



Occupational Health and Safety Branch

Mining Sector Plan

2010-2011

Safe At Work Ontario
Enforcement > Compliance > Partnership >

Ministry of Labour

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Introduction

Safe At Work Ontario is the Ministry of Labour's (MOL) strategy for enforcing the Occupational Health and Safety Act (OHSA) and its regulations. As part of *Safe At Work Ontario*, MOL develops annual sector-specific enforcement plans that focus on hazards and outline what inspectors will be looking for during an inspection. This Mining Sector Plan outlines the MOL's strategy to protect Ontario's mine workers from occupational injury and illness.

There have been significant changes to the OHSA with regards to workplace violence and harassment that will take effect on June 15, 2010. As well, amendments to the Control of Exposure to Biological or Chemical Agents Regulation (O. Reg. 833/90) change occupational exposure limits for 36 hazardous chemical substances; these come into force on July 1, 2010.

These can be reviewed at the following link:

www.e-laws.gov.on.ca/navigation?file=browseStatutes&reset=yes&menu=browse&lang=en.

Because on occasion there will be work done on mining sites that falls under the Industrial or Construction classification, it may be useful to be aware of current health and safety concerns and MOL enforcement activities for these sectors. They can be viewed at this link:

www.labour.gov.on.ca/english/hs/sawo/sectorplans/index.php.

The mining sector

The mining sector in Ontario is varied in terms of location, setting and activity. It is characterized by both large and small firms and includes unionized and non-unionized workplaces. It comprises both underground and surface operations as well as processing plants including mills, smelters and refineries. This sector also includes sand and gravel operations, mineral exploration sites and oil and gas extraction facilities.

The mining sector consists of the following key sub-sectors:

- **Underground mines** – Includes ramp or shaft (conveyance) access mines and can involve a variety mining methods such as bulk or narrow-vein mining
- **Open pit mines and quarries** – Surface operations that typically involve large scale drilling, blasting, sizing and trucking
- **Sand and gravel operations** – Range in size from small open pits to large scale operations with hundreds of pieces of mobile equipment. Typically, these operations do not involve blasting
- **Mineral exploration sites** – Surface operations that typically involve diamond drilling and bulk sampling to determine ore reserve potential
- **Mining plants** – Includes mills, blast furnaces, smelters and refineries
- **Oil and gas extraction sites and facilities** – Includes site and facilities both on land and on water

The number of workers registered under each sub-sector of the mining sector between 2006 and 2009 is shown in the table below. (MOL MIS/INB Data).

Sub-sector	2006	2007	2008	2009
Assay laboratories	794	799	816	825
Diamond drilling	1,021	1,242	1,385	1,514
Mills	1,710	2,645	2,645	2,643
Oil and natural gas	779	815	831	876
Open pit mines	889	946	966	967
Quarries	5,755	5,996	6,091	6,114
Sand and gravel pits	11,547	11,979	12,145	12,431
Refineries	928	1,008	1,008	1,008
Smelters	1,285	1,330	1,330	1,330
Surface plants	7,601	7,731	8,020	8,821
Underground mines	13,189	13,563	13,532	15,582

The number of premises registered under each sub-sector the mining sector between 2006 and 2009 is shown in the table below. (MOL MIS/INB Data).

Sub-sector	2006	2007	2008	2009
Assay laboratories	61	62	66	68
Diamond drilling	204	256	288	322
Mills	37	39	39	38
Oil and natural gas	361	368	372	384
Open pit mines	84	92	96	96
Quarries	770	838	848	860
Sand and gravel pits	5,601	5,709	5,735	5,837
Refineries	9	10	10	10
Smelters	6	7	7	7
Surface plants	156	164	177	179
Underground mines	183	197	205	222

MOL's compliance focus in mining for 2010-2011

Partnerships: a key success factor

The MOL is one of several partners in the health and safety system in Ontario focused on preventing and reducing injuries and illnesses. The MOL's Mining Health and Safety Program (MHSP) works collaboratively with a number of external and internal partners to improve health and safety.

Through the Sector Inter-agency Group (SIG), the MHSP meets regularly with representatives from the Workplace Safety North (WSN) and the Workplace Safety Insurance Board (WSIB). This group provides a forum to share concerns and develop and coordinate solutions to issues as they arise in the field.

One of the most prominent partnerships that the MHSP is involved in is the Mining Legislative Review Committee (MLRC). The MLRC is a committee established under Section 21 of the OHSA to provide advice to the Minister of Labour (the Minister) on health and safety in the mining sector. Meeting regularly, the MLRC allows for dialogue on safety concerns between industry management and labour and submits joint recommendations to the Minister for improvements.

Compliance: intervention based on need

Some businesses require focused enforcement intervention up to and including prosecution to deter non-compliance. While these firms are not the majority of businesses in Ontario, the MOL will continue to pay particular attention to them.

Other mining industry firms require tools, information, and education on compliance. MOL is one of several partners in the occupational health and safety system in Ontario focused on preventing and reducing workplace injuries and illnesses. The various health and safety associations (HSAs) are the system partners tasked with providing educational services to workplace parties and WSN provides a wide selection of materials for education and training, as well as on-site training when desired. Mining inspectors may refer workplaces to WSN for assistance.

The Internal Responsibility System: fostering a culture of safety

The MOL has a primary responsibility to ensure that workplaces comply with the OHSA and associated regulations. This includes ensuring that a strong Internal Responsibility System (IRS) is in place that will foster a sustained culture of workplace health and safety. One of the indicators of a sound IRS is a well-functioning Joint Health and Safety Committee (JHSC), where required.

A strong health and safety workplace culture consists of:

- **Competence** (appropriate knowledge and training, systems for responding to events, a properly functioning JHSC and other IRS components);
- **Commitment** (demonstration by the employer of leadership on safety, appropriate policies and procedures to protect workers, low tolerance for poor health and safety practices, insistence upon full compliance); and
- **Capacity** (adequate resources for preventing injuries, and a good system for obtaining assistance from HSAs and the WSIB).

A strong IRS produces a strong culture of health and safety. Strong leadership by senior executives and other managers sets the tone and establishes a corporate culture that nurtures the IRS. A health and safety culture requires all work place parties to pay constant and appropriate attention to workplace health and safety.

A sustainable workplace health and safety culture needs a strong commitment by everyone to prevent injuries and illness and to reduce risk.

The functioning of the IRS in mining establishments will be a key focus of inspections undertaken by the MHSP.

Enforcement focus: targeted enforcement to maximize impact

The following enforcement plan outlines the *Safe at Work Ontario* enforcement strategy that will be executed by MHSP inspectors for those hazards that are specific to the MHSP.

The MHSP inspectors are designated MOL health and safety inspectors. Beyond the proactive work that will be carried out by these inspectors through *Safe at Work Ontario*, it should be noted that the overall work plan for the MHSP inspectors also includes reactive work in the form of investigations.

Injury rates and chronic violators

Workplaces that have higher than average lost-time injury (LTI) rates are the focus of inspections in the mining sector this year.

Special enforcement focus for 2010-2011

Mining sector heightened enforcement campaigns (blitzes)

Heightened enforcement campaigns afford a stronger, focused enforcement and awareness opportunity on key hazards and prevention approaches. These allow inspectors to focus on very specific health and safety issues unique to the sector, while also promoting general compliance. They also raise awareness at the workplace level to encourage regular compliance.

In June 2010, the MHSP will embark on a campaigns focused on mobile equipment used both in underground and surface mines. Mobile equipment mainly involves motor vehicles used for both surface and underground mining operations. These vehicles can include “load-haul-dump equipment” (scoop trams, loaders), trucks, tractors, tracked vehicles, motor vehicles running on rails (but not locomotives) and drilling equipment.

More than one-third of fires in underground mines in 2008 were caused by mobile equipment problems or defects. In total, 26 of 74 fires were blamed on these hazards. The fires were caused by:

- material or fluid coming in contact with hot equipment surfaces, hot exhaust or engine parts; or
- faulty electrical wiring resulting in short circuits, overloaded circuits and battery compartment fires.

In addition to fires, mobile equipment hazards resulted in 31 incidents over the past 10 years, including collisions, or near collisions. Most involved mobile equipment hitting another vehicle or worker, or nearly missing them, and all occurred underground.

Mobile equipment hazards are being proactively targeted because of a number deaths and near misses. According to MOL records 15 deaths have occurred involving mobile equipment. These hazards are also being targeted because of the importance of keeping equipment well maintained. Inspectors will take enforcement action as appropriate to any contraventions found under the OHSA and its regulations.

MHSP inspectors will target surface and underground mines:

- identified as being high-priority due to possible lifting devices and forklift hazards;
- known to have highly hazardous processes and equipment;
- where complaints have been received; and
- where there is a poor compliance history.

Inspectors will focus on the following key mobile equipment priorities:

- **Mobile equipment related systems:** Inspectors will check the condition of equipment, including brakes, lights, steering and other safety components to ensure they are being properly maintained. They will ensure equipment is being maintained to prevent a fire hazard that can be caused by an accumulation of oil, grease or other flammable material and substandard electrical wiring.
- **Diesel emission tests:** Inspectors will ensure employers are performing emission tests on diesel-powered underground mobile equipment, as required by Section 183.2 of Regulation 854, the Regulations for Mines and Mining Plants (the Mining Regulation).
- **Locking out and tagging:** Inspectors will check to ensure power sources to mobile equipment are being locked and tagged when maintenance and repair work is being performed, as required by Section 185 of the Mining Regulation. These “locking out and tagging” procedures include shutting down equipment, using an energy isolating device so that all energy sources are disconnected or isolated from the equipment, releasing stored energy in the machine, and placing a lock and tag on the energy isolating device. These procedures must be performed whenever workers are installing, servicing, maintaining or removing any type of machinery, equipment, or components. This is to ensure workers do not work on live, energized equipment and that equipment does not unexpectedly start-up or release stored energy while being worked on.

In the third quarter of 2010, MHSP inspectors will undertake another heightened enforcement campaign that will focus on the use of personal protective equipment both in underground and surface mines. The emphasis of this campaign will be to ensure that personal protective equipment is in good condition and effective, and that clothing and hard hats are fitted with reflective materials.

The need for reflective materials exists not only in underground mines, but also in surface mines that operate night shifts. Recommendations by juries at coroner’s inquests into fatalities that have occurred in mines have identified the requirement for personal protective equipment relied upon by mine workers to be fitted with reflective materials.

Also in the third quarter of 2010, MHSP inspectors will participate in a cross program heightened enforcement campaign being conducted in the Health Care, Construction, Mining and Industrial Programs which will focus on Musculoskeletal Disorder (MSD) hazards. In the mining sector, close attention will be paid to the handling of drills and drill rods. Other aspects that will come under inspector scrutiny include; MSD hazard awareness training, proper lifting technique training, ergonomic design of drill rod storage, and suitable work floor conditions for moving or handling equipment.

Injury and illness trends

Lost-time injury (LTI) rates between 2006 and 2008 in the mining sector are shown in the table below for several mining sub-sectors. (WSIB Data)

Sub-sector	LTI Rate in 2006	LTI Rate in 2007	LTI Rate in 2008
Oil and natural gas	7.79	0	2.07
Quarries	1.88	2.02	1.95
Underground mines	1.17	1.11	0.96

The numbers of fatalities reported to the MOL between 2006 and 2009 for various mining sub-sectors are shown in the table below. (MOL INB/MIS Data).

Sub-sector	2006	2007	2008	2009
Assay laboratories	0	0	0	0
Diamond drilling	0	0	0	0
Mills	0	0	0	0
Oil and natural gas	0	0	0	0
Open pit mines	0	0	0	0
Quarries	1	1	1	0
Sand and gravel pits	0	0	0	0
Refineries	0	0	0	0
Smelters	0	0	0	0
Surface plants	0	0	0	1
Underground mines	2	3	1	0

The numbers of critical injuries reported to the MOL between 2006 and 2009 for various mining sub-sectors are shown in the table below. (MOL INB/MIS Data)

Sub-sector	2006	2007	2008	2009
Assay laboratories	1	0	1	0
Diamond drilling	0	1	3	1
Mills	2	1	1	1
Oil and natural gas	1	0	0	0
Open pit mines	0	1	0	0
Quarries	2	2	4	1
Sand and gravel pits	3	0	4	1
Refineries	3	1	1	1

Sub-sector	2006	2007	2008	2009
Smelters	1	2	1	2
Surface plants	4	4	6	4
Underground mines	11	20	14	11

Health and safety characteristics of the mining sector

The numbers of field visits (total field visits/proactive field visits) conducted by the ministry between 2006 and 2009 for various mining sub-sectors are shown in the table below (MOL INB/MIS Data).

Sub-sector	2006	2007	2008	2009
Assay laboratories	51/43	42/42	35/32	27/25
Diamond drilling	139/130	170/163	174/165	133/130
Mills	94/64	112/84	103/68	75/56
Oil and natural gas	43/33	20/20	14/14	16/16
Open pit mines	86/80	119/102	68/57	55/41
Quarries	640/550	997/958	648/581	685/647
Sand and gravel pits	1,572/1,536	2,176/2,116	1,629/1,575	1,676/1,640
Refineries	44/20	66/32	59/28	28/17
Smelters	46/24	47/18	34/27	26/12
Surface plants	282/214	327/254	273/218	228/168
Underground mines	708/465	803/560	712/471	760/569

The numbers of orders issued by the MOL between 2006 and 2009 for various mining sub-sectors in the mining sector are shown in the table below (MOL INB/MIS Data).

Sub-sector	2006	2007	2008	2009
Assay laboratories	30	43	57	14
Diamond drilling	259	380	506	149
Mills	148	119	42	46
Oil and natural gas	43	18	12	11
Open pit mines	108	79	37	24
Quarries	502	1,011	682	623
Sand and gravel pits	1,420	2,071	2,036	1,555
Refineries	32	38	24	12
Smelters	56	49	21	16

Sub-sector	2006	2007	2008	2009
Surface plants	240	259	187	93
Underground mines	1,086	825	884	764

The most costly hazards for which orders were issued by the MOL in 2009 were “falls to a lower level” in the quarries sub-sector and “exposure to caustic or noxious substances” in the underground mines sub-sector.

Health and safety hazards inherent in mining sector work

The major causes of serious injury in the mining sector continue to be falls of person, vehicle-worker contact and falls of ground. Other hazards in mining include noise, entanglement and engulfment. Major causes of occupational illness include inhalation of dusts and other substances resulting in cancers and other respiratory illnesses.

Major hazards and inspection focus

MOL inspectors enforce the OHSA and its regulations at workplaces across the province. As part of the *Safe At Work Ontario* strategy they will give special focus to certain specific sector and workplace hazards, but will continue to ensure overall compliance with the OHSA and its regulations. Inspectors are not limited to the issues identified in this document as major hazards or key health and safety issues, and will take appropriate enforcement action based on the facts at each individual workplace inspected.

Major hazards and key health and safety issues	MOL mining health and safety inspection focus
Falls of persons	• Are ladder and travel ways in safe condition? • Is fall arrest equipment being used as required (i.e. where workers can fall more than 3 metres, such as near open holes) and is the equipment in good condition? • Are procedures for rescue in place where workers are using fall arrest? • Are barricades for open holes adequate for the hazard and do they have proper warning signs?
Vehicle-worker contact	• Are important related procedures (i.e., pre-operational checks, daily vehicle brake tests, and the installation and use of remote stands for mucking operations) being followed in the workplace? • Are requirements for clear communication between vehicle operators and pedestrians complied with? • Are workers wearing reflective striping on clothing as prescribed, and is striping in good condition?

Major hazards and key health and safety issues	MOL mining health and safety inspection focus
Falls of ground	• If loose ground is observed in a heading underground or quarry that poses a potential hazard to workers, is it being removed promptly by mine personnel? • Do workers know proper procedures to deal with seismicity in headings? (E.g. when to leave and what to report to management)? • Is ground support adequate in underground areas where workers are required to work?
Occupational disease	• Does the use of controlled products adhere to Workplace Hazardous Materials Information System (WHMIS) requirements? • What WHMIS - controlled products are used in the workplace? • Does the personal protective equipment program include respiratory protection essentials such as fit-testing, routine checks, cleaning, and mask selection? • Are underground vehicles being tested for emissions as required?
Shaft sinking	• Are workers trained for their activities? • Is this part of on the training with respect to the s. 11 requirements?
Shaft inspections	• Are repair workers trained to work in the shaft? • Are shaft problems logged in the shaft log book? • Are shafts and manways properly inspected and maintained?
Hoisting	• Have hoisting plants undergone the required inspections? • Are hoist plant maintenance programs adequate?
Blasting practices	• What is the potential for stray current to reach blasting cable from bolts, pipes or screen? • Do workers know and practice proper loading, clearing and guarding and gas-checking procedures? • Do workers know the proper safe procedure to find the problem in shorted lines?

Summary and highlights

MOL inspectors will continue to visit proactively and review health and safety practices in mining operations, especially involving the more known hazards: hoist plants; shaft inspection; shaft sinking; explosives use and storage; and electrical practices. They will also continue to assess and promote, along with system partners, the development of a strong and sustainable health and safety culture (IRS) in the mining sector.

For more information on mining health and safety, visit the MOL website at www.labour.gov.on.ca.