

Cefalo, James

From: Cefalo, James
Sent: Thursday, September 5, 2024 4:54 PM
To: 'idahoelkhunter@me.com'
Cc: Nebeker, Jake
Subject: Application for Transfer 89018 (Mowrey)
Attachments: Hydrology Staff Review of Application 82496.pdf; Hydrology Staff Review of Application 79844.pdf; Ground Water Resources in Marsh Valley, Bannock County, Idaho.pdf

Dear Applicants,

In April 2024, you filed Application for Transfer 89018, proposing to move 3.5 acres of ground water right 29-7009 from your property near Pocatello to a property in Marsh Valley. Jake Nebeker in our office prepared the application for public notice. The application was not protested and has now been given to me for final review.

Your application proposes to move a portion of ground water right 29-7009 from the Pocatello area to March Valley. In the last ten years, our office has reviewed a couple of applications proposing to move ground water rights from Marsh Valley into the Pocatello area. These proposals were reviewed by the Department's hydrology staff and were rejected because of injury concerns. Some of the analysis from these other proposals may be relevant to your proposal. Attached to this email are three reports for your reference.

The report for Application 82496 states that the ground water aquifer around Pocatello is referred to as the Lower Portneuf River Valley (LPRV) aquifer. According to the report, "the LPRV aquifer is hydraulically connected to the [Eastern Snake Plain Aquifer] and there is not a definitive boundary at the transition between the aquifers." (83496 Report, page 1) The existing point of diversion for water right 29-7009 pumps from the LPRV aquifer, which is hydraulically connected to the Eastern Snake Plain Aquifer (ESPA). According to the report for Application 79844, "The Marsh Valley aquifer is not directly connected to the ESPA . . ." (79844 Report, page 1)

In Idaho, a water user may change many of the elements of a water right. The state law, however, does not allow a water user to change the source of a water right. For example, a Bear River water right could not be moved from the Bear River to the Portneuf River because those two sources are not hydraulically connected. Similarly, a water right could not be moved from a spring on one side of a valley to a spring on the other side of the valley. Each spring is a unique source. For ground water rights, a water right cannot be moved from one aquifer to another if the two aquifers are not hydraulically connected. If such a change were allowed, the transferred water right would be equivalent to a new diversion in the proposed aquifer and could cause injury to the ground water rights in the proposed aquifer.

The report titled *Ground Water Resources in Marsh Valley, Bannock County, Idaho* states: "Based on the available data, there is evidence of long-term groundwater level decline in the Marsh Valley aquifer system and long-term decline in aquifer discharge to Marsh Creek." (Marsh Valley Report, page 31) A ground water right moved into the Marsh Valley aquifer from a hydraulically disconnected aquifer has the potential of increasing the rate of aquifer decline. Water right 29-7009 bears a priority date of March 22, 1968, and is senior to many of the ground water rights in Marsh Valley. Because of the long-term decline in ground water levels in the Marsh Valley aquifer, moving a senior right into the aquifer has the potential to injure junior water rights.

Before making a final decision on your application, I wanted to make you aware of these reports and give you an opportunity to provide any additional information about the hydraulic connection between the LPRV aquifer and the Marsh Valley aquifer. Please provide any additional information you would like me to consider on or before September 30, 2024. Feel free to call me if you have any questions.

James



MEMO

State of Idaho

Department of Water Resources

322 E Front Street, P.O. Box 83720, Boise, Idaho 83720-0098

Phone: (208) 287-4800 Fax: (208) 287-6700

Date: November 26, 2018
To: James Cefalo, Water Resources Program Manager
Cc: Sean Vincent, P.G., Hydrology Section Manager
From: Jennifer Sukow, P.E., P.G., Hydrology Section
Subject: Hydrology staff review of application for transfer 82746

This memorandum summarizes my review of application for transfer 82746, which requests to transfer a portion of groundwater right 29-7006 from a location in Marsh Valley to a location in the lower Portneuf River Valley (Figure 1). The transfer proposes changing the water use from seasonal irrigation use to year-round industrial use. The applicant's consultant, Brockway Engineering, PLLC (Brockway), submitted a hydrologic analysis in support of the application. You requested hydrology staff review the analysis submitted by Brockway.

The proposed points of diversion (PODs) are located within the lower Portneuf River Valley (LPRV) aquifer system as described by Welhan (2006)¹. The LPRV aquifer is hydraulically connected to the eastern Snake Plain aquifer (ESPA) and there is not a definitive boundary at the transition between the aquifers. Figure 2 shows the location of the proposed PODs, the LPRV aquifer as delineated by Welhan (2006), and the ESPA area of common groundwater supply. Note the northern portion of the LPRV aquifer overlaps with the ESPA area of common groundwater.

Between the Portneuf Gap and Batiste Road (Figure 2), the Portneuf River is perched and is not hydraulically connected to the aquifer (Welhan, 2006). Figure 3 shows a conceptual cross-section of the LPRV (Thackray, 2010)². The bedrock constriction in Figure 3 is located in the vicinity of Red Hill, which is shown for reference on Figure 2. The proposed PODs are located in the lower

¹ Welhan, 2006, *Water Balance and Pumping Capacity of the Lower Portneuf River Valley Aquifer, Bannock County, Idaho*. Staff Report 06-5, Idaho Geological Survey, Moscow, Idaho, 33 p.

² Thackray, G., 2010, *Hydrology and Vulnerability of the Lower Portneuf Valley Aquifer*. Idaho State University Department of Geosciences, 30 slides.

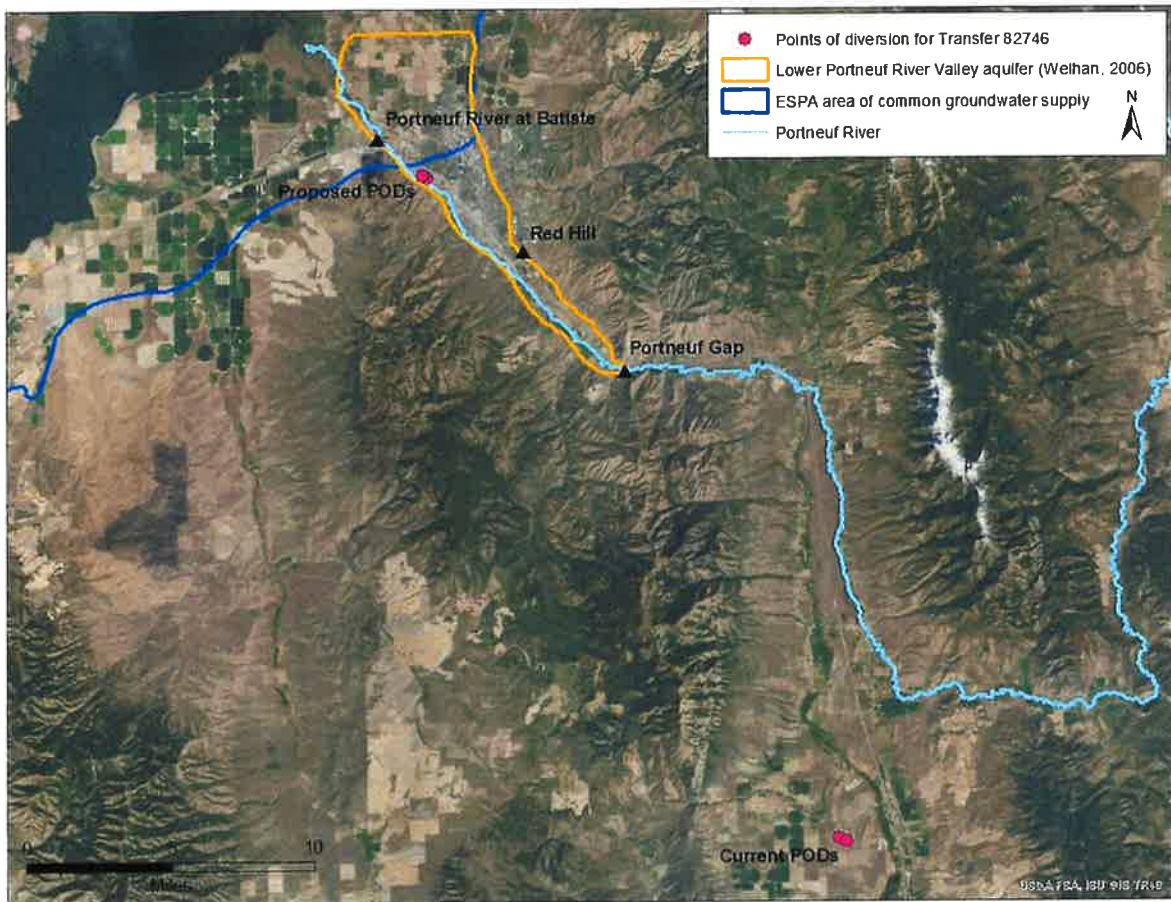


Figure 2. Location of points of diversion and the LPRV aquifer system.

assumption is incorrect. The nearest location at which the Portneuf River is hydraulically connected to the aquifer is at a distance of approximately 2.2 miles from the proposed PODs. Because the distance is much greater than assumed in Brockway's stream-aquifer interaction, the Portneuf River will not supply more than 50% of the pumped water in less than 24 hours. Depletions from pumping at the proposed location will impact aquifer storage in the LPRV aquifer and the ESPA, and will impact ESPA discharge to the Portneuf River downstream of Batiste Road and other river reaches hydraulically connected to the ESPA. Because I disagree with the distance assumed in Brockway's stream-aquifer interaction analysis, I did not review the other assumptions or calculations used in the analysis.

2. Brockway's analysis does not provide information on well construction, production zones, and water levels in the three proposed PODs, which apparently are existing wells currently used to divert water right 29-7504. The submittal includes one driller's log for an Idaho Malt Company well drilled in 1980, but does not state if this well is one of the proposed PODs. The driller's log is consistent with the lower end of Welhan's cross-section and indicates the well produces water from the confined sedimentary and basalt aquifers shown in Figure 3.
3. Brockway's analysis states, "*non-pumped groundwater from 29-7006 is discharged into Marsh Creek and is conveyed down the Portneuf River.*" Brockway's analysis does not address the timing of the impacts of not pumping at the existing POD location on streamflow in Marsh Creek and the Portneuf River, or the effect of existing surface water rights on the fate of increased streamflow in Marsh Creek. Brockway's analysis does not address the issues identified in Findings of Fact 10 and 11 of the Preliminary Order Denying Application for transfer number 79844³, which appear to also be applicable to this transfer application.
4. Brockway's analysis assumes an average consumptive use of 2.3 feet per acre per year for 205 acres to calculate the proposed diversion volume of 471.5 acre feet per year for industrial use. This assumption is based on two affidavits that state hay and grain were historically grown on the existing place of use, prior to entry into a Conservation Reserve Program contract in 1997. One of the affidavits states the property was irrigated from 1968 through 1996. Evapotranspiration (ET) data computed by the University of Idaho using Mapping EvapoTranspiration at high Resolution with Internalized Calibration (METRIC) are available for the irrigation seasons of 1986, 1992, and 1996. The METRIC data indicate

³ Preliminary Order Denying Application, In the Matter of Application for Transfer No. 79844 (Water Right No. 29-7006) in the Name of Idaho Water Company, LLC, Idaho Department of Water Resources, October 22, 2015, 7 p.

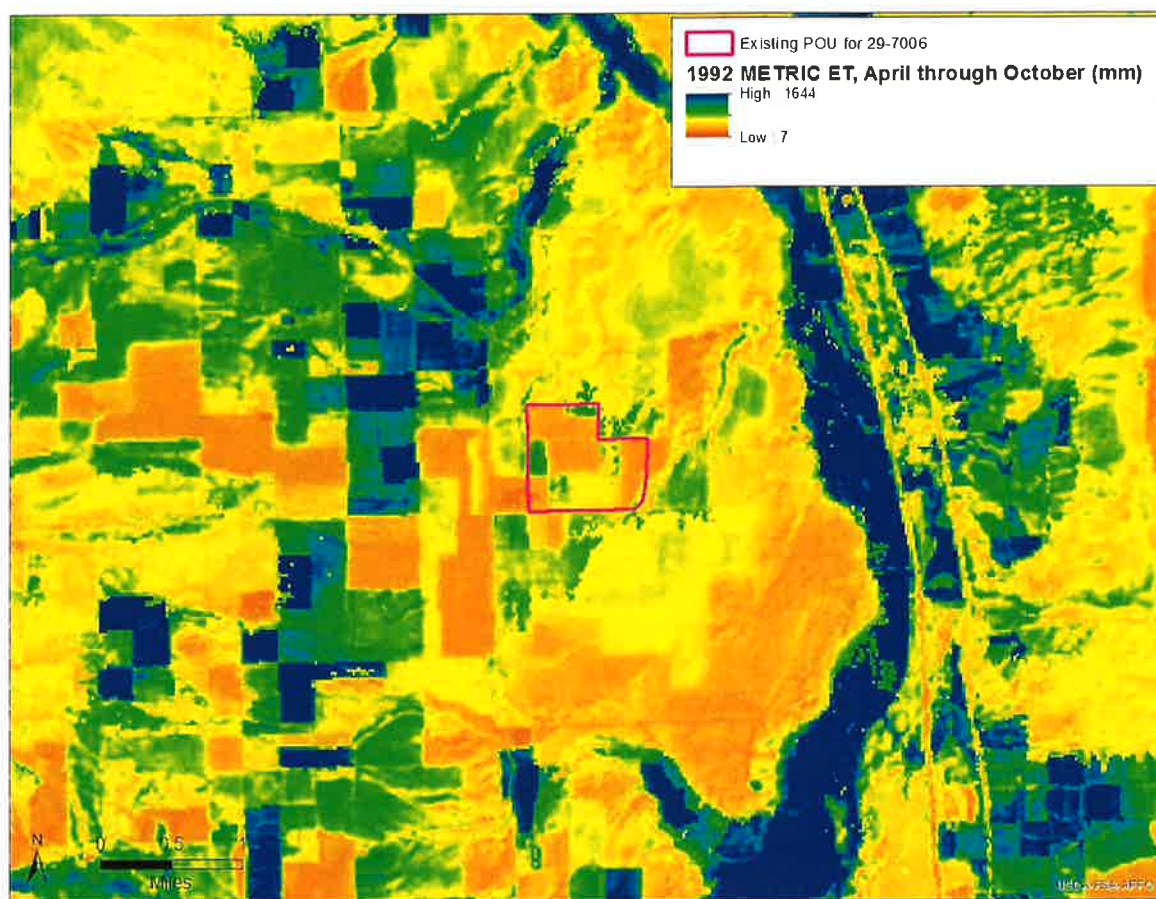
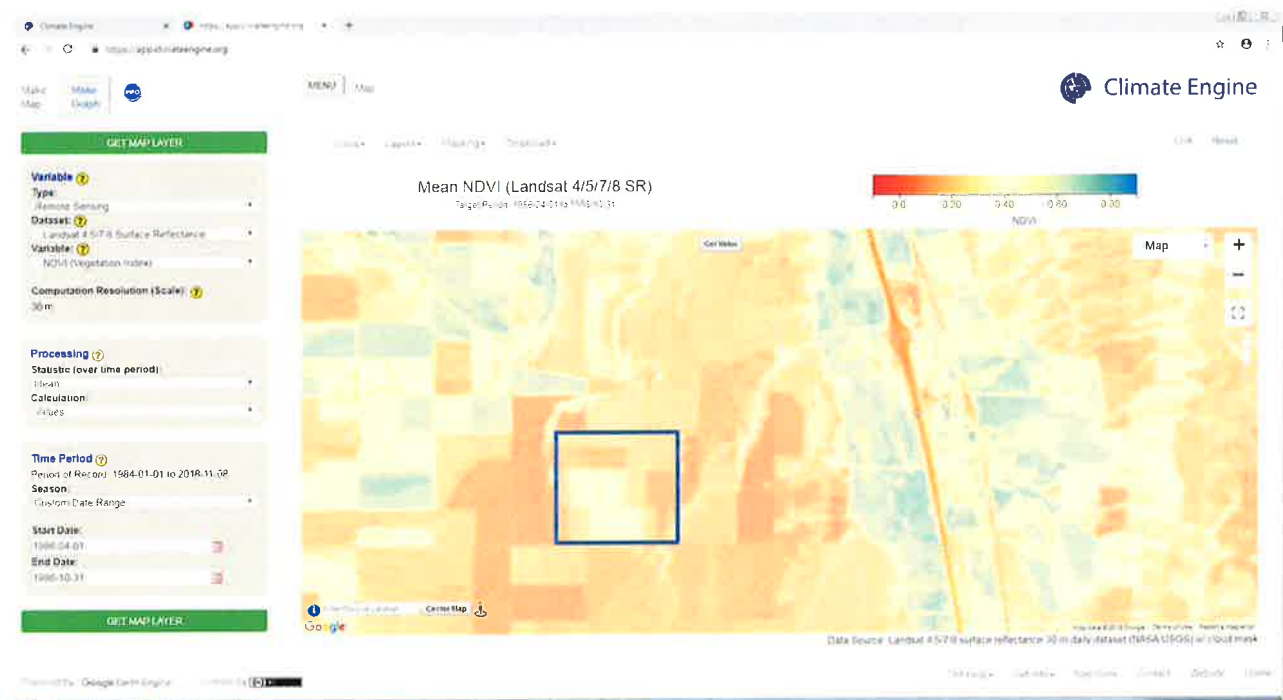


Figure 5. 1992 METRIC ET at existing place of use

ATTACHMENT A. Normalized Differential Vegetation Index (NDVI) from <http://climateengine.org/>.
(Rectangle indicates approximate location of current place of use.)















MEMO

State of Idaho

Department of Water Resources

322 E Front Street, P.O. Box 83720, Boise, Idaho 83720-0098

Phone: (208) 287-4800 Fax: (208) 287-6700

Date: November 26, 2018

To: James Cefalo, Water Resources Program Manager

Cc: Sean Vincent, P.G., Hydrology Section Manager

From: Jennifer Sukow, P.E., P.G., Hydrology Section

Subject: Hydrology staff review of application for transfer 82496

This memorandum summarizes my review of application for transfer 82496, which requests to transfer groundwater right 29-14257 from a location near Pocatello to a location near Idaho Falls (Figure 1). The application has been protested by the Surface Water Coalition (SWC), which raised two issues of concern at a pre-hearing conference. The SWC is concerned that the water right has not been used for many years. The SWC is also concerned that the change in point of diversion will constitute a new diversion from the eastern Snake Plain aquifer (ESPA). Hydrology staff was asked to answer the following questions related to the SWC's second concern:

"Is the existing point of diversion within the ESPA? If not, is there a hydrologic connection between the existing point of diversion and the ESPA? What is the nature of that connection?"

The existing point of diversion (POD) for water right 29-14257 is located within the lower Portneuf River Valley (LPRV) aquifer, as described by Welhan (2006)¹. The LPRV aquifer is hydraulically connected to the ESPA and there is not a definitive boundary at the transition between the aquifers. Figure 2 shows the location of the existing POD, the LPRV aquifer as delineated by Welhan (2006), the ESPA area of common groundwater, and the model grid for version 2.1 of the eastern Snake Plain aquifer model (ESPAM2.1). Note the northern portion of the LPRV aquifer overlaps with the ESPA area of common groundwater, and both aquifers are included in the ESPAM2.1 model domain.

¹ Welhan, 2006, *Water Balance and Pumping Capacity of the Lower Portneuf River Valley Aquifer, Bannock County, Idaho*. Staff Report 06-5, Idaho Geological Survey, Moscow, Idaho, 33 p.

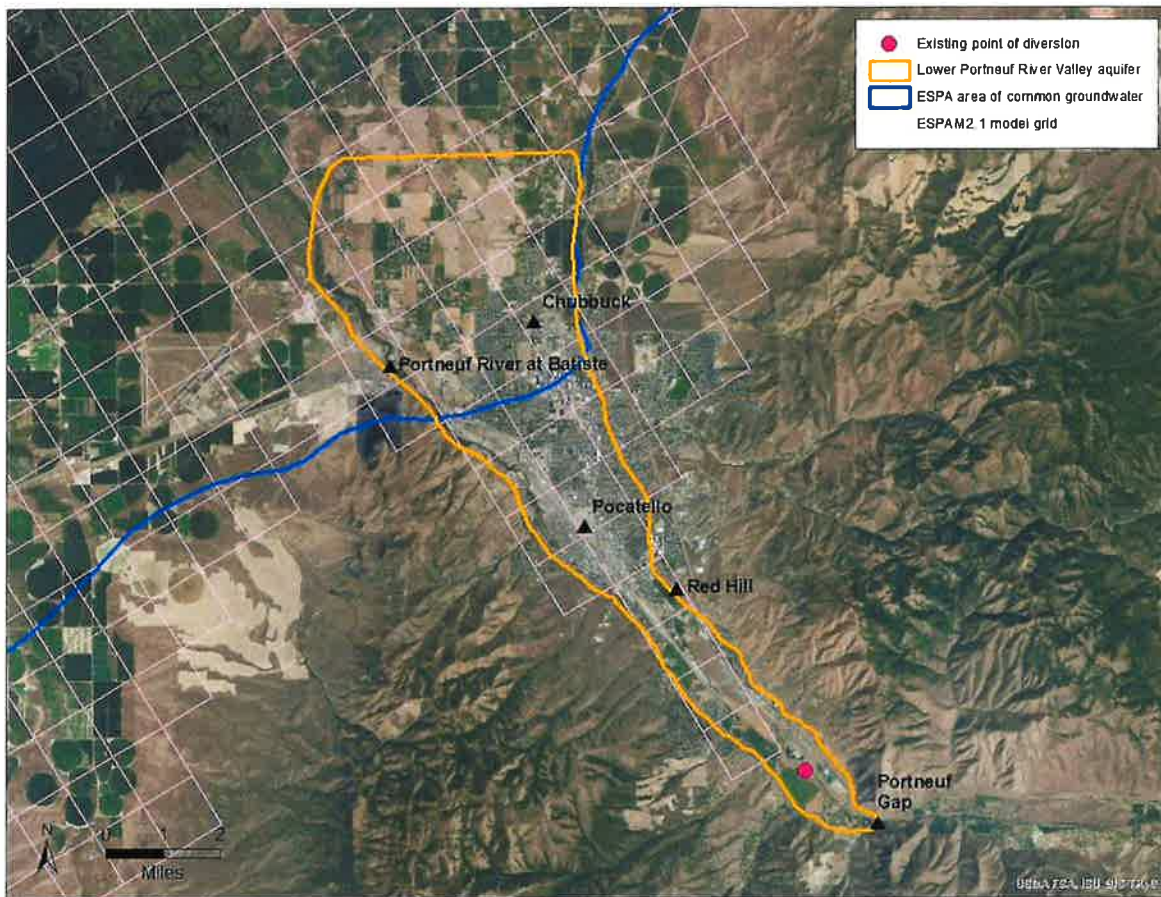


Figure 2. Location of existing point of diversion and the LPRV aquifer as delineated by Welhan (2006).

Between the Portneuf Gap and Batiste Road, the Portneuf River is perched and is not hydraulically connected to the aquifer (Welhan, 2001²; Welhan 2006). Figure 3 is a geologic cross-section of the LPRV presented by Welhan (2001). The section represented in Figure 3 is located approximately ¼ mile northwest of the existing POD. As discussed in Welhan (2006), diversion of groundwater from the LPRV aquifer for consumptive use reduces aquifer storage in the LPRV aquifer and reduces tributary underflow from the LPRV aquifer to the ESPA. This connectivity between the LPRV aquifer and the ESPA is consistent with the representation of this area in ESPAM version 2.1 and the ESPA Model Transfer Spreadsheet (ETRAN) version 3.3.

² Welhan, 2001, *Ground-Water Interactions Near the Highway Pond Gravel Pit, Pocatello, Idaho*. Staff Report 01-3, Idaho Geological Survey, Moscow, Idaho, 34 p.

website³. While JCH's analysis uses model cell (102,121) as the FROM cell, an analysis I performed using ETRAN version 3.3 and model cell (104,121) as the FROM cell yields similar results. In both analyses, net depletion increases are less than 2 acre-feet per trimester for each reach.

Although the hydraulic connectivity of the LPRV aquifer and the ESPA supports the validity of the transfer spreadsheet analysis, the analysis is only valid if the volume of water modeled at the FROM well has actually been used continuously from 1951 through 2017. Evapotranspiration (ET) data computed by the University of Idaho using Mapping EvapoTranspiration at high Resolution with Internalized Calibration (METRIC) are available at the existing place of use for the irrigation seasons of 1986, 1992, 1996, 2000, 2002, 2006, 2008, 2009, 2010, 2011, 2013, 2015, 2016 and 2017. The METRIC ET data indicate little or no irrigation occurred at the place of use during these years, and do not support the modeled diversion of 32 AF/year at the FROM well. Figure 4 through Figure 7 show examples of METRIC ET at the existing place of use for water right 29-14257 for the 2013 and 2015 through 2017 irrigation seasons. Although METRIC ET data are not available for 2014, Normalized Difference Vegetation Index (NDVI) data can be viewed on Climate Engine⁴ for additional years. Attachment A shows mean NDVI data for the irrigation seasons of 2013 through 2018. The vegetation index was relatively low throughout these irrigation seasons, indicating little or no irrigation occurred at the place of use in recent years.

³ <https://idwr.idaho.gov/water-rights/transfers/resources.html>

⁴ Desert Research Institute and University of Idaho, <http://climateengine.org/>.

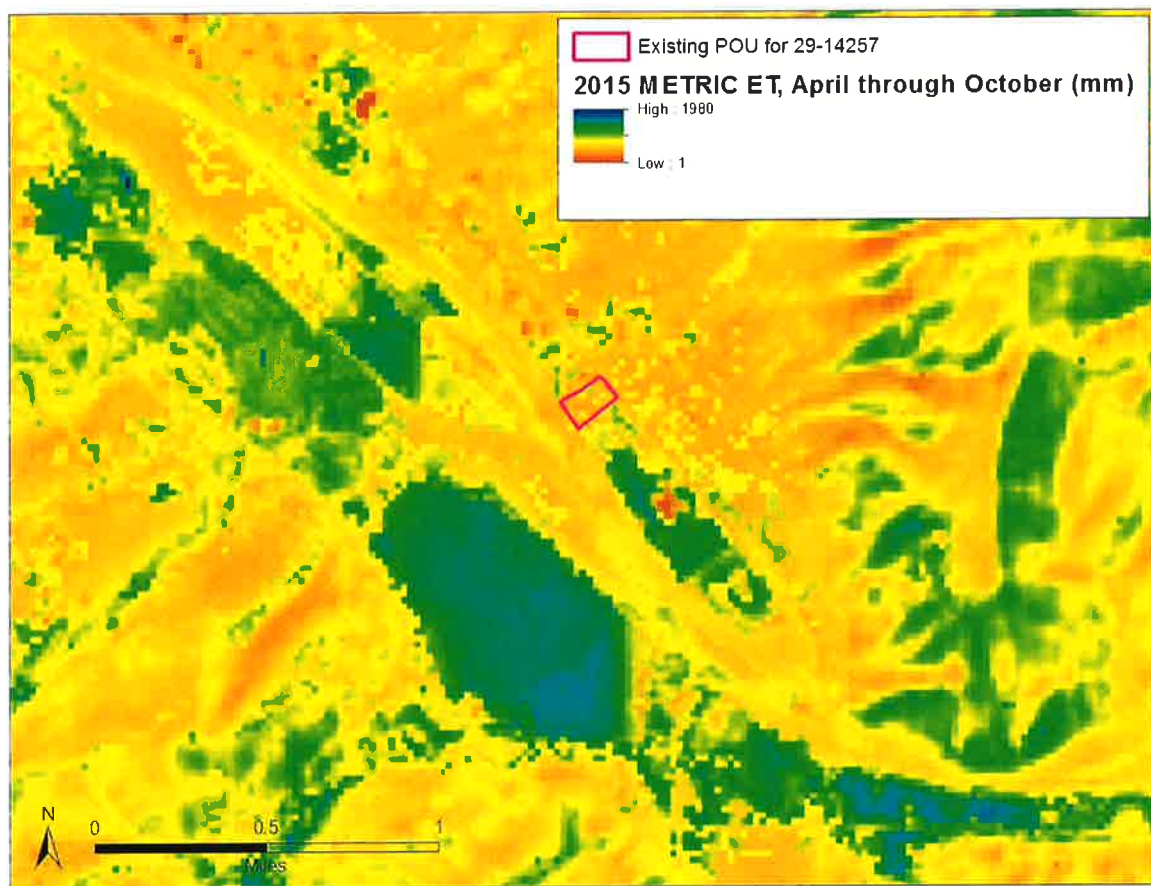


Figure 5. 2015 METRIC ET at existing place of use

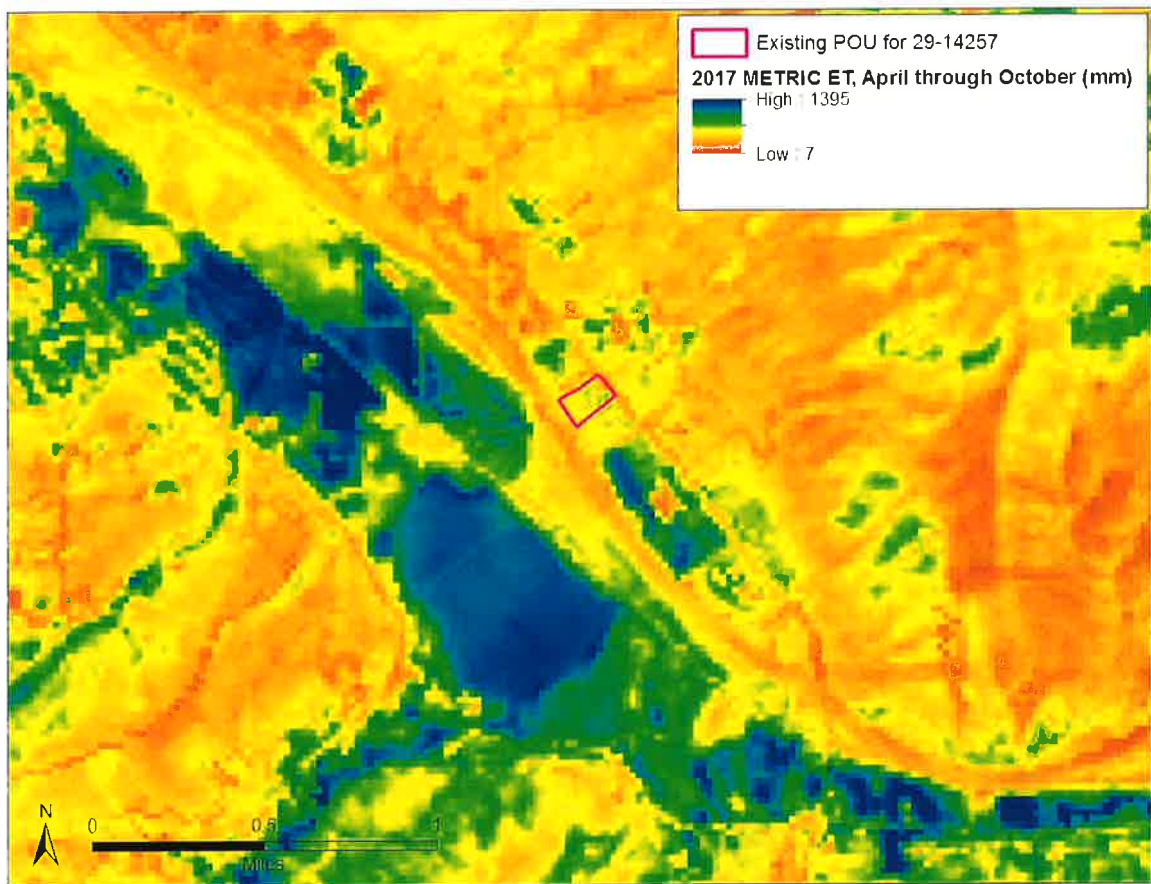
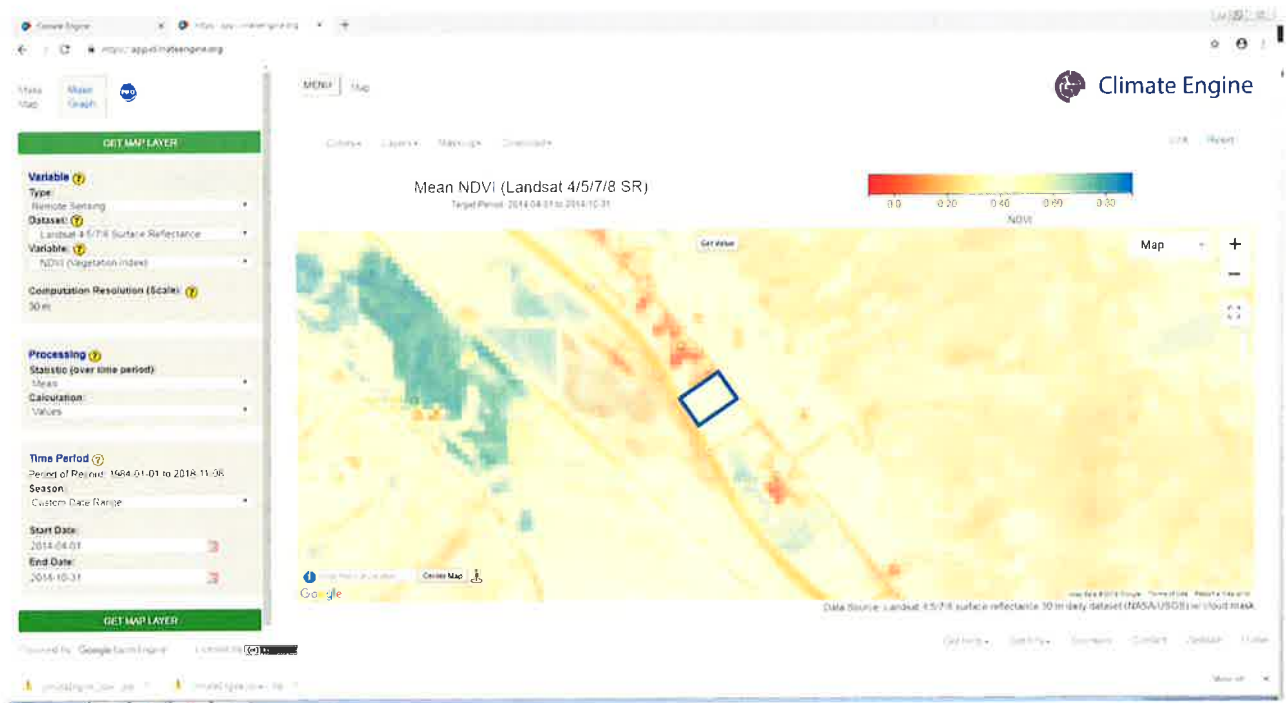


Figure 7. 2017 METRIC ET at existing place of use

In conclusion, the existing point of diversion is located within the LPRV aquifer, which is hydraulically connected to the ESPA. Reduction of pumping for consumptive use within the LPRV aquifer will result in an increase in inflow from the LPRV aquifer to the ESPA. However, METRIC ET and NDVI data indicate the historic use modeled in the transfer spreadsheet analysis submitted by the applicant has not occurred in recent years.







MEMO

State of Idaho

Department of Water Resources

322 E Front Street, P.O. Box 83720, Boise, Idaho 83720-0098

Phone: (208) 287-4800 Fax: (208) 287-6700

Date: July 10, 2015

To: Jeff Peppersack, P.E., Water Allocation Bureau Chief

Cc: Sean Vincent, P.G., Hydrology Section Manager

From: Jennifer Sukow, P.E., P.G., Hydrology Section

Subject: Hydrology staff review of application for transfer 79844

This memorandum summarizes hydrology staff review of application for transfer 79844, which requests to transfer a portion of groundwater right 29-7006 from the Marsh Valley near Arimo, Idaho approximately 50 miles northwest to Pleasant Valley near Aberdeen, Idaho. The current points of diversion (PODs) and place of use (POU) for water right 29-7006 are located outside of the Eastern Snake Plain Aquifer (ESPA) area of common groundwater supply (Figure 1) and are not located within a groundwater district or an active water district. The proposed transfer would move the POD and POU to a location within the ESPA area of common groundwater supply, the Aberdeen-American Falls Ground Water District, and Water District 120. Water right 29-7006 has a priority date of 1/10/1968.

The Marsh Valley aquifer is not directly connected to the ESPA, but groundwater discharge to Marsh Creek may be conveyed to the ESPA boundary as surface flow via the Portneuf River. The Portneuf River does not have significant interaction with groundwater between Inkom and Batiste Road. At Batiste Road (coincident with ESPA model cell 1095119), the Portneuf River becomes hydraulically connected to the ESPA and begins to gain significant flow from groundwater. If the Portneuf River carries additional water in the connected reach downstream of Batiste Road, the stage in the river will be higher, and the river will gain less water from the Eastern Snake Plain aquifer. However, water discharged from the Marsh Valley aquifer to Marsh Creek is natural flow available for diversion by numerous surface water users on Marsh Creek and the Portneuf River (Figure 1). During the irrigation season, groundwater discharged to Marsh Creek may be diverted for consumptive use and may not reach the Portneuf River at Batiste Road.

Snake River would not exceed the thresholds set forth in "Transfer Processing Memo No. 24", dated December 21, 2009.

In my opinion, the most significant issue with JCH's analysis is the assumption that additional groundwater discharge to Marsh Creek resulting from cessation of pumping at the current POD will travel as surface flow down Marsh Creek and the Portneuf River without being diverted for consumptive use. If groundwater discharged to Marsh Creek as a result of non-pumping at the current POD is diverted from Marsh Creek or the Portneuf River upstream of ESPA model cell 1095119, then the inputs to JCH's transfer spreadsheet analysis are not valid.

JCH also assumes any additional groundwater discharge to Marsh Creek will "recharge" the ESPA in model cell 1095119. While any additional flow in the Portneuf River at Batiste will result in reduced groundwater discharge to the Portneuf River and/or American Falls Reservoir, the location of the impacts to the ESPA is uncertain.

Hydrology staff identifies the following concerns regarding proposed transfer 79844.

1. Groundwater discharged to Marsh Creek is natural flow subject to diversion from Marsh Creek or the Portneuf River. If groundwater discharge to Marsh Creek resulting from non-pumping at the current POD is diverted upstream of Batiste Road, the transfer spreadsheet analysis submitted by the applicant is invalid.
2. Even if additional groundwater discharge to Marsh Creek is conveyed to the Portneuf River at Batiste Road, the location of impacts to the ESPA is uncertain. Simulating all of the impact in model cell 1095119 may not be appropriate.