

August 26, 2020

Carl Johansson
Senior Enforcement Analyst
Impact Assessment Agency of Canada
Place Bell Canada, 22nd Floor
160 Elgin Street
Ottawa, ON K1A 0H3

Dear Mr. Johansson,

SUBJECT: NOTICE OF NON-COMPLIANCE - RAINY RIVER PROJECT - STOCKPILE DAM SEEPING – CIAR # 80007

Following the receipt of the Notice of Non-compliance regarding the Stockpile Dam seepage, New Gold Rainy River Mine (RRM) has developed the following plan to investigate and formulate a path to remediate the current seepage issues at the Stockpile Diversion Dam at RRM.

New Gold has begun taking action on the Stockpile Diversion Dam seepage by approaching BGC Engineering (BGC), the dam Engineer of Record (EoR) to be involved as a third party to help with developing a sound engineered solution. BGC engineering is well versed with knowledge in the local geology and soil characteristics in the region and will be instrumental in developing a robust engineered solution. BGC Engineering will begin the investigative stage by completing a shovel test pit program upstream of the dam structure to determine if there are potential porous layers of Whiteshell till near bedrock outcrops at surface, which could be acting as a flow path. BGC engineering will also be proposing a dye testing program to help determine if the water seeping within the catchment area of the structure is related to water seepage at the toe of the Stockpile diversion dam. Both of these investigations will occur in early September, followed by a brief memo of the findings.

Concurrent to the BGC investigations noted above, New Gold has finalized plans to mobilize a geophysical company (attached) in order to help identify potential flow paths through the structure. This will aid in pinpointing the seepage issue and help with developing an engineered solution. New Gold will be reviewing the geophysical proposals the last week of August, with the intent to begin field work in mid to late September. To date, it appears that using the Willowstick technology will prove to be very useful in helping to identify potential seepage paths through the dam foundation. The Willowstick technology and reporting is estimated to be completed by early October.

Further to this, New Gold has reached out to potential vendors to begin conversations with various methods of remediation. While it is too early to develop a remediation plan when the problem is not known, New Gold wants to take a proactive approach to ensure that the various methods are identified and reviewed ahead of time to increase our reaction time when a proposed solution is selected. Some of the remediation methods that are being explored include; bentonite cut-off trench, jet grouting, polyurethane injection, clay liner, etc.

New Gold has also begun to investigate lowering the spillway invert from the Stockpile Diversion Pond and accompanying channel; however this is considered a temporary band aid and will negatively impact the compensation area. Based on the amount of investigative requirements for this project, it is expected that an engineered solution will be developed by the end of 2020, with execution to remediate the issue in spring 2021.

If you have any questions regarding the information provided, please contact the undersigned at your earliest opportunity.

Respectfully submitted,

<original signed by>

Sylvie St. Jean
Environmental Manager
New Gold, Rainy River Mine
(807) 707-3497
sylvie.st.jean@newgold.com

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August 20, 2020

Mr. Erik Wimmelbacher, EIT
Project Coordinator
New Gold Inc.
Rainy River Mine
5967 Highway 11/17,
P.O. Box 5
Emo, Ontario, Canada P0W 1E0

**Subject: Proposal for Dam Seepage Investigation and Conceptual Repair Design
Stockpile Pond Dam (Dam)
New Gold Inc. Rainy River Mine
Emo, Ontario**

Dear Mr. Wimmelbacher:

<sensitive information removed> is pleased to provide New Gold Inc. (New Gold) with this Proposal to perform a dam seepage investigation and conceptual repair design for the Stockpile Pond Dam at New Gold's Rainy River Mine (Site), located at 317 Heatwole Road, Barwick, Ontario.

It is our understanding that the Dam was designed by Amec Foster Wheeler and was constructed in 2016. The main elements of the dam include an impermeable core, a chimney drain, upstream and downstream shell and a clay cut off trench. The dam crest is at elevation 375.5 m and minimum foundation elevation is 366 m, indicating maximum height of 9.5 m. Available information indicates that the subsurface stratigraphy prior to construction included a layer of topsoil underlain by varved silty clay/clayey silt, underlain by a thick layer of silty clay till, underlain varved silty clay/clayey silt overlying a layer of gravelly sand till. Bedrock in the area is reported to be from 1.5 m to more than 14.0 m below the existing ground. Existing information indicates the presence of a layer of sandy gravel material interbedded within the silty clay/clayey silt material. As per the discussions with the Client, it is our understanding that seepage through the dam were observed from the early life stages of the dam. Observations show that this seepage amount is increasing with time. A hypothesis is that the seepage is occurring through the existing sand and gravel layers within the native soil layers and inefficiency of the cut off trench in cutting through these layers. The reported seepage rate depends on the pond levels but averages approximately 3 m³/hour. The Dam has a hazard potential classification of High in accordance to the Canadian Dam association guidelines. To meet the environmental compliance requirements the Client is seeking a qualified engineering firm to complete field investigation along with associated analysis to evaluate the existing seepage conditions and propose conceptual remediation designs to limit the seepage to the possible extent. Following the completion of conceptual design options, a final design is required to complete the construction works by the end of 2020.

NCP2020-9013 Stockpile Pond Dam – New Gold Rainy River Mine

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<sensitive information remc understands the importance of the Stockpile Pond to site operations and environmental compliance at the Site and the critical need to complete repairs by the end of 2020. <sensitive information remc is committed to supporting New Gold in this task by establishing an accelerated project schedule to quickly determine the source of the observed seepage and develop conceptual repair options. Following the selection of a conceptual repair option, <sensitive information remc will be available to move directly into the design phase to allow repairs to be initiated as quickly as feasible.

COMPANY BACKGROUND

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environmental challenges facing federal, provincial/state, municipal, industrial, and private owners and operators to create site-specific solutions that are efficient, cost effective, and enduring.

<sensitive information remove provides extensive experience developing site-specific solutions for dams using our expertise in civil, geotechnical, structural, hydraulic, hydrologic, and environmental engineering, natural resources, information management, and construction management. Our practice encompasses the development of new structures as well as the assessment and rehabilitation of existing dams, dikes, and levees. We respond to the unique technical, environmental, and regulatory issues facing federal, state, municipal, industrial, and private owners and operators. Our services include dam safety reviews, design and design review for new structures and rehabilitation and enhancement projects. We also specialize in hydraulic and hydrologic engineering in support of dam, dike, and levee design and performance evaluations, including studies to assess probable flood levels, flood storage, and inundation maps.

We distinguish ourselves through continued development of innovative technology applications that result in significant long-term savings and reliability for our clients. Further information on our comprehensive Geotechnical and Geostructural Engineering and Design Services is provided in Attachment 1.

SCOPE OF WORK

The purpose of this Scope of Work (SOW) is to (1) determine the source of observed seepage at the Stockpile Pond, and (2) to develop conceptual repair design(s) and construction cost estimates to mitigate the seepage. The results of this assessment will be provided to New Gold to select a preferred repair option. In the follow up steps <sensitive information remove can complete the final design of the repair, and provide assistance for procurement of a construction contractor to complete repairs within 2020, preferably before winter conditions impact the site. <sensitive information remove is in a position to provide support during the construction work.

<sensitive information remove will perform this SOW using a Tasked approach. The Tasked approach will allow for an accelerated schedule by performing background data review and developing conceptual repair designs while the proposed onsite geophysical investigation is being conducted. <sensitive information remove will then incorporate the results of the geophysical investigation in our engineering analysis to refine the conceptual repair designs. As part of a future SOW, <sensitive information remove is available to prepare preliminary Issued for Bid drawings and specifications for the preferred repair option, and assist

New Gold in selecting a construction contractor. ^{<sensitive information remove>} would then be available to work with the contractor and New Gold to optimize the design and allow the project to be constructed faster than a typical design-bid-build approach.

During our work if we notice any issue that may put the safety of the dam at risk the issue will be communicated with the Client immediately and the path forward will be discussed. However, it is noted that complete safety assessment of the Dam is beyond the scope of this work.

Details of our proposed scope of work is provided in the below sections.

Task 1 – Background Data Review and Site Visit:

^{<sensitive information remove>} will review all the relevant available background data for the Stockpile Pond and Stockpile Pond Dam to support the development of our understanding of the dam and potential issues that may be contributing to the observed seepage. This data includes borings and lab test data, design reports, construction records, as-built drawings, instrumentation data, and Site records of observed seepage and pond levels.

^{<sensitive information remove>} will perform a one-day site visit within approximately one week of receiving the background data from New Gold. During the site visit, ^{<sensitive information remove>} will visit the Stockpile Pond Dam, photograph observed seepage and other issues, interview the staff involved in the maintenance and management of the dam, get familiarized with the dam system operation, and discuss the project with New Gold.

At the end of this task ^{<sensitive information remove>} will prepare a brief Technical Memorandum including photographic records to document the site visit and obtained results. This memorandum will be submitted for Client review and it will be included as an attachment to the final technical report.

We propose our project manager (Ali Nasseri-Moghaddam, Ph.D., P.Eng.) to complete this visit. Prior to the site visit he will complete all the required health and safety orientation requirements.

Task 2 –Engineering Analysis and Development of Conceptual Repair Options

^{<sensitive information remove>} will perform a engineering analysis to develop an understanding of seepage mechanisms at the site. The analysis will consist of a two-dimensional, steady-state, finite-element seepage analysis prepared for a single cross-section using SEEP/W software. The analysis will be developed based on the background data and will be calibrated based on piezometric data, seepage

observations from the site and the completed geophysical investigations at the site (see Task 3). It is assumed that no additional intrusive field investigation data and/or instrumentation data (i.e. new borings, piezometers) will be required to complete this engineering analysis.

<sensitive information remove will then use the calibrated seepage analysis to analytically evaluate the technical feasibility for up to four (4) potential conceptual repair options for the dam. The repair options, at this time, are expected to consist of pressure grouting, a deep cutoff wall, a shallow cutoff, and an upstream surficial cutoff (i.e. geosynthetic clay liner). Alternative methods may also be identified by <sensitive information remove and/or New Gold.

A Technical Memorandum will be prepared to (1) describe seepage mechanisms at the site; (2) summarize the results of the seepage analysis, and (3) discuss each repair option, including constructability, construction schedule, short-term performance, long-term performance, and order-of-magnitude construction costs. New Gold will then review the Technical Memorandum and select a preferred repair option for the Stockpile Pond Dam.

Task 3 – Geophysical Investigation

<sensitive information remove will hire the services of Willowstick to complete a geophysical investigation at the Stockpile Pond Dam. Detail technical concepts of the Willowstick method is included as **Attachment 2**. The Willowstick method will allow for a three-dimensional visualization of the dam including identified seepage paths. This method will allow for the spatial extents of preferential seepage paths to be identified and allow for the repair design to be targeted to only areas where seepage is currently occurring. This should result in both an accelerated construction schedule and reduced construction costs for future phases of work, as the extents of the repairs would be limited to the extent practical.

The geophysical survey will be performed immediately after the Phase 1 site visit, and a report will be provided within 2 weeks.

It is noted that <sensitive information remove is familiar with other geophysical methods that are commonly used for this purpose. It is our opinion that Willowstick method is the most advanced available method for this application. In general, for these type of investigations a phased approach using different methods is preferred and more technically suitable. However, considering the time constraints for this project we only recommend to complete the Willowstick method for this project, which has a large chance for success. If needed alternative methods can be discussed with the Client.

PROVISIONAL FUTURE PHASES

<sensitive information remove has scoped future phases to support New Gold during the final design, contractor procurement, and design optimization phases of the work. Costs for these phases will be provided to New Gold after the completion of the above noted tasks when more information regarding the project needs become available. This information is intended to demonstrate <sensitive information removed> commitment to New Gold in advancing the project to construction on an accelerated schedule after the preferred repair option has been selected. <sensitive information remove has the manpower and capacity to complete these tasks within acceptable timeframe and upon authorization.

Provisional task A – Cone Penetration Test (CPT) Investigation

Following the review of all the existing information a data gap analysis will be completed. If it is determined that missing subsurface information exist that may affect the project needs a Cone Penetration Testing investigation program may be recommended. This investigation would support the development of repair options by providing additional information on subsurface layer interfaces below the dam, the hydraulic conductivity of the dam and foundation soils via pore pressure dissipation (PPD) testing, and evaluate if seepage may potentially be occurring in the deep aquifer beneath the dam.

<sensitive information remove will hire the services of a specialized subcontractor for this investigation. It is envisioned that the field work would be completed in three (3) to five (5) onsite days of investigation. Approximately six (6) CPTs would be completed during this investigation, including three CPTs at the crest of the dam and three CPTs at the downstream toe. No more than four (4) PPD tests would be conducted in each CPT, with a maximum test duration of 30 minutes.

<sensitive information remove would provide full-time oversight during the investigation by an engineer or geologist in trainee. This would include coordinating with New Gold personnel to obtain site access, verifying with New Gold personnel that proposed locations are clear of subsurface utilities, and determining depths for PPD testing. Each CPT would be tremie-grouted after advancement.

<sensitive information remove has assumed that as-drilled CPT locations would be surveyed by onsite New Gold personnel and provided to <sensitive information removed

Provisional task B – Issued for Bid Construction Drawings and Contractor Selection Support

Upon request, <sensitive information remove is in a position to prepare preliminary Issued for Bid construction drawings (i.e. 60% design drawings) for the selected repair option. <sensitive information remove will also prepare an

Instructions for Bidders package for use by contractors, including a bid form and discussion of information to include within bids (i.e. project schedule, project approach information).

After bids have been received, <small>< sensitive information remove </small> will support New Gold to evaluate the bids and select a preferred construction contractor. Ranking of the bids will be determined based on criteria jointly developed between New Gold and <small>< sensitive information removed </small> and is expected to consist of schedule, cost, past experience, and/or technical approach.

Provisional task C – Issued for Construction Drawings

<small>< sensitive information remove </small> will work with the selected contractor to identify potential optimizations to the Issued for Bid drawings and specifications that may accelerate the schedule and/or result in cost savings for New Gold, while maintaining the necessary level of performance. <small>< sensitive information remove </small> will then prepare an Issued for Construction drawing set, sealed by an Ontario-licensed professional engineer. Preliminary engineering analyses performed as part of Phase 2 will also be updated, finalized, and documented in a calculation package.

PROJECT COMMUNICATIONS AND MEETINGS

Upon project award <small>< sensitive information remove </small> will make arrangements for a call to review the scope of work, work schedule and other project requirements. <small>< sensitive information remove </small> will participate in a weekly teleconference meeting with New Gold, held via the Skype or Microsoft Teams platform. The weekly meeting is assumed to last approximately one hour. During the meeting, <small>< sensitive information remove </small> will provide an update on the project, discuss any data gaps, and provide preliminary findings to New Gold. The weekly meeting will allow New Gold to be actively involved in the project as it progresses, and expedite addressing any issues that arise during the project.

Considering the urgent nature of this project <small>< sensitive information remove </small> is prepared to communicate the project needs, and findings on an as required basis.

PROJECT TEAM

<small>< sensitive information remove </small> proposes a strong team to complete this task which will be led by <small>< sensitive information removed </small>, who is a licensed professional engineer in Ontario and based in <small>< sensitive information removed </small>. Short biographies of our proposed team members are provided below and detailed CVs are provided in **Attachment 4**. With over 250 professionals with expertise in dam engineering <small>< sensitive information remove </small> has the capacity to complete all the required assessment/investigation and design tasks to meet the project requirements.

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Resumes for each project team member are provided in **Attachment 3**.

SCHEDULE

<sensitive information removed> is in a position to start this work immediately upon project award. We are committed to completing this project on an accelerated schedule. We have developed a milestone schedule for the project, as shown in the GANTT chart below.

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Task No	Task Description	Start	End	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	1-Sep	2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep	9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep	16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep	
0.00	Project Initiation	20-Aug-20	25-Aug-20	█	█	█	█	█	█																														
0.01	Proposal Submission	20-Aug-20	20-Aug-20	█																																			
0.02	Proect Award (Assumed)	25-Aug-20	25-Aug-20																																				
1.00	Background Information Review/Site Visit	25-Aug-20	4-Sep-20																																				
1.01	Background Information Review	25-Aug-20	4-Sep-20																																				
1.02	Health and Safety Orientation	27-Aug-20	27-Aug-20																																				
1.03	Site Visit including travel	31-Aug-20	2-Sep-20																																				
1.04	Site visit Memo	3-Sep-20	4-Sep-20																																				
2.00	Engineering Analysis and Development of Conceptual Repair Option	31-Aug-20	23-Sep-20																																				
2.01	Seepage Modelling	31-Aug-20	11-Sep-20																																				
2.02	Conceptual Repair Options Development	9-Sep-20	16-Sep-20																																				
2.03	Technical Memorandum (Draft)	9-Sep-20	16-Sep-20																																				
2.04	Client Review	17-Sep-20	18-Sep-20																																				
2.05	Technical Memorandum (Final)	21-Sep-20	23-Sep-20																																				
3.00	Geophysical Testing	31-Aug-20	11-Sep-20																																				
3.01	Filed Investigation	31-Aug-20	4-Sep-20																																				
3.02	Data Analysis and Reporting	31-Aug-20	11-Sep-20																																				

It is noted that the above schedule is tentative, and the final schedule will be prepared based on discussions with the Client after the project award.

PROFESSIONAL SERVICES FEE

We are prepared to conduct this work in accordance with the attached Service Agreement (Attachment 4). The total estimated cost to perform the outlined services is <small>< sensitive information removed </small> excluding taxes. A breakdown of the costs is provided below:

Phase	Labor Cost	Subcontractors & Expenses	TOTAL
1 – Background Data Review, Site Visit, Health and Safety Orientation	<small>< sensitive information removed </small>		
2 –Engineering Analysis and Development of Conceptual Repair Options	<small>< sensitive information removed </small>		
3 – Geophysical Investigation	<small>< sensitive information removed </small>		
4 – Meetings (Conference calls)	<small>< sensitive information removed </small>		
TOTAL	<small>< sensitive information removed </small>		
	New Client Incentive Discount		<small>< sensitive information removed </small>
	Grand Total (Before taxes)		<small>< sensitive information removed </small>

ASSUMPTIONS AND LIMITATIONS

The cost and schedule provided in this proposal was based on the following assumptions and limitations:

- All available background information will be provided to ^{<sensitive information remove>} by New Gold within three (3) working days of receiving Notice to Proceed.
- Provided instrumentation data will include tabulated vibrating-wire piezometer readings vs. time and will also include lake levels in Microsoft Excel or another native file format.
- The Phase 1 site visit is expected to consist of no more than six (6) hours onsite. Round-trip travel for the project manager to the site is included within this phase.
- It has been assumed that the existing data, supplemented with the Phase 3 geophysical survey, will be sufficient to complete the Phase 2 preliminary engineering analysis and development of repair options. In the event that additional data (i.e. borings, lab testing data, instrumentation) is determined to be necessary to complete the project, ^{<sensitive information remove>} will immediately notify New Gold and a path forward will be jointly determined.
- ^{<sensitive information remove>} has included costs and time for updating draft deliverables based on comments received from New Gold. In order to maintain the accelerated schedule, ^{<sensitive information remove>} has assumed that New Gold will provide one consolidated set of written comments on each deliverable within two (2) working days of receipt.
- The Phase 3 Geophysical Investigation will be completed by Willowstick's experienced personnel. At this time, we do not envision a need for ^{<sensitive information removed>} fulltime supervision for this task.
- ^{<sensitive information remove>} has assumed that existing as-built survey data will be sufficient for this project, so survey costs for the development of construction drawings and engineering analyses are not included in this proposal. If additional survey data is determined to be necessary, ^{<sensitive information remove>} will immediately notify New Gold and a path forward will be jointly determined.
- ^{<sensitive information remove>} understands that New Gold is currently determining what, if any, permitting considerations may be required to complete repairs at the dam. ^{<sensitive information remove>} has not included costs for permitting support or other regulatory agency liaison. We would be pleased to provide support if required.
- Scope and budget for Construction Quality Assurance (CQA) and engineering support during construction has not been included in this proposal. Costs for these services can be provided at a later date.

Mr. Erik Wimmelbacher
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CLOSING

We trust that the above information satisfies your current needs. Should you have any comments or questions or if you need additional information, please contact <sensitive information removed> at:

Cell: <sensitive information removed>

Email: <email address removed>

We look forward to work with you on this interesting assignment.

Sincerely, 
<original signed by>

<sensitive information removed>
Principal

Attachments:

Attachment 1 – Dam, Geotechnical and Geotechnical Engineering and Design Services SOQ

Attachment 2 – Willowstick Detail Technical Concepts

Attachment 3 – Project Team Member Resumes

Attachment 4 – <sensitive information removed> Standard Contract terms

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