STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

March 16, 2021
Honolulu, Hawai‘i

Approval of After-the-Fact Variances with Special Conditions to
Moloa’a Irrigation Cooperative, Gerard Bosman, and
Oasis Water Systems, Inc.
MIC 1(Well No. 2-1019-012)
TMK (4) 4-9-012:022, Anahola, Kaua’i

WELL OWNER:	LANDOWNER:	DRILLER/PERMITTEE:
Moloa’a Irrigation Cooperative P.O. Box 506 Anahola, Hawai‘i 96703	Gerard Boma 3094 Aukele Street Līhu‘e, Hawai‘i 96766	Oasis Water Systems, Inc. P.O. Box 507 Hanalei, Hawai‘i 96714

SUMMARY OF REQUEST:

The applicant requests approval of after-the-fact variances for the well depth exceeding the ¼ depth limitation and not meeting the minimum well casing thickness from provisions of the 2004 Hawai’i Well Construction and Pump Installation Standards.

LOCATION MAP: Exhibit 1

WATER AVAILABILITY:

MIC well 1 (Well No. 2-1019-002) is located in the Anahola Aquifer System Area with estimated sustainable yield (SY) of 21 mgd. Current Anahlola Aquifer System Area (AASA) Pumpage: (12-MAV as of October 2020): 2.181 mgd (10.4 % of SY) based on 29 of 105 (27.6 %) production wells reporting. Proposed Use: < 0.72 mgd (500 gpm), for private municipal use (use code MUNPR) though the majority of water is for agricultural irrigation.

The Anahola Aquifer System Area (AASA) has many individual domestic wells (90) that are not reporting. Kauai Island does not have an Out-Reach program at this time due to staff and budget limitations and the small amount of use compared to the area’s sustainable yield.

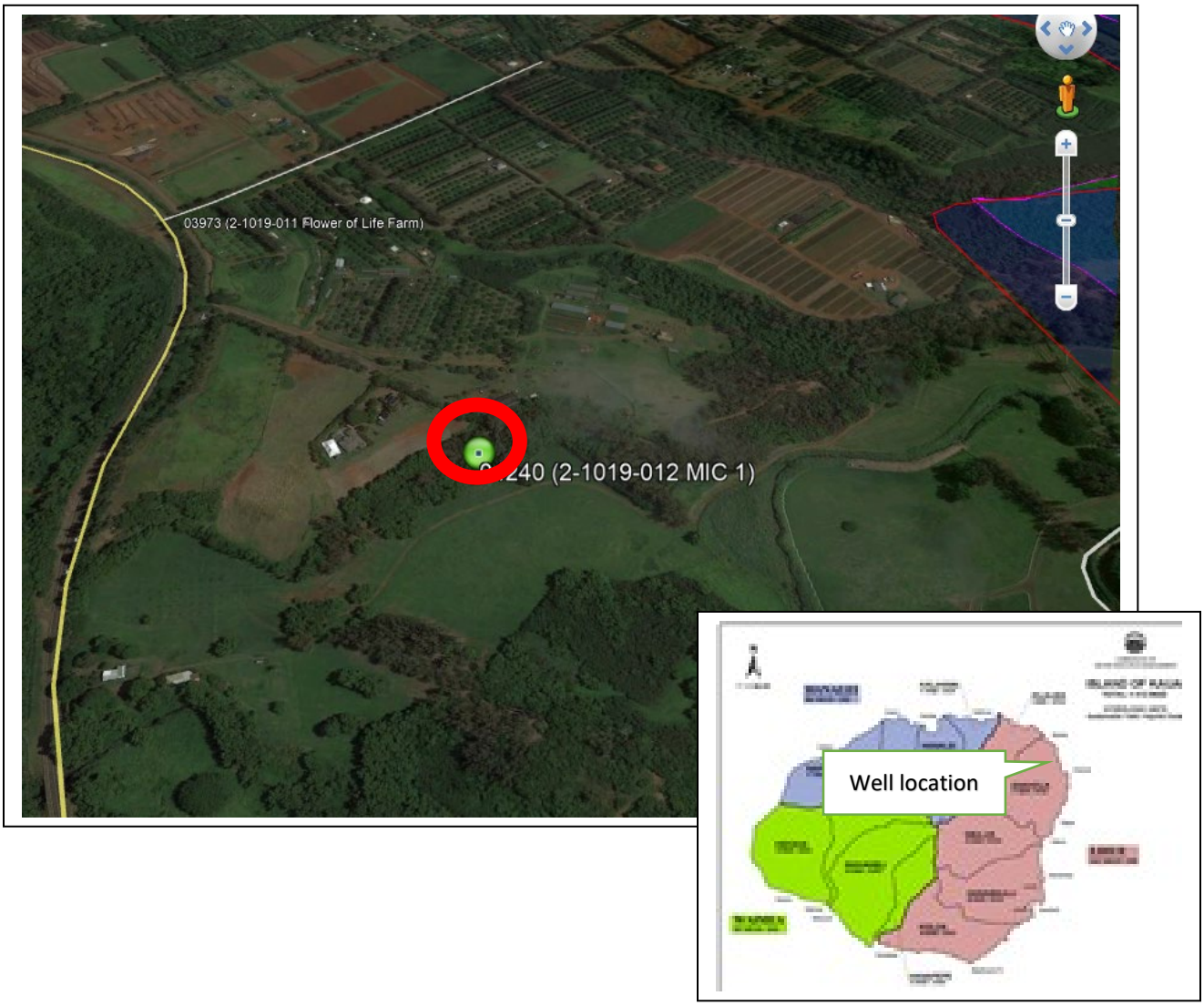


EXHIBIT 1 – Location Map

BACKGROUND:

October 9, 2018	Well Construction and Pump Installation Permit approved. Anticipated water level of ±10 feet above mean sea level (msl) and proposed well depth of -440 ft. below msl is within the ¼ depth limit (-442 ft. msl) as specified in the 2004 Hawaii Well Construction and Pump Installation Standards (2004 HWCPIS). Casing diameter was appropriate for original stated domestic use well.
May 4, 2020	Driller submitted Well Completion Report Part 1 (WCR 1) (Exhibit 2).
August 2020	WCR1 review indicated three potential problems with the as-built well. The data provided in the original drilling log looked like a potential cross-connection between a perched layer (at 96.2 ft water level) and basal (at 120-ft water level) existed, the well depth exceeded the ¼ theoretical aquifer depth, and the well casing thickness is less than the minimum for public water system. Well Construction Permit did not include a special condition regarding casing diameter for public water system. Review from Department of Health indicated the proposed well qualifies as a source for a public water system and requires approval by the Director of the Department of Health (DOH) prior to use. All DOH comments are part of all well permits, though the casing issue is one that should have been highlighted as a special condition. Staff emailed driller regarding these three potential problems and followed up with a formal letter on August 27, 2020.
September 2020	Driller provided explanation and additional information in the September 27, 2020 reply letter (Exhibit 4). On September 29, 2020, staff requested well drilling log video to further investigate the cross-connection issue.
October 2020	On October 19, 2020, staff received the log video. Video depths are a little different than the measured depths reported. Staff determined that the video cleared up the cross-connection issue. Therefore, the potential cross connections to water-bearing zones above the water table have been addressed, and are no longer a concern. The proposed well is for a public water system (PWS 437), which was a change from the original majority agricultural/domestic use stated in the application. Although DOH review back in 2008 indicated that the public water system certification requirement before pumping could commence and the applicant had been working with DOH, the well permit did not specifically identify the need for a change in the casing requirement in the special condition section. Based on the 2004 HWCPIS, the well casing does not meet the minimum casing thickness requirements of 0.375 inch for public supply water wells. Staff requested driller to provide the engineering calculations on casing strength and analysis to address potential deformation concerns.

November 2020	Between November 11 to 16, 2020, Driller provided material strength calculations from consultant (Tom Nance Water Resource Engineering, Inc.) and manufacturer data sheets from Roscoe Moss Company.
December 2020	Staff reviewed supplemental data and determined that analysis of the casing thickness and the manufacturer's data sheets addressed the strength and potential deformation concerns.

ANALYSIS/ISSUES:

This well has both duly approved well construction and pump installation permits. Well Construction was completed on December 18, 2019 and Well Completion Report was submitted on May 4, 2020. Variances are discussed below in more detail:

I. Depth of well variance

Section 2.2 of the Hawaii Well Construction and Pump Installation Standards states that "*Upon request by the permittee and submission of the supporting data and analysis, the Chairperson may allow deepening and subsequent testing of such wells to a depth below sea level not exceeding one-half of the theoretical thickness of the basal ground-water body*."

Driller indicated that when drilling in Koloa volcanics, it is very often necessary to exceed the ¼ lens thickness to obtain any significant yields. Staff concurs that there are complexities in the geologic conditions in this area such that the straightforward measurements of the basal lens calculations does not apply. Previous projects in the area, such as Wells 2-1019-008 and 2-1120-034, had similar anomalies and were drilled to depth 147' and 200' below sea level, respectively; deeper than the theoretical ¼ lens thickness.

Staff recommends this variance approval based on the successful pump tests from January 2020 that showed chlorides decreased from 139 ppm to 36 ppm at the end of the test, indicating no saltwater intrusion issues, and no adverse impacts to water levels from this well or the resource. However, the pump tests only conducted up to 350 gpm at both step-draw down and constant rate tests. The tests did not meet the proposed pump capacity of 500 gpm rate as requested in application. Staff recommends to revise the maximum pump capacity at the test rate of 350 gpm.

II. Minimum of well casing variance

Background
On August 20, 2018, Staff sent an email (Exhibit 3) to Driller to confirm the number of connections identified in the well and pump application and asked the driller to confirm if this well will serve as a public water system. On the same day, Driller replied that "This is ag water. it's a big farm co-op. Not municipal water."

On August 28, 2018, the DOH SDWB, identified this well may qualify as a source that serves a regulated public water system. "Federal and state regulations define a public water system as a system that regularly serves an average of 25 or more individuals at least 60 days per year or

has at least 15 service connections providing water for human consumption. All public water system owners and operators are required to comply with Hawaii Administrative Rules (HAR), Title 11, Chapter 20, Rules Relating to Public Water Systems."

In the final well permit, Staff misinterpreted Driller's reply regarding "not municipal water" . "Municipal" is defined as a well runs by a municipality (county/city) for multiple uses. Although "big farm co-op" is not defined as municipal, and based on the number of domestic users, this well serves as a public water system rather than just agricultural use. In this case, this well should have been classified as a public water system as defined by DOH SDWB. Due to the misinterpretation, the well permit did not specifically include a special condition for well casing. Although technically, the driller must be in compliance with all 2004 HWCPIS regulations as stated in the permit whether the condition is identified or not. A copy of the DOH SDWB determination was also included as an attachment with the issuance of the well permit.

Standards for Well Casing

In accordance with 2004 HWCPIS, Section 2.4 Well Casing, (b) Wall Thickness of Casing, "…the wall thickness for steel casing in public water supply wells shall be as listed in Table 4 and "Water System Standards," State of Hawaii, 2002, p.306-3, as may be amended…." For a 20-inch nominal diameter well, the minimum wall thickness is specified as 0.375 inch. The as-built well section in the well completion report (exhibit 2) indicated a wall thickness as 5/16 inch (.3125).

But according to the driller's September 21, 2020 reply letter (exhibit 4), page 2, no. 3, 2nd bullet (in quote)

> *"Moloa'a Irrigation Cooperative (MIC) has communicated that they have been involved in a number of system improvements that have required review and approval by SDWB. This includes meter relocations and an on-going major tank repair. MIC has been told during the design phase for all of these projects that they are not required to meet the requirements of the Hawai'i County Water Standards."*

Staff verified with DOH SDWB (Exhibit 5) on September 29, 2020 if DOH SDWB has reviewed the design and approved the well casing. DOH clarified that they did not approve any well casing standards. Staff contacted both the driller and the well owner and requested for calculation and analysis that would address material strength. Staff also notified the driller and the well owner that DOH did not approve the well casing standards.

In November, driller provided engineering calculations and analysis done by Tom Nance Water Resources Engineering, Inc., and the manufacturer's data sheets provided by Roscoe Moss Company. This additional information addresses the material strength and potential deformation concerns. Staff recommends approval of the well casing variance from CWRM standards.

Please note that if the well owner is to turn over its water system to the Kauai Department of Water Supply, the well owner is responsible to meet the applicable county standards.

OTHER ISSUES:

I. Chapter 343 – Environmental Assessment (EA) Compliance

EA Triggers
In accordance with HRS § 343-5(a), the applicant's proposed action does not trigger the need for an EA, as none of the items below are a trigger for the variance request of this well.

Potential triggers: (1) use of state or county land or state or county funds; (2) use of conservation district lands; (3) use within a shoreline area as defined in HRS § 205A-41; (4) use within any historic site designated on the National or Hawai'i registers; (5) use within the Waikiki Special District; (6) amendment to county general plans which results in designations other than agriculture, conservation or preservation except as initiated by a county; (7) reclassification of land classified as conservation by the Land Use Commission; (8) construction/modification of helicopter facilities that may affect conservation district lands, a shoreline area, or a historic site designated on the National or Hawai'i Register; (9) construction of (a) wastewater treatment units (except an individual wastewater system or water treatment unit serving <50 SFR dwellings or the equivalent, (b) waste-to-energy facility (c) landfill, (d) oil refinery, or (e) power generating facility.

II. *Traditional and Customary Practices*

Ka Pa'akai Analysis
In *Ka Pa'akai O Ka'aina v. Land Use Commission*, the Hawai'i Supreme Court recognized that the State has an obligation to protect Hawaiian traditional and customary practices to the extent feasible, and that the proponent of an action must show sufficient evidence that these types of practices are protected, if they exist in the location in question. 94 Hawai'i 31, 7 P.3d 1068 (2000). The "Ka Pa'akai framework" was created by the Court "to help ensure the enforcement of traditional and customary native Hawaiian rights while reasonably accommodating competing private development interests." 94 Hawai'i at 35, 7 P.3d at 1072. The Commission is obligated to conduct a "Ka Pa'akai analysis" of a proposed action requiring CWRM approval independent of the entity proposing the action. This analysis should be used to inform any decision on the impact of the proposed action on traditional and customary practices.

The assessment set forth by the Court requires specific findings and conclusions regarding:

(1) the identity and scope of valued cultural, historical, or natural resources in the petition area, including the extent to which traditional and customary native Hawaiian rights are exercised in the petition area;
- The OHA Kipuka database shows no sites or crown lands involved.
- On April 30, 2019, SHPD responded that the well location is in an area that has been previously cleared and permitting process may continue.

(2) the extent to which those resources -- including traditional and customary native Hawaiian rights -- will be affected or impaired by the proposed action
- pending Aha Moku review.

The use of this well is to replace and lower demand from another existing well on state land, so in essence this action spreads pumpage out in accordance with the principles specified in the 2019

Water Resource Protection Plan (Sections F4.2.2 & G.2.2.4), and is good to reduce potential localized impacts. Protection of the resource in turn should also translate to protection of traditional and customary Hawaiian Rights or on fish and wildlife.

(3) the feasible action, if any, to be taken … to reasonably protect native Hawaiian rights if they are found to exist.
- pending Aha Moku review.

If reporting data show such impacts occurring, standard conditions of the permits (well construction condition 7, and pump installation condition 8, exhibit 6) issued as normal processing, notify and hold accountable the well and landowner that pumpage may need to be reduced in the future should any legal uses, such as traditional & customary practices, be impacted. These notices are provided throughout the routine well permitting process. Alternatively, designation as a ground water management area is another action that may occur should the resource or traditional and customary practices with respect to ground water use in the Anahola ASA become threatened.

III. *Consistency with Hawai'i Water Plan, 2019 Water Resource Protection Plan* (WRPP)

This new well is actually replacing demand serviced by pumpage from another existing well (Moloaa 1 2-1020-002) and is therefore spreading & optimizing pumpage consistent with Sections F.4.2.2

IV. *Agency Review*

Copies of the application were sent to the Department of Health's Safe Drinking Water and Wastewater Branches, DLNR Land Division and State Historic Preservation Division (SHPD). DOH Wastewater Branches and DLNR Land Division provided routine or standard comments, but no special concerns nor objections, or no response. As mentioned earlier, in April 2019, SHPD responded that the well location is in an area that has been previously cleared and permitting process may continue. DOH SDWB identified this well as a source for a public water system determination as described in the Analysis/Issues above.

RECOMMENDATION:

Staff recommends that the Commission:

I. Approves the following after-the-fact variances for the MIC 1 Well (Well No. 2-1019-012) from:

a. Section 2.2 of the 2004 Hawai'i Well Construction and Pump Installation Standards (HWCPIS)to drill beyond the ¼ but less than ½ of the theoretical aquifer thickness.

b. Section 2.4, Table 4, of the 2004 HWCPIS Table 4 for Public Water Supply Systems minimum thickness of 5/16".

II. Approves the revision to the MIC 1 (Well No. 2-1019-012), standard pump installation condition 4 (listed in Exhibit 6) , changing the pump capacity from 500 gpm to 350 gpm as follows:

   a. The pump installation permit shall be for installation of a 350 gpm rated capacity, or less, pump in the well. This permanent capacity may be reduced in the event that the pump test data does not support the capacity.

III. Approves the following special condition that the above joint and several Parties be responsible to conduct a water audit following the methodology in the American Water Works Association Manual of Water Supply Practices, M36, Water Audits and Loss Control Programs, to identify system efficiency.

Ola i ka wai,

M. KALEO MANUEL
Deputy Director

Exhibits:
1 (Location Map)
2 (WCR 1)
3 (PWS)
4 (Correspondences)
5 (DOH SDWB)
6 (WCP and PIP)

APPROVED FOR SUBMITTAL:

SUZANNE D. CASE
Chairperson

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

WELL COMPLETION REPORT - PART I
Well Construction

For Official Use Only:

Instructions: Please print in ink or type and send completed report (with attachments, if applicable) to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. The Commission may not accept incomplete reports. This form shall be submitted within 60 days of the completion of work. For assistance, please consult the Hawaii Well Construction and Pump Installation Standards or call the Regulation Branch at **587-0225**. For updates to this form or additional information, please visit our website at http://www.state.hi.us/dlnr/cwrm/

1. State Well No.: 2-1019-012 Well Name: MIC-1 Island: Kauai
2. Well Location Address: Moloa'a Tax Map Key: (4) 4-9-009: 012-022
3. Drilling Company: Oasis Water Systems, Inc.
4. Drilling method used during construction: ☒ Rotary ☐ Percussion ☐ Other (describe)
5. Date Well Construction (drilled,cased,grouted) completed: 12/18/2019 (month/day/year)
6. Was the subject well cored? ☐ Yes ☒ No
7. Step-Drawdown Test completed? ☐ No ☒ Yes **Attach Step-Drawdown Test form (*12/17/97 SDPTD Form*)**
8. Constant Rate Aquifer Test completed? ☐ No ☒ Yes **Attach Constant Rate Aquifer Test form (*12/17/97 CRPTD Form*)**

Water Level Data:	**Reference point elevation**	-	**Depth to water** (feet)	=	**Water Level** ft. above mean sea level (see note below)	**Date/time of measurement**
9. Initial encountered during drilling (this should also be filled in on the driller's log)	Ground = 173.81 ft. msl		96.20		76.91	8/20/19
10. Just prior to casing installation	Ground = 173.81 ft. msl		166.80		7.01	8/26/19
11. After casing installation (this information should be before any pump tests are performed with casing installed) Chloride: 36 mg/l ppm, Temperature: 72.86 °F	If this reference point is not the benchmark, the difference between the benchmark and this point is: 176.81 ft.		167.70		6.11	01/26/20

note: for all elevations referenced to mean sea level, take the ground elevation (surveyed or estimated if survey not required at this time) and subtract the depth to the water level.

12. **As-built section filled in completely (refer to attached sheet)** ☒
13. **Driller's Log filled in completely (refer to attached sheet)** ☒
14. **Well location info filled in completely (refer to attached sheet)** ☒
15. **Well elevation certification filled in completely (refer to attached sheet)** ☒
16. **Photograph of well and concrete pad showing benchmark on concrete pad attached** ☒
17. If a pump is not planned to be installed, please describe (below in the remarks section) how well is secured to prevent unauthorized access (example: lockable cover, threaded coupling, etc.)
18. Remarks: Welded cap

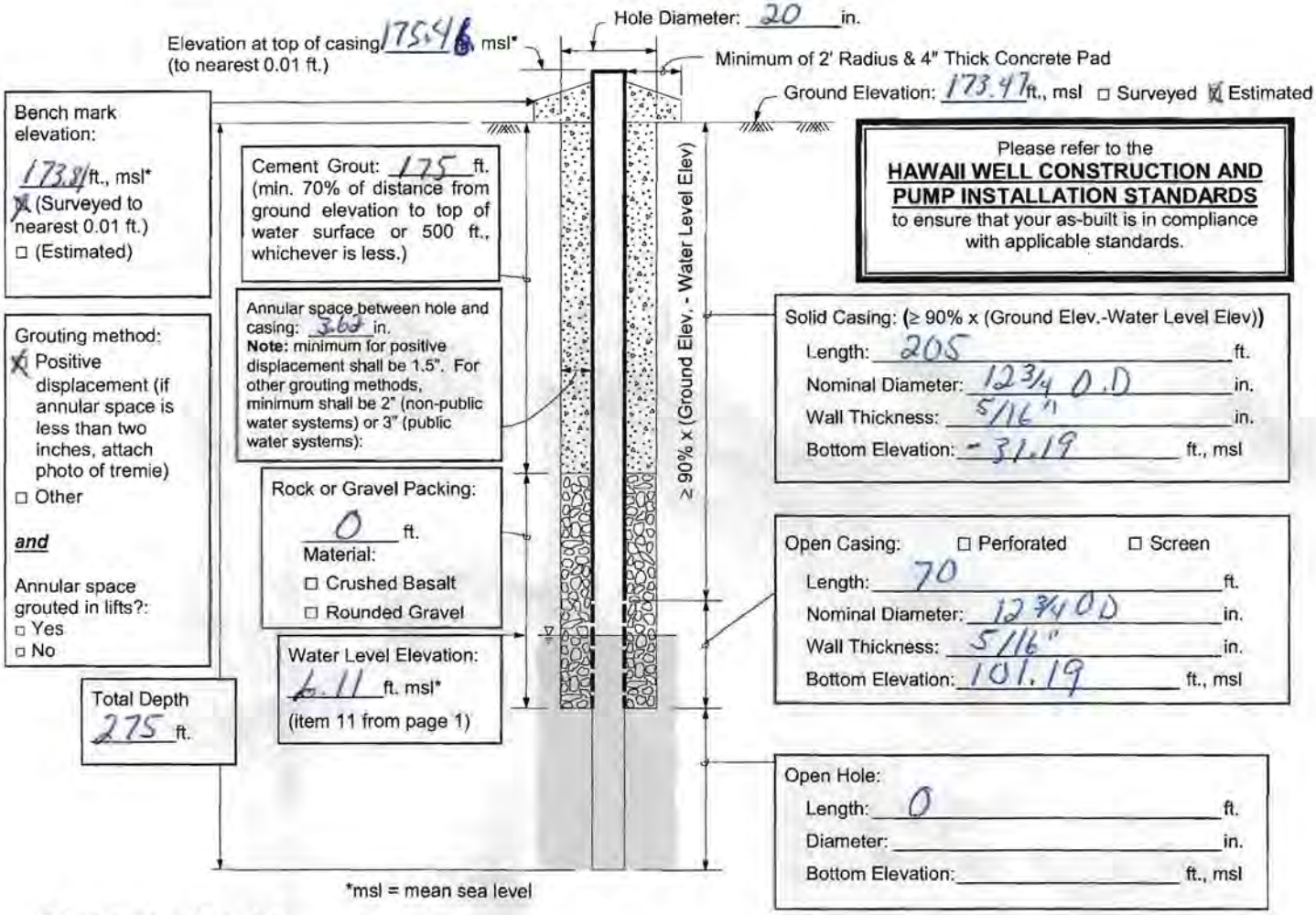
Licensed Driller (print) Barry Simmons C-57 Lic. No. C-21457

Signature Barry Simmons Date 05/04/2020

Exhibit 2 WCR 1

12. AS-BUILT WELL SECTION *(Please attach as-built if different from diagram provided below)*

STATE WELL NO. 2-1019-012



Solid Casing Material:

Carbon Steel: compliant with (*check one or more*): ☐ ANSI/AWWA C200 ☐ API Spec. 5L ☐ ASTM A53 ☐ ASTM A139
And compliant with (*check one or more*): ☒ ASTM A242 or A606 ☐ Type E ☐ Type S ☐ Grade B ☐ Other
Stainless Steel: (*check one*): ☐ ASTM A409 (production wells) ☐ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527: (*check one*) ☐ Schedule 40 ☐ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (*check one*): ☐ Schedule 40 ☐ Schedule 80 ☐ Schedule 120
Thermoset Plastic: (*check one*)
☐ Filament Wound Resin Pipe conforming to ASTM D2996
☐ Centrifugally Cast Resin Pipe conforming to ASTM D2997
☐ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
☐ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
☐ PTFE Fluorocarbon Tubing conforming to ASTM D3296
☐ FEP Fluorocarbon Tubing conforming to ASTM D3296

Open Casing Material:

Carbon Steel: compliant with (*check one or more*): ☐ ANSI/AWWA C200 ☐ API Spec. 5L ☐ ASTM A53 ☐ ASTM A139
And compliant with (*check one or more*): ☒ ASTM A242 or A606 ☐ Type E ☐ Type S ☐ Grade B ☐ Other
Stainless Steel: (*check one*): ☐ ASTM A409 (production wells) ☐ ASTM A312 (monitor wells)
ABS Plastic conforming to ASTM F480 and ASTM D1527: (*check one*) ☐ Schedule 40 ☐ Schedule 80
PVC Plastic conforming to ASTM F480 and (ASTM D1785 or ASTM D2241): (*check one*): ☐ Schedule 40 ☐ Schedule 80 ☐ Schedule 120
Thermoset Plastic: (*check one*)
☐ Filament Wound Resin Pipe conforming to ASTM D2996
☐ Centrifugally Cast Resin Pipe conforming to ASTM D2997
☐ Reinforced Plastic Mortar Pressure Pipe conforming to ASTM D3517
☐ Glass Fiber Reinforced Resin Pressure Pipe conforming to AWWA C950
☐ PTFE Fluorocarbon Tubing conforming to ASTM D3296
☐ FEP Fluorocarbon Tubing conforming to ASTM D3296

13. DRILLER'S LOG

STATE WELL NO. 2-1019-012

In addition to the driller's log, if a geologic log was prepared, please submit with this form

Depths (ft.)	Rock Description	Water Level (ft.)	Cl- (ppm)	Dates	Depths (ft.)	Rock Description	Water Level (ft.)	Cl- (ppm)	Dates
0 to 15	dirt/mud	N/A		8/14/19	to				
15 to 20	Weathered rock			8/14/19	to				
20 to 65	Weathered rock			8/15/19	to				
65 to 90	gray clay			8/15/19	to				
90 to 95	gray clay			8/19/19	to				
95 to 100	red dirt			8/19/19	to				
100 to 115	Weathered rock			8/19/19	to				
115 to 120	Weathered rock			8/19/19	to				
120 to 125	Mud			8/19/19	to				
125 to 155	mud/rock	96.2'		8/19/19	to				
155 to 170	Weathered rock			8/20/19	to				
170 to 190	Weathered rock/dirt			8/20/19	to				
190 to 210	Weathered rock/dirt			8/20/19	to				
210 to 220	Firm rock	96.2'		8/20/19	to				
220 to 270	Weathered rock	120.6		8/21,22/19	to				
270 to 275	rock/water			8/22/19	to				
275 to	Water	166.8		8/26/19	to				
to					to				

Remarks:

Exhibit 2 WCR 1

14. WELL LOCATION AND CURRENT OWNERSHIP INFORMATION

STATE WELL NO. 2-1019-012

Well coordinates (decimal degrees to at least 5 decimal places, example Latitude 21.334303, Longitude -157.962447)

Latitude 22.102690 N Longitude 159.192312 W

Was a GPS used? ☐ yes ☒ no (if no, specify how you got these coordinates: Google Earth)

Current well owner ☒ same as application or ☐ new (fill in below)

Company Name **Moloa'a Irrigation Cooperative** Contact **Paul Huber**

Address **P.O. Box 506**

City **Anahola** State **HI** Zip **967013**

Business Phone **808-828-0095** Residential Phone **808-639-2768** Fax

E-mail Address **moloaairrigationcoop@gmail.com** Company Website **www.moloaairrigationcoop.org**

Current land owner ☒ same as application or ☐ new (fill in below)

Company Name Contact **Rudy Bosma**

Address **3094 Aukele St.**

City **Lihue** State **HI** Zip **96766**

Business Phone Residential Phone **808-652-6555** Fax

E-mail Address **twofrogshugging@gmail.com** Company Website

Sketch of well location (Referenced to permanent landmark, i.e. building, road, fence, etc.)

See attached

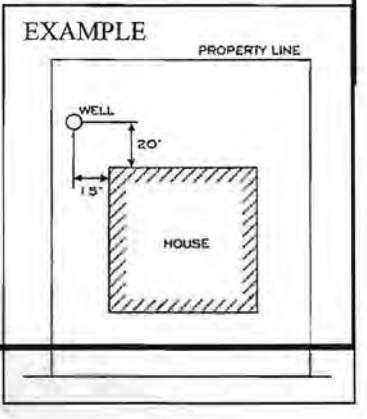


Exhibit 2 WCR 1

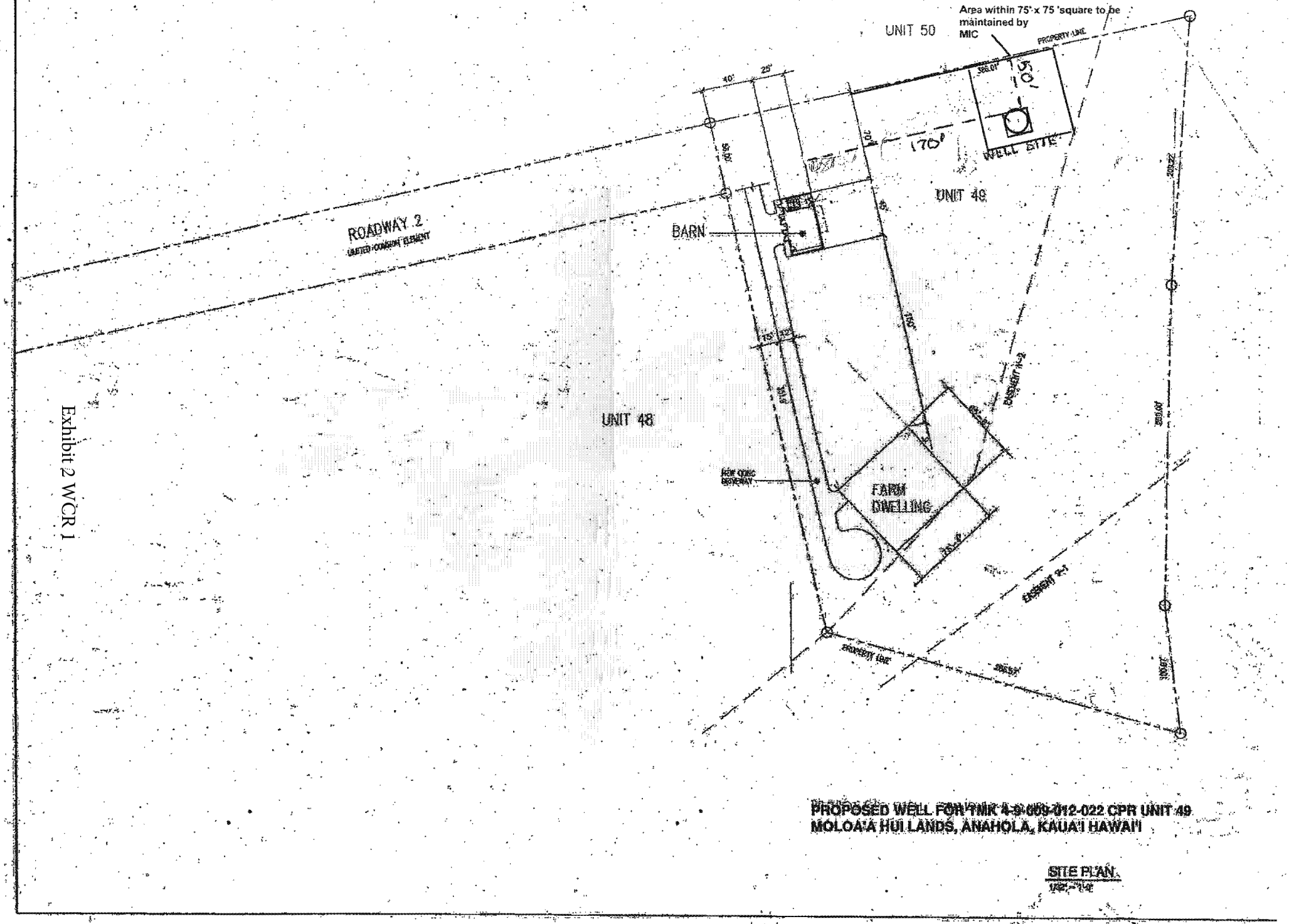
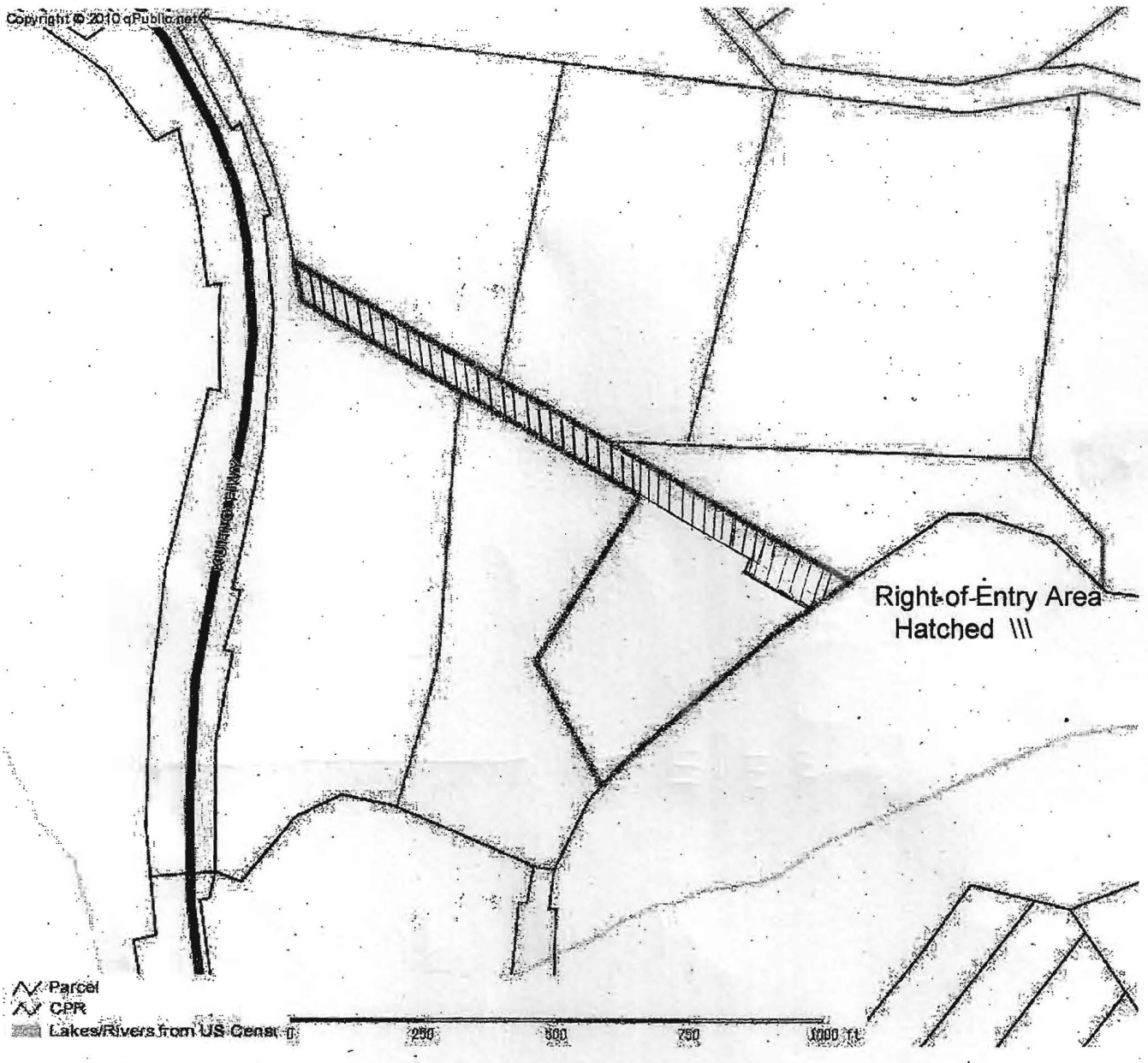


Exhibit 2 WCR 1

EXHIBIT "A"

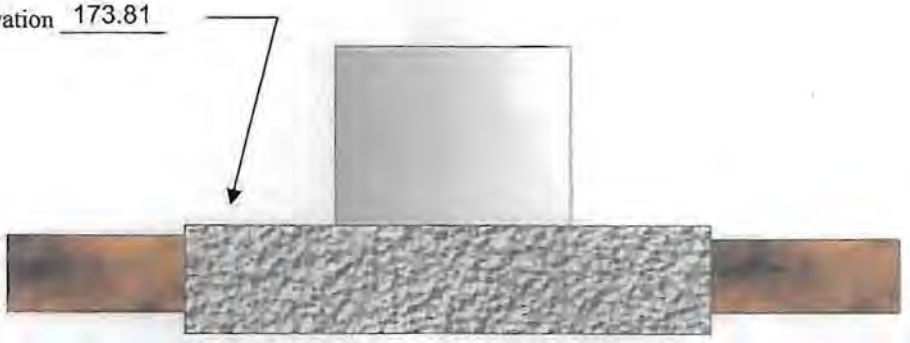


Unit 49			
Parcel: 490090120022 Acres: 3.19			
Name:	BOSMA,GERARD R	Land Value	
Site:	6020 KOOLAU RD	Building Value	
Sale:	$285,000 on 2001-07-30 Reason= Qual=	Misc Value	
Mail:	3094 AUKELE ST LIHUE, HI 96766	Just Value	
		Assessed Value	0
		Exempt Value	0
		Taxable Value	0

15. WELL ELEVATION

STATE WELL NO. 2-1019-012

Benchmark Elevation 173.81



I certify that the elevation shown above:

1) Was done in accordance with acceptable surveying practices
2) Is accurate to the nearest 0.01 ft.
3) Is referenced to mean sea level

BRIAN M. HENNESSY
LICENSED PROFESSIONAL LAND SURVEYOR
No. 14,484
HAWAII, U.S.A.

Brian M. Hennessy, PLS	14,484	April 24, 2020
Surveyor	License No.	Date

Exhibit 2 WCR 1

STEP-DRAWDOWN PUMP TEST DATA

(not required for wells producing < 100,000 gpd or 70 gpm)

Pumped Well No. 2-1019-012 | Observation Well No. N/A

Pumped Well Name MIC 1 | Distance between Obs. & Pumped Well N/A ft.

Target Q 157, 255, 360 gpm | Reference pt. for depth to water 174.08 ft. msl

Static Water Level @ start of test 6.33 ft. msl

Water level measurements by: ☒ electrical sounder ☐ pressure transducer ☐ airline

START TEST Date: 01/27/2020 Time of day: 855 am

Flow Meter Reading Start: 17244520 gallons

Suggested Elapsed time t (min)	Actual Elapsed Time t (min)	Depth to water (nearest 0.1 ft)	Drawdown S (unadjusted to nearest 0.1 ft)	Pumping rate Q (at least 3 steps) (gpm)	EC (µS/cm)	Cl⁻ (mg/l)	Temp. ___°F or X °C	Data in this table is for: ☒ Pumped Well ☐ Observation Well — Remarks
-45	855	167.75		0			.	**Start test/ Step 1**
-30	910	167.74		0			.	
-15	925	167.73		0			.	
0	940	167.73		[1]			.	**Start pump**
1	941	173.5	5.77	250			.	
1.5	942	173.8	6.07	184			.	
2	943	171.45	3.72	141			.	
2.5	944	171.4	3.67				.	
3	945	171.4	3.67		934	169	23.3.	
4	946	171.4	3.67	159			.	
5	947	171.37	3.64				.	
6	948	171.37	3.64				.	
7	949	171.38	3.65	157			.	
8	950	171.38	3.65				.	
10	952	171.4	3.67				.	
15	954	171.39	3.66	157			.	
20	956	171.39	3.66				.	
25	958	171.39	3.66				.	
30[2]	1000	171.4	3.67			[3]	.	**Conductivity reading Chloride sample taken**
	1005	171.4	3.67	156			.	**Step 2 next page**
	1010	171.4	3.67		924	167	23.2	

SDPTD Form 3/24/2015

Suggested Elapsed time **t** (min)	Actual Elapsed Time **t** (min)	Depth to water (nearest 0.1 ft)	Drawdown **S** (unadjusted to nearest 0.1 ft)	Pumping rate **Q** (at least 3 steps) (gpm)	**EC** (µS/cm)	**Cl⁻** (mg/l)	Temp. ___° F or X° C	Data in this table is for: ☒ Pumped Well ☐ Observation Well Remarks
0	1010	171.4	3.67		924	167	23.2	**Start Step 2**
1	1011	172.8	5.07				.	
1.5	1012	174.35	6.62	243			.	
2	1013	174.65	6.92	253			.	
2.5	1014	174.7	6.97				.	
3	1015	174.7	6.97				.	
4	1016	174.7	6.97				.	
5	1017	174.7	6.97	254			.	
6	1018	174.7	6.97				.	
7	1019	174.7	6.97				.	
8	1020	174.7	6.97				.	
10	1022	174.7	6.97				.	
15	1024	174.73	7.0	255			.	
20	1026	174.7	6.97				.	
25	1028	174.7	6.97				.	
30[2]	1030	174.8	7.07			[3]	.	**Conductivity reading Chloride sample taken**
	1035	174.85	7.12	255				
	1040	174.9	7.17		848	153	23.3	

SDPTD Form 3/24/2015

Suggested Elapsed time **t** (min)	Actual Elapsed Time **t** (min)	Depth to water (nearest 0.1 ft)	Drawdown **S** (unadjusted to nearest 0.1 ft)	Pumping rate **Q** (at least 3 steps) (gpm)	EC (µS/cm)	Cl^- (mg/l)	Temp. °F or °C	Data in this table is for: ☒ Pumped Well ☐ Observation Well Remarks
0	1040	174.9	7.17	[1]	848	153	23.3.	**Start Step 3**
1	1041	177.4	9.67				.	
1.5	1042	178.52	10.79	370			.	
2	1043	178.6	10.87				.	
2.5	1044	178.63	10.9				.	
3	1045	178.8	11.07	344			.	
4	1046	178.85	11.12				.	
5	1047	178.87	11.14				.	
6	1048	178.89	11.16	355			.	
7	1049	178.9	11.17				.	
8	1050	178.91	11.18	360			.	
10	1052	178.95	11.23				.	
15	1054	178.98	11.26	361			.	
20	1056	178.95	11.23				.	
25	1058	178.95	11.23				.	
30[2]	1100	178.93	11.2	360		[3]	.	**Conductivity reading Chloride sample taken**
	1105	178.9	11.17					
	1110	178.9	11.17	360	782	139	23.3	
								Max possible duration, water level or quality did not stabilize for any 24 period
			[4]	0				**Begin recovery data next page** Flow meter reading at end of pumped period: 1524360 gals

[1] starting pumping rate Q
[2] minimum length of step period of constant pumping rate
[3] minimum mandatory Chloride (Cl^-) measurement/sampling at end of every step
[4] Use same ending drawdown figure as start for recovery

SDPTD Form 3/24/2015

Suggested elapsed time **t** (min)	Actual elapsed time **t** (min)	Depth To Water (nearest 0.1 ft)	Recovery Drawdown **S** (unadjusted to nearest 0.1 ft)	Pumping rate **Q** (gpm)	**EC** (µS/cm)	**Cl⁻** mg/l)	Temp. °F or °C	Data in this table is for: ☒ Pumped Well ☐ Observation Well Remarks
0	11:10 0	178.9	11.17	0	782	179	23.3	**Pump off, start recovery**
1	11:11	168.1	0.37	0			.	
1.5	1112	168.12	0.39	0			.	
2	1113	168.1	0.37	0			.	
2.5	1114	168.1	0.37	0			.	
3	1115	168.1	0.37	0			.	
4	1116	168.05	0.32	0			.	
5	1117	168.05	0.32	0			.	
6	1118	168.05	0.32	0			.	
7	1119	168.03	0.3	0			.	
8	1120	168.02	0.29	0			.	
10	1122	168.02	0.29	0			.	
15	1124	168.03	0.3	0			.	
20	1126	168.02	0.29	0			.	
25	1128	168.02	0.29	0			.	
30	1130	168.03	0.3	0			.	
40				0			.	
50				0			.	
60				0			.	
70				0			.	
80				0			.	
90				0			.	
100				0			.	
150				0			.	
200				0			.	
250				0			.	☒ 80% recovery achieved ☐ 80% recovery not achieved

END TEST Date: 01/27/2020 Time of day: 1130 am

ADDITIONAL REMARKS: _____

Person in charge of pump test (print): Barry Simmons

Signature: _____

The signature above indicates that the data reported on this form is accurate and true to the best of the person's knowledge who operated this pump test.

Exhibit 2 WCR 1

CONSTANT-RATE PUMP TEST DATA

(not required for wells producing < 50 gpm)

Pumped Well No. 2-1019-012 Observation Well No. N/A

Pumped Well Name MIC1 Distance between Obs. & Pumped Well N/A ft.

Target Q 360 gpm Reference pt. for depth to water 174.08 ft. msl

Static Water Level @ start of test 6.05 ft. msl

Water level measurements by: ☒ electrical sounder ☐ pressure transducer ☐ airline

START TEST Date: 01/27/2020 Time of day: 1130 am

Flow Meter Reading Start: 013267355 gallons

Suggested elapsed time t (min)	Actual elapsed time t (min)	Depth to water (nearest 0.1 ft)	Drawdown S (unadjusted to nearest 0.1 ft)	Pumping rate Q (gpm)	EC (µS/cm)	Cl⁻ (mg/l)	Temp. ___° F or X° C	Data in this table is for: ☒ Pumped Well ☐ Observation Well Remarks
-45								**Start test**
-30								
-15	1115	168.1						
0	1130 0	168.03	0.00			1	.	**Start pump/Cl⁻ taken***
1	1131	178.94	10.91				.	
1.5	1132	179.0	10.97		800		.	
2	1133	179.05	11.02	361			.	
2.5	1134	179.06	11.03				.	
3	1135	179.06	11.03		788	140	.	
4	1136	179.07	11.04				.	
5	1137	179.1	11.07				.	
6	1138	179.12	11.09				23.3.	
7	1139	179.12	11.09				.	
8	1140	179.12	11.09				.	
10	1142	179.12	11.09				.	
15	1144	179.12	11.09				.	
20	1146	179.13	11.10				.	
25	1148	179.13	11.10	359			.	
30	1150	179.15	11.12		746		.	
40	1155	179.15	11.12				.	
50	1200	179.16	11.13		733.7		23.2.	
60	1230	179.16	11.13				.	

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Suggested elapsed time **t** (min)	Actual elapsed time **t** (min)	Depth to water (nearest 0.1 ft)	Drawdown **s** (unadjusted to nearest 0.1 ft)	Pumping rate **Q** (gpm)	EC (µS/cm)	Cl^- (mg/l)	Temp. ___ °F or X °C	Data in this table is for: ☒ Pumped Well ☐ Observation Well — Remarks
70	1300	179.16	11.13				23.3.	
80	1330	179.16	11.13	361			.	
90	1400	179.16	11.13		628.4		.	
100	1430	179.15	11.12				.	
150	1500	179.15	11.12	357			.	
200	1530	179.13	11.10				.	
250	1600	179.15	11.12	358	577.6		23.8.	
300	1630	179.1	11.07		568.0	88	.	
400	1700	179.1	11.07			[1]	23.3.	**Conductivity reading**
500	1730	179.1	11.07				.	
600	1800	179.1	11.07	356			.	
700	1830	179.12	11.09				.	
800	1900	179.3	11.27		578.8	[1]	22.8.	**Conductivity reading**
900	1930	179.25	11.22				.	
1000	2000	179.32	11.29	359		[1]	.	**Conductivity reading**
1500	2030	179.3	11.27	362		[1]	.	**Conductivity reading**
2000	2100	179.4	11.37		505.8	[1]	.	**Conductivity reading**
2500	2130	179.4	11.37			75 [1]	.	**Conductivity reading**
3000	2200	179.35	11.32	355		[1]	22.6.	**Conductivity reading**
4000	2230	179.35	11.32			[1]	.	**Conductivity reading**
5000	2300	179.35	11.32			[1]	.	**Conductivity reading**
6000	2330	179.35	11.32	362		[1]	.	**Conductivity reading**
7000 (01/28)	0:00	179.35	11.32			[1]	22.9.	**Conductivity reading**
8000	0:30	179.52	11.49		479.0	[1]	.	**Conductivity reading**
9000	100	179.4	11.37			[1]	.	**Cl^- sample taken***
10000	130	179.35	11.32					**Max possible duration,** water level or quality did not stabilize for any 24 period
			[2]	0				**Begin recovery data next page** Flow meter reading at end of pumped period: N/A gals

[1] Conductivity reading (*Chloride sampling required at the beginning and end of test)

[2] Use same ending drawdown figure as start for recovery

CRPTD Form 3/24/2015

Suggested elapsed time **t** (min)	Actual elapsed time **t** (min)	Depth to water (nearest 0.1 ft)	Drawdown **S** (unadjusted to nearest 0.1 ft)	Pumping rate **Q** (gpm)	**EC** (µS/cm)	**Cl⁻** (mg/l)	Temp. ___ °F or X °C	Data in this table is for: ☒ Pumped Well ☐ Observation Well Remarks
70	200	179.35	11.32		466.6		.	
80	230	179.42	11.39			61	.	
90	300	179.34	11.31				22.3.	
100	330	179.28	11.25				.	
150	400	179.23	11.20	359	455.1		.	
200	430	179.15	11.12				.	
250	500	179.25	11.22				.	
300	530	179.23	11.20				.	
400	600	179.15	11.12			[1]	.	**Conductivity reading**
500	630	179.1	11.07				22.1.	
600	700	179.23	11.20	357	429.2		.	
700	730	179.22	11.19				.	
800	800	179.16	11.13			58[1]	.	**Conductivity reading**
900	830	179.16	11.13				.	
1000	900	179.21	11.18	360		[1]	.	**Conductivity reading**
1500	930	179.27	11.27			[1]	23.4.	**Conductivity reading**
2000	1000	179.25	11.22		412.0	[1]	.	**Conductivity reading**
2500	1030	179.2	11.17			[1]	.	**Conductivity reading**
3000	1100	179.2	11.17	360		[1]	.	**Conductivity reading**
4000	1130	179.42	11.39			[1]	.	**Conductivity reading**
5000	1200	179.27	11.24			[1]	22.9.	**Conductivity reading**
6000	1230	179.25	11.22			[1]	.	**Conductivity reading**
7000	1300	179.25	11.22	356		[1]	.	**Conductivity reading**
8000	1330	179.25	11.22			50[1]	.	**Conductivity reading**
9000	1400	179.35	11.22		398.6	[1]	23.4.	**Cl⁻ sample taken***
10000	1430	179.35	11.32					**Max possible duration,** water level or quality did not stabilize for any 24 period
			[2]	0				**Begin recovery data next page** Flow meter reading at end of pumped period: N/A gals

[1] Conductivity reading (*Chloride sampling required at the beginning and end of test)

[2] Use same ending drawdown figure as start for recovery

CRPTD Form 3/24/2015

Suggested elapsed time t (min)	Actual elapsed time t (min)	Depth to water (nearest 0.1 ft)	Drawdown S (unadjusted to nearest 0.1 ft)	Pumping rate Q (gpm)	EC (µS/cm)	Cl⁻ (mg/l)	Temp. ___°F or X°C	Data in this table is for: ☒ Pumped Well ☐ Observation Well — Remarks
70	1500	179.25	11.32	356			.	
80	1530	179.25	11.22				.	
90	1600	179.25	11.22				.	
100	1630	179.31	11.28				22.9.	
150	1700	179.25	11.22	357	318.4		.	
200	1730	179.25	11.22				.	
250	1800	179.25	11.22				.	
300	1830	179.3	11.27				.	
400	1900	179.43	11.40	359		[1]	22.7.	**Conductivity reading**
500	1930	179.43	11.40			47	.	
600	2000	179.4	11.37				.	
700	2030	179.38	11.35				.	
800	2100	179.4	11.37		366.0	[1]	.	**Conductivity reading**
900	2130	179.42	11.39				22.6.	
1000	2200	179.4	11.37	357		[1]	.	**Conductivity reading**
1500	2230	179.42	11.39			[1]	.	**Conductivity reading**
2000	2300	179.6	11.57	360		[1]	.	**Conductivity reading**
2500	2330	179.47	11.44			[1]	.	**Conductivity reading**
01/29 3000	0:00	179.43	11.40		357.4	[1]	22.5.	**Conductivity reading**
4000	0:30	179.44	11.41			[1]	.	**Conductivity reading**
5000	1:00	179.42	11.39	359		[1]	.	**Conductivity reading**
6000	1:30	179.55	11.52			40 [1]	.	**Conductivity reading**
7000	2:00	179.43	11.40			[1]	.	**Conductivity reading**
8000	2:30	179.36	11.33			[1]	22.2.	**Conductivity reading**
9000	3:00	179.32	11.29		347.8	[1]	.	**Cl⁻ sample taken***
10000	3:30	179.28	11.25					**Max possible duration,** water level or quality did not stabilize for any 24 period
			[2]	0				**Begin recovery data next page** Flow meter reading at end of pumped period: N/A gals

[1] Conductivity reading (*Chloride sampling required at the beginning and end of test)

[2] Use same ending drawdown figure as start for recovery

CRPTD Form 3/24/2015

Suggested elapsed time **t** (min)	Actual elapsed time **t** (min)	Depth to water (nearest 0.1 ft)	Drawdown **s** (unadjusted to nearest 0.1 ft)	Pumping rate **Q** (gpm)	**EC** (µS/cm)	**Cl⁻** (mg/l)	Temp. ~~°F~~ / or ~~°C~~	Data in this table is for: ☒ Pumped Well ☐ Observation Well — Remarks
70	400	179.4	11.37	362			.	
80	430	179.25	11.22				22.6.	
90	500	179.17	11.14				.	
100	530	179.16	11.13		343.0		.	
150	600	179.3	11.27				.	
200	630	179.15	11.12				.	
250	700	179.15	11.12	359	339.2		.	
300	730	179.26	11.23				.	
400	800	179.17	11.14			[1]	22.5.	**Conductivity reading**
500	830	179.15	11.12				.	
600	900	179.15	11.12	360	336.3		.	
700	930	179.15	11.12				.	
800	1000	179.15	11.12			[1]	22.6.	**Conductivity reading**
900	1030	179.34	11.31		330.6		.	
1000	1100	179.25	11.22			[1]	.	**Conductivity reading**
1500	1130	179.25	11.22	358	331.5	36 [1]	23.2.	**Conductivity reading**
2000						[1]	.	**Conductivity reading**
2500						[1]	.	**Conductivity reading**
3000						[1]	.	**Conductivity reading**
4000						[1]	.	**Conductivity reading**
5000						[1]	.	**Conductivity reading**
6000						[1]	.	**Conductivity reading**
7000						[1]	.	**Conductivity reading**
8000						[1]	.	**Conductivity reading**
9000						[1]	.	**Cl⁻ sample taken***
10000								**Max possible duration,** water level or quality did not stabilize for any 24 period
			[2]	0				**Begin recovery data next page** Flow meter reading at end of pumped period: 014300530 gals

[1] Conductivity reading (*Chloride sampling required at the beginning and end of test)
[2] Use same ending drawdown figure as start for recovery

Suggested elapsed time **t** (min)	Actual elapsed time **t** (min)	Depth to water (nearest 0.1 ft)	Recovery Drawdown **S** (unadjusted to nearest 0.1 ft)	Pumping rate **Q** (gpm)	EC (µS/cm)	Cl⁻ (mg/l)	Temp. ___° F or X° C	Data in this table is for: ☒ Pumped Well ☐ Observation Well Remarks
0	0	179.75	11.22	0	331.5	36	23.2	**Start recovery**
1	11:31	168	-0.03	0			.	
1.5	11:32	168	-0.03	0			.	
2	11:33	168.2	0.17	0			.	
2.5	11:34	168.2	0.17	0			.	
3	11:35	168.2	0.17	0			.	
4	11:36	168.2	0.17	0			.	
5	11:37	168.2	0.17	0			.	
6	11:38	168.2	0.17	0			.	
7	11:39	168.2	0.17	0			.	
8	11:40	168.2	0.17	0			.	
10	11:42	168.2	0.17	0			.	
15	11:44	168.2	0.17	0			.	
20	11:46	168.2	0.17	0			.	
25	11:48	168.1	0.07	0			.	
30	11:50	168.1	0.07	0			.	
40	11:55	168.1	0.07	0			.	
50	12:00	168.1	0.07	0			.	
60				0			.	
70				0			.	
80				0			.	
90				0			.	
100				0			.	
150				0			.	
200				0			.	
250				0			.	☒ 80% recovery achieved ☐ 80% recovery not achieved

END TEST Date: 01/29/2020 Time of day: 12:00 pm

ADDITIONAL REMARKS: _____

Person in charge of pump test (print): Barry Simmons

Signature: _____

The signature above indicates that the data reported on this form is accurate and true to the best of the person's knowledge who operated this pump test.

Komori, Queenie K

From: Oasis Water Systems <oasiskauai@yahoo.com>
Sent: Monday, August 20, 2018 9:41 AM
To: Komori, Queenie K
Subject: Re: question on unit served RE: Mic 1 & 2 well application

Hi Queenie -
This is ag water - it's a big farm co-op.
Not municipal water.
Aloha,
Betsy

Oasis Water Systems, Inc
P.O. Box 507
Hanalei, HI 96714
(808) 826-1854 office
(808) 826-6530 fax
Far Superior Products

From: "Komori, Queenie K" <queenie.k.komori@hawaii.gov>
To: Oasis Water Systems <oasiskauai@yahoo.com>
Sent: Monday, August 20, 2018 8:55 AM
Subject: question on unit served RE: Mic 1 & 2 well application

Aloha Betsy,

The Mic1&2 application identified the number of units served as 65.
Will this be a public water system?
Public water system is defined as more than 25 people served or more than 15 service connections.
Please confirm.

Queenie Komori, P.E.
Dept. of Land & Natural Resources
Commission on Water Resource Management
1151 Punchbowl Street, Room 227
Honolulu, HI 96813

Ph. (808) 587-0251

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

August 28, 2018

TO: Mr. Bruce S. Anderson, Ph.D., Director
Department of Health
Attention: Sina Pruder, Chief, Wastewater Branch
Joanna L. Seto, Chief, Safe Drinking Water Branch

FROM: Jeffrey T. Pearson, P.E., Deputy Director for
Suzanne D. Case, Chairperson
Commission on Water Resource Management

SUBJECT: Well Construction/Pump Installation Permit Application
Mic 1 and Mic 2 Wells (Well Nos. 2-1019-012 & 2-1019-013)
TMK: (4) 4-9-009:012:022
Well address: 6020 Koolau Road, Apt 49

Transmitted for your review and comment is a copy of the captioned Well Construction/Pump Installation permit application.

We would appreciate your comments on the captioned application for any conflicts or inconsistencies with the programs, plans, and objectives specific to your department. **Please respond by returning this cover memo form by September 28, 2018**. If we do not receive comments or a request for additional review time by this date, we will assume that you have no comments.

Please find the attached maps to locate the proposed well. If you have any questions about this permit application, request additional information, or request additional review time, please contact Queenie Komori of the Commission staff at 587-0251.

QK:ss
Attachment(s)

RESPONSE:

[X] This well qualifies as a source which will serve as a source of potable water to a public water system (defined as serving 25 or more people at least 60 days per year or has 15 or more service connections) and must receive Director of Health approval **prior** to its use to comply with Hawaii Administrative Rules (HAR), Title 11, Chapter 20, Rules Relating to Potable Water Systems, §11-20-29.

[ ] This well does not qualify as a source serving a public water system (serves less than 25 people or more people at least 60 days per year or 15 service connections) and if the well water is used for drinking, the private owner **should** test for bacteriological and chemical presence before initiating such use and routinely monitor the water quality thereafter. However, if future planned use from this source increases to meet the public water system definition then Director of Health approval is required **prior** to implementation.

[X] If the well is used to supply both potable and non-potable purposes in a single system, the user shall eliminate cross-connections and backflow connections by physically separating potable and non-potable systems by an air gap or an approved backflow preventer, and by clearly labeling all non-potable spigots with warning signs to prevent inadvertent consumption of non-potable water. Backflow prevention devices should be routinely inspected and tested.

[ ] It does not appear that this well will be used for consumptive purposes and is not subject to Safe Drinking Water Regulations.

[ ] For the applicant's information, a source of possible wastewater contamination **[ ]is [ ] is not** located near the proposed well site (information attached).

[ ] An NPDES permit is required.

[ ] Other relevant DOH rules/regulations, information, or recommendations are attached.

[ ] In the event that the location of the well changes but is still within the parcel described on this application, our division considers the comments to still be applicable, and we do not need to review the new location.

[ ] An injection well permit is required for the disposal of the effluent from this well.

[ ] No comments/objections

Contact Person: MICHAEL MIYAHIRA Phone: 586-4258

Signed: _____ Date: 8/28/18

CWRM Application Source: MIC 1 & MIC 2 wells

State Well No. 2-1019-012 and 2-1019-013

Safe Drinking Water Branch Engineering Section

☐ 1. See attached private water wells information sheet.

■ 2. This well **may** qualify as a source that serves a regulated public water system. Federal and state regulations define a public water system as a system that regularly serves an average of 25 or more individuals at least 60 days per year or has at least 15 service connections providing water for human consumption. All public water system owners and operators are required to comply with Hawaii Administrative Rules (HAR), Title 11, Chapter 20, "Rules Relating to Public Water Systems."

☐ 3. All new public water systems are required to demonstrate and meet minimum capacity requirements prior to their establishment. This requirement involves demonstration that the system will have satisfactory technical, managerial and financial capacity to enable the system to comply with safe drinking water standards and requirements.

■ 4. Projects that propose development of new sources of drinking water serving or proposed to serve a public water system must comply with the terms of HAR 11-20-29, entitled "Use of new sources of raw water for public water systems." This section requires that all new public water system sources be approved by the Director of Health prior to its use. Such approval is based primarily upon the submission of a satisfactory engineering report, which addresses the requirements set in HAR Section 11-20-29.

■ 5. The engineering report must identify all potential sources of contamination and evaluate alternative control measures, which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses for all regulated contaminants, performed by a laboratory certified by the State Laboratories Division of the state of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional parameters may be required by the Director for this submittal or additional tests required upon his or her review of the information submitted.

■ 6. All public water system sources must undergo a source water assessment, which will delineate a source water protection area. This process is preliminary to the creation of a source water protection plan for that source and activities which will take place to protect the drinking water source.

■ 7. Projects proposing to develop new public water systems or proposing substantial modifications to existing public water systems must receive approval by the Director of Health prior to construction of the proposed system or modification. These projects include treatment, storage and distribution systems of public water systems. The approval authority for projects owned and operated by a County Board or Department of Water or Water Supply has been delegated to them.

■ 8. All public water systems must be operated by certified distribution system and water treatment plant operators as defined by HAR Chapter 11-25, entitled "Rules Pertaining to Certification of Public Water System Operators."

■ 9. All projects which propose the use of dual water systems or the use of a non-potable water system in proximity to an existing drinking water system to meet irrigation or other needs must be carefully designed and operated these systems to prevent the cross-connection of these systems and prevent the possibility of backflow of water from the non-potable system to the drinking water system. The two systems must be clearly labeled and physically separated by air gaps or reduced pressure principle backflow prevention devices to avoid contaminating the drinking water supply. In addition backflow devices must be tested periodically to assure their proper operation. Further, all non-potable spigots and irrigated areas should be clearly labeled with warning signs to prevent the inadvertent consumption on non-potable water. Compliance with HAR Chapter 11-21, entitled "Cross-Connection and Backflow Control" is also required.

■ 10. All projects which propose the establishment of a potentially contaminating activity (as identified in the Hawai`i Source Water Assessment Plan) within the source water protection area of an existing source of water for a public water supply should address this potential and activities that will be implemented to prevent or reduce the potential for contamination of the drinking water source.

For further information concerning the application of capacity, new source approval, operator certification, source water assessment, backflow/cross-connection prevention or other regulated public water system programs, please contact the Safe Drinking Water Branch Engineering Section at (808) 586-4258.

<u>Underground Injection Control (UIC)</u>

☐ 1. The application's information is not fully complete.
☐ However, based on the information provided, we offer the following comments.
☐ Comments would not be appropriate at this time.
☐ We recommend that a satisfactorily complete application be first obtained.

☐ 2. In general, a shallow well, or a well that recharges quickly from local rainfall, should not be used as a drinking water source because such a well increases the risk of having unsatisfactory groundwater quality that when consumed may compromise health. Factors that directly influence a well's groundwater quality include wastewater disposal systems (cesspools, septic systems, drainage wells), lawn/garden/crop-growing activities, and even the proximity to the ocean where salt water intrusion may occur.

■ 3. The siting of a drinking water source below the UIC line affects the allowed potential for new injection well construction. New injection wells will then be prohibited within setback areas defined in Chapter 11-23. We suggest that surrounding landowners be informed of this proposed action because it may affect the development potential of the properties within the setback area.

☐ 4. Well water quality should be initially and periodically tested for its acceptable and intended use, especially if for human consumption. Water quality should not be presumed acceptable and unchanging. Land-based activities around the well and within the well's recharge area may, over time, have an unacceptable effect on the well's water quality. Well construction materials and related equipment could also affect water quality.

☐ 5. The proposed well section details
- ☐ are inconsistent and should be corrected.
- ☐ appear to be in error and should be corrected.

☐ 6. New rainfall-runoff drainage injection wells are construction prohibited within one-quarter mile of any private or municipal drinking water well. Eliminate all plans to construct a drainage injection well within one-quarter mile of the proposed water well.

☐ 7. The well's bottom elevation
- ☐ appears incorrect.
- ☐ is inconsistent with other application data.
- ☐ is missing.

Questions about UIC may be directed to Mr. Norris Uehara at (808) 586-4258.

Additional Comments:

Well is below the UIC line. May require notification of existing, affected UIC permittees.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

August 27, 2020

2-1019-012.wcr1issues&pipexten.docx

Mr. Barry Simmons
Oasis Water Systems, Inc.
P.O. Box 507
Hanalei, HI 96714

Aloha Mr. Simmons:

Well Completion Report Part I for Well No. 2-1019-012 Issues and
Extension of Pump Installation Permit for Well No. 2-1019-012
Anahola, Island of Kauai

Well Completion Report Part I:

We have received your Well Completion Report Part I for the Mic 1 (Well No. 2-1019-012) dated May 4, 2020. Based on the data submitted in the WCR- Part 1, three significant issues must be addressed before we can accept your report as complete.

1. Cross-connection: From the driller's log, it seems very clear that there is a significant cross- connection between the upper and lower artesian aquifers.

   - On August 19, 2019, you encountered an artesian aquifer when the bit was at 125' below grade (mud/rock) when the depth to water level came up to 96.2' below grade.

   - On August 20, 2019, you continued to drill and reported the same 96.2' depth to water until the bit was at 220' below grade (or -46' msl). This upper zone cannot be considered perched, as the bit was well below sea level when the water level changed, implying a fully saturated zone to below sea level.

   - On August 21 and 22, 2019, when the bit reached 220' to 270' below grade (-46' to -96' msl). You reported a drop of depth to water to 120.6' below grade (or +53.4' msl). Four days later, when the bit was at TD (275' below grade), you reported a depth to water of 166.8' from grade, or +7.2' msl. Four months later, the water level had dropped further when the casing was grouted into place, to 167.70' below TOC, or +6.11' msl.

- From the as-built well diagram, the solid casing was installed at a length of 205' with 175' of cement grout. The bottom of solid casing is at -31.19' which is 15' above the point of the lower confined aquifer (at about 220' to 270' below grade). This indicates that you did not seal off the upper artesian aquifer with casing and grout.

Based on the above information, there is a cross-connection between the two aquifers and the cross-connection is not sealed.

2. 2004 Hawaii Well Construction and Pump Installation Standards, Section 2.2 Basal Well Depth, well drilled beyond the ¼ of the theoretical thickness: It appears that the subject well exceeded one-fourth of the theoretical thickness (41 times the head) without authorized by the Chairperson. Using the reported water levels at 7' and 6.11' msl, the calculated one-fourth theoretical thickness are 71.75' and 62.63', respectively. The as-built well depth is reported as 275 ft and exceeded one-fourth of the theoretical thickness by at least 90 ft in either cases.

3. Casing Diameter Thickness: The casing wall (5/16" or 0.3125") is thinner than the specified wall of 0.365". In your well application, under Proposed Use Section, the number of units to be served was identified as 65. Water system serves more than 25 people or 15 connections is classified as a public water system. We have already forwarded you the Department of Health comments which included classifying your well as a Public Water System. As you are aware, as a public water supply well, the minimum for 12" casing is 3/8" (Table 4, 2004 HWCPIS). The current casing wall thickness is inadequate.

At this point, you must make a decision on how to seal the cross-connection:

a) Completely abandon\seal the well and ensuring a good seal in the confining layer between 210' and 220' below grade; OR

b) backfill\seal the well below 210' below grade (-36' msl).

For the backfill option, you would be required to backfill the bottom section of perforated up to 210' below grade to ensure a good seal in the confining layer from 210' to 220'. Based on the driller's log, this would result in only 5' of perforations exposed to the upper artesian aquifer, from 205' to 210'. Given the challenges of backfilling, it seems that grouting and sealing this well and move over to drill a shallower well into the thick artesian aquifer would be the least expensive and would likely produce better water.

Extension of Pump Installation Permit:

The response to your email dated June 16, 2020 requesting an extension for the pump installation completion date of the Mic 1 (Well No. 2-1019-012) is dependent on how your decision on how to proceed with fixing the cross-connection. If you choose option a) then you must reapply for the new well location and pump and also submit an application for the well abandonment work. However, if you choose option b) then your pump extension request is approved along with a commensurate extension to your current well construction permit to finish the cross-connection work. Your new permit expiration dates are September 28, 2022 and all other conditions of your permits remain the same.

Until the above matters are addressed, we cannot issue the certificate(s) of well construction completion that transfer(s) responsibility of all aspects of well usage and maintenance to the well operator/landowner. Please remember that the well may not be pumped for purposes other than well and aquifer testing until the certificates of 1) well construction completion and 2) pump installation completion have been issued, otherwise such pumpage would constitute a violation of the permit conditions. Since the permit is issued to the contractor, the contractor will be responsible for any non-testing pumpage violations when the certificates of completion have not been issued (where pumping tests are as defined in the Hawaii Well Construction and Pump Installation Standards). Please respond to the above item(s) within thirty (30) days of this letter's date. Failure to do so may result in fines of up to $5,000 per day.

If you have any questions, please contact Queenie Komori of the Commission staff at (808) 636-8503.

Ola i ka wai,

M. KALEO MANUEL
Deputy Director

QK:ss

c: Well Owner: Moloaa Irrigation Cooperative
Land Owner: Paul R & Shanda S Bosma

OASIS
Water Systems Inc.

21 September 2020

M. Kaleo Manuel
Deputy Director
Commission on Water Resource Management
State of Hawai'i Dept. of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai'i 96809

Well Completion Report Part I for Well No. 2-1019-012 Issues
and Extension of Pump Installation Permit for
Well No. 2-1019-012 Anahola, Island of Kaua'i

Aloha e Mr. Manuel,

In response to your letter dated August 27, 2020, please see our comments as outlined below:

1. Cross-connection: Based on the driller's log, we disagree with this being an artesian aquifer. On August 19th, when the bit was at 125' – 155' below ground (mud rock), there was no evidence of an aquifer encountered as there was a negligible amount of water being airlifted to the surface from that depth.

    - On August 20th, we drilled to a depth of 220' and observed similar conditions. There was still no noticeable increase in water volume at that depth. Based on video evidence, moisture was observed on the borehole wall from 70-109' depth. The video shows that at 109', traces of water run down the borehole wall. The amount of water slightly increases at the 115' level. At 155', the amount of water flow increases to less than 2 gpm which rules out the possibility of it being an artesian aquifer because essentially the borehole is blown out dry in the process of airlifting. As opposed to an artesian aquifer, what we observed was a small amount of water permeating through dense clay, weathered rock, mud and mud rock layers.

    - On August 21st and 22nd, we drilled from 220' – 270' with the depth to water of 120.6'. Between 155' – 270' we encountered a more permeable formation where the perched water could travel. If an aquifer had been encountered, it would be obvious by continuous airlifting of the water to the ground surface. If we had encountered a substantial yield, we would have stopped and performed a pump test to determine its yield.

P.O. Box 507 Hanalei, HI 96714 P: 808-826-1854 F: 808-826-6530 License #C-21547 Email: oasiskauai@yahoo.com

Four days later when the bit was at 270' - 275', we encountered a substantial increase of water through the drilling process, at which time we stopped to proceed with test pump and casing. There was no cross-connection of the aquifer. Oasis Water Systems, Inc. has more experience drilling in the Koloa volcanics than any other driller in the State of Hawai'i. In our experience, these conditions are to be expected and is typical of wells drilled in the Koloa volcanics.

2. 2004 Hawai'i Well Construction and Pump Installation Standards, Section 2.2 Basal Well Depth, well drilled beyond the ¼ of the theoretical thickness: The permit application filed by Oasis Water Systems, Inc. in July 2018 shows a drill depth of 270' to bottom elevation of 100' below sea level. We had estimated water elevation at +10' msl. In basal ground water, that would put the ¼ lens thickness at 92.5'. CWRM approved the permit application without any comment at the proposed depth.

    - Wells 1019-004, 1019-008, 1120-034, the latter two were drilled by Oasis Water Systems, Inc. Their completed depths were 107', 147', 200' below sea level respectively; deeper than the theoretical ¼ lens thickness. When drilling in Koloa volcanics, it is very often necessary to exceed the ¼ lens thickness to obtain any significant yields. We disagree with the Commission's interpretation of the ¼ lens thickness being exceeded by at least 90'. The well was drilled to -101.5'. Our calculations indicate that the ¼ lens thickness would be 36.5' to 45.5' below sea level, an exceedance of 56' to 65'. In the future, Oasis Water Systems, Inc. will apprise the CWRM of the need to drill deeper than the ¼ lens thickness.

3. Casing Diameter Thickness: The permit application filed by Oasis Water Systems, Inc. in July 2018 stated that the thickness of the solid and louvered casing would be 5/16" wall. The permit was approved without comment by CWRM.

    - The manufacturer, Roscoe Moss Company, states that 0.312" A606 solid casing is rated beyond 2,000 ft. BGS (below ground surface). This does not take into consideration the added benefit of louvered casing. With our vast practical knowledge and experience using this material, we are of the opinion that it is more than adequate to maintain the integrity of the structure as well as preserving and protecting the ground-water aquifer.

    - Moloa'a Irrigation Cooperative (MIC) has communicated that they have been involved in a number of system improvements that have required review and approval by SDWB. This includes meter relocations and an on-going major tank repair. MIC has been told during the design phase for all of these projects that they are not required to meet the requirements of the Hawai'i County Water Standards. Refer to Hawai'i Well Construction and Pump Installation

Standards rev. 02/2004 Table 3 in Section 2.4(b) Wall Thickness of Casing. For Non-Public Water Supply Wells, the standard states that 12-inch 5/16" steel casing is rated for depths of up to 2,000 ft.

To this end, Oasis Water Systems, Inc. takes the position that there is no cross-connection, that drilling beyond the ¼ theoretical thickness was necessary to achieve sustainable yield given the unique characteristics of Koloa volcanics and that the casing diameter thickness used falls well within and even exceeds the applicable standards as set forth by both the manufacturer and CWRM. Therefore, no remediation efforts are necessary at this time.

We appreciate your consideration and look forward to hearing from you.

Me Ke Aloha Pumehana,

Barry Simmons, President
Oasis Water Systems, Inc.

Exhibit 4 Correspondences

RE: Letter Request

From: Steve Quintero (squintero@roscoemoss.com)

To: oasiskauai@yahoo.com

Date: Monday, August 31, 2020, 12:25 PM HST

Please refer to the chart attached.

12 ¾"OD x .312" Carbon Blank is rated beyond 2,000 ft BGS; this doesn't take into consideration the added benefit of louvers.

Thank you,

Steve Quintero

Sales Director

Roscoe Moss Company

4360 Worth Street

Los Angeles, CA 90063

O: (323)263-4111

C: (951)454-3902

F: (323)263-4497

www.roscoemoss.com

Our HSLA & Stainless Products are in full compliance with

NSF/ANSI 61 and NSF/ANSI 372

MH63127

Table 4 Minimum thickness for steel well casing—single casing

Depth of Casing *ft (m)*	Nominal Casing Diameter—*in. (mm)*									
	8 (203)	10 (254)	12 (305)	14 (356)	16 (406)	18 (457)	20 (508)	22 (559)	24 (610)	30 (762)
0–100	¼	¼	¼	¼	¼	¼	¼	5/16	5/16	5/16
(0–30)	(6.35)	(6.35)	(6.35)	(6.35)	(6.35)	(6.35)	(6.35)	(7.94)	(7.94)	(7.94)
100–200	¼	¼	¼	¼	¼	¼	¼	5/16	5/16	5/16
(30–60)	(6.35)	(6.35)	(6.35)	(6.35)	(6.35)	(6.35)	(6.35)	(7.94)	(7.94)	(7.94)
200–300	¼	¼	¼	¼	¼	5/16	5/16	5/16	5/16	3/8
(60–90)	(6.35)	(6.35)	(6.35)	(6.35)	(6.35)	(7.94)	(7.94)	(7.94)	(7.94)	(9.52)
300–400	¼	¼	¼	¼	5/16	5/16	5/16	5/16	3/8	3/8
(90–120)	(6.35)	(6.35)	(6.35)	(6.35)	(7.94)	(7.94)	(7.94)	(7.94)	(9.52)	(9.52)
400–600	¼	¼	¼	¼	5/16	5/16	5/16	3/8	3/8	7/16
(120–180)	(6.35)	(6.35)	(6.35)	(6.35)	(7.94)	(7.94)	(7.94)	(9.52)	(9.52)	(11.11)
600–800	¼	¼	¼	5/16	5/16	5/16	3/8	3/8	3/8	7/16
(180–240)	(6.35)	(6.35)	(6.35)	(7.94)	(7.94)	(7.94)	(9.52)	(9.52)	(9.52)	(11.11)
800–1,000	¼	¼	¼	5/16	5/16	5/16	3/8	7/16	7/16	½
(240–300)	(6.35)	(6.35)	(6.35)	(7.94)	(7.94)	(7.94)	(9.52)	(11.11)	(11.11)	(12.70)
1,000–1,500	¼	5/16	5/16	5/16	3/8	3/8	3/8	7/16	*	*
(300–450)	(6.35)	(7.94)	(7.94)	(7.94)	(9.52)	(9.52)	(9.52)	(11.11)	—	—
1,500–2,000	¼	5/16	5/16	5/16	3/8	3/8	7/16	7/16	*	*
(450–600)	(6.35)	(7.94)	(7.94)	(7.94)	(9.52)	(9.52)	(11.11)	(11.11)	—	—

*Reference Section 4.4.5 of A100-15 regarding thickness of well casings.

Table 5 Minimum thickness for two-ply steel well casing*

Depth of Casing *ft (m)*	Diameter—*in. (mm)*								
	10 (254)	12 (305)	14 (356)	16 (406)	18 (457)	20 (508)	22 (559)	24 (610)	30 (762)
0–100	12	12	12	12	10	10	10	10	8
(0–30)	(2.66)	(2.66)	(2.66)	(2.66)	(3.42)	(3.42)	(3.42)	(3.42)	(4.18)
100–200	12	12	12	10	10	10	10	8	8
(30–60)	(2.66)	(2.66)	(2.66)	(3.42)	(3.42)	(3.42)	(3.42)	(4.18)	(4.18)
200–300	12	12	10	10	10	10	8	8	8
(60–90)	(2.66)	(2.66)	(3.42)	(3.42)	(3.42)	(3.42)	(4.18)	(4.18)	(4.18)
300–400	12	12	10	10	10	8	8	8	8
(90–120)	(2.66)	(2.66)	(3.42)	(3.42)	(3.42)	(4.18)	(4.18)	(4.18)	(4.18)
400–600	10	10	10	10	8	8	8	8	8
(120–180)	(3.42)	(3.42)	(3.42)	(3.42)	(4.18)	(4.18)	(4.18)	(4.18)	(4.18)
600–800	10	10	10	8	8	8	6	6	6
(180–240)	(3.42)	(3.42)	(3.42)	(4.18)	(4.18)	(4.18)	(4.94)	(4.94)	(4.94)
800–1,000	10	8	8	8	8	6	6	6	6
(240–300)	(3.42)	(4.18)	(4.18)	(4.18)	(4.18)	(4.94)	(4.94)	(4.94)	(4.94)

*Values are US standard steel thickness gauge (mm).

Moloa'a Irrigation Cooperative
P.O Box 506
Anahola, HI 96703
www.moloaairrigationcoop.org

September 21, 2020

M. Kaleo Manuel
Deputy Director
Commission on Water Resource Management
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Aloha e Mr. Manuel,

We have received your August 27, 2020 letter to Oasis Water Systems, Inc. regarding MIC Well 1 (No. 2-1019-012).

Moloa'a Irrigation Cooperative (MIC) is a small, private water system that serves 70 connections on almost 600 acres of agricultural land in Moloa'a. Our members are primarily farmers, and our only source of water at present is the State Well located in the Moloa'a Forest Reserve. In 2015, due to the number of dwellings on our system, our irrigation system was declared a Drinking Water System by the Safe Drinking Water Branch (SDWB) of the Department of Health. This has presented us with many challenges over the past five years. Like other private water systems in Hawai'i, MIC is not required to follow the Hawai'i County Water Standards which have been promulgated and adopted by the County Water Departments in the State. This was most recently reiterated to us in an August 25th message from SDWB which resulted from discussions regarding the engineering of repairs to our water tank which are being funded by the DWSRF:

Is MIC required to follow Hawaii Water System Standards? Will doing so affect cost? Are there other options for standards that may be followed that are adequate for MIC's needs?	It is not required in HAR 11-20, nor for DWSRF, but is strongly recommended by the SDWB, that private systems follow the County Water System Standards as long as it is feasible and reasonable for the system. This is in the best long-term interest of the system and its users. Whether the design follows the Standards or not, it will still have to be reviewed and approved by DOH per HAR 11-20-30.

MIC understands that not only CWRM, but also SDWB, will have to approve the well as a source for drinking water. To that end, MIC has been in close conversation with the SDWB as the planning and work on the well has progressed. SDWB has received all of the testing results performed by Tom Nance to date.

MIC received state funding in 2016 for the construction of this well. Our present source, while an extraordinarily rich and robust source of water, is located almost one mile from our storage tank. Water is delivered via plantation era steel pipes, and the water pump for this well is over 20 years old. MIC purchases

this water from Moloa'a Water Company whose owner has a Revocable Permit on the State Well. It has long been a dream of our farmers to have their own source of water and become autonomous. The cost of our water from the State Well is almost double the cost for agricultural water from the Kaua'i Department of Water. This makes it exceedingly difficult for our farmers to compete and realize a sustainable profit.

MIC is fully focused on conserving water and has adopted several water conservation measures in our operations. In 2017, we received a CWRM Water Security Grant in partnership with a County OED Grant to install analytical meters. This gives our members the benefit of having real-time reporting of their water use. This has been successful in reducing water losses because our members identify individual leaks right away. In late August 2020, we were awarded an Agriculture Water Efficiency Grant from Hawai'i Community Foundation to purchase leak detection equipment to further our conservation goals. Also, we have received Cares Act Funding to help relocate our production meter.
https://www.thegardenisland.com/2020/09/01/hawaii-news/fixing-the-water-system-in-moloaa-hui-lands/

To achieve our goals to control costs, enhance conservation, and achieve autonomy, we entered into a contract with Tom Nance Water Resource Engineering (TNWRE) in 2018. Based on his vast experience and knowledge of the hydrogeology in Hawai'i, we chose Tom Nance to oversee the design and construction of the well. In 2017, prior to the well contract, Tom performed a survey of well sites in our area to help us pinpoint the best potential sites so we could begin negotiations with land-owners. Tom prepared the contract documents and RFP for the well construction which were sent to three well drilling companies in Hawai'i. Based on his knowledge and experience on Kaua'i, MIC chose Barry Simmons of Oasis Water Systems, Inc.to do the well construction.

Until we received this August 27th letter, we had no idea that anything was amiss, and our understanding was that all procedures had been followed. MIC had representatives at the well-site almost daily during drilling, testing, and at other times in the construction. Prior to construction, we had Kahu Sabra Kauka perform a blessing at the site with the landowners and members of the cooperative present.

We have read the responses by Tom Nance to the issues raised in your August 27th letter. We are not hydrogeologists, but both Tom and Barry Simmons had told us beforehand that a perched water lens could be anticipated prior to drilling into the actual aquifer. We have also viewed the entire bore hole video which, to our untrained eyes, appears to verify what Tom notes in his memos. It is our sincere hope that we can develop this well based on the permits that were issued to Oasis Water Systems, Inc. which did not call into question the issues that are now being raised.

We believe that all parties involved in this well, including CWRM, SDWB, MIC, TNWRE, and Oasis Water Systems, Inc, are acting in the highest and best interest to protect and care for this precious resource.

Me ko mākou ho'oha'aha'a,

Paul Huber, President MIC

M. Louisa Wooton

Louisa Wooton, Executive Director/General Manager MIC

Tom Nance Water
Resource Engineering

No. of pages: 3
Email: oasiskauai@yahoo.com
paulieworld86@gmail.com
moloaairrigationcoop@gmail.com
greg@tnwre.com
todd@tnwre.com

Original will not be mailed to you.

September 14, 2020
20-269.r2 | 18-34

MEMORANDUM

To: Barry Simmons – Oasis Water Systems, Inc.
Paul Huber and Louisa Wooton – Moloaa Irrigation Cooperative

From: Tom Nance

Subject: Actual Groundwater Conditions Encountered by the MIC-1 Well, State No. 1019-012

This memo has been prepared to respond to the characterization of groundwater conditions encountered in the MIC-1 Well in the August 27, 2020 letter from the Commission on Water Resource Management (CWRM) to Oasis Water Systems, Inc. The CWRM's letter asserts that the well cross-connects two "artesian" aquifers. This is not actually the case. The following lays out my interpretation of the actual groundwater conditions based on the Driller's Log in the Well Completion Report – Part 1, information I developed starting on August 27, 2019 with a CTD profile and during two subsequent pump tests, and the video log of the reamed borehole done by Oasis on October 29, 2019.

- The Driller's log shows a 96.2-foot depth to water for the drilled interval of 125- to 155-foot depth. The CWRM has interpreted this to mean that an "artesian" aquifer had been encountered at 125-foot depth on August 19, 2019. The reality is as follows:
  - The water level measurement was made on the morning of August 20, 2019 before the start of drilling. If it had been made on August 19, 2019 at any time during or following the drilling on that day, there would not have been water in the borehole to measure as it would have all been air lifted out during the drilling process which drained a small, perched water body.
  - The video log of October 29, 2019 shows moisture on the borehole wall from 70- to 109-foot depth. At 109-foot depth, a very small amount of water (less than one GPM) runs down the borehole wall. A small increase occurs at 115-foot depth. At 155-foot depth, the amount of water running down the borehole wall is on the order of one to two GPM. This is absolutely not an "artesian" aquifer. It is simply a small amount of perched water in the poorly permeable clay, weathered rock, mud, and mud/rock layers.
- In the 220- to 270-foot depth interval, the Driller's Log describes this 50-foot interval as weathered rock with a depth to water of 120.6 feet and a date of August 21-22, 2019. Again, this is a measurement on the morning following the drilling, not on the day of drilling. The CWRM states that this identifies a lower confined aquifer from 220- to 270-foot depth that should have been sealed off with grouting of the annulus and is now "cross-connected" to the actual aquifer the well draws from. This is not a second, confined, and cross-connected aquifer. It is simply a reflection

that the modest amounts of water seeping into the borehole have found a layer or two somewhere between 155- and 270-foot depths into which it could move. The rotary drilling process air lifts water out of the borehole to the ground surface. If an actual "aquifer" had been encountered, it would have been obvious by the continuous air lift pumping of water to the ground surface. If this had been the case, drilling would have stopped and the "aquifer" pump tested to determine its potential yield. This did not occur because an aquifer delivering a continuous supply of water during drilling was simply not encountered.

- The only actual aquifer encountered, the one the well draws from, starts at a depth of 270 feet. It is a basal aquifer (based on its response to the ocean tide shown on Figure 1) and it is also confined. There is no cross-connection of aquifers.

Some final comments to put the CWRM's misinterpretation of groundwater conditions are in order. First, the highly variable layering shown in the Driller's Log are typical for boreholes drilled in the Koloa volcanics. Second, one or more perched water bodies with little or no long-term yield are very common in the Koloa volcanics. Third, no other drilling contractor or consultant, including myself, has anywhere near the experience of Oasis Water in drilling and developing wells in the Koloa volcanics. If the perched water the CWRM has misinterpreted to be aquifers were actually such, they would have been evaluated for their potential yield before drilling deeper. This was just not the case.

Attachments: Figure 1

Exhibit 4 Correspondences

Email Copy: Greg Fukumitsu and Todd Yonamine – TNWRE Inc.

Figure 1. Comparison of the Water Level in the MIC-1 Well During its 48-Hour Constant Rate Pump Test with the Nawiliwili Harbor Tide Level

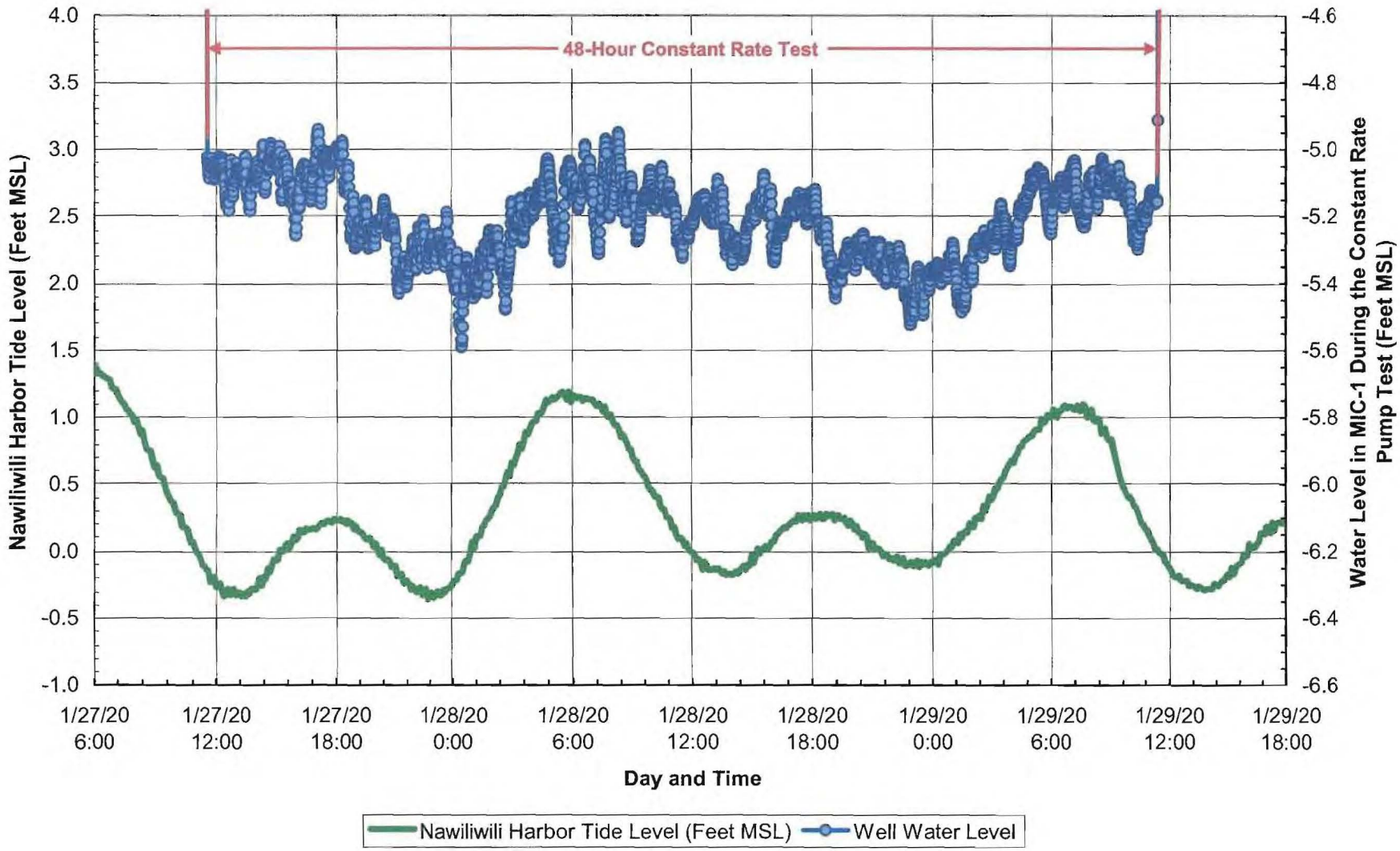

Exhibit 4 Correspondences

Tom Nance Water
Resource Engineering

No. of pages: 2
Email: oasiskauai@yahoo.com
paulieworld86@gmail.com
moloaairrigationcoop@gmail.com
greg@tnwre.com
todd@tnwre.com

Original will not be mailed to you.

September 10, 2020
20-281 | 18-34

MEMORANDUM

To: Barry Simmons – Oasis Water Systems, Inc.
Paul Huber and Louisa Wooton – Moloaa Irrigation Cooperative

From: Tom Nance

Subject: Drilled Depth of the MIC-1 Well, State No. 1019-012

1. The Well Construction / Pump Installation Permit application filed by Oasis in July 2018 showed a drilled depth of 270 feet to a bottom elevation of 100 feet below sea level. It also indicated an expected water level of 10 feet. In basal groundwater, that would put the 1/4 lens thickness at -92.5 feet, about 7.5-foot less depth than the permit application. The Commission on Water Resource Management (CWRM) approved the permit application without comment on the proposed depth.

2. The expectable necessary depth in the application is significantly less than the completed depths of nearby Well Nos. 1019-004 and 1019-008, the latter of which was drilled by Oasis. Their completed depths were 107 and 147 feet below sea level, deeper than the hypothetical 1/4 lens thickness. Both Wells were approved by the CWRM without comment on the completed depths.

3. The 1/4 lens thickness limit is to avoid salinity intrusion in wells tapping basal groundwater. The reality for wells drilled in to the Koloa volcanics is that drilled depths very commonly must exceed the hypothetical 1/4 lens thickness to get any significant yield and have done so without any salinity issues when put into use.

4. The CWRM's August 27, 2020 letter states that at the Well's 275-foot drilled depth, it exceeds the 1/4 lens depth by "at least 90 feet" for reported water levels of 6.1 and 7.0 feet. The well was drilled to -101.5 feet. Exceedances of the 1/4 lens thickness are actually 36.5 to 45.5 feet:
    - at 6.1-foot water level, 1/4 lens thickness is at -56 feet
    - at 7.0-foot water level, 1/4 lens thickness is at -65 feet

5. Oasis drilled to 275 feet depth in a similar manner that it had drilled numerous other wells in the Koloa volcanics which required drilling deeper than the hypothetical 1/4 lens thickness. In the past, these depths were never raised as an issue, apparently because CWRM staff members had some familiarity with groundwater conditions in the Koloa volcanics. The reality for the MIC-1 well is that its depth is not a concern with regard to salinity.

TNWRE Inc. | 560 N. Nimitz Hwy. - Suite 213 | Honolulu, Hawaii 96817 | Phone: (808) 537-1141 | Fax: (808) 538-7757 | Email: tom@tnwre.com

6. The CWRM's current objection to the drilled depth, while technically correct, is unprecedented relative to its practice for many years. Going forward, Oasis needs to apprise the CWRM of the likely need to drill deeper than the 1/4 lens thickness.

Email Copy: Greg Fukumitsu and Todd Yonamine – TNWRE Inc.

TNWRE
Tom Nance Water
Resource Engineering

No. of pages: 2
Email: oasiskauai@yahoo.com
paulieworld86@gmail.com
moloaairrigationcoop@gmail.com
greg@tnwre.com
todd@tnwre.com

Original will not be mailed to you.

September 17, 2020
20-278.r1 | 18-34

MEMORANDUM

To: Barry Simmons – Oasis Water Systems, Inc.
Paul Huber and Louisa Wooton – Moloaa Irrigation Cooperative

From: Tom Nance

Subject: Some Thoughts on Addressing the Casing Thickness of the MIC-1 Well

1. The Well Construction / Pump Installation Permit application specified that the thickness for the solid and louvered casing would be 5/16-inch. The permit was approved without comment on the casing thickness or any other aspect of the Well's dimensions and depth.

2. The Commission on Water Resource Management (CWRM) standards state that the casing must be ***"adequate to maintain the structural integrity and intended use of the Well and to maintain the natural pre-existing state of protection of the ground-water aquifer from pollution or contamination."*** The 5/16-inch wall thickness casing has already demonstrated that this is the case:
   - Table 3 on page 2-4 of the CWRM standards indicates that 1/4-inch wall thickness would be adequate for 12-inch casing in wells up to 300 feet deep;
   - That the formation pressure is negligible was physically demonstrated with the drilled borehole standing open without collapse prior to casing installation;
   - That the 5/16-inch casing has sufficient strength was physically demonstrated by its performance during the period of the far greatest pressure for collapse or distortion of the casing, the cementing of the annular space;
   - Once the casing had been installed and cement grout in the annular space had set, the differential hydrostatic pressure would be at its greatest due to both the pressure of the perched water bodies and drawdown during pumping; and
   - Results of the plumbness testing done after the pump test with an expandable cage demonstrated that the casing has not been distorted or mis-aligned.

3. Table 4 on page 2-4 of the CWRM standards specifies a 0.375-inch wall thickness for 12-inch casing for Public Water Supply Wells. It references the 2002 County Water System Standards as the basis for this size.

4. The Moloaa Irrigation Cooperative has repeatedly confirmed with the Safe Drinking Water Branch of the State Department of Health that the design of its private water system is not required to meet County Water System Standards. It is on this basis that the 5/16-inch wall thickness is deemed to be both adequate in meeting the requirements stated in item 2 above and does not

need to be 3/8-inch in thickness because it does not need to meet County Water System Standards.

Email Copy: Greg Fukumitsu and Todd Yonamine – TNWRE Inc.

Komori, Queenie K

From: Oasis Water Systems <oasiskauai@yahoo.com>
Sent: Friday, November 20, 2020 10:19 AM
To: Komori, Queenie K
Cc: tom nance; Greg; 3. todd yonamine; Paul Huber; Louisa Wooton
Subject: [EXTERNAL] Moloa'a Irrigation Cooperative
Attachments: 20-343 - PHuber & LWoton - MIC-1 Well (18-34).pdf

Aloha e Queenie,

Please find and confirm receipt of the attached memo from Tom Nance of TNWRE addressing the casing issue for MIC-1.

It is our understanding that variances are being addressed at higher levels, can you kindly advise on next steps?

Mahalo!
SK

Oasis Water Systems, Inc.
P.O. Box 507
Hanalei, HI 96714
(808) 826-1854 office
(808) 826-6530 fax

Far Superior Products

Tom Nance Water
Resource Engineering

No. of pages: 4
Email: paulieworld86@gmail.com
moloaairrigationcoop@gmail.com
oasiskauai@yahoo.com
greg@tnwre.com
todd@tnwre.com

Electronic Submission Only

November 19, 2020
20-343 | 18-34

MEMORANDUM

To: Paul Huber and Louisa Wooton – Moloaa Irrigation Cooperative
Barry Simmons – Oasis Water Systems, Inc.

From: Tom Nance

Subject: Adequate Collapse Strength of the Casing Installation in the MIC-1 Well, State No. 1019-012

1. As indicated on the attachment from the casing supplier, Roscoe Moss Company, the collapse strength of the 12-inch (ID), 5/16-inch wall thickness solid casing conforming to ASTM A606 Type 4 that was installed in the MIC-1 well is 629 psi.

2. The borehole stands open for its entire length, meaning that the formation does not apply any lateral pressure on the casing.

3. The maximum collapse pressure on the casing occurred when the cementing of the annulus was just completed and the cement had not yet set up. To be conservative, the pressure applied by the perched water will be added to that of the cement:

   - Pressure of Cement: 175 feet of cement above the cement basket at 156 lbs/ft^3 = 27.300 lbs/ft^2 or 189.6 psi
   - Pressure of Perched Water: 72-feet at 62.4 lbs/ft^3 = 4492.8 lb/ft^2 = 31.2 psi
   - Combined maximum pressure on the casing immediately above the upper cement basket = 220.8 psi, far less than the 629 psi collapse strength of the casing. After the cement hardened, there is no longer any lateral pressure on the casing.

Attachment: Letter from Roscoe Moss Company

Email Copy: Greg Fukumitsu and Todd Yonamine – TNWRE Inc.
Exhibit 4 Correspondences

ROSCOE MOSS COMPANY

4360 Worth Street
Los Angeles, California 90063, U.S.A.
Phone: (323) 263-4111, Fax: (323) 263-4497
E-mail: squintero@roscoemoss.com
Web site: www.roscoemoss.com

November 3, 2020

Oasis Water
P.O. Box 507
Hanalei, HI 96714

Re: Invoice 158616 – Nawiliwili MIC 1

Please accept this letter as our Submittal for the casing and screen materials required for the above referenced job. Roscoe Moss Company will supply the following:

1. 12.75" OD x .312" wall High Strength Low Alloy Steel Blank Casing,
   Well casing shall be manufactured in accordance with applicable parts of ASTM A606 Type 4. Welding shall be by the submerged-arc process using at least one pass on the inside and one pass on the outside. Well Casing shall be 12.75" outside diameter and .312" wall thickness made from High Strength Low Alloy steel. Casing shall be provided in desired lengths with welded collars attached.
   - **Collapse Strength:** 629 psi
   - **Tensile Strength:** 610,524 lbs

2. 12.75"OD X .312" wall High Strength Low Alloy Ful Flo Louvered Screen,
   Well casing shall be manufactured in accordance with applicable parts of ASTM A606 Type 4. Welding shall be by the submerged-arc process using at least one pass on the inside and one pass on the outside. Well Casing shall be 12.75" outside diameter and .312" wall thickness made from High Strength Low Alloy steel. Casing shall be provided in desired lengths with welded collars attached. Well screen shall be manufactured in accordance with the aforementioned casing requirements with the following additions:

   Screen openings shall be machine made, horizontal to the axis of the casing and of a louver form with the aperture facing downward. The aperture size shall be 0.250" with 96 openings per linear foot. The minimum area of opening shall be no less than 14.97%.
   - **Collapse Strength:** 846 psi
   - **Tensile Strength:** 235,172 lbs

Enclosed, for your records, are the mill certifications for the raw materials that were used in the construction of the blank and screen casings. If you have any questions please do not hesitate to call.

Regards,
Steven Quintero
Steve Quintero
Sales Director

METALLURGICAL CERTIFICATION

BIG RIVER STEEL

2027 East State Highway 198
Osceola, AR 72370
www.bigriversteel.com

Sold To: METAL ONE AMERICA
SANTA FE SPRINGS, CA 90670

Ship To: METAL ONE AMERICA
FONTANA, CA 92335

Certificate #: 147508
Load Number: 175801
Ship Date: 02/27/2019
Material ID: 19029521-08
Linear Ft: 628 ft

Material Weight: 40,380 LBS
Heat Number: 19029521
Customer PO: 240132-1
Order #: 23592

Part No.: 239201/33954-00
Spec: A606-15 TYPE 4

Description: HOT ROLLED BLACK-PRIME CARBON STEEL COILS 0.3030X60.5000 (MIN)

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	Ti	V	Nb	N	B	Ca	C(eq)
.05	.94	.017	.001	.32	.029	.31	.27	.47	.018	.0056	.002	.023	.016	.0077	.0002	.0017	.347

BRS RESULTS

Tested With Coil	19029521-02	
0.2% Yield Strength	71 ksi	490 MPa
Direction	Longitudinal	
Tensile Strength	83 ksi	574 MPa
Total Elongation	31 %	31 %
Actual Gauge	0.3079 in	8 mm

BRS RESULTS

Tested With Coil	19029521-04	
0.2% Yield Strength	71 ksi	487 MPa
Direction	Longitudinal	
Tensile Strength	83 ksi	575 MPa
Total Elongation	33 %	33 %
Actual Gauge	0.3077 in	8 mm

We hereby certify the above is correct as contained in the records of the company. All tests performed according to ASTM standard E8, A370, E18, E415 and E1019.

This product was melted and manufactured in the USA.

The value of the material is not portrayed in this document due to confidential clauses.

Certified By: Denis Hennessy
E-mail: dhennessy@bigriversteel.com
Main: 870-819-3031

Certificate Date: 02/27/2019

鋼材検査証明書
INSPECTION CERTIFICATE

東京製鐵株式会社
TOKYO STEEL MFG.CO.,LTD.
本社:〒100-0013 東京都千代田区霞ヶ関３丁目７番１号 霞が関東急ビル(15階)
Head Office:Kasumigaseki Tokyu Bldg. (15F), 3-7-1 Kasumigaseki, Chiyoda-ku Tokyo 100-0013 Japan

注文者 Shipper

特約店 Customer

品名 Commodity HOT-ROLLED COIL

規格 Specification ASTM A606-09A TYPE4

受注番号 Contract No. KT8P390　　送り状番号 Invoice No. E-901797

発行日 Date of Issue JANUARY.24.2019　　証明書番号 Certificate No. 468050

需要家 Customer

工事名 Project Name

寸法 Size (INCH)	数量 Quantity 員数 Pieces	数量 Quantity 質量 Weight (kg)	コイル番号 Coil No.	鋼番 Charge No.	引張試験 Tensile Test ※1 BEHKN 降伏点又は耐力 Yield Point or Yield Strength N/mm²(MPa)	引張強さ Tensile Strength N/mm²(MPa)	降伏比 Yield Ratio %	伸び Elongation %	曲げ試験 ※2	衝撃試験 ※3 Impact Test J 1	J 2	J 3	J Ave	厚さ方向特性 Through-thickness Characteristics 絞り % Reduction of Area % 1	2	3	Ave	超音波 UT	外観・形状・寸法 ※4	備考 Remark
0.3030X60.500XCOIL	1	20200	A9108018N	AB7352	411	522		49	G										G	
0.3030X60.500XCOIL	1	20190	A9108017N	AB7352	411	522		49	G										G	
0.3030X60.500XCOIL	1	20180	A9108019N	AB7352	411	522		49	G										G	
0.3030X60.500XCOIL	1	20170	A9108016N	AB7352	411	522		49	G										G	
0.3030X60.500XCOIL	1	20110	A9108014N	AB7352	411	522		49	G										G	
0.3030X60.500XCOIL	1	20100	A9108012N	AB7353	406	516		53	G										G	

※1 引張試験 Tensile Test
規格 Standard A:JIS Z 2241 B:ASTM E8/E8M C:EN10002-1 D:
方向 Direction of Sampling E:圧延方向 Longitudinal F:直角方向 Transverse W:
位置 Location of Sampling H:1/4 I:1/6 J:
試験片 Specimen K:平形試験片 Rectangular L:丸形試験片 Round
標点距離 Gauge Length M:200mm N:50mm P:8do Q:5.65√So R:

※2 曲げ試験 Bend Test 合格 G:Good

※3 衝撃試験 Impact Test
規格 Standard A:JIS Z 2242 B:ASTM A370 C:EN10045-1 D:
方向 Direction of Sampling E:圧延方向 Longitudinal F:直角方向 Transverse W:
位置 Location of Sampling H:1/4 I:1/6 J: 温度 Test Temperature K:0℃ L:
寸法 Dimension M:10mm N:
衝撃刃半径 Radius at tip of striker O:2mm P:8mm
定格容量 Nominal energy Q:150J R:300J S: ノッチ Notch T:V U:U

※4 外観・形状・寸法 Visual and Dimensions 合格 G:Good

鋼番 Charge No.	化学成分 Chemical Composition (%) C ×100	Si	Mn	P ×1000	S	CU X100	NI	CR
AB7352	6	51	94	80	3	26	10	14
AB7353	6	54	87	81	2	28	10	13

上記注文品は御指定の規格または仕様に従って製造され、その要求事項を満足していることを証明します。
We hereby certify that above steels have been satisfactorily tested in accordance with the specification.

PO NO.33907-00

田原工場：〒441-3436愛知県田原市白浜二号１番３
TAHARA PLANT：2-1-3, Shirahama, Tahara-city, Aichi pref. 441-3436, Japan

田原工場 品質環境管理課長 Chief Inspector MURAKAMI MAKOTO
Quality Control Sec. Tahara Plant

From: Miyahira, Michael M
To: Komori, Queenie K
Cc: Hardy, Roy; Casey, Patrick N; Corrigan, Joan; Seto, Joanna L
Subject: RE: well 2-1019-012 MIC 1 - SDWB standards
Date: Tuesday, September 29, 2020 3:18:19 PM

Aloha Queenie,

MIC has submitted design plans for several projects where we have strongly recommended but not required the use of County Water System Standards, including their referenced meter relocation and tank repair projects. That said, we have not reviewed any construction plans for the well and therefore have not approved any deviations from CWRM Well Standards. I note that we did review the CWRM Well Construction/Pump Installation Permit application for 2-1019-012 back in August 2018 and made comments within our jurisdiction only. We do not generally comment on well casing construction unless it jumps out at us upon reviewing the application, and we would only then point this out to CWRM for their action. CWRM's Well Construction Standards, Sec 2.4(b) require a minimum sized casing for public water supply wells that reference County Water System Standards but we have no jurisdictional authority to override that requirement.

I understand that the well is already drilled and cased. So what do you guys have for options?

Mike

From: Komori, Queenie K <queenie.k.komori@hawaii.gov>
Sent: Tuesday, September 29, 2020 1:42 PM
To: Miyahira, Michael M <michael.miyahira@doh.hawaii.gov>
Cc: Hardy, Roy <roy.hardy@hawaii.gov>; Casey, Patrick N <patrick.n.casey@hawaii.gov>
Subject: well 2-1019-012 MIC 1 - SDWB standards

Aloha Mike,

We have an applicant, Oasis, submitted a well completion report for State Well No. 2-1019-012 MIC 1.
However, the **well casing** does not meet the casing thickness requirements of at least .375" as stated in the Hawaii Well Construction and Pump Installation Standards

But according to Oasis -- attached letter, page 2, no. 3, 2nd bullet (in quote below)

> *"Moloa'a Irrigation Cooperative (MIC) has communicated that they have been involved in a number of system improvements that have required review and approval by SDWB. This includes meter relocations and an on-going major tank repair. MIC has been told during the design phase for all of these projects that they are not required to meet the requirements of the Hawai'i County Water Standards."*

- Did DOH approve the well casing and that this well does not need to meet Hawaii county water standards?

- We are planning a zoom meeting to discuss further with our applicant. Are you

available for a zoom meeting next week Monday or Friday?
Could you provide me your available time slot?

Thank you for your help.
Queenie

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

October 9, 2018

2-1019-012 &-013.wcp.docx

Mr. Barry Simmons
Oasis Water Systems, Inc.
P.O. Box 507
Hanalei, HI 96714

Dear Mr. Simmons:

Well Construction Permit
Mic 1 and Mic 2 Wells (Well Nos. 2-1019-012 & 2-1019-013), Anahola, Island of Kauai

Enclosed are two (2) copies of your approved Well Construction Permit for the captioned wells that authorize well construction activities but excludes installation work for a permanent pump. As part of the Chairperson's approval, the following special condition was added and are part of your permit under Permit Condition 17:

Special Conditions

1. **Attached for your information are copies of the Department of Health's (DOH) review comments. Please note DOH's requirements related to discharge of effluent from well drilling and testing activities. Also, please contact the Noise Radiation and Indoor Air Quality Branch at 586-4700 to check compliance with construction noise permit requirements for this project.**

Please refer to the Permit Processes Worksheet (transmitted with your acknowledgement letter) for further information regarding the process of drilling a well and installing a pump.

No withdrawal of water shall be made other than for testing purposes until a certificate of pump installation completion has been issued by the Commission.

Please sign both permit originals and return **one** copy to the Commission office for our files. For copies of the aquifer pump test worksheet, please call staff or visit http://files.hawaii.gov/dlnr/cwrm/forms/APTR.pdf.

IMPORTANT - Drilling work shall not commence until a fully signed permit is returned to the Commission. The permit shall be prominently displayed or made available at the construction site during construction. Be advised that you may be subject to fines of up to $5,000 per day for any violations of your permit conditions starting from the permit approval date.

If you have any questions, please call Queenie Komori of the Commission staff at 587-0251.

Sincerely,

Jeffrey T. Pearson, P.E., Deputy Director for
Suzanne D. Case, Chairperson

Enclosures

c: Well Owner: Moloaa Irrigation Cooperative (with applicable comments – DOH SDWB, WWB, CWB and Kauai DOP)
Land Owner: Paul R Shanda S Bosma (with applicable comments – DOH SDWB, WWB, CWB, and Kauai DOP)

WELL CONSTRUCTION PERMIT

Mic 1 & Mic 2 Wells, Well Nos. 2-1019-012 & 2-1019-013

Note: This permit shall be prominently displayed at the construction site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the construction and testing of Mic 1 & Mic 2 Wells (Well Nos. 2-1019-012 and 2-1019-013) at TMK (4) 4-9-009:012, Island of Kauai, subject to the Hawaii Well Construction & Pump Installation Standards (HWCPIS - February 2004) which include but are not limited to the following conditions:

1. The Chairperson of the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work authorized by this permit commences and staff shall be allowed to inspect installation activities in accordance with §13-168-15, Hawaii Administrative Rules (HAR).
2. This permit shall be prominently displayed, or made available, at the site of construction work until work is completed.
3. The well construction permit shall be for construction and testing of the well only. The permittee shall coordinate with the Chairperson and conduct a pumping test in accordance with the HWCPIS (the latest pump test worksheet can be obtained by contacting Commission staff or at http://files.hawaii.gov/dlnr/cwrm/forms/APTR.pdf). The permittee shall submit to the Chairperson the test results as a basis for supporting an application to install a permanent pump. No permanent pump may be installed until a pump installation permit is approved and issued by the Chairperson. No withdrawal of water shall be made for purposes other than testing without a Certificate of Pump Installation Completion. The permitted pump capacity described on the pump installation permit **may be reduced** in the event that the pump test does not support the capacity.
4. In basal ground water, the depth of the well may not exceed one-fourth (1/4) of the theoretical thickness (41 times initial head) of the basal ground water unless otherwise authorized by the Chairperson. If it can be shown that the well does not tap basal ground water then this condition may be waived after consultation with and acceptance by Commission staff. However, in no instance can the well be drilled deeper than one-half (1/2) of the theoretical thickness without Commission approval.
5. The permittee shall incorporate mitigation measures to prevent construction debris from entering the aquatic environment, to schedule work to avoid periods of high rainfall, and to revegetate any cleared areas as soon as possible.
6. In the event that historically significant remains such as artifacts, burials or concentrations of shells or charcoal are encountered during construction, the permittee shall stop work and immediately contact the Department of Land and Natural Resources' State Historic Preservation Division. Work may recommence only after written concurrence by the State Historic Preservation Division.
7. The proposed well construction shall not adversely affect existing or future legal uses of water in the area, including any surface water or established instream flow standards. This permit or the authorization to construct the well shall not constitute a determination of correlative water rights.
8. The Well Completion Report Part I shall be submitted to the Chairperson within thirty (30) days after completion of work (please contact staff or visit http://files.hawaii.gov/dlnr/cwrm/forms/WCR1.pdf for current form).
9. The permittee shall comply with all applicable laws, rules, and ordinances; non-compliance may be grounds for revocation of this permit.
10. The well construction permit application and, if relevant, any related staff submittal approved by the Commission are incorporated into this permit by reference.
11. If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.
12. Any variances from the HWCPIS shall be approved by the Chairperson prior to invoking the variance.
13. The work proposed in the well construction permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than the date the permit expires.
14. If the well is not to be used it must be properly capped. If the well is to be abandoned during the course of the project then the permittee must apply for a well abandonment permit in accordance with §13-168-12(f), HAR, prior to any well sealing or plugging work.
15. The permittee, its successors, and assigns shall indemnify, defend, and hold the State of Hawaii harmless from and against any loss, liability, claim, or demand for property damage, personal injury, or death arising out of any act or omission of the applicant, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit.
16. This permit shall apply to the location shown on the application only. If the well is to be relocated, the permittee shall apply for a new well construction/pump installation permit in accordance with §13-168-12(f), HAR.
17. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

Date of Approval: **September 28, 2018**
Expiration Date: **September 28, 2020**

Jeffrey T. Pearson, P.E., Deputy Director for
Suzanne D. Case, Chairperson
Commission on Water Resource Management

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed and understand that I shall not commence work until I have signed, dated, and returned the permit to the Commission. I understand that this permit is not to be transferred to any other entity. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $5,000 per day starting from the permit date of approval.

Driller's Signature: _____ C-57 License #: C-21457 Date: _____

Printed Name: Barry Simmons Firm or Title: Oasis Water Systems, Inc.

Please sign both copies of this permit, return one copy to the Commission office, and retain the other for your records.

Attachment

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

October 9, 2018

2-1019-012 & -013.pip.docx

Mr. Barry Simmons
Oasis Water Systems, Inc.
P.O. Box 507
Hanalei, HI 96714

Dear Mr. Simmons:

Pump Installation Permit
Mic 1 & Mic 2 Wells (Well Nos. 2-1019-012 & 2-1019-013), Anahola, Island of Kauai

Enclosed are two (2) originals of your approved Pump Installation Permit for the captioned wells that authorize permanent pump installation work for your wells. As part of the Chairperson's approval, the following special conditions were added and are part of your permit under Permit Condition 14:

Special Conditions

1. **If the elevation benchmark needs to be altered, the permittee, well operator, and/or well owner shall ensure that the benchmark is transferred (or the well resurveyed) and documentation of the new benchmark shall be submitted to the Commission within sixty (60) days after the pump is installed.**

2. **Attached for your information are copies of the Department of Health's (DOH) review comments. Please note DOH's requirements related to discharge of effluent from well drilling and testing activities. Also, please contact the Noise Radiation and Indoor Air Quality Branch at 586-4700 to check compliance with construction noise permit requirements for this project.**

The permittee is responsible for all conditions of the permit. This includes ensuring the submission of a completed Well Completion Report Part II form within thirty (30) days after the pump installation work is completed. Be advised that you may be subject to fines of up to $5,000 per day for any violations of your permit conditions starting from the permit approval date.

Please sign both permit originals and return **one** copy to the Commission office for our files.

IMPORTANT - Pump installation shall not commence until a fully signed permit is returned to the Commission.

If you have any questions, please call Queenie Komori of the Commission staff at 587-0251.

Sincerely,

Jeffrey T. Pearson, P.E., Deputy Director for
Suzanne D. Case, Chairperson

Enclosures

c: Well Owner: Moloaa Irrigation Cooperative
(with applicable comments – DOH SDWB, WWB, CWB and Kauai DOP)
Land Owner: Paul R Shanda S Bosma
(with applicable comments – DOH SDWB, WWB, CWB and Kauai DOP)

PUMP INSTALLATION PERMIT
Mic 1 & Mic 2 Wells, Well Nos. 2-1019-012 & 2-1019-013

Note: This permit shall be prominently displayed at the site until the work is completed

In accordance with Department of Land and Natural Resources, Commission on Water Resource Management's Administrative Rules, Section 13-168, entitled "Water Use, Wells, and Stream Diversion Works", this document permits the pump installation for Mic 1 & Mic 2 Wells (Well Nos. 2-1019-012 & 2-1019-013) at TMK (4) 4-9-009:012, Island of Kauai, subject to the Hawaii Well Construction & Pump Installation Standards (HWCPIS - February 2004) which include but are not limited to the following conditions:

1. The Chairperson to the Commission on Water Resource Management (Commission), P.O. Box 621, Honolulu, HI 96809, shall be notified, in writing, at least two (2) weeks before any work covered by this permit commences and staff shall be allowed to inspect installation activities in accordance with §13-168-15, Hawaii Administrative Rules (HAR).

2. No withdrawal of water shall be made other than for testing until a Certificate of Pump Installation Completion has been issued by the Commission.

3. This permit shall be prominently displayed, or made available, at the site of construction work until work is completed.

4. The pump installation permit shall be for installation of a 500 gpm rated capacity, or less, pump in the well. This permanent capacity may be reduced in the event that the pump test data does not support the capacity.

5. A water-level measurement access shall be permanently installed, in a manner acceptable to the Chairperson, to accurately record water levels.

6. The permittee shall install an approved meter or other appropriate means for measuring and reporting withdrawals and appropriate devices or means for measuring chlorides and temperature at the well head.

7. Well Completion Report Part II shall be submitted to the Chairperson within thirty (30) days after completion of work (please contact staff or visit **http://files.hawaii.gov/dlnr/cwrm/forms/WCR2.pdf** for current form).

8. The permittee, well operator, and/or well owner shall comply with all applicable laws, rules, and ordinances, and non-compliance may be grounds for revocation of this permit.

9. The pump installation permit application and, if relevant, any related staff submittal approved by the Commission are incorporated into this permit by reference.

10. If the HWCPIS are not followed and as a consequence water is wasted or contaminated, a lien on the property may result.

11. Any variances from the HWCPIS shall be approved by the Chairperson **prior** to invoking the variance.

12. The work proposed in the pump installation permit application shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Chairperson upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Chairperson no later than the date the permit expires.

13. The permittee, its successors, and assigns shall indemnify, defend, and hold the State of Hawaii harmless from and against any loss, liability, claim, or demand for property damage, personal injury, or death arising out of any act or omission of the applicant, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit.

14. Special conditions in the attached cover transmittal letter are incorporated herein by reference.

Date of Approval: **September 28, 2018**
Expiration Date: **September 28, 2020**

Jeffrey T. Pearson, P.E., Deputy Director for
Suzanne D. Case, Chairperson
Commission on Water Resource Management

I have read the conditions and terms of this permit and understand them. I accept and agree to meet these conditions as a prerequisite and underlying condition of my ability to proceed and understand that I shall not commence work until I and the pump installer have signed, dated, and returned the permit to the Commission. I understand that this permit is not to be transferred to any other entity. I also understand that non-compliance with any permit condition may be grounds for revocation and fines of up to $5,000 per day starting from the permit date of approval.

Installer's Signature: _____ C-57, C-57a, or A License #: C-21457 Date: _____

Printed Name: Barry Simmons Firm or Title: Oasis Water Systems, Inc.

Please sign both copies of this permit, return one copy to the Commission office, and retain the other for your records.

Attachments