

SECTION 4: RECOMMENDATIONS

These recommendations present some of the key approaches and actions that can be taken to promote sustainable development and improve MCLM's environment.

THE NATURAL ENVIRONMENT

Air quality

- An air pollution-monitoring network needs to be established, involving the major role-players, including the community.
- A detailed air pollution management strategy needs to be developed for MCLM.
- An education and awareness campaign, focusing on the causes and effects, as well as the minimisation of air pollution, needs to be conducted.
- Indigenous natural vegetation needs to be preserved and/or re-established in the urban open space area, to prevent dust pollution and assist in purifying the air.
- Land use planning should take cognisance of waste sources, such as industrial areas, and special care should be taken where human settlements are in close proximity of industrial areas. In situations where this currently occurs, air quality should be monitored and publicised.
- Avoid any residential settlements adjacent to major roads.
- Develop a clean burning fuel and alternative energy programme for Kagiso, Munsieville and all the informal settlements in the area, in order to reduce air pollution in the communities (refer to programmes such as those run by the Sustainable Energy Environment and Development Programme (SEED), a research and training programme aiming at the development of skills and awareness in the field of clean energy supply).
- Develop and improve the effectiveness of the public transport systems and cycling lanes in MCLM.

Water

- Develop an integrated water pollution management system.
- Initiate and extend formal ground and surface water monitoring programmes, which should include identification of point and non-point discharge.
- Ensure, in collaboration with DWAF, that all industrial and mining discharge is permitted and complies with statutory requirements.
- Monitor and prioritise wetlands and water sources for rehabilitation.
- Map and define wetlands as "no-go" areas.
- Establish artificial wetlands to assist with water management.
- Facilitate education and awareness raising regarding the importance and management of water.
- Manage peat mining to avoid the destruction of wetlands and biodiversity.
- MCLM should link with DME regarding enforcement of EMPR's for all mines and requirements of the Minerals and Petroleum Resources Development Act, (Act 28 of 2002). The MCLM can assist in monitoring and reporting to DME.

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- Address the dolomite structure in Mogale in relation to the mining and industrial pollution, which threatens the quality of underground and surface water in MCLM and the WHS.
- Strictly manage developments along rivers and within the 1:100 flood line.
- Agricultural activities adjacent to rivers should be monitored, and more environmentally sensitive practices should be encouraged.
- Address the unlawful disposal of tailings in quarries.
- Waterborne sewerage systems should be installed to avoid underground water pollution.
- The implementation of WFW and Land Care programmes should be accelerated.
- Develop and integrate the MCLM water management plan to include the use of boreholes.
- Encourage the greening of MCLM. Green spaces and vegetation cover in urban areas are essential for biological and hydrological balance as well as economic development. Indigenous vegetation creates natural habitats and facilitates the infiltration of rainwater by natural means and contributes to sustainable water management (UN HABITAT Agenda, 1996).

Habitat and Biodiversity

- Involve local communities in conservation awareness and educational programmes, such as indigenous tree planting, nature appreciation programmes, as well as rehabilitation programmes of rivers, wetlands and open spaces.
- Develop a conservation plan for developers to adhere to, prior to approval of development, e.g. all endemic plant species should be transplanted and placed in holding nurseries prior to site clearance. The use of indigenous plants for all new developments should also be specified. This will not only enhance the local natural character, but it will also add to the biodiversity of the biozone, reduce the use of water and have cost savings for the direct investor as well.
- Provide protection status to all sensitive areas.
- Conduct a survey for recording the location and suitable habitat of red data plants and animals.
- Conduct ecological restoration plan for damaged riparian habitats.
- Accelerate the WFW Programme and Land Care programme in the MCLM to eradicate invasive and alien vegetation, which not only exploit the valuable underground water resources but also encourage veld fires.
- Compile an internal policy on road design, specifically gravel roads, to ensure sound stormwater management and drainage practices.
- Formulate By-Laws to protect all ecologically sensitive environments.

Geomorphology

- Rehabilitation should be undertaken in areas with bare soil to prevent erosion, to improve storm water management and vegetation rehabilitation.
- Improve and vegetate urban open spaces, specifically in the low cost housing areas. This will reduce soil loss, decrease crime and minimize illegal dumping.

- Assess the extent of historical contamination of soil in the MCLM and its impacts, with remediation actions being prioritized.
- Avoid development in areas that have the potential for sinkhole formation in order to avoid potential catastrophes.
- Formulate a policy to force mast sharing of cellphone providers.
- All cellular service providers should submit co-ordinates on all cellular infrastructures, accompanied by detailed information (including EIA authorisation).
- The extent and location of radioactivity of soils due to past mining activities should be established and a correction plan implemented.

THE BUILT ENVIRONMENT

Agriculture

- Assist in the compilation of an effective subdivision policy for agricultural land (e.g. link with Gauteng Agricultural Potential Atlas, SDF for Gauteng, SDS for Mogale City).
- Develop a policy for Agri-villages and formulate a strategy.
- Small-scale agriculture in derelict land in the urban areas should be encouraged and implemented in terms of permaculture principles.

Housing

- Planning for informal settlements should be undertaken in an integrated manner that complies with all statutory requirements.
- Formulate a formal housing development strategy with adequate bulk services and integrated environmental principles.
- All new housing schemes must include EIAs.
- Approval of new housing developments should be based on the inclusion of the principles of sustainable development and the adequate execution thereof.
- All new housing developments should take into account the use of local labour and knowledge, as well as the inclusion of passive solar energy principles and the use of local labour manufactured materials and natural materials found in the area.
- MCLM should provide incentives for all environmentally sound housing developments.
- Provision of basic services in consultation with residents and taking into account alternative energy and sanitation options based on environmental sound technology.

Industrial

- By-Laws should be formulated with regard to the setting of pollution limits for all industries and the pollutants released into the air and water should be strictly controlled. Industries should use the appropriate processes to ensure that all pollutants released conform to legal limits.
- Identify all air, water and soil pollution sources emanating from the industries.
- Request waste management plans from the industries (signed by the CEO), which should be approved by MCLM.
- Compile a policy to be phased in through By-Laws, stipulating that all industries and businesses should submit an EMP, which should be approved by MCLM.

- Monitoring and Reporting Systems should be implemented to ensure compliance with statutory requirements by MCLM.
- The introduction of small industrial areas adjacent to Muldersdrift could have a negative effect on the tourism potential and the rural character of this area and could negatively impact on the existing industrial areas in the city.

Mining

- Large mining operations within the MCLM extract non-renewable resources. Water is a scarce resource in some areas, and a proliferation of boreholes results in aquifers being depleted at a rate faster than they recharge. Bulk water supply infrastructure is limited and may not support large-scale water intensive industry. Water should therefore not be used as an incentive to attract industries to Mogale.
- Request waste management plans from Mining Houses (signed by the CEO) and approved by MCLM.
- All EMPRs for mines should be submitted to and approved by MCLM.
- Monitoring and Reporting Systems should be formulated to ensure compliance with statutory requirements by MCLM (i.e. IEM officers; EHO'S and Waste Water Engineering).
- Link with DME on enforcement of EMPRs and requirements of the Mineral and Petroleum Resources Development Act - assist in monitoring and reporting to DME.
- Proactively compile an integrated pollution monitoring programme - linked with DME, DWAF, GDACEL and mining houses.

Open Space

- Formulate a greening and rehabilitation programme.
- Use of renewable resources:
 - Grass: making thatch tiles; and
 - Wood: mulch planks and charcoal.
- By-Laws should be formulated with regard to development on ridges, landscaping, the regulation of medicinal plant harvesting, sensitive environments and potential greening initiatives, food gardens; agri-villages and urban agricultural projects.
- Develop urban conservancies, green belts, urban hikes and Environmental Education and Awareness Programmes.

Heritage

- There is a need to assess the current cultural heritage in MCLM in terms of its economic value. Management plans should be developed to preserve and enhance these assets in the MCLM.
- Map all heritage sites in the area.
- Ensure responsibility of enforcement of the National Heritage Resources Act, (Act 25 of 1999).

Transport

- Introduce a traffic plan for MCLM, which is based on the enhancement of sustainable development and the improvement of the quality of life in urban and rural communities.

- Implement a more sustainable transport system with a significant share of cycling. This will contribute to:
 - CO² emission reduction / climate change control /improving air quality;
 - Road safety and overall traffic management;
 - Poverty relief;
 - Sustainable economic development;
 - Accessibility and emancipation; and
 - Health promotion.
- The bicycle is a clean, non-polluting mode of transport that consumes no fossil fuels and occupies little space, but still, as an alternative to the private automobile, ensures mobility and accessibility. Facilitating cycling is essential in combating poverty, since it saves time and increases income generation opportunities. A cycling policy directly relates to the Agenda 21 objectives. Its cross-sectoral benefits relate to the quality of life, economic growth and social equity in urban and rural areas. Cycling promotes economic independence (International Council for Local Environmental Initiatives, ICLEI, 2002).
- An integrated land use and transport strategy is necessary, in order to develop a more effective public transportation system.
- Public transport – in particular busses - should be focussed on.
- Promote the integration of land use, communications and transport planning to encourage development patterns that reduce the demand for transport (UN HABITAT Agenda, 1996).

Waste Water Management

- Pit latrines need to be replaced by dual flush toilets, and the use of alternative eco-toilets should be investigated.
- It is proposed that all water care works be registered with DWAF and managed accordingly.
- Proper monitoring and reporting mechanism to comply with permit / license conditions should be designed and enforced.

Solid Waste Management

- Pro-active awareness campaigns are required to educate residents and industry with regard to their attitudes to waste.
- All waste disposal sites should be legally permitted and upgraded, where necessary.
- Groundwater quality should be monitored through boreholes at the various waste disposal sites to ensure that pollutants are not contaminating the groundwater.
- An integrated waste management plan needs to be developed, as required by DEAT and DWAF.
- The most important opportunity in respect of waste in the MCLM is the development of a buy-back centre (as a public-private partnership), where waste is purchased for recycling and possible re-use. For example, building rubble is purchased and then used as fill material, and all office waste from the MCLM is taken to the buy-back centre for recycling. Given the good rail infrastructure in the area, there are also opportunities for waste transfer by rail initiatives (MCLM IEM Draft Strategy, July 2002).
- An Environmental Education and Awareness Programme through involvement with

CBOs and NGOs should be implemented.

- Perform inspections of local medical waste removal systems.
- Formulate a project to establish and manage refuse bins along local internal roads.
- Formulate By-Laws and policies to regulate all waste storage, transport and disposal.
- Establish a Hazardous Waste Site in the West Rand, with the assistance of MIIU/other embassies.
- Reduce waste through economic empowerment initiatives using grass and wood.

Energy

- Implement initiatives on energy, including the promotion of cleaner and more efficient use of natural gas and increased use of renewable energy.
- Improve energy efficiency and access to advanced energy technologies, including cleaner fossil fuel technologies, particularly in rural and peri-urban areas.

Water supply

- Promote integrated water resources development and optimise the upstream and downstream benefits thereof.
- The development and effective management of water resources across all uses and the protection of water quality and aquatic ecosystems, through initiatives at all levels to:
"Provide access to potable domestic water, hygiene education and improved sanitation and waste management at the household level through initiatives to encourage public and private investment in water supply and sanitation that give priority to the needs of the poor, within stable and transparent national regulatory frameworks provided by Governments, while respecting local conditions involving all concerned stakeholders and monitoring the performance and improving the accountability of public institutions and private companies; and develop critical water supply, reticulation and treatment infrastructure, and build capacity to maintain and manage systems to deliver water and sanitation services, in both rural and urban areas" (WSSD: Plan of Implementation, 2002).
- More efficient technologies are needed, for example, new types of toilets using less water for flushing.
- Develop an awareness campaign regarding the economic advantages of planting indigenous plants in private and public gardens.
- Conduct a costing of the economical resource value of the natural open spaces in MCLM. This should be taken into consideration during development decisions.

SOCIO ECONOMIC ENVIRONMENT

Local Economy

- There is a need for business to become more involved in environmental management and concerns.
- There are several opportunities for the sustainable utilisation of resources within the MCLM. These include the use of wood from invasive trees that have been removed, an abundance of thatch grass and a rich diversity of medicinal plants (MCLM IEM Draft Strategy, July 2002).
- The existing industrial areas in Mogale City should be softened by means of greening and developing permaculture food gardens on under-utilised land.
- Introduce small-scale mining and re-mining of old slimes dams and sand dumps belonging to MCLM.

Health

- Compile a schedule to ensure the monitoring of ventilation systems for indoor pollution.
- Facilitate community health education.

Safety and Security

- Development a Public Safety Strategy with suitable management and organizational structure.

Governance

- Ensure the incorporation of Integrated Environmental Management Principles at all levels and all sections in integrated planning in MCLM (Integrated Environmental Management Guideline Series, DEAT, 1992).
- In order for MCLM to formalise their commitment to sustainable development, it is recommended that MCLM consider becoming a member of ICLEI (International Council for Local Environmental Initiatives). In this way, MCLM will be able to take part in international programmes and gain support and cooperation from cities across the globe with regard to sustainable development.

Tourism

- Until recently, MCLM was not directly involved in giving direction to tourism in the area. A tourism sub-directorate has, however, recently been established to specifically focus on the promotion of tourism. It should be noted that tourism is one of the most powerful tools for developing economies and has the ability to unite diverse strengths and transform socio-economic conditions.
- The SMME sector should be closely linked to the Tourism sector, as this will promote job creation.
- Undertake aggressive marketing.
- Develop an urban hiking trail.
- In line with the Plan of Implementation of the WSSD September 2003, tourism should be promoted in terms of:
 - Implementing projects at the local level with specific emphasis on marketing African tourism products, such as adventure tourism, eco-tourism and cultural tourism;

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- Respecting local traditions and cultures and promoting the use of indigenous knowledge in natural resource management and eco-tourism; and
- Assisting host communities in managing their tourism projects for maximum benefit, while limiting negative impacts on their traditions, culture and environment.

CONCLUSION

Although mining only constitutes 3% of the total area in MCLM, it has a profound negative impact on the landscape, air and water in the area, something that would have to be addressed if Mogale wants to make use of the vast historical and cultural heritage and the natural habitat to promote tourism as an economic contributor to the area.

South Africa is classified as a semi arid country, and Mogale is no different. Water in the MCLM should be treated as a scare resource and should not be used as a trade tool to attract more industries to MCLM.

MCLM should take notice of and manage the insensitive developments taking place in close proximity to environmentally sensitive areas. The ridges in Mogale are biodiverse ecozones, and 565 ha have already been transformed by development (agriculture, residential etc.).

The SoE should inform the Environmental Management Framework (EMF). The EMF in turn should facilitate the development of detailed sector strategies to ensure that development takes place in a sustainable manner.

As stated in the Draft IEM Strategy of MCLM, July 2002: “The tourism potential of the area is significant”.

