

# The Bennett Report

Volume 1

No. 1

"The Earth is our Business"

Summer 2002

## The need for Bennett Environmental

There are two kinds of people when it comes to the environment - those who worry and talk about it, and those who do something. John Bennett has spent his life doing something, making the environment better. In the 1960s, while working at a pulp and paper mill, a chemical company and a steel mill, he recognized that something must be done about the toxins industry was introducing to the environment. Most vividly, he remembers the bleach from Rayonier pulp and paper killing the inlet at Port Alice, B.C., rendering a huge body of water unusable for fishing or swimming.

There and then, he saw the need to set up a company to permanently treat the toxins the modern world produces.

In 1968, the engineer from Cardiff, Wales started Bennett Pollution Controls with \$500 and high-pressure water-blasting equipment he designed. For his first job, he and one employee drove a truck down from Vancouver to Santa Barbara, California where he won a contract to clean up an oil spill on beaches from Ventura to Santa Barbara. With that success, he reinvested in pollution control equipment such as booms, and eventually an incinerator. Today, Bennett employs 55 people and is a \$50 million-year business, trading on the Toronto and Amex exchanges.

Bennett's success has been in recognizing that untreated PCBs and dioxins will not go away on their own. Society would have to deal with them at some point, because untreated contaminated soil, whether it is in Timiskaming or Toronto, continues to pollute our air, ground and water supplies. Sure, John Bennett is a businessman. But first and foremost he is an environmentalist. The father of three and grandfather of six cares about the impact these chemicals can have on future generations.

So should you.

These chemicals are already present in Timiskaming. You produce them everyday when you drive your car, burn your garbage, stoke your fireplace or smoke cigarettes. More importantly, they can be found in the food we eat, the ground we walk on, the water we drink, and subsequently, in humans, animals and vegetation. They are everywhere and they come from everywhere. Dioxins created in Toronto, Hamilton or Montreal will make their way here through the air. The key is to treat them when they are found in the public domain.

Bennett's business is to destroy these chemicals when found in contaminated soils and other solid materials. It is doing its bit to clean up one area that is threatening Canadians.

Bennett Environmental takes pride in having an impeccable record of safety, which they improve upon when they identify benefits. The studies they commission are not assessed by them, but by qualified scientists employed by the Ministry of the Environment. They have purchased parts of used incinerators, but only to recycle the unaltered steel; it will be combined with the best available technology. And instead of adding to pollution in the north, Bennett hopes one day to reduce the problems extant in Timiskaming and beyond.

Furthermore, Bennett hopes its purified soils can do much to repair the scars left on the north from mining, whether it be the filling of shafts or the resurfacing of stripped groundcover.

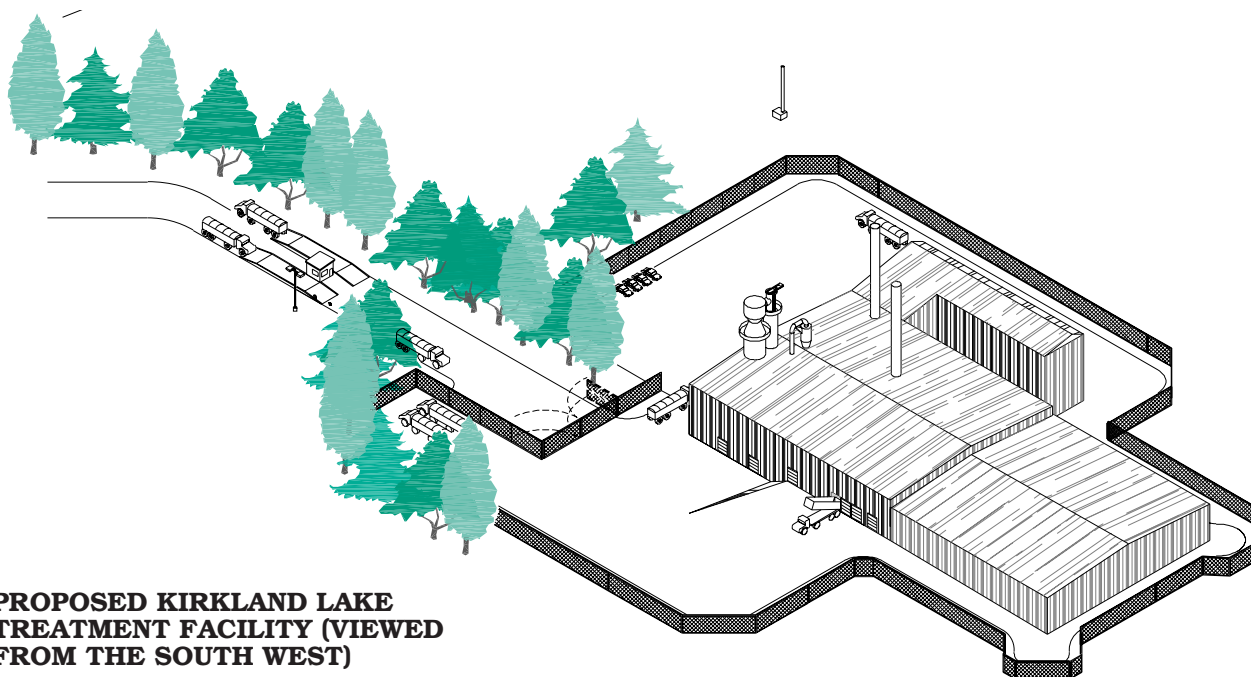
Financially, Bennett itself will hire at least 35 people at the plant, at \$1.2 million a year in salaries, and create another 82 spin-off jobs in the trucking and service sector at \$2.78 million a year. Another \$18 million will be spent in Kirkland Lake during the construction of the plant, and that will spawn 90 jobs. And besides contributing half a million dollars in municipal and education taxes, Bennett has agreed to set aside \$10 per tonne of soil processed into

a Community Development Fund for local projects and business development. When the plant is fully operational, that should equal \$2.7 million annually for the creation of new business in Kirkland Lake.

Please read on. Bennett feels its presence will enhance Kirkland Lake, and contribute to the general economic health of the Timiskaming region.



**John Bennett**



**PROPOSED KIRKLAND LAKE TREATMENT FACILITY (VIEWED FROM THE SOUTH WEST)**

*This artist's concept drawing of the Bennett facility in Kirkland Lake shows the entire operation will be located in a controlled environment building where even treated soils will be stored. The site was selected by the Citizens' Advisory Committee (CAC).*

## Index: The need to communicate

Our interest is in cleaning the environment. In the to and fro' that always occurs during the siting of a treatment facility like ours, there is much fear of the unknown, which breeds much misinformation. We'd like this process to be as open as possible to public scrutiny. That's why we're presenting the enclosed scientific information about our project in Kirkland Lake.

Bennett recently submitted its final environmental assessment documents. The main thrust is 616 pages, supplemented by 2,500 pages of technical data. The studies show that a Bennett treatment plant can be safely located in Kirkland Lake without any impact on the region's air, water, agriculture, livestock or humans. The Ministry of the Environment and Energy now has five months to review the material and make its decision.

Inside the Bennett Report, you'll discover why Bennett Environmental is necessary for our society, and you'll also find an attempt to decode the science behind it all. All we ask is that you read it, and judge the plan on its merits. It is not to be confused or compared with any other proposal for Kirkland Lake. We believe you will be proud of this addition to the community.

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# The Bennett Report

## Bennett solves problems for Canadian communities

The most rewarding part of Bennett Environmental's work is when the last truck containing contaminated soil leaves a community. It allows for a rebirth, an opportunity for a town to reclaim a derelict property—either for a park, a school or a new subdivision. When a community can remove scars from its past and start afresh, it can add to their built landscape without fear that toxins in the soil will come back to haunt them.

Bennett has already given that opportunity to Northern Ontario towns like Ramore, Smooth Rock Falls and Mattice. There are umpteen other Ontario towns that need the services of Bennett. Some of them know it, some of them don't. Of the sites that are known, there is enough work in Ontario alone to last a decade.

When Bennett is called upon to clean up a site, the contamination is already well-defined. Bennett is given a site history and soil analysis information. If the contaminants are listed in Bennett's permit, the project can be accepted for treatment.

For example, Bennett only cleans solid material such as soil, concrete and other building and related materials. It does not treat liquid waste.

"That's one of the misconceptions people have about what we do," says company founder John Bennett. "This is not liquid waste that can spread easily, but inert soil. There might be two eyedroppers of chemicals in a barrel of sand. If one of our trucks turned over, all you would have to do is just shovel it up and put it back. It would have no impact on the environment."

The dangers arise if contaminants are left in soil for long periods of time. Certain chemical compounds, such as benzene, can't be left in soil and be allowed to shift into groundwater.

As soon as Bennett is awarded a contract, it takes over the whole removal process to make sure it is done properly. First, it arranges for loading of the soil and for safe transportation.

### TRANSPORTATION

The company operates under the Transportation of Dangerous Goods Act and uses only specially licensed carriers for this purpose. Selected carriers have specially trained drivers who know what to do in emergency situations. The government also knows where these vehicles are from the point of departure to their destination.

In each case an emergency response and accident prevention plan is in place, insurance covers each situation, and special rules apply. For example the driver must do a circle check of the vehicle every 200 kilometers.

For added safety truck beds are lined with two layers of heavy plastic that act as a

cocoon-like shell for the load. This prevents contaminants from escaping into the environment during transportation and also stops the truck bed from being contaminated. Once the load is in place, the truck is sealed to prevent tampering.

Seals must be checked when the truck arrives at the plant, before the load is accepted into the building. The material is then unloaded in an interior pit that is under negative pressure to prevent the escape of emissions. The pit also prevents material from touching the truck tire during unloading.

Once the material is inside it is screened. Any oversized materials such as rocks or bricks are crushed. If the load contains metal, the smaller pieces are shredded while the larger pieces are pressure-washed. The entire load—the crushed material and the filtered soil—is

### CONTAMINANT DESTRUCTION

During the heating process the pollutants such as creosotes, pesticides, PCBs and similar chemicals are transformed into gases. These are sent to an afterburner or secondary combustion chamber that destroys them at over 1000 degrees centigrade.

When the chemicals have been destroyed the exit gas is monitored and the hot gases are sent to another chamber. There, the hot gases are rapidly cooled from 1000 degrees to 150 degrees to prevent the chemical compounds from re-forming.

To complete the process, lime and activated carbon are injected into a dry scrubber to neutralize acidic gases. Meanwhile the scrubbed gases are directed to fabric filters to remove dust particles such as used lime and activated charcoal from the dry scrubber.

Once the filtered gases are ready for release, they are continuously monitored for oxygen, carbon dioxide, carbon monoxide and sulphur dioxide. The carbon monoxide levels indicate the efficiency of the combustion process. They are also monitored for hydrogen chloride, oxides of sulfur and nitrogen, total hydrocarbons, temperature and flow rate.

The computerized monitoring system allows the Ministry of the Environment and Energy to examine the monitor results at any time.

The Bennett process destroys contaminants to a level of 99.9999 per cent efficiency. This means that if 1,000,000 molecules of a given substance are treated, one molecule might escape into the atmosphere. This process thus contributes

nothing to the existing levels of contaminants already present in the environment.

### BACKUP SYSTEMS

Bennett has several backup systems to prevent emergency conditions from creating serious problems and to shut the operation down in a controlled fashion if required.

At the Kirkland Lake plant a water reservoir with a capacity for up to six hours of operation is being constructed in case a water main breaks and interrupts the supply of water to the plant.

The main fuel for the process is natural gas. If supplies are interrupted there is a back-up supply of propane to maintain the burner and destruction temperature in the kiln and the afterburner.

Backup generators will also be in place to bridge the gap when power fails. The critical components of the plant and the control and monitoring devices use uninterruptible power supply sources.

All these, combined, ensure the integrity of the plant and its safe operation.



An aerial view of a Bennett Environmental Plant in St. Ambroise, Quebec

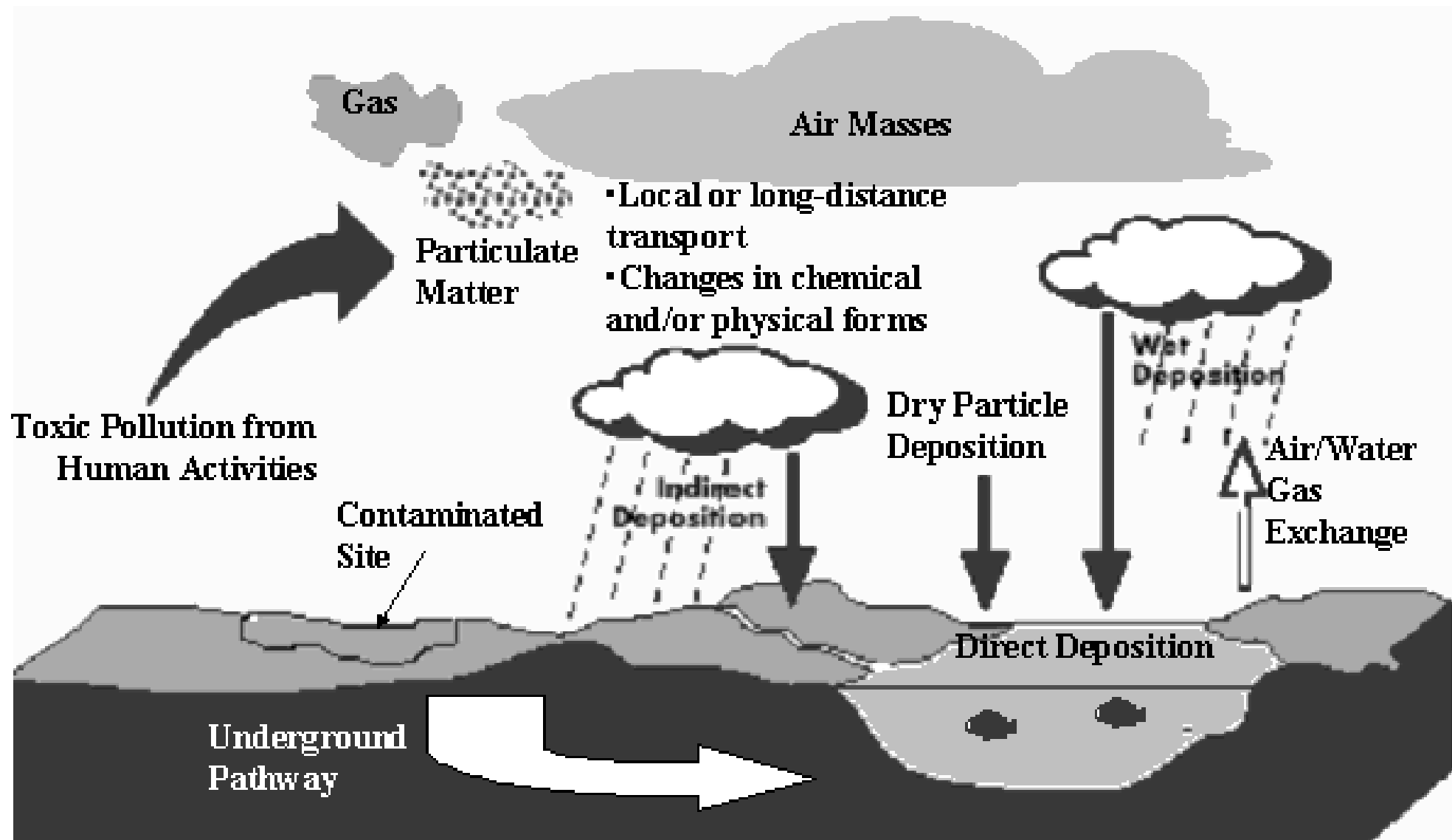
then mixed in order to spread out the contaminants and the moisture equally.

### THERMAL TREATMENT

There are two phases to thermal treatment. The first cleanses the soil. The second destroys the contaminants. When the load is ready, it is metered into the kiln at a steady rate. The soil or other material is then heated up to 600 degrees centigrade in order to drive the contaminants out of the material. When the cleaned soil leaves the kiln, it is put aside where samples are collected and sent for analysis. It must be kept in mind that this procedure does not destroy heavy metals. It is designed for organic chemicals.

That analysis is designed to determine whether the treated soil is clean enough for unrestricted disposal which means it is cleaner than the soil in your garden; managed disposal where it is used as industrial fill, municipal waste cover or in mine reclamation projects or it is sent to a secure landfill where it is held indefinitely.

# The Bennett Report



## Why contaminated soil should be treated

You don't have to go far to find contaminated soils. Spilled gasoline comes to mind, but you can also find contaminated soil underneath a pile of pressure-treated wood, or land soaked with pesticides. The soil might appear harmless, because it is inert, but chemical compounds in contaminated soil are mobile. When the compounds are polychlorinated biphenols, or PCBs, you can expect them to damage our environment and contribute to air and water pollution throughout the world.

Toxins from the southern United States are found in the Arctic. Air pollutants from Canada are detectable in Greenland. Sand from the Sahara Desert has been found in Italy.

What makes this possible? How can a contaminate from one country or continent travel to another? How can we prevent it? Perhaps, the more important question is how do we clean it up once and for all?

Over the past few years you have probably heard the term "fugitive emissions." They are chemicals that escape from an industrial activity or contaminated site into the air and water.

When fugitive emissions come into contact with groundwater, rivers, streams and wells, they naturally go

where the water takes them. Depending on the watercourse, they can travel as far as a message in a bottle thrown from an ocean liner.

Lake Timiskaming, for example, already suffers from arsenic and mercury contamination from both natural sources and from previous mining operations in the Cobalt area. Those contaminants have been found in river water as far south as Ottawa, because Lake Timiskaming drains into the Ottawa River.

Airborne emissions are released into the atmosphere from contaminated sites and are then carried by air currents. That's why we find measurable levels of PCBs and other contaminants in our air in Northern Ontario.

While we pride ourselves on living in a "pristine" area, it is sad to say there are virtually no areas in the world which have escaped the effects of our industrial way of life. Chemicals are present in every living thing and everywhere in the environment. That is the reality of our world today.

There is no question that Dioxins and PCBs are harmful. The best solution is to get rid of them. Today, the best-demonstrated technology available is high temperature incineration.

So where do they come from? PCBs are no longer being manufactured.

They were used for a variety of applications such as a cooling agent in electrical transformers like the ones you see hanging from hydro poles and in substations.

Dioxins are byproducts of making chlorinated chemicals such as pesticides, wood preservatives and from burning. You produce them when you drive your car or truck, light the fireplace or wood stove, smoke cigarettes or burn trash in the backyard. They are naturally produced by such events as forest fires and volcano eruptions. They are also generated by sunlight breaking down chlorinated chemicals found in wood preservatives and pesticides.

In a perfect world, if we were serious about eliminating these chemicals from our environment, we would simply stop doing everything that creates them. We would stop driving cars, get rid of trains, trucks, boats and airplanes. We would each grow our own food without the use of pesticides or mechanical equipment, manufacture our own clothing by hand and build only with rocks and wood using hand tools and non-mechanical technology.

As much as some might like the sound of that, it simply will not happen, at least, not in the foreseeable future. And if it did, this would still

not eliminate naturally occurring dioxins from the environment.

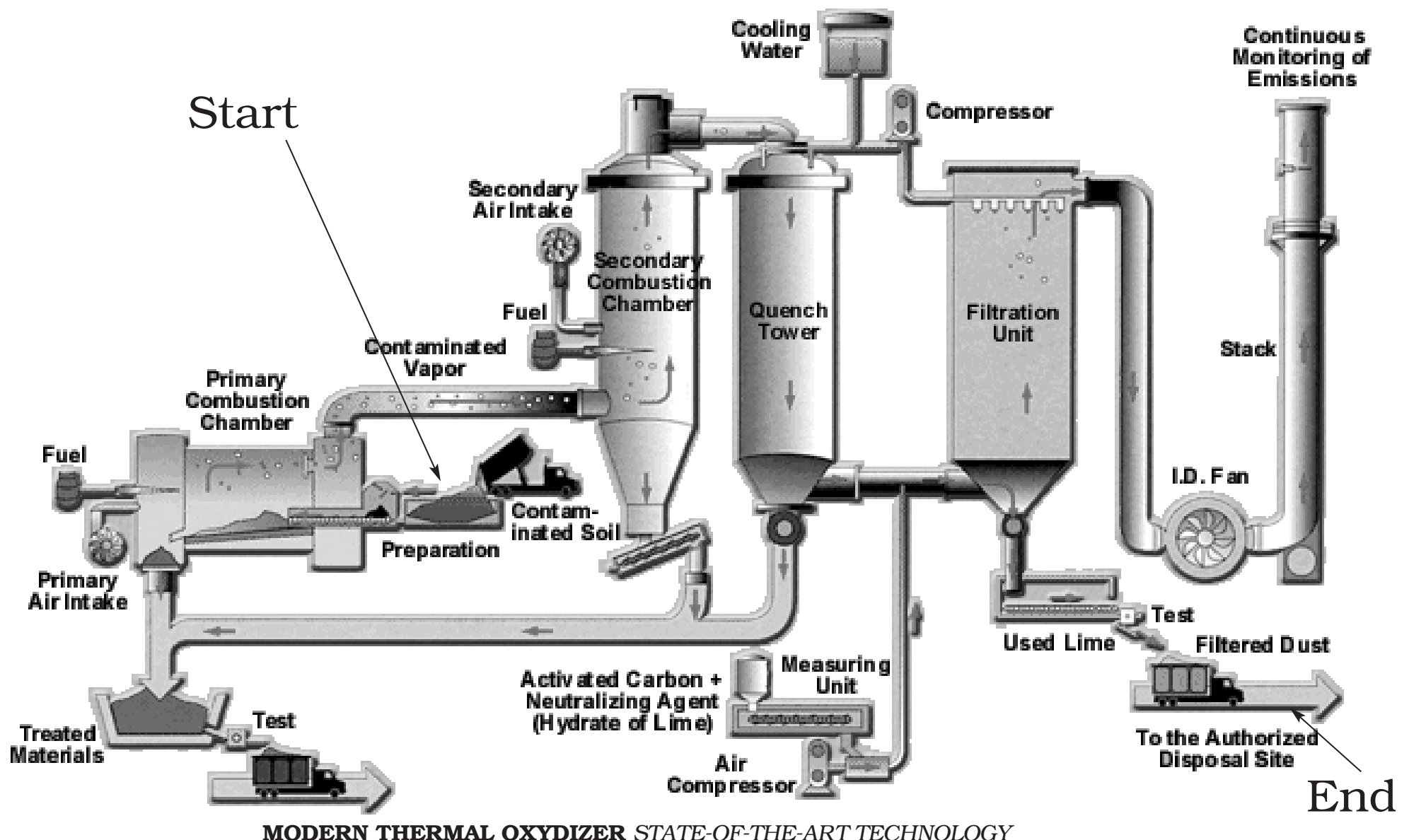
Contaminated sites are a concern to everyone, as they should be. So what do we do about them? In the case of PCBs and other organic compounds, they need to be identified and destroyed. Since PCBs are no longer being manufactured the challenge is to find them and convince governments and responsible parties to act quickly to get rid of them.

Other pollutants, such as lead, mercury and other heavy metals, cannot be treated by the method proposed by Bennett Environmental Inc.

But PCBs, creosote, fuel oil, pesticides, plastics and similar compounds can be treated by the Bennett process, which uses technology originally developed in the mid-1980s. Since then, the technology has improved, such that the incineration process destroys over 99.9999 % of these compounds, rendering them harmless.

**More information on this process is available from Bennett, at libraries and other public information sources. You can also try Health Canada's web-site and the U.S. Environmental Protection Agency (EPA) website at [www.epa.gov](http://www.epa.gov)**

# The Bennett Report



MODERN THERMAL OXYDIZER STATE-OF-THE-ART TECHNOLOGY

## Bennett brings high-tech jobs to Kirkland Lake

Bennett's new facility will create 35 new jobs with wages topping \$1.2 million a year.

"The plant, when operating at full capacity is designed to require 35 personnel," says Danny Ponn, Vice President and Chief Operations Officer of Bennett Environmental. "It must be remembered that this is a highly-technical operation which requires a variety of skills ranging from engineering to equipment operators."

The workforce falls into two categories: a management team and its support staff; and a plant operations staff that is on shift work.

The management team will include a plant manager, plant engineer, health and safety officer, compliance and QA/QC officer, office administrator, receptionist, two maintenance technicians and four chief operators.

The chief operators, who report to the plant engineer, will be supported by a number of floor, feed and treated soil operators, along with helpers, waste-receiving and preparation personnel, a shipper/receiver, housekeeping staff and a floating operator.

So what about the education and

training levels of the employees who will be hired to operate this plant?

The Plant Engineer must have an engineering degree and be eligible for registration with the Professional Engineers of Ontario. The engineer must have a thorough knowledge and understanding of the incineration process, material handling and related technical and administrative skills.

As for the compliance officer, that position requires expertise in the area of analytical protocol, soil sampling and sample preparation, compliance testing, dangerous goods transportation and related skills.

Qualifications for the operator and other positions all require a minimum Grade 12 or better education with good mechanical aptitude and experience involving sophisticated equipment and processes.

"These are not low-level jobs," asserts Mr. Ponn. "We are looking for intelligent, motivated people who will want a long-term relationship with our company."

"Our pay scales reflect the commitment on our part to creating a low-turnover environment."

Total wages at the plant will be more than \$1.2 million per year. Another \$2.78 million will be produced in 82 spin-off jobs in trucking and the service sector. Mr. Ponn noted that trucking will be a major component of the operation. How it affects the local area will be determined by the ability of local transportation companies to compete for the hauling business.

During the construction phase a total of about 90 jobs will be created and will generate about \$3.4 million in income in the Kirkland Lake area. A further 84

jobs will be created outside, especially in the construction trades.

The Bennett facility will take up approximately 44 acres of land while the plant site occupies 6.8 acres of fenced-in property on Archer Drive, in the community's industrial park. None of the open area will be used for storage of soils waiting to be treated.

Bennett is constructing a controlled environment building of 2.5 acres or 110,000 square feet in size. Contaminated soils will be brought directly into the building and stored there for treatment.

The company has stated in the past that it is committed to employing local people and using local businesses as much as it can, similar to its practice in Quebec.

Bennett Environmental sees some real potential for entrepreneurs in the Kirkland Lake area who might want to look for ways to provide services the company will need.

"Few people realize it," notes Mr. Ponn, "but when this facility is in full production, this could well become a \$100 million per year business in Kirkland Lake."

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# The Bennett Report

## Bill Mills: The scientist behind the St. Ambroise study

Dr. Bill Mills routinely sees the value of his work as an environmental scientist concerned about public health. In May, he was on a U.S. Environmental Protection Agency research vessel in the middle of Lake Superior.

"We took a sample of sediment in the middle of lake, 1,000-feet deep—it takes 15 minutes for the sampler to get down there—and we find PCBs and other persistent organic pollutants (POPs) there," says the Canadian who is now based outside Chicago. "The stuff is everywhere. I have 11 nieces and nephews, I hope they can grow up in a better world. We need to clean up PCBs and POPs at their source to lower the burden on the environment."

For Mills, that is part of the reason he wants to see Ontario get its own incinerator to destroy the chemicals.

In a career that began as a high-school volunteer with Pollution Probe, through his work as inspector with both provincial and federal environment agencies, in private consulting and also his work as an adjunct professor at both Trent University in Peterborough and the University of Illinois at Chicago, Mills knows the extent of the problem and what must be done to clean it up.

"We're finding PCBs in the sediments in the middle of Lake Superior, in the Canadian Arctic, the South Pole, and all points in between," says the 43-year-old canoeist and cyclist who has camped all across Canada. "The real issue is: The longer we wait, the more these other persistent PCBs get out into the environment. I don't know if you know, but there have been seals and beluga whales in the Canadian Arctic, which are not near any known PCB source, which have had to be considered hazardous waste because of the toxins that have accumulated in their tissues. That is affecting the native population up there. The only way the chemicals are getting there is from long-range transport, either through air or water. The problem is not going away until we destroy the PCBs and other POPs when we find them in brownfields or contaminated sites."

"The do-nothing alternative will continue to result in an impact on the Canadian north."

Mills splits his year between Canada and the U.S., and considers himself an Ontarian, even though his wife's work moved him to Oak Park, the Chicago suburb that is the birthplace of author Ernest Hemingway and a showplace for the work of architect Frank Lloyd Wright.

"I'm from Arnprior, Ontario and proud of it," he says. "There's not a whole lot of difference between Arnprior, which is between Renfrew and Ottawa, and Kirkland Lake. We were always considered the boonies. Hockey is a craze, even though we don't have the history of NHLers like Kirkland Lake does. But we do have a lot of natural resources. I can't understand why there's so much concern about this there and not about the mining industry?"

He says that not to disparage the mining industry. Mining has been a big employer around Kirkland Lake and has historically resulted in environmental impacts and a high rate of industrial accidents. On the other hand, the planned incin-



Dr. Bill Mills

erator will have a benign effect on Kirkland Lake.

In May, Mills came out with a study of Bennett Environmental's St. Ambroise plant that has been peer-reviewed and is part of a presentation he will make at a conference in Barcelona this year. His findings show there is no discernible impact from the Bennett plant. "This type of facility, built with very stringent standards, can result in a net decrease in environmental levels because the source of the POPs is destroyed."

His method to determine that makes him feel like a detective. It's called Principal Component Analysis, and it works in much the same way scientists use the results from DNA analysis to match someone's blood to a crime scene.

Using computer software, Mills can analyze a tremendous amount of variables—in this case, the results for approximately 100 different dioxins and furans in soil samples from the St. Ambroise plant that were taken in 1999, 2000 and 2001 within 400-, 1000- and 2000-metres from the incinerator. The samples were taken in all directions from the plant, even though the prevailing wind, 90 to 95 per cent of the time, is on an east-west axis.

The pattern of the chemicals that exist in the soil in St. Ambroise are similar in every direction from the plant, and their fingerprint bears no relation to the fingerprint of chemicals found in the St. Ambroise incinerator stack. In other words, the pattern of chemicals found in St. Ambroise has not been impacted by stack emissions from the Bennett plant, which is known as Recupere Sol Inc.

On the subject of incinerators, Mills is quite clear. "I used to work and continue to work for companies that offer alternatives to incinerators. I am on record for recommending other technologies for certain applications, but with the amount of soils

that need to be treated, and the variety of contaminants in them, I do not believe, professionally, that anything can touch incinerators for destroying POPs in soils. Despite what people would like you to believe, there are not any other technologies advanced as thermal oxidation (incineration) in its abilities to treat large quantities of soil at this time. Because this facility will produce the lowest emissions of any facility in North America, it will lead to a net decrease of dioxins in the environment, compared to other alternatives.

"Nothing can compete for cost or the feed rates, and speed in handling this problem is paramount. Being a public health person, my concern is that we're already seeing environmental health effects. This type of facility is needed."

He says it "makes me throbbing mad" when public interest groups and others suggest we opt for the continued "safe" storage of PCBs.

"It does not currently exist," he says. "My Ph.D. thesis shows how ludicrous that is."

His thesis studied the storage and eventual cleanup of PCBs in Smithville, Ontario. He found that the Smithville site—a showpiece, with all the bells and whistles, for PCB storage on four-fifths of a hectare—was emitting as many PCBs as the whole of Chicago would with 7 million people. "How,"

he asks rhetorically, "do you call that safe storage?"

By contrast, the emissions from the incinerator stack were approximately one/ten-thousandth of storage emissions.

Doing the scientific work, though, is only part of the problem.

"It doesn't matter how good a scientist I am," he says. "I have to get the message out and educate people."

For the moment, he does that by teaching at the Watershed Ecosystems Program at Trent University, and at the School of Public Health, Environmental and Occupational Health Sciences division, in the University of Illinois at Chicago.

To educate the people of Timiskaming, he has one message.

"The answer here is not to do nothing. This facility, with the technology that's out there, with the low emission limits, with ongoing monitoring of the process and the environment, and the oversight of community and Ministry of the Environment, you shouldn't have a problem. Their measurement stick will be strict, and if they don't perform, they should be shut down. But judge them by their performance. I believe the facility will do what it says it can."

As for people who might think he was just a paid consultant for Bennett, he says, "My scientific integrity has never been questioned, nor has it been challenged by Bennett. If anything, they ask me what I suggest they should do in order to be the most protective of public health. I'm a certified industrial hygienist and a chartered chemist in the province of Ontario. If you read our creed, my first obligation is to the public good. I serve the public first, then a client second."

# The Bennett Report

## *Bennett plant will generate millions in Timiskaming region*

The total value of this project has been estimated at over \$30 million. Almost 60 per cent of this amount, or \$18 million, will benefit local businesses. Over the construction period an estimated 90 full-time jobs will be created through the injection of \$18 million into the local economy.

The new jobs will have an average salary 20 per cent higher than current average levels. The jobs also represent a 15 per cent permanent increase in the salaries of local manufacturing jobs.

And, after years of decline in the community, the presence of Bennett will bolster the municipal tax base significantly.

The facility will generate, annually, nearly

\$300,000 in municipal taxes and almost \$200,000 in education taxes. That represents an additional 4 per cent to the overall municipal property tax.

Some indirect economic benefits will be generated through the injection of \$3.3 million in new local spending when the facility is in operation and create an additional 14 new jobs providing goods and services required to operate the facility.

But the economic benefits go beyond the construction and operation of the plant. Bennett has committed itself to helping the community in its economic development strategy.

Bennett will allocate \$10 per tonne of soil processed, which translates into \$2 million annu-

ally when operating at full capacity. This money will be available as a Community Development Fund for local projects and business development. Placed together with other funding agencies, this money could lever up to \$2.7 million annually for the creation of new business in Kirkland Lake.

Another spin-off will be to enhance the stability of Northern College's Kirkland Lake campus. It will benefit from an increased demand for participants in its Waste Management Technicians program, and from an increase in demand for training for professional development employers.

**Note: The full text of this study is available by contacting Bennett Environmental Inc.**

## **Bennett's concern for the environment extends beyond the plant**

John Bennett does not place the word "Environmental" on his company just for show. Thinking environmentally is part of the corporate strategy.

Bennett invested the first half-million in Unisphere Waste Conversion Ltd., a company designed to convert used tires to carbon black and diesel fuel. It plans to establish plants in Le Baie, Quebec and New Brunswick, and possibly a third one in Kirkland Lake.

Bennett is also a 50 per cent owner of Purdo, a wood company that takes cheaper woods like pines and birches and, through a heat process, turns them into the same quality wood as oak or cherry. By doing away with the use of chemicals, it will reduce the work of Bennett Environmental, but the goal of any good environmental company is to one day find itself with nothing left to do. With the North American rights to the process, Bennett would like to establish a plant in St. Ambroise, Quebec this summer.

On a personal level, John Bennett is a supporter of the Outward Bound movement. In the early 1950s, Bennett was profoundly impacted by his training at the original Outward Bound base in Aberdovey, Wales. He has donated money to build a training centre in British Columbia and has begun an annual pledge to send 10 Quebec teens from the St. Ambroise area to the camp in British Columbia.

Part of the program is designed for survival, but it is also geared to environmental appreciation.



John Bennett (left) shown at the Outward Bound Camp that bears his name.

## **Mining activities will not harm Bennett structures**

Could everyday mining activities threaten the operation of a Bennett plant in Kirkland Lake?

That was one of the questions posed during the Environmental Assessment process. To get that answer, Bennett retained the services of DST Consulting Engineers Inc. to conduct a study on the potential impacts of mining the Amalgamated Kirkland (AK) gold zone, on the proposed high-temperature incinerator to be built on Archer Drive in Kirkland Lake.

Bennett's facility will include a large environmentally controlled building with separate structures supporting a truck scale, office building and gatehouse.

Within the large building will be the soil-receiving area and soil-storage stockpile, a rotary kiln, a vertical after-burner, a vertical gas-quench tower, a vertical dry-scrubber, fabric filter modules, ID fan, treated soil-cooler, treated soil-stacker conveyor and treated soil-storage pads. Design of the facility will include a ventilation system for the storage building and a continuously controlled stack.

The study concluded that the rock under the location of the proposed plant is "very competent," and it is "highly unlikely" mining activities will ever affect the plant location during the foreseeable future.

That finding is based on several factors: the very competent nature of the rock in and above the AK main zone; the relatively narrow width of the average drill intersection; the fact that the plant is located more than 70 metres to the south of the zone projected to surface; and the almost certain probability that any large open stoping method will use some degree of backfill.

Reported groundwater flow and expected hydraulic gradients due to mine de-watering are minimal and are not expected to impact soil or rock stability in the vicinity of the proposed Bennett plant. Since the Bennett plant

will be constructed on bedrock (massive volcanics), it will not be subject to the possibility of subsidence as a result of mine de-watering activities.

Blast vibrations from surface-mining the possible higher-grade zone located 273 metres east of the plant will be below the threshold of damage from close-in blasting and will not result in any damage to the Bennett plant.

In conclusion, no impact on the operation of the high temperature incinerator is expected from potential future mining of the AK zone when considering ground stability and control, seismic effects of blasting and the effects of mine de-watering.

# The Bennett Report

## Putting dioxins in perspective

Before we all get bent out of shape about the words "dioxin" and "furan," realize that they are part of our daily lives.

If you smoke cigarettes, you produce dioxins and furans. Operate your car, snowmobile, lawnmower or outboard motor, you likewise send dioxins and furans into the atmosphere.

Some people have argued that incinerators are the largest, single threat to the environment where dioxins and furans are concerned. But are they?

In reality, North American dioxin inventories from incinerators have been reduced by 75 to 85 per cent. By 2005, with the introduction of new emission standards in Canada and the U.S. it is expected to be reduced by over 99 per cent.

According to the U.S. Environmental Protection Agency (EPA), open burning represents the single largest source of dioxins which has not been subjected to regulation. This includes the burning of backyard barrel burning, the use of fireplaces and woodstoves, slash burning in the forests and similar activities.

But how much dioxin will these activities produce compared to the treatment facility being proposed by Bennett Environmental Inc.?

First let's consider the measurements we are talking about. Dioxin production is measured in nanograms. One nanogram is one billionth of a gram. One billionth.

For every kilogram of material treated by Bennett, it will produce .25 nanograms of dioxin. That is, one quarter of one nanogram.

If you burn waste in your backyard barrel you will produce 140 nanograms of dioxin for every kilo of waste. If you burn one kilogram of wood at home, you will produce two nanograms of dioxin.

Drive your car 100 kilometres and you generate .17 nanograms of dioxin. Burn brush on your farm and you generate 2 nanograms of dioxin per kilo of organic burned material. **Please refer to the adjacent graph for additional information.**

So, dioxins and furans are presently toxic chemical substances that are found in very small amounts in the environment all around us, including our air, water and soil. They are also present in some of the foods we eat.

In small doses, these substances do not appear to be

a threat. However, large doses of dioxins and furans are known to cause serious health problems, including cancer, in laboratory animals.

The biggest source of dioxins and furans in Canada is the large-scale burning of municipal and medical waste. Other major sources include:

- \* The production of iron and steel
- \* The backyard burning of household waste, especially plastics
- \* Wood burning, especially if the wood has been chemically treated
- \* Fuel burning, including diesel fuel and fuel for agricultural purposes and home-heating

er levels of dioxins and furans through job-related activities, or through chemical accidents. This kind of exposure has been linked to a skin condition called "chloracne." It resembles regular acne, and usually disappears within a few months, if people are separated from the source of high levels of dioxins and furans. There is not enough evidence available to say for certain whether large doses would have similar effects on people. However, scientists agree that our exposure to dioxins and furans should be kept as low as possible.

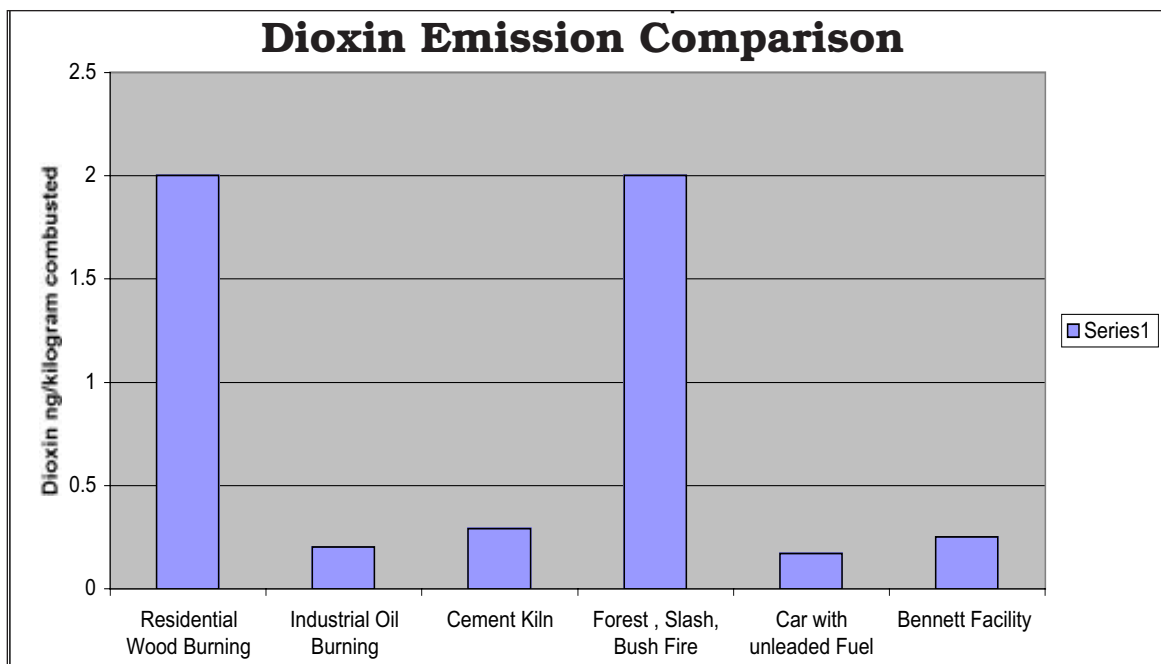
The latest inventory shows a 60 per-cent decrease since 1990 in the overall release of dioxins and furans from sources within Canada. In addition, the levels of

dioxins in breast milk, which were already low, went down by 50 percent from the 1980s to the 1990s.

The government's ultimate goal is to eliminate all dioxins and furans from the environment as part of the federal Toxic Substances Management Policy.

If you are concerned about exposure to dioxins and furans, consider taking the following steps:

- \* Limit the amount of fish you eat, and pay attention to government advisories that warn against eating a particular type of fish or fish from certain waters.
- \* Eat a balanced diet. Vegetables, fruits and grains contain fewer dioxins and furans than meat, dairy products, and fish.
- \* Don't smoke, and keep your family away from second-hand smoke as much as possible.
- \* Don't burn garbage in your



\* Electrical power generation

The health risks of exposure to any toxic substance depend on a number of factors, including the dose, the duration, how you are exposed, your general health and habits, and whether other chemicals are present.

According to the scientific evidence available now, current levels of dioxins and furans in our food, air, water and soil are so low that they pose no serious health threat to most of us. However, there may be health risks for certain groups, including people who eat large amounts of fish that contain high levels of dioxins and furans.

The health risks also go up for people exposed to high-

backyard, especially construction materials that might contain preservatives or plastic.

\* Don't let children play near construction sites or dumps.

\* Try to keep children from eating dirt, or from putting hands and toys into their mouths if they have been playing in dirt.

\* Limit the amount of wood you burn in your fire-place.

**The preceding information was reprinted from Health Canada's website feature "It's your Health." It can be found at [www.hc-sc.gc.ca/english/iyh/dioxins.html](http://www.hc-sc.gc.ca/english/iyh/dioxins.html).**

## Agriculture will continue to prosper

A recent study of the region's agriculture industry shows it will continue to grow and prosper with the Bennett plant in place.

ESG International Inc. (ESG) was retained by Bennett Environmental Inc. to complete an agricultural assessment of a proposed thermal treatment facility to be located in Kirkland Lake, Ontario.

The purpose of the assessment was 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 south of Kirkland Lake known as the "Little Clay Belt."

The study showed that operation of the

proposed treatment facility will have an undetectable impact on the quality of meat and dairy products produced in the Kirkland Lake/New Liskeard area.

To determine the impact of the proposed facility on the agricultural industry of the area, two objectives were identified. The first objective was to identify any potential pathways whereby contaminants could enter the food production process.

The second objective was to determine potential effects on agriculture with respect to loss of profit resulting from the reduced marketability of products grown in the area due to perceived risks of food contamination.

The objective of the agricultural assessment was to identify actual or potential impacts on agriculture resulting from the

construction and operation of Bennett's proposed thermal treatment facility in Kirkland Lake.

The analysis shows that agriculture is a vibrant and growing industry in the study area. The study area is one of the most important agricultural regions in Northern Ontario, comprising more than 20% of Northern Ontario's farms and farmland.

Bioaccumulation estimates generally show no increases in Point of Contact (POC) concentrations in beef and milk products as a result of the activity of the proposed Bennett thermal treatment facility.

All values were calculated by assuming an individual's beef and dairy diet is composed entirely of products produced

in the exposure area.

As expected, all increases in POC concentrations and POC dietary intakes decrease as one moves further away from the proposed facility.

It is felt that operation of the proposed treatment facility will have a virtually undetectable impact on the quality of meat and dairy products produced in the Kirkland Lake/New Liskeard area.

Predicted increases in bioaccumulated contaminants within agricultural products are so low and far below available background concentrations, that the implementation of a bioaccumulation monitoring program is not justified.

*The full text of this study is available through public libraries and other sources as indicated elsewhere in this publication.*

# The Bennett Report

## Ask John Bennett

### How was the site chosen?

The Kirkland Lake Citizens Advisory Committee undertook the site selection process for the Bennett high temperature thermal oxidizer. This process was accomplished with Bennett and Ministry of Environment staff available as a resource. The committee considered MOE legislation, various guidelines, numerous local issues and the concerns of individual committee members.

The CAC started with nine suggested sites offered by the municipality. During numerous lengthy meetings, where all the issues were discussed in detail, the sites were scrutinized and prioritized one by one. The result was a unanimous decision by the committee to select the current site on Archer drive.

### What happens to the treated soil?

Once the soils and solids have passed through the treatment process, you are left with a clean sandy/gravel-like material. This treated material is inert. It will have no organic material remaining. Heavy metal concentrations, if found in the contaminated material, will still be present in the treated material. The process used at the Bennett plant does not destroy heavy metals. All treated material will, however, be analyzed for content then disposed of, or managed, according to current provincial regulations.

For example, the majority of treated soil can be used as inert fill. A small portion may contain some metals that would require secure landfill for safe disposal. Secure landfills are designated sites outside our region. It all depends on what the metals are and in what concentrations they remain.

### What studies were undertaken by Bennett Environmental?

**Studies that were part of Environmental Assessment include:** Air Quality, Surface and Ground Water Quality, Human Health Risk, Ecological Risk, Agriculture, Biophysical, Social/Cultural, Archaeological, Noise, Economic, Traffic and Impact of Mining Operations.

These studies are available upon request from Bennett Environmental and were conducted by specialists in their various fields.

### How advanced is Bennett's technology?

The equipment and processes to be employed at the Kirkland Lake plant represent the latest developments in the incineration process and emission controls. Bennett is constantly reviewing its systems for improvements and will continue to do so to ensure maximum safety and maximum waste-destruction efficiency.

### Why was Kirkland Lake chosen?

Bennett Environmental was asked to consider Kirkland Lake by its town council under then-Mayor Dr. Richard Denton. Subsequently, the new council elected in 2000 under Mayor Bill Enouy confirmed the town's desire to have the facility located there. The council further stipulated that any facility to be built must pass an Environmental Assessment and outdo all government safety and performance standards.

### Is Bennett Environmental following all government regulations?

Bennett Environmental volunteered that its plant be subject to the environmental assessment process. That process has been ongoing for almost two years now and will not be completed until the end of 2002.

### How stringent is the environmental assessment process?

The environmental assessment process looks at the needs of industry, addresses the concerns of citizens and assesses potential risks to the environment and residents. Ontario has one of the most stringent processes in the world and Bennett has met every condition necessary.

### Are the studies commissioned by Bennett Environmental accurate?

It has been suggested that, because Bennett pays for the studies, that they are written in favour of the company. In fact, Bennett neither approves nor rejects the results. Each of the studies required under the Environmental Assessment process are reviewed by the provincial government and its scientists. Under current legislation, Bennett is required to pay the cost of the studies and selects the group to conduct the studies. It is clear, however, that no legitimate scientist would put their reputation at stake to present misleading results.

### How many jobs will be created?

At full capacity, the plant is designed for 35 full time employees. The plant in St. Ambrose, Que., which is half the size of the Kirkland Lake facility, has already surpassed that number. Total direct payroll will exceed \$1.2 million per year.

### Will the facility emit dioxins and furans?

The facility is expected to release much less than the 0.05 gram per year permitted under the upcoming Canada-wide standard which will become law in 2004. To give you some idea of the amount, bio-medical incinerators release 15 grams per year in Ontario, Stelco Hilton works in Hamilton releases 6.25 grams per year. Residential and agricultural fuel combustion accounts for 0.11 grams, wood preserving plants, 0.7 grams and residential wood stoves 0.84 grams.

### How will air quality be affected?

According to the air dispersion model, dioxins and furans will have the highest annual average concentration at a location 1230 m north of the plant. The concentration is 3% to 6% of the existing background concentration of dioxins and furans in the town's air.

### What about the contaminated soil?

The entire facility will be enclosed indoors in a 110,000 square-foot building. There will be no outdoor storage of contaminated soil or treated soils. The material is transported to the site enclosed in plastic and is unloaded directly into the indoor pit in the plant. Packaging of soil would also be acceptable in the form

of barrels, bulk bags, roll off containers and steel bins.

### What kind of materials will be treated?

The facility will treat soils, sediments, concrete, packaging material and similar solid materials contaminated with chlorinated and non-chlorinated organic compounds such as oils, creosote, wood preservatives, pesticides, herbicides, solvents and PCBs and related contaminants.

### How long has dioxin exposure existed?

Dioxins have been around for a long time. There are even natural sources for dioxins like forest fires and volcanoes. In the 1920s, because of industrialization, dioxin began increasing in the global environment.

### What are the major sources of dioxins?

The Environmental Protection

Agency in the United States reports the uncontrolled burning of residential waste and accidental fires at landfills are thought to be among the largest sources of dioxins in the U.S. environment.

### What happens when dioxins enter the environment?

When released into the air, some dioxins may be transported long distances. Because of this, dioxins are found in most places in the world. When dioxins are released into water, they tend to settle into sediments where they can be further transported or ingested by fish and other aquatic organisms. Dioxins are broken down in the environment very slowly and can be deposited on plants and taken up by animals and aquatic organisms. Dioxins may be concentrated in the food chain so that animals have higher concentrations than plants, water, soil or sediments. Within animals, dioxins tend to concentrate in fats.

### Are test burns conducted under ideal conditions?

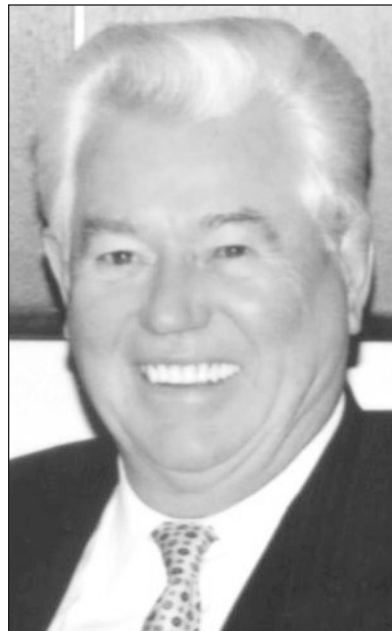
No. Test burn conditions are designed to push the equipment to its maximum capacities. The test burn conditions then become the day-to-day operating conditions for the facility.

### Is there a safe limit for PCBs?

Successive Ontario governments have concluded there are safe limits for PCBs. These limits are set for everything from milk, cheese and other foods to our drinking water. There are 75 dioxins and 135 furan compounds that make up the dioxin and furan family. Of the 210 compounds, 17 are considered toxic. The 17 compounds are assigned toxic factors and summed to arrive at one dioxin number. Ontario allows three (3) parts per billion of PCBs in water as acceptable for human consumption. This means that just over three (3) kilograms of PCBs left in the environment could render one (1) billion litres of water unfit for human consumption. This points to the need to destroy this contaminant.

### Where can I get copies of the studies cited here?

Copies of the studies, complete with reports have been widely circulated. They are available through office of public record such as area libraries, Kirkland Lake town hall, Northern College and Ministry of the Environment offices in Timmins. They have also been sent to various government ministries, Kirkland Lake Citizens Advisory Committee members, First Nations groups and others. You can also contact the local Bennett Environmental offices in Kirkland Lake at 567-1448 on the Web at <http://www.bennettenv.com>



John Bennett