SINCE 1874
FARMERS IRRIGATION DISTRICT

● 1985 Country Club Road, Hood River, OR 97031 Phone 541-387-5261 Fax 541-386-9103 www.fidhr.org ●

Low Impact Hydropower Institute Re-certification Application

Farmers Irrigation District Hydroelectric Project, Hood River, Oregon

FERC Project No. P-6801 and P-7532

LIHI Certificate No. 45

Prepared by:

Les Perkins, District Manager

Farmers Irrigation District

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INTRODUCTION

Farmers Irrigation District (FID) is located in Hood River County, Oregon between the Hood River and the Cascades (to the east and west) and the Columbia River and unincorporated community of Dee (to the north and south). Irrigation water from tributaries to the West Fork Hood River and the mainstem Hood River is transported to the north and east for delivery to irrigation district patrons.

Farmers Irrigation District has been supplying irrigation water to Hood River area farms since 1874 (formerly under the names Water Supply Company of Hood River, Valley Improvement Company, Farmers Irrigating Company, and Hood River Irrigation District). The irrigation water delivery system was developed throughout the late 1800s and early 1900s, as the Hood River Valley was settled and previously forested lands came under cultivation. Prior to the 1980s, the District's irrigation delivery system included 34 diversions, 2 reservoirs, minimal pipeline, and roughly 70 miles of open canal. FID has made great strides in increasing the efficiency of its irrigation delivery system. As of 2019, the District's irrigation delivery system includes 11 diversions, 2 reservoirs, about 70 miles of pipeline, and 2.4 miles of open canal (Figure 1). FID provides irrigation water to 5,800 acres of agricultural and residential users.

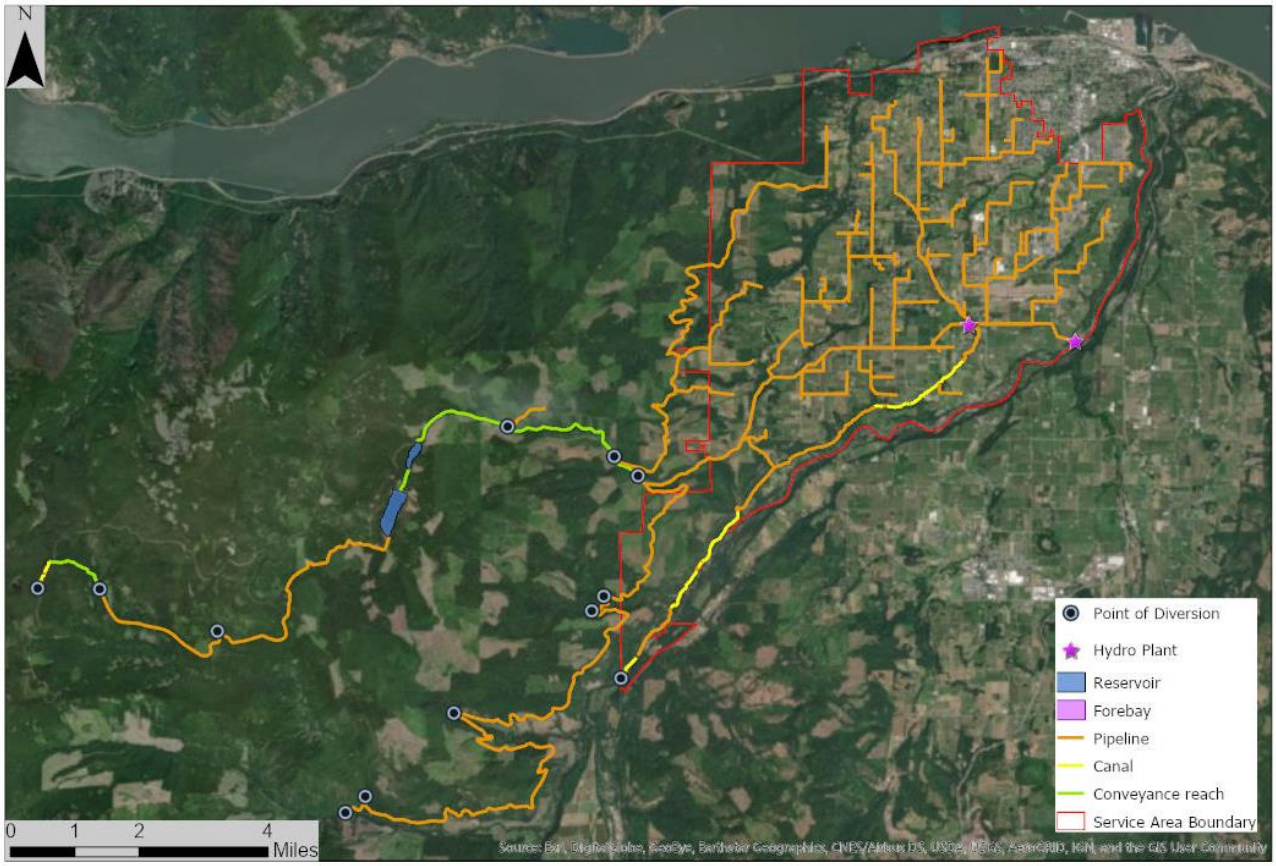

Figure 1: Map of Farmers Irrigation District's current irrigation water conveyance and distribution system.

The District became more actively involved in watershed restoration efforts in the 1980s through the implementation of instream and riparian restoration projects in the Green Point Creek drainage system. FID's efforts have continued and grown since then with active participation in the local watershed council (Hood River Watershed Group, founded in 1993) and basin-wide studies/action plans, the development of a new type of horizontal fish screen (patented in 2003, licensed to and marketed by the non-profit Farmers Conservation Alliance), and engagement in local water and energy conservation efforts. The District "strives

to promote ecologically, socially, and economically sustainable agriculture by providing energy and irrigation service for the common good".

Hydroelectric History

Farmers Irrigation District began to explore the idea of generating power from irrigation water in the mid-1970s. The elevation changes of the irrigation water lines increased the water pressure enough to make conditions ideal for hydrogeneration, and it would create the necessary funds to modernize the irrigation delivery system. Plant 1, now decommissioned, was on the Farmers Canal adjacent to Reed Road. It went online in the late 1970s and last produced power in the mid-1980s. In 1986, Plant 2 was built on Copper Dam Road, replacing and out-producing Plant 1. Plant 3, a smaller facility on Peters Drive, was added in 1987. Generating electricity from the irrigation water system is now an important part of Farmers Irrigation District's daily operations.

FID's Hydro Project was first Low Impact Hydropower Institute certified in 2009 and re-certified in 2014. The hydroelectric facilities are also Oregon Renewable Portfolio Standard (OR-RPS) and California Energy Commission (CEC) certified.

Hydroelectric Facilities

FID's Hydroelectric Project consists of 2 forebays, roughly 5.7 miles of penstock, and two hydroelectric plants (Figure 2). Water from FID's upper and middle district diversions (on tributaries to the West Fork Hood River and tributaries to the mainstem Hood River) is delivered to Forebay 3. Up to 35 cfs is transported from Forebay 3 down the penstock to Plant 3. During irrigation season, this water is diverted for irrigation use before reaching Forebay 3 and/or from the penstock, resulting in decreasing flows running through Plant 3 in the spring until plant shut-off (usually in early June) through the end of irrigation season. Water from FID's lower district diversion on the mainstem Hood River is mixed with waters run through Plant 3 in Forebay 2. Up to 108 cfs is transported from Forebay 2 down the penstock to Plant 2. During irrigation season, much of this water has been diverted for irrigation use before reaching Forebay 2, resulting in decreasing flows running through Plant 2 generally reaching minimum flows of ~10-40 cfs between July through September. Water run through Plant 2 outfalls into the mainstem Hood River at RM 4.5.

Forebay 3

Plant 3 and Forebay 2

Forebay 2 from Plant 3

Plant 2 and tailrace from the east

Tailrace from Plant 2

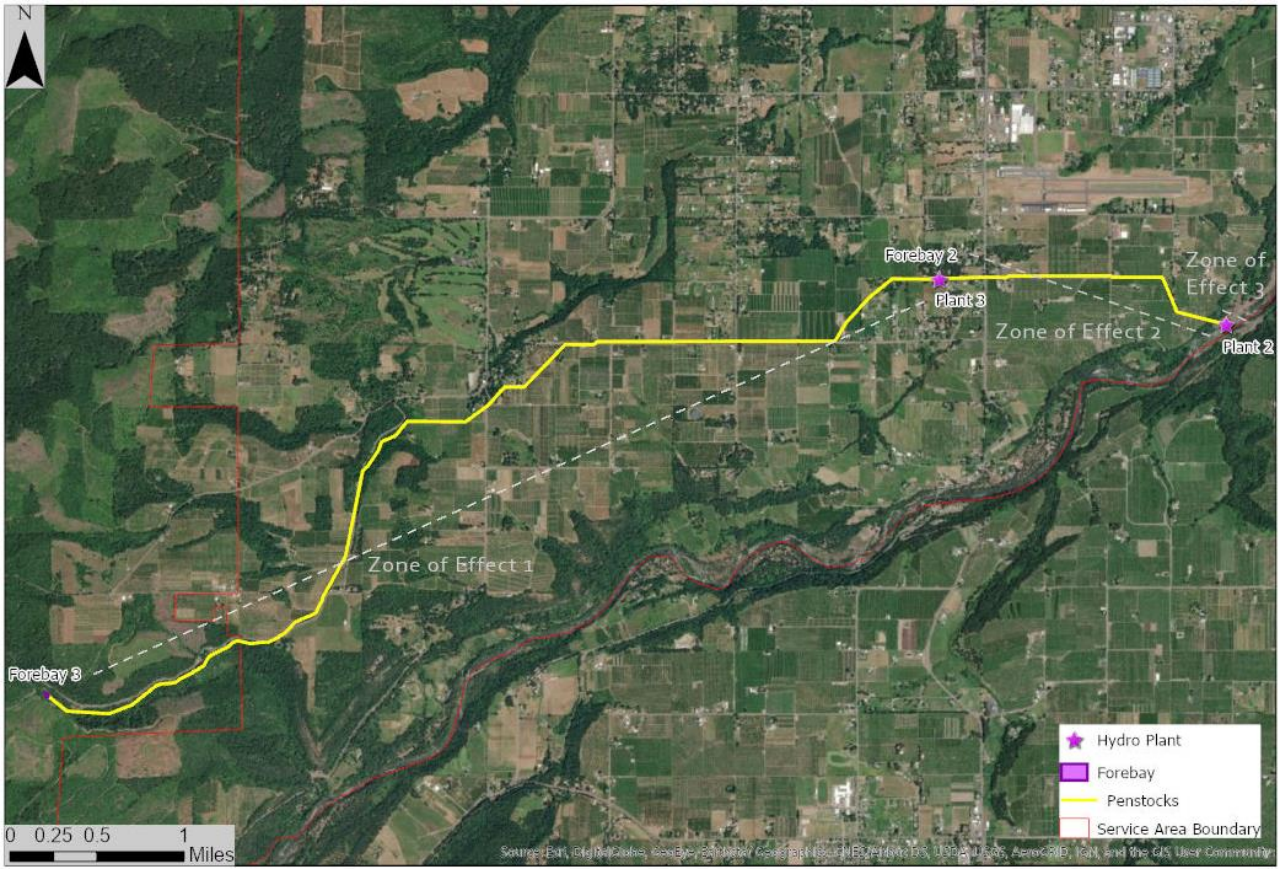

Figure 2: Map of Farmers Irrigation District's existing hydropower facilities. Forebays, hydroelectric plants, and zones of effect are labeled.

The District's hydroelectric project plants, Plant 2 and Plant 3, create a total kilowatt capacity of 4,400 kilowatts. Both plants consist of the following: generators, turbines, shutoff valves, bypass valves, cooling water systems, hydraulic control devices, oil lubrication systems, programmable logic controllers, and computer interface controls. District generators produce ~23 million kilowatts per year. This is enough to power about 2,000 homes annually (based on an average home energy use of 950 kWh/month).

<u>Plant 2</u>

Plant 2 (FERC No. P-7532) is located in FID's lower district along the mainstem Hood River at RM 4.5. It is fed by diversions on Gate, Cabin, North Green Point, Dead Point, South Pine, North Pine, and Ditch creeks and the mainstem Hood River, via Forebay 2 and the penstock (Figures 1 and 2).

Since the last LIHI certification application, Farmers Irrigation District replaced two 30-year-old Francis style turbines with a total maximum nameplate capacity of 3 megawatts with a single Gilkes Turgo style turbine with a maximum nameplate capacity of 2.6 megawatts. While the nameplate capacity is less, the total annual generation for the plant was projected to increase 12.4 percent due to greater operational efficiencies through the entire flow range.

The Gilkes Turgo turbine was the preferred technology for the repowering project due to its proven ability to perform in systems with a wide flow range and aggressive water (water with high levels of abrasive silt). Historically the aggressive water in FID's system caused excessive wear on the Francis style turbines, decreasing efficiency rapidly and causing expensive down time and maintenance.

The repowering project also included complete replacement of the controls, the High-Pressure Unit (HPU),

and the Main Unit Breaker (MUB), as well as some switchyard upgrades, including an entirely new transformer in the switchyard.

The installation was completed in September 2015 and has been operating nearly continuously since. Local contractors were utilized for the construction project including Crestline Construction, Schuepbach Builders and Custom Concrete, and Hage Electric. The Turgo unit has exceeded the projected efficiency curves and has proven to be as reliable as promised by the manufacturer. This repowered facility will serve the District and the residents of Hood River County with reliable, low-impact power for generations to come.

Control panel in Plant 2

Gilkes Turgo turbine in Plant 2

Hydraulic system for Plant 2

Plant 3

Plant 3 (FERC No. P-6801) is located in FID's lower district off of Peters Drive. It is fed by diversions on Gate, Cabin, North Green Point, Dead Point, South Pine, North Pine, and Ditch creeks, via Forebay 3 and the penstock (Figures 1 and 2).

Farmers Irrigation District Plant 3 has one 1.8-megawatt generator, a Pelton style turbine. A Pelton turbine has one or more jets of water that impinge on the buckets of a runner which looks like a water wheel. Pelton turbines are used for medium to high elevation sites (50 ft to 6,000 ft). At Plant 3, the Pelton turbine has two jets utilizing over 700 feet of head to produce 350 PSI. A Pelton style turbine was chosen at this facility due to the high head and extremely clean water.

In 2017, the Plant 3 control system and HPCU were upgraded. These upgrades allowed for an auto start procedure and more reliable remote monitoring/control.

Control panel in Plant 3

Pelton style turbine in Plant 3

Hydraulic system for Plant 3

Operations

The plants are operated based on water availability through the conveyance system. Plant operation can be managed both on-site and remotely, via FID's SCADA system. Plants are checked in-person at least once daily.

Maintenance

Maintenance for this system can be quite labor intensive. The plants receive water via two main pipelines and canal systems. The forebays are checked and the forebay screens cleaned daily. The penstocks are

inspected via camera roughly every 5 years. Both plants require daily plant checks, switchyard inspections, and annual maintenance programs.

Annual maintenance is separated into two parts: electrical and mechanical. Electrical maintenance is conducted in August for Plant 3 and in October for Plant 2 and requires technical equipment and personnel to clean, recalibrate, and measure all electronic devices. These devices include batteries, breakers, relays, transformers, fuses, meters, and generators. Mechanical maintenance is done July through October for Plant 3 and in October for Plant 2, and includes bearing oil changes and inspection of the turbines, hydraulic pump systems, piping, and valve systems.

Zones of Effect

The Farmers Irrigation District Hydroelectric Project has three Zones of Effect (Figure 2).

Zone of Effect 1: Begins at Forebay 3 where waters from the Ditch Creek conveyance and the Lowline Pipeline mix. Forebay 3 is roughly 0.15 acres. Forebay 3 feeds the penstock which runs to Plant 3. Irrigation water for FID's Middle District patrons is pulled from the penstock, resulting in little to no water reaching Plant 3 during peak irrigation season. When Plant 3 is operational, water from the penstock is run through the Plant 3 turbine and immediately drops into Forebay 2.

Zone of Effect 2: Begins at Forebay 2 where waters from the Plant 3 sources and Farmers Canal mix. Forebay 2 is just outside the Plant 3 building (roughly 0.17 acres). Forebay 2 feeds the penstock which runs to Plant 2. While most of FID's Lower District patrons receive water from the pump station located at Plant 3, some divert water from the Plant 2 penstock. Water from the penstock is run through the Plant 2 turbine and to the Plant 2 tailrace.

Zone of Effect 3: The Plant 2 tailrace flows about 75 feet to the mainstem Hood River entering at approximately RM 4.5.

TABLE B-1.1. FACILITY INFORMATION

Item	*Information Requested*	*Response (include references to further details)*
Name of the Facility	Facility name (use FERC project name or other legal name)	Farmers Irrigation District Hydroelectric Project (FERC names: Farmers Irrigation District No. 2 and Farmers Irrigation District No. 3)
Location	River name (USGS proper name)	Hood River
	Watershed name (select region, click on the area of interest until the 8-digit HUC number appears. Then identify watershed name and HUC-8 number from the map at: https://water.usgs.gov/wsc/map_index.html)	Middle Columbia-Hood 17070105
	Nearest town(s), county(ies), and state(s) to dam	No dam associated with this project. Nearest town to Plant 3 and Plant 2: City of Hood River, Hood River County, Oregon
	River mile of dam	No dam associated with this project. RM of Plant 2 outfall: Hood River RM 4.5
	Geographic latitude of dam	No dam associated with this project. Plant 3: 45° 40’ 3.6” N Plant 2: 45° 39' 54.1" N
	Geographic longitude of dam	No dam associated with this project. Plant 3: 121° 32’ 54.4” W Plant 2: 121° 31' 28.6" W
Facility Owner	Application contact names (Complete the Contact Form in Section B-4 also):	Les Perkins, District Manager
	Facility owner company and authorized owner representative name. **For recertifications: If ownership has changed since last certification, provide the date of the change.**	Les Perkins, Farmers Irrigation District
	FERC licensee company name (if different from owner)	Same as owner
Regulatory Status	FERC Project Number (e.g., P-xxxxx), issuance and expiration dates, or date of exemption	P3: P-6801, exemption issued 2/1/1983 P2: P-7532, exemption issued 4/6/1984
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", “non-jurisdictional”)	P3: Exemption (conduit) P2: Exemption (5MW or less)
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	n/a – no Water Quality Certificate required

	Hyperlinks to key electronic records on FERC e-library website or other publicly accessible data repositories[1]	FERC eLibrary P3: Docket # P-6801-000, exemption P2: Docket # P-7532-000, exemption not online
Item	***Information Requested***	***Response (include references to further details)***
Powerhouse	Date of initial operation (past or future for pre-operational applications)	Plant 3: 1987 Plant 2: 1986
	Total installed capacity (MW) **For recertifications: Indicate if installed capacity has changed since last certification**	4.4 megawatts total Plant 3: 1.8 megawatts Plant 2: 2.6 megawatts Since last certification, Plant 2 capacity has decreased by 0.4 megawatts.
	Average annual generation (MWh) and period of record used **For recertifications: Indicate if average annual generation has changed since last certification**	22,526 megawatt hours Period of record used is 2016-2019 because the changes in Plant 2 turbine and generation capacity (completed September 2015) mean historic generation results are no longer applicable to the facility. Since last certification, annual generation has decreased from 23,967 MWh (2009-2014 period of record) due to the change in Plant 2 turbine and changes in available/seasonal streamflows.
	Mode of operation (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) **For recertifications: Indicate if mode of operation has changed since last certification**	Run-of-river/diversion Mode of operation has not changed since last certification.
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	Plant 3: one 1.8 MW Pelton turbine, 4-36 cfs hydraulic capacity Plant 2: one 2.6 MW Gilkes Turgo turbine, 12-116 cfs hydraulic capacity
	Trashrack clear spacing (inches), for each trashrack	No trashrack in system. Horizontal fish screens, which allow debris to pass, are used at all points of diversion.
	Dates and types of major equipment upgrades	2015: New turbine and generator set, including switch yard, at Plant 2. 2017: Plant 3 controls, main unit breaker, high pressure unit, and exciter replacement.
	Dates, purpose, and type of any recent operational changes	No operational changes since last certification.

[1] For example, the FERC license or exemption, recent FERC Orders, Water Quality Certificates, Endangered Species Act documents, Special Use Permits from the U.S. Forest Service, 3rd-party agreements about water or land management, grants of right-of-way, U.S. Army Corps of Engineers permits, and other regulatory documents. If extensive, the list of hyperlinks can be provided separately in the application.

	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments	Not required.
Dam or Diversion	Date of original construction and description and dates of subsequent dam or diversion structure modifications	No dam associated with this project. Mainstem Hood River diversion was originally constructed in the 1800s for irrigation. The diversion stemwall was rebuilt in 2007 after being destroyed in a debris flow. New fish screen installed in March 2019. The diversions at Gate, Cabin, North Green Point, Dead Point, South Pine, North Pine, and Ditch creeks were all originally built in the late 1800s/early 1900s for irrigation. Improvements in diversion structure and screening technology have occurred over the years. New horizontal fish screens were installed at North Green Point in 2006 and Dead Point in 2009.
	Dam or diversion structure height including separately, the height of any flashboards, inflatable dams, etc.	Diversions are run-of-river stemwalls without cross-river structures.
	Spillway elevation and hydraulic capacity	n/a – No dam associated with this project.
	Tailwater elevation (provide normal range if available)	n/a – No dam associated with this project.
	Length and type of all penstocks and water conveyance structures between the impoundment and powerhouse	Forebay 3 to Plant 3 penstock: 4.5 miles, concrete reinforced steel Forebay 2 to Plant 2 penstock: 1.2 miles, concrete reinforced steel
	Dates and types of major infrastructure changes	2019: New Farmers Screen at mainstem Hood River diversion.
Item	***Information Requested***	***Response (include references to further details)***
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Hydropower and irrigation supply.
	Source water	Gate Creek Cabin Creek North Green Point Creek Dead Point Creek South Pine Creek North Pine Creek Ditch Creek Mainstem Hood River (RM 11.6)
	Receiving water and location of discharge	Mainstem Hood River at RM 4.5
Conduit	Date of conduit construction and primary purpose of conduit	Irrigation canal was originally built between 1874 and the early 1900s. Primary purpose is irrigation water supply. Penstock 3 piped in 1986/87. Penstock 2 piped in 1985/86.

Impoundment and Watershed	Authorized maximum and minimum water surface elevations **For recertifications: Indicate if these values have changed since last certification**	n/a – No reservoir associated with this project.
	Normal operating elevations and normal fluctuation range **For recertifications: Indicate if these values have changed since last certification**	n/a – No reservoir associated with this project.
	Gross storage volume and surface area at full pool **For recertifications: Indicate if these values have changed since last certification**	n/a – No reservoir associated with this project.
	Usable storage volume and surface area **For recertifications: Indicate if these values have changed since last certification**	n/a – No reservoir associated with this project.
	Describe requirements related to impoundment inflow, outflow, up/down ramping and refill rate restrictions.	n/a – No reservoir associated with this project.
	Upstream dams by name, ownership and river mile. If FERC licensed or exempt, please provide FERC Project number of these dams. Indicate which upstream dams have downstream fish passage.	n/a – No upstream dams on the mainstem Hood River.
	Downstream dams by name, ownership, river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream fish passage	n/a – No downstream dams on the mainstem Hood River.
	Operating agreements with upstream or downstream facilities that affect water availability and facility operation	n/a – No upstream or downstream facilities that affect water availability or facility operation.
Item	***Information Requested***	***Response (include references to further details)***
	Area of land (acres) and area of water (acres) inside FERC project boundary or under facility control.	FID owns 2.2 acres of land under/around Plant 3 and Forebay 2. FID has easements for the land under/along Forebay 3, Penstock 3, Penstock 2, and Plant 2. Combined acreage of Forebays 3 and 2 is roughly 0.3 acres.
Hydrologic Setting	Average annual flow at the dam, and period of record used	n/a – No dam associated with this project.
	Average monthly flows and period of record used	At the USGS gauge site on the mainstem Hood River (period of record used: 1966-2018): Jan 1,550cfs, Feb 1,450cfs, Mar 1,340cfs, Apr 1,280cfs, May 1,180cfs, Jun 845cfs, Jul 504cfs, Aug 350cfs, Sept 331cfs, Oct 483cfs, Nov 984cfs, Dec 1,370cfs

		At the OWRD gauge site on the West Fork Hood River (period of record used: 1933-2017): Jan 840cfs, Feb 774cfs, Mar 719cfs, Apr 753cfs, May 667cfs, Jun 452cfs, Jul 247cfs, Aug 170cfs, Sept 161cfs, Oct 269cfs, Nov 626cfs, Dec 857cfs
	Location and name of closest stream gauging stations above and below the facility	Above Plant 2 outflow: USGS Gauge Station 14120000 00060 HOOD RIVER AT TUCKER BRIDGE, NEAR HOOD RIVER, OR No gauge station below the facility on the mainstem Hood River.
	Watershed area at the dam (in square miles). Identify if this value is prorated and provide the basis for proration.	n/a – No dam associated with this project.
Designated Zones of Effect	Number of zones of effect	3
	Upstream and downstream locations by river miles	Zones 1 and 2 are located off-channel Zone 3 intersects the mainstem Hood River at RM 4.5
	Type of waterbody (river, impoundment, bypassed reach, etc.)	Zones 1 and 2 are in conduit (pipe) Zone 3 discharges to a river
	Delimiting structures or features	Between Zones 1 and 2: Plant 3 turbine Between Zones 2 and 3: Plant 2 turbine
	Designated uses by state water quality agency	Irrigation and Hydropower

Table B-1.2. Matrix of Alternative Standards Template.

Facility Name: _Farmers Irrigation District Hydroelectric Project_ Zone of Effect: _1_

	Criterion	*Alternative Standards*				
		1	*2*	*3*	*4*	*Plus*
A	**Ecological Flow Regimes**	X				X
B	**Water Quality**	X				
C	**Upstream Fish Passage**	X				X
D	**Downstream Fish Passage**	X				X
E	**Watershed and Shoreline Protection**	X				X
F	**Threatened and Endangered Species Protection**	X				
G	**Cultural and Historic Resources Protection**	X				
H	**Recreational Resources**	X				

Table B-1.2. Matrix of Alternative Standards Template.

Facility Name: _ Farmers Irrigation District Hydroelectric Project _ **Zone of Effect: _2_**

		Alternative Standards				
	Criterion	***1***	***2***	***3***	***4***	***Plus***
A	**Ecological Flow Regimes**			X		X
B	**Water Quality**			X		
C	**Upstream Fish Passage**	X				X
D	**Downstream Fish Passage**	X				X
E	**Watershed and Shoreline Protection**	X				X
F	**Threatened and Endangered Species Protection**	X				
G	**Cultural and Historic Resources Protection**	X				
H	**Recreational Resources**	X				

Table B-1.2. Matrix of Alternative Standards Template.

Facility Name: _ Farmers Irrigation District Hydroelectric Project _ **Zone of Effect: _3_**

		Alternative Standards				
	Criterion	***1***	***2***	***3***	***4***	***Plus***
A	**Ecological Flow Regimes**			X		X
B	**Water Quality**			X		
C	**Upstream Fish Passage**		X			X
D	**Downstream Fish Passage**	X				X
E	**Watershed and Shoreline Protection**	X				X
F	**Threatened and Endangered Species Protection**		X			
G	**Cultural and Historic Resources Protection**	X				
H	**Recreational Resources**	X				

B.2.1 Ecological Flow Standards

Table B-1. Information Required to Support Ecological Flows Standards.

Criterion	*Standard*	*Instructions*
A	1	Not Applicable / De Minimis Effect: • Confirm the location of the powerhouse relative to dam/diversion structures and demonstrate that there are no bypassed reaches at the facility. • For run-of-river facilities, provide details on operations and demonstrate that flows, water levels, and operation are monitored to ensure such an operational mode is maintained. If deviations from required flows have occurred, discuss them and the measures taken to minimize reoccurrence. • In a conduit facility, identify the source waters, location of discharge points, and receiving waters for the conduit system within which the hydropower facility is located. This standard cannot be used for conduits that discharge to a natural waterbody. • For impoundment zones only, explain water management (e.g., fluctuations, ramping, refill rates) and how fish and wildlife habitat within the zone is evaluated and managed. ***NOTE:*** this is required information, but it will not be used to determine whether the Ecological Flows criterion has been satisfied. All impoundment zones can apply Criterion A-1 to pass this criterion.
A	2	Agency Recommendation (see Appendix A for definitions): • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally protective). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Explain how the recommendation relates to agency management goals and objectives for fish and wildlife. • Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations).
A	3	Limited Storage: • Explain the calculation of active storage capacity and retention time (storage/flow), including data sources. • Provide the name and published reference for the methodology used, including developer of the methodology and several successful, recent applications, and how it has been regionally accepted. • Provide the calculations used to derive the final flow, including data sources and any pre-processing applied.

Criterion	*Standard*	*Instructions*
A	4	Site-Specific Studies: • Describe the site-specific, habitat evaluation technique that was used to define the ecological flow regime and how the results satisfy the goal of this criterion. • Describe the resultant flow regime in terms of base flow, seasonal variability, high-flow events, short-term rates of change, and year-to-year variability. • Describe the target fish and wildlife resources that were considered and how the resultant flow regime supports their habitat over their life cycles.
A	PLUS	Bonus Activities: • If an adaptive management program is in place, provide sufficient information to describe the program, the current status of implementation and consultation, and how it is expected to achieve the desired results. • If non-flow habitat enhancements have been applied, explain what they are, how their benefits are being monitored, and how they are achieving a positive net benefit to fish and wildlife resources.

Zone of Effect 1: Standard A-1. Not Applicable/De Minimis Effect
Forebay 3, the penstock, and Plant 3 are located within the existing irrigation water conduit and Plant 3 discharges to Forebay 2 (Zone of Effect 2). Source waters are Gate Creek, Cabin Creek, North Green Point Creek, Dead Point Creek, South Pine Creek, North Pine Creek, and Ditch Creek (under Certificates 67266, 67267, and 75809), which are all mixed in Forebay 3.

Zone of Effect 2 and Zone of Effect 3: Standard A-3. Limited Storage
Forebay 2, the penstock, Plant 2, and the tailrace discharge to the mainstem Hood River. Storage capacity in Forebay 2 was calculated to be 1.36 acre-feet (area of the forebay measured on GIS at 0.17 acres, multiplied by an average depth of 8 feet). Storage time is between 9-49 minutes (depending on flow rate, between 20-108 cfs throughout the year, measured via flow meter in Plant 2), based on time it takes to fill the forebay, followed by flow rate into the forebay being matched to the flow rate through Plant 2.

Plant 2 operates under a MOA with ODFW and DEQ to maintain minimum instream flows and provide a shutdown period for fish populations and water quality (Attachment A). FID first signed a MOA with ODFW and DEQ in 2009 that regarded hydropower operations, instream flows, and temperature monitoring. The MOA was updated in 2011 and, again, in 2019. Under the 2019 MOA, FID ceases diversions from the mainstem Hood River under their hydropower right when mainstem mean daily discharge drops below 250 cfs (FID still diverts under their irrigation water right), shutdowns mainstem hydropower diversion from August 16-30, and conducts temperature monitoring around Plant 2 operations. The main change in the 2019 MOA was moving the mainstem hydropower diversion shutdown period from October 1-15 to August 16-30. This period was determined to be a higher priority timeframe for both fish populations and stream temperature. FID was able to be more flexible with the timing of this shutdown period in the 2019 MOA due to the Plant 2 upgrades that were completed in 2015 (and proved in subsequent years).

Standard A-PLUS
FID has worked with ODFW and DEQ to conduct adaptive management of the hydropower facility (specifically Plant 2) through the MOA and its versions throughout the years. Under the MOA, FID has conducted temperature studies on hydropower operations since 2009, with an update report sent to both ODFW and DEQ after each monitoring season. In addition, each time FID, ODFW, and DEQ come together to update the MOA, changes are made to the flow management and/or monitoring components of the agreement based on what has been learned since the previous update, as well as changes in hydropower

operation and/or watershed conditions. While the MOA could be updated at any time that all parties want to do so, the current MOA is scheduled to end in 2029. The MOA would therefore be updated at that time, at the latest.

FID has also supported and implemented non-flow habitat enhancements. As part of FID's hydropower water right for Gate Creek, Cabin Creek, and North Green Point Creek (Certificate 75809), the District was required to conduct habitat enhancement and passage improvements in the Green Point Creek drainage. This work was conducted with the assistance of ODFW, USFWS, USFS, NRCS, and other agencies. Enhancement efforts included: placement of logs and the creation of log structures, riparian tree planting, and "pool and weir" passage improvements at the mouth of Green Point Creek. FID conducted improvement activities through much of the 1990s and early 2000s, with monitoring conducted up through the aughts. Many of the large wood installations are still present and have created debris accumulation sites and other in-stream/riparian habitat.

FID has been a member and partner of the Hood River Watershed Group since the group's founding in 1993. As a member/partner of the Watershed Group, FID has provided both financial and in-kind support for organizational and watershed restoration activities prioritized and undertaken by the group. The Hood River Watershed Group is the local watershed council recognized by Hood River County. It is an "organization that includes landowners, farmers, Tribes, irrigation and conservation districts, governments, environmental organizations, businesses, recreationists, and community members working together to sustain and improve the Hood River Watershed through education, cooperation, and stewardship". The most recent Hood River Watershed Action Plan was adopted in 2014 and projects included: aquatic habitat restoration and conservation projects (in-stream and riparian habitat creation, water conservation, fish passage restoration, etc.), terrestrial habitat restoration and conservation projects (native plant enhancement, invasive weed removal, etc.), monitoring and assessment projects, watershed planning projects, and education and technical assistance projects (Attachment B). Since 2018, Watershed Group partners, including FID, have been developing an expanded Strategic Action Plan, with the aim to have the plan adopted in summer 2020.

In addition, FID was a very active partner in the Indian Creek Stewards (a sub-group under the Hood River Watershed Group) for many years. Efforts included: in-stream and riparian clean-ups, instream and riparian habitat restoration, education, and more. In 2009-2010, FID contracted with a local hydrologist to improve habitat along Indian Creek around where FID's Forebay 2 emergency overflow pipes outfall. This section of creek had been channelized and created a fish passage barrier. The creek was reconfigured to remove the passage barrier, reduce grade, and create sinuosity. The banks were armored to prevent erosion during an emergency spill event and were planted with native vegetation (Attachment B, p. 68).

B.2.2 Water Quality Standards

Table B-2. Information Required to Support Water Quality Standards.

Criterion	*Standard*	*Instructions*
B	1	Not Applicable / De Minimis Effect: • If facility is located on a Water Quality Limited river reach, provide a link to the state's most recent impaired waters list and indicate the page(s) therein that apply to facility waters. If possible, provide an agency letter stating that the facility is not a cause of such limitation. • Explain the rationale for why the facility does not alter water quality characteristics below, around, and above the facility.
B	2	Agency Recommendation: • If facility is located on a Water Quality Limited river reach, provide a link to the state's most recent impaired waters list and indicate the page(s) therein that apply to facility waters. If possible, provide an agency letter stating that the facility is not a cause of such limitation. • Provide a copy of the most recent Water Quality Certificate and any subsequent amendments, including the date(s) of issuance. If more than 10 years old, provide documentation that the certification terms and conditions remain valid and in effect for the facility (e.g., a letter from the agency). • Identify any other agency recommendations related to water quality and explain their scientific or technical basis. • Describe all compliance activities related to water quality and any agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations.
B	3	Site-Specific Monitoring Studies: • If facility is located on a Water Quality Limited river reach, provide a link to the state's most recent impaired waters list and indicate the page(s) therein that apply to facility waters. If possible, provide an agency letter stating that the facility is not a cause of such limitation. • Document consultation with appropriate water quality agency to determine what water quality parameters and sampling methods are required. • Present recent water quality data from the facility or from other sources in the vicinity of the facility (e.g., data collected from the state, watershed associations, or others who collected data under generally accepted sampling protocols and quality assurance procedures) and explain and demonstrate how it satisfies current applicable water quality standards including designated uses, or provide a letter from the appropriate state or other regulatory agency accepting the data.
B	PLUS	Bonus Activities: • Describe any advanced technologies or methods that have been deployed at the facility to enhance ambient water quality and how its performance is being monitored. • If adaptive management is being applied, describe the management objectives, the monitoring program in place to evaluate performance against those objectives, and the management actions that will be taken in response to monitoring results.

Zone of Effect 1: Standard B-1. Not Applicable/De Minimis Effect
Forebay 3, the penstock, and Plant 3 are located within the existing irrigation water conduit and Plant 3 discharges to Forebay 2 (Zone of Effect 2). There are not fish and wildlife resources or human water uses within or around this in-conduit system to be affected.

Zone of Effect 2 and Zone of Effect 3: Standard B-3. Site Specific Studies
Forebay 2, the penstock, Plant 2, and the tailrace discharge to the mainstem Hood River, which has a temperature TMDL from RM 1.5 to the confluence of the East and West forks (RM 14.6, which is above FID's point of diversion).

Plant 2 operates under the MOA with ODFW and DEQ to conduct annual temperature monitoring. FID first signed a MOA with ODFW and DEQ in 2009. Since then, annual temperature monitoring has been conducted to determine the thermal effects of its hydropower system operation. In 2019, FID signed a new MOA with ODFW and DEQ that continues to include temperature monitoring (Attachment A).

Monitoring results since 2009 have shown 1) the Plant 2 tailrace inputs are cooler than mainstem Hood River temperatures at their confluence, 2) the input of Plant 2 tailrace water results in cooler water in the mainstem Hood River after mixing than in waters upstream of tailrace inputs, and 3) there are no clear impacts on bypass reach temperatures from FID's hydropower diversion (Attachment C).

The Hood River is also listed for copper, iron, lead, and thallium. FID's hydropower facility/operation would not introduce any metals into the waters passing through the system or to downstream Hood River waters. The copper, iron, lead, and thallium listings are completely unrelated to FID's hydropower facility or operations.

Oregon DEQ's latest impaired waters list:
https://www.deq.state.or.us/wq/assessment/rpt2012/results.asp.

B.2.3 Upstream Fish Passage Standards

Please provide a list all migratory fish species (anadromous, catadromous, and potamodromous species) that occur now or have occurred historically at the facility.

Table B-3. Information Required to Support Upstream Fish Passage Standards.

Criterion	*Standard*	*Instructions*
C	1	Not Applicable / De Minimis Effect: • Explain why the facility does not impose a barrier to upstream fish passage in the designated zone. Typically, impoundment zones will qualify for this standard since once above a dam and in an impoundment, there is no facility barrier to further upstream movement. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.
C	2	Agency Recommendation: • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally protective). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.
C	3	Best Practice / Best Available Technology: • Describe the upstream fish passage technologies that have been deployed and are in operation and justify why they qualify as best practices or best available technology. • Identify all the migratory fish species in the area and explain how the upstream fish passage facilities provide adequate and safe passage for them. • Describe the monitoring and effectiveness activities that have been or are being conducted for the upstream passage facilities.
C	4	Acceptable Mitigation: • Describe the alternative mitigation measures being deployed in lieu of upstream fishways and provide documentation of agency approval of them. • Explain how the total benefits of the mitigation provided equals or exceeds the benefits that might accrue from providing upstream passage in terms of reproductive success (e.g., numbers of fish produced, or area of suitable habitat provided). • Explain how the alternative mitigation measures sustain the abundance and diversity of fish stocks in the river system.

Criterion	*Standard*	*Instructions*
C	PLUS	Bonus Activities: • If advanced technology has been or will be deployed, explain how it will increase fish passage success relative to other options. • If a basin-scale redevelopment strategy is being pursued, explain how it will increase the abundance and sustainability of migratory fish species in the river system. • If adaptive management is being applied, describe the management objectives, the monitoring program pursuant to evaluating performance against those objectives, and the management actions that will be taken in response to monitoring results.

Migratory fish:
Summer and winter steelhead, spring and fall Chinook, coho, bull trout, pacific lamprey, and coastal cutthroat trout.

All diversions associated with FID's irrigation, hydropower, and other water rights are screened.

Zone of Effect 1 and Zone of Effect 2: Standard C-1. Not Applicable/De Minimis Effect
Forebay 3, the penstock, Plant 3, Forebay 2, the penstock, and Plant 2 are all in-conduit. Plant 2 discharges to the tailrace (Zone of Effect 3). Fish cannot (and should not) pass into Plant 2 or upstream through the conduit system.

Zone of Effect 3: Standard C-2. Agency Recommendation
The tailrace discharges to the mainstem Hood River. Upstream fish passage is maintained through the river. Migratory fish are deterred from entering the tailrace or being attracted to tailrace flows via tailrace design. Prior to the removal of PacifiCorp's Powerdale Dam in 2010, FID's Plant 2 discharged directly into the Powerdale Dam's impoundment (Attachment D). With the removal of the Powerdale Dam and the drawdown of that dam's impoundment, the tailrace from Plant 2 to the mainstem Hood River was created. At the time of dam removal, FID had concerns about the cascade over the stem wall and outflow becoming attraction water for salmonids and other migratory fish. FID coordinated with and conducted site visits with ODFW to discuss these concerns and possible solutions. ODFW worked with a local contractor to place boulders in the roughly 75-foot tailrace to dissipate energy and reduce attraction. The tailrace continues to operate under these conditions, with the added improvement that the new turbine installed in 2015 does not require backwatering, so the stem wall was removed and the cascade no longer exists (Attachment E).

Standard C-PLUS
While all of FID's diversions use fish screening technology, the main diversions use an off-channel horizontal fish screen developed by FID in the early 2000s. Smaller FID diversions (where the Farmers Screen is an appropriate screening style) are being upgraded to the same technology as money allows. The Farmers Screen was developed by District employees with input and testing by local/federal agencies to improve both fish screening and debris passage. The prototype screen was built on FID's mainstem diversion in 2002. After testing, the screens received agency approval and the technology was patented. Farmers Conservation Alliance, a local non-profit, were licensed the technology in 2006 with the agreement to market the new screen technology and to invest any excess revenue into developing other technologies that benefit both the environment and agriculture. Off-channel screening predominately means upstream passage is maintained in the natural stream channel, but migratory fish are capable of passing the screens upstream if they access the fish return channel (Attachment F).

FID has also been involved in a basin-scale redevelopment strategy since the founding of the Hood River Watershed Group, the Hood River Basin's local watershed council, in 1993. The Watershed Group works to "sustain and improve the Hood River Watershed through education, cooperation, and stewardship". Since 2002, the Watershed Group has developed a Hood River Watershed Action Plan focused on education, planning, monitoring, and implementation projects to conserve and restore fish & wildlife habitat and overall watershed health. The Action Plan has been updated in 2008 and 2014. The Watershed Group members/partners are in the process of developing a new strategic action plan, which is anticipated to be completed in summer 2020. Since 2001, FID has contributed $116,000 to the Hood River Watershed Group for operations and implementation of the action plans. In addition, FID has been an active member/partner in Watershed Group meetings and events, the sub-watershed group Indian Creek Stewards, basin-wide planning efforts, and project implementation (Attachment B).

B.2.4 Downstream Fish Passage and Protection Standards

In addition to the migratory species list provided for criterion C above, please provide a list all riverine fish species that occur now or have occurred historically at the facility.

Table B-4. Information Required to Support Downstream Fish Passage Standards.

Criterion	*Standard*	*Instructions*
D	1	Not Applicable / De Minimis Effect: • Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines). Typically, tailwater/downstream zones will qualify for this standard since below a dam and powerhouse there is no facility barrier to further downstream movement. Bypassed reach zones must demonstrate that flows in the reach are adequate to support safe, effective and timely downstream migration. • For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.
D	2	Agency Recommendation: • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally protective). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is part of a Settlement Agreement or not. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.
D	3	Best Practice / Best Available Technology: • Describe the downstream fish passage technologies that have been deployed and are in operation and justify why they qualify as best practices or best available technology. • Identify all the migratory fish species in the area and explain how the downstream fish passage facilities provide adequate and safe passage for them. • Describe the monitoring and effectiveness activities that have been or are being conducted for the downstream passage facilities.

Criterion	*Standard*	*Instructions*
D	4	<u>Acceptable Mitigation:</u> • Describe the alternative mitigation measures being deployed in lieu of downstream fishways and provide documentation of agency approval of them. • Explain how the total benefits of the mitigation provided equals or exceeds the benefits that might accrue from providing downstream passage in terms of reproductive success (e.g., numbers of fish produced, or area of suitable habitat provided). • Explain how the alternative mitigation measures sustain the abundance and diversity of fish stocks in the river system.
D	PLUS	<u>Bonus Activities:</u> • If advanced technology has been or will be deployed, explain how it will increase fish passage success relative to other options. • If a basin-scale redevelopment strategy is being pursued, explain how it will increase the abundance and sustainability of migratory fish species in the river system. • If adaptive management is being applied, describe the management objectives, the monitoring program pursuant to evaluating performance against those objectives, and the management actions that will be taken in response to monitoring results.

Migratory fish:
Summer and winter steelhead, spring and fall Chinook, coho, bull trout, pacific lamprey, and coastal cutthroat trout.

Riverine fish:
Rainbow trout, redband rainbow trout, cutthroat trout, brook lamprey, sculpin, mountain whitefish, bridge-lipped sucker, large-scale sucker, long nose dace, spotted dace, leopard dace, stickleback, and northern pikeminnow.
Non-native: Brook trout.

All diversions associated with FID's irrigation, hydropower, and other water rights are screened.

Zone of Effect 1, Zone of Effect 2, and Zone of Effect 3: Standard D-1. Not Applicable/De Minimis Effect
Fish have been screened out of the conduit system before waters used for hydropower generation reach Forebay 3, the penstock, Plant 3, Forebay 2, the penstock, Plant 2, and the tailrace. Downstream passage for all species is maintained in the river (outside of the hydropower facilities), as there are no passage barriers associated with FID's diversions. The facility does not adversely impact the sustainability of riverine fish populations or their access to habitat.

Standard D-PLUS
FID has deployed an advanced technology, is part of a basin-scale redevelopment strategy, and has operated an adaptive management program.

FID's main diversions use an off-channel horizontal fish screen developed by the District in the early 2000s. Smaller FID diversions (where the Farmers Screen is an appropriate screening technology) are being upgraded as funding allows. The Farmers Screen was developed by District employees with input and testing assistance from local/federal agencies to improve both fish and debris passage. The prototype

screen was built on FID's mainstem diversion in 2002. After testing, the screens received agency approval and the technology was patented. Farmers Conservation Alliance, a non-profit, was founded in 2006 and they were licensed to market the new screen technology. Since founding, Farmers Conservation Alliance has installed Farmers Screens at roughly 50 diversions around the western US. Tests of the Farmers Screen compared to traditional screening technologies have shown passage and fish survival are as good or better than other screen technologies. In addition, because the diversions and screens are off-channel, the majority of downstream passage can continue to occur in the natural stream channel (Attachment F).

FID has also been involved in a basin-scale redevelopment strategy since the founding of the Hood River Watershed Group, the Hood River Basin's local watershed council, in 1993. The Watershed Group works to "sustain and improve the Hood River Watershed through education, cooperation, and stewardship". Since 2002, the Watershed Group has developed a Hood River Watershed Action Plan with its members/partners outlining education, planning, monitoring, and implementation projects to conserve and restore fish & wildlife habitat and overall watershed health. The Action Plan has been updated in 2008 and 2014. The Watershed Group members/partners are in the process of developing a new strategic action plan, which is anticipated to be completed in summer 2020. Since 2001, FID has contributed $116,000 to the Hood River Watershed Group for operations and implementation of the Watershed Group and its action plans. In addition, FID has been an active member/partner in Watershed Group meetings and events, the sub-watershed group Indian Creek Stewards, basin-wide planning efforts, and project implementation (Attachment B).

With the development and implementation of the Farmers Screen, FID has been operating an adaptive management program. The prototype screen at FID's mainstem diversion was built to be adjustable, allowing District employees, agencies, and researchers to experiment with different dimensions, flows, etc. The results of these tests led to the development of a patent (subsequently marketed by Farmers Conservation Alliance). Lessons learned from the prototype tests and day-to-day operations have informed the design and use of Farmers Screens at all other diversions. FID continues to work with Farmers Conservation Alliance to expand the use of the Farmers Screen both within the US and around the world (Attachment G, p.44). In March 2019, the original Farmers Screen on the mainstem diversion was replaced to provide a life-size model of the screening technology to be used on a Bureau of Reclamation fish screen project. This BOR project is the largest flow capacity Farmers Conservation Alliance has ever built and the FID screen is a real-life proof-of-concept and model. Lessons learned from the installation and operation of the newly installed Farmers Screen have informed the design and implementation of the BOR project screens. FID's mainstem diversion screen (and other Farmers Screens around the west) continue to be used to test both the screening technology, fish imitation sensors, and other experimental methodology (Attachment H).

B.2.5 Shoreline and Watershed Protection Standards

Table B-5. Information Required to Support Shoreline and Watershed Protection Standards.

Criterion	*Standard*	*Instructions*
E	1	Not Applicable / De Minimis Effect: • If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the FERC project or facility boundary). • Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.
E	2	Agency Recommendation: • Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans). • Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.
E	3	Enforceable Protection: • Demonstrate that there is an approved and enforceable shoreline buffer or equivalent watershed protection plan in place for conservation purposes, including buffered shoreline along river corridors. • In lieu of an existing shore land protection plan, provide documentation that the facility commits to protect and not develop an equivalent land area for conservation purposes as a condition of LIHI Certification, with such commitment to be in effect for the duration of LIHI Certification.
E	PLUS	Bonus Activities: • Provide documentation that the facility has a formal conservation plan protecting a buffer zone of 50% or more of the undeveloped shoreline that the facility owns around its reservoirs and river corridors • In lieu of a formal conservation plan, provide documentation that the facility has established a watershed enhancement fund for ecological land management that will achieve the equivalent land protection value of an ecologically effective buffer zone of 50% or more around undeveloped shoreline.

Zone of Effect 1, Zone of Effect 2, and Zone of Effect 3: Standard E-1. Not Applicable/De Minimis Effect
There are no lands of significant ecological value for protecting water quality, aesthetics, or low-impact recreation associated with Forebay 3, the penstock, Plant 3, Forebay 2, the penstock, Plant 2, or the tailrace. FID does not have ownership or control over any other lands associated with its hydropower facilities. The land around Plant 2 and the tailrace are owned by Hood River County (land ownership was transferred in 2012 after the removal of PacifiCorp's Powerdale Dam and associated facilities) and is under easement to: protect existing fish and wildlife habitat, retain existing recreational uses, and preserve tribal fishing rights. Natural riparian vegetation has grown along the banks of the tailrace since the removal of the Powerdale Dam and its impoundment, which created the tailrace.

FID owns roughly 2.15 acres around Plant 3 and Forebay 2 (and some of its irrigation facilities, including a debris screen and pump station). The rest of FID's hydropower facilities are located on/under easements. Property owners along these easements include Hood River County (forestland, vacant) and private landowners (forest land, EFU, rural residential).

Standard E-PLUS

The buffer zone around the river corridor within/around FID's hydropower facilities is minimal (around the ~75-foot tailrace from Plant 2 to the mainstem Hood River). However, FID participates in and contributes funding to the Hood River Watershed Group, which works to protect and restore the Hood River Watershed. Since 2001, FID has contributed $116,000 to Hood River Watershed Group operational support and action plan implementation. This funding and the work of the Hood River Watershed Group would equate to at least 50% of an ecologically effective buffer zone (which, again, would be a minimal amount), through the restoration of both riparian and in-stream habitat.

B.2.6 Threatened and Endangered Species Standards

Please identify and list all federal and state listed species (fish, aquatic plants and organisms, and terrestrial plants and wildlife) in the facility area based on current data. Avoid using privileged locational information or provide that information in a separate confidential attachment or appendix.

Table B-6. Information Required to Support Threatened and Endangered Species Standards.

Criterion	*Standard*	*Instructions*
F	1	Not Applicable / De Minimis Effect: • Document that there are no listed species in the facility area or affected riverine zones downstream of the facility. • If listed species are known to have existed in the facility area in the past but are not currently present, explain why the facility was not the cause of the extirpation of such species. • If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.
F	2	Finding of No Negative Effects: • Identify all federal and state listed species in the facility area based on current data from the appropriate state and federal natural resource management agencies. • Provide documentation that there is no demonstrable negative effect of the facility on any listed species in the area from an appropriate natural resource management agency or provide documentation that habitat for the species does not exist within the ZoE or is not impacted by facility operations.
F	3	Recovery Planning and Action: • If listed species are present, document that the facility is in compliance with relevant conditions in the species recovery plans, incidental take permits or statements, biological opinions, habitat conservation plans, or similar government documents. • Document that any incidental take permits and/or biological opinions currently in effect were designed as long-term solutions for protection of listed species in the area.
F	4	Acceptable Mitigation: • If newly listed species are present for which environmental requirements have not been fully determined, describe any significant measures that the facility is implementing to avoid or minimize the impacts on such newly ***listed species.*** • Document that the mitigation measures for newly listed species are being implemented to the interim satisfaction of applicable resource agencies.
F	PLUS	Bonus Activities: • Describe any enforceable agreement that the facility has with resource agencies to operate the facility in support of rare and endemic species. • Describe any enforceable agreement that the facility has with resource agencies to take proactive measures in the vicinity of the facility to substantially minimize impacts on species that are at risk of becoming listed species. • Describe any enforceable agreement that the facility has with resource agencies to be a significant participant in a species recovery effort.

Listed Species within the Facility Area:
Summer and winter steelhead, spring and fall Chinook, coho, and bull trout.

No listed plants or terrestrial wildlife species are located within the facility area.

Zone of Effect 1 and Zone of Effect 2: Standard F-1. Not Applicable/De Minimis Effect
There are no listed species present in Forebay 3, the penstock, Plant 3, Forebay 2, the penstock, or Plant 2, as they are screened out of the in-conduit system.

Zone of Effect 3: Standard F-2. Finding of No Negative Effect
Listed species can be present in the roughly 75-foot tailrace, which enters the mainstem Hood River. Listed fish are deterred from entering the tailrace or being attracted to tailrace flows via tailrace design. Prior to the removal of PacifiCorp's Powerdale Dam in 2010, FID's Plant 2 discharged directly into the Powerdale Dam's impoundment (Attachment D). With the removal of the Powerdale Dam and the drawdown of that dam's impoundment, the tailrace from Plant 2 to the mainstem Hood River was created. At the time of dam removal, FID had concerns about the cascade over the stem wall and outflow becoming attraction water for salmonids and other migratory fish. FID coordinated with and conducted site visits with ODFW to discuss these concerns and possible solutions. ODFW worked with a local contractor to place boulders in the roughly 75-foot tailrace to dissipate energy and reduce attraction. The tailrace continues to operate under these conditions, with the added improvement that the new turbine installed in 2015 does not require backwatering, so the stem wall was removed and the cascade no longer exists (Attachment E).

B.2.7 Cultural and Historic Resources Standards

Please identify the cultural and historic resources present on facility-owned property or that may be affected by facility operations. Avoid using privileged locational information or provide that information in a separate confidential attachment or appendix.

Table B-7. Information Required to Support Cultural and Historic Resources Standards.

Criterion	*Standard*	*Instructions*
G	1	Not Applicable / De Minimis Effect: • Document that there are no cultural or historic resources located on facility lands that can be affected by construction or operations of the facility. • Document that the facility construction and operation have not in the past, nor currently adversely affect any cultural or historic resources that are present on facility lands.
G	2	Approved Plan: • Provide documentation of all approved state, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility. • Document that the facility is in compliance with all such plans.
G	PLUS	Bonus Activities: • Document any substantial commitment that the facility has made to restoring one or more significant cultural or historical resource in the vicinity, beyond what is required in existing plans such as a Historic Resources Management Plan. • Document any significant new educational opportunity about cultural or historical resources in the area that the facility has created, including contractual obligations that guarantee that this opportunity will exist for the duration of the LIHI Certification.

Zone of Effect 1, Zone of Effect 2, and Zone of Effect 3: Standard G-1. Not Applicable/De Minimis Effect

There were/are no cultural or historic resources present at/around Forebay 3, the penstock, Plant 3, Forebay 2, the penstock, Plant 2, or the tailrace.

B.2.8 Recreational Resources Standards

If applicable, please provide a copy or link to the most recent FERC Environmental Inspection Report and any follow up communications.

Table B-8. Information Required to Support Recreational Resources Standards.

Criterion	*Standard*	*Instructions*
H	1	Not Applicable / De Minimis Effect: • Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.
H	2	Agency Recommendation: • Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations. • Document that the facility is in compliance with all such recommendations and plans.
H	3	Assured Accessibility: • In lieu of existing recommendations and plans for recreational uses, document the facility's current and future commitment to accommodate reasonable requests from recreation interests for adequate public access for recreational use of lands and waters of the facility, including appropriate recreational water flows and levels, without fees or charges.
H	PLUS	Bonus Activities: • Document any new public recreational opportunities that have been created on facility lands or waters beyond those required by agencies (e.g., campgrounds, whitewater parks, boating access facilities and trails). • Document that such new recreational opportunities did not create unmitigated impacts to other resources.

Zone of Effect 1, Zone of Effect 2, and Zone of Effect 3: Standard H-1. Not Applicable/De Minimis Effect

FID owns roughly 2.15 acres around Plant 3 and Forebay 2 (and some of its irrigation facilities, including a debris screen and pump station). This land is gated and restricted due to high-voltage and otherwise sensitive equipment unsafe for the general public. The rest of FID's hydropower facilities are located on/under easements. Property owners along these easements include Hood River County (forestland, vacant) and private landowners (forest land, EFU, rural residential). FID does not have any authority to allow public access on these easements. FID does not restrict public access to its hydropower facilities if the landowner (e.g. Hood River County) allows public access, excepting swimming in Forebay 3 and access into Plant 2, due to dangerous conditions and/or sensitive equipment unsuitable for the general public.

Sworn Statement and Waiver Form

All applications for LIHI Certification must include the following sworn statement before they can be reviewed by LIHI:

SWORN STATEMENT

As an Authorized Representative of FARMERS IRRIGATION DISTRICT, the Undersigned attests that the material presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's certification program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The Undersigned further acknowledges that if LIHI Certification of the applying facility is granted, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified®.

The Undersigned further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's certification program.

Company Name: FARMERS IRRIGATION DISTRICT

Authorize Representative:

Name: LES PERKINS

Title: DISTRICT MANAGER

Authorized Signature: _____

Date: 2-14-2020

CONTACTS FORM

A. Applicant-related contacts

Facility Owner:	
Name and Title	Farmers Irrigation District Hydroelectric Project
Company	Farmers Irrigation District
Phone	541-387-5261
Email Address	les@fidhr.org
Mailing Address	1985 Country Club Road, Hood River, OR 97031
Facility Operator (if different from Owner):	
Name and Title	Same as owner
Company	
Phone	
Email Address	
Mailing Address	
Consulting Firm / Agent for LIHI Program (if different from above):	
Name and Title	n/a
Company	
Phone	
Email Address	
Mailing Address	
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	Les Perkins, District Manager
Company	Farmers Irrigation District
Phone	541-387-5261
Email Address	les@fidhr.org
Mailing Address	1985 Country Club Road, Hood River, OR 97031
Party responsible for accounts payable:	
Name and Title	June Brock, Office Manager
Company	Farmers Irrigation District
Phone	541-387-5261
Email Address	june@fidhr.org
Mailing Address	1985 Country Club Road, Hood River, OR 97031

B. Current and relevant state, federal, and tribal resource agency contacts with knowledge of the facility (copy and repeat the following table as needed).

Agency Contact (Check area of responsibility: Flows X, Water Quality __, Fish/Wildlife Resources X, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation X):	
Agency Name	Oregon Department of Fish & Wildlife
Name and Title	Rod French, District Fish Biologist
Phone	541-296-4628
Email address	rod.a.french@state.or.us
Mailing Address	3701 W. 13th Street, The Dalles, OR 97058
Agency Contact (Check area of responsibility: Flows X, Water Quality X, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Oregon Department of Environmental Quality
Name and Title	Smita Mehta, Middle Columbia-Hood Basin Coordinator
Phone	541-278-4609
Email address	MEHTA.Smita@deq.state.or.us
Mailing Address	475 NE Bellevue Drive, Suite 110, Bend, OR 97701
Agency Contact (Check area of responsibility: Flows X, Water Quality X, Fish/Wildlife Resources X, Watersheds __, T/E Spp. X, Cultural/Historic Resources __, Recreation __):	
Agency Name	National Marine Fisheries Service
Name and Title	Tom Hausmann, Biologist
Phone	503-231-2315
Email address	tom.hausmann@noaa.gov
Mailing Address	1201 NE Lloyd Blvd, Suite 1100, Portland, OR 97232
Agency Contact (Check area of responsibility: Flows X, Water Quality X, Fish/Wildlife Resources X, Watersheds __, T/E Spp. __, Cultural/Historic Resources X, Recreation __):	
Agency Name	Confederated Tribes of Warm Springs
Name and Title	Chris Brun, Hood River Production Program Supervisor
Phone	541-352-3548
Email address	chris.brun@ctwsbnr.org
Mailing Address	6030 Dee Hwy, Parkdale, OR 97041
Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources X, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Army Corp of Engineers
Name and Title	Winston Zack, Regulatory Project Manager
Phone	503-808-4337
Email address	Winston.S.Zack@usace.army.mil
Mailing Address	333 SW 1st Ave, Portland, OR 97208
Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources X, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	US Fish & Wildlife Service
Name and Title	Ann Gray, Biologist
Phone	503-231-6179
Email address	Ann_gray@fws.gov
Mailing Address	2600 SE 98th Ave, Suite 100, Portland, OR 97208

C. Current stakeholder contacts that are actively engaged with the facility (copy and repeat the following table as needed).

Stakeholder Contact (Check areas of interest: Flows X, Water Quality X, Fish/Wildlife Resources X, Watersheds X, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Stakeholder Organization	Hood River Watershed Group
Name and Title	Cindy Thieman, Watershed Coordinator
Phone	541-386-6063
Email address	cindy@hoodriverwatershed.org
Mailing Address	3007 Experiment Station Road, Hood River, OR 97031
Stakeholder Contact (Check areas of interest: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Stakeholder Organization	
Name and Title	
Phone	
Email address	
Mailing Address	
Stakeholder Contact (Check areas of interest: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Stakeholder Organization	
Name and Title	
Phone	
Email address	
Mailing Address	
Stakeholder Contact (Check areas of interest: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Stakeholder Organization	
Name and Title	
Phone	
Email address	
Mailing Address	

ATTACHMENTS

Attachment A – 2019 Memorandum of Agreement (MOA) between ODFW, DEQ, and FID
https://www.fidhr.org/images/LIHI/2019_LIHI_MOA_-_Fully_Executed.pdf

Attachment B – Hood River Watershed Action Plan: 2014 Update
http://hoodriverswcd.org/revised/wp-content/uploads/2019/09/HRWG_HRWatershedActionPlan.pdf

Attachment C – Thermal Impact from the Farmers Irrigation District Hydroelectric Facility on the Hood River: 2018 Update
https://www.fidhr.org/images/LIHI/2018_Update_FID_Thermal_Study.pdf

Attachment D – Photo of Plant 2 prior to the removal of the Powerdale Dam
https://lowimpacthydro.org/lihi-certificate-45-farmers-irrigation-district-hydro-project-ferc-s-7532-and-6801/

Attachment E – ODFW documentation of Plant 2 tailrace improvements
https://www.fidhr.org/images/LIHI/ODFW_email_tailrace_attraction.pdf

Attachment F – Patented Farmers Screen technology
https://farmerscreen.org/

Attachment G – Farmers Screen story in Gorge Magazine
https://issuu.com/thegorgemagazine/docs/the_gorge_magazine_summer_2018

Attachment H – Fish passage evaluation using FID's mainstem Hood River Farmers Screen as a study site
https://www.fidhr.org/images/news/FID_Marine_and_Freshwater_Research_Article_July_2019.pdf