



**STATE OF WASHINGTON
DRAFT
REPORT OF EXAMINATION
FOR WATER RIGHT CHANGE**

Added Irrigated Acres
Added Purpose of Use
Changed Place of Use
Changed Point of Withdrawal/Diversion

PRIORITY DATE 07/10/1946	WATER RIGHT NUMBER SWC 2691 [WRTS S1-*07312ALC]
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MAILING ADDRESS Marty Maberry/MDM Properties, LLC 816 Loomis Trail Road Lynden, WA 98264	SITE ADDRESS (IF DIFFERENT)
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Total Quantity Authorized for Withdrawal

WITHDRAWAL RATE	UNITS	ANNUAL QUANTITY (AF/YR)
85	GPM	34.6

Total withdrawals from all sources must not exceed the total quantity authorized for withdrawal listed above.

Purpose

PURPOSE	WITHDRAWAL			ANNUAL QUANTITY (AC-FT/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	
Irrigation		85	GPM	17.2		04/15 - 10/01
Industrial	85			17.4	2.6*	

*The non-additive annual quantity for industrial purposes is associated with the 5.6 ac-ft/yr allowed under RCW 90.44.050 for "industrial" purposes (i.e., 5,000 gallons per day). The remaining 3.0 ac-ft/yr allowed under this exemption will be used during the non-irrigation season, from 10/2 – 4/14.

IRRIGATED ACRES	
ADDITIVE	NON-ADDITIVE
32.5	77.5

Source Location

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
Whatcom	Groundwater	N/A	WRIA 1 (Nooksack)

SOURCE	PARCEL	WELL TAG	TOWNSHIP	RANGE	SECTION	QUARTER QUATER	LATITUDE	LONGITUDE
IW-1	400214070079	BHN-686	40N	02E	14	SW SW	48.95140	-122.52599
IW-2	400214070079	BHN-687	40N	02E	14	SW SW	48.95137	-122.52474
IW-3	400214070079	BHN-689	40N	02E	14	SW SW	48.95185	-122.52469
IW-4	400214070079	BHN-690	40N	02E	14	SW SW	48.95259	-122.52463
IW-5	400214070079	BHN-691	40N	02E	14	SW SW	48.95375	-122.52779
IW-6	400214114260	BHN-407	40N	02E	14	SW NW	48.95761	-122.52458
IW-7	400214114260	BHN-408	40N	02E	14	SW NW	48.95780	-122.52454
HW-1	400214114260	BHE-778	40N	02E	14	SW NW	48.95762	-122.52479
Future Well	400214086014	NA	40N	02E	14	SW SW	-	-
Future Well	400214070173	NA	40N	02E	14	NW SW	-	-
Future Well	400214026217	NA	40N	02E	14	NW SW	-	-
Future Well	400214347240	NA	40N	02E	14	NW SE	-	-
Future Well	400214470244	NA	40N	02E	14	NE SW	-	-

Place of Use (See Attached Map)

PARCELS

400214070079, 400214114260, 400214347240, 400214070173, 400214470244, 400214086014, and 400214026217

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE

Those portions of Section 14, Township 40 North, Range 2 East, W.M., more particularly described as follows:

Parcel A

The Southwest quarter of the Southwest quarter of said Section 14, less the South 250 feet of the East 872 feet thereof; LESS ROADS. AKA parcel 400214070079.

Parcel B

Lot B of the Monte Short Plat, as recorded in Book 6, Page 3 of Whatcom County Short Plats, Auditors File Number 1375824. AKA parcel 400214114260.

Parcel C

The North half of a tract as measured along the West line described as follows:
That portion of a tract lying Northerly of Bertrand Creek described as follows: Beginning at a point on the South section line of said Section 14 1409.9 ft West of Southeast corner, thence West along said Southerly line 240.01 ft; thence North 1320 ft; thence West to North-South section centerline; thence North along said line to the North line of the Southeast quarter as established in civil cause 11571; thence Easterly along said line to Northeast corner of West half the Southeast quarter; thence South to the point of beginning. LESS ROADS. AKA parcel 400214347240.

Parcel D

The South Half of the Northwest quarter of the Southwest quarter of said Section 14; LESS ROADS. AKA parcel 400214070173.

Parcel E

The North half of a tract in said Section 14 as measured along the West line described as follows:
A tract in the Southeast quarter described as follows: Beginning at a point 1650 feet West and 1320 ft north of the Southeast corner; thence West parallel to South line to Westerly line of Southeast Quarter; thence Northerly along said Westerly line to Northwest corner as established in Civil Cause 11571; thence Easterly along said established line to a point 495 ft West of Easterly line of Southeast quarter; thence Southerly parallel to said Easterly line to a point 875.55 ft South and 495 ft west of the Northeast Corner of Southeast Quarter; thence Westerly 30 ft to a point 875.55 ft South and 525 ft West of the Northeast corner of Southeast quarter; thence Southerly parallel to Easterly line 275 ft to Northerly line of Bertranda Estates Division Number 2; thence westerly

along said Northerly line to thread of Bertrand Creek; thence Westerly along said creek to its intersection with a line south of the point of beginning; thence North to the point of beginning. LESS that portion lying in the Northwest quarter of the Southeast quarter. AKA parcel 400214470244.

Parcel F

The South 250 ft of the East 872 ft of the Southwest quarter of the Southwest quarter of Said section 14, LESS ROADS. AKA parcel 400214086014.

Parcel G

Lot A of the Monte Short Plat as recorded in Book 6, Page 3 of Whatcom County Short Plats, Auditors File Number 1375824, EXCLUDING that portion lying Northwesterly of a line described as follows:

Beginning at the Northwest corner of said Lot A; thence S 01°11'50" W along West line of said lot A 124.09 feet to the TRUE POINT OF BEGINNING of this line description; thence N 81°51'55" E 32.71 ft; thence N 79°53'54" E 30.21 ft; thence S 85°18'22" E 240.77 ft; thence N 87°43'55" E 12.04 ft; thence N 45°14'20" E 15.89 FT; thence N 21°07'14" E 7.38 ft; thence N 02°28'48" E 337.66 ft to the North line of said Lot A, and the terminus of this Line description. AKA parcel 400214026217.

All situate within Whatcom County, Washington.

Proposed Works

The proposed works includes eight irrigation wells (IW-1 through IW-7 and HW-1). The irrigation system is interconnected with 8-inch mains and 4- and 5-inch sub-mains.

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Started	December 31, 2016	December 31, 2021

Measurement of Water Use

How often must water use be measured?	Weekly
How often must water use data be reported to Ecology?	Annually (Jan 31)
What volume should be reported?	Total Annual Volume
What rate should be reported?	Annual Peak Rate of Withdrawal (gpm)

Provisions

Relationship to Other Water Rights Used within the Place of Use (Home Place Farm)

GWC 2787(A), GWC 3262, and SWC 2691 are authorized for a combined total of 227 gallons per minute (gpm) and 127.2 acre-feet per year (af/yr) (109.8 af/yr for the irrigation of 110 acres and 17.4 af/yr for industrial use) within the same place of use. MDM properties is also pumping 5.6 ac-ft/yr, not to exceed 5,000 gallons per day, for industrial purposes, as allowed under the groundwater permit exemption (RCW 90.44.050).

Decommissioning Original Points of Diversion

The original points of diversion shall be decommissioned by December 31, 2016. This includes removal of any diversion structures, pumps, and pipes that are no longer needed for irrigation.

Pumping from the Unlined Pond

The volume of water pumped from the unlined pond located in the SW¼ NW¼, Section 14, Township 40 North, Range 2 East W.M. for use within the authorized place of use must not exceed the volume of

water pumped into the pond from the authorized points of withdrawal. Metering data must be collected to verify this to be true.

Wells, Well Logs and Well Construction Standards

All wells constructed in the state must meet the construction requirements of WAC 173-160 titled "Minimum Standards for the Construction and Maintenance of Wells" and RCW 18.104 titled "Water Well Construction". Any well which is unusable, abandoned, or whose use has been permanently discontinued, or which is in such disrepair that its continued use is impractical or is an environmental, safety or public health hazard must be decommissioned.

All wells must be tagged with a Department of Ecology unique well identification number. If you have an existing well and it does not have a tag, please contact the well-drilling coordinator at the regional Department of Ecology office issuing this decision. This tag must remain attached to the well. If you are required to submit water measuring reports, reference this tag number.

Installation and maintenance of an access port as described in WAC 173-160-291(3) is required.

Measurements, Monitoring, Metering and Reporting

An approved measuring device must be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173, which describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of Ecology for modifications to some of the requirements.

Recorded water use data shall be submitted via the Internet. To set up an Internet reporting account, contact the Bellingham Field Office. If you do not have Internet access, you can still submit hard copies by contacting the Bellingham Field Office for forms to submit your water use data.

Proof of Appropriation

The water right holder must file the notice of Proof of Appropriation of water (under which the superseding certificate of water right is issued) when the permanent distribution system has been constructed and the quantity of water required by the project has been put to full beneficial use. Once Ecology has accepted the Proof of Appropriation form, the applicant shall retain the services of a Certified Water Rights Examiner (CWRE) to verify the extent of the perfected right and prepare the necessary documentation to allow Ecology to issue a water right certificate for this project. The certificate will reflect the extent of the project perfected within the limitations of this authorization. Elements of a proof inspection may include, as appropriate, the source(s), system instantaneous capacity, beneficial use(s), annual quantity, place of use, and satisfaction of provisions. Information on hiring a CWRE is available on Ecology's website at: <http://www.ecy.wa.gov/programs/wr/rights/cwrep.html> or by calling the appropriate Ecology regional office.

Schedule and Inspections

Department of Ecology personnel, upon presentation of proper credentials, will have access at reasonable times, to the project location, and to inspect at reasonable times, records of water use, wells, diversions, measuring devices and associated distribution systems for compliance with water law.

Findings of Facts

Upon reviewing the investigator’s report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I concur with the investigator that the water right is eligible for change, the wells are tapping the same source water as the original points of diversion; there will be no impairment of existing rights; and there will be no detriment to the public interest.

Therefore, I ORDER approval of Application No. CS1-*07312ACL subject to existing rights and the provisions specified above.

Your Right To Appeal

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. “Date of receipt” is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of the Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Street Addresses	Mailing Addresses
<p>Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503</p>	<p>Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608</p>
<p>Pollution Control Hearings Board 1111 Israel RD SW, Suite 301 Tumwater, WA 98501</p>	<p>Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903</p>

Signed at Bellevue, Washington, this _____ day of _____, 2015.

Tom Buroker, Section Manager

For additional information visit the Environmental Hearings Office Website: <http://www.eho.wa.gov>. To find laws and agency rules visit the Washington State Legislature Website: <http://www1.leg.wa.gov/CodeReviser>.

BACKGROUND

This report serves as the written findings of fact concerning Water Right Change Application Number CS1-*07312ALC, an application to change Surface Water Certificate (SWC) 2691.

This application is one of four water right applications filed on behalf of MDM Properties, LLC (MDM) for water rights associated with, or to be associated with, MDM's Home Place and Axling Place operations. The groundwater change applications will be processed by RH2 Engineering, Inc. (RH2) through Ecology's cost reimbursement program. The two surface water to groundwater water change applications, including this application, will be processed by the Department of Ecology.

Through these proposed changes, MDM is seeking greater operational flexibility and consistency across existing water rights. The applications collectively seek to:

- Cease direct pumping from Bertrand Creek (CS1-*07312ALC and CS1-*07520C).
- Split and transfer a water right currently owned by West Main Street Investments to the Home Place and Axling Place properties (CG1-*04400C).
- Change water rights associated with the Home Place to have the place of use (POU) cover the entire property (CG1-*03622C and CS1-*07312C).
- Change water rights associated with the Axling Place to have the POU cover the entire property (CS1-*07520C).
- Add a purpose of use to include industrial uses associated with an agricultural processing plant (CS1-*07312C).

EXISTING Water Right Attributes

Water Right Owner	Maberry Packing, Inc.
Priority Date	07/10/1946 (amended superseding certificate issued 05/21/2014)
Place of Use	Whatcom County Tax Parcel 4002143472400000

County	Waterbody	Tributary To	WRIA
Whatcom	Bertrand Creek	Nooksack River	1 (Nooksack)

Purpose	Rate	Unit	Acre-feet/yr	Begin Season	End Season
Irrigation	0.19	CFS	34.6	April 15	October 1

Source Name	Parcel	Well Tag	Township	Range	Section	Quarter Quarter	Latitude	Longitude
POD #1	400214470244	N/A	40N	02E	14	N½ SE	Not Provided	Not Provided
POD #2	400223152498				23	NE NW		

REQUESTED Water Right Attributes

Applicant Name	MDM Properties, LLC
Date of Application	3/13/2013
Place of Use	Whatcom County Parcels 400214070079, 400214114260, 400214347240, 400214070173, 400214470244, 400214086014, and 400214026217

County	Waterbody	Tributary To	WRIA
Whatcom	Groundwater	N/A	01 (Nooksack)

Purposes	Rate	Unit	Acre-feet/year	Begin Season	End Season
Industrial and Irrigation	85	GPM	36.5	April 15	October 1

Source Name	Parcel	Well Tag	Township	Range	Section	Quarter Quarter	Latitude	Longitude
HW-1	400214114260	BHE-778	40N	02E	14	SW NW	48.95762	-122.52479
IW-1	400214070079	BHN-686				SW SW	48.95140	-122.52599
IW-2	400214070079	BHN-687				SW SW	48.95137	-122.52474
IW-3	400214070079	BHN-689				SW SW	48.95185	-122.52469
IW-4	400214070079	BHN-690				SW SW	48.95259	-122.52463
IW-5	400214070079	BHN-691				SW SW	48.95375	-122.52779
IW-6	400214114260	BHN-407				SW NW	48.95761	-122.52458
IW-7	400214114260	BHN-408				SW NW	48.95780	-122.52454
Future Well	400214086014	N/A				SW SW	-	-
Future Well	400214070173	N/A				NW SW	-	-
Future Well	400214026217	N/A				NW SW	-	-
Future Well	400214347240	N/A				NW SE	-	-
Future Well	400214470244	N/A				NE SW	-	-

Datum in NAD83/WGS84

Requirements for Requested Change

The following are requirements that must be met prior to authorizing the proposed changes.

Public Notice

RCW 90.03.280 requires that notice of a water right application be published once a week, for two consecutive weeks, in a newspaper of general circulation in the county or counties where the water is to be stored, diverted, and used. Notice of this application was published in the *Lynden Tribune* on June 5 and 12, 2013.

Consultation with the Department of Fish and Wildlife

The Department of Ecology must give notice to the Washington State Department of Fish and Wildlife (WDFW) of applications to divert, withdraw or store water. Mr. Steven Boessow, Water Rights Biologist with WDFW, was notified of the proposed decision on this pending water right change application. On May 15, 2014, Mr. Boessow responded that WDFW does not oppose this water right change because there is no increase in the quantity of the water used. However, Mr. Boessow requested that any surface diversions that are no longer used be removed from the stream.

Consultation with the Lummi Nation and Nooksack Tribe

The Lummi Nation and Nooksack Tribe were notified of the water right change application by Ecology. Neither the Lummi Indian Business Council (LIBC), nor the Nooksack Tribe provided comments on this change application.

State Environmental Policy Act

A water right application is subject to a State Environmental Policy Act (SEPA) threshold determination (i.e., an evaluation whether there are likely to be significant adverse environmental impacts) if any one of the following conditions are met.

- (a) It is a surface water right application for more than 1 cubic foot per second (cfs), unless that project is for agricultural irrigation, in which case the threshold is increased to 50 cfs, so long as that irrigation project will not receive public subsidies;
- (b) It is a groundwater right application for more than 2,250 gpm;
- (c) It is an application that, in combination with other water right applications for the same project, collectively exceed the amounts above;
- (d) It is a part of a larger proposal that is subject to SEPA for other reasons (e.g., the need to obtain other permits that are not exempt from SEPA); and
- (e) It is part of a series of exempt actions that, together, trigger the need to do a threshold determination, as defined under WAC 197-11-305.

Because this application does not meet any of these conditions, it is categorically exempt from SEPA and a threshold determination is not required.

Water Resources Statutes and Case Law

RCW 90.03.380(1) states that a water right that has been put to beneficial use may be changed. The point of diversion, POU, and purpose of use may be changed if it would not result in harm or injury to other water rights.

The Washington Supreme Court has held that Ecology, when processing an application for change to a water right, is required to make a tentative determination of extent and validity of the claim or right. This is necessary to establish whether the claim or right is eligible for change. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp*.

INVESTIGATION

Site Visit/Description

On December 12, 2013, Mr. Andrew B. Dunn and Mr. Jim Bucknell from RH2 and Mr. Tom Buroker from Ecology met with Mr. Allen Brown from MDM Properties and Mr. Chuck Lindsay, their consultant from Associated Earth Sciences, Inc., (AESI). This site visit included a visit to the original and proposed POU, original points of diversion, proposed points of withdrawal, and a discussion of farm operations and the proposed changes to these water rights.

Mr. Brown confirmed that during the 2013 irrigation season, which occurred after submittal of the change application and associated supporting documentation prepared by AESI (2013), only raspberries and blueberries were grown on the Home Place property. Irrigation season on the proposed POU is weather dependent, but typically runs from April through September. All irrigation is demand-based.

Mr. Brown indicated that MDM Properties plan to grow raspberries and blueberries with an occasional rotation of potatoes. Raspberries are often grown on a field for 5 to 10 years before they are removed. Blueberries can be grown for many decades before they need to be removed. In the past, MDM has periodically included strawberries in the rotation. When potatoes are grown, they are irrigated with travelling big gun sprinklers through separate high-pressure mains.

Mr. Brown drew the approximate locations of the main and sub-mains on aerial photographs of the property. He also explained that water for irrigation is currently routed from each well or diversion point

to an unlined pond near the north end of the property and then pumped into the irrigation system. Water is also pumped directly from the wells to the packaging plant for use in that industrial facility. Mr. Brown explained that upcoming food safety rule changes will make it less desirable to use water from an open pond for irrigation or processing the berries, so they are determining how they can pump directly from the wells into the distribution system.

Irrigation pipes range from 8-inch diameter mainlines to 4- and 5-inch diameter sub-mains. Mr. Brown said they maintain about 70 pounds per square inch (psi) of pressure in the mainlines and about 10 to 12 psi in the driplines. In addition to pumps associated with the 10 points of withdrawal/diversion, there is a pump house located near the treatment pond that contains sand filters for particle removal and plumbing to allow for introduction of fertilizer into the irrigation system (fertigation). They also have the ability to aerate the water by pumping it into the air and letting it return to the pond. The only point of withdrawal with an installed meter is Well HW-1, for which source approval is sought.

For the raspberry and blueberry crop, water is delivered through drip irrigation. Typically, there are two drip tapes running along a row. The drip tape is $\frac{7}{8}$ -inch diameter drip tape with emitters every 2 feet. Two drip tapes are buried on either side of the plant or one is buried and one is hanging from the trellis. Rows are typically spaced at 11-foot centers to allow for mechanical harvesting.

During the site visit, each proposed well, horizontal well, and surface water diversion was visited to confirm the location and to take GPS coordinates. The precise location of Well IW-2 could not be determined since pallets were stacked on top of the well vault. Depth to water measurements were taken at accessible wells during the site visit using an electronic water level probe. The measurements obtained are discussed in the Hydrogeology section of this investigation.

All company water use comes from the on-site wells and surface water diversions. The home located within the proposed POU receives water from the City of Lynden.

History of Water Use

Information on the history of water use under this water right was pieced together from a variety of sources, including two affidavits, pump curves, aerial photos, Landsat imagery, irrigation guides, the site visit, and weather records.

The existing POU encompasses 20 acres within parcel 400214347240, owned by Maberry Properties, LLC, and located in the NW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 14, Township 40 North, Range 2 East, W.M.

Affidavit

Mr. Marty Maberry submitted an affidavit with this change application, signed and notarized on February 26, 2013. In that affidavit, Mr. Maberry states that he is familiar with the farming and irrigation operations on the property and the operational, historical, farming, irrigation, and general water use practices described in the AESI report (2013), are “true and correct” to the best of his knowledge.

Instantaneous Rate

Pumps on the two existing points of diversion associated with SWC 2691 include (1) a John Deere 120 horsepower tractor with a power take-off (PTO) pump capable of discharging at approximately 400 gallons per minute and (2) a portable centrifugal pump with a 25 horsepower motor capable of a

discharge rate of 625 gpm. Therefore, it is reasonable to conclude that the instantaneous rate of .19 CFS (85 GPM), as authorized under this water right, has been maintained through beneficial use.

Irrigated Acres

Historical aerial photos of this property were provided with the application packet (AESI, 2013). These aerial photos were labeled with the following dates: 1951, 1961, 1975, July 1998, October 2003, July 2004, July 2005, September 2006, April 2009, June 2009, and August 2011. The photographs indicate that the current place of use, as defined in the 1994 superseding certificate under the name Maberry Packing Inc, was cleared for agricultural production sometime between 1975 and the mid-1990s—the POU is forested in the 1975 photo and farmed and irrigated in the 1998 photo. The applicant has indicated that the existing POU has been farmed since the early 1990s. Documentation prepared by AESI and the affidavit submitted by the applicant support the assertion that 20 acres have been irrigated continuously since at least 1994, when the superseding certificate was issued.

Annual Volume

From 1994 until 1997, the applicant irrigated 20 acres with a rotating crop of raspberries, strawberries, and potatoes using moveable big guns. Beginning in 1998, the applicant grew raspberries using drip irrigation methods, with an occasional rotation of potatoes irrigated with moveable big guns. Between 2008 and 2013, raspberries were grown every year except for 2012, when potatoes were rotated in. There are no water meters installed on the points of diversion. Therefore, the following resources are drawn from: (1) the Washington Irrigation Guide (WIG, 1985), weather data, and the Water Resources Guidance GUID-1210.

To determine the existing annual volume, the crop irrigation requirement (CIR) must be calculated. This is the amount of water that the crop would need to avoid stress due to water availability. The POU is roughly equidistant between the two closest WIG stations (Blaine and Clearbrook); thus, the crop irrigation requirements for these stations have been averaged. The average of the data from the WIG (1985) suggests that, with a 2-year return interval, the CIR for raspberries is 16.53 inches.

The WIG (1985) CIR estimates are for an average year and are based on almost 30 years of weather data collected from 1951 to 1980. The University of Washington – Climate Impacts Group has predicted that over the next 10 to 30 years, average air temperatures in the Pacific Northwest will be 2 to 3 degrees Fahrenheit higher than the 1970 to 1999 averages and that less precipitation will occur during the summer months due to global climate changes affecting Washington State. The available weather data shows that the period of May through September was on average 1.6 degrees Fahrenheit warmer from 2009 through 2013, than the average temperature from the Blaine and Clearbrook stations provided in the WIG (**Table 1**). Therefore, it is apparent that, because the WIG values are based on weather data from 1951 to 1980, utilizing the WIG estimated CIR would result in underestimating the amount of irrigation water an irrigator has actually been using over at least the last 5 years.

Table 1. Weather Comparison of WIG Averages to Actual Data

Irrigation Season	Temperature (degrees F)			Precipitation (inches)		
	WIG Average	Actual	Difference (Actual - WIG)	WIG Average	Actual	Difference (Actual - WIG)
2009	58.65	61.01	2.36	10.42	8.02	-2.40
2010		59.37	0.72		14.35	3.93
2011		59.23	0.58		11.05	0.63
2012		59.91	1.26		8.64	-1.78
2013		61.90	3.25		11.70	1.28
<ul style="list-style-type: none"> • Irrigation season is considered to be May through September. • Annual data is average of the Clearbrook and Blaine weather stations. • Weather data was obtained from www.wrcc.dri.edu. 						

Station Circular 512 (Irrigation Water Requirements Estimates for Washington, November 1969) and EB1513 (Irrigation Requirements for Washington Estimates and Methodology, 1982) show that, for the Bellingham station (closest location to the site), the crop irrigation requirement will increase as the return period increases. These documents show an increase of 1 to 3 inches going from the 2-year to the 5-year and 10-year return intervals.

Publication EB1513 presents CIR estimates for various crops (based on average weather data from 1948 through 1973) and 2-, 5-, 10-, and 20-year return intervals to account for climatic variability. Publication EB1513 states that the CIR 2-year return period values will be adequate on the average, once every 2 years. Similarly, the 5-year, 10-year, and 20-year CIR values will be adequate on the average 4 of 5 years, 9 of 10 years, and 19 of 20 years, respectively. Again, it should be noted that these CIR values and return periods are based on weather data collected from 1948 through 1973 and, as discussed above, likely underestimate the current CIR values and return interval time periods due to ongoing global climate change.

Publication EB1513 indicates that for Bellingham (closest location to site), the raspberry crop CIR increased by approximately 17 percent going from the 2-year to the 10-year return interval. Increasing the WIG raspberry CIR by 17 percent yields a new estimated CIR of 19.34-inches. This assumes that increasing the WIG values to represent the anticipated 10-year return interval for the crop is a reasonable way to estimate the actual CIR for this water right.

Ecology guidance document 1210 indicates that the efficiency of the trickle/drip micro-irrigation methods utilized to irrigate raspberries ranges between 70 and 95 percent, with an average of 88 percent (Ecology Guidance 1210).

Table 2 contains calculations of the annual volume based on the WIG. One uses the values directly from the WIG and the second adjusts the WIG values upward to account for climate change and a longer return interval, as discussed above.

Table 2. Annual Volume Calculated Using Various Methods

Method	CIR (inches)	Application Efficiency	TIR (inches)	TIR (feet)	Volume (af/yr)
WIG 2-year return	16.53	88%	18.78	1.57	31.3

interval					
Adjusted WIG 10-year return interval	19.34	88%	21.98	1.83	36.6
<ul style="list-style-type: none"> • Crop is raspberries • Irrigation method is trickle/drip. • WIG value is average of Clearbrook and Blaine Stations. • Adjusted WIG 10-year return interval is the WIG times 1.17. • 20 acres of irrigation. • Application efficiency and percent consumptive use equal to the average values provided in Ecology Guidance 1210. • Water right limit is 34.6 af/yr. 					

Given the adjusted WIG value and the fact that this water right is limited to an annual volume of 34.6 af/yr, it is reasonable to conclude that the full annual volume granted in the 2014 amended superseding certificate is available for change.

Proposed Use

The purpose of this change application is to: (1) switch from a surface water diversion from Bertrand Creek to multiple points of withdrawal, (2) change the POU to include additional property owned by the applicant, (3) add an industrial purpose of use, and (4) increase the number of irrigated acres.

Proposed Place of Use

The proposed POU is approximately 124 acres located in Section 14, Township 40 North, Range 2 East, W.M. The proposed POU is referred to as the Home Place POU for the purposes of this report. The Home Place POU includes seven tax parcels which form a contiguous block of primarily agricultural property. A summary of the property ownership in the Home Place POU is presented in **Table 3**.

Table 3. Summary of Land Ownership in Proposed Place of Use

Tax Parcel No.	Parcel Owner	Gross Acres	Irrigable Acres
400214070079	Maberry Land Holdings LLC	33.81	28.00
400214114260	Maberry Properties LLC	28.25	27.80
400214347240	Maberry Properties LLC	23.75	23.25
400214070173	Maberry Land Holdings LLC	19.55	19.25
400214470244	Maberry Properties LLC	10.80	6.00
400214086014	Marty K & Debbie R Maberry	4.40	2.60
400214026217	Maberry Properties LLC	3.18	3.10
Totals		123.74	110.0

Annual Consumptive Quantity

A change in the place of use of a water right to enable irrigation of additional acreage or the addition of new uses may be permitted if the change results in no increase in the annual consumptive quantity (ACQ) of water used under the water right (RCW 90.03.380).

ACQ means the estimated or actual amount of water diverted in a year, allowed under a water right, reduced by the estimated annual amount of return flows. This quantity is then averaged using the

greatest two years of use within the most recent five-year period of continuous beneficial use of the water right.

ACQ analysis for this change application will be performed on the on the 2010 through 2014 irrigation seasons. Based on the data available, it is reasonable to use 2011 and 2013 to represent the years when the crops grown and weather conditions would require the most irrigation water. Therefore, these two years will be used as the two highest years of use within the last five years of consecutive water use.

Table 4. Annual Consumptive Quantity Calculation

Year	Estimated CIR (inches)	Actual CIR (feet)	WR Limit (feet)	Application Efficiency (%)	Cons. Use Efficiency (%)	Actual Cons. Use (feet)	TIR (af/yr)	Cons. Use (af/yr)	Return Flow (af/yr)
2011	19.34	1.61	1.73	93	98	1.70	34.6	34.0	.6
2013	19.34	1.61	1.73	93	98	1.70	34.6	34.0	.6
Average							34.6	34.0	.6
Estimated CIR = Washington irrigation guide (average of Blaine and Clearbrook stations) multiplied by 117% to account for current climatic conditions CIR = Crop irrigation requirement WR Limit = Annual volume of 34.6 af/yr divided by 20 acres Application Efficiency from Ecology GUID-1210. af/yr = acre-feet per year Cons. = Consumptive Crop Grown: Raspberries Area: 20 acres Irrigation Method: Trickle/drip Cons. Use Efficiency = Application Efficiency + 5% Total Evaporated from Ecology GUID-1210. Actual Cons. Use = WR Limit x Cons. Use Efficiency									

Table 4 shows that, using the irrigation requirements for 2011 and 2013, the consumptive use to irrigate 20 acres of raspberries is 34.0, which is less than the water right limit of 34.6 af/yr.

The proposal under this application is to add an industrial purpose of use and to increase the number of irrigated acres. The anticipated ACQ of both the industrial and irrigation portions of the post-change right will be reviewed to determine if the ACQ will remain at or below existing levels.

The applicant requests 17.4 ac-ft/yr for industrial purposes (e.g., agricultural packaging/processing, facility clean-up, etc). Of that quantity, 16.2 ac-ft/yr will be used as wash water in the facility. Once used, the greywater will be collected and applied to a portion of a ~230 acre parcel north of the Home Field properties and owned by the City of Lynden (Whatcom Parcel No. 4002143064420000). This quantity will be fully consumed. The remaining 1.2 ac-ft/yr will be used for sanitation purposes in the packaging facility (e.g., toilet flushing, faucet, leaks, etc.). Because the facility is on a septic system, a percentage of the 1.2 ac-ft/yr will be return flow. Based on knowledge of the site hydrogeology, residential end use estimates (AWWA, 1999), and assumptions on per use gallon per day estimates, AESI estimates that 0.3 ac-ft/yr will be consumed from April 15 – October 1 and 0.9 ac-ft\yr will be return flow.

In addition to the proposed industrial quantity, 17.2 ac-ft\yr will remain as irrigation water. This annual quantity will be used to irrigate 110 acres (32.5 are additive and 77.5 are non-additive). Because this

quantity will be applied to a larger POU using deficit irrigation, it is assumed that this full quantity will be consumed. With the septic return flow, the ACQ associated with this proposal is 33.7; thus, there will be no increase in ACQ.

Period of Use

The period of use for SWC 2691 is April 15 – October 1. The application requests year-round industrial use; however, subsequent discussions with the applicant’s consultant, Chuck Lindsay, indicate that the applicant only needs this additive industrial water during the certificated period of use. MDM Properties will rely on the groundwater exemption for the non-irrigation season industrial water needed. Thus, no change in the period of use is needed.

Other Rights Appurtenant to the Place of Use

The Department of Ecology’s Water Resources Explorer was used to determine which rights are appurtenant to the existing and proposed POU.

In addition to the water right that is subject of this report of examination for change, MDM holds one other irrigation water right within the proposed POU. Water Right CG1-*03622C is going through a similar change. There are also two water right claims within the proposed POU that are for domestic and lawn and garden uses that were originally filed by William A. Maberry and are listed in **Table 5**.

Table 5. Water Rights Appurtenant to the Existing Place of Use

Water Right Name	Water Right Number	Purpose of Use	Notes
Melvin Cowin	GWC 3262 (G1-*03622C)	Irrigation	Concurrently going through change application process.
Marshall Bayes	SWC 2691 (S1-*07312C)	Irrigation	Subject of this Report of Examination
William A. Maberry	G1-137156CL	Domestic and Lawn and Garden	Not being changed. Likely represents a permit-exempt well.
William A. Maberry	G1-137157CL	Domestic and Lawn and Garden	Not being changed. Likely represents a permit-exempt well.

In addition to the water rights that are appurtenant, MDM is currently going through a water right change application process to move a portion of GWC 2787 (Vermeulen) to the proposed POU for irrigation under change application CG1-*04400C.

There are three water right certificates and one permit whose POU includes the proposed POU that are not owned by MDM. These water rights are listed in **Table 6**.

Table 6. Water Rights Appurtenant to the Proposed Place of Use Not Held By MDM Properties

Water Right Name	Water Right Number	Purpose of Use
Delta Water Association	GWC 2418	Municipal
Delta Water Association	G1-24815C	Municipal
Berthusen Road Water Association	G1-20260C	Municipal

City of Lynden	S1-28116P	Domestic ¹
¹ To alleviate a public health emergency arising from the contamination of groundwater with ethylene dibromide (EBD) and 1,2-dichloropropane (1,2-DCP).		

All four of these water rights are for municipal/domestic water supply purposes. The overlap of these rights with the proposed POU does not present a problem since the purposes of use are different.

Hydrologic/Hydrogeologic Evaluation

A separate hydrogeologic memorandum was prepared by Andrew B. Dunn, L.G., L.H.G., focusing on the same body of public groundwater test and impairment (RH2 Engineering Technical Memorandum, May 1, 2014). A summary of that memorandum is presented here and more detail can be obtained from the memorandum, located in the water right file.

The points of diversion, withdrawal, and POU involved in this water right change application lie on the geographic feature commonly referred to as the Lynden Terrace. The Lynden Terrace is a slightly elevated but gently sloping region located in northern Whatcom County to the north of the Nooksack River Lowland. The existing and proposed water right points of diversion/withdrawal fall within the Bertrand subbasin (WRIA 1 Initiating Governments, 2002) and are completed within the Sumas outwash aquifer. At the Home Place properties the Sumas outwash deposit can be 30 to 50 feet thick.

The original points of diversion for the subject water right change are two surface water diversions from Bertrand Creek (SD-1 and SD-2). The requested points of withdrawal include classic dug and drilled wells (IWs 1-7) and a new type of well, referred to as a horizontal well (HW-1), that consists of a 48-inch diameter vertical pump chamber and a long (650-foot) buried horizontal perforated PVC collector pipe located within the saturated portion of the aquifer. While water well logs do not exist for every well (e.g., Wells IW-1, IW-5, IW-6, and IW-7 do not have well logs), it is a safe assumption that all wells within the Home Place are completed in the Sumas outwash aquifer since deeper wells drilled into the underlying glaciomarine drift often encounter saline water and lack production necessary for irrigation.

The groundwater contours created by Cox and Kahle (1999) include the project site. These contours show groundwater flow to the southeast toward the mainstem of Bertrand Creek. This groundwater flow direction was confirmed by water level measurements made during the December 12, 2013 site visit.

Same Source of Supply

The original points of diversion are located on Bertrand Creek. Therefore, this water right must continue to withdraw water from points of withdrawal (existing or future) that are located within the same source of supply. Based on RH2's hydrogeological analysis, it has been determined that the source water tapped by the existing points of diversion are hydraulically connected to the proposed points of withdrawal and are the same source of supply based on the following facts:

1. The future points of withdrawal will tap the shallow Sumas outwash aquifer.
2. All existing points of diversion and proposed points of withdrawal are located within the Bertrand Subbasin.
3. The Sumas outwash aquifer is hydraulically connected to Bertrand Creek.

Pumping Impacts on Neighboring Wells

Nearby water rights were reviewed to determine the approximate distance between the proposed wells and existing wells for purposes of calculating the anticipated interference drawdown in the neighboring wells. In addition to the existing on-site wells (Wells IW-1, IW-2, IW-3, IW-4, IW-5, IW-6, IW-7 and HW-1), MDM has requested the ability to add additional wells in the future on the remaining parcels within the proposed POU that do not currently have wells on them (Parcels 400214026217, 400214070173, 400214086014, 400214347240, and 400214470244). Since exact locations for the future wells have not been specified, analysis for impact was completed assuming that the wells are located on the edge of the parcel boundaries closest to any neighboring wells with which they could interfere. This “worst-case” assumption is made to be as protective of neighboring well users as possible. The closest water rights, not held or operated by MDM, to either the closest existing well or the potential future points of withdrawal were approximately 450 and 150 feet away, respectively.

Interference drawdown was calculated using a transmissivity of 18,678 gallons per day per foot (gpd/ft) based on pump test results of a well at MDM’s Axling Place property and published values and a storage coefficient of 0.2 since it is an unconfined aquifer. Even if all of the water rights that are being changed (227 gpm) were withdrawn from IW-6, IW-7, and HW-1, continuously until the full annual volume was pumped (127 days), the maximum anticipated interference drawdown at a distance of 500 and 1,000 feet is 3.7 feet and 1.9 feet, respectively, with a maximum radius of influence of 1,886 feet. These data indicate that the anticipated interference drawdown drops off rapidly with distance from the pumping well.

Impairment Considerations

Impairment of Minimum Instream Flow Water Rights

The term "instream flow" is used to identify a specific stream flow (typically measured in cfs) at a specific location for a defined time, and typically following seasonal variations. Instream flows are usually defined as the stream flows needed to protect and preserve instream resources and values, such as fish, wildlife, and recreation. Instream flows are most often described and established in a formal legal document, typically an adopted state rule.

Once established by rule, a minimum flow constitutes an appropriation with a priority date as of the effective date of the rule establishing the minimum flow (RCW 90.03.345). Thus, a minimum flow set by rule is an existing right which may not be impaired (RCW 90.03.345; RCW 90.44.030). Minimum flows for the Nooksack River Basin are established by Chapter 173-501 WAC.

The proposed changes will cause no greater impact on minimum instream flows established in Chapter 173-501 WAC than exist with the originally approved diversion points. Therefore, the change will not cause any impairment of minimum instream flows.

Impairment, Qualifying Groundwater Withdrawal Facilities, and Well Interference

There are three concepts that are important when considering whether a withdrawal of water from a well would impair another existing water right. The concepts are defined as follows:

- Impairment is an adverse impact on the physical availability of water for a beneficial use that is entitled to protection, i.e., water rights that are both senior and junior in priority to the right the applicant seeks to change.

- Qualifying groundwater withdrawal facilities are defined as those wells which, in the opinion of the Department of Ecology, are adequately constructed. An adequately constructed well is one that (a) is constructed in compliance with well construction requirements; (b) fully penetrates the saturated thickness of an aquifer or withdraws water from a reasonable and feasible pumping lift (WAC 173-150); (c) the withdrawal facilities must be able to accommodate a reasonable variation in seasonal pumping water levels; and (d) the withdrawal facilities including pumping facilities must be properly sized to the ability of the aquifer to produce water.
- Well interference may occur when several wells penetrate and withdraw groundwater from the same aquifer.

As discussed in the Hydrologic/Hydrogeologic Evaluation section, no impairment is expected to occur in neighboring wells as a result of pumping in the wells associated with this water right change application, for the following reasons:

1. The aquifer is very thin and most wells fully penetrate the aquifer (typically a depth of less than 50 feet with a saturated thickness of less than 30 feet).
2. The hydraulic conductivity of the aquifer is only moderate.
3. The aquifer is unconfined, which results in a higher storage coefficient (specific yield) than if the aquifer was confined.

Pumping a well completed at the base of a thin aquifer with a moderate hydraulic conductivity and high storage coefficient will tend to create a steep cone of depression around the well. This steep cone of depression often reduces the ability to pump these wells at a high rate for a long enough duration to impact neighboring wells.

As of May 14, 2015, Ecology had not received any complaints from well owners near the Home Place farm related to declining water levels, excessive seasonal drawdowns, and wells pumping air.

Public Interest Considerations

The changes proposed by the applicant will not be detrimental to the public interest.

Environmental Impact of Surface to Ground Water Change

A tributary to the Nooksack River, Bertrand Creek supports populations of coho, steelhead, Chinook, chum, and sockeye salmon as well as cutthroat trout. The Creek is the focus of a number of local and statewide management efforts to improve habitat and increase instream flows. **Table 7** shows the mean, median, and minimum instantaneous Bertrand Creek flows from the 2010 - 2014 irrigation season (May – September). Flows are likely lower at the existing points of diversion associated with this water right, located approximately four miles upstream from this gage. Combined with application CS1-*07520C, which is being concurrently processed, the existing diversions contribute to a significant portion of low flows during the July – September months, when salmonids are migrating upstream to spawn. For example, during the August 2010 low flow, the diversion rates authorized by these two water rights represented approximately 12% of the total Bertrand Creek flows.

This proposed change will put more water in Bertrand Creek during the most critical, low-flow times. A technical memorandum, prepared by AESI (see water right file), calculated that the proposed package of MDM water right transfer/changes would be a total net increase in flow to Bertrand Creek of 80 gpm

(see February 14, 2014 technical memorandum in file). The switch from surface water to groundwater will benefit flows by creating a lag time on impacts on the stream.

WDFW supports the switch from surface water to groundwater and has indicated that this change supports the conservation goals on Bertrand Creek.

Table 7. 2010-2014 Bertrand Creek Flow Data during Irrigation Season (in CFS)

	May	June	July	August	September
Mean	69.76	36.16	14.2	9.26	17.7
Median	45.6	29.8	11.1	9.5	10.6
Minimum	16.8	11.7	4.0	3.7	5.4

Note: this flow data is maintained by Ecology’s Environmental Assessment Program. The gage is located near the confluence of Bertrand Creek and the Nooksack River, 4 miles downstream of the diversions points associated with this water right.

Consideration of Protests and Comments

The only comments received on this change application were submitted by WDFW. On May 15, 2014, WDFW provided a letter stating it does not oppose the approval of this change application. The letter states that while there is an increase from seasonal to year-round use for a portion of the right (which is no longer the case), there will be no increase in the quantity of water used. No protests were filed against this change application.

Conclusions

The subject water right is eligible for change, the proposed wells will tap the same source water as the original points of diversion; there will be no impairment of existing rights; the right will not be enlarged; and there will be no detriment to the public interest.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that this request for a water right be approved in the amounts and within the limitations listed below and subject to the provisions listed above.

Purpose of Use and Authorized Quantities

The amount of water recommended is a maximum limit and the water user may only use that amount of water within the specified limit that is reasonable and beneficial:

- 85 gpm
- 17.4 acre-feet per year for industrial purposes (April 15 – October 1)
- 17.2 acre-feet per year for irrigation purposes (April 15 – October 1)
- Irrigation of 32.5 acres (additive)

Points of Withdrawal

SOURCE	PARCEL	WELL TAG	TOWNSHIP	RANGE	SECTION	QUARTER QUATER	LATITUDE	LONGITUDE
IW-1	400214070079	BHN686	40N	02E	14	SW SW	48.95140	-122.52599
IW-2	400214070079	BHN687	40N	02E	14	SW SW	48.95137	-122.52474
IW-3	400214070079	BHN689	40N	02E	14	SW SW	48.95185	-122.52469
IW-4	400214070079	BHN690	40N	02E	14	SW SW	48.95259	-122.52463
IW-5	400214070079	BHN691	40N	02E	14	SW SW	48.95375	-122.52779
IW-6	400214114260	BHN407	40N	02E	14	SW NW	48.95761	-122.52458
IW-7	400214114260	BHN408	40N	02E	14	SW NW	48.95780	-122.52454
HW-1	400214114260	BHE778	40N	02E	14	SW NW	48.95762	-122.52479
Future Well	400214086014	NA	40N	02E	14	SW SW	-	-
Future Well	400214070173	NA	40N	02E	14	NW SW	-	-
Future Well	400214026217	NA	40N	02E	14	NW SW	-	-
Future Well	400214347240	NA	40N	02E	14	NW SE	-	-
Future Well	400214470244	NA	40N	02E	14	NE SW	-	-

Note: All additional or replacement wells constructed under this water right must be at least as far from Bertrand Creek as the authorized points of withdrawal identified in this Report of Examination.

Place of Use

Described on Page 2 of this Report of Examination.

Water Rights Associated with the Same Place of Use

Table 8 lists all of the state-issued water rights that are held by MDM and associated with the Home Place POU. Water right changes are being simultaneously processed for all of the water rights listed. This table is intended to assist the water right holder and later Ecology investigators to more easily understand the attributes and limitations on the portfolio of state-issued water rights associated with the Home Place POU. This table does not account for any permit-exempt groundwater rights that might be used within the POU.

Table 8. Summary of Recommended Water Right Change Decisions, Associated with MDM Properties, LLC Home Place

Water Right	Qi (gpm)	Total Qa (af/yr)	Additive Irrigated Acres	Industrial Use (af/yr)	Irrigation Use (af/yr)	Season of Use	Place of Use	Points of Withdrawal
GWC 3262 G1-*03622C (Cowan)	72	57.6	60	0	57.6	04/01 – 10/01	Home Place	IW-1, IW-2, IW-3, IW-4, IW-5, IW-6, IW-7, and HW-1
GWC 2787(A) G1-*04400C(A) (Vermeulen)	70	35	17.5	0	35	04/15 – 10/01		IW-6, IW-7, and HW-1
SWC 2691 CS1-*07312ALC (Bayes)	85	34.6	32.5	17.4	17.2	04/15 – 10/01		IW-1, IW-2, IW-3, IW-4, IW-5, IW-6, IW-7, and HW-1
Total	227	127.2	110	17.4	109.8			

Report by: _____
Ria Berns, Report Writer Date

Reviewed by: _____
Buck Smith, L.G., L.HG. Date

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Associated Earth Sciences, Inc., February 14, 2014, Technical Memorandum, Stream Flow Impacts Evaluation

RH2 Engineering, Inc., May 1, 2014, Hydrogeologic Report for MDM Properties, LLC, Change Applications.

Washington State Department of Fish and Wildlife, May 15, 2014, Comment Letter Re: CS1-*07312C.

ATTACHMENT 1: PLACE OF USE

