NORTH COAST RESOURCE PARTNERSHIP

A. General Project Information

1. Organization / Project Sponsor Name:
   City of Crescent City California

2. Project Name:
   Crescent City Area Regional Water Supply Augmentation

3. Has the organization implemented similar projects in the past? ☒ yes ☐ no

4. If the project sponsor has worked with NCRP in the past, describe the project and outcome.
   The City and NCRP completed projects including: Proposition 84 Priority Project (Crescent City, Elevated Water Tank Rehabilitation); Proposition 50 Priority Project (Crescent City, Wastewater Treatment Plant Renovation); Proposition 50 Round 1 Priority Project Energy Efficient Conservation Block Grant Project (Crescent City Energy Efficient Motors); Energy Efficient Conservation Block Grant Project (Crescent City Variable Frequency Control Panel. Projects were completed on time and budget.

5. Please describe the qualifications, experience, and capacity of the project team that will be overseeing project implementation.
   The City has an excellent track record of managing state and federal grants, totaling over $36 million in the last 5 years with tight internal controls in place. Upon project implementation, City staff will have regular project meetings throughout the duration of the project to ensure constant oversight and team collaboration. The project team will be lead by Eric Wier, City Manager, 15 years experience as Public Works Director and 4 years.

6. Is this project part of a larger project or program? If so, what effectiveness monitoring is being conducted and what are the results?
   No.

7. Project Abstract [500 characters max.]
   Crescent City supplies water to an economically disadvantaged region from a single well near the Smith River. The shallow nature and proximity to the River make it vulnerable to surface water impacts (including hazardous materials spills) and drawdown during drought conditions. Crescent City is requesting funding for planning, design and installation of 2 new 12" municipal well(s) in the Smith River Groundwater Basin on property owned by the City adjacent to the main transmission line.

8. Project Description [3,000 characters max.]

The City of Crescent City serving approximately 17,840 people, proposes to develop two new municipal groundwater wells to improve the resilience of the only major water source in the area. The City in coordination with GHD Inc. completed the "Crescent City Groundwater Well Feasibility Study" in November 2022, attached to this application. The study included a summary of the hydrogeologic information in the vicinity of the proposed project at in Crescent City, California at APN 105-260-011 (Site) and an evaluation and recommendations for the potential to develop a secondary water source for the City of Crescent City (City).

The City's water is supplied from the Smith River via a well point type structure known and patented as a "Ranney Well." The well is located on the bank of the Smith River approximately 8.5 miles north of the City limits. Without a secondary water source the City is vulnerable to be without water should their Ranney Well be contaminated, or require any significant maintenance or repairs causing down time on this one water supply source.

The results of the feasibility study showed the site has a high likelihood of being a good well site. The final proposed project includes: planning, permitting, and drilling a test well that extends to bedrock to evaluate the hydrogeologic conditions specific to the Site and verify the depths and specifications for the two proposed wells. It is anticipated that the test well will include a 10-inch diameter boring that extends to bedrock (approximately 100 feet); a minimum 6-inch diameter well that is constructed with a 50-foot sanitary seal. A 24-hour pump test will be performed to estimate the long-term yield, obtain water quality samples, and evaluate the potential impact on private wells in the area . Upon completion of the pump test the test well can be converted into a monitoring well or emergency water source in support of the subsequent two production wells that will serve as the secondary water source.

Upon verification of well design standards, the City will work with a contractor to develop final permitting, CEQA compliance documents, and design plans and specifications for bid for the installation and connection of two new well(s) in the Smith River Groundwater Basin on property owned by Crescent City adjacent to the main transmission line. The new site is upstream of the existing chlorination facility, and no new chlorination will be needed as part of this project.

9. Specific Project Goals/Objectives

Goal 1: Improve Water Supply Resilience [100 characters max.]
Goal 1 Objective: Develop additional redundant water supplies [200 characters max.]
Goal 1 Objective: Increase resilience against spills on highway 199
Goal 1 Objective: Increase resilience from drought
Goal 1 Objective:

Goal 2: Support the Economic Vitality of the Community
Goal 2 Objective: Keep rate costs low for this disadvantaged community.
Goal 2 Objective: Ensure that economically disadvantaged communities are supported with high quality water.
Goal 2 Objective: Ensure tourists and vistors to the Redwood Area have access to clean drinking water.
Goal 2 Objective: Protect the enviornmental justice communites including tribes.

Goal 3: Beneficial Uses of Water
Goal 3 Objective: Ensure water supply reliability and quality for municipal, domestic, agricultural, Tribal, and recreational uses while minimizing impacts to sensitive resources
Goal 3 Objective: Improve drinking water quality and water related infrastructure to protect public health, with a focus on economically disadvantaged communities
Goal 3 Objective:
Goal 3 Objective:

Additional Goals & Objectives (List)
Goal 4: Climate Adaptation & Energy Independence
Objective: Address climate change effects, impacts, vulnerabilities, including droughts, fires, floods, and sea level rise. Develop adaptation strategies for local and regional sectors to improve air and water quality and promote public health

10. **Describe how the project addresses the NCRP Goals and Objectives selected**. [1,000 characters max.]

The project is supported by several local agencies, taking advantage of their local autonomy and knowledge in project implementation. This project supports DACs, and enhances the economic vitality of DACs by improving built infrastructure systems. The entire service areas benefiting from this project are DACs. The Project ensures water supply reliability and quality for municipal, agricultural, Tribal, and recreational uses while minimizing impacts to sensitive resources. This project also serves the prison, typically an underserved community. This project will increase reliability and minimize the impacts to sensitive resources in the Smith River. Improves drinking water related infrastructure to protect public health, with a focus on DACs. The project will improve water infrastructure which provides water to several DACs and Address's climate change effects, impacts, vulnerabilities, including droughts and floods. This project will increase water system resilience to extreme drought.

11. **Describe the physical, biological and/or community need for the project**. [1,000 characters max.]

The physical need for the project is a result of the region being geographical isolated. There are no neighboring public water systems to provide an intertie or emergency supplies. The shallow nature of the well and proximity to the Smith River make it vulnerable to surface water

impacts and drawdown during drought conditions caused/worsened by climate change. The biological need for the project is to minimize surface water withdrawls to make water available downstream to support salmonids, endangered/threatened species and sensitive habitats/biological resources. The community need for the project is that no surrounding public water supply systems can provide water into the region. If the single water well were out of commission, for any of the above reasons, or if a toxic spill were to ocurr on Highway 199, all of the communities within the regions would be facing a water emergency.

12. **Describe the financial need for the project**. [1,000 characters max.]

Currently the City of Crescent City and the communities within the region benifiting from the project do not have the financial resources to develop an alternative water supply. The entire region benefiting from the project is classified as an Economically Disadvantaged Area (EDA). A majority of the region is classified as an Economically Disadvantaged Community (DAC), and almost half of the region is classified as Severely Economically Disadvantaged (SDAC). According to the US Census 2016-2020, all of Del Norte County is classified as an Economically Disadvantaged Community (DAC) with a mean household income (MHI) of $49,981 which is only 64% of the Statewide MHI. The US Census 2016-2020 also indicates that the City of Crescent City has a MHI of $33,347 which is only 42% of the Statewide MHI making it a Severely Disadvantaged Community (SDAC).

13. **Describe potential adverse impacts from project implementation and how they will be mitigated.**

There is a potential that the project could have a negative impact on surrounding private water wells. This potential impact will be evaluated during 24-hour pump test of the test will. It is currently thought that the smith river groundwater basin has capacity and conditions for the City to ensure water supply reliability.

14. **Will this project mitigate an existing or potential Cease and Desist Order or other regulatory compliance enforcement action?** ☐ yes ☒ no

If yes, please describe. [500 characters max.]

15. **Does the project address a contaminant listed in AB 1249 (nitrate, arsenic, perchlorate, or hexavalent chromium)?**

☐ yes ☒ no

If yes, provide a description of how the project helps address the contamination. [500 characters max.]

16. **Describe how the project contributes to regional water self-reliance and addresses climate change.** [1,000 characters max.]

Crescent City's regional water source augmentation project contributes to regional water self-reliance and addresses climate change. The region supplied by the City water system is geographically isolated from other communities/infrastructure. Nearby or adjacent public water supplies with opportunities for interties or emergency supplies do not exist. Emergency water for the region would be through hauling. Adding a second water source to the regional system contributes to regional self-reliance. The project addresses climate change by reducing the dependence on a nearby surface water supply. The water supply is vulnerable to water level extremes in the Smith River. Low water levels brought on by drought conditions/climate change could limit the use of the supply. High water levels brought on by changes in weather patterns could threaten existing infrastructure. The location of the proposed well(s) is removed from climate change risks associated with the Smith River.

17. **Does the project increase public safety with regards to flood protection, wildfire hazard risk reduction, increasing firefighting capacity, or in other ways contribute to regional emergency resiliency?**

☒ yes ☐ no

Please explain. [500 characters max.]

This project would result in incresased fire fighting capacity (and public safety) if there was a reduction or interuption of the current water supply due to reasons discussed previously in the proposal. This project will make additional water available for fire fighting which contributes to regional emergency resiliency.

18. **Does the project employ new or innovative technologies or practices, including Decision Support Tools that support the integration of multiple jurisdictions, including, but not limited to, water supply, flood control, land use, and sanitation?** ☒ yes ☐ no

If yes, please describe. [500 characters max.]

By moving the secondary water supply for the City, the project results in increased resilience form Climate change

19. **Describe the population served by this project, including any economically disadvantaged communities or Tribes that will directly benefit.**

A total of 4,312 water connections will benefit from the project including Crescent City, Del Norte County, Elk Valley Rancheria, several Community Services districts (CDSs), and a State Prison. All of the communities that will benefit from this project are classified as DACs. Crescent City which represents 34% of the water connections that will benefit from this project is classified as a SDAC. Elk Valley Rancheria will also benefit from the project.

20. **Describe local and/or political support for this project.** [500 characters max.]

Project benefits were discussed with Del Norte County, Elk Valley Rancheria, Bertsch Oceanview CSD, and Church Tree CSD. All of the entities understand the importance of the

project and are in full support of the project. Local support is documented through formal letters of project support (attached). Although the City did have a dialogue with California Department of Corrections and Rehabilitation personnel, a letter of support was not available in the limited timeframe.

21. List all collaborating partners and agencies and nature of collaboration. [750 characters max.]

Collaborating partners and agencies include Del Norte County, Elk Valley Rancheria, Bertsch Oceanview CSD, and Church Tree CSD. All of these agencies were contacted and provided with information regarding the need of the project and the benefits of the project. Discussions with representatives of the agencies above resulted in their support. Representatives of these agencies presented the need for the project and the anticipated benefits of the project to the governing boards of the agencies. Consideration and discussion of the project resulted in the generation of formal letters of support.

22. Is this project part or a phase of a larger project? ☐ yes ☒ no
Are there similar efforts being made by other groups? ☐ yes ☒ no
If yes to either, please describe. [500 characters max.]

B. Project Location

1. Describe the latitude and longitude of the project site.
Latitude: 41 52' 05.26" Longitude: 124 08' 08.05"

2. Site Address (if relevant):
APN: 05-260-011

3. Does the applicant have legal access rights, easements, or other access capabilities to the property to implement the project?

☒ yes	If yes, please describe below
☐ no	If no, please provide a concise narrative below with a schedule, to obtain necessary access
☐ NA	If NA, please describe below why physical access to a property is not needed

Explanation. [500 characters max.]

The proposed location of the new well(s) is Del Norte County APN: 105-260-011. The 5.36 acre parcel is owned by the City of Crescent City. The parcel is adjacent to an existing legal easement that contains the main water transmission line between the existing extraction well on

the Smith River and the existing supply chlorination facility. The City has all the necessary legal access rights and easements to implement the proposed project.

4. **Project Location Notes:**
   The project location is adjacent to the main water transmission line going from the existing Ranney well to the water treatment facility. The propsed location of the groundwater well(s) is upstream of the existing water treatment facility which will not require modification for the project.

C. Benefits To Disadvantaged Communities and/or Tribes

1. **Does the project provide direct water-related benefits to a project area comprised of Disadvantaged Communities or Economically Distressed Communities?** If partially, please estimate percentage of project that benefits disadvantaged communities and list the communities.
   ☒ Entirely
   ☐ Partially; estimate the percentage of benefits provided directly to DAC:
   ☐ No
   List the Disadvantaged Community(s)
   Del Norte County

2. **Does the project provide direct water-related benefits to a project area comprised of Severely Disadvantaged Communities (SDAC)**? If partially, please estimate percentage of project that benefits disadvantaged communities and list the SDACs.
   ☐ Entirely
   ☒ Partially; estimate percentage of benefits provided directly to SDAC:
   ☐ No
   List the Severely Disadvantaged Community(s)
   Crescent City

3. **Does the project provide direct water-related benefits to a Tribe or Tribes**? If partially, please estimate percentage of project that benefits Tribe(s) and list the Tribes.
   ☐ Entirely
   ☒ Partially; estimate percentage of benefits provided directly to Tribe(s): 20
   ☐ No
   List the Tribal Community(s)
   Elk Valley Rancheria
   If yes, please provide a letter of support from each Tribe listed as receiving these benefits.

4. **If the project provides benefits to a DAC, EDA or Tribe, explain the water-related need of the DAC, EDA or Tribe and how the project will address the described need.** [750 characters max.]

The region served by the Crescent City water system consists of EDAs, DACs, SDACs, and the Elk Valley Rancheria. Since there is only one water source that serves the region, the communities are vulnerable to water service disruption due to power and equipment failures, lack of redundancies, natural disasters, climate change, and contamination. The project addresses these weaknesses by adding a second water source. This new source of water will be less vulnerable to climate change and contamination impacts since it will be a groundwater source not influenced by surface water. Having a second water source creates redundancies is the water supply system that will reduce power and equipment failures and reduce the impact of natural disasters.

5. **Describe the kind of notification, outreach and collaboration that has been completed with the county(ies) and/or Tribes within the proposed project impact area, including the source and receiving watersheds, if applicable.** [500 characters max.]

A written description of the need for the project, details, and benefits were provided to Del Norte County and Elk Valley Rancheria. Representatives of Del Norte County and Elk Valley Rancheria were then contacted by telephone to discuss the merits of the project and to address any questions. Following these discussion, Elk Valley Rancheria prepared a letter of support. The County will present the project to their governing body on November 8th, likely resulting in a letter of support.

D. Project Benefits & Justification

1. **For each of the Potential Benefits that the project claims, complete the following table to describe an estimate of the benefits expected to result from the proposed project. Provide quantitative benefit amounts for at least the primary and secondary benefits. Provide a qualitative narrative description of expected benefits that cannot be quantified.** *See the NCRP Project Application Instructions for more information and a listing of potential benefits.*

PROJECT BENEFITS TABLE

Benefit Description	Units	Quantitative Amount	Qualitative Description
Water Supply			
Additional Water Supply	gal/min	415	Production Target
Water Quality			

Benefit Description	Units	Quantitative Amount	Qualitative Description
Climate Change			
Resilient Water Supply	see above		Drought Resilience
Other Ecosystem Service Benefits			
enhanced surface			
water supply	-	-	Smith River Benefit
Jobs Created or Maintained			
Other Benefits			

2. Does the proposed project provide physical benefits outside of the North Coast Region?
   ☐ yes ☒ no
   If yes, describe the impacts to areas outside the North Coast Region. [500 characters max.]

3. List the impaired water bodies (303d listing) that the project benefits:
   N/A

4. Describe how the project benefits salmonids, endangered/threatened species and sensitive habitats.
   The project will benefit salmonids, endangered/threatened species and sensitive habitats by reducing water extraction from the Smith River. By reducing water extraction from the

Smith River increases the amount of water available in the lower reaches of the Smith River which will benefit salmonids, endangered/threatened species and sensitive habitats

5. Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project?
   ☒ yes ☐ no
   Please explain. [500 characters max.]
   The City could expand the existing intake on the Smith River. However, this would not provide the same resiliency as the proposed project, and would not have the same watershed benefits.

6. Is the proposed project the lowest cost alternative to achieve the physical benefits?
   ☒ yes ☐ no
   Please explain. [500 characters max.]
   The proposed well location is on City owned property, and is adjacent to the City's existing transmission main. The site is also upstream of the City's water treatment facilities, and no new treatment will be required at the site.

7. How will the project be monitored to determine whether it is producing the desired benefits?
   City will maintain separate logs of water obtained from the new wells and existing supply and monitor water levels at each location.

8. Provide a narrative for project technical justification. Include any other information that supports the justification for this project, including how the project can achieve the claimed level of benefits listed below. [3,000 characters max.]
   The development of a new groundwater well is feasible on the project parcel. Based on the production of the Ranney Well (4,154 gallons per minute) providing 1/10th of that capacity will require a production of 415 gallons per minute which is the project goal. This is significantly higher than the production of domestic wells constructed in the vicinity. The primary productive geologic unit on the Site is the alluvial terrace deposits (up to 100-feet below ground surface) with comparatively unproductive underlying bedrock. The neighboring pond is likely directly connected to the primary unconfined aquifer and a resulting relatively shallow water table preliminarily indicates good water quantity. A review of the GeoTracker and Enviorstor databases indicates that there are no known active environmental clean-up sites within the vicinity of the Site to 1,000-feet, and the nearest closed environmental site is approximately 4,000-feet to the east. Further information can be found in the “Crescent City Groundwater Well Feasibility Study” included as Attachment A in the Technical Attachments.

9. List and include any studies, plans, designs or engineering reports completed for the project as a “Technical & Reference Supporting Materials” into one document that includes a Table

of Contents and is limited to approximately 50 pages. *Please see the instructions for more information about submitting these documents with the final application.*

10. Project Justification & Technical Basis Notes: Please provide any additional information *not included above* that you think is important.

E. Project Tasks, Budget, And Schedule

1. Projected Project Start Date: 4/1/23
   Anticipated Project End Date: 12/31/25

2. Describe the basis for the costs used to derive the project budget in each budget category. [500 characters max.]
   Costs are based on recent bid estimates for similar projects, and typical construction work costs. The costs also include a 6-inch test well to ensure the best final design for the two municipal wells, anticipated to be drilled with a DR rotary rig with a 20-24" borehole, 12"-SS casing, and 100 feet each of screened casing.

3. Provide a narrative on cost considerations including alternative project costs. [500 characters max.]
   As Crescent City is the largest water system in Del Norte County and due to the remote nature of the County. It is important for Crescent City to have a robust and resilient water system. The Costs for mobilization, pump testing, demobilization, and other one time services can be maximized by constructing the two wells at the same time.

4. List the sources of non-state matching funds, amounts and indicate their status. Proposition 1 requires a minimum cost share of 50% of the total project costs, though a waiver may apply (see Question 6 below).
   There are no state matching funds, and a match waiver is being requested.

5. List the sources and amount of State matching funds.

6. Cost Share Waiver Requested (DAC or EDA)? ☒ yes ☐ no
   Describe what percentage of the proposed project area encompasses a DAC/EDA, how the community meets the definition of a DAC/EDA, and the water-related need of the DAC/EDA that the project addresses. In order to receive a cost share waiver, the applicant must demonstrate that the project will ***directly*** provide benefits that address a water-related need of a DAC/EDA.
   100 % of the serrvice area that will benefit from the project is DAC/EDA. According to the US Census 2016-2020, all of Del Norte County is classified as an Economically Disadvantaged

Community (DAC) with a mean household income (MHI) of $49,981 which is only 64% of the Statewide MHI. The US Census 2016-2020 also indicates that the City of Crescent City has a MHI of $33,347 which is only 42% of the Statewide MHI making it a Severely Disadvantaged Community (SDAC). The water related need that will be adresses by the project is that a single well supplies water to the entire region without backup or reduncency. This project will address the need by adding an addditional well(s) to the water system.

7. **Is the project budget scalable?** ☒ yes ☐ no

8. **Describe how a scaled budget would impact the overall project,** its expected benefits and state the minimum budget amount that would be viable (see Instructions E.7 for scaled budget examples). [500 characters max.]

   The proposed project includes the development of two new wells as a secondary supply for the City's only current source. The project could be scaled to one new well, which would result in an approximately 30% decrease in costs. However this may still leave the City vulnerable, with less capacity available in emergencies.

9. **Major Tasks, Schedule and Budget for Project Solicitation**
   Please complete MS Excel table available at https://northcoastresourcepartnership.org/ncrp-proposition-1-irwm-round-2-solicitation/see instructions for the information to be included in this document and for how to submit the required excel document with the application materials.

10. **Project Tasks, Budget and Schedule Notes:**

11. **Project Information Notes.** Please provide any information that that has not been specifically requested that you feel is important for the NCRP to know about your project.

Major Tasks, Schedule and Budget for North Coast Resource Partnership GENERIC Project Solicitation

Cells in RED indicate either added categories or linked values from the "Project Cost Estimating Tool" worksheet.

Project Name: Crescent City Area Regional Water Supply Augmentation

Organization Name: City of Crescent City

Task #	Major Tasks	Task Description	Major Deliverables	NCRP Task Budget	Non-State Match	Other Match	Total Task Budget	30% Scaled NCRP Budget	50% Scaled NCRP Budget	Current Stage of Completion (%)	Start Date	Completion Date
A	**Category (a): Direct Project Administration**											
1	Administration	In cooperation with the County of Humboldt sign a sub-grantee agreement for work to be completed on this project. Develop invoices with support documentation. Provide audited financial statements and other deliverables as required	Invoices, audited financial statements and other deliverables as required	$18,911.00	$0.00	$0.00	$18,911.00	$13,085.50	$9,455.50	0%	6/1/23	6/30/25
2	Reporting	Develop monthly reports describing work completed, challenges, and strategies for reaching remaining project objectives. Develop Final Report	Quarterly and Final Reports	$9,455.50	$0.00	$0.00	$9,455.50	$6,542.75	$4,727.75	0%	6/1/23	6/30/25
B	**Category (b): Land Purchase/Easement**											
1				$0.00	$0.00	$0.00	$0.00	$0.00		0%		
C	**Category (c): Planning/Design/Engineering/Environmental Documentation**											
1	Final Design /Plans	Based on the results of the test well completed. This task includes the design, specifications, and cost estimate for two new 12-inch steel wells installed to a depth of 150 feet and then connected to the City's existing transmission main.		$94,555.00	$0.00	$0.00	$94,555.00	$65,427.50	$47,277.50	0%	8/1/23	3/1/24
2	Project Performance Monitoring Plan	Develop Monitoring Plan to include goals and measurable objectives	Final Monitoring Plan	$2,000.00	$0.00	$0.00	$2,000.00	$2,000.00	$1,000.00	0%	6/1/23	7/31/23
3	Environmental Documentation: CEQA	Complete environmental review pursuant to CEQA. Prepare all necessary environmental documentation. An IS/ MND with minimal mitigations is anticipated for this project.	Environmental Information Form approved by DWR	$9,455.50	$0.00	$0.00	$9,455.50	$6,542.75	$4,727.75	0%	9/1/23	2/28/24
4	Environmental Documentation: NEPA	(N/A)		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0%		
5	Permit Development	Del Norte Health Dept. Well Permits, SWRCB Division of Drinking Water Permit Amendment, Building permit for the pump house		$9,455.50	$0.00	$0.00	$9,455.50	$6,542.75	$4,727.75		9/1/23	2/28/24
D	**Category (d): Construction/Implementation**											
1	Contract Services		Bid Documents; Proof of Advertisement; Award of Contract; Notice to Proceed	$4,727.75	$0.00	$0.00	$4,727.75	$3,271.38	$2,363.88	0%	3/1/24	5/1/24
2	Construction Administration	Complete tasks necessary to administer construction contract. Keep daily records of construction activities, inspection, and progress. Conduct project construction photo-monitoring.	Construction Management Logs; Completed construction administration tasks documented in monthly progress reports	$67,134.05	$0.00	$0.00	$67,134.05	$46,453.53	$33,567.03	0%	3/1/24	10/30/24
4	Mobilization and Site Preparation	Move drill rigs and materials to the site, prepare the site, including any avoidance zones.	site observation reports	$94,850.00	$0.00	$0.00	$94,850.00	$61,425.00	$47,425.00	0%	6/1/24	8/1/24
5	Project Construction/Implementation: Major Equipment and Construction Items	Well Boring, casing, filterpack installation; well pumps and housing.	Well drilling permit and well logs	$677,500.00	$0.00	$0.00	$677,500.00	$438,750.00	$338,750.00	0%	7/15/24	9/1/24
6	Project Construction/Implementation: Electrical	New Pump Controls and connections	site observation reports	$33,875.00	$0.00	$0.00	$33,875.00	$21,937.50	$16,937.50	0%	8/1/24	10/1/24
7	Project Construction/Implementation: Instrumentation	Integration with the City's existing SCADA	site observation reports	$20,325.00	$0.00	$0.00	$20,325.00	$13,162.50	$10,162.50	0%	8/1/24	10/1/24
8	Project Construction/Implementation: Test Well	Complete boring and installation of a test well to 150 feet with a six inch casing for designing new municipal wells.	Well drilling permit and well logs	$117,500.00	$0.00	$0.00	$117,500.00	$117,500.00	$58,750.00	0%	8/1/23	9/1/23
9	Construction Contigency	Additional costs associated with uncertainty in the construction project.		$141,832.50	$0.00	$0.00	$141,832.50	$98,141.25	$70,916.25	0%		
10	Project Signage		site observation reports	$1,500.00	$0.00	$0.00	$1,500.00	$1,500.00	$750.00	0%	7/15/24	7/30/24
11	Project Close Out, Inspection & Demobilization	Inspect project components and establish that work is complete. Verify that all project components have been installed and are functioning as specified will be conducted as part of construction inspection and project closeout. Conduct project completion photo monitoring. Prepare record drawings.	As-Built and Record Drawings; Project completion site photos	$18,911.00	$0.00	$0.00	$18,911.00	$13,085.50	$9,455.50	0%	10/1/24	12/1/24
12	Project Performance Monitoring	The performance of the project will be monitored in accordance to the Monitoring Plan using the following measurement tools and methods: [PLEASE COMPLETE}		$9,455.50	$0.00	$0.00	$9,455.50	$6,542.75	$4,727.75	0%	12/1/24	6/30/25
	Total North Coast Resource Partnership Grant Request			**$1,331,443.30**	**$0.00**	**$0.00**	**$1,331,443.30**	**$921,910.65**	**$665,721.65**			
	Percentage of Total Project Cost			**100.0%**	**0.0%**	**0.0%**	**100.0%**	**69.2%**	**50.0%**			

City of Crescent City Water Supply Reliability Project

Major Equipment and Construction Items

Unit Items	Quantity	Unit	Unit Cost	Total	Typical Ranges
For One (1) 150 FT Well					
Drill Boring for Well Installation	150	FT	$ 250.00	$37,500	*Includes costs for purchase, tax, shipping, and installation. In place cost is typically 150-300% of purchase price.*
Install Blank Well Casing (top 50 FT)	50	FT	$ 250.00	$12,500	
Install Screened Well Casing (screened bottom 100 FT)	100	FT	$ 350.00	$35,000	
Supply and Install Filter Pack	100	FT	$ 250.00	$25,000	
Supply and Install Sanitary and Annualar Seal	50	FT	$ 75.00	$3,750	
Well development	2	Day	$ 5,000.00	$10,000	
Step Drawdown Aquifer Test	2	Day	$ 5,000.00	$10,000	
Well Protection and housing	1	EA	$ 30,000.00	$30,000	
Connection to Water System	1500	FT	$ 150.00	$225,000	
valves and appurtenances	1	LS	$ 50,000.00	$50,000	
			$ -	$0	
Subtotal 1				**$438,750**	

Other Construction Items	Cost Estimate		Total	Typical Ranges
Site Work	4%	of subtotal 1	$17,550	*5-15% of subtotal 1*
Mobilization/ Demolition	10%	of subtotal 1	$43,875	*5-20% of subtotal 1*
Electrical	5%	of subtotal 1	$21,938	*5-125% of subtotal 1*
Instrumentation	3%	of subtotal 1	$13,163	*3-15% of subtotal 1*
Test Well Installation and Analysis		of subtotal 1	$117,500	*Variable*
Project Signage			$1,500	*Varies - Typically $1,000 to $2,000*
Subtotal 2	22%	of subtotal 1	**$215,525**	

Non Construction Implementation Costs (Soft Costs)

Administration	2%	of (subtotal 1 + 2)	$13,086	*1-5% of (subtotal 1 + 2)*
Reporting	1%	of (subtotal 1 + 2)	$6,543	*1-5% of (subtotal 1 + 2)*
Land/ROW Acquisition			$0	*Variable*
Engineering	10%	of (subtotal 1 + 2)	$65,428	*10-20% of (subtotal 1 + 2)*
Monitoring Plan			$2,000	*Varies - Typically $1,500 to $5,000*
CEQA - Exempt	1%	of (subtotal 1 + 2)	$6,543	*1-10% of (subtotal 1 + 2)*
NEPA	0%	of (subtotal 1 + 2)	$0	*5-10% of (subtotal 1 + 2) if required*
General Permitting	1%	of (subtotal 1 + 2)	$6,543	*5-20% of (subtotal 1 + 2)*
Bid Period Services	0.5%	of (subtotal 1 + 2)	$3,271	*0.5-1.0% of (subtotal 1 + 2)*
Construction Administration	7%	of (subtotal 1 + 2)	$45,799	*7-20% of (subtotal 1 + 2)*
Labor Compliance	0.1%	of (subtotal 1 + 2)	$654	*0.5-1% of (subtotal 1 + 2)*
Project Close Out	2%	of (subtotal 1 + 2)	$13,086	*3-8% of (subtotal 1 + 2)*
Performance Monitoring	1%	of (subtotal 1 + 2)	$6,543	*1-5% of (subtotal 1 + 2)*
Contingency	15%	of (subtotal 1 + 2)	$98,141	*10-50% of (subtotal 1 + 2)*
Subtotal 3	41%	of (subtotal 1 + 2)	**$267,636**	

Cost Summary

Total Construction Estimate (w/o Contingency)	100%	of (subtotal 1 + 2)	**$654,275**
Total Estimated Project Costs	100%	of (subtotal 1 + 2 + 3)	**$921,911**
For Initial Funding Application	150%	of Total Estimated Project Costs	**$1,382,866**

City of Crescent City Water Supply Reliability Project

Major Equipment and Construction Items

Unit Items	Quantity	Unit	Unit Cost	Total	Typical Ranges
For Two (2) 150 FT Wells					
Drill Boring for Well Installation	300	FT	$ 250.00	$75,000	*Includes costs for purchase, tax, shipping, and installation. In place cost is typically 150-300% of purchase price.*
Install Blank Well Casing (top 50 FT each well)	100	FT	$ 250.00	$25,000	
Install Screened Well Casing (screened bottom 100 FT each well)	200	FT	$ 350.00	$70,000	
Supply and Install Filter Pack for each well	200	FT	$ 250.00	$50,000	
Supply and Install Sanitary and Annualar Seal	100	FT	$ 75.00	$7,500	
Well development (2 days each well)	4	Day	$ 5,000.00	$20,000	
Step Drawdown Aquifer Test (2 days each well)	4	Day	$ 5,000.00	$20,000	
Well Protection and housing	2	EA	$ 30,000.00	$60,000	
Connection2 to Water System	2000	FT	$ 150.00	$300,000	
valves and appurtenances	1	LS	$ 50,000.00	$50,000	
			$ -	$0	
Subtotal 1				**$677,500**	

Other Construction Items	Cost Estimate		Total	Typical Ranges
Site Work	4%	of subtotal 1	$27,100	*5-15% of subtotal 1*
Mobilization/ Demolition	10%	of subtotal 1	$67,750	*5-20% of subtotal 1*
Electrical	5%	of subtotal 1	$33,875	*5-125% of subtotal 1*
Instrumentation	3%	of subtotal 1	$20,325	*3-15% of subtotal 1*
Test Well Installation and Analysis		of subtotal 1	$117,500	*Variable*
Project Signage			$1,500	*Varies - Typically $1,000 to $2,000*
Subtotal 2	22%	of subtotal 1	**$268,050**	

Non Construction Implementation Costs (Soft Costs)

Administration	2%	of (subtotal 1 + 2)	$18,911	*1-5% of (subtotal 1 + 2)*
Reporting	1%	of (subtotal 1 + 2)	$9,456	*1-5% of (subtotal 1 + 2)*
Land/ROW Acquisition			$0	*Variable*
Engineering	10%	of (subtotal 1 + 2)	$94,555	*10-20% of (subtotal 1 + 2)*
Monitoring Plan			$2,000	*Varies - Typically $1,500 to $5,000*
CEQA - Exempt	1%	of (subtotal 1 + 2)	$9,456	*#REF!*
NEPA	0%	of (subtotal 1 + 2)	$0	*5-10% of (subtotal 1 + 2) if required*
General Permitting	1%	of (subtotal 1 + 2)	$9,456	*5-20% of (subtotal 1 + 2)*
Bid Period Services	0.5%	of (subtotal 1 + 2)	$4,728	*0.5-1.0% of (subtotal 1 + 2)*
Construction Administration	7%	of (subtotal 1 + 2)	$66,189	*7-20% of (subtotal 1 + 2)*
Labor Compliance	0.1%	of (subtotal 1 + 2)	$946	*0.5-1% of (subtotal 1 + 2)*
Project Close Out	2%	of (subtotal 1 + 2)	$18,911	*3-8% of (subtotal 1 + 2)*
Performance Monitoring	1%	of (subtotal 1 + 2)	$9,456	*1-5% of (subtotal 1 + 2)*
Contingency	15%	of (subtotal 1 + 2)	$141,833	*10-50% of (subtotal 1 + 2)*
Subtotal 3	41%	of (subtotal 1 + 2)	**$385,893**	

Cost Summary

Total Construction Estimate (w/o Contingency)	100%	of (subtotal 1 + 2)	**$945,550**
Total Estimated Project Costs	100%	of (subtotal 1 + 2 + 3)	**$1,331,443**
For Initial Funding Application	150%	of Total Estimated Project Costs	**$1,997,165**

NORTH COAST RESOURCE PARTNERSHIP

ORGANIZATION INFORMATION

1. Project Name:
   Crescent City Area Regional Water Supply Augmentation

2. Applicant Organization Name:
   City of Crescent City

3. Contact Name/Title
   Name: Eric Wier
   Title: City Manager
   Email: ewier@crescentcity.org
   Phone Number (include area code): 707-464-7483

4. Organization Address (City, County, State, Zip Code):
   377 J Street
   Crescent City, CA 95531

5. Organization Type
   ☒ Public agency
   ☐ 501(c)(3) Non-profit organization
   ☐ Public utility
   ☐ Federally recognized Indian Tribe
   ☐ California State Indian Tribe listed on the Native American Heritage Commission's California Tribal Consultation List
   ☐ Mutual water company
   ☐ Other:

6. Authorized Representative (if different from the contact's name)
   Name:
   Title:
   Email:
   Phone Number (include area code):

7. List all projects the organization is submitting to the NCRP for this Solicitation in order of priority.
   Crescent City Area Regional Water Supply Augmentation

8. Organization Information Notes:

NORTH COAST RESOURCE PARTNERSHIP

ELIGIBILITY

1. North Coast Resource Partnership Goals and Objectives

GOAL 1: INTRAREGIONAL COOPERATION & ADAPTIVE MANAGEMENT

☒ Objective 1 - Respect local autonomy and local knowledge in Plan and project development and implementation

☒ Objective 2 - Provide an ongoing framework for inclusive, efficient intraregional cooperation and effective, accountable NCRP project implementation

☐ Objective 3 - Integrate Traditional Ecological Knowledge in collaboration with Tribes to incorporate these practices into North Coast Projects and Plans

GOAL 2: ECONOMIC VITALITY

☒ Objective 4 - Ensure that economically disadvantaged communities are supported and that project implementation enhances the economic vitality of disadvantaged communities by improving built and natural infrastructure systems and promoting adequate housing

☐ Objective 5 - Conserve and improve the economic benefits of North Coast Region working landscapes and natural areas

GOAL 3: ECOSYSTEM CONSERVATION AND ENHANCEMENT

☐ Objective 6 – Conserve, enhance, and restore watersheds and aquatic ecosystems, including functions, habitats, and elements that support biological diversity

☒ Objective 7 - Enhance salmonid populations by conserving, enhancing, and restoring required habitats and watershed processes

GOAL 4: BENEFICIAL USES OF WATER

☒ Objective 8 - Ensure water supply reliability and quality for municipal, domestic, agricultural, Tribal, and recreational uses while minimizing impacts to sensitive resources

☒ Objective 9 - Improve drinking water quality and water related infrastructure to protect public health, with a focus on economically disadvantaged communities

☐ Objective 10 - Protect groundwater resources from over-drafting and contamination

GOAL 5: CLIMATE ADAPTATION & ENERGY INDEPENDENCE

☒ Objective 11 - Address climate change effects, impacts, vulnerabilities, including droughts, fires, floods, and sea level rise. Develop adaptation strategies for local and regional sectors to improve air and water quality and promote public health

☐ Objective 12 - Promote local energy independence, water/ energy use efficiency, GHG emission reduction, and jobs creation

GOAL 6: PUBLIC SAFETY

☐ Objective 13 - Improve flood protection, forest and community resiliency to reduce the public safety impacts associated with floods and wildfires

2. Does the project have a minimum 15-year useful life?
   a) ☒ yes ☐ no
   b) If yes, will the organization be able to provide compliance documentation outlined in the instructions should the project be selected as a Priority Project?
   ☒ yes ☐ no

3. Other Eligibility Requirements and Documentation

CALIFORNIA GROUNDWATER MANAGEMENT SUSTAINABILITY COMPLIANCE

a) Does the project directly affect groundwater levels or quality?
   ☒ yes ☐ no
b) If yes, will the organization be able to provide compliance documentation outlined in the instructions including a Groundwater Sustainability Agency letter of support, to include in the NCRP Regional Project Application should the project be selected as a Priority Project?
   ☐ yes ☒ no

CASGEM COMPLIANCE

a) Does the project overlie a medium or high groundwater basin as prioritized by DWR?
   ☐ yes ☒ no
b) If yes, list the groundwater basin and CASGEM priority:
c) If yes, please specify the name of the organization that is the designated monitoring entity:
d) If yes, please specify whether the local Groundwater Sustainability Agency has endorsed the project:

URBAN WATER MANAGEMENT PLAN

a) Is the organization required to file an Urban Water Management Plan (UWMP)?
   ☒ yes ☐ no
b) If yes, has DWR verified the current 2020 UWMP?
   ☒ yes ☐ no
c) If the 2020 UWMP has not been verified by DWR, explain and provide anticipated date for verification:
d) Has DWR verified a water loss audit report in accordance with SB 555 as submitted by the urban water supplier?
   ☒ yes ☐ no
e) Does the urban water supplier meet the water meter requirements of CWC 525?
   ☒ yes ☐ no

f) Does the urban water supplier meet the State Water Resources Control Board's Water Conservation and Production Reporting requirement?
☒ yes ☐ no

g) If yes, will the organization be able to provide compliance documentation outlined in the instructions, to include in the NCRP Regional Project Application should the project be selected as a Priority Project?
☒ yes ☐ no

AGRICULTURAL WATER MANAGEMENT PLAN

a) Is the organization – or any organization that will receive funding from the project – required to file an Agricultural Water Management Plan (AWMP)?
☐ yes ☒ no

b) If yes, will the organization be able to provide compliance documentation outlined in the instructions, to include in the NCRP Regional Project Application should the project be selected as a Priority Project?
☐ yes ☐ no

SURFACE WATER DIVERSION REPORTS

a) Is the organization required to file State Water Resources Control Board (SWRCB) annual surface water diversion reports per the requirements in CWC Part 5.1?
☒ yes ☐ no

b) If yes, will the organization be able to provide compliance documentation outlined in the instructions, to include in the NCRP Regional Project Application should the project be selected as a Priority Project?
☒ yes ☐ no

STORM WATER MANAGEMENT PLAN

a) Is the project a stormwater and/or dry weather runoff capture project?
☐ yes ☒ no

b) If yes, does the project benefit a Disadvantaged Community with a population of 20,000 or less?
☐ yes ☐ no

c) If this is a stormwater/dry weather runoff project but does not benefit a small DAC population, please provide documentation that the project has been included in a Stormwater Resource Plan that has been incorporated into the NCRP IRWM Plan:

d) If no, will the organization be able to provide documentation that the project is included in a Stormwater Resource Plan that has been incorporated into the NCRP IRWM Plan, should the project be selected as a Priority Project?
☐ yes ☒ no

4. Eligible Project Type under 2022 IRWM Grant Solicitation

- ☐ Water reuse and recycling for non-potable reuse and direct and indirect potable reuse
- ☐ Water-use efficiency and water conservation
- ☐ Local and regional surface and underground water storage, including groundwater aquifer cleanup or recharge projects
- ☐ Regional water conveyance facilities that improve integration of separate water systems
- ☒ Watershed protection, restoration, and management projects, including projects that reduce the risk of wildfire or improve water supply reliability
- ☐ Stormwater resource management projects to reduce, manage, treat, or capture rainwater or stormwater
- ☐ Stormwater resource management projects that provide multiple benefits such as water quality, water supply, flood control, or open space
- ☐ Decision support tools that evaluate the benefits and costs of multi-benefit stormwater projects
- ☐ Stormwater resource management projects to implement a stormwater resource plan
- ☐ Conjunctive use of surface and groundwater storage facilities
- ☐ Decision support tools to model regional water management strategies to account for climate change and other changes in regional demand and supply projections
- ☒ Improvement of water quality, including drinking water treatment and distribution, groundwater and aquifer remediation, matching water quality to water use, wastewater treatment, water pollution prevention, and management of urban and agricultural runoff
- ☐ Regional projects or programs as defined by the IRWM Planning Act (Water Code §10537)
- ☐ Other:

5. Describe how the project provides a benefit that meets at least one of the Statewide Priorities as defined in DWR's Final 2022 Guidelines (see page 7) and Tribal priorities as defined by the NCRP?

The benefit of a new groundwater well(s) would be shared among water users sharing watersheds and provide a water management solutions to multiple agencies. Including Elk River Rancheria, Bertch Ocean View CSD, Church Tree CSD, Del Norte County, and a Californa State Prison.
The new groundwater well(s) would be a new water supply and enhance drought preparedness and improve climate resilience. This projects would benefit multiple local partner sponsors.

NORTH COAST RESOURCE PARTNERSHIP

CERTIFICATION OF AUTHORITY

By signing below, the Authorized Representative executing the certificate on behalf of the Project Sponsor affirmatively represents that s/he has the requisite legal authority to do so on behalf of the Project Sponsor. The Authorized Representative executing this proposal on behalf of the project sponsor understands that the NCRP is relying on this representation in receiving and considering this proposal. The person signing below hereby acknowledges that s/he has read the entire NCRP 2022 Project Review and Selection Process Guidelines and the NCRP 2022 Proposition 1 IRWM Round 2 Project Application & Instructions documents and has complied with all requirements listed therein.

Official Authorized to Sign for Proposal

Signature

11/4/2022

Date

Crescent City Area Regional Water Supply Augmentation Project

City of Crescent City, California

North Coast Resource Partnership Proposition 1 Round 2

Technical Attachments

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Attachment 1: Letters of Support
Attachment 2: Groundwater Sustainability Agency Letter
Attachment 3: Crescent City Groundwater Well Feasibility Study

Attachment 1: Letters of Support

Appendix D contains letters of support from Church Tree Community Services District (CSD) and Elk Valley Rancheria.

Elk Valley
RANCHERIA
Crescent City, CA

2332 Howland Hill Road
Crescent City, CA 95531

Phone: 707.464.4680
Fax: 707.464.4519
rancheria@elk-valley.com

10/25/2022

Eric M. Wier, PE
City Manager
City of Crescent City
377 J Street
Crescent City, CA 95531

Re: Support for Crescent City Area Regional Water Supply Augmentation Project

Dear Mr. Wier:

The Elk Valley Rancheria, California, a federally recognized Indian tribe (the "Tribe"), understands that the City of Crescent City is applying for funding available through the North Coast Resource Partnership (NCRP) Integrated Regional Water Management (IRWM) Proposition 1 Implementation Grant.

The City of Crescent City is the sole provider of water to a regional customer base, including the Elk Valley Rancheria ("reservation"), sourced from a single groundwater extraction well located adjacent to the Smith River. If the existing well goes offline for any reason, (extreme drought, contamination, mechanical failure, natural disaster…) there are no other water sources, water agencies, or interties that could provide water to the reservation.

The proposed project will ensure water supply reliability and quality for municipal, domestic, agricultural, Tribal, and recreational uses while minimizing impacts to sensitive resources. The project addresses climate change effects, impacts, vulnerabilities, including droughts, fires, floods, and sea level rise. This project will increase water system resilience to extreme drought.

The Tribe fully supports this project proposal.

Sincerely,

Dale A. Miller
Chairman

Eric M. Wier, PE
City Manager
City of Crescent City
377 J Street
Crescent City, CA 95531

Re: **Support for Crescent City Area Regional Water Supply Augmentation** Project

Dear Mr. Wier,

Church Tree Community Services District (CSD) understands that the City of Crescent City is applying for funding available through the North Coast Resource Partnership (NCRP) Integrated Regional Water Management (IRWM) Proposition 1 Implementation Grant.

City of Crescent City is the sole provider of water to a regional customer base, including Church Tree CSD, sourced from a single groundwater extraction well located adjacent to the Smith River. If the existing well goes offline for any reason, (extreme drought, contamination, mechanical failure, natural disaster...) there are no other water sources, water agencies, or interties that could provide water to the Del Norte County region.

The proposed project will ensure water supply reliability and quality for municipal, domestic, agricultural, Tribal, and recreational uses while minimizing impacts to sensitive resources. The project addresses climate change effects, impacts, vulnerabilities, including droughts, fires, floods, and sea level rise. This project will increase water system resilience to extreme drought.

Church Tree CSD is in full support this project proposal.

Sincerely,

Jim Nelson

Chairman of the Board

Attachment 2: Groundwater Sustainability Agency Letter

Attachment B contains a letter from the Del Norte Groundwater Sustainability Agency (GSA).

From: Heidi Kunstal <hkunstal@co.del-norte.ca.us>
Sent: Thursday, October 13, 2022 11:59 AM
To: Orrin <Orrin@freshwaterenvironmentalservices.com>
Subject: Re: Letter of support timeline

Hi Orrin,
The Board of Supervisors approved the creation of a GSA when the Smith River Plain was classified as a Medium Priority Basin by DWR. Once the basin was reprioritized to a Very Low Priority Basin, the Board discontinued any actions with regard to the GSA and the preparation of a GSP. We had grant funds to pay for the preparation of the plan which the Board declined to accept once the reprioritization occurred. Since we have no active GSA, I don't think we can provide a letter. I will be after 2:30 pm if you want to talk about it.
Heidi

On Thu, Oct 13, 2022 at 11:33 AM Orrin <Orrin@freshwaterenvironmentalservices.com> wrote:

Heidi,

NCRP says ” It is recommended that proponents work on getting the Groundwater Sustainability Agency letter, and confirm by Nov. 4 that it can be supplied if selected by the TPRC as a priority project.”

This means we need an indication of support by Nov 4 and letter if selected as a priority project.

I went ahead and asked for the letter just to give time for your internal process, assuming we are selected as a priority project.

Talk to you soon,

Regards,

Orrin Plocher

Geologist

Freshwater Environmental Services

78 Sunny Brae Center

Arcata, CA 95521

orrin@freshwaterenvironmentalservices.com

cell 707 498-9071

--

Heidi Kunstal
Director, Del Norte County Community Development Department

P 707-464-7254 E hkunstal@co.del-norte.ca.us
W www.co.del-norte.ca.us
A 981 H Street, Suite 110 Crescent City CA 95531

Attachment 3: Crescent City Groundwater Well Feasibility Study

Crescent City Groundwater Well Feasibility Study

For the City of Crescent City

North Coast Resource Partnership

4 November 2022

→ **The Power of Commitment**

Project name		Crescent City Groundwater Well Feasibility Study | For the City of Crescent City					
Project number		12590356					
File name		Groundwater Well Feasibility Studyv2.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4		CG	RC		RC		11/4/22
[Status code]							
[Status code]							
[Status code]							

GHD Inc.

2235 Mercury Way, Suite 150

Santa Rosa, California 94928, USA

T 1 707 523 1010 | **F** 1 707 444 8330 | **ghd.com**

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1. Introduction

1.1 Purpose of this report

GHD, Inc. (GHD) was engaged by West Coast Watershed Inc. (WCW) to prepare this report summarizing the hydrogeologic information in the vicinity of the project parcel (APN 105-260-011; Site) to evaluate the potential development of a secondary water source for the City of Crescent City (City). The Site is located at 377 J Street, Crescent City, California, shown in Appendix A, Figure 1.

The City of Crescent City Water System (CA 0810001) serves approximately 17,840 people in the City of Crescent City (City), California. The system has 3,933 service connections, 3,381 residential and 552 commercial and additionally sells water wholesale to the Pelican Bay State Prison. The City supplies water to three water districts as well as customers in the urban service area and within the City's jurisdictional area. The City's water is supplied from the Smith River via a well point type structure known and patented as a "Ranney Well." The well is located on the bank of the Smith River approximately 8.5 miles north of the City limits, shown in Appendix A, Figure 1. Without a secondary water source the City is vulnerable to be without water should their Ranney Well be contaminated, or require any significant maintenance or repairs causing down time on this one water supply source.

1.2 Scope and limitations

This report: has been prepared by GHD for the City of Crescent City and the North Coast Resource Partnership and may only be used and relied on by the City of Crescent City and the North Coast Resource Partnership for the purpose agreed between GHD and North Coast Resource Partnership as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than North Coast Resource Partnership arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1.3 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

1.3 Assumptions

This feasibility study was performed as a desktop review of available public documents, previously completed reports by GHD, institutional knowledge of the geology and groundwater in the immediate area by GHD's professional geologists and engineers, and information shared by Freshwater Environmental Services.

2. Background Data Collection

Records available from public resources were reviewed to provide information regarding the Site history, geology, hydrogeology, and other supply wells in the immediate vicinity. The principal sources of information reviewed included:

- **California Department of Water Resources (DWR) Well Completion Reports (WCR).** These reports include information on well number, construction details, groundwater levels, installation and testing dates, and pump testing results. Reviewed WCR are included in Appendix B.

- This database provides information tracking for areas where domestic wells and state small water systems may be accessing raw source groundwater that do not meet primary drinking water standards maximum contaminant levels (MCL). An image of the Site vicinity as shown in the Aquifer Risk Database is presented in Figure 1 below.

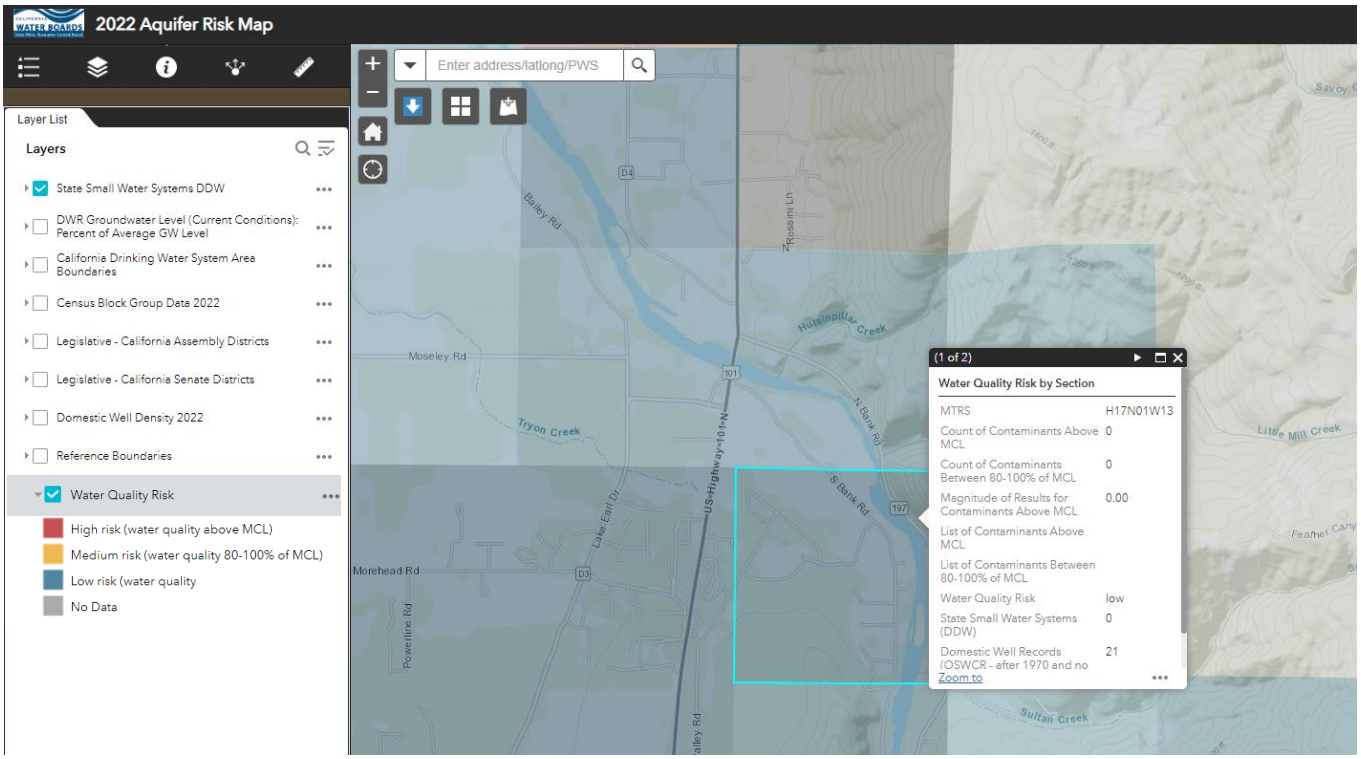

Figure 1 Aquifer Risk Map in Project Vicinity (accessed October 2022)

- **California Geological Survey – Online Geologic Map of California.** This database provides generalized regional geological information. Geological information is described in Section 2.0.

- **DWR Bulletin 118 – Update 2003, California's Groundwater.** This report provides regional hydrogeological information including groundwater basin descriptions and statistics for groundwater quantity and quality. Hydrogeological information is described in Section 2.0.

- **DWR Bulletin 118 – Interim Update 2016, California's Groundwater.** This report provides an update to the 2003 version for regional hydrogeological information including groundwater basin descriptions and statistics for groundwater quantity and quality. Hydrogeological information is described in Section 2.0.

- **Department of Toxic Substances Control EnviroStor Database.** This database provides information tracking for clean-up, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known contamination or suspected contamination. An image of the Site vicinity as shown in the EnviroStor Database is presented in Figure 2 below.

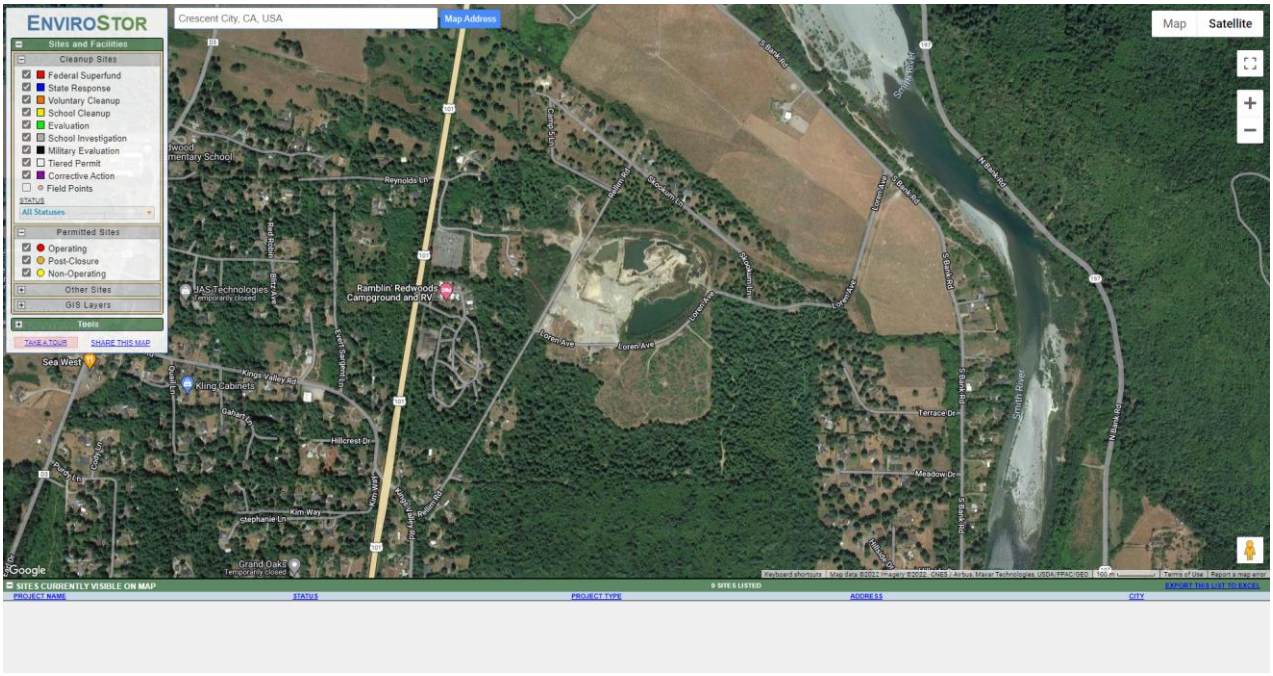

Figure 2 EnviroStor Database in Project Vicinity (accessed October 2022)

- **State of California GeoTracker Database.** This database provides information tracking compliance data from authorized or unauthorized discharges of waste to land, or unauthorized releases of hazardous substances from underground storage tanks. An image of the Site vicinity as shown in the GeoTracker Database is presented in Figure 3 below.

Figure 3 GeoTracker Database in Project Vicinity (accessed October 2022)

- **United States Geological Survey – The National Geologic Map Database:** This database provides generalized regional geological information. Geological information is described in Section 2.0.

3. City of Crescent City Water System

The existing distribution system, Ranney Well, and storage tank (50,000 gallons) were constructed in 1958. The capacity of the transmission and storage system is about 6,700 acre-feet per year (2,181 million gallons per year). Under Water Resources Control Board water rights permits, the appropriation from the Smith River (underflow) is specified as an average of 12.8 cubic feet per second or 8.3 million gallons per day with a maximum annual diversion of 3,666 acre-feet per year (1,194 million gallons per year).

The City Ranney Well is capable of producing about 4,151 gallons per minute (6,700 acre-feet per year). The most recent maintenance performed on the Ranney Collector was in 1989 and involved replacing two pumps and rebuilding the third. Each pump is capable of moving approximately 1,680 gallons per minute at 235 feet of total dynamic head. Field pump flow tests indicated that the three pumps together produce between 6.0 and 6.2 million gallons per day (FES 2020).

After extraction from the Ranney Well, water is pumped to a chlorination and fluoridation facility off Kings Valley Road approximately one mile from the Smith River. Chlorination (disinfection) is the only treatment the raw water requires. After treatment water is pumped to the 50,000-gallon elevated reservoir tank were water flows into approximately two miles of transmission main to the City's distribution system and storage reservoirs via gravity. An overview of the City's water infrastructure facilities and distribution system is shown below in Figure 4.

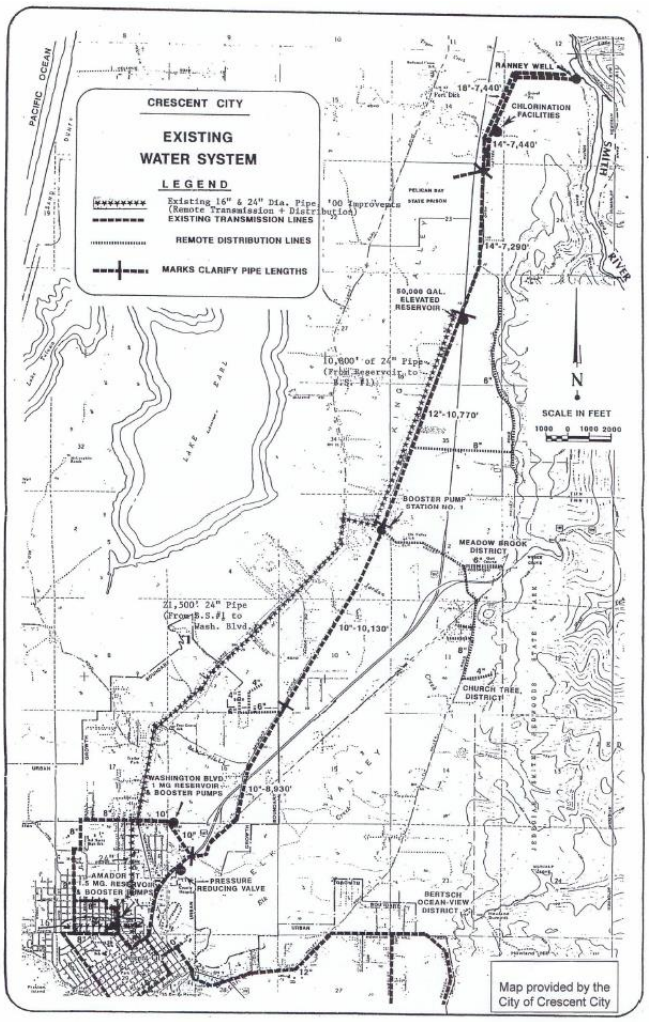

Figure 4 ***Service Area Map for City of Crescent City System***

3.1 Water Supply

The water provided by the Ranney Well is Smith River underflow associated with the Smith River Plain Groundwater Basin. The Smith River provides an abundant supply of high quality, fresh water and will generally provide water to the groundwater basin in the winter/rainy season and is supplemented by upland groundwater inflows in the summer/dry season.

The Ranney Well is located at approximately (36) feet above mean sea level (msl). The pump intake elevation is 12.13 feet msl. The elevation of the laterals entering the Ranney Collector well range from 11.63 to 9.13 feet msl and the elevation of the top of the plug at the bottom of the well's concrete caisson is 7.13 feet msl.

Previous investigations have found that the Smith River discharge and corresponding gauge height elevation is correlated to the water levels observed in the City Ranney collector well under static (non-pumping) conditions (FES 2022). This is due to proximity of the well to the river and the relatively shallow intake elevations.

As precipitation totals approach zero inches per month, the influence of the surrounding groundwater basin supplies the Smith River with baseflow, generally keeping the groundwater elevation from falling below 10 feet msl. Historical low river conditions (September 2021) resulted in a drawdown that left only 8.7 feet of water remaining above the pump intake.

The recently documented historical groundwater and river flows relative to the City's demand indicated that the short-term water supply from the Ranney Well will satisfy the short-term demand (1 year). While water supply is not viewed as an immediate concern, the relatively shallow intake depths of the Ranney Well and high connectivity to the river water levels indicate that should a large contamination event occur near the intake of the Ranney Well, it would likely be pulled into the City's water supply (FES 2022).

4. Existing Site Conditions

4.1 Topographic Setting

The Site is located approximately 7.5 miles north of Crescent City and 4 miles from the Pacific Ocean. It is situated on a relatively flat terrace at an elevation between 50 to 60-feet (NAD88), shown in Appendix A, Figure 1. Access to the Site is provided by Relim Road which forms the eastern boundary of the Site. Across Relim Road is an old gravel quarry that contains a significant, approximately 30-acre-foot, pond from previous excavation of sand and gravel. Arial imagery indicates that the pond has been present for the last 20 years and lasts year-round, shrinking to approximately half of its area by the end of the dry season. Annual precipitation in the area ranges from 65 to 77-inches.

4.2 Smith River Groundwater Basin

The Smith River Plain is an emerged low-relief marine terrace. The surface of the plain is comprised of sand dunes, floodplain deposits, unconsolidated river terrace deposits, and surface exposures of the marine Battery Formation. Underlying the terrace deposits are the marine Battery Formation and the St. George Formation. Beneath the St. George Formation is basement rock of the Jurassic-Cretaceous Franciscan Complex (CGS 1975).

Within the Smith River Groundwater Basin, Quaternary alluvial fan, flood-plain, terrace, and Battery Formation deposits form the primary water-bearing formations. The bedrock of the St. George Formation and Franciscan formation yield very little water to wells. The primary geologic units around the Site are early Holocene to Pleistocene aged stream terrace deposits (Qt) under the Site, the Battery Formation (Qby) to the south, and younger stream and terrace deposits (Qht and Qha) closer to the Smith River to the north and east.

- **Holocene Floodplain Deposits (Qht and Qha)**

These deposits rest on either basement rock or the Battery Formation and overlie river terrace deposits along the edge of the floodplain. The overlying deposits consist of unconsolidated clay, sand, and gravel and range in thickness from about 40 to 95-feet. The deposits contain large amounts of unconfined water and are the most productive aquifers in the Smith River Plain. Yields to wells range from about 200 to 800-gpm (DWR 1987).

- **Pleistocene Terrace Deposits (Qt)**

  The Pleistocene age terrace deposits are associated with Smith River and Rowdy Creek and serve as the major aquifer in the northern part of the basin. These deposits contain poorly-sorted silt, sand, and gravel and include some clay and become coarser with depth with large boulders often encountered at the base. Thickness of the deposits generally range from about 30 to 55-feet, but may exceed 75-feet in the area south of the community of Smith River. Generally, well yields are not high due to the limited saturated thickness; however, several irrigation wells in the Fort Dick and Rowdy Creek areas yield 140 to 400-gpm (DWR 1987).

- **Pleistocene Battery Formation (Qby)**

  The Pleistocene Battery Formation is a thin, flat-lying, marine terrace deposit that unconformably overlies the basement rocks of the Franciscan complex or the Pliocene St. George Formation. It consists of alternating sand and clay beds with interbedded continental deposits of stream gravel and sand that is generally 30 to 70-feet thick. The producing zones consist of lenticular beds of fine to medium grained, well sorted sand that range from 5 to 30-feet. Groundwater in this aquifer is either perched or unconfined. Well yields are sufficient for domestic and limited irrigation uses (DWR 1987).

- **Tertiary Pliocene St. George Formation (Tsg)**

  The Pliocene St. George Formation consists of massive, poorly indurated siltstone and shale that contain irregular and sporadic lenses of sand and pebbles. The formation thickness is estimated at about 400 feet. The permeability of the St. George Formation is very low but contains two prominent joint sets that yield limited water to some wells (DWR 1987).

4.2.1 CASGEM Wells

The Smith River Groundwater Basin contains 7 California Statewide Groundwater Elevation Monitoring (CASGEM) Program wells that provide a record to historical groundwater levels around the Basin. There are two CASGEM wells that are within the vicinity of the Site, shown in Appendix A, Figure 1. Nearby CASGEM wells indicate that the groundwater levels generally fluctuate between a high of 18-feet and a low of 8-10 feet, shown in Figure 5 and Figure 6 below.

The CASGEM wells indicate, for the 60+ year time period of water level measurements, very consistent water levels with no overall upward or downward trend. Although both nearby CASGEM wells are approximately 30-feet lower in elevation than the Site and are located in the younger alluvial deposits; they are likely an indication that groundwater elevations in the Site vicinity are generally expected to be consistent and not in an overdraft condition.

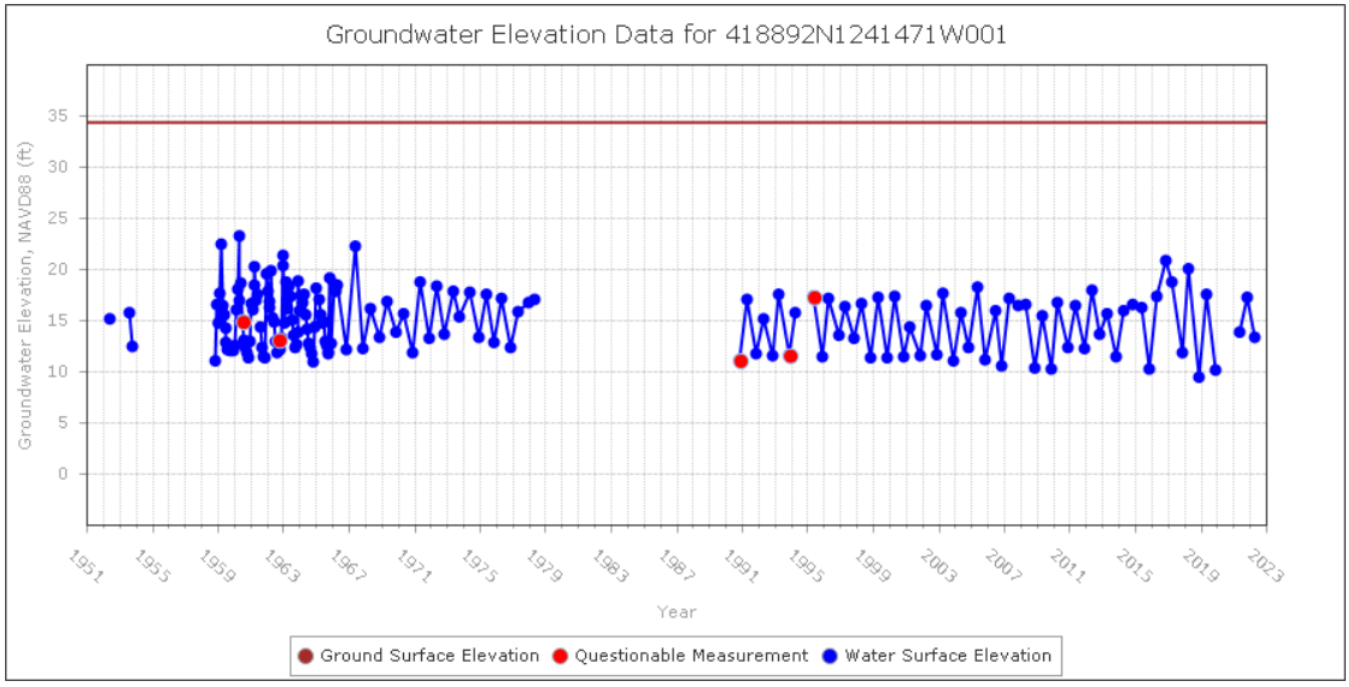

Figure 5 *Historical Groundwater Levels for Voluntary CASGEM Well 22036*

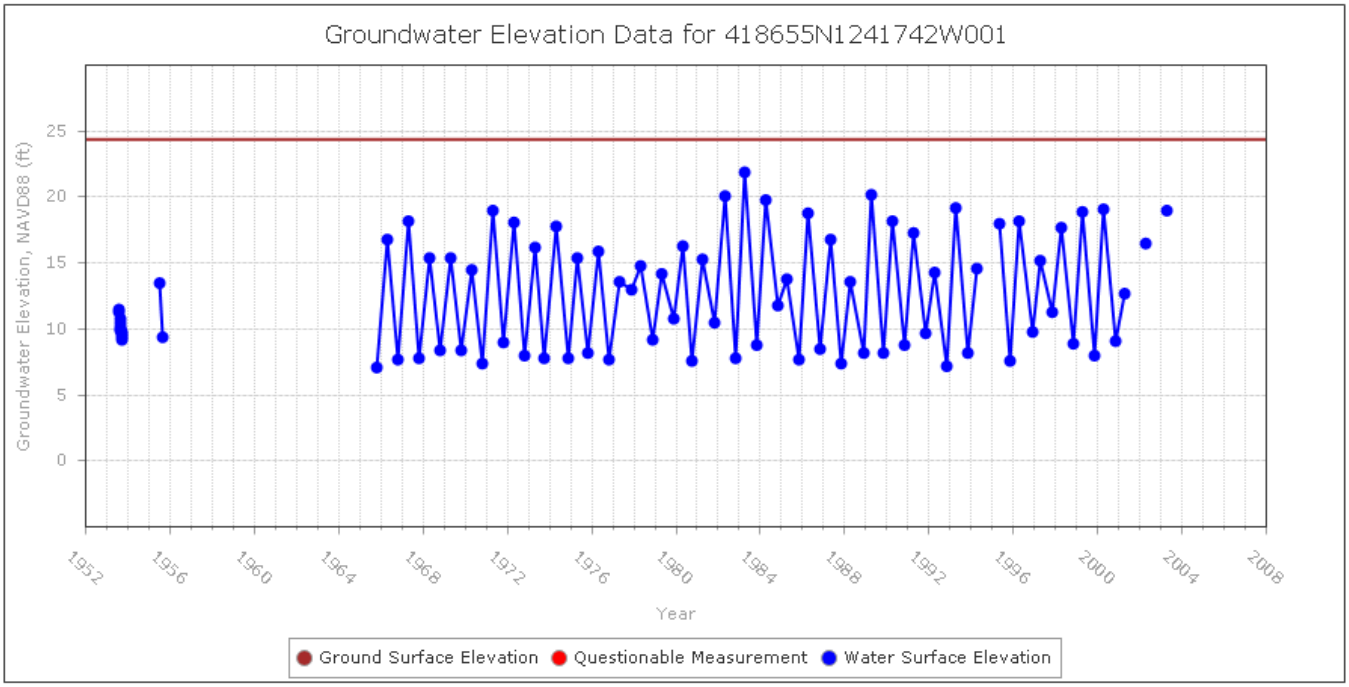

Figure 6 *Historical Groundwater Levels for Voluntary CASGEM Well 33037*

4.2.2 Vicinity Well Completion Reports

Well Completion Reports (WCR) from the Department of Water Resources database were reviewed within the project vicinity to evaluate potential yield and designs from similar geologic settings. Six applicable WCRs were reviewed as reference documents (See Appendix B) based on their completeness, exploration depth, and location relative to the Site.

WCR borings ranged in depth from 40 to 160-feet below ground surface, with screened intervals generally beginning around 30-feet below ground surface and ending at the bottom of the completed well. The reported yields were up to 50-gallons per minute with an average of 21-gallons per minute. Wells are generally constructed with steel or polyvinyl chloride (PVC) casing that is 6-inches in diameter.

The lithologies encountered in the wells generally within Pleistocene Terrace deposits and consist of boulders, alluvial gravel, sand, silt and clay. Clay was indicated to be brown, blue, or black and encountered between 18 to 90 feet below ground surface. Bedrock was only explored in one of the WCR and was described as hard grey sandstone and black claystone. Of the six WCRs the bedrock well had the lowest estimated yield of only 5 gallons per minute.

4.2.3 Groundwater Quality

A review of the GeoTracker and Enviorstor databases indicates that there are no known active environmental clean-up sites within the vicinity of the Site to 1,000-feet, and the nearest closed environmental site is approximately 4,000-feet to the east.

Groundwater within the basin is generally magnesium bicarbonate and magnesium-sodium bicarbonate type waters. Groundwater quality for drinking water supply is generally considered excellent and localized areas with elevated concentrations of iron, chloride, calcium and total dissolved solids (TDS).

5. Recommendations

Available documents provide inconclusive information regarding the maximum production of a single well at the proposed Site. The production of the existing Ranney Well is 4,154 gallons per minute. As a secondary water source, the desired minimum production is 1/10th of the Ranney Well capacity, which is a total production rate of 415 gallons per minute which is significantly higher than the production of domestic wells constructed in the vicinity.

The primary productive geologic unit on the Site are the alluvial terrace deposits (up to 100-feet below ground surface) with comparatively unproductive underlying bedrock. The neighboring pond is likely directly connected to the primary unconfined aquifer and its perennial presents indicates a relatively shallow water table and preliminarily indicates good water quantity.

Therefore, we recommend drilling a test well that extends to bedrock to evaluate the hydrogeologic conditions specific to the Site and determine if a single large diameter well can provide the desired production or if multiple wells will be required. The test well should have the following characteristics:

- Minimum 10-inch diameter boring that extends to bedrock (approximately 150 feet).
- Minimum 6-inch diameter well that is constructed with a 50-foot sanitary seal.
- Following development, a 24-hour pump test should be performed to estimate the long-term yield and to obtain water quality samples.

Upon completion of the pump test the test well can be converted into a monitoring well or emergency water source in support of the subsequent municipal well(s) that will serve as the secondary water source.

Based on our desktop study we anticipate that two (2) municipal wells will achieve project goals. We anticipate these wells will be stainless steel 12-inch diameter wells that are installed within a 20 to 24-inch diameter borehole and drilled using direct rotary drilling rig. Final well design and drilling method should be determined following analysis of the test well's performance.

5.1 Permitting

Table 1 below provides a minimum list of the permits and applications that will be needed for the development of a new well.

Table 1 Required Permits and Applications

Agency	Document	Required Procedure
Del Norte Department of Health and Human Services	Well Permit Application	Sanitary seal inspections, setback checks, and environmental review
State Water Resources Control Board Division of Drinking Water	Permit Amendment	Well Design and specifications
Crescent City	Initial Study / Mitigated Negative Declaration	30-day public review with required noticing, adoption of CEQA document, and filing of Notice of Determination
County of Del Norte Department of Environmental Health	Backflow Prevention Assembly Tester Application	Facility supervising operator's or contractor's information conduction tests
County of Del Norte Department of Building Inspection	Building Permit (Pump House)	Project design sheets and specifications

5.2 Costs

The well location will provide easy access for drilling construction and long-term maintenance operations. A Class 4 cost estimate is provided in Appendix C. A summary of the cost estimate for the test well and recommended number of municipal wells are provided in Table 2 and Table 3, below.

Table 2 Gross Cost Estimate - Test Well Drilling

Item	Qty.	Unit Price	Total Price
Mobilization/ Demobilization of Drilling Equipment and Crew	1	$10,000	$10,000
Drilling 6-inch Test Well, 10-inch borehole	150-feet	$350	$52,500
Test Well Construction Materials & Supporting Equipment	1	$40,000	$40,000
Well Development and 24-Hour Pump Test	1	$15,000	$15,000
Total			**$117,500**

Table 3 Gross Cost Estimate - Two Municipal Wells

Item	Qty.	Unit Price	Total Price
Drilling Boring and Well Construction	2	$133,750	$267,500
Well Housing and Connection to Water System	1	$410,000	$410,000
Other Construction Items	1	$260,550	$260,550

Item	Qty.	Unit Price	Total Price
(Including Test Well)			
Non-Construction Implementation Costs	1	$382,848	$382,848
Total			**$1,331,443**

6. Conclusions

Based on the available data, the development of a new groundwater well is feasible on the project parcel. The hydrogeology indicates the Site is located in a highly productive groundwater zone. To confirm anticipated conditions and collect data for the design of the municipal wells, a test well should be constructed and extend to bedrock or a minimum of 150 feet below ground surface. Municipal well should fully penetrate the alluvial/terrace aquifer to provide the maximum potential production. The total estimated cost for the design and construction of two (2) municipal wells is **$1,331,443.**

7. References

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State Water Resources Control Board. *GeoTracker*. Sacramento, (CA). Viewed online at: GeoTracker (ca.gov). Accessed June 2022.

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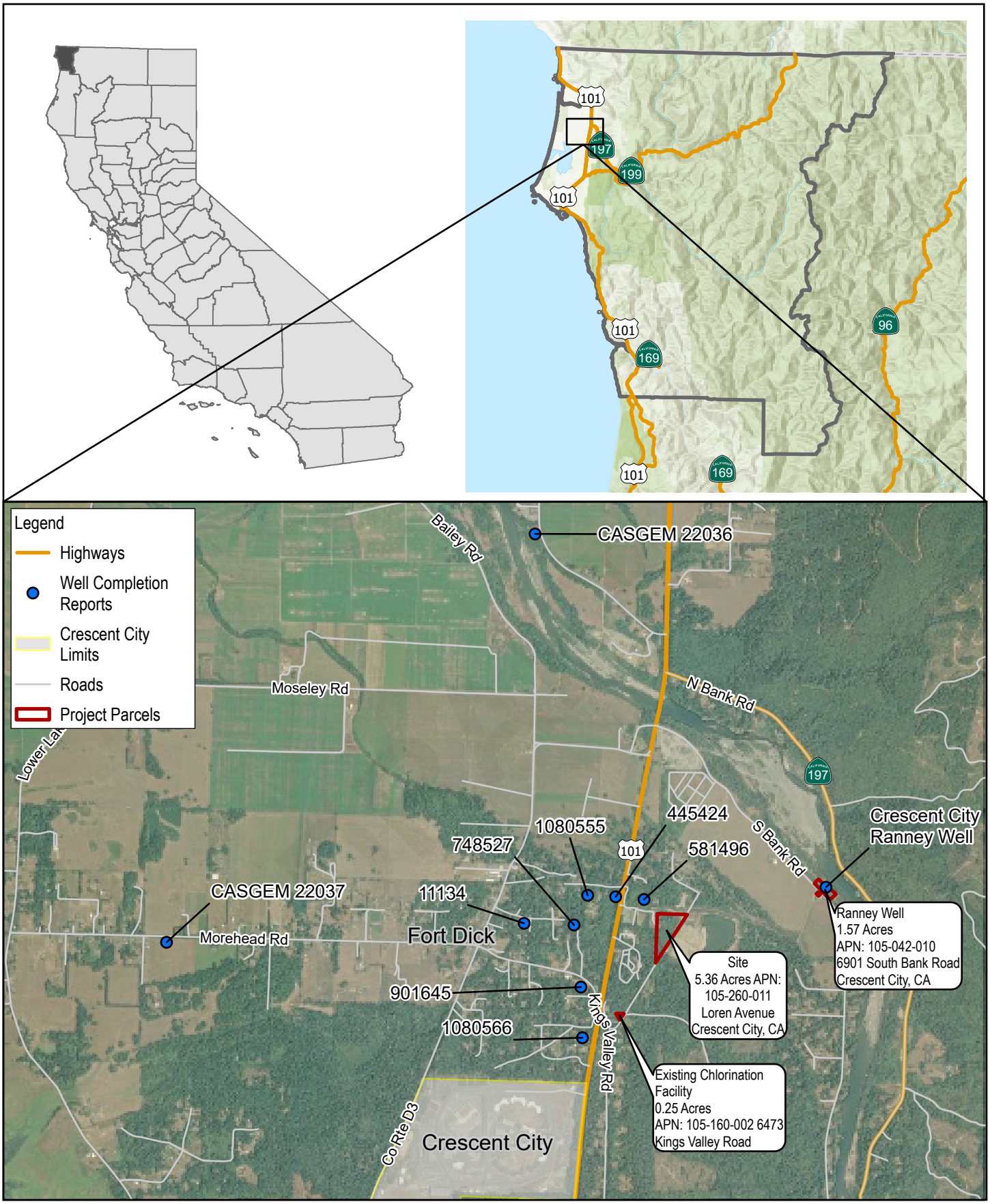
Appendices

Appendix A

Figures



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0 1,000 2,000 3,000

US Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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GHD

West Coast Watershed, Inc.
Groundwater Well Feasibility Study

Project No. **12590356**
Revision No. **-**
Date **10/21/2022**

Vicinity Map

FIGURE 1

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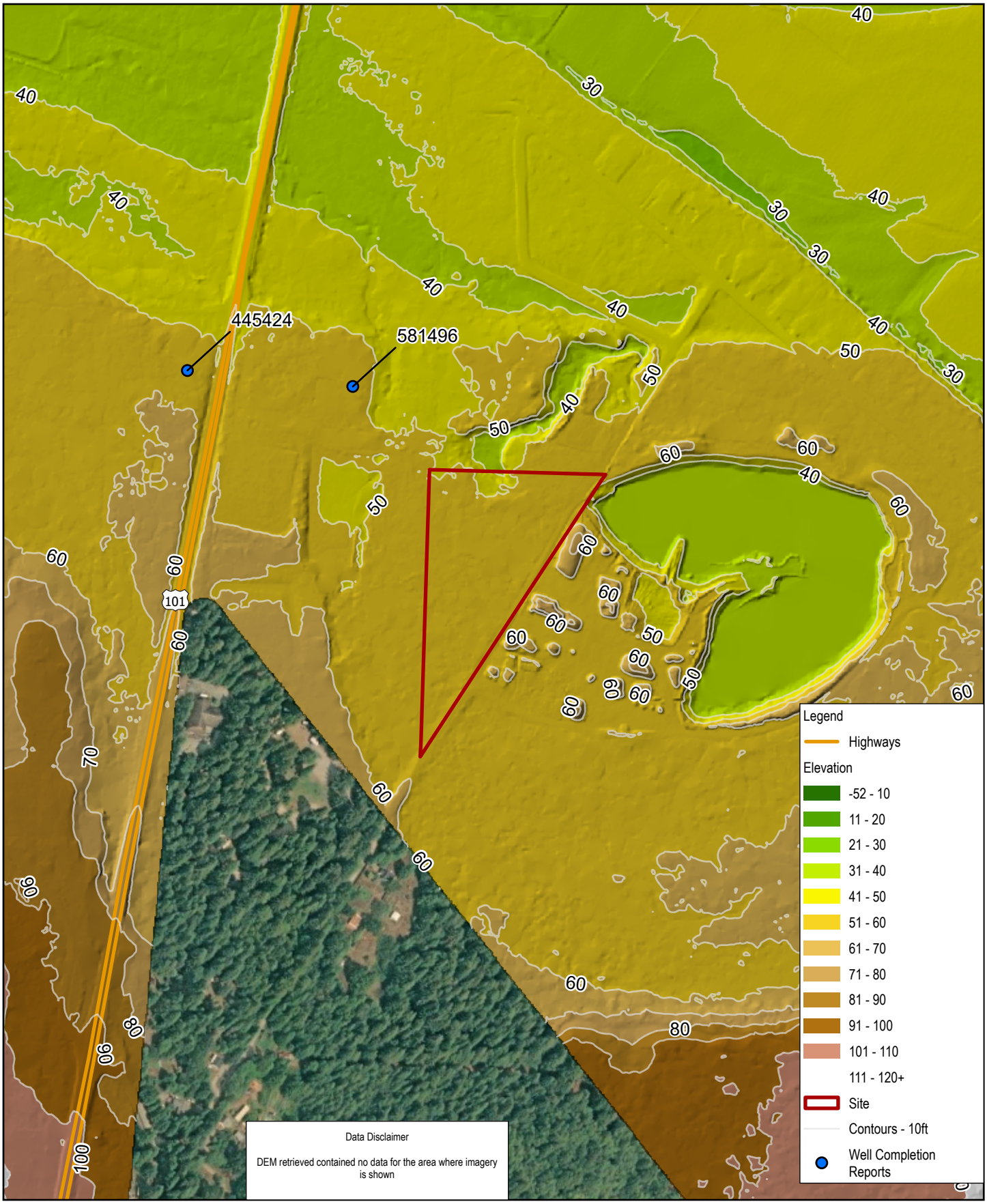
Data source: World Topographic Map - labelless: California State Parks, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS; World Imagery: Maxar; World Hillshade: Esri, CGIAR, USGS. Created by: zporteous



Paper Size ANSI A

0 100 200 300 400

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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GHD

West Coast Watershed, Inc.
Groundwater Well Feasibility Study

Project No. **12590356**
Revision No. **-**
Date **10/21/2022**

Site Plan

FIGURE 2

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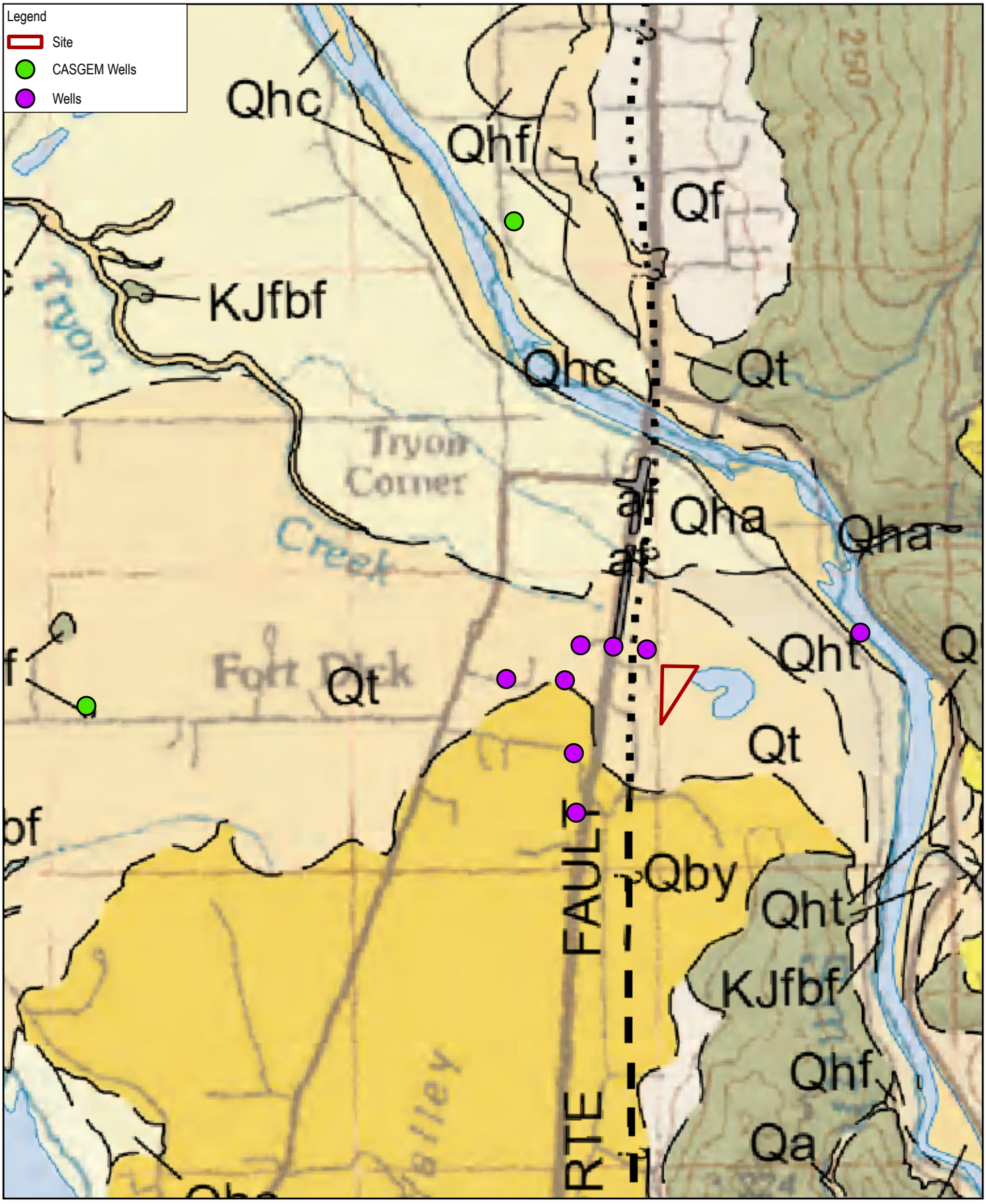
Data source: World Imagery: MaxarNOAA. Created by: zporteous



Paper Size ANSI A

0 1,000 2,000 3,000 4,000

Feet

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 10N

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GHD

West Coast Watershed, Inc.
Groundwater Well Feasibility Study

Project No. **12590356**
Revision No. **-**
Date **10/21/2022**

Site Geology

FIGURE 3

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Data source: World Imagery: Maxar CGS. Created by: zporteous

ABBREVIATED EXPLANATION

(Approximate stratigraphic relationships only; see pamphlet for more detailed information)

CENOZOIC

QUATERNARY

Holocene

- af — Artificial fill (historical)
- Qhc — Stream channel deposits (latest Holocene)
- Qbs — Beach deposits (latest Holocene)
- Qha — Young alluvial deposits, undifferentiated (Holocene)
- Qhf — Young alluvial fan deposits (Holocene)
- Qht — Young stream terrace deposits (Holocene)
- Qds — Dune sand (Holocene)
- Qe — Estuarine deposits (Holocene)

Pleistocene

- Qls — Landslide deposits (historical to Pleistocene)
- Qa — Alluvial deposits, undifferentiated (Holocene to latest Pleistocene)
- Qf — Alluvial fan deposits (Holocene to Pleistocene)
- Qt — Stream terrace deposits (early Holocene to Pleistocene)
- Qby — Battery Formation (late Pleistocene)
- Qmt — Marine terrace deposits (Pleistocene)

Trinidad marine terraces; names and approximate ages (ka=1000 years) from Woodward-Clyde Consultants (1980), and Carver (1992):

- Qmt_1 — Patricks Pt. terrace, age 64 ka
- Qmt_2 — Savage Creek terrace, age 83 ka, and McKinleyville terrace, age 96 ka
- Qmt_3 — Westhaven terrace, 103 ka
- Qmt_4 — Fox Farm terrace, 120 ka, and Sky Horse terrace, 130 ka
- Qmt_5 — A-Line terrace, 176 ka and older
- Qmt_6 — Maple Stump terrace, 200+ ka

- Qsc — Terrace gravels of Surpur Creek (Pleistocene)

TERTIARY

Pliocene

- Qu — Undifferentiated marine and nonmarine overlap deposits (Pleistocene to late Pliocene?)
- QTpc — Prairie Creek Formation (early Pleistocene to late Pliocene)

Miocene

- Twi — Wimer Formation (late Miocene)
- Tsg — St. George Formation (late Miocene)

MESOZOIC

CRETACEOUS

Franciscan Complex - Central Belt

- KJfm — Mélange of the Central Belt (Late Cretaceous to Late Jurassic)
  - gs — Greenstone block within mélange

Franciscan Complex - Eastern Belt

- KJfbf — Broken formation (Early Cretaceous to Middle Jurassic)
- KJfmc — Mélange unit of Crescent City area (Early Cretaceous to Middle Jurassic)

Blocks within mélange:

- gs — Greenstone
- ch — Chert
- mg — Metagraywacke
- u — Undifferentiated

- KJfmg — Metagraywacke (Cretaceous to Jurassic)

Redwood Creek watershed units of Hardin and others (1982)

- KJfl — Coherent unit of Lacks Creek (Cretaceous to Jurassic)
- KJfc — Incoherent unit of Coyote Creek (Cretaceous to Jurassic)
- KJfg — Transitional rocks of the Grogan Fault Zone (Cretaceous to Jurassic)
- KJfrc — Redwood Creek Schist (Early Cretaceous to Late Jurassic)
  - mv — Interbedded metatuff
  - sp — Serpentinite block
- KJfpp — Patricks Point unit of Aalto and others, 1981 (Cretaceous to Jurassic)

Klamath Mountains Province - Western Jurassic Belt

Josephine Ophiolite of Harper (1980)

JURASSIC

- Jdc — Dike Complex (Late Jurassic)
- Jgb — Gabbro (Late Jurassic)
- Jpd — Peridotite (Late Jurassic)
- Juc — Cumulate ultramafic rocks (Late Jurassic)
- sp — Sheared serpentinite (Jurassic)
- spm — Serpentinite matrix mélange (Jurassic)

Blocks within mélange:

- gs — Greenstone
- gr — Granitic rocks
- ms — Metasedimentary rocks

Paper Size ANSI A

GHD

West Coast Watershed, Inc.
Groundwater Well Feasibility Study

Project No. **12590356**
Revision No. **-**
Date **10/21/2022**

Site Geology

FIGURE 3A

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Appendix B

Well Completion Reports

ORIGINAL
File with DWR

JUN 0 3 2005

Page ___ of ___

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 445424

DWR USE ONLY — DO NOT FILL IN
17N/01W-14
STATE WELL NO./STATION NO.
LATITUDE ___ LONGITUDE ___
APN/TRS/OTHER

Owner's Well No. ___
Date Work Began 4-10-04 , Ended 4-13-04
Local Permit Agency Del Norte County Health Dep.
Permit No. ___ Permit Date 9-8-03

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 15 (Ft.) BELOW SURFACE

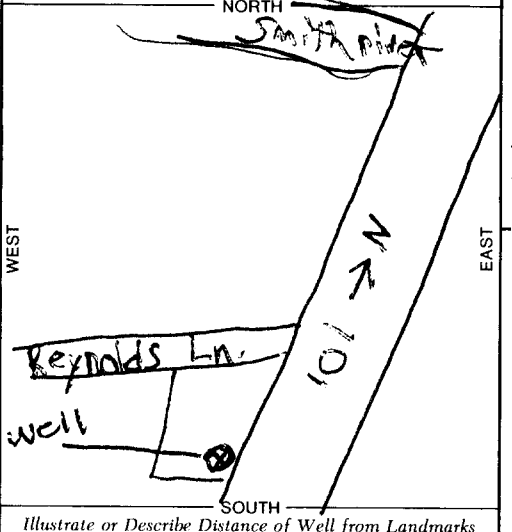
DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	7	Brn. Clay
7	15	Boulders & Brn Sandy Clay
~~15~~	~~20~~	
15	42	Gravel Blue
42	50	Saint George Clay

TOTAL DEPTH OF BORING 50 (Feet)
TOTAL DEPTH OF COMPLETED WELL 50 (Feet)

WELL LOCATION

Address 110 Reynolds Lane
City Crescent City
County Del Norte
APN Book 105 Page 150 Parcel 25
or Township 17N Range 1W Section 14
or Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH



Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL
___ MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

___ MONITORING
WATER SUPPLY
✓ Domestic
___ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Mud Rotary FLUID Bentonite

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 12 (Ft.) & DATE MEASURED 4-16-04
ESTIMATED YIELD* 8 (GPM) & TEST TYPE Pump
TEST LENGTH 72 (Hrs.) TOTAL DRAWDOWN 40 (Ft.)
** May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	20	14	X				PVC	5"	Sch 40	
20	40	14		X			PVC	5"	1	.020
40	50	14	X				PVC	5"		

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	20		X		
20	50				#3 Pea

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Stanley R Dickey (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED) Rich Drilling
ADDRESS 1287 Rail Road dr CITY Mckinleyville STATE CA ZIP 95519
Signed Stanley R Dickey (WELL DRILLER/AUTHORIZED REPRESENTATIVE) DATE SIGNED 4-17-04 C-57 LICENSE NUMBER 721799

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

Page 1 of 1

Owner's Well No. DEC 1[illegible]

Date Work Began 10-26-95, Ended 10-30-95

Local Permit Agency Del Norte Bldg/Health Dept.

Permit No. B23332 Permit Date 11-9-95

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 581496

DWR USE ONLY — DO NOT FILL IN
17N/01W T 14H
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER 25 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	16	Clay, Sand & Boulders
16	90	Sand-Gravel & Boulders

TOTAL DEPTH OF BORING 90 (Feet)

TOTAL DEPTH OF COMPLETED WELL 90 (Feet)

WELL LOCATION

Address 6835 Highway 101 N.

City Crescent City CA 95531

County Del Norte

APN Book 105 Page 150 Parcel 03

or Township 17N Range 01W Section 14

or Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH

well

House

WEST EAST

SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

___ MONITORING

WATER SUPPLY

✓ Domestic

___ Public

___ Irrigation

___ Industrial

___ "TEST WELL"

___ CATHODIC PROTECTION

___ OTHER (Specify)

DRILLING METHOD Air Rotary FLUID Air

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 25 (Ft.) & DATE MEASURED 11-9-95

ESTIMATED YIELD* 50 (GPM) & TEST TYPE Air

TEST LENGTH 2 (Hrs.) TOTAL DRAWDOWN 12 (Ft.)

** May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	20	10	✓							
0	90	6			✓		STEEL	6	250	1/4x3
0	90			✓			P.V.C	4	250	.010

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	20	✓			
20	90			✓	1/4 Down

DEC 22 1995

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Art Carter Well Drilling (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

4658 Hwy 238 Jacksonville OR 97530
ADDRESS CITY STATE ZIP

Signed Art Carter WELL DRILLER/AUTHORIZED REPRESENTATIVE

12-12-95 DATE SIGNED

667606 C-57 LICENSE NUMBER

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

Page ___ of ___
Owner's Well No. ___
Date Work Began 9/19/00 , Ended 9/20/00
Local Permit Agency Del Norte County Health Dept
Permit No. ___ Permit Date 9/18/00

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 748527

DWR USE ONLY — DO NOT FILL IN
17N/01W-14H
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) [X] VERTICAL [ ] HORIZONTAL [ ] ANGLE [ ] (SPECIFY)
DRILLING METHOD ___ FLUID ___

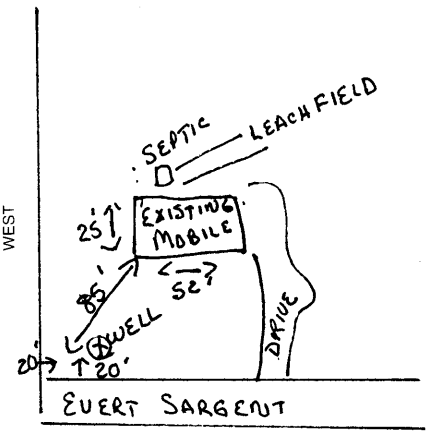
DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	18	Brown Sandy Soil & Clay
18	89	Hard Gray Sandstone
89	93	Hard Black Claystone
93	160	Sandstone & Claystone

TOTAL DEPTH OF BORING 160 (Feet)
TOTAL DEPTH OF COMPLETED WELL 160 (Feet)

WELL LOCATION

Address 130 Evert Sagent Lane
City Crescent City
County Del Norte
APN Book 105 Page 211 Parcel 72
Township 17N Range 1W Section 14 H
Latitude ___ DEG. ___ MIN. ___ SEC. NORTH
Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH


SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

[X] NEW WELL
MODIFICATION/REPAIR
[ ] Deepen
[ ] Other (Specify)
[ ] DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USES (✓)

WATER SUPPLY
[X] Domestic [ ] Public
[ ] Irrigation [ ] Industrial
[ ] MONITORING
[ ] TEST WELL
[ ] CATHODIC PROTECTION
[ ] HEAT EXCHANGE
[ ] DIRECT PUSH
[ ] INJECTION
[ ] VAPOR EXTRACTION
[ ] SPARGING
[ ] REMEDIATION
[ ] OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 138 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 21 (Ft.) & DATE MEASURED 9/20/00
ESTIMATED YIELD * 5 (GPM) & TEST TYPE Air
TEST LENGTH 2 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
+1	20	10"					Steel	6"	.250	
20	160	6"								

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	20		x		

ATTACHMENTS (✓)

[ ] Geologic Log
[ ] Well Construction Diagram
[ ] Geophysical Log(s)
[ ] Soil/Water Chemical Analyses
[ ] Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME G.L. Meyer Well Drilling (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
P.O. Box 1183 ADDRESS Gold Beach. CITY Oregon STATE 97444 ZIP
Signed ___ WELL DRILLER/AUTHORIZED REPRESENTATIVE
10/23/00 DATE SIGNED
783760 C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
~~File with DWR~~

JUN 0 [illegible] 2004

Page ___ of ___

Owner's Well No. ___

Date Work Began 5/5/04 , Ended 5/5/04

Local Permit Agency Del Norte County Health Department

Permit No. ___ Permit Date 4/04

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 0901645

DWR USE ONLY — DO NOT FILL IN

17N/01W-14 N

STATE WELL NO./STATION NO.

LATITUDE ___ LONGITUDE ___

APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD Air Rotary FLUID ___

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	40	Boulders, sand & gravel

TOTAL DEPTH OF BORING 40 (Feet)

TOTAL DEPTH OF COMPLETED WELL 40 (Feet)

WELL LOCATION

Address 6520 Kings Valley Road

City Crescent City

County Del Norte

APN Book 105 Page 182 Parcel 10

Township 17N Range 01W Section 14

Lat ___ DEG. ___ MIN. ___ SEC. N Long ___ DEG. ___ MIN. ___ SEC. W

LOCATION SKETCH

NORTH / WEST / EAST / SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. ***PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

USES (✓)

WATER SUPPLY
X Domestic ___ Public
___ Irrigation ___ Industrial

___ MONITORING
___ TEST WELL
___ CATHODIC PROTECTION
___ HEAT EXCHANGE
___ DIRECT PUSH
___ INJECTION
___ VAPOR EXTRACTION
___ SPARGING
___ REMEDIATION
___ OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 34 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 16 (Ft.) & DATE MEASURED 5/5/04

ESTIMATED YIELD * 15 (GPM) & TEST TYPE Air

TEST LENGTH 1 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)

** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	25	10"	x				Steel	6"	.250	
25	34	6"	x				Steel	6"	.250	
34	40	6"	x				Steel	6"	.250	1/8x6"
0	30		x				PVC	4"	.160	
30	40			x			PVC	4"	.160	0.10

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	25		x		17

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME G.L. Meyer Well Drilling (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS P.O. Box 1183 CITY Gold Beach STATE Or ZIP 97444

Signed ___ C-57 LICENSED WATER WELL CONTRACTOR

DATE SIGNED 5/25/04

C-57 LICENSE NUMBER 783760

DWR 188 REV. 05-03

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

OSP 03 78836

ORIGINAL
File with DWR

DEC 0 4 2008

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 1080555

Page ___ of ___
Owner's Well No. ___
Date Work Began 11/18/08, Ended 11/19/08
Local Permit Agency Del Norte County Health Department
Permit No. ___ Permit Date 11/17/08

DWR USE ONLY — DO NOT FILL IN
17N/01W-14
STATE WELL NO./STATION NO.
LATITUDE ___ LONGITUDE ___
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) C VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD Air Rotary FLUID ___

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	4	Brown Sandy Soil
4	42	Boulders & Gravel
42	60	Med Blue Claystone

TOTAL DEPTH OF BORING 60 (Feet)
TOTAL DEPTH OF COMPLETED WELL 60 (Feet)

WELL OWNER

WELL LOCATION

Address 170 Reynolds Lane
City Crescent City
County Del Norte
APN Book 105 Page 211 Parcel 36
Township 17N Range 1W Section 14
Lat ___ DEG. ___ MIN. ___ SEC. N
Long ___ DEG. ___ MIN. ___ SEC. W

LOCATION SKETCH

NORTH / WEST / EAST / SOUTH

*Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

USES (✓)

WATER SUPPLY
X Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ___
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 40 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 30 (Ft.) & DATE MEASURED 11/19/08
ESTIMATED YIELD * 18 (GPM) & TEST TYPE Air
TEST LENGTH 1 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	22	10	x				Steel	6	.250	
22	32	6	x				Steel	6	.250	
32	41	6	x				Steel	6	.250	1/8x8"
41	60	6								
0	35		x				PVC	4	.160	
35	55			x			PVC	4	.160	.010

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	22		x		15

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Meyer Well Drilling (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
P.O. Box 1183 ADDRESS — Gold Beach CITY — Or STATE — 97444 ZIP
Signed ___ C-57 LICENSED WATER WELL CONTRACTOR
12/1/08 DATE SIGNED
783760 C-57 LICENSE NUMBER

DWR 188 REV. 05-03

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

OSP 03 78836

MADDEN
170 REYNOLDS LANE
105-211-36

COUNTY OF DEL NORTE

DEPARTMENT OF HEALTH AND HUMAN SERVICES

PUBLIC HEALTH BRANCH

[illegible] Northcrest Drive

Crescent City, California 95531

[illegible]

Receipt # [illegible]

Date Paid: Nov 2008

Check No: [illegible]

Rec'd By: [illegible]

APPLICATION FOR WATER WELL PERMIT

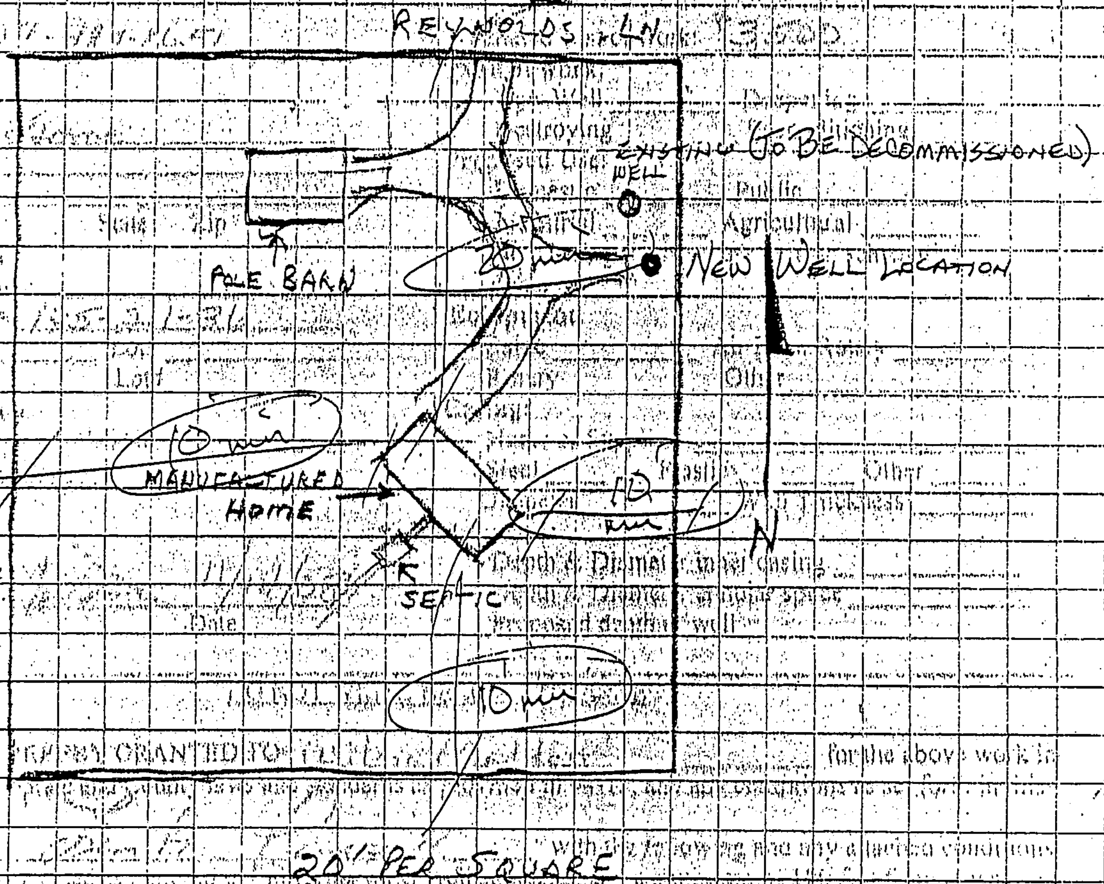
FEE: $150.00 – NO FEE FOR DOMESTIC WELL DESTRUCTION

Well Contractor: [illegible]

License number: [illegible]

Mailing Address: [illegible]

State Zip



Destroying

Public

Agricultural

Other

Steel Plastic Other

Depth & Diameter of casing

Date

PERMIT IS HEREBY GRANTED TO [illegible] for the above work in

20' PER SQUARE

with the following and any attached conditions

[illegible] tank, and a minimum of 100 feet from any structure or facility used to allow sewage to [illegible] into the ground [illegible]

Well completion reports to be submitted prior to final approval

[illegible]

Final approval by

[illegible] SHOW ALL EXISTING OR PROPOSED BUILDINGS AND ONSITE SEWAGE DISPOSAL SYSTEMS

ORIGINAL
File with DWR

APR 28 2011

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 1080566

Page ___ of ___
Owner's Well No. _____
Date Work Began 4/13/11, Ended 4/13/11
Local Permit Agency CDD-Environmental Health Dept
Permit No. _____ Permit Date 4/11/11

DWR USE ONLY — DO NOT FILL IN
17N/1w-14
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) ___ VERTICAL X HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD Air Rotary FLUID _____

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	4	Brown Clay
4	28	Brown Sand & Clay
28	48	Black Sand
48	60	Sand & Gravel

TOTAL DEPTH OF BORING 60 (Feet)
TOTAL DEPTH OF COMPLETED WELL 60 (Feet)

WELL OWNER

WELL LOCATION

Address 110 Stephane Lane
City Crescent City
County Del Norte
APN Book 105 Page 220 Parcel 70
Township 17N Range 1W Section 14
Lat ___ DEG. ___ MIN. ___ SEC. N
Long ___ DEG. ___ MIN. ___ SEC. W

LOCATION SKETCH

NORTH / WEST / EAST / SOUTH

*Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.***

ACTIVITY (✓)

X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

USES (✓)

WATER SUPPLY
X Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ___
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 52 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 22 (Ft.) & DATE MEASURED 4/13/11
ESTIMATED YIELD * 30 (GPM) & TEST TYPE Air
TEST LENGTH 1 (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	20	10	x				Steel	6	.250	
20	46	6	x				Steel	6	.250	
46	56	6	x				Steel	6	.250	1/8x8"
56	60	6								
0	36		x				PVC	4	.160	
36	46			x			PVC	4	.160	0.10
56	60						PVC	4	.160	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	25		13		

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other _____
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

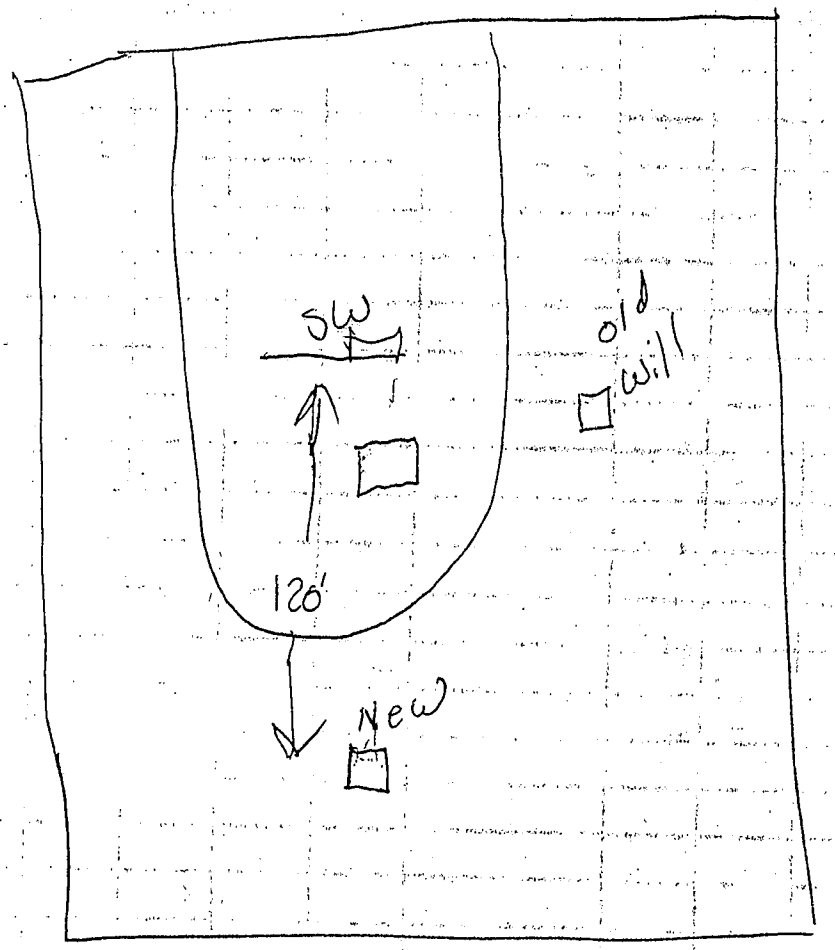
CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Meyer Well Drilling (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS P.O. Box 1183 CITY Gold Beach STATE Or ZIP 97444
Signed _____ C-57 LICENSED WATER WELL CONTRACTOR
DATE SIGNED 4/22/11
C-57 LICENSE NUMBER 783760

DWR 188 REV. 05-03
IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM
OSP 03 78836

APR 28 2011



Appendix C

Project Cost Estimates

City of Crescent City Water Supply Reliability Project

Major Equipment and Construction Items

Unit Items	Quantity	Unit	Unit Cost	Total	Typical Ranges
For Two (2) 150 FT Wells					
Drill Boring for Well Installation	300	FT	$ 250.00	$75,000	*Includes costs for purchase, tax, shipping, and installation. In place cost is typically 150-300% of purchase price.*
Install Blank Well Casing (top 50 FT each well)	100	FT	$ 250.00	$25,000	
Install Screened Well Casing (screened bottom 100 FT each well)	200	FT	$ 350.00	$70,000	
Supply and Install Filter Pack for each well	200	FT	$ 250.00	$50,000	
Supply and Install Sanitary and Annualar Seal	100	FT	$ 75.00	$7,500	
Well development (2 days each well)	4	Day	$ 5,000.00	$20,000	
Step Drawdown Aquifer Test (2 days each well)	4	Day	$ 5,000.00	$20,000	
Well Protection and housing	2	EA	$ 30,000.00	$60,000	
Connection2 to Water System	2000	FT	$ 150.00	$300,000	
valves and appurtenances	1	LS	$ 50,000.00	$50,000	
			$ -	$0	
Subtotal 1				**$677,500**	

Other Construction Items	Cost Estimate		Total	Typical Ranges
Site Work	4%	of subtotal 1	$27,100	*5-15% of subtotal 1*
Mobilization/ Demolition	10%	of subtotal 1	$67,750	*5-20% of subtotal 1*
Electrical	5%	of subtotal 1	$33,875	*5-125% of subtotal 1*
Instrumentation	3%	of subtotal 1	$20,325	*3-15% of subtotal 1*
Test Well Installation and Analysis		of subtotal 1	$117,500	*Variable*
Project Signage			$1,500	*Varies - Typically $1,000 to $2,000*
Subtotal 2	22%	of subtotal 1	**$268,050**	

Non Construction Implementation Costs (Soft Costs)

Administration	2%	of (subtotal 1 + 2)	$18,911	*1-5% of (subtotal 1 + 2)*
Reporting	1%	of (subtotal 1 + 2)	$9,456	*1-5% of (subtotal 1 + 2)*
Land/ROW Acquisition			$0	*Variable*
Engineering	10%	of (subtotal 1 + 2)	$94,555	*10-20% of (subtotal 1 + 2)*
Monitoring Plan			$2,000	*Varies - Typically $1,500 to $5,000*
CEQA - Exempt	1%	of (subtotal 1 + 2)	$9,456	*1-10% of (subtotal 1 + 2)*
NEPA	0%	of (subtotal 1 + 2)	$0	*5-10% of (subtotal 1 + 2) if required*
General Permitting	1%	of (subtotal 1 + 2)	$9,456	*5-20% of (subtotal 1 + 2)*
Bid Period Services	0.5%	of (subtotal 1 + 2)	$4,728	*0.5-1.0% of (subtotal 1 + 2)*
Construction Administration	7%	of (subtotal 1 + 2)	$66,189	*7-20% of (subtotal 1 + 2)*
Labor Compliance	0.1%	of (subtotal 1 + 2)	$946	*0.5-1% of (subtotal 1 + 2)*
Project Close Out	2%	of (subtotal 1 + 2)	$18,911	*3-8% of (subtotal 1 + 2)*
Performance Monitoring	1%	of (subtotal 1 + 2)	$9,456	*1-5% of (subtotal 1 + 2)*
Contingency	15%	of (subtotal 1 + 2)	$141,833	*10-50% of (subtotal 1 + 2)*
Subtotal 3	41%	of (subtotal 1 + 2)	**$385,893**	

Cost Summary

Total Construction Estimate (w/o Contingency)	100%	of (subtotal 1 + 2)	**$945,550**	
Total Estimated Project Costs	100%	of (subtotal 1 + 2 + 3)	**$1,331,443**	
For Initial Funding Application	150%	of Total Estimated Project Costs	**$1,997,165**	

City of Crescent City Water Supply Reliability Project

Major Equipment and Construction Items

Unit Items	Quantity	Unit	Unit Cost	Total	Typical Ranges
For One (1) 150 FT Well					
Drill Boring for Well Installation	150	FT	$ 250.00	$37,500	*Includes costs for purchase, tax, shipping, and installation. In place cost is typically 150-300% of purchase price.*
Install Blank Well Casing (top 50 FT)	50	FT	$ 250.00	$12,500	
Install Screened Well Casing (screened bottom 100 FT)	100	FT	$ 350.00	$35,000	
Supply and Install Filter Pack	100	FT	$ 250.00	$25,000	
Supply and Install Sanitary and Annualar Seal	50	FT	$ 75.00	$3,750	
Well development	2	Day	$ 5,000.00	$10,000	
Step Drawdown Aquifer Test	2	Day	$ 5,000.00	$10,000	
Well Protection and housing	1	EA	$ 30,000.00	$30,000	
Connection to Water System	1500	FT	$ 150.00	$225,000	
valves and appurtenances	1	LS	$ 50,000.00	$50,000	
			$ -	$0	
Subtotal 1				**$438,750**	

Other Construction Items		Cost Estimate	Total	Typical Ranges
Site Work	4%	of subtotal 1	$17,550	*5-15% of subtotal 1*
Mobilization/ Demolition	10%	of subtotal 1	$43,875	*5-20% of subtotal 1*
Electrical	5%	of subtotal 1	$21,938	*5-125% of subtotal 1*
Instrumentation	3%	of subtotal 1	$13,163	*3-15% of subtotal 1*
Test Well Installation and Analysis		of subtotal 1	$117,500	*Variable*
Project Signage			$1,500	*Varies - Typically $1,000 to $2,000*
Subtotal 2	22%	of subtotal 1	**$215,525**	

Non Construction Implementation Costs (Soft Costs)

Administration	2%	of (subtotal 1 + 2)	$13,086	*1-5% of (subtotal 1 + 2)*
Reporting	1%	of (subtotal 1 + 2)	$6,543	*1-5% of (subtotal 1 + 2)*
Land/ROW Acquisition			$0	*Variable*
Engineering	10%	of (subtotal 1 + 2)	$65,428	*10-20% of (subtotal 1 + 2)*
Monitoring Plan			$2,000	*Varies - Typically $1,500 to $5,000*
CEQA - Exempt	1%	of (subtotal 1 + 2)	$6,543	*1-10% of (subtotal 1 + 2)*
NEPA	0%	of (subtotal 1 + 2)	$0	*5-10% of (subtotal 1 + 2) if required*
General Permitting	1%	of (subtotal 1 + 2)	$6,543	*5-20% of (subtotal 1 + 2)*
Bid Period Services	0.5%	of (subtotal 1 + 2)	$3,271	*0.5-1.0% of (subtotal 1 + 2)*
Construction Administration	7%	of (subtotal 1 + 2)	$45,799	*7-20% of (subtotal 1 + 2)*
Labor Compliance	0.1%	of (subtotal 1 + 2)	$654	*0.5-1% of (subtotal 1 + 2)*
Project Close Out	2%	of (subtotal 1 + 2)	$13,086	*3-8% of (subtotal 1 + 2)*
Performance Monitoring	1%	of (subtotal 1 + 2)	$6,543	*1-5% of (subtotal 1 + 2)*
Contingency	15%	of (subtotal 1 + 2)	$98,141	*10-50% of (subtotal 1 + 2)*
Subtotal 3	41%	of (subtotal 1 + 2)	**$267,636**	

Cost Summary

Total Construction Estimate (w/o Contingency)	100%	of (subtotal 1 + 2)	**$654,275**
Total Estimated Project Costs	100%	of (subtotal 1 + 2 + 3)	**$921,911**
For Initial Funding Application	150%	of Total Estimated Project Costs	**$1,382,866**

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