15. SUMMARY OF COMMITMENTS

This section summarizes commitments made by Bennett Environmental Inc. based on consultant recommendations. The consultant recommendations were formed or derived from their specific assessment topics. Commitments have been broken down into key sections based on the consultant reports presented in this Environmental Assessment. Commitments by Bennett are summarized herein:

15.1. AIR

Envirometrex Corporation set out a number of recommendations in the Air Quality Impact Assessment (Appendix 3). Bennett has agreed to implement every recommendation, and they are summarized here for clarity.

1. The Canadian Environmental Protection Act Domestic Substances List (CEPA DSL) lists approximately 23,000 substances in commercial use, the Non-Domestic Substances List includes approximately 50,000 compounds used in industrial processes internationally. The proposed facility could potentially treat a large number of these compounds. Evaluation of the entire list(s) is obviously impossible, so an attempt has been made to select the compounds most likely to be treated, and the most likely to pose health and/or environmental risks.

During the operation of the facility, substances may need to be treated that have not been evaluated in the environmental assessment. The following recommendation provides a foundation for handling these new substances:

When Bennett encounters material contaminated with organic compounds of potential concern not specifically evaluated herein, an evaluation of the compound's concentration and properties will have to be made to determine how it would behave, and what it's resulting health and environmental risk would be compared with the evaluated compounds.

A formal procedure for this evaluation will be included in the Certificate of Approval should the Environmental Assessment be approved. The procedure will include a process for public notice and comment. The evaluation procedures will follow the methodologies developed by the various consultants in this Environmental Assessment.

2. The initial maximum process feed rates recommended in the Air Quality Impact Assessment (Appendix 3) for various compounds were back calculated from the POI standards or in-stack standard as applicable based on expected facility emission control efficiencies. A margin of safety was then added for each target substance concentration that was based on a POI standard. During facility commissioning, the actual performance of the facility emissions control system will be proven by source testing. Data obtained from source testing will then be used to model downwind concentrations that can be compared with Ontario standards. The model will be revised to incorporate the background data obtained by the four-season pre-operational monitoring program.

If the emissions controls do not achieve the efficiencies modelled, then the feed rates and concentration limits will be reduced accordingly until remedial steps are taken to bring the emission control systems to

modelled specifications. After remedial steps are implemented, a second source test should be used to verify emissions before obtaining approval to restore feed rates and concentration limits.

If actual emissions control performance is proven better than modelled, then Bennett could apply to the MOEE, via the amending mechanism of the Environmental Assessment, to adjust these initial feed rate and concentration limits. The application for amendment would be subject to public notice and comment.

3. To maintain dust levels from truck traffic at acceptable levels, it is recommended that Archer Drive be paved. This action is not up to Bennett, but the Town of Kirkland Lake. If the proposed facility is approved, discussions between Bennett and the Town will need to take place to discuss the paving of Archer Drive.

The paving of Archer Drive will prevent the track-in of mud from the road during wet periods, which would then be emitted to the atmosphere as dust particles from the facility roads during dry periods.

The paved areas of the facility will be cleaned regularly and thoroughly with a dedicated vacuum street sweeper to prevent any un-necessary dust generated by truck traffic.

4. A dustfall monitoring program on the perimeter of the proposed Bennett facility will be implemented if Archer Drive is paved. If the road is not paved, the monitoring program will be overwhelmed by the gravel road contribution. Dustfall is measured over the period of 30 days and is determined by weighing the mass of materials that settle out in a standard dustfall bucket. In addition, upwind-downwind ambient monitoring of the facility will be implemented during summer periods when the potential for fugitive emissions is the greatest.

5. During the course of this environmental assessment, Envirometrex recommended that Bennett enclose the treated soil storage area. Bennett accepted this recommendation immediately and the air dispersion modelling work has been done with the treated material storage area being enclosed.

6. Also during the course of this environmental assessment, preliminary emission estimates on the original process design indicated that the HCl levels would have approached the Ontario A7 guideline when high levels of chlorine were processed. Bennett moved ahead with the recommendation to include additional control. A wet scrubber has been added to the process Air Pollution Control System. Please refer to Section 2.2.3.8. for more information on the Wet Scrubber.

7. The largest source of most organic compound emissions will be via the building ventilation. After additional evaluations following the draft report, Envirometrex recommended that the efficiency of the proposed ventilation organic compound control system for organic compounds be improved. Bennett accepted this recommendation and upgraded the activated carbon adsorption system from powdered activated carbon fed into air upstream of the fabric filters to a dedicated carbon adsorption system following the fabric filters.

8. Each fabric filter will be fitted with a broken bag detector to immediately alert the operators in the event that a filter bag begins to leak. The stack will continuously be monitored for particulate and total hydrocarbons (THC), and the results will be data-logged.

9. The process emissions monitor will consist of oxygen, carbon dioxide, carbon monoxide, sulphur dioxide, hydrogen chloride, hydrocarbons, and nitrogen oxides. In addition, temperatures will be monitored in the primary and secondary combustion chambers. The data from the monitors will be displayed on screens for operators to use as a guide to operations. Data will also be recorded for regular inspection and they will provide a record for historical analyses.

10. A comprehensive four season pre-operational air monitoring program will be carried out if the Bennett facility is approved.

Ambient air quality monitoring would be conducted in two phases. In the first or pre-operational phase, a permanent air monitoring location will be selected. This monitoring program will be carried for at least one year before the facility commences operations. The monitoring program will consist of the same target compounds included in the air monitoring screening program and will add pesticides, mercury, and hydrogen chloride. A weather station will also be installed as part of the monitoring program in order to provide a refined meteorological dataset for modelling and to interpret ambient air quality results.

In the second phase, a comprehensive ongoing operational air monitoring program will be carried out by Bennett. Upon operation of the facility, the pre-operational monitoring will be continued on the same basis.

The detailed ambient air pre-operational and operational monitoring plans, including monitoring schedules for the specific target compounds are currently under development. The details of the monitoring program will be determined with discussions with the Ministry of Environment and Energy and the Kirkland Lake Citizen's Advisory Committee. The completed monitoring program will be submitted with the Certificate of Approval applications.

Special attention will be paid during emission and ambient monitoring for mercury and PCBs.

11. Upon completion of the pre-operational monitoring program, the dispersion models will be run again with the onsite meteorology and updated target substance background levels.

12. Bennett will comply with applicable reporting regulations, both provincial and federal, and will make annual emission reports available to the public. The two main regulated monitoring requirements are:

- Ontario Airborne Contaminant Discharge – Monitoring and Reporting (Regulation 127/01)
- National Pollutant Release Inventory operated by Environment Canada.

Bennett will also submit annual reports to the MOEE's District Manager as a condition for obtaining an air approval permit. The reports will contain information on activities that took place during the previous year and activities planned for the upcoming year. Bennett will provide copies of these reports to the Clerk of the Town of Kirkland Lake, the Medical Officer of Health for the Temiskaming Health Unit and the Kirkland Lake Citizen's Advisory Committee.

The air emission related reports will include:

- The results of the monitoring programs, a discussion of the results, a description of mitigation measures, if any, and recommendations;

- A summary of the continuous emission and process monitoring data of parameters specified by the Certificate of Approval, including average monthly and yearly values, contaminant standard deviations in the case of CO, O_2, NO_x, HCl, SO_2 and THC, number and total duration of exceedances of the limits listed in the Certificate of Approval and, as applicable, a list of reasons for any exceedances and a list of corrective actions;
- A summary of the results of Source Testing, including average values, highest and lowest values, Point of Impingement values, a comparison of these values with the limits specified in the Certificate of Approval, discussion of these results and a list of corrective actions if any;
- An annual summary of the quantities of waste received by type and Ministry Waste Classes;
- Annual quantity of fabric filter residue transported off-site and its destination, plus copies of analysis results;
- A summary of spills and discharges to the environment, and the mitigative actions taken or required, including at least in the case of spills, plans to prevent a reoccurrence;
- A summary of all complaints and actions taken in response to these complaints.

In addition to accepting all recommendations described above, Bennett will also carry out passive air monitoring at the closest school location.

15.2. WATER

A&A Environmental Services Inc. (A&A) set out a number of recommendations in the Surface and Groundwater Impact Assessment: Potential Impacts and Mitigation Measures (Appendix 6). Bennett has agreed to implement all recommendations, and they are summarized here for clarity.

1. Pending facility approval, during the construction phase, the following mitigation measures will be implemented:

Runoff from the site will be managed to simulate pre-construction sheet flow without the ditches draining to the swamp. Staggered snow fencing will be installed 75 to 100m on the downslope side of the construction area.

If construction activities encroach on the south side of the water divide, the road leading down the hill will be modified to divert and slow the expected increase in runoff. Specifically, the excavation of diagonal ditches in the road to divert ands low runoff to prevent erosion will be implemented.

A stormwater runoff pond located to the northeast of the facility will be constructed to allow the collected runoff to slowly drain to the north swamp – resulting in reduced instantaneous input to the north swamp from paved areas .

2. Pending facility approval, during the construction phase, the following **will** be monitored with regards to groundwater:

- Water levels in the following boreholes: AK-9, AK-45, AK-46, and AK-51 (refer to Figure 4-5 for borehole locations), and
- A visual inspection of the turbidity of groundwater by obtaining a sample with a transparent 1L bailer (by an experienced technician).

3. Pending facility approval, during the operational phase, the following monitoring will be implemented:

The following surface water sampling points will be used:

- Upstream Murdock Creek where a trail will be cut to provide access for sampling;
- Downstream Murdock Creek where a trail will be cut to provide access for sampling;
- Mouth of Amikougami Creek at Blanche River;
- Surface water from the north swamp; and
- Water from Spring 1 located on the road in the south area.

For the first two years of operation, the sampling frequency is 4 times per year (each season), specifically during March, June, September and late November or early December before freeze-up. After the first two years of operation, Bennett will hold discussions with the MOEE to determine an appropriate sampling schedule.

For the first two years of operation, Murdock Creek will be sampled for pH just before and after the snowmelt period. A pH datalogger will be used, and the list of parameters that will be analyzed are as follows:

pH	Alkalinity	Conductivity
Calcium	Magnesium	Sodium
Potassium	Chloride	Sulphate
Nitrate	Aluminum	Arsenic
Beryllium (Hardness <75)	Beryllium (hardness > 75)	Cadmium
Chromium	Lead (alkalinity > 80)	Mercury
Benzene	PCB	PCP

Results from the Drinking Water Surveillance Program (DWSP) for Gull Lake will be incorporated into the annual report to be submitted to the MOEE. An analysis of trends of concentrations of PCBs in the lake will be part of the report.

4. Pending facility approval, during the operational phase, the following monitoring will be implemented:

A network of monitoring wells will be installed in order to meet the requirements of MOEE Policy B-7, the Reasonable Use Policy. A background well located Upgradient (upslope) of the facility will be required with two monitoring wells located at downgradient site boundaries.

The monitoring program will consist of six monitoring wells. The exact location of the monitoring wells will be better chosen after construction of the facility has been completed. The Upgradient well will be installed as soon as possible and sampling will begin to establish baseline quality that will be used to determine the Reasonable Use allowable limits.

For the first two years of operation, the sampling frequency will be at least 4 times per year (each season) specifically March, June, September and late November or early December before freeze-up. After the first two years of operation, discussions will take place between Bennett and the MOEE to determine an

appropriate sampling schedule. The list of groundwater parameters to be analyzed for in the groundwater-monitoring program is as follows:

Fluoride	Silver	Copper	Lead
Chloride	Aluminum	Iron	Antimony
Bromide	Arsenic	Gallium	Silicon
Nitrate	Gold	Mercury	Strontium
Nitrite	Boron	Potassium	Thallium
Phosphate	Barium	Lanthium	Titanium
Sulphate	Beryllium	Lithium	Uranium
Conductivity	Bismuth	Magnesium	Vanadium
pH	Calcium	Molybdenum	Tungsten
Total Alkalinity	Cadmium	Sodium	Ytrium
Total Ammonia	Cesium	Niobium	Zinc
Total Suspended Solids	Cobalt	Nickel	Zirconium
Total Dissolved Solids	Chromium	Phosphorus	Total PCBs
Pentachlorophenols			

15.3. BIOPHYSICAL

EcoTec Environmental Consultants Ltd. set out a number of recommendations in the Biophysical Impact Assessment (Appendix 7). Bennett has agreed to implement every recommendation, and they are summarized here for clarity.

15.3.1. Sensitive/Unique Landforms and Geological Features

In order to manage stormwater runoff from compacted or paved soils, a stormwater management plan will be developed in order to attenuate peak flow discharges to receiving water bodies and also maximize groundwater infiltration to soils. To mitigate sedimentation of wetlands and water features as a result of erosion of surface soils, various environmental measures (such as straw bale flow checks, rock flow check dams, silt fence barriers) will be installed in the ditch lines along Archer Drive.

15.3.2. Vegetation and Forestry Resources

In order to lessen the disturbance of vegetation outside of the facility footprint, a number of mitigation measures will be implemented, including:

- Minimization of vegetation removal;
- Replacement of vegetative cover with topsoil and sod or seed (standard roadside seed mixture) and mulch in areas which remain exposed following construction;
- Protection of existing trees during the construction phase through the delineation of areas off limits to construction activity;

- Implementation of certain design options, for example the location of storage and management of excess materials, that could result in preserving specimen trees; and

- Preservation of existing grades within the dripline of specimen trees.

15.3.3.Fish and Wildlife

1. To mitigate the release and transport of sediment-laden runoff from the construction site to wetland and water features the following construction operational constraints will be implemented:

- Various environmental protection measures (such as straw bale flow checks, rock flow check dams, silt fence barriers, and erosion control blankets) will be installed in the ditch lines along Archer Drive. Silt fence barrier will also be installed around the construction perimeter.
- All exposed slopes will be protected by requiring the Contractor to limit the time that such areas are exposed prior to final application of topsoil, seed and mulch (within 45 days of soil exposure from construction activities)
- Following the completion of final site grading and topsoil application, a suitable seed mixture should be applied to all exposed soils.
- No stockpiles of construction excess materials will be located closer than 30m from water features. Waste generated on-site which requires off-site removal will be managed in accordance with Ontario Regulation 347 under the Ontario Environmental Protection Act, which provides for the transportation and processing of hazardous and non-hazardous waste.
- Care will be taken to avoid accidental spillage or discharge of chemical contaminants (e.g., gasoline, oils and lubricants). Equipment refuelling will be properly maintained to avoid contaminant leakage and be free of excess oil/grease. In the event that a spill does occur, proper containment, cleanup and reporting, in accordance with provincial requirements, will be completed.

2. The entire facility will be fenced in order to deter any potential interactions between construction activities and local wildlife.

3. If outdoor lights are found to be required, white strobe lights, where time of is greater than time on, will be used. The use of flood lighting and spot lights will be avoided within all areas of the facility because research shows floodlit stacks and areas provoke an increase in bird kills.

Security lighting for on-ground facilities and equipment will be carefully matched with lighting level application and numbers should be kept to a minimum.

Bennett commits to practice the following:
- Use of down-shielded lighting keep light within the boundaries of the site.
- Use of ‘full-cutoff’ luminaries fixtures to avoid up-light or glare.
- Lighting pole heights be lowered and spaced closely together.
- Outdoor light wattage will be below 250 watts.
- Lights will focus downward at a minimum of 20 degrees below the horizontal plane.
- Spotlights and/or floodlights will be avoided.
- Use of back-illuminated lighting or above lighting on signs.

4. Artificial noise pollution is inevitable but will be reduced by implementing the following :

- Changing the road surface from a rough surface (i.e., gravel/rock asphalt) to smooth asphalt (this can lower noise levels by about 5dB,
- Increasing the density of vegetation around the footprint perimeter by planting trees and shrubs will provide some acoustic screening and buffer adjacent woodland environments

5. Road access and fencing will be minimized to reduce habitat fragmentation and disturbance to wildlife corridors and fencing will completely restrict wildlife passage. This will reduce the chance of entanglement and entrapment with the facility.

Fencing will consist of 8ft high 12 gauge above the ground and fencing will be buried underground to serve as a dig barrier. The two will be tied together using locking knot.

15.4. MINING

DST Engineering Consultants Inc. (DST) set out a number of recommendations in the Mining Impact Assessment (Appendix 9). Bennett has agreed to implement the recommendations, and they are summarized here for clarity.

1. Bennett meet with the holder of the mining rights to negotiate an agreement to allow defined mining exploration work to be conducted on facility property.

2. Bennett takes the lead informing a liaison committee with the mining company that develops the Amalgamated Kirkland deposit. Suitable topics for discussion within the committee would be topics of mutual concern including but not limited to mining plans including blasting methods, local traffic concerns, environmental concerns, etc.

15.5. AGRICULTURE

ESG International (ESG) set out the following recommendation in the Agricultural Impact Assessment (Appendix 10). Bennett has agreed to implement the recommendation.

Bennett will carry out good and frequent communications with the farming community and local residents involving facility operations.

15.6. NOISE

Hatch & Associates (Hatch) set out a number of recommendations in the Noise and Traffic Noise Impact Assessment (Appendix 11). Bennett has agreed to implement the recommendations, and they are summarized here for clarity.

Comprehensive frequency and sound level information for all proposed equipment, manufacturers or suppliers, **will** be examined in accordance with a Certificate of Approval under Section 9 of the Environmental Protection Act.

15.7. ECONOMIC

Commerce Management Group (CMG) set out a number of enhancement recommendations in the Economic Impact Assessment (Appendix 12). Bennett has agreed to implement most enhancement recommendations, and they are summarized here for clarity.

1. To enhance the participation of local suppliers, the following action will be taken:

The tendering process will be designed to encourage use of local labour and suppliers. This may be in the form of preference for local companies. At minimum, the tendering will not present any artificial barriers that prevent local companies from bidding, such as excessive bonding or performance guarantees.

2. Bennett will do its best to establish strict delivery policies to prevent early morning or late evening truck traffic.

3. Bennett will continue to build good relations with local people and work on improving the knowledge of the positive impact of the Bennett operation on the local community.

4. The network of snowmobile trails (Golden Corridor Snowdrifters snowmobile club) crosses Archer Drive. Bennett will focus on increasing the safe use of the road crossings.

15.8. SOCIAL CULTURAL

Holistic Impax Group set out a number of recommendations in the Socio-Cultural Impact Assessment (Appendix 13). Bennett has agreed to make note of and follow the recommendations provided below.

1. Carry out consultation with the Golden Corridor Snowdrifters Club, Kingdom Hall and the Living Faith Assembly Church to advise members of construction activities.

2. Restrict construction activity to daylight hours.

3. Carry out consultation with the Town of Kirkland Lake regarding the desirability of paving the entire length of Archer Drive.

4. Ensure dirt/mud on trucks exiting the Archer Drive site is minimized during the construction phase.

5. Ensure construction vehicles using Highway 66 / Government Road adhere to basic vehicle safety practices and drivers are also aware that school buses and children use Highway 66 / Government Road.

6. Bennett will conduct a community monitoring program for issues related to property valuation, community satisfaction, social cohesion and community concerns about the facility.

7. Bennett will carry out ongoing consultation with the Kingdom Hall and the Living Faith Assembly Church to monitor any potential impacts related to the Bennett facility.

8. Bennett will carry out ongoing consultation with the Golden Corridor Snowdrifters Club to monitor the potential impact of Bennett-related traffic at the trail's intersection with Archer Drive.

9. Bennett will establish a complaints procedure and publicize information on the types and quantities of materials processed.

10. Bennett will prepare a fact sheet on the protocols related to the transportation of dangerous/hazardous materials.

11. Bennett will ensure that the site is visually bermed, vegetated and secure. A monitoring committee will be established comprised of local citizens, representatives of local government and Bennett.

12. Bennett will offer to conduct site tours, and establish a public information telephone line and distribute an annual newsletter to members of the community.

15.9. ARCHAEOLOGICAL

A.F.B.Y Archaeological & Heritage Consultants (AFBY) set out two recommendations in the Archaeological Stage 1 & 2 Impact Assessment (Appendix 14). Bennett has agreed to make note of and follow the recommendations provided below.

1. Should any deeply buried archaeological deposits be encountered during any development activities across the study area, the Ministry of Citizenship Culture and Recreation (MCzCR) will be contacted immediately.

2. Should human remains be encountered during development or other activities, which cause soil disturbance, Bennett will contact both the MCzCR, and the Cemeteries Regulation Unit of the Ontario Ministry of Consumer and Commercial Relations (416) 326-8392.

15.10. TRAFFIC

McCormick Rankin Corporation (MRC) set out a number of recommendations in the Traffic Impact Assessment (Appendix 15). Bennett has agreed to implement the recommendation summarized here for clarity.

Bennett will avoid routing any truck traffic towards Government Road along this street. Archer Drive provides suitable access for any truck traffic generated towards the east, without significant impacts on travel time.

15.11. HUMAN HEALTH RISK / ECOLOGICAL RISK

Cantox Environmental Inc. (CEI) set out a number of recommendations in the Human Health Risk Assessment and the Ecological Risk Assessment (Appendix 17 & 18, respectively). Bennett has agreed to implement the recommendations, and they are summarized here for clarity.

1. Data will be collected in the future to minimize the uncertainty associated with future fish concentrations. Bennett will implement a sampling and analysis for Gull Lake water and sediments if the facility is approved.

2. Baseline monitoring will be conducted for selected chemicals in the area around the proposed Bennett facility to assess the potential impact of existing facilities (e.g., mine wastes, the power facility, other outfalls).

3. Bennett will need to understand current levels of contamination and current levels of impact (if any) to aquatic and terrestrial organisms, before the proposed facility is built. Monitoring will include chemical concentrations in soil, water and sediment, and possibly biological tissues (e.g., fish).

15.12. OPERATIONS

Bennett will establish, install or implement the following:

- Critical systems responses will be automated.
- A comprehensive Preventative Maintenance program.
- A detailed Inspection program.
- A detailed training program.
- Continuous sensors to monitor critical process components.
- E.g. Vibration/temperature/motion sensors, which will give advanced warning if any equipment is experiencing premature signs of degradation
- Frequent sampling and analysis of process parameters will indicate as to the effectiveness of the process.
- Equipment specifications will require “Heavy Duty” components were reasonably possible.
- E.g. Heavier-duty bearings, or increased equipment “Capacity Capability” in reasonable excess of expected demands. This will impact favourably on the operational life of equipment and reliability.
- Trained staff will be present at all times during the process operation.
- Planned maintenance shut down 2x/year.

Should the Environmental Assessment be approved, Bennett will submit an Application for Approval - Waste Disposal Site-Thermal Destruction under the Ontario Environmental Protection Act. This application will include, among others, the following documents:

- Maintenance and Inspection Plan
- Emergency Response Plan
- Waste Handling Procedures Manual

- Training Plan
- Spill Prevention, Control and Countermeasures Plan

The training program will teach the facility personnel how to perform their duties by:

- Providing classroom instruction,
- Hands-on training equipment,
- Supervised on-the-job training,
- Cross training for related jobs.

Experienced staff from our Récupère Sol Inc. facility will be present for training during the initial operating period at the proposed facility. Alternatively, Kirkland Lake operators may receive training at Récupère Sol