



Sewage Disposal Update: Sumps for Sewage Outfalls at CAM-3, FOX-3, DYE-M, and BAF-3

Licensee: Department of National Defence (DND),
Government of Canada

Licenses, Locations, & Monitoring Station #s:

Licence	Location	Monitoring Station # (Final Discharge Point from the Sewage Disposal Facility)
3BC-SHE0919 Type "B"	CAM-3 North Warning System Site, Shepherd Bay, Kitikmeot Region, Nunavut	SHE-2
3BC-FOD0919 Type "B"	FOX-3 North Warning System Site, Dewar Lakes, Qikiqtani Region, Nunavut	FOD-2
3BC-DYE0919 Type "B"	DYE-M North Warning System Site, Cape Dyer, Qikiqtani Region, Nunavut	DYE-2
3BC-BAF0919 Type "B"	BAF-3 North Warning System Site, Brevoort Island, Qikiqtani Region, Nunavut	BAF-2

Update prepared by: Nasittuq Corporation

Date: 28 January 2010

Background

The current methodology of pumping untreated waste water directly onto the tundra is not acceptable to the authority having jurisdiction, the Nunavut Water Board (NWB), and does not meet the conditions of the revised water licenses issued by the NWB in September 2009 for CAM-3, FOX-3, DYE-M, and BAF-3. The revised licenses require all effluent from the current Sewage Disposal Facility be disposed to a sump which is defined as "an excavation for the purpose of catching or storing liquids such as greywater with the water draining to the soil". Further, the sump must be located at least 31 meters above the ordinary high water mark of any water body, at a site where direct flow into a water body is not possible, and no additional impacts are created. The revised licenses require a "Sewage Disposal Update" be submitted to the NWB for approval. The update must include the dimensions and capacity of the sump "to be located at the sewage outfall".

After being informed that the current situation of discharging untreated waste water directly onto the tundra was unacceptable to the NWB, Nasittuq proposes to build sumps at CAM-3, FOX-3, DYE-M, and BAF-3 to satisfy the requirements of the water licenses.

The Statement of Work below covers the construction and maintenance of sumps at CAM-3, FOX-3, DYE-M, and BAF-3.

Statement of Work

CAM-3

Construct a sump from native material at the outfall of Train A sewage discharge piping. Native material consists of coarse aggregate (medium rock/boulder down to sand). The area is un-surveyed. It consists of uneven terrain generally sloping away from the outfall piping. The sump shall be located at a minimum distance of thirty-one (31) meters above the ordinary high water mark of any water body, at a site where direct flow into a water body is not possible and no additional impacts are created. Attached sketch **SK-01 CAM-3 Topographic Site Map** shows the topography of the site and the location of the sump in relation to water bodies.

Level the construction area to the extent possible by subsurface conditions. The uphill portion of the sump should blend into the natural angle of the native slope. Deposit native material around the construction area perimeter to create a berm. Use native material from the surrounding area as required to construct a berm to the height indicated in the attached sketch **SK-02 CAM-3 Sewage Outfall Sump Plan and Sections**. The bottom of the sump should maintain the existing natural grade. Scarify and line the bottom of the sump with rip-rap sized 10 cm and under.

Compact the berm in layers no greater than 0.3 meter thickness. The berm shall be circular and measure 3 meters in diameter and be of sufficient height to contain approximately 2.5 meters³ of effluent in the sump. Repair or replace damaged sections of sewage outfall piping. Refer to attached sketch **SK-02**.

The sump shall be constructed and in use no later than August 31, 2010. Photos of completed sump and outfall system will be forwarded to NWB upon project completion.

The sump will be reevaluated after one year of use in order to ensure that it has sufficient capacity to handle the quantity of effluent produced at the site. If it is determined that the sump is undersized, it will be appropriately altered to increase capacity. Additionally, regular maintenance will be performed to the sump in order to empty out built up sludge as necessary in order to maintain capacity. Sludge will be deposited in an approved landfill site.

FOX-3

Construct a sump from native material at the outfall of Train A sewage discharge piping. Native material consists of coarse aggregate (medium rock/boulder down to sand). The area is un-surveyed. It consists of uneven terrain generally sloping away from the outfall piping. The sump shall be located at a minimum distance of thirty-one (31) meters above the ordinary high water mark of any water body, at a site where direct flow into a water body is not possible and no additional impacts are created. Attached sketch **SK-05 FOX-3 Topographic Site Map** shows the topography of the site and the location of the sump in relation to water bodies.

Level the construction area to the extent possible by subsurface conditions. The uphill portion of the sump should blend into the natural angle of the native slope. Deposit native material around the construction area perimeter to create a berm. Use native material from the surrounding area as required to construct a berm to the height indicated in the attached sketch **SK-06 FOX-3 Sewage Outfall Sump Plan and Sections**. The bottom of the sump should maintain the existing natural grade. Scarify and line the bottom of the sump with rip-rap sized 10 cm and under.

Compact the berm in layers no greater than 0.3 meter thickness. The berm shall be circular and measure 3 meters in diameter and be of sufficient height to contain approximately 2.5 meters³ of effluent in the sump. Repair or replace damaged sections of sewage outfall piping. Refer to attached sketch **SK-06**.

The sump shall be constructed and in use no later than August 31, 2010. Photos of completed sump and outfall system will be forwarded to NWB upon project completion.

The sump will be reevaluated after one year of use in order to ensure that it has sufficient capacity to handle the quantity of effluent produced at the site. If it is determined that the sump is undersized, it will be appropriately altered to increase capacity. Additionally, regular maintenance will be performed to the sump in order to empty out built up sludge as necessary in order to maintain capacity. Sludge will be deposited in an approved landfill site.



DYE-M

Construct sumps from native material at the outfall of the sewage discharge piping for Train A and Train B. Native material consists of coarse aggregate (rock/boulder down to sand). The area is un-surveyed. It consists of uneven terrain generally sloping away from the outfall piping. The sumps shall be located at a minimum distance of thirty-one (31) meters above the ordinary high water mark of any water body, at a site where direct flow into a water body is not possible and no additional impacts are created. Attached sketch **SK-03 DYE-M Topographic Site Map** shows the topography of the site and the location of the sump in relation to water bodies.

Level the construction area to the extent possible by subsurface conditions. The uphill portion of the sumps should blend into the natural angle of the native slope. Deposit native material around the construction area perimeter to create a berm. Use native material from the surrounding area as required to construct a berm to the height indicated in the attached sketch **SK-04 DYE-M Sewage Outfall Sump Plan and Sections**. The bottom of the sumps should maintain the existing natural grade. Scarify and line the bottom of the sumps with rip-rap sized 10 cm and under.

Compact the berms in layers no greater than 0.3 meter thickness. The berms shall be circular and measure 3 meters in diameter and be of sufficient height to contain approximately 2.5 meters³ of effluent in the sumps. Repair or replace damaged sections of sewage outfall piping. Refer to attached sketch **SK-04**.

Sumps shall be constructed and in use no later than August 31, 2010. Photos of completed sump and outfall system will be forwarded to NWB upon project completion.

Sumps will be reevaluated after one year of use in order to ensure that they have sufficient capacity to handle the quantity of effluent produced at the site. If it is determined that the sumps are undersized, they will be appropriately altered to increase capacity. Additionally, regular maintenance will be performed to the sumps in order to empty out built up sludge as necessary in order to maintain capacity. Sludge will be deposited in an approved landfill site.

BAF-3

Construct a sump from native material at the outfall of the Accommodations Module sewage discharge piping. Native material consists of coarse aggregate (medium rock/boulder down to sand). The area is un-surveyed. It consists of uneven rocky terrain generally sloping away from the outfall piping. The sump shall be located at a minimum distance of thirty-one (31) meters above the ordinary high water mark of any water body, at a site where direct flow into a water body is not possible and no additional impacts are created. Attached sketch **SK-07 BAF-3 Topographic Site Map** shows the topography of the site and the location of the sump in relation to water bodies.

Level the construction area to the extent possible by subsurface conditions. The uphill portion of the sump should blend into the natural angle of the native slope. Deposit native material around the construction area perimeter to create a berm. Use native material from the surrounding area as required to construct a berm to the height indicated in the attached sketch **SK-08 BAF-3 Sewage Outfall Sump Plan and Sections**. The bottom of the sump should maintain the existing natural grade. Scarify and line the bottom of the sump with rip-rap sized 10 cm and under.

Compact the berm in layers no greater than 0.3 meter thickness. The berm shall be semi-circular and located approximately 2 meters from the sewage discharge. The berm shall be of sufficient height to contain approximately 2.5 meters³ of effluent in the sump. Repair or replace damaged sections of sewage outfall piping. Refer to attached sketch **SK-08**.

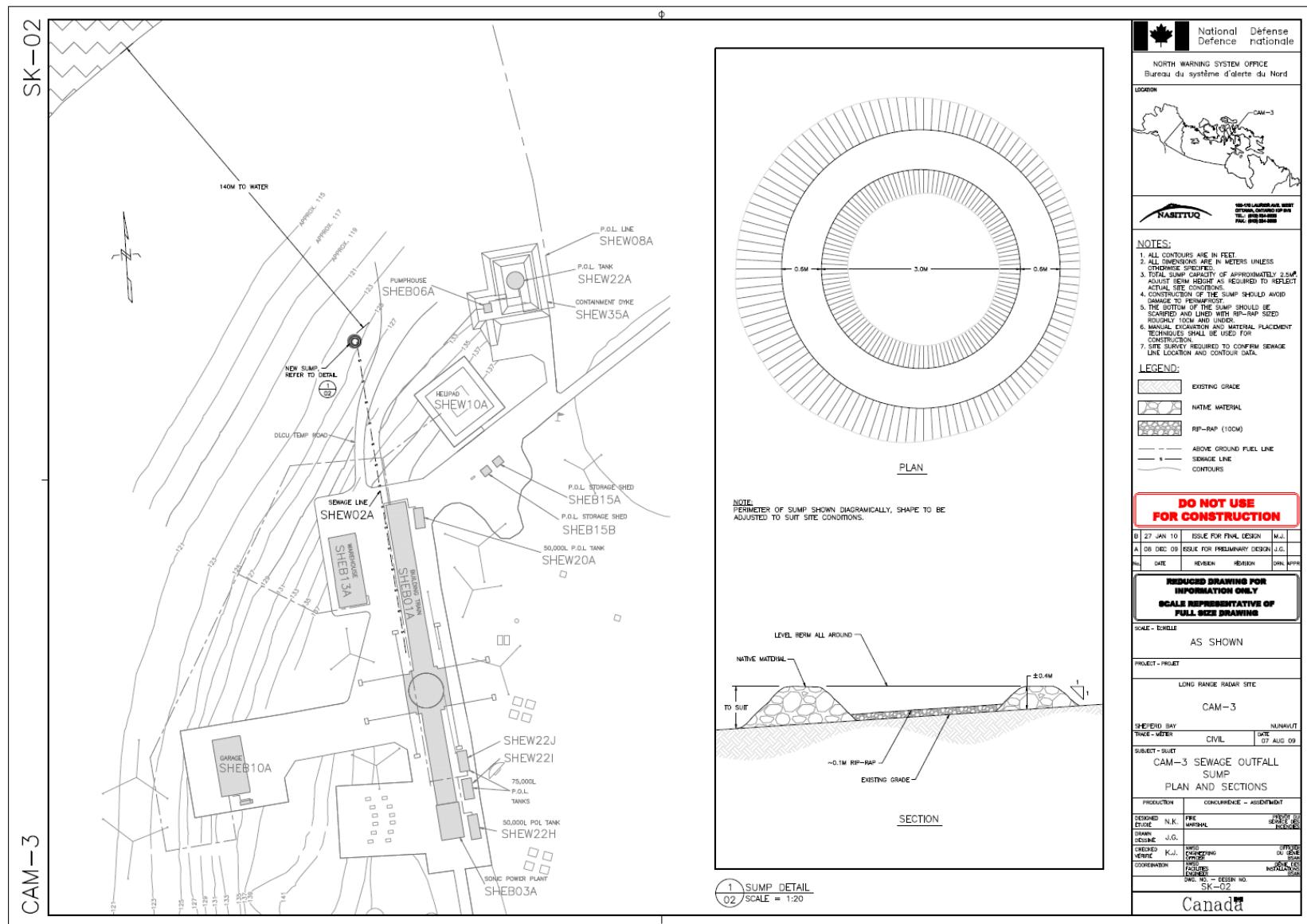
The sump shall be constructed and in use no later than August 31, 2010. Photos of completed sump and outfall system will be forwarded to NWB upon project completion.

The sump will be reevaluated after one year of use in order to ensure that it has sufficient capacity to handle the quantity of effluent produced at the site. If it is determined that the sump is undersized, it will be appropriately altered to increase capacity. Additionally, regular maintenance will be performed to the sump in order to empty out built up sludge as necessary in order to maintain capacity. Sludge will be deposited in an approved landfill site.



Sewage Disposal Update: Sumps for Sewage Outfalls at CAM-3, FOX-3, DYE-M, & BAF-3

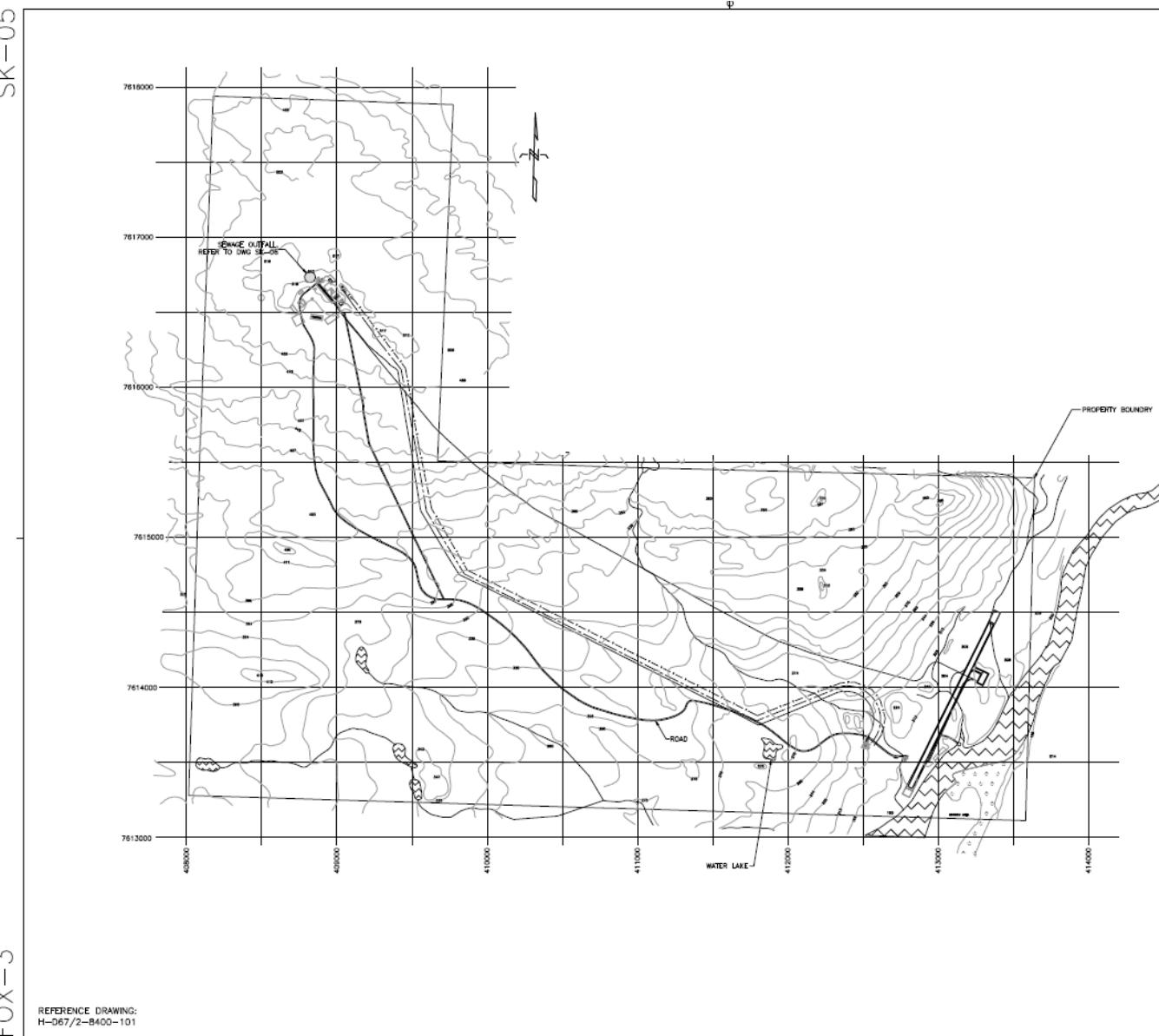
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Sewage Disposal Update: Sumps for Sewage Outfalls at GAM 3, FOX 3, DYE M, & RAE 3

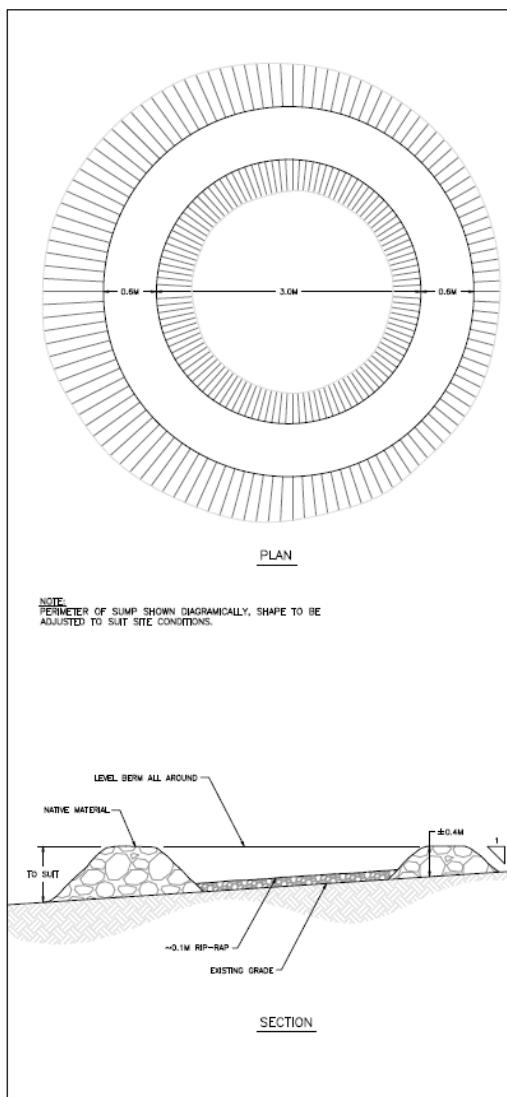
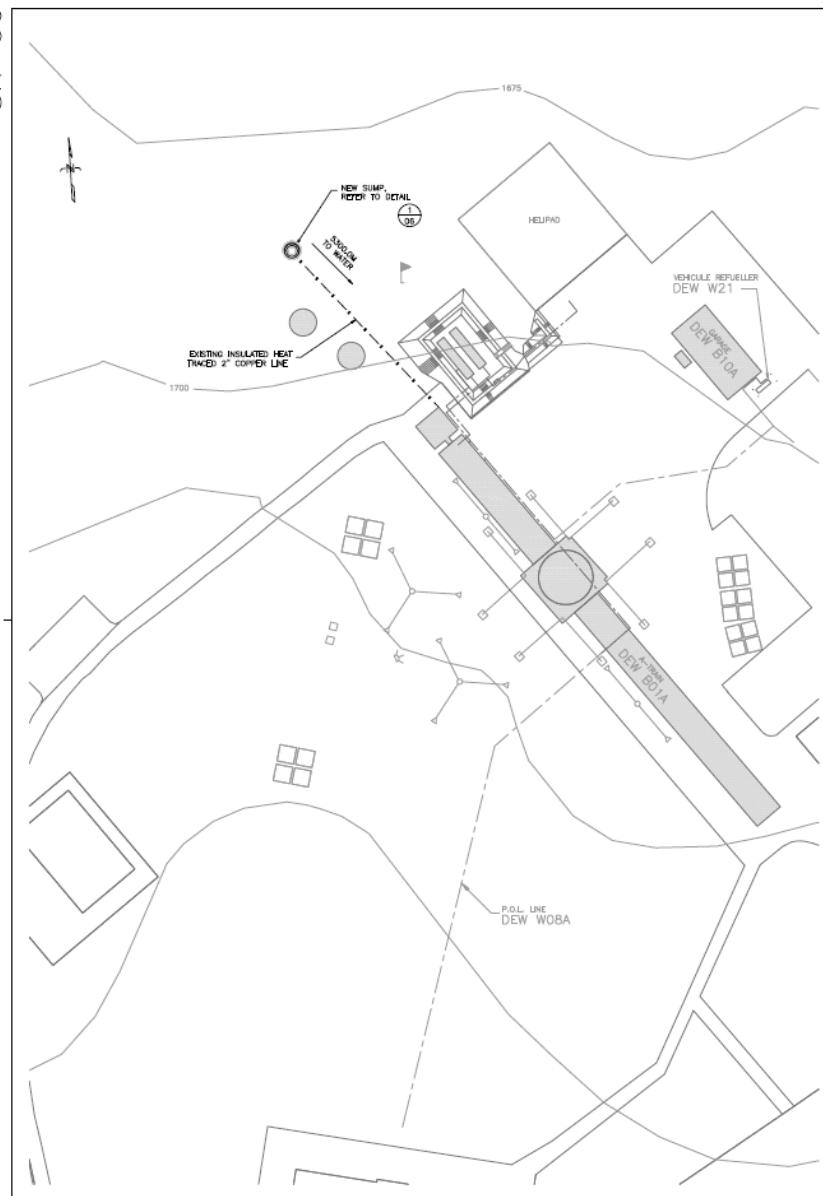
at CAM-5, F
28 Jan 2010

SK-05



REFERENCE DRAWING:
H-067/2-B400-101

SK-06



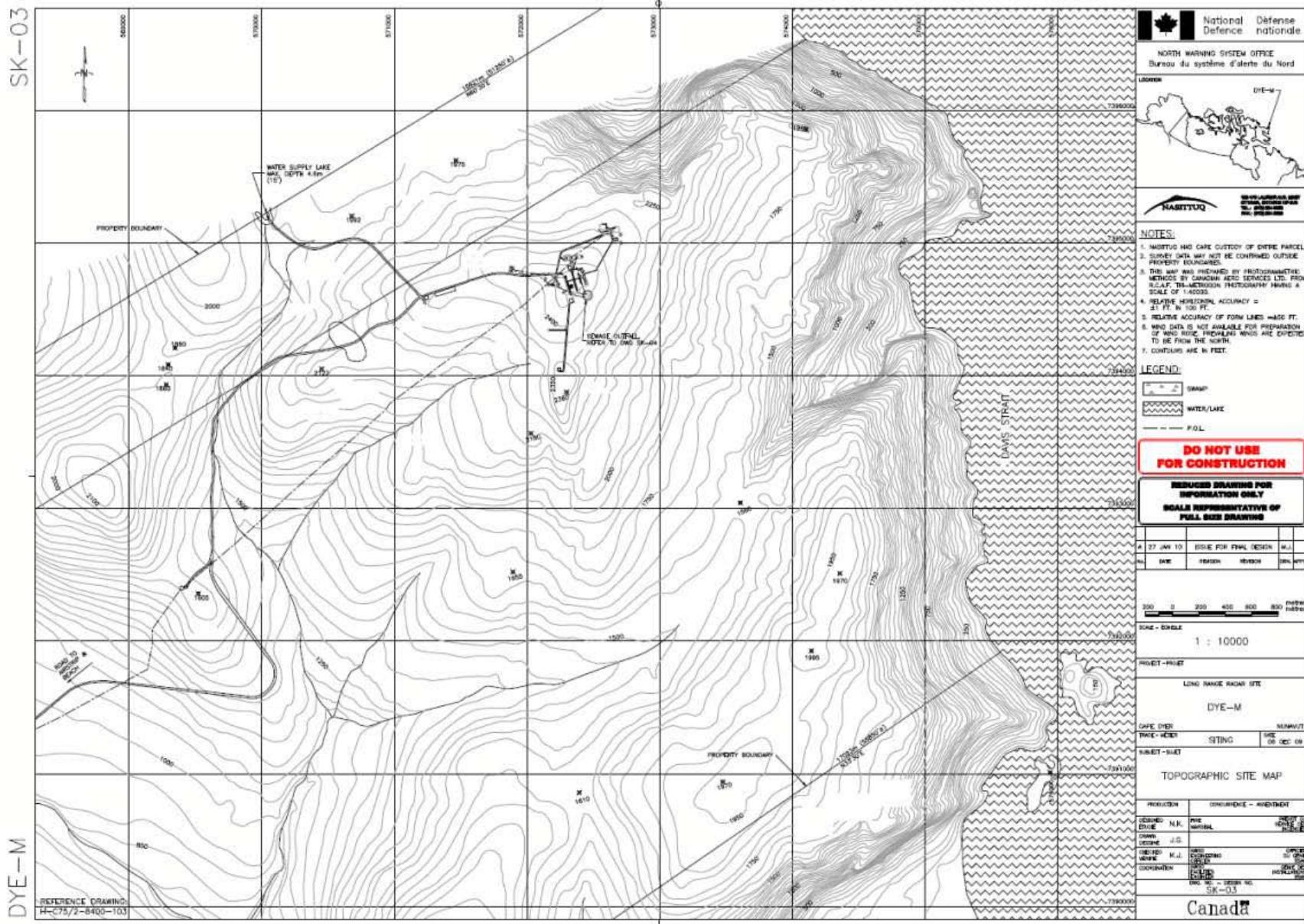
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06 SCALE - 1:20

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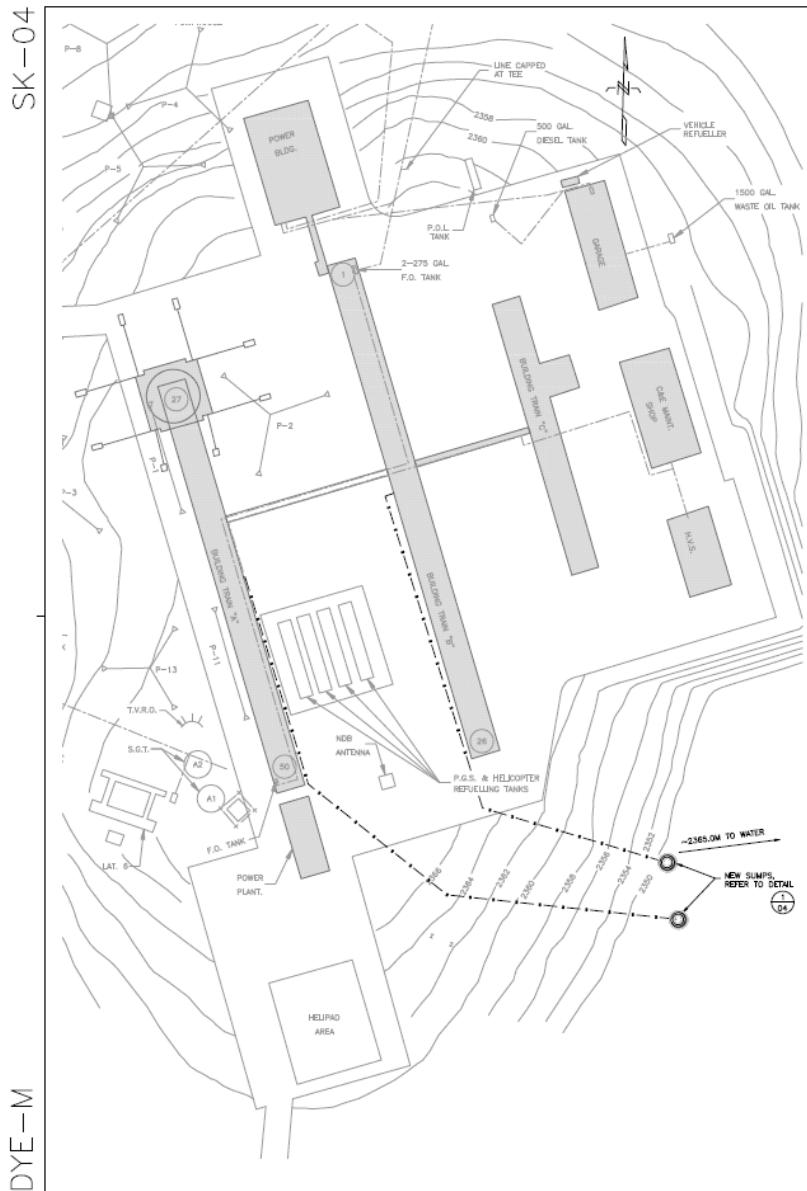
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SK-03



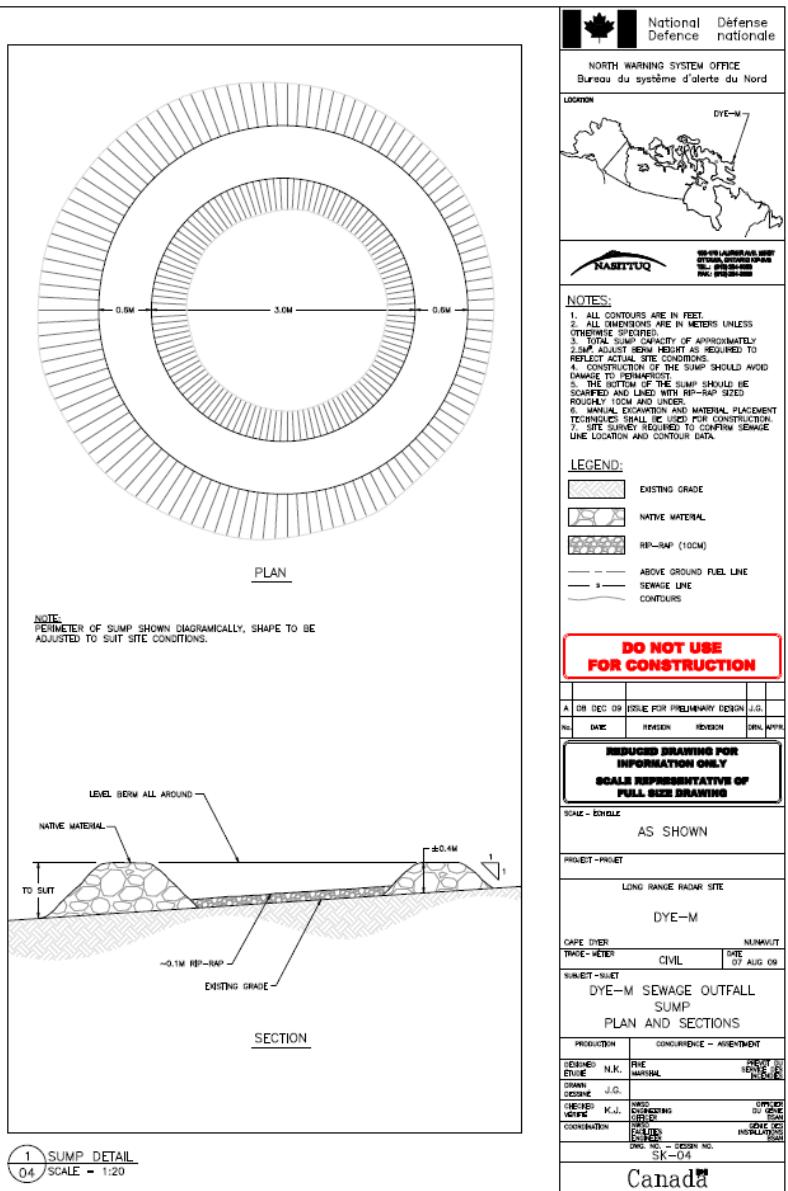


SK-04



Sewage Disposal Update: Sumps for Sewage Outfalls at CAM-3, FOX-3, DYE-M, & BAF-3

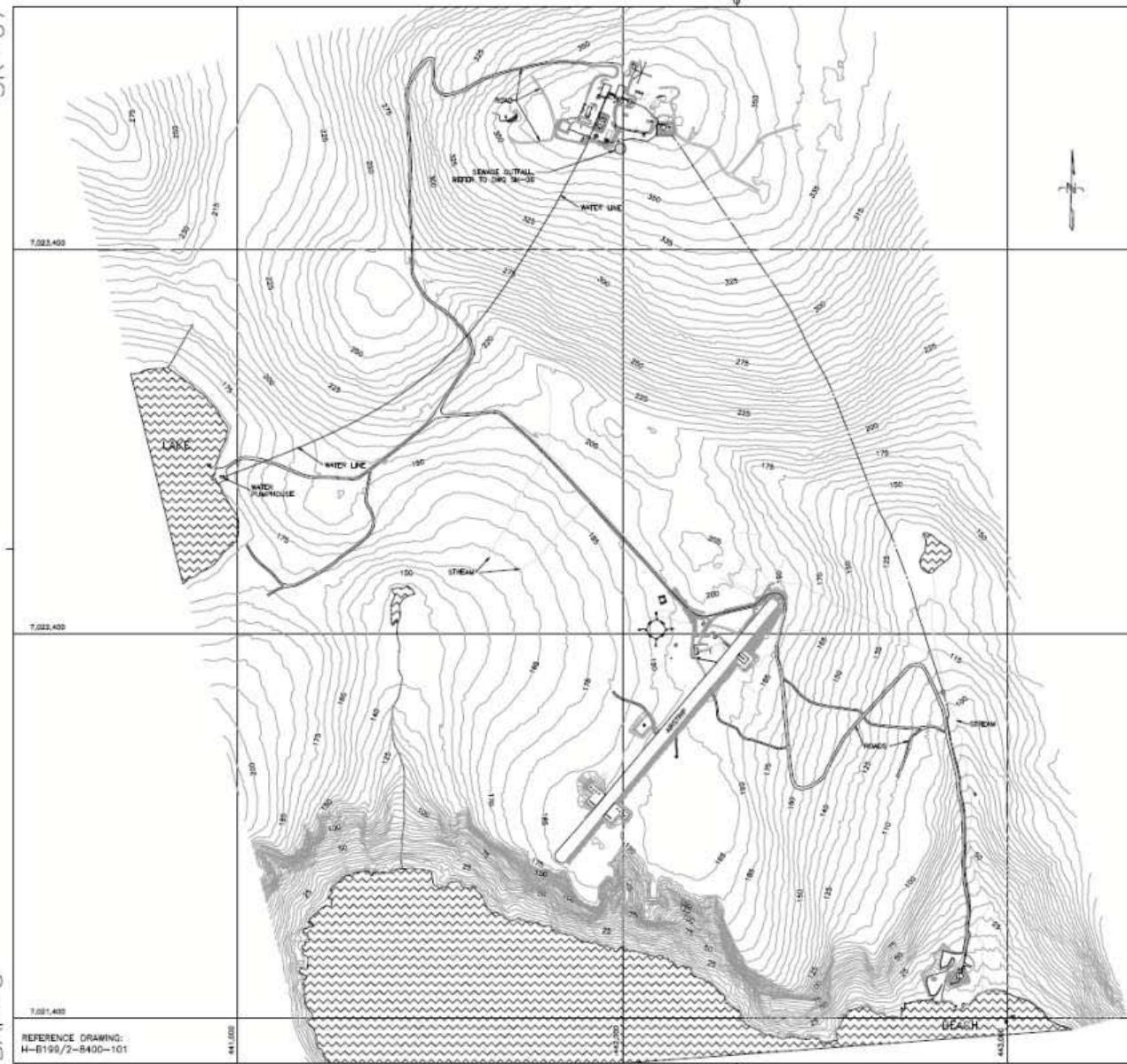
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SK-07

BAE-3



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