

A CASE STUDY IN ENVIRONMENTAL CONFLICT RESOLUTION BETWEEN THE COMMUNITY AND THE RAND LEASES MINE TAILINGS DUMP

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ABSTRACT

Community complaints about the negative impact of dust fall-out from a nearby mine tailings dump led residents of Meadowlands, a suburb of Soweto, to join in a monitoring network together with NACA, scientific institutions, NGO's and the mining company involved.

Both indoor and outdoor samples showed high fall-out rates. A community-driven initiative to resolve the conflict with the mining house concerned led to public involvement and a subsequent commitment by the mining house to implement and maintain dust control measures. Monitoring will continue to measure the success of these measures.

1. INTRODUCTION

Meadowlands is a Black residential township which is situated along the north-eastern "horn" of Soweto. The township was established in the early 1950s as a result of mass "forced" resettlement of people from Sophiatown and Alexandra townships. The settlement in Meadowlands comprises four-room, similarly-styled houses, either single or semi-detached, some of which are situated less than 500 metres from the Durban Roodepoort Deep (DRD) Rand Leases mine tailings dam.

Several potential environmental concerns were identified by the Meadowlands Environmental Group (MEG). These environmental concerns included contaminated waste water from the mine dump discharging mine waste water into the nearby Kliprivier stream, which is within the water catchment area for local residents' fresh water supply.

There is possible caving and / or collapse of the slopes of the mine dump, which poses a significant danger to local residents. A case in point is that of a local child who was buried alive when a sloping surface of a mine dump caved in while children were playing a "hide-and-seek" game on the dump.

Complaints by the local residents about nuisance dust fallout from the neighbouring mine tailings dump were

received by the National Association for Clean Air (NACA) - Soweto Branch. The nuisance dust fallout was most evident during the windy, dry early spring season, that is, late July through to early November. A layer of white dust / sand from the mine tailings dump often covers the township during this time of the year.

Taxi drivers are forced to switch on vehicle headlights earlier than normal because visibility is impaired. The neighbouring schools are forced to close and school children are sent home due to visibility and the difficulties encountered in breathing during these episodes of wind-blown dust fallout.

The local residents complained of high incidences of respiratory-related infections during the main windy season. Residents nearer the dump complained of dust particles on their window sills and on domestic utensils. The community is forced to use cottonwool in an attempt to seal out and prevent dust particles through edges and openings of window and door frames. There are complaints about malfunctioning of electronic equipment (for example, television sets and radios) of the residents as a result of dust particles adhering to and clogging the electronic equipment.

A sampling programme of nuisance dust monitoring was thus initiated as a result of numerous complaints of dust fallout from residents residing in close proximity to the

Rand Leases mine tailings dump and from residents more distant, along the direction of wind drainage. The dust fallout during early spring was noticeably high and necessitated scientific and technical quantification.

The dust monitoring network was a co-operative venture between the Greater Soweto Health Departments, NACA-Soweto Branch, AER (Pty) Ltd, the Group for Environmental Monitoring (GEM), MEG, RMP Properties Land Clearing and Gold Recovery Division.

The prime motivation for the measurement of dust fallout from this site was the concerns raised by the residents who were exposed to high levels of visible dust fallout during the windier seasons. The direct stimulus was to establish data on the size distribution of the dust fraction and to compare the respirable Threshold Limit Value (TLV) guidelines with suspended dust levels to justify the complaints of the community.

2. SAMPLING SITES

The choice of the dust sampling sites was based on their proximity to the dust generation sources. A background site was located 8 kilometres away from the dust-generating source. The purpose of the background site was to measure the influences of dust from unpaved roads, dust generated from indiscriminate garbage-burning and other anthropogenic dust generating sources.

Two dust sampling methods were operated for the substantiation of dust concerns namely outdoor and indoor sampling programmes were conducted.

2.1 Outdoor Dust Sampling

Three sites were selected for the outdoor sampling exercise. One site was placed opposite the mine tailings dump, approximately 500 metres away from the dump; a second site was also situated along the north-eastern horn of the dump, approximately 1 kilometre away, and a third site was located along a south-westerly direction. A control site was situated 8 kilometres away in a south-westerly direction from the dump where the persistent wind drainage occurs.

The sampling equipment comprised a 5 litre, open plastic bucket containing de-ionised water doped with CuSO_4 , which was placed on a specially designed metal stand 2 metres above the ground.

The sample collecting buckets were exposed for periods of one calendar month to collect wind blown, settlement dust. The sample containers were then retrieved and the solution was dehydrated and analysed and the fallout rate of insoluble dust was calculated in accordance with the

American Standard test Method (ASTMD1739).

2.2 Indoor Dust Sampling

Fourteen indoor dust fallout sampling sites were selected for the study to collect nuisance dust fallout at homes in the vicinity of the Rand Leases mine tailings dump. The choice of these sites was based upon the decisions taken in consultation with the community. The parameters for the choice of the sites were based on distance from the mine tailings dump, that is:

4 sites > 500 m from the dust source

3 sites < 500 m from the dust source

2 sites ~ 1 km from the dust source

The sampling equipment was placed in selected residential homes, health centres, in a school caretakers's cottage and in a nursery school. The possible dust generating conditions of the premises were taken into consideration in the selection of the indoor sampling sites. The provision of a dust-proof ceiling; the type of floors; the energy infrastructure, that is, the use of coal stoves and the method of floor cleaning (whether the traditional floor sweeping / cleaning method is practised which could have the potential of influencing the generation of background dust) were all noted and considered when selecting the indoor sampling sites. Inputs from the community were also noted.

The sampling method consisted of a 900 ml open plastic container, half-filled with de-ionised water that has been doped with CuSO_4 . The sampler is placed in the room most often used by the family, in most cases the bedroom. (At the nursery school, the sampler was placed in the room most often used). The solution in the open containers is then exposed to dust fallout for one calendar month and thereafter retrieved, dehydrated, analysed and the fallout rate calculated.

3. RESULTS OF SAMPLING

The sample data over the number of years of sampling were adequate enough to establish seasonal trends and also to confirm the dust generation sources. Sites that were situated opposite the Rand Leases mine tailings dump at Moroeroe School and at the private dwelling of a community member recorded significantly high values^[3].

The results of the indoor samples taken were significantly high and these levels constituted a major nuisance as the community was exposed to large quantities of fallout dust. Immediate intervention by all the relevant stakeholders was required.

This important information / finding was communicated to all stakeholders through meetings and workshops.

4. RAND LEASES INITIATIVE TO ADDRESS DUST PROBLEMS

The problem of dust emission from the mine dump was not a problem of the 1990s; it has a long historic background. It is alleged that the mine started operating in the early 1930s and the central government at that time developed houses adjacent to the mine tailings dump some twenty years later when the mine was in operation.

- The mine attempted to address the dust problem in isolation of the community:
- The mine started to pump 1000 tonnes of wet slime weekly from DRD in an attempt to suppress the loose dust fallout.
- Manually operated irrigation water sprinklers were erected in an attempt to abate dust fallout from the mine.
- The spraying of chemicals on top of dump was also initiated as part of the dust abatement programme.
- The preparation of the soil for vegetation was also attempted, although this proved futile.

These attempts to suppress dust by the mining house were either undertaken without consultation with the role players or they were undertaken with members of the community who were not recognised by the local community. The result was that these attempts at dust suppression were not sustainable.

Some of these attempts were not effective because the dump was not secured from use / access by the local residents. The local residents would use the dump as a thoroughfare to visit the neighbouring suburb of Florida where dust suppressant chemical used would be trampled on and its effect negated by humans and animals moving around on top of the dump.

The mining house also alleged that some members of the community removed the water sprinklers that were installed for irrigating the dump. The mining house initially formed an alliance with members of the community who were not recognised as representatives of the community, creating a strong debate among the community circles.

5. COMMUNITY DRIVEN INITIATIVE TO RESOLVE DUST CONFLICT

The Soweto Air Monitoring Project in collaboration with NACA, the University of Witwatersrand's Schonland

Research Centre for Nuclear Sciences, the Soweto and Diepmeadow Environmental Health Departments initiated a dust-monitoring project in 1994 following numerous complaints from the local community. In 1996 MEG approached GEM to facilitate discussions with the mine in an attempt to resolve the environmental degradation caused by the mine^[1,2].

The community identified dust fallout as being the main environmental problem of concern. The community identified stakeholders who were to facilitate and resolve the nuisance dust fallout and other related environmental problems to the satisfaction of all the affected and interested parties.

5.1 Meetings

The mining house held several meetings with all affected and interested parties where the community expressed their concerns about the environmental problems caused by the dust fallout.

The interested and affected parties included the mining house officials, officials from Metropolitan Local Councils, officials from Government Departments (such as the Department of Mineral and Energy Affairs, Department of Health and the Department of Water Affairs and Forestry).

5.2 Workshops

Several workshops were held with the members of the community including school children from the neighbourhood schools affected by the nuisance dust fallout. The workshop drew media coverage from local newspapers, the television environmental series 50/50 and from local radio stations. The media coverage attracted other institutions like the Legal Resource Centre who offered their legal expertise in resolving the nuisance dust issue.

Mass demonstrations by the school children carrying placards stating their disapproval of the environmental degradation of the area caused by the mine tailings dump and asking Government Departments to intervene took place at one of the workshops.

The demonstration also sent "shock waves" to the mining house that something had to be done towards the restoration of the environment and the abatement of the dust fallout before irreversible damage was caused to the environment and the neighbouring communities.

Scientific and technical information on levels of dust fallout measured by the Soweto Air Monitoring Project, as described above, equipped the community to argue from an informed base to justify their concerns. The

offer of help by the Legal Resource Centre gave the community the confidence to challenge the mining house "head-on" about the nuisance dust fallout and other related environmental issues.

The publicity by the news media alerted other members of the community who thought the dust from the mine was not an issue. Other communities who are suffering from similar environmental problems copied the approaches taken by the community of Meadowlands to address similar problems, for example the Kagiso Group in Krugersdorp.

The community was now well equipped to exert more pressure on the mining house to engage in dust abatement initiatives and address other identified environmental concerns in the best interest of the community.

6. CONCLUSIONS

The mining house, through their new management structure, undertook a commitment to address all environmental issues as identified by the community and to work closely with the community.

The first commitment of the mining house was to circulate its Environmental Management Plan Report on their mining activities to all the relevant stakeholders for easy monitoring of the mine's commitment.

The mining house's second commitment was to address the nuisance dust fallout issue. A company was engaged to vegetate the top of the dump to trap and suppress loose sand on the surfaces of the dump.

The mining house has employed some members from the community of Meadowlands to prepare the soil of the dump for the planting of grass as part of the rehabilitation process of the mine tailings dump. The greening of the dump will control nuisance dust fallout from the mine and restore the beauty of the environment. The wildlife habitat will also be restored.

The Soweto Air Monitoring Group will continue to monitor dust fallout from the mine until it is satisfied that the mining house has adhered to its commitment.

Amicable solutions and agreement would not have been reached if the community was working in isolation with the other affected and interested parties. Consultation with all the relevant stakeholders in addressing environmental concerns is of paramount importance if a suitable agreement is to be reached.

The conflict between the residents of Meadowlands Township and the DRD Rand Leases Mine was resolved through the acknowledgement by the mine that their dump was a potential nuisance to the residents and the community.

The acknowledgement by the mine came about because those affected by the dust fallout were able to substantiate their claims scientifically and thus justify their argument.

The commitment and positive action taken by the mine in addressing and resolving the problem to the satisfaction of all stakeholders and role players is laudable.

7. REFERENCES

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