; **not the determining factor** for a merchantable timber species under the marginal land definition. OAR 629-610-0050(1)(c) is not applicable to land use law. Michael Farthing will discuss this point in more detail.

Mr. Just operates a tree farm; he states that ODF assisted with reforestation planning and he received cost-share assistance and tax credits for the reforestation. Was that for the KMX trees planted or the other species planted and other reforestation activities (if any) carried out? Mr. Just does not say. In his opinion, as a landowner, **not** a professional forester or log buyer, he states that the trees growing are straight and well formed. From pictures in his own exhibits I see twisted, S shaped trees with knots left from pruned limbs that are almost as large as the bole of the tree. Mr. Just further states that his neighbor, Mr. Monroe, has reforested with KMX and his trees are now large, straight and well-formed.

In my discussions with foresters from Roseburg Lumber, Seneca and Lone Rock Timber, three companies which have planted this tree, I have gotten the opposite. They have all stated that the trees are like bushes, are incredibly limby and of very poor form. This is what I personally have observed with KMX trees. In addition, many of the trees growing are now dying from foliar diseases. In short, none of these companies will plant KMX again. Furthermore, the state foresters I have talked to, including those in Linn County, discourage planting KMX; as a professional consulting forester managing private owners small woodlands, I would **not** recommend planting KMX.

Mr. Just further states that in **limited** testing, **of the caracteristics of KMX (not actual KMX saw logs)**, it produces high quality pulp and is suitable for studs and dimension lumber. Talking with mills and log buyers throughout the state of Oregon shows otherwise. The pulp is so high in resin content that it gums up the machinery in the mills; they will not use it for pulp. **No mill** will purchase **KMX logs** with a purchase order. No **mills** will purchase ponderosa pine or KMX pulp logs. There are two chip/pulp plants in the area that will **occasionally** purchase ponderosa pine pulp logs; they **will not** purchase KMX for pulp.

The final argument for merchantibility of KMX concerns the use of KMX for firewood. To begin with it is hard to conceive of someone planting KMX to grow for firewood. The next point is whether or not it makes good firewood, not just will it burn. Anything will burn, given enough fuel. Ponderosa pine is horrible as firewood. It is extremely pitchy and resinous; both of these substances create creosote in chimneys, whether burned in an open fireplace or a wood stove. Creosote creates an extreme fire hazard. Furthermore, unless ponderosa pine is extremely dry, it is hard to light and burns poorly, which creates huge amounts of smoke. In today's world this is extremely undesirable and under certain conditions in Lane County (when it is put out on the news to not burn wood due to atmospheric conditions) it is illegal. KMX has even more resin than ponderosa pine which would mean it produces even more smoke than ponderosa pine produces. Although it may happen, I have never seen anyone selling KMX as firewood from the back of their pickup.

Page 7: Mr. Just states that Monterey pine in New Zealand and Australia produce merchantable timber. This is true. He then makes a quantum leap and states that there is no reason to believe KMX will not produce merchantable timber. This is simply not true. The characteristics of the wood in KMX are different from Monterey pine just like Monterey pine is different from ponderosa pine. Because one species of pine is merchantable **does not** mean another pine species is merchantable.

Mr. Just states that I do not explain my use of a 50-year rotation cycle for my calculations. I will **repeat again;** I have used 50 years because Lane County has determined that this is the cycle which will be used. I originally used a 60-year cycle; Mr. Just assailed this as incorrect and stated I should be using a 50-year cycle as required by Lane County. Mr. Just further states that the rotation age should be changed because the 50-year growth cycle does not "constitute reasonable management practices". This is the **exact same statement** he originally made concerning the 60-year cycle I used.

Page 8: Mr. Just statements concerning the length of an appropriate growth cycle (for calculation of income) cites a graph (see Mr. Just's Exhibit 3-13, my Exhibit 8) showing the culmination of mean annual increment, the point in time that the periodic annual increment intersects the mean annual increment. While the culmination of mean increment may be 80 years that is not when a company or landowner would log in order to maximize income. Culmination of mean annual increment is the point in time that the stand is mature, not necessarily when it should be harvested (see Exhibit 8). It can be seen that the periodic annual increment peaks between 40-50 years; this is the point in time a company would log, as well as a landowner wishing to maximize their income. Up to this point in time the growth is increasing, after this point in time the growth rate is slowing down. From a companies standpoint this is the point in time where the cost of holding on to the timber is increasing because the growth is decreasing. Therefore from a profit standpoint, a company and a private landowner would harvest at this time (see Exhibit 8). As most private individual tree farmers are interested in income (or cash flow), as well as growing trees, a reasonable management practice would be to harvest between 40 and 50 years. While some owners would not harvest at this point in time, it would be for other reasons than maximizing their income.

Mr. Just sites testimony from Jesse and Jo Ann Ulloa confirming that "substantial" amounts of western red cedar and ponderosa pine were logged from the subject properties; did they go onto the property with a forester who knows how to identify trees? As I have **repeatedly** stated, **incense cedar** and ponderosa pine as well as Douglas-fir were harvested from the property. As I have **repeatedly** stated **incense cedar** did grow and does currently grow on the property, but at a considerably slower growth rate than Douglas-fir and well below the 85 cf/ac/yr standard accepted by Lane County.

I stated that prices for 250-350 year old "yellow belly" ponderosa pine, primarily from central and eastern Oregon, were not the same as 50 year old Douglas-fir 2S grade. Mr. Just states that I am incorrect because his prices were from the Grants Pass Unit, for southwestern Oregon pine and ponderosa pine peelers. I am not sure what he is trying to prove with this statement. Ponderosa pine grades are the same regardless of where the tree grows, I simply stated that the majority of old growth pine comes from central and eastern Oregon. In other words the **price** may be different in the Grants Pass Unit but the **grades** are the same as anywhere else. Mr. Just states the prices presented are for southwestern Oregon pine and ponderosa pine peelers. To **clarity; pine peelers** are an Oregon pine grade. You **cannot** have a peeler grade pine log in a 50 year old ponderosa pine tree, the rotation age being discussed in this analysis.

As a follow up to the price issue Mr. Just has presented 20 years worth of ponderosa pine prices in an August 19th letter. He presents this information as proof that ponderosa pine is a merchantable tree species. At **no point** have I stated ponderosa pine is not merchantable; my statements have been made in regards to the much lower value of ponderosa pine logs than Douglas-fir logs. Mr. Just then tries to compare 2S Douglas-fir to 2S ponderosa pine; this is comparing apples to oranges. A 2S Douglas-fir log is equivalent to a 4S ponderosa pine log (see Exhibit 9).

Notes on discussions of productivity. Mr. Just repeatedly brings up the issue of **"reasonable management practices"**. Generally speaking, forest management activities carried out on forestland are conducted in order **to produce an income as well as manage the forest.** A reasonable person would want these activities to be profitable, not necessarily in the short term, but definitely over time. Most of the activities espoused by Mr. Just would cost the landowner substantial amounts of money, with very little return. Most people managing forestland seek some sort of return. Growing tree species which you cannot sell on today's market would not be a prudent or reasonable management practice. Very few people are willing to plant a tree species based on the hope that it **may be** merchantable in the future. Furthermore, there are few tree farmers who are in the business to lose money. The practices Mr. Just proposes would be prohibitively expensive to carry out and in most cases cause the landowner to lose money. These practices would also take ground out of production from an income producing standpoint.

In conclusion, as a practicing professional forester, I would not consider planting ponderosa pine, KMX, or hybrid poplar a reasonable or prudent practice to carry out. The KMX tree species is not a commercially marketable species; planting it would cost a substantial amount of money, with no return in the foreseeable future. Hybrid poplar would be all but impossible to plant and maintain on this site (see explanation on page 6), it would also be prohibitively expensive even if it was possible. Furthermore, while a market for the wood may exist in isolated areas (such as near Pendleton), it would be prohibitively expensive to truck the wood there (it is a very heavy wood, chip trucks reach their maximum weight before the truck is full). Planting valley ponderosa pine at this point in time is also a huge risk; the IPS beetle (which attacks freshly cut ponderosa pine) is becoming a real problem, currently there is not a good market for pine and even when you can sell it the delivered price paid will not cover the cost of getting the logs to a mill. As a professional forester managing private owners forestland, I **would not** recommend planting any of these species. The large amounts of capital needed to grow these trees would be better spent on brush and grass control to establish Douglas-fir, the highest value conifer growing today.

Sincerely,

Marc E Setchell

EXHIBIT 7

Washington State University

Hybrid Poplar Research Program

WSU-Puyallup

Establishing High Yield Plantations

In most cases, high yield plantations will be established on cleared land. In western Washington and Oregon, consider agricultural lands not currently suited for cultivated crops. Usually, such lands are in grass for hay or pasture. Quality cropland also can be used, since methods are available to eliminate the stumps and return the field to agriculture. Special considerations required to establish plantations on grasslands are discussed below. For more details please refer to "High Yield Hybrid Poplar Plantations i the Pacific Northwest."

Genetic Diversity - Use of a single clone in plantations increases risk from insects and disease. Therefore, in extensive plantings (over 40 acres), plant several clones, either in pure blocks or in mixed clone stands.

Suitable soils - Hybrid poplars attain the best growth on deep, fertile, alluvial soils that have adequate moisture. One reason for their high productivity is their ability to fully use such soils. Light textured soils, such as sandy loams abd silt loams, are generally best, t heavier textured soils can produce excellent growth if the soil is relatively loose and friabl

Where can hybrid poplar be grown? - Use caution in planting hybrids developed for the Pacific Northwest in regions of the world that have unsuitable climates and significantly different latitudes. Even in similar climates, susceptibility to local diseases can limit hybri growth.

Cold Injury - Most serious cold injury has resulted from sudden cold in fall. Low temperatures occurring later, when the trees are fully dormant, is of little concern. Spring frosts can injure newly emerging leaves and succulent stems. Such damage occurs both east and west of the Cascades in Washington, but rarely kills trees. The other type of col injury noted with older specimens of certain clones is frost cracking of the trunk.

Choosing the spacing - If trees will be harvested as biomass fuel, small sized trees as young as one year can be used. Expect resrouting for subsequent harvests (provided harvesting is done in the dormant season). Under such conditions, use close spacing - 2 4 feet or 4 x 4 feet. Spacing for longer cycle cuttings can range up to 20 x 20 feet, depending on the size of the tree desired.

Land Preparation - Proper land preparation is vital for ensuring high productivity plantations. The major objectives in land preparation include:

1. controlling competing vegetation
2. loosening the soil by plowing, ripping, subsoiling, and
3. improving drainage by using either surface ditches or subsurface tile.

7-1

Cost share assistance - Establishment of hybrid poplar plantations may be eligible for USDA cost-sharing funds if harvest rotations exceed 10 years. Local offices of the USDA Agricultural Stabilization and Conservation Service (ASCS) or your state forestry agency, Washington State Department of Natural Resources, Oregon Department of Forestry, or Idaho Department of Lands can advise you regarding the eligibility of hybrid poplar in you area