TRAVELERS

INDUSTRIAL HYGIENE REPORT

PREPARED EXCLUSIVELY FOR

HI-LITE MARKINGS, INC.
Brownsville/South Padre Island International Airport
Brownsville, TX 78526

January 22, 2007

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SURVEY DATE: December 5, 2006

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APPENDICES

Job Number: 0086-038563
Business Unit: CONS
Location Code: 42-061-00360
SAI number: 2523F1013

EXECUTIVE SUMMARY

An industrial hygiene survey was conducted on December 5, 2006 at the request of Audrey Sargent – Director of Human Resources/Safety for Hi-Lite Markings, Inc. at Brownsville/South Padre Island International Airport job site in Brownsville, Texas. The purpose of this survey was to evaluate employees' exposures to asphalt fumes/coal tar pitch volatiles while applying RejuvaSeal™ to a runway and a polymer-based sealer to apron areas.

The results of the air monitoring indicate that the airborne exposures were below current applicable hygienic standards. These standards include the Permissible Exposure Limits (PELs) established by the Occupational Safety and Health Administration (OSHA), and the Threshold Limit Values (TLVs) established by the American Conference of Governmental Industrial Hygienists (ACGIH). Because these standards were not exceeded, it may be concluded that these exposures were adequately controlled on this airport project.

A complete discussion of the survey and findings can be found in the attached report. No new recommendations are being submitted based on my observations and the air monitoring results obtained during this survey.

PURPOSE

An industrial hygiene survey was conducted on December 5, 2006 at the request of Audrey Sargent – Director of Human Resources/Safety for Hi-Lite Markings, Inc. at Brownsville/South Padre Island International Airport job site in Brownsville, Texas. The purpose of this survey was to evaluate employees' exposures to asphalt fumes/coal tar pitch volatiles while applying RejuvaSeal™ to a runway and a polymer-based sealer to runway apron areas.

CONTACTS

Audrey Sargent – Director of Human Resources/Safety (via telephone)
Kevin Parker – Project Manager
John Hildebrandt – *RejuvaSeal*™ Crew Supervisor
William Vandemark – Technical Service Manager with Pavement Rejuvenation International, LP

DESCRIPTION OF OPERATIONS

At the Brownsville/South Padre Island International Airport job site, one crew was applying RejuvaSeal™ to a runway and another crew was applying a polymer-based sealer to various runway apron areas. On the day of sampling, there were three employees on each of these crews. There was a driver, an applicator, and a supervisor on each crew. The driver and applicator were also responsible for mixing the sealers prior to application.

To mix the sealers for application, bulk product was pumped from the storage tanker into the tank on the applicator truck. Water was then pumped and mixed with the sealer product. Employees climbed atop the tank on the applicator truck and manually dumped the required additives into the top manhole. Additives may include emulsifiers and sand/coal slag (*Black Beauty*). The ingredients are then heated and blended. During the mixing process, employees wear gloves, hard hats, face shield, and steel-toed shoes.

For application, one employee drives the applicator truck and another employee operates the applicator controls. The sealer is sprayed onto the surface by a series of computer-controlled application nozzles positioned at the rear of the truck. Both of these employees are seated in the truck cab during the sealer application process. The crew supervisor follows the applicator truck in another vehicle to oversee and inspect the sealer application process to ensure that it meets specifications.

For a short time period during sampling, about twenty minutes, one employee on the RejuvaSeal™ crew operated the Desco applicator to touch-up the end of the runway. This is a small open air applicator where the operator sits in the vicinity of the spray applicator nozzles. Since the operator is located in the vicinity of the applicator nozzles, the potential for inhalation exposures to asphalt fumes/coal tar pitch volatiles are greater.

The temperature during the sampling period ranged from 51 °F to 77 °F with humidity ranging from 77% to 59% with an east-south-easterly wind at 7 to 17 mph. On the day of sampling, the crews worked approximately ten-hours.

SURVEY SCOPE

Air Monitoring

Exposure monitoring was conducted using standard industrial hygiene methods. The driver, applicator, and supervisor of the *RejuvaSeal*™ crew were sampled to evaluate their exposures to asphalt fumes/coal tar pitch volatiles. These were the main employees responsible for loading the applicator truck and applying the sealer product. Also, two of the crew members applying the polymer-based sealer product to the runway apron areas were sampled to evaluate their exposures to asphalt fumes/coal tar pitch volatiles. According to the available material safety data sheets (MSDSs) provided at the job site, both of these sealer products contain coal tar pitch volatiles.

Details regarding monitoring equipment and locations are provided in Appendix B, Sampling Methods and Interpretation of Results and on the Industrial Hygiene Survey Data sheets contained in Appendix E. A summary of the monitoring results is found in Appendix C, Data Summary.

RESULTS AND CONCLUSIONS

The following conclusions are based upon my observations and data collected during this survey:

- During application of the *RejuvaSeal*™, employees' exposures to coal tar pitch volatiles as benzene-soluble particulates were below applicable OSHA PELs and ACGIH TLVs.
- During application of the polymer-based sealer to runway apron areas, employees' exposures to coal tar pitch volatiles as benzene-soluble particulates were below applicable OSHA PELs and ACGIH TLVs.
- In both cases, employees' measured exposures were also below the ACGIH TLV adjusted for an extended ten-hour work shift.
- Because these standards were not exceeded, it may be concluded that these exposures were adequately controlled at this airport project.
- Since the results for coal tar pitch volatiles as benzene-soluble particulates were less than 50% of the applicable hygienic standard for all samples taken, the samples were not specifically analyzed for the presence of polynuclear aromatic hydrocarbons (PAHs). According to the *ACGIH Documentation of TLVs*, if the benzene-extractable material from the sample contains detectable quantities of PAHs, the TLV is 0.2 mg/m^3. If no PAHs are detected, then the airborne contaminant is evaluated in terms of the TLV for asphalt fumes which is 5 mg/m^3.
- These sampling results may not be representative of employees' inhalation exposures on other job sites especially when using the Desco applicator which does not have an enclosed cab. At this job site, the sealer and rejuvenator products were applied while both the driver and applicator were inside of an enclosed truck cab.

Limitations associated with the air monitoring should be noted. The results are considered representative of employee exposures under the conditions existing on the survey date. Exposures can be affected by changing conditions in the workplace. Such conditions might include changes in operational procedures, production levels, worker mobility, work practices, atmospheric conditions or other similar circumstances.

Report by:

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Job Number: 0086-038563
Business Unit: CONS
Location Code: 42-061-00360
SAI number: 2523F1013

Contact: Joseph E. David, III
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RECOMMENDATIONS

No recommendations are being submitted as a result of this industrial hygiene survey.

SAMPLING METHODS AND INTERPRETATION OF RESULTS

Air Monitoring

Air monitoring was conducted using active sampling techniques and following standard industrial hygiene methods. Active sampling uses a battery powered pump attached by a hose to collection media specific for the chemical being monitored.

Sampling media was placed in the employees breathing zone for the duration of their exposure (unless otherwise noted). The sampling pumps were calibrated prior to and immediately after the survey using a primary calibration device. Details regarding the monitoring equipment and its use are provided on the Industrial Hygiene Survey Data sheets contained in Appendix E. The samples were submitted to the St. Paul Travelers AIHA-accredited industrial hygiene laboratory for subsequent analysis. Appendix F contains the laboratory analytical results.

Evaluation Criteria for Air Contaminants

Air monitoring results may be compared to various standards that have been developed for occupational exposure to air contaminants. The most widely accepted standards in the United States are the Permissible Exposure Limits (PELs) established by the Occupational Safety and Health Administration (OSHA), the Threshold Limit Values (TLVs) established by the American Conference of Governmental Industrial Hygienists (ACGIH) and the National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs). The OSHA PELs are mandatory standards that all employers are required to comply under penalty of law. The ACGIH TLVs and the NIOSH RELs are advisory standards, although OSHA may enforce them for air contaminants that do not have an established PEL.

According to the ACGIH, the TLVs refer to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effects. Due to individual sensitivities, some workers may experience adverse health effects or discomfort from airborne substances present at or below the TLV. They are not fine lines between safe and dangerous concentrations. However, the TLVs represent the current opinion of professional industrial hygienists. It is generally considered prudent industrial hygiene practice to compare air sample results to the most protective standard published for each air contaminant. Ideally, exposures should not exceed 50% of the referenced hygienic standard. This approach allows for daily fluctuations in airborne contaminant levels and provides a margin of safety to ensure compliance under changing conditions.

The standards described above typically reflect either 8-hour "Time-Weighted Average" (TWA) exposures, 15 minute Short Term Exposure Limits (STELs), or "Ceiling" concentrations (that should not be exceeded at any time). Unless otherwise noted, exposure concentrations provided in this report represent actual "time-weighted average" (TWA) exposures, or in other words, time-weighted average airborne concentrations during the sampling period.

Where more than one sample was collected per individual or area, or where the chemical exposure was not for the entire work shift, a time-weighted average (TWA) was calculated in order to compare the result with the recommended exposure limit. The sample result or results were placed into the formula below to calculate a TWA.

$$TWA = \frac{C(1)\,T(1) + C(2)\,T(2) + \ldots + C(n)\,T(n)}{T(1) + T(2) + \ldots + T(n)}$$

TWA - 8-hour Time-Weighted Average
C(n) - Contaminant Amount for sample n (n=1,2,...,n)
T(n) - Sample Time (minutes) for sample n (n=1,2,...,n)

If an 8-hour time-weighted average is calculated then substitute 480 minutes for T(1) + T(2) + ...+ T(n) in the denominator.

Extended Work Shifts For Air Contaminants

ACGIH and OSHA have established exposure limits for workers based on an eight-hour time-weighted average. An eight-hour TWA exposure limit allows excursions above the hygienic standard provided they are compensated by equal excursions below the hygienic standard during the workday. To evaluate sampling results, TWA values for the sampling period are compared to applicable hygienic standards.

Employees working extended work shifts (greater than eight hours) have potential chemical or physical exposures that do not fall within the bounds of typical eight-hour time-weighted average exposure limits. Whenever extended or novel work schedules are used, an uncertainty exists concerning chemical or physical exposure effects. A model developed by Brief and Scala, researchers at Exxon Corporation, estimates the needed reduction in the published eight-hour time-weighted average exposure limits to provide protection for the workers. The exposure limit must be reduced by some amount to take into account not only the increased hours of exposure per day, but also the decreased hours of recovery. They developed a formula to calculate a *Reduction Factor* (RF) that is applied to TLVs expressed as eight-hour time-weighted averages.

Example: For a 10-hour work shift: RF = 0.7.
the TLV for coal tar pitch volatiles is 0.2 mg/m^3 as an 8-hour TWA,
the modified TLV for a ten-hour shift is:
0.2 mg/m^3 x 0.7 = 0.14 mg/m^3

The calculation for modifying the occupational limit is not formally adopted by either OSHA or ACGIH. It is provided in this report because an uncertainty exists concerning the effects of exposure to chemical agents. The modified occupational exposure limits, which are quantifiable from the method suggested above, estimates the needed reduction in the hygienic standard to provide protection for the exposed workers. These reduced limits are an effort to provide an additional layer of protection to the employees working the unique work shifts but are no guarantee that an adequate safety margin will have been achieved.

DATA SUMMARY

TABLE 1 EXPOSURE RESULTS		
EMPLOYEE / OPERATION	**PNOR/PNOS (mg/m^3)**	**Coal Tar Pitch Volatiles as Benzene-Soluble Particulates (mg/m^3)**
Jason Babel – Gem Seal Coat Crew	0.088	LT 0.036
Randy Williams – Gen Seal Coat Crew	0.22	0.044
Richard McNeely – RejuvaSeal Crew	0.17	LT 0.037
Fred Cole – RejuvaSeal Crew	0.25	0.040
John Hildebrandt – RejuvaSeal Crew Supervisor	0.16	LT 0.037
OSHA PEL	**15**	**0.2**
ACGIH TLV	**10 I**	**0.2**
ACGIH TLV (Adjusted for 10-hour work shift)	**N/A**	**0.14**

Notes:

1. *mg/m^3 = milligrams (of air contaminant) per cubic meter (of air).*
2. *LT = Less than. This value is less than the analytical laboratory's lowest limit of quantification. Thus this result is below the quantity listed and its exact value is unknown.*
3. *OSHA PEL = The Permissible Exposure Limit (PEL) enforced by the Occupational Safety and Health Administration (OSHA).*
4. *ACGIH TLV = The Threshold Limit Value (TLV) as recommended by the American Conference of Governmental Industrial Hygienists (ACGIH).*
5. *I = Designates an exposure limit that is based on the inhalable fraction of the airborne compound.*
6. *N/A = No exposure limit for the chemical has been established by this governing body.*
7. *PNOR - Particulates Not Otherwise Regulated as defined by OSHA.*
8. *PNOS - Particulates Not Otherwise Specified as defined by the ACGIH.*
9. *The ACGIH no longer recommends a TLV for Particulates Not Otherwise Specified (PNOS), such as airborne dust. In its place the ACGIH states that the inhalable and respirable limits can be used as a guideline if the particles do not have an applicable TLV, are insoluble or poorly soluble in water, and have low toxicity. In addition, the ACGIH no longer has a Total Particulate TLV but has established an Inhalable TLV for airborne particulates. This TLV requires the use of an inhalable sampling device.*
10. *The exposure concentrations provided in this table represent time-weighted average (TWA) exposures. The remaining work shift periods not monitored were assumed to have similar airborne concentration exposures as those monitored.*

REFERENCES

American Conference of Governmental Industrial Hygienist (ACGIH): *2006 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposures Indices,* Cincinnati, Ohio: ACGIH 2006.

American Conference of Governmental Industrial Hygienist (ACGIH), *Guide to Occupational Exposure Values – 2006*, Cincinnati, Ohio: ACGIH 2006.

"Air Contaminants", *Code of Federal Regulations* Title 29, Part 1910, Subpart 1000.

The St. Paul Travelers Industrial Hygiene Laboratory *Air Sampling Guidelines*, May 16, 2006 ed.

"Respiratory Protection", Code of Federal Regulations Title 29, Part 1910, Subpart 134.

Material Safety Data Sheet for *Brewer Cote 3405 Crack Sealer* manufactured by The Brewer Company, Date: January 4, 2000.

Material Safety Data Sheet for *Concrete Pavement Sealer* manufactured by The Brewer Company, Date: January 12, 2000.

Material Safety Data Sheet for *RejuvaSeal™* manufactured by BC&L Pavement Services, Inc., Date: Not Provided.

Material Safety Data Sheet for *Tarmax® R-100* manufactured by Southern Emulsions, Inc., Date: June 1, 2002.

INDUSTRIAL HYGIENE SURVEY DATA - AIR MONITORING

INDUSTRIAL HYGIENE SURVEY DATA - AIR MONITORING

Industrial Hygiene Specialty Services
90 Lamberton Road, Windsor, CT 06095
Phone: 800-842-0355 Fax: 860-687-7430

Rev: 02/97

Job #:	0086-038563	Business Unit:	CONS
Survey Date:	December 5, 2006	Engineer Office:	Richardson
Account Name/Address:	HI-LITE MARKINGS, INC.	Engineer Name:	Joseph E. David, III CIH, CSP, ARM
	Brownsville/South Padre Island International Airport	Engineer Signature:	Joseph E. David, III
	Brownsville, TX 78526		

Media Type and Lot #: Tared Teflon Filter Instrument Mfg/Model: Gilian GilAir5 Calibrator: BIOS DryCal DC-Lite 0932

Sample Number	Pump TIC #	Sampling Location or Employee Name, and Observations	Analytes	Sampling Time Start	Stop	Mins.	Flow Rate (L/min) Pre	Post	Avg.	Vol. (L)
101W	--------	Field Blank	Asphalt Fumes/CTPVs	------	------	------	------	------	------	------
			OSHA PAH Scan							
51W	15340	Jason Babel – Gem Seal Coat Crew	Asphalt Fumes/CTPVs	0070	1540	520	2.02	2.01	2.01	1045
			OSHA PAH Scan							
97W	15336	Randy Williams – Gem Seal Coat Crew	Asphalt Fumes/CTPVs	0705	1520	495	2.11	2.11	2.11	1044
			OSHA PAH Scan							
99W	03457	Richard McNeely – RejuvaSeal Crew –	Asphalt Fumes/CTPVs	0706	1550	524	2.06	2.06	2.06	1079
		Loading/Driver	OSHA PAH Scan							
98W	15345	Fred Cole – RejuvaSeal Crew –	Asphalt Fumes/CTPVs	0707	1515	488	2.03	2.04	2.03	991
		Loading/Operating Distributor	OSHA PAH Scan							

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Job #:	0086-038563	Business Unit:	CONS
Survey Date:	December 5, 2006	Engineer Office:	Richardson
Account Name/Address:	HI-LITE MARKINGS, INC. Brownsville/South Padre Island International Ai Airport Brownsville, TX 78526	Engineer Name: Engineer Signature:	Joseph E. David, III CIH, CSP, ARM

Media Type and Lot #: Tared Teflon Filters Instrument Mfg/Model: Gilian GilAir5 Calibrator: BIOS DryCal DC-Lite 0932

Sample Number	Pump TIC #	Sampling Location or Employee Name, and Observations	Analytes	Sampling Time Start	Stop	Mins.	Flow Rate (L/min) Pre	Post	Avg.	Vol. (L)
102W	15535	John Hildebrandt – RejuvaSeal Crew -	Asphalt Fumes/CTPVs	0708	1550	522	2.06	2.06	2.06	1075
		Supervisor	OSHA PAH Scan							

TRAVELERS

90 Lamberton Road, Windsor, CT 06095
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AIHA Accredited Laboratory # 100126

Laboratory Work Order Number: 2006120188

Report Issued To:
Joseph David
St. Paul Travelers
1301 East Collins Blvd.
Richardson, TX 75081

Date Samples 12/7/2006
Report Date: 12/15/2006

Location Sampled: Hi-Lite Markings, Inc.
Sample Submitter: Joseph David

ESP Job #: 0086-038563

Benzene Extractables (Benzene Solubles)

Sample ID	Sample Description	Results mg/m3	Results µg
101W	Field Blank		LT 40.
51W	Jason Babel	LT 0.038	LT 40.
97W	Randy Williams	0.044	46.
99W	Richard McNeely	LT 0.037	LT 40.
98W	Fred Cole	0.040	40.
102W	John Hildebrandt	LT 0.037	LT 40.

101W The benzene soluble sample results have been blank corrected.

Total Particulates

Sample ID	Sample Description	Results mg/m3	Results µg
101W	Field Blank		LT 50.
51W	Jason Babel	0.088	92.
97W	Randy Williams	0.22	230.
99W	Richard McNeely	0.17	180.
98W	Fred Cole	0.25	250.
102W	John Hildebrandt	0.16	170.

101W The total particulate sample results have been blank corrected.

Analyte	Media type	LOQ	Reference Method	Analysis Date
Benzene Extractables (Benzene Solubles)	Tared TF Filter	40. µg	Extraction/Gravimetry - Modified NIOSH 5042	12/14/200
Total Particulates	Tared TF Filter	50. µg	Gravimetry - NIOSH 0500	12/12/200

Please Note: The limits of quantitation (LOQs) listed are for normally processed samples. Sample requiring special processing (i.e. dilutions) may have elevated LOQs.
N.A. = Not Applicable

WORKORDER COMMENTS:

The reported data relate only to the samples as received by the Laboratory. The reported air concentrations have been calculated using information supplied by the customer and have NOT been adjusted to represent a Time Weighted Average (TWA). "LT" indicates less than the limit of quantitation (LOQ). The contaminant may or may not be present at levels below this concentration. This report shall not be reproduced except in full, without written approval of the laboratory. The samples have not been blank corrected unless otherwise noted. Unless otherwise noted, all samples were received in satisfactory condition.

Approved by:

Tom Surveski	Josef Chrzanowski	George E. Johnson	Marcel F. Baril
Tom Surveski	Josef Chrzanowski	George E. Johnson	Marcel F. Baril
QA Group Leader	Production Group Leader	Group Leader	Laboratory Director