Project Memo

H349000

April 22, 2013

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cc: J. Binns
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Mary River Project

Abandonment and Reclamation of Proposed Type B Water Licence Activities

1. Introduction

The Mary River Project is an advanced iron ore Project (the Project) located on north Baffin Island, in the Qikiqtani Region of Nunavut. A camp currently operates at both Milne Port and Mary River Mine site to support advanced exploration and other authorized activities on site. During the sealift of 2013 equipment and material will begin to arrive on site for use during the construction and mining operation phase of the Project. Prior to the approval of the Project Type A Water Licence, project preparation activities will be undertaken at Milne Port and the Mine Site from May to July 2013 to prepare for sea lift and post sea lift construction phase of the work program. The specific activities to be undertaken were described in Baffinland's Type B Water Licence Application, dated March 11, 2013. The completion of this work is contingent on receipt of the new Type B Licence (8BC-MRY) and approval of applicable 2013 Work Plan activities by the Qikiqtani Inuit Association (QIA), the land owner. This document describes the Abandonment and Reclamation (A&R) strategy and closure liability estimate for the project preparation works proposed under the Type B Water Licence (8BC-MRY) application prior to the issuance of the Type A Water Licence for the Mary River Project (expected July 2013).

Upon the anticipated issuance of the Type A Water Licence, the Preliminary Mine Closure and Reclamation Plan (H337697-0000-07-126-0014, Rev. D) submitted with the Final Environmental Impact Statement (FEIS) will become the overriding project document describing A&R requirements. Until such time, the 2013 Mary River Project Abandonment and Reclamation for Advanced Exploration Activities (AMEC, 2013) is the project document describing A&R requirements. This memo describes how A&R requirements will be handled during the limited bridging period between those two documents applicability, prior to the approval of the Project Type A Water Licence.

Note that an estimate of the closure A&R liabilities is presented in section 8; however this cost is also already captured in the 2013 Marginal Closure Cost (H349000-1000-07-245-0001, Rev C).

2. Scope

This A&R strategy and liability estimate applies to all infrastructures, equipment and material associated with proposed Type B Water Licence (8BC-MRY) project preparation activities for the Project, including facilities located at the Mary River Camp and the Milne Inlet Camp.

3. Regulatory Context

This A&R strategy and financial liability estimate has been prepared in accordance with the requirements of the QIA A&R Policy for Inuit Owned Lands and in accordance with the conditions of the Nunavut Water Board water license (License Number: 2BB-MRY1114). It was prepared to address closure and reclamation of works conducted under the proposed Type B Water Licence as a condition of the surface lease held by BIM with the QIA and as a requirement of the NWB Licensing guidelines (NWB, Guide 4: Completing and Submitting a Water Licence Application for a New Water Licence, April 2010). The applicable guidelines and policies, and abandonment and reclamation objectives and criteria adopted for the proposed Type B Water Licence work are the same as outlined in the existing January 2013 Mary River Project A&R Plan for Advanced Exploration (AMEC, 2013).

4. Proposed Type B Water Licence Project Preparation Work

The activities of the proposed Type B Water Licence project preparation works are summarized in the Project Description submitted as part of our Type B Water Application (see Attachment A) and are associated with the site capture, preparation for increased camp populations, and staging of equipment and materials to allow for more efficient implementation of the project execution plan. This activities generally include the following:

- Begin development of Quarry Q1 1+100 at Milne Port and Quarry Q2 located at the Mary River Mine Site to generate crushed and screened aggregate for the development of the Milne Port site and the Mine Site.
- Construct camp facility pads at both the Mary River Mine Site and at the Milne Port site , as well as begin installation of construction camps and associated camp facilities.
- Begin development of two laydown areas (laydowns A and B) at Milne Port for the storage of equipment and supplies being delivered via the summer sealifts.
- Expand existing camp sewage facilities (additional PWSP pond) at Milne Port that will provide additional capacity with respect to the sewage treatment system.
- Expand existing fuel tank secondary containment area at Milne Port.
- Construct one additional 5ML diesel fuel storage tank at Milne Port within the existing secondary containment constructed in 2011 (same construction as the existing 5 ML tank).

The detailed project description as included in the Type B Water Licence Application (submitted to the NWB on March 11, 2013) is provided as Attachment A.

5. Abandonment and Reclamation Scenario

A decision on the Type A Water Licence application is expected in late June or early July 2013. When the Type A Licence is granted, Baffinland will proceed with the construction of the Project. In the event of an unfavourable decision, Baffinland will reassess its decision to carry on with the Mary River Project as currently defined. After further consultations with NIRB, and the land owners (QIA and AANDC), Baffinland will make its decision with respect to abandonment and reclamation of the proposed Type B Water Licence works.

If Baffinland does choose to make the decision to initiate abandonment and reclamation of proposed Type B Water Licence work, as per the QIA Abandonment and Reclamation Policy, the security estimate assumes a hypothetical worst-case bankruptcy scenario where QIA assumes authority over Project components on Inuit Owned Land. The closure costs assume a hypothetical closure date of July 31, 2013.

Note that a decision to implement the A&R strategy for proposed Type B Water Licence activities does not mean that Baffinland would abandon its current bulk sampling and exploration program for which it holds valid authorizations, licenses and permits. Security for the existing bulk sampling and exploration project is currently held by QIA and the Crown in the form of letters of credit.

6. Abandonment and Reclamation Activities

Closure and reclamation of proposed Type B Water Licence project preparation work described in section 4, will include:

- Removing all equipment and materials either off-site or into an on-site landfill at Mary River (for inert, non-hazardous, non-combustible materials).
- Equipment and materials to be taken off-site will be transported overland from Mary River Mine Site to Milne Port. Arrangements will be made with a sealift contractor to collect the shipment of materials and equipment at Milne Port and ship material offsite if required.
- Contouring ground surfaces to mimic the natural surrounding topography to allow for natural re-vegetation.
- Re-establish previous drainage patterns.

A detailed reclamation schedule will be developed assuming productive use of resources performed in a logical manner with consideration given to unique challenges of working in the arctic such that reclamation can be accomplished in a timely fashion and in accordance with the approved Abandonment and Reclamation Plan. No items are expected to be left as a result of proposed Type B Water Licence activities that will require long term monitoring or management. All Project-related facilities have been designed and constructed to minimize the footprint and to be as temporary in nature as possible. These design and construction considerations have facilitated reclamation plans and minimized the engineering required to support the complete decommissioning and reclamation of the site.

The abandonment and reclamation activities associated with the proposed Type B Water Licence work will follow applicable QIA and federal/territorial guidelines and policies, and abandonment and reclamation objectives and criteria outlined in the 2013 Abandonment and Reclamation (AMEC, January 2013).

The proposed Type B Water Licence project preparation works A&R implementation strategy is broken down into the following principal activities for the purpose of the financial liability estimate:

- Re-grading and scarifying camp pad to restore natural drainage at Milne Port and Mary River Mine Site.
- Re-grading and scarifying laydown areas to restore natural drainage at Milne Port.
- Reclamation of constructed Polishing Waste Stabilization Pond (PWSP) at Milne Port.
- Conduct geotechnical monitoring for required reclamation area at Q1 Quarry at Milne Port and Quarry Q2 at the Mary River Mine Site.
- Grade and contour site at Q1 Quarry at Milne Port and Quarry Q2 located at the Mary River Mine Site.
- Remove liner at fuel tank farm secondary containment structure at Milne Port.
- Re-grading and scarifying fuel tank farm secondary containment area at Milne Port.
- Decommission, decontaminate and disposed of on-site 5 ML steel bulk fuel tank at Milne Port.
- General site cleanup.
- Limited project management and engineering.

7. Schedule of Abandonment and Reclamation Activities

At the earliest, it is expected that A&R activities for the proposed Type B Water Licence works would commence during the open water shipping season of 2014, and be completed by the end of the 2015 open water season.

If the full implementation of the 2013 A&R Plan for Advanced Exploration (AMEC, 2013) is initiated, then it is expected that the A&R activities required for the proposed Type B Water Licence works would commence concurrently to the A&R schedule presented in the 2013 A&R Plan for Advanced Exploration Appendix H, with alignment of similar and/or associated tasks.

If the A&R activities required for the proposed Type B Water Licence project preparation works are carried out independently of full site reclamation, the activities would be scheduled as follows:

- Reclamation of the quarries at the Milne Inlet and the Mine Site used for Type B Water Licence works would be completed and rehabilitated in 2014.

- The PWSP, 5ML Bulk fuel tank and all buildings installed under the proposed Type B Water Licence will be decommissioned and disposed of in the on-site landfill in 2014.
- All Type B Water Licence works laydowns and camp pads would be reclaimed and water courses returned to their natural drainage pattern in 2015.

Post closure monitoring would continue during open water seasons for three years from 2016-2018 or until approved reclamation objectives have been met. Note: no post closure monitoring requirement is expected based on the proposed Type B Water Licence project preparation works.

8. Estimate of Proposed Type B Water Licence Works A&R Financial Liability

The proposed Type B Water Licence works A&R financial liability estimate is provided in Table 8-1. The A&R strategy and cost estimate is based on Baffinland's operating and progressive reclamation labour and equipment productivity and experience in North Baffin Island. It is supported by contributions from its consultants, AMEC, Knight Piésold and Hatch, which have extensive Canadian and international closure experience in Arctic and other environments. A&R activities required for the proposed Type B Water Licence have an estimated associated cost of $122,019.

Note that if the full implementation of the 2013 A&R Plan (AMEC, 2013) is initiated, then the A&R indirect costs required for the proposed Type B Water Licence project preparation works associated with camp operation, mobilization and crew transportation would be covered under the 2013 Mary River A&R Plan for Advanced Exploration closure cost estimate. If the A&R activities required for the proposed Type B Water Licence project preparation works are carried out independently of full site reclamation, then the camp operation, mobilization and crew transportation costs would be captured in annual operating costs for the current bulk sampling and exploration program which continues. Any unforeseen extra indirect costs are covered in contingency.

Table 8-1: Proposed Type B Water Licence Works A&R Financial Liability Estimate Breakdown

Proposed Type B Activity	Required Reclamation Activity	Cost Type	# of Units	Unit	Unit Cost ($)[1, 2]	Total
Construction of camp pad from local borrow sources at Mary River Mine Site.	Re-grading and scarifying camp pad to restore natural drainage	Labour	2	person/day	808.9	$1,617.80
		Equipment	20	hours	153.69	$3,073.80
					Subtotal	$4,691.60
Construct a second Polishing Waste Stabilization Pond (PWSP) at Milne Port.	Infill constructed pond	Labour	3	person/day	808.9	$2,426.70
		Equipment	30	hours	153.69	$4,610.70
					Subtotal	$7,037.40

Proposed Type B Activity	Required Reclamation Activity	Cost Type	# of Units	Unit	Unit Cost ($)[1, 2]	Total
Begin development of Q1 Quarry and local borrow sources at Milne Port.	Conduct geotechnical monitoring for required reclamation area	Labour	2	person/day	808.9	$1,617.80
		Equipment	20	hours	153.69	$3,073.80
	Grade and Contour Site	Labour	2	person/day	808.9	$1,617.80
		Equipment	30	hours	153.69	$4,610.70
	Grade and Contour Site access road	Labour	1	person/day	808.9	$808.90
		Equipment	10	hours	153.69	$1,536.90
					Subtotal	$13,265.90
Begin development of Q2 Quarry and local borrow sources at the Mine Site	Conduct geotechnical monitoring for required reclamation area	Labour	2	person/day	808.9	$1,617.80
		Equipment	20	hours	153.69	$3,073.80
	Grade and Contour Site	Labour	2	person/day	808.9	$1,617.80
		Equipment	30	hours	153.69	$4,610.70
	Grade and Contour Site access road	Labour	1	person/day	808.9	$808.90
		Equipment	10	hours	153.69	$1,536.90
					Subtotal	$13,265.90
Complete earthworks infrastructure including laydowns, camp pad, and fuel tank farm secondary containment structure at Milne Port.	Re-grading and scarifying laydown areas (A&B) at Milne Port to restore natural drainage	Labour	2	person/day	808.9	$1,617.80
		Equipment	20	hours	153.69	$3,073.80
	Re-grading and scarifying camp pad area at Milne Port to restore natural drainage	Labour	2	person/day	808.9	$1,617.80
		Equipment	20	hours	153.69	$3,073.80
	Remove liner at fuel tank farm secondary containment structure at Milne Port	Labour	10	person/day	808.9	$8,089.00
		Equipment	40	hours	153.69	$6,147.60
	Re-grading and scarifying fuel tank farm secondary containment area at Milne Port	Labour	5	person/day	808.9	$4,044.50
		Equipment	50	hours	153.69	$7,684.50
					Subtotal	$35,348.80
Construct one 5 ML steel bulk fuel tank at Milne Port.	Decommission, decontaminate and dispose of on-site 5 ML steel bulk fuel tank at Milne Port	Labour	10	person/day	808.9	$8,089.00
		Equipment	100	hours	153.69	$15,369.00
					Subtotal	$23,458.00
General	General Site Clean Up. Coarse clean up of streams and clean up residual fine waste on ground.	Labour	8	person/day	808.9	$6,471.20
		Equipment	8	hours	153.69	$307.38
					Subtotal	$6,778.58
					DIRECT COST SUBTOTAL	$103,846.18
					Project Management (5%)	$5,192.31
					Engineering (2.5%)	$2,596.15
					Contingency (10%)	$10,384.62
					INDIRECT COST SUBTOTAL	$18,173.08
					TOTAL COST	**$122,019.26**

NOTES:

1: $153.69/hour based on blended Equipment Rate from 2013 Nuna – Hourly Charge-Out Rates Effective January 1. 2013. Baffinland Iron Mines Corporation, Mary River Project
2: $808.90/person-day based on blended Labour Rate from 2013 Nuna – Hourly Charge-Out Rates Effective January 1. 2013. Baffinland Iron Mines Corporation, Mary River Project at 10 hours/day

A. Grzegorczyk

AG:sb
Attachment(s)/Enclosure
Attachment A: Mary River Site Preparation Project Description

Attachment A: Mary River Site Preparation Project Description

Project Description

The Site Preparation Project undertaking is required to ensure that the Milne Port and Mary River Mine Sites are prepared to accept equipment and supplies that will be arriving by sealift during the July to October 2013 period. The materials that will be arriving on the sealift are required for the execution of the work planned for 2013 and 2014 as approved under the existing Project Certificate (received December 28, 2012). Once the Type A Licence is issued, the activities described, herein, under the proposed Type B Licence will migrate to the Type A.

Specifically, starting on May 1, 2013, Baffinland plans to undertake the following spring-summer construction program. Descriptions of the key elements of this Project undertaking (described in the Executive Summary at Appendix 2 of this Type B Water Licence Application), cross referenced to applicable plans and reports, are provided under the headings below.

With respect to required plans, It is anticipated that the following management/monitoring plans (with current status) will be required under this licence to support the proposed facilities:

1. Borrow Pit and Quarry Management Plan – Refer to Attachment 8.e to this application.
2. Quarry Management Plan - Milne Inlet Quarry (Q1) – Refer to Attachment 8.f to this application
3. Spill Response Plan and Surface Water and Aquatic Ecosystems Management Plan – Updates of these plans, originally provided with the FEIS, Volume 3b, Attachment 5 will be updated by March 31, 2013 to include the proposed works.

1. <u>Begin development of Quarry Q1 1+100 at Milne Port to generate crushed and screened aggregate for the development of the Milne Port site, and Quarry QMR2 located at the Mary River Mine Site</u>

   Refer to the following list of documents and drawings:

   - 8.a - Drawing H349000-2100-10-015-0001 Milne Port Site Layout and Drainage Plan
   - 8.b - Drawing H349000-2100-10-015-0001 Milne Port Preliminary Earthworks Quantities

- 8.d - Drawing H349000-4134-10-015-0001 Mine Site – Camp Infrastructure Drainage Plan
- 8.e – Updated Borrow Pit and Quarry Management Plan
- 8.f - Quarry Management Plan - Milne Inlet Quarry (Q1)

Baffinland's policies, commitments and guidance requirements for the development of borrow pits and quarries for the Mary Project are captured in the Borrow Pits and Quarry Management Plan (Attachment 8.e). This management plan provides guidelines and guidance for siting, operation, closure, monitoring and reporting obligations for all quarry developments associated with the Mary River Project. This management plan also includes a ARD/ML screening protocol for quarry sites, and, a blasting management framework for the use of explosives in quarries. All Baffinland's contractors involved in the development of borrow pits and quarries are required to comply with this management plan.

The development of quarry Q1 at Milne Port is required to generate crushed and screened aggregate for the development of the Milne Port site. The development of Q1 rock quarry will commence in early May 2013. The current planned quarry development area is estimated to produce an aggregate volume of approximately 600,000 m^3 from an estimated area of 6.42 hectares. During the May to August 2013 period, approximately 200,000 m^3 of aggregate will be produced for the construction of camp pads, laydowns, and fuel containment berms, Tote Road and general site maintenance, and the development of aggregate stockpiles for future use. The quarry will be accessed by the existing Tote Road, which runs adjacent to the southwest corner of the proposed quarry site. The Milne Quarry site will share the portable crushing equipment currently located at the Mary River Camp Mine Site. A heavy lift aircraft will deliver to the site approximately 200,000 kg of prepackaged emulsion explosives and two drills to be used for quarry development. The plan is to have a small storage area in magazine(s) adjacent to the Tote Road, 13 km from Milne Port camp, with the bulk of the explosives being stored at explosive magazines located at the Mine Site. This plan awaits the final approval of the Nunavut Mines Inspector. These same locations were used for the storage of explosives used for the bulk sample program in 2007 and 2008.

Equipment to be used for the quarry operation will include:

- A portable crushing, screening and cleaning plant (delivered via the Milne Inlet Tote Road from the Mine Site)
- Three (3) blasthole drills with blasting gear
- Two (2) Rock loading trucks

- Four (4) Haul trucks
- Two (2) Front end loaders
- One (1) Excavator

A quarry specific management plan (Q1 Quarry Management Plan, Appendix 8.f) has been developed for the Milne Inlet Quarry Q1. The Milne Inlet Quarry Q1 Management Plan demonstrates how the commitments captured in the "Borrow Pits and Quarry Management Plan" will be implemented for the development of Q1 quarry. The plan includes a consultant's assessment report on the potential for acid rock drainage of the quarry material, the quarry contractors Blasting Operational Management Plan, and a quarry drainage plan.

The development of Quarry QMR2 is required to generate crushed and screened aggregate for the development of the Mary River Mine Site. The development of QMR2 rock quarry will commence in August 2013. A site specific Quarry Management Plan, originally provided in the FEIS (Volume 3, Appendix 3B, Attachment 6: Operation and Management Plan Mary River Mine Site Quarry) will be updated and submitted prior to quarry operations. The surface area of the quarry is 252,700 m^2 and the total volume of material to be extracted is approximately 538,000 m^3. During August 2013, it is expected that approximately 20,000 m^3 of aggregate will be produced. The equipment list will be very similar to the Milne Inlet Q1 Quarry.

2. Construct camp facility pads at both the Mary River Mine Site and at the Milne Port site, as well as begin installation of construction camps and associated camp facilities

3. Begin development of two laydown areas (laydowns A and B) at Milne Port for the storage of equipment and supplies being delivered via the summer sealifts

   Refer to the following list of drawings:

   - 8.a Drawing H349000-2100-10-015-0001 Milne Port Site Layout and Drainage Plan
   - 8.b Drawing H349000-2100-10-015-0001 Milne Port Preliminary Earthworks Quantities.
   - 8.c Drawing H349000-2735-10-035-0001 Milne Port – Off Spec Effluent Pond (PWSP)
   - 8.d Drawing H349000-4134-10-015-0001 Mine Site – Camp Infrastructure Drainage Plan

At Milne Port, the following laydown areas and camp pads will be developed, using approximately 200,000 m^3 of quarried rock fill from Milne Inlet Q1 Quarry. In addition, there will also be a requirement for approximately 16,000 m^3 of borrowed material (sand and gravel) to be obtained from existing nearby borrow pits that are presently permitted under an existing QIA Quarry Concession Agreement.

- Laydown A1 – Earthworks contractor yard.
- Laydown B1 – Mixed usage.
- Camp Infrastructure Pad B2 – For site facilities including Accommodations complex, Emergency Response office and garage, Sewage treatment plant, Potable water treatment facility, waste management facility.
- Site Facilities Pad B3 – For Maintenance/Warehouse building, Welding shop, Offices.

A drainage plan has been developed for Milne Port site to accommodate the construction to be undertaken during the May to August period.

At the Mary River Mine Site the accommodations camp pad, access driveway, and parking lot is to be constructed. A preliminary drainage plan has been developed showing the approximate location of the pad and QMR2 quarries which is a likely candidate source of aggregate material. When the final location of the accommodations camp pad and access roads are finalized, an updated site drainage plan will be provided along with estimated quantity of quarried/borrowed material that will be required. The current preliminary estimate for aggregate requirements is approximately 26,000 m^3.

Equipment that will be required for the camp pad and laydown construction will include:

- One (1) D8 track-type dozer
- One (1) rubber tired motor grader
- One (1) D4 track-type tractor-dozer
- Four (4) x 20 Ton Tri Axles Dump Truck
- One (1) x 10 Ton Drive on Packer.

4. <u>Expand existing camp sewage facilities (additional PWSP pond) at Milne Port that will provide additional capacity with respect to the sewage treatment system.</u>

Refer to the following list of drawings:

- 8.a - Drawing H349000-2100-10-015-0001 Milne Port Site Layout and Drainage Plan
- 8.b - Drawing H349000-2100-10-015-0001 Milne Port Preliminary Earthworks Quantities.
- 8.c - Drawing H349000-2735-10-035-0001 Milne Port – Off Spec Effluent Pond (PWSP)

A second polishing waste stabilization pond (PWSP) for off-spec treated sewage will be constructed at Milne Port in preparation for larger off-specification sewage treatment capacity during construction ramp up. The PWSP has a capacity of approximately 1080 m^3 which will expand on the capacity of the existing 600 m^3 of off-spec pond storage. Approximately 4000 m^3 Borrow sand and gravel from nearby permitted pits will be used for the construction of this facility.

Equipment that will be required for the PWSP construction includes the following:

- One (1) D4 track-type tractor-dozer
- One (1) 320 Excavator
- One (1) Bob Cat
- Four (4) x 20 Ton Tri Axle Dump Trucks
- One (1) x 10 Ton Drive on Packer.

5. Expand existing fuel tank secondary containment area at Milne Port and construct one additional 5ML diesel fuel storage tank at Milne Port within the existing secondary containment constructed in 2011 (same construction as the existing 5 ML tank)

   Refer to the following list of drawings:
   - 8.a - Drawing H349000-2100-10-015-0001 Milne Port Site Layout and Drainage Plan
   - 8.b - Drawing H349000-2100-10-015-0001 Milne Port Preliminary Earthworks Quantities.
   - 8.i - Drawing H349000-2613-10-014-0002 Milne Port Bulk Fuel Storage - Site Grading Plan
   - 8.j - Drawing H349000-2613-10-035-0001 Milne Port Bulk Fuel Storage - Dyke Sections
   - 8.k - Drawing H349000-2613-10-035-0002 Milne Port Bulk Fuel Storage - Sections Through Truck Loading Area
   - 8.l - Drawing H349000-2613-10-035-0003 Milne Port Bulk Fuel Storage – Tank Pad Details

- 8.m - Drawing H349000-2613-10-035-0004 Milne Port Bulk Fuel Storage – Dyke Sections and Details

An additional fuel containment berm will be constructed north of the existing berm where a 5 ML fuel tank was constructed in 2011. A second five (5) ML fuel tank will be constructed within the existing containment and adjacent to the existing five (5) ML tank for storage of P-50 diesel. The additional fuel containment berm will eventually accommodate 4 x ten (10) ML tanks (for P-50 diesel) and four additional pre-fabricated 750,000 L tanks that will be used to store Jet-A fuel. The scope of this project involves the construction of a single additional fuel tank (five (5) ML) within existing constructed fuel berm and the construction of the additional fuel berm. Please note that the four (4) additional ten (10) ML tanks will be constructed later in 2013 after the issuance of the Type A licence. In addition, the proposed tanks will receive fuel later in the summer after the Type A Licence for the Project has been issued. Total aggregate required for this project is approximately 40,000 m^3 of combined quarried rock from Milne Inlet Q1 quarry and borrow material obtained from nearby sand and gravel borrows that are already permitted.

Equipment that will be required for the fuel tank and fuel containment berm expansion:

- One (1) D8 track-type tractor dozer
- One (1) D4 track-type tractor dozer
- Four (4)x 20 Ton Tri Axles Dump Truck
- One (1) x 10 Ton Drive on Packer.