

**December 2010 Indoor Air Quality
Sampling and Analysis Report
Tronox LLC
Henderson, Nevada**

February 3, 2011

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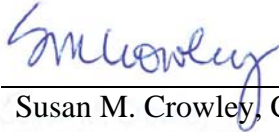


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Tronox LLC
Henderson, Nevada**

Responsible Certified Environmental Manager (CEM) for this project

I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and, to the best of my knowledge, comply with all applicable federal, state and local statutes, regulations and ordinances.



Susan M. Crowley, CEM 1428 Exp.:03/08/11
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TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	SAMPLING AND ANALYSIS METHODS.....	3
2.1	Sample Locations.....	3
2.1.1	<i>Unit Building 3.....</i>	3
2.1.2	<i>Administration Building.....</i>	4
2.1.3	<i>Wash/Change House.....</i>	4
2.1.4	<i>Boron Production Facility.....</i>	4
2.1.5	<i>Laboratory.....</i>	4
2.1.6	<i>Field Office.....</i>	4
2.1.7	<i>Steam Plant.....</i>	4
2.1.8	<i>West of Unit Building 1 at Gate 2.....</i>	5
2.1.9	<i>West of the Laboratory.....</i>	5
2.2	Sampling and Analysis Methods.....	5
2.3	Meteorological Data.....	6
3.0	SAMPLING AND ANALYSIS RESULTS.....	7
3.1	Air Sample Test Results.....	7
3.1.1	<i>Unit Building 3.....</i>	7
3.1.2	<i>Administration Building.....</i>	8
3.1.3	<i>Wash/Change House.....</i>	8
3.1.4	<i>Boron Production Facility.....</i>	8
3.1.5	<i>Laboratory.....</i>	9
3.1.6	<i>Field Office Trailer.....</i>	9
3.1.7	<i>Steam Plant.....</i>	9
3.1.8	<i>West of Unit Building 1 at Gate 2.....</i>	9
3.1.9	<i>West of the Laboratory.....</i>	9
3.2	Data Validation.....	10
4.0	DISCUSSION AND CONCLUSION.....	11
4.1	Discussion.....	11
4.2	Conclusions.....	12
5.0	REFERENCES.....	14



FIGURE

- 1 Site Map Showing Air Sampling Locations

TABLES

- 1 Summary of Air Sampling Field Measurements
- 2 Summary of Air Sampling Analytical Results
- 3 Summary of April and December 2010 Air Sampling Analytical Results
- 4 Summary and Comparison of Site Data

APPENDIX

- A Laboratory Report (included on CD)



1.0 INTRODUCTION

This report presents the results of a second round of indoor air testing performed by Northgate Environmental Management, Inc. (Northgate) on December 6 and 7, 2010 at the Tronox LLC (Tronox) facility located in Henderson, Nevada (the Site). Initial sampling was conducted in spring 2010 and presented in the *Spring 2010 Indoor Air Quality Sampling and Analysis Report, Henderson, Nevada (Northgate, 2010d)* and the *Errata to the Spring 2010 Indoor Air Quality Sampling and Analysis Report, Henderson, Nevada (Northgate, 2010e)*. The objective of the second round of IAQ sampling was to understand the different seasonal meteorological conditions and potential differences in the building operations and activities, and to collect additional data to supplement the indoor air modeling efforts and the uncertainty evaluation presented in the *Site-wide Soil Gas Human Health Risk Assessment*, dated November 22, 2010 (HRA; Northgate, 2010f).

The report describes the methods and procedures used to implement the second round of testing as outlined in the *Revised Indoor Air Quality Investigation Work Plan, Tronox LLC Facility, Henderson, Nevada* (Work Plan; Northgate, 2010a,b) approved by the Nevada Division of Environmental Protection (NDEP) on June 18, 2010 (NDEP, 2010b).

Background

In May 2008, a soil gas survey was conducted under the oversight of NDEP as part of the Phase B Source Area Investigation at the Site. Analytical results for samples collected during the soil gas survey were presented in a Data Validation Summary Report (DVSR) that was submitted to NDEP on October 13, 2008 (ENSR, 2008) and approved by NDEP on October 20, 2008. In general, chloroform, trichloroethene (TCE), and carbon tetrachloride were detected at elevated concentrations in soil gas samples obtained at the Site; however, the results of previous investigations indicated that some of these elevated volatile organic compound (VOC) concentrations in soil gas may be associated with off-site groundwater sources.

As an initial step of the Indoor Air Quality (IAQ) investigation, a building evaluation was conducted on May 5 and 6, 2010 to collect information on the location of buildings, type of building construction, foundation, building ventilation (e.g., heating, ventilation, and air conditioning [HVAC]; open building; etc.), and building occupancy use (including possible use of products containing VOCs by building occupants). The June 3, 2010 technical memorandum *Proposed Indoor Air Sampling Locations, Tronox Facility, Henderson, Nevada, Supplement to Indoor Air Quality Investigation Work Plan, Henderson, Nevada* (Northgate, 2010b) presented



the results of the building evaluation. The memorandum recommended that the IAQ investigation include the Unit Building 3, the Administration Building, the wash/change house (wash house), the boron production facility, the maintenance shop, the laboratory, the field office, and the steam plant; however, sampling at the maintenance shop became unfeasible following a fire that rendered the building uninhabitable.

This report includes a description of the methods used to collect and analyze samples during the December 6 and 7, 2010 sampling event, a summary of field measurements recorded during the event, and tabulated analytical results. As presented in the approved Work Plan, the target analytes consisted of chloroform, TCE, and carbon tetrachloride. Tronox will continue discussions with NDEP regarding the potential applicability of indoor air sampling results in the HRA.



2.0 SAMPLING AND ANALYSIS METHODS

On December 6 and 7, 2010, Tronox performed air sampling in accordance with the approved Work Plan (Northgate, 2010a,b) and corresponding technical memoranda, and collected a total of 27 air samples, including 17 indoor samples, five outdoor samples near the vicinity of building air intakes, and five ambient air samples. Air inlet samples were located as close as possible to air intake locations. Rooftop air inlet samples were not obtained due to access and safety limitations. On the day of sampling, a certified industrial hygienist inspected the buildings to ensure consistency with the information gathered during the initial building evaluation. The following sections describe the sampling locations and activities.

2.1 Sample Locations

Tronox collected a total of 27 air samples at locations shown on Figure 1 and summarized below:

- Unit Building 3 (eight indoor and two proximate air intake samples);
- Administration Building (two indoor and one outdoor ambient air sample);
- Wash/change house (one indoor and one proximate air intake sample);
- Boron production facility (two indoor and one outdoor ambient air sample);
- Laboratory (two indoor and one proximate air intake sample);
- Field office (one indoor and one proximate air intake sample);
- Steam plant (one indoor sample);
- West of the laboratory (one outdoor upwind ambient air sample); and
- West of the Unit Building 1 at Gate 2 (two outdoor ambient air samples).

The following sections describe the number and type of samples collected at each location.

2.1.1 Unit Building 3

A total of seven indoor air samples were collected inside four offices and one break room at the engineering office in the Unit Building 3 basement, including three duplicate samples located in one of the offices. An additional indoor air sample was collected on the unit floor (open area) of the building. Two outdoor air samples were collected near the air intake on the south side of the Unit Building 3 engineering office. The locations were the same as those sampled during the spring 2010 sampling program and no changes in chemical use or occupancy were observed.



2.1.2 Administration Building

Two indoor air samples were collected each inside an office room at the Administration Building. One outdoor air sample was collected on the south side of the Administration Building in the general vicinity of the air conditioning unit area. The inside office location was the same as that sampled during the spring 2010 sampling program. Additionally, a second inside office was sampled.

2.1.3 Wash/Change House

One indoor air sample was collected in the men's shower room at the wash house, and one outdoor air sample was collected on the west side of the building near the air intake of the men's portion of the wash house at the same locations as those sampled during the spring 2010 sampling program.

2.1.4 Boron Production Facility

Two indoor air samples were collected inside the Boron Production Facility, including one sample in a control room and a second sample in the supervisor's office. One outdoor air sample was collected on the north side of the building near the air conditioning unit area. The inside facility locations were the same as those sampled during the spring 2010 sampling program.

2.1.5 Laboratory

Two indoor air samples were collected inside the laboratory, one sample in each of the two chemists' offices. One outdoor air sample was collected near the air intake on the north side of the laboratory building. All locations were the same as those sampled during the spring 2010 program.

2.1.6 Field Office

One indoor air sample was collected inside the field office trailer, and one outdoor air sample was collected near the air intake on the west side of the trailer at the same locations as those sampled during the spring 2010 sampling program.

2.1.7 Steam Plant

One indoor air sample was collected inside a control room at the steam plant at the same location that was sampled during the spring 2010 sampling program.



2.1.8 West of Unit Building 1 at Gate 2

Two ambient outdoor air samples were collected approximately 50 feet west of Unit Building 1 at Gate 2. This location was not sampled during the spring 2010 event, but was considered an appropriate upwind location for this round of sampling.

2.1.9 West of the Laboratory

One upwind outdoor air sample was collected at a location approximately 50 feet west of the laboratory at the same location that was sampled during the spring 2010 sampling program.

2.2 Sampling and Analysis Methods

Air samples were collected using passivated steel 6-liter Summa canisters for selected ion monitoring (SIM) analysis by Environmental Analysis Service, Inc. (EAS), an Environmental Laboratory Approval Program certified laboratory. All sampling media (both flow controllers and canisters) were provided and certified by the laboratory. Sampling was conducted between 7 a.m. and 7 p.m. (normal Site working hours), with indoor air samples collected over an approximate 8-hour work day.

The samples were collected using a sampling train of components that regulate the rate and duration of sampling into the Summa canisters. For indoor air sampling, the flow controllers were set to collect approximately 5 liters of air over an 8-hour sampling interval. For outdoor air sampling, the flow controllers were preset by the laboratory to collect approximately 5 liters of air over an approximate 9- to 10-hour sampling interval. Outdoor sampling began approximately 1 to 2 hours prior to indoor air sampling and continued to be collected until approximately 30 minutes prior to the end of the corresponding indoor air sampling period. All indoor air samples were collected at a height approximately 3 to 5 feet above the floor to represent a height at which occupants are normally seated. Outdoor samples were generally obtained near the vicinity of air intakes and were collected at heights ranging from 2 to 6 feet.

Table 1 summarizes the sampling field records, including sampling start and end times, temperature readings, initial and final canister pressure measurements, and calculated sample duration.

Between December 7 and 9, 2010, the air samples were transferred under proper chain-of-custody protocol to the EAS laboratory. EAS analyzed the 27 air samples between December 14 and 16, 2010 for concentrations of the target analytes (chloroform, carbon tetrachloride, and TCE) using the



U.S. Environmental Protection Agency (USEPA) Method TO-15 gas chromatograph/mass spectrometry (GC/MS) SIM. A detailed description of TO-15 GC/MS SIM is included in the laboratory report in Appendix A.

2.3 Meteorological Data

Localized meteorological data for the sample dates were obtained from a mobile weather station (Vantage Pro[™]), which is located at the field office trailer. Figure 1 shows the location of the field office trailer in the northern portion of the Site.

Over the 2-day, 10-hour daily sample period between December 6 and 7, 2010:

- Temperatures ranged from a low of 48.1° Fahrenheit (°F), in the early morning of December 6 to a high of 63.8°F in the afternoon of the first monitoring day. Temperatures ranged from a low of 42.3° Fahrenheit (°F), in the early morning of December 7 to a high of 66.7°F in the afternoon of December 7 at the end of the sampling event;
- No precipitation was reported during the sampling event;
- The observed barometric pressure ranged between a high of 30.36 inches of mercury (in. Hg) in the morning and a low of 30.16 in. Hg in the early afternoon of the first monitoring day. The observed barometric pressure ranged between a high of 30.36 inches of mercury (in. Hg) in the early morning and a low of 30.24 in. Hg, in the afternoon of the second monitoring day; and
- The wind was predominately blowing from the west-northwest on December 6 and from the north-northwest on December 7 at an average speed of approximately 2.5 miles per hour on both days.



3.0 SAMPLING AND ANALYSIS RESULTS

3.1 Air Sample Test Results

This section presents a brief description of the indoor, outdoor, and ambient air results for each sampling location (e.g., building, facility, or outdoor area). A summary of the December 2010 chemical analytical results for all samples is presented in Table 2, and laboratory analytical reports are presented in Appendix A. Table 3 provides a summary of both the April and December 2010 results for the target analytes. The tables include J qualifiers for results reported between the Method Detection Limit (MDL) and the RL. All J qualified data were considered usable and were included in evaluation of average sample results. The following provides a discussion of target analytes detected during the December 2010 sampling program.

3.1.1 Unit Building 3

Eight indoor air samples were collected and analyzed for the target analytes: seven samples (including three duplicates) were collected from office spaces, and one was collected from the Unit Building floor area. Chloroform concentrations in the office space samples ranged from 1.427 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to 4.935 $\mu\text{g}/\text{m}^3$ with an average concentration of 2.93 $\mu\text{g}/\text{m}^3$, compared to the average concentration of 1.44 $\mu\text{g}/\text{m}^3$ for the spring 2010 samples. Carbon tetrachloride was detected between 0.218 $\mu\text{g}/\text{m}^3$ and 0.737 $\mu\text{g}/\text{m}^3$ in the indoor samples with an average concentration of 0.53 $\mu\text{g}/\text{m}^3$ which is similar to the average concentration of 0.61 $\mu\text{g}/\text{m}^3$ for the spring 2010 indoor air samples. TCE concentrations in the office space ranged from 0.162 $\mu\text{g}/\text{m}^3$ to 1.034 $\mu\text{g}/\text{m}^3$ with an average concentration of 0.65 $\mu\text{g}/\text{m}^3$ which is much lower than the average concentration of 10.73 $\mu\text{g}/\text{m}^3$ for the spring indoor air samples.

Target analytes were below the RL in the floor area sample, except for carbon tetrachloride, which was present at a concentration of 0.778 $\mu\text{g}/\text{m}^3$.

Two outdoor building air intake samples were also collected and analyzed for the target analytes, with chloroform detected in one sample at 0.392 $\mu\text{g}/\text{m}^3$, carbon tetrachloride detected in one sample at 0.613 $\mu\text{g}/\text{m}^3$ and TCE detected in one sample at 0.276 $\mu\text{g}/\text{m}^3$. The reported outdoor concentrations of all target analytes were similar to the outdoor concentrations reported during the spring testing program.



3.1.2 Administration Building

Two indoor air samples, each collected from one of two adjacent offices within the administration building were analyzed for the target analytes. Chloroform concentrations ranged from 0.993 $\mu\text{g}/\text{m}^3$ to 1.003 $\mu\text{g}/\text{m}^3$, carbon tetrachloride ranged from 0.764 $\mu\text{g}/\text{m}^3$ to 1.102 $\mu\text{g}/\text{m}^3$ and TCE concentrations ranged from 0.122 to 0.158 $\mu\text{g}/\text{m}^3$. Indoor concentrations were consistent with levels reported during the spring 2010 event for carbon tetrachloride, with measured indoor air concentrations of chloroform somewhat higher than those measured in the spring sampling event and TCE concentrations lower than those reported in the spring sampling event. Constituents were below their corresponding RLs in the one building outdoor sample collected, except for carbon tetrachloride, which was present at a concentration of 0.648 $\mu\text{g}/\text{m}^3$. TCE was also below its MDL in the outdoor sample.

3.1.3 Wash/Change House

For the indoor building sample, chloroform was present at a concentration of 13.028 $\mu\text{g}/\text{m}^3$ compared to the concentration of 3.417 $\mu\text{g}/\text{m}^3$ reported for the spring sampling event. Carbon tetrachloride and TCE were detected below their respective RL at 0.233 $\mu\text{g}/\text{m}^3$ and 0.145 $\mu\text{g}/\text{m}^3$, respectively and at concentrations somewhat lower than those reported in the spring event. While TCE was not detected above its MDL, chloroform and carbon tetrachloride were detected in the one building air intake sample collected at concentrations of 0.39 $\mu\text{g}/\text{m}^3$ and 0.698 $\mu\text{g}/\text{m}^3$, respectively. The reported building intake concentrations of all target analytes were similar to the outdoor concentrations reported during the spring testing program.

3.1.4 Boron Production Facility

The indoor air sample from the control room contained no target analytes above their corresponding RLs except for chloroform, which was present at a concentration of 0.662 $\mu\text{g}/\text{m}^3$. The sample from the supervisor's office contained chloroform and carbon tetrachloride concentrations at 1.073 $\mu\text{g}/\text{m}^3$ and 0.72 $\mu\text{g}/\text{m}^3$, respectively, while TCE was not detected above its RL. Constituents were below their corresponding RLs in the one building outdoor sample collected, except for carbon tetrachloride, which was present at a concentration of 0.801 $\mu\text{g}/\text{m}^3$. TCE was also not detected above its MDL in any of the boron facility indoor and outdoor samples.

The reported indoor and outdoor concentrations of all target analytes were similar to those reported during the spring testing program.



3.1.5 Laboratory

Two indoor air samples, each collected from one of two adjacent offices within the laboratory were collected and analyzed for the target analytes. While TCE was below its RL in both samples, chloroform concentrations ranged from 4.294 to 4.639 $\mu\text{g}/\text{m}^3$, and carbon tetrachloride concentrations ranged from 2.551 to 2.8481 $\mu\text{g}/\text{m}^3$. Except for chloroform, which was present at a concentration of 0.742 $\mu\text{g}/\text{m}^3$, no other constituent was detected above the RLs in the outdoor building air intake sample. TCE was also not detected above its MDL in one of the two indoor samples and in the building outdoor sample.

3.1.6 Field Office Trailer

In the one indoor sample collected, chloroform, carbon tetrachloride and TCE were detected at concentrations of 0.628 $\mu\text{g}/\text{m}^3$, 0.799 $\mu\text{g}/\text{m}^3$ and 0.637 $\mu\text{g}/\text{m}^3$, respectively. The indoor chloroform and carbon tetrachloride concentrations were lower than those reported in the spring 2010 sampling event. In the one outdoor building air sample collected, chloroform and carbon tetrachloride were detected at concentrations of 0.509 $\mu\text{g}/\text{m}^3$ and 0.702 $\mu\text{g}/\text{m}^3$, respectively, while TCE was below its MDL. Ambient concentrations were fairly consistent with those reported in the spring 2010 event.

3.1.7 Steam Plant

Chloroform and carbon tetrachloride were detected at a concentration of 0.604 $\mu\text{g}/\text{m}^3$ and 0.838 $\mu\text{g}/\text{m}^3$, respectively, in the one indoor air sample collected, while TCE was below its MDL. The chloroform concentration of 0.604 $\mu\text{g}/\text{m}^3$ was slightly higher than the chloroform concentration of 0.367 $\mu\text{g}/\text{m}^3$ reported during the spring 2010 sampling event.

3.1.8 West of Unit Building 1 at Gate 2

In the two outdoor air samples collected, chloroform and carbon tetrachloride were detected at concentration ranges of 0.426 $\mu\text{g}/\text{m}^3$ to 0.434 $\mu\text{g}/\text{m}^3$ and 0.719 $\mu\text{g}/\text{m}^3$ to 0.786 $\mu\text{g}/\text{m}^3$, respectively, while TCE was detected in only one sample at 0.63 $\mu\text{g}/\text{m}^3$. This location was not sampled during the spring 2010 sampling event.

3.1.9 West of the Laboratory

One outdoor air sample was collected and analyzed for the target analytes, with chloroform and carbon tetrachloride detected at concentrations of 3.453 $\mu\text{g}/\text{m}^3$ and 1.046 $\mu\text{g}/\text{m}^3$, respectively.



TCE was not detected above its MDL in the outdoor sample. The ambient chloroform of 3.453 was higher than the concentration of 0.43 $\mu\text{g}/\text{m}^3$ reported during the spring 2010 event.

3.2 Data Validation

The resulting data from the field and laboratory were examined for conformity to standard quality assurance indicators. The detailed laboratory quality assurance report is included in Appendix A along with the laboratory reports. The findings were:

- It is noted that no end time was recorded for the outdoor sample collected at the air intake at the wash house. Oversampling beyond 8-hour duration occurred resulting in a remaining pressure beyond 5 mm Hg. Review of the constituents results indicates that the chloroform, carbon tetrachloride and TCE concentration (0.39 $\mu\text{g}/\text{m}^3$, 0.698 $\mu\text{g}/\text{m}^3$, and less than 0.362 $\mu\text{g}/\text{m}^3$, respectively) are likely a valid result as constituent concentrations in a similar range were reported in nearby outdoor samples;
- The laboratory spike recovery values of 100% (chloroform and carbon tetrachloride) and 101% (TCE), and duplicate laboratory spike recoveries of 99% (chloroform) and 98% (TCE and carbon tetrachloride), were within the laboratory quality control (QC) limits of 70 to 130%;
- While there were insignificant differences in the chloroform results for the duplicate sample result for the pair IA-U3-02-001 and IA-U3-02-002 (Unit Building 3), the carbon tetrachloride and TCE duplicate samples showed concentrations to differ by a factor of approximately 3;
- As in the spring 2010 sampling event, the highest chloroform result for an indoor air sample was collected at the Wash House shower room indicating that domestic water sources treated with chlorine likely contribute to indoor air concentrations. It was noted during the December 2010 sampling event that the shower was used, as the area was wet; and
- The detection limits for several of the indoor and outdoor air samples were elevated due to sample size limitations. However, none of the detection limits was elevated more than 2.7 times.



4.0 DISCUSSION AND CONCLUSION

4.1 Discussion

The objective of the December 2010 IAQ sampling event was to understand the different seasonal meteorological conditions and potential differences in the building operations and activities, and to collect data in addition to the spring 2010 data to supplement the indoor air modeling efforts and the uncertainty evaluation conducted as part of the Site-wide soil gas HRA.

Statistical interpretation of both the spring and December indoor air sampling results is limited based on the small data set. Table 4 provides a summary of spring and December 2010 measured ranges of the target analytes, their current average indoor and outdoor concentrations, and a general comparison to occupational exposure levels, NDEP ambient air basic comparison levels (BCLs) modified to reflect commercial worker exposure assumptions, and EPA-reported indoor commercial and ambient concentrations.

As shown in Table 4, for both the spring and December 2010 sampling programs, the range and mean indoor concentrations of target analytes are significantly below their respective occupational exposure levels. Additionally, the mean indoor air concentrations of the target analytes are below their respective risk-based commercial air concentrations for a 1×10^{-5} risk level.

For the December 2010 sampling event, the mean and range of indoor versus outdoor concentrations of carbon tetrachloride and TCE were fairly similar, with the highest measured indoor air concentrations detected in the laboratory and the administration building, respectively. For chloroform, the mean and range of indoor air concentrations were higher than the outdoor air concentrations. As with the spring 2010 sampling event, the highest chloroform concentrations were detected inside the wash house, indicating that domestic water sources treated with chlorine likely contribute to the indoor air concentrations.

When comparing the results for the two sampling events, the mean spring 2010 and December 2010 indoor concentrations of carbon tetrachloride were essentially similar ($0.854 \mu\text{g}/\text{m}^3$ versus $0.873 \mu\text{g}/\text{m}^3$). For chloroform, indoor air concentrations were generally higher during the December 2010 event, particularly in the wash house, which resulted in an the average concentration of $2.81 \mu\text{g}/\text{m}^3$ as compared to the average concentration of $1.35 \mu\text{g}/\text{m}^3$ measured during the spring 2010 sampling event. The TCE concentrations in indoor samples collected during the December 2010 event resulted in a lower overall average indoor TCE concentration of $0.440 \mu\text{g}/\text{m}^3$ compared to the spring 2010 average concentration of $4.60 \mu\text{g}/\text{m}^3$, primarily based



on the Unit 3 building measurements. Indoor air TCE concentrations in Unit 3 building were significantly lower in December 2010, with potential differences in the building operations and chemical use activities likely contributing to the varying indoor TCE levels. As a similar large concentration difference between the spring and December 2010 sampling events was not observed for chloroform or carbon tetrachloride in the Unit 3 building, it is unlikely that building ventilation and pressure changes alone could have contributed to the reduced TCE air concentrations. Rather, it is likely that some TCE source was present during the initial spring 2010 sampling program that was not present in December 2010. Furthermore, as discussed in the Site-Wide Soil Gas Risk Assessment (Northgate 2010f), high soil gas and groundwater TCE concentrations are not present beneath the Unit 3 building, again suggesting some other source for the higher spring 2010 TCE air results.

With regard to the ambient outdoor sample results, the mean and range of carbon tetrachloride and TCE concentrations were similar for both the December 2010 and spring 2010 sampling events. The mean and range of outdoor concentrations of chloroform were higher during the December than the Spring 2010 event (mean $0.710 \mu\text{g}/\text{m}^3$ and $0.321 \mu\text{g}/\text{m}^3$ respectively), due the contribution of an upwind ambient sample west of the Laboratory building, resulting in the greatest variability of outdoor measurements of all the analytes. With the exception of chloroform, the range of the spring 2010 and December 2010 constituent concentrations was fairly similar, indicating that different seasonal meteorological conditions did not significantly impact outdoor monitoring results.

4.2 Conclusions

In total, thirty two indoor and eighteen outdoor air samples were collected at several locations throughout the Tronox facility in spring and December 2010 and analyzed for chloroform, carbon tetrachloride, and TCE. Chloroform was detected in all but one indoor air sample and all outdoor air samples. Carbon tetrachloride was detected in all but one indoor and one outdoor sample; while TCE was detected the least frequently in outdoor and indoor air samples.

The range and mean indoor concentrations of target analytes are significantly below their respective occupational exposure levels, with the mean indoor air concentrations of the target analytes also below their respective risk-based commercial air concentrations for a 1×10^{-5} risk level. The mean spring and December 2010 carbon tetrachloride and December 2010 TCE air concentrations are also below the EPA reported mean concentrations for indoor buildings. The higher spring 2010 TCE concentrations in the Unit 3 Building 3 were not confirmed during the December 2010 sampling event.



In general, the indoor chloroform concentrations are higher than ambient levels; however, based on the Site-Wide Soil Gas Risk Assessment (Northgate 2010f), the modeled soil gas and groundwater chloroform concentrations do not entirely explain the measured indoor air concentrations, as the measured chloroform results are generally higher than the modeled values. Nevertheless, the measured chloroform concentrations are low (below occupational levels and below the 1×10^{-5} risk level).

Further evaluation of the relationship between subsurface soil gas and groundwater chloroform concentrations and indoor air concentrations will always have some uncertainty because multiple factors influence the concentrations of chemicals measured in indoor air, including building-specific operations and ventilation systems, environmental factors such as ambient building sources, and incidental chemical usage. Further indoor air sampling may be prudent if occupancy or building conditions change in the future and/or to assure current workers that chloroform concentrations remain below occupational and commercial risk based levels.



5.0 REFERENCES

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- Northgate, 2010e. Errata to the *Spring 2010 Indoor Air Quality Sampling and Analysis Report, Henderson, Nevada*, dated November 10, 2010
- Northgate, 2010f. *Site-Wide Soil Gas Human Health Risk Assessment, Henderson, Nevada*, dated November 22, 2010.



TABLES



FIGURE



**APPENDIX A
LABORATORY REPORT**

(Included on CD)

