

13. ADVANTAGES AND DISADVANTAGES

The proposed construction and operation of Bennett Environmental Inc.'s Thermal Oxidizer facility for the town of Kirkland Lake will result in a State of the Art facility capable of destroying various chemical contaminants consisting of chlorinated and non-chlorinated organic compounds found in soil and other solid matrices. Many of these contaminants are persistent and biocumulative once released into the environment.

The result of past industrial practices has led to large-scale soil and groundwater contamination problems especially on industrial sites. While impacts of contaminated sites to land is typically a local concern, more serious concerns relating to both surface and ground water contamination is a regional concern and impacts to air through the long-range transport of these contaminants is a regional or global concern. Air and water contamination presents a real and serious threat to public health and the eco-system. Remedial measures are often difficult and extremely expensive as they have been well documented in Ontario and other jurisdictions. Therefore, environmentally sound solutions to remove these contaminated sites and permanently destroy these sources of hazardous materials are urgently needed.

Management of hazardous waste from impacted sites precludes waste minimization, recycling and reuse as the preferred method for reducing the volume of hazardous wastes. These wastes are already in the environment and carry with them the associated public health and environmental hazards. The need for effective technology to deal with the destruction of hazardous waste impacted soils and solids is undeniable in the best interest of the public.

For many chlorinated and non-chlorinated compounds, which are hazardous waste, high temperature incineration is the Best Demonstrated Available Technology (BDAT).

The advantages of the construction and operation of the Bennett facility far outweigh the potential disadvantages. On the positive side, hazardous waste impacted soils and solids will be effectively and permanently destroyed, thereby reducing the inventory of contaminants in the environment. This has positive regional, national and even global ramifications. This facility will improve on the environmental performance of the province of Ontario and Canada in many areas. Provincial and Federal hazardous waste elimination plans can proceed to completion in an environmentally sound manner. Ontario and Canada can now honour our international obligation in cleaning up our waste stockpile.

This undertaking may have a small impact on the environment surrounding the proposed facility as a result of process, ventilation and fugitive emissions. However, mitigative measures are proposed to control and minimize the potential impacts. Designed redundancy and safety back up systems as well as proposed limits on treatment feed rates and contaminant concentration also mitigates impact to the environment and ensures compliance with very stringent Ambient Air Quality Criteria established by the Ministry for the protection of health and the environment. Studies have been conducted on the negative impacts that may result from the operation of the proposed facility and conclusions from the studies suggest the impacts will be negligible and well below permissible levels.

This chapter summarizes the advantages and disadvantages of the proposed Thermal Oxidizer facility in light of resultant impacts on the environment.

13.1. ADVANTAGES AND DISADVANTAGES – AIR

In order to assess potential air impacts of general operations on the environment, 3 operating conditions were modelled:

- Normal Operations of the facility alone;
- Normal Operation of the facility plus estimated emissions from other point sources, and
- Upset Conditions

For each of the three conditions, the modeling results indicate conclusively that the facility operations will be in compliance with the air quality standards of Regulation 346 (point of impingement), existing approval requirements, and the applicable air quality criteria used by the Ministry of the Environment and Energy for contaminants not included in Regulation 346. In fact all air quality standards and criteria are met by large margins (Refer to Appendix 3 for further detail).

On balance, although the proposed facility may result in some contaminants being released into the air, the emissions will meet not only Regulation 346, but Guideline A-7 and Canada Wide Standards (CWS) for mercury, and PCDD/PCDF, this level of environmental performance far exceeds current regulatory requirements.

One of the goals of the proposed undertaking is to destroy these pollutants of concern by eliminating the source. Thus, when properly operated, the State-of- the-Art facility is expected to actually reduce the ambient concentrations of those pollutants.

While the facility will create a potential for increased fugitive dust emission generated by increased truck traffic on Archer drive, these potential problems can be effectively mitigated. It has been recommended that paving Archer Drive will in effect alleviate the potential for dust problems.

Therefore, the advantages of this facility far exceed its disadvantages from an air emissions point of view; overall air performance is superior as far as current regulatory requirements are concerned.

13.2. ADVANTAGES AND DISADVANTAGES - WATER

The advantages of the undertaking include an assessment of surface and groundwater conditions for the Kirkland Lake area as part of the Environmental Assessment and sampling of surface and groundwater in the area as part of the proposed monitoring programs. The monitoring data will augment the surface water quality sampling already being conducted by Kirkland Power on Murdock Creek and Kinross Mines on Amikougami Creek. The quality of the water entering the Blanche River, which flows south to Round Lake, has been a concern of local residents. Bennett Environment has committed to ensuring that annual surface and groundwater-monitoring reports be available to concerned citizens with total transparency and cooperation.

The decision to enclose the facility is the most effective method of minimizing if not eliminating any potential impacts to surface and groundwater in the area. Localized impacts such as a slight lowering of the water table beneath the process building and the interception of precipitation by impervious surfaces may occur. Bennett Environment is committed to institute mitigation measures, including the

construction of a stormwater retention pond, to address these potential impacts. Both surface and groundwater will be monitored during the construction and operating phases of the undertaking. Studies performed for this Environmental Assessment have demonstrated that predicted impacts to the quality of surface and groundwater do not exceed applicable limits.

In summary, the environmental quality data collected as part of the undertaking will enhance the understanding of surface and groundwater conditions of the Kirkland Lake area while impacts to the quality and quantity of surface and groundwater are minimal.

13.3. ADVANTAGES AND DISADVANTAGES – HUMAN HEALTH RISK

Cantox Environmental Inc. conducted a human health risk assessment to evaluate the potential human health impacts on the local community as small concentrations of some chemicals may be emitted through the stack and building ventilation system.

A residential exposure scenario was considered as a reasonable “worst case” scenario. Hypothetical people, used to predict potential health risks to the local community, were conservatively assumed to spend 24 hour per day, 7 days a week, 52 weeks per year for 70 years at the theoretical maximum point of impingement (MPOI) while supplementing their diet with local fruits, produce, meat, fish and dairy products from the local farming community and the local lake.

Both short term and long-term exposures to expected contaminant emissions were considered. Results showed that future levels of chemicals in air, soil, surface water and food (fish and agricultural crops) as a result of potential emissions from the proposed Bennett facility, are not expected to cause adverse health risks to people in the Kirkland Lake area.

Based on the risk assessment, the operation of the Bennett facility is not likely to cause measurable health effects in the community. The likelihood of any potential adverse health effect is negligible and can be mitigated. In addition, the MPOI is in an area where there is no residences or commercial property and it is unlikely that any will be constructed in the immediate vicinity.

A number of references are available in the literature showing that modern incineration facilities (most operated with emissions limits even higher than Bennett’s proposed facility), do not adversely impact the area in which they operate.

While the Bennett facility is not risk free, it is not likely to cause measurable effects. Therefore the advantages of the construction and operation of the facility outweigh the disadvantages from a health risk perspective.

13.4. ADVANTAGES AND DISADVANTAGES – ECOLOGICAL RISK

Cantox Environmental Inc. conducted an ecological risk assessment to evaluate the potential risks to the local ecological community as a result of the expected chemical releases from the proposed treatment facility.

The ecological risk assessment for the vicinity of the Bennett facility evaluated potential impacts to terrestrial plants, soil, invertebrates, fish and other aquatic organisms and avian and mammalian wildlife.

To be conservative, risks were estimated at the MPOI for terrestrial receptors, and at Gull Lake and Murdock Creek for aquatic organisms.

Results showed future levels of chemicals in soil, surface water and sediment, in effect from the Bennett facility emissions, are not expected to cause direct toxicity or indirect effects to valued ecological species (*i.e.*, plants, soil invertebrates, wildlife and aquatic organisms). It can be concluded that:

- Desired plant communities can be maintained;
- Wildlife populations will continue to persist;
- Plant and invertebrate populations that are at the base of the food chain will continue to persist;
- There are no threatened or endangered species in the vicinity of the site;
- Aquatic and riparian ecosystems along area creeks will be maintained; and
- Aquatic communities in and associated with lakes will be maintained.

In order to ensure that the likelihood and magnitude of any potential impacts on the surrounding ecosystem as a result of the proposed Bennett facility is minimal, Bennett is committed to conduct baseline monitoring in the surrounding area, so as to develop an understanding of the current level of contamination as a benchmark before the facility is built. This commitment to conduct a comprehensive baseline monitoring will further aid in the protection of the local community by tracking the facility footprint on the neighbouring environment once the facility is operational.

13.5. ADVANTAGES AND DISADVANTAGES – TRAFFIC AND NOISE

The proposed facility will probably result in increase noise and vehicle movements to and from the site.

13.5.1. Noise

The proposed facility will generate noise within the industrial park. This would bring sound levels reaching the nearest residences to anywhere between 41 and 43dBA. However, these levels are within MOE Guidelines.

While the proposed facility will create greater levels of noise than no facility, the levels will meet the MOE Guidelines and therefore, are not considered to be a major impact.

13.5.2. Traffic

The traffic analysis evaluated existing conditions, future background conditions (without the development of the proposed facility) and future total conditions (including the development of the proposed treatment facility).

The construction of the facility would lead to an increase in truck traffic of an average of 21 trucks a day visiting the site. Even with background traffic included, only minor increases in traffic are anticipated. The intersection levels of service will be maintained on all intersections approaches, and all of the highways sections within the study area will also continue to operate with good levels of service. The level of service analysis indicates that traffic generated by the disposal of treated material can be accommodated on the study area road network. Overall the level of service impacts resulting from the combined traffic volume increases related to general corridor growth and development of the proposed

thermal treatment facility can be accommodated on the existing road network without the need for mitigation.

The town of Kirkland Lake was developed with a larger population in place. The decrease in population is providing growing room for traffic. The traditional users of the highway in and around Kirkland Lake were related to mining activities. Since mining is down these days, there is traffic room on the highways.

While the proposed facility will add to traffic in the area, the traffic analysis demonstrates that the proposed treatment facility can be readily accommodated on the surrounding road network.

13.6. ADVANTAGES AND DISADVANTAGES- ECONOMIC

The construction and operation of the proposed facility will bring significant economic benefits to Kirkland Lake and local businesses. The positive effect of the project will provide benefits to the whole town in terms of new private sector jobs, support for its economic development strategy and a stabilizing of property values while being consistent with the existing land uses in the area.

Kirkland Lake has been a noted mining community for the better part of ninety years. The stable and high paying jobs in the mining sector provided Kirkland Lake residents with an enviable quality of life. Unfortunately, over the past ten years, the mining industry has been hard hit and can no longer be considered the primary economic activity in Kirkland Lake.

The environmental industry has demonstrated excellent growth potential and represents a viable economic alternative to the mining industry. It provides good wages as well as a high level of skilled employment and requires additional goods and services that can stimulate other local business development.

The overall effect of the proposed project should benefit property values in Kirkland Lake. The minor increases in truck traffic at the intersection of Highway 66 and Archer Drive may negatively impact on the values of properties in this vicinity. However, since the project is being developed within an existing industrial park and is consistent with land use designations, any impacts should be minimal.

A key factor in supporting property values within the vicinity of the facility is ensuring that the project and treatment process is viewed positively and clearly understood by local residents that Kirkland Lake can be a base for an environmental industry. Potential negative effects will be limited to the “nuisance” effects of increased industrial activity.

While the facility will be located in Kirkland Lake, there will be economic effects gained throughout the region from Matheson to Temagami both directly and indirectly. As part of its contribution as a participant in the Kirkland Lake economy, Bennett has proposed to start a community development fund based upon tonnage of soil treated the proposed facility.

Not only will this facility provide opportunities to enhance economic benefits in regards to existing businesses, but this proposal could generate a \$1.225 million increase in the local employment income annually, as well as increase of \$294,290 in municipal tax and an \$149,889 increase in provincial education tax.

On balance, the advantages to the economic environment outweigh the disadvantages.

13.7. ADVANTAGES AND DISADVANTAGES- BIOPHYSICAL ENVIRONMENT

EcoTec Environmental Consultants conducted a biophysical impact assessment as it relates to the biophysical resources of the study area.

Although the construction of the proposed facility will result in the permanent displacement of approximately 2.3 Ha of; wildlife habitat in the form of upland woodlot, and lowland scrub meadow, and herbaceous vegetation, shrub and trees, no sensitive wildlife habitat, wildlife species, or rare, threatened or endangered vegetation species were identified within the footprint. Further, the facility footprint did not possess any Environmentally Sensitive Areas or Areas of Natural or Scientific Interest.

Although no sensitive wildlife corridors were noted through the subject property, the working portion of the facility is to be fenced in, in order to deter any potential interactions between construction activities and local wildlife.

Several wetland habitat features were located within or adjacent to the study area. Within the subject property there are two unevaluated wetlands. During project construction sediment laden runoff could be released to these wetlands and impact surface water quality as well as wetland habitat features. In addition approximately 0.2 Ha of one of the two wetlands pockets will be permanently infilled as a result of facility construction, which could potentially transport sediment to Murdock Creek during rain events. However various sediment and erosion control measures as well as construction operational constraints can be implemented during facility construction to alleviate sediment loading.

On balance, although the facility footprint will permanently encroach on approximately 2.3 Ha of the 17.8 Ha property, no Environmentally Sensitive Areas, Areas of Natural and Scientific Interest, rare, threatened or endangered species or valued habitat and ecosystems were identified.

13.8. ADVANTAGES AND DISADVANTAGES- SOCIAL/CULTURAL

Holistic Impax Group Inc. was retained by Bennett to conduct a study on the social environment surrounding and potentially affected by the proposed undertaking, to be located at 233 Archer Drive. An inventory of the existing environment was established as well as an assessment of the potential impacts on the socio-cultural environment.

Due to the industrial zoning of the Archer Drive area, it's proximity to residential development and the change in land use from open space to industrial use, it is anticipated that there will be a level of concern exhibited by the residential community regarding the construction and operation of the Bennett Thermal Oxidizer Facility. However it should be noted that the Archer Drive corridor has been zoned as industrial since the early 1980s and currently has a number of industrial tenants.

The proposed facility will be entirely closed, located in an area zoned for industrial activities and is approximately 700 meters for the nearest household. Therefore, the potential for social-cultural impact from this facility is low to negligible. Technical reports from other specialists indicate a similar low potential for adverse environmental impacts. In addition, social, recreational and cultural facilities are

unlikely to experience adverse environmental impacts. While Kirkland Lake has been characterized by industrial activities in the past, the community could and should be proud to have a new environmental industry for the future.

On Balance although the results of the site vicinity study indicate that residents in the study area are closely attached to their community, value many communities attributes and have expressed various levels of concern surrounding Bennett's proposal, the majority of residents who responded to the community survey indicated that they don't anticipate that the Bennett proposal would affect their day to day activities. In addition when respondents were asked to indicate the community attributes they least liked, unemployment was cited most frequently. As an estimated 90 Full-Time Equivalent jobs will be created locally over the course of the construction and development period, another 34 people will be employed at the facility, this will result in an estimated \$12.2 million injected into the local economy and an increase of \$1.225 million annually in total employment income. Thus the advantages of the Bennett facility outweigh the disadvantages from a socio/cultural perspective.

13.9. ADVANTAGES AND DISADVANTAGES – AGRICULTURAL

ESG International Inc. was retained to conduct an agricultural assessment to determine what effects, if any, the construction and operation of this facility will have on agriculture in the area. While agriculture is not prevalent in the immediate vicinity of Kirkland Lake, there is an area of agricultural production starting at approximately 35 kilometers south of Kirkland Lake known as the "Little Clay Belt".

While the biggest disadvantage as seen with regards to agricultural industry appears to be public perception, a review of agricultural statistics demonstrates that the construction and operation of the RSI Thermal Treatment Facility in St. Ambroise, Quebec has had little to no effect on local agricultural productivity. The farms in the St. Ambroise region are situated throughout the town with the closest farm being 500 meters north of the RSI facility. Trends in the number of farms, availability of cropland, livestock inventories and farm gate sales and revenues in St. Ambroise are consistent with those experienced in the larger geographic regions within the province of Quebec outside the RSI facility's zone of influence.

Although the proposed Kirkland Lake facility is larger in scale, the emission limits are lower and it is anticipated that the impacts upon agriculture in the study area should be consistent with those in St. Ambroise. Farmers in the study area will not be inhibited in their abilities to operate their farms by the construction and operation of the proposed Kirkland Lake facility, nor should there be any long-term impact on their abilities to sell their produce.

As shown in the St. Ambroise case study, the short-lived negative market perceptions regarding agricultural products for that area was largely based on a lack of accurate information. With greater public consultation efforts and a more transparent process, negative market perceptions, with regards to the safety of agricultural products from the study, should be alleviated.

13.10. CONCLUSIONS ON ADVANTAGES AND DISADVANTAGES

Based on the preceding discussion it is clear that the advantages of the construction and operation of Bennett's Thermal Oxidizer Facility far outweigh the disadvantages and will result in significant benefits

not only to the community of Kirkland Lake from an economic standpoint but to the environment as results will be seen in the following ways:

- Cleanup of contaminated sites in Ontario and around the great lake basin;
- Protection of public health and the environment through removal and destruction of contaminants of concern.
- Protects ground and surface water resources from contamination; and
- Redevelopment of brownfield sites creates jobs, improves utilization of existing infrastructure (roads, sewer, utilities, etc.), reduces urban sprawl, and revitalizes communities

The environmental benefit of proceeding with the construction of this facility will be manifested in the destruction of persistent organic pollutants (POPs) that presently exist in our environment in the form of contaminated soils and solids.

The political benefit will be manifested in Canada being able to meet our national obligations in meeting clean up goals and schedules.

The infrastructure benefit to Ontario is to have a world-class facility that can clean up contaminated sites by destruction rather than containment technologies such as land-filling or other temporary solution.

The economic impact resulting from this facility is an estimated 35 direct jobs. In addition, 44 indirect jobs in the area of transportation are also expected. Overall, construction of this facility will create the equivalent of 90 man-years of employment, from a private sector investment of close to \$30 million dollars. When facility production reaches the permitted level of 200,000 tonnes per year, the facility will generate an economic activity in excess of \$100 million dollars. This economic activity will generate millions of tax dollars at the Municipal, Provincial and Federal levels to support our society's needs for government services such health care, education and good government.

On balance the advantages of the construction and operation of Bennett's Thermal Oxidizer facility proposed for the Town of Kirkland Lake far outweigh the disadvantages.