

WATER



Water is essential to Syncrude's operation and plays a key role in our production processes. However, we realize it is a resource that must be managed responsibly. Toward this, we aim to minimize the withdrawal of fresh water from the watershed, maximize reuse of process-affected water, and safely manage its storage. This includes taking steps to protect local water bodies, creeks and rivers, and to develop scientifically-sound treatment methods which will allow us to release water stored on our site safely back to the environment.

OUR WATER SOURCES

The majority of our operation relies on recycled water sourced from our tailings ponds. Of the total water used in 2019, 87 per cent was recycled from these facilities.

Our main source of fresh water is the Athabasca River, which provided approximately 13 per cent of our water needs in 2019. This water is used to cool upgrading processes, generate steam, and for potable consumption. Our water license permit allows withdrawal of 61.7 million m³ of fresh water from the river annually. In over 40 years of production, we have always operated well within our license and will limit withdrawals during low flow periods. In 2019, we used about 0.19 per cent of the river's total annual average flow, which is equivalent to about 17 hours for the year.

0.19% of the river's total annual average flow was used for production



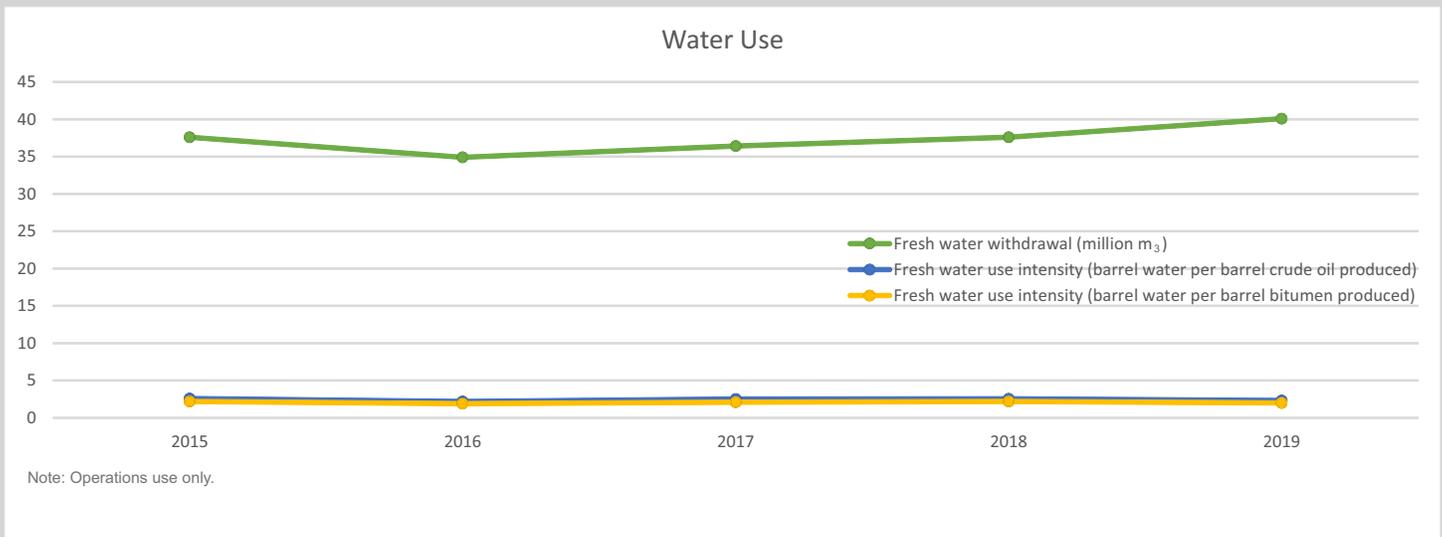
OUR PROGRESS

In 2019, we withdrew 40.1 million m³ from the Athabasca River for production operations and potable water.

For non-production purposes, an additional 6.3 million m³ of fresh water was diverted from Beaver Creek Reservoir for the Base Mine Lake tailings reclamation demonstration project. To offset this diversion, we fund the Alberta Conservation Association's work to protect and enhance the riparian zone and streambed of the Owl River, near Lac La Biche. The offset constitutes compensation, as per our Fisheries Act approval, for Harmful Alteration, Disruption or Destruction of fisheries habitat (known as HADD).

As per provincial regulation, precipitation and runoff that comes in contact with our mining area is collected and routed into our closed circuit recycle water system. In 2019, this included a Mildred Lake site fence line diversion of an estimated 14 million m³ in precipitation (snowmelt, rainfall) and 0.1 million m³ in surface water. Fence line diversion at our Aurora North site was an estimated 2.3 million m³ in precipitation, 2.9 million m³ in surficial water and 3.2 million m³ in basal groundwater.

Over the last few years, extensive efforts have been undertaken to return natural surface water and basal groundwater from our leases to the watershed. In 2019, 5.3 million m³ of water was returned to the environment upon meeting provincially-regulated water quality parameters.



TOWARD IMPROVED WATER EFFICIENCY

In 2019, water use was 2.33 barrels per barrel of production. Toward our effort to continuously improve our water efficiency, we have implemented a strategy under three specific goals:

- Reduce – optimize raw water use and reduce external environmental inputs
- Reuse – more efficient reuse of our existing on-site water supply
- Release – remediate and treat process water for use in reclamation and eventual release to the environment

Extensive analyses is underway throughout every aspect of our operation to identify specific projects that can improve our efficiency and use of this valuable natural resource.

RESEARCH ON TREATMENT AND RELEASE

Presently, Syncrude does not release process-affected water to the environment. The only releases to the Athabasca River are treated sanitary sewage similar to that from municipalities, as well as surface and aquifer water that has not been used in the bitumen production process. All releases are routinely tested to ensure compliance with government specified quality regulations.

We however recognize that storing process-affected water is not a sustainable long-term practice. To expedite landscape restoration activities and improve overall environmental stewardship, the hydrology of the reclaimed landscape must be integrated within the surrounding environment. To address these goals, Syncrude collaborates through COSIA and with academic institutions to research and develop appropriate water treatment technologies. At our site, two large-scale projects are currently underway – the Base Mine Lake water-capped tailings technology demonstration (see our Tailings fact sheet) and the Water Release Demonstration project.

WATER RELEASE DEMONSTRATION PROJECT

Syncrude's Research department has been successfully conducting research on tailings water treatment using petroleum coke, a byproduct of our upgrading process. The treatment is similar to using a home water filter. The coke, which is almost pure carbon, acts as a filter to remove contaminants in the water such as naphthenic acids. Field programs completed to date shows the treated water will support aquatic life and can be released in a manner to ensure protection of downstream uses.

A large pilot-scale plant at the Mildred Lake Settling Basin is further assessing the technology, and will provide engineering design and operational information necessary for potential commercial-scale implementation. With input from government, industry and Indigenous communities, a comprehensive monitoring and testing plan has been developed to evaluate the water quality throughout the treatment process. Academic institutions are also being engaged to advance knowledge and ensure results are transparent and publicly available in peer-reviewed scientific literature.

In addition, both the federal and provincial governments have started the process to ensure a regulatory framework is in place to enable the safe release of treated oil sands mine water. Releases will be managed consistent with those approved from other industries in Alberta and Canada.



REGIONAL WATER MONITORING

Syncrude funds regional monitoring which is managed at arm's length by federal and provincial agencies through the Oil Sands Monitoring Program under the Environmental Monitoring and Science Division within Alberta Environment and Parks. Areas of oversight include water, biodiversity and ecosystem health. An Indigenous Knowledge Advisory Panel also provides advice on monitoring activities.

In addition, Syncrude participates in and is compliant with the Surface Water Quantity Management Framework under the Lower Athabasca Regional Plan. This framework sets out weekly management triggers to limit oil sands water withdrawals during low flow periods. From this, Syncrude then works with other oil sands operators to establish and agree upon withdrawal allocations.

Water Use Performance Data	2015	2016	2017	2018	2019
Fresh water withdrawal ¹ (million m ³)	37.6	34.9	36.4	37.6	40.1
Fresh water use intensity (barrel water per barrel crude oil produced)	2.57	2.19	2.50	2.56	2.33
Fresh water use intensity (barrel water per barrel bitumen produced)	2.17	1.89	2.10	2.18	1.98
Process water recycled (million m ³)	236	241	239	252	274
Process water recycled (% total water used)	86	87	87	87	87
Water returned (million m ³) ²	8.1	4.8	4.1	4.8	5.5

1 Athabasca River water diversion for direct operations use only. In 2019, under regulatory approval, an additional 6.3 Mm³ of fresh water was diverted from Beaver Creek Reservoir for the Base Mine Lake tailings reclamation demonstration project.

2 Water is returned to the Athabasca River and includes surface water and groundwater from dewatering activities as well as treated sanitary.