



**Nunami Stantec Limited**  
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**VIA E-MAIL**

July 5, 2016  
File No.: 144930029

Qulliq Energy Corporation  
PO Box 250  
Iqaluit, NU  
X0A 0H0

**Attention: Mr. Rick Hunt**  
**Director of Health, Safety and Environment**

Dear Mr. Hunt:

**Reference: Proposal for Detailed Design, Procurement Services, and Additional Remedial Work at the Impacted Soil Hot Spot Location, QEC Properties in Baker Lake, Nunavut**

## **1 INTRODUCTION**

Nunami Stantec Limited (Nunami Stantec) was retained by Qulliq Energy Corporation (QEC) in 2015 to conduct a human health and ecological risk assessment (HHERA) of the Baker Lake Former Plant Site, the Ministry of Transport (MOT) Compound Site, Federal and Territorial Government Former Tank Farm, and the Baker Lake Shoreline Area located in Baker Lake in the Kivalliq region of Nunavut (the "Site").

Nunami Stantec subsequently completed a Remedial Options Feasibility Analysis (ROFA) for the remediation of selected areas identified during the HHERA. The ROFA consisted of a review of potential remedial options for the impacted soil "hot spot" identified from the preliminary HHERA; as well as the replacement the existing depleted Waterloo Emitter™ system located near the shoreline of Baker Lake. The ROFA presented a summary of potential remedial options including a summary of their approximate costs, timelines, and challenges. The remedial options were developed based on data generated through a review of previous environmental reports and the results of the Preliminary HHERA completed by Nunami in 2016.

Based on Nunami Stantec's review, the recommended remedial option for the impacted soil "hot spot" at location TP33/MW3 was to excavate the impacted soil, place the soil in an engineered containment cell constructed on site and then landfarm the soil to reduce the contaminant concentrations to levels which will satisfy the applicable GN criteria for the site.

QEC has indicated that they would like to implement these recommendations in the summer of 2016 and has requested a proposal from Nunami Stantec to complete the remedial design work, contractor pricing and additional field work needed to support the design assumptions.

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## **2 SCOPE OF WORK**

Nunami Stantec proposes to complete the following:

1. Detailed design and description for the remedial excavation area, Landfarm, cell size, liner material type and thickness, bedding, drainage, soil placement in order to obtain quotes from equipment suppliers and contractors.
2. Preparation of a letter report including;
  - Summary of field work, including interpretation of analytical results and treatability analysis (as per Section 5 -Schedule, this section would be provided in the final letter report issued after completion of the field work).Design description and construction scope of work tasks;
  - One design drawing showing plan view of the proposed excavation area and Landfarm cell, including a cross-section details;
  - Schedule for Installation and Operation and Maintenance;
  - Operations plan, including monitoring and maintenance plan.
3. Additional fieldwork based on the recommendations in the ROFA, including the following:
  - Delineation of soil impacts at the TP-33 “hot spot” by excavating four (4) test pits with soil sampling to assess the actual amount of impacted soil which currently exceeds the GN criteria.
  - Laboratory analysis of soil samples from the “hot spot” to characterize physical (grain size) and chemical parameters (confirmation of petroleum hydrocarbon concentration range, moisture content and existing nutrient concentrations).
  - Bacteria count to confirm presence of hydrocarbon degrading bacteria.
  - Selection of the location of the Landfarm cell.
  - Collection of two (2) background soil samples at the proposed Landfarm cell location
4. Obtain quotations from suppliers/contractors for:
  - HDPE liner and granular material for the landfarm (including shipping);
  - Remedial excavation, backfilling and construction of Landfarm cell and application of initial nutrient requirements.
5. Tendering and award of Construction Services contract.
6. Construction supervision services, including the following:

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- Collection of two (2) baseline soil samples in the footprint of the proposed landfarm
  - Landfarm containment cell, including construction of granular berms and liner installation
  - Remedial excavation of soil in TP33 area
  - Haul impacted soil to landfarm cell
  - Backfill TP33 area with clean backfill
  - HDPE liner and granular material for the landfarm (including shipping);
  - Remedial excavation, backfilling and construction of Landfarm cell and application of initial nutrient requirements.
7. Submission of proposal for Nunami Stantec to complete follow-up field work, including the following:
- Mobilize to Site in spring of 2017
  - Supervise turning and aeration of soil in landfarm
  - Collection of soil samples
  - Train QEC staff

### **3 OPINION OF PROBABLE COST**

Our opinion of probable cost is **\$91,595** and is detailed in Table 1 in Appendix A.

As described in Section 2, the scope of work will include obtaining quotes from 3<sup>rd</sup> party suppliers and contractors. Procurement and contracting of these services would be completed directly by Nunami..

Estimates for project tasks are based on the activities proposed in the sections of this proposal. Should a change in scope of services or proposed activities be agreed upon, there may be a need for a budget adjustment.

### **4 ASSUMPTIONS**

The following assumptions have been made in preparing the scope of work:

- Nunami would retain the site contractor directly.
- Nunami Stantec has assumed that the Landfarm will be constructed on QEC property and additional regulatory submittals would not be required.
- Costs for airfare and travel time have not been included in the opinion of probable cost for the work outlined in section 2.3. Nunami has assumed that the proposed additional fieldwork would occur concurrently with the previously approved work in support of the HHERA.

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- Costs for airfare and travel time have been included in the opinion of probable cost for one (1) Nunami field representative to conduct the work outlined in section 2.5. Nunami has assumed that the remedial excavation at the TP33 hotspot and the landfarm construction work would occur concurrently with the trench excavation and installation.
- The cost estimate includes an 8% flat rate disbursement on fees (intended to cover miscellaneous project expenses including incidental printing, communications expenses and office expenses) and a 5% mark-up for third-party costs.
- Estimates for project tasks are based on the activities proposed in the sections of this proposal. Should a change in scope of services or proposed activities be agreed upon, there may be a need for a budget adjustment.
- These costs do not include weather delays or other delays outside of Nunami Stantec's control. Should these occur; the client will be notified immediately and be charged on a time and material basis.
- Laboratory costs are based on Rush (48 hour) turn-around time analysis for the number of samples specified above. If additional or fewer samples are required and/or if different turn-around times are requested, costs will be adjusted accordingly.
- Costs do not include operation and monitoring of the landfarm conducted during the 2017 field season.

Fees quoted are net of any deductions and/or applicable taxes.

## **5 SCHEDULE**

Based on our knowledge of the Site, the schedule of commercial flights and of the work to be completed, Nunami Stantec proposes the following tentative schedule:

- July 8, 2016 – Specification of Landfarm materials and obtain quotes for supply and shipping.
- July 15, 2016 - Mobilization of Landfarm construction materials.
- July 22, 2016 – Completion of preliminary design package and obtain preliminary quote from construction contractor.
- July 25-29, 2016 – Field work to collect information to support completed detailed design.
- August 12, 2016 - Finalization of design package and confirmation of Contractor quote, award of contract to Contractor.
- August 22 to 26, 2016 – Remedial excavation, backfilling, Landfarm construction and commissioning.

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## **6 CLOSURE**

Nunami Stantec has assumed that the abovementioned work will be completed under a call-up under the standing offer with QEC (SOA #201570-50). Should you have any questions or require clarification on any element of this request, please feel free to contact any of the undersigned.

Sincerely,

**NUNAMI STANTEC LIMITED**



Nick Lawson, B.Sc.  
Principal, Operations Manager  
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Dan Morehouse, B.Sc., P.Eng.  
Principal, Nunavut Environmental Sector Lead  
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## **APPENDIX A:**



## 144930029 - Baker Lake TP33 Hot Spot Remediation

						Labour								Expenses												Labour and Expenses Total			
All Task Numbers	Top Task Name	Subtask Name	Sub-Subtask Name	Sub-Subtask Name	Task Assumptions	Carlos L Philipovsky Project Manager \$ 180	Dan Morehouse Technical Advisor \$ 201	Rob McCullough Senior Technical Lead \$ 201	Marc Bouchard Senior Engineer \$ 162	Kassandra DeFrancis Field Crew \$ 160	Drafting CAD/GIS \$ 121	Admin Admin \$ 98	Total Hours	Total Labour	Accommodation Expense Link	Airfare Expense Link	Per Diem Incidentals Expense Link	Equipment Expense Link	Vehicle Transportation Expense Link	BLCS - Equipment and Labour Expense Link	Soil Analysis Expense Link	Liner Expense Link	Granular Fill Expense Link	Fencing Expense Link	Flat Rate Disbursement	Expenses Total	Labour and Expenses Total		
200	Project Management					8.0	2.0					3.0	13.0	\$ 2,130.00												170.40	\$ 170.40	\$ 2,300.40	
													0.0	\$ -												-	\$ -	\$ -	
300	Design Development/Regulatory												0.0	\$ -												-	\$ -	\$ -	
		Detailed Design Description				12.0	4.0	12.0	2.0		4.0		36.0	\$ 6,462.00												516.96	\$ 516.96	\$ 6,978.96	
		Draft Letter Report				7.5	2.0	7.5	2.0	6.0		1.0	32.0	\$ 5,365.50													429.24	\$ 429.24	\$ 5,794.74
		Final Letter Report				4.0	1.0	1.0			6.0		6.0	\$ 1,122.00													89.76	\$ 89.76	\$ 1,211.76
		Logistics, Contractor Pre-qualification						2.0	7.5					9.5	\$ 1,909.50												152.76	\$ 152.76	\$ 2,062.26
													0.0	\$ -												-	\$ -	\$ -	
400	Additional Fieldwork												0.0	\$ -												-	\$ -	\$ -	
		Field Work								10.0			10.0	\$ 1,600.00	304.50		18.90	90.00	357.00	3,150.00	1,029.00					128.00	\$ 5,077.40	\$ 6,677.40	
													0.0	\$ -				90.00			71.40					-	\$ 161.40	\$ 161.40	
													0.0	\$ -				45.00			1,014.30					-	\$ 1,059.30	\$ 1,059.30	
500	Procurement Coordination/Facilitation					4.0	2.0	8.0		15.0			29.0	\$ 5,130.00				540.00			1,260.00						410.40	\$ 2,210.40	\$ 7,340.40
													0.0	\$ -												-	\$ -	\$ -	
600	Construction Supervision												0.0	\$ -												-	\$ -	\$ -	
		Travel Time				15.0							15.0	\$ 2,700.00													216.00	\$ 3,838.50	\$ 6,538.50
		Landfarm Construction				24.0		12.0					36.0	\$ 6,732.00	1,218.00	3,622.50	75.60		714.00	7,560.00	1,764.00	10,500.00	2,625.00	2,625.00		538.56	\$ 27,620.16	\$ 34,352.16	
		Remedial Excavation				24.0							24.0	\$ 4,320.00							1,953.00		10,500.00				345.60	\$ 12,798.60	\$ 17,118.60
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