

3.0 Description Of Potential Impacts Due To The Operation Of The Groundwater Well

The existing environmental setting within the study area is documented in a separate report prepared by North-South Consultants Inc. (November 2005) submitted as part of this application. The following description of the potential impacts due to the operation of the groundwater well is made in consideration of the existing environmental setting and the detailed hydrogeologic assessment of the proposed groundwater withdrawal documented in a separate report (UMA, November 2005) that has been submitted in support of a Water Rights License for this project. The potential impacts due to the construction and operation of the pipeline are discussed in a separate report prepared by Cochrane Engineering Ltd. (December, 2005).

The predicted effects to the water balance in the study area, as documented in the hydrogeologic assessment report (UMA, November 2005) are summarized as follows:

The proposed source of the groundwater for this project is a deep, confined aquifer located within the glaciofluvial sediments underlying the Agassiz Sandilands Uplands. These sediments are part of an extensive aquifer complex that extends from the Trans Canada Highway to the north to near the United States border to the south, and from the Bedford Ridge east to near the Lake of the Woods. The surficial soils in the area are predominantly sand and as a result, the infiltration rate of precipitation is high as is the recharge rate to the aquifers. Regionally, drainage is poor and extensive bogs are present to the east (St. Labre Bog), south (Caliento Bog), southwest (Rat River Swamp) and north (Brokenhead Swamp). To the west, drainage works have been constructed (ie: Davidson Ditch) to enhance the run-off of excess water and improve the suitability of the land for agriculture.

The results of previous and the current studies have shown that in the area of the proposed well there are three aquifer systems, described as follows:

Upper Sand Unit - The upper aquifer system is an unconfined aquifer which extends from surface to a depth of 30 to 40 metres, where it is underlain by a low permeability Upper Silt Unit. Precipitation infiltrates rapidly into this aquifer and then flows west off the Bedford Ridge and onto the adjoining lowlands. Beneath the uplands, the water table is at a depth of 7.5 metres in the immediate area of the proposed groundwater well, and up to a depth of 38.5 metres elsewhere. Direct interaction between the groundwater in the upper aquifer system and the surface environment is therefore limited. To the west in the lowlands, the majority of the surface and shallow water is likely derived from drainage of this upper aquifer system.

Lower Sand Unit – An intermediate confined aquifer system is present from a depth of 50 to 70 metres (locally to 100 metres). The depth to the piezometric surface in this aquifer is approximately 24 metres in the immediate area of the proposed groundwater well. The large difference in depths to water between the upper and intermediate aquifer systems (16.5 metres) confirms that the lower permeability Upper Silt Unit is effectively limiting the vertical movement of groundwater downwards. Groundwater flow in this aquifer system is from east to west. Recharge of the aquifer is likely the result of the cumulative effects of small amounts of infiltration through

the Upper Silt Unit over a very large area, and potentially the infiltration of water from the surface to the east in the St. Labre Bog area where the lower permeability Upper Silt Unit is absent.

Sandstone – The lower aquifer system in the area of the proposed groundwater well is contained within the sandstone aquifer located directly above the Precambrian granitic bedrock. This aquifer system is separated from the Lower Sand Unit system by a low permeability Lower Till Unit which limits the downward vertical flow of groundwater from the Lower Sand Unit.

The target aquifer system selected for this project is the Lower Sand Unit. This aquifer system was selected because it has a limited hydraulic connection with the surface environment within the area of influence of the well and therefore the environmental effects of groundwater withdrawal would be minimized. In particular, the studies conducted at this site have shown that the proposed groundwater withdrawal will not affect the water balance within the Pocock Lake Ecologic Reserve, the Watson P. Davidson Wildlife Management Area nor the Sandilands Provincial Forest as all these areas rely on groundwater flow within the Upper Sand Unit which will not be affected by pumping from the deeper aquifer.

3.1 Type, Quantity and Concentration of Pollutants to be Released

3.1.1 Releases into the Air

During operation of the groundwater wells there will be no releases of pollutants to the air. During construction, dust will be raised by construction equipment and there will be gaseous and particulate emissions from the construction equipment. Water spraying is an important, common and practical procedure that would be applied as required to alleviate potential dust problems. Emissions of gases and particulates would be minimized by keeping machinery in good working order. Any effects would be localized, temporary and insignificant.

3.1.2 Releases into the Water

During operation of the groundwater wells there will be no releases of pollutants to the water. During construction, there is a risk that fuel or lubricant spills from heavy equipment and vehicle operation. The storage of fuel or lubricants within the area of the well construction site will not be allowed. Therefore, the potential spills will be very small in size and standard construction spill clean-up procedures, including the removal of any impacted soil, will be used to prevent impact to the groundwater. There are no surface water bodies in the area of the well site and therefore surface water impacts are not likely.

3.1.3 Releases onto the Land

During operation of the groundwater wells there will be no releases of pollutants to the land. During construction, there is a risk that fuel or lubricant spills from heavy equipment and vehicle operation. The storage of fuel or lubricants within the area of the well construction site will not be allowed. Therefore, the potential spills will be very small in size and standard construction spill clean-up procedures, including the removal of any impacted soil, will be used to prevent impact.

3.2 Impacts on Wildlife

The well site is located adjacent to a road right-of-way that is regularly used by recreational all terrain vehicles. The presence of humans and machinery is therefore common. Wildlife may experience some short term, localized disturbance during construction at the well site due to the presence of humans, vehicles and machinery. This will be of short term duration and will not adversely affect wildlife.

During the operation of the well system, groundwater will be withdrawn from a lower confined aquifer and as a result groundwater pressures will be locally lowered. As is discussed in the hydrogeologic assessment report (UMA, November 2005), the lower confined aquifer has a very limited hydraulic connection with the upper unconfined aquifer which is in contact with the surface environment. As a result of this natural restriction to vertical flow, the withdrawal of groundwater from the lower aquifer will not adversely affect the shallow unconfined aquifer water balance and therefore wildlife habitat will not be affected.

3.3 Impacts On Fisheries

There are no surface water bodies in the area of the well site and therefore impacts to aquatic habitat during construction of the well site is not likely. As is discussed in the hydrogeologic assessment report (UMA, November 2005), the withdrawal of groundwater during operation will not significantly change the water balance in the surface water courses. Therefore, aquatic habitat will not be affected.

3.4 Impacts on Surface Water and Groundwater

As is discussed in the hydrogeologic assessment report (UMA, November 2005), the withdrawal of groundwater during operation will not significantly change the water balance in the surface water courses in the area. The report also documents that the proposed groundwater withdrawal rate is sustainable and will not result in the depletion of the groundwater resource, nor changes to the water quality.

3.5 Impacts on Forestry and Vegetation

The development of the well site will require minimal clearing of vegetation as the selected site is within a natural clearing. A few trees may need to be removed to allow equipment to access the site. The clearing of trees will be kept to a minimum as it is considered desirable to maintain a natural visual barrier around the well site. It should be noted that the well site is located within the Sandilands Provincial Forest. This forest is designated for timber harvesting and as a result is periodically cleared and revegetated. The local clearing of a small area of vegetation for this well site is therefore not a concern.

As is documented in the hydrogeologic assessment report (UMA, November 2005), in the area of the well site, the unconfined water table is located at a depth of approximately 6.5 metres below grade. The groundwater will be withdrawn from a deeper confined aquifer below the upper unconfined aquifer and there is a very limited vertical hydraulic connection between the two aquifers. Therefore, the withdrawal of groundwater will not significantly change the water balance in the upper soil zone and neither surficial vegetation nor the productivity of the forest will be adversely affected.

3.6 Impacts on Heritage Resources

All project components will be constructed and operated within existing road right-of-ways or clearings. All these lands have been previously disturbed by construction of the roads and adjoining ditches. Therefore, the project is unlikely to cause significant adverse impacts to heritage resources. There are no known culturally or historically significant areas at the well site. The Manitoba Heritage Resources Branch will be reviewing this proposal as part of the Environment Act License application process.

3.7 Socioeconomic Implications Resulting From Environmental Impacts

No significant environmental impacts associated with the construction and operation of this project have been identified. Therefore, no socioeconomic impacts as a result of this project are expected. Population demography is not expected to change as a result of this project. There will be a small temporary

increase in economic opportunities associated with the construction of the well site and therefore there will be a short term positive impact. The system will be operated as part of the existing water treatment and distribution system and additional long term economic opportunities are expected to be minimal. The only visual features of the project will be the well head and associated 2.5 x 3 metre control building. These facilities will be located within a natural clearing adjacent to an existing trail that will only be visible to recreational users of the area. Long term visual effects are therefore minimal.

As part of the review of the potential socio-economic implications of this project, a public consultation process was initiated to identify any potential concerns. The consultation included contacting the seven municipal governments in the vicinity of the proposed project, providing them with information on the proposed project and soliciting feedback. A summary of the results of this consultation is included in Appendix B. As indicated, the only significant concerns were expressed by the Rural Municipality of Piney. These concerns related to the sustainability of the groundwater supply and the environmental reviews that would be completed. Both these concerns have been addressed in this Environment Act License submission and the submission made to MB Water Stewardship for a Water Rights License.