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CAPT Tim Radtke, CIH
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Office of Occupational Health and Safety
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CAPT Radtke:

I have enclosed a report of exposure assessments for Lakeview District Office as part of the DOI Exposure Assessment and Medical Surveillance Inclusion project. In the report you will find two attachments and guidance for reading and interpreting assessment results. One attachment presents the processes, tasks, and agents that were evaluated during the 17 August 2010 on-site visit with details of the associated exposure profiles that were developed. The other provides a health risk-based prioritized summary list of process-task-agent groups for control and further information gathering.

An Access database containing complete data and supporting documentation is available for download at www.BleicherCIH.com/DoleA4TR.html (please note that the page address is case sensitive). This database file will be updated periodically as assessments and profiles are completed for additional facilities.

Please do not hesitate to contact me if you have any questions.

Sincerely,

David P. Bleicher, CIH

Enclosure: Lakeview District Office Occupational Exposure Assessment

Lakeview District Office
Occupational Exposure Assessment and Medical Surveillance Inclusion
For
Department of Interior, Safety Council/Office of Health and Safety
On-site: 17 August 2010

Exposure assessments have been conducted as a part of the Department of Interior's Exposure Assessment and Medical Surveillance Inclusion Determination initiative. The objective of this effort is to document work processes at DOI facilities, describe the individual tasks associated with those processes, identify hazardous agents that are used or generated during the task, and characterize employee exposure to those agents. The ultimate goal is to identify similarly exposed groups (SEGs) within and between bureaus in order to facilitate exposure management requirements including exposure control, validation of medical surveillance, and prioritized use of limited occupational health resources.

Methods.

Exposure assessments were conducted following the strategy set forth by the American Industrial Hygiene Association's Exposure Assessment Strategies Committee for assessing and managing occupational exposures¹.

An on-site visit to Lakeview District Office was conducted on 17 August 2010 by David P. Bleicher, CIH to characterize selected processes and collect information needed to develop task-agent exposure profiles. A number of methods were available and used to gather this information. Characterization of processes, tasks, conditions and controls, and agent identification was obtained through observation of work sites and facilities, documentation of procedures, material safety data sheets, and importantly, worker interview. Data useful for estimating exposure was obtained through screening and short term measurement, historical sampling data, mathematical modeling, and the scientific literature.

Two reports are provided for this facility (Attachments A and B). One presents the processes, tasks, and agents that were evaluated during the site visit along with details of the associated exposure profile. The other is a health risk-based prioritized summary list of process-task-agent groups for control and further information gathering.

Task-Agent Exposure Profile Detail Report.

Task-agent exposure profiles are based on observation and employee description of processes. Due to the nature of many DOI missions, processes and tasks can be highly variable—task duration, frequency, and operating conditions can differ from one iteration to another. Therefore, process and task characterizations were frequently, and necessarily, reported as “typical” with a range of conditions described. Judgments about worker exposure are based on the tasks as presented in this report. When actual processes or the conditions under which they are carried out differ from those recorded, the exposure profile and classification should not be generalized without appropriate consideration of variables.

Reading the Report.

¹ Bullock, Wm.H. and J.S.Ignacio, Eds. 2006. A Strategy for Assessing and Managing Occupational Exposures, 3rd. AIHA Press, Fairfax.

The Task-Agent Exposure Profile Detail Report is arranged in hierarchical fashion by Division or Project, Process, Task, and Agent. Process entries include a brief description of the process and when appropriate, unique operating conditions. Task entries include a brief characterization of the task, a description of any controls in place, the duration and frequency of occurrence, and appropriate recommendations. It should be noted that many task characterizations and agent exposure profiles will immediately suggest rather obvious recommendations. Some of these have been included in the report. However, in many cases it would not be appropriate to make definitive control recommendations without more careful consideration of control strategies and factors that would affect their efficacy (e.g. design, economic, and cultural factors) which is beyond the scope of the exposure assessment project.

Exposure Profile. Information used to develop the exposure profile is found for each Agent under a Task. It is important to understand that the exposure profile accounts for engineered and administrative controls and reflects potential worker exposure in the absence of personal protective equipment such as respirators.

- Exposure Category: Exposures have been categorized as Acceptable, Unacceptable, or Uncertain.
- OEL: The Occupational Exposure Limit or OEL is the threshold value used as a standard for comparison with the exposure estimate. OELs may describe full shift or short-term acceptable or unacceptable exposure limits.
- Exposure Rating & Exposure Estimate: When possible the Exposure Rating is based on quantitative data which yields an Exposure Estimate. In practice, very little quantitative information is available to support a judgment. In the absence of strong quantitative data, it is often practical and reasonable to categorize an exposure as acceptable, unacceptable, or uncertain based on qualitative or semi-quantitative information. However, in these cases it is difficult to assign intermediate exposure ratings as a fraction of the OEL, therefore an exposure rating of 4 is assigned to clearly unacceptable exposures and a rating of 1 for those that are clearly acceptable.
- Health Effects Rating: The Health Effects Rating reflects both the severity and permanence of the health impacts of an unacceptable exposure.
- Uncertainty Rating: The Uncertainty Rating provides an indicator of the level of certainty associated with the exposure profile. For example; exposure estimates based on definitive monitoring studies would be highly certain while profiles based on screening measurement, mathematical modeling, data from similar activities, or qualitative judgment may add degrees of uncertainty. Other factors that may affect the industrial hygienist's assignment of an uncertainty rating are inadequate understanding of health impacts by scientific community and excessive generalization of the task activity or conditions during the characterization process.
- Basis & Discussion: The Basis for the estimated exposure, its assignment to an exposure category, and the factors affecting certainty is given. A brief Discussion of available information and factors leading to judgments about the exposure profile is also provided.
- Risk/Control Priority: A Risk/Control Priority is calculated as the product of the Health Effects Rating and the Exposure Rating. Ratings range from 0 for the lowest risk exposures to a high of 16.
- FIG Priority: When uncertainty exists in the exposure profile, further information gathering may be required to resolve it. FIG Priority is calculated as the product of the Risk/Control Priority and the Uncertainty Rating. Both the Risk/Control Priority and the FIG Priority values may be used to more efficiently direct resources to control exposures and resolve exposure questions. FIG priority ratings range from a low of 0 to a high of 32.

Medical Surveillance. The exposure profile provides validation of, or indicates justification for, medical surveillance programs. In the report, medical surveillance is Justifiable when the exposure category is unacceptable or uncertain. Note that justifiable means simply that an unacceptable (or uncertain) exposure is identified. It does not suggest that medical surveillance is required, needed or even useful. On the other hand, some exposures are designated as Triggered or Critical Exposures. For unacceptable or uncertain exposure to some agents, medical surveillance may be triggered or required by regulation. A critical exposure refers to unacceptable or uncertain exposure to an agent which may pose very severe and irreversible health effects if not controlled. Examples include potent human carcinogens.

David P. Bleicher, CIH

16 September 2010

Attachment A: Task-Agent Exposure Profile Detail Report

Attachment B: Health Risk and Further Information Gathering Priorities Report

Task-Agent Exposure Profile Detail Report

Lakeview District Office

Fleet Maintenance

Process: *Bat Gate Fabrication*

Closure gates are fabricated for abandoned mines. Gates are constructed of galvanized culvert with bars of mild steel and angle iron. Slots are cut in galvanized culver with the plasma cutter. Angle iron is then fitted and tacked. Galvanized coating is not removed before plasma cutting. After cutting, the remaining galvanizing material is removed by grinding before tacking using SMAW and 7018 stick on-site or by MIG in the shop.

Operating Conditions:

Plasma cutting and MIG welding are conducted in the shop. Final assembly is conducted in the field.

Task: Weld Steel and Galvanized

Frequency:

Weld steel and galvanized steel to complete final assembly of bat gate closure. Task may require up to 2 days and require 2.5 - 3 pounds of rod.

Duration: 4 - 8 hours

Controls:

Recommendation:

AGENT Welding fume, NOS

OEL: 5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 1 Reversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 0 Certain

Risk/Control Priority: 1

Basis: Qualitative Judgement

FIG Priority: 0

Discussion: OEL is not expected to be exceeded based on short duration of actual welding.

Medical Surveillance Justifiable no
Triggered or Critical Exposure no
Reference:

AGENT Zinc oxide fume

OEL: 5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 2 Severe, reversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 2

Basis: Qualitative Judgement

FIG Priority: 2

Discussion: OEL is not expected to be exceeded based on short actual welding time. Also, zinc has been removed from the welds previously by burning (in the plasma cutting process) or by grinding.

Medical Surveillance Justifiable no
Triggered or Critical Exposure no
Reference:

Process: Collision Repair

Welding is required to repair collision damage. Four to five jobs may be completed per year. Jobs may require bracket or part fabrication. Process may include cutting steel with oxy-acetylene cutting torch or plasma cutter. All work is conducted in mild steel. Total job duration is variable. A fabrication project may require cutting, grinding, drilling, and welding, in the bay, over a period of 2-3 hours. Surface preparation may require 15 minutes. Total welding time may range from 10 to 30 minutes.

Operating Conditions:

All work is conducted in the shop bay.

Task: Weld Mild Steel

Mild steel is welded using 7018 stick in a SMA method or 7000 pound hard wire with a MIG method, to weld bumper brackets and shock mounts. Paint may be removed with a die grinder or electric angle grinder. The part is then tacked and welded. Total welding time is typically 10 minutes to 30 minutes.

Frequency:

Duration:

Controls:

Recommendation:

AGENT Noise

OEL: 85 dBA

Exposure Estimate: dBA

Health Effects Rating: 3 Irreversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 3

Basis: Qualitative Judgement

FIG Priority: 3

Discussion: No noise dosimetry or sound level data was available for this task. OEL is not expected to be exceeded based on duration. Hearing protection was reportedly worn only when using the plasma cutter.

Medical Surveillance

Justifiable no

Triggered or Critical Exposure yes

Reference: 29 CFR 1010.95

AGENT Welding fume, NOS

OEL: 5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 1 Reversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 0 Certain

Risk/Control Priority: 1

Basis: Available Literature

FIG Priority: 0

Discussion: NIOSH (HETA 85-252-1625) studies of indoor small parts production MIG and MAG welding operations have shown acceptable full shift exposure to welding fume agents. Exposure for this task is anticipated to be considerably less based on frequency and duration.

Medical Surveillance

Justifiable no

Triggered or Critical Exposure no

Reference:

Process: Periodic Inspection and Service

Fleet vehicles are inspected annually according to the Equipment Repair/Requisition Order. Follow up service may include brake replace, fluid and filter replacement, U joints servicing or replacement, light replacement lights, repair of windshield chips, compressor replacement, and door seal replacement.

Operating Conditions:

All work is conducted in the Fleet Shop

Task: Change Oil

Frequency: Daily

Change oils and replace filters. Approximately 4 oil changes are conducted per day in the shop. Oil is dispensed from a 280 gallon reservoir using a pneumatic piston pump. Waste oil is collected into drain pans, then transferred into a waste oil tank and then burned.

Duration: <1/2 hour

Controls:

Recommendation:

AGENT Lubricants; oil, grease

OEL:

Exposure Estimate:

Health Effects Rating: 0 Reversible health effects of little concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 0 Certain

Risk/Control Priority: 0

Basis: Qualitative Judgement

FIG Priority: 0

Discussion: Short duration exposure to skin. Reportedly, only one of 3 mechanics use barrier protection . Approximately 6 qt of oil are used per vehicle.

Medical Surveillance Justifiable no

Triggered or Critical Exposure no

Reference:

Task: General Shop Operations

Frequency: Daily

Pneumatic tools, such as a lug wrench, die grinders, and air ratchets, are used in several shop operation resulting in hazardous noise conditions.

Duration: 4 - 8 hours

Controls:

Recommendation:

AGENT Noise

OEL: 85 dBA

Exposure Estimate: dBA

Health Effects Rating: 3 Irreversible health effects of concern

Exposure Rating: 3 (50-100% OEL; 95th %tile 0.5-1.0 OEL)

Exposure Category: Uncertain

Uncertainty: 1 Uncertain

Risk/Control Priority: 9

Basis: Qualitative Judgement

FIG Priority: 9

Discussion: Hearing protection is reportedly used by only one of the 3 workers when operating air ratchet.

Medical Surveillance Justifiable yes

Triggered or Critical Exposure yes

Reference: 29 CFR 1010.95

Task: Inspection

Frequency: Daily

Periodic and annual inspections are required of approximately 400 vehicles. Inspections occur seasonally in the fall, winter, and spring. An inspection requires approximately 10 minutes. Six to 8 inspections may be conducted per day.

Duration: 1 - 2 hours

Controls:

Recommendation:

AGENT Lubricants; oil, grease

OEL:

Exposure Estimate:

Health Effects Rating: 0 Reversible health effects of little concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 0 Certain

Risk/Control Priority: 0

Basis: Qualitative Judgement

FIG Priority: 0

Discussion: Contact with agent is incidental, however, long term exposure to oils and lubricants may dry the skin and produce dermatitis.

Medical Surveillance Justifiable no

Triggered or Critical Exposure no

Reference:

AGENT Noise

OEL: dBA

Exposure Estimate: dBA

Health Effects Rating: 3 Irreversible health effects of concern

Exposure Rating: 3 (50-100% OEL; 95th %tile 0.5-1.0 OEL)

Exposure Category: Uncertain

Uncertainty: 1 Uncertain

Risk/Control Priority: 9

Basis: Qualitative Judgement

FIG Priority: 9

Discussion: Numerous other tasks conducted concurrently within the shop generate hazardous noise, however supporting data is not available.

Medical Surveillance Justifiable yes

Triggered or Critical Exposure yes

Reference: 29 CFR 1010.95

AGENT Particulates, NOC/R

OEL: 5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 1 Reversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 1

Basis: Qualitative Judgement

FIG Priority: 1

Discussion: OEL is PEL (respirable). Compressed air is used to remove break dust. Asbestos fibers are not anticipated with most fleet vehicles; uncertainty due to heavy equipment. Task may result in several short duration spike exposures during the shift, but not expected to exceed the OEL.

Medical Surveillance Justifiable no

Triggered or Critical Exposure no

Reference:

Task: Rebuild Transmission

Frequency:

One or two vehicle transmissions may be rebuilt per year, typically on heavy equipment. Task may require several days. Transmission is removed from equipment then worked on the ground or on a bench. Fluids are drained prior to removing the transmission. Parts are cleaned in a solvent tank, typically requiring 2 hours. Hubs, gears, and seals are replaced as needed.

Duration:

Controls:

Conducted in shop

Recommendation:

Use nitrile or butyl rubber gloves when cleaning parts.

AGENT Lubricants; oil, grease

OEL:

Exposure Estimate:

Health Effects Rating: 0 Reversible health effects of little concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 0

Basis: Qualitative Judgement

FIG Priority: 0

Discussion: Primary agent is motor oil. Primary route of exposure is dermal contact. Use of barrier protection and hygiene practices were not reported.

Medical Surveillance Justifiable no
Triggered or Critical Exposure no
Reference:

AGENT Stoddard solvent

OEL: 100

Exposure Estimate:

Health Effects Rating: 1 Reversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Uncertain

Uncertainty: 1 Uncertain

Risk/Control Priority: 1

Basis: Qualitative Judgement

FIG Priority: 1

Discussion: Product is Chevron 325 thinner and contains 89% agent. OEL is TLV and is not expected to be exceeded. Barrier protections were not reported. Long term immersion (2 hours) in stoddard solvent can dry skin, produce dermatitis, and result absorption through the skin. Product also contains 1% xylenes.

Medical Surveillance Justifiable yes
Triggered or Critical Exposure no
Reference:

Task: Replace Brakes

Frequency:

Disk brakes are replaced. Tires and wheels are pulled and calipers are removed. Rotors are resurfaced by a vendor. May use aerosol brake cleaner to clean mechanisms and, reportedly, "to get oils off parts and hands."

Duration:

Controls:

Recommendation:

AGENT Methylene chloride

OEL: 125 ppm

Exposure Estimate: 60 ppm

Health Effects Rating: 4 Life threatening or disabling injury or illness

Exposure Rating: 2 (10-50% OEL; 95th %tile 0.1-0.5 OEL)

Exposure Category: Uncertain

Uncertainty: 2 Highly Uncertain

Risk/Control Priority: 8

Basis: Mathematical Modeling

FIG Priority: 16

Discussion: CRC Brakleen may us 1/4 can 16 Oz can. Used in shop bay. Product contains 10-30% methylene chloride. OEL is OSHA STEL. Modeling of potential concentrations using highly uncertain assumption for ventilation rate and diffusion/volume, an exposure of 60 ppm was determined. Target organ effects of this agent are shared with tetrachloroethylene, the major component of the product. In combination, these agents may result in an unacceptable short duration exposure.

Medical Surveillance

Justifiable yes

Triggered or Critical Exposure yes

Reference: 29 CFR 1910.1052

AGENT Tetrachloroethylene

OEL: 200 ppm

Exposure Estimate: 75 ppm

Health Effects Rating: 4 Life threatening or disabling injury or illness

Exposure Rating: 2 (10-50% OEL; 95th %tile 0.1-0.5 OEL)

Exposure Category: Unacceptable

Uncertainty: 2 Highly Uncertain

Risk/Control Priority: 8

Basis: Qualitative Judgement

FIG Priority: 16

Discussion: Product is CRC Brakleen. A quarter of a 16 oz can may be used for the task in the shop bay. Product contains 30-60% tetrachloroethylene. OEL is OSHA Ceiling which is 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm. Applying a box model, using highly uncertain assumptions for ventilation rate and diffusion/volume, estimated exposure is 75 ppm. However, DFG MAK recognizes skin absorption and an important route of exposure, and product is reportedly used as a hand cleaning agent. Exposure category is based on dermal exposure.

Medical Surveillance

Justifiable yes

Triggered or Critical Exposure no

Reference:

Task: Replace Fuel Pump

Frequency:

Fuel pumps in gas vehicles are replaced. These are typically located in the fuel tank. Tank is drained into a gas caddy. Air is pumped through the fill pipe, then the tank is removed. Task results in limited contact with liquid fuel. This task may be conducted 3-4 times per year.

Duration: 1 - 4 hours

Controls:

Recommendation:

AGENT Gasoline

OEL: 500 ppm

Exposure Estimate: ppm

Health Effects Rating: 2 Severe, reversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 0 Certain

Risk/Control Priority: 2

Basis: Qualitative Judgement

FIG Priority: 0

Discussion: Task results in limited contact with liquid fuel. This task may be conducted 3-4 times per year. OEL is TLV STEL. Although vapor may be released into the workspace during fuel transfer and when air is pumped through the fill pipe, OEL is not expected to be exceeded.

Medical Surveillance	Justifiable	no
	Triggered or Critical Exposure	no
	Reference:	

Mining**Process:** Abandoned Mine Closure

Polyurethane foam is used for mine shaft and adit closure. A wooden frame and chicken wire barrier covered with plastic sheeting is constructed to fit the portal. This process is used in remote locations when there issues of road access or when mine oar on or cross cultural or archeological sites.

Operating Conditions:

Task: Foam Application

Frequency: Single Event

Foam Concepts product is contained 1 yd³ boxes that weigh 75 lbs. Each box contains 3 bags. In the center of the bag there is a rubber clip that is pulled allowing components to mix inside the bag. Product begins to expand in approximately 1 minute. Bag must be opened and then are poured along the base of the frame structure and allowed to fill and close the portal. The closure is constructed approximately 4 feet into the portal. Task requires approximately 1 yd³/ 4x4 ft hole and approximately 1 hour per site (for 4X 4 ft openings including framing).

Duration: 1/2 - 1 hour

Controls:

Recommendation:

Consider procedures for response to acute isocyanate sensitisation reactions at remote field sites.

AGENT Mercury, elementalOEL: 0.025 mg/m³Exposure Estimate: mg/m³

Health Effects Rating: 3 Irreversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 3

Basis: Qualitative Judgement

FIG Priority: 3

Discussion: OEL is TLV. Other relevant OEL is Ceiling level of 0.1 mg/m³. Task may be conducted at abandoned Hg mine sites and adjacent to retorts, creating a potential for inhalation and dermal exposure. Inhalation of Hg vapor is expected to be low at the portal, but this has not been validated. Skin contact is an important route of exposure. Uncertainty is related to dermal contact with soils during barrier construction and quantities of Hg present. Barrier protections that were reported, will limit skin contact.

Medical Surveillance	Justifiable	no
	Triggered or Critical Exposure	no
	Reference:	

AGENT Methylene bisphenyl isocyanate

OEL: 0.02 ppm

Exposure Estimate: ppm

Health Effects Rating: 4 Life threatening or disabling injury or illness

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 4

Basis: Qualitative Judgement

FIG Priority: 4

Discussion: OEL is Ceiling limit. Free isocyanate functional groups can initiate strong and critical sensitization reactions. Consequently the threshold is very low (TLV = 0.005 ppm). Low volatility results in low inhalation exposure risk. Product is mixed in the bag, limiting direct contact. Use of barrier protections is limited but will decrease dermal exposure risk in the event of contact during application.

Medical Surveillance Justifiable no
Triggered or Critical Exposure no
Reference:

Road Maintenance

Process: Asphalt Patching.

Asphalt road surfaces are patched using hole patch or skim patching techniques. Annually, 385 tons of patching material may be applied per year. Work is conducted seasonally. "Cold mix" which is a mixture of MC800 Asphalt Oil and 1/2 inch rock, can be stock piled for one month. Material is picked up at the plant using BLM fleet dump trucks and belly dumps. Skim patch tasks include brooming the patch, dumping product, grading, and rolling. Pot hole patching may require use of manual broom and shovel to fill hole followed by rolling (truck may be used for rolling task).

Operating Conditions:

Task: Manual Patch Application and Brooming

Frequency:

Manual methods are frequently used for pot hole patching. Surfaces are swept manually and patch product is applied with a shovel.

Duration:

Controls:

Recommendation:

AGENT Particulates, NOC/R

OEL: 5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 1 Reversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 1

Basis: Qualitative Judgement

FIG Priority: 1

Discussion: OEL is PEL (respirable fraction) and is not expected to be exceeded during this task. Task requires a series of short duration patches to be made. Manual methods are not expected to generate large amounts of particulate in comparison with mechanical methods.

Medical Surveillance Justifiable no
Triggered or Critical Exposure no
Reference:

Task: Operate Grader

Frequency: Daily

There are 4 graders in the fleet; 3 each John Deer 770 ; 1 Cat 14.

Duration: extended shift

Controls:

Equipment is reportedly fitted with cabs.

Recommendation:

AGENT Noise

OEL: 85 dBA

Exposure Estimate: dBA

Health Effects Rating: 3 Irreversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 3

Basis: Engineering Controls in Place

FIG Priority: 3

Discussion: Sound level data is not available for this equipment. Newer cabs typically attenuate noise to acceptable levels in this kind of equipment. Workers operate graders for extended shifts.

Medical Surveillance

Justifiable no

Triggered or Critical Exposure yes

Reference: 29 CFR 1010.95

Task: Operate Hydraulic Broom

Frequency:

Operate Superior hydrolic driven broom. Duration and frequency are variable.

Duration:

Controls:

Recommendation:

AGENT Noise

OEL: 85 dBA

Exposure Estimate: dBA

Health Effects Rating: 3 Irreversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Uncertain

Uncertainty: 1 Uncertain

Risk/Control Priority: 3

Basis: Qualitative Judgement

FIG Priority: 3

Discussion: Sound level within cab during operation has not been evaluated. Modern cabs are capable of effectively controlling noise exposure. Operators are currently enrolled hearing conservation program and use insert hearing protectors.

Medical Surveillance

Justifiable yes

Triggered or Critical Exposure yes

Reference: 29 CFR 1010.95

AGENT Particulates, NOC/R

OEL: 5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 1 Reversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 1

Basis: Engineering Controls in Place

FIG Priority: 1

Discussion: OEL is PEL (respirable). Cab in combination with surface wetting is expected to limit operator exposure. Uncertainty exists because wet methods are not used consistently and use and efficacy of cab have not been evaluated.

Medical Surveillance	Justifiable	no
	Triggered or Critical Exposure	no
	Reference:	

Task: Operate Steel Drum Roller

Frequency:

Operate steel drum roller after skim patching. Duration and Frequency variable.

Duration:

Controls:

Equipment is fitted with a cab providing air conditioning and heat.

Recommendation:

AGENT Noise

OEL: 85 dBA

Exposure Estimate: dBA

Health Effects Rating: 3 Irreversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 3

Basis: Engineering Controls in Place

FIG Priority: 3

Discussion: Sound level data is not available for this equipment. Newer cabs typically attenuate noise to acceptable levels in this kind of equipment. Workers operate drum roller for extended shifts.

Medical Surveillance	Justifiable	no
	Triggered or Critical Exposure	yes
	Reference:	29 CFR 1010.95

Process: Chip Sealing

Asphalt paved road surfaces are rehabilitated by chip sealing. The process requires spraying oil which may be of several types; CRS2 or CRS2P or RS90-1S (=high float polymer oil). Oil is sprayed by a contractor and followed by the chip spreader operated by BLM employees. The surface is then rolled with a rubber tire roller to flatten chip, then followed by steel drum roller. Finally, the surface is swept with the self propelled broom.

Operating Conditions:

Task: Operate Broom

Frequency:

Superior brand hydraulic driven broom is used to brush surfaces in preparation for patching. Task may be required on one project per year. Current 2010 project was a 1 mile 3-"lift" project which is considered small. Other projects may be as large as 30 miles--one lift. Ten miles can be broomed per day. Surface may or not be wetted during this task. Surface may require washing to remove soil and cattle manure. Shifts are 10 hours or longer. Broom is also used after chip seal application is cured. Approximately 3 days is required for curing. Surface preparation and post-cure brooming require about the same amount of time to complete.

Duration: extended shift

Controls:

Equipment is fitted with heated and air conditioned cab.

Recommendation:

AGENT Noise

OEL: dBA

Exposure Estimate: dBA

Health Effects Rating: 3 Irreversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Uncertain

Uncertainty: 1 Uncertain

Risk/Control Priority: 3

Basis: Qualitative Judgement

FIG Priority: 3

Discussion: Sound level within cab during operation has not been evaluated. Modern cabs are capable of effectively controlling noise exposure. Operators are currently enrolled hearing conservation program and use insert hearing protectors.

Medical Surveillance Justifiable yes
Triggered or Critical Exposure yes
Reference: 29 CFR 1010.95

AGENT Particulates, NOC/R

OEL: 5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 1 Reversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 1

Basis: Qualitative Judgement

FIG Priority: 1

Discussion: OEL is PEL (respirable). Cab in combination with surface wetting is expected to limit operator exposure. Uncertainty exists because wet methods are not used consistently and use and efficacy of cab have not been evaluated.

Medical Surveillance Justifiable no
Triggered or Critical Exposure no
Reference:

Task: Operate Rubber Tire Roller

Frequency: Daily

After stone is spread the surface is rolled with a rubber tire roller to flatten chip.

Duration: extended shift

Controls:

Equipment is open with no cab. An umbrella is provided for shade.

Recommendation:

AGENT Diesel engine emissionsOEL: Exposure Estimate: Health Effects Rating: Severe, reversible health effects of concernExposure Rating: (<10% OEL; 95th %tile <0.1 OEL)Exposure Category: Uncertainty: UncertainRisk/Control Priority:

Basis: Qualitative Judgement

FIG Priority:

Discussion: Exposure to diesel exhaust was reported to be a concern during this task. Diesel engine exhaust contains several hazardous agents. Those of acute exposure concern during this task are NO₂, NO, CO, and SO₂. Exposure to particulate polycyclic aromatic hydrocarbons, coal tar pitch volatiles present long term exposure hazard.

Medical Surveillance	Justifiable	yes
	Triggered or Critical Exposure	no
	Reference:	

AGENT HeatOEL: Exposure Estimate: Health Effects Rating: Life threatening or disabling injury or illnessExposure Rating: (<10% OEL; 95th %tile <0.1 OEL)Exposure Category: Uncertainty: UncertainRisk/Control Priority:

Basis: Qualitative Judgement

FIG Priority:

Discussion: High heat conditions may be experienced during this task. With the exception of provision of shade, no heat stress prevention measures were reported. Operational constrains such as materials coordination and short cure times may make administrative control difficult to implement.

Medical Surveillance	Justifiable	no
	Triggered or Critical Exposure	no
	Reference:	

AGENT Noise

OEL: 85 dBA

Exposure Estimate: dBAHealth Effects Rating: Irreversible health effects of concernExposure Rating: (>10% OEL; 95th %tile > OEL)Exposure Category: Uncertainty: UncertainRisk/Control Priority:

Basis: Qualitative Judgement

FIG Priority:

Discussion: Exposure to hazardous noise is anticipated for tire roller operators. However, degree of hazard has not been determined--sound level data was not available for this equipment.

Medical Surveillance	Justifiable	yes
	Triggered or Critical Exposure	yes
	Reference:	29 CFR 1010.95

Task: Operate Steel Drum Roller

Frequency: Daily

The surface is rolled with a steel drum roller after rolling with the rubber tire roller.

Duration: extended shift

Controls:

Equipment is fitted with a cab providing air conditioning and heat.

Recommendation:

AGENT Noise

OEL: 85 dBA

Exposure Estimate: dBA

Health Effects Rating: 3 Irreversible health effects of concern

Exposure Rating: 1 (<10% OEL; 95th %tile <0.1 OEL)

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 3

Basis: Qualitative Judgement

FIG Priority: 3

Discussion: Sound level data is not available for this equipment. Newer cabs typically attenuate noise to acceptable levels in this kind of equipment. Workers operate drum roller for extended shifts.

Medical Surveillance

Justifiable no

Triggered or Critical Exposure yes

Reference: 29 CFR 1010.95

Task: Spread Stone

Frequency: Daily

Duration: extended shift

Operate chip spreader. Oil product that has been heated to 400F is spread immediately in front (within 50 ft) of the chip spreader. Product is a water emulsion, so steam rises. The oil product sets in 15 minutes on a warm day. At 40F or below, a chemical cure oil product will be used. Operation of the chip spreader requires 3 employees: the driver, the belt operator, and the hopper operator. Other employees are on the ground with broom and shovel to level or finish. In addition there is one operator in the dump truck. Chip spreader is 1974 vintage H & W brand, with 12 and 14 ft headers.

Controls:

Umbrellas are provided for shade on the equipment. A 5000 gallon water tender is used to wet rock at the staged piles prior to loading into the chip spreader.

Recommendation:**AGENT** Asphalt Fume

OEL: 0.5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 1 Reversible health effects of concern

Exposure Rating: 4 (>10% OEL; 95th %tile > OEL)

Exposure Category: Uncertain

Uncertainty: 1 Uncertain

Risk/Control Priority: 4

Basis: Available Literature

FIG Priority: 4

Discussion: Product is a cationic asphalt emulsion consisting of petroleum asphalt (>65%), a proprietary emulsifier (<1%), and water (balance). OEL is TLV as benzene soluble aerosol. NIOSH documentation of worker mean exposure during asphalt paving operations places many workers at or near the OEL. NIOSH referenced temperatures were much lower than the reported 400F reported for this chip seal task. Higher product temperatures are expected to increase concentration. Extended shifts were reported.

Medical Surveillance

Justifiable yes

Triggered or Critical Exposure no

Reference:

AGENT HeatExposure Estimate: Exposure Rating: (<10% OEL; 95th %tile <0.1 OEL)Uncertainty: Uncertain

Basis: Qualitative Judgement

Discussion: High heat conditions may be experienced during this task. With the exception of provision of shade, no heat stress prevention measures were reported. Operational constraints such as materials coordination and short cure times may make administrative control difficult to implement.

OEL: Health Effects Rating: Life threatening or disabling injury or illnessExposure Category: Risk/Control Priority: FIG Priority:

Medical Surveillance Justifiable

Triggered or Critical Exposure

Reference:

AGENT NoiseExposure Estimate: Exposure Rating: (>10% OEL; 95th %tile > OEL)Uncertainty: Uncertain

Basis: Qualitative Judgement

Discussion: Exposure to hazardous noise is anticipated for the chip spreader operators. However, degree of hazard has not been determined--sound level data was not available for this equipment.

OEL: Health Effects Rating: Irreversible health effects of concernExposure Category: Risk/Control Priority: FIG Priority:

Medical Surveillance Justifiable

Triggered or Critical Exposure

Reference:

Task: Stage Rock

Crushed rock is hauled from the stock pile to smaller staging pile along the project site. Task requires operation of an articulated loader or backhoe and a dump truck. Approximately 5 minutes are required to load a dump truck. Fifteen to 20 truck loads may be required per stage pile spaced every 3 miles and require about one day to complete the transfer. Later the dump truck must be reloaded for spreading.

Frequency: Duration: Controls:

Loader is fitted with a cab.

Recommendation: **AGENT Noise**Exposure Estimate: Exposure Rating: (<10% OEL; 95th %tile <0.1 OEL)Uncertainty: Uncertain

Basis: Qualitative Judgement

Discussion: Sound level data is not available for this equipment. Newer cabs typically attenuate noise to acceptable levels in this kind of equipment. OEL is not expected to be exceeded for loader and dump truck operators working inside enclosed cabs. Task requires extended shifts.

OEL: Health Effects Rating: Irreversible health effects of concernExposure Category: Risk/Control Priority: FIG Priority:

Medical Surveillance Justifiable

Triggered or Critical Exposure

Reference:

AGENT Particulates, NOC/R	OEL:	5 mg/m3
Exposure Estimate: <input type="text" value=""/> mg/m3	Health Effects Rating:	1 Reversible health effects of concern
Exposure Rating: <input type="text" value="1"/> (<10% OEL; 95th %tile <0.1 OEL)	Exposure Category:	Acceptable
Uncertainty: <input type="text" value="1"/> Uncertain	Risk/Control Priority:	1
Basis: Qualitative Judgement	FIG Priority:	1
Discussion:	Modern cabs are capable of reducing particulate exposures to acceptable levels. Efficacy of cabs was not evaluated. Stock piles are wetted prior to transfer, reducing dust generation. Availability of a cab on the backhoe was not reported.	
Medical Surveillance	Justifiable	no
	Triggered or Critical Exposure	no
	Reference:	

Process: Heavy Equipment Operation

Operate heavy equipment to complete road maintenance requirements.

Operating Conditions:

Task: Operate Dozers

Frequency: Monthly

Case 1150 and Cat D7 dozers are used for rock pit development, to pull grid roller, in fire suppression, for brushing ditches, or used with a ripper to "obliterate " roads. Double hearing protection is used when operating the D7.

Duration: extended shift

Controls:

Equipment is not fitted with cabs.

Recommendation:

AGENT Noise	OEL:	85 dBA
Exposure Estimate: <input type="text" value=""/> dBA	Health Effects Rating:	3 Irreversible health effects of concern
Exposure Rating: <input type="text" value="4"/> (>10% OEL; 95th %tile > OEL)	Exposure Category:	Unacceptable
Uncertainty: <input type="text" value="0"/> Certain	Risk/Control Priority:	12
Basis: Qualitative Judgement	FIG Priority:	0
Discussion:	Exposure is expected to exceed the OEL based on duration of exposure, lack of engineering controls (cabs) and typical high noise levels generated by this type and vintage equipment.	
Medical Surveillance	Justifiable	yes
	Triggered or Critical Exposure	yes
	Reference:	29 CFR 1010.95

AGENT Particulates, NOC/R	OEL:	5 mg/m3									
Exposure Estimate: <input type="text" value=""/> mg/m3	Health Effects Rating:	1 Reversible health effects of concern									
Exposure Rating: <input type="text" value="3"/> (50-100% OEL; 95th %tile 0.5-1.0 OEL	Exposure Category:	Uncertain									
Uncertainty: <input type="text" value="1"/> Uncertain	Risk/Control Priority:	3									
Basis: Qualitative Judgement	FIG Priority:	3									
Discussion: OEL is PEL respirable. Exposure is uncertain. Considering the type of work and duration, along with lack of engineering controls, exposure to particulates, including silica, may at times, approach or exceed the OEL.											
<table border="0"> <tr> <td>Medical Surveillance</td> <td>Justifiable</td> <td>yes</td> </tr> <tr> <td></td> <td>Triggered or Critical Exposure</td> <td>no</td> </tr> <tr> <td></td> <td>Reference:</td> <td></td> </tr> </table>			Medical Surveillance	Justifiable	yes		Triggered or Critical Exposure	no		Reference:	
Medical Surveillance	Justifiable	yes									
	Triggered or Critical Exposure	no									
	Reference:										

Process: Road Grading

Road grading occurs year round on forest and desert roads. There are 4 graders in the fleet; 3 each John Deer 770 ; 1 Cat 14. Roads may be rolled after grading using an Ingersol Rand SD100 steel drum roller.

Operating Conditions:

Task: Operate Grader

Road grading occurs throughout the year on forest and desert roads. There are 4 graders in the fleet; 3 each John Deer 770 ; 1 Cat 14.

Frequency: Daily

Duration: extended shift

Controls:

Surface may be watered prior to and after grading. Graders and roller are fitted with cabs.

Recommendation:

Conduct personal noise dosimetry to validate acceptable exposure. Ensure conditions are representative of actual operations, i.e. cab window and door configuration.

AGENT Noise	OEL:	85 dBA									
Exposure Estimate: <input type="text" value=""/> dBA	Health Effects Rating:	3 Irreversible health effects of concern									
Exposure Rating: <input type="text" value="3"/> (50-100% OEL; 95th %tile 0.5-1.0 OEL	Exposure Category:	Acceptable									
Uncertainty: <input type="text" value="1"/> Uncertain	Risk/Control Priority:	9									
Basis: Engineering Controls in Place	FIG Priority:	9									
Discussion: Sound level data is not available for this equipment. Newer cabs typically attenuate noise to acceptable levels in this kind of equipment. Worker operate graders for extended shifts.											
<table border="0"> <tr> <td>Medical Surveillance</td> <td>Justifiable</td> <td>no</td> </tr> <tr> <td></td> <td>Triggered or Critical Exposure</td> <td>yes</td> </tr> <tr> <td></td> <td>Reference:</td> <td>29 CFR 1010.95</td> </tr> </table>			Medical Surveillance	Justifiable	no		Triggered or Critical Exposure	yes		Reference:	29 CFR 1010.95
Medical Surveillance	Justifiable	no									
	Triggered or Critical Exposure	yes									
	Reference:	29 CFR 1010.95									

AGENT Particulates, NOC/R

OEL: mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: Reversible health effects of concern

Exposure Rating: (10-50% OEL; 95th %tile 0.1-0.5 OEL)

Exposure Category:

Uncertainty: Uncertain

Risk/Control Priority:

Basis: Qualitative Judgement

FIG Priority:

Discussion: OEL is PEL, respirable fraction. Sealed and filtered cabs provide significant control of dust. Road watering as reported is also an effective means of reducing dust generation. Dust accumulation is reported within the cab.

Medical Surveillance Justifiable

Triggered or Critical Exposure

Reference:

Health Risk and Further Information Gathering Priorities

Lakeview District Office

Division, Shop, Project	Process	Task	Agent	Exposure Category	Justified Medical Surveillance	Triggered Surveillance	Health Risk Priority	FIG Priority
Road Maintenance	Chip Sealing	Operate Rubber Tire Roller	Noise	Unacceptable	yes	yes	12	12
Road Maintenance	Chip Sealing	Spread Stone	Noise	Unacceptable	yes	yes	12	12
Road Maintenance	Heavy Equipment Operation	Operate Dozers	Noise	Unacceptable	yes	yes	12	0
Road Maintenance	Road Grading	Operate Grader	Noise	Acceptable	no	yes	9	9
Fleet Maintenance	Periodic Inspection and Service	Inspection	Noise	Uncertain	yes	yes	9	9
Fleet Maintenance	Periodic Inspection and Service	General Shop Operations	Noise	Uncertain	yes	yes	9	9
Fleet Maintenance	Periodic Inspection and Service	Replace Brakes	Methylene chloride	Uncertain	yes	yes	8	16
Fleet Maintenance	Periodic Inspection and Service	Replace Brakes	Tetrachloroethylene	Unacceptable	yes	no	8	16
Road Maintenance	Chip Sealing	Spread Stone	Asphalt Fume	Uncertain	yes	no	4	4
Road Maintenance	Chip Sealing	Spread Stone	Heat	Uncertain	yes	no	4	4
Road Maintenance	Chip Sealing	Operate Rubber Tire Roller	Heat	Acceptable	no	no	4	4
Mining	Abandoned Mine Closure	Foam Application	Methylene bisphenyl isocyanate	Acceptable	no	no	4	4
Road Maintenance	Chip Sealing	Stage Rock	Noise	Acceptable	no	yes	3	3
Mining	Abandoned Mine Closure	Foam Application	Mercury, elemental	Acceptable	no	no	3	3
Road Maintenance	Heavy Equipment Operation	Operate Dozers	Particulates, NOC/R	Uncertain	yes	no	3	3
Road Maintenance	Chip Sealing	Operate Broom	Noise	Uncertain	yes	yes	3	3
Road Maintenance	Asphalt Patching.	Operate Hydraulic Broom	Noise	Uncertain	yes	yes	3	3
Fleet Maintenance	Collision Repair	Weld Mild Steel	Noise	Acceptable	no	yes	3	3
Road Maintenance	Chip Sealing	Operate Steel Drum Roller	Noise	Acceptable	no	yes	3	3
Road Maintenance	Asphalt Patching.	Operate Grader	Noise	Acceptable	no	yes	3	3
Road Maintenance	Asphalt Patching.	Operate Steel Drum Roller	Noise	Acceptable	no	yes	3	3
Road Maintenance	Chip Sealing	Operate Rubber Tire Roller	Diesel engine emissions	Uncertain	yes	no	2	2
Road Maintenance	Road Grading	Operate Grader	Particulates, NOC/R	Acceptable	no	no	2	2
Fleet Maintenance	Bat Gate Fabrication	Weld Steel and Galvanized	Zinc oxide fume	Acceptable	no	no	2	2
Fleet Maintenance	Periodic Inspection and Service	Replace Fuel Pump	Gasoline	Acceptable	no	no	2	0
Road Maintenance	Chip Sealing	Stage Rock	Particulates, NOC/R	Acceptable	no	no	1	1

Division, Shop, Project	Process	Task	Agent	Exposure Category	Justified Medical Surveillance	Triggered Surveillance	Health Risk Priority	FIG Priority
Road Maintenance	Chip Sealing	Operate Broom	Particulates, NOC/R	Acceptable	no	no	1	1
Fleet Maintenance	Periodic Inspection and Service	Inspection	Particulates, NOC/R	Acceptable	no	no	1	1
Fleet Maintenance	Periodic Inspection and Service	Rebuild Transmission	Stoddard solvent	Uncertain	yes	no	1	1
Road Maintenance	Asphalt Patching.	Operate Hydrolic Broom	Particulates, NOC/R	Acceptable	no	no	1	1
Road Maintenance	Asphalt Patching.	Manual Patch Application and Brooming	Particulates, NOC/R	Acceptable	no	no	1	1
Fleet Maintenance	Collision Repair	Weld Mild Steel	Welding fume, NOS	Acceptable	no	no	1	0
Fleet Maintenance	Bat Gate Fabrication	Weld Steel and Galvanized	Welding fume, NOS	Acceptable	no	no	1	0
Fleet Maintenance	Periodic Inspection and Service	Change Oil	Lubricants; oil, grease	Acceptable	no	no	0	0
Fleet Maintenance	Periodic Inspection and Service	Rebuild Transmission	Lubricants; oil, grease	Acceptable	no	no	0	0
Fleet Maintenance	Periodic Inspection and Service	Inspection	Lubricants; oil, grease	Acceptable	no	no	0	0