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DIVISION OF RECLAMATION
MINING AND SAFETY

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BLACK RANGE
MINERALS

April 29, 2015

State of Colorado
TO Division of Reclamation, Mining and Safety
Attn: Mr. Tim Cazier
1313 Sherman Street, Room 215
Denver, Colorado 80203

Re: Hansen Uranium Project; DRMS NOI File No. P-2009-025; Modification 3 (MD03) Response to Deficiencies

Dear Mr. Cazier,

Below are Black Range Mineral's responses to the Division of Reclamation, Mining and Safety's Notice of Deficiencies letter for the subject NOI modification received on January 29, 2015.

1) *Page 3, Item L (Form 2, Item F on form 1) – The box is checked for "evidence of notification is attached to this NOI from BLM Land". The Division has been in contact with the BLM, but did not receive an attachment with the application confirming BLM notification. Please clarify the evidence of BLM notification.*

   Stephanie Carter of the BLM's Royal Gorge Field office in Canon City was CC'd on the digital and hard copy versions of the original MD03 submittal. In the future, Black Range will provide a certified mail receipt as evidence of notification.

2) *Page 4, Item 11 (Form 2, Item 5 on form 1) – The Division is concerned with the potential for subsidence as a result of the formation of a cavern at an unspecified depth, diameter, and duration of being open prior to the proposed backfill with the cement-bentonite mix. Please clarify:*

   a. *The expected depth range of the cavern, expected horizontal extents of the cavern and/or geologic structure above the cavern that might be expected to mitigate subsidence;*

   The depth of the Hansen uranium deposit ranges from 450 to 850 feet below ground surface. The maximum amount of dry equivalent material BLR is proposing to remove from the subsurface is 200 tons. The density of the Echo Park sandstone formation (the deposit's host formation) averages approximately 1.75 tons per cubic yard. Therefore, 200 tons is approximately equivalent to a 115 cubic yard cavern. This is roughly the volume of a standard semi truck trailer. A study utilizing drilled core from 2011 indicated that an underground jet cutting distance of up to 18 feet may be possible. If BLR can achieve a 360 degree arc at a cutting radius of 18 feet, the cylindrical cavern would be approximately three feet tall by the time 200 tons of material was removed from the subsurface.

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It is expected that the cavity will be water-filled for the majority of the bulk sample duration (including non-operational periods), which will provide nearly the same roof support as if there were no cavity at all. Throughout the bulk sample exercise the borehole condition and cavity shape will be monitored via a sonar ranging tool to ensure no subsidence is taking place. Finally, after the sample is complete, the entire cavity and borehole will be plugged to ensure subsidence does not take place in the future.

b. *The expected duration the cavern is to be open – from initial operation of the hydraulic jet cutting to the ultimate backfilling with the cement-bentonite mix.*

The anticipated duration is within a range of 5 to 30 days.

3) *Page 4, Item 12 (Form 2, Item 6 on Form 1) – The Division's understanding of hydrogeology in the area includes as many as three water bearing zones above the targeted ore zone. The proposed method of obtaining the bulk sample utilizes high water pressure.*

a. *Please describe how the aquifers above the ore zone are protected from cross contamination; especially consider the high pressure of the proposed system*

BLR anticipates jet cutting and removing material from within the Echo Park formation at depths of at least 100 feet below the next above-lying formation. An annular seal will be in place to keep any circulating water from infiltrating into the above-lying formations through the borehole annulus.

The water pump which controls the jet cutting tool is capable of high pressures required cut the underground rock face. The high pressure will, however, only be expressed within the water line between the surface pump and the jet cutting tool. As the pressurized water pushes through the jet cutting tool, the pressure will be translated to a high velocity stream of water which then cuts the rock face, loosening the bulk sample material.

Because water and solids will be moving out of the cavity as a slurry via air lift at greater rate than water will be entering the cavity via the water jet, the operating hydrologic gradient will be into the cavity from the surrounding rock and not out of the cavity or into the surrounding rock. In combination with the very low hydraulic conductivity of the host formation, the low pressure conditions, the short duration and the annular seal, any significant amount of potentially contaminated groundwater escaping the cavity and affecting above-lying or surrounding formations is unlikely. Water monitoring wells will be installed down gradient of the sample area prior to the bulk sample collection within each rock formation to verify no cross contamination occurs.

b. *Please indicate the maximum expected horizontal and vertical extents of the high pressure water intrusion (i.e., beyond the edge of the cavern).*

It is not expected that the cavity will experience high pressure but that it will be subject to a high velocity water stream and air lift suction. Water from the high velocity jet will intrude the Echo Park sandstone formation until the rock breaks apart – which is the intention of the bulk sample exercise. Because the flow of water to the surface will be greater than the flow of water from the jet cutting tool, the hydraulic gradient will be into the cavity instead of out of the cavity.

4) *Page 4, Item F (Form 2, Item D on Form 1) – Please clarify:*

a. *In which water bearing zones the clustered monitoring wells will be completed; and*

BLR intends to install a monitoring well in each rock formation in the immediate area of the bulk sample: 1) the underlying Precambrian granitic rocks, 2) the Echo Park sandstone, 3)

the Wall Mountain tuff (if present), 4) the Tallahassee Creek conglomerate, and 5) the Thirty-nine Mile andesite.

b. *What is the expected horizontal proximity of the limits of the proposed cavern to the monitoring wells?*

The monitoring wells will be installed within 100 feet of and in the down gradient groundwater flow direction of the proposed bulk sample cavity.

5) *Page 4, Item G (Form 2, Item E on Form 1) – The list of chemical stored on site is limited to those brought in for the project. The nature of the bulk sample acquisition will likely add uranium to or include uranium in the water used for hydraulic cutting as well as the coarser and finer material collected "coarser material". Please clarify the ultimate disposition of:*

a. *The decanted "jet" water (after the completion of the cavern and collection of the bulk sample),*

Dependent on the potential UIC permit conditions, this water will be analysed and then either used for the cement backfill, shipped offsite for disposal at an appropriate waste facility, or stored onsite and allowed to evaporate.

b. *The "coarser material directed to a mobile storage bin" (reference the fourth paragraph on page 2 of the December 16, 2014 cover letter), and*

The coarser material is part of the bulk sample material. The material is to be used for mining and processing studies and ultimately disposed of at either a licensed uranium mill site or disposed at an appropriate waste facility.

c. *The "finer material directed to a mobile upright tanks".*

The finer material is part of the bulk sample material. The material is to be used for mining and processing studies and ultimately disposed of at either a licensed uranium mill site or disposed of at an appropriate waste facility.

6) *Page 6, Item 9 (Form 2, Item 4 on Form 1) – The bulk sample cavity abandonment description appears adequate to the Division. However, for the purpose of estimating the bond for the abandonment of the borehole and cavity, the Division will need an estimate of the total borehole/cavity volume. Please provide:*

a. *An estimated borehole/cavity volume and a basis for estimate, and*

200 tons of dry equivalent Echo Park sandstone is approximately 115 cubic yards.

b. *A unit cost for the cement-bentonite*

A shipment of 80 tons dry cement to the project location from Fremont Paving Redi Mix was quoted at $20,000. A shipment of 5 tons of bentonite to the project location was quoted by Preferred Pump at $2,000. This is the estimated volume of dry materials to be mixed with water and backfill the bulk sample cavity.

7) *Page 6, Item 10 (Form 2, Item 5 on Form 1) – The Division appreciates and accepts the commitment from Black Range to sample the mud pit contents and provide the Division a complete suite analysis for metals along with an analysis for uranium, radium, 226, and radium 228 per Stipulation No. 1, NOI Modification No. 2 (MD-02). No response necessary.*

8) *Page 7, Item 12 (Form 2, Item 7 on Form 1) – Modification No. 2 increased the seeding rate for Mountain Mahogany from 0.10 (original application) to 1.80. Modification No. 3 now reduces the rate back to the original 0.10. Please explain the reason for the change.*

Mountain Mahogany is to remain at 0.10 for this modification. The Mountain Mahogany species is more prevalent in the wooded locations of the NOI area and the proposed exercise is not anticipated to occur in a wooded location.

9) *UIC Permit – The Division was contacted by Craig Boomgaard, EPA's UIC Program about the need for an injection well permit. Mr. Boomgaard indicated he has spoken with Rod Grebb regarding the need for a UIC Class III Well Permit. Please comment on the status of that permit.*

BLR is aware for the potential need of a UIC permit from EPA. BLR will work with EPA to resolve this issue and comply with appropriate permit requirements prior to conducting this bulk sampling program.

10) *Geochemistry – The Division is aware that under certain conditions bicarbonate (HCO3-) may be used in the alkaline in situ leaching of uranium. Ms. Kay Hawklees's January 17, 2015 letter of objection provided a copy of, and references a white paper authored by Adrian Brown, P.E. Geohydrologist, Denver, Colorado; titled "Groundwater and Soil Conditions at the South T-Bar Ranch" (no publication or date). This paper suggests the Hansen orebody has a bicarbonate concentration of 3150 mg/l. Please provide some discussion on the known and/or expected geochemistry of the orebody and what effect the injection of water with dissolved oxygen used for the hydraulic cutting is expected to have on the solubility of uranium and other metals in the orebody.*

The cutting jet that will be used for this bulk sampling exercise is a water jet using formation and make-up water. Air injection will not be used in the cutting jet circuit. The capacity of dissolved oxygen concentrations in water at this altitude are expected to be below 9 mg/l.

The referenced paper is a discussion of water quality in the South T-Bar ranch area to provide potential home owners guidance when drilling a domestic water well. The paper advises that homeowners should not complete domestic wells within the mineral zone of the Echo Park due to natural poor water quality. The poor water quality is due to high TDS within the ore zone resulting in brackish water. The paper also notes that uranium concentrations are generally low. Low uranium concentrations are due to the chemically reducing environment of the ore zone. Under reducing conditions, uranium and other minerals will precipitate from water and form uranium-bearing minerals. The reducing conditions in the mineral zone is facilitated by the presence of organic material and pyrite (iron sulfide, fools gold) that consume oxygen.

In order to leach uranium in this reduced environment, the oxygen reducing capacity of the formation must be overcome by the introduction of strong oxidizers. In alkaline (carbonate-bicarbonate) waters found in the mineral zone, strong oxidizers such as liquid oxygen or peroxide would need to be introduced to effectively leach minerals in the reduction zone.

The oxygen-bearing water used in the cutting jet to collect samples will be withdrawn as part of the sample collection process and will be removed from the cavity. Further, the the low dissolved oxygen concentration in the cutting jet water will not overcome the massive reduction capacity of the formation due to the short contact time. This massive formation reduction capacity is documented by the continued presence of the mineral zone interacting with infiltrating meteoric water (rain and snow melt) that has a similar dissolved oxygen concentration as the cutting jet water will have.

11) *Source of water – The Division understands Black Range intends to purchase water for the borehole drilling and hydraulic cutting. Please provide a source and estimated volume of water.*

BLR will purchase and haul water required to drill the 12-inch borehole into the Echo Park formation from the Canon City Water Department. A volume of water suitable to fill a mid pit for drill fluid circulation and to make up for the volume of the drill hole will be required. This volume is typically in the range from 10,000 to 30,000 gallons of water, or two to six water truck loads.

12) *Borehole size – Please confirm the proposed 12-inch borehole will be adequate for the purpose of the bulk sample collection.*

BLR confirms that a 12-inch borehole will be adequate for the purpose of the bulk sample collection.

13) *Groundwater Baseline Monitoring – So that the Division may determine an acceptable groundwater monitoring plan for MD-03, please consult with the Division regarding previously collected baseline groundwater monitoring data in the vicinity of MD-03.*

Enclosed is groundwater data from the Hansen deposit area which has been collected on a quarterly basis since the 4th quarter, 2011.

Please do not hesitate to call me if you have any questions or comments.

Sincerely,

Patrick Siglin
Geologist

w/ Enclosure

cc: Tom Kaldenbach, DRMS, via email (w/ encl)
cc: Stephanie Carter, BLM – Royal Gorge, via email (w/ encl)
cc: Bill Giordano, Fremont County, via email (w/ encl)
cc: Sam Kozacek, Fremont County, via email (w/ encl)

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - MW-27-290

Station Name	Units	MW-27-290			MW-27-290			MW-27-290			MW-27-290			MW-27-290		
Field Sample ID		MWDG-1-131122			MWC-290-140318			MW-27-290.140528			MW-27-290.140910			MW-27-290-141110		
Sample Date		11/22/2013			3/18/2014			5/28/2014			9/10/2014			11/10/2014		
		Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC
Major Ions & Indicator Parameters																
pH, Lab	s.u.	8.2	H		7.9	H		8.2	H		8.2	H	J	8.2	H	
Electrical Conductivity (EC), Lab	uS/cm	582			610			655			640		J	633		
Alkalinity (as CaCO3)	mg/l	268			313	H		328	H		321		J	327		
Bicarbonate (as CaCO3)	mg/l	268			313	H		328	H		321		J	327		
Carbonate as CaCO3	mg/l	<2.	U		<2.	U H		<2.	U H		<2.	U	J	<2.	U	
Hydroxide (as CaCO3)	mg/l	<2.	U		<2.	U H		<2.	U H		<2.	U	J	<2.	U	
Hardness (as CaCO3)	mg/l	267			285			300			304			296		
Calcium, dissolved	mg/l	60.2			64.2			67			67			66.4		
Magnesium, dissolved	mg/l	28.3			30.2			32.3			33.1			31.5		
Potassium, dissolved	mg/l	3.7			3.7			3.8			3.8			3.8		
Sodium, dissolved	mg/l	24.6			25			25.2			25.6			24.9		
Chloride	mg/l	5.88			6.18			6.73			6.54			6.56		
Fluoride	mg/l	0.45	B		0.42	B		0.42			0.35			0.45		
Sulfate	mg/l	24.9			25.1			27			25.4		J	26.1		
Sulfide as S, total	mg/l	<0.02	U		<0.02	U		<0.02	U		<0.02	U	J	<0.02	U	
Total Dissolved Solids	mg/l	350			350			380			380		J	366		
Total Suspended Solids	mg/l	<5.	U		<5.	U		<5.	U		<5.	U	J	<5.	U	
Cyanide, WAD	mg/l	<0.003	U	J	<0.003	U		<0.003	U		<0.003	U	J	<0.003	U	
Nutrients																
Phosphorus, total as P	mg/l	0.17			0.15			0.15			0.14			0.16		J
Nitrate as N, dissolved	mg/l	0.42	H		0.7	H		1.06	H		1.11	H	J	0.93	H	
Nitrite as N, dissolved	mg/l	<0.01	U H		<0.01	U H		<0.01	U H		<0.01	U H	J	<0.01	U H	
Nitrate/Nitrite as N, dissolved	mg/l	0.42	H		0.7	H		1.06	H		1.11	H		0.93	H	
Nitrogen, ammonia	mg/l	<0.05	U		<0.05	U		<0.05	U		<0.05	U	J	<0.05	U	
Metals, dissolved																
Aluminum, dissolved	mg/l	<0.03	U		<0.03	U		<0.03	U		<0.03	U		<0.03	U	
Antimony, dissolved	mg/l	<0.0004	U		<0.0004	U		<0.0004	U		<0.0004	U		<0.0004	U	
Arsenic, dissolved	mg/l	0.0007	B		0.0007	B		0.0006	B		0.0007	B		0.0007	B	
Barium, dissolved	mg/l	0.094			0.087			0.092			0.095			0.09		
Beryllium, dissolved	mg/l	<0.01	U		<0.01	U		<0.01	U		<0.01	U		<0.01	U	
Boron, dissolved	mg/l	0.02	B		0.03	B		0.03	B		0.02	B		0.03	B	
Cadmium, dissolved	mg/l	<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U	
Chromium, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Cobalt, dissolved	mg/l	<0.01	U		<0.01	U		<0.01	U		<0.01	U		<0.01	U	
Copper, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Iron, dissolved	mg/l	<0.02	U		<0.02	U		<0.02	U		<0.02	U		<0.02	U	
Lead, dissolved	mg/l	<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U	
Lithium, dissolved	mg/l	<0.02	U		0.012	B		0.008	B		0.012	B		<0.008	U	
Mercury, dissolved	mg/l	<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U	
Manganese, dissolved	mg/l	0.012	B		<0.005	U		<0.005	U		<0.005	U		<0.005	U	
Molybdenum, dissolved	mg/l	<0.02	U		<0.02	U		<0.02	U		<0.02	U		<0.02	U	
Nickel, dissolved	mg/l	<0.0006	U		<0.0006	U		<0.0006	U		<0.0006	U		<0.0006	U	
Selenium, dissolved	mg/l	0.0024			0.0015			0.001			0.001			0.0012		
Silver, dissolved	mg/l	<0.00005	U		<0.00005	U		<0.00005	U		<0.00005	U		<0.00005	U	
Thallium, dissolved	mg/l	<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U	
Uranium, dissolved	mg/l	0.0571			0.0606			0.073			0.0705			0.0646		
Vanadium, dissolved	mg/l	0.006	B		<0.005	U		<0.005	U		0.005	B		<0.005	U	
Zinc, dissolved	mg/l	<0.01	U		<0.01	U		<0.01	U		<0.01	U		<0.01	U	
Radiologic																
Gross Alpha, total	pCi/l	25±5.5			28±6.8			29±6.6			16±5.3			29±6.2		
Gross Beta, total	pCi/l	18±4.2			19±4.7			16±4.6			15±4.3			16±4		
Radium 226 + AERI, total	pCi/l	0.41±0.22			0.85±0.33			0.39±0.75			0.52±0.28			0.32±0.3		J
Radium 228, total	pCi/l	0.99±0.67		J	1.2±0.97			0.34±0.62			0.53±0.57			0.93±0.53		
Thorium 228, total	pCi/l	-0.19±0.6			0.03±0.19			0.01±0.25			-0.19±0.25			0±0.21		
Thorium 230, total	pCi/l	-1.2±1.6			0.07±0.32			0.19±0.24			0.14±0.45			0.12±0.21		
Thorium 232, total	pCi/l	0.49±1.1			0±0.11			0.05±0.08			0.33±0.34			-0.05±0.07		
Lead 210, total	pCi/l	-6.7±2.6			0.57±1.7			1.2±1.6			-2.6±2			1.6±1.4		
Polonium 210, total	pCi/l	2.6±3			-0.75±2.5			-2±1.5			-0.19±1.8			-0.67±1.8		
QC																
Sum of Anions	meq/l	6.1			7			7.4			7.2			7.4		
Sum of Cations	meq/l	6.5			6.9			7.2			7.3			7.1		
Cation-Anion Balance	%	3.2			-0.7			-1.4			0.7			-2.1		
TDS (calculated)	mg/l	311			346			367			363			363		
TDS (ratio - measured/calculated)	Unitless	1.13			1.01			1.04			1.05			1.01		
Field Parameters																
Temperature, Field	deg C	10.4			5.6			11.2			6.2			8.7		
pH, Field	s.u.	8.1			7.48			7.65			7.57			7.55		
Electrical Conductivity (EC), Field	uS/cm				655			691			690			685		
Depth to Water	ft	12.92			79.89			10.42			12.22			12.41		
Water Elevation	ft															

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - MW-27-291

Station Name	Units	MW-27-291			MW-27-291			MW-27-291			MW-27-291			MW-27-291		
Field Sample ID		MW-DG-2-131120			MWC-291-140319			MW-27-291.140529			MW-27-291.140911			MW-27-291.141112		
Sample Date		11/20/2013			3/19/2014			5/29/2014			9/11/2014			11/12/2014		
		Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC
Major Ions & Indicator Parameters																
pH, Lab	s.u.	8.3	H		7.9	H		8	H		8	H		8	H	
Electrical Conductivity (EC), Lab	uS/cm	2320			2340			2720			2540			2880		
Alkalinity (as CaCO3)	mg/l	922			772			969			1060			1240		
Bicarbonate (as CaCO3)	mg/l	921			772			969			1060			1240		
Carbonate as CaCO3	mg/l	<2.	U		<2.	U		<2.	U		<2.	U		<2.	U	
Hydroxide (as CaCO3)	mg/l	<2.	U		<2.	U		<2.	U		<2.	U		<2.	U	
Hardness (as CaCO3)	mg/l	217			204			197			224			273		
Calcium, dissolved	mg/l	55.2			52.6			48.9			56.2			69.2		
Magnesium, dissolved	mg/l	19.3			17.7			18.3			20.2			24.3		
Potassium, dissolved	mg/l	22.1			23.8			23			27.7			31.6		
Sodium, dissolved	mg/l	456			462			383			483			574		
Chloride	mg/l	143			243			110			155			230		
Fluoride	mg/l	0.75			<1.	U		0.83			0.59	B		0.54	B	
Sulfate	mg/l	133			135			105			126			134		
Sulfide as S, total	mg/l	<3.	U		0.4	B		0.8			0.49			0.31	B	
Total Dissolved Solids	mg/l	1620			1430			1760			1650	H		1900		
Total Suspended Solids	mg/l	900			440			400	B		70			180	B	J
Cyanide, WAD	mg/l	<0.006	U	J	<0.006	U		<0.003	U		<0.003	U		<0.003	U	
Nutrients																
Phosphorus, total as P	mg/l	0.77			0.14			0.2			0.1			0.1		J
Nitrate as N, dissolved	mg/l	0.1	H		0.04	B H		<0.02	U H		<0.02	U H		<0.02	U H	
Nitrite as N, dissolved	mg/l	0.13	H		<0.01	U H		<0.01	U H		0.02	B H		<0.01	U H	
Nitrate/Nitrite as N, dissolved	mg/l	0.23	H		0.04	B H		<0.02	U H		<0.02	U H		<0.02	U H	
Nitrogen, ammonia	mg/l	1.77			1.46			0 43			0.27			0.37		
Metals, dissolved																
Aluminum, dissolved	mg/l	1.61			1.47			0.31			0.51			0.24		
Antimony, dissolved	mg/l	0.0007	B		<0.0004	U		<0.0004	U		<0.0004	U		<0.0004	U	
Arsenic, dissolved	mg/l	0.0043			0.005			0.0024			0.0033			0.0038		
Barium, dissolved	mg/l	0.166			0.136			0.096			0.111			0.123		
Beryllium, dissolved	mg/l	<0.01	U		<0.01	U		<0.01	U		<0.01	U		<0.01	U	
Boron, dissolved	mg/l	0.31			0.28			0.24			0.3			0.37		
Cadmium, dissolved	mg/l	0.0002	B		<0.0001	U		<0.0001	U		<0.0001	U		0.0002	B	
Chromium, dissolved	mg/l	0.0023			0.0029			0.002			0.0009	B		0.0007	B	
Cobalt, dissolved	mg/l	0.02	B		0.01	B		<0.01	U		<0.01	U		0.02	B	
Copper, dissolved	mg/l	0.0113			0.0089			0.0015	B		0.0011	B		0.002	B	
Iron, dissolved	mg/l	1.61			4.37			1.61			3.22			3.69		
Lead, dissolved	mg/l	0.0034			0.0033			0.0005			0.001			0.0011		
Lithium, dissolved	mg/l	0.47			0.521			0.436			0.624			0.789		
Mercury, dissolved	mg/l	<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U	
Manganese, dissolved	mg/l	0.748			1.16			0.797			0.832			1.05		
Molybdenum, dissolved	mg/l	0.02	B		<0.02	U		<0.02	U		<0.02	U		<0.02	U	
Nickel, dissolved	mg/l	0.0105			0.0105			0.0055			0.0097			0.013		
Selenium, dissolved	mg/l	0.0015			<0.0001	U		0.0001	B		0.0004			<0.0001	U	
Silver, dissolved	mg/l	0.00013	B		<0.00005	U		<0.00005	U		<0.0005	U		0.00008	B	
Thallium, dissolved	mg/l	0.0001	B		0.0001	B		<0.0001	U		<0.0001	U		0.0002	B	
Uranium, dissolved	mg/l	0.0233			0.0245			0.0162			0.0285			0.0337		
Vanadium, dissolved	mg/l	0.01	B		<0.005	U		<0.005	U		<0.005	U		<0.005	U	
Zinc, dissolved	mg/l	3.35			1.33			0.3			0.53			0.32		
Radiologic																
Gross Alpha, total	pCi/l	70±19			44±19			30±14			-6.8±11			27±13		
Gross Beta, total	pCi/l	64±14			80±19			56±15			63±17			60±14		
Radium 226 + AERI, total	pCi/l	8.8±1.3			4.4±0.96			2.1±1.3			2.4±0.81			3.5±1		J
Radium 228, total	pCi/l	30±13		J	5.7±2.6			3.2±1.5			1.5±1.5			6.4±2.4		
Thorium 228, total	pCi/l	7.1±16			0.17±1.5			0.12±1.7			0±0.97			0.4±1.3		
Thorium 230, total	pCi/l	18±19			2.7±2			0.05±1.8			0.46±0.98			1.5±1.4		
Thorium 232, total	pCi/l	5.76±12			0.76±1.1			1.24±1.4			0.36±0.71			0.68±0.63		
Lead 210, total	pCi/l	2.5±2.3		J	7.2±4.3			-5.8±8.6			-220±110			-5.1±6.5		
Polonium 210, total	pCi/l	5.5±2.3			-0.97±1.9			3.4±3.4		J	3±2.3			0.8±2		
QC																
Sum of Anions	meq/l	25			25			24.7			28			34		
Sum of Cations	meq/l	26			26			21.6			27			32		
Cation-Anion Balance	%	2			2			-6.7			-1.8			-3		
TDS (calculated)	mg/l	1390			1410			1280			1520			1830		
TDS (ratio - measured/calculated)	Unitless	1.17			1.01			1.38			1.09			1.04		
Field Parameters																
Temperature, Field	deg C	9.8			4.7			15.8			12.7			4.0		
pH, Field	s.u.	6.92			6.95			7.08			6.94			7.00		
Electrical Conductivity (EC), Field	uS/cm	2450			2670			1970			2770			3340		
Depth to Water	ft	3.2			1.7			2.34			2.25			5.84		
Water Elevation	ft															

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - MW-27-292

Station Name	Units	MW-27-292			MW-27-292			MW-27-292			MW-27-292			MW-27-292		
Field Sample ID		MWF-2-131122			MWC-292-140318			MW-27-292.140528			MW-27-292.140911			MW-27-292.141112		
Sample Date		11/22/2013			3/18/2014			5/28/2014			9/11/2014			11/12/2014		
		Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC
Major Ions & Indicator Parameters																
pH, Lab	s.u.	8.2	H		8.1	H		8.1	H		8.2	H		8.2	H	
Electrical Conductivity (EC), Lab	uS/cm	526			527			491			522			520		
Alkalinity (as CaCO3)	mg/l	252			218	H		261	H		257			263		
Bicarbonate (as CaCO3)	mg/l	252			218	H		261	H		257			263		
Carbonate as CaCO3	mg/l	<2.	U		<2.	U	H	<2.	U	H	<2.	U		<2.	U	
Hydroxide (as CaCO3)	mg/l	<2.	U		<2.	U	H	<2.	U	H	<2.	U		<2.	U	
Hardness (as CaCO3)	mg/l	242			239			236			237			240		
Calcium, dissolved	mg/l	54.7			54.1			53.8			53.3			53.9		
Magnesium, dissolved	mg/l	25.5			25.2			24.8			25.3			25.7		
Potassium, dissolved	mg/l	3.6			3.4			3.4			3.6			3.6		
Sodium, dissolved	mg/l	21.7			21.4			20.9			21.6			21		
Chloride	mg/l	5.35			5.1			5.59			5.31			5.09		
Fluoride	mg/l	0.34	B		0.34	B		0.34			0.35			0.38		
Sulfate	mg/l	20.9			19.4			22.8			23.2			24.5		
Sulfide as S, total	mg/l	<0.02	U		<0.02	U		<0.02	U		<0.02	U		<0.02	U	
Total Dissolved Solids	mg/l	320			320			300			300	H		320		
Total Suspended Solids	mg/l	<5.	U		<5.	U		<5.	U		<5.	U		<5.	U	
Cyanide, WAD	mg/l	<0.003	U	J	<0.003	U		<0.003	U		<0.003	U		<0.003	U	
Nutrients																
Phosphorus, total as P	mg/l	0.2			0.19			0.19			0.18			0.22		J
Nitrate as N, dissolved	mg/l	0.19	H		0.53	H		0.58	H		0.32	H	J	0.25	H	
Nitrite as N, dissolved	mg/l	<0.01	U	H	<0.01	U	H	<0.01	U	H	<0.01	U	H	<0.01	U	H
Nitrate/Nitrite as N, dissolved	mg/l	0.19	H		0.53	H		0.58	H		0.32	H	J	0.25	H	
Nitrogen, ammonia	mg/l	<0.05	U		<0.05	U		<0.05	U		<0.05	U		<0.05	U	
Metals, dissolved																
Aluminum, dissolved	mg/l	<0.03	U		<0.03	U		<0.03	U		<0.03	U		0.03	B	
Antimony, dissolved	mg/l	<0.0004	U		<0.0004	U		<0.0004	U		<0.0004	U		<0.0004	U	
Arsenic, dissolved	mg/l	0.0008	B		0.0008	B		0.0006	B		0.0007	B		0.0008	B	
Barium, dissolved	mg/l	0.056			0.051			0.051			0.055			0.057		
Beryllium, dissolved	mg/l	<0.01	U		<0.01	U		<0.01	U		<0.01	U		<0.01	U	
Boron, dissolved	mg/l	0.03	B		0.03	B		0.03	B		0.02	B		0.04	B	
Cadmium, dissolved	mg/l	<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U	
Chromium, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Cobalt, dissolved	mg/l	<0.01	U		<0.01	U		<0.01	U		<0.01	U		<0.01	U	
Copper, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Iron, dissolved	mg/l	<0.02	U		<0.02	U		<0.02	U		<0.02	U		<0.02	U	
Lead, dissolved	mg/l	<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U	
Lithium, dissolved	mg/l	<0.02	U		0.011	B		<0.008	U		<0.008	U		0.01	B	
Mercury, dissolved	mg/l	<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U	
Manganese, dissolved	mg/l	<0.005	U		<0.005	U		<0.005	U		0.021	B		<0.005	U	
Molybdenum, dissolved	mg/l	<0.02	U		<0.02	U		<0.02	U		<0.02	U		<0.02	U	
Nickel, dissolved	mg/l	<0.0006	U		<0.0006	U		<0.0006	U		<0.0006	U		<0.0006	U	
Selenium, dissolved	mg/l	0.0008			0.0007			0.0008			0.0007			0.0009		
Silver, dissolved	mg/l	<0.00005	U		<0.00005	U		<0.00005	U		<0.00005	U		<0.00005	U	
Thallium, dissolved	mg/l	<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U	
Uranium, dissolved	mg/l	0.0094			0.0082			0.0088			0.0094			0.0097		
Vanadium, dissolved	mg/l	<0.005	U		<0.005	U		<0.005	U		<0.005	U		<0.005	U	
Zinc, dissolved	mg/l	<0.01	U		<0.01	U		<0.01	U		<0.01	U		<0.01	U	
Radiologic																
Gross Alpha, total	pCi/l	8.1±3.5			3.5±3.4			3.3±2.9			0.98±3			8.1±4.3		
Gross Beta, total	pCi/l	4.7±3.4			6.5±4.3			5.8±3.8			7.2±4.3			13±5.1		
Radium 226 + AERI, total	pCi/l	0.89±0.48			1.4±0.4			0.11±0.23			0.65±0.35			47±2.5		J
Radium 228, total	pCi/l	2.9±0.86		J	0.45±0.43			-0.05±0.73			0.23±0.63			1.5±0.63		
Thorium 228, total	pCi/l	0±0.21			0.15±0.33			0.36±0.38			-0.17±0.32			0±0.21		
Thorium 230, total	pCi/l	-0.01±0.46			0.19±0.28			0.08±1.1			-0.07±0.36			0.15±0.22		
Thorium 232, total	pCi/l	0.05±0.26			-0.13±0.12			-0.34±0.88			-0.24±0.19			0±0.11		
Lead 210, total	pCi/l	2.7±2.3		J	0.07±1.9			-0.82±1.5			0.51±2.1			4.5±1.5		
Polonium 210, total	pCi/l	-0.34±1.3			-1.6±2.2			-0.94±3.6			1.1±1.8			0.86±1.8		
QC																
Sum of Anions	meq/l	5.7			5			5.9			5.8			6		
Sum of Cations	meq/l	5.9			5.8			5.7			5.8			5.8		
Cation-Anion Balance	%	1.7			7.4			-1.7			0			-1.7		
TDS (calculated)	mg/l	284			262			293			291			296		
TDS (ratio - measured/calculated)	Unitless	1.13			1.22			1.02			1.03			1.08		
Field Parameters																
Temperature, Field	deg C	9.3			3.6			11.1			6.9			4.9		
pH, Field	s.u.	8.1			7.41			7.61			7.45			7.00		
Electrical Conductivity (EC), Field	uS/cm	588			522			581			560			594		
Depth to Water	ft	14.07			13.77			13.07			14.05					
Water Elevation	ft															

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - MW-27-293

Station Name	Units	MW-27-293			MW-27-293			MW-27-293			MW-27-293			MW-27-293		
Field Sample ID		MWF-2-131122			MWC-293-140319			MW-27-293.140528			MW-27-293.140911			MW-27-293.141112		
Sample Date		11/22/2013			3/19/2014			5/28/2014			9/11/2014			11/12/2014		
		Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC
Major Ions & Indicator Parameters																
pH, Lab	s.u.	7.9	H		7.8	H		7.8	H		7.4	H		7.8	H	
Electrical Conductivity (EC), Lab	uS/cm	6800			7010			7020			6910			6870		
Alkalinity (as CaCO3)	mg/l	2060			1830			1790			2230			2260		
Bicarbonate (as CaCO3)	mg/l	2060			1830			1790			2230			2260		
Carbonate as CaCO3	mg/l	<2.	U		<2.	U		<2.	U		<2.	U		<2.	U	
Hydroxide (as CaCO3)	mg/l	<2.	U		<2.	U		<2.	U		<2.	U		<2.	U	
Hardness (as CaCO3)	mg/l	193			162			192			191			182		
Calcium, dissolved	mg/l	46			40.2			46.2			45			44		
Magnesium, dissolved	mg/l	19			15			18.5			19			17.5		
Potassium, dissolved	mg/l	61			52			61.4			61			56.9		
Sodium, dissolved	mg/l	1580			1380			1600			1570			1490		
Chloride	mg/l	1130			1110			1150			1110			1150		
Fluoride	mg/l	<5.	U		<5.	U		3.6	B		5.08			5.46		
Sulfate	mg/l	55.1	B		60.7	B		57.5	B		61.3			69.3		
Sulfide as S, total	mg/l	<0.2	U		0.04	B		<0.03	U		<0.08	U		<0.08	U	
Total Dissolved Solids	mg/l	4130	H		4220	H		4470			4320			4120		
Total Suspended Solids	mg/l	118			690			61			43			860		J
Cyanide, WAD	mg/l	<0.003	U	J	<0.003	U		<0.003	U		<0.003	U		<0.003	U	
Nutrients																
Phosphorus, total as P	mg/l	0.08			0.11			0.05			0.04	B		0.14		J
Nitrate as N, dissolved	mg/l	<0.02	U	H	<0.02	U	H	<0.02	U	H	<0.02	U	H	<0.02	U	H
Nitrite as N, dissolved	mg/l	<0.01	U	H	<0.01	U	H	<0.01	U	H	<0.01	U	H	<0.01	U	H
Nitrate/Nitrite as N, dissolved	mg/l	<0.02	U	H	<0.02	U	H	<0.02	U	H	<0.02	U	H	<0.02	U	H
Nitrogen, ammonia	mg/l	<0.05	U		<0.05	U		<0.05	U		<0.05	U		<0.05	U	
Metals, dissolved																
Aluminum, dissolved	mg/l	<0.2	U		<0.2	U		0.04	B		<0.2	U		0.07	B	
Antimony, dissolved	mg/l	<0.002	U		<0.002	U		<0.002	U		<0.002	U		<0.002	U	
Arsenic, dissolved	mg/l	0.127			0.138			0.142			0.137			0.15		
Barium, dissolved	mg/l	0.12			0.1			0.114			0.11			0.109		
Beryllium, dissolved	mg/l	<0.05	U		<0.05	U		0.01	B		<0.05	U		0.01	B	
Boron, dissolved	mg/l	5.4			4.46			5.47			5.46			5.24		
Cadmium, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Chromium, dissolved	mg/l	<0.003	U		<0.003	U		<0.003	U		<0.003	U		<0.003	U	
Cobalt, dissolved	mg/l	<0.05	U		<0.05	U		<0.01	U		<0.05	U		<0.01	U	
Copper, dissolved	mg/l	<0.003	U		<0.003	U		<0.003	U		<0.003	U		<0.003	U	
Iron, dissolved	mg/l	2.5			1.9			1.93			1.9			1.72		
Lead, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Lithium, dissolved	mg/l	3.1			2.6			3.15			3.13			3.05		
Mercury, dissolved	mg/l	<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U	
Manganese, dissolved	mg/l	0.22			0.14			0.164			0.13			0.127		
Molybdenum, dissolved	mg/l	<0.1	U		<0.1	U		<0.02	U		<0.1	U		<0.02	U	
Nickel, dissolved	mg/l	0.005	B		<0.003	U		<0.003	U		<0.003	U		<0.003	U	
Selenium, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Silver, dissolved	mg/l	<0.0003	U		<0.0003	U		<0.0003	U		<0.0003	U		<0.0003	U	
Thallium, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Uranium, dissolved	mg/l	0.0626			0.056			0.0611			0.0674			0.0712		
Vanadium, dissolved	mg/l	<0.03	U		<0.03	U		<0.005	U		<0.03	U		<0.005	U	
Zinc, dissolved	mg/l	0.09	B		<0.05	U		<0.01	U		<0.05	U		<0.01	U	
Radiologic																
Gross Alpha, total	pCi/l	330±63			300±77			270±59			190±50			220±47		
Gross Beta, total	pCi/l	170±42			180±57			130±40			160±37			150±31		
Radium 226 + AERI, total	pCi/l	100±5.7			100±4.4			80±5.2			110±6.4			130±5.3		J
Radium 228, total	pCi/l	7.5±1.2		J	7.9±1.4			4.4±1.5			4.7±1.4			20±1.8		
Thorium 228, total	pCi/l	0.71±0.68			0.28±1.7			0.03±1.1			0.28±0.78			1±1.7		
Thorium 230, total	pCi/l	9.1±1.6			3±2			1.8±1.6			0.84±0.9			6.9±2.2		
Thorium 232, total	pCi/l	0.38±0.5			0.28±1			0.49±0.88			0.13±0.57			0.94±0.99		
Lead 210, total	pCi/l	5.8±2.7		J	15±4.7			7.6±2			180±120			52±9.1		
Polonium 210, total	pCi/l	14±3.5			3.6±2.3			1.4±2.9			10±3.3			38±5.6		
QC																
Sum of Anions	meq/l	74			69			69			77			79		
Sum of Cations	meq/l	75			65			76			75			71		
Cation-Anion Balance	%	0.7			-3			4.8			-1.3			-5.3		
TDS (calculated)	mg/l	4130			3760			4030			4230			4210		
TDS (ratio - measured/calculated)	Unitless	1			1.12			1.11			1.02			0.98		
Field Parameters																
Temperature, Field	deg C	10.2			5			14.8			10.4			7.6		
pH, Field	s.u.	7.8			6.53			7.37			6.36			6.5		
Electrical Conductivity (EC), Field	uS/cm				7100			6510			7120			7330		
Depth to Water	ft	0						0			0			0		
Water Elevation	ft															

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - MW-27-294

Station Name	Units	MW-27-294			MW-27-294			MW-27-294			MW-27-294			MW-27-294		
Field Sample ID		MW-F-3			MWC-294-140319			MW-27-294.140529			MW-27-294.140911			MW-27-294.141112		
Sample Date		11/22/2013			3/19/2014			5/29/2014			9/11/2014			11/12/2014		
		Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC
Major Ions & Indicator Parameters																
pH, Lab	s.u.	7.7	H		7.4	H		7.6	H		7.5	H		7.7	H	
Electrical Conductivity (EC), Lab	uS/cm	7220			7300			6870			7260			7390		
Alkalinity (as CaCO3)	mg/l	2750			2770			2820			2830			2800		
Bicarbonate (as CaCO3)	mg/l	2750			2770			2820			2830			2800		
Carbonate as CaCO3	mg/l	<2.	U		<2.	U		<2.	U		<2.	U		<2.	U	
Hydroxide (as CaCO3)	mg/l	<2.	U		<2.	U		<2.	U		<2.	U		<2.	U	
Hardness (as CaCO3)	mg/l	476			395			479			474			460		
Calcium, dissolved	mg/l	121			102			121			119			117		
Magnesium, dissolved	mg/l	42.3			34			43			43			40.8		
Potassium, dissolved	mg/l	64.4			53			64			64			61.7		
Sodium, dissolved	mg/l	1630			1370			1610			1640			1600		
Chloride	mg/l	976			957			948			972			1000		
Fluoride	mg/l	<5.	U		<5.	U		<2.5	U		<2.5	U		<2.5	U	
Sulfate	mg/l	101	B		115	B		98.1	B		90.8	B		96	B	
Sulfide as S, total	mg/l	<0.2	U		0.2			0.41			0.46			0.24		
Total Dissolved Solids	mg/l	4630	H		4000			4350			4600	H		4410	H	
Total Suspended Solids	mg/l	33			34			61			36			30		J
Cyanide, WAD	mg/l	<0.003	U	J	<0.003	U		<0.003	U		<0.003	U		<0.03	U	
Nutrients																
Phosphorus, total as P	mg/l	0.04	B		0.04	B		0.05			0.05			0.05		J
Nitrate as N, dissolved	mg/l	<0.02	U	H	<0.02	U	H	0.06	B	H	<0.02	U	H	<0.02	U	H
Nitrite as N, dissolved	mg/l	<0.01	U	H	<0.01	U	H	<0.01	U	H	<0.01	U	H	<0.01	U	H
Nitrate/Nitrite as N, dissolved	mg/l	<0.02	U	H	<0.02	U	H	0.06	B	H	<0.02	U	H	<0.02	U	H
Nitrogen, ammonia	mg/l	<0.05	U		0.14	B		0.08	B		0.14	B		0.09	B	
Metals, dissolved																
Aluminum, dissolved	mg/l	0.05	B		<0.2	U		<0.3	U		<0.2	U		<0.2	U	
Antimony, dissolved	mg/l	<0.002	U		<0.002	U		<0.002	U		<0.002	U		<0.002	U	
Arsenic, dissolved	mg/l	0.012			0.007			0.012			0.01			0.011		
Barium, dissolved	mg/l	0.17			0.16			0.14	B		0.16			0.16		
Beryllium, dissolved	mg/l	<0.01	U		<0.05	U		<0.1	U		<0.05	U		<0.01	U	
Boron, dissolved	mg/l	3.29			2.5			3.1			3.34			3.38		
Cadmium, dissolved	mg/l	0.0005	B		0.0007	B		<0.0005	U		<0.0005	U		0.0009	B	
Chromium, dissolved	mg/l	<0.003	U		<0.003	U		<0.003	U		<0.003	U		<0.003	U	
Cobalt, dissolved	mg/l	0.03	B		<0.05	U		<0.1	U		<0.05	U		0.02	B	
Copper, dissolved	mg/l	<0.003	U		<0.003	U		<0.003	U		<0.003	U		<0.003	U	
Iron, dissolved	mg/l	2.22			5.6			6.9			8.7			6.98		
Lead, dissolved	mg/l	<0.0005	U		<0.0005	U		0.0018	B		<0.0005	U		<0.0005	U	
Lithium, dissolved	mg/l	2.79			2.27			2.85			2.92			3		
Mercury, dissolved	mg/l	<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U	
Manganese, dissolved	mg/l	0.997			1.08			1.13			0.88			0.799		
Molybdenum, dissolved	mg/l	<0.02	U		<0.1	U		<0.2	U		<0.1	U		<0.02	U	
Nickel, dissolved	mg/l	0.035			0.03			0.026			0.019	B		0.018	B	
Selenium, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Silver, dissolved	mg/l	<0.0003	U		<0.0003	U		<0.0003	U		<0.0003	U		<0.0003	U	
Thallium, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U	
Uranium, dissolved	mg/l	0.0559			0.0539			0.0527			0.0634			0.0672		
Vanadium, dissolved	mg/l	<0.005	U		<0.03	U		<0.05	U		<0.03	U		<0.005	U	
Zinc, dissolved	mg/l	2.93			<0.05	U		<0.1	U		<0.05	U		<0.01	U	
Radiologic																
Gross Alpha, total	pCi/l	69±39			130±50			110±42			29±34			50±31		
Gross Beta, total	pCi/l	78±41			130±47			130±41			98±42			60±36		
Radium 226 + AERI, total	pCi/l	7.8±1.2			5.9±0.9			7±1.7			8.3±1.3			8.3±1.2		J
Radium 228, total	pCi/l	9.6±1.6		J	10±1.4			4.1±0.91			6.5±1.5			24±3.3		
Thorium 228, total	pCi/l	2±3			-2.1±4.3			0.12±1.5			0.3±0.98			-0.12±0.68		
Thorium 230, total	pCi/l	-1.4±11			-0.67±2.4			1±1.5			-0.21±0.6			0.39±0.72		
Thorium 232, total	pCi/l	1.04±9.5			0.64±2.3			-0.12±0.8			0.68±0.47			0.18±0.43		
Lead 210, total	pCi/l	6.5±2.5		J	-2.5±4.4			-5.2±3			-7.4±5.5			1.7±5.9		
Polonium 210, total	pCi/l	0.63±1.1			-0.56±1.7			-0.29±1.3			0.63±2			-0.27±1.1		
QC																
Sum of Anions	meq/l	84			85			85			86			86		
Sum of Cations	meq/l	83			70			82.5			84			82		
Cation-Anion Balance	%	-0.6			-9.7			-1.5			-1.2			-2.4		
TDS (calculated)	mg/l	4590			4300			4610			4660			4630		
TDS (ratio - measured/calculated)	Unitless	1.01			0.93			0.94			0.99			0.95		
Field Parameters																
Temperature, Field	deg C	8.5			6.1			12.9			11.02			5.9		
pH, Field	s.u.	7.7			6.5			6.28			6.35			7.00		
Electrical Conductivity (EC), Field	uS/cm				7190			7030			7450			7800		
Depth to Water	ft	0			0			10.19			3.9			12.67		
Water Elevation	ft															

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - MWC-109

Station Name	Units	MWC-109	MWC-109	MWC-109	MWC-109	MWC-109	MWC-109	MWC-109	MWC-109	MWC-109	MWC-109	MWC-109	MWC-109	MWC-109
Field Sample ID		MWC109-111116	MWC-109-120313	MWC-109-120611	MWC-109-120910	MWC-109-121126	MWC-109-130318	MWC-109-130610	MWC-109-130909	MWC-109-131120	MWC-109-140317	MWC-109.140528	MWC-109.140909	MWC-109-141110
Sample Date		11/16/2011	3/13/2012	6/11/2012	9/10/2012	11/26/2012	3/18/2013	6/10/2013	9/9/2013	11/20/2013	3/17/2014	5/28/2014	9/9/2014	11/10/2014
		Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC
Major Ions & Indicator Parameters														
pH, Lab	s.u.	8.2 H	8.1 H	8.3 H T	8 H T	8.2 H	8.2 H	8.2 H	8.2 H	8.2 H	8.1 H	8.1 H	8.1 H	8.2 H
Electrical Conductivity (EC), Lab	uS/cm	536	510	628 T	566 T	553	749	626 T	639 T	621	577	654	613	586
Alkalinity (as CaCO3)	mg/l	259	248	312 T	251 T	250	237	271 T	275 T	266	255 H	306 H	289	272
Bicarbonate (as CaCO3)	mg/l	259	249	312 T	251 T	250	237	271 T	275 T	266	255 H	306 H	289	272
Carbonate as CaCO3	mg/l	<2. U	<2. U	<2. U T	<2. U T	<2. U	<2. U	<2. U T	<2. U T	<2. U	<2. U H	<2. U H	<2. U	<2. U
Hydroxide (as CaCO3)	mg/l	<2. U	<2. U	<2. U T	<2. U T	<2. U	<2. U	<2. U T	<2. U T	<2. U	<2. U H	<2. U H	<2. U	<2. U
Hardness (as CaCO3)	mg/l	232	217	236 T	224	246	313	258	250	262	235	241	233	226
Calcium, dissolved	mg/l	61.1	56.8	62.2	59.3	65.2	82.5	68.5	66.7	69.7	62.3	64.6	62.4	60.5
Magnesium, dissolved	mg/l	19.2	18.2	19.5	18.4	20.3	26	21.1	20.3	21.3	19.2	19.3	18.7	18.2
Potassium, dissolved	mg/l	4.9	4.4	5.2	5.1	5.1	4.7	4.6	4.8	5	4.3	4.9	4.6	4.7
Sodium, dissolved	mg/l	36.4	30.2	55.4	37.8	30.6	42	36.3	32.2	32.3	29.1	48.6	39.7	34.6
Chloride	mg/l	12.59	12.73	13.87	13.98	15.37	23.64	20.8	19.4	20.3	19	14.6	12.6	15
Fluoride	mg/l	0.38 B	0.42 B	0.4 B	0.42 B	0.44 B	0.55	0.54	0.52	0.5	0.45 B	0.43	0.43	0.5
Sulfate	mg/l	26.77	27.27	27.33 T	29.98 T	28.41	125.69	54.1 T	36.5 T	33.3	34.5	33.8	27.4	32.1
Sulfide as S, total	mg/l		<0.02 U	<0.02 U T	<0.02 U T	<0.02 U	<0.02 U	<0.02 U T	<0.02 U T	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U
Total Dissolved Solids	mg/l	360	320 H	380 T	360	340	480	380 T	384 T	380	350	370	360	334
Total Suspended Solids	mg/l	34	22	44 T	67	120	10 B J	70 J T	59 T	48	20	17 B	15 B	139 J
Cyanide, WAD	mg/l	<0.003 U	<0.003 U J	<0.003 U J	<0.003 U T	<0.003 U	<0.003 U	<0.003 U T	<0.003 U J	<0.003 U J	<0.003 U	<0.003 U	<0.003 U	<0.003 U
Nutrients														
Phosphorus, total as P	mg/l	0.36	0.16	0.24 T	0.31 T	0.9	0.12	0.2 T	0.34 T	0.4	0.15	0.08	0.06	0.16 J
Nitrate as N, dissolved	mg/l	0.06 B H	0.11 H	0.03 B H T	0.06 B H T	0.05 B H	0.64 H	0.13 H	0.08 B H T	0.07 B H	0.13 H	<0.02 U H	0.07 B H J	0.07 B H
Nitrite as N, dissolved	mg/l	<0.01 H U	<0.01 U H	<0.01 U H T	<0.01 U H T	<0.01 U H	<0.01 U H	<0.01 U H	<0.01 U H T	<0.01 U H	<0.01 U H	<0.01 U H	<0.01 U H	<0.01 U H
Nitrate/Nitnte as N, dissolved	mg/l	0.06 H B	0.11 H	0.03 B H T	0.06 B H T	0.05 B H	0.64 H	0.13 H	0.08 B H T	0.07 B H	0.13 H	<0.02 U H	0.07 B H J	0.07 B H
Nitrogen, ammonia	mg/l	<0.05 U	<0.05 U	<0.05 U T	<0.05 U T	<0.05 U	<0.05 U	<0.05 U	<0.05 U T	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U
Metals, dissolved														
Aluminum, dissolved	mg/l	<0.03 U	<0.03 U	0.05 B	<0.03 U	<0.03 U	<0.03 U	<0.03 U	<0.03 U	<0.03 U	<0.03 U	<0.03 U	<0.03 U	<0.03 U
Antimony, dissolved	mg/l	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U
Arsenic, dissolved	mg/l	0.0075	0.0053	0.0059	0.017 J	0.005	0.0041	0.0042	0.0041	0.0046	0.0043	0.0028	0.0033	0.0045
Barium, dissolved	mg/l	0.212	0.195	0.25	0.246	0.207	0.214	0.195	0.211	0.222	0.192	0.212	0.206	0.198
Beryllium, dissolved	mg/l	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U
Boron, dissolved	mg/l	0.04 B	0.03 B	0.05 B	0.04 B	0.05 B	0.04 B	0.03 B	0.03 B	0.03 B	0.03 B	0.06	0.05	0.03 B
Cadmium, dissolved	mg/l	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U
Chromium, dissolved	mg/l	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U
Cobalt, dissolved	mg/l	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U
Copper, dissolved	mg/l	<0.0005 U	<0.0005 U	<0.0005 U	0.0006 B	<0.0005 U	0.001 B	0.0017 B	0.0006 B	0.0006 B	<0.0005 U	0.0009 B	0.0008 B	0.0007 B
Iron, dissolved	mg/l	0.04 B	<0.02 U	<0.02 U	0.6 J	<0.02 U	0.05 B	<0.02 U	<0.02 U	<0.02 U	0.04 B	<0.02 U	<0.02 U	0.02 B
Lead, dissolved	mg/l	<0.0001 U	<0.0001 U	<0.0001 U	0.0001 B	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U
Lithium, dissolved	mg/l	0.03 B	0.02 B	0.05 B	0.04 B	0.02 B	0.02 B	0.02 B	0.02 B	0.02 B	0.022 B	0.043	0.037 B	0.027 B
Mercury, dissolved	mg/l	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U
Manganese, dissolved	mg/l	0.257	0.068	0.392	0.264 J	0.098	0.259	0.093	0.143	0.18	0.213	0.068	0.285	0.161
Molybdenum, dissolved	mg/l	<0.01 U	<0.01 U	0.01 B	<0.01 U	<0.01 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U
Nickel, dissolved	mg/l	0.0006 B	<0.0006 U	0.0007 B	0.0008 B	<0.0006 U	0.0008 B	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	0.0014 B	<0.0006 U
Selenium, dissolved	mg/l	0.0007	0.0011	<0.0001 U	0.0006	0.0006	0.0084	0.0014	0.0008	0.0012	0.0012	<0.0001 U	0.0001 B	0.0006
Silver, dissolved	mg/l	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U
Thallium, dissolved	mg/l	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U
Uranium, dissolved	mg/l	0.011	0.0112	0.008	0.0088	0.0118	0.0308	0.0309	0.0236	0.0236	0.0154	0.0122	0.012	0.0138
Vanadium, dissolved	mg/l	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	0.01 B	0.007 B	<0.005 U	0.007 B	<0.005 U	<0.005 U	<0.005 U	<0.005 U
Zinc, dissolved	mg/l	<0.01 U	<0.01 U	0.02 B	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U
Radiologic														
Gross Alpha, total	pCi/l	110±2.4	100±11	110±10	32±8.9 J	110±12	22±5.5	28±6.2	60±8.5	37±6.7	18±5.5	13±4.5	7.4±4.7	9.8±4
Gross Beta, total	pCi/l	76±4.3	63±5.7	67±4.9	27±7	69±5.8	19±4.1	24±4.8	40±5.1	44±5.2	15±4.4	13±4.1	4.9±5.2	9.5±4.1
Radium 226 + AERI, total	pCi/l	45±0.65	62±3.1	7±0.5	11±1	37±1.9	3.7±0.67	10±1.1 J	8.8±0.86 J	14±1.1	3.2±0.56	4.1±0.54	1.8±0.45	4±0.63 J
Radium 228, total	pCi/l	12±0.91	4.9±0.67	11±0.9	9±0.78	11±0.66	2.3±1.2	6±1.3	7.7±1.6 J	6.7±0.87 J	2.2±0.67	1.9±0.76	1.7±0.77	2.5±0.64
Thorium 228, total	pCi/l	18±0.25	18±1.6	11±1.2	9.6±1.2	12±1.4	0.97±0.81	4.6±0.8	6.3±1.4	4±1.1	0.98±0.48	1.9±0.75	0.47±0.35	0.51±0.81
Thorium 230, total	pCi/l	0.22±0.65	0.65±0.52 J	-0.03±0.38	-0.75±0.62	-0.04±0.45	0.09±0.6	-0.15±0.36	0.18±0.74	-0.24±0.52	0.37±0.36	0.12±0.61	0.33±0.32	-1±1.7
Thorium 232, total	pCi/l	-0.01±0.25	0.21±0.42	-0.03±0.11	0±0.43	-0.12±0.2	-0.06±0.31	0±0.15	-0.06±0.28	-0.22±0.32	0±0.19	-0.05±0.27	-0.03±0.15	0.37±1.4
Lead 210, total	pCi/l	17±14	6.8±1.7	20±2.8	8.6 J	50±9.5	-2.7±4	-5.1±5	12±2.7	4.8±2.2 J	0.79±1.5	-2.5±2.6	-3.6±2	-2.7±7.5
Polonium 210, total	pCi/l	13±1.1	13±3.1	12±5.7	4.6	12±4.7	0.71±2.4	1.3±2.2	-3.5±2.8 J	8.9±2.2	0.61±1.8	1.2±2.1	2.7±1.8	2.1±1.9
QC														
Sum of Anions	meq/l	6.1	5.9	7.2	6.1	6.1	8.1	7.2	6.8	6.6	6.4	7.3	6.7	6.6
Sum of Cations	meq/l	6.4	5.8	7.3	6.3	6.4	8.3	6.9	6.6	6.8	6.1	7.1	6.5	6.2
Cation-Anion Balance	%	2.4	-0.9	0.7	1.6	2.4	1.2	-2.1	-1.5	1.5	-2.4	-1.4	-1.5	-3.1
TDS (calculated)	mg/l	317	300	372 T	317 T	316	450	369	346	342	323	373	343	332
TDS (ratio - measured/calculated)	Unitless	1.14	1.07	1.02 T	1.14 T	1.08	1.07	1.03	1.11	1.11	1.08	0.99	1.05	1.01
Field Parameters														
Temperature, Field	deg C		8.8	12.4	10.6	9.4	7.2	10.5	11.3	9.8	4.9	8.6	6.4	9.9
pH, Field	s.u.		7.37	7.05	6.76	6.74	7.26	7.24	7.31	7.11	7.09	7.3	7.35	7.59
Electrical Conductivity (EC), Field	uS/cm		596	669	365	742	782	687	711	697	609	707	695	664
Depth to Water	ft	9.9	9.82	10.16	10.43	10.13	9.82	10.63	10.32	10.34	10.22	9.67	10.05	10.7
Water Elevation	ft											8044.08	8045.38	

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - MWC-21-150

Station Name	Units	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150	MWC-21-150
Field Sample ID		MWC21-150-111115	WC-21-150-1203	WC-21-150-12061	WC-21-150-12091	WC-21-150-12112	WC-21-150-13032	MWC-21-150-13061	MWC-21-150-13090	WC-21-150-13112	MWC-150-140319	WC-21-150.14052	MWC-21-150.14091	MWC-21-150.141112	
Sample Date		11/15/2011	3/14/2012	6/13/2012	9/11/2012	11/29/2012	3/20/2013	6/14/2013	9/9/2013	11/22/2013	3/19/2014	5/29/2014	9/11/2014	11/12/2014	
		Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	
Major Ions & Indicator Parameters															
pH, Lab	s.u.	7.6 H	R	R	7.7 H T	7.6 H	8.1 H	7.5 H	7.9 H	7.8 H	7.5 H	7.8 H	7.4 H	7.7 H	
Electrical Conductivity (EC), Lab	uS/cm	2530	R	R	3230 T	1480	652	1070 T	1580 T	4140	4020	4040	1320	1520	
Alkalinity (as CaCO3)	mg/l	1010	R	R	1300 T	647	284	495 H	667 H T	1750	1480	1450	613	757	
Bicarbonate (as CaCO3)	mg/l	1010	R	R	1300 T	647	284	495 H	667 H T	1750	1480	1450	613	757	
Carbonate as CaCO3	mg/l	<2. U	R	R	<2. U T	<2. U	<2. U	<2. U H	<2. U H T	<2. U	<2. U	<2. U	<2. U	<2. U	
Hydroxide (as CaCO3)	mg/l	<2. U	R	R	<2. U T	<2. U	<2. U	<2. U H	<2. U H T	<2. U	<2. U	<2. U	<2. U	<2. U	
Hardness (as CaCO3)	mg/l	100	R	R	90	108	98	117	80	85	68	71	113	99	
Calcium, dissolved	mg/l	26	R	R	24.4	35	33.1	39	25.4	26.5	21	20	27.8	24.8	
Magnesium, dissolved	mg/l	8.5	R	R	7	5.1	3.6	4.7	4.1	4.5	3.7	5 B	10.7	9	
Potassium, dissolved	mg/l	30.6	R	R	22.9	13.1	9.7	11.3	16	18.8	17	26	36.4	31.9	
Sodium, dissolved	mg/l	646	R	R	466	183	105	135	253	332	332	542	830	725	
Chloride	mg/l	317.2	R	R	168.8	39.9	26.94	29.4	59.3	76.7	94.7	191	308	270	
Fluoride	mg/l	5.52	R	R	<2. U	0.6	0.47 B	0.45 B	0.94	1.24	<2. U	2.52	4.15	4.08	
Sulfate	mg/l	26.89	R	R	24.1 B T	21.83	18.34	21.9 H	16.5 T	15.1	15.1 B	21.6 B	30.1	30.9	
Sulfide as S, total	mg/l	0.2	R	R	0.17 T	1.2	2.9	2.2	2 T	0.26 B	5.2	<0.02 U	0.06 B	<0.08 U	
Total Dissolved Solids	mg/l	1940	R	R	1290	560	460	460	932 T	2630	2490	2640 H	760 H	934	
Total Suspended Solids	mg/l	154	R	R	104	17 B	90 J	24 J	32 T	135	103	70	34	42 J	
Cyanide, WAD	mg/l	<0.003 U	R	R	<0.003 U T	<0.003 U	<0.003 U	<0.003 U J	<0.003 U J	<0.003 U J	<0.003 U	<0.003 U	<0.003 U	<0.003 U	
Nutrients															
Phosphorus, total as P	mg/l	0.19	R	R	0.15 T	0.04 B	0.03 B	0.04 B	0.07 T	0.16	0.1	0.09	0.06	0.08 J	
Nitrate as N, dissolved	mg/l	0.03 B H	R	R	<0.02 U H T	0.02 B	0.02 B	0.04 B	0.04 B H T	0.02 B H	0.02 B H	0.03 B	<0.02 U H	<0.02 U H	
Nitrite as N, dissolved	mg/l	0.01 H B	R	R	<0.01 U H T	<0.01 U	0.02 B	<0.01 U	0.02 B H T	<0.01 U H	<0.01 U H	0.04 B	<0.01 U H	0.01 B H	
Nitrate/Nitrite as N, dissolved	mg/l	0.04 H B	R	R	<0.02 U H T	0.02 B	0.04 B	0.04 B	0.06 B H T	0.02 B H	0.02 B H	0.07 B	<0.02 U H	0.02 B H	
Nitrogen, ammonia	mg/l	<0.05 U	R	R	<0.05 U T	<0.05 U	<0.05 U	<0.05 U	<0.05 U T	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	
Metals, dissolved															
Aluminum, dissolved	mg/l	0.2	R	R	0.14 B J	0.05 B	0.07 B	0.06 B	0.06 B	<0.06 U	0.04 B	0.07 B	0.03 B	0.21	
Antimony, dissolved	mg/l	0.0018 B	R	R	0.02 B	<0.01 U	0.0023	<0.01 U	<0.01 U	<0.01 U	<0.0008 U	<0.004 U	<0.0004 U	0.0005 B	
Arsenic, dissolved	mg/l	0.0559	R	R	0.039 J	0.015 B	0.0019	0.011 B	0.041	0.031	0.0387	0.06	0.0574	0.059	
Barium, dissolved	mg/l	0.08	R	R	0.077	0.078	0.065	0.078	0.05	0.058	0.042	0.061	0.08	0.076	
Beryllium, dissolved	mg/l	<0.01 U	R	R	<0.02 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.02 U	<0.01 U	<0.01 U	<0.01 U	0.01 B	
Boron, dissolved	mg/l	1.9	R	R	1.15	0.25	0.11	0.14	0.45	0.66	0.65	1.36	2.31	2.01	
Cadmium, dissolved	mg/l	<0.0001 U	R	R	<0.003 U	<0.003 U	<0.0001 U	<0.003 U	<0.003 U	<0.003 U	<0.0002 U	<0.001 U	<0.0001 U	<0.0001 U	
Chromium, dissolved	mg/l	<0.0005 U	R	R	<0.01 U T	<0.01 U	<0.0005 U	<0.01 U	<0.01 U	<0.01 U	<0.001 U	<0.005 U	<0.0005 U	<0.0005 U	
Cobalt, dissolved	mg/l	<0.01 U	R	R	<0.02 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.02 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	
Copper, dissolved	mg/l	<0.0005 U	R	R	<0.01 U	<0.01 U	0.0034	<0.01 U	<0.01 U	<0.01 U	<0.001 U	<0.005 U	<0.0005 U	<0.0005 U	
Iron, dissolved	mg/l	0.94	R	R	0.72 J	0.67	0.51	0.49	0.55	0.73	0.62	0.6	0.78	0.71	
Lead, dissolved	mg/l	0.0003 B	R	R	<0.003 U	<0.003 U	0.0044	<0.003 U	<0.003 U	<0.003 U	<0.0002 U	<0.001 U	<0.0001 U	0.0002 B	
Lithium, dissolved	mg/l	1.16	R	R	0.8	0.25	0.13	0.16	0.35	0.48	0.475	0.91	1.5	1.33	
Mercury, dissolved	mg/l	<0.0002 U	R	R	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	
Manganese, dissolved	mg/l	0.078	R	R	0.06 J	0.032	0.027 B	0.028 B	0.025 B	0.03 B	0.025 B	0.045	0.066	0.067	
Molybdenum, dissolved	mg/l	<0.01 U	R	R	<0.02 U	0.01 B	<0.02 U	<0.02 U	<0.02 U	<0.04 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	
Nickel, dissolved	mg/l	0.0013 B	R	R	<0.02 U	<0.02 U	0.0036	<0.02 U	<0.02 U	<0.02 U	<0.001 U	<0.006 U	0.0006 B	0.0009 B	
Selenium, dissolved	mg/l	<0.0001 U	R	R	<0.003 U	0.019	<0.0001 U	0.024	<0.003 U	0.004 B	0.0103	<0.001 U	0.0001 B	<0.0001 U	
Silver, dissolved	mg/l	<0.00005 U	R	R	<0.001 U	<0.001 U	<0.00005 U	<0.001 U	<0.001 U	<0.001 U	<0.0001 U	<0.0005 U	<0.00005 U	<0.00005 U	
Thallium, dissolved	mg/l	<0.0001 U	R	R	<0.003 U	<0.003 U	<0.0001 U	<0.003 U	<0.003 U	<0.003 U	<0.0002 U	<0.001 U	<0.0001 U	<0.0001 U	
Uranium, dissolved	mg/l	0.014	R	R	0.008 B	0.004 B	0.0033	0.004 B	<0.003 U	0.005 B	0.0048	<0.001 U	0.0183	0.0181	
Vanadium, dissolved	mg/l	<0.005 U	R	R	<0.01 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.01 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	
Zinc, dissolved	mg/l	0.06	R	R	<0.02 U	<0.01 U	0.05	<0.01 U	<0.01 U	<0.02 U	0.02 B	<0.01 U	<0.01 U	<0.01 U	
Radiologic															
Gross Alpha, total	pCi/l	300±10	R	R	87±17 J	26±7.9	17±4.9	5.1±3	25±7.9	180±25	31±9.5	130±26	34±11	110±23	
Gross Beta, total	pCi/l	180±18	R	R	61±9.5	24±5.3	28±5	16±4.3	42±7.3	130±16	52±8.1	82±18	57±10	66±16	
Radium 226 + AERI, total	pCi/l	100±6.6		R		11±2	6.5±1.6	3±0.66 J	30±1.9 J	17±1.7	6.5±0.93	61±4.6	20±2	36±2.3 J	
Radium 228, total	pCi/l			R		0.93±0.63	7.3±3.1	-1.1±0.69	3±0.81 J	3±1.6 J	1.6±0.63	2±0.77	3.2±1.9	66±3.1	
Thorium 228, total	pCi/l	0.53±0.27		R			0.18±0.67	-0.07±0.76	0.15±0.34	-2.9±14	-0.01±1.5	0.26±1.3	0.25±0.56	-0.01±0.74	
Thorium 230, total	pCi/l	4.8±0.71		R			1.3±0.79	0.68±0.84	2.2±0.68	7±27	2.5±1.6	3.9±2.5	2.3±1	2.5±1.1	
Thorium 232, total	pCi/l	0.19±0.27		R			0±0.35	0±0.3	0.03±0.33	-17.5±18	-0.27±0.75	-0.37±1.6	0.3±0.34	0.07±0.3	
Lead 210, total	pCi/l	120±5.9	R	R	18		-6.9±9.5	-14±5.9	19±2.8	28±3.1 J	12±4.2	0±4	-37±110	19±6.3	
Polonium 210, total	pCi/l	110±1.6	R	R	14	-2.2±3.1	0.68±2.1	3.4±1.6	4.5±2.2 J	10±3.3	3.8±2.5	10±3.7 J	2.8±2.6	5.9±2.6	
QC															
Sum of Anions	meq/l	29.9	R	R	31.2	14.5	6.9	11.2	15	38	33	34.9	22	24	
Sum of Cations	meq/l	31.3	R	R	23	10.6	6.9	8.6	13	17	16	26	40	35	
Cation-Anion Balance	%	2.3	R	R	-15.1	-15.5	0	-13.1	-7.1	-38.2	-34.7	-14.6	29	18.6	
TDS (calculated)	mg/l	1670	R	R	1490 T	688	368	540	776	1530	1370	1690	1620	1560	
TDS (ratio - measured/calculated)	Unitless	1.16	R	R	0.87 T	0.81	1.25	0.85	1.2	1.72	1.82	1.56	0.47	0.6	
Field Parameters															
Temperature, Field	deg C		R	R	15.8		10.9	16.7	16.4	10.1	6.1	9.1	10.5	4.6	
pH, Field	s.u.				6.4		6.69	6.55	6.77	6.5	6.52	6.68	6.71	6.12	
Electrical Conductivity (EC), Field	uS/cm		R	R	1840		878	775	1344		1743	2650	4100	3480	
Depth to Water	ft	109.15	109.32	109.45	109.54		109.55	109.78	109.83	109.74	109.66	109.75	113.51	113.55	
Water Elevation	ft											8200	8220.24	8196.2	

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - MWC-21-202

Station Name	Units	MWC-21-202		MWC-21-202		MWC-21-202		MWC-21-202		MWC-21-202		MWC-21-202		MWC-21-202		MWC-21-202		MWC-21-202		MWC-21-202		MWC-21-202		MWC-21-202		MWC-21-202	
Field Sample ID		MWC21-202-111116		MWC-21-202-12031		MWC-21-202-12061		MWC-21-202-12091		MWC-21-202-12112		MWC-21-202-13031		MWC-21-202-13061		MWC-21-202-13091		MWC-21-202-13112		MWC-202-140318		MWC-21-202.14052		MWC-21-202.14091		MWC-21-202.141111	
Sample Date		11/16/2011		3/13/2012		6/13/2012		9/11/2012		11/28/2012		3/19/2013		6/12/2013		9/10/2013		11/20/2013		3/18/2014		5/29/2014		9/10/2014		11/11/2014	
		Result	FC VC	Result	FC VC	Result	FC VC	Result	FC VC	Result	FC VC	Result	FC VC	Result	FC VC	Result	FC VC	Result	FC VC	Result	FC VC	Result	FC VC	Result	FC VC	Result	FC VC
Major Ions & Indicator Parameters																											
pH, Lab	s.u.	8.3	H	8.1	H	8.0	H	8.0	H T	8.1	H	8.3	H	8.3	H	8.3	H	8.1	H	8.1	H	8.2	H	7.8	H	8.1	H
Electrical Conductivity (EC), Lab	uS/cm	2100		2000		2120		2110	T	2040		2280		2300		2330		2600		2720		2600		2650		2720	
Alkalinity (as CaCO3)	mg/l	981		982		1000		946	T	968		996		1000		1000		1070		944		947		1120		1170	
Bicarbonate (as CaCO3)	mg/l	955		982		963		946	T	968		969		980		977		1070		944		947		1120		1170	
Carbonate as CaCO3	mg/l	26		[illegible]	U	39		<2.	U T	<2.	U	27		24		23		<2.	U	<2.	U	<2.	U	<2.	U	<2.	U
Hydroxide (as CaCO3)	mg/l	<2.	U	<0.02	U	<2.	U	<2.	U T	<2.	U	<2.	U	<2.	U	<2.	U	<2.	U	<2.	U	<2.	U	<2.	U	<2.	U
Hardness (as CaCO3)	mg/l	98		80		88		96		94		106		104		93		128		108		129		122		129	
Calcium, dissolved	mg/l	25.1		20.5		23.1		24.9		24.3		27.3		26.7		23.9		33.2		28.3		33.6		31.7		33.1	
Magnesium, dissolved	mg/l	8.7		7		7.4		8.2		8		9.1		9		8		11		9		11		10.4		11.2	
Potassium, dissolved	mg/l	20.7		19.4		20.1		22.1		21.7		22		23.1		20.6		24.5		21.1		24.5		23.6		23.9	
Sodium, dissolved	mg/l	466		466		479		523		508		520		549		492		587		499		588		538		553	
Chloride	mg/l	123.33		123.1		114.82		121.3		123.5		159.1		163		167		224		201		221		198		211	
Fluoride	mg/l	9.23		9.4		8.64		9.3		8.9		10.7		9.47		9.79		8.28		8.18		8.22		7.83		8.54	
Sulfate	mg/l	24.73		27.8		30.73		31.7	T	19.1	B	24.7	B	29.9		31.9		36.4		27.8		29.3		24.3	B	28	
Sulfide as S, total	mg/l			0.03	B	0.13		0.29	T	2.2		0.9	B	0.15		0.2		0.4	B	0.08	B	<0.02	U	<0.02	U	<0.08	U
Total Dissolved Solids	mg/l	1390		1350	H	1350		1350		1350		1440		1440		1420		1610		1670		1680		1640		1660	
Total Suspended Solids	mg/l	494		122		103		31		28		900		196	J	272		120		500		450		104		135	J
Cyanide, WAD	mg/l	<0.003	U	<1.	U J	<0.003	U J	<0.003	U T	<0.003	U	<0.003	U	<0.003	U J	<0.003	U J	<0.003	U J	<0.003	U	<0.003	U	<0.003	U	<0.003	U
Nutrients																											
Phosphorus, total as P	mg/l	0.17		0.08		0.6		0.2	T	0.16		0.46		0.27		0.23		0.09		0.1		0.79		0.08		0.09	J
Nitrate as N, dissolved	mg/l	<0.02	U H	<0.02	U H	<0.02	U H	<0.02	U H T	<0.02	U H	<0.02	U H	0.05	B H	0.21	H	0.09	B H	<0.02	U H	<0.02	U H	0.12	H J	<0.02	U H
Nitrite as N, dissolved	mg/l	<0.01	U H	<0.05	U H	<0.01	U H	<0.01	U H T	<0.01	U H	<0.01	U H	<0.01	U H	0.01	B H	<0.01	U H	<0.01	U H	<0.01	U H	<0.01	U H	<0.01	U H
Nitrate/Nitrite as N, dissolved	mg/l	<0.02	U H	<0.01	U H	<0.02	U H	<0.02	U H T	<0.02	U H	<0.02	U H	0.05	B H	0.22	H	0.09	B H	<0.02	U H	<0.02	U H	0.12	H J	<0.02	U H
Nitrogen, ammonia	mg/l	0.83		<0.1	U	0.78		0.32	B T	0.13	B	0.18	B	0.24	B	0.08	B	0.06	B	<0.05	U	<0.5	U	<0.05	U	<0.05	U
Metals, dissolved																											
Aluminum, dissolved	mg/l	0.08	B	0.04	B	0.04	B	0.04	B J	0.06	B	0.13	B	0.2		0.57		0.12	B	0.05	B	0.05	B	0.35		0.09	B
Antimony, dissolved	mg/l	0.0009	B	<0.0005	U	<0.0004	U	0.0004	B	<0.0004	U	<0.0004	U	<0.0004	U	<0.0004	U	<0.0004	U	<0.0004	U	<0.0004	U	<0.0004	U	<0.0004	U
Arsenic, dissolved	mg/l	0.0435		0.0394		0.0168		0.008	J	0.0031		0.0293		0.031		0.0397		0.0398		0.0224		0.0354		0.0244		0.0258	
Barium, dissolved	mg/l	0.109		0.115		0.12		0.124		0.116		0.13		0.137		0.137		0.173		0.137		0.16		0.153		0.154	
Beryllium, dissolved	mg/l	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Boron, dissolved	mg/l	1.04		0.98		1.01		1.09		1.07		1.1		1.12		1.04		1.31		1.08		1.27		1.22		1.27	
Cadmium, dissolved	mg/l	<0.0001	U	<0.2	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U
Chromium, dissolved	mg/l	<0.0005	U	<0.01	U	<0.0005	U	<0.0005	U T	<0.0005	U	<0.0005	U	<0.0005	U	0.0006	B	<0.0005	U	<0.0005	U	0.0007	B	0.0011	B	<0.0005	U
Cobalt, dissolved	mg/l	<0.01	U	<0.0005	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Copper, dissolved	mg/l	<0.0005	U	<0.02	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	0.002	B	0.001	B	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U
Iron, dissolved	mg/l	0.52		0.45		0.67		0.79	J	0.68		0.51		0.45		1.07		0.68		0.44		0.54		1		0.46	
Lead, dissolved	mg/l	0.0002	B	0.0002	B	0.0005	B	0.0005		0.0001	B	0.0004	B	0.0002	B	0.0035	J	0.0001	B	<0.0001	U	0.0002	B	0.0023		0.0001	B
Lithium, dissolved	mg/l	0.65		0.66		0.67		0.73		0.71		0.72		0.78		0.7		0.84		0.723		0.861		0.807		0.848	
Mercury, dissolved	mg/l	<0.0002	U	<0.01	U	<0.0002	U	<0.0002	U	<0.0002	U	<0.0002	U	<0.0002	U	<0.0002	U	<0.0002	U	<0.0002	U	<0.0002	U	<0.0002	U	<0.0002	U
Manganese, dissolved	mg/l	0.07		0.059		0.099		0.102	J	0.097		0.09		0.089		0.082		0.094		0.102		0.101		0.121		0.118	
Molybdenum, dissolved	mg/l	0.05		0.05		0.06		0.04	B	0.01	B	0.04	B	0.04	B	0.05	B	0.04	B	0.03	B	0.04	B	0.03	B	0.04	B
Nickel, dissolved	mg/l	<0.0006	U	<0.3	U	0.0015	B	0.0013	B	<0.0006	U	<0.0006	U	<0.0006	U	0.0009	B	<0.0006	U	<0.0006	U	<0.0006	U	0.0006	B	<0.0006	U
Selenium, dissolved	mg/l	<0.0001	U	<0.00005	U	<0.0001	U	<0.0001	U	<0.003	U	<0.0001	U	0.0035		0.0006		<0.0001	U	<0.0001	U	0.0003		0.0004		<0.0001	U
Silver, dissolved	mg/l	<0.00005	U	<0.3	U	<0.00005	U	<0.00005	U	<0.001	U	<0.00005	U	<0.00005	U	<0.00005	U	<0.00005	U	<0.00005	U	<0.00005	U	<0.0005	U	<0.00005	U
Thallium, dissolved	mg/l	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U	<0.0001	U
Uranium, dissolved	mg/l	0.079		0.0764		0.0745		0.0755		0.0924		0.0817		0.0796		0.0797		0.092		0.0764		0.0777		0.0954		0.0844	
Vanadium, dissolved	mg/l	<0.005	U	<0.01	U	<0.005	U	0.006	B	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U
Zinc, dissolved	mg/l	0.18		<5.4	U	<0.01	U	<0.01	U	0.05	B	<0.01	U	<0.01	U	0.05		0.01	B	<0.01	U	<0.01	U	0.07		<0.01	U
Radiologic																											
Gross Alpha, total	pCi/l	6300±9.4		420±18		270±28		220±26	J	270±29		1100±68		260±29		290±31		1100±86		540±54		360±42		280±40		240±37	
Gross Beta, total	pCi/l	6500±17		340±9.2		91±11		120±12		100±11		1300±45		490±25		270±19		1300±57		750±39		370±29		360±28		150±22	
Radium 226 + AERI, total	pCi/l	440±3.5		34±0.68		26±1.8		34±2.5		29±3.1		140±7.6		34±2.3	J	66±3.1	J	160±5.5		57±2.4		62±4.8		69±3.6		0.57±0.45	J
Radium 228, total	pCi/l	27±2.4		6.3		7±0.78				12±0.87		26±3.9		15±1.6		28±3	J	19±1.5	J	14±1.2		8.4±1.1		11±1.6		5.4±0.92	
Thorium 228, total	pCi/l	43±0.41				0.99±1.9						15±2		4.5±1.4		4±1.1		9.1±22				1.1±1.7		5.7±1.5		2±1.1	
Thorium 230, total	pCi/l	15±1.1				-0.33±1.6						7.1±1.4		2.1±1.1		1.4±0.96		20±20				1±1.3		4.8±1.3		1.1±0.88	
Thorium 232, total	pCi/l	2.74±0.41				-0.71±0.9						1.19±0.62		0.6±0.55		0.31±0.69		1.82±7.1				0.64±0.85		1.52±0.92		-0.06±0.45	
Lead 210, total	pCi/l	6000±7.9		290±15		23±11		30				770±23		350±8.5		190±4.7		1100±12	J			30±5.4		-38±140		71±8.1	
Polonium 210, total	pCi/l	4600±1		270±4.4		13±5.1		14		8±4.4		720±35		350±20		250±14	J	4±3.1				130±10	J	170±13		58±7.3	
QC																											
Sum of Anions	meq/l	24.1		24.2		24.4		23.5		23.7		25.5		25.8		26		29		26		26		29		30	
Sum of Cations	meq/l	23.1		22.6		23.5		25.6		24.8		25.6		26.9		24		29		25		29		27		28	
Cation-Anion Balance	%	-2.1		-3.4		-1.9		4.3		2.3		0.2		2.1		-4		0		-2		5.5		-3.6		-3.4	
TDS (calculated)	mg/l	1270		1260		1290		1310	T	1300		1370		1410		1360		1570		1360		1490		1520		1580	
TDS (ratio - measured/calculated)	Unitless	1.09		1.07		1.05		1.03	T	1.04		1.05		1.02		1.04		1.03		1.23		1.13		1.08		1.05	
Field Parameters																											
Temperature, Field	deg C			12.6		13.8		15.1				10.2		20.3		14.3		10.9		7.7		13.6		9.9		8.9	
pH, Field	s.u.			6.97		6.87		6.94				7.12		6.86		7.09		6.97		6.79		7.08		7.0		6.89	
Electrical Conductivity (EC), Field	uS/cm			245		1824		1336				2340		2440		2540		2830		2840		3010		2850		2830	
Depth to Water	ft	64.9		65.05		65.77		15.1				65.56		65.5		65.61		68.78		68.85		69.97		68.74		68.71	
Water Elevation	ft																					8,199.78		8,212.65		8,201.04	

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - MWC-21-210

Station Name	Units	MWC-21-210	MWC-21-210	MWC-21-210	MWC-21-210	MWC-21-210	MWC-21-210	MWC-21-210	MWC-21-210	MWC-21-210	MWC-21-210	MWC-21-210	MWC-21-210	MWC-21-210
Field Sample ID		MWC21-210-111115	WC-21-210-12013	MWC-21-210-120612	WC-21-210-12091	WC-21-210-12112	MWC-21-210-130319	WC-21-210-13061	WC-21-210-13091	WC-21-210-13112	MWC-210-140318	WC-21-210.14052	WC-21-210.140910	WC-21-210.141111
Sample Date		11/15/2011	3/13/2012	6/12/2012	9/10/2012	11/27/2012	3/19/2013	6/14/2013	9/10/2013	11/20/2013	3/18/2014	5/29/2014	9/10/2014	11/11/2014
		Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC	Result FC VC
Major Ions & Indicator Parameters														
pH, Lab	s.u.	8.2 H	8.2 H	8.1 H T	8.2 H	8.2 H	8.3 H	8.1 H	8.2 H	8.3 H	8.3 H	8.2 H	8.2 H	8.2 H
Electrical Conductivity (EC), Lab	uS/cm	395	378	382 T	405	400	427	415	435	423	432	404	408	405
Alkalinity (as CaCO3)	mg/l	188	187	189 T	182 T	188	194	188	196	196	169 J	203 H	193	195
Bicarbonate (as CaCO3)	mg/l	188	187	188 T	182	188	188	188	196	189	166 J	203 H	193	195
Carbonate as CaCO3	mg/l	<2. U	[illegible] U	<2. U T	<2. U	<2. U	6 B	<2. U	<2. U	7 B	3 B	<2. U H	<2. U	<2. U
Hydroxide (as CaCO3)	mg/l	<2. U	<0.02 U	<2. U T	<2. U	<2. U	<2. U	<2. U	<2. U	<2. U	<2. U	<2. U H	<2. U	<2. U
Hardness (as CaCO3)	mg/l	193	185	196	190	200	200	208	196	197	175 J	200	188	188
Calcium, dissolved	mg/l	46.7	44.7	48	46	48.1	47.2	50.5	47	47.4	42.4 J	48.4	45	46.4
Magnesium, dissolved	mg/l	18.5	17.8	18.6	18.3	19.4	19.9	19.9	19.2	19.2	16.9 J	19.2	18.4	17.6
Potassium, dissolved	mg/l	3.5	3.6	3.9	3.7	3.7	3.9	3.9	4	4.1	3.3	3.8	3.8	3.7
Sodium, dissolved	mg/l	12.1	11.8	12.3	11.8	12.2	12.8	12.8	13.6	13	11.6	12.7	12.1	11.9
Chloride	mg/l	4.54	4.61	4.44	4.5	4.34	4.69	4.92	4.56	4.59	4.41	4.34	3.88	3.96
Fluoride	mg/l	0.27 B	0.27 B	0.3 B	0.29 B	0.27 B	0.38 B	0.3 B	0.29 B	0.29 B	0.27 B	0.3	0.3	0.31
Sulfate	mg/l	22.28	22.44	22.97 T	23.23	22.66	19.24	23.3	23.4	22.6	22.6	22.7	21.3	22.4
Sulfide as S, total	mg/l		0.04 B	<0.02 U T	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U
Total Dissolved Solids	mg/l	240	260 H	270 T	260	250	260	250	246	270	270 J	240	250	252
Total Suspended Solids	mg/l	21	<0.5 U	12 B T	44	44	11 B J	26 J	23	43	13 B	7 B	10 B	16 B J
Cyanide, WAD	mg/l	<0.003 U	<0.1 U J	<0.003 U J	<0.003 U	<0.003 U	<0.003 U	<0.003 U J	<0.003 U J	<0.003 U J	<0.003 U	<0.003 U	<0.003 U	<0.003 U
Nutrients														
Phosphorus, total as P	mg/l	0.26	0.22	0.23 T	0.27	0.26	0.19	0.25	0.25	0.25	0.2	0.18	0.2	0.22 J
Nitrate as N, dissolved	mg/l	0.54 H	0.57 H	0.53 H T	0.49 H	0.43 H	0.41 H	0.41	0.56 H	0.38 H	0.4 H	0.44 H	0.39 H	0.35 H
Nitrite as N, dissolved	mg/l	[illegible] H U	<0.05 U H	<0.01 U H T	<0.01 HU	<0.01 U H	<0.01 U H	<0.01 U	<0.01 U H	<0.01 U H	<0.01 U H	<0.01 U H	<0.01 U H	<0.01 U H
Nitrate/Nitrite as N, dissolved	mg/l	0.54 H	0.57 H	0.53 H T	0.49 H	0.43 H	0.41 H	0.41	0.56 H	0.38 H	0.4 H	0.44 H	0.39 H	0.35 H
Nitrogen, ammonia	mg/l	<0.05 U	<0.1 U	<0.05 U T	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U
Metals, dissolved														
Aluminum, dissolved	mg/l	<0.03 U	<0.0004 U	<0.03 U	<0.03 U	<0.03 U	<0.03 U	0.03 B	<0.03 U	<0.03 U	<0.03 U	<0.03 U	<0.03 U	<0.03 U
Antimony, dissolved	mg/l	<0.0004 U	<0.0005 U	<0.0004 U	0.0005 B	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U	<0.0004 U
Arsenic, dissolved	mg/l	0.0014 B	0.0008 B	0.0007 B	0.0013	0.0013	0.0015	0.0012	0.0012	0.0016	0.0013	0.0013	0.0011	0.0011
Barium, dissolved	mg/l	0.065	0.073	0.074	0.07	0.078	0.082	0.078	0.086	0.086	0.072	0.076	0.07	0.072
Beryllium, dissolved	mg/l	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U
Boron, dissolved	mg/l	0.03 B	0.01 B	<0.01 U	0.03 B	0.03 B	0.03 B	0.01 B	0.02 B	0.02 B	0.02 B	0.01 B	0.02 B	0.02 B
Cadmium, dissolved	mg/l	<0.0001 U	<0.2 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U
Chromium, dissolved	mg/l	<0.0005 U	<0.01 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	0.0019 B	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U
Cobalt, dissolved	mg/l	<0.01 U	<0.0005 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U
Copper, dissolved	mg/l	0.0019 B	0.0008 B	0.0011 B	0.0011 B	0.0013 B	0.0011 B	0.002 B	0.0009 B	0.0015 B	0.0009 B	0.0012 B	0.0012 B	0.001 B
Iron, dissolved	mg/l	<0.02 U	<0.0001 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	0.02 B	<0.02 U	<0.02 U	<0.02 U	0.03 B	<0.02 U
Lead, dissolved	mg/l	<0.0001 U	<0.02 U	<0.0001 U	<0.0001 U	0.0002 B	0.0001 B	<0.0001 U	0.0002 B J	<0.0001 U	<0.0001 U	<0.0001 U	0.0004 B	<0.0001 U
Lithium, dissolved	mg/l	<0.02 U	<0.2 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.008 U	<0.008 U	<0.008 U	<0.008 U
Mercury, dissolved	mg/l	<0.0002 U	<0.01 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U
Manganese, dissolved	mg/l	<0.005 U	<0.0002 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U
Molybdenum, dissolved	mg/l	<0.01 U	<0.0006 U	<0.01 U	<0.01 U	<0.01 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U	<0.02 U
Nickel, dissolved	mg/l	<0.0006 U	<0.3 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U	<0.0006 U
Selenium, dissolved	mg/l	0.0009	0.001	0.0009	0.001	0.0009	0.0009	0.001	0.0006	0.0009	0.0008	0.0008	0.0007	0.0008
Silver, dissolved	mg/l	<0.00005 U	<0.3 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U	<0.00005 U
Thallium, dissolved	mg/l	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U
Uranium, dissolved	mg/l	0.0014	0.0012	0.0012	0.0013	0.0014	0.0014	0.0015	0.0014	0.0015	0.0012	0.0012	0.0012	0.0014
Vanadium, dissolved	mg/l	<0.005 U	<0.01 U	<0.005 U	0.006 B	<0.005 U	<0.005 U	0.005 B	0.006 B	0.009 B	<0.005 U	<0.005 U	<0.005 U	<0.005 U
Zinc, dissolved	mg/l	<0.01 U	<2.2 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	0.05	<0.01 U	0.01 B	<0.01 U	<0.01 U	<0.01 U	<0.01 U
Radiologic														
Gross Alpha, total	pCi/l	3.4±3.5	7.6±3.6	3.8±4.1	7.7±3.1	5.9±2.8	3.9±2.6	2.2±2.1	5.3±2.9	5.7±3	2±3.8	2.4±2.3	-4.7±2.5	1.3±2.3
Gross Beta, total	pCi/l	15±8.2	14±1.9	3.6±5.3	11±3.2	13±3.3	8.9±3.5	10±3.5	8.6±3.6	5.8±3.4	8.2±6.3	7.8±3.5	8.3±4.7	2.5±3.5
Radium 226 + AERI, total	pCi/l		0.64	0.78±1.8	0.73±0.55		1.3±0.92	0.62±0.63	1.2±0.82 J	1.9±0.61	0.5±0.29	0±0.7	0.2±0.37	0.18±0.34 J
Radium 228, total	pCi/l			0.97±0.49			1.9±2	2.7±2.1	-0.04±1.2 J	3.3±0.91 J	1.4±0.68	0.1±0.65	-0.58±1.7	3.1±2
Thorium 228, total	pCi/l			-0.2±0.72			0.53±0.62	0.39±1	-0.11±0.4	8.6±18		0.49±1.3	0.73±0.76	-0.03±0.25
Thorium 230, total	pCi/l			0.18±0.64			-0.64±0.96	0.12±0.85	0.17±0.38	4.2±17		1.2±1.2	1.2±0.83	0.2±0.27
Thorium 232, total	pCi/l			-0.42±0.38			-0.3±0.7	-0.01±0.33	0.05±0.25	-4.31±7.9		0.6±0.56	-0.06±0.38	-0.12±0.13
Lead 210, total	pCi/l	7.4±6.2	5.7±2.6	44±30	7.7		-30±8.4	-32±6	2.4±1.9	2.2±2.7		-3.6±3.7	-12±120	15±6.3
Polonium 210, total	pCi/l	-3.9±2.6	5.4±0.45	-6±8.9	2.7	1.2±3.9	0±1.6	3.5±1.8	1.7±1.2 J	0.92±1.8		-0.26±2.1	2.3±1.8	2.4±2.5
QC														
Sum of Anions	meq/l	4.4	4.4	4.4	4.3	4.4	4.5	4.4	4.6	4.6	4	4.7	4.5	4.5
Sum of Cations	meq/l	4.5	4.3	4.6	4.4	4.6	4.7	4.8	4.6	4.6	4.1	4.7	4.4	4.4
Cation-Anion Balance	%	1.1	-1.1	2.2	1.1	2.2	2.2	4.3	0	0	1.2	0	-1.1	-1.1
TDS (calculated)	mg/l	223	220	226	219	225	226	230	232	230	205	237	224	227
TDS (ratio - measured/calculated)	Unitless	1.08	1.18	1.19	1.19	1.11	1.15	1.09	1.06	1.17	1.32	1.01	1.12	1.11
Field Parameters														
Temperature, Field	deg C	8.6	11.8	16.4	12.7		8.3	13.2	11.7	8.3	3.7	10.6	8.8	5.8
pH, Field	s.u.	7.38	6.97	7.01	7.45		7.73	7.3	7.65	7.77	7.73	7.54	7.51	7.57
Electrical Conductivity (EC), Field	uS/cm	432	650	425	261		461	449	489	473	463	472	440	459
Depth to Water	ft	32.98	29.71	31.43	33.56	33.47	35.5	30.72	32.99	33.27	28.67	28.99	31.17	31.96
Water Elevation	ft											8,240.76	8,248.90	8,236.79

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - MWC-21-216

Station Name	Units	MWC-21-216			MWC-21-216			MWC-21-216			MWC-21-216			MWC-21-216		
Field Sample ID		MWC-21-216-13112			MWC-21-216-140318			MWC-21-216.14052			MWC-21-216.14091			MWC-21-216.141111		
Sample Date		11/22/2013			3/18/2014			5/29/2014			9/10/2014			11/11/2014		
		Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC	Result	FC	VC
Major Ions & Indicator Parameters																
pH, Lab	s.u.	7.9	H		8	H		8	H		7.9	H	J	8	H	
Electrical Conductivity (EC), Lab	uS/cm	2210			2570			2350			2320		J	2340		
Alkalinity (as CaCO3)	mg/l	997			994			947			1100		J	1110		
Bicarbonate (as CaCO3)	mg/l	997			994			947			1100		J	1110		
Carbonate as CaCO3	mg/l	<2.	U		<2.	U		<2.	U		<2.	U	J	<2.	U	
Hydroxide (as CaCO3)	mg/l	<2.	U		<2.	U		<2.	U		<2.	U	J	<2.	U	
Hardness (as CaCO3)	mg/l	73			82			76			76			73		
Calcium, dissolved	mg/l	18			15.7			18.9			18.9			19.2		
Magnesium, dissolved	mg/l	6.7			5.6			7			6.9			6.1		
Potassium, dissolved	mg/l	21.4			20.6			23.4			20.6			18.2		
Sodium, dissolved	mg/l	488			501			553			470			389		
Chloride	mg/l	121			145			139			117			95.5		
Fluoride	mg/l	2.51			2.87			2.78			2.25			1.89		
Sulfate	mg/l	36.9			38			36.1			29		J	21.7		
Sulfide as S, total	mg/l	0.07	B		0.17			0.38			0.59		J	0.27		
Total Dissolved Solids	mg/l	1380			1620			1470			1400		J	1440		
Total Suspended Solids	mg/l	174			107			37			8	B	J	82		J
Cyanide, WAD	mg/l	<0.003	U	J	<0.003	U		<0.003	U		<0.003	U	J	<0.003	U	
Nutrients																
Phosphorus, total as P	mg/l	0.49			0.67			<0.01	U		0.27			0.29		J
Nitrate as N, dissolved	mg/l	<0.02	U	H	<0.02	U	H	0.14	H		<0.02	U	H J	<0.02	U	H
Nitrite as N, dissolved	mg/l	<0.01	U	H	<0.01	U	H	<0.01	U	H	<0.01	U	H J	<0.01	U	H
Nitrate/Nitrite as N, dissolved	mg/l	<0.02	U	H	<0.02	U	H	0.14	H		<0.02	U	H	<0.02	U	H
Nitrogen, ammonia	mg/l	0.54			0.29	B		0.35			0.75		J	0.35		
Metals, dissolved																
Aluminum, dissolved	mg/l	0.04	B		0.05	B		<0.03	U		0.31			0.04	B	
Antimony, dissolved	mg/l	<0.0004	U		<0.0004	U		<0.0004	U		<0.0004	U		<0.01	U	
Arsenic, dissolved	mg/l	0.1046			0.0601			0.0621			0.0305			0.018	B	
Barium, dissolved	mg/l	0.091			0.079			0.089			0.094			0.074		
Beryllium, dissolved	mg/l	<0.01	U		<0.01	U		<0.01	U		<0.01	U		<0.01	U	
Boron, dissolved	mg/l	1.27			1.31			1.48			1.28			1.05		
Cadmium, dissolved	mg/l	0.0001	B		<0.0001	U		<0.0001	U		<0.0001	U		<0.003	U	
Chromium, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		<0.0005	U		<0.01	U	
Cobalt, dissolved	mg/l	<0.01	U		<0.01	U		<0.01	U		<0.01	U		<0.01	U	
Copper, dissolved	mg/l	<0.0005	U		<0.0005	U		<0.0005	U		0.0007	B		<0.01	U	
Iron, dissolved	mg/l	0.83			1.36			1.41			1.48			0.29		
Lead, dissolved	mg/l	0.0002	B		0.0002	B		<0.0001	U		0.0017			<0.003	U	
Lithium, dissolved	mg/l	0.81			0.851			0.959			0.806			0.684		
Mercury, dissolved	mg/l	<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U		<0.0002	U	
Manganese, dissolved	mg/l	0.232			0.101			0.138			0.152			0.217		
Molybdenum, dissolved	mg/l	0.04	B		<0.02	U		<0.02	U		<0.02	U		<0.02	U	
Nickel, dissolved	mg/l	0.0007	B		<0.0006	U		<0.0006	U		<0.0006	U		<0.02	U	
Selenium, dissolved	mg/l	<0.0001	U		<0.0001	U		<0.0001	U		0.0004			0.007		
Silver, dissolved	mg/l	<0.00005	U		<0.00005	U		<0.00005	U		<0.00005	U		<0.001	U	
Thallium, dissolved	mg/l	<0.0001	U		<0.0001	U		<0.0001	U		<0.0001	U		<0.003	U	
Uranium, dissolved	mg/l	0.0238			0.0055			0.0052			0.006			0.006	B	
Vanadium, dissolved	mg/l	<0.005	U		<0.005	U		<0.005	U		<0.005	U		<0.005	U	
Zinc, dissolved	mg/l	0.02	B		<0.01	U		<0.01	U		<0.01	U		<0.01	U	
Radiologic																
Gross Alpha, total	pCi/l	68±15			48±17			20±9.8			22±14			38±14		
Gross Beta, total	pCi/l	50±11			88±15			46±11			62±15			55±13		
Radium 226 + AERI, total	pCi/l	11±1.3			15±1.7			6.5±1.6			8.1±1.3			6.5±1		J
Radium 228, total	pCi/l	12±2.7		J	8.4±0.95			2.6±0.81			3.8±1.7			7.6±1.1		
Thorium 228, total	pCi/l	0.55±1.6						0.25±1.2			1.4±1			0.59±0.86		
Thorium 230, total	pCi/l	0.09±4						0.77±1.5			0.26±0.77			0.28±0.77		
Thorium 232, total	pCi/l	1.63±3.1						-0.12±0.7			-0.23±0.4			0.13±0.34		
Lead 210, total	pCi/l	36±3.5		J				-8.5±4.4			2.6±5			-7.5±6.4		
Polonium 210, total	pCi/l	18±3.4						3.3±3.1		J	4.4±2.2			2.5±2.2		
QC																
Sum of Anions	meq/l	24			25			24			26			25		
Sum of Cations	meq/l	24			24			27			23			19		
Cation-Anion Balance	%	0			-2			5.9			-6.1			-13.6		
TDS (calculated)	mg/l	1290			1330			1360			1340			1230		
TDS (ratio - measured/calculated)	Unitless	1.07			1.22			1.08			1.04			1.17		
Field Parameters																
Temperature, Field	deg C	7.3			3			13.6			9.2			6.6		
pH, Field	s.u.	8.3			6.6			6.96			6.81			7.01		
Electrical Conductivity (EC), Field	uS/cm				2670			2610			2380			2040		
Depth to Water	ft	79.89			80.11			78.4			78.62			79.08		
Water Elevation	ft							8,182.35			8,206.21			8,179.67		

Hansen/Taylor Ranch Project Cumulative Groundwater Quality Results - Table Footnotes

Notes:

FC =	Laboratory analytic flag code
VC =	Validation code
meq =	milliequivalents
pCi/l =	picoCuries per liter
< =	Not detected at the detection limit (DL) shown.
U =	Not detected at the detection limit (DL) shown.
B =	Estimated result greater than the method detection limit (MDL) and less than the practical quantitation limit (PQL).
FB =	Estimated result due to field blank detection.
H =	Exceeded holding time for specific analyte and method
IM =	Instrument malfunction
R =	Rejected result based on quality control (QC) criteria.
J =	Estimated result based on quality control (QC) criteria.

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