2004 Annual Compliance Report

NSPFOL-13.00/2005

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2004 Annual Compliance Report

NSPFOL-13.00/2005

Prepared by: _____
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General Manager

Approved by: _____
S. Levesque
President

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2004 Annual Compliance Report NSPFOL-13.00/2005

Part A

Facility:	**SRB Technologies (Canada) Inc.**
License Number:	**NSPFOL-13.00/2005**
Owner:	**SRB Technologies Inc.**
Reporting Period:	**January 1, 2004 through December 31, 2004**
Author:	**K. K. Shane MacDougall**
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Annual Compliance Report Requirement

Condition R2 of the Canadian Nuclear Safety Commission issued Nuclear Substance Processing Facility Operating License, NSPFOL-13.00/2005 reads:

"R2. The licensee shall prepare and submit to the Commission an annual report that describes the operation of the facility in each calendar year, summarizing facility and equipment performance, occurrences described in condition R1, personnel radiation exposures, stack tritium releases, environmental monitoring results, and any changes in the licensee's organizational structure. The annual report shall be submitted by March 31 of the next calendar year."

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Part B

1. Operational Review

The facility described in the CNSC-issued Nuclear Substance Processing Facility Operating License; NSPFOL-13.00/2005 includes 12,000 sq. ft. of a Butler™ building located in a strip mall on the South edge of the city of Pembroke.
The main product manufactured within the facility includes gaseous tritium light sources that are used to provide lighting without the requirement of an external source of power such as batteries, household electrical, etc. The gaseous tritium light sources may be placed in device housings that make up such devices as safety signs (exit and multi-purpose), aisle markers, special service lighting (aircraft dials and panels), special locators (personnel and route markers), and a variety of applicable lighting devices where electrical power supply is not a practical option.
For the purpose of providing a safe working environment, the facility has several air handling units that provide supply air and protective ventilation. The main air handling units are maintained through a contract maintenance and service program with local contractors in conjunction with routine maintenance performed by qualified staff. All ventilation systems have been maintained in fully operational condition with no system failures during 2004.
Equipment maintenance was performed under contract with a fully licensed maintenance and TSSA certified local HVAC contractor. The contract stipulates a quarterly service and maintenance program.
All process equipment is serviced and maintained by qualified staff and through contract with companies that specialize in process control systems. All process equipment has been maintained in fully operational condition with no equipment failures during 2004.

The *schedule of maintenance activities and results* carried out during 2004 is described in **Appendix D**.

2. Production

In accordance with Section IV of the Nuclear Substance Processing Facility Operating License-13.00/2005, SRBT:

i) manufactured gaseous tritium light sources, which consist of tritium gas ($^3H_2$) sealed in borosilicate glass tubes, and incorporating the sources into devices as described in the Radiation Safety Program (Rev. III).

ii) possessed, used, stored, and transferred nuclear substances necessary or incidental to the operations as described in i) above, that refers to Section N1, N2 and N3 of the license conditions. Procedures were reviewed by management and amended as required to ensure effective and efficient operations with respect to the safety of the operations. The maximum tritium activity possessed during 2004 did not exceed 4.55PBq, well below the possession limit of 11.00PBq. At all times, unsealed source material was stored on uranium getter beds or in the handling volumes of the gas filling rigs.

iii) at no time imported more than 37 TBq within any two year period without applying for and receiving a license to import tritium issued by the CNSC. During 2004, SRBT applied for and received 5 individual import licenses to import tritium for the purpose of reclaiming the residual tritium in time-expired tritium devices to manufacture gaseous tritium light sources.
SRBT maintained export licenses for a variety of countries worldwide for the purpose of supplying GTLS's and GTLD's to customers.

3. Modifications

During 2004 there were no modifications within the organization, administration and/or operating procedures that had an effect on licensed activities.

4. Health Physics

During 2004, SRBT maintained a Dosimetry Service License (DSL-1-1.2/2005) for the purpose of providing in-house dosimetry services for the staff, contractors and visitors of SRB Technologies (Canada) Inc.
The license was reviewed by staff of the CNSC and an Annual Compliance Report issued to the CNSC for the 2004 dosimetry year.
Dosimetry results on a quarterly basis were submitted to Health Canada for input to the National Dose Registry for 41 individual staff members.

Staff Annual Dose Report

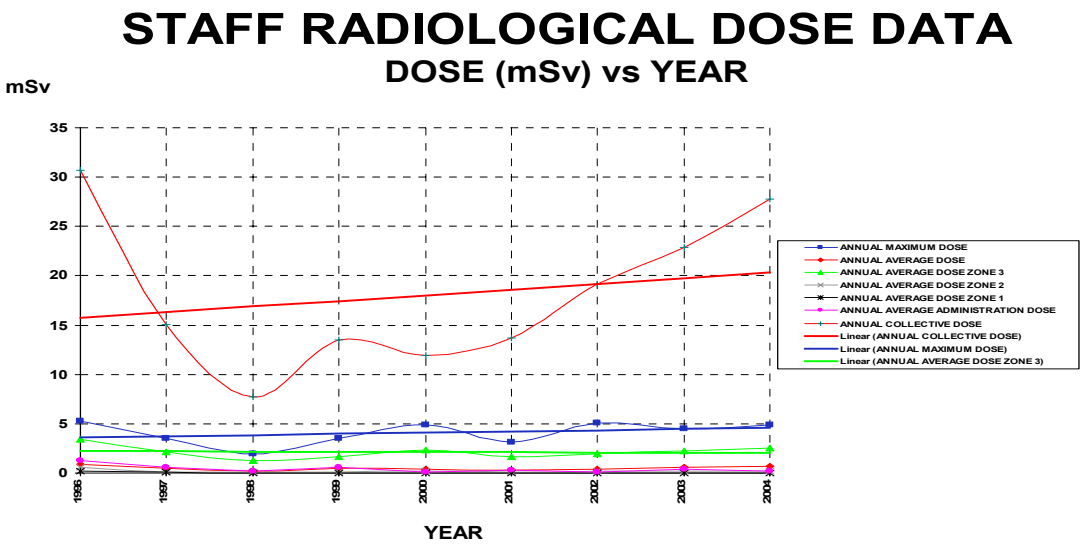
During 2004, the maximum dose received by any person employed by SRBT is well within the regulatory limit for a nuclear worker, which is 50.0 mSv per calendar year. The maximum annual staff dose of 4.90mSv represents only 9.8% of the annual NEW dose limit.

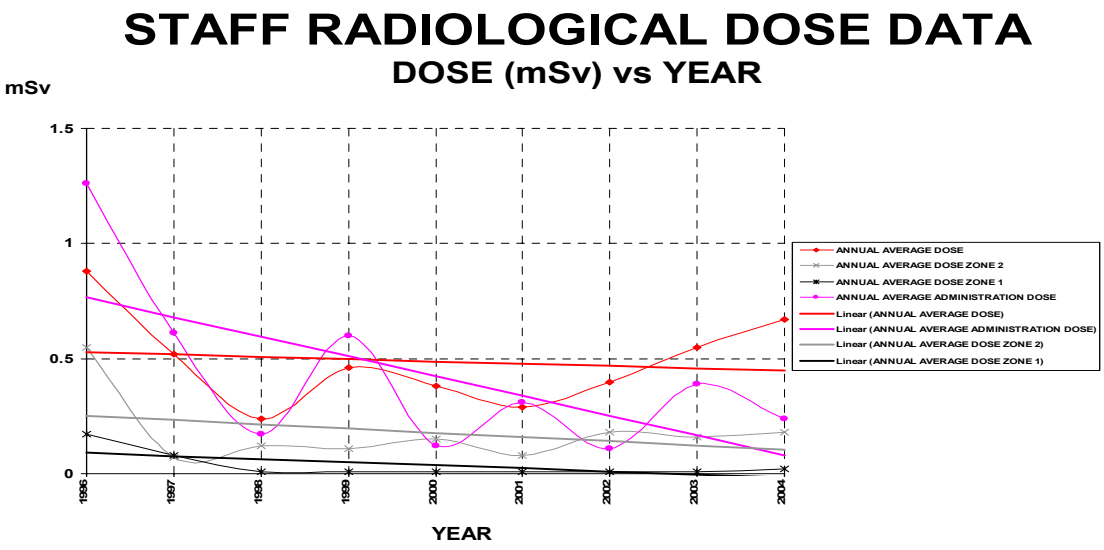
The table entitled 'Staff 2004 Radiological Dose' shows the data for staff dose and provides a comparison to dosimetry results for the years 1996 to 2004. The dosimetry results indicate that the Annual Collective Dose has been increasing. This increase is believed to be due to the increasing portion of staff members being assigned to operate within Zones 2 and 3. With increasing GTLS production and QA functions carried out within Zone 3 and increased assembly operations carried out within Zone 2 there is a greater percentage of staff members working within Zones 2 and 3.

Table Staff 2004 Radiological Dose Data

Description	1996	1997	1998	1999	2000	2001	2002	2003	2004	Ave.
Annual Maximum Dose (mSv)	5.29	3.55	1.91	3.48	4.89	3.11	5.08	4.54	4.90	**4.08**
Annual Average Dose (mSv)	0.88	0.52	0.24	0.46	0.38	0.29	0.40	0.55	0.67	**0.49**
Annual Average Dose Zone 3 (mSv)	3.43	2.12	1.26	1.62	2.30	1.70	1.94	2.22	2.58	**2.13**
Annual Average Dose Zone 2 (mSv)	0.55	0.07	0.12	0.11	0.15	0.08	0.18	0.16	0.18	**0.18**
Annual Average Dose Zone 1 (mSv)	0.17	0.08	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.02	**0.03**
Annual Average Admin. Dose (mSv)	1.26	0.61	0.17	0.60	0.12	0.31	0.11	0.39	0.24	**0.42**
Annual Collective Dose (mSv)	30.69	15.01	7.72	13.47	11.91	13.65	19.21	22.91	27.75	**18.03**
Dosimetry Range										
0.00 – 0.99 mSv/a	29	23	29	28	33	43	43	39	30	**33.0**
1.00 – 1.99 mSv/a	0	4	3	4	1	4	2	0	5	**2.6**
2.00 – 2.99 mSv/a	3	1	0	0	1	1	2	3	2	**1.4**
3.00 – 3.99 mSv/a	1	1	0	2	1	1	0	2	2	**1.1**
4.00 – 4.99 mSv/a	2	0	0	0	1	0	0	1	2	**0.7**
> 5.00 mSv/a	1	0	0	0	0	0	1	0	0	**<1.0**
> 50.00 mSv/a	0	0	0	0	0	0	0	0	0	**0.0**
Number of Staff	36	29	32	34	37	49	48	45	41	**39.0**

In evaluating the trending of staff dose data for the years 1996 to 2004, it is evident that the collective dose is trending up. This may be due to the requirement for more technicians being assigned to operate in Zone 3. The increased QA and QC requirements mean that more personnel for longer periods of time are potentially exposed to tritium in air levels in Zone 3.
It appears that the maximum annual dose has a slight upward trend; however, the administrative annual dose limit for staff at SRBT is 5.0mSv/a.
An evaluation and assessment of the annual average dose for all staff shows a downward trend.





Administrative Staff Dose Limit Excedences

During 2004 there were two instances whereby a staff member's tritium body burden exceeded the administrative limit of 1000 Bq/mL. Both individuals were restricted from work activities that would cause further significant tritium exposure until such time as the body burden for tritium dropped below 500 Bq/ml. Investigations into the reasons for the exposure were initiated and actions taken to mitigate the potential for repeat of the exposure. The investigation reports were submitted to CNSC for review and comment.

Derived Release Limit Review

In 2003, SRBT contracted out for a review of the DRL calculations to determine if it was necessary to revise the existing DRL calculations.
The review was submitted to CNSC staff members in 2004.
The CNSC review is expected to be complete in 2005.

5. Environmental and Radiological Compliance

Data from the Environmental Monitoring Program are shown in **Appendix A**. In the table in Appendix A, any sample result designated as '0' is a result that is less than the detectable limit of 1Bq/m^3. The use of '0' enables the inclusion for calculating the result in the column and the row in the MS Excel program.

Loss of Data

There was no loss of sampling data for the passive air monitoring during 2004.

LLD (lower limit of detection)

The lower limit of detection for passive air monitoring results is 1.0 Bq/m^3.

Produce and Dairy Data

Included in Appendix A are the tritium concentration results of produce samples locally grown and locally processed milk.
All produce and milk samples were analyzed by a laboratory approved for use by CNSC staff.
Several samples of each of zucchini, cucumber and tomato were submitted for analysis as market supplied produce.
Produce samples (potatoes) were also submitted from a garden located in a residential property at or near the location of the critical group. The local garden was a typical small backyard garden which normally would not have the capacity to supply 10% of the annual produce consumption for one average individual; however, the annual consumption of produce from a home garden is assumed to be 10% of the annual total produce consumed as used in the annual public dose calculation. The tritium analysis result for the produce sample indicated a concentration of 12737.5 Bq/L. This result was believed to be abnormally high by comparison to previous samples and when compared to emissions for that period; however, the result was used in the evaluation and analysis of the critical group annual dose.
Dairy samples were purchased from a local supplier which represents the usual consumption habits of the area.
The dairy product identifiers (Sample #) indicate the year, the quarter and the designation of sample submitted.

EMP versus Stack Monitoring Data

It has been observed that the comparison of data from the EMP versus the Weekly Stack Emissions data has been increasing in variance over the past several years. SRBT had determined an error in the MS Excel spreadsheet for calculating the mass of sampling air by a factor of 10X.
For the year 2004 the variance has been shown to be 2.5X for EMP data (40.2uSv/a) versus Stack Emissions Data (1.6%DEL = 16uSv/a) for the critical group annual estimated dose.
In future, the variance between the dose as determined from the EMP data and the dose as determined from the Stack Emissions Data will be analyzed and evaluated.

When the data shown in Appendix G is evaluated and analyzed it is observed that there is an upward trend in the HTO in air as determined by Passive Air Monitoring. There may be several factors that can explain why the results for passive air sampling are increasing while emissions monitoring results are decreasing.
One of the factors found to contribute to this variance has been:

- the elimination of background sample subtraction, which account for changes due to:

- increasing concentration of tritium in the lab grade glycol used in the passive air sampler preparation and is stored on site,
- increasing concentration of tritium in the DD water used in the passive air sampler preparation and is stored on site, and
- general changes in instrument performance.

SRBT is reviewing the program to determine if there are other factors that contribute to the variance observed between the Environmental Monitoring Program data and the Stack Emissions data. SRBT is also taking action to eliminate these factors from the analysis. Evaluation of the Stack Sampling systems has shown that the effectiveness and efficiency of the flow control indicating devices and the scrubber systems are acceptable. SRBT has contacted Radiation Measurement Systems regarding the procurement of Overhoff Industries manufactured stack monitoring systems.

It can be stated that for both the Stack Monitoring data and the EMP data that the dose to the public based on the defined critical group is less than 50uSv per year, which is ALARA (As Low As Reasonably Achievable, taking into account social and economic factors).

Good Laboratory Practices

During the sampling of the Passive Air Monitoring system good laboratory practices are employed to ensure that samples are not subject to cross contamination and are properly identified.

The increasing trend in the Passive Air Sampling results could be attributed to the increasing concentration of tritium building up in the lab grade glycol and DD water used to prepare the samples.

Emissions and EMP Data Discussion

In an evaluating and assessing the data related to emissions and EMP it was observed that the highest result was seen to be at PAS #1. This sampler is located very close to the facility and is subject to effects due to meteorological events such as precipitation and wind. The greatest effects are seen at samplers located close to the point of release. It may be assumed that washout due to rain has resulted in an increased value for this sampler during the month of August.

There has not been sufficient meteorological data collected make a pure assessment to fully explain the reasons for variations in sampling results.

Effects due to plume washout during precipitation which strips the plume of HTO early on and therefore does not enable HTO to disperse in a predictable manner cannot be taken into account based on the data available.

Effects due to wind direction and wind velocity during each week of stack emissions monitoring has not been evaluated.

All of the above, although not fully encompassing effect the outcome of the sampling results and these effects can be used to determine variations in passive air sampler results when compared to stack emissions results.

In future meteorological data will be considered for the evaluation of emissions and environmental data.

Passive Air Samplers (PAS)

The following samplers are included in the passive air sampler array for the EMP:

PAS #1 is located approximately 94.1 meters west of the point of release and represents the potential exposure to HTO by the adult worker at BOC Gases for a 2000 hour work year.

PAS #2 is located approximately 52.8 meters SW of the point of release and represents the potential HTO exposure for the adult worker at Med-Eng for a 2000 hour work year.

PAS #3 is located near the Pem-Ice II arena and represents the potential exposure to HTO for the adult worker.

PAS #4 is located 222 meters north-west of the point of release and represents the critical group for the adult non-worker, worker and infant which are located 240 meters North West of the point of release.

PAS #5 is located near the municipal sand and salt storage building on International Street and represents the potential HTO exposure for the adult worker at that facility.
PAS #6 is located near the Irving Big Stop at the corner of the Trans Canada and Paul Martin Drive and represents the potential exposure to HTO for the adult worker.
PAS #7 is located at 209 Market Street and represents the potential HTO exposure for the adult non-worker, worker and/or infant.
PAS #8 is located on Boundary Road 1050 meters from the point of release and represents the potential exposure to HTO for the adult non-worker, worker and infant.
PAS #9 is located at the KI Pembroke facility and represents the potential HTO exposure for the adult worker.
PAS #10 is located at a residence in the Alice Fraser Township 6.7 kilometers south-west of the point of release and represents the potential exposure to HTO for the adult non-worker, worker and adult. This sample point is located in a direction normally out of the prevailing wind directions and effectively downwind and approximately the same distance as the SRBT facility from another CNSC licensee and therefore was considered as the background value.
PAS #11 is located 356 meters south of the point of release near the Renfrew County Health Unit building on International Street and represents the potential exposure to HTO for the adult worker.
PAS #12 is located at the Saar Dairy Farm 1450 meters South West of the point of release and represents the potential exposure to HTO for the adult worker, worker and infant at that residence.
PAS #13 is located approximately 61.5 meters south of the point of release and represents the potential exposure to HTO for the adult worker at the Brewers' Edge.

PAS #1, 2, 3, 5, 6, 9, 11, and 13 all represent the workplaces for the adult workers for a 2000-hour work year.
PAS #4, 7, 8, 10, and 12 represent the adult non-worker, worker and infant at the place of residence. The adult non-worker and infant occupy these points for 8400 hours per year whereas the adult worker occupies these points for 6400 hours per year based on 50 weeks per year.

Critical Group Annual Dose Due to Inhalation and Skin Absorption of HTO

The results of the monthly passive air monitoring sampling are each averaged for the year. The results of Pas # 1, 2, and 13 are averaged and used to express the average HTO in air concentration at the work place for the adult worker for a 2000 hour work year. The HTO inhaled and absorbed is determined by the average breathing rate, occupancy time and HTO in air concentration at that place.
The HTO absorbed through the skin is taken as the same as the value for inhalation.
The result for PAS #4 is used to express the HTO in air concentration for the place of residence for the adult worker, the adult non-worker and the infant. The HTO inhaled and absorbed is determined by such factors as the breathing rates, occupancy time and HTO in air concentration.
The calculations are shown in **Appendix B**.

Contract Laboratory QA

SRB Technologies (Canada) Inc. has entered into contract with Ontario Power Generation Health Physics Laboratories to analyze produce and dairy samples submitted for the Environmental Monitoring Program. The OPG report indicates the L_d for tritium analysis, the QC result for the expected value for NIST traceable reference standards used in the analysis, and the acceptable QC range for sample analysis results reporting.

6. Facility Effluents

Liquid Effluent

In conjunction with CNSC facility licensing mitigating measures in 2000, during 2004 the Health Physics department established and implemented a new procedure and performed sampling and analysis for tritium concentrations in **liquid effluent** in accordance with that procedure. The new procedure was established and submitted to CNSC staff for review and comment. The results of the assessment were submitted to CNSC staff for review.
A report is expected from CNSC staff in 2005.

Gaseous Effluent

Gaseous effluent samples were taken on a weekly basis in accordance with operational procedures. The results of the stack emission analysis are shown in **Appendix C**.
Tritium emissions from the facility are determined by continuously drawing a known portion of sample from the known quantity of exhaust of the ventilation systems and analyzing for tritium content. The results are assessed for emissions on a weekly basis to determine what percentage of the regulatory limit a member of the public, defined as that individual that is most likely to receive the highest exposure due to any releases, would receive.
The ratio of HT to HTO has been observed to vary depending on the ambient humidity level. The air being supplied to Zone 3, where tritium is dispensed from the Amersham container to the PUTT's and then further to the gaseous tritium light sources is not condition to remove moisture due to relative humidity in the air; therefore, the air supplied to Zone 3 is the same as the ambient air at the point of intake. As the relative humidity increases so does the quantity of HTO that is emitted through the exhaust systems.
An evaluation and assessment of the emissions data showed variations in the results for HTO versus HT concentrations in the emissions gases.
The variations in atmospheric conditions have a significant affect on the concentration of HTO in effluent gases, particularly during weeks 19 and 20 and the peak in HT concentration during week 26. It is highly probable that there was higher than average humidity during week 19 and 20 and lower than average humidity during week 26.
The derived release limit (DRL's) calculations for the facility were performed in accordance with CAN/CSA-N288.1-M, 'Guidelines for Calculating Derived Release Limits for Radioactive Material in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities'.
The DRL's were calculated for adult workers, non-adult workers and infants within the public domain.
The report data for gaseous emissions was revised in late 2005 based on the recognition of an error found in the calculation of the volume of gas sampled per week in the excel program. The revised average weekly DRL results for 2004, based on weekly assessment, were as follows:

Adult Worker	**1.6% DRL**
Adult Non-worker	**1.4% DRL**
Infant	**1.0% DRL**

The SRBT administrative level is 2.5% annual DRL and the action level is 5.0% weekly DRL.
Note that the CNSC-issued Class 1B Nuclear Facility license includes documents that refer to dose limits that were in force at the time of implementation of those documents. The annual public dose limit at that time was 5.0 mSv per year compared to the present dose limit of 1.0 mSv per year. Therefore, in accordance with the existing public annual dose limit, the administrative limit is 2.5% as compared with 0.5% and the action limit is 5.0% as compared with 1.0% of DRL.

Precipitation Sampling

In conjunction with CNSC facility licensing mitigating measures in 2000, during 2004, SRBT established and implemented a new procedure and performed sampling and analysis for tritium concentrations in accordance with that procedure for precipitation (rain, snow) at several locations around the facility, at the four major points of the compass: N, S, E and W. The four points were approximately 70 meters from the central point from the air-handling unit exhaust stacks. The results of the sampling were submitted to CNSC staff for assessment and review.

Many results where tritium was measurable indicated a SQPI which is not indicative of tritium. It is known that the zinc sulfide powders (phosphors) used in the coating process are interfering with tritium measurements and resulting in higher than actual tritium concentrations. SRBT has researched methods for reducing and possibly eliminating the effects of the zinc sulfides during tritium assessments. Present methods involve distillation or vacuum filtration to remove the zinc sulfides. SRBT does not possess the laboratory equipment or the dedicated laboratory space for distillation and filtration.
The results for the precipitation sampling show essentially the direction of the wind during the sampling and the concentration of the liquid collected for that duration.

Ontario Ministry of the Environment

The certificate for emissions of hazardous substances as issued by the Ontario Ministry of the Environment is contained in **Appendix E**.

7. Waste Management

In 2004 there were two (2) shipments of waste material identified as Class 7, UN2915, Type A packages that were transferred to a CNSC licensed waste handling facility for decay storage.

WM-2004-001

Shipment WM-2004-001 included 10 x 200L drums of tritium contaminated crushed glass. Total H-3 activity of the consignment was 40.0TBq.

WM-2004-002

Shipment WM-2004-002 included 8 x 200L drums of tritium contaminated crushed glass. Total H-3 activity was stated as 32.0TBq.

All shipments were prepared in conformance with the requirements of the IAEA Safety Standards Series, Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Rev.01), TS-R-1.

8. Facility Updates

Ontario Ministry of Labour

During 2004 there were no facility visits by the Ministry of Labour nor was there any correspondence between SRBT and the MOL.
The SRBT Joint Health & Safety Committee met quarterly during 2004 to discuss health and safety issues and facility inspections.
During 2004 there were 9 incidents reported to the SRBT Joint Health & Safety Committee. The 9 reported incidents included 3 thermal burns, 1 chemical burn, 2 cuts by sharps, 1 chemical solvent splash, and 2 falling type incidents. Of the 9 reported incidents, only two involved lost time.

Security Review

The **security program** for the facility has been reviewed by CNSC staff.

Quality Assurance

The **quality assurance** program has been submitted and reviewed by CNSC staff. Revisions have been made in accordance with a schedule as agreed between SRBT and CNSC staff.
SRBT has performed in-house audits of all processes in accordance with ISO9001:2000.
On June 28, 2004 the QA department performed an audit on the Radiation Safety, Radiation Production and Logistics functions of the Health Physics department.
The audit persons identified 2 non-conformities:

1.) The volume of LSC cocktail used in the analysis did not match the volume as stated in the procedure. The procedure was revised to indicate the current volume of LSC cocktail used.
2.) There was a discrepancy between the sampling schedules as indicated in procedure RSO-027 when compared to procedure RSO-001. The schedule as stated in procedure RSO-027 was amended to reflect the sampling schedule as per RSO-001.

All liquid scintillation counting has been performed in accordance with the document SRBT LSC-QA Program.

Results of the Quality Assurance Program

The QA program included:

a) weekly instrument efficiency checks using NIST traceable standards of a blank, H-3 and C-14 standards,
b) weekly program performance checks using NIST traceable reference standards set in a matrix very similar to the samples being prepared for analysis,
c) annual preventative maintenance carried out by contract to Fisher Scientific on each of the two LSC instruments: Wallac 1215 and Wallac 1409, and
d) participation in the Health Canada, National Calibration Reference Centre for Bioassay, 2004 Tritium Urinalysis Intercomparison program.

The results of the performance checks as per the Quality Assurance Program are displayed in the Appendices.

The results for the liquid scintillation counting instrumental analysis assessment are shown in **Appendix F**.

High-vacuum Pump Oil

SRBT has been **researching** the use of an oil-free high vacuum pump. The pump is capable of achieving extremely low pressures, however, not as low as what can be achieved using an oil-sealed rotary vacuum pump.

Several staff members have been in contact with the supplier and manufacturer of pyrophoric uranium tritium traps (PUTT's) to ensure that the traps are able to withstand specified pressures as well as the vacuum pressure usually exerted on the traps.

Waste Management

Waste management activities are described in Section 7 (above).

Radiation Protection Training

All staff members received **Radiation Protection Training** as part of the ongoing employee training program. The training program given was a refresher course which included all of the material that is contained in the main training program. The training included information with respect to proper handling of tritium throughout the facility, WHMIS introduction, safety features within the facility, a briefing on TDG regulations, and open dialogue with a question and answer session.

A follow up written test was provided to all participants to determine if any further training was required for individuals who obtained a mark of 70% or less. All participants had successful results.

9. Compliance with other Federal and/or Provincial Regulations

As a member of the manufacturing community, SRBT must maintain compliance with not only the CNSC regulations, but also several international, federal, and provincial regulations.

Internationally, federally, provincially and for the purpose of packaging and offering for transport, shipments of product designated as dangerous goods, SRBT must comply with the requirements of the Transport Canada Dangerous Goods Act and Regulations, the US code of Federal Regulations 49, Transportation, IAEA Safety standard Series, Regulations for the Safe Transport of Radioactive Material, 1996 Ed. (Revised), and IATA Dangerous Goods Regulations, most current edition. Staff members involved with the packaging, offering for transport and receipt of dangerous goods are given training in accordance with the applicable regulations and are issued certificates by the employer.

Provincially and for the purpose of operating a business within Ontario the dangerous goods used in manufacturing procedures were evaluated by the Ontario Ministry of the Environment for potential release from the facility and deemed acceptable. In accordance with Section 9 of the Environmental Protection Act, SRBT applied for the approval for emissions and in 2000 received from the Ministry of the Environment, the Certificate of Approval for Air, number 5310-4NJQE2.

Provincially and for the purpose of operating a business within Ontario whereby the number of workers is twenty or more, a Joint Health & Safety had been established and maintained in accordance with the Ontario Occupational Health and Safety Act and WHMIS Regulation. The committee consists of one employee representative and one employer representative, each with Part I and II certification.
All staff members have received WHMIS training which includes pertinent information with respect to Material Safety Data Sheets and workplace hazardous material information system training.

10. Public Information Initiatives

SRBT has established a website which contains pertinent information with respect to product, people, services and environmental issues with respect to the operation of the facility.

Environment Monitoring Results

SRBT has sampled and submitted produce samples from the garden of one of the members of the public. The samples were submitted to a contract laboratory for tritium concentration assessment and the results were reported to the member of the public and to the CNSC staff. The sample results are shown in **Appendix A, Produce and Dairy 2004 SRBT EMP: Produce and Dairy Data**. This data was used in the calculations for critical group annual estimated dose for 2004.

Site Tours and Open Houses

SRBT has in the past opened the doors of the facility to visitors who wish to view the operations. However, in light of security issues following the September 11, 2001 terrorist actions that took place in the USA and further action taken by the USA and national and international authorities, tours of the facility have in 2003 and 2004 been preempted at the request of the CNSC staff.

SRBT Participates in Community Events

SRBT continues to participate in community events and to support needs of the community with involvement in service groups, charitable organizations, and specialty group organizations. In our involvement we take the opportunity to relate the benefits of the life-safety products that we manufacture.

Staff members are active within nuclear science organizations and national and international organizations such as the Pembroke and Area chamber of Commerce, Canadian Radiation Protection Association, Canadian Nuclear Society, Health Physics Society, Bioassay and Analytical Environmental Radiochemistry, Measurements and Radiochemical Committee, Institute of Environmental Sciences and Technology, Ottawa Valley Manufacturers' Alliance, etc.

Pubic Information Program

SRBT has been working to develop a Public Information Program to comply with the CNSC Regulatory Guide G-217, Licensee Public Information Programs.
The program document will be completed and submitted in 2005 to CNSC staff for review and comment.
The program document details the available methods of providing information such as:

2. Internet website
3. Product Health & Safety Brochure
4. Periodical Pamphlet

11. Forecast for Coming Years

As the population becomes more educated we hope for acceptance of the value of the products we manufacture, similar to the acceptance of smoke detectors and other devices that use nuclear material.

The products we manufacture are all related to life-safety, whether it is used to provide access to a safe exit during extreme life threatening situations or to provide illumination specific for military activities. The main purpose of the devices is to provide a life-safety aspect with the intent of saving lives.

SRBT has been working diligently to prepare documentation to comply with the many new documents that are being provided by the CNSC for Class 1B nuclear facilities. These documents will be submitted to CNSC staff for review and comment for use in the programs for SRBT.

It is the goal of SRBT to continue to foster a trusting relationship with the vast majority of the public.

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Part C

I hereby certify that I have reviewed the documents referred to in the Appendix A of the license NSPFOL-13.00/2005 and do believe that SRB Technologies (Canada) Inc. has operated in compliance with the license conditions except as noted herein:

Signature:_____ Date:_____

Name (print): Stephane Levesque

Title: President

Address: 320-140 Boundary Road, Pembroke, Ontario, K8A 6W5

Phone Number: (613) 732-0055 Fax Number: (613) 732-0056

Other approvals, as required:

Name (Signature)	Title	Date
Ross Fitzpatrick	General Manager	
K.K. Shane MacDougall	Corporate Health Physicist	

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Appendices

Appendix A: **Environment Monitoring Program**

Appendix B: **Annual Public Dose Estimate**

Appendix C: **Stack Emission Analysis Results**

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Appendix E: **Ontario Ministry of the Environment Certificate**

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Appendix H: **Stack Monitoring Data 2000 to 2004**

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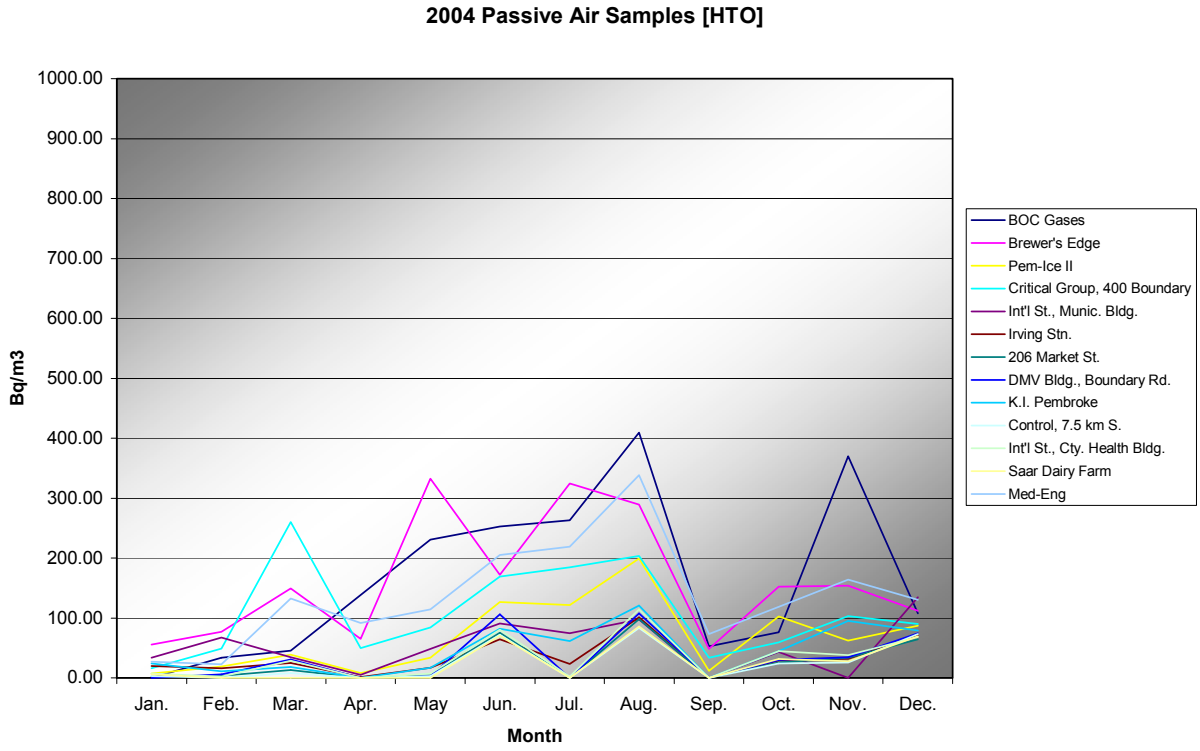
Appendix A: Environment Monitoring Program

Table A1: Passive Air Sampler Results

Year	2004	MDA (minimum detectable activity) = 1.0 Bq/m^3											
	Passive Air Sampler Results (Bq/m3)												
Sample Point	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ave.
1	0.00	33.55	45.52	138.75	230.86	252.59	263.13	409.23	52.43	76.13	370.00	107.83	**165.00**
2	56.00	76.77	149.66	65.00	332.57	171.85	324.38	289.23	48.65	152.26	153.50	112.17	**161.00**
3	7.20	19.35	38.62	8.13	33.71	126.67	121.88	199.23	11.89	102.58	62.50	86.96	**68.23**
4	16.00	49.03	260.00	50.00	84.00	168.89	184.38	203.85	34.05	59.35	103.00	90.43	**108.58**
5	33.60	67.10	34.48	5.00	48.00	91.11	74.38	97.69	0.00	43.23	0.00	134.78	**52.45**
6	20.00	16.13	24.83	1.25	16.57	64.44	23.75	100.77	0.00	29.03	32.50	71.30	**33.38**
7	2.40	3.87	13.10	0.00	4.57	75.56	0.00	98.46	0.00	25.81	34.00	64.35	**26.84**
8	0.00	5.81	31.03	0.00	2.86	105.93	0.00	107.69	0.00	30.32	34.50	74.78	**32.74**
9	24.00	10.97	18.62	0.00	16.57	82.22	61.25	120.77	0.00	44.52	95.00	79.13	**46.09**
10	3.20	0.00	8.28	0.00	2.86	71.85	0.00	83.85	0.00	24.52	25.50	73.04	**24.42**
11	7.20	1.94	28.28	0.00	7.43	80.74	1.88	114.62	0.00	44.52	38.00	67.83	**32.70**
12	5.60	0.00	0.00	0.00	0.00	70.37	0.00	85.38	0.00	31.61	28.00	69.57	**24.21**
13	27.20	22.58	132.41	91.25	114.29	205.19	219.38	338.46	73.51	118.71	164.00	130.43	**136.45**

Note: '0.00' indicates that the sample result is less than the MDA value of 1.0 Bq/m^3.

Passive



2004 SRBT EMP: Produce & Dairy Data

Produce Samples (Bq/L)

Sample #	Sample Description	2004-Q3	Average
0409001A	Zucchini	4.5±2.6	(4.5+0+0.9)/3 = **1.8**
0409002A	Cucumber	-1.4±2.3	
0409003A	Tomato	0.9±2.4	
Critical Group Garden	Produce: potatoes	12737.5±60.0	**12737.5**

Milk Samples (Bq/L)

Sample #	Description	2003-Q4	2004-Q1	2004-Q2	2004-Q3	Average
0301001B	Milk	1.2±2.5				(1.2+1.3+0.9+2.4)/4 = **1.55**
0302001B	Milk		1.3±2.5			
0303001B	Milk			0.9±2.4		
0304001B	Milk				2.8±2.5	

Note: The dairy product identifiers (Sample #) indicate the year, the quarter and the designation of sample submitted. The identifier is a unique identifier for sample submission and tracking purposes only.

Appendix B Annual Public Dose

2004 Effective Annual Public Dose for 'Critical Group'

The calculation method used to determine the dose to the 'Critical Group' as defined in the SRBT Environment Monitoring Program is described in the EMP document.
The dose assessed for the Critical Group is a summation of:

a) Dose due to the tritium exposure deemed to occur at the place of residence for the time period allocated (128 hours/week),
b) Tritium uptake deemed to occur at the worksite (40 hours/week), and
c) Tritium uptake due to consumption of fruit, vegetables and dairy products.

Tritium in Air Concentration at Passive Air Sampler #4

Passive air sampler #4 is located on a hydro pole approximately 220 meters from the point of release for tritium in gaseous and oxide forms. The passive air sampler, which is in place for about 1 month at a time, has an affinity to trap tritium in oxide form. The passive air sampler allows air to diffuse through the orifice at a rate of 5 liters per day. The tritium oxide contained in that air is absorbed into the liquid contained within the sampler. This liquid is a 50/50 mixture of lab grade glycol and water. The purpose of the glycol is to reduce the possibility of evaporation during the warmer season and freezing during the colder season. At the end of the sampling period the collection liquid is sampled and then analyzed for tritium content. The tritium content is then used to determine the tritium oxide in air concentration at that sample point.
The average annual concentration of tritium oxide in air at **Passive Air Sampler #10** has been determined to be **108.58 Bq/m3**. The closest residence to Passive Air Sampler #10 is located at 400 Boundary Road and is approximately 240 meters from the point of release. The residence of the defined critical group is farther from the point of release of tritium than the PAS #4; therefore the concentration of tritium oxide in air is less than the concentration at Passive Air Sampler #10 due to further diffusion and dilution.

Dose Due to Tritium Uptake at Place of Residence

$H_{inh,res}$ = [$H\text{-}3_{air}$] (Bq/m^3) x Time (h/a) x Breathing Rate (m^3/h) x DCF for H-3 (uSv/Bq)

$108 Bq/m^3$ x 6,400h/a x $1.0 m^3/h$ x 1.8E-05uSv/Bq = **12uSv/a**

Dose Due to Uptake of Tritium at Place of Work

The average tritium oxide concentration for Passive Air Samplers #1, 2, and 13 equals $154.15 Bq/m^3$.

$H_{inh,w}$ = [$H\text{-}3_{air}$] (Bq/m^3) x Time (h/a) x Breathing Rate (m^3/h) x DCF for H-3 (uSv/Bq)

154Bq/m3 x 2,000 h/a x 1.0m3/h x 1.8E-05uSv/Bq = **5.5uSv/a**.

Dose Due to Consumption of Produce

The tritium uptake due to consumption of produce, both locally purchased and home grown is calculated as follows:

(a) the average tritium concentration of 1.8 Bq/L for locally grown fruit and vegetables purchased from the local market and consuming 90% of the annual total;
(b) the average tritium concentration of 12,737 Bq/L for home grown produce and consuming 10% of the annual total; and
(c) the annual consumption rate for produce (M_{prod}) of 150kg/a,

Using this data we can calculate the tritium uptake due to consumption of produce as follows:

H_{prod} = [[$\mathbf{H_{prod,market}}$] + [$\mathbf{H_{prod,res}}$]] x 1.8E-05uSv/Bq

[[$H\text{-}3_{veg}$] (Bq/L) x M_{prod}(kg) x 0.9] + [$H\text{-}3_{veg}$] (Bq/L) x M_{prod}(kg) x 0.10]] x 1.8E-05uSv/Bq

[[1.8Bq/L x 150kg/a x 0.9] + [12,737Bq/L x 150kg/a x 0.1]] x 1.8E-05uSv/Bq = **3.44uSv/a**

Dose Due to Consumption of Dairy

The average tritium concentration for locally produced milk procured (1.55Bq/L) from the local market and using the daily average consumption rate of 0.3L/da., we can calculate

H_{dairy} = $[H\text{-}3]_{dairy}$ x M x 1.8E-05uSv/Bq

= [1.55Bq/L] x 0.3L/da x 365 da/a x 1.8E-05uSv/Bq = **0.003uSv/a**

Total Maximum Hypothetical Annual Public Dose Due to Tritium Uptake

The total dose ($\mathbf{H_{total}}$) due to tritium uptake from inhalation and immersion in tritium (skin absorption) in the air at or near the home; at the workplace environment; from consumption of locally grown fruit and vegetables and locally produced milk equates to approximately **40.2uSv** during 2004 to a member of the defined critical group as per estimates through the environmental monitoring program.

This public dose is based on a hypothetical individual that works at or near the SRBT facility for 2000 hours per week for 50 weeks of the year and lives at 400 Boundary Road. This hypothetical person also consumes 150 kilograms of produce per year whereby 10% comes from a garden at his place of residence and 90% is purchased from a local market.

The total estimated dose to a hypothetical member of the public is determined in the following equation:

$$H_{total} = H_{inh,w} + H_{abs,w} + H_{inh,res} + H_{abs,res} + H_{prod,market} + H_{prod,res} + H_{dairy}$$

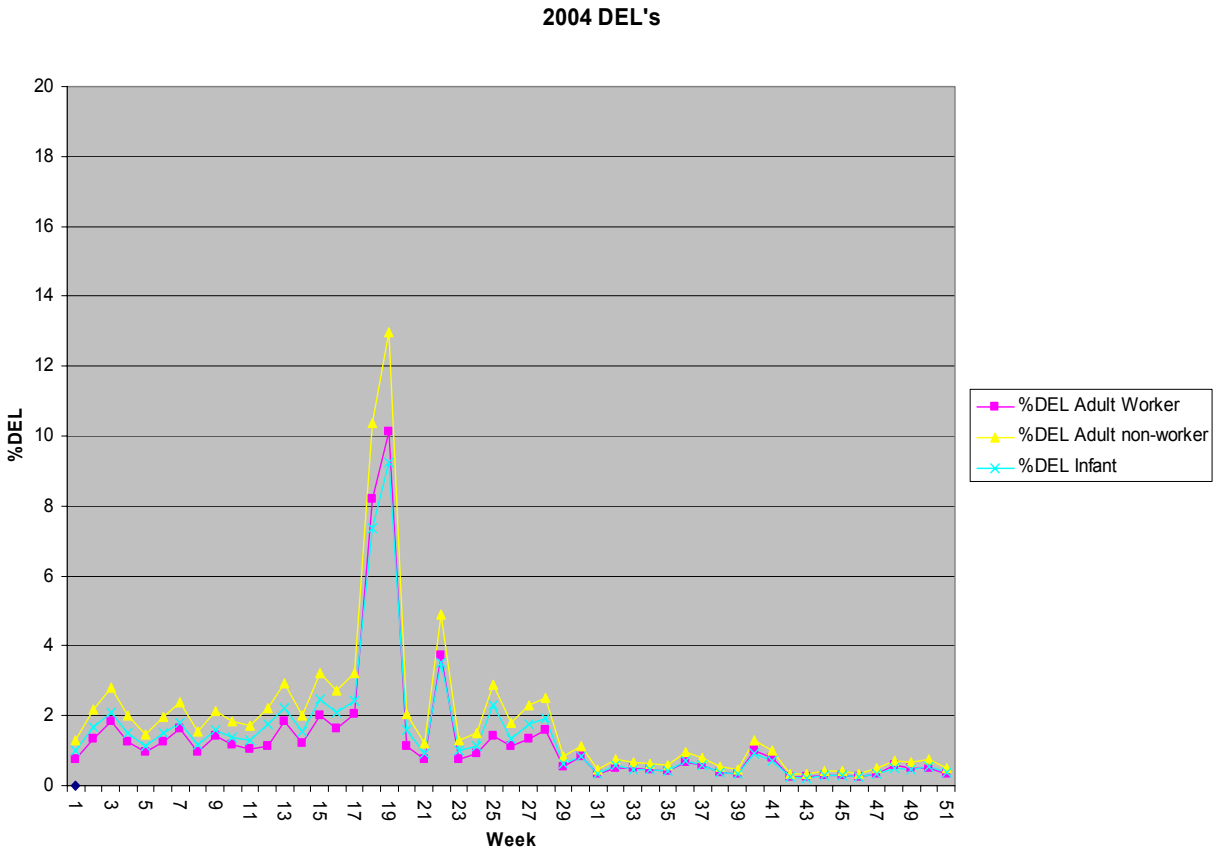
Table: Annual Dose Due to Uptake of Tritium via Inhalation, Skin Absorption and Consumption of Dairy and Produce for an Adult Worker

	Dose Contributor	Annual Dose (uSv/a)
Annual dose due to inhalation of HTO at work	$\mathbf{H_{inh,w}}$	**5.5**
Annual dose due to skin absorption of HTO at work	$\mathbf{H_{abs,w}}$	**5.5***
Annual dose due to inhalation of HTO at residence	$\mathbf{H_{inh,res}}$	**12**
Annual dose due to skin Absorption of HTO at residence	$\mathbf{H_{abs,res}}$	**12***
Annual dose due to consumption of produce 10% of annual being home grown produce	$\mathbf{H_{prod,market}}$	**3**
Annual dose due to consumption of produce 90% of annual being market purchased produce	$\mathbf{H_{prod,res}}$	**0.004**
Annual dose due to dairy consumption	$\mathbf{H_{dairy}}$	**0.003**
Total Annual Dose due to Tritium Uptake	$\mathbf{H_{total}}$	**40.2**

* The dose applied is based on ICRP estimates for tritium absorbed through the skin due to immersion in a cloud of tritium with a concentration in air value as defined by the Environmental Monitoring Program passive air sampler array.

Appendix C: Stack Emission Analysis Results

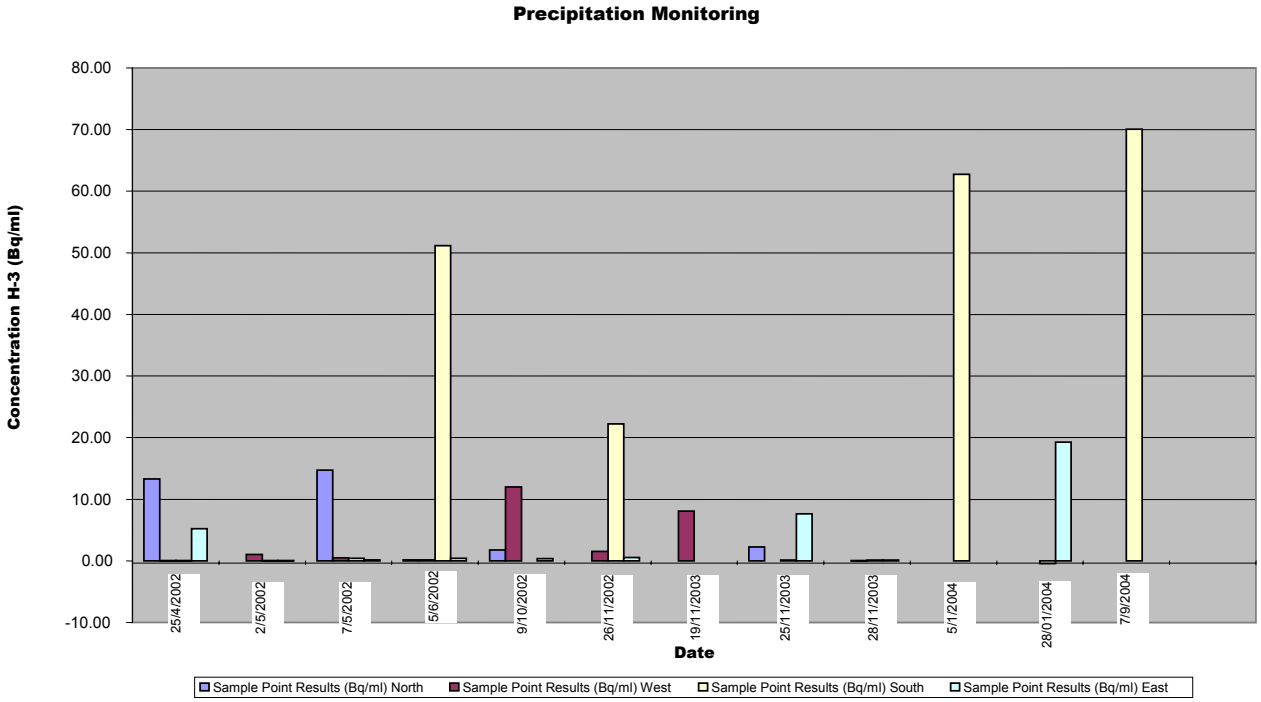
Stack Sampling						
Year: 2004						
Week #	HTO	HT	Total	%DEL		
	(GBq)	(GBq)	(GBq)	Adult Worker	Adult non-worker	Infant
1	2133	25611	27744	0.5	0.5	0.3
2	3144	84108	87252	0.8	0.8	0.6
3	6158	123892	130050	1.6	1.4	1.1
4	8974	129369	138343	2.2	2.0	1.4
5	5783	107781	113564	1.5	1.3	1.0
6	4622	71823	76445	1.2	1.0	0.8
7	6064	98828	104892	1.5	1.4	1.0
8	8537	92534	101071	2.1	1.8	1.3
9	4641	80921	85562	1.2	1.1	0.8
10	7028	97630	104658	1.7	1.6	1.1
11	5412	96055	101467	1.4	1.2	0.9
12	4897	94614	99511	1.3	1.1	0.9
13	3786	182764	186550	1.1	1.0	1.1
14	8547	158780	167327	2.2	1.9	1.5
15	5389	119624	125013	1.4	1.3	1.0
16	9291	178027	187318	2.4	2.1	1.6
17	7153	163589	170742	1.9	1.7	1.4
18	9783	165312	175095	2.5	2.2	1.7
19	47985	131073	179058	11.1	9.8	5.6
20	58905	191618	250523	13.7	2.1	7.0
21	4531	146903	151434	1.3	1.1	1.0
22	3313	70656	73969	0.9	0.8	0.6
23	20971	103220	124191	4.9	4.4	2.6
24	3308	83098	86406	0.9	0.8	0.7
25	4006	88608	92614	1.0	0.9	0.8
26	4546	249018	253564	1.4	1.3	1.4
27	5298	95048	100346	1.3	1.2	0.9
28	5891	141582	147473	1.6	1.4	1.2
29	7617	130542	138159	1.9	1.7	1.3
30	2738	37312	40050	0.7	0.6	0.4
31	4546	30098	34644	1.1	1.0	0.6
32	1788	15606	17394	0.4	0.4	0.2
33	2592	32112	34704	0.6	0.6	0.4
34	2685	16303	18988	0.6	0.6	0.3
35	2506	18930	21436	0.6	0.5	0.3
36	2204	18532	20736	0.5	0.5	0.3
37	3667	31167	34834	0.9	0.8	0.5
38	3074	27254	30328	0.7	0.7	0.4
39	2064	15675	17739	0.5	0.4	0.3
40	1789	13432	15221	0.4	0.4	0.2
41	5838	22268	28106	1.4	1.2	0.7
42	4782	9227	14009	1.1	1.0	0.5
43	1288	12196	13484	0.3	0.3	0.2
44	1430	4873	6303	0.3	0.3	0.2
45	1563	12707	14270	0.4	0.3	0.2
46	1730	10080	11810	0.4	0.4	0.2
47	1349	7191	8540	0.3	0.3	0.2
48	1958	12630	14588	0.5	0.4	0.3
49	3407	7941	11348	0.8	0.7	0.4
50	2838	12405	15243	0.7	0.6	0.3
51	2515	31332	33847	0.6	0.6	0.4
52	1685	20362	22047	0.4	0.4	0.3
Average	6581	76405	Ave. % DRL	1.6	1.4	1.0



NOTE: The above emissions chart is a revision based on new information which indicated a 10X error in the calculations for sampling volume.

The SRBT annual administrative limit for emission of tritium based on stack sampling techniques performed on a weekly basis is 2.5% of the DRL. The DRL is calculated on the regulatory annual public dose limit of 1.0 mSv per year.
The SRBT weekly action level for emission of tritium based on stack sampling techniques performed on a weekly basis is 5.0% of the DRL.

Please note that in the CNSC-issued Class 1B Nuclear Facility license includes documents that refer to dose limits that were in force at the time of implementation. The annual public dose limit at that time was 5.0 mSv per year compared to the present dose limit of 1.0 mSv per year; therefore, in accordance with the existing public annual dose limit, the annual administrative limit is 2.5% as compared with the previous 0.5% and the weekly action level is 5.0% as compared with the previous 1.0% of DRL.



NOTE: The above chart, Precipitation Monitoring, is the result of sampling at 4 points on the SRBT property. The results indicate that during precipitation that tritium oxide is washed out of the gaseous plume and deposited to ground. The results show essentially the wind direction during the sampling of precipitation and are an indication of soil deposition.

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Appendix D: Facility Maintenance

EQUIPMENT MAINTENANCE PROGRAM

Equipment Maintained:

Qty	Type	Zone	Location
1	Heat Recovery unit	1	Mold area/Office
2	Makeup air units	1 &2	Coating room, Assembly room
4	Exhaust fans	1 &2	Coating, Assembly, Glass room, Paint Booth
1	HRV with reheat	2	Assembly room
2	Fan coils	1	Office, Mold area/Office
2	Condenser	1	Mold area/Office
1	Mid efficient gas furnace & central air	1	Stores
1	Mid efficient gas furnace	1	Receiving
1	Air handling unit (Rig Room)	3	Compound
1	Air handling unit (Trit Lab)	3	Compound

2004 Equipment Maintenance Information:

Major maintenance carried out in 2004:	None
Quarterly Maintenance Schedule: **Contract:** 03-320 **Contract Term:** Oct. 1/2003 to Sept. 30/2004	November 19/ 2003 January 12/ 2004 May 3/ 2004 July 27/ 2004
Report of any weakening or possible failure of any components:	None

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Appendix E: Ontario Ministry of the Environment Certificate

Ministry of the Environment / Ministère de l'Environnement

Ontario

CERTIFICATE OF APPROVAL
AIR
NUMBER 5310-4NJQE2

SRB Technologies (Canada) Inc.
140 Boundary Road, Unit 320
Pembroke, Ontario
K8A 6W5

Site Location: 140 Boundary Road, Unit 320
Pembroke City, County Of Renfrew
K8A 6W5

You have applied in accordance with Section 9 of the Environmental Protection Act for approval of:

an exhaust system serving a tube washing process, complete with a fume hood, fiber filter, ductwork and a fan, discharging into the atmosphere at a volumetric flow rate of 0.74 actual cubic metre per second, through a stack, having exit dimensions of 0.61 metre by 0.61 metre, extending 0.91 metre above the roof and 5.48 metres above grade,

- an exhaust system serving a tube coating process, complete with four (4) fume hoods, fiber filter, ductwork and a fan, discharging into the atmosphere at a volumetric flow rate of 0.74 actual cubic metre per second, through a stack, having exit dimensions of 0.61 metre by 0.61 metre, extending 0.91 metre above the roof and 5.48 metres above grade,

- an exhaust system serving a silk screening process, complete with a fume hood, fiber filter, ductwork and a fan, discharging into the atmosphere at a volumetric flow rate of 1.47 actual cubic metres per second, through a stack, having exit dimensions of 0.71 metre by 0.61 metre, extending 0.91 metre above the roof and 5.48 metres above grade,

- an exhaust system serving a silk screening process, complete with a fume hood, fiber filter, ductwork and a fan, discharging into the atmosphere at a volumetric flow rate of 0.55 actual cubic metre per second, through a stack, having exit dimensions of 0.51 metre by 0.2 metre, extending 3.05 metres above grade,

all in accordance with the application for a Certificate of Approval (Air), and all supporting information dated May 12, 2000 and signed by Stephane Levesque.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

Page 1 - NUMBER 5310-4NJQE2

according to a procedure that will result in compliance with the Act, the regulations and this Certificate.

In addition the Company is required to keep records and to provide information to staff of the Ministry so that compliance with the Act, the regulations and this Certificate can be verified.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written Notice served upon me, the Environmental Appeal Board and in accordance with Section 47 of the Environmental Bill of Rights, S.O. 1993, Chapter 28, the Environmental Commissioner, within 15 days after receipt of this Notice, require a hearing by the Board. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Appeal Board 2300 Yonge St., 12th Floor P.O. Box 2382 Toronto, Ontario M4P 1E4	AND	The Environmental Commissioner 1075 Bay Street, 6th Floor Suite 605 Toronto, Ontario M5S 2B1	AND	The Director Section 9, *Environmental Protection Act* Ministry of the Environment 2 St. Clair Avenue West, Floor 12A Toronto, Ontario M4V 1L5

*** Further information on the Environmental Appeal Board's requirements for an appeal can be obtained directly from the Board at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

This instrument is subject to Section 38 of the Environmental Bill of Rights, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at www.ene.gov.on.ca, you can determine when the leave to appeal period ends.

The above noted works are approved under Section 9 of the Environmental Protection Act.

1) "Act" means the *Environmental Protection Act;*

(2) "Certificate" means this Certificate of Approval issued in accordance with the Act;

(3) "Company" means SRB Technologies (Canada) Inc.:

(4) "Equipment" means the exhaust systems described in the Company's application, this Certificate and in the supporting documentation referred to herein, to the extent approved by this Certificate; and

(5) "Manual" means a document or a set of documents that provide written instructions to staff of the Company.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

OPERATION AND MAINTENANCE

1. The Company shall ensure that the Equipment is properly operated and maintained at all times. The Company shall:

   (1) prepare, not later than three (3) months after the date of this Certificate, and update as necessary, a Manual outlining the operating procedures and a maintenance program for the Equipment, including:

      (a) routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the Equipment suppliers;

      (b) emergency, spill prevention and spill clean-up procedures;

      (c) procedures for any record keeping activities relating to operation and maintenance of the Equipment.

   (2) implement the recommendations of the operating and maintenance Manual; and

   (3) retain, for a minimum of two (2) years from the date of their creation, all records on the maintenance, repair and inspection of the Equipment, and make these records available for review by staff of the Ministry upon request.

The reasons for the imposition of these terms and conditions are as follows:

Condition No. 1 is included to emphasize that the Equipment must be maintained and operated

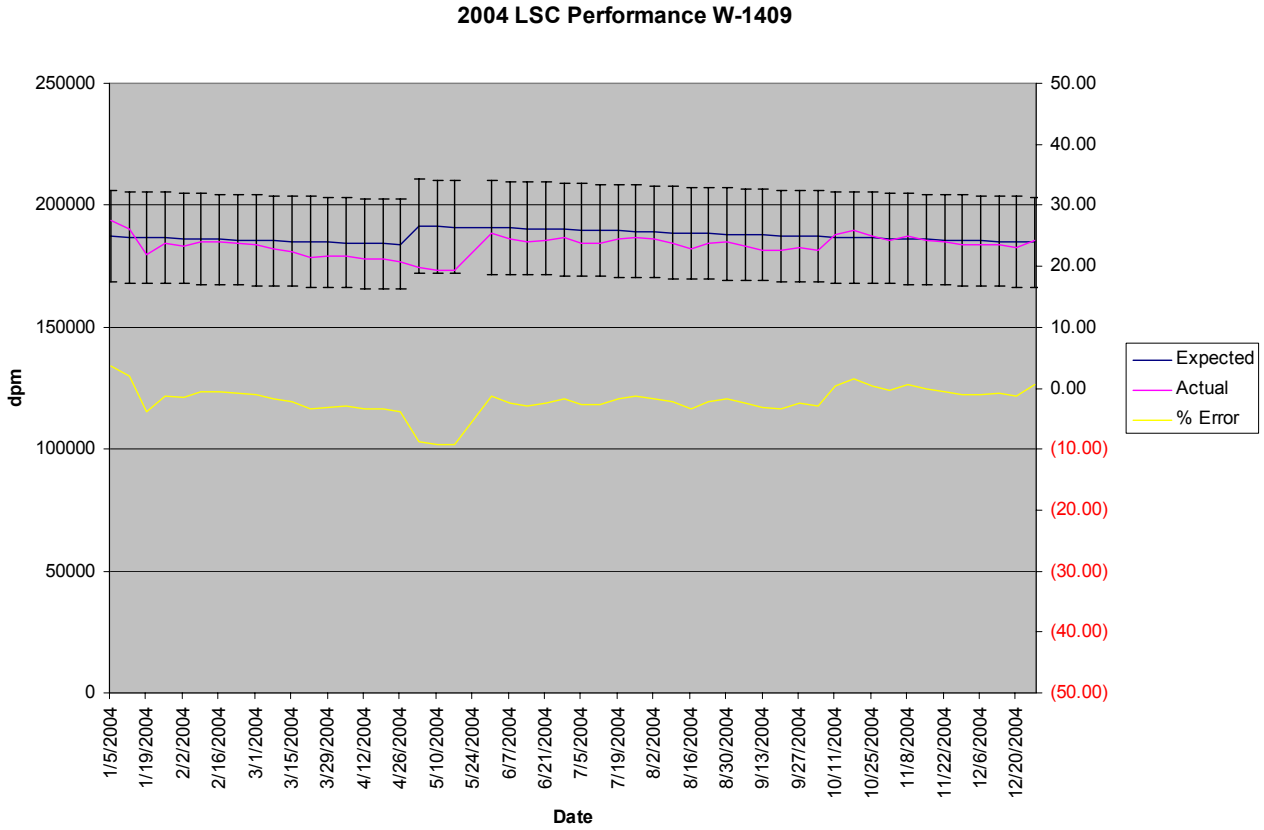
DATED AT TORONTO this 31st day of August, 2000

Steve Klose, P.Eng.
Director
Section 9, *Environmental Protection Act*

ZT/
c: District Manager, MOE Ottawa
Stephane Levesque, SRB Technologies (Canada) Inc.

Appendix F: Quality Assurance

Weekly Instrument Performance Report



The reference standard used in the weekly instrument performance assessments is Perkin-Elmer product number 1210-120 ^{3}H for Organic Solvents (^{3}H-O).
The absolute activity of the capsules is calibrated by comparison with the reference standards of tritiated toluene supplied by the National Institute of Standards and Technology (NIST), USA. The Standard Reference Material (SRM) is certified to have an estimated accuracy of ± 1.2%.

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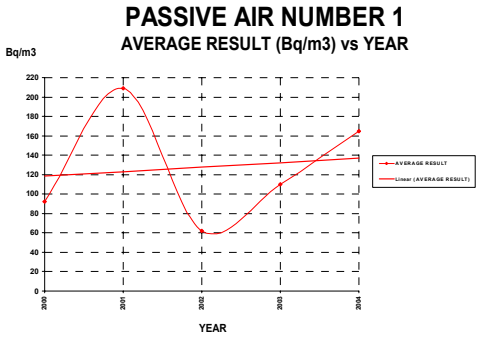
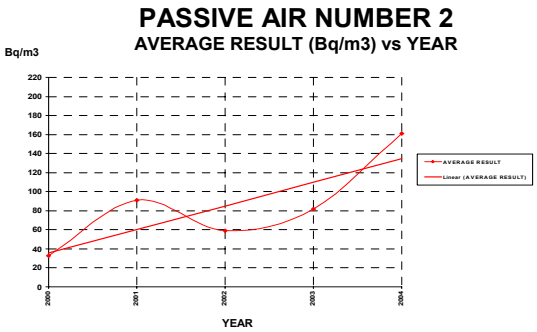
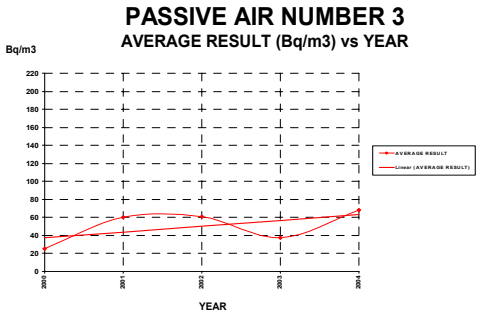
Appendix G: Environmental Monitoring Data 2000 to 2004

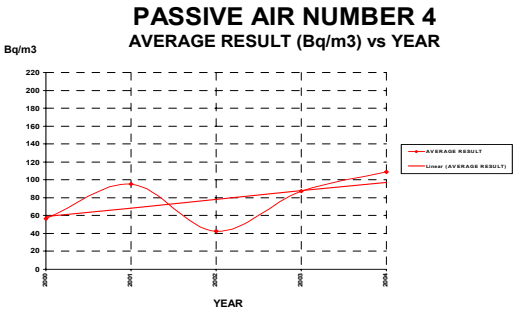
SRBT Environmental Monitoring Program Results from 2000 - 2005																
Mon.	Year	Analysis Results, Bq/m3												Ave.	Less BKG
	Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	(Bq/m3)	(Bq/m3)
1	2000			110.8			101.3			76.5			80.0	92.2	86.7
	2001			61.3			126.2			164.8			484.3	209.2	206.2
	2002	0.0	0.0	0.0	16.0	0.0	137.9		276.4	101.4	80.6	31.6	39.3	62.1	43.6
	2003	43.8	45.7	104.1	178.0	93.8	72.7	120.6	86.4	185.8	273.9	56.3	58.4	110.0	83.5
	2004	0.0	33.6	45.5	138.8	230.9	252.6	263.1	409.2	52.4	76.1	370.0	107.8	165.0	140.6
2	2000			0.0			54.9			35.5			39.1	32.4	27.0
	2001			58.5			130.0			90.1			84.2	90.7	87.7
	2002	24.7	28.6	11.6	42.7	14.5	242.8	63.1	74.6	49.3	85.8	18.7	52.9	59.1	40.6
	2003	23.1	25.7	82.8	100.0	88.8	55.3	74.1	50.7	270.3	137.6	38.5	34.1	81.7	55.3
	2004	56.0	76.8	149.7	65.0	332.6	171.9	324.4	289.2	48.7	152.3	153.5	112.2	161.0	136.6
3	2000						34.8			18.9			20.9	24.9	19.4
	2001			22.1			53.2			74.7			90.3	60.1	57.1
	2002	10.3	0.0	0.0	32.0	9.7	66.2	178.3	102.8	158.6	113.5	17.4	40.6	60.8	42.3
	2003	35.0	1.4	44.8	53.3	20.0	36.7	45.3	31.4	145.8	32.7	0.0	3.8	37.5	11.1
	2004	7.2	19.4	38.6	8.1	33.7	126.7	121.9	199.2	11.9	102.6	62.5	87.0	68.2	43.8
4	2000			131.9			37.0			22.8			34.2	56.5	51.1
	2001			105.3			128.2			44.0			103.6	95.3	92.3
	2002	24.7	22.8	0.0	48.0	10.3	82.8	59.4	33.9	88.6	90.9	16.1	34.8	42.7	24.2
	2003	41.9	27.1	89.0	115.3	78.8	33.3	62.4	27.9	305.8	38.2	222.2	7.6	87.4	61.0
	2004	16.0	49.0	260.0	50.0	84.0	168.9	184.4	203.9	34.1	59.4	103.0	90.4	108.6	84.2
5	2000						0.0			5.7			9.0	4.9	-0.5
	2001			13.6			15.0			24.2			30.4	20.8	17.8
	2002	0.0	0.0	0.0	0.0	5.4	60.7	14.6	27.1	64.3	81.3	8.4	29.0	24.2	5.8
	2003	40.0	2.1	41.4	62.7	55.6	22.7	40.6	17.1	95.5	31.5	93.3	0.0	41.9	15.5
	2004	33.6	67.1	34.5	5.0	48.0	91.1	74.4	97.7	0.0	43.2	0.0	134.8	52.4	28.0
6	2000									12.2			10.9	11.6	6.1
	2001			13.2			6.5			4.4			19.8	11.0	8.0
	2002		0.0		0.0	0.0	0.0	19.4	20.4	72.8	58.1	5.2	31.0	20.7	2.2
	2003	30.0	7.9	38.6	46.0	38.1	18.7	35.3	15.7	85.8	36.4	0.0	0.0	29.4	3.0
	2004	20.0	16.1	24.8	1.3	16.6	64.4	23.8	100.8	0.0	29.0	32.5	71.3	33.4	9.0
7	2000			0.0			0.0			0.0			0.0	0.0	-5.4
	2001			0.0			11.0			4.4			9.4	6.2	3.2
	2002	0.0	0.0	0.0	0.0	0.0	0.0	24.3	0.0	55.7	32.9	0.0	26.4	11.6	-6.9
	2003	21.3	2.1	43.5	35.3	15.0	20.0	25.3	27.9	94.2	24.2	8.2	0.0	26.4	-0.0
	2004	2.4	3.9	13.1	0.0	4.6	75.6	0.0	98.5	0.0	25.8	34.0	64.4	26.8	2.4
8	2000			0.0			0.0			0.0			2.9	0.7	-4.7
	2001			0.0			6.5			6.6			29.2	10.6	7.6
	2002	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	55.7	75.5	5.2	27.7	14.4	-4.1
	2003	24.4	2.9	24.8	42.0	38.1	16.0	35.3	20.7	105.8	29.7	32.6	0.0	31.0	4.6
	2004	0.0	5.8	31.0	0.0	2.9	105.9	0.0	107.7	0.0	30.3	34.5	74.8	32.7	8.3
9	2000			15.8			8.4			10.2			10.9	11.3	5.9
	2001			8.7			19.0			17.6			29.6	18.7	15.8
	2002	0.0	0.0	0.0	5.3	0.0	0.0	36.6	13.6	67.8	55.5	7.1	40.0	18.8	0.3
	2003	41.9	5.7	38.6	39.3	25.0	25.3	31.2	34.3	83.2	24.2	72.6	8.7	35.8	9.4
	2004	24.0	11.0	18.6	0.0	16.6	82.2	61.3	120.8	0.0	44.5	95.0	79.1	46.1	21.7
10	2000			5.5			2.6			3.5			10.1	5.4	0.0
	2001			3.1			0.0			0.0			8.8	3.0	0.0
	2002	18.0	0.0	0.0	0.0	0.0	0.0	9.1	33.9	67.8	56.8	13.6	22.6	18.5	0.0
	2003	25.0	0.0	66.9	35.3	24.4	14.7	10.0	17.9	76.8	32.7	13.3	0.0	26.4	0.0
	2004	3.2	0.0	8.3	0.0	2.9	71.9	0.0	83.9	0.0	24.5	25.5	73.0	24.4	0.0
11	2000			0.0			0.0			0.0			0.7	0.2	-5.3
	2001			0.6			3.8			4.4			23.2	8.0	5.0
	2002	0.0	0.0	0.0	0.0	0.0	0.0	9.2	13.6	80.0	56.8	5.2	27.7	16.0	-2.4
	2003	16.9	5.7	33.1	46.7	26.3	14.7	45.3	0.0	81.3	34.6	9.6	0.0	26.2	-0.2
	2004	7.2	1.9	28.3	0.0	7.4	80.7	1.9	114.6	0.0	44.5	38.0	67.8	32.7	8.3
12	2000			0.0			0.0			0.0			0.0	0.0	-5.4
	2001			0.0			0.0			0.0			19.2	4.8	1.8
	2002	0.0	0.0	0.0	0.0	0.0	0.0	54.0	12.8	80.7	71.0	0.0	29.7	20.7	2.2
	2003	22.5	0.0	21.4	41.3	53.1	16.7	17.7	8.6	60.0	13.3	0.0	0.0	21.2	-5.2
	2004	5.6	0.0	0.0	0.0	0.0	70.4	0.0	85.4	0.0	31.6	28.0	69.6	24.2	-0.2
13	2000			0.0			61.2			25.9			25.9	28.3	22.8
	2001			9.0			88.0			257.1			396.7	187.7	184.7
	2002	3.3	5.7	5.2	48.0	38.8	77.2	73.5	154.3	76.4	73.6	9.0	30.3	49.6	31.1
	2003	90.6	225.0	86.2	178.7	83.8	71.3	64.1	45.0	114.8	94.6	5.2	21.6	90.1	63.7
	2004	27.2	22.6	132.4	91.3	114.3	205.2	219.4	338.5	73.5	118.7	164.0	130.4	136.4	112.0

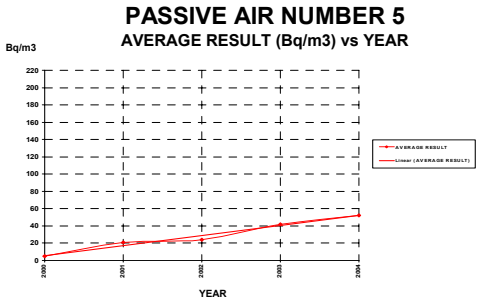
Passive Air Results for 2000 to 2004

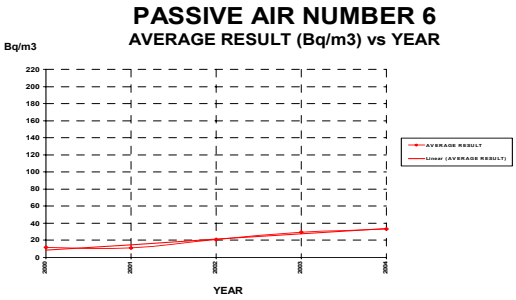


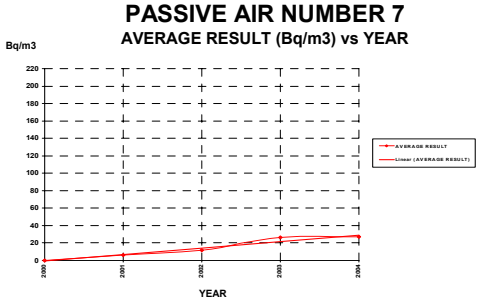


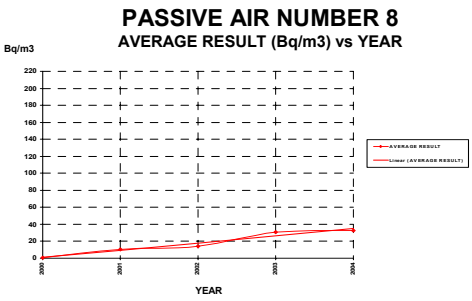


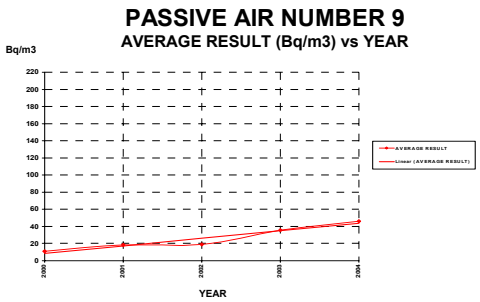


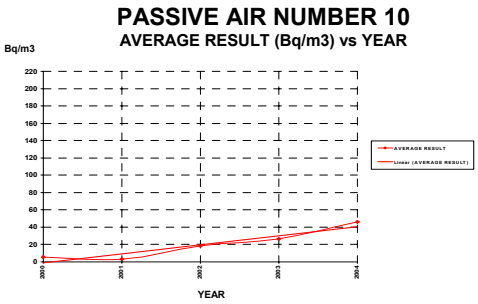


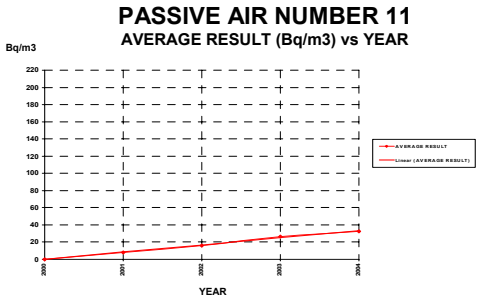


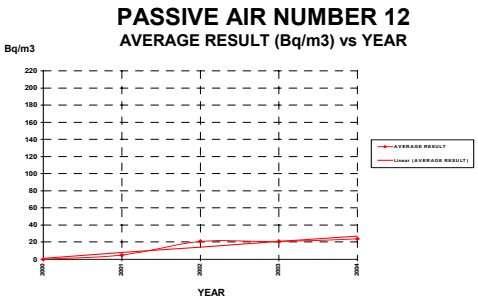


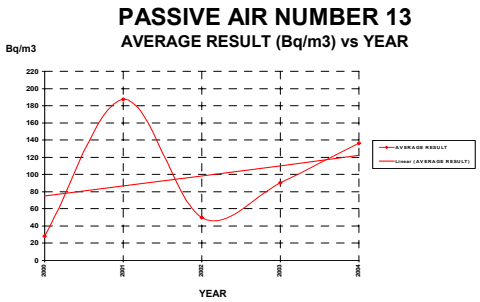








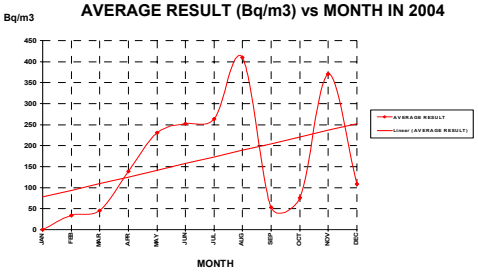




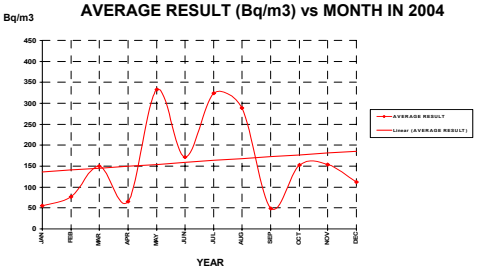
The above graphs show the average HTO concentrations at each of the sampling points as described in the SRBT EMP during the years 2000 to 2004. The graphs also indicate the trending by way of a trend line on each graph.

Passive Air Sampler Results for 2004

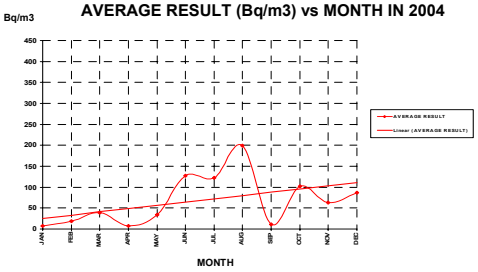
PASSIVE AIR NUMBER 1
AVERAGE RESULT (Bq/m3) vs MONTH IN 2004



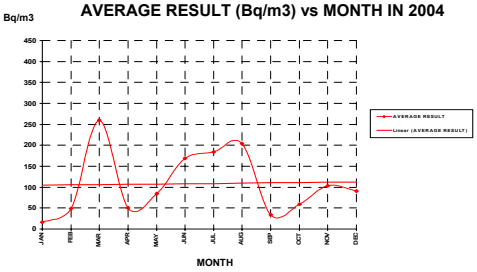
PASSIVE AIR NUMBER 2
AVERAGE RESULT (Bq/m3) vs MONTH IN 2004



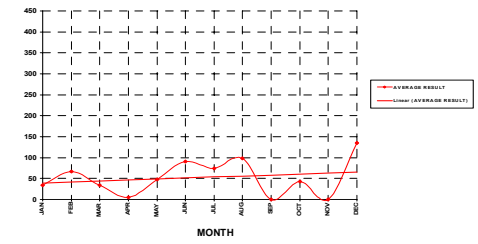
PASSIVE AIR NUMBER 3
AVERAGE RESULT (Bq/m3) vs MONTH IN 2004



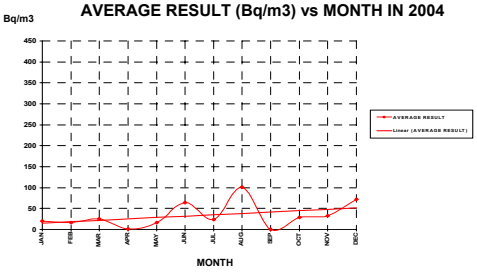
PASSIVE AIR NUMBER 4
AVERAGE RESULT (Bq/m3) vs MONTH IN 2004



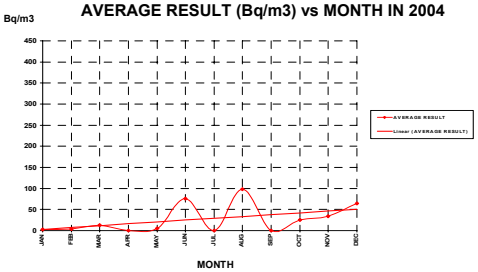
PASSIVE AIR NUMBER 5
AVERAGE RESULT (Bq/m3) vs MONTH IN 2004



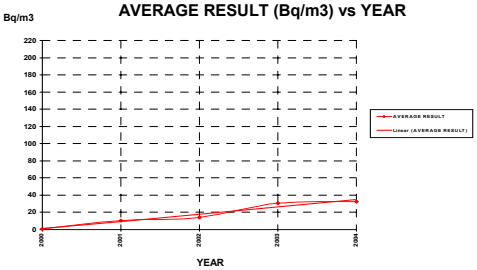
PASSIVE AIR NUMBER 6
AVERAGE RESULT (Bq/m3) vs MONTH IN 2004

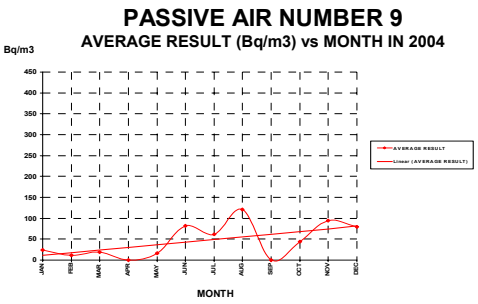


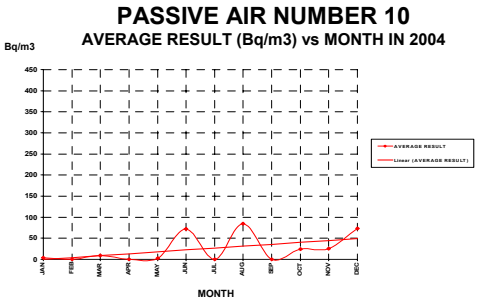
PASSIVE AIR NUMBER 7
AVERAGE RESULT (Bq/m3) vs MONTH IN 2004

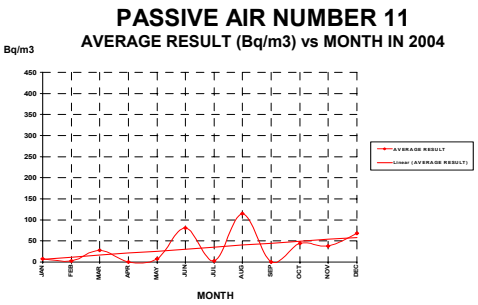


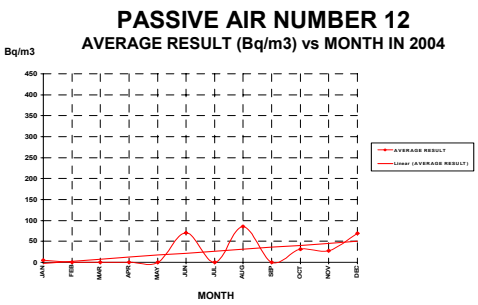
PASSIVE AIR NUMBER 8
AVERAGE RESULT (Bq/m3) vs YEAR

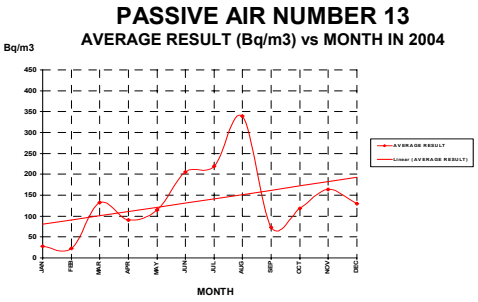








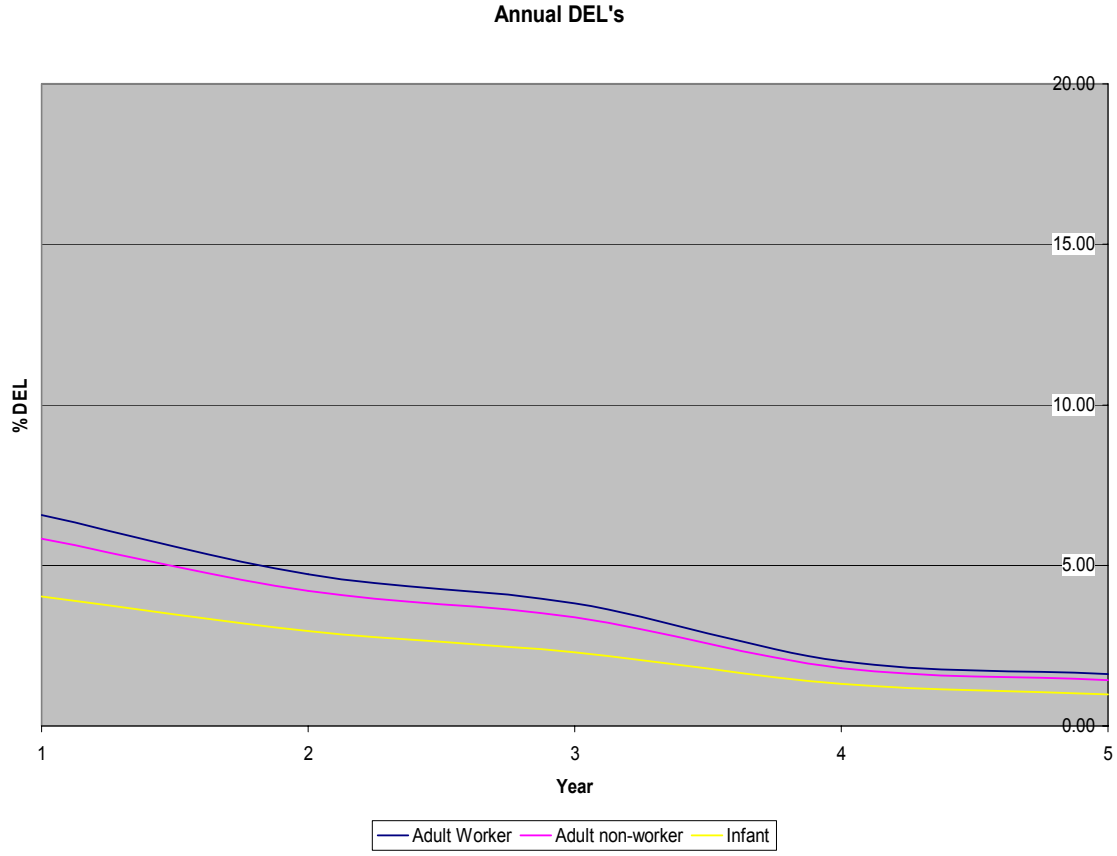




The above graphs show the average HTO concentrations at each of the passive air sampler points as described in the SRBT EMP during each month during 2004. The graphs also indicate the trending by way of a trend line on each graph.

Appendix H: Stack Monitoring Data 2000 to 2004

Stack Sampling						
YEAR	HTO	HT	Total	%DEL		
	(GBq)	(GBq)	(GBq)	Adult Worker	Adult non-worker	Infant
2000	**26732.0**	**319223.0**	345955.0	6.56	5.83	4.03
2001	**19124.0**	**247597.0**	266721.0	4.72	4.20	2.95
2002	**15655.0**	**166838.0**	182493.0	3.81	3.38	2.28
2003	**8082.3**	**121884.2**	129966.4	2.02	1.80	1.31
2004	**6580.7**	**76404.9**	82985.6	1.61	1.43	0.98
Ave.	**20503.7**	**244552.7**	**Ave. % DRL**	**3.74**	**3.33**	**2.31**



Note: In the above chart the years are designated as 1 for 2000, 2 for 2001, 3 for 2002, 4 for 2003, and 5 for 2004.

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