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8 August 2010

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 the Richfield Field 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 12 March 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/DoIeA4TR.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: Richfield Office Occupational Exposure Assessment

Richfield Field Office
Occupational Exposure Assessment and Medical Surveillance Inclusion
For
Department of Interior, Safety Council/Office of Health and Safety
On-site: 12 March 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 exposures[1].

An on-site visit to the Richfield Field Office was conducted on 12 March 2010 by David P. Bleicher, CIH to characterized 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 categorized 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
8 August 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

Richfield Office

Support Services Division

Process: *Aluminum Fabrication and Repair*

Aluminum welding projects using MIG welding include tool box; fabrication and for vehicles, storage boxes, repair ATV ramps; fabrication of frost free water troughs. Twelve to fourteen projects may be completed in a year, each project requiring from 1 hour to a full shift to complete.

Operating Conditions:

All aluminum welding projects are conducted in the workshop.

Task: Weld Aluminum

Frequency:

Duration:

Welding aluminum using MIG welding. May use a stainless steel wire brush on a high speed grinder to clean surfaces. All work conducted in the workshop, on the work bench, shop floor on saw horses or on vehicle. Duration is 1 hour to full shift for project completion.

Controls:

Local exhaust ventilation available at the bench with hood reportedly placed within 18 inches of work.

Recommendation:

AGENT Aluminum

OEL:	1 mg/m3		
Exposure Estimate:	mg/m3	Health Effects Rating:	2 Severe, reversible health effects of concern
Exposure Rating:	2 (10-50% OEL; 95th %tile 0.1-0.5 OEL)	Exposure Category:	Uncertain
Uncertainty:	1 Uncertain	Risk/Control Priority:	4
Basis:	Available Literature	FIG Priority:	4

Discussion: Literature reports median aluminum exposure of studied welders in industrial settings as 1.4 mg/m3. In contrast with heavy industrial settings, projects conducted at this facility are expected to be smaller, generally of shorter duration with the worker conducuting numerous tasks such as layout and cutting in addition to welding.

Medical Surveillance

Justifiable	yes
Triggered or Critical Exposure	no
Reference:	

Process: *Galvanized Metal Fabrication and Repair*

Fabricate and repair spring boxes, head boxes, piping, gates, fences, equipment (such as stress cracks repair and build up metal), troughs, culverts

Operating Conditions:

Work is conducted in welding shops and at remote sites. An adjacent to overhead door is reportedly opened while welding in the shop. An auxilliary fan within the shop aids air circulation during welding, grinding, and cleanup.

Task: Galvanized Welding Indoors

Frequency:

Duration: 1 - 4 hours

Welding projects involving galvanized steel are conducted within the workshop on a work bench or on saw horses. Process typically uses 7018 rod. A typical job is building pipe gates which may require 1/2 day.

Controls:

In the shop area an axial fan enhances general dilution ventilation. Work is conducted adjacent to an overhead door which typically remains open during work. Lincoln brand local exhaust ventillation is available.

Recommendation:

AGENT Heat

OEL:

Exposure Estimate:

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

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

Exposure Category: Uncertain

Uncertainty: 1 Uncertain

Risk/Control Priority: 4

Basis: Qualitative Judgement

FIG Priority: 4

Discussion: Risk of heat strain due to high environmental heat conditions can be exacerbated by PPE used during this task. Duration of task requiring heavy leather PPE is1-4 hours. Metabolic heat generation during this task is moderate. Monitoring of environment or workers was not reported.

Medical Surveillance

Justifiable yes

Triggered or Critical Exposure no

Reference:

AGENT Ultraviolet radiation

OEL:

Exposure Estimate:

Health Effects Rating: 3 Irreversible health effects of concern

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

Exposure Category: Unacceptable

Uncertainty: 0 Certain

Risk/Control Priority: 12

Basis: Qualitative Judgement

FIG Priority: 0

Discussion: Ultraviolet radiation (UV) is generated by the electric arc in the welding process. Skin exposure to UV can result in severe burns, in many cases without prior warning. UV radiation can also damage the lens of the eye. Barrier protections available and used provide adequate protection to control exposure to this agent.

Medical Surveillance

Justifiable yes

Triggered or Critical Exposure no

Reference:

AGENT Zinc Oxide fume

OEL: 10 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: Screening Measurement

FIG Priority: 2

Discussion: OEL is STEL (10 mg/m3 respirable fraction). Short term personal sampling during simulated typical indoor welding job produced 1.1 mg/m3 total Zn. Past symptoms of zinc fume fever have been reported by workers.

Medical Surveillance

Justifiable: no

Triggered or Critical Exposure: no

Reference:

Task: Galvanized Welding Outdoors

Frequency: Bi-Annually

Duration: 4 - 8 hours

Welding projects involving galvanized steel are conducted at field sites. Process typically uses 7018 rod. Typical jobs include installing pipe gates; fence and gate fabriction and assembly (which may require 1-2 days over a 1 week period; welding galvanized fittings into troughs and spring boxes (which may require 3-4 hours and occur 2-3 time each year.

Controls:

Recommendation:

Consider application of ACGIH WBGT threshold values for management of heat stress and prevention of heat strain.

AGENT Heat

OEL:

Exposure Estimate:

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: 1 Uncertain

Risk/Control Priority: 8

Basis: Qualitative Judgement

FIG Priority: 8

Discussion: Risk of heat strain due to high environmental heat conditions can be exacerbated by PPE used during this task. Duration of task requiring heavy leather PPE is 4-8 hours. Metabolic heat generation during this task is moderate. Monitoring of environment or workers was not reported.

Medical Surveillance

Justifiable: yes

Triggered or Critical Exposure: no

Reference:

AGENT Ultraviolet radiation

OEL:			
Exposure Estimate:		Health Effects Rating:	3 Irreversible health effects of concern
Exposure Rating:	4 (>10% OEL; 95th %tile > OEL)	Exposure Category:	Unacceptable
Uncertainty:	0 Certain	Risk/Control Priority:	12
Basis:	Qualitative Judgement	FIG Priority:	0

Discussion: Ultraviolet radiation (UV) is generated by the electric arc in the welding process. Skin exposure to UV can result in severe burns, in many cases without prior warning. UV radiation can also damage the lens of the eye. Barrier protections available and used provide adequate protection to control exposure to this agent.

Medical Surveillance

Justifiable	yes
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:	2 (10-50% OEL; 95th %tile 0.1-0.5 OEL)	Exposure Category:	Acceptable
Uncertainty:	1 Uncertain	Risk/Control Priority:	4
Basis:	Screening Measurement	FIG Priority:	4

Discussion: OEL is TWA (5 mg/m3 respirable fraction). Short term personal sampling during simulated typical outdoor welding job produced 4.7 mg/m3 Zn in the total fraction. Exposure will vary depending on duration of job and time spent actually welding and generating Zinc fume. Past symptoms of zinc fume fever have been reported by workers.

Medical Surveillance

Justifiable	no
Triggered or Critical Exposure	no
Reference:	

Task: Grind Galvanized Coating

Frequency: Quarterly

Duration: 1 - 4 hours

Use grinder to remove galvanized coating approximately 2 inches from welding work. Task is conducted infrequently on a project basis.

Controls:

In the shop area an axial fan enhances general dilution ventilation. Work is conducted adjacent to an overhead door which typically remains open during work. Lincoln brand local exhaust ventillation is available.

Recommendation:

AGENT Noise

OEL: 85 dBA

Exposure Estimate: dBA

Health Effects Rating: 3 Irreversible health effects of concern

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

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 6

Basis: Qualitative Judgement

FIG Priority: 6

Discussion: Sound levels produced by grinders during similar tasks may exceed 90 dBA. Base of limited duration of this task, OEL is not expected to be exceeded, especially for shorter duration projects.

Medical Surveillance

Justifiable no

Triggered or Critical Exposure yes

Reference: 29 CFR 1010.95

AGENT Zinc (Zn)

OEL: 10 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 STEL (10 mg/m3 respirable fraction). Task involves high speed, but coarse grinding. Particulate size not determined, but expected to have a relatively low percentage respirable fraction. Actual grinding duration is short.

Medical Surveillance

Justifiable no

Triggered or Critical Exposure no

Reference:

Process: *Heavy Equipment Operation*

Operate a variety of heavy equipment including dozers, graders, back hoes to complete a number of tasks or "dirt work" in support of field office missions.

Operating Conditions:

Work is conducted outdoors, year round in conditions that may be very dusty. Some pieces of equipment environmental cabs with heating and ac but without Hepa filtration.

Task: Chaining

Frequency: Annually

Duration: extended shift

trees, primarily pinion juniper, and brush, principally sage, are knocked down after natural fire as a fire rehabilitation measure. Two dozers, a D7 and a D6 (or on occasion a leased D8) with a heavy chain rigged between them are used. The task may occur annually and require approximately one month of 10 hour shifts for the operators.
D6 does not have enviro-cab--heat and ac is available but cab not sealed to stop dust infiltration.

Controls:

Environmental cabs with are available on D7 and D8 dozers used. The D6 has a more loosely fitting, cab that supplies heat and air conditioning, but is reportedly not sealed to stop dust infiltration.

Recommendation:

AGENT Noise

Exposure Estimate:	dBA	OEL:	85 dBA
Exposure Rating:	4 (>10% OEL; 95th %tile > OEL)	Health Effects Rating:	3 Irreversible health effects of concern
Uncertainty:	1 Uncertain	Exposure Category:	Unacceptable
Basis:	Qualitative Judgement	Risk/Control Priority:	12
		FIG Priority:	12

Discussion: No indication of threshold shift in limited audiometric data. Sound level data was not available for the various pieces of equipment of different vintage. Older equipment of this type frequently exceeds 90 dBA and this task may be conducted over multiple shifts. Environemtal cabs such as those reportedly fitted on D7 and D8 dozer may provide equipment noise control to below 90 dBA. Profile exposure rating based on operation of D6 (worst case) equipment.

Medical Surveillance

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

AGENT Particulates, NOS

Exposure Estimate:	mg/m3	OEL:	5 mg/m3
Exposure Rating:	1 (<10% OEL; 95th %tile <0.1 OEL)	Health Effects Rating:	1 Reversible health effects of concern
Uncertainty:	1 Uncertain	Exposure Category:	Acceptable
Basis:	Qualitative Judgement	Risk/Control Priority:	1
		FIG Priority:	1

Discussion: Heavy dust accumulations within cabs was reported. Dust infiltration variable and related to vintage of the equipment. Environmental cabs such as those reported for D7 and D8 dozers are capable of reducing particulate levels to acceptable levels when used properly. Particulate exposures while operating D6 dozer are uncertain.

Medical Surveillance

Justifiable	no
Triggered or Critical Exposure	no
Reference:	

AGENT Pollen

Exposure Estimate:		OEL:	
Exposure Rating:	1 (<10% OEL; 95th %tile <0.1 OEL)	Health Effects Rating:	1 Reversible health effects of concern
Uncertainty:	0 Certain	Exposure Category:	Acceptable
Basis:	Qualitative Judgement	Risk/Control Priority:	1
		FIG Priority:	0

Discussion: Exposure to pollen and dust from organic vegetation may cause various allergic and non-allergic health disturbances, including asthma, dermal disorders, fever reactions, and airway obstruction and inflammation. Studies have shown link between worker productivity and allergic rhinitis. Total particulate expsoure may provide an indicator of exposure to pollen and other allergens, but may show seasonal variability. Environmental cabs such as those reported for D7 and D8 dozers are capable of reducing total particulate and pollen levels to acceptable levels when used properly. Particulate exposures while operating D6 dozer are uncertain.

Medical Surveillance

Justifiable	no
Triggered or Critical Exposure	no
Reference:	

AGENT Silica, crystalline quartz

OEL: 25 ug/m3

Exposure Estimate: ug/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: Heavy dust accumulations within cabs was reported. Dust concentrations, which may include varying concentrations of silica, infiltrating the cab are variable and related to the vintage of the equipment. OEL is TLV (25 ug/m3 respirable fraction). Environmental cabs such as those reported for D7 and D8 dozers are capable of reducing total particulate, and silica levels to acceptable levels when used properly. Particulate exposures while operating D6 dozer are uncertain.

Medical Surveillance

Justifiable: no

Triggered or Critical Exposure: no

Reference:

Task: Operate Backhoe

Frequency: Daily

Duration: 4 - 8 hours

Operate backhoe to dig a trench from pipeline to water trough, backfill, and bury "frost free" trough (mound soil above). Task requires less than 8 hours per day. Total duration of the project may be 2 weeks. Frequency of the jobs was not determined.

Controls:

Recommendation:

AGENT Noise

OEL: 85 dBA

Exposure Estimate: dBA

Health Effects Rating: 3 Irreversible health effects of concern

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

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 6

Basis: Qualitative Judgement

FIG Priority: 6

Discussion: No indication of threshold shift in limited audiometric data. Sound level data was not available for this piece of equipement. Environmental cab reported.

Medical Surveillance

Justifiable: no

Triggered or Critical Exposure: yes

Reference: 29 CFR 1010.95

AGENT Particulates, NOS

OEL: 5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 1 Reversible health effects of concern

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

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 2

Basis: Qualitative Judgement

FIG Priority: 2

Discussion: Dust infiltration variable and related to vintage of the equipment. Environmental cabs reported. Such cabs are capable of reducing particulate levels to acceptable levels when used properly.

Medical Surveillance

Justifiable: no

Triggered or Critical Exposure: no

Reference:

Task: Operate Road Grader

Frequency: Daily

Duration: extended shift

Road grader is used to cut ditches and shape and grade road beds. Task is conducted seasonally for 2-3 months per year. Approximately half of the work is conducted in the spring and the remaining is conducted in the fall. During these periods work is conducted daily for full shifts.

Controls:

Equipment equiped with environmental cab equiped to condition and filter air within the cab.

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: 0 Certain

Risk/Control Priority: 3

Basis: Engineering Controls in Place

FIG Priority: 0

Discussion: No indication of threshold shift in limited audiometric data. Sound level data was not available for this piece of equipement. The various pieces of equipment of different vintage to evaluate noise control afforded by cabs. Older equipment of this type frequently exceeds 90 dBA and this task may be conducted over multiple shifts. Environemtal cabs such as those reportedly fitted on D7 and D8 dozer may provide equipment noise control to below 90 dBA. Profile exposure rating based on operation of D6 (worst case) equipment.

Medical Surveillance

Justifiable: no

Triggered or Critical Exposure: yes

Reference: 29 CFR 1010.95

AGENT Particulates, NOS

OEL: 5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 1 Reversible health effects of concern

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

Exposure Category: Acceptable

Uncertainty: 0 Certain

Risk/Control Priority: 2

Basis: Engineering Controls in Place

FIG Priority: 0

Discussion: Enviro cabs reportedly effective (i.e. there is less dust accumulation compared with cabs in older equipment), still, workers reported dusty coveralls at the end of the day. When used properly environmental cabs are capable of reducing particulate levels to acceptable levels.

Medical Surveillance

Justifiable: no

Triggered or Critical Exposure: no

Reference:

AGENT Silica, crystalline quartz — OEL: 25 ug/m3

Exposure Estimate: ug/m3 — Health Effects Rating: 3 Irreversible health effects of concern

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

Uncertainty: 0 Certain — Risk/Control Priority: 6

Basis: Engineering Controls in Place — FIG Priority: 0

Discussion: Heavy dust accumulations within cabs was reported. Dust concentrations, which may include varying concentrations of silica, infiltrating the cab are variable and related to the vintage of the equipment. OEL is TLV (25 ug/m3 respirable fraction). Environmental cabs are capable of reducing total particulate, and silica levels to acceptable levels when used properly. OEL is not expected to be exceeded under the conditions reported.

Medical Surveillance

Justifiable: no

Triggered or Critical Exposure: no

Reference:

Task: Pipe laying,

Frequency: Annually

Duration: 4 - 8 hours

D6 dozer with a ripper tooth attachment is used to rip slit with pipe is laid immediately behind. Pipe spool is attached to the front of the dozer. Jobs may require consecutive full shifts over a two week period. Pipe is laid at the rate of up to 1 mile per day is a good day. Other dozers may be used to complete this task.

Controls:

Vintage cabs on some pieces of equipment may be supplied with heating and air conditioning by not filtration.

Recommendation:

AGENT Noise — OEL: 85 dBA

Exposure Estimate: dBA — Health Effects Rating: 3 Irreversible health effects of concern

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

Uncertainty: 1 Uncertain — Risk/Control Priority: 12

Basis: Qualitative Judgement — FIG Priority: 12

Discussion: No indication of threshold shift in limited audiometric data. Sound level data was not available for the various pieces of equipment of different vintage to evaluate noise control afforded by cabs. Older equipment of this type frequently exceeds 90 dBA and this task may be conducted over multiple shifts. Environemtal cabs such as those reportedly fitted on D7 and D8 dozer may provide equipment noise control to below 90 dBA. Profile exposure rating based on operation of D6 (worst case) equipment.

Medical Surveillance

Justifiable: yes

Triggered or Critical Exposure: yes

Reference: 29 CFR 1010.95

AGENT Particulates, NOS

OEL: 5 mg/m3

Exposure Estimate: mg/m3

Health Effects Rating: 1 Reversible health effects of concern

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

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 2

Basis: Qualitative Judgement

FIG Priority: 2

Discussion: Heavy dust accumulations within cabs was reported. Dust concentrations infiltrating the cab are variable and related to the vintage of the equipment. OEL is TLV (5 mg/m3 respirable fraction). Environmental cabs such as those reported for D7 dozer are capable of reducing total particulate concentrations to acceptable levels when used properly. Particulate exposure while operating D6 dozer is uncertain, but is not expected to to exceed the OEL under the conditions reported.

Medical Surveillance

Justifiable: no

Triggered or Critical Exposure: no

Reference:

AGENT Silica, crystalline quartz

OEL: 25 ug/m3

Exposure Estimate: ug/m3

Health Effects Rating: 3 Irreversible health effects of concern

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

Exposure Category: Acceptable

Uncertainty: 1 Uncertain

Risk/Control Priority: 6

Basis: Qualitative Judgement

FIG Priority: 6

Discussion: Heavy dust accumulations within cabs was reported. Dust concentrations, which may include varying concentrations of silica, infiltrating the cab are variable and related to the vintage of the equipment. OEL is TLV (25 ug/m3 respirable fraction). Environmental cabs such as those reported for D7 dozer are capable of reducing total particulate, and silica levels to acceptable levels when used properly. Particulate exposure while operating D6 dozer is uncertain, but is not expected to to exceed the OEL under the conditions reported.

Medical Surveillance

Justifiable: no

Triggered or Critical Exposure: no

Reference:

Process: *Mix and Pour Concrete*

Small concrete projects such as construction of pads and foundations are conducted using bagged "sakcrete" sand and portland cement mixture and an electric powered mixer. Cement is mixed in batches of three 90 pound bags per batch. When projects require more than 3 yards of concrete it is delivered, pre-mixed, to the site. Cement is poured, screed, and floated.

Operating Conditions:

Work is conducted at field sites.

Task: Mix Concrete.

Frequency: Bi-Annually

Duration: 1/2 - 1 hour

Dry concrete in 90 pound bags is added to an electric mixer, then water added. Typically 1-2 jobs are conducted each year. For general concrete work no PPE is used. Wildland firefighters are enlisted to assist in the pouring and finishing work for larger projects.

Controls:

Recommendation:

AGENT portland cement

OEL: 5 mg/m3

Exposure Estimate: 0 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: 0 Certain

Risk/Control Priority: 2

Basis: Qualitative Judgement

FIG Priority: 0

Discussion: PEL and REL are 5 mg/m3 respirable, while TLV is 1 mg/m3 respirable. Task is conducted infrequently and for a short duration. OELs are not expected to be exceeded during these short exposures. Dry portland cement presents less of a caustic skin exposure hazard than wet cement.

Medical Surveillance

Justifiable no

Triggered or Critical Exposure no

Reference:

Task: Pour and Finish Concrete

Frequency: Bi-Annually

Duration: 1 - 4 hours

Concrete that has been either delivered ready mixed or mixed on site is poured, screed and floated.

Controls:

Recommendation:

Ensure barrier protections are used, especially hands, to protect exposed skin from contact with wet portland cement.

AGENT Portland cement

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: 0 Certain

Risk/Control Priority: 2

Basis: Qualitative Judgement

FIG Priority: 0

Discussion: Wet portland cement is caustic, abrasive, and will absorb water from the skin. Deep and severe burns can result from prolonged contact. Considering the short and infrequent duration of cement projects, dermatitus should not be unexpected but is likely to be mild and reversible. Barrier protection for hands was not reported.

Medical Surveillance

Justifiable no

Triggered or Critical Exposure no

Reference:

Health Risk and Further Information Gathering Priorities

Richfield Office

Division, Shop, Project	Process	Task	Agent	Exposure Catagory	Justified Medical Surveillance	Triggered Surveillance	Health Risk Priority	FIG Priority
Support Services Division	Heavy Equipment Operation	Chaining	Noise	Unacceptable	yes	yes	12	12
Support Services Division	Heavy Equipment Operation	Pipe laying,	Noise	Unacceptable	yes	yes	12	12
Support Services Division	Galvanized Metal Fabrication and Repair	Galvanized Welding Outdoors	Ultraviolet radiation	Unacceptable	yes	no	12	0
Support Services Division	Galvanized Metal Fabrication and Repair	Galvanized Welding Indoors	Ultraviolet radiation	Unacceptable	yes	no	12	0
Support Services Division	Galvanized Metal Fabrication and Repair	Galvanized Welding Outdoors	Heat	Uncertain	yes	no	8	8
Support Services Division	Galvanized Metal Fabrication and Repair	Grind Galvanized Coating	Noise	Acceptable	no	yes	6	6
Support Services Division	Heavy Equipment Operation	Operate Backhoe	Noise	Acceptable	no	yes	6	6
Support Services Division	Heavy Equipment Operation	Pipe laying,	Silica, crystalline quartz	Acceptable	no	no	6	6
Support Services Division	Heavy Equipment Operation	Operate Road Grader	Silica, crystalline quartz	Acceptable	no	no	6	0
Support Services Division	Galvanized Metal Fabrication and Repair	Galvanized Welding Outdoors	Zinc oxide fume	Acceptable	no	no	4	4
Support Services Division	Galvanized Metal Fabrication and Repair	Galvanized Welding Indoors	Heat	Uncertain	yes	no	4	4
Support Services Division	Aluminum Fabrication and Repair	Weld Aluminum	Aluminum	Uncertain	yes	no	4	4
Support Services Division	Heavy Equipment Operation	Chaining	Silica, crystalline quartz	Acceptable	no	no	3	3
Support Services Division	Heavy Equipment Operation	Operate Road Grader	Noise	Acceptable	no	yes	3	0
Support Services Division	Galvanized Metal Fabrication and Repair	Galvanized Welding Indoors	Zinc Oxide fume	Acceptable	no	no	2	2
Support Services Division	Heavy Equipment Operation	Pipe laying,	Particulates, NOS	Acceptable	no	no	2	2
Support Services Division	Galvanized Metal Fabrication and Repair	Grind Galvanized Coating	Zinc (Zn)	Acceptable	no	no	2	2
Support Services Division	Heavy Equipment Operation	Operate Backhoe	Particulates, NOS	Acceptable	no	no	2	2
Support Services Division	Mix and Pour Concrete	Mix Concrete.	portland cement	Acceptable	no	no	2	0
Support Services Division	Mix and Pour Concrete	Pour and Finish Concrete	Portland cement	Acceptable	no	no	2	0
Support Services Division	Heavy Equipment Operation	Operate Road Grader	Particulates, NOS	Acceptable	no	no	2	0
Support Services Division	Heavy Equipment Operation	Chaining	Particulates, NOS	Acceptable	no	no	1	1
Support Services Division	Heavy Equipment Operation	Chaining	Pollen	Acceptable	no	no	1	0