BACK RIVER PROJECT
Fuel Management Plan

Type B Development Works Water Licence

August 2017

Version 2.0

BACK RIVER PROJECT
FUEL MANAGEMENT PLAN

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Acronyms

CCME	Canadian Council of Ministers of the Environment
CCG	Canadian Coast Guard
FMP or Plan	Fuel Management Plan
MLA	Marine Laydown Area
NWB	Nunavut Water Board
Project	Back River Project
OPEP	Oil Pollution Emergency Plan
Sabina	Sabina Gold & Silver Corp.
SCP	Comprehensive Spill Contingency Plan
SOPEP	Shipboard Oil Pollution Emergency Plan
WHMIS	Workplace Hazardous Materials Information System
WIR	Winter Ice Road

1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of southwestern Nunavut. It is situated approximately 400 kilometres (km) southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet (Kingaok), and 520 km northeast of Yellowknife, Northwest Territories. The Project is located predominantly within the Queen Maud Gulf Watershed (Nunavut Water Regulations, Schedule 4).

The Project is comprised of two main areas with interconnecting winter ice roads (WIR): Goose Property (Appendix A of the MAD, base Figure 2) and the Marine Laydown Area (MLA) (Appendix A of the MAD, base Figure 3) situated along the western shore of southern Bathurst Inlet. The majority of annual resupply will be completed using the MLA, and an approximately 160 km long WIR will interconnect these sites.

The Fuel Management Plan (FMP or Plan) outlines the approach for managing hydrocarbon products that are to be stored and managed at the Project. This plan includes provisions for the MLA and the Goose Property. The FMP is intended to support the Type B Water Licence Application for the Project.

The Plan was prepared following the requirements of:

- the Supplementary Information Guidelines (SIG) for Mining and Milling MM3 and Water Works M1, issued by Nunavut Water Board (NWB 2010 a, b);
- the Environmental Impact Statement Guidelines issued by the Nunavut Impact Review Board to Sabina (NIRB 2013); and
- in accordance with best management practices and in conformance with current Federal and Territorial statutory requirements.

The information presented herein is current as of August, 2017.

2. Scope and Objectives

This Fuel Management Plan has been written to meet requirements of a Type B Water Licence and entails the implementation of procedures for transportation, handling, inspection, storage, transfer, reporting, and documentation of all fuel products in relation to the site preparation and development work activities as described in Table 2-1. The Plan is supported by a suite of Project-specific mitigation, monitoring, and/or management plans that set out the Project's standards and requirements for particular areas of environmental management, including the:

- Comprehensive Spill Contingency Plan (August 2017);
- Fuel Management Plan (August 2017);
- Road Management Plan (August 2017);
- Quarry Management Plan (August 2017);
- Oil Pollution Emergency Plan (August 2017);
- Environmental Management and Protection Plan (August 2017); and
- Interim Closure and Reclamation Plan and cost estimate (August 2017) specific to development works.

Included within the plans are monitoring with adaptive management measures to confirm that the Project is executed as planned, that mitigation is successful, and potential adverse effects are minimized.

Table 2-1. List of Activities

GOOSE PROPERTY
Goose Exploration Camp Operation
Ice Airstrip Construction and Operation
Mobilize Fuel, Equipment, and Supplies
Winter Ice Road Construction and Operation
Operate Airstrip Quarry
Operate Umwelt Quarry
Locate Temporary Fuel Storage
Construct All-weather Service Roads and Water Crossings
Construct Goose Plant Site and Fuel Storage Area Pad
Airstrip Extension
Rascal Stream Re-alignment
Relocate Explosives Storage Area
Water Intake Installation
MARINE LAYDOWN AREA
Ice Airstrip Construction and Operation
Mobilize Fuel, Equipment, and Supplies (Air)
Upgrade Temporary Exploration Camp
Operate MLA Quarry
Construct All-weather Service Roads, Laydown Areas, and Fuel Storage Area
Mobilize Additional Fuel, Equipment, and Supplies (Vessels)
Install One Steel Bulk Fuel Tank
Water Intake/Discharge Installation

3. Applicable Legislation and Guidelines

Federal and Territorial legislation that is applicable to fuel management in Nunavut is presented in Table 3-1.

Other applicable standards, systems, and regulatory bodies include:

- Underwriters' Laboratories of Canada (ULC) Standards;
- Canadian Standards Association (CSA) Standards;
- Workplace Hazardous Materials Information System (WHMIS); and
- Workers' Compensation Board (WCB).

Table 3-1. Applicable Legislation for Back River Project Fuel Management

Acts	Regulations	Guidelines
Federal		
Canadian Environmental Protection Act (1999 c.33)	*Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* (SOR/2008-197) *Environmental Emergency Regulations* (SOR/2003-307) *Interprovincial Movement of Hazardous Waste and Hazardous Recyclable Material Regulations* (SOR/2002-301)	Canadian Council of the Ministers of Environment - Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products Notice with respect to substances in the National Pollutant Release Inventory Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil
Transportation of Dangerous Goods Act (1992, c. 34)	*Transportation of Dangerous Goods Regulations* (SOR/2001-286)	
Fisheries Act (1985, c. F-14)		
		National Fire Code of Canada (2010)
Territorial – Nunavut and Northwest Territories		
Nunavut Environmental Protection Act	*Spill Contingency Planning and Reporting Regulations* (NWT Reg (Nu) 068-93) *Used Oil and Waste Fuel Management Regulations* (NWT Reg 064-2003)	Guideline for the General Management of Hazardous Waste in Nunavut Guideline for Industrial Waste Discharges in Nunavut Guideline for the Management of Waste
Nunavut Waters and Nunavut Surface Rights Tribunal Act (S.C. 2002, c.10)	*Nunavut Water Regulations (SOR/2013-69)*	Guidelines for Spill Contingency Planning, Aboriginal Affairs and Northern Development Canada
Territorial Lands Act		
Mackenzie Valley Resource Management Act		

Sabina notes that the Canadian Coast Guard (CCG) is the lead federal agency for all ship-source spills or pollution incidents in water under Canadian jurisdiction. Sabina recognizes its responsibility to manage

the risks effectively and to be prepared to respond in the event of a spill. Response to spills that occur during the act of shipping will be covered under the vessel's Shipboard Oil Pollution Emergency Plan (SOPEP). The SOPEP is a required document that must be reviewed and approved by Transport Canada.

The *Canada Shipping Act,* 2001, stipulates that operators of designated oil handling facilities must have an Oil Pollution Emergency Plan (OPEP). An OPEP must be reviewed and approved by Transport Canada.

Transport Canada and the CCG have the expertise, jurisdiction, and mandate to advise on shipping and marine spill response, in accordance with the *Canada Shipping Act* and its regulations, which include numerous specific requirements relating to shipping in the Canadian Arctic and marine spill prevention and response. Other federal agencies and departments, such as Fisheries and Oceans Canada, the CCG, and Environment and Climate Change Canada, have distinct but interrelated responsibilities for the management of marine transportation safety and environmental protection in the Arctic (FEIS Volume 10, Chapter 15, Appendix A) (FEIS Addendum Section 9.3, Accidents and Malfunctions (Addenda)).

4. Roles and Responsibilities

The General Manager is ultimately responsible for the success of this plan and approves all relevant policies and documents, auditing, action planning, and the verification process.

The Environmental Superintendent is responsible for ensuring regular inspection of petroleum storage facilities at the Project and will coordinate with the relevant Superintendents with respect to their areas of responsibility. All employees, contractors, and contractor employees are responsible for complying with the intent of this plan.

All manifests, training, and other tracking documentation will be maintained and kept readily available, as required, by the Environmental Superintendent or designate.

Contractors who will be interacting with fuel will be trained in Sabina's FMP and in the safe handling procedures, emergency response, and spill contingency procedures consistent with the OPEP and Comprehensive Spill Contingency Plan (SCP). As a contractual condition with penalties, Contractors will be obliged to comply with Sabina's approvals and environmental management plans, including this plan. Sabina staff will monitor contractor performance and adherence to legislation and the commitments in the environmental management plans.

5. Facility Planning and Fuel Delivery

5.1 GOOSE PROPERTY

All fuel to be used in support of the development works, as well as ongoing exploration and environmental monitoring programs will be stored within existing fuel storage located at the Goose Exploration Camp comprised of thirteen 75,000 L double-walled fuel tanks, one 40,000 L fuel bladder, and additional drummed fuel storage. Fuel will continue to be either flown to Goose by aircraft or hauled to Goose by Cat-train from a supply tanker/barge or aircraft cargo delivery to the MLA.

The handling and storage of this fuel is currently licensed under NWB 2BE-GEO1520 and 2BE-GOO15020. Overland winter access activities (Cat-train) for Sabina exploration activities is currently licensed under Kitikmeot Inuit Association land use permit: KTL304F049, and Indigenous and Northern Affairs Canada land use permit: N2017F0016. Sabina intends to maintain these licenses.

One 15 ML field erected fuel tank will be constructed at the Goose Property as part of the development works. The Goose Fuel Storage Area will be constructed in conformance with the Canadian Council of Ministers of the Environment (CCME) Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME 2003), and the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* (2008). Project fuel storage facilities will be designed to have bermed spill containment with capacity equal to the volume of the largest tank plus 10% of the volume of the remaining tanks, or 110% volume of the largest tank, whichever is greater. The fuel tank storage areas embankments (or bund) will be lined with HDPE for spill containment. The fuel storage areas will be provided with standard instrumentation and controls to monitor and safely manage the inventory in the tanks.

Sabina is committed to provide detailed designs for construction of the 15 ML fuel storage and fuel transfer facilities at the Goose Property to the NWB at least 60 days prior to construction of fuel storage facilities and associated infrastructure. Sabina expects the Engineer of Record or the service provider through the Engineer of Record will confirm detailed implementation plans for fulfilling contractual responsibilities including procedures and schedules for testing of all fuel containments systems. The Engineer of Record or service provider will also confirm how their fire and contingency plans needs will be confirmed and integrated into Sabina's overall Risk Management and Emergency Response Plan.

The current conceptual fuel storage facility placements for the Goose are presented in Figure 5.1-1. Note, Sabina intends to construct only one of the fuel tanks as part of development works.

5.2 MARINE LAYDOWN AREA

Fuel for the development works and ongoing exploration and environmental programs brought to the MLA will be initially mobilized in nine approximately 70,000 L double walled fuel tanks via the ice airstrip. These materials will be flown in on 737 combi's and Hercules sized aircraft. These tanks will be installed within tertiary Arctic-grade Insta-berms. This temporary storage of fuel is required as permanent storage tanks are under construction. As built drawings will be provided 90 days following installation.

During the open water season, fuel will travel in tanker ships and/or barges, and then will be transferred through floating hose to on land storage tanks at the MLA. The summer sealift freight will originate from the east from Bécancour, Quebec or from the west from Vancouver, British Columbia, largely depending on the origin of the goods. Other points of origin, including international locations, may be considered

in the future. Freight originating from Bécancour will travel by barges and ships, and by barges from Vancouver. The ships and barges will be self-sufficient for offloading cargo. Lightering barges will be used to transfer cargo from the vessel to the MLA Marshalling Area on shore.

One 15 ML field erected fuel tank will be constructed at the MLA as part of the development works. The MLA Fuel Storage Area will be constructed in conformance with the Canadian Council of Ministers of the Environment (CCME) Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME 2003), and the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* (2008). Project fuel storage facilities will be designed to have bermed spill containment with capacity equal to the volume of the largest tank plus 10% of the volume of the remaining tanks, or 110% volume of the largest tank, whichever is greater. The fuel tank storage areas embankments (or bund) will be lined with HDPE for spill containment. The fuel storage areas will be provided with standard instrumentation and controls to monitor and safely manage the inventory in the tanks.

Sabina is committed to provide detailed designs for construction of the 15 ML fuel storage and fuel transfer facilities at the MLA to the NWB at least 60 days prior to construction of fuel storage facilities and associated infrastructure. Sabina expects the Engineer of Record or the service provider through the Engineer of Record will confirm detailed implementation plans for fulfilling contractual responsibilities including procedures and schedules for testing of all fuel containments systems. The Engineer of Record or service provider will also confirm how their fire and contingency plans needs will be confirmed and integrated into Sabina's overall Risk Management and Emergency Response Plan.

The current conceptual fuel storage facility placements for the MLA are presented in Figures 5.1-2. Note, Sabina intends to construct only one of the fuel tanks as part of development works.

431050

N

CONCRETE BARRIERS - 8 TOTAL
550W x 2000L x 650H
EACH WITH 30' HIGH LIGHTS

3.3m WIDE BERM / 1.1m HIGH BERM

150 HIGH x 2000W
CURB - (TYP

CONCRETE BARRIERS - 4 TOTAL
1100W x 4000L x 1500H
EACH WITH 9.1m HIGH LIGHTS

316.40

315.00

14500

315.00

316.40

FUEL UNLOADING
AND DISPENSING

FUEL TRANSFER
PUMP

4 - 75 000L
WASTE OIL
STORAGE
TANKS

SLOPE

312.85

313.15

Sump
(typ.)

20800
TYP.

64390

313.80

DIESEL STORAGE TANKS
(3 x 15 000 000L)

315.00

14000

34800

62400

62400

34800

315.00

316.40

315.00

TANK

TANK

TANK

PLAN
1:500

7269500

EXISTING
GROUND

15 000 000 LITRE TANK
41.6mDIA x 12.19m HIGH

EDGE OF TANK

ASSUMED BEDROCK
4m BELOW EXISTING

20800

1500

10354

4950

1000

2400

1450

3300

300 THICK 19mm MINUS
SAND/GRAVEL BEDDING

600 THICK 50mm MINUS
BASE

150 THICK 19mm
SAND/GRAVEL
BEDDING

-1.0 %
MIN.

540g/m² NON-WOVEN
GEOTEXTILE

60mil HDPE LINER

T.O. BERM
EL.313.20

T.O. RAMP
EL.314.00

-2.0 %

3H
1V

LINER ANCHOR
TRENCH

150 THICK 50mm MINUS
SURFACING

BERM

- ROM FILL -

900 THICK 50mm MINUS
SUB-BASE

50mm MINUS
FILL

SOUND
BEDROCK

600 THICK (MAX) 50mm MINUS
SUB-BASE

SECTION A
SCALE 1:100

0 5 10 15 20 25
1:500 SCALE IN METRES

NOTE: mm for length and m for elevation unless otherwise noted

7269500

Sabina
GOLD & SILVER CORP.

Goose Property
Preliminary Fuel Storage Plan and Section
Type B Water Licence

Projection: NAD 1983 UTM Zone 13N

Figure 5.1-1

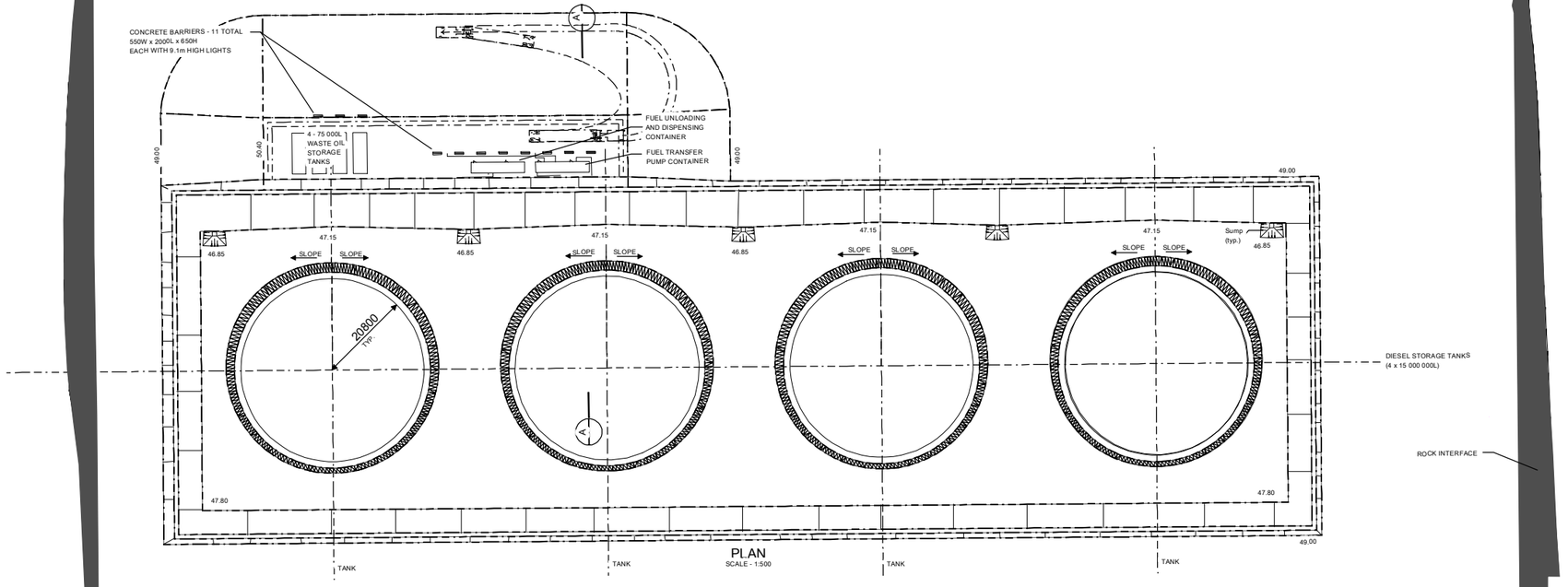
DESCRIPTION	CHK'D	APP'D	DATE
ISSUED FOR PERMIT	CP	JE	16/05/26

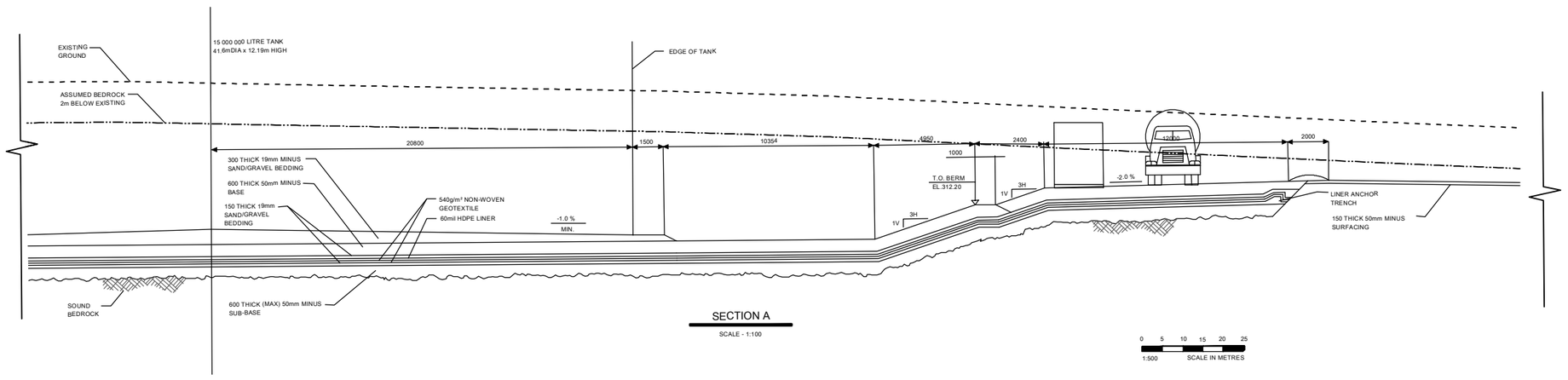
Original Drawings Stamped
and Signed by Engineer

This drawing is unconstructed when printed unless stamped and signed with orginal ink and recorded on a Distribution Register

PROFESSIONAL ENGINEERS STAMP

381050





7393500

NOTE: mm for length and m for elevation unless otherwise noted

Sabina GOLD & SILVER CORP.

Projection: NAD 1983 UTM Zone 13N

Marine Laydown Area
Preliminary Fuel Storage Plan and Section Type B Water Licence

Figure 5.1-2

DESCRIPTION	CHK'D	APP'D	DATE
ISSUED FOR PERMIT	CP	JE	17/07/29

Original Drawings Stamped and Signed by Engineer

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PROFESSIONAL ENGINEERS STAMP

6. Environmental Protection Measures

Permanent refuelling stations will be equipped with lined and bermed areas to contain minor spills or leaks that may occur during refuelling. The liner (e.g., 40 mm Hypalon liner or equivalent) will be protected by aggregate bedding. Vehicles and mobile equipment will drive onto this bedding for refuelling.

Fuel storage areas and vehicles will be equipped with spill kits for emergency response. Sabina's SCP identifies spill kit locations and appropriate response measures for spills. The spill kits will contain the appropriate type, size, and quantity of equipment for the volume/type of product present in each of the fuel storage facilities.

Sabina has designed the facilities taking into account storage, location/siting, and will implement standard operating procedures and appropriate training to minimize potential for accidents and malfunctions associated with fuel management.

6.1 DESIGN REQUIREMENTS

The fuel storage facilities will be designed with features that protect the environment as per Table 6.1-1.

Table 6.1-1. Fuel Storage Facility Design Requirements

Topic / Activity	Environmental Protection Measures
Design Features	• The CCME Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products will be followed in design, construction, and operation of the fuel storage facilities. • NWT Design Rationale for Fuel Storage and Distribution Facilities. • All fixed location Above Ground Storage Tanks (AST) > 230 L will be constructed and maintained in accordance with Underwriters' Laboratories of Canada (ULC) tank specifications, and bear a current ULC certification plate or label. • All ASTs will be installed on firm foundations (excavate to sound bedrock) designed to minimize uneven settling and corrosion, and to prevent the design stress of the tank from being exceeded. • Fuel hose length will not exceed 4.5 m, or 6 m where a retracting system is used. • Fuel tanks will be locked (unless enclosed by a fence) when not being used for vehicle fuelling, or when not being filled by tanker trucks. • Fuel storage tanks must be vented to allow vapours to escape.
Moving Tanks	• Where a storage tank > 230 L is removed (e.g., moved from one site to another) or abandoned, it is permitted to be reused for the storage of flammable liquids and combustible liquids only after having been refurbished and found to conform to acceptable standards. • A fuel storage tank > 230 L requires spill control (or secondary containment) when it is removed from a mobile unit and installed in a fixed location. • Lighting will provide adequate illumination to ensure safe fuelling and allow users the ability to read safety placards and posted fuelling procedures, and to readily locate spill response equipment. • There must be no leaks from the valve or pipe system to the pump. Draw-off valves must be threaded at the discharge end or otherwise designed to provide a liquid tight connection to the delivery hose. • Collision protection may include concrete filled steel posts placed more than 1 m from the outer edge of the tank shell and spaced less than 1.5 m apart. Concrete barriers, if used, will have a minimum height of 750 mm and be spaced at least 500 mm from the tank shell. Posts and barriers will be painted yellow and equipped with reflective stripes. Earthen materials may be used in similar manner to serve as traffic barriers.

6.2 SITING AND STORAGE

Table 6.2-1 summarizes the fuel storage facilities siting and storage requirements.

Table 6.2-1. Fuel Facility Siting and Storage

Topic / Activity	Environmental Protection Measures
Siting and Storage	• Design of fuel storage facilities will meet regulatory requirements for design and operation and will apply best management practices including: o fire prevention system design appropriate and adequate for the materials being stored; o tanks will have a minimum 1m separation between them; o siting away from ignition sources and environmentally sensitive areas; o drums, containers, and storage areas properly labelled, marked, placarded, and secured; and o containers or liner materials will be matched with the materials being stored. • All tanks for fuelling operations will be placed aboveground, and outside of buildings. • Tank siting will consider site drainage and surface flow routes for fluids if spilled during tank filling or product transfers. Grading and drainage will be designed to prevent liquids from reaching waterways, drain systems, and potable water sources. • Spill response and cleanup kits will be readily available in the refuelling area.
Secondary Containment & Collision Protection	• Fuel storage and dispensing systems will meet all applicable Nunavut regulations and all applicable Fire Code requirements. • Large or stationary equipment will be placed in secondary containment or will have a drip pan placed under vehicle/equipment prior to commencing any maintenance. • Precipitation accumulating within the containment area will be tested and treated if necessary prior to discharge. • Water collection facilities will be designed to convey water to oil/water separators for hydrocarbon removal. • Accidental damage to containment structures will be inspected immediately and appropriate repairs undertaken. The extent of damage, repairs, and any follow-up inspection will be reported in accordance with best practices.

6.3 FUELLING OPERATIONS AND TRAINING

Environmental Protection Measures for fuel management entail the implementation of proper transportation, inspection, storage, transfer, and use of all petroleum products. Protection measures to ensure that fuel products are managed effectively are summarized in Table 6.3-1.

Table 6.3-1. Fuelling Operations

Topic / Activity	Environmental Protection Measures
Transportation	• Drivers making deliveries on-site will receive a site orientation that includes relevant sections of the *Transportation of Dangerous Goods Act* (1992, c. 34), *Transportation of Dangerous Goods Regulations* (SOR/2001-286), Sabina safety requirements, and site traffic protocols. • Fuels will be trucked in sealed containers, be manifested, and equipment will be labelled and placarded in accordance with *Transportation of Dangerous Goods Regulations* (SOR/2001-286). • Applicable WHMIS signage and Transportation of Dangerous Goods (TDG) placards will be identifiable on all containers during transportation and storage. • Manifests will identify fuel type, quantity, and date of all deliveries to the mine site and will be retained on file at the contractor's head office for a period of two years. • Transportation vehicles will be equipped with spill kits of appropriate size and content. Vehicle operators will be trained in haul road safety and spill response. • Planning of delivery timing will consider weather conditions, road conditions, and availability of appropriate transportation equipment and personnel.
Bulk Transfer and Refuelling	• Only persons trained to safely handle fuels and aware of WHMIS and TDG requirements will implement procedures to transfer fuel. • Qualified personnel will continuously supervise the refuelling operation to ensure against overflow or spillage. • Daily inspections will be performed by the personnel responsible for the refuelling facility. • Refuelling will occur at a refuelling point with drainage capture / collection installed, in the event that refuelling occurs elsewhere, drip trays will be used under vehicles and equipment. • Refuelling and maintenance activities of equipment will not occur within 31 m of a watercourse or waterbody except where required due to equipment breakdown or approved activities near water. • Refuelling equipment from a tank vehicle is permitted if the fuelling is conducted using approved hose-reel and automatic closing nozzles, and appropriate training and equipment are supplied to deal with any incidental spillage. • Before fuel transfer, verify that a level shutoff device can be substituted for the person at the delivery tank, in which case operation of the shutoff should be verified each time it is used. • All connections will be bonded to prevent static discharge. • Any delivery hose that has the potential to cause a spill, if it were pulled from the delivery pump or valve, should be fitted with a breakaway valve. • Propane fuel delivery vehicle tanks will be manufactured and certified in accordance with applicable regulations and equipped to ensure the safe discharging of propane to a receiving tank. • Smoking is not permitted where dispensing is being carried out. • Spill control is required for small containers of flammable and combustible liquids that have the potential to spill. • When dispensing flammable liquids, ensure that static electrical charges are controlled by establishing an electrical connection between the tank or container and truck box fill stem, or by providing other appropriate measures as applicable. • Hose nozzle valves must conform to CAN/ULC-S620-M, "Hose Nozzle Valves for Flammable and Combustible Liquids" (FC 4.5.5.2.). • Valves at the storage tank must be constructed of steel according to the Fire Code. • An automatic shutoff nozzle must be used when using an integral hold-open device. • When a hose nozzle valve with a hold-open device is used, a break-away coupling conforming to CAN/ULC-S644-M, "Emergency Break-away Fittings for Flammable and Combustible Liquids" will be provided. • Do not use any object or device to maintain the flow of fuel that is not an integral part of the hose nozzle valve assembly. • Use only manufacturer's specified pressure relief security caps.

(continued)

Table 6.3-1. Fuelling Operations (completed)

Topic / Activity	Environmental Protection Measures
Bulk Transfer and Refuelling (continued)	• Use fuel dispensing pumps conforming to good engineering practice, and designed for flammable or combustible liquids. • Employees will remain at the dispensing nozzle whenever they are pumping fuel from any storage tank. • Tanks must not be filled beyond their safe filling level.
Training and Review	• Training for fuel dispensing attendants will include procedures for: supervising the dispensing of flammable and combustible liquids; taking appropriate measures to prevent sources of ignition from creating a hazard at the dispensers; taking appropriate action in the event of a spill to reduce the risk of fire; and shutting off the power to all dispensers in the event of a spill or fire. • Fuel management training for all employees and contractors will include: evacuation procedures and routes; distributing Material Safety Data Sheets (MSDS); alarm systems; when to attempt immediate response to an emergency and when to call for help; reporting procedures for personnel; shutdown procedures for equipment and electrical systems; types of potential emergencies; procedures for handling flammable liquids; importance of good housekeeping; importance of safe work habits; and procedures for control and cleanup of leaks and spills. • Training will be provided by a combination of trained, qualified mine staff and outside training service organizations, as appropriate. Training manuals will be developed before the mine begins operation.

6.4 BULK FUEL TRUCK TRANSFER PROCEDURE

A contract service provider or Sabina will fill the storage tanks in the Goose Fuel Storage Area and the MLA. General procedures will ensure that the handling of fuel will meet the applicable legislation that includes the *Transportation of Dangerous Goods Act* and the *Transportation of Dangerous Goods Regulations.* The general procedures to be followed are listed below. Similar procedures would be followed for fuelling remote station tanks. Before fuel transfer, it will be verified that:

- All fuel transfer hoses are connected properly and couplings are tight;
- Transfer hoses are not obviously damaged;
- Fuel transfer personnel are familiar with procedures;
- Personnel are located at both the fuel delivery truck/barge and fuel transfer tank(s) and can manually shutoff the flow of fuel;
- The high liquid level shutoff device installed at the transfer tank (if present) is operating correctly; and
- Fuel transfer proceeds per the established procedures of the contract supplier.

Any accident or spill must be reported immediately to the Operations Superintendent or Environment Department. Notification and response procedures are detailed in the SCP.

6.5 FUEL INVENTORY MANAGEMENT

All fuel products discussed in this plan will be transported to the Project and will be safely stored in the designated fuel storage areas as previously discussed. Total amounts of the fuel products received will be reconciled against amounts ordered. Fuel volumes will be measured (metered or manual dipping) as they are distributed for use from the bulk tanks. Inventory records will be updated when fuel is used and added to each tank. An unexplained loss of fuel may indicate a leak and will be immediately investigated.

Fuel tanks and fuelling equipment will be kept in good operating condition and the potential for inadvertent releases of product will be identified through procedures provided in Table 6.5-1.

Table 6.5-1. Facility Monitoring and Preventative Maintenance

Topic / Activity	Environmental Protection Measures
Facility Monitoring and Preventative Maintenance	• Vehicles and equipment will be inspected prior to mobilization to the Project and malfunctions will be rectified. • Inspections will look for signs of deterioration, leaks, unsecured container lids or excess accumulation of materials in the containment areas. All visible leaks and releases will be documented and promptly corrected. • Equipment and light vehicle operators will conduct daily visual inspections at the start of their shifts to ensure equipment integrity, cleanliness, and the adequacy of spill prevention material. • Fuel tanks will be visually monitored on a weekly basis for signs of leakage. This will include looking for signs of corrosion, staining on the ground, and cracks or breaks in hoses and other ancillary equipment during the visual inspection. Tanks will be repaired as soon as problems are noted. • Signs on tanks will be visible and legible. • Containment areas will be kept clear of debris, excess snow, ice, or standing water. • If sheen is visible on water within the secondary containment, it will be tested prior to discharge and treated if necessary. • Inspection, monitoring, and record keeping for tanks will be in accordance with regulatory requirements for the Project. • Inspection findings will be reviewed with transporters to correct deficiencies, maintain awareness, and to recognize negative or positive performance.

6.6 POTENTIAL EFFECTS ACCIDENTS OR MALFUNCTIONS

The potential effects to the environment in the event of an accident or malfunction causing a spill during transport, storage, or use of fuel are outlined in Table 6.6-1. Sabina's objective is to avoid accidents or malfunctions through implementation of effective operating practices, and ensuring proper training of employees and contractors. In addition, Sabina will ensure the petroleum, oils, and lubricant products are transported, stored, handled, transferred, and used in compliance with appropriate legislation to minimize the risk of potential environmental effects. However, if an accident or malfunction should occur, Sabina will implement the SCP, Risk Management and Emergency Response Plan, Hazardous Materials Management Plan, OPEP, and SOPEP where appropriate.

Table 6.6-1. Potential Environmental Effects of Fuel Product Spill to Environment

Material	Class	Potential Impact
Diesel	3	Water and soil contamination
Gasoline	3	Water and soil contamination
Aviation fuel	3	Water and soil contamination
Propane	2.1	Low risk to water and soil with proper handling
Lubricating oils	Non-regulated	Water and soil contamination
Hydraulic fluids	Non-regulated	Low risk to water and soil with proper handling
Paint thinner	Not classified	Harmful to aquatic life with long lasting effect

A complete list of potential environmental effects of hazardous materials is presented in the Hazardous Materials Management Plan (FEIS Volume 10, Chapter 12).

7. Monitoring Program

Deliveries of fuel to the Project will be overseen by the operations department. Trained, on-site staff will be responsible for observing and documenting the bulk transfer of fuel.

Monitoring of fuel storage tanks on-site will be conducted in accordance with the CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME 2003) and *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* (2008).

Monitoring will be conducted by environmental coordinators and, if needed, Operations staff trained in spill prevention and response. Environmental monitoring staff trained in sample collection will follow-up with Operations staff and conduct periodic inspections of fuel storage and transfer facilities, and take water samples when needed.

Water pooling within the secondary containment of the fuel storage facilities will be tested and treated as necessary prior to release to the receiving environment in conformance with discharge water quality criteria (Table 7-1) consistent with the requirements of the 2BE-G001520 Water Licence.

Table 7-1. Proposed Bulk Fuel Storage Pooling Water Discharge Criteria

Parameter	Maximum Average Concentration (mg/L)
Benzene	0.370
Ethyl benzene	0.090
Toluene	0.002
Phenols	0.02
pH	6 to 9 (pH units)
Oil and Grease	5

Notes:
The concentrations for Benzene, Ethyl benzene, Toluene, Xylene, and Lead are Freshwater CCME Guidelines for the Protection of Aquatic Life (CCME 2013).
The concentration for Oil and Grease is included in CCME (2003).

Potentially contaminated water, ice, and snow from fuel storage areas will be collected in the fuel storage area bunds at the Goose Property and at the MLA. If water does not meet the proposed discharge criteria, Sabina will treat with oil water separators located at each of the sites.

Treated and untreated water that meets discharge criteria will be discharged to the terrestrial environment at a minimum setback of 31 m from all waterbodies. Sabina will, at least 10 days prior to initiating any discharge, notify an Inspector. The notice shall include water quality results, an estimate of volume and the proposed receiving location. Discharges may vary year to year depending on operating conditions and the receiving environment. Sabina will not discharge any water from any fuel storage area directly to the aquatic receiving environment.

Sabina anticipates the Type B Water Licence for development works will confirm the monitoring stations and effluent discharge criteria to protect the receiving environment from discharges from any secondary containment fuel storage facility at the MLA and Goose Property. At the Goose Exploration Camp, Sabina will continue to comply with the monitoring program stipulated under Part J, Item 1 of the existing 2BE-GOO1520 Type B Water Licence.

8. Mitigation and Adaptive Management

8.1 SPILL PREVENTION AND RESPONSE

Spill prevention will occur through design of fuel storage and transfer facilities including 110% secondary containment capacity where appropriate, inspections of storage areas and equipment for leaks, and the training of workers and contractors in the safe storage, transport, and use of fuel. Further details of spill prevention measures are provided in the OPEP and SCP.

Spill response procedures, equipment, and organizations are based on a work and activity scope level assessment of potential spill risk. The SCP and OPEP outline Sabina's plan for responding to hydrocarbon or other contaminant spill incidents that may occur at the Project.

In the event of a spill in the marine environment at the MLA, the OPEP will apply. In the event of a spill at the Goose Property, or at the MLA, the SCP will apply. General spill prevention and response measures specific to fuel management are provided in Table 8.1-1.

Table 8.1-1. Spill Prevention and Response

Topic / Activity	Mitigation Measures
Spill Response Equipment (further detailed in Oil Pollution Emergency Plan and Comprehensive Spill Contingency Plan)	• Spill kits appropriate for the hydrocarbon products being handled or transported will be positioned at refuelling areas. At a minimum, each kit will contain: o Sufficient hydrophobic absorbent material (e.g., oil absorbent booms and sorbent pads) to contain and cleanup potential drips, leaks, or spills. o Gloves and heavy plastic bags to contain oily absorbent materials and contaminated soils or wastes. • Spill kits will be inspected daily to ensure sufficient materials are available. • Containment booms, linkable oil absorbent booms, and floating oil absorbent pads will be stored on-site to manage any releases to water. • Reserve spill response equipment such as booms, socks, and pads will be available for response to larger spill incidents, or to replenish materials used in the smaller equipment spill kits. • Sabina will ensure that relevant personnel are responsible for maintaining or providing necessary spill response equipment in their area, if there is a potential for an environmental spill. • Sabina will ensure secondary spill response teams are in place and capable of effecting containment, remediation, communication, and reporting.
Spill Response (further detailed in Oil Pollution Emergency Plan and Comprehensive Spill Contingency Plan)	• In the event a spill does occur, the following immediate actions will be taken by the responder (as is safe): o Identify source. o Stop release if safe to do so. o Contain spill to minimize impacts. o Notify the supervisor immediately. • Clean-up in a manner appropriate to the spill, removing contaminated soil and snow. • Used spill kit materials will be disposed of in designated hazardous waste areas. • Spill kits will be restocked after use.
Spill Reporting	• All spills will be reported to appropriate personnel per the procedures defined in Sabina's Spill Contingency Plan.

8.2 ADAPTIVE MANAGEMENT

The Plan will be reviewed, and if necessary, updated again prior to submission of the Type A Water Licence application. The Plan will be reviewed on a regular basis to incorporate any lessons learned, major changes to facility Operations or maintenance, and environmental monitoring results.

All employees will be informed of relevant updates and the updated FMP will be located in a designated area at each site.

Sabina will retain all raw data records and annual reporting for at least two years in digital format. The updated FMP, raw data, and annual reporting will be made available by Sabina at all times for review by the lands and waters inspectors, the NWB, and Environment and Climate Change Canada.

This plan represents an adaptive approach to understanding the effects of the Project on the landscape and the species that live there. In this context, the Plan is part of a continually evolving process that relies not only on the efficacy of data collection and analytical results, but is also dependent on feedback from the communities, government, Aboriginal groups, and the public. Having an adaptive and flexible program allows for appropriate and necessary changes to the design of monitoring studies, and the mitigation and monitoring plans. Some changes may come about through the observation of unanticipated effects or inadequacies in the sampling methods to detect measurable effects. Other changes may result from ecological knowledge acquired through working with Aboriginal community members and discussions with Elders, both in the field and through workshops.

Sabina is committed to considering and incorporating Traditional Knowledge into the Plan. The incorporation of Traditional Knowledge will occur throughout all stages of the Plan, including identification of mitigation measures, monitoring study design, data collection, and follow-up programs to obtain feedback.

9. Record Keeping and Environmental Reporting

Records will be kept under the supervision of designated Sabina personnel at each Project site for reconciled bulk fuel inventory, weekly use summaries, weekly reconciliation for each storage tank, overfill alarm tests, pressure tests (if applicable), inspections and maintenance checks, any alteration to the system, reports of leaks or losses, reports of spill responses, and records of training.

A record will document all significant changes that have been incorporated in the FMP subsequent to the latest annual review. The record will include the names of the persons who made and approved the change, as well as the date of the approval.

Spill reporting will be conducted in accordance with Sabina's SCP. Reportable spills will be immediately and externally reported by the Operations Superintendent or designated alternate to the 24-hour NWT/Nunavut Spill Response Line as required.

10. Reclamation and Closure

The closure of the Project, including fuel storage and associated infrastructure, is described in detail in the Interim Closure and Reclamation Plan. In general, steps will include:

- Fuel tanks will be steam cleaned, cut up and landfilled. The rinse water will be treated before disposal;
- Concrete structures and rebar will be cut to grade, or infilled, and levelled;
- Developed areas will be re-graded to reduce the erosion potential;
- Fuel storage areas will be tested for hydrocarbon contaminated and soils remediated appropriately; and
- Excess fuel will be used, incinerated, or removed.

11. References

CCME (Canadian Council of Ministers of the Environment). 2003. *Environmental Code of Practice for Above Ground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.*

CCME. 2013. *Canadian Environmental Quality Guidelines Summary Table.* Retrieved from: http://st-ts.ccme.ca/

NIRB (Nunavut Impact Review Board). 2013. *Guidelines for the Preparation of an Environmental Impact Statement for Sabina Gold & Silver Corp.'s Back River Project*. NIRB File No. 12MN036).

NWB (Nunavut Water Board). 2010a. Mining and Milling Supplemental Information Guideline (SIG) for Mine Development (MM3). February 2010.

NWB. 2010b. Miscellaneous Supplemental Information Guideline (SIG) for General Water Works (including crossings, flood control, diversions, and flow alterations) (M1). February 2010.