

Health, Safety, Environmental & Community Management: A Case Study For Rio-Tinto IMEx Turkey

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ABSTRACT: Health, Safety, Environmental and Community (HSE&C) issues are important parts of all stages of mining including exploration. To achieve a successful HSE&C management a good Environmental Management Plan and well organized training programs, audits and reporting is necessary. In this article a new HSE&C management program prepared and successfully applied for Rio-Tinto Industrial Mineral Exploration Group's drill sites in Turkey was explained.

1 INTRODUCTION

Health, Safety, Environmental & Community (HSE&C) management is one of the most important issues related to mining. Each stage of mining differs from another in this concept. Exploration being the one having least environmental impact but still need to be considered. There are strict regulations on mine safety and environmental pollution caused by mining industry. In United States these regulations are somehow changing from state to state. For example California is the one having most strict environmental regulations. Canada and Australia are very sensitive on environmental issues related to mining. Besides developed countries some developing countries also have environmental regulations related to mining.

Before to start any mining project it is important to prepare an environmental management plan in order to identify problems long before they become difficult and costly to repair. In mining this is done by the mining company itself or by an independent consultant. In this article the health, safety, environmental & community management carried by an independent consultant for a Drilling Company, working for Rio-Tinto Industrial Mineral Exploration Group in Turkey, which will be called IMEX hereafter, is explained.

2 LEGISLATION

In Turkey all environmental pollution related activities are regulated by the Turkish Ministry of Environment. There are several regulations related to mining such as:

- Water Pollution Control Regulation
- Air Pollution Control Regulation
- Solid Waste Control Regulation
- Hazardous Waste Control Regulation
- Environmental Impact Assessment

Ministry of Health and Ministry of Labor and Social Security has also some regulations related to mine health and safety.

All of above regulations consist specific chapters related to mining activities to be considered while preparing the environmental management plan.

3 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

EMP was covering drill sites, office and core-shed. In this article only the part related to drill sites was described. EMP starts with the "Environmental Policy" stating the company's willingness to prevent environment and to be sensitive to natural resources. "Planning" stage starts with the description of all environmental aspects related to drilling. These aspects can be listed as follows:

- Waste water
- Solid waste management
- Use of raw materials and natural resources
- Contamination of soil and groundwater
- Local flora & fauna
- Natural disaster
- Construction of road
- Spills
- Cement platform
- Transportation
- Healing

- Electricity
- etc.

Then objectives and targets are described related to each environmental aspect. This part includes predictions and explanations on possible pollution, and contamination problems due above items. In "Environmental Management" part preventive measures could be taken against all of the above aspects were explained. For example, according to this plan used oil was being collected in drill sites and after reaching a considerable amount given to an oil company or used lubricating oil treatment facility. In an EMP policy, targets and objectives and actions should be consistent. An important part of EMP is the emergency action plan which is described below.

3.1 Emergency Action Plan (EAP)

A general emergency action plan, which is a requirement of EMP, describing all possible emergency cases in a drill site was prepared and located into a place where all employees can see it easily. Then separate emergency plans were also prepared for following case:

- Fire
- Earthquake
- Flood
- Lightening
- Oil or chemical spill
- Any injuries requiring first aid

All of above emergency plans were prepared both in English and Turkish, covered with plastic and located properly within drill tent. It was supplied that all employees should be aware of the content of each plan by reading them during the meetings. It was also strongly emphasized that the contents of these plans should be kept in mind.

4 HEALTH, SAFETY, ENVIRONMENTAL & COMMUNITY MANAGEMENT PLAN

The safety rules applied to all drill sites may be divided into two groups: pre-drilling and during drilling.

4.1 Pre-Drilling

In pre-drilling stage, the safety and environmental issues are taken into consideration and the locations of sites were selected accordingly if possible. Before to start, the pictures of selected site were taken to compare with those after drilling. Then a drill site plan was prepared and the site was established according to this plan, which is located at the entrance of the site, after establishment, as can be seen easily.

In this plan, all drill equipments, drill tents, drill rig, safety equipments, fuel and oil containers, trash, lights were all shown. In our drill sites we have two tents one is the drill tent covering drill rig and main drill equipments and another one for the storage of core boxes and possible use for engineers. Fuel and oil were stored in metal containers onto metal pans to prevent any seepage and all were located at least 50 m away from drill rig. Main drill site and these fuels were fenced around. At the main entrance warning signs were placed. Drill site and drill tent have emergency exits also. Ground of drill site was covered with metal platforms to prevent any slides of employees. All pipes were located properly having stoppers at both sites. Plastic plugs should be put for both ends of drill pipes. Sites should be lightened enough to work at nights safely.

4.2 During Drilling

According to safety standards all employees should obey following rules during drilling:

- Use of personnel protective cloths (hard had, steel toe boots, safety goggles, gloves, dust mask-if necessary, etc.)
- While working at heights (where the potential to fall is greater than 4 m -13 feet) safety belt with full body hardness and shock absorbing lanyard should be used,
- Electrical safety was obtained with written isolation procedures for plant and equipment. It was strictly forbidden to enter confined space which is an enclosed or partially enclosed space such as storage tanks, hoppers, boilers, flues, ventilation and exhaust ducts, sumps, manholes, pipelines, trenches, excavations etc.
- Smoking is not allowed in 3 m to the rig.
- Tools should always be placed below shoulder level after use.
- Any trash should not be present in drill site.

4.3 Safety Equipments

In drill sites following safety equipments should always be present and located properly:

- Fire extinguishers (enough number and proper locations),
- Fire blanket,
- First aid kit,
- Warning signs (at the entrance, near the fuels, exits, etc.),
- MSDS forms,
- Emergency plans,
- Emergency phone numbers,
- Drill site plan.
- Eye wash station,
- Flashlights and spare batteries,

4.4 Trainings

There are three main training programs carried out under HSE&C procedures. These trainings were briefly explained below.

Fire training:

Fire training was performed regularly with the participation of all employees. Trainers were usually the representatives of private fire fighting companies. During these trainings all employees became familiar with use of a fire extinguisher, learned how to act during a fire and how to use a fire blanket etc.

- "First Aid/CPR training:

First aid training was performed regularly. Trainers were certified first aid trainer doctors. Trainings were held in drilling company's office. Training materials were available for every employee to practice the theoretical part of training. During these trainings employees learned how to act in an emergency case, what are the responsibilities of first aider, what is the aim of first aid, when and how to apply CPR, etc.

Safety training:

Safety training were performed regularly and especially if there was a new employee. Trainer was usually the HSE&C Manager. During these trainings, health, safety and environmental standards and rules were explained. Importance of obeying these rules was emphasized and previous experiences were discussed.

4.5 Checklists

There are some standard forms to be filled according to our HSEC program. These three forms were briefly explained below;

- Shift reports:

Filled by driller and controlled by the foreman. Basic information related to drilling was given in addition to some safety information. Questions related to protective clothing, tailgate meetings, safety equipments, etc., were included in standard forms used for shift reports.

Daily maintenance checklists:

To prevent any accident due to the lack of maintenance or any regular control of engine parts, daily maintenance checklists were filled. These were filled and signed by foreman. Questions related to rig engine oil level, pump's belt, etc. were included in these standard forms.

- Weekly maintenance checklists:

Again to prevent any possibility of an accident weekly maintenance is required for some parts and these forms guarantee that the required maintenance was performed on time. Similar to daily maintenance checklist some questions related to engine oil replacement, diesel filter replacement etc. were included in these forms.

4.6 Audits

There are four different audits in our HSE&C program as follows. Aim of these audits was to control the application of safety standards properly all the times.

- Drill site audits:

Audits are important parts of our program and performed by the HSE&C manager at least once a week. Frequency of audits can change depending on the situation of site. For example, if serious mistakes and lack of important safety equipment were recognized new audits could take place one day after the former one. Although most of the audits were scheduled, some of them were unexpected, such as midnight audits. Standard audit forms were used during the audits. In these forms questions about; use of personnel protective cloths, safety equipments, pressure levels of fire extinguishers, methane measurements, etc. were included.

- Vehicle audits:

Vehicle audits were also performed at least once a week. Standard forms used for these audits contain questions related to regular maintenance of vehicle, brakes, safety belts, fire extinguisher, first aid kit, chain, shovel, towing rope, etc. According to our standards one of the company cars should always be park on drill site keys are on, unlocked and ready to be used.

- Core-Shed audits:

These audits were not performed regularly since the company was not using the core-shed all the times. Standard forms used for core-shed audit includes questions related to the presence of fire extinguishers, first aid kit, fire blanket, eye wash stations, etc.

- Office audits:

Office audits were performed rarely since all employees were on site usually. Questions included in standard office audit forms are related to; exit signs, emergency action plan, fire extinguishers, first aid kit, etc.

4.7 Meetings

Meetings are another important part of our HSE&C program. Major aim of these meetings is to provide the active participation of all employees and make them to understand the importance of their willingness in the application of these procedures. In addition to these the procedures were repeated each time and some examples of accidents were given from other sites not applying such strict safety rules. Examples were also given from other countries. Sometimes comparisons and evaluation of our standards were made to encourage them. Followings are the meetings included in our HSE&C program.

Pre-hole safety meeting:

Before each hole a brief safety meeting was performed with the participation of all employees. During the meeting health, safety, environmental

and community program being applied was explained briefly and discussed with them.

- Tailgate meetings:

These are short meetings up to 5 minutes and performed before each shift. Usually the driller talks about safety issues or they read a chapter from first aid handbook. It was emphasized them to read the book and look at the pictures in this book frequently to refresh their memories.

- Weekly safety meetings:

These meetings were performed by HSE&C Manager and the standard form including a brief summary of the meeting was signed by all participants. These meetings were performed between two shifts hence all employees could participate in it. Aim of these meetings is to discuss the standards and procedures applied in drill sites.

4M Reports

In our HSE&C program the paperwork is quite similar to all Environmental Management Plan studies based on ISO 14000 standards. Four different reports as described below were prepared and submitted to IMEx regularly.

- Weekly reports:

Weekly reports mainly constitute the daily and weekly maintenance checklists, shift reports, drill site audits, vehicle audits and weekly safety meeting forms. Observations during the audits were discussed in these reports. Topics covered in tailgate safety meetings were also included in weekly reports. Weekly report usually includes some photographs from drill site.

Monthly reports:

Monthly reports are generally the summary of weekly reports. Main difference of these reports is the monthly statistics related to lost time injuries, medical treatment case and first aid cases.

Hole reports:

After the completion of a drill hole, hole report was prepared including everything related to the hole. In hole report a picture of drill site after drilling operation was always present to show that the site was remained as clean as its original situation without any change on it. This photographs were compared with those taken before drilling.

Hole follow up report:

This report was prepared at least 3 months after the completion of a drill hole to show that the top soil was recovered completely. If the vegetation was not enough further study will be performed to obtain the same vegetation on drill site and its environment.

4.9 Community Relations

Community relations are also another important issue of our HSE&C program. In all environmental issues we should always consider the public involve-

ment. One of the aims of our program is to have a good community relation and in almost all drill sites all employees had very good relations with local people. In some regions local people were very interested on drilling activities and want to see the site. In such circumstances we inform them about our safety procedures, warn them about any risk, made them wear hard hat and steel toe boot and finally sign the visitor log before to enter the site.

- Visitor's log:

Visitor log contains the name of visitor, purpose of visit, date and hours of visit and a statement mentioning that the visitor was understand and accepted all safety rules and possible risks.

4.10 Event Log

An event log was prepared when there was an important event such as an accident or a visit by governor. Event log describes the event stating the date, place, involved parties, results, etc. and send to the IMEx within 24 hours.

4.11 Hole Follow Up

Although all drill sites were remained as same as their original situations, they were visited at least 3 months later to be sure that the soil was recovered itself and vegetation is same as the surrounding. During these visits photographs of site were taken and included in a hole follow up report. It was observed that in all of our drill sites self-recovery was enough and no further vegetation was required. The recovery time, of course, depends on the region and climate.

5 CONCLUSION

Key issues to achieve a successful health, safety, environmental and community management are planning, training, auditing and reporting stages and each of them should be well organized. We are continuously improving our HSE&C program with the feedbacks from the current applications. We are proudly continuing our program after 150000 hours without any lost time injuries.