

W0. Introduction

W0.1

**(W0.1) Give a general description of and introduction to your organization.**

Vermilion is playing a meaningful role in the energy transition that is unfolding globally, & we are doing so with an unwavering commitment to our priorities of health & safety, environmental protection, & economic prosperity. Vermilion is an international energy producer that seeks to create value through the acquisition, exploration, development & optimization of producing properties in North America, Europe & Australia. Our business model emphasizes free cash flow generation and returning capital to investors when economically warranted, augmented by value-adding acquisitions. Vermilion’s operations are focused on the exploitation of light oil and liquids-rich natural gas conventional resource plays in North America and the exploration and development of conventional natural gas and oil opportunities in Europe and Australia. Vermilion holds a 20% working interest in the Corrib gas field in Ireland & assumed operatorship of the asset in late 2018. Vermilion’s ongoing reserve & production growth is anticipated to come from a combination of development drilling, reservoir optimization & strategic acquisitions.

Vermilion remains a conventional producer in Europe and Australia, not employing hydraulic fracturing in any of our operated European assets. In North America, we do utilize hydraulic fracturing of horizontal wells to develop some of our oil & gas reservoirs. However, we would point out that even in North America, we use fracturing at lower fracturing intensity than is typical of the industry, & only in semi-conventional clastic reservoirs. We do not develop shale reservoirs.

One of Vermilion’s defining strengths is our belief that sharing our success is essential to being a success. We have embedded this philosophy in our mission, & we continue to live it today. Our objective is to ensure that all of our key stakeholders – our shareholders, employees, communities, governments, partners & suppliers – benefit from our achievements. This approach, based on the concepts of inclusive & sustainable growth, frames our business strategy & guides our role in the energy transition. As the energy transition continues to advance, two avenues of action have become increasingly important to us.

First, it is of course critical that we continue to develop & expand the implementation of reliable, secure & cost-effective sources of renewable and low-carbon energy. Our geothermal projects in France, in which we provide heat from our produced water to agricultural and residential sectors, are already demonstrating that oil & gas companies such as ours can not only participate in renewable energy production, but lead it as well. We are researching geothermal development in concert with hydrocarbon production in the Netherlands, and hydrogen potential in the Netherlands, France and Ireland.

Second, because hydrocarbons, particularly natural gas, will be required until the energy transition is completed, we believe that citizens, governments & investors should turn to best-in-class oil & gas operators. We will need to continue to produce safely & responsibly the oil & gas that is still needed to fuel essential products & services. In particular, natural gas has a role to play by replacing high-carbon fuels such as coal for electricity generation, which will become increasingly important as the number of electric vehicles increases. In 2020, our natural gas production in Canada alone would have enabled a third party to avoid 9,447 kT of CO2e compared to utilizing power generated by a coal-fired power plant.

In our operating regions of North America, Europe & Australia, we comply with some of the world’s most stringent health, safety, environmental & human rights regulations. We voluntarily report to international frameworks such as GRI & CDP. Environmental responsibility is only a part of our sustainability focus. We have seen first hand that inclusive growth, which we see as ensuring that everyone has an opportunity for economic advancement, is fundamental to community wellbeing & long-term democratic stability. We are therefore committed to ensuring that we produce energy in the most socially responsible manner possible, respecting worker rights & community engagement. This broad focus on sustainability (environmental, economic & social) is why we have integrated our sustainability strategy with the UN’s Global Goals for Sustainable Development (SDGs). The SDGs provide a common focus & language for the planet, stating a clear vision for our collective future. We recognize that our capabilities in health and safety, environmental stewardship, long-term economic growth generation, & creation of shareholder value provide us with opportunities and the responsibility to move the SDGs forward. You’ll see us referring to the SDGs throughout the submission and other sustainability reporting.

W-OG0.1a

**(W-OG0.1a) Which business divisions in the oil & gas sector apply to your organization?**

Upstream

W0.2

**(W0.2) State the start and end date of the year for which you are reporting data.**

	Start date	End date
Reporting year	January 1 2020	December 31 2020

### W0.3

(W0.3) Select the countries/areas for which you will be supplying data.

Australia  
Canada  
Croatia  
France  
Germany  
Hungary  
Ireland  
Netherlands  
United States of America

### W0.4

(W0.4) Select the currency used for all financial information disclosed throughout your response.

CAD

### W0.5

(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.

Companies, entities or groups over which operational control is exercised

### W0.6

(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?

No

## W1. Current state

### W1.1

(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Important	Neutral	Reflecting our activities as an upstream oil & gas company, water is accessed within all of Vermilion's operational areas for various uses: e.g. dust control, drilling, well completion (fracturing North America only), voidage replacement, enhanced oil recovery, etc. In all areas, water use is highly regulated and 100% of water volumes withdrawn (including purchased) and discharged are tracked and reported. The majority of Vermilion's water withdrawals (88%) are produced water associated with conventional oil production, primarily within the Canada Business Unit (CBU). Strict compliance with regulatory requirements related to water use is mandatory across all business units. Through proactive water management, Vermilion is able to secure water for future activities, while reducing risk and impacts. We prefer to use brackish rather than freshwater in our operations; however, the use of freshwater aquifers is unavoidable in some locations. The availability of freshwater, both now and in the future, is therefore considered important to our operational activities. While alternatives are available now and are expected to continue to be available based on government licensing of water supplies in our regions, there would be an economic and potentially environmental (transport) impact should we need to seek sources other than our current options. For indirect use in our value chain -- for example, our upstream suppliers (e.g. office contractors and supplies) and downstream customers (e.g. midstream pipeline operators) - these operations are not as dependent on sources of freshwater, so we consider its importance to be neutral, with a lack of availability unlikely to materially impact their ability to provide services or contracts to us. (Note that we have included the activities of contractors in areas such as drilling and completions in our direct use category, as they more accurately reflect activities under our direct control).
Sufficient amounts of recycled, brackish and/or produced water available for use	Important	Neutral	Reflecting our activities as an upstream oil and gas company, water is accessed within all of Vermilion's operational areas for various uses: e.g. dust control, drilling, well completion (fracturing North America only), voidage replacement, enhanced oil recovery, etc. In all areas, water use is highly regulated and 100% of water volumes withdrawn (including purchased) and discharged are tracked and reported. The majority of Vermilion's water withdrawals (88%) are produced water associated with conventional oil production, primarily within the Canada Business Unit (CBU). Strict compliance with regulatory requirements related to water use is mandatory across all business units. Through proactive water management, Vermilion is able to secure water for future activities, while reducing risk and impacts. We prefer to use brackish rather than freshwater in our operations. The availability of brackish water, both now and in the future, is therefore considered important to our operational activities. While alternatives such as freshwater are available now and are expected to continue to be available based on government licensing of water supplies in our regions, there would be an economic impact should we need to seek sources other than our current options. For indirect use in our value chain - for example, our upstream suppliers (e.g. office contractors and supplies) and downstream customers (e.g. midstream pipeline operators) - these operations are not dependent on sources of brackish water, so we consider its importance to be neutral, with a lack of availability unlikely to materially impact their ability to provide services or contracts to us. (Note that we have included the activities of contractors in areas such as drilling and completions in our direct use category, as they more accurately reflect activities under our direct control).

### W1.2

(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations	Please explain
Water withdrawals – total volumes	100%	Water is accessed within all of Vermilion's operational areas for various uses (dust control, drilling, well completion (fracturing - North America only), voidage replacement, enhanced oil recovery, etc.). In all areas, water use is highly regulated and 100% of water volumes withdrawn and discharged are tracked for internal and external accounting, management and reporting purposes. The majority of Vermilion's water withdrawals (58,955/67,202 = 88%) are produced water associated with conventional oil production, primarily within the Canadian Business Unit (CBU). Adherence to regulatory requirements and industry best practices related to water use is monitored across all BU's. All water volumes regardless of source are measured at the point of withdrawal and discharge (including deep well disposal) using a combination of meters and volumetric calculations. The data is tracked and analyzed to support regulatory reporting and internal governance and sustainability initiatives.
Water withdrawals – volumes by source	100%	Water is accessed within all of Vermilion's operational areas for various uses (dust control, drilling, well completion (fracturing - North America only), voidage replacement, enhanced oil recovery, etc.). In all areas, water use is highly regulated and 100% of water volumes withdrawn and discharged are tracked for internal and external accounting, management and reporting purposes. The majority of Vermilion's water withdrawals (58,955/67,202 = 88%) are produced water associated with conventional oil production, primarily within the Canadian Business Unit (CBU). Adherence to regulatory requirements and industry best practices related to water use is monitored across all BU's. All water volumes regardless of source are measured at the point of withdrawal and discharge (including deep well disposal) using a combination of meters and volumetric calculations. The data is tracked and analyzed to support regulatory reporting and internal governance and sustainability initiatives.
Entrained water associated with your metals & mining sector activities - total volumes [only metals and mining sector]	<Not Applicable>	<Not Applicable>
Produced water associated with your oil & gas sector activities - total volumes [only oil and gas sector]	100%	Organizationally, the majority of Vermilion's water withdrawals (58,955/67,202 = 88%) are produced water associated with conventional oil production, most of which occurs within the CBU (Saskatchewan and Alberta). The tracking and reporting of produced water withdrawals and discharges (re-injection) is a regulatory requirement and is undertaken in accordance with defined accounting practices. Produced water withdrawal volumes are generally determined using metering systems and accounting calculations associated with capturing hydrocarbon production volumes. The withdrawal data is collected in Vermilion's production accounting systems which facilitate the associated regulatory reporting as well as financial accounting processes.
Water withdrawals quality	76-99	In total, 99% (66,549/67,202 = 99%) of Vermilion's water withdrawals are assessed for water quality parameters. Produced water is assessed to determine compatibility and treatment requirements with respect to future re-injection and to assess corrosivity in the context of asset integrity and management programs (e.g. pipelines). Freshwater used for drilling purposes (e.g., drilling fluid systems) is also assessed to ensure compatibility with the drilling formations and to determine additive requirements. Depending on the circumstances, the water quality assessment may include routine chemistry parameters (pH, conductivity, major cations/anions, etc.), total and/or dissolved metals, hydrogen sulphide, and biological parameters iron reducing and acid producing bacteria. The majority of the analyses are completed at accredited laboratories. Some parameters (e.g. temperature) may also be monitored in the field.
Water discharges – total volumes	100%	As an organization, the majority of Vermilion's water withdrawal (58,955/67,202 = 88%) is produced water associated with conventional oil production. The majority of this volume (48,914/67,202 = 73% of our total discharge), is reinjected into the oil producing formations for voidage replacement or disposed via deep well injection. Lifecycle tracking of produced water is a regulatory and corporate obligation with defined accounting and reporting requirements. In Vermilion's offshore Australian operations, discharge occurs to seawater in accordance with a government authorization that mandates water quality and quantity, as well as monitoring and reporting requirements. This volume (constituting 17,386/67,202 = 26% of our total discharge) is metered as part of the discharge process. The remaining approximately 1.4% of Vermilion's total water discharge is to third-party facilities (1.2%) or deep well disposal (0.2%) and is metered or quantified using volumetric accounting calculations.
Water discharges – volumes by destination	100%	As an organization, the majority of Vermilion's water withdrawal (58,955/67,202 = 88%) is produced water associated with conventional oil production. The majority of this volume (48,914/67,202 = 73% of our total discharge), is reinjected into the oil producing formations for voidage replacement or disposed via deep well injection. Lifecycle tracking of produced water is a regulatory and corporate obligation with defined accounting and reporting requirements. In Vermilion's offshore Australian operations, discharge occurs to seawater in accordance with a government authorization that mandates water quality and quantity, as well as monitoring and reporting requirements. This volume (constituting 17,386/67,202 = 26% of our total discharge) is metered as part of the discharge process. The remaining approximately 1.4% of Vermilion's total water discharge is to third-party facilities (1.2%) or deep well disposal (0.2%) and is metered or quantified using volumetric accounting calculations.
Water discharges – volumes by treatment method	76-99	As an organization, the majority of Vermilion's water withdrawals (88%) are produced water associated with conventional oil production. The majority of this volume (73%) is reinjected into the oil producing formations for voidage replacement, or disposed via deep well injection. Lifecycle tracking of produced water is a regulatory obligation with defined accounting and reporting requirements. Treatment typically involves the addition of an oxygen scavenger and biocide prior to reinjection. In Vermilion's offshore Australian operations, discharge to seawater occurs in accordance with a government authorization that defines water quality, monitoring and reporting requirements. This volume (~26% of our total discharge) is metered as part of the discharge process. The remaining approximately 1.4% of Vermilion's total water discharge is to third-party facilities (1.2%) or deep well disposal (0.2%), and is metered or quantified using volumetric calculations.
Water discharge quality – by standard effluent parameters	76-99	As an organization, 99% (66,549/67,202 = 99%) of Vermilion's water withdrawals are monitored for water quality prior to discharge as the chemical composition and compatibility of the water must be determined for environmental and operational purposes (e.g., hydraulic fracturing or drilling fluid systems). Some parameters (e.g. temperature) may be measured continuously while other parameters are analyzed at an accredited laboratory (e.g., routine chemistry, metals, biological parameters, H2S, etc.). In Vermilion's offshore Australian operations, discharge to seawater (~26% of our total water discharge) occurs in accordance with a government authorization that defines water quality, monitoring and reporting requirements. A detailed impact assessment of various components (e.g. residual hydrocarbons, radionuclides, etc.) on the marine environment is part of the regulatory approval process.
Water discharge quality – temperature	76-99	As an organization, 99% of Vermilion's water withdrawals are monitored for water quality prior to discharge as the chemical composition and compatibility of the water must be determined for operational purposes. Some parameters (e.g. temperature) may be measured continuously while others are analyzed at an accredited laboratory (e.g., routine chemistry, metals, biological parameters, H2S, etc.). Water temperature is generally not a key operating parameter in the context of deep well injection. In Vermilion's offshore Australian operations, discharge to seawater (~26% of our total water discharge) occurs in accordance with a government authorization that defines water quality monitoring and reporting requirements. Vermilion meets the assessment criteria for temperature set in the Environmental Health and Safety Guidelines for Offshore Oil and Gas Development (IFC, 2007) of a temperature increase of no more than 3°C within 100 m of the discharge point.
Water consumption – total volume	100%	As described previously, lifecycle tracking of water withdrawals and discharges is undertaken within all operational areas in accordance with regulatory requirements and industry best practices. Annual water consumption is calculated by subtracting water discharge volumes from water withdrawal volumes, both of which are monitored and measured as per previous answers. As a conventional oil and gas producer, Vermilion's operations do not typically involve the consumption of water (ie. water withdrawals and discharges are generally in balance). Accordingly, in 2020 Vermilion's net water consumption was zero.
Water recycled/reused	Less than 1%	At this time, water recycling/reuse is not a material component of Vermilion's operations but may become more relevant in the future as opportunities for water use reduction and conservation continue to be evaluated as an organizational priority.
The provision of fully-functioning, safely managed WASH services to all workers	100%	Across the operational areas, Vermilion provides WASH services to ensure that the quality and quantity of water provided meets the safety standards for all workers and the communities where we operate. All drinking water associated with Vermilion's operations is either supplied via municipal sources or from private suppliers.

W1.2b

**(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, and how do these volumes compare to the previous reporting year?**

	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total withdrawals	67202.5	About the same	In all operational jurisdictions, water use reporting is a regulatory requirement and 100% of water volumes withdrawn, produced, and purchased are measured, monitored, and tracked internally. All water volumes regardless of source are tracked accordingly, e.g., using meters at extraction points or by volumetric calculations for trucked water. The total volume of Vermilion's water withdrawal is an aggregate of volumes tracked (i.e., measured or calculated) across all the operational jurisdictions. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our total 2020 withdrawal represents an approximately $[(67,202 - 70,156)/70,156 = 4.2\%$ decrease in relation to the 2019 volume. It is expected that water volumes in this category will fluctuate from year to year based on activity and production levels.
Total discharges	67202.5	About the same	As an organization, the majority of Vermilion's water withdrawals (88%) are produced water associated with conventional oil production. The majority of this volume (48,914/67,202 = 73% of our total discharge) is reinjected into the oil producing formations for voidage replacement, or disposed via deep well injection. Lifecycle tracking of produced water is a regulatory obligation with defined accounting and reporting requirements. In Vermilion's offshore Australian operations, discharge to seawater occurs in accordance with a government authorization that defines water quality, monitoring and reporting requirements. This volume (~26% of our total water discharge) is metered as part of the discharge process. The remaining approximately 1.4% of Vermilion's total water discharge is to third-party facilities (1.2%) or deep well disposal (0.2%), and is metered or quantified using volumetric calculations. The total volume of Vermilion's water discharges is an aggregate of volumes tracked (i.e., measured or calculated) across all the operational jurisdictions. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our total 2020 discharge represents an approximately $[(67,202 - 70,156)/70,156 = 4.2\%$ decrease in relation to the 2019 volume. It is expected that water volumes in this category will fluctuate from year to year based on activity and production levels.
Total consumption	0	About the same	Lifecycle tracking of water withdrawals and discharges is undertaken within all operational areas in accordance with regulatory requirements and industry best practices. Annual water consumption is calculated by subtracting water discharge volumes from water withdrawal volumes, both of which are monitored and measured as per previous answers. As a conventional oil and gas producer, Vermilion's operations do not typically involve the consumption of water (i.e. water withdrawals and discharges are generally in balance). Accordingly, Vermilion's net water consumption in 2020 was zero.

**W-OG1.2c**

**(W-OG1.2c) In your oil & gas sector operations, what are the total volumes of water withdrawn, discharged, and consumed – by business division – and what are the trends compared to the previous reporting year?**

	Volume (megaliters/year)	Comparison with previous reporting year %	Please explain
Total withdrawals - upstream	67202.5	About the same	In all operational jurisdictions, water use reporting is a regulatory requirement and 100% of water volumes withdrawn, produced, and purchased are measured, monitored, and tracked internally. All water volumes regardless of source are tracked accordingly, e.g., using meters at extraction points or by volumetric calculations for trucked water. The total volume of Vermilion's water withdrawal is an aggregate of volumes tracked (i.e., measured or calculated) across all the operational jurisdictions. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our total 2020 withdrawal represents an approximately $[(67,202 - 70,156)/70,156 = 4.2\%$ decrease in relation to the 2019 volume. It is expected that water volumes in this category will fluctuate from year to year based on activity and production levels.
Total discharges – upstream	67202.5	About the same	As an organization, the majority of Vermilion's water withdrawals (88%) are produced water associated with conventional oil production. The majority of this volume (48,914/67,202 = 73% of our total discharge) is reinjected into the oil producing formations for voidage replacement, or disposed via deep well injection. Lifecycle tracking of produced water is a regulatory obligation with defined accounting and reporting requirements. In Vermilion's offshore Australian operations, discharge to seawater occurs in accordance with a government authorization that defines water quality, monitoring and reporting requirements. This volume (~26% of our total water discharge) is metered as part of the discharge process. The remaining approximately 1.4% of Vermilion's total water discharge is to third-party facilities (1.2%) or deep well disposal (0.2%), and is metered or quantified using volumetric calculations. The total volume of Vermilion's water discharges is an aggregate of volumes tracked (i.e., measured or calculated) across all the operational jurisdictions. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our total 2020 discharge represents an approximately $[(67,202 - 70,156)/70,156 = 4.2\%$ decrease in relation to the 2019 volume. It is expected that water volumes in this category will fluctuate from year to year based on activity and production levels.
Total consumption – upstream	0	About the same	Lifecycle tracking of water withdrawals and discharges is undertaken within all operational areas in accordance with regulatory requirements and industry best practices. Annual water consumption is calculated by subtracting water discharge volumes from water withdrawal volumes, both of which are monitored and measured as per previous answers. As a conventional oil and gas producer, Vermilion's operations do not typically involve the consumption of water (i.e. water withdrawals and discharges are generally in balance). Accordingly, Vermilion's net water consumption in 2020 was zero.
Total withdrawals - midstream/downstream	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total discharges – midstream/downstream	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total consumption – midstream/downstream	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total withdrawals – chemicals	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total discharges – chemicals	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total consumption – chemicals	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total withdrawals – other business division	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total discharges – other business division	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total consumption – other business division	<Not Applicable>	<Not Applicable>	<Not Applicable>

W1.2d

(W1.2d) Indicate whether water is withdrawn from areas with water stress and provide the proportion.

	Withdrawals are from areas with water stress	% withdrawn from areas with water stress	Comparison with previous reporting year	Identification tool	Please explain
Row 1	No	<Not Applicable >	<Not Applicable>	Other, please specify (Vermilion considers several factors when evaluating water stress, including: regulatory consultation, regional risk or stress-based allocation requirements, and landowner engagement in relation to current water use practices and water availability.)	As an organization, Vermilion recognizes that water is a shared resource and that our activities have implication beyond our direct operations. Although freshwater use represents a relatively small percentage of our annual water withdrawal, water stewardship is a core element of our sustainability program and has been identified by our Executive Board as one of four pillars in our sustainability strategy. Initiatives related to the identification of water-related risk and consequence, and related opportunities for the advancement of organizational or region-specific water management initiatives, is a prioritized objective within all business units. Several factors are considered when evaluating water stress within our operating areas, both in terms of water availability and the risk our operations may present to sensitive or region-critical water resources. In general, regulatory oversight of water use in all of our operated areas is well developed with water allocation or diversion licensing requirements that consider other water users and the capacity of the resource (surface and groundwater) to support the intended withdrawals. Regulatory authorizations for groundwater withdrawals typically involve an assessment of aquifer yield as part of the licensing process. Longer-term (i.e. multi-year) diversion licenses typically include a requirement for ongoing aquifer monitoring to ensure that the withdrawal, or collective withdrawals of multiple users, is not adversely impacting the reservoir with time. Authorizations for surface water withdrawals typically set limits with respect to maximum allowable drawdown and include additional provisions (e.g. inlet screening, access requirements, etc.) to mitigate risk to aquatic organisms and habitat. Limits with respect to the permitted withdrawal volumes and recovery rate are typically stipulated in the withdrawal authorizations and are enforceable under regulation. In addition to working within the existing regulatory frameworks in our operating areas and engaging with local, field-level environmental and fisheries officers with respect to water use and availability, Vermilion's surface land and community relations groups also actively engage with other stakeholders with respect to water related matters. Landowner consultation is an integral part of all drilling programs and includes dialogue with respect to current water uses and vulnerabilities. Where practical, and particularly in agricultural areas, landowners are often engaged in the provision of freshwater to limit risk and facilitate mutual benefit. Open attendance ("townhall") events are also routinely hosted by Vermilion's operations and community relations teams which provide a forum for stakeholder discussion and communication of water-related concerns. Vermilion's field operations and joint-venture teams are also in regular communication with other industry operators, either through formal industry associations or ad hoc engagements, which allows for a direct sharing of water-related activities and concerns, as well as identification of collaborative opportunities. As part of our corporate risk evaluation process, which prioritizes water, we recognize that several publicly available water stress assessment tools, including the Water Resources Institute (WRI) Aqueduct tool and World Wildlife Fund (WWF) Water Risk Filter, would identify some of our operating areas as water stressed. However, based on our field-level observations and monitoring programs, regulatory communications, and interactions with other industrial, agricultural and domestic water users, none of our operating areas are at this time deemed to be under water stress in the context of our operations. Should our ongoing monitoring and stakeholder engagement activities indicate that an acute or chronic water stress condition is evolving in any of our operating areas, the risk presented to, and by, our operations would be further assessed and appropriate mitigative measures implemented. Depending on the area-specific circumstances, this could include sourcing (and hauling) water from outside of the water stressed area, switching to drilling fluid systems that do not require freshwater, implementation of additional risk management measures to monitor and safeguard vulnerable water resources (surface and groundwater) and, potentially, short or long-term suspension of operations within the water stressed areas.

W1.2h

**(W1.2h) Provide total water withdrawal data by source.**

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	11.5	Much lower	Approximately 0.02% of Vermilion's total water withdrawal comes from fresh surface water, primarily within the Canadian Business Unit. This is relevant because the water is used operationally for well drilling and development and part of our efforts toward water efficiency and protecting water bodies. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 fresh surface water withdrawal represents a $[(11.5 - 43.8)/43.8] = 74\%$ decrease in relation to the 2019 volume.
Brackish surface water/Seawater	Relevant	7397.7	Higher	Approximately 11% of Vermilion's total water withdrawal comes from seawater as part of offshore operations in the Australia Business Unit. The majority of this water (97.5%) is cooling water that is utilized in a direct, flow-through system. The remainder of the water is used for domestic or maintenance purposes. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 seawater withdrawal represents a $[(7,397.7 - 6,188.7)/6,188.7] = 19.5\%$ increase in relation to the 2019 volume.
Groundwater – renewable	Relevant	691.5	Higher	Approximately 1% of Vermilion's total water withdrawal comes from renewable groundwater sources. It is relevant because it is used operationally for well drilling, hydraulic fracturing (North America only) and enhanced oil recovery (waterflood). It is part of our efforts toward water efficiency and protecting water bodies. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 renewable groundwater withdrawal represents a $[(691.5 - 621.8)/621.8] = 11.2\%$ increase in relation to the 2019 volume.
Groundwater – non-renewable	Relevant	108.7	About the same	Approximately 0.2% of Vermilion's total water withdrawal comes from non-renewable groundwater sources. It is relevant because it is generally used operationally for enhanced oil recovery (waterflood) or well completions (North America). It is part of our efforts towards water efficiency. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 non-renewable groundwater withdrawal represents a $[(108.7 - 105.6)/105.6] = 2.9\%$ increase in relation to the 2019 volume.
Produced/Entrained water	Relevant	58954.7	About the same	Approximately 88% of Vermilion's total water withdrawal is produced water. The tracking and reporting of produced water withdrawals and discharges (re-injection) is a regulatory requirement & is undertaken in accordance with defined accounting practices. The withdrawal data is collected in our production accounting systems which facilitate regulatory reporting as well as financial accounting processes. Although this is our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 produced water withdrawal represents a $[(58,955 - 63,148)/63,148] = 6.6\%$ decrease in relation to the 2019 volume.
Third party sources	Relevant	38.5	Lower	Approximately 0.06% of Vermilion's total water withdrawal comes from public supply of potable water. It is relevant because this water withdrawal is typically used for domestic or wash water use only and is generally metered or measured at source. It is part of our efforts toward water efficiency and protection of water bodies. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 third party water withdrawal represents a $[(38.5 - 49.4)/49.4] = 22.1\%$ decrease in relation to the 2019 volume.

**W1.2i**

**(W1.2i) Provide total water discharge data by destination.**

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water	Relevant	0	About the same	Discharges of water to fresh surface water bodies is generally prohibited in the regulatory jurisdictions in which Vermilion operates and is contrary to our standard organizational practices. Vermilion had no planned discharges to freshwater in 2020 and no such discharges are anticipated in the future. This is relevant because it is part of our efforts toward water efficiency and protecting water bodies. Similar to 2019, discharges to fresh surface water were not undertaken in 2020 and are not anticipated going forward.
Brackish surface water/seawater	Relevant	17385.7	Higher	In Vermilion's offshore Australian operations, discharge occurs to seawater in accordance with a government authorization that mandates water quality and quantity, as well as monitoring and reporting requirements. This volume (~26% of our total discharge) is metered as part of the discharge process. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 seawater discharge represents a $[(17,386 - 15,273)/15,273] = 13.8\%$ increase in relation to the 2019 volume.
Groundwater	Relevant	49024.5	Lower	Approximately 73% of Vermilion's total water discharge is reinjected into deep, non-renewable, saline aquifers for voidage replacement to maintain formation pressure, or disposed via similar deep well injection. The reinjection and disposal volumes are recorded and tracked for internal and external water accounting and reporting purposes. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 groundwater discharge represents a $[(49,024 - 54,596)/54,596] = 10.2\%$ decrease in relation to the 2019 volume.
Third-party destinations	Relevant	792.3	Much higher	Approximately 1.2% of Vermilion's total water discharge volume is to third party waste water treatment and/or disposal facilities, and is either metered or measured by volumetric calculations for trucked water. It is relevant because it is part of our efforts toward water efficiency and protecting water bodies. Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 third-party discharge represents a $[(792.3 - 288.8)/288.8] = 174.3\%$ increase in relation to the 2019 volume.

## W1.2j

(W1.2j) Within your direct operations, indicate the highest level(s) to which you treat your discharge.

	Relevance of treatment level to discharge	Volume (megaliters/year)	Comparison of treated volume with previous reporting year	% of your sites/facilities/operations this volume applies to	Please explain
Tertiary treatment	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	
Secondary treatment	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	
Primary treatment only	Relevant	59193.2	About the same	81-90	Our 2020 primary treatment volume represents an approximately $[(59,193 - 63,872)/63,872] = 7.3\%$ decrease in relation to the 2019 treatment volumes.
Discharge to the natural environment without treatment	Relevant	7217	Higher	11-20	Our 2020 discharge to natural environment without treatment volume represents an approximately $[(7,217 - 5,996)/5,996] = 20.4\%$ increase in relation to the 2019 volume.
Discharge to a third party without treatment	Relevant	792.3	Much higher	1-10	Our 2020 discharge to third party without treatment volume represents an approximately $[(792.3 - 288.8)/288.8] = 174.3\%$ increase in relation to the 2019 volume.
Other	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	

## W-OG1.3

(W-OG1.3) Do you calculate water intensity for your activities associated with the oil & gas sector?

Yes

## W-OG1.3a

(W-OG1.3a) Provide water intensity information associated with your activities in the oil & gas sector.

### Business division

Upstream

### Water intensity value (m3)

0.02

### Numerator: water aspect

Freshwater withdrawals

### Denominator

Barrel of oil equivalent

### Comparison with previous reporting year

About the same

### Please explain

As described previously, water stewardship is a core element of our sustainability program and has been identified by our Executive Board as one of four pillars in our sustainability strategy. As part of our corporate risk management process, water-related risks, including renewable (fresh) and non-renewable water dependencies, are analyzed on a district level to help mitigate risk exposure and identify opportunities for organizational or region-specific water management initiatives, which is a prioritized objective within all business units. As an organization, freshwater (i.e. renewable groundwater, surface water and third-party potable sources) represent approximately 1% of our total annual withdrawal ( $741.5/67,202.5 = 1.1\%$ ). Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 freshwater withdrawal intensity represents a  $[(0.018 - 0.016)/0.016] = 9.8\%$  increase in relation to the 2019 value.

### Business division

Upstream

### Water intensity value (m3)

1.59

### Numerator: water aspect

Total water withdrawals

### Denominator

Barrel of oil equivalent

### Comparison with previous reporting year

About the same

### Please explain

As described previously, water stewardship is a core element of our sustainability program and has been identified by our Executive Board as one of four pillars in our sustainability strategy. As part of our corporate risk management process, water-related risks, including renewable (fresh) and non-renewable water dependencies, are analyzed on a district level to help mitigate risk exposure and identify opportunities for organizational or region-specific water management initiatives, which is a prioritized objective within all business units. Approximately 88% of our total water withdrawal in 2019 was produced water ( $58,954.7/67,202.5 = 87.7\%$ ). Although this is only our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. Our 2020 total

withdrawal intensity represents a  $[(1.59 - 1.57)/1.57] = 1.41\%$  increase in relation to the 2019 value. The year-over-year intensity comparison reflects an amendment to the 2019 value from 1.75 to 1.57 to better represent the total operated BOE throughput.

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**Business division**

Upstream

**Water intensity value (m3)**

0

**Numerator: water aspect**

Freshwater consumption

**Denominator**

Barrel of oil equivalent

**Comparison with previous reporting year**

About the same

**Please explain**

Vermilion's freshwater consumption (withdrawals - discharges) was zero in 2020.

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**Business division**

Upstream

**Water intensity value (m3)**

0

**Numerator: water aspect**

Total water consumption

**Denominator**

Barrel of oil equivalent

**Comparison with previous reporting year**

About the same

**Please explain**

Vermilion's total water consumption (withdrawals - discharges) was zero in 2020.

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**W1.4**

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**(W1.4) Do you engage with your value chain on water-related issues?**

Yes, our suppliers

Yes, our customers or other value chain partners

**W1.4a**

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**(W1.4a) What proportion of suppliers do you request to report on their water use, risks and/or management information and what proportion of your procurement spend does this represent?**

**Row 1**

**% of suppliers by number**

None currently, but we plan to request this within the next two years

**% of total procurement spend**

<Not Applicable>

**Rationale for this coverage**

We plan to request this information within the next two years as part of an extension of our current approach to supplier engagement, which includes working with specific suppliers to improve water management, and to better understand potential risks and opportunities. Our rationale for this approach is to take the time necessary to establish internal and external benchmarks for water use and intensity, and to demonstrate our own performance via CDP Water Security submissions. This will provide a solid foundation for data gathering from suppliers, and will help guide the data and information requests that we make of them.

**Impact of the engagement and measures of success**

<Not Applicable>

**Comment**

**W1.4b**

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#### (W1.4b) Provide details of any other water-related supplier engagement activity.

##### Type of engagement

Onboarding & compliance

##### Details of engagement

Requirement to adhere to our code of conduct regarding water stewardship and management

##### % of suppliers by number

1-25

##### % of total procurement spend

26-50

##### Rationale for the coverage of your engagement

We require 100% of third-party contractors & sub-contractors to be HSE pre-qualified prior to commencing service work. This includes water-related issues, ranging from compliance with regulations to groundwater protection from spills. This helps ensure they have an HSE program in place that meets or exceeds our requirements. We also observe & interact with our vendors on an ongoing basis to ensure that they are adhering to Vermilion's HSE practices, procedures & rules. This is essential to our approach to climate issues, in part because we operate in regions with very strong regulatory approaches to climate & water: we prioritize regulatory compliance, but also the safety & environmental protection of our communities, so this helps ensure our contractors understand this & operate to our standards. We engage with partners (vendors, consultants, peers, etc.) throughout our operating regions to ensure we are pursuing and/or developing industry best practices and identification of opportunities to collaborate on innovated development solutions, as it relates to sustainability and water. Vermilion's strategy currently allows for flexible engagement with an additional focus on engaging those organizations in our supply chain where the supplier has an understanding of sustainability and water management, and whose interest in water issues may impact business outcomes. To support this, we hold mandatory monthly HSE meetings (virtually if needed to support COVID-19 precautions) in every field district that all staff attend & senior management routinely participate in. On a quarterly basis, the HSE district meetings are replaced by HSE-focused town hall meetings that include our vendors. With regard to our supply chain, our Corporate Contractor Selection and Management Standard & Guidance Document include specific activities to support HSE performance, including a pre-qualification questionnaire. In addition, we are conducting a global supply chain risk assessment, analyzing risks based on geography, industry and operations, including climate change policies. Annually, we are focusing on all suppliers with which we spent more than \$1 million, assessing whether they have public commitments to environmental protection, including climate change, in place, & the level of detail & external assurance.

##### Impact of the engagement and measures of success

The most important impact of engagement and measure of success is 100% compliance with water-related regulations in our operating areas, which has a direct impact on our company reputation. A further impact of the supply chain risk assessment is the identification of suppliers without public commitments to climate change including water ('50). We are reassessing those suppliers in 2021, to assess change and the potential for direct engagement with them to encourage public commitments. We continually engage key vendors on reduction of water use, among other areas. Measurements of success will eventually be the quantification of a sustainability capital effectiveness ratio to aid in our internal assessment of the supplemental benefit of our capital investments. This will support our strategic objective of Integrated Sustainability, while providing a way for Vermilion to demonstrate to our investors and the public that our market outperformance is correlated to our strong sustainability focus and performance.

##### Comment

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#### W1.4c

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##### (W1.4c) What is your organization's rationale and strategy for prioritizing engagements with customers or other partners in its value chain?

Our customers include North American midstream & downstream refiners, Asia Pacific refining & lubricant businesses, European downstream refiners & key aggregators & utilities. In some cases, we are mandated to use specific customers (eg GasTerra); for the rest, there is a transparent bid process. Our goals for engaging with these entities in our value chain is to ensure awareness of our commitment to ESG, including climate change & encourage their own activities to reduce climate change impacts. Our Marketing department has established an ESG section in customer communications, including requests for proposal, tenders & bid documents. This establishes our commitment to ESG, including climate issues such as water & requests entities include information about their commitment to ESG in bids. We use this to compare between bidders and raise awareness with these customers – successful bidders or not – about the growing criticality of ESG, including water.

Our measures of success include the number of potential customers that we communicate with on ESG commitments, including climate change & water security, as our input measure. We also track the number of potential customers that respond with their ESG info – our output measure. As the initiative further develops, we anticipate using outcome measures, such as number of successful bids where ESG commitments made a material difference & the potential for developing partnerships based on a mutual recognition of the importance of ESG, particularly climate change & water security, & tracking results from those partnerships.

Current impact is that 64% of new tenders/requests for proposals or bids, etc. for our crude oil & gas marketing in 2020 include our own ESG commitment & also request information on the potential customer's commitment. We track the bids that return with ESG, including climate & water, information (19% in 2020), & compare this to the companies' externally communicated ESG & climate information.

#### W2. Business impacts

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##### W2.1

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##### (W2.1) Has your organization experienced any detrimental water-related impacts?

Yes

##### W2.1a

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(W2.1a) Describe the water-related detrimental impacts experienced by your organization, your response, and the total financial impact.

Country/Area & River basin

Canada	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, the impacts referenced in this response pertain to the Canada Business Unit.)
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Type of impact driver & Primary impact driver

Physical	Pollution incident
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Primary impact

Increased operating costs

Description of impact

A produced (salt) water pipeline release on forested pasture land in SE Saskatchewan resulted in impact to a Class V (Steward and Kantrud) wetland area. The release was the result of a mechanical pipeline failure.

Primary response

Other, please specify (Implement Remedial Measures)

Total financial impact

3000000

Description of response

The pipeline was immediately depressurized and isolated. Free liquids in the release area and along the downslope flow path were recovered and hauled to a licensed disposal facility. Limited (short-duration) fluid recovery was also undertaken within the effected wetland area. Remedial excavation was undertaken to remove salt-impacted soil in proximity to the release location and the area was then restored. In consultation with the regulatory authorities, a network of interceptor trenches were installed along the downslope spill path to facilitate longer-term groundwater containment and recovery. Maintenance of the groundwater collection facilities and related groundwater, surface water and vegetation monitoring within the release are remain ongoing. The pipeline was exposed and the failed section of the line sent for analysis to support root cause determination and future risk management and mitigative action planning. The total remedial cost, including anticipated future management and monitoring costs, is expected to be approximately \$3MM. This impact does not meet our substantive financial or strategic impact thresholds. The pipeline was acquired by Vermilion in 2018. Subsequent to the acquisition, a field-level pipeline risk assessment was completed and we are in the process of decommissioning, repairing, updating maintenance practices, and replacing pipelines accordingly. The pipeline involved in this incident was removed from service.

Country/Area & River basin

France	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, the impacts referenced in this response pertain to the France Business Unit.)
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Type of impact driver & Primary impact driver

Physical	Pollution incident
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Primary impact

Increased operating costs

Description of impact

A crude oil pipeline release in central France resulted in a small quantity of crude oil entering an adjacent river system. The release was the result of pipeline corrosion.

Primary response

Other, please specify (Implement Remedial Measures)

Total financial impact

1800000

Description of response

The pipeline was immediately depressurized and isolated. Free liquids in the release area and along the downslope flow path were recovered and hauled to a disposal facility. In consultation with the regulatory authorities, booms and sorbent pads were deployed to recover the estimated 200 L of crude oil that had entered the river system. Remedial soil excavation was undertaken in proximity to the release location and the area was backfilled and restored. The total remedial cost, including anticipated future monitoring and management costs, is expected to be approximately \$1.8MM. The majority of this cost is associated with the onshore remedial activity rather than the river system, which experienced no sustained impact. This impact does not meet our substantive financial or strategic impact thresholds. The pipeline has been removed from service.

Country/Area & River basin

Canada	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, the impacts referenced in this response pertain to the Canada Business Unit.)
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Type of impact driver & Primary impact driver

Physical	Pollution incident
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Primary impact

Increased operating costs

Description of impact

A crude oil emulsion pipeline release on cultivated agricultural land in SE Saskatchewan resulted in impact to a small, Class IV (Stewart and Kantrud) wetland area. The release was the result of a mechanical failure of the pipeline.

**Primary response**

Other, please specify (Implement Remedial Measures)

**Total financial impact**

500000

**Description of response**

The pipeline was exposed and repaired and the damaged section of the line sent for analysis to support root cause determination. In consultation with the regulatory authorities and landowner, impacted soils in the release area were excavated for offsite disposal and the area was backfilled and reseeded. In accordance with regulatory requirements, annual vegetation monitoring in the release area will be undertaken for the next five years, at which time regulatory closure is expected. Based on the line repair and remedial costs incurred to date and projected future costs to closure, the total financial impact of the release is estimated to be approximately \$0.5MM. This impact does not meet our substantive financial or strategic impact thresholds. The pipeline was acquired by Vermilion in 2018. Subsequent to the acquisition, a field-level pipeline risk assessment was completed and we are in the process of decommissioning, repairing, updating maintenance practices, and replacing pipelines accordingly. The pipeline involved in this incident was repaired and returned to service.

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**Country/Area & River basin**

Canada	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, the impacts referenced in this response pertain to the Canada Business Unit.)
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**Type of impact driver & Primary impact driver**

Physical	Pollution incident
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**Primary impact**

Increased operating costs

**Description of impact**

A faulty valve on a recycle pump resulted in petroleum hydrocarbon (PHC) impact to a small Class IV (Stewart and Kantrud) wetland area adjacent to a crude oil facility in SE Saskatchewan.

**Primary response**

Other, please specify (Implement Remedial Measures)

**Total financial impact**

100000

**Description of response**

The pump was isolated and the faulty valve removed. PHC impacted soils in the vicinity of the release location were excavated for offsite disposal and the area was backfilled. In consultation with the regulatory authorities and landowner, the wetland was drained and confirmatory soil and water samples recovered for laboratory analysis. Water quality monitoring within the release area remains ongoing and the wetland is scheduled to be drained again this season. Based on the facility repair and remedial costs incurred to date and the projected future costs to closure, the total financial impact of the release is estimated to be approximately \$0.1MM. This impact does not meet our substantive financial or strategic impact thresholds.

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**Country/Area & River basin**

Canada	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, the impacts referenced in this response pertain to the Canada Business Unit.)
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**Type of impact driver & Primary impact driver**

Physical	Pollution incident
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**Primary impact**

Increased operating costs

**Description of impact**

Vermilion is currently engaged in a voluntary, regulatory supported initiative to assess water crossings on forested, Crown lands in west-central Alberta. The objective of the initiative is to identify and repair (or replace) crossings that may represent a potential barrier to fish passage or risk to fish habitat. The majority of these crossings are older, legacy installations that pre-date Vermilion's operating tenure.

**Primary response**

Improve maintenance of infrastructure

**Total financial impact**

1000000

**Description of response**

As part of the program, Vermilion has completed a screening level assessment of crossings within our west-central Alberta operating area and developed a staged, risk-based prioritization scheme for further assessment and remedial response. The implementation of remedial measures related to several crossings has been completed and the program remains ongoing. In addition to mitigating fish passage or habitat concerns, hydrotechnical analysis and engineering design related to a flood or scour damaged crossings is also undertaken, where warranted. The costs related to the program are generally built into the annual maintenance budgets and are expected to exceed \$1MM over time. Upfront costs associated with the preliminary, screening assessment and northern hydrotechnical design totalled approximately \$80k. This impact does not meet our substantive financial or strategic impact thresholds.

**(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?**

No

W3. Procedures

W-OG3.1

**(W-OG3.1) How does your organization identify and classify potential water pollutants associated with its activities in the oil & gas sector that may have a detrimental impact on water ecosystems or human health?**

Vermilion employs, or otherwise engages as required, subject matter specialists with knowledge in human health and ecological risk evaluation, groundwater assessment (including contaminant fate and transport processes), habitat assessment (aquatic and terrestrial), and occupational health & safety exposure monitoring and management. These specialists collectively drive the identification, classification and prioritization decisions at Vermilion with respect to potential environmental pollutants in water, soil and air.

In the context of our operating practices, potential pollutants of concern are identified with consideration to published resources, including risk-based environmental quality guidelines and product-specific safety data sheets (SDS), technical guidance provided by agencies such as Health Canada, Environmental Protection Agency (EPA) and the World Health Organization, and prior experience (direct and third-party) with similar contaminants in similar circumstances.

In general, the risk evaluation considers toxicity (human and ecological), potential for release, persistence in the environment, mobility, and product availability and frequency of use. On an application- or location-specific basis, site-specific considerations are also integrated, particularly in relation to relevant receptors and exposure pathways (e.g. aquatic toxicity concerns may not be a primary driver in circumstances where there are no nearby surface water bodies).

Within our value chain, our suppliers are expected to follow the same standards as we do internally, beginning with absolute adherence to all regulations in our operating areas regarding the use of potential water pollutants. We pre-qualify 100% of our contractors to our HSE standard, ensuring that they have adequate systems in place to manage all areas, including water and potential pollutants.

W-OG3.1a

**(W-OG3.1a) For each business division of your organization, describe how your organization minimizes the adverse impacts on water ecosystems or human health of potential water pollutants associated with your oil & gas sector activities.**

Potential water pollutant	Business division	Description of water pollutant and potential impacts	Management procedures	Please explain
Hydrocarbons	Upstream	Petroleum hydrocarbons (PHCs) are the principal output of upstream oil exploration and production activities and, as such, represent a primary contaminant of concern to our industry, both in free-liquid and dissolved phases. In addition to production fluids (i.e. crude oil and natural gas liquids), refined hydrocarbons are also widely used in the industry, examples of which include: vehicle and equipment fuels (e.g. drilling rigs, generators, etc.), oil based mud (OBM) systems, fracturing fluids, and various maintenance and cleaning products (e.g. lubricating oils, degreasing agents, etc.). Both production fluids and refined products commonly contain constituents of toxicological (or aesthetic) concern at concentrations and solubilities that represent a potential risk to groundwater and surface water bodies. Examples of such constituents include benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), and shorter-chain, higher solubility aliphatic hydrocarbons.	Compliance with effluent quality standards Measures to prevent spillage, leaching and leakages Emergency preparedness Other, please specify (Compliance with risk-based regulatory standards related to environmental assessment and remediation.)	Vermilion's approach involves multiple elements & technical disciplines, including: <ul style="list-style-type: none"> <li>• Robust asset integrity programs that involve technical experts in corrosion protection &amp; control &amp; sophisticated assessment &amp; monitoring technologies including intelligent pigging systems.</li> <li>• Product containment, storage &amp; transfer facilities specifically engineered to reduce the risk of release &amp; mitigate adverse effect (e.g. automated process monitoring &amp; shut-down systems, pressure relief &amp; backflow prevention devices, secondary containment facilities &amp; multi-walled storage tanks, petroleum resistant liners, etc.).</li> <li>• Groundwater &amp; surface water monitoring programs undertaken at higher-risk operating locations as a regulatory condition, or in discretionary monitoring &amp; risk management programs.</li> <li>• Pre-construction assessments are routinely undertaken by environmental specialists to ensure sensitive or potentially at-risk aquatic environments are identified &amp; avoided.</li> <li>• Post construction, operator inspections typically completed daily at producing assets to identify potential problem scenarios.</li> <li>• Project specific environmental monitoring during sensitive field programs (e.g. directional boring beneath water bodies).</li> <li>• Area &amp; job specific spill preparedness &amp; response plans in all business units with mock ERP exercises involving spill response elements undertaken periodically in accordance with corporate and/or regulatory requirements. We also actively participate in industry &amp; governmental spill response organizations (e.g. OSRL, AMOSC, POLMAR, WCSS, SK Oil Spill Cooperative) &amp; maintain a standing service agreement with Wild Well Control (Houston/Aberdeen) for well blowout support. Pre-job &amp; daily hazard assessments are a standard HSE requirement &amp; consider potential release scenarios &amp; release response requirements. When releases infrequently occur &amp; breach containment facilities, remedial response activities are undertaken in consultation with the relevant regulatory authorities with the objective of timely closure. In circumstances with timely closure is not practical (e.g. operating infrastructure limits access), risk management measures are implemented to safeguard area receptors &amp; monitored until full remediation can be achieved. Success is measured using leading &amp; lagging KPIs, including inspections conducted, exercises held, release (spill) numbers &amp; volumes &amp; process safety incidents reported to the organization monthly.</li> </ul>

Potential water pollutant	Business division	Description of water pollutant and potential impacts	Management procedures	Please explain
Other, please specify (Salinity Parameters)	Upstream	Salt (NaCl) is a common contaminant of concern associated with produced water, particularly in our Canadian Business Unit where chloride concentrations in produced water often exceed 150,000 ppm. Although generally not a concern from a human health perspective, freshwater aquatic toxicity guidelines for chloride have been developed, as well as aesthetic guidelines for drinking water. Chloride is highly soluble and mobile and is not influenced by many of the natural attenuation processes that apply to hydrocarbon compounds (e.g. sorption, biodegradation, volatilization). Consequently, salt often represents the dominant contaminant of concern in circumstances where lateral groundwater transport to a surface waterbody or downward migration into a potable aquifer is of concern.	Measures to prevent spillage, leaching and leakages Emergency preparedness Other, please specify (Compliance with risk-based regulatory standards related to environmental assessment and remediation.)	Vermilion's approach involves multiple elements & technical disciplines, including: <ul style="list-style-type: none"> <li>• Robust asset integrity programs that involve technical experts in corrosion protection &amp; control &amp; sophisticated assessment &amp; monitoring technologies including intelligent pigging systems.</li> <li>• Product containment, storage &amp; transfer facilities specifically engineered to reduce the risk of release &amp; mitigate adverse effect (e.g. automated process monitoring &amp; shut-down systems, pressure relief &amp; backflow prevention devices, secondary containment facilities &amp; multi-walled storage tanks, petroleum resistant liners, etc.).</li> <li>• Groundwater &amp; surface water monitoring programs undertaken at higher-risk operating locations as a regulatory condition, or in discretionary monitoring &amp; risk management programs.</li> <li>• Pre-construction assessments routinely undertaken by environmental specialists to ensure sensitive or potentially at-risk aquatic environments are identified &amp; avoided.</li> <li>• Post construction, operator inspections typically completed daily at producing assets to identify potential problem scenarios.</li> <li>• Project specific environmental monitoring during sensitive field programs (e.g. directional boring beneath water bodies).</li> <li>• Area &amp; job specific spill preparedness &amp; response plans in all business units with mock ERP exercises involving spill response elements undertaken periodically in accordance with corporate and/or regulatory requirements. We also actively participate in industry &amp; governmental spill response organizations (e.g. OSRL, AMOSC, POLMAR, WCSS, SK Oil Spill Cooperative) &amp; maintain a standing service agreement with Wild Well Control (Houston/Aberdeen) for well blowout support. Pre-job &amp; daily hazard assessments are a standard HSE requirement &amp; consider potential release scenarios &amp; release response requirements. When releases infrequently occur &amp; breach containment facilities, remedial response activities are undertaken in consultation with the relevant regulatory authorities with the objective of timely closure. In circumstances with timely closure is not practical (e.g. operating infrastructure limits access), risk management measures are implemented to safeguard area receptors &amp; monitored until full remediation can be achieved. Success is measured using leading &amp; lagging KPIs, including inspections conducted, exercises held, release (spill) numbers &amp; volumes &amp; tier 1&amp;2 process safety incidents reported to the organization monthly.</li> </ul>
Other, please specify (Metals)	Upstream	Metals are a common contaminant of concern associated with upstream exploration and production activities. Certain metals (e.g. boron) are often present in production fluids at concentrations that may represent a potential human health or ecological risk. Historically, certain metals (e.g. barium, zinc, chromium) have also been a constituent of drilling mud additives and represent a potential concern with respect to drilling waste handling and disposal. Metals in operational equipment (e.g. mercury switches) represent another potential source of metals concern in the context of facility decommissioning and abandonment activities. Experience has also shown that elevated concentrations of salt (NaCl) in groundwater can result in an associated increase in dissolved metals concentrations related to a shift in partitioning between sorbed and dissolved states.	Measures to prevent spillage, leaching and leakages Emergency preparedness Other, please specify (Compliance with risk-based regulatory standards related to environmental assessment and remediation.)	Vermilion's approach involves multiple elements & technical disciplines, including: <ul style="list-style-type: none"> <li>• Robust asset integrity programs that involve technical experts in corrosion protection &amp; control &amp; sophisticated assessment &amp; monitoring technologies including intelligent pigging systems.</li> <li>• Product containment, storage &amp; transfer facilities specifically engineered to reduce the risk of release &amp; mitigate adverse effect (e.g. automated process monitoring &amp; shut-down systems, pressure relief &amp; backflow prevention devices, secondary containment facilities &amp; multi-walled storage tanks, petroleum resistant liners, etc.).</li> <li>• Groundwater &amp; surface water monitoring programs undertaken at higher-risk operating locations as a regulatory condition, or in discretionary monitoring &amp; risk management programs.</li> <li>• Pre-construction assessments routinely undertaken by environmental specialists to ensure sensitive or potentially at-risk aquatic environments are identified &amp; avoided.</li> <li>• Post construction, operator inspections typically completed daily at producing assets to identify potential problem scenarios.</li> <li>• Project specific environmental monitoring during sensitive field programs (e.g. directional boring beneath water bodies).</li> <li>• Area &amp; job specific spill preparedness &amp; response plans in all business units with mock ERP exercises involving spill response elements undertaken periodically in accordance with corporate and/or regulatory requirements. We also actively participate in industry &amp; governmental spill response organizations (e.g. OSRL, AMOSC, POLMAR, WCSS, SK Oil Spill Cooperative) &amp; maintain a standing service agreement with Wild Well Control (Houston/Aberdeen) for well blowout support. Pre-job &amp; daily hazard assessments are a standard HSE requirement &amp; consider potential release scenarios &amp; release response requirements. When releases infrequently occur &amp; breach containment facilities, remedial response activities are undertaken in consultation with the relevant regulatory authorities with the objective of timely closure. In circumstances with timely closure is not practical (e.g. operating infrastructure limits access), risk management measures are implemented to safeguard area receptors &amp; monitored until full remediation can be achieved. Success is measured using leading &amp; lagging KPIs, including inspections conducted, exercises held, release (spill) numbers &amp; volumes &amp; tier 1&amp;2 process safety incidents reported to the organization monthly.</li> </ul>
Chemicals	Upstream	Numerous other commercially available chemical products are used in the upstream oil industry that have the potential to adversely impact groundwater or surface water quality if released. A few examples of such chemicals include ethylene and triethylene glycol used in natural gas refrigeration and dehydration process, methanol used for hydrate suppression, corrosion inhibitors used in asset integrity programs, and wax inhibitors or dispersants used in production maintenance applications. In addition to the pure products (e.g. glycols, methanol), the blended products also commonly contain organic and/or inorganic constituents of human health or ecological concern, and require due care in management and application.	Measures to prevent spillage, leaching and leakages Emergency preparedness Other, please specify (Compliance with risk-based regulatory standards related to environmental assessment and remediation.)	Vermilion's approach involves multiple elements & technical disciplines, including: <ul style="list-style-type: none"> <li>• Robust asset integrity programs that involve technical experts in corrosion protection &amp; control &amp; sophisticated assessment &amp; monitoring technologies including intelligent pigging systems.</li> <li>• Product containment, storage &amp; transfer facilities specifically engineered to reduce the risk of release &amp; mitigate adverse effect (e.g. automated process monitoring &amp; shut-down systems, pressure relief &amp; backflow prevention devices, secondary containment facilities &amp; multi-walled storage tanks, petroleum resistant liners, etc.).</li> <li>• Groundwater &amp; surface water monitoring programs undertaken at higher-risk operating locations as a regulatory condition, or in discretionary monitoring &amp; risk management programs.</li> <li>• Pre-construction assessments routinely undertaken by environmental specialists to ensure sensitive or potentially at-risk aquatic environments are identified &amp; avoided.</li> <li>• Post construction, operator inspections typically completed daily at producing assets to identify potential problem scenarios.</li> <li>• Project specific environmental monitoring during sensitive field programs (e.g. directional boring beneath water bodies).</li> <li>• Area &amp; job specific spill preparedness &amp; response plans in all business units with mock ERP exercises involving spill response elements undertaken periodically in accordance with corporate and/or regulatory requirements. We also actively participate in industry &amp; governmental spill response organizations (e.g. OSRL, AMOSC, POLMAR, WCSS, SK Oil Spill Cooperative) &amp; maintain a standing service agreement with Wild Well Control (Houston/Aberdeen) for well blowout support. Pre-job &amp; daily hazard assessments are a standard HSE requirement &amp; consider potential release scenarios &amp; release response requirements. When releases infrequently occur &amp; breach containment facilities, remedial response activities are undertaken in consultation with the relevant regulatory authorities with the objective of timely closure. In circumstances with timely closure is not practical (e.g. operating infrastructure limits access), risk management measures are implemented to safeguard area receptors &amp; monitored until full remediation can be achieved. Success is measured using leading &amp; lagging KPIs, including inspections conducted, exercises held, release (spill) numbers &amp; volumes &amp; tier 1&amp;2 process safety incidents reported to the organization monthly.</li> </ul>
Other, please specify (Naturally Occurring Radioactive Materials (NORM))	Upstream	Similar to many other upstream operators, naturally occurring radioactive material (NORM) has been identified as a potential contaminant of concern in relation to our oil and gas production operations. Although generally limited in magnitude and scope in the context of our operations, NORM is known to accumulate in scale, sludge and similar waste products and can result in contamination to process equipment (e.g. wellheads, vessels, pumps, etc.) and fluids, resulting in a potential human health risk.	Compliance with effluent quality standards Measures to prevent spillage, leaching and leakages Emergency preparedness Other, please specify (Waste management in accordance with industry and regulatory requirements.)	NORM surveys are undertaken as an operational requirement in areas where NORM may be, or is suspected to be, present (e.g. Australia) and as part of facility decommissioning and abandonment activities. NORM-containing waste material or equipment, where identified, is segregated and managed in accordance with regulatory requirements. Worker training programs are also in place organizationally to promote NORM awareness.

Potential water pollutant	Business division	Description of water pollutant and potential impacts	Management procedures	Please explain
Drilling fluids	Upstream	Although considerable advancements have been made in recent years in relation to environmentally friendly drilling products, drilling mud and completions fluids still often contain organic and/or inorganic constituents that may represent a potential risk to groundwater or surface water if released to the environment. Oil based mud systems, which typically use diesel or fuel oil as the continuous phase, and high salinity, water-based systems (e.g. KCl) are two higher risk examples that warrant heightened management practices. Drilling fluids used in hydraulic fracturing in Canada and the US may also contain chemicals of concern, including hydrocarbons, inorganics and biocides.	Measures to prevent spillage, leaching and leakages Emergency preparedness Other, please specify (Waste management in accordance with industry and regulatory requirements.)	Similar to prior sections, Vermilion's approach to managing and mitigating the risks presented by drilling fluids involves several elements, including: <ul style="list-style-type: none"> <li>• Product containment, storage and transfer facilities specifically engineered to minimize the risk of release and mitigate adverse effect.</li> <li>• Field-level monitoring to identify and correct potential problem scenarios (mechanical or operational) prior to a release occurring.</li> <li>• Pre-job and daily hazard assessments and emergency response planning that includes release response elements.</li> <li>• Lifecycle monitoring and tracking of environmental sensitive inventory.</li> <li>• Drilling waste management in accordance with regulatory requirements and industry best practices.</li> <li>• Third-party waste disposal solely at appropriately licensed and managed receiving facilities.</li> </ul> As described previously, when releases occur and breach containment facilities, remedial response activities are undertaken in consultation with the relevant regulatory authorities with the objective of timely closure. In circumstances when timely closure is not practical (e.g. operating infrastructure limits access), risk management measures are implemented to safeguard area receptors and monitored until full remediation can be achieved. Additionally, with respect to well completions, Vermilion publicly discloses all chemicals used in hydraulic fracturing through FracFocus in Canada and the US. In the US, our suppliers of frac fluids do not use any proprietary chemicals. In Canada, where some fluids are protected by trade secrets, they are disclosed in full to the regulatory authority, which assigns them a code that is then disclosed through FracFocus. Success is measured using leading & lagging KPIs, including inspections conducted, exercises held, release (spill) numbers & volumes & tier 1&2 process safety incidents reported to the organization monthly.

### W3.3

#### (W3.3) Does your organization undertake a water-related risk assessment?

Yes, water-related risks are assessed

### W3.3a

#### (W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.

##### Direct operations

##### Coverage

Full

##### Risk assessment procedure

Water risks are assessed as part of an enterprise risk management framework

##### Frequency of assessment

Annually

##### How far into the future are risks considered?

More than 6 years

##### Type of tools and methods used

Tools on the market  
Enterprise Risk Management  
Databases

##### Tools and methods used

WRI Aqueduct  
WWF Water Risk Filter  
Regional government databases

##### Comment

Vermilion uses our Enterprise Risk Management (ERM) System, with its Corporate Risk Register & Risk Matrix, to identify, assess & monitor new & emerging climate-related risks on an ongoing basis, updating the Register as needed but annually at minimum. We also use tools such as WRI Aqueduct and WWF Water Risk Filters to identify water stress areas as it relates to our operations and value chain partners and ensure that the information is fed into operational development strategies to protect water bodies and increase water efficiency. We use regional government databases whenever available to us.

### Supply chain

#### Coverage

Partial

#### Risk assessment procedure

Water risks are assessed in an environmental risk assessment

#### Frequency of assessment

Annually

#### How far into the future are risks considered?

More than 6 years

#### Type of tools and methods used

Tools on the market

Other

#### Tools and methods used

WRI Aqueduct

Internal company methods

#### Comment

We are conducting a global supply chain risk assessment, analyzing risks using publicly declared commitments to ESG issues, including climate and water, based on geography, industry and operations, for suppliers with > \$1MM spend annually. An impact of the supply chain risk assessment is the identification of suppliers without public commitments to climate change including water, which we then assess against the WRI Aqueduct tool for water stressed areas and water risk. We are reassessing those suppliers in 2021, to assess change and the potential for direct engagement with them to encourage public commitments.

### Other stages of the value chain

#### Coverage

None

#### Risk assessment procedure

<Not Applicable>

#### Frequency of assessment

<Not Applicable>

#### How far into the future are risks considered?

<Not Applicable>

#### Type of tools and methods used

<Not Applicable>

#### Tools and methods used

<Not Applicable>

#### Comment

### W3.3b

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**(W3.3b) Which of the following contextual issues are considered in your organization's water-related risk assessments?**

	Relevance & inclusion	Please explain
Water availability at a basin/catchment level	Relevant, always included	Water availability local to our operations is an important element of our upstream oil and gas operations, as it is used in operations that range from enhanced oil recovery to reservoir pressure maintenance to hydraulic fracturing (which is used in our operated areas in North America only). Project or operational activities might not proceed if water availability is insufficient. We assess water availability as part of our efforts toward water efficiency and protection of water bodies, based on local regulatory water authority permits and licenses for water withdrawals, and on the Aqueduct tool. This assessment is performed throughout our project management process, is a critical part of our stakeholder engagement and is performed using a Hazard Identification, Risk Evaluation and Risk Mitigation approach in accordance with our COSO-based Enterprise Risk Management Framework. Vermilion's risk matrix is used to determine the impact and probability of water availability local to our operations and mitigation measures are put in place to satisfy stakeholder requirements.
Water quality at a basin/catchment level	Relevant, always included	Water quality local to our operations is an important element of our upstream oil and gas operations. Water is used in operations that range from enhanced oil recovery to reservoir pressure maintenance to hydraulic fracturing (which is used in our operated areas in North America only). Project or operational activities might not proceed if water quality is not met. Water quality requirements depend on the type of operations/ projects that the resource will be used for, and are part of our efforts toward water efficiency and protection of water bodies. Physical properties of water sources considered are analysed to determine compatibility in the desired application and finalized water source selection. This assessment is performed throughout our project management process, is a critical part of our stakeholder engagement, and is performed using a Hazard Identification, Risk Evaluation and Risk Mitigation approach in accordance with our COSO-based Enterprise Risk Management Framework. Vermilion's risk matrix is used to determine the impact and probability of water availability local to our operations and mitigation measures are put in place to satisfy stakeholder requirements.
Stakeholder conflicts concerning water resources at a basin/catchment level	Relevant, always included	Depending on location, our operations may be near communities, agricultural lands or industrial neighbours, all of which have their own requirements for water as a shared resource. We operate in areas that offer strong oversight of water use, including water licensing and permitting, and so our assessment of risk for stakeholder conflicts in these areas is based on regional government databases, environmental impact assessments conducted prior to selecting operational sites, monitoring regulations, new or changing applications for water use, and on extended weather conditions that have the potential to impact water supplies. This assessment is performed at least annually using our COSO-based Enterprise Risk Management Framework; we update the risk case using our risk matrix to determine the impact and probability of water availability local to our operations, and we put mitigation measures in place as needed to satisfy stakeholder requirements.
Implications of water on your key commodities/raw materials	Relevant, always included	We currently have sufficient quantities of water available to us, now and in the foreseeable future. However, should that change, we would be required to find alternative sources of water that would be expected to increase costs, impacting the economic returns of our assets. This risk assessment is performed throughout our project management process, is a critical part of our stakeholder engagement, and is performed using a Hazard Identification, Risk Evaluation and Risk Mitigation approach in accordance with our COSO-based Enterprise Risk Management Framework. Vermilion's risk matrix is used to determine the impact and probability of water availability local to our operations and mitigation measures are put in place to satisfy stakeholder requirements.
Water-related regulatory frameworks	Relevant, always included	We operate in areas with regulatory frameworks that offer strong oversight of water use, including water licensing and permitting. This is particularly relevant because we are one of many stakeholders that depend on water, including our communities and local agricultural operations, all operating within our regulatory frameworks. Understanding trends that may impact them is therefore essential for understanding future water licensing risks. Our assessment of risk in these areas is based on regional government databases, monitoring regulations, new or changing applications for water use, and on extended weather conditions that have the potential to impact water supplies. Much of this is monitored on an ongoing basis, or as part of our participation in voluntary water oversight bodies (e.g. Ambes, France), but we also update it at least annually using our COSO-based Enterprise Risk Management Framework; we update the risk case using our risk matrix to determine the impact and probability of water availability local to our operations, and we put mitigation measures in place as needed to satisfy stakeholder requirements.
Status of ecosystems and habitats	Relevant, always included	We operate in areas with regulatory frameworks that offer strong environmental oversight, including varying requirements for environmental impact assessments, depending on the location and habitat. These are relevant because water issues are integrated into these assessments, and because we require our own operations and those of our suppliers to be within regulatory compliance at all times. If the frameworks identify increased risks to ecosystems and habitats, we need to anticipate that regulations will increase to protect against these risks. This risk assessment is performed throughout our project management process, is a critical part of our stakeholder engagement, and is performed using a Hazard Identification, Risk Evaluation and Risk Mitigation approach in accordance with our COSO-based Enterprise Risk Management Framework. Vermilion's risk matrix is used to determine the impact and probability of water availability local to our operations and mitigation measures are put in place to satisfy stakeholder requirements.
Access to fully-functioning, safely managed WASH services for all employees	Relevant, always included	The provision of high quality WASH services for all staff is a matter of strong regulatory health and safety approaches in all of our operating areas, and is essential for the protection against disease, including COVID-19, which has placed a much higher focus on the ability to wash and sanitize hands over the past 18 months. Our risk assessment tool is our internal Health, Safety and Environmental Management System and, with specific reference to COVID-19, our Emergency Response Plan. While WASH services were already in place for 100% of our staff, we increased hand sanitization stations (along with a suite of other COVID-19 responses) to ensure that critical staff working in the field or office locations had even greater access to this.
Other contextual issues, please specify	Please select	

**W3.3c**



**(W3.3c) Which of the following stakeholders are considered in your organization's water-related risk assessments?**

	Relevance & inclusion	Please explain
Customers	Relevant, always included	As an upstream oil and gas producer, Vermilion has customers within the hydrocarbon sector such as downstream refiners and suppliers to industrial and residential consumers. Traditionally, these customers have not been ESG- or water-sensitive. However, our value chain analysis indicates that this is beginning to change, with the potential for customer requests for water data and management approaches. There is also an opportunity present for company operations to be certified by external agencies such as Equitable Origin as responsibly produced, which may include water management as a certification element; these certifications may lead to higher prices for our products. Thus, customers as stakeholders are growing in relevance both from a risk and related opportunity perspective. We are communicating one-to-one with our customers, including discussions during the bid/tender process as a result of our inclusion of ESG requests in those documents, are engaging directly with certification bodies in several business units. Our submission into CDP Water Security will assist in reaching other customers.
Employees	Relevant, always included	Our employees are our first line of defence against adverse events that may impact water in our operational areas, and they are a source of excellent ideas for water efficiency and risk mitigation; as such, they are important stakeholders in water risk assessments. To support hazard assessment and the robust reporting of actual and potential water-related incidents, we use an online HSE event reporting tool that every employee in the company has access to. This is monitored and assessed by our HSE staff corporately and in every business unit to ensure that learnings are shared throughout the company. We also feature water-related projects in our monthly HSE manager meetings and on our intranet, to support wide communication of learnings, technology and results throughout the company.
Investors	Relevant, always included	Investors have increasingly demonstrated their concern regarding water efficiency and management over the past several years, including, but not limited to, investor communication supporting company reporting through the CDP Water Security questionnaire. We have engaged with ESG-sensitive investors in one-on-one meetings and responded to the CDP Water Security requests directly via return email/letter. On a broader basis, we report water data and approaches through our sustainability reporting that is available to the public and investors online 24/7, and have done so since 2014; we also began responded to the specific investor request for alignment with and submission into CDP Water Security last year, representing the importance of investor support, including our ability to access cost-effective capital.
Local communities	Relevant, always included	Our communities are a critical stakeholder, because they are potentially impacted by negative water events, such as potential spills, and they are also users of local water resources. Thus, we communicate and work with communities and neighbours collaboratively, to help avoid potential conflicts between our activities. In addition, our operations exist in some areas close to water bodies of recreational and ecological value to our communities -- which in fact include our employees, as most live near our operations. We therefore communicate with our communities on water issues, through our external sustainability reporting and business unit-level websites (which include opportunities for feedback or concerns) and through location- and activity-specific activities such as town halls. We have dedicated public and government relations and surface land staff who regularly engage with our communities through meetings, phone calls, emails and letters; they provide insight into community concern, including water, and points of contact with community representatives. We have also dedicated one of four pillars of our community investment program environmental stewardship, including water.
NGOs	Relevant, always included	We work closely with conservation-oriented NGOs in all of our business units, as we recognize their extensive knowledge and expertise in issues that include water management and protection. Our activities include direct engagement via meetings and emails, along with supporting these NGOs through donation programs such as our Global Environmental Stewardship community investment program, and with employee Days of Caring on company time, which have included activities such as riverbank cleanups, tree planting after forest fires in order to prevent water run-off, and invasive plant species removal from lakes. In addition, we recognize that NGOs opposed to oil and gas activity may target the sector with legal and media actions related to water protection; our public reporting of water data and management provides an opportunity for transparency in this regard and supports our internal commitment to water management.
Other water users at a basin/catchment level	Relevant, always included	Since we operate in many areas that also have agricultural and industrial operations, along with other oil and gas producers, we include the potential for conflicts in water use requirements in our assessment of water availability, regulations, and reputation. Where available, we proactively join collaborative groups working on these issues, including industry working groups on water, river basin management authorities, and government-industry consultation processes.
Regulators	Relevant, always included	We operate in areas with strong regulatory approaches to water management, including licensing and permitting for water use, and regulations on water body protection. We therefore include regulators such as water protection authorities and environmental protection agencies, depending on our business unit, as important stakeholders. We engage with these regulators in clearly laid-out processes for water use applications and licenses, and in sector/area working groups with the regulators where these are offered, often in relation to location-specific issues.
River basin management authorities	Relevant, always included	We operate in areas with strong regulatory approaches to water management, including licensing and permitting for water use, and regulations on water body protection such as river basin management authorities. One example of this is in France, where we are a member of the Regional Water Basin Committee in the Ambès region located on an estuary that leads to the Atlantic Ocean. This is one of six water basin committees in the country, and brings together both private and public stakeholders to discuss and define the main priorities of the region's water policy and the protection of its natural aquatic environments. In 2014, our Ambès superintendent was elected to the committee for a six-year term. The committee was responsible for the creation of a master plan for water development and management (SDAGE), and is often referred to as the "Water Parliament" of the basin. We therefore include river basin management authorities, depending on our business unit, as important stakeholders. We engage with these regulators in clearly laid-out processes for water management and in sector/area working groups with the regulators where these are offered, often in relation to location-specific issues.
Statutory special interest groups at a local level	Relevant, always included	These local stakeholders may include community-specific groups such as farmers' associations, river basin committees or industrial committees. We identify these wherever they might exist, as they represent users of water as a shared resource and are therefore material to our operations. Our engagement would include working with them to understand possible concerns, opportunities for working together on water protection projects, and shared approaches to water conservation.
Suppliers	Relevant, always included	We have assessed that water is not a critical issue for our suppliers (keeping in mind that we have identified key activities that may involve contractors, such as drilling and operations, as our direct operations/activities, rather than indirect in the supply chain). However, we have assessed the risk of water-related issues such as flooding and extreme weather events disrupting our supply chain, and the impact of that disruption on our operations, and so suppliers are included as important stakeholders. We engage individually with suppliers as needed on this risk, to mitigate the potential for supply chain disruption and to support their protection of same.
Water utilities at a local level	Relevant, always included	Water utilities are important stakeholders, given their role in protecting water availability for communities and other industrial users. Since we operate in many areas that also have agricultural and industrial operations, along with other oil and gas producers, we include the potential for conflicts in water use requirements in our assessment of water availability, regulations, and reputation. Where available, we proactively join collaborative groups working on these issues that may include water utilities, including industry working groups on water, river basin management authorities, and government-industry consultation processes.
Other stakeholder, please specify	Relevant, always included	Since oil and gas exploration and production often depends on partnerships, in which we may be operated or non-operated partners, we identify joint venture partners as material stakeholders. It is important that they consider water issues at a similar level of importance as ours, in order to protect water availability for the project or asset, and to protect water bodies from any adverse effects of the project or asset. Environmental standards are therefore included when setting up the partnership, and we actively monitor environmental concerns and issues that may impact the project as it proceeds. Our joint ventures include regular partner meetings and email communication as a way for all partners to update the venture on concerns and activities.

W3.3d

**(W3.3d) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.**

**Identifying**

We use our Enterprise Risk Management (ERM) System, with its Corporate Risk Register & Risk Matrix, to identify, assess & monitor new & emerging climate-related risks, including water, on an ongoing basis, updating the Register annually at minimum. Water-related risks are viewed with short- (e.g. severe weather) mid- and long-term (e.g. rising sea levels) contexts, to the end of asset reserve life. Our ERM process is based on a Top-Down, Bottom-Up approach to engage all staff. Top-Down begins with our Board and its committees with clear terms of reference, including specific allocation of risk type. Our Executive Committee reviews & manages the ERM process. Our staff helps develop systems, standards and procedures. Bottom-Up is how staff implement, maintain & improve risk management processes, applying the hazard-risk-mitigation process in every part of our business, with our Executive Committee and Board providing oversight on key risks & broad issues of corporate governance & regulatory compliance.

**Assessing**

The ERM process is integral to decision making & is regularly reviewed, with action taken to manage risks. At the corporate level, our HSE team used the WRI Aqueduct, WWF Water Risk & regional government databases to assess water availability risks in all operating areas. At the asset level, risk is assessed & managed with input from technical teams, leadership & Corporate groups. This ensures we effectively identify existing or emerging risk within each operating region, including integrated risks. For each risk case, our subject matter experts, Business Unit leadership, Executive Committee & Board of Directors (depending on the risk) assess scope & materiality, anticipated severity & probability in terms of human, environment, financial & social license impacts. Risk profiles include Operational, Market & Financial, Credit, Organizational, Political, Regulatory Compliance, Strategic & Reputational, & Sustainability. Each risk case is entered into the Risk Register, which tracks all material risks & communicates risks & mitigation plans.

At a minimum annually & more frequently when required (e.g. daily during cyclone season), we reassess risk associated with climate change, which we identify as including water, including the impact of a 1.5 to 2 degree Celsius scenario:

- Changes in temperature & precipitation extremes
- Sea level rise
- Tropical cyclones (hurricanes & typhoons)
- Water reporting obligations
- Uncertainty surrounding new regulation
- Legal
- Technology
- Reputation &
- Changing consumer behaviour

In 2018, every Business Unit conducted a review of climate-related risks, including where climate-related risk is a contributing factor to other risks and vice versa. These were quantified, including implications & mitigating measures to reduce risk & liabilities to an acceptable & manageable level. Results were provided to the Board's HSE, Audit & Sustainability Committees, including timelines & mitigation/opportunity. This formalizes identification & assessment of climate-related risks & integrates them into the ERM system, supporting the Board's oversight. In 2019, we integrated the results of GRI's sustainability matrix approach (external stakeholder concerns & internal company impact) into our Risk Matrix, which resulted in the active consideration of Sustainability in both the Risk Matrix and the Corporate Risk Register, elevating the profile of climate-related issues identification, assessment & mitigation.

**Managing**

Our ERM framework allows us to identify mitigation activities to reduce risk to a level as low as reasonably practicable, or to accept or control risk including potential impact, financial implications, management methods & cost. For climate-related risks & opportunities, we prioritize reducing the risk to our people, the environment & the company. If direct mitigation is not possible (i.e. changes in temperature extremes), we adapt our business processes to reduce the potential impact. If this is not practical, we may accept the risk, insuring our operations against it wherever possible. Senior levels of management, including our Board, have a direct link to our risk management processes & activities, & required changes can be made, including shifts in the organizational direction/structure. Where climate opportunities are identified, they are advanced using our project management framework, which follows several phases to assess costs, benefits, and implementation paths. As an example of risk response, following our assessment of investor concern over water issues, we made the decision in 2019 to report into the 2020 CDP Water Security questionnaire, aligning our existing public water data & management reporting with CDP's.

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**W4. Risks and opportunities**

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**W4.1**

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**(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?**

Yes, only within our direct operations

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**W4.1a**

**(W4.1a) How does your organization define substantive financial or strategic impact on your business?**

Our Enterprise Risk Management system includes a corporate risk register in which we maintain records of all material risks to our business and our operations. Within the risk register, in addition to descriptions of the background and context of the risk, we use a risk matrix approved by our Executive and Board of Directors to identify the potential magnitude of the financial or strategic impact of each identified risk on our business. The risk matrix is used to establish impact thresholds across a broad range of risk categories, including people, environment, business loss, reputation, regulatory, security. We define substantive financial or strategic impact as part of this risk matrix, to ensure that the risks with the highest potential impact are appropriately managed. This definition applies to both direct operations and supply chain. As per our matrix, financial impact is deemed substantive if it could cause a business loss of more than \$10 MM CAD (unrisked & before mitigation/recovery instruments) A strategic impact is defined as substantive beginning at the following levels and including any escalations if it: • Has persistent but reversible, long term effects on habitat, ecological communities, land, air, or water. Escalations include irreversible effects on these elements, persistent reduction in sensitive ecosystem function, or effects beyond a regional or operations scale. • Requires a specific asset to be shut in for unknown duration during regulatory or legal proceedings. Escalations include the permanent withdrawal of authority to operate. • Has reputational damage nationally or internationally and where stakeholder concerns lead to regional or more widespread interruption of operations. Potential impacts to our business are also assessed within the risk matrix and the corporate risk register in terms of likelihood in order to quantify or qualify risk exposure to the organization and determine order of priority in which these risks will be managed. Substantive impacts with a probability greater than 10-3 or assessed as Possible require the implementation of additional safeguards to achieve ALARP (As Low As Reasonably Possible) or the formal approval from the COO or Managing Director to temporarily maintain operations while solutions are being put in place. Other measures such as speed of onset and organizational vulnerability are risk qualifiers that are also used to help us with our risk ranking process to provide greater context for risk management. An example of potential substantive impact is the risk scenario that Vermilion would not be able to maintain its water withdrawal license from the Lasseube aquifer due to a change in regulations, generating a revenue loss of \$12.8MM with a likelihood of "about as likely as not".

**W4.1b**

**(W4.1b) What is the total number of facilities exposed to water risks with the potential to have a substantive financial or strategic impact on your business, and what proportion of your company-wide facilities does this represent?**

	Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment
Row 1	2	1-25	Substantive, water-related risks have been identified in relation to our Canada and France business units, which represents 25% of our total business units (2/8 = 25%).

**W4.1c**

**(W4.1c) By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive financial or strategic impact on your business, and what is the potential business impact associated with those facilities?**

**Country/Area & River basin**

Canada	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, all of the referenced water accounting metrics reflect business unit totals rather than river basin totals.)
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**Number of facilities exposed to water risk**

1

**% company-wide facilities this represents**

1-25

**Production value for the metals & mining activities associated with these facilities**

<Not Applicable>

**% company's annual electricity generation that could be affected by these facilities**

<Not Applicable>

**% company's global oil & gas production volume that could be affected by these facilities**

26-50

**% company's total global revenue that could be affected**

41-50

**Comment**

As an organization, Vermilion is comprised of eight Business Units, generally defined by operating country (Canada, United States, Australia, France, Netherlands, Germany, Ireland) or geographic region (Central Eastern Europe). In the context of this question, facilities correspond to Business Units. Consequently, one Business Unit (e.g. Canada) would represent 1/8 = 12.5% of company-wide facilities.

**Country/Area & River basin**

France	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, all of the referenced water accounting metrics reflect business unit totals rather than river basin totals.)
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**Number of facilities exposed to water risk**

1

**% company-wide facilities this represents**

1-25

**Production value for the metals & mining activities associated with these facilities**

<Not Applicable>

**% company's annual electricity generation that could be affected by these facilities**

<Not Applicable>

**% company's global oil & gas production volume that could be affected by these facilities**

1-25

**% company's total global revenue that could be affected**

11-20

**Comment**

As an organization, Vermilion is comprised of eight Business Units, generally defined by operating country (Canada, United States, Australia, France, Netherlands, Germany, Ireland) or geographic region (Central Eastern Europe). In the context of this question, facilities are defined as Business Units. Consequently, one Business Unit (e.g. Canada) would represent 1/8 = 12.5% of company-wide facilities.

**W4.2**

**(W4.2) Provide details of identified risks in your direct operations with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.**

**Country/Area & River basin**

France	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, all of the referenced water accounting metrics reflect business unit totals rather than river basin totals.)
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**Type of risk & Primary risk driver**

Regulatory	Statutory water withdrawal limits/changes to water allocation
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**Primary potential impact**

Reduction or disruption in production capacity

**Company-specific description**

Vermilion owns and operates the Champotran/Latorche and Chaunoy oil fields located in the department of Seine-et-Marne, France since 1999. Production comes from 34 wells drilled into the Chaunoy sandstone formation at a depth ranging from 1900 to 2500 m. Water is injected in 12 injection wells to support pressure of these reservoirs

(also known as voidage replacement), and also to sweep or displace oil from the reservoir and push it towards producing wells. Water used to maintain reservoir pressure and increase oil recovery comes in priority from the water that is produced with the oil and separated in our surface facilities. The water is stored in tanks and pipelined to injection wells. When there is insufficient volume of recycled water to maintain pressure in the reservoir, two additional sources of make-up water are used. Vermilion first uses saline water from well CHN 22 which produces saline water from a Triassic aquifer. Should a second source of water be required, water can be produced from the Champigny aquifer as authorized by prefectural decree n°09/DAIDD/M/017, July 17 2009 (ref. Appendix 2).

**Timeframe**

More than 6 years

**Magnitude of potential impact**

Medium

**Likelihood**

Unlikely

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

10000000

**Potential financial impact figure - minimum (currency)**

<Not Applicable>

**Potential financial impact figure - maximum (currency)**

<Not Applicable>

**Explanation of financial impact**

In the event that Vermilion is no longer be able to maintain its water withdrawal license from the Calcaires de Champigny aquifer due to a change in regulations, an alternative water source would have to be identified and tested to replace the current volume of make-up water used to maintain reservoir pressure in the Chaunoy, Champotran/Latorche oil fields. It is estimated that 5 wells at a cost of \$2.0MMM/well would need to be drilled, equipped and tied-in to produce the new source water wells to existing facilities in replacement of volumes previously extracted from the Champigny aquifer.

**Primary response to risk**

Comply with local regulatory requirements

**Description of response**

Vermilion is fully committed to operating responsibly in all of our jurisdictions, and as such meeting regulatory requirements and industry standards. This commitment makes both Current Regulation and Emerging Regulation material to our operations. On an ongoing basis in every BU our technical teams assess our current operations and planned development activities to ensure that we operate within our commitment to responsible operations. We also engage external regulatory experts to ensure that our staff is up to date on current regulation, as well as upcoming changes to regulations impacting our operation. In addition, the Public and Government Relations staff in our business units provide important monitoring of the interpretation of current regulations, which can be subject to change by the courts and government departments. In this risk case, the steps that Vermilion would follow as part of regulatory approval process would include: Regulatory request sent to the Prefecture with Environment impact assessment (including a specific regional hydrogeological survey and study); consultation with the public, with water and health agencies, and with local health and safety committee.

**Cost of response**

200000

**Explanation of cost of response**

The cost of response to this change of regulation is estimated at \$200K (1 FTE) and corresponds to time spent by internal resources to manage this work. Functions involved in this type of project include regulatory advisor, public-government relationship coordinator, communication, operations and technical services.

**Country/Area & River basin**

France	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, all of the referenced water accounting metrics reflect business unit totals rather than river basin totals.)
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**Type of risk & Primary risk driver**

Regulatory	Statutory water withdrawal limits/changes to water allocation
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**Primary potential impact**

Reduction or disruption in production capacity

**Company-specific description**

Vermilion owns and operates the Vic Bilh oil field located in the department of Pyrénées- Atlantiques, France since 2012. Production comes from wells drilled into the Barrémien et Mano dolomite formations at a depth ranging from 2200 to 2500 m. Water is injected in 3 injection wells to support pressure of this reservoir (also known as voidage replacement), and also to sweep or displace oil from the reservoir and push it towards 30 producing wells. Water used to maintain reservoir pressure and increase oil recovery comes in priority from the water that is produced with the oil and separated in our surface facilities. The water is stored in tanks and pipelined to injection wells. When there is insufficient volume of recycled water to maintain pressure in the reservoir, additional make-up water is used. Vermilion is authorized to produce saline water from 3 source water wells from the Lasseube aquifer as per prefectural decree n° MI NES/ 2019/001, January 25 2019.

**Timeframe**

More than 6 years

**Magnitude of potential impact**

High

**Likelihood**

About as likely as not

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

12800000

**Potential financial impact figure - minimum (currency)**

&lt;Not Applicable&gt;

**Potential financial impact figure - maximum (currency)**

&lt;Not Applicable&gt;

**Explanation of financial impact**

In the event that Vermilion is no longer able to maintain its water withdrawal license from the Lasseube aquifer due to a change in regulations and the fact that there is no other known source of saline water that is available and economic to produce, Vermilion will most likely stop reinjecting make-up water in its Vic Bilh oil field. The lack of voidage replacement will cause the reservoir pressure to deplete over time and reduce the ultimate oil recovery of this reservoir. Reduction in water injection will also reduce sweeping efficiency of the waterflooding scheme and negatively impact ultimate oil recovery of the reservoir. Based on historical reservoir performance and modelling, the loss of make-up water reinjection would reduce the ultimate oil recovery of the Vic Bilh field by an average of 55 boe/d over the remaining 15 years of operations remaining for this field. The financial impact in lost revenue is estimated at \$12.8MM (55 boe/d\*365d/yr\*15yrs\*\$42/boe netback).

**Primary response to risk**

Comply with local regulatory requirements

**Description of response**

Vermilion is fully committed to operating responsibly in all of our jurisdictions, and as such meeting regulatory requirements and industry standards. This commitment makes both Current Regulation and Emerging Regulation material to our operations. On an ongoing basis in every BU our technical teams assess our current operations and planned development activities to ensure that we operate within our commitment to responsible operations. We also engage external regulatory experts to ensure that our staff is up to date on current regulation, as well as upcoming changes to regulations impacting our operation. In addition, the Public and Government Relations staff in our business units provide important monitoring of the interpretation of current regulations, which can be subject to change by the courts and government departments.

**Cost of response**

200000

**Explanation of cost of response**

The cost of response to this change of regulation is estimated at \$200K (1 FTE) and corresponds to time spent by internal resources to manage this work. Functions involved in this type of project include regulatory advisor, public-government relationship coordinator, communication operations and technical services.

**Country/Area & River basin**

France	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, all of the referenced water accounting metrics reflect business unit totals rather than river basin totals.)
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**Type of risk & Primary risk driver**

Regulatory	Statutory water withdrawal limits/changes to water allocation
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**Primary potential impact**

Reduction or disruption in production capacity

**Company-specific description**

Vermilion owns and operates five Neocomian oil fields from the Neocomian sandstone formation (multi-layer reservoirs) in the department of Loiret, France since 2012. In this region, the Neocomian aquifer (same layer than oil bearing reservoir) is at a depth of 550 -600 m is classified as a strategic resource for fresh water supply. No industrial use is allowed and every well must be authorized under very stringent +-conditions. Water is injected in 19 injection wells to support pressure of these reservoirs (also known as voidage replacement), and also to sweep or displace oil from the reservoir and push it towards 81 producing wells. Water used to maintain reservoir pressure and increase oil recovery comes from the water that is produced with the oil and separated in our surface facilities. The water is stored in tanks and pipelined to injection wells.

**Timeframe**

More than 6 years

**Magnitude of potential impact**

Medium

**Likelihood**

Unlikely

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

10000000

**Potential financial impact figure - minimum (currency)**

&lt;Not Applicable&gt;

**Potential financial impact figure - maximum (currency)**

&lt;Not Applicable&gt;

**Explanation of financial impact**

In the event that Vermilion temporarily (3 years) loses its permit to operate its Neocomian oil fields due to a change in regulations regarding the protection of the Neocomian aquifer (even though our reservoir are disconnected from regional fresh water aquifers), Vermilion will be required to shut in its operations prematurely and leave recoverable oil reserves still remaining in the reservoir. Based on historical reservoir performance and modelling, the financial impact in lost revenue is estimated at \$10MM (238,000 bbl of reserves not recovered (\$42/bbl netback).

**Primary response to risk**

Comply with local regulatory requirements

**Description of response**

Vermilion is fully committed to operating responsibly in all of our jurisdictions, and as such meeting regulatory requirements and industry standards. This commitment makes both Current Regulation and Emerging Regulation material to our operations. On an ongoing basis in every BU our technical teams assess our current operations and planned development activities to ensure that we operate within our commitment to responsible operations. We also engage external regulatory experts to ensure that our staff is up to date on current regulation, as well as upcoming changes to regulations impacting our operation. In addition, the Public and Government Relations staff in our business units provide important monitoring of the interpretation of current regulations, which can be subject to change by the courts and government departments.

**Cost of response**

200000

**Explanation of cost of response**

The cost of response to this change of regulation is estimated at \$200K (1 FTE) and corresponds to time spent by internal resources to manage this work. Functions involved in this type of project include regulatory advisor, public-government relationship coordinator, communication, operations and technical services.

**Country/Area & River basin**

Canada	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, all of the referenced water accounting metrics reflect business unit totals rather than river basin totals.)
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**Type of risk & Primary risk driver**

Regulatory	Statutory water withdrawal limits/changes to water allocation
------------	---

**Primary potential impact**

Increased operating costs

**Company-specific description**

Due to economic, operational (i.e. outcome) and fluid handling requirements, Vermilion currently uses freshwater based, crosslinked gel (CG) fluid systems in its hydraulic fracturing operations in Canadian (Saskatchewan and Alberta). This risk case recognizes the possibility that future regulatory and/or social pressure, or water availability concerns, may limit or prohibit the use of freshwater in this application, either temporarily or over a longer-term. Although more strategic than financial at current drilling levels, as a responsible energy producer we have identified this risk as substantive because of its links to reputation, social license to operate and current and future regulations, all of which will impact our ability to not only operate in our areas, but also to grow.

**Timeframe**

More than 6 years

**Magnitude of potential impact**

Medium

**Likelihood**

Unlikely

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

7400000

**Potential financial impact figure - minimum (currency)**

<Not Applicable>

**Potential financial impact figure - maximum (currency)**

<Not Applicable>

**Explanation of financial impact**

In recognition of this risk, Vermilion has evaluated the technical feasibility and cost implications of switching from the freshwater fluid system to a saltwater based, High Viscosity Friction Reducer (HFVR) system. In relation to our Alberta operations, while technically feasible, the evaluation identified increased operational costs in relation to fluid storage and handling (e.g. increased fluid requirements, bigger tanks, increased hauling, etc.), on-lease transfer equipment (including maintenance), and increased waste management and disposal. The total cost differential associated with these activities is estimated to be approximately \$105k/well. Direct, third-party fracturing costs (i.e. materials, consulting services, etc.) are estimated to be an additional \$20k per well. Due to different geologic conditions, the feasibility assessment determined that the completion technologies applied in Saskatchewan can likely modified to handle saltwater without a similar change in frac fluid system. The incremental cost associated with shifting from freshwater to saltwater in Saskatchewan is estimated to be approximately \$30k/well. With consideration of the current asset base, the potential financial impact of the risk is based on a 40 well per year drilling program in Alberta and 80 well per year drilling program in Saskatchewan (40 x \$125k + 80 x \$30k = \$7.4MM).

**Primary response to risk**

Comply with local regulatory requirements

**Description of response**

Should future circumstances limit access to freshwater for fracturing purposes, the drilling program in the affected area(s) would be reassessed and, with consideration to the scope and anticipated duration of the expected restriction, an appropriate decision would be made with respect to modifying the drilling program to maintain regulatory compliance. This may include prioritizing drilling activities in other areas where freshwater availability is not a concern and/or shifting to a saltwater frac fluid system.

**Cost of response**

100000

**Explanation of cost of response**

The cost differential associated with shifting from freshwater to saltwater based fracturing fluids forms the basis of the potential impact figure. At current drilling levels, the increased engineering, coordination and management costs associated with the change is estimated to be approximately 0.5 FTE = \$100k (\$200k x 0.5 = \$100k) per annum.

**(W4.2c) Why does your organization not consider itself exposed to water risks in its value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact?**

	Primary reason	Please explain
Row 1	Risks exist, but no substantive impact anticipated	The suppliers with the greatest water risk exposure have been included as part of our direct operations, as we have direct control over these activities. These suppliers work directly with us, managed by us, in our drilling and production activities, and we thus have direct control over them. Other suppliers, such as those providing personnel or administration supplies, have far lower exposure to water risks.

**W4.3**

**(W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?**

Yes, we have identified opportunities, and some/all are being realized

**W4.3a**

**(W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.**

**Type of opportunity**

Efficiency

**Primary water-related opportunity**

Improved water efficiency in operations

**Company-specific description & strategy to realize opportunity**

Environmental stewardship of water resources includes two key focus areas for Vermilion: protection of water bodies, including oceans, lakes and rivers; and increasing our water efficiency. We support this using key performance indicators on water use in the Performance Metrics section of our Sustainability Report and, beginning in 2020, in our CDP Water Security questionnaire submission. This includes water withdrawal by source, and percentage and volume of water recycled and reused. We are committed to careful stewardship of the planet's resources, including water. We do not currently operate in areas that are considered water stressed; however, our capital and operating procedures recognize the critical importance of this resource. As a result, we emphasize: -The efficient use of all water, - The prioritization of non-potable water over potable water, and the consideration of our communities and their concerns. Operationally and environmentally, we continue to work hard to establish the most efficient and sustainable ways of sourcing and reusing this critical resource. As the single largest component used in hydraulic fracturing operations, water is essential to developing many types of oil and gas reservoirs, particularly in North America. In Vermilion's operations, we use fracturing only in some semi-conventional clastic reservoirs. We do not develop shale or other unconventional reservoirs. As a result, our semi-conventional development activities are significantly less frac intensive than shale development, requiring much lower volumes of water. Approximately one-quarter of the water we pump during a Canadian frac, for example, returns immediately during flowback operations. We then employ fracture fluid technology that lets us re-use this flowback water on subsequent wells. We are also assessing where we can adjust completion schedules to optimize water use, and recycle flowback water to reduce overall make-up water requirements. Finally, we are also looking at the potential of using produced water (non-potable water produced with oil and gas) from our operations to replace other water sources. To support water efficiency, all business units assessed water risks and opportunities in 2019-2021, and will be identifying potential opportunities for increased water efficiency in 2022-2023.

**Estimated timeframe for realization**

1 to 3 years

**Magnitude of potential financial impact**

Low

**Are you able to provide a potential financial impact figure?**

No, we do not have this figure

**Potential financial impact figure (currency)**

<Not Applicable>

**Potential financial impact figure – minimum (currency)**

<Not Applicable>

**Potential financial impact figure – maximum (currency)**

<Not Applicable>

**Explanation of financial impact**

Efficiency in water use will reduce water that needs to be either (a) purchased or (b) produced, transported and disposed of, all of which will lead to cost efficiencies.

**Type of opportunity**

Products and services

**Primary water-related opportunity**

Sales of new products/services

**Company-specific description & strategy to realize opportunity**

We are assessing circular economy approaches to our operations, particularly with respect to the use of produced water, including geothermal energy, metals extraction such as lithium, & distillation to create usable or potable water rather than disposal. The most advanced opportunity is the development of community-based geothermal applications in our France business, using the heat from our produced water to heat an industrial-sized tomato greenhouse operation. Today, this ongoing operation has catalyzed an entire agricultural sector, and we have expanded the concept to heating a residential neighbourhood and, in 2021, a spirulina (microalgae) agricultural operation. In Parentis, our commitment to provide heat free-of-charge and free of carbon emissions for 25 years has made the greenhouse operation profitable to build and operate, which in turn has enabled our partners to expand, and has attracted other business to the area. Our similar geothermal community-building project specifically target economic inclusivity in the form of social housing: 30% of residences are reserved for those with lower incomes. In the Netherlands and France, we are continuing to research the potential to convert depleted gas wells to geothermal assets, which could supply energy to community and economic assets such as eco-neighbourhoods and agriculture centres, and to use our land base for partnerships with renewable energy suppliers. An example of the development of low emission goods/services is our France-based industry partnership with Avenia to expand the use of geothermal energy production in oil production, & a geothermal association in Germany. We also partnered with the Green Deal partnership in Netherlands to investigate potential for ultra-deep geothermal development appropriate to industrial power and heat requirements; this consortium of industry, research and government partners is continuing on, although our regional partnership identified that the local potential was not strong enough. This does, however, demonstrate our commitment to reusing and indeed repurposing our sources of water to support the community. While we are



providing our geothermal energy free of charge in France as part of our strong community relations program there, we are using the projects as pilots to assess the potential to develop similar projects in other regions that would produce revenue.

**Estimated timeframe for realization**

More than 6 years

**Magnitude of potential financial impact**

Low-medium

**Are you able to provide a potential financial impact figure?**

No, we do not have this figure

**Potential financial impact figure (currency)**

<Not Applicable>

**Potential financial impact figure – minimum (currency)**

<Not Applicable>

**Potential financial impact figure – maximum (currency)**

<Not Applicable>

**Explanation of financial impact**

The financial impact of our current projects is difficult to quantify, as it is a contributor to positive community relations, and the resulting social license to operate. However, we believe our work in this area has potential for revenue through the sales of new products and services, along with potential cost savings from the reduction of produced water transportation and disposal. The exploration of these revenue and cost impacts is at too early a stage to identify the full scale of the financial impact.

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## W5. Facility-level water accounting

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### W5.1

**(W5.1) For each facility referenced in W4.1c, provide coordinates, water accounting data, and a comparison with the previous reporting year.**

**Facility reference number**

Facility 1

**Facility name (optional)**

Canada Business Unit

**Country/Area & River basin**

Canada	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, all of the referenced water accounting metrics reflect business unit totals rather than river basin totals.)
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**Latitude**

51.0447

**Longitude**

114.0719

**Located in area with water stress**

No

**Primary power generation source for your electricity generation at this facility**

<Not Applicable>

**Oil & gas sector business division**

Upstream

**Total water withdrawals at this facility (megaliters/year)**

34851.9

**Comparison of total withdrawals with previous reporting year**

Lower

**Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes**

11.5

**Withdrawals from brackish surface water/seawater**

0

**Withdrawals from groundwater - renewable**

116

**Withdrawals from groundwater - non-renewable**

0

**Withdrawals from produced/entrained water**

34711

**Withdrawals from third party sources**

13.35

**Total water discharges at this facility (megaliters/year)**

34851.9

**Comparison of total discharges with previous reporting year**

Lower

**Discharges to fresh surface water**

0

**Discharges to brackish surface water/seawater**

0

**Discharges to groundwater**

34686.9

**Discharges to third party destinations**

165

**Total water consumption at this facility (megaliters/year)**

0

**Comparison of total consumption with previous reporting year**

About the same

**Please explain**

Although this is just our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. As a conventional oil and gas producer, Vermilion's operations do not typically involve the consumption of water (i.e. water withdrawals and discharges are generally in balance). Accordingly, in 2020 net water consumption was zero.

**Facility reference number**

Facility 2

**Facility name (optional)**

France Business Unit

**Country/Area & River basin**

France	Other, please specify (At this time, Vermilion's water accounting data is aggregated at the business unit level rather than river basin level. As such, all of the referenced water accounting metrics reflect business unit totals rather than river basin totals.)
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**Latitude**

44.3526

**Longitude**

1.073

**Located in area with water stress**

No

**Primary power generation source for your electricity generation at this facility**

<Not Applicable>

**Oil & gas sector business division**

Upstream

**Total water withdrawals at this facility (megaliters/year)**

13903

**Comparison of total withdrawals with previous reporting year**

About the same

**Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes**

0

**Withdrawals from brackish surface water/seawater**

0

**Withdrawals from groundwater - renewable**

575

**Withdrawals from groundwater - non-renewable**

0

**Withdrawals from produced/entrained water**

13322

**Withdrawals from third party sources**

6

**Total water discharges at this facility (megaliters/year)**

13903

**Comparison of total discharges with previous reporting year**

About the same

**Discharges to fresh surface water**

0

**Discharges to brackish surface water/seawater**

0

**Discharges to groundwater**

13322

**Discharges to third party destinations**

581

**Total water consumption at this facility (megaliters/year)**

0

**Comparison of total consumption with previous reporting year**

About the same

**Please explain**

Although this is just our second year of compiling data under the CDP framework, water-related measurements, monitoring and reporting have been undertaken by Vermilion historically in other contexts (e.g. regulatory and/or sustainability reporting). With consideration to the more recent CDP data and historical data, Vermilion has applied the following thresholds when evaluating year-over-year changes in the context of this question: - About the Same: < 10% - Higher/Lower: 10 to 25% - Much Higher/Lower: > 25%. As a conventional oil and gas producer, Vermilion's operations do not typically involve the consumption of water (i.e. water withdrawals and discharges are generally in balance). Accordingly, in 2020 our net water consumption was zero.

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W5.1a

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(W5.1a) For the facilities referenced in W5.1, what proportion of water accounting data has been externally verified?

**Water withdrawals – total volumes**

% verified  
Not verified

What standard and methodology was used?  
<Not Applicable>

**Water withdrawals – volume by source**

% verified  
Not verified

What standard and methodology was used?  
<Not Applicable>

**Water withdrawals – quality**

% verified  
Not verified

What standard and methodology was used?  
<Not Applicable>

**Water discharges – total volumes**

% verified  
Not verified

What standard and methodology was used?  
<Not Applicable>

**Water discharges – volume by destination**

% verified  
Not verified

What standard and methodology was used?  
<Not Applicable>

**Water discharges – volume by treatment method**

% verified  
Not verified

What standard and methodology was used?  
<Not Applicable>

**Water discharge quality – quality by standard effluent parameters**

% verified  
Not verified

What standard and methodology was used?  
<Not Applicable>

**Water discharge quality – temperature**

% verified  
Not verified

What standard and methodology was used?  
<Not Applicable>

**Water consumption – total volume**

% verified  
Not verified

What standard and methodology was used?  
<Not Applicable>

**Water recycled/reused**

% verified  
Not verified

What standard and methodology was used?  
<Not Applicable>

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**W6. Governance**

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**W6.1**

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**(W6.1) Does your organization have a water policy?**

Yes, we have a documented water policy that is publicly available

W6.1a

**(W6.1a) Select the options that best describe the scope and content of your water policy.**

	Scope	Content	Please explain
Row 1	Company-wide	Description of business impact on water Commitments beyond regulatory compliance Commitment to water-related innovation Commitment to water stewardship and/or collective action Acknowledgement of the human right to water and sanitation	Policy/position statement on water □ We recognize water as a basic human right, and as a vital resource that is shared among many stakeholders in our communities □ We are committed to protecting both the supply and the quality of water sources in our areas of operation, by: – Proactively preventing harm and supporting healthy surface and groundwater bodies – Reducing potable and freshwater usage to the lowest level practical – Taking a lifecycle and circular economy approach to water, exploring opportunities to reuse and recycle products such as produced water □ As part of this commitment, in 2021 we are building on our existing water data reporting to benchmark our performance against our peers, and assess potential for next steps, including reductions

W6.2

**(W6.2) Is there board level oversight of water-related issues within your organization?**

Yes

W6.2a

**(W6.2a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.**

Position of individual	Please explain
Board-level committee	Sustainability is 1 of 6 strategic objectives in our long-range business plan. As such, the Board has responsibility for oversight of Vermilion’s sustainability performance, with Board committees providing additional expertise. Comprised of 4 independent directors, the Board’s Sustainability Committee (SC) provides targeted oversight of & advice for our approach, including: Sustainability Policy & long-range strategic plan; performance & progress on sustainability goals; id & mgmt of sustainability risks and opportunities; impact of sustainability & climate issues, including water, on business strategy, budgets & risk management; & communication of sustainability policies & performance. At least quarterly, the SC reviews management’s sustainability performance reports, which include ESG & climate risks, opportunities, activities & performance; environmental & social trends; & strategic community investment activities. The SC Chair reports to the Board on the SC’s work, including the Company’s performance & progress. Most members of the full Board attended SC meetings in 2020, & the Board also reviewed ESG thought leadership papers such as oversight frameworks, decarbonization pathways & managing the energy transition, from experts eg McKinsey, State Street & Kimmeridge Energy. The Board also oversees sustainability strategy & performance via the HSE Committee (environment & safety, risk management), Audit Committee (risk management), & GHR Committee (governance & people). The Board & SC use this info to ensure integration of sustainability & climate risks & opportunities, including water, into decision-making on business strategy, policy & resilience. In 2020, the Board assessed the results of Vermilion’s climate-related scenario analysis, reviewed our long-range plan for sustainability & provided guidance for management’s development of a 10-year strategy for managing risks & opportunities identified by the scenario analysis, including water-related issues.

W6.2b

**(W6.2b) Provide further details on the board's oversight of water-related issues.**

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - all meetings	Monitoring implementation and performance Overseeing acquisitions and divestiture Overseeing major capital expenditures Reviewing and guiding annual budgets Reviewing and guiding business plans Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding strategy Reviewing and guiding corporate responsibility strategy Setting performance objectives	The Board's primary responsibility is to foster the long-term success of Vermilion for all stakeholders, consistent with the Board's responsibility to the shareholders to maximize shareholder value. The Board is also responsible to ensure management identifies the principal risks of Vermilion's business and implements the appropriate systems to manage risks identified. In climate-related work in 2020, the Board: ensured there was a strategic planning process, & reviewed, discussed and approved the strategy and monitored its implementation; and reviewed and evaluated our business and risk management reports at each of its meetings. It also reviewed the results of the climate-related scenario analysis conducted by Vermilion's Board and senior management to assess the resilience of the Company under different climate change and energy transition models; reviewed sustainability-related risks and opportunities, including water-related, and their integration into our enterprise risk management system; & reviewed Vermilion's sustainability performance relative to the Company's peers based on key ESG rating agency scores. In addition, the Sustainability Committee: • Assessed the results of Vermilion's scenario analysis of the potential trajectory and impacts on the Company of the speed of the energy transition. Conducted at the Board and senior management level, the analysis provided insights into the resilience of the Company under World Economic Forum 'business as usual' and 'rapid transition' scenarios. • Reviewed Vermilion's current long-range strategic plan for sustainability, which resulted in management developing a 10-year strategy for managing risks and opportunities identified in part by the scenario analysis, including water-related issues. • Assessed Vermilion's sustainability performance via results from third-party ESG rating agencies, including CDP, SAM, Sustainalytics, MSCI, ISS and Vigeo-Eiris, including in relation to the company's ESG-related risks and peer performance. Results for CDP, SAM and Sustainalytics contribute to employee and executive long-term compensation. • Analyzed Vermilion's sustainability-related risks, correlated to those identified as material for our industry by the TCFD and SASB, along with emerging issues, and investor and financial sector ESG trending, and approved the related management approach. • Updated the Board skills matrix to ensure appropriate representation of sustainability-related skills and experience, including climate-related issues. • Ensured that Vermilion's process for sustainability reporting includes oversight by the Company's disclosure committee. • Reviewed results from Vermilion's strategic community investment program, including the global emergency responder and environmental stewardship programs.

**W6.3**

**(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).**

**Name of the position(s) and/or committee(s)**

Other C-Suite Officer, please specify (Executive Chair)

**Responsibility**

Both assessing and managing water-related risks and opportunities

**Frequency of reporting to the board on water-related issues**

More frequently than quarterly

**Please explain**

Organizational responsibility for sustainability & climate-related issues, including water, flows from the Board & its Sustainability Committee throughout the Company via our Executive Committee, comprised of the Executive Chair, President, Chief Financial Officer, VP Business Development, VP International & HSE, VP North America, & VP European Operations. Our Executive Committee as a group replaces the position of CEO, & is responsible to review & approve key financial, operational & strategic decisions. The Committee reports to the Board more frequently than quarterly & is responsible through its reporting lines for assessing, monitoring & managing climate issues including water use, regulatory changes, & weather impacts, etc. As part of the Executive Committee, the Chair has oversight of risks & opportunities pertaining to water such as current & emerging regulations, emerging technology, legal, market, company reputation & exposure to extreme weather events (e.g. drought).

**Name of the position(s) and/or committee(s)**

President

**Responsibility**

Both assessing and managing water-related risks and opportunities

**Frequency of reporting to the board on water-related issues**

More frequently than quarterly

**Please explain**

Organizational responsibility for sustainability & climate-related issues, including water, flows from the Board & its Sustainability Committee throughout the Company via our Executive Committee, comprised of the Executive Chair, President, Chief Financial Officer, VP Business Development, VP International & HSE, VP North America, & VP European Operations. Our Executive Committee as a group replaces the position of CEO, & is responsible to review & approve key financial, operational & strategic decisions. The Committee reports to the Board more frequently than quarterly & is responsible through its reporting lines for assessing, monitoring & managing climate issues including water use, regulatory changes, & weather impacts, etc. As part of the Executive Committee, the President has oversight of risks & opportunities pertaining to water such as current & emerging regulations, emerging technology, legal, market, company reputation & exposure to extreme weather events (e.g. drought).

**Name of the position(s) and/or committee(s)**

Chief Financial Officer (CFO)

**Responsibility**

Both assessing and managing water-related risks and opportunities

**Frequency of reporting to the board on water-related issues**

More frequently than quarterly

**Please explain**

Organizational responsibility for sustainability & climate-related issues, including water, flows from the Board via our Executive Committee, comprised of the Executive Chair, President, Chief Financial Officer, VP Business Development, VP International & HSE, VP North America, & VP European Operations. Our Executive Committee replaces the position of CEO, & is responsible to review & approve key financial, operational & strategic decisions. The Committee reports to the Board more frequently than 1/4ly & is responsible through its reporting lines for assessing, monitoring & managing climate issues including water use, regulatory changes, weather impacts, etc. As part of the Committee, the CFO has oversight of risks & opportunities pertaining to water such as current & emerging regulations, emerging technology, legal, market, company reputation & exposure to extreme weather events (e.g. drought) & of the integration of sustainability risks into our Enterprise Risk Management framework.

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**Name of the position(s) and/or committee(s)**

Chief Operating Officer (COO)

**Responsibility**

Both assessing and managing water-related risks and opportunities

**Frequency of reporting to the board on water-related issues**

More frequently than quarterly

**Please explain**

Our VP North America and our VP International & HSE together replace the position of Chief Operation Officer and lead the operationalization of sustainability. They are both members of the Executive Committee, and thus have oversight of risks & opportunities pertaining to water with respect to current & emerging regulations, emerging technology, legal, market, company reputation & exposure to extreme weather events (e.g. drought). Both VPs attend the Sustainability and HSE Board Committee meetings. These committees meet at least three times per year, in addition to a full Board strategy meeting & quarterly Board meetings.

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**Name of the position(s) and/or committee(s)**

Other, please specify (Vice President, Sustainability)

**Responsibility**

Both assessing and managing water-related risks and opportunities

**Frequency of reporting to the board on water-related issues**

More frequently than quarterly

**Please explain**

The VP Sustainability is a corporate function that reports to the President & is responsible for assessing & managing Sustainability (including water) risks & opportunities as part of developing & implementing sustainability strategy. This function leads a team that provides a Centre of Excellence approach, advising the business on all aspects of sustainability & reporting at least quarterly to the Board. The VP Sustainability focuses on integrating sustainability throughout our business, including identifying & managing associated risks & opportunities, particularly climate-related (including water). The VP Sustainability briefs the Board's Sustainability Committee, which meets at least three times a year, in addition to a full Board strategy meeting &, as required, quarterly Board meetings.

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**Name of the position(s) and/or committee(s)**

Business unit manager

**Responsibility**

Both assessing and managing water-related risks and opportunities

**Frequency of reporting to the board on water-related issues**

More frequently than quarterly

**Please explain**

Organizational responsibility for sustainability & climate-related risks & opportunities, including those related to water, flows from the Board to our Executive Chair & our President, & throughout the Company via our Executive Committee. Our business unit managers have responsibility for assessing & managing sustainability (including water) risks & opportunities in their regions, and they present to the Board on sustainability strategy, projects & progress in rotation, generally at least one per Sustainability Committee meeting. Each of our business units has also identified a Sustainability Lead, to support sustainability-related work. This work is aided by risk identification & management by BU public & government relations staff focusing on our external stakeholders.

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**Name of the position(s) and/or committee(s)**

Other, please specify (Manager, Corporate HSE)

**Responsibility**

Both assessing and managing water-related risks and opportunities

**Frequency of reporting to the board on water-related issues**

More frequently than quarterly

**Please explain**

The Manager Corporate HSE is a corporate function that reports to the VP International & HSE, & is responsible for assessing & managing health safety & environmental (including water) risks & opportunities within Vermilion's operations. This function works closely with the corporate sustainability function, focused on integrating sustainability throughout our business, including identifying & managing associated risks & opportunities, particularly climate-related and including water-related. The Manager, Corporate HSE briefs the Board's HSE committee, which meets at least three times a year, in addition to a full Board strategy meeting &, as required, quarterly Board meetings.

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**(W6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?**

	Provide incentives for management of water-related issues	Comment
Row 1	Yes	Our compensation approach is one program for all to incentivize staff at every level to work toward our strategic objectives, including climate-related issues. Compensation program elements include base salary & short & long-term incentives, which we believe strengthens our organizational alignment with shareholder expectations. Our objectives are: - ensuring our operations worldwide are sustainable under a range of commodity price environments & when changes occur in our workforce; - aligning compensation programs with our strategy to ensure prudent risk taking; - allowing us to attract & retain high-calibre employees that are important to our success - rewarding all employees & executives when their performance & the Company's performance is top quartile. We measure Company performance annually using our balanced scorecards, which include climate-related measures. Company & individual performance are used to determine annual short-term incentive awards & annual grant of share awards.

**W6.4a**

**(W6.4a) What incentives are provided to C-suite employees or board members for the management of water-related issues (do not include the names of individuals)?**

	Role(s) entitled to incentive	Performance indicator	Please explain
Monetary reward	Corporate executive team	Reduction of water withdrawals Reduction in consumption volumes Improvements in efficiency - direct operations Improvements in efficiency - supply chain Improvements in efficiency - product-use Improvements in waste water quality - direct operations Improvements in waste water quality - supply chain Improvements in waste water quality - product-use Implementation of employee awareness campaign or training program Supply chain engagement Increased access to workplace WASH Implementation of water-related community project	Employee & executive compensation is tied directly to performance targets, including those related to sustainability and climate, through our corporate performance scorecards. Achievements within the short-term incentive plan (STIP or bonus) & long-term incentive plan (LTIP) scorecards also help determine STIP & LTIP budgets overall. The 2020 corporate performance scorecards included both standard industry metrics & internal measures of performance which were compared to management plans approved by the Board. Our STIP scorecard (past year performance) includes a 25% weighting on HSE Performance, including water-related goals such as HSE inspections, compliance / regulatory inspections, and spills. We believe there is a direct link between sustainability performance, including climate performance & overall business performance, & we expect sustainability performance to be a very significant factor in the long-term viability of our economic model. Our 2020 LTIP corporate performance scorecard includes a sustainability-specific measure to illustrate to our organization the importance of this measure & to incentivize all staff to focus on sustainability performance in their daily work. We measure our performance relative to our peer group in 3 third-party sustainability rankings: CDP Climate, S&P Global and Sustainalytics, the latter 2 of which include water scores. This holds a 10% weighting & applies to all employees & executives.



	Role(s) entitled to incentive	Performance indicator	Please explain
Non-monetary reward	Corporate executive team	Reduction of water withdrawals Reduction in consumption volumes Improvements in efficiency - direct operations Improvements in efficiency - supply chain Improvements in efficiency - product-use Improvements in waste water quality - direct operations Improvements in waste water quality - supply chain Improvements in waste water quality - product-use Implementation of employee awareness campaign or training program Supply chain engagement Increased access to workplace WASH Implementation of water-related community project	Recognition is provided to groups & individual employees & executives by managers, the executive committee &/or Board based on performance & project-specific successes. Our Extraordinary Effort recognition program also provides small monetary rewards when staff have contributed significantly to project success, including environmental/energy efficiency projects & the rollout of a future-forward assessment of business strategy in France.

## W6.5

### (W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?

- Yes, direct engagement with policy makers
- Yes, trade associations
- Yes, funding research organizations

## W6.5a

### (W6.5a) What processes do you have in place to ensure that all of your direct and indirect activities seeking to influence policy are consistent with your water policy/water commitments?

Vermilion has identified personnel in Sustainability, HSE, Communications, Community Investment & Investor Relations (IR) groups as responsible to ensure that corporate guidance & direction relating to health, safety, environment & sustainability, including water, is passed effectively & consistently to the Business Units (BUs) & external parties. This responsibility extends to the individual BUs to ensure that activities & engagement completed at the BU level support our sustainability strategy, including water. Our VP Sustainability regularly engages with BU leaders, Vice President Europe & our Public & Government Relations teams to ensure multi-directional communication on sustainability, including expectations & shared best practices, & consistency of external messaging. All external messaging is reviewed by IR. Any inconsistencies are resolved prior to publication, & approved via our Disclosure Committee, including the President, CFO & VP IR. We are aware that trade & industry associations may represent their membership by advocating for government policy & regulations, including on water. We monitor that advocacy to ensure that it fairly represents our position. This monitoring is carried out at the corporate level by our sustainability team for all BUs. Should we identify a discrepancy between our position & the association's position, our approach is to engage the association to influence their direction.

## W6.6

### (W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?

- Yes (you may attach the report - this is optional)

## W7. Business strategy

## W7.1

(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	5-10	Based on the results of our scenario analysis in 2019 and 2020, we reassessed and revitalized our business strategy. This included Integrated Sustainability as 1 of 6 strategic objectives, with clear priorities set within the 3 areas of Carbon, Conservation (including Water, Abandonment & Reclamation, & Biodiversity) & Community. Within the Water objective, we established long-term tangible objectives to 2030, along with short-to mid-term commitments that included creating a low-carbon transition plan. □ We recognize water as a basic human right, and as a vital resource that is shared among many stakeholders in our communities □ We are committed to protecting both the supply and the quality of water sources in our areas of operation, by: – Proactively preventing harm and supporting healthy surface and groundwater bodies – Reducing potable and freshwater usage to the lowest level practical – Taking a lifecycle and circular economy approach to water, exploring opportunities to reuse and recycle products such as produced water As part of this commitment, in 2021 we are building on our existing water data reporting to benchmark our performance against our peers, and assess potential for next steps, including reductions Assessment of water issues, including water availability & pollution risk, is built into this planning through our enterprise risk management system.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	5-10	Based on our Enterprise Risk Management system, our long-range sustainability-specific planning & business need, water-related issue mitigations are prioritized & completed that allow us to support healthy communities as well as augment our strong shareholder value & return. This includes: • Water availability; • Water reporting & protection regulation changes by governments & regulators; • Water protection measures; • Reputational issues related to water protection & use; Opportunities to view water, including produced water, from a circular economy perspective. The results annually feed back into our risk/opportunity management process to ensure Vermilion has a sound data foundation to support responsible decisions in our operating areas. Detailed analysis of these risks, including potential impact, financial implications, management methods & cost of management, support our business strategy related to managing water. As part of our strategy, in 2021 we are building on our existing water data reporting to benchmark our performance against our peers, and assess potential for next steps, including reductions.
Financial planning	Yes, water-related issues are integrated	11-15	Our strategic long range business plan focuses on the economic impacts of production & commodity pricing levels. Assessment of water issues, including water availability & pollution risk, is built into this planning through our enterprise risk management system. Overall, we prioritize risk & opportunities based on the materiality, probability & potential impact to our operations; impact to the environment plus financial & strategic implications of identified climate change, including water-related, risks & potential project opportunities are also built into the ERM process. This includes identifying the financial impacts of water-related issues, such as water availability in each location, increased regulation in water protection zones such as more detailed environmental impact assessments, & potential clean-up costs if spills into water bodies occurred. Financial implications support the prioritization process & the resulting projects approved for development. We have identified cases related to climate change that either have or could impact operating expenditures: financial impact associated with regulation & taxation & impact from physical risks, including changes in temperature extremes, changes in precipitation, & the frequency & intensity of cyclones/storms. A case example is our participation & funding contribution to the Rigs to Reef study at Wandoo, which could lead to maintaining current ecosystems, biodiversity & reduced ARO liabilities.

## W7.2

(W7.2) What is the trend in your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?

### Row 1

Water-related CAPEX (+/- % change)

-31

Anticipated forward trend for CAPEX (+/- % change)

15

Water-related OPEX (+/- % change)

-17

Anticipated forward trend for OPEX (+/- % change)

10

### Please explain

The year-over-year spends are based on a cursory evaluation of maintenance Capex and Opex accounts and represent approximate values. With consideration to the current global circumstances, water related Capex and Opex budgets are currently expected to increase in 2021 by approximately 15% and 10%, respectively. Should global demand and related commodity prices increase (or decrease) in the near future, both Capex and Opex budgets would be reassessed.

## W7.3

(W7.3) Does your organization use climate-related scenario analysis to inform its business strategy?

	Use of climate-related scenario analysis	Comment
Row 1	Yes	In 2019/20, we also expanded our scenario analysis process. The Board of Directors, executive team & senior management participated in a robust scenario analysis, examining two scenarios from the World Economic Forum that bring together the work of experts from the International Energy Agency to Carbon Tracker. These scenarios compare a Gradual & Rapid transition to low carbon, with the latter meeting the aims of the Paris Agreement to limit global temperature increases to 1.5°C to 2 °C. We assessed key factors impacting the speed of the energy transition, including the influence of new energy technologies, the potential speed of adoption of these technologies, anticipated changes in policy & regulation & their rate of change, & emerging market pathways. The analysis extended to the risks & opportunities related to these climate-related factors, including water issues, impacts on the company's future in the medium to long term (2050+), & strategies for Company resilience.

## W7.3a

(W7.3a) Has your organization identified any water-related outcomes from your climate-related scenario analysis?

Yes

## W7.3b

### (W7.3b) What water-related outcomes were identified from the use of climate-related scenario analysis, and what was your organization's response?

	Climate-related scenarios and models applied	Description of possible water-related outcomes	Company response to possible water-related outcomes
Row 1	2DS IRENA IEA Sustainable Development Scenario Nationally determined contributions (NDCs) Other, please specify (IEA NPS, BP Evolving Transition Scenario, Shell Sky Scenario, BP Rapid Transition Scenario)	We have identified several water-related risks associated with climate change, including tropical cyclones, rising sea levels, changes in temperature extremes & changes in precipitation extremes, which could result in outcomes such as lack of water availability for our operations, flooding, drought or storm damage. Examples include potential for physical damage to our assets (\$21MM – Cazaux battery, \$129 – Wandoo B platform & \$21MM – Garijp plant), loss of production capacity (\$6.3MM- Cazaux Lege fields, \$105MM – Wandoo field, \$54MM - Garijp field) & environmental clean-up (\$8MM– Garijp field). Note that all costs are before mitigation (i.e. Insurance).	To manage these outcomes, Vermilion employs a number of mitigation techniques including operational changes to protect worker health & safety, the environment & our assets; identification of operational efficiencies &/or capital projects to increase water efficiency & reuse, insurance, investment in response capabilities, & regulatory/external monitoring for potentially impactful trends in water use. We proactively conduct operational & engineering reviews aimed at increasing efficiency, including reducing emissions & monetary expenditure requirements at major facilities. We believe that ongoing assessment & optimization of operations, as well as the ability to respond to non-operational events, is key to reducing the impact of climate related water risks.

## W7.4

### (W7.4) Does your company use an internal price on water?

#### Row 1

#### Does your company use an internal price on water?

No, but we are currently exploring water valuation practices

#### Please explain

As part of the integrated sustainability objective within our business strategy, in 2021 we are building on our existing water data reporting to benchmark our performance against our peers, and assess potential for next steps, including reductions. This includes an assessment of natural capital accounting to identify its potential to support water valuation.

## W8. Targets

### W8.1

#### (W8.1) Describe your approach to setting and monitoring water-related targets and/or goals.

	Levels for targets and/or goals	Monitoring at corporate level	Approach to setting and monitoring targets and/or goals
Row 1	Activity level specific targets and/or goals Country level targets and/or goals Basin specific targets and/or goals	Goals are monitored at the corporate level	Activity Level Specific Targets and/or Goals: In 2019-2020, all Business Units updated their risk assessments related to water availability & the protection of water, including groundwater & water bodies. Based on sustainability strategy development over the next year, we will assess the scope & practicality of business-wide water targets. Previously, the importance of water efficiency has been managed at the Business Unit level, with goals being set on a project basis & monitored by local leadership & Corporate HSE, including for supplier engagement. Basin Specific Targets and/or Goals: In 2020, our France Business Unit set a goal to improve water use monitoring on a monthly basis to support regulatory compliance with water withdrawal limits. A spreadsheet approach was developed, with automatic calculations based on water use data in every basin, to clearly identify areas where regulatory compliance could be at issue, to enable proactive water reduction activities. Country Level Targets and/or Goals: At our Corrib facility in Ireland, our 2014-2020 Biodiversity Action Plan included water-related goals such as the construction of wetland ponds on the pipeline wayleave and at the gas terminal, small stream risk surveys, marine mammal monitoring and marine invasive species monitoring. These goals have been achieved, including the construction of 25 wetland ponds. This Plan has been renewed for 2021-2026, with additional goals for monitoring marine mammals, managing freshwater invasive plant species, and managing ponds and wetland areas to maintain biodiversity.

### W8.1b

#### (W8.1b) Provide details of your water goal(s) that are monitored at the corporate level and the progress made.

**Goal**

Engagement with suppliers to help them improve water stewardship

**Level**

Business activity

**Motivation**

Cost savings

**Description of goal**

We currently recover approximately one-third of the water used in fracturing our Cardium & condensate-rich Mannville gas wells in Alberta. We are also working to optimize, through technology, the removal of contaminants from the water. We are further striving to refine logistics for the transport of water between wells & locations in order to reduce the resulting cost, energy consumption & greenhouse gas emissions currently associated with trucking water to disposal or treatment facilities. One of the key challenges is developing technology that will support the re-use of flowback fluids. In 2013, we successfully piloted a filtration system that allowed us to save nearly 5 million litres of water in six months. This successfully reduced our hauling of fluid for disposal, decreased our impact on infrastructure & the environment, & reduced our requirements for make-up water to support our fracturing operations. This is important to the company not only for operational and cost efficiency, but to help mitigate future water availability risks; while we have identified that this is not an immediate risk, we recognize that water basins are vulnerable to climate change.

**Baseline year**

2012

**Start year**

2012

**End year**

2030

**Progress**

While this technology is not applicable to all of the wells we drill, it is available to us for those within the range of its use, and we continue to assess other opportunities for water reduction.

**Goal**

Engaging with local community

**Level**

Business

**Motivation**

Recommended sector best practice

**Description of goal**

In January 2012, the environmental approval process changed in Australia, requiring operators in the region to demonstrate their oil spill response capability to a significantly higher level than previously required. Vermilion was one of the first companies to develop an Oil Spill Contingency Plan subject to the new regulation. As we undertook this process, it became clear that Australia lacked the oiled wildlife response capability necessary to effectively manage the impact of a large oil spill on wildlife. Vermilion therefore stepped forward, setting a goal to take an industry-leading role in developing an emergency response plan suitable for such an impact. We funded the equipment to support the plan, which required the construction of a rapid response unit from DwyerTech in New Zealand. This Oiled Wildlife Container is a first response centre that would receive, assess & treat oiled wildlife. It has its own power & wash facilities to allow the animals to be cleaned & dried in a temperature-controlled facility. Staffed by three to six trained personnel, it would handle up to 50 small animals per day.

**Baseline year**

2012

**Start year**

2013

**End year**

2030

**Progress**

To enable all-industry access, we subsequently donated this equipment to the Australian Marine Oil Spill Centre, which is funded by the Australia Upstream & Downstream Industry group that includes Vermilion. This is currently the only oiled wildlife response unit available in Western Australia. Further, we created a register of trained wildlife responders, & commissioned Massey University in New Zealand, recognized leaders in the field of Oiled Wildlife Response, to conduct focused training for personnel assuming first strike & supervisory roles in the event of a spill & subsequent wildlife exposure. To ensure the resources needed to support our response plan, Vermilion has entered into agreements with several organizations to provide "at call" capacity for logistics personnel, scientists, veterinarians, equipment & reptile handling specialists. While we hope there is never a reason to use this equipment, we are proud to have meaningfully increased the spill response capabilities of industry in our operating area.

**Goal**

Watershed remediation and habitat restoration, ecosystem preservation

**Level**

Country level

**Motivation**

Increase freshwater availability for users/natural environment within the basin

**Description of goal**

Biodiversity management is important to our operations in Ireland, as we operate offshore and onshore in areas of natural significance. We therefore established a 2014-2020 Biodiversity Action Plan not only to support regulatory permits but also to assure our communities of our commitment to and progress on protecting these areas. The plan included Objective 6 to apply best practice stewardship to manage lands within the development's landholding and lease for biodiversity and ecosystem services, and to establish and implement a Land Management Plan – this including water-related goals such to consider the construction of ponds or other wetland areas on the pipeline wayleave and at the gas terminal, and to manage water courses and their margins to benefit biodiversity, along with conducting small stream risk surveys, marine mammal monitoring and marine invasive species monitoring. With the completion of the first plan timeline, we established a second plan covering 2021-2026, with objective 3.12 to manage ponds or other wetland areas to maintain habitat & species diversity, 3.16 to manage water courses and their margins to benefit biological diversity, 5.4 to remain vigilant against invasive aquatic species.

**Baseline year**

2014

**Start year**

2014

**End year**

2026

**Progress**

Our 2014-2020 Biodiversity Action Plan included specific water-related goals such as the construction of wetland ponds on the pipeline wayleave and at the gas terminal, small stream risk surveys, marine mammal monitoring and marine invasive species monitoring. These goals have been achieved, including the construction of 25 wetland ponds, marine mammal monitoring including cetaceans, and invasive species management. Species monitoring data has been shared with conservation organizations to build the database in this area. This Plan has now been renewed for 2021-2026, with additional goals that build on the success of the first plan, for monitoring marine mammals, managing freshwater invasive plant species, and managing ponds and wetland areas to maintain biodiversity.

**Goal**

Other, please specify (Improve water use data management to support regulatory and reduction purposes)

**Level**

Country level

**Motivation**

Risk mitigation

**Description of goal**

In 2020, our France Business Unit set a goal to improve water use monitoring on a monthly basis to support regulatory compliance with water withdrawal limits. A spreadsheet approach was developed, with automatic calculations based on water use data in every basin, to clearly identify areas where regulatory compliance could be at issue, to enable proactive water reduction activities.

**Baseline year**

2020

**Start year**

2020

**End year**

2021

**Progress**

The water management tool is now in place, and is being used on an ongoing basis to track water usage at every site within our basins. This provides early warnings for water withdrawals that may be larger than expected, which in turn offers an opportunity for water reduction decisions to ensure we remain within our expected water use parameters.

**W9. Verification**

**W9.1**

**(W9.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1a)?**

No, but we are actively considering verifying within the next two years

**W10. Sign off**

**W-FI**

**(W-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.**

**W10.1**

**(W10.1) Provide details for the person that has signed off (approved) your CDP water response.**

	Job title	Corresponding job category
Row 1	President	President

**W10.2**

**(W10.2) Please indicate whether your organization agrees for CDP to transfer your publicly disclosed data on your impact and risk response strategies to the CEO Water Mandate's Water Action Hub [applies only to W2.1a (response to impacts), W4.2 and W4.2a (response to risks)].**

No

Submit your response

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**In which language are you submitting your response?**

English

**Please confirm how your response should be handled by CDP**

	I am submitting to	Public or Non-Public Submission
I am submitting my response	Investors	Public

**Please confirm below**

I have read and accept the applicable Terms