DAN NAPIER, CIH
INDUSTRIAL HYGIENE
LICENSE # 773462

2520 Artesia Boulevard
P.O. Box 2208
Redondo Beach, CA 90278
Telephone 310/800 644-1924
Fax 310/406-1939
www.cihcsp.com

March 22, 2023

Meta Study for MRL and Bobcat Automated Stripe Removal Equipment

I have reviewed the air monitoring data collected at various locations throughout California. All tests were conducted while operating the MRL (Mark Rite Lines, MRL Equipment Company, Inc. ®) lead based paint removal truck and High Pressure Water Jetting Equipment. Air Monitoring was conducted in compliance with OSHA and NIOSH Standards. All data was collected during operations using containerized equipment. This data includes locations throughout the State of California the dates are indicated on the table, as well as the general location. The Level of detection (LOD) for the NIOSH Method 7082 Issue 2 is 2.6 µg per sample. The LOD for NIOSH 7300 is 0.062 µg per filter.

Date	Location	Lead Content of Stripe	Lead level µg/m^3
23MAR07	SR 405 / 22 Interchange	>1000 *	Below Detection <2µg/m^3
23MAR07	SR 405 / 22 Interchange (Significant Visible dust cloud was created when the system was opened during operation by operator. Operator was subsequently dismissed.	>1000 *	2.3 µg/m^3
21MAR07	Mentone Blvd & State Highway 38	>1000 *	Below Detection <2µg/m^3
16JUN08	Route 243/10 Separation, Banning	>1000 *	Below Detection <2µg/m^3
24JULY08	11-SD-8-9.6/R52.6, San Diego	>1000 *	Below Detection <2µg/m^3
23SEPT08	SR 57 near Alpine	>1000 *	Below Detection <2µg/m^3

26JUN09	I 405 at Crenshaw (Driver Location) NIOSH Method 7105	>1000 *	Below Detection <0.03µg/m^3
26JUN09	I405 at Crenshaw (At Planer Head) NIOSH Method 7105	>1000 *	0.06 µg/m^3
15SEPT09	SR 14 Northbound Mojave	>1000 *	Below Detection <2µg/m^3
8AUG09	SR 15 at Foothill	>1000 *	Below Detection <2µg/m^3
20JUN10	Caltrans No. 07-166814	>1000 *	Below Detection <2µg/m^3
1JUN10	Transbay Essex Street Widening San Francisco NIOSH Method 7105 Operator station	>1000 *	Below detection <0.2 µg/m^3
1JUN10	Transbay Essex Street Widening San Francisco NIOSH Method 7105 at planer head	>1000 *	0.3 µg/m^3
8JULY11	SR 170 near and North of SR 101 Interchange North bound and South bound lanes.	>1000 *	Below Detection <2µg/m^3
12JUN12	SR 5 in Santa Clarita at Lyons Avenue Operators Station	>1000 *	Below detection <2 µg/m^3
12JUN12	SR 5 in Santa Clarita at Lyons Avenue At planer head	>1000 *	Below detection <2 µg/m^3
11JUL13	MRU Operators Station Caltrans No. 08-0P3804	>1000 *	Below detection <2 µg/m^3
11JUL13	Planer Head Caltrans No. 08-0P3804	>1000 *	Below detection <2 µg/m^3
11JUL13	Sweeper Operators Station Caltrans No. 08-0P3804	>1000 *	Below detection <2 µg/m^3
7APR14	SR 145 Road 27 @ Ave 51/2 Operator	>1000 *	Below detection <2 µg/m^3
7APR14	SR 145 Road 27 @ Ave 51/2 Sweeper	>1000 *	Below detection <2 µg/m^3

7APR14	SR 145 Road 27 @ Ave 51/2 Sweeper	>1000 *	Below detection <2 µg/m^3
7APR14	SR 145 Road 27 @ Ave 51/2 Bobcat Ope.	>1000 *	Below detection <2 µg/m^3
29APR14	CA 105 Operator Caltrans No. 07-1W5804	>1000 *	Below detection <2 µg/m^3
29APR14	CA 105 Operator Sweeper Caltrans No. 07-1W5804	>1000 *	Below detection <2 µg/m^3
29APR14	CA 105 HEPA Exhaust Caltrans No. 07-1W5804	>1000 *	2.5 µg/m^3
8JUN15	SR 710 @ SR 105 Operator MRL	>1000 *	Below detection <2 µg/m^3
8JUN15	SR 710 @ SR 105 Sweeper Operator	>1000 *	Below detection <2 µg/m^3
29JUN16	SR 710 @ Florence Sweeper Operator	>1000 *	Below detection <0.38 µg/m^3
29 JUL16	SR 710 @ Florence MRL Operator	>1000 *	Below detection <0.38 µg/m^3
28JUL16	NB 405 @ Imperial HWY	>1000 *	Below detection <0.38 µg/m^3
28JUL16	NB 405 @ Imperial HWY	>1000 *	Below detection <0.38 µg/m^3
7AUG16	SB I-405 @ Carson MRL Operator Caltrans No. 07-287404	>1000 *	Below detection <0.38 µg/m^3
7AUG16	SB I-405 @ Carson Sweeper Caltrans No. 07-287404	>1000 *	Below detection <0.38 µg/m^3
17JAN17	I-5 NB Newhall MRL Operator	>1000 *	Below detection <0.38 µg/m^3
15MAY17	HWY 99, Merced MRL Operator Cab Caltrans No. 10-0Y7404	>1000 *	Below detection <0.38 µg/m^3
15MAY17	HWY 99, Merced MRL Rear Operator Caltrans No. 10-0Y7404	>1000 *	Below detection <0.38 µg/m^3

3OCT17	Hawthorne Blvd @ PCH, MRL Operator Cab Caltrans No. 07-1XE704	>1000 *	Below detection <0.38 µg/m^3
3OCT17	Hawthorne Blvd @ PCH, MRL Rear Operator Caltrans No. 07-1XE704	>1000 *	Below detection <0.38 µg/m^3
3OCT17	Hawthorne Blvd @ PCH, Sweeper Operator Cab Caltrans No. 07-1XE704	>1000 *	Below detection <0.38 µg/m^3
27MAR18	Route 65 Milepost 8-14 MRL Operator Caltrans No. 06-0U9904	>1000 *	Below detection <0.38 µg/m^3
27MAR18	Route 65 Milepost 8-14 Sweeper Operator Caltrans No. 06-0U9904	>1000 *	Below detection <0.38 µg/m^3
18APR18	US-101 Milepost 24-19 MRL Operator Caltrans No. 05-1J7404	>1000 *	Below detection <0.38 µg/m^3
18APR18	US-101 Milepost 24-19 Sweeper Operator Caltrans No. 05-1J7404	>1000 *	Below detection <0.38 µg/m^3
24APR18	CA-43 Milepost 18.2- 3.5 Arrow Stripe Removal Equipment Operator Caltrans No. 06-0T9504	>1000 *	Below detection <0.38 µg/m^3
24APR18	CA-43 Milepost 18.2- 3.5 Sweeper Operator Caltrans No. 06-0T9504	>1000 *	Below detection <0.38 µg/m^3
24APR18	CA-43 Milepost 18.2- 3.5 Sweeper Operator Caltrans No. 06-0T9504	>1000 *	0.46 µg/m^3
11DEC18	CA-33 Ventura MRL Operator Caltrans No. 07-303404	>1000 *	Below detection <0.38 µg/m^3
11DEC18	CA-33 Ventura Sweeper Operator Caltrans No. 07-303404	>1000 *	Below detection <0.38 µg/m^3

3APR19	SR 99 @7STD Road, Sweeper Operator, MRL Operator, Up and Dowind	>1000 *	3.13 µg/m^3
17DEC19	Point Mugu Naval Base, MRL Operator, MRL Rear Operator, Skid-Steer Operator, Sweeper Operator	>1000 *	Below detection <0.38 µg/m^3
29APR20	Caltrans Project No. 08-1H3404, MRL Operator, Sweeper Operator, Up & Downwind	>1000 *	Below detection <0.38 µg/m^3
22JUN20	Caltrans Project No. 08-1E8404 Twenty-nine Palms, 2 MRL Operators, Sweeper Operator, Area Sample	>1000 *	Below detection <0.15 µg/m^3
8JUL20	Vidal Junction, Vidal CA CA-62 West & East, MRL Operator, MRL Rear Operator Sweeper Operator, Area Sample	>1000 *	Below detection <0.15 µg/m^3
22AUG20	Caltrans Project No. 1XQ904 I-605 pm R9.3 to 20.1, Automated Stripe Removal Operator, Up and Downwind	>1000 *	Below detection <0.15 µg/m^3
9SEP20	US-101 Northbound at Barham Blvd Los Angeles CA, MRL Operator, Sweeper Operator, Skid-Steer Operator, Area Sample	>1000 *	Below detection <0.15 µg/m^3
21SEP20	Caltrans Project No. 07-3W9004 I-405 Studebaker Road Long Beach, CA Sweeper Operator, Automated Stripe Removal Operator, Skid-Steer Operator	>1000 *	Below detection <0.15 µg/m^3

22SEP20	Project No. B1P18168, Indian Canyon Drive Palm Springs, CA, MRL Operator, Rear MRL Operator, Sweeper Operator	>1000 *	Below detection <0.15 µg/m^3
22MAR21	Caltrans Project No. 07-332604 I-10 Alrlington Ave, MRL Operator, Sweeper Operator, Area Sample	>1000 *	Below detection <0.15 µg/m^3
12JUL21	Caltrans Project No. 05- 1E004 US-101 Buellton CA, Skid-Steer Operator, Sweeper Operator	>1000 *	Below detection <0.15 µg/m^3
10AUG21	South Lewis Road, Camarillo CA, MRL Operator, Sweeper Operator	>1000 *	Below detection <0.15 µg/m^3
22FEB22	River Road/Archibald Ave Eastvale, CA, Automated Stripe Removal Operator, Up and Downwind	>1000 *	Below detection <0.15 µg/m^3
27FEB22	Caltrans Project No.08-1L3304 Euclid Ave Hwy-71, MRL Operator, MRL Rear Operator, Sweeper Operator, Area Sample	>1000 *	Below detection <0.15 µg/m^3
16MAR22	Caltrans Project No. 12-0Q3504 Nohl Canyon Road, Orange, CA, Sweeper Operator, MRL Operator	>1000 *	Below detection <0.15 µg/m^3
22MAR22	Caltrans Project No. 07-311704 Route 134 N. Pacific Ave Glendale, CA, MRL Operator, Sweeper Operator	>1000 *	1.5 µg/m^3
29MAR22	Caltrans Project No. 07-4P8901 Rout 150 Ventura County	>1000 *	Below detection <0.15 µg/m^3
4APR22	Caltrans Project No. Z10017.1 I-15 Lake Elsinore, CA	>1000 *	Below detection <0.15 µg/m^3

5APR22	Caltrans Project No. 04-0P48U4 Route 9 to 84 Portla Valley, CA	>1000 *	Below detection <0.15 µg/m^3
3OCT22	HWY130 Santa Clara and Stanislaus County, Patterson	>1000 *	1.3 µg/m^3
4OCT22	HWY130 Santa Clara and Stanislaus County, Patterson	>1000 *	Below detection <0.15 µg/m^3

* Agency indicated level above 1000 mg/kg (PPM).

All levels measured were conducted or managed by a Certified Industrial Hygienist (CIH)[1], the data clearly demonstrates that the system can not and does not create an exposure above the 30 µg/m^3 action level. During conditions that should trigger a stop work condition, such as a removal or by-passing of the filter system, the measurements were still below the Action Level. The proper use of this equipment does not create measurable levels. Improper use does create a low level of exposure, but it is readily discernable since it is accompanied by a significant visible and dense dust cloud. That level is however substantially less than the action level.

The OSHA code discusses several classes of work that require annual monitoring, and cannot be designated as qualifying for Section *(5) Negative initial determination*. The Code discusses the operation of tools with HEPA Vacuum systems. The definition of a tool is a : a handheld device that aids in accomplishing a task[2] , clearly the MRL Planer unit is not *" power tool cleaning with dust collection system(s)"* The MRL is a very large piece of construction equipment, the planer head is the only part of the equipment that can be considered as a "*regulated area*". It is less than one cubic foot in area. Therefore the equipment operator is never inside a "regulated area" nor is it possible for anyone to enter the "regulated area". The operator never "manipulates the planer head". The operator is physically located inside the MRL tractor cab, he can monitor the planer head because he has a video display that shows the exact location and function of the planer head. The location of the regulated area and the operators work is physically separated by more than ten feet. Further the truck cab is an enclosed unit.
All levels measured were conducted by a Certified Industrial Hygienist (CIH), or technician working under the direct supervision of a CIH. The data clearly demonstrates that the system can not and does not create an exposure above the 30 µg/m^3 action level, even during conditions that should trigger a stop work condition. The proper use of this equipment does not create measurable levels. Improper use does create a low level of exposure, but it is readily discernable

[1] Acknowledging the following Certified Industrial Hygienists, Dan Napier, CIH CP2267, Mark Gigas, CIH, CP5722, Michael R. Tiffany, CIH CP5056

[2] http://www.merriam-webster.com/dictionary

since it is accompanied by a dense dust cloud. That level is however substantially less than the action level.

The recorded detection levels that are indicated above 2 µg/m^3 are the result of calculations when the work period is significantly less than eight hours. In many cases the available work time is less than eight hours or the task is simply completed in less than eight hours. In all cases where the test indicated below detection levels the reader must understand the laboratory detection level of less than 2.6 µg was always met. The method requires that the smaller volume of collected air must be considered when developing the detection level.

Further notes and comments. There is a misunderstanding of the code by many regulators. The code requires annual testing ONLY when lead is detected above the 30 µg/m^3 level. The next paragraph indicates that if the levels are below the action level further testing need not be accomplished, unless a substantial change in the work happens. Travel on a northbound road versus a westbound road is not a substantial change, nor is a road in Northern California substantially different from a road in Southern California. The Bobcat Equipment is not substantially different than the MRL Equipment. The tests have been conducted in all the various parts of California, in all conditions and locations. The action level has never been approached, levels above detection are seldom seen.

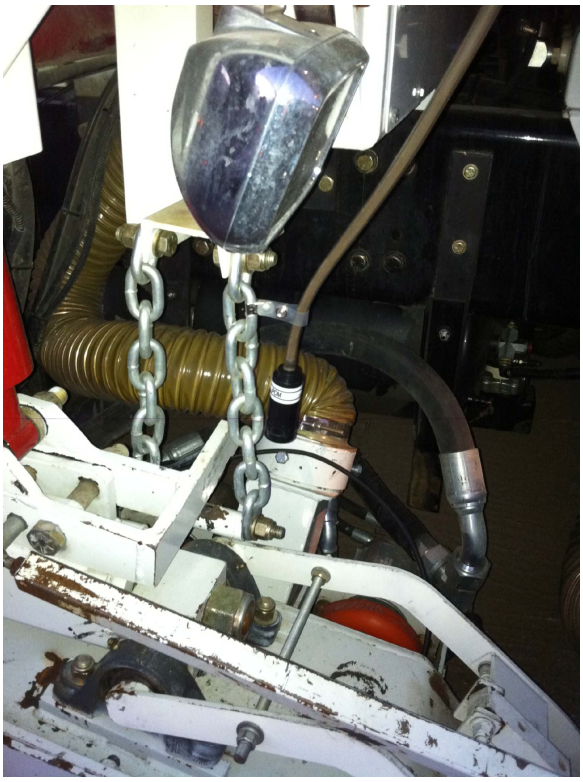
The first edition of this study was presented at the American Industrial Hygiene Conference and Exposition in Austin Texas in 2013. This study meets all requirements of California Code of Regulations, Title 8, Section 1532.1. Lead --OSHA requirements for an industry wide study. The study is a meta study, the full reports are available for reading at the author's office. We require an appointment for anyone who desires to review the studies that the META study is based upon. Due to the privacy of the companies and individuals who have made this study possible, copies of the original studies are not available. The author has not been compensated in any way for the work accomplished in this study.

Respectfully Submitted;

2023.04.21
16:54:36
-07'00'

Dan Napier, MS
Certified Industrial Hygienist
ATT Photographs

Photographs of equipment



Area above the rotomill head. Note the dust free condition. This photograph was taken in the field during the work cycle.

MRL Equipment