Water Resources Department

MEMO   04/01   , 200 4

TO   Application G- 16190

FROM   GW: V. K. Ball
                    <u>(Reviewer's Name)</u>

SUBJECT   **Scenic Waterway Interference Evaluation**

☒ Yes

☐ No   The source of appropriation is within or above a Scenic Waterway

☒ Yes

☐ No   Use the Scenic Waterway condition (Condition 7J).

PREPONDERANCE OF EVIDENCE FINDING: (Check box only if statement is true)

☒   At this time the Department is unable to find that there is a preponderance of evidence that the proposed use of ground water will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway in quantities necessary for recreation, fish and wildlife.

FLOW REDUCTION: *(To be filled out only if <u>Preponderance of Evidence</u> box is not checked)*

Exercise of this permit is calculated to reduce monthly flows in _____ Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: <mark>Water Rights Section</mark> Date **April 1, 2004**

FROM: Ground Water/Hydrology Section ___ **Ivan Gall** _____
Reviewer's Name

SUBJECT: Application G- **16190** ____ Supersedes review of ___ **na** ___
Date of Review(s)

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

OAR 690-310-130 (1) *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525.* Department staff review ground water applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation.**

A. GENERAL INFORMATION:
Applicant's Name: **Leslie Rushing** County: **Jackson**

A1. Applicant(s) seek(s) **0.022** cfs from **one** well(s) in the **Rogue** Basin,

Sterling Creek subbasin Quad Map: **Sterling Creek**

A2. Proposed use: **Irrigation of 3.1 acres** Seasonality: **April 1 to October 31**

A3. Well and aquifer data (**attach and number logs for existing wells; mark proposed wells as such under logid**):

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	JACK 16893	1	bedrock	0.022	38S-02W-29cd	1,500' S, 1,040' W fr center S 29
2						
3						
4						

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	3020	142	20	5-7-1980	244	unk	unk	-1 - 244	-1 - 244	35	164	Air

Use data from application for proposed wells.

A4. **Comments:** This well was deepened in 1980 (JACK 16893). I was unable to find the original log, so no information is available regarding well casing and seal depths. _____
_____
_____
_____
_____

A5. ☒ **Provisions of the Rogue** _____ Basin rules relative to the development, classification and/or management of ground water hydraulically connected to surface water ☐ **are**, *or* ☒ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: **See OAR 690-515-0030; note that no new irrigation is allowed from the Little Applegate and Forest Creeks.** _____
_____
_____

A6. ☐ **Well(s) #** _____ , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____
Comments: _____
_____
_____

B. GROUND WATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that <u>ground water</u>* for the proposed use:

    a. ☐ **is** over appropriated, ☐ **is not** over appropriated, *or* ☒ **cannot be determined to be** over appropriated during any period of the proposed use. * This finding is limited to the ground water portion of the over-appropriation determination as prescribed in OAR 690-310-130;

    b. ☐ **will not** *or* ☐ **will** likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the ground water portion of the injury determination as prescribed in OAR 690-310-130;

    c. ☐ **will not** *or* ☐ **will** likely to be available within the capacity of the ground water resource; or

    d. ☒ **will, if properly conditioned**, avoid injury to existing ground water rights or to the ground water resource:
        i. ☒ The permit should contain condition #(s) __**7B, 7F, 7J**_____;
        ii. ☐ The permit should be conditioned as indicated in item 2 below.
        iii. ☒ The permit should contain special condition(s) as indicated in item 3 below;

B2. a. ☐ **Condition** to allow ground water production from no deeper than _____ ft. below land surface;

    b. ☐ **Condition** to allow ground water production from no shallower than _____ ft. below land surface;

    c. ☐ **Condition** to allow ground water production only from the _____ ground water reservoir between approximately_____ ft. and_____ ft. below land surface;

    d. ☐ **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Ground Water Section.

        Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____
        _____
        _____
        _____
        _____

B3. **Ground water availability remarks: __* Require applicant to install a properly functioning, totalizing flow meter.____**

The subject well is completed in a fractured bedrock aquifer. I have no aquifer property or water level data for this area. Although the casing and seal depth are unknown, it is unlikely that there is a shallow, alluvial aquifer at this location that could be impacted by pumping the deeper fractured system. Nearby well logs indicate that groundwater occurs in discrete fractures, which have been logged as quartz veins. 14 well logs in section 29, yield varies from 1 gpm to 75 gpm, 3 deepenings. Static water levels reported between 8 feet and 220 feet bgs, with three static levels deeper than 100 feet. The subject property lies in a saddle, essentially at the margin between the Forest Creek WAB to the north (Bishop and Poormans Creeks are tribs to Forest Creek) and the Little Applegate WAB to the south (Sterling Creek is a trib to the Little Applegate). In an email from Tom Wiley (DOGAMI geologist), the local geology is composed of meta-sediments (mudstone, sandstone, pebbly sandstone, argillite, and tuffaceous shale. Tom has a syncline mapped 100 feet west of Hill 3192 and trending N to NE. Smith and others (1982) mapped a fault coming up Bishop Creek; it appears that there may be other faults in the area.

C. GROUND WATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Bedrock**	☐	☒
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: **The aquifer is likely semi-confined. Static water level rises above the logged water-bearing zone. However, the degree of incision of drainages on all sides of the applicant's well suggests that the fractured rock aquifer is likely unconfined at the locations where the groundwater discharges into streams. Well log for the subject well indicates the same 20-foot static water level from 92 to 244 feet. There is no evidence on the well log of any confining unit or significant change in lithology.**

_____

_____

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	1	**Bishop Creek**	**3000**	**2640**	**2100**	☒	☐	☐	☐	☐
1	2	**Hopkins Gulch**	**3000**	**2960**	**2100**	☒	☐	☐	☐	☐
1	3	**Sailor Gulch**	**3000**	**3000**	**4900**	☐	☒	☐	☐	☐
1	4	**Poormans Creek**	**3000**	**2760**	**3500**	☒	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: **The drainages are deeply incised into the local bedrock. Water level in well is equal to, or greater than, water level in stream. Streamflow in local streams in SW Oregon is supported by groundwater discharge during the dry months, and a mix of groundwater and surface water runoff during the wet months. Bruce Sund has observed flow in these small tributaries during summer months. Water rights have also been filed on some of these tributaries.**

_____

_____

Water Availability Basin the well(s) are located within: Little Applegate (70982); adjacent to Forest Creek ((71614)

C3a. **690-09-040 (4):** Evaluation of stream impacts for <u>each well</u> that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked ☒ box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	1	☐	☐	**NA**	**NA**	☐	**NA**	☐	10%	☐
1	2	☐	☐	**NA**	**NA**	☐	**NA**	☐	10%	☐
1	4	☐	☐	**NA**	**NA**	☐	**NA**	☐	1%	☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

C3b. **690-09-040 (4):** Evaluation of stream impacts <u>by total appropriation</u> for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells.** Otherwise same evaluation and limitations apply as in C3a above.

	SW #		Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: ___ There are no instream water right or natural streamflow values for any of the streams listed above. The distance to the main WABs exceeds one mile so an impact on those streams against their instream water rights or natural streamflow values is not conducted. _____

_____

_____

_____

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells

Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													

Distributed Wells

Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(A) = Total Interf.												
(B) = 80 % Nat. Q												
(C) = 1 % Nat. Q												

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(D) = (A) > (C)												
(E) = (A / B) x 100	%	%	%	%	%	%	%	%	%	%	%	%

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation: Used Jenkins model; simple analytical model with values estimated from textbook for hydraulic conductivity and storage. Streambed conductance likely greater than that of aquifer, given steep nature of drainages. Stream width minimal.

C4b.   **690-09-040 (5) (b)   The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.**

C5. ☒ **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or ground water use under this permit can be regulated if it is found to substantially interfere with surface water:

   i. ☒ The permit should contain condition #(s)____**7B, 7F, 7J, ****_____;
   ii. ☒ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. SW / GW Remarks and Conditions **It is very likely that the applicant's groundwater is hydraulically connected to nearby surface water. However, the hydraulic properties of the aquifer suggest that impact to local streamflow will be minimal. Simple analytical modeling using estimated values of aquifer hydraulic conductivity (K) and storage (S) indicate 10% or less of the pumping rate will be seen at a 2,100 feet distance. Existing water rights on the small streams, and personal observations by watermaster Bruce Sund, indicate that many of the small tributaries in this area have flow into the summer months, a function of groundwater discharging to maintain baseflow in the streams.**

** *Require applicant to install and maintain a properly functioning, totalizing flow meter.*

References Used: Sterling Creek and Medford West 7.5 minute quadrangles, 1983 provisional editions.
OWRD GRID well log database (online).
Tom Wiley, pers. communication (email).
Jenkins analytical model.

D. WELL CONSTRUCTION, OAR 690-200

D1.   **Well #:** _____   **Logid:** _____

D2.   **THE WELL does not meet current well construction standards based upon:**
- a. ☐ review of the well log;
- b. ☐ field inspection by _____;
- c. ☐ report of CWRE _____;
- d. ☐ other: (specify) _____
  _____

D3.   **THE WELL construction deficiency:**
- a. ☐ constitutes a health threat under Division 200 rules;
- b. ☐ commingles water from more than one ground water reservoir;
- c. ☐ permits the loss of artesian head;
- d. ☐ permits the de-watering of one or more ground water reservoirs;
- e. ☐ other: (specify) _____

D4.   **THE WELL construction deficiency is described as follows:** _____
_____
_____
_____
_____

D5.   **THE WELL**   a. ☐ **was,** *or* ☐ **was not** constructed according to the standards in effect at the time of original construction or most recent modification.

                b. ☐ I don't know if it met standards at the time of construction.

D6. ☐ **Route to the Enforcement Section.** I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Enforcement Section and the Ground Water Section.

THIS SECTION TO BE COMPLETED BY ENFORCEMENT PERSONNEL

D7. ☐ Well construction deficiency has been corrected by the following actions: _____
_____
_____
_____
_____
_____
_____
_____
_____

_____   _____, 200____.
(Enforcement Section Signature)

D8. ☐ **Route to Water Rights Section (attach well reconstruction logs to this page).**

G16190_Rushing.xls

Input Data:

Variable	Name	Minimum	"Best"	Maximum	Unit
Well Owner or Well Number	Well		G-16190		
X Coord. for X-Section (Head Distribution)	x		0		[ft]
Perpendicular Distance From Well to Stream	a		2,100		[ft]
Net Steady Pumping Rate	Q		10		[gpm]
Hydraulic Conductivity	K	1	10	100	[gpd/ft*ft]
Aquifer Thickness	b	100	100	100	[ft]
Well Depth	d		244		[ft]
Storativity	S		0.00500		
Effective porosity	n		0.00500		
Hydr. Grad. Perpend. to Stream (must be > 0)	i	0.10000	0.10000	0.10000	
Time Since Pumping Started	time		30.00		[days]

Output Data:

General Output:

Transmissivity	T	100	1,000	10,000	[gpd/ft]	= K*b
Hydraulic Conductivity	K	1	10	100	[gpd/ft*ft]	
		0	1	13	[ft/day]	
		4.69E-07	4.69E-06	4.69E-05	[m/s]	
Average linear velocity	ALV	2.67	26.74	267.38	[ft/day]	= K*i/n
		976.60	9,766.04	97,660.43	[ft/yr]	
Ambient Flux at River per Foot	dQ	0.0069	0.0694	0.6944	[gpm/ft]	= K*b*i

Transient Stream Depletion Output:

k	SDTr_k	13.7445	1.3745	0.1374		= ((a^2*S)/(4Tt))*7.48
Transient Stream Depletion (Theis/Jenkins)	SDTr	0%	10%	60%		= erfc SQRT(a*a*S)/4Tt
Transient Induced Infiltration (Theis/Jenkins)	IITr					

1% @ 3500 feet

Steady-State Stream Depletion:

Dimensionless Pumping Rate	Beta, ß	0.22	0.02	0.00		= Q/(K*b*i*•*a)
(ß >= 1 ==> velocity divide has reached stream)						
SQRT(Beta-1)		0.00	0.00	0.00		
Critical pumping rate	Qc	46	458	4581	[gpm]	= K*b*i*•*a
Dist. fr Well to Velocity Divide at Steady State	rvd	243	23	2	[ft]	= a-(a*SQRT(1-ß))
Steady-State Stream Depletion (Wilson & Linderfelt)		100%	100%	100%		
Steady-State Induced Infiltration (Wilson & Linderfelt)		0%	0%	0%		= (2/•)*{-SQRT(ß-1)/ß+AT

Page 1

G-16190

Q = 10 gpm   K Max = 100 gpd/ft*ft   T Max = 10,000 gpd/ft
a = 2100 ft   K = 10 gpd/ft*ft   T = 1,000 gpd/ft
S = 0.0050   K Min = 1 gpd/ft*ft   T Min = 100 gpd/ft
t = 30.00 days   Transient Stream Depletion = 10% at t = 30.00 days

Stream Depletion [% of Well Discharge]

Time Since Start of Pumping [days] or Distance from Pumped Well [ft]

Residual SD — Max SD — SD ····· Min SD — SD vs a
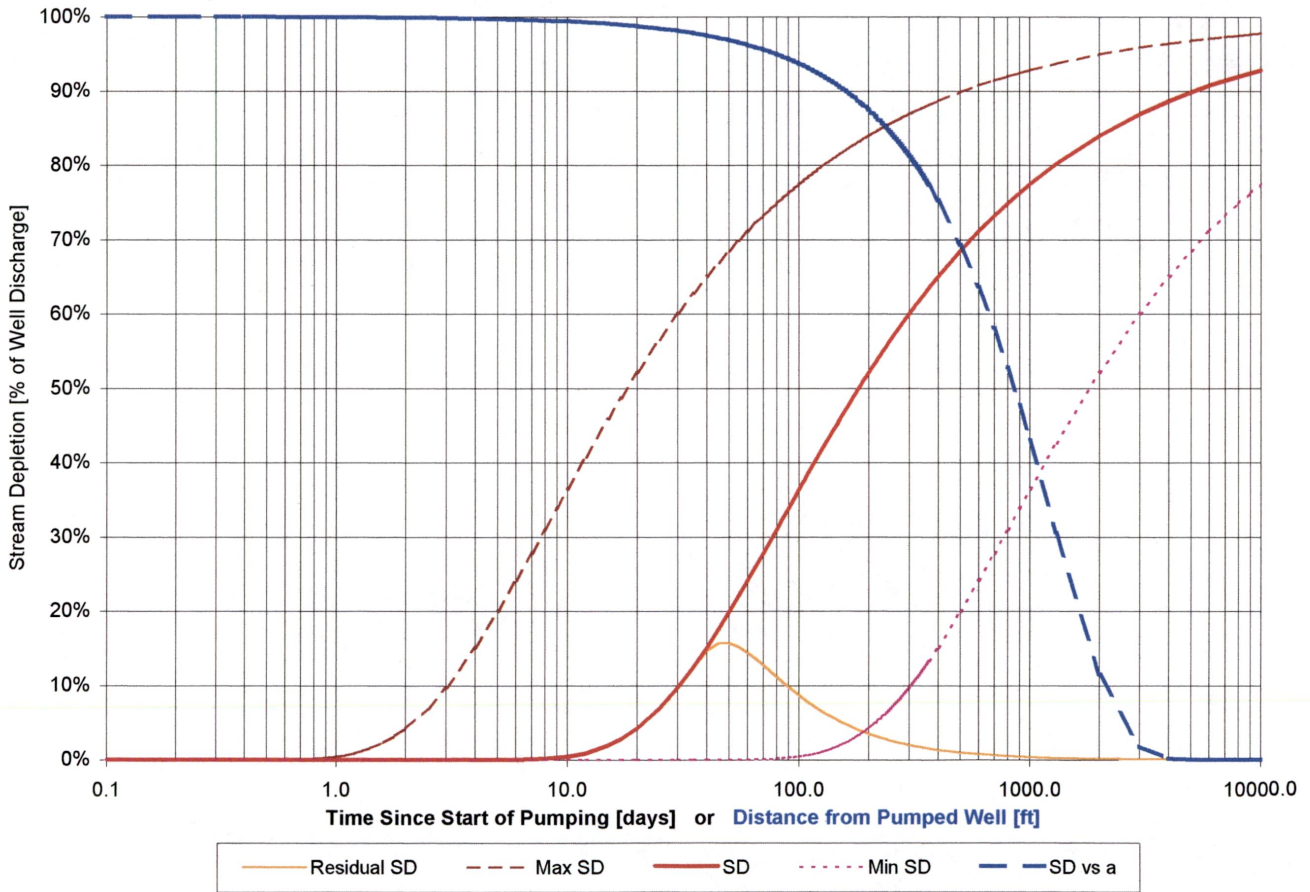
From: WILEY Tom <Tom.Wiley@state.or.us>
To: GALL Ivan K <Ivan.K.Gall@state.or.us>,
  "'WILEY Tom '" <Tom.Wiley@state.or.us>
Subject: RE: geology @ 38S-02W-29
Date: Wed, 24 Mar 2004 10:37:20 -0800
X-Mailer: Internet Mail Service (5.5.2653.19)

Ivan:
Sorry this took so long. Been out sick and on vacation (It's a long
story.).

Most of the rocks in this area are metasediments. Lithologies that occur
nearby include mudstone, sandstone, pebbly sandstone, argillite, and
tuffaceous shale. I have the north- to north-northeast-trending axis of a
syncline approximately located about 100' west of the top of Hill 3192
(strikes are more northerly to the north and swing west as you go south).
The nearest attitude I measured is located about 1/8th mile to the northeast
of Tax Lot 1100. There the strike is north-south and the dip is 25 degrees
to the west. Nearest lava / dike that I'm aware of is in the southeast 1/4
of section 19. There are probably a bunch of unmapped, unmetamorphosed
(Cretaceous?)hornblende-phyric dikes in this area. But I would guess that
the drillhole encountered a suite of greenschist facies meta-sediments with
volcanic provenance.

Smith and others (1982) mapped a fault coming up Bishop Creek and crossing
the divide onto the south end of the property. An attitude I measured along
the Bishop Creek in NW 1/4 of section 30 is not consistent with surrounding
attitudes and similarly suggests local rotation by a fault following the
creek. I've mapped two other faults that trend toward the property from the
northeast, but stopped them at the center of section 29 due to a lack of
data farther southwest.

Jad might have a better strike and dip or know if there are any flows or
dikes along strike near his house.

Tom

-----Original Message-----
From: Ivan Gall
To: WILEY Tom
Sent: 3/18/04 7:45 AM
Subject: geology @ 38S-02W-29

        Tom, I need a short geological description for a water right
review at 38S-02W-29cd. Is there a published geology map of the
Sterling
Creek quad? Your Medford sheet stops just north of this site. I assume
it
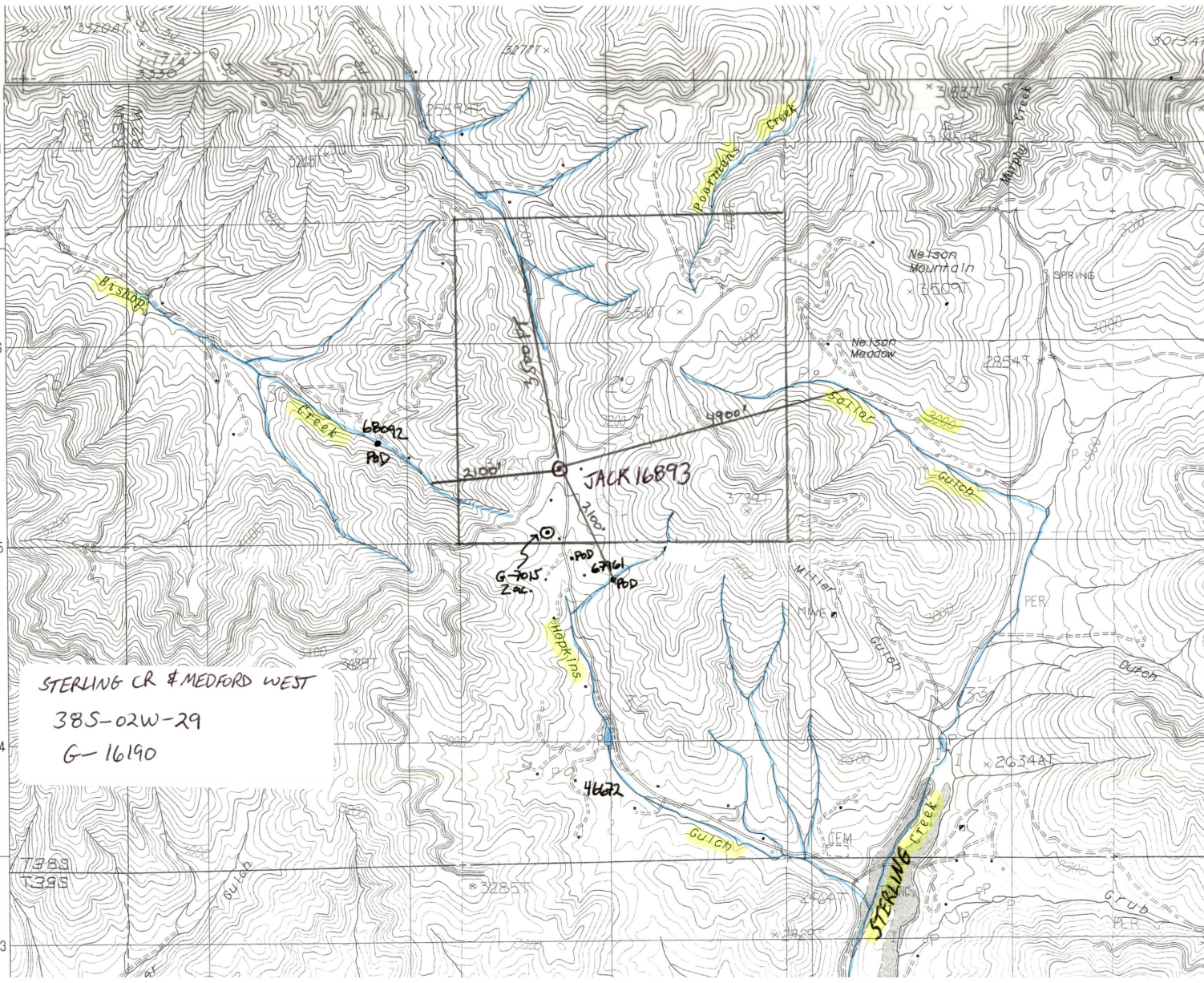is meta-sediments or meta-volcanics of the applegate group? The log

42°15'

4677000m N

4676

4675

4674

4673

Bishop

Creek

68092
POD

3.50 ft

2100'

JACK 16893

4900'

G-7015
2 ac.

POD
67961
POD

Poormain Creek

Creek

Nelson Mountain
3509T

Nelson Meadow

Sailor

Gulch

Hopkins

Miller

Gulch

MINE

STERLING CR & MEDFORD WEST
38S-02W-29
G-16190

4672

GULCH

CEM

STERLING Creek

2634AT

T38S
T39S

Wiley & Smith, 1993

O-93-13

site of map ↓

42° 15'
123° 00'

42° 15'
57' 30"

B

230 000 FEET

1 330 000 FEET

Qls
JFls
Qaf
Qya

M80
M81
M83
M84
M85