Siskiyou County Community Development-Environmental Health Division

806 South Main Street, Yreka CA 96097
Telephone: (530) 841-2100 FAX: (530) 841-4076

T 43 N R 6 W S 22

WATER WELL PERMIT

PERMIT# W 24074

APPLICANT (Must be licensed contractor or property owner and must be legible)

Name Tom Nielsen
Address 15400 Old Hwy 99
Mailing Address PO Box 49
City, State, Zip Code Gazelle, CA 96034
Telephone 530-598-5422

Well Type — **Annular Seal Depth**

- ☐ Domestic ..... 20 foot minimum
- ☐ Industrial ..... 50 foot minimum
- ☑ Agricultural ..... 20 foot minimum
- ☐ Public ..... 50 foot minimum
- ☐ Monitoring ..... as approved #.....
- ☐ Deepening ..... n/a
- ☐ Destruction ..... n/a
- ☐ Soil bores ..... as approved #.....
- ☑ Other ..... as approved

Minimum thickness of annular space seal is 2 inches

Replacement Well

A PLOT PLAN MUST be submitted on an 81/2 x 11 sheet of paper. It must include all property boundaries, waterways, roads, septic systems and structures, location of the proposed well in relationship to the property boundaries.

Permit Conditions

- Well driller must provide a minimum of 24 hours notice prior to installing or placing annular seal.
- All wells must be drilled under a C-57 license
- Applicant/well driller is responsible for maintaining all setbacks as approved by on location map below including a minimum of 100 feet from any established on-site sewage disposal location.
- Owner and well contractor are required to submit a completed well log within 30 days of well completion.
- This permit does not guarantee issuance of any other development permits or land use requests for this property.
- This permit expires 6 months from the date of issuance.

Owner/Contractor Signatures

SIGNATURE OF OWNER: *(required on all applications)*

I am the owner of the property and certify that the information contained herein is accurate. I understand that this application will become a permit upon review and approval by the Environmental Division. I understand that well construction may not begin prior to receiving a permit and all terms and conditions apply. I hereby authorize SISKIYOU COUNTY to enter the property for inspection purposes.

I hereby authorize the contractor listed herein to obtain the permit. Tom Nielsen 1/30/24
Signature Date

Signature of Contractor *(required on all applications)*
I certify that I possess a valid C-57 contractor's license that is in full force and effect. I certify that I have read this application and the above information is correct. I agree to comply with all Siskiyou County Ordinances and State Laws relating this well construction. I understand that this application will become a permit upon review and approval by the Environmental Division. I understand that well construction may not begin prior to receiving a permit and all terms and conditions apply.

Contractor 1/30/24
Contractor Date

Property Location

Property Owner Tom Nielsen
Assessors parcel # 022-430-080
Location Gazelle, CA
Parcel Size 164 acres

WELL CONTRACTOR

Name North State Drilling
Mailing Address 3282 Highway 32
City, State, Zip Code Chico, CA 95973
Telephone 530-891-5545
License # C-57 # 812678

FEES

Water Well Permit	$360
Water Well Deepening	$185
Water Well Destruction	$185
Monitoring well(s) construction or destruction and Soil bores ..... First three	$360

$75 for each additional bore/MW construction/destruction

For Official Use Only

	Date	Initials
Property Owner Verification	6/18	
Set back Requirements	6/18	
Flood	Ø	
Zoning	Ag-1	
City Public Works	N/A	

Received by IMB Date 1-31-24
Fee Received

Permission is hereby granted for the above well work in accordance with all State and County laws and standards as provided in Siskiyou County Code, Title 6, Chapter 8 and any conditions as set forth in this permit.

Issued by Date 9/5/24
Seal Inspection Date
Seal Depth
Final Inspection by Date
Inspection Notes:
Date Well Log Received Log #

LOCATION MAP
(to be completed by department)

See attached Site Location map for replacement well and permit Conditions
Replacement Well # 2
restore 75 area use.

Nielsen replacement well #1 APN 022-430-080

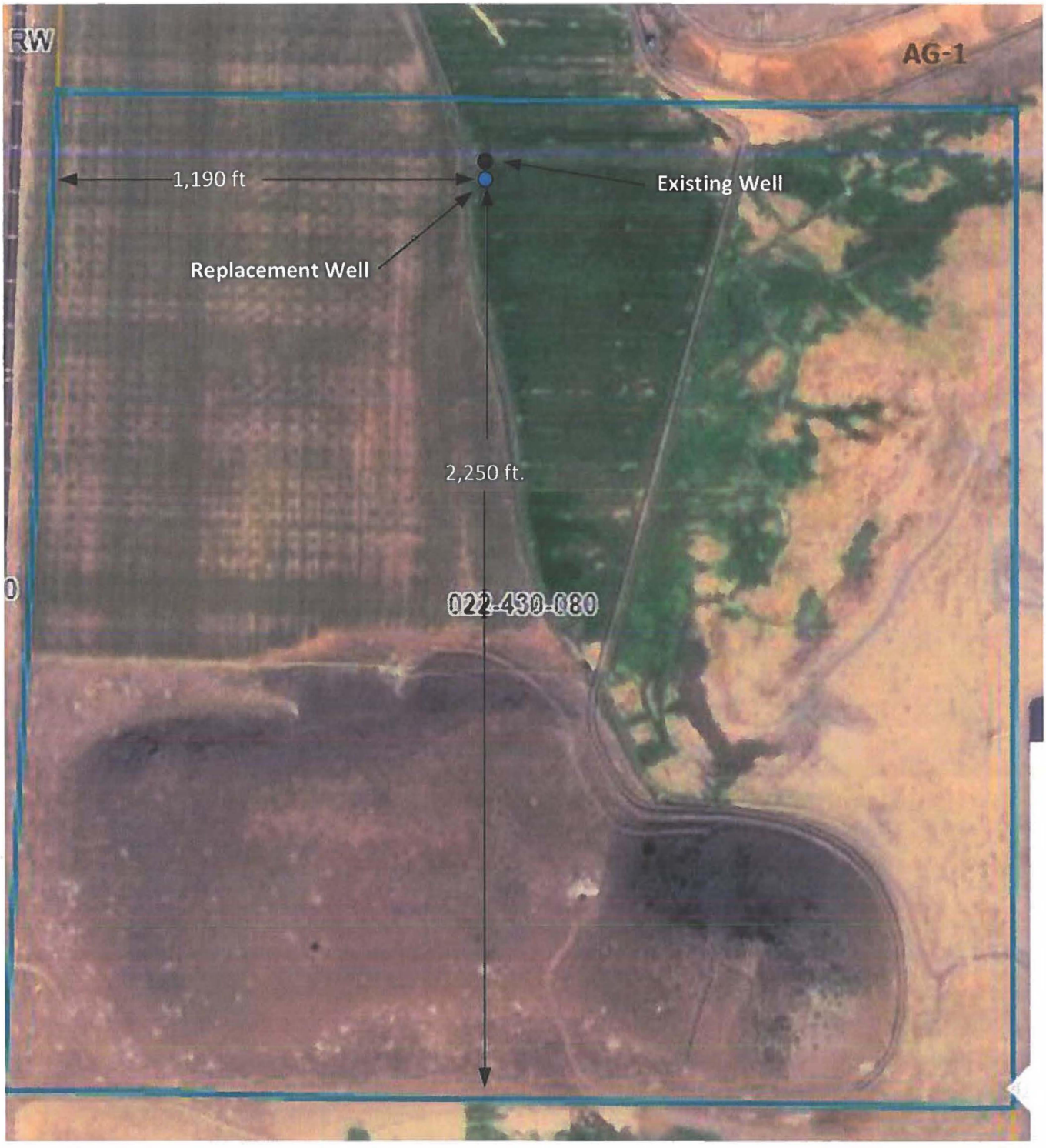
06/20/2024

N

NOT TO SCALE

Replacement Well permit conditions:

- Replacement well is installed within 50 feet of the existing well.
- Replacement well production is not to exceed irrigation of the 71 acres historically farmed as served by the former well and as stipulated by the GSA administrator.
- Former well is to be destroyed upon development of the replacement well.



Siskiyou County Environmental Health Division
Groundwater Well Executive Order N-7-22/N-3-23 Determination.

Owner Information		*Well Information*	
Name:	TOM NIELSEN	**A.P.N:**	022-430-080
Address:	15400 S. Old Hwy 99	**Latitude:**	41 33' 34.36 N
City:	GAZELLE	**Longitude:**	122 31' 15.60 W
Zip:	96034	**Township**	43N
Phone:	(530) 598-5422	**Range**	6W
Email:		**Section**	22

Groundwater production well: water well interference/subsidence determination

☒ The proposed production water well is not likely to interfere with the production and functioning of existing nearby wells.

☒ The proposed production water well is not likely to cause subsidence that would adversely impact or damage nearby infrastructure.

☒ Application was accompanied by a report signed by a California licensed Professional Geologist that concludes both that extraction of groundwater from the well (1) "is not likely to interfere with the production and functioning of existing nearby wells" and (2) "is not likely to cause subsidence that would adversely impact or damage nearby infrastructure."

Environmental Health has reviewed the above conditions for the subject property for compliance with Executive Order N-7-22/N-3-23 and has marked each box for compliance as applicable.

ENVIRONMENTAL HEALTH DIVISION — DATE: 6/20/24

Rick Dean — PRINTED NAME

CDP — TITLE

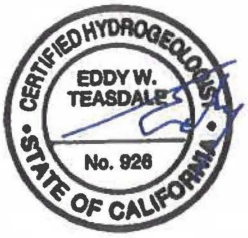
Luhdorff & Scalmanini
Consulting Engineers

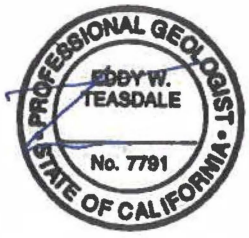
TECHNICAL MEMORANDUM

DATE: June 18, 2024 Project No. 23-2-169

TO: Mr. Tim Nielsen
Nielsen Orchards
15404 Old Hwy 99 S
Grenada, CA 96038

FROM: Eddy Teasdale, PG, CHG
Matt Sturdivant





SUBJECT: Nielsen Orchards Well #1 Evaluation - Specific to Executive Order N-7-22 Section 9 Analysis

BACKGROUND

The State of California issued Executive Order N-7-22 in March 2022 in response to expanding drought conditions. This order establishes new well permitting requirements to protect health, safety, and the environment. As part of new well permit issuance procedures adopted by Siskiyou County in response to Section 9(b) of the Executive Order, LSCE carried out analyses to assess whether the proposed Nielsen Orchards Well #1 to be installed near Old Hwy 99 S (41.57083, -122.52444) in Siskiyou County, CA satisfies the order for new groundwater wells to not likely "interfere with the production and functioning of existing nearby wells" or cause a decrease in land surface elevation (i.e., subsidence) that would "adversely impact or damage nearby infrastructure."

METHODOLOGY

To determine the lateral extent of impact due to pumping, LSCE simulated a decline in water levels (i.e., drawdown) under expected aquifer and pumping conditions. A Theis (1935) drawdown model was used as an approximation of dewatering due to pumping. The extent of drawdown was determined using aquifer properties from the Shasta Valley Groundwater Subbasin Groundwater Sustainability Plan (GSP) (SCFCWCDGSA, 2022) and pumping continuously at the planned pumping rate of 550 GPM until reaching the total water demand of 145 acre-ft annually.

Input Data

The Theis model calculates drawdown at a time and location based on a constant pumping rate and the aquifer's transmissivity and storativity. These model parameters were determined at the well site using calibrated values from the Shasta Watershed Groundwater Model (SWGM) at the planned screened interval depths of 200 to 300 feet below ground surface (SCFCWCDGSA, 2022). The proposed well location is overlying quaternary alluvium in approximately the upper 50 feet, and based on nearby cross-section E-E' (**Figure 1**), the well will be screened predominantly in quaternary volcanic rocks with some possible

inclusion of the upper Hornbrook Formation. The nearby representative monitoring well **SV03** is screened from 120 to 250 feet and 270 to 285 feet and intersects both the quaternary alluvium and volcanics (**Figure 2**).

The aquifer in the region of the well site consists of volcanic and sedimentary heterogeneous debris flow material overlain by basaltic and andesitic flows. Volcanic deposits may be porous and fractured, and the younger volcanics of the aquifer systems are characterized by high transmissivities and significant recharge. Water levels measured in some of the deeper volcanic formations are greater than water levels in the shallow aquifer, suggesting confinement in some regions of the aquifer system (Jefferson et al. 2006). Well yields for agricultural wells in the volcanic rocks are hundreds of gallons per minute (GPM), up to approximately 1,200 GPM (SCFCWCDGSA, 2022).

Table 1 shows the range of calibrated model parameters from the Shasta Watershed Groundwater Model. The proposed well will be screened within model layer 7. In unconfined aquifers, pumping causes gravity drainage, resulting in dewatering of the pore space (i.e., specific yield). This is in contrast with elastic storage release (i.e., storativity) from changing pressure in confined aquifers. Confinement is observed in some regions of the volcanic aquifer, so we conservatively model the layer with moderate and significant confinement to assess each possibility. For the moderate case, the aquifer's "semi-confined" storativity is calculated as the average of the layer's specific yield and specific storage. The geometric average is used for the significant case, which emphasizes the storativity value over the specific yield.

The transmissivity was calculated as the product of the calibrated model's hydraulic conductivity and the planned screen interval of 100 feet, with the assumption of full saturation over the 100-foot interval. For the expected case, we used the layer 7 hydraulic conductivity of 56.25 ft/day. We also simulate drawdown with a low transmissivity value using 80% of the layer's hydraulic conductivity. Aquifer parameters used in the Theis model are summarized in **Table 2**.

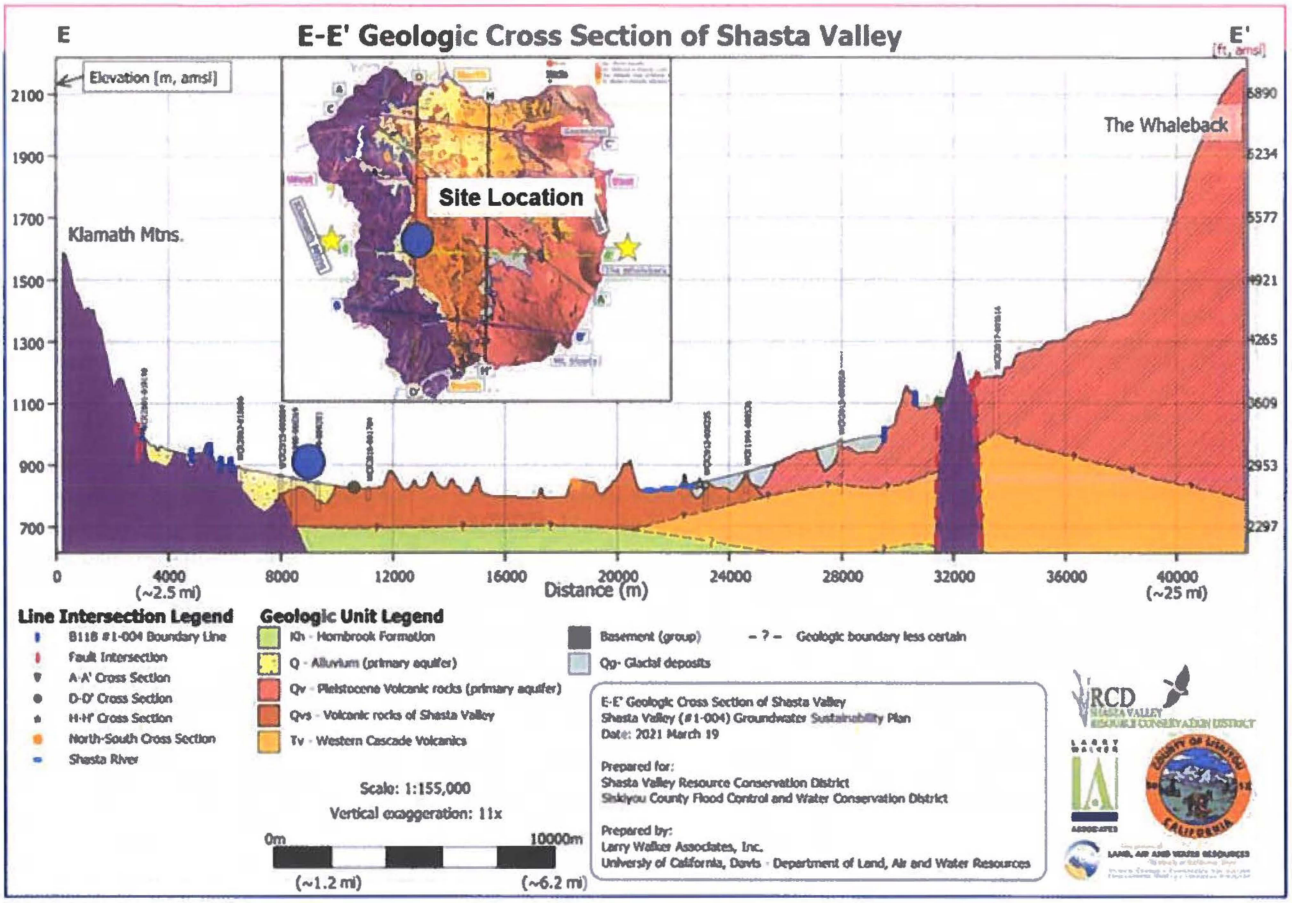


Figure 1. Cross Section E-E' and Site Location

Modified from (SCFCWCDGSA, 2022)

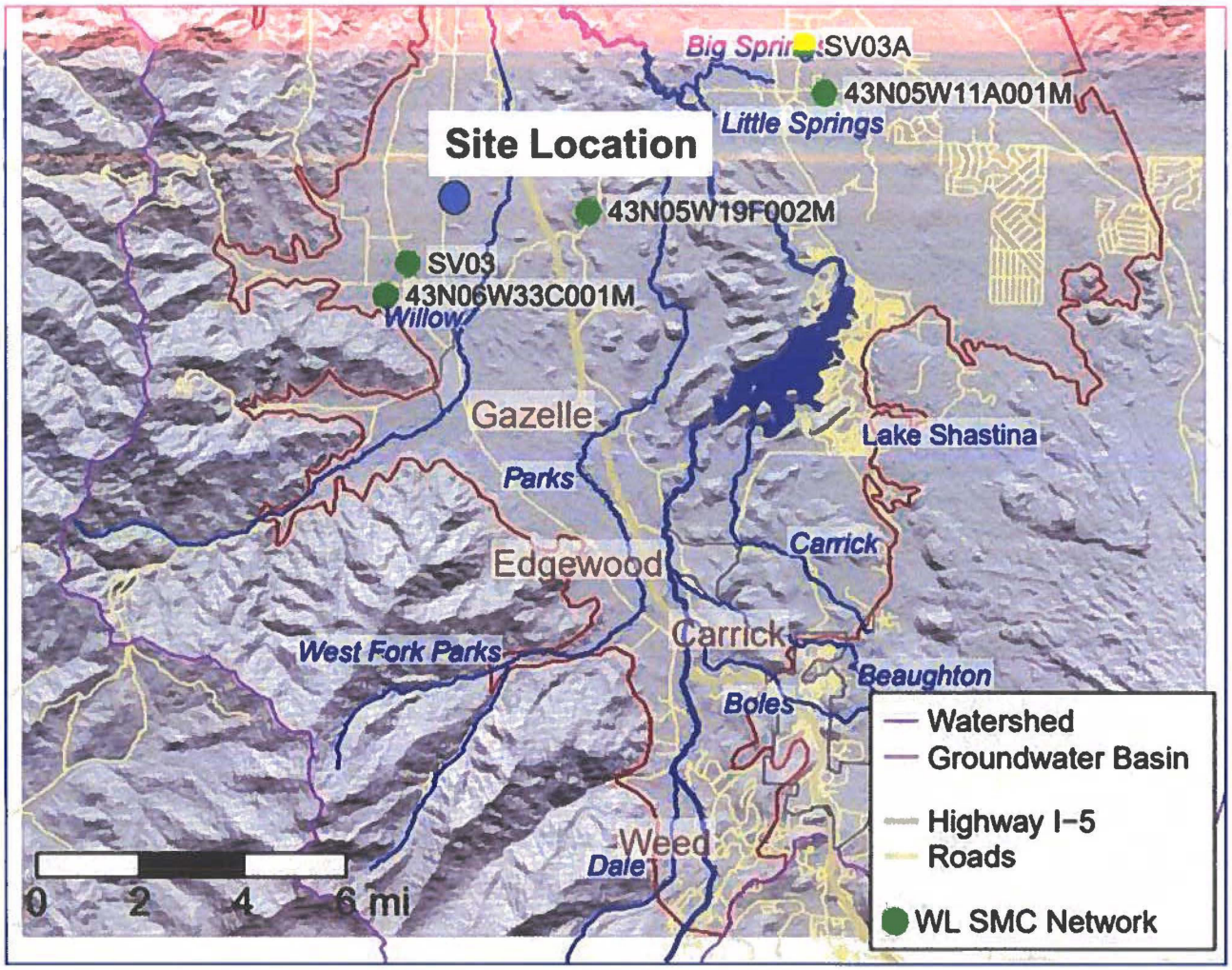


Figure 2. Nearby Representative Groundwater Monitoring Wells
Modified from (SCFCWCDGSA, 2022)

Table 1 – Well Site Aquifer Properties	
Parameter	Layer 7
Horizontal Hydraulic Conductivity (ft/day)	56.25
Specific Storage (ft^{-1})	0.0000114
Specific Yield	0.5847

Table 2 – Well Site Aquifer Properties			
Parameter	Expected Value, Typical Aquifer Conditions	Low Value, Poor Aquifer Conditions	Source
Transmissivity[1]	5,625 ft^2/day	4,500 ft^2/day	*Expected*: uses average Layer 7 hydraulic conductivity *Poor*: uses the lowest Layer 7 hydraulic conductivity [1]Transmissivity, T = k*b where k is the hydraulic conductivity and b is the screened interval (100 ft)
Storativity	0.2929	0.0258	*Expected*: average of Layer 7 specific yield and storativity[2] *Poor*: geometric average of Layer 7 specific yield and storativity [2]Storativity, S = Ss*b where Ss is the specific storage (**Table 1**) and b is the screened interval (100 ft)

The proposed well will be installed adjacent to and replace the current Well #1 and will be 16 inches in diameter with a planned operational pumping rate of 550 GPM. Historical records indicate 145 acre-feet of use annually. Pumping rates and volumes will not increase with the proposed well, but the screen interval for the new well will impact different aquifer units. To simulate the most intensive possible conditions, we apply the total annual volume by pumping at the intended rate continuously, equating to 60 days of continuous pumping. The pumping conditions are summarized in **Table 3**.

Table 3 – Well Pumping Rates		
Parameter	Value	Source
Annual Use	145 acre-feet	Typical use reported from site
Intended Pumping Rate	550 GPM	Typical rate reported from site. Proposed well not to alter rate
Pumping Duration	60 days	Duration to pump 145 acre-feet at 550 GPM

Drawdown Analysis

The impacts to wells nearby due to pumping at the well site were analyzed using the Theis drawdown model. **Figure 3** shows all water supply wells located within 1.5 miles of the well site from the Department of Water Resources Well Completion Report dataset (CNRA, 2023). The nearest well (WCR2017-003475)

is an 85-foot domestic well located by address 1,295 feet northwest of the well site. Additional well locations known on and near the site parcels are included.

Drawdowns were analyzed at the well located 1,295 feet from the well site to determine the largest impact from pumping. An additional well (Well #2) located at the site (**Figure 3**) may be in use concurrently and is proposed to be screened at an interval similar to Well #1. Well #2 will pump approximately the same volume and at the same rate (640 GPM for 53 days). Well #2 is located 5,473 feet from the well nearest Well #1. We additionally analyze impacts from Well #2 and combine the results with the Well #1 drawdown to assess whether both wells combined would impact water levels significantly.

Drawdowns were analyzed after 60 days of pumping *continuously* at 550 ± 10% GPM under typical aquifer conditions (expected transmissivity, semi-confined/unconfined) and under poor aquifer conditions (low transmissivity, semi-confined/confined), spanning the range of possible conditions. The analysis extends 10,000 feet from the proposed well and highlights 1,295 feet as the distance of the nearest water supply well. An additional simulation for pumping at Well #2 assesses the combined impact of both wells on the site.

Drawdowns were also assessed at the nearest surface water feature, Willow Creek, which flows north through the eastern portion of the site parcel. Willow Creek is approximately 5,782 feet east of Well #1 at its nearest point, which is 6,993 feet from Well #2. Shasta River is approximately four (4) miles from the site, outside the bounds of the analysis where drawdown is negligible.

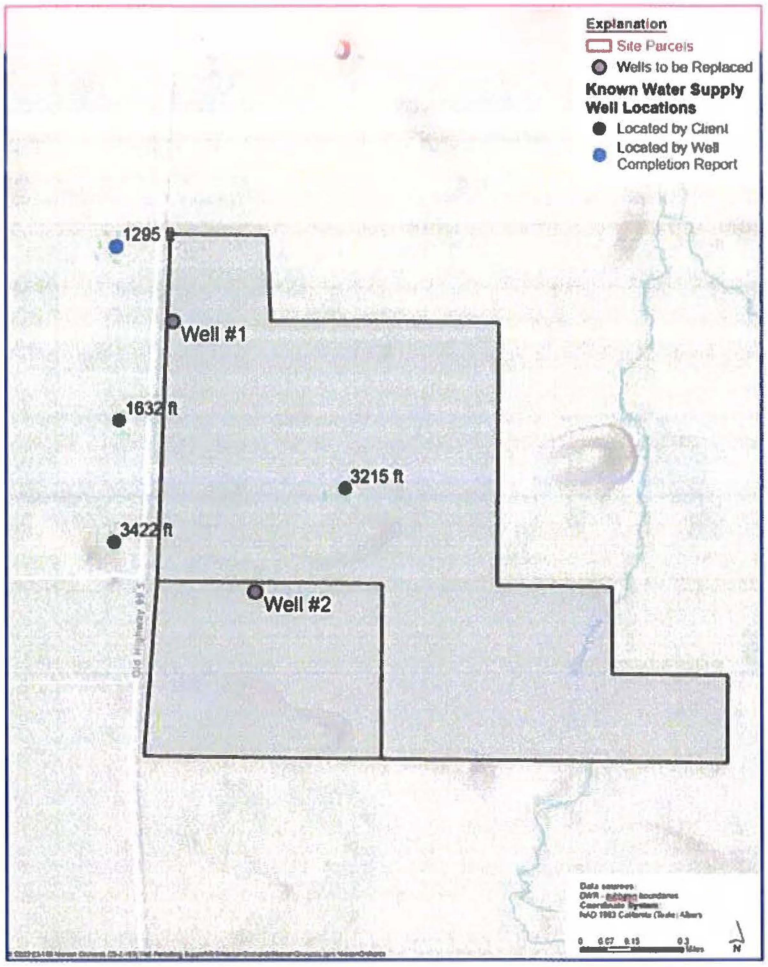


Figure 3. Well Site and Nearby Water Supply Wells

Subsidence Analysis

As part of Executive Order N-7-22 Section 9(b), LSCE evaluated whether the proposed well is likely to cause subsidence that could impact nearby infrastructure. LSCE analyzed total vertical displacement data from Interferometric Synthetic Aperture Radar (InSAR) imaging (Tre Altamira, 2023) and regional water levels at representative monitoring sites (**Figure 2**) to assess current and projected subsidence. The InSAR dataset spans eight (8) years, from June 2015 to November 2023.

RESULTS

Impacts on Production in Nearby Wells

Simulated drawdown after 60 days of pumping under typical pumping and aquifer conditions (**Figure 4**, dashed blue line) at the proposed well site resulted in 1.14 feet of drawdown at the nearest well location, 1,295 feet away. Assuming a 10% higher pumping rate and poor aquifer conditions, the simulated drawdown (**Figure 4**, bottom extent of red region) at the nearest well increased to 5.51 feet. The expected drawdown from annual pumping ranged from 1.14 feet to 5.51 feet between the typical and extreme pumping scenarios. When considering the combined impact of simultaneously pumping at Well 2, the expected impact is an additional 0.0001 feet of drawdown, increasing to an additional 0.73 feet with poor conditions. Combining the drawdown from both wells, the expected drawdown is 1.14 feet, and the maximum is 6.24 feet.

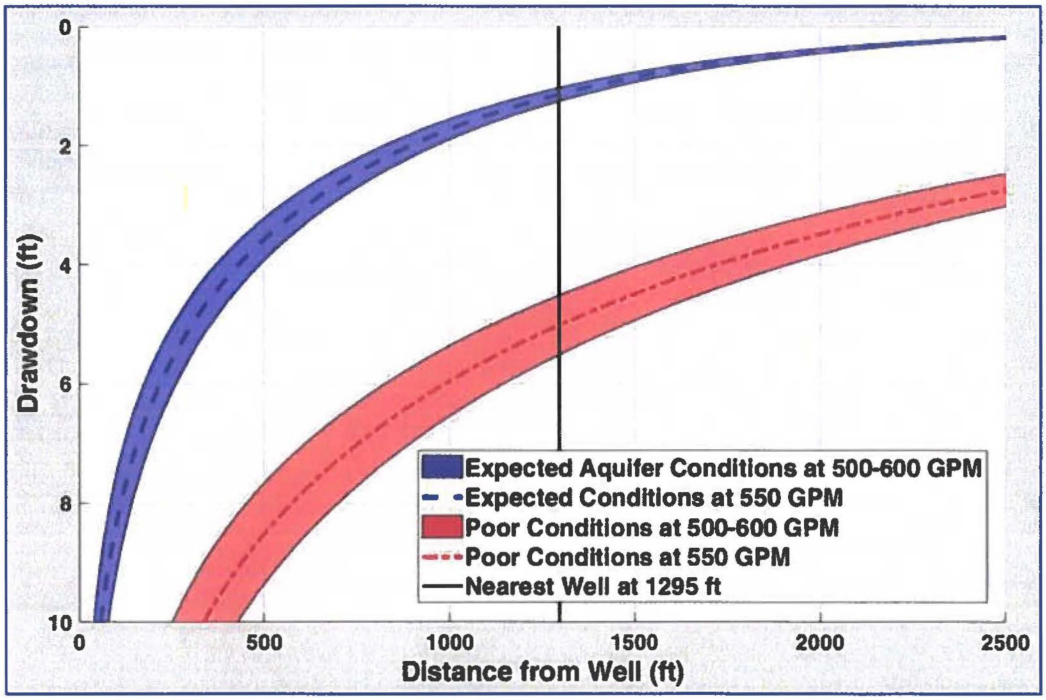


Figure 4. Simulated Seasonal Drawdown

Projected drawdowns at the nearest well did not exceed two (2) feet with anticipated aquifer conditions. Drawdowns increase to approximately six (6) feet with a high pumping rate and poor aquifer conditions. Nearby representative monitoring wells **SV03** and **43N06W33C001M** (**Figure 2**) show Fall water level fluctuations of ten to thirty feet (**Figures 5 & 6**), greater than disturbances due to pumping at the proposed well. These drawdowns consider continuous pumping with no periods of recharge, representing more intensive pumping conditions than anticipated. Drawdowns induced under any projected conditions at the proposed well site are not sufficiently large to impact production in nearby water supply wells.

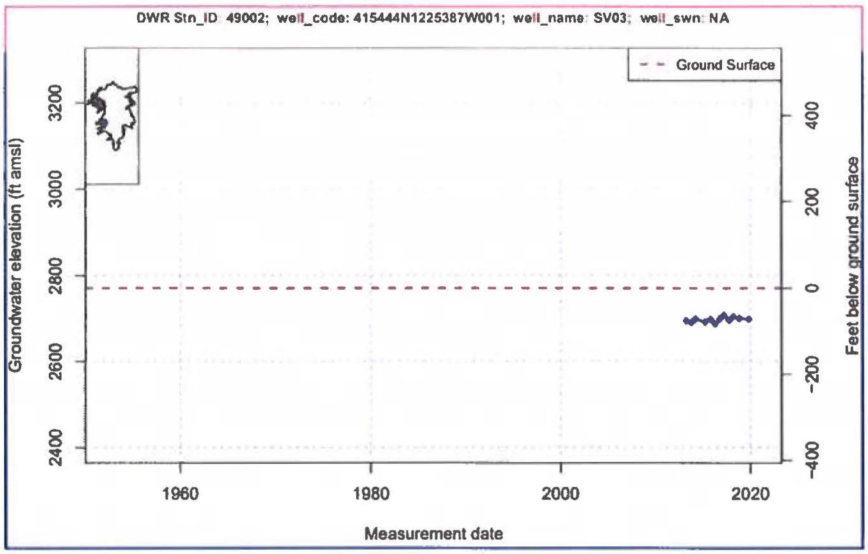


Figure 5. Groundwater Levels at Representative Monitoring Site SV03

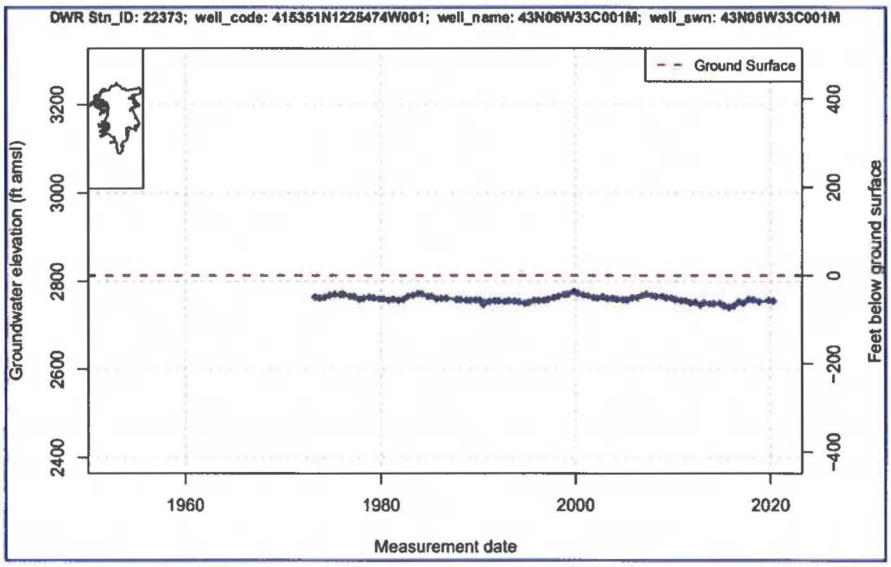


Figure 6. Groundwater Levels at Representative Monitoring Site 43N06W33C001M

Impacts on Surface Water

Projected drawdowns at Willow Creek located 5,782 feet from Well #1 are negligible (0.0001 ft) with anticipated aquifer conditions. Surface water flow rates will not be disrupted as the modeled cone of depression from the combined impact of pumping at Well #1 and Well #2 would not extend to Willow Creek given expected conditions.

Potential for Land Subsidence

The InSAR dataset (**Figure 7**) shows that over an 8-year period, all the land surface near the well has not subsided more than 0.1 feet. Total subsidence spans from -0.003 feet to -0.04 feet within the parcel (-0.038 feet at the well site), representing average annual subsidence rates of -0.0004 feet/year to -0.005 feet/year. Nearby water levels in RMS wells (**Figures 5** & **6**) fluctuate on the order of tens of feet in similar wells **SV03** and **43N06W33C001M**. Seasonal fluctuations in water levels are greater than expected drawdown for typical and poor conditions. Current rates of subsidence are insignificant and will not be significantly influenced by pumping at the proposed well.

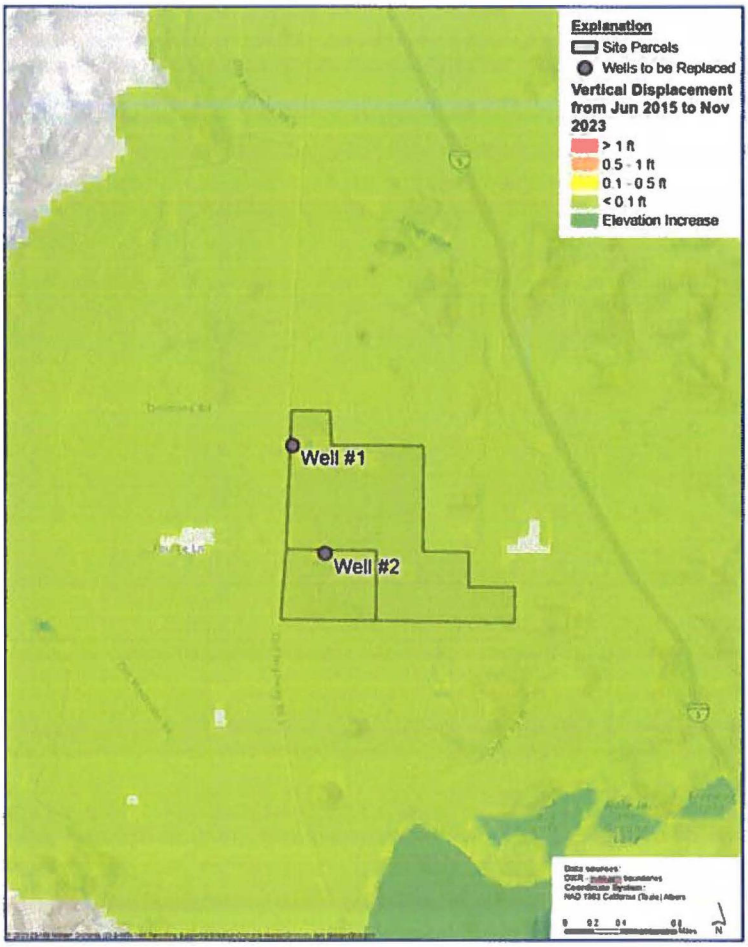


Figure 7. Vertical Land Displacement from June 2015 – November 2023

SUMMARY

LSCE simulated pumping scenarios to evaluate potential drawdowns that would occur under typical pumping (550 GPM) and aquifer conditions to high pumping (600 GPM) and poor aquifer conditions. Drawdowns less than two (2) feet are expected at the nearest well when applying the expected water. With an increased pumping rate and poor aquifer conditions, simulated drawdowns did not exceed seven (7) feet at the nearest well, even when concurrently pumping at Well #2 with poor conditions. Expected annual pumping at the proposed location is approximately 145 acre-ft (295 acre-ft for both wells), while the sustainable yield of the Shasta Valley Subbasin is estimated at 42,000 acre-ft (SCFCWCDGSA, 2022).

The proposed well will not impact production in any nearby well because the drawdown induced is insignificant compared to seasonal fluctuations in water level, and the applied water is 0.3% of the estimated sustainable yield. The analysis additionally indicates pumping at the proposed well will not disrupt flow at the nearby Willow Creek.

InSAR data shows rates of subsidence are less than -0.01 feet/year within a mile of the site and between -0.0004 feet/year and -0.005 feet/year at the site. Current rates of subsidence are insignificant to impact nearby infrastructure. The simulated drawdowns induced by pumping at the proposed well are small compared to regular fluctuations in water levels and will not increase rates of subsidence.

DISCLAIMER

This memorandum has been prepared by LSCE under the review of registered professionals. The professional judgments presented in this technical memorandum regarding the geology, anticipated subsurface conditions, and hydrogeological parameters are based on information obtained from published literature and previous studies by others. LSCE represents that the services were conducted in a manner consistent with the standard of care ordinarily applied as the state of practice in the profession within the limits prescribed by our client. No other warranties, either expressed or implied, are included or intended in this technical memorandum.

REFERENCES

California Department of Water Resources. 1978. *Evaluation of Ground Water Resources: Sacramento Valley*. Bulletin 118-6. August 1978.

California Department of Water Resources. 1997. *Feasibility Report, American Basin Conjunctive Use Project*. Sacramento, CA.

California Natural Resources Agency, 2023. Well Completion Reports. https://data.cnra.ca.gov/dataset/well-completion-reports/resource/8da7b93b-4e69-495d-9caa-335691a1896b.

Jefferson, A., G. Grant, T. Rose, and S. L. Lewis. 2006. "Influence of volcanic history on groundwater patterns on the west slope of the Oregon High Cascades." Water Resources Research 42 (W12411).

Siskiyou County Flood Control and Water District Groundwater Sustainability Agency, Shasta Valley Groundwater Sustainability Plan, January 2022, https://www.co.siskiyou.ca.us/naturalresources/page/sustainable-groundwater-management-act-sgma

Theis, C.V., 1935. *The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage*, Am. Geophys. Union Trans., vol. 16, pp. 519-524.

Tre Altamira, 2023. *InSAR Land Surveying and Mapping Services to DWR supporting SGMA*. https://data.cnra.ca.gov/dataset/tre-altamira-insar-subsidence/resource/2535a9b9-ed25-4b19-9734-4b1409e3fdce.

September 3, 2024

MEMORANDUM

MEMO TO: RICK DEAN, DIRECTOR, COMMUNITY DEVELOPMENT DIRECTOR; DAN WESSELL, DEPUTY DIRECTOR ENVIRONMENTAL HEALTH, SISKIYOU COUNTY

FROM: MATT PARKER, SHASTA VALLEY GROUNDWATER SUSTAINABILITY AGENCY, PLAN MANAGER

RE: GSA COMPATABILITY REVIEW: NIELSEN REPLACEMENT PRODUCTION WELL PERMIT APPLICATIONS ON APN: 022-230-130 & 022-430-080

The Shasta Valley Groundwater Sustainability Agency (GSA), has reviewed the above entitled well permit applications and accompanying LWA technical memorandum for two replacement production wells in the Shasta Valley. The GSA has considered the information in the applications, along with the Siskiyou County Flood Control and Water Conservation District's Groundwater Sustainability Plan for the Shasta Valley.

- The Department finds:
  - The applications are to replace two existing wells in poor condition. The existing wells will be decommissioned upon completion of the new production wells.
  - The applicant is not expanding the applicant's irrigation footprint. Well #1 (75 acres) and Well #2 (71 acres) outside the property's historic irrigation practices pre-2015.
  - The new wells will not cause an increase in net consumptive groundwater use in the Shasta Valley groundwater basin in accordance with the "Avoiding Significant Increase of Total Net Groundwater Use from the Basin" in the Shasta Valley Groundwater Sustainability Plan (Shasta GSP), Chapter 4.

- The applicant should be made aware of and encouraged to voluntarily implement practices as described in the Shasta GSP Chapter 4, to improve irrigation efficiency [for example, the applicant is welcome to work with Siskiyou County Natural Resources Staff, UC Cooperative Extension, Siskiyou RCD, NRCS or other entities with resources to assist in acquiring funding for irrigation efficiency improvements].

- The verifications required under Executive Order N-7-22 for these applications can be made and are attached hereto.

- Attachment:

    - GSA Verification form for Well #1
    - GSA Verification form for Well #2
    - Attachment #1 - LWA Technical Memorandum.

Groundwater Sustainability
Agency Verification Form

Siskiyou County Flood Control and Water Conservation District

Owner Information

Name:	Tom Nielsen
Address:	15400 S. Old Hwy 99
City:	Gazelle
Zip:	96034
Phone:	530-598-5422
Email:	

Well Information

A.P.N:	022-430-080
Latitude:	41 34'15.00 N
Longitude:	122 31'28.00 W
Township	
Range	
Section	

Groundwater Sustainability Agency:

☑ The proposed well is not inconsistent with the Groundwater Sustainability Agency's adopted, or in progress, Groundwater Sustainability Plan; and,

☑ The proposed well does not interfere with the Groundwater Sustainability Agency's SGMA authorities, including the Agency's addressing of undesirable results and the likelihood of achieving the sustainability goal.

I hereby certify that the GSA has reviewed the above conditions for the subject property for compliance with Executive Order N-7-22 and have marked each box for compliance as applicable.

Groundwater Sustainability Agency Signature

9/3/24
Date

Matt Parker
Printed Name

GSA Plan Manager
Title

Groundwater Sustainability
Agency Verification Form

Siskiyou County Flood Control and Water Conservation District

Owner Information

Name: Tom Nielsen	
Address: 15400 S. Old Hwy 99	
City: Gazelle	
Zip: 96034	
Phone: 530-598-5422	
Email:	

Well Information

A.P.N: 022-230-130	
Latitude: 41 34'15.00 N	
Longitude: 122 31'28.00 W	
Township	
Range	
Section	

Groundwater Sustainability Agency:

☐ The proposed well is not inconsistent with the Groundwater Sustainability Agency's adopted, or in progress, Groundwater Sustainability Plan; and,

☐ The proposed well does not interfere with the Groundwater Sustainability Agency's SGMA authorities, including the Agency's addressing of undesirable results and the likelihood of achieving the sustainability goal.

I hereby certify that the GSA has reviewed the above conditions for the subject property for compliance with Executive Order N-7-22 and have marked each box for compliance as applicable.

Groundwater Sustainability Agency Signature

9/3/24
Date

Matt Parker
Printed Name

GSA Plan Manager
Title

September 3, 2024

MEMORANDUM

MEMO TO: RICK DEAN, DIRECTOR, COMMUNITY DEVELOPMENT DEPARTMENT; DAN WESSELL, DEPUTY DIRECTOR ENVIRONMENTAL HEALTH DEPARTMENT, SISKIYOU COUNTY

FROM: MATT PARKER, NATURAL RESOURCES SPECIALIST, NATURAL RESOURCES DEPARTMENT

RE: PUBLIC TRUST CONSIDERATION: NIELSEN REPLACEMENT PRODUCTION WELL PERMIT APPLICATIONS, APN: 022-230-130 & 022-430-080

Whereas the counties, as subdivisions of the State of California have a fiduciary duty to consider the public trust before authorizing the drilling of groundwater wells whose extractions might have an adverse impact on public trust resources.

The Siskiyou County Natural Resources Department (Department) has reviewed the above entitled well permit applications for the replacement of two production wells with two new wells to re-establish capacity to serve the same purpose of irrigating 146 acres of farmland in the Shasta Valley. The Department has reviewed 1) the information in the application, and 2) the technical memorandum (Attachment #1) prepared by Larry Walker Associates to aid in its evaluation of Public Trust Doctrine consideration.

The Department finds:

- The well locations are approximately 3.67 miles from the nearest navigable waterway (Shasta River).

- The professional technical memorandum prepared by Larry Walker Associates, which models impacts from the proposed well replacement , along with the other materials reviewed, do not indicate that extraction of water from the proposed wells would substantially impair or interfere with public trust uses or values within interconnected downstream navigable waters, including the Shasta River.
- More specifically, under the conditions specified below, the limited pumping from this existing Agricultural Use (146 acres) in the Shasta Valley watershed in the same historic farmed acreage/volumes will not substantially impair or interfere

with public trust uses or values within interconnected downstream navigable waters, including the Shasta River.

- To the extent the continued historical use of groundwater from this site may ultimately contribute to cumulative reductions in surface waters in downstream navigable waters, the production of groundwater for irrigation uses on these parcels in the Shasta Valley is within the public interest because these parcels hold groundwater rights intended to be put to beneficial use consistent with Article X, section 2 of the California Constitution.

- The issuance of these permits for a replacement well purpose qualifies as a Class 2 categorical exemption under Section 15302 of the CEQA Guidelines which allows for replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced. The new replacement wells do not propose to serve additional connections/acreage and will have substantially the same purpose and capacity as the well being replaced. In addition, the project has been found to be consistent with Siskiyou County Codes and Policies.

- Alternately, the issuance of these permits for two wells to replace the existing wells is exempt from CEQA because the activity is covered by the common sense exemption (Cal. Code Regs. Title. 14 Sec. 15061(b)(3)). CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. The County has determined the that issuance of these permits qualify under the common sense exemption because it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment based on the following factors: 1) the proposed continued use of groundwater is consistent with historic activity occurring on the parcels,

Recommended replacement (well permit conditions:

- The replacement wells will be located on the same site within 50 feet of the existing well.
- Replacement well water production is not to exceed irrigation of the 146 acres of farmland historically farmed as served by the former wells on APN #022-230-130 & #022-430-080. .
- The former/replaced wells are to be destroyed under permit by C-57 well driller upon development of the replacement wells.

Attachment:

- Attachment #1 - LWA Technical Memorandum

Attachment #1

TECHNICAL MEMORANDUM

DATE	August 29, 2024
TO	**Matt Parker** Natural Resources Specialist Siskiyou County Flood Control & Water Conservation District 1312 Fairlane Road, Suite 1 Yreka, CA 96097 530.842.8019 mparker@co.siskiyou.ca.us
PREPARED BY	**Jerry O'Neill, P.G., CHG** **Laura Foglia, Ph.D.** Vice President Larry Walker Associates, Inc. 1480 Drew Ave., Suite 100 Davis, CA 95618 530.753.6400 LauraF@lwa.com

SUBJECT **Preliminary Evaluation of Nielsen Orchard Well #1 and Well #2**

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This memorandum describes a preliminary modeling analysis of the effects on groundwater levels at nearby wells and streams from pumping two proposed Nielsen Orchards wells. The general location of the two wells located in Shasta Valley is shown in **Figure 1**, along with the groundwater model grid.

The Shasta Watershed Groundwater Model (SWGM), documented in the Shasta Valley Groundwater Sustainability Plan (GSP)[1], was used to simulate pumping from the proposed wells; this model represents the best currently available scientific tool for this purpose. The model is presently being updated through the GSP process, and the most recent version available was used for the analysis presented herein.

Thus, SWGM was used to compute impacts of the proposed pumping on nearby wells, Willow Creek, and the Shasta River. Location, depth, pumping rate, and data pertaining to the period of pumping for the wells were obtained from the Luhdorff & Scalmanini Consulting Engineers' Technical Memorandum (LSCE, 2024).

SWGM was used to compute changes from the current model to the following model simulations:

- Nielsen Orchards Well #1 pumping at 550 gallons per minute (gpm), until 145 acre-feet is pumped, or approximately 60 days;
- Nielsen Orchards Well #2 pumping at 640 gpm, until 150 acre-feet is pumped, or approximately 53 days; for convenience, 60 days was used in the simulation; and
- Nielsen Orchards Well #1 and Well #2 pumping at above rates for 60 days.

In these simulations, pumping for the proposed wells was added to the current SWGM in June and July 2023 to represent system conditions during a recent irrigation season.

The "drawdown" shown on the figures presented in this memorandum refers to the head difference between the current model and the simulation results.

[1] Siskiyou County Flood Control and Water Conservation District Groundwater Sustainability Agency, Shasta Valley Groundwater Sustainability Plan, January 2022. https://www.co.siskiyou.ca.us/naturalresources/page/sustainable-groundwater-management-act-sgma

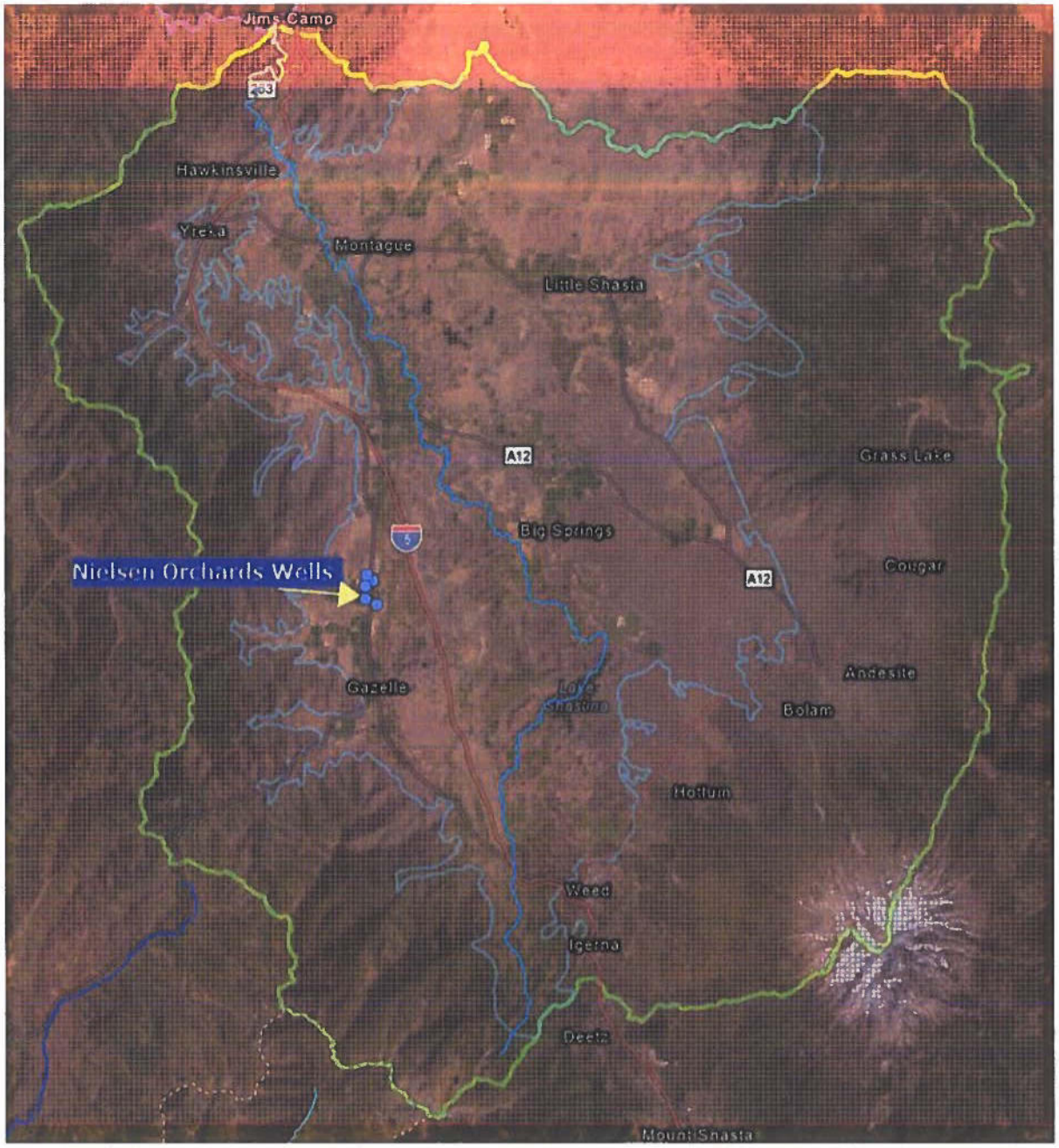

Figure 1. Shasta Valley Watershed and Groundwater Basin

Figure 2 shows locations of the proposed pumping wells, Well #1 and Well #2, and a few nearby wells identified by their distance from Well #1, i.e., 1295 feet (ft), 1632 ft, and 3422 ft. The screen interval of each well is assumed to be located within SWGM model Layer 2, which is the same for the proposed Wells #1 and #2. Locations of two regional monitoring wells used in SWGM calibration, c_21 and c_22, and the SWGM grid are also shown.

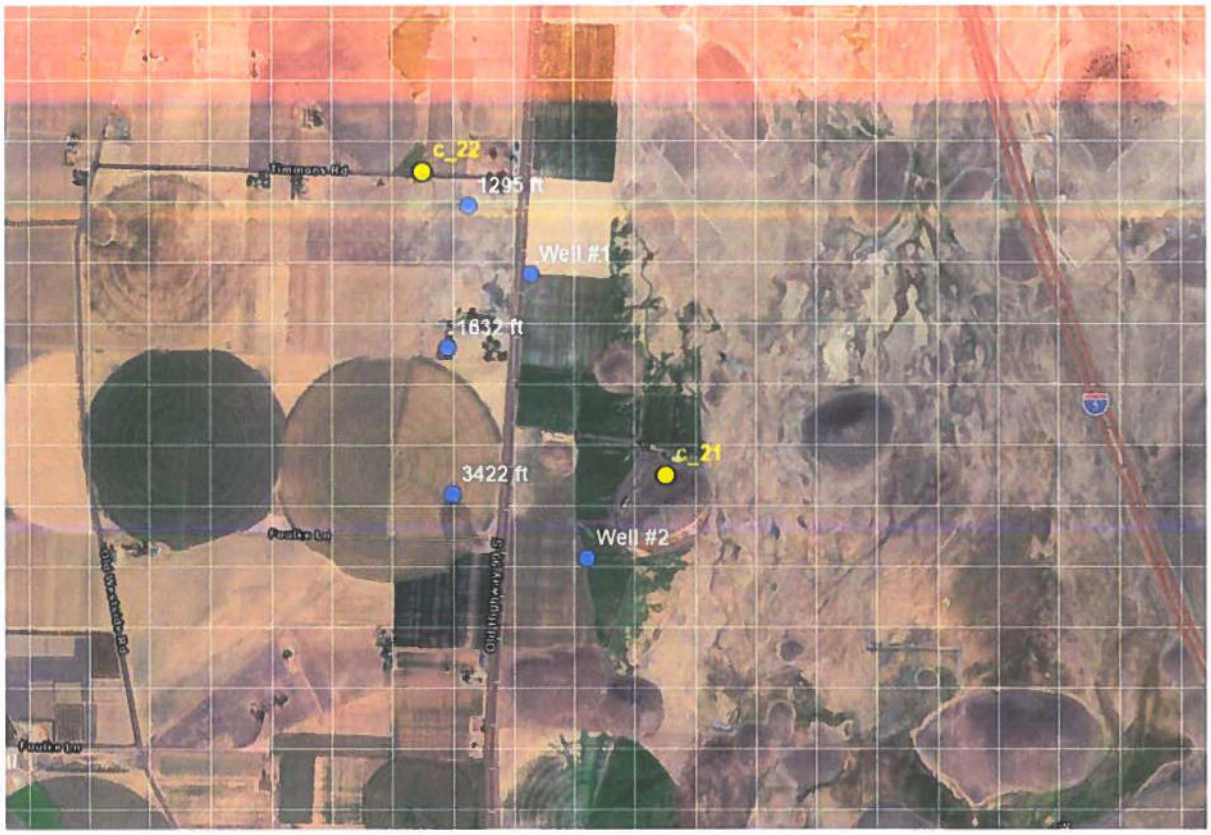

Figure 2. Nielsen Orchard Wells #1 and #2 Location Map

Figure 3 below shows a zoomed in view of the model grid and Nielsen Orchards well locations. Model grid cells are uniform 270 meter (m) squares (~886 ft). Stream locations are shown in green, and represent Willow Creek, about 1 mile to the east of the proposed wells, and Shasta River, near its confluence with Parks Creek, located about 4 miles from the proposed wells.

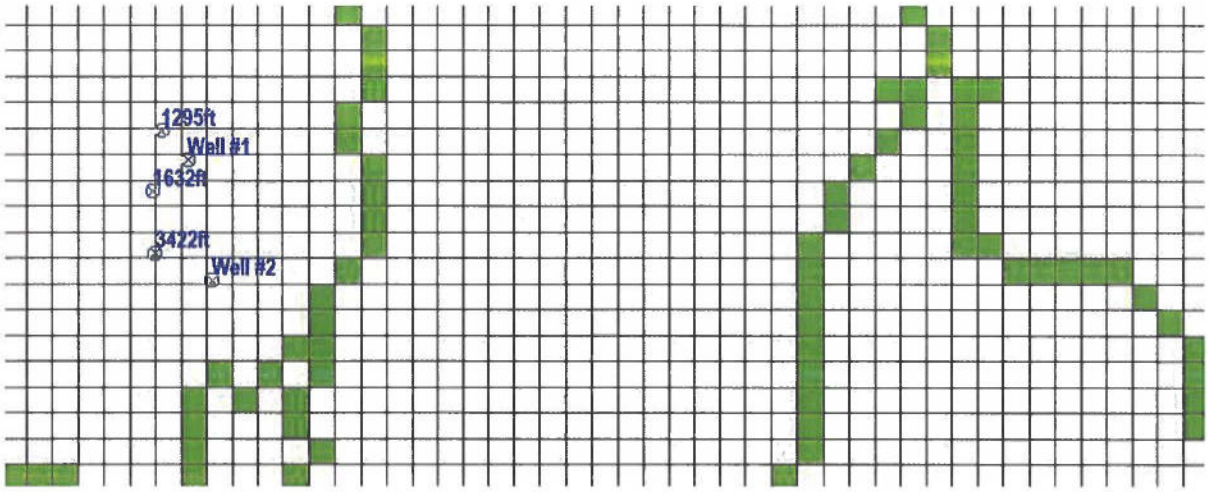

Figure 3. Model Grid and Nielson Orchards Well Locations

Figure 4 below shows a cross-section along model row 110, which is where Well #1 is located, as shown by the blue line and symbol. Layers are numbered from top to bottom, where the top of Layer 1 represents the land surface, and the bottom of Layer 4 represents the base of the aquifer system. Green cells in Layer 1 represent the streams, and the red cells represent agricultural pumping in model Layer 3.

The model layers approximately correspond with different geologic units at depth. The thickness of model Layer 1 in the vicinity of the proposed wells varies from about 12-15 m, or 40-50 ft; thickness of Layer 2 is 50 m, or about 164 ft, thickness of Layer 3 is 100 m, or about 328 ft, and thickness of Layer 4 is 350 m or about 1,150 ft.

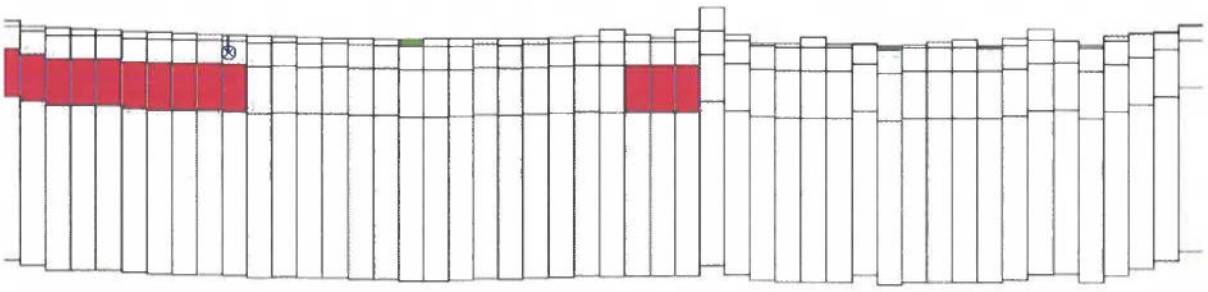

Figure 4. Ground water Model Cross-Section with location of Well #1

IMPACTS OF PUMPING WELL #1

Figure 5 shows the SWGM computed drawdown at the closest well located 1,295 ft from Well #1. Drawdown is plotted in meters for each model layer at the well location. Time is presented in days since the start of the model simulation, with pumping beginning on June 1, 2023 or 11,932 days from October 1, 1990, and cessation of pumping on July 31, 2023 or 11,992 days from the model start time, for a pumping period of 60 days.

Maximum drawdown at this location ranges from approximately 0.5 to 0.6 m in the top three model layers; drawdown in Layer 4 is computed to be less than 0.25 m.

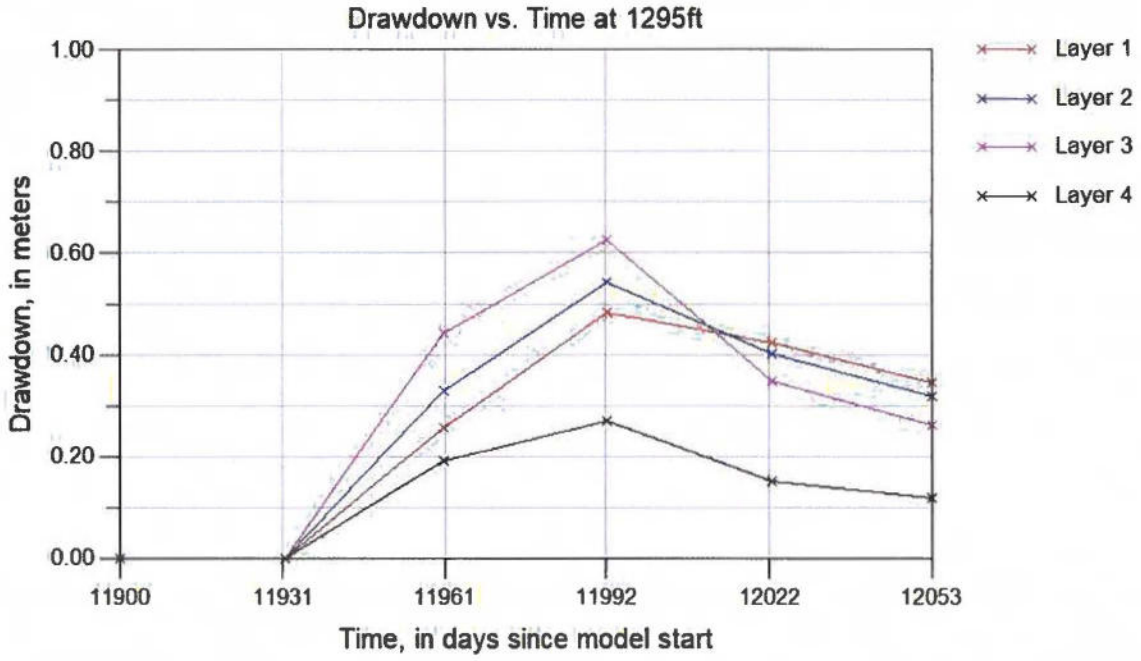

Figure 5. SWGM Computed Drawdown at Closest Water Supply Well

Figure 6 below shows contours of drawdown in Layer 1, the uppermost model layer, along with stream cells (green) representing Willow Creek, where the model computes drawdown from pumping Well #1 for 60 days of approximately 1 centimeter (cm).

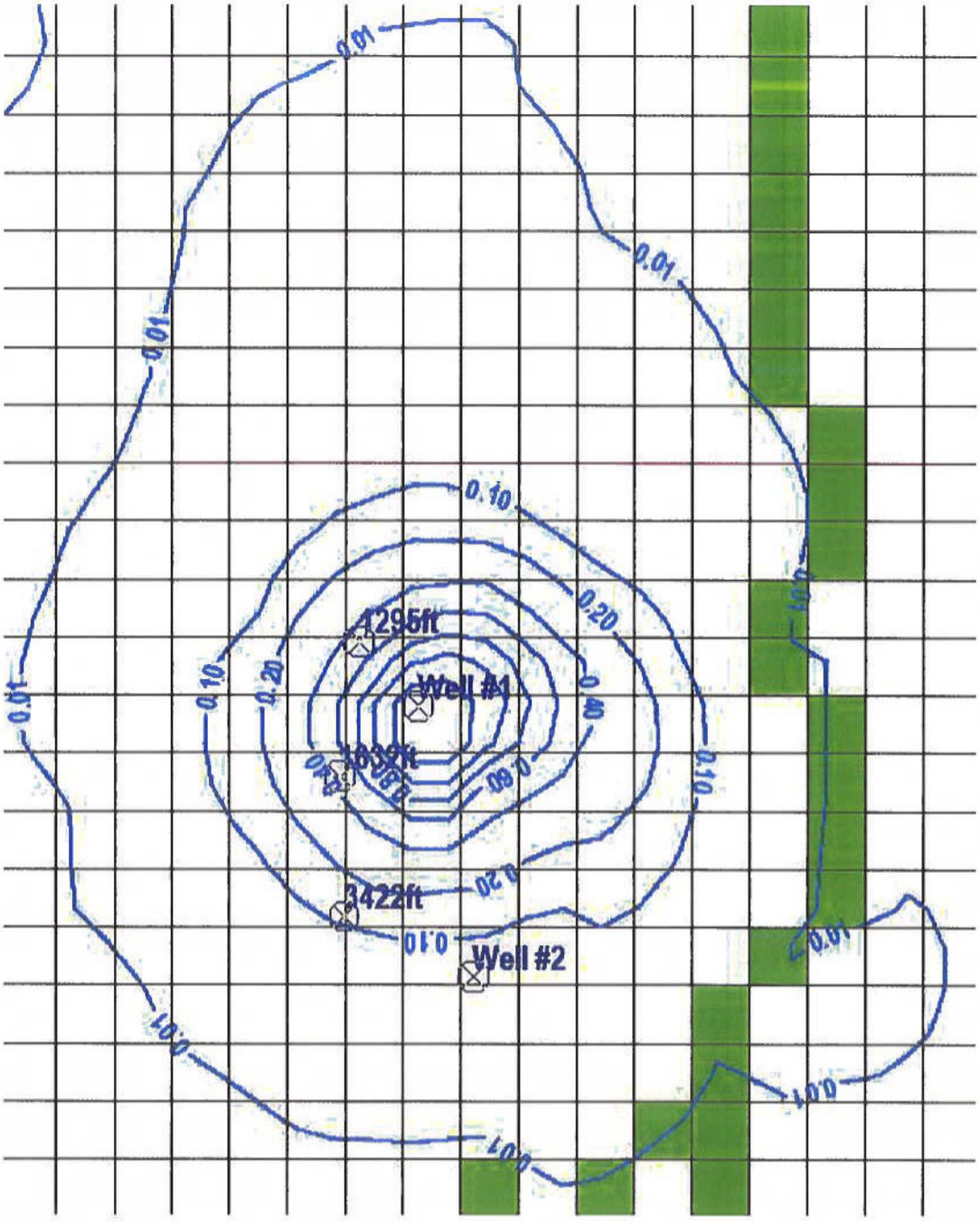

Figure 6. Drawdown Contours in Layer 1 (meters) Resulting from Pumping Well #1 for 60 days (contour interval varies)

IMPACTS OF PUMPING WELL #2

Figure 7 plots model computed drawdown at the well closest to Well #2, which is the well named 3,422 ft (**Figure 2**). Recall that its distance of 3,422 ft is actually from Well #1. Maximum drawdown at this location is computed to be about 0.35 m.

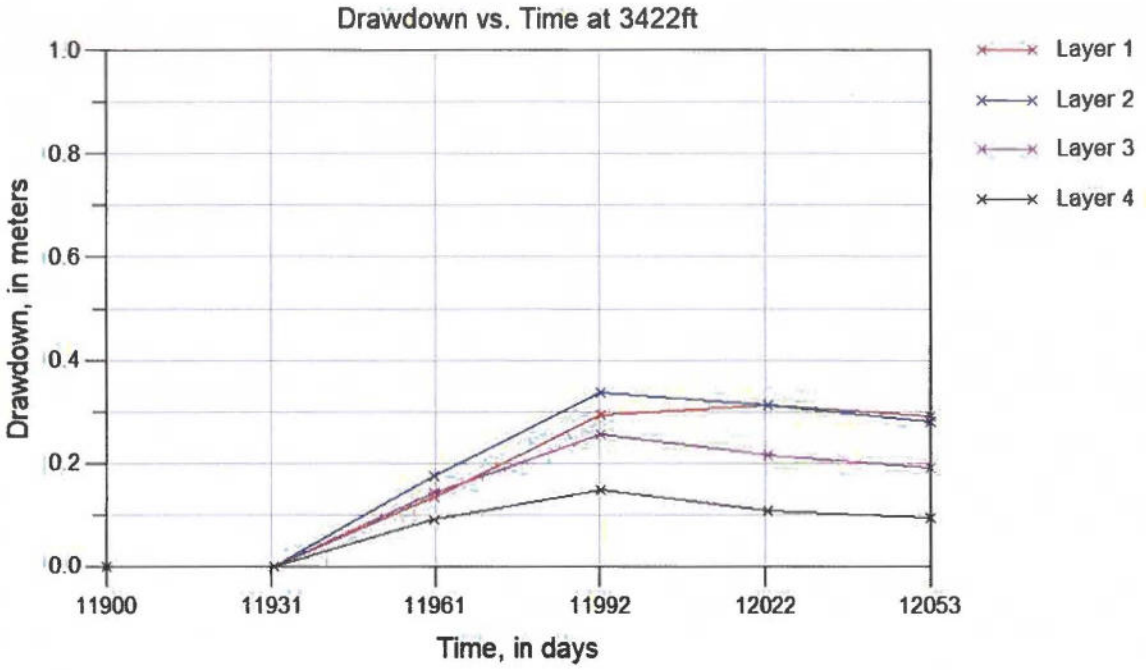

Figure 7. SWGM Computed Drawdown at 3,422 ft Well Due to Pumping Well #2 for 60 days

Figure 8 shows contours of drawdown computed in the uppermost model layer due to pumping Well #2 for 60 days. Owing to its location closer to Willow Creek, and its slightly higher pumping rate, Well #2 causes slightly more drawdown of groundwater levels near Willow Creek than Well #1, from 0.01 to 0.1 m (1 to 10 cm).

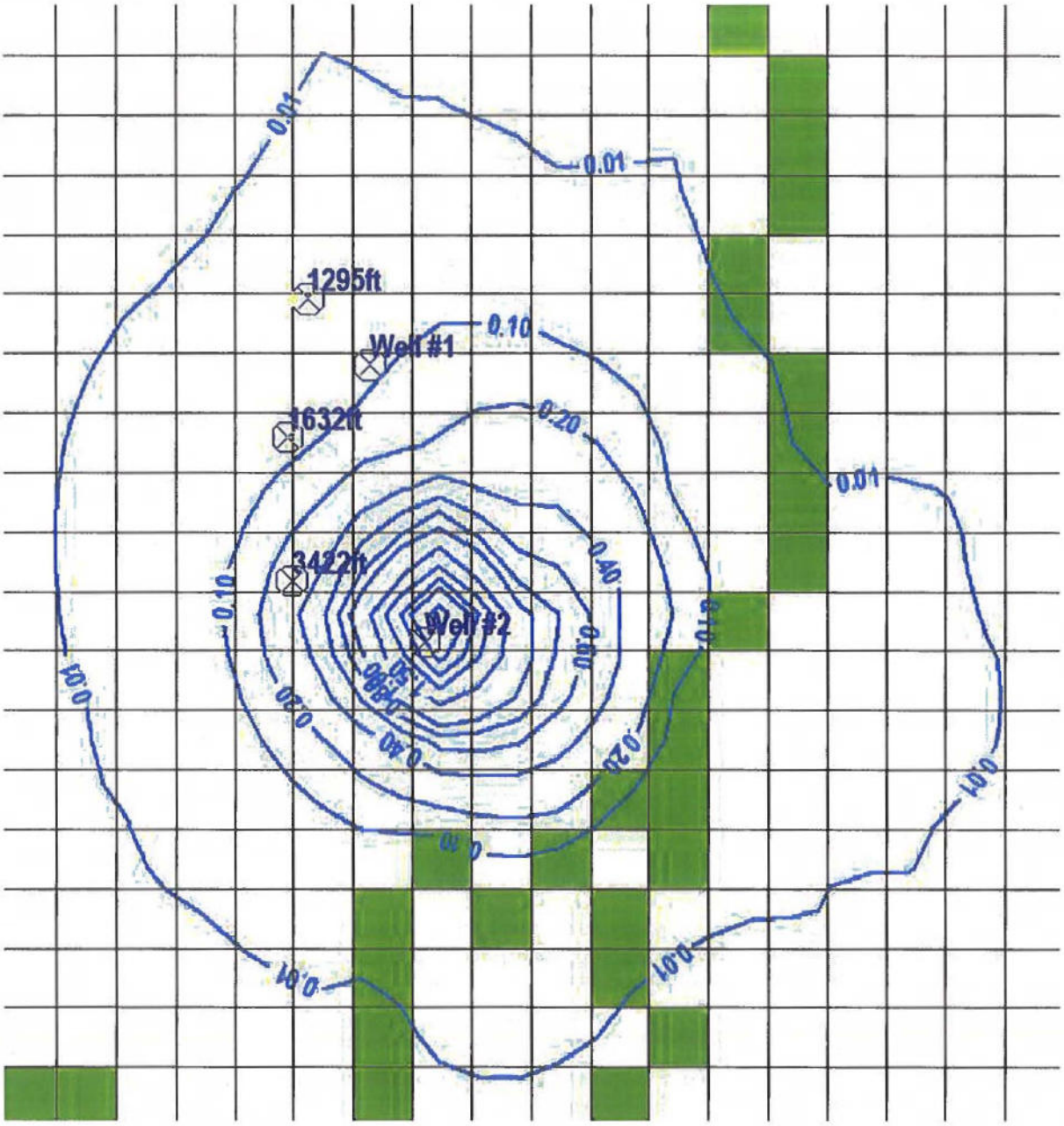

Figure 8. Contours of Drawdown (meters) Computed by Pumping Well #2 for 60 days

IMPACTS OF PUMPING WELL #1 AND WELL #2

Figure 9 below shows the drawdown, computed at the well located 1,295 ft from Well #1, due to pumping both Well #1 and Well #2 for 60 days. A visual comparison with **Figure 5** indicates that drawdown has slightly increased, as expected, due to the addition of Well #2 pumping.

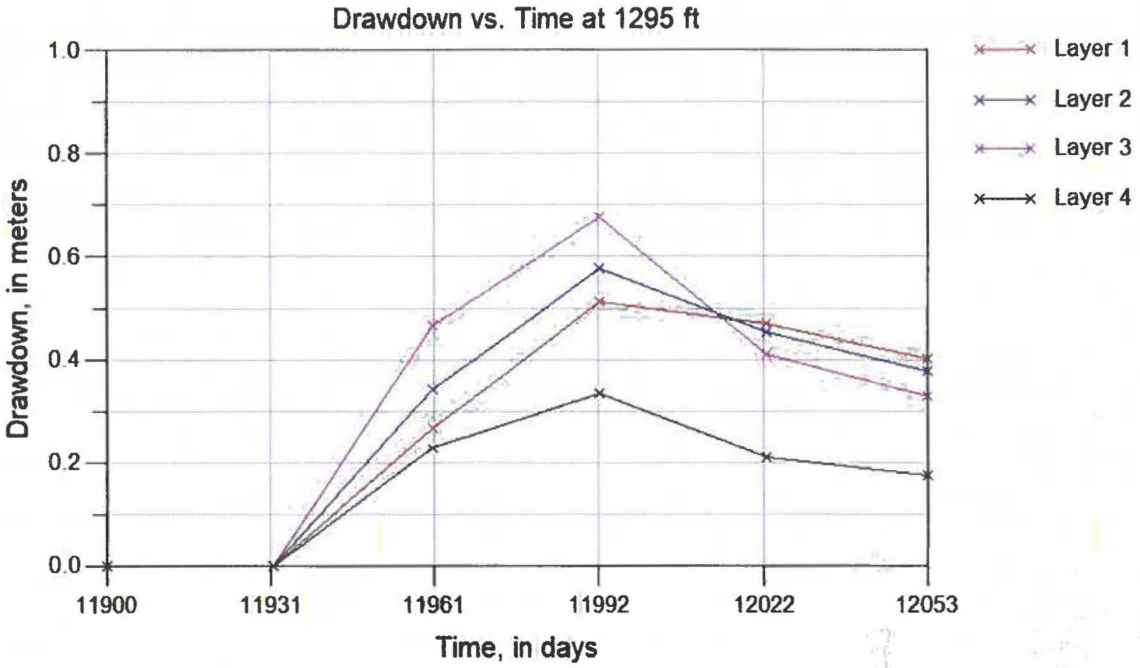

Figure 9. Well #1 Drawdown at 1,295 ft

Figure 10 below shows the drawdown computed at the well located 3,422 ft from Well #1, which is the well closest to Well #2, due to pumping both Well #1 and Well #2 for 60 days. A visual comparison with **Figure 7** indicates that drawdown has increased, as expected, due to the addition of Well #2 pumping.

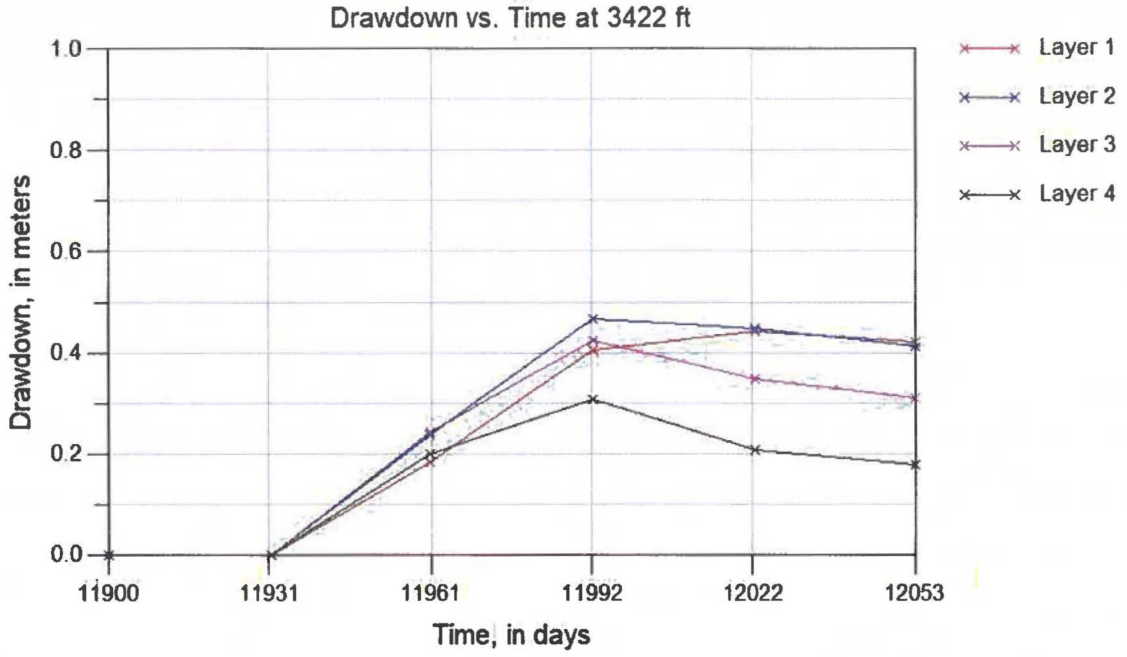

Figure 10. Well #1 Drawdown at 3,422 ft

Figure 11 below shows contours of drawdown computed in the uppermost model layer due to pumping Well #1 and Well #2 for 60 days. Drawdown of the water table is computed to be about 0.01 m (1 cm) below Willow Creek, 0.001 m (1 millimeter, mm) below Parks Creek, and less than 0.0001 m ($\frac{1}{10}$ mm) below the Shasta River.

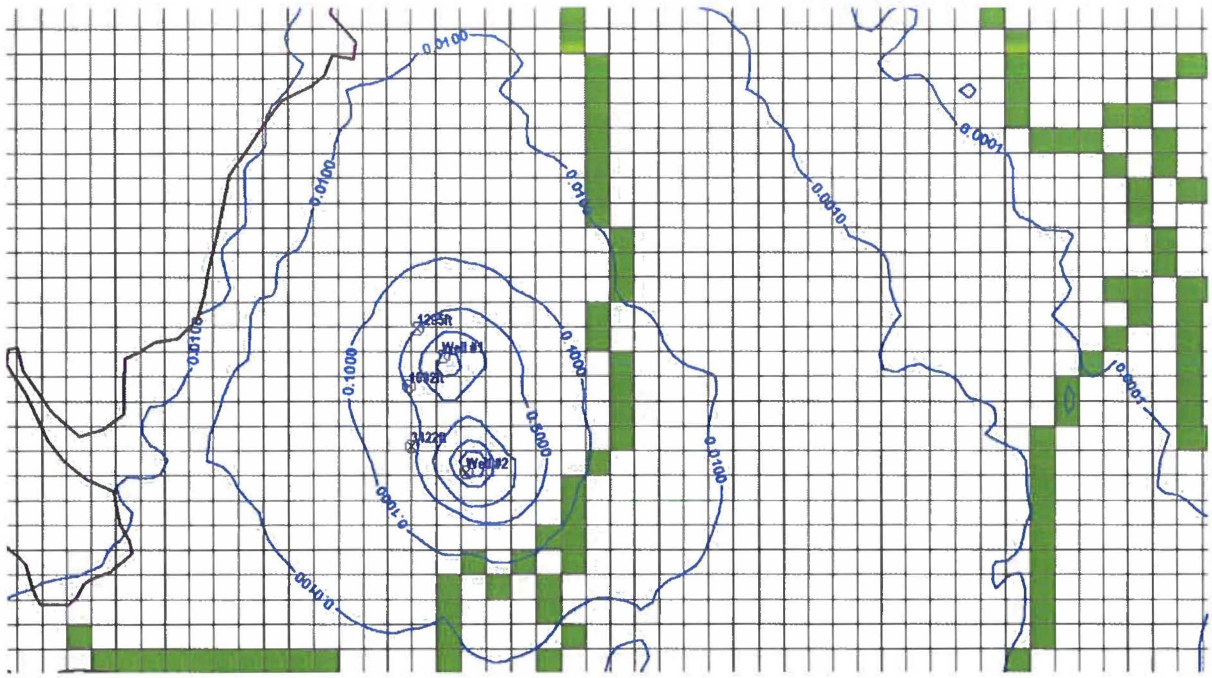

Figure 11. Wells #1 #2 Drawdown Over 60 Days

CONCLUSIONS

The SWGM was used to compute impacts on nearby wells, Willow Creek, about 1 mile away, and the Shasta River, about 4 miles away from the two proposed Nielsen Orchards wells. Results based on the current model suggest the pumping at the proposed locations, depths, rates, and duration would have negligible impact on nearby wells and stream flows.

REFERENCES

LSCE, 2024, Nielsen Orchards Well #1 (and Well #2) Evaluation - Specific to Executive Order N-7-22 Section 9 Analysis, Luhdorff & Scalmanini (LSCE) Technical Memorandum, June 18, 2024, 12p.

Siskiyou County Flood Control and Water Conservation District Groundwater Sustainability Agency, Shasta Valley Groundwater Sustainability Plan, January 2022. https://www.co.siskiyou.ca.us/naturalresources/page/sustainable-groundwater-management-act-sgma