UN GLOBAL COMPACT 2011 REPORT

EXECUTIVE SUMMARY

The Ghana Manganese Company Ltd (GMC) voluntarily signed on to the United Nations Global compact (UNGC) in order to align its operations and strategies with the ten universally accepted principles in the area of human rights, labour, environment and anti- corruption.

The company's vision is to maintain its position as an important market leader in mining and exportation of quality manganese ore in the world. Based on this vision, GMC, in 2011 actively developed and mined a pit, called Pit C. Current Life of Mine (LoM) pit and waste dump designs, will allow GMC to move into other pits in the future.

Total manganese ore mined during the year under review was 1,720,588 wet tons which represents 103% of the total budgeted figure of 1,662,644 wet tons.

During the year under review, the following technical and engineering updates were carried out by Consolidated Minerals Limited Australia (CMLA), Australia, as per the scope of work of the technical services model:

- Updating of X-sections,
- Updating of the block volume,
- Geological and Resource modeling,
- Geotechnical advice,
- Exploration review, planning and summary of results,
- Quarterly reconciliation and updating of the mine plan for re-sequencing.

The year 2011 also witnessed a commitment on the part of GMC to further promote and enforce adherence to safety regulations to the letter. Morning meetings were used to discuss safety issues before work started while personnel induction programmes were also used in drumming home on safety issues. Specifically, the company pursued programmes and activities that ensured avoidance or minimization of workplace accidents, injuries and illnesses. The company made efforts to internalize safety rules and practices among its employee through awareness creation and full professional training programmes. Based on the safety culture the company promoted in 2011, GMC was honored by the Minerals' Commission as the most improved mine in Ghana after the 2011 Mine Safety audit among other awards.

In area of corporate social responsibility (CSR), GMC applied a lot of resources to support developmental projects within its catchment area and beyond. The company undertook both infrastructural projects and provided financial support to various programmes and activities. Areas that received support from the company's corporate social responsibility programmes include education, health, alternative livelihood

activities, social-cultural projects, and national programmes. A total amount of USD$ 304,235.38 was spent on corporate social responsibility programmes during 2011.

On issues of environmental practices, the company made great strides during the year 2011. GMC conducted all its operations in compliance with all the relevant environmental legislations while efforts were made to prevent pollution and contamination. To show the company's commitment to good environmental practices, various strategies were employed to promote environmental best practices. Some of the strategies used are; regular environmental monitoring activities and awareness creation programmes etc. The company was able to maintain the goodwill and support it has gained from its catchment communities and there were no legal issues.

Regarding labour and human rights issues, the company undertook programmes that promoted labour freedom of association and respect for human rights. Collective bargaining agreements were respected by the company by engaging the Workers' Union as and when a need arose to discuss staff issues. Labour issues were handled within the confines of Act 651, Labour Law 2003. Employment opportunities were made open to both males and females and those with the requisite qualifications were employed. In terms of training, 2011 witnessed improvement in Training and Development activities to the extent that all departments of the company had some of their workers benefitting from training. Training activities covered areas such as managerial, technical, apprenticeship as well as Health, Safety and Environment. The company uses morning meetings and personnel induction programmes to educate workers on human right issues, the company's anti-discrimination policies and the disciplinary actions that are meted out to offenders.

Lastly, the company has integrated anti-corruption practices into its business processes. Activities such as procurement, award of contracts and financial transaction and auditing processes have been designed in line with international standards...

1.0 INTRODUCTION

Ghana Manganese Company (GMC) is located at Nsuta near Tarkwa in the Tarkwa-Nsuaem Municipal Assembly. It is the only manganese producing mine in Ghana. Nsuta town is 4km from Tarkwa, the seat of the Tarkwa-Nsuaem Municipal..

In 2011, GMC actively mined and developed Pit C. According to the pit and waste dump designs of the Life of Mine plan (LOM), GMC will move into other pits in the future. GMC's attention was focused on the Pit C central and the southern sector of the

pit, involving cutback and establishment of a temporary access ramp for ongoing mining operations.

The mining method employed is exclusively open-cast, comprising drilling, blasting, loading and hauling. Thereafter the ore is processed (crushed and screened with no chemical addition) and stockpiled for transportation by rail and road to Takoradi Port for shipment.

The management of Ghana Manganese Company Limited, conscious that mining and its associated activities affect the environment in which it operates, therefore ensures that within its economic limits and the need to be internationally competitive, the Company's activities are carried out with due cognizance of the Environment.

Manganese Carbonate ore was the main ore body exploited during the year under review with the budgeted stripping ratio of 1: 13.79 (ton: ton).

2.0 Mining Performance

Total ore mined during the year under review was 1,720,588 wet tonnes. This represents 103% of the total budget figure of 1,662,644 tonnes (ref. table 1 and 2 below).

PIT C	Tonnage Mined
Central West	283,921
Central East	
Southwest	707,498
Southeast	729169
Total	1,720,588

Table 1: Total ore mined for 2011.

PIT C	Tonnage Mined
Central West	6,893,228
Central East	4,997,507
Southwest	3,475,490
Southeast	8,233,528
Total	23,599,753

Table 2: Total waste mined for 2011.

Total waste mined during the year under review was 23,599,753 tonnes. This represents 102.9% of the total budgeted figure of 22,933,974 tonnes (ref. table 2 above), resulting in an ore to waste stripping ratio of 1:13.72 (ton: ton).

2.1.1 Exploration Activities on the Mine

Planning and execution of exploration as well as infill borehole drilling programme on the mine is the responsibility of Ghana Manganese Company Limited.

2.1.2 **Exploration Site**

Currently exploration and infill borehole drilling activity, have taken place in four (4) operational areas in the mine pits. These are pits C North, C south west, C south east and pit A.

2.1.3 **Pit C North**

Reverse circulation and Diamond drilling.

- Drilling pattern for reverse circulation is in grid system (15.0 meters along strike and 10 meters across strike.)

  Maximum depth of each hole is 54.0 meters.

- Diamond drilling pattern is along strike. (i.e. 30 .0 meters along strike and dip).

- The purpose of this drilling is to probe the possible extension of Manganese Carbonate ore body toward the south east portion of the mine pit.

2.1.4 **Pit C South West**

Infill drilling is being executed with diamond drilling rigs. This exercise is to confirm the authenticity of the existing Manganese Carbonate ore body on the east limb ore zone which were not oriented during the initial borehole exercise conducted previously.

Depth of each borehole varies; the shallowest was 75.0 meters while the deepest was 150.0 meters. All holes were drilled along the strike of the ore zone.

2.1.5 **Pit C South East**

Grade control boreholes were drilled in pit C south east with Reverse Circulation rig. Drilling pattern was in grid form at 15.0 meters on strike by 10.0 meters across strike. The purpose was for grade distribution control.

In addition, some few diamond drilling holes were drilled for geotechnical studies on slope stability for the pit walls toward the east. Depth drilled for each hole was 120.0 meters.

2.1.6 **Pit A (North and Central Ore Body)**

Diamond drilling activities were centered in two areas of the mine pit. Drilling was done in grid pattern (i.e. 30 × 30.0meters along and across strike). All the holes drilled were infill exploratory boreholes. Purposes for this exercise was to upgrade the resource base of the manganese carbonate ore body for prolong mine life. Depth of borehole varies; ranging between 110.0-230.0meters and strike distance is 30.0meters.

2.1.7 **Drill Rigs**

Three (3) wire line core drilling rigs and one reverse circulation drill rig are currently in operation (i.e. one (1) Boart long year 38 model core drilling machine, three (3) Atlas Copco wire line core drilling rig model CS14 and one (1) Atlas Copco reverse circulation rig model Roc. RC L8)

2.1.8 **Core Size**

Diamond drill rigs: BQ = 33.5mm

NQ = 45.0mm

HQ = 55.0mm

BW casing=75mm

NW casing=95mm

Reverse Circulation rig; produce chip sample for laboratory analysis. Hole diameter = 140mm.

MONTH	NO. OF RC HOLES DRILLED		NO. OF DD HOLES DRILLED		TOTAL NO. OF HOLES DRILLED	
	No. of holes	Depth of holes(m)	No. of holes	Depth of holes(m)	Total No. of holes	Total depth
JANUARY	14	732.0	9	1,201.20	23	1,933.20
FEBRUARY	21	1,116.0	5	813.90	26	1,929.90
MARCH	29	1,566.0	5	704.10	34	2,270.10
APRIL	35	1,890.0	9	866.10	44	2,756.10
MAY	11	594.0	9	1,711.47	20	2,305.47
JUNE	-	-	15	3,314.41	15	3,314.41
JULY	-	-	13	2,985.80	13	2,985.80
AUGUST	-	-	11	2,589.90	11	2,589.90
SEPTEMBER	-	-	9	2,208.00	9	2,208.00
OCTOBER	-	-	9	1,731.60	9	1,731.60
NOVEMBER	-	-	16	2,241.90	16	2,241.90
DECEMBER	16	864.0	8	1,205.20	24	2,069.20
TOTAL	**126**	**6,762.0**	**118**	**21,573.58**	**244**	**28,335.58**

Table 5: Diamond/reverse circulation boreholes drilled from Jan-Dec 2011

3.0 Safety Performance for 2011

Ghana Manganese Company topped the national mine safety audit and national community safety competition, 2011. To underscore the importance of safety and strengthen its practice in the various mining companies and their catchment communities, the Minerals Commission in collaboration with the Ghana Chamber of Mines organized the year's National Mine Safety Week Celebration.

GMC community team, which was in zone 3 with Goldfields Ghana Limited Tarkwa, AngloGold Ashanti Iduapriem and Golden Star Resources, Bogoso came first at the zonal level competition held on August 27, 2011 at AngloGold Iduapriem. On this ticket, the company's community team thus qualified to compete at the national level alongside winners of the other three zones.

The week-long program which ended on December 3 with a keen contest saw GMC emerging as the best performing community team at the National Community Safety and First Aid Competition held at Kinross Chirano Mine. The Minerals Commission has honored GMC as the most improved mine after their 2011 Mine Safety Audit. The company doubled its winning achievements by being crowned as the Best Company for the year 2011 in a Safety Audit carried out by the Minerals Commission and Ghana Chamber of Mines in the areas of Machinery, Environment and Mining.

See Plate 2: Award presentation to Mr Paul M. Kuunang, Health and Safety Officer and Plate 3: Award lifted with joy below

Plate 2: Award presentation to Mr Paul M. Kuunang, Health and Safety officer

Plate 3: Award lifted with joy

4.0 OUR ENVIRONMENTAL RESPONSIBILITY

4.1 Environmental Policy Statement

Ghana manganese Company Limited is committed to minimizing the potential impact of its mining activities on the environment. We will therefore strive to conduct all our operations in compliance with all relevant environmental legislation and will endeavor to use pollution prevention measures and incorporate environmental best practices in all our operation.

In the light of this GMC is committed to;

- Co-manage the environment by integrating the consideration of environmental concerns and impacts into all of our decision making and activities,
- Promote environmental awareness among our employees and encourage them to work in an environmentally responsible manner,
- Train, educate and inform our employees about environmental issues that may affect their work,
- Reduce waste through re-use and recycling and by purchasing recycled, recyclable or re-furbished products and materials where these alternatives are available, economical and suitable,
- Promote efficient use of materials and natural resources throughout our facility including water, electricity, raw materials and other resources, particularly those that are non-renewable,
- Avoid unnecessary use of hazardous materials and products, seek substitutions when feasible, and take all reasonable steps to protect human health and the environment when such materials must be used, stored and disposed of,
- Purchase and use environmentally responsible products accordingly,
- Where required by legislation or where significant health, safety or environmental hazards exist, develop and maintain appropriate emergency and spill response programmes,
- Communicate our environmental commitment to our sub-contractors and the host communities and encourage them to support it,
- Strive to continually improve our environmental performance and minimise the social impact and damage of activities by periodically reviewing our environmental policy in light of our current and planned future activities.

4.2 **ENVIRONMENTAL PROJECTS FOR 2011**

4.2.1 Construction of Volatilization Pad (VP)

Construction of a Volatilization pad for contaminated soil generated on the mine was completed for the year under review. The pad is lined with HDPE liner to prevent underground seepage and equipped with oil spillage kits (socs) to separate oil from run-offs emanating from the contaminated soil during rainy season. The pad is sited at Pit A close to the domestic waste dump. Plate 9 and 10 below shows volatilization pad under construction.

This pad was constructed to serve as storage facility for all contaminated soils from the workshops and other places on the mine where such soils are generated. The second chamber to the facility was recommended by EPA to serve as a secondary containment in case there is an overflow as a result of heavy rain.

The second sump recommended to be attached to the main pad has been completed and some amount of contaminated soil had already been deposited in it. It is expected that the facility will work to perfection. See plate 9: Volatilization pad ground preparation and Plate10: Volatilization pad under construction below.

Plate 9: Volatilization pad ground preparation

Plate10: Volatilization pad under construction.

4.2.2 Hydrogeological Investigation of Pit CN

Three (3) monitoring boreholes (piezometers) were constructed at pit CN for investigation and modeling the hydrogeological regime to assess the impact of future mining operation of the area pending a technical presentation on Pit C North projects to be presented to the EPA and the Minerals Commission

Air drilling was adopted in the drilling of the three piezometers at the C North Pit. Three drill points were selected for drilling at an approximate distance of 100m apart. For identification purpose, these, points were named, PZ 1, PZ 2 and PZ 3 respectively. The piezometers were drilled to depth exceeding 100m. Drill samples were collected at 1 meter intervals.

4.2.3 Project objective

The following have been established as the main objectives for the drilling of the Piezometers

- To understand the behavioral change of the overlying aquifer
- To have first-hand knowledge of the hydro geological environment
- To access the possibility of the Takwa Banso lake seeping into pit C as the mines progresses

Each piezometer was developed over a three hour constant period using compressed air. The development was carried out to flush all foreign elements that might have entered the well during drilling and at the same time to improve turbidity.

See Plate: 11 Piezometer under construction and Plate 12: Field Technician downloading diver data below.

Plate: 11 Piezometer under construction. Plate 12: Field Technician downloading diver data.

4.2.4. Aquifer Test

A fifteen hour aquifer test was carried out on the boreholes in order to obtain the following data:

- To determine the actual yield of each borehole.
- To determine both the static and dynamic water level of each borehole.
- To determine the draw down and recovery rate of each borehole.

In carrying out this test, a 1.5hrs/p submersible pump with a maximum pump rate of 120 ltrs/min was dropped in each borehole and pumped over a five hour constant period. During this period, borehole yield was recorded at 120litrs/min. equipment used in carrying out the test include, submersible pump, water level indicator, calibrated bucket, stop watch and a generating plant. Please find attached a detailed report of the constant discharge test carried out.

4.2.5 Dust Suppression Systems

A Fog Maker dust suppression system has been installed at the Carbonate plant to ensure effective dust suppression on the primary crusher and transfer point between number 2 and 3 conveyors (plate 15) and also at the transfer point between number 3 and 4 conveyors (plate 16).The high-pressure water mist dust suppression system was customary developed by the GMC Electrical Department.

Plate 15: Fog Maker at tippler

Plate 16: Fog Maker high pressure nozzle

4.2.6 Reclamation of Waste Dump

The concurrent reclamation/rehabilitation of the Hill B waste rock dump was continued steadily for the year under review. In 2011 daily agronomic practices mostly weeding in and around the plantain and palm trees and application of NPK (15:15:15) fertilizers, pruning dead branches to improve aeration were carried out in the plantation to promote healthy growth and high yield.

Plate 17: shows spreading of topsoil Plate 18: shows current state of the palm seedlings

Plantains inter-cropped with the palm trees, have started fruiting and on the average three bunches are harvested weekly to supplement workers and the hospital canteen. An appreciable quantity of cassava and plantain were harvested from the Hill B reclaimed site. See plates 19 and 20 below. The sizes of the crops (yield) were also found to be encouraging considering the maturity period of the crops. This is seen as a good indicator of the fertility of the soil at the reclaimed site.

The plantains on the farm after the first harvest continue to show good signs of better yield in the second year.

A second batch of cassava has also been planted which is expected to be harvested early next year so that a fair idea of its yield could also be known. Fifty-six bunches of plantain were harvested from the reclamation site during the year under review. See plates 19 and 20 Reclamation officer showing cassava harvested from the Rehabilitation site

Plates 19 and 20: showing cassava and plantains harvested from the Hill B Rehabilitation site.

4.2.7 Weed Control

Weeding as an agronomic activity was carried out daily on the land. This was done to get rid of any unwanted plant species from competing with the species for nutrients. Cutlasses were the only tool used for the weeding operation.

4.2.8 Re-vegetation of Pit C LOM Footwalls

Grassing on the Pit C Central West footwalls was brought to a halt mainly because the pit was re-designed as per standard bench heights and slope and to reach the ultimate pit bottom to ensure pit stability and compliance with international recognized JORC and SRK criteria. The new pit design took cognizance of the Akoben criteria on best mining management practices.

4.2.9 Tree Seedling Nursery

The tree nursery produced various trees species including Royal palm seedlings. At the nursery tree species such as Senna siamea, Acacia alata, Terminalia superba and Royal palm seedlings were raised in polypots and transplanted in various locations in the mine village. The Department also undertook vegetable cultivation such as cabbage, carrot and onions.

Four hundred and seventy-two (472) nitrogen-fixing tree seedlings were nursed and planted along the pit periphery, residential areas, and reclaimed site and along the

Kawere stream. The total area of the nursery is one hectare. Tree species found at the nursery are;

- Cassia alata
- Senna siamea
- Terminalia superba
- Royal palm

Reclamation programs in the teak and ofram afforested areas were vigorously pursued during the year under review to promote ecological integrity of the site and surrounding landscapes. Various places including along the road from the main security gate to the hospital, Ofram and teak plantations and surroundings of the nursery were weeded.

Pruning of trees at some bungalows continued; dead and /or obstructing branches of trees were removed to improve their aesthetic value as well as avoid any unforeseen accident. Plates 21 and 22 shows the Ofram reforested Area and the beautification of the Tamso Roundabout.

Plate 21: The Ofram reforested Area Project

Plate 22: Tamso Round about Beautification

4.2.10 Beautification of Tamso Roundabout

The Tamso Roundabout is where GMC Nsuta mine road joins the Tarkwa-Takoradi trunk road. This area used to be filled with weeds and litter. During the year under review, the area caught the attention of the environmental department which carried out beautification and maintenance of the area as seen in plate 22 above. After clearing

of litters and stones, the area was hoed to lose the ground to support plants growth. It was then filled with top soil, leveled and grassed. "Duranta" was planted as a hedge all around the grassed area.

A huge Manganese Waste Rock was positioned and an arrow indicating the direction to the Nsuta mine painted on it. 'Duranta" hedge has also been planted in the letters GMC near the rock for aesthetic purposes. The roundabout is regularly maintained by picking of litters, shaping hedges and mowing the grass to maintain its beauty.

4.3.0 Major Activities at the Nursery for the year 2011

The main activities carried out in the nursery within the year under review were generally, maintenance of the nursery such as weeding of surroundings, uprooting of weeds around seedlings and tree planting. Trees in residential areas were also pruned to improve their aesthetic value.

- A tree planting exercise was carried out in schools within the Nsuta Community. Two hundred and twelve (212) trees were planted at vantage points at the Roman Catholic and Methodist schools to serve as shade, windbreaks and improve the aesthetics of the school compounds.

- A tree planting exercise was carried out at vantage points within the Nsuta community and the mine. Within the mine, fifty five (55) royal palm seedlings were planted to serve as avenue trees while Forty five (45) trees made up of "ofram" and Acacia were planted in the Nsuta village to serve as windbreak and provide shade.
- Eighty-eight (88) Acacia seedlings were transplanted, twelve (12) around the 28 control post, seventeen (17) on Pit C Central benches and fifty-nine (59) at the golf course, twenty-one (21) "Ofram" seedlings were also planted adjacent the timber shed and twenty-two (22) royal palms at the golf course. Agronomic practices such as application of manure and disease control were undertaken on the re-afforested area near the CP1, the hatchery and the Junior Staff bungalows. A total of 147 Leuceana and Acassia seedlings from the nursery were transplanted;
- 47 seedlings were planted on the windrow at the washing plant, 89 seedlings on the windrow from Pit C Central West to the mining office junction and 36 seedlings planted along the reservoir at the golf course. Thirty five (35) royal palms were transplanted along the road between the village office and the post office as replacement of the old ones.

Trees along the hospital road were pruned in order to avoid accidents that may be caused by broken off branches. The transplanted seedlings at various locations within the mine were regularly watered to promote good root establishment.

A total of Eight Hundred and Eighty-seven (887) tree seedlings were transplanted during 2011.

Table 6: shows locations and number of trees planted in 2011.

No. of Trees Planted	Location	Type of Tree	Remarks
131	Pit C windrow Golf Course	Leuceana Ofram Royal Palm	Planted on Pit C windrow to improve aesthetic impacts
101	Junior workers residential area. (New Compound)	Royal Palm Ofram	To serve as storm windbreakers and also for the purpose of creating shade in the residential areas
30	Pit C windrow	Accasia	Replacement
212	Roman Catholic School Methodist School	Accasia/Leuceana	Beautification
59	Control Post 23 and Transit shed area	Ofram	To serve as storm windbreakers and also for the purpose of creating shade in the residential areas

33	Along Kawere stream	Acasia	To reduce Evaporation
139	Along Pit CCW to Mining office	Acasia	Planted on Pit C windrow to improve aesthetic impacts
182	Village and Admin office	Royal Palm Ofram	Beautification

4.4.0 EPA & AKOBEN AUDIT 2010 RECOMMENDATIONS

4.4.1 Profiling of the Zongo Rock Waste Dump

As per EPA recommendation, a portion of the dump facing the Zongo community has been re-profiled to improve aesthetic impact of the dump. The dump profiling was carried out by the Mining dept. and sufficient amount of sub and top soil had been spread on it. Purria and other creeping/cover grass species have been planted on it. It is expected that after few months re- vegetation will take place to bring back its green nature. See Plate 27: Re-profiling of the Zongo Dump and Plate: 28 Spreading of topsoil below.

Currently about forty percent (40%) of the area is newly occupied by villagers and there are signs that more settlers would be coming if measures are not strictly taken.

Plate 27: Re-profiling of the Zongo Dump

Plate: 28 spreading of topsoil

4.4.2 Zongo Bridge

Based on a concern lodged by the Nsuta Zongo community during the 2010 Akoben Audit over flooding condition of the stream during the rainy season, the EPA recommended repairs and desilting of the Zongo stream. Carbonate Plant workshop was tasked to replace the wooden parts of the bridge. The bridge was raised one (1) meter from the existing level to avoid the risk of being submerged during heavy down poor.

Two (2) beams hold the Steel cross members. The old steel support base was maintained. See Plate 29 and 30 for Zongo Bridge before and after repairs.

Plate 29: Zongo Bridge before repairs

Plate 30: Zongo Bridge after repairs

4.4.3 Zongo Borehole Complains Raised

During the 2010 Akoben Audit, the Zongo community complained about a low pump rate of the hand pump GMC provided and yellowish brown colouration when water is kept overnight. Field insvestigation was conducted by the environmental dept to access the quality condition of the water. During the field trip to the site, water sampling and pump test were carried out,the hand pump on the borhole was distmantled in order to identify the main reason why the pump losses pressure during pumping. It was observed that the valve attached to the pump was loose hence the inability to pump at full capacity.

With regards to the yellowish brown colour of the water, it was also obsreved that the galvanised pipes used in the mechanisation of the borehole was reacting with the iron in the water thereby increasing the iron level in the water. The galvanized was changed to stainless steel pipes which are more iron resistant, whiles at the time, the valve attached to the hand pump was also changed. The above measures have improved the quality of the water.

4.4.4 Tailings Storage Facility

During the recent AKOBEN audit at the Ghana Manganese Company (GMC) mine at Nsuta, the Ghana Environmental Protection Agency (GEPA) recommended that the GMC Tailings Storage Facility (TSF) auxiliary dam be investigated to establish the profiles of the elemental contaminants in the pond, if any, and determine the levels of water quality parameters to establish conformity to GEPA and WHO standards. Following from this, Messrs Jorge y Joyce Ltd., Aquaculture and Environment Restoration Consultants were invited to perform water quality assessment of the pond in June 2011. The outcome of the study is expected to be the profiling of the elemental contaminants in the water column and in the underlying sediment as well as the safety of the general usage of the water.

Plate 31: Profile sampling of Pit A Dam

Plate 32: Profile sampling of the Tailings

The general chemical status of the GMC TSF auxiliary pond water with respect to its physico-chemical parameters of temperature, turbidity, hardness, alkalinity, hydrogen ion concentration, Dissolved Oxygen and Oxidation-reduction potentials show the

system to be unpolluted and are well within normal levels of surface waters as per Ghana EPA and WHO standards.

Concentrations of heavy metals in sediment do not show any significant correlations with levels in the contiguous water column. This implies that adsorption and desorption processes do not follow any forced metabolic processes but natural exchanges following from the dynamics of the physico-chemical processes in the water column and the general environment.

4.5.0 OIL MANAGEMENT

During the year under review a total of 183,040 liters of used oil was retrieved from the routine maintenance and servicing of equipment in the workshops and from periodic cleaning of the oil/water separator was sold.

4.5.1 Oil Management Training

The Environmental Department ensures that hydrocarbons including petrol, diesel, grease and lubricants are properly managed in order to prevent health and safety hazards in the mine. In view of this, a presentation on the environmental topics "Hydrocarbon Management" was carried out during the year under review with the entire workforce. For effective participation, it was organized for the various departments on a rotational basis with the respective HOD's in attendance as indicated in plates 33 and 34 below.

Shell Ghana Limited, GMC's major supplier of fuel and lubricants also complemented the effort of the environmental department by organizing lubricants seminar for the workers especially those directly involved in the use oil on the mine. The main objective of the seminar was to create awareness among workers about proper storage and avoidance of oil spillages thus contaminating soil and water bodies.

Plate 34: A cross-section of participants

Plate 33: Hydrocarbon awareness training

4.6.0 Waste Management System

Wastes segregated at the work shop was a challenge for the department since used filters are disposed-off without much appropriate measures to drain the oil out. Because of this situation, GMC purchased filter crushing machine to retrieve about 99.5% oil in the filter prior to disposal. Thus all filters segregated from the domestic waste are kept at the volatilization pad for sales as scraps.

Plate 35: Filter crushing device under test

Plate 36: Filter crushing in use at the dozer shop

4.6.1 Waste Segregation and Disposal

Education on the importance of waste segregation and colour codes has been intensified at the various departments. Dust bins depicting the appropriate colours have been placed at vantage points. The environmental department intends to paste pictures of various wastes on the bins.

4.7.0 Environmental Incident 2011

5.1.0 INFRASTRUCTURE IMPROVEMENTS 2011

5.1.1 Takoradi Port

During the year under review, the following infrastructural and structural improvement projects were undertaken at the GMC Takoradi Port facility.

The rail car tippler structure and operating system were extensively renovated.

- The barge loading conveyor system was fitted with a variable speed vibrating feed hopper to improve efficiency of operation.
- In addition to work undertaken at Takoradi Port facilities, this year saw extensive renovation work being undertaken on the Junior Staff quarters:
    - 1 block (4 rooms) were renovated
    - 1 kitchen block (6 rooms) were renovated
    - 1 block (2 apartments) self-contained junior staff house at Effiakuma was renovated
    - 1 senior staff house at Effiakuma was renovated

Plates 39 and 40 show conveyor structures for Conveyors No3. Point and a new transfer house at the transfer between number 2 and 3 conveyors.

Plate 39: New conveyor structure for Conveyor between No .2 and 3 conveyors.

Plate 40: New transfer house No.3 point

5.1.2 Auto Sampler and a new lathe machine installation at Takoradi Plant.

An automatic sampler that collects ore samples at pre-determined intervals during loading of vessels has been installed at Takoradi Plant. It is based on a PLC system that automatically samples in dependence of the material mass transported. An automatic lathe machine was also installed to take care of jobs which were previously sent to Nsuta.

5.2.0 Nsuta Infrastructure

During the year under review, several infrastructural projects were undertaken. New Projects: Refurbishment/construction of staff housing units-. A total of 14 junior staff housing units were completed in 2011. These housing units were upgraded to include:

- Two bedrooms
- One enclosed porch
- One open courtyard
- A toilet
- A bathroom equipped with a shower
- Kitchen.

Plates 41 and 42 show Junior Staff houses under construction and completed Junior Staff housing units.

Plate 41: Junior Staff houses under construction

Plate 42: completed Junior Staff housing units

5.2.1 Construction of new toilet blocks

During the year, (five) 5 new toilet blocks were constructed. Another two (2) units on which construction started in 2010 were completed early in 2011.

In order to address the ever increasing volume of sewage generated in the Nsuta Village, an alternative to the traditionally used KVIP toilet system was sought. GMC elected to construct a Biofil toilet system as a pilot project to be used with the first 12 renovated junior staff housing units described above. The Biofil Digester is a simple compact on-site organic waste treatment system that uniquely combines the benefits of the flush toilet system (septic tank) and those of the composting toilets (KVIP and Pit latrine) and eliminates the disadvantages and drawbacks of both systems as indicated in plates 43 and 44 below.

Plate 43: Biofil toilet system

Plate 44: New constructed Toilet system at Nsuta

5.2.2 Construction of New Staff Housing Units

Construction of new staff housing units commenced at GMC's Tamso Estate residential area. Provision has been made for the following housing units:

- One senior staff bungalow completed,
- Two semi-detached senior staff bungalows completed

Plate 45: New senior staff bungalow – Tamso Estate

Plate 46: Two semi-detached senior staff bungalows – Tamso Estate

5.2.3 Construction of Junior Staff Function Hall

Construction commenced on a junior staff function hall located alongside the junior staff swimming pool. The function hall will be equipped with male and female toilets, a kitchen, and a stage and will have a floor area of approximately 275m². The function hall will form the focal point of a general upgrade of the junior staff recreation facilities. Construction of the junior staff function hall will be completed in 2012. See Plate 47 and 48 showing a new junior staff function hall under construction.

Plate 47: New junior staff function hall under construction.

Plate 48: Ongoing work on new junior staff hall

A gymnasium including male and female toilet and shower facilities was constructed within the confines of the "old" junior staff club. This gymnasium marks the beginning of a process of converting the "old" junior staff club into a fully equipped sporting facility which will among other things include an open air basketball/tennis court. Work on this project will continue into 2012. 'All work and no play makes Jack a dull boy', as the sayings goes, an ultra-modern gym built for workers in order to exercise their bodies, were wired to suit equipment positions and air conditioning installations.

5.2.4 Construction of New Bath Houses

During the year under review, 12 junior staff bath houses at the Nsuta village were extensively renovated. See Plates 49 and 50, showing two of the six (6) renovated junior staff bath houses at Nsuta.

Plate 49 and 50: Two of the six (6) renovated junior staff bath houses at Nsuta

The renovation works was aimed at improving hygiene of the facilities and therefore extensive tiling works and improvement of waste water drainage facilities were carried out.

5.2.5 Construction of New Tennis Court

Construction of two new tennis courts near the Nsuta Restaurant commenced in December 2011 and is expected to be completed in early 2012.

5.2.6 Refurbishment Projects:

The following infrastructural refurbishment projects were undertaken during the year under review:

Extensive rehabilitation work was undertaken on the so-called "Blackman Bungalows", inclusive of kitchens and bathrooms, at Nsuta village. Eight housing units occupied by thirty-two families were rewired to avoid electrical faults and risk of electrical fires.

Plate 51: One of the newly renovated "Blackman Bungalows"

Plate 52: Senior and junior staff houses at Tamso Estate

5.2.7 Renovation of Senior Staff Ward at GMC Hospital.

Extensive renovation of the Senior Staff ward at GMC Hospital was commenced in 2011. When completed, the "new" ward will comprise two fully air-conditioned male and female wards, each with an on-suit bathroom. Also included is a centrally positioned nurse's office.

5.2.8 Construction of New Change House Facility

Construction of a new change house facility started in 4th quarter of 2011 and was completed in the first quarter of 2012. The change house facility has been designed to include solar heating and lighting technology in order to reduce GMC's dependence on electricity supply.

The old fuel discharge point situated at the top of the filling station has been refurbished by constructing a concrete bound wall to prevent spillage and seepage of fuel.

Plates 53 and 54 show construction of new change house facility and a view of the solar heating panels.

Plate 53: Newly commissioned staff change house

Plate 54: Solar heating panels

TAMSO ESTATE SENIOR STAFF HOUSING		92,000
Block 7 & 8	Painting and general maintenance	
Block 9 & 10	Painting and general maintenance	
Block 11 & 12	Painting and general maintenance	
Senior staff housing, 2 units – approx. each	New Structures	
TAMSO ESTATE SENIOR HOUSING		92,000
Block 2A	Painting and general maintenance	
Block 3A	Painting and general maintenance	

Block 4A	Painting and general maintenance	
Junior staff housing, 2 units – approx. each	New Structures	
JUNIOR STAFF HOUSING	Complete Renovation	
Rehab Jnr staff housing - New Compound Nsuta	10 units	368,000
Rehab Jnr staff bath houses - Old Compound	6 units	138,000
16 seater Aqua privy toilets for Nsuta village	6 units	115,000
Rehab Jnr staff housing Takoradi – Effiakuma	9 units	51,750
SENIOR STAFF HOUSING	Complete Renovation	115,000
Rehab Snr. staff housing Takoradi	4 units	
Rehab Snr. staff housing Nsuta	10 units	
BLACKMAN BUNGALOW (8Nos)	Complete Renovation	184,000
GRAND TOTAL		**USD 1,155,750**

Table 7: Approved Budget - Projects 2011

5.2.9 Nsuta Golf Club

Three (3) years ago it was decided to resurrect the original golf course which was built on the current site during the late 1920's. The design philosophy of the course was simple; to create a course which closely follows the natural terrain which will offer the occasional and experienced golfer alike at true challenge of his skills. The Ghana Golf Association (GGA) officially inaugurated and welcomed the Nsuta Golf Course as a new national course in Ghana in September 2011.

The golf course was built with the Kawere stream as its main feature alongside of which previously unusable ground was systematically reclaimed, retaining as many of the originally occurring trees as possible to lend character to the young course.

The course is not overly long by modern standards, however, those who rely on drivers beware, for the hazards are unforgiving and your skills with irons will be tested.

On Saturday, 19th February 2011 the inaugural tournament was held at Nsuta under the auspices of the Ghana Golf Association, several of whose executives attended.

Consequently, the Nsuta Golf Club was officially welcomed as an affiliated member to the Ghana Golf Association on 7th May 2011.

Plate 55: Aerial view of original golf course, circa 1940

Plate 56: View of the green on the 1st hole.

Plate 57: A photo of some of the competitors at the Nsuta Golf Course inaugural Tournament held on 19th February 2011

Plate 58: View down the 3rd fairway

5.4. ENVIRONMENTAL IMPROVEMENT PROGRAMMES DURING YEAR 2011

5.4.1 Environmental Training and Workshops

- The environmental policy statement was discussed with workers in the various departments during the HSE morning meetings on a rotational basis. This is to make them aware of the company's commitment to environmental issues and the role of employees in achieving the company's goal.
- Presentation on oil management was made as part of training for workers at the filling station organized to sensitize them on Standard Operating Procedures and safety precautions during their work.
- The company's waste classification colors were regularly discussed at the HSE morning meetings. This is to make the workforce familiar with the colors so as to enhance proper segregation of waste on the mine.
- A meeting with the agenda ''Result of Akoben rating 2010'' was held; all heads of departments and sectional heads as well as the Managing Director were present. This was followed by meetings with the various departments on a rotational basis; presentation on the Akoben criteria and the role of the workforce to ensure compliance was made.

- Induction of newly employed workers and employees resuming from annual leave was also conducted.
- Staff of the Environmental Department attended all the ENSOC meetings held during the year 2011.
- A training session was organized on the theme "General House Keeping," to encourage the workers to practice good housekeeping at all times. The workers were also informed about the next Akoben Audit requirements and the need to follow oil spillage management procedures by cleaning up oil spills immediately with either saw-dust or sand/rag which, should thereafter be put into the contaminated material/waste bins.
- The Akoben audit was successfully conducted by EPA on the 9th and 10th of May 2011. Final ratings were later released for the year under review.

5.4.2 Summary of Environmental Activities during Year 2011

- The oil/water separator was thoroughly cleaned; the four (4) siltation chambers connected to the oil/ water separator were de-silted and regularly checked to ensure only water free of oil was discharged into surrounding streams.
- Various drains on the mine were regularly de-silted to improve drainage and surroundings regularly weeded to maintain a clean environment.
- The metal pipes on the piezometric points at the tailings dam were painted to prevent rusting of the pipes.
- More dustbins were made available in the Nsuta village to improve sanitation in the village so far as waste management is concerned. The various workshops were regularly inspected; oil spillage, waste segregation, littering and general housekeeping were closely monitored to ensure good housekeeping was practiced in the workshops.
- The dustbins/room for disposal of wastes from the canteen were thoroughly scrubbed and disinfected to remove stench and keep the place hygienic.
- Expired drugs at the pharmacy of the Nsuta hospital were properly disposed of by burying.
- Various drains on the mine including "Essuabena", Kawere and Tarkwa Banso were de-silted to improve drainage and to maintain a clean environment.
- The contaminated soil containers at the workshops were repainted black in accordance with GMC color code.

- Various measures such as cutting of trench, planting of more trees and filling of gulleys with waste rocks were carried out on benches to ensure stability.
- Plastic dustbins with lids were provided to some departments and residences to aid in improving sanitation.
- Overgrown branches of trees in the residential areas, hospital and on the mine were pruned to improve their aesthetic value.
- The water storage chambers of the oil/water separator used for washing dump trucks were de-silted and thoroughly cleaned. The regular de- silting and cleaning of the separating chambers also continued within the year to ensure that only oil-free water is released into the external environment. Silt-trap constructed at the Golf course to reduce the amount of silt carried by storm water into the Kawere stream was regularly de-silted.

5.5.0 Visiting Groups

- Consultants on Aquaculture visited the mine and assessed the suitability of water in Pit A, B, and C for fish farming during/after closure of the mine.
- As part of the Mine Safety Day Celebration, the Inspectorate Division of Minerals Commission visited the mine to conduct Mine Safety audit.
- The Ankobra Basin Officer of the Water Resources Commission visited the mine for inspection of water bodies and their management.
- The Inspectorate Division of the Minerals Commission visited the mine on the 17th of quarterly bases for inspection and reporting to the government.
- Engineering students from the Cape Coast Polytechnic paid an industrial visit to familiarize themselves with the operations of the mine.
- The Municipal EPA director was invited to the mine to hold discussions on projects to be undertaken this year. He also visited the mine on their quarterly visit.

5.6.0 ENVIRONMENTAL MONITORING PROGRAMMES

The environmental monitoring program at G.M.C Limited is designed to evaluate the potential impacts of the operation on the surrounding environment and, to validate predictions made in the Environmental Impact Assessment and the Environmental Management Plan. Monitoring results are compared to the Environmental Protection Agency (EPA) guidelines and standards. In the absence of the applicable guidelines and standards, the results are compared to the World Health Organization (WHO) international standard.

5.6.1 Environmental Quality Monitoring

Environmental quality monitoring is one of the key tasks carried out by the environmental department throughout the year. For this purpose the Electrical department designed a fully networked system, coupled over encrypted radio connections from the most required locations to the corporate network. Local meteorological conditions were monitored throughout the year. Places monitored include tailings dam, Pit C, and Tarkwa Banso. The meteorological conditions monitored included rainfall, temperature, wind speed, wind direction, rate of evaporation.

Periodic water monitoring was carried out to measure the depth and level of water in the tailings. This was carried out by the use of a piezometer gauge. At the tailings dam the ground water level measurement took place at six different points. The values secured from the water level measurement were recorded and analyzed.

5.6.2 Rainfall Data

Rainfall data describing the pattern and amounts, which characterized the year in the operational area, was obtained from GMC local Meteorological Station. The annual rainfall in the area was measured to be 2,166.7 mm which was 10% less than that of 2010 total rainfall value.

5.7.0 Air Temperature

The hottest month of the year was March and just before the beginning of the rainy season. The coolest months occurred in February and November. The maximum and minimum air temperatures measured within the area was about 37.5˚C with RH 60.67% and 18˚C with RH 99.8% respectively. The Nsuta climate simulations show an annual mean temperature decreased by 2.5°C to 3°C on the mine. There are smaller diurnal temperature variations during the rainy periods when compared to the dry periods, mainly because of the effects of cloud cover.

5.8.0 Dynamics of Evaporation in Nsuta

The analysis of this joint climate-hydrology modeling approach shows a very heterogeneous response to changes in climate variables. Nevertheless, most of the rainfall surplus was found to evaporate due to an increase in temperature, wind speed and humidity with average daily evaporation of 3.16mm. Annual potential evaporation rate was 728mm.

5.9.0 Surface Water Quality Monitoring

The mine has an effective monitoring system designed to evaluate the potential operational impacts on the surrounding environment. Water sampling was carried out every month. Water was sampled from surface water and boreholes in the surrounding communities for quality assurance. See plates 59 and 60 below. Samples of all water sources within and outside mine were taken on monthly basis and are reported to the EPA, Mineral Commission and other stakeholders in the mining industry. These water sources include pits, bore holes, rivers and streams. Samples are then sent to SGS for analysis

Plate 59: Technician sampling surface water Plate 60: Technicians taking piezometer reading

During the monitoring, water samples are collected from twenty-three (23) main location points and analyzed for parameters such as pH, Turbidity, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Dissolved Oxygen (DO), Biological Oxygen Demand, True Color, Apparent Color, Nitrates (NO_3), Sulphate, Iron (Fe) total and

Manganese (Mn) Arsenic Total, Arsenic Dissolved, Copper, Cadmium including oil and grease .Groundwater emanating from mining pits is also analyzed quarterly for arsenic (dissolved and total).

5.9.1 Daily Drinking Water Analysis

Drinking water is also analyzed for microbiological parameters such as total coli-form, faecal coliform, E coli, Yeast and Mould. Two samples of water were taken daily to determine quality of the presence of some water constituent. The parameters analyzed under investigation were mainly physiochemical parameters. Below is the detail of the qualitative analysis. A conductivity meter was used to measure the specific conductance, and total dissolved solid (TDS). Chlorine and pH were analyzed qualitatively using Brometymol and O-T iodine as reagents respectively. Lovibond 1000 comparator was used to carry out the qualitative analysis. The water samples were taken from two different places namely Gallaway and Golf course. The Gallaway pump station supplies portable water to the Nsuta community and the company's operational areas whiles the Golf course pump station supplies water to the bungalows.

Water quality analysis was carried out on daily, weekly and monthly basis. Water samples from Golf Course and Gallaway were taken to the GMC Hospital on daily basis for laboratory testing. Results from the hospital are collected the following day to check for bacteria presence.

Plate 61: shows reading rain gauge values.

Plate 62: shows taking reading from evaporation pan.

Water quality monitoring is undertaken on daily, monthly, quarterly or biannually basis depending on the sensitivity of the circumstance. Samples collected are sent to the

SGS laboratory in Tema for analysis. The results are compared to the Ghana EPA guidelines and standards for water quality and, also compared with the WHO International Standards. Though concentrations are within the EPA effluent quality standard, frequent increases in concentration are noticed at the Tarkwa Banso village (EPA Nitrates NO_3- standard is 50mg/l). Again Sulphate values for all the sampling locations throughout the year indicated that, the level of concentration fell within the EPA effluent quality standard. Between August and November, Tarkwa Banso recorded highly values than all the sampled areas.

5.10.0 Dust Monitoring

Dust monitoring was conducted throughout the year using the Minivol Air sampler to mine TSP and PM_{10} concentrations respectively at the carbonate processing plant, workers canteen, Takoradi Port, Nsuta village and the Tarkwa Banso community. Averagely most of the measured results were below EPA threshold values due to rains and effective dust suppression systems.

5.10.3 Ground Vibration

The standard Ground Vibration limit is 5 mm/sec. All the figures recorded on ground vibration throughout the year fell within the acceptable limits as per the table below:

Month	**Avg. Peak Velocity (mm/s)**	**Akoben Criteria**	**Month**	**Avg. Peak Velocity (mm/s)**	**Akoben Criteria**
JAN	0.13	5	JUL	0.41	5
FEB	0.21	5	AUG	0.45	5
MAR	0.25	5	SEPT	0.34	5
APR	0.19	5	OCT	0.48	5
MAY	0.19	5	NOV	0.63	5
JUN	0.05	5	DEC	0.35	5

Table 11: Ground vibration recordings for 2011

5.10.4 Air Blast

Out of a total of 261 blast events monitored during the year under review, 207 shots representing 79.3% of the total blasts conducted fell within the acceptable criteria by Akoben Criteria, 54 of the blast events monitored representing 20.7% did not trigger. In terms of exceedance, 2.9% was also recorded.

Month	Avg. Air Overpressure	Akoben Criteria	Month	Avg. Air Overpressure	Akoben Criteria
JAN	108	120	JUL	111	120
FEB	111	120	AUG	108	120
MAR	114	120	SEPT	111	120
APRIL	114	120	OCT	110	120
MAY	111	120	NOV	111	120
JUN	112	120	DEC	112	120

Table 12: GMC air overpressure result.

5.11.1 Noise Monitoring Analysis

Noise monitoring was conducted for the year under review to determine amplitude or loudness in dB (A) and the frequency in Hz. In terms of noise levels, periodic data collection exercises were conducted throughout the year. It was observed that the periodical increase in noise levels on the mine though lower than EPA threshold were mainly due to train (Rail) movements and heavy equipment in operation as well as the convergence of a lot of light vehicles at the canteen area during lunch break hours. Workers have been advised to wear ear-plugs and ear muffs to avoid any negative impact. The precautionary measure has been taken because, management observe that, activities that generate these noise levels are irregular. The EPA Regulation on ambient noise level standards is 70dB (A) by day and 70dB (A) by night. The table below shows the recorded figures for 2011:

Month	Measurement Locations					
	EPA Guideline	Canteen	Carbonate Plant	Nsuta Village	Tarkwa Banso	Takoradi Port
Jan	70	63.10	70.00	54.00	48.10	65.70
Feb	70	59.05	69.00	50.50	50.50	68.20
Mar	70	58.20	67.58	50.45	48.23	68.00
Apr	70	65.36	68.74	49.90	50.45	69.20
May	70	65.34	70.00	56.39	53.39	68.10
Jun	70	64.89	67.69	60.58	48.60	66.78
Jul	70	60.47	68.90	62.50	49.10	66.10
Aug	70	58.30	59.40	56.60	50.10	69.60
Sep	70	60.30	64.80	61.40	55.10	67.30
Oct	70	65.30	67.56	68.46	63.17	69.01
Nov	70	64.53	66.11	69.89	63.29	69.97
Dec	70	65.08	68.07	69.01	63.07	69.63

The above table 13 shows the average monthly noise levels at various monitoring points within the year 2011.

5.12.0 WATER AND ENERGY RESOURCES MANAGEMENT

5.12.1Construction of new boreholes and pump houses

In order to augment potable water supply to the Nsuta village, three new mechanized boreholes were drilled. In addition to fully equipping them with pumps and electronic controllers, each borehole was mechanized and housed in order to secure the pump equipment. Installation of new water treatment pumps for the two water treatment stations as replacements was undertaken during the year under review.

The old treatment pumps, originally delivered by the manufacturer suffered several corrosions and damages during the extremely low quality grade. Rapid stoppages and rampant starts were causing damages on the line system since these devices were started directly by a hydraulic pressure switch (2 point control). The new system is internationally approved for drinking water supply systems, made of stainless steel and driven by intelligent PID controlled frequency drives.

5.12.2 Ground Water Pump Station

In 2011, GMC pursued vigorous community borehole infrastructure refurbishment and commissioned new ones. The objective was to properly assess the water supply needs of the people in addition to the water quality. New boreholes were constructed in the communities Akyem, Domeabra, Teacher Ekorasi. In order to augment potable water supply to the Nsuta village, 5 new boreholes were drilled. In addition to fully equipping them with pumps and electronic controllers, each borehole was equipped with a pump house in order to secure the pump equipment. See Plate 64 showing one of the new borehole/pump houses.

Plate 63: Newly constructed Borehole houses At Domeabra

Plate 64: One of the new borehole/pump

COMMUNITY	**DESCRIPTION OF BOREHOLE**	**COST ($)**
Nsuta	Four (2) New mechanized boreholes	17,000
Domeabra	One (1) New Bore Hole	8,500
Akyem	One (1) New mechanized borehole	8,500
Teacher Ekorasi	One (1) New mechanized borehole	8,500
Total Cost		**42,500**

Table 14: Community boreholes

5.12.4 Water Consumption for 2011

The table below illustrates water usage from the various sources during 2011. From table 15 shows data on water use.

WATER CONSUMPTION FOR 2011					
Month	**Boreholes**	**GWC**	**Month**	**Boreholes**	**GWC**
Jan	9,350.0	-	Jul	9,872.0	1,963
Feb	7,761.0	-	Aug	9,607.0	7,370
March	7,954.0	-	Sept	9,789.0	6,777
April	8,181.0	2,793	Oct	9,481.0	3,521
May	7,421.0	2,201	Nov	9,560.0	3,086
Jun	9,480.0	1,963	Dec	9,410.0	3,042

Table 15: Water use data.

5.12.5 Energy Management

The following measures were in place to improve on energy management on site:

- A "Power Factor Correction" system was installed to allow more effective utilization of electrical power supplied to the mine,
- Significant capital investment in more efficient equipment in the processing plants resulted in reduced unit power consumption rates,
- Similarly, replacement of old, obsolete mining equipment with new, more efficient equipment resulted in improved unit fuel consumption rates.

Month	**ECG Grid**	**Local Grid**	**Month**	**ECG Grid**	**Local Grid**
JAN	584,000	19,350	**JULY**	574,000	29,860
FEB	535,000	33,400	**AUG**	572,000	18,580
MAR	598,000	46,830	**SEPT.**	542,000	24,340

APR	536,000	46,830	**OCT.**	582,000	31,100
MAY	590,000	20,470	**NOV**	554,000	35,920
JUNE	582,000	23,240	**DEC**	547,316	45,310

Table 16: Power consumption data

5.13.0 New Electrical Equipment Installation

It became necessary to install 2-525/415 V, 2-415/11kV new transformers to replace the old existing 2-525/11kV transformers. The transformer has its accompanied switchgears and panels which initiated the installation at the Power House.

Plate 65: New electrical equipment installation

Plate 66: Electrician installing transformer

The existing transformers, switchgears and panel are too old and give problems. All low voltage overhead copper cables were replaced with aluminum ones to avoid rampant cable thefts on the mine and the Nsuta township. Copper cable thefts were recorded many times last year. There have not been any thefts ever since the cables were replaced.

5.13.1 Energy Saving Plan

As part of the 5 years energy demand reduction program, centralized capacitor banks at optimal 0.94 phase shift were changed to enable GMC restructure major energy supply facilities.

5.13.2 Security illumination

In line with the energy reduction program, efforts to eliminate constant lighting during night continued. In 2011 the Electrical department replaced street illuminations with on-demand lighting systems and all renovated premises were thoroughly planned in more energy efficient way than ever before.

Plates 67 and 68: showing renovated blocks with automated illumination in the night

Street lighting of the village and other specific places is also necessary since night activities and outing are enhanced by the presence of these lights. It also discourages nefarious activities in the night such as stealing.

5.13.3 HT& LT Overhead Line Diversions

Security guards assigned to the scrap yard find it very difficult to see intruders to the yard at night, hence finds working conditions very dangerous. The extension of light therefore improved illumination there. It was planned to provide 11kV (domestic) power to the Mine village since about 50%of industrial power from the national grid is consumed every month, and at a cost higher than what the plant consumed for the same period.

Since the same step down transformer serves the Mine Hospital and the village, it was decided that their sources of power could be separated so as to supply power from the standby generators during power outages.

Due to regular theft cases of high tension lines on GMCs 11kV in-house system, the Electrical department decided to divert lines to less critical paths and use aluminum instead of copper. With this dependable wiring, the power house renovation project is enabled to kick-off direct supply in 2011.

Plate 69: HT/LT overhead line Before

Plate 70: HT/LT overhead line After

A new remotely controlled sixteen ton Demag crane has been installed at the plant to make servicing and repairs easier. It has made lifting of carbonate boulders from the crusher easier and faster. Similar remotely controlled sixteen ton Demag crane was also installed at EME workshop. Now it's possible to lift and transport heavier loads at regulated and varying speeds around including the light vehicle workshop.

5.14.0 Installation of two Atlas Copco Compressors at Washing Plant and EME Workshop

Two Atlas Copco compressors were installed at EME workshop and the old Washing Plant. Two 10 ton air receivers were installed together with them. The one at old washing plant is serving Rana Motors Tyre repair Service that take care of all the company's tyres from dump trucks to light vehicles. The second one is serving the Carbonate Plant Workshop, Hydraulics/Caterpillar w/shop, Earth Moving Equipment w/shop and Light Vehicle Workshop.

5.15.0 Installation of a new GPS for Survey Department

This was installed to help the Survey Department have accurate result sights to be surveyed in order to get correct projections on demand. With erection of a new antenna pole and installation of this system, all 3 global positioning systems (GPS, Gallileo, GLONASS) are base-stationed and error-corrected, transmitting on a new GMC internal network to all rover units, allowing survey result within an accuracy of 6mm XYZ.

5.16.0 Installation of new Equipment in Assay Laboratory

As part of measures to improve on turn-around time of samples received at the Mine Assay Laboratory, new pulverizers and an additional crusher were introduced at the sample preparation line. To ensure an environmentally friendly operation and safety of employees in Sample Prep operations, the Metallurgical Department also commissioned a new dust collector at the sample prep. and two fume hoods in the Wet Chem. La.

Other laboratory equipment like Water Heaters, Emergency Showers, Emergency Acid Fume Extractor and Higher Capacity Air Compressor were also commissioned to improve on personnel safety in the lab and efficiency of work.

5.16.1 **Assay Laboratory Pulverizers (Lm2-P) & Jaw Crusher (Jc2000)**

Plate 71: Assay Lab Jaw Crusher (Jc2000)

Plate 72: Assay Lab Pulverizer

2 No. Lab Pulverizers and 1 No. Jaw Crusher added to the existing ones at the sample prep have increased the daily output capacity of the lab and also improved on turn-round time of samples submitted to the lab.

The sample prep had to be rewired to accommodate the new sample prep equipment and the dust collector. A higher capacity air compressor was installed to take care of the two extra pulverizers and the dust collector.

5.16.2 Gold Series Dust Collector (Essair 2201) With Automatic Timer Control

The installation of this equipment has solved a major problem associated with ore samples preparation – dust generation. The new dust collection system ensures an environmentally friendly operation at the sample prep.

Plate73: The Laboratory Gold Series Dust Collector

Plate 74: Assay Laboratory Plasticair Fume Hood with Scrubber and Extractor

5.16.3 Fistreem Cyclon Water Still

Distilled water is required for preparation of reagents and sample solutions for analytical work. For determination of elements in the order of ppm it is required that matrix effects of interference are reduced to the minimum.

Installation of the water distillation unit has solved the problems the mine Assay Lab used to encounter with unreliable and poor quality distilled water that was being sourced from local suppliers in Tarkwa.

Water heaters (Ref. plate 75) were also installed to provide hot water for washing of laboratory glass ware. The Fistreem Cyclon distillation unit delivers about 1-2 l/min of distilled water, enough to meet the laboratory's requirements and also supply to other departments on the mine. (Ref. plate 76).

Plate 75: Fistreem Cyclon Water Still

Plate 76: Water Distillation Unit

5.16.4 **Mirage Air Compressor**

Plate 77: Assay lab Mirage Air Compressor

Plate 78: Side view of the Mirage Air Compressor

Installation of a new compressor to replace an old one and relocation of the compressor house was a major improvement in sample prep operations. This now ensures continuous supply of compressed air for cleaning at the sample prep and operation of the dust extractor.

The relocation of the compressor house solved a long-time problem of uncomfortable noise levels associated with the previous compressor, which was located too close to the sample prep and the Metallurgist's office.

5.16.4 Safety Shower

Plate 79: Safety shower at the Assay lab

Plate 80: Second Emergency shower at the Assay lab

Installation of emergency showers at various points at the laboratory was completed. (See plates 79 and 80).

This forms part of requirements of emergency response plan for laboratory personnel. It is to be used in case of accidental chemical spill on lab staff.

5.16.5 Emergency Fan/Extractor with Acid Resistant Duct

Plate 81: Emergency Fan/Extractor

Plate 82: Assay Lab fan extractor

UPS power source enables this to be used to clear the digestion room of acid fumes whenever the laboratory fume extractor goes off as a result of power outage.

Two fumes hoods (Ref. plate 81) were also installed to replace old ones, which were without scrubbers and were therefore releasing acid fumes into the atmosphere. The newly installed fume hoods with scrubbers ensure that all acid fumes generated in the lab are collected and neutralized before being released into the drains. This ensures an environmentally friendly lab operation.

6.0 COMMUNITY ASSISTANCE PROGRAMME

As part of the vision of the community assistance program enshrined in the Corporate Social Responsibility Policy of the company, GMC pursues a vigorous policy of providing infrastructure based projects like school buildings, aqua-privy toilet facilities, water closet toilet facilities, provision of low tension poles to support governments rural electrification project, community centers, market places and many more.

In 2011, these programs were continued. Below is a review of the projects executed (to date).

6.1.0 Community Infrastructural Projects

The seven communities (Anomakokrom, Tarkwa Banso, Nsuta, Essuoso, Teacher Ekurasi, Akyem and Zongo) projects have been completed, commissioned and handed over to the various communities. The Awudua and Bankyim projects are also completed. The details of completed projects are presented below:

6.1.1 Road Repairs

The Tarkwa Banso – Esuaso/ Domeabra stretch of roads (10km) were repaired under a special arrangement between the Company and the Esuaso Divisional Stool Council. First, a complete grading of both roads was undertaken. The second phase involves filling of roads with uncrushed materials. Estimated cost of this project stands at US$22,782.92

Plate 83: Tarkwa Banso-Esuaso/ Domeabra Road Reconstruction

6.1.2 Storm Drainage System

The construction of a drainage system to prevent flooding especially during the peak of the rainy season was completed at Tarkwa Banso. The project cost US$1,656.67

Plate 84 & 85: Two newly constructed drainage system at Tarkwa Banso

6.1.3 New School Block Constructed

A 4-unit classroom block constructed at Tarkwa Banso was completed. The new project replaces the existing nursery block thus improving teaching and learning. The three-unit classroom and two offices block were constructed at a cost of US$35,620.11

Plate 86: 4-Unit school block at Tarkwa Banso Community

A new community and social center was constructed at an estimated cost of US$ 25,517.27 for the people of Anomakokrom. Three new projects; Borehole and Bath for "Akyem", Aqua privy facility for "Bonsawire" and "Charlekrom" have been awarded on contract.

Plate 87: The community and social center project.

6.1.4 Refurbishment of Dadwen School Complex

The Dadwen School Complex canteen was refurbished at a cost of US$4,700.00 to provide a hygienic environment for pupils and teachers of the school.

Plate 88: Refurbishment of Dadwen School Complex Canteen

6.1.5 Resealing of Cracks

As part of MOU between GMC and the Tarkwa Banso community, resealing of cracks in buildings have been completed. Cracks in 200 buildings were resealed. Eight members of the community were engaged on this project as an employment opportunity. Below is a sample of how the resealing was done.

Plates 89: Resealing of cracks in buildings

6.2.0 Community Apprenticeship Training Pilot Programme

Sustainable Livelihood program was inaugurated for forty-two (42) apprentices from Tarkwa Banso and three other communities on a pilot project basis. Facilitators include Agyle Safety Training Institute, Gyanvik Automobile, Nyame Ntsi Welding Shop, Quayson Tailoring Shop, Ref Engineering and Harriet Fashion Shop. Skill based projects aimed at community economic empowerment.

A research conducted through community engagement, informed a shift from the conventional livelihood projects such snail rearing, Soap and tie and dye making into Project areas like HD Machine Operators' Training, Welding & Fabrication, Auto Mechanics and Hair dressing. This training cost an amount of US$25,272.01

Twenty four (24) of the forty–two (42) were sponsored by GMC to be trained in operation of mining equipment such as Dump Trucks, Excavators, and Graders etc. at the Agyle Training Consult whilst the other 24 went into trades such as dress making, welding and mechanic works. Since training in equipment operation has shorter duration than the other employable skills programs. A graduation ceremony was organized for the 24 graduands who successfully completed the sponsored training in machine operating at Agyle Safety Training Institute.

Training is in progress for the remaining 24 trainees enrolled on other programs such as Welding & Fabrication, Auto Mechanics and Hairdressing which take three (3) years to complete.Out of the twenty four (24) trainees who have successfully completed the training in Heavy Duty Machine operating at Agyle Safety Training institute at Bonsa, GMC Ltd has employed twelve (12) on the Mine.

Plate 90: Equipment operating training

Plate 91: An apprentice snapped during training

Plate 92: Shows community members in the pilot apprenticeship program during commissioning

6.3.0 Educational Bursary Scheme

- Financial grant given to a beneficiary in support of his/ her educational financial commitments
- Beneficiaries must be in a 2nd Cycle or Tertiary educational institution and also a member of a community under the scheme
- A beneficiary must meet the basic educational criteria to qualify for a grant
- 582 applicants benefitted from a total allocation of US$48, 240.00.

Plate 95: Donation made to Archbishop Porter Girls' Sec. School

Plate 96: Presentation of Bursary to Nana Atobra II, Esuoso Divisional Council

Total expenditure, 2011

Period	Project	Total Cost (USD)
January – march 2011	Boreholes, Education, Health, Roads and others	**72,583.19**
April- June 2011	Education, Health, Roads, Boreholes, Housing, Sanitation and others	**116,198.00**
July- September 2011	Education, Health, Roads, Boreholes, Housing, Sanitation and others	**81,641.91**
October- December 2011	Education, Health, Roads, Boreholes, Housing, Sanitation and others	**33,812.28**
		304,235.38

Table 17: shows the details of completed projects.

6.3.1 Summary of Community Bursary for Year 2011

- Bursaries at a total amount of US$48,240.00 were disbursed to applicants from the seventeen host communities.

Community	No.of Beneficiaries	Total Amount (US$)
Agona Wassa	26	1,386.7
Ahwetieso	18	986.7
Akyem Wassa	6	346.7
Akyempim	22	1,520.0
Anomakokrom	36	1,893.3
Anyinase	14	746.7
Bankyim	46	2,533.3

Bonsa No.2	27	1,506.7
Chalekrom	50	2,826.7
Essikuma/Bonsawire	20	1,186.7
Esuaso	128	19,866.7
Jerusalem	8	453.3
Kwaminakrom	24	1,320.0
Nsuta-Wassa	50	2,933.3
Senyakrom	35	1,893.3
Tamso	42	2,466.7
Tarkwa Banso	30	1,706.7
Cost of Mail, Fuel and Transportation		2,666.7
Total No. of Beneficiaries	**582**	
Overall Total		**US $48,240.00**

Table 18: Summary of community bursary for year 2011

6.4.0 Community Leadership Training Programme

Ghana Manganese Company held a 3-Day leadership training programme for the Chiefs and Queen Mother of the seventeen (17) communities in its catchment area. The programme was aimed among others, to inculcate into the participants', basic leadership and community development skills. Topics treated at this all important workshop by Mr. Benjamin Asare Ankrah a community development practitioner from Abenje's Business Services (Consulting Firm based in Accra) included; Community Mobilization Skills, Community Development Principles, Facilitation Skills, Communication Skills (questioning and listening), Conflict Prevention and Management, just to mention a few.

The training programme, which took place between the 30th of November and 2nd of December at the Senior Staff Club House, was attended by a total number of fifty eight (58) delegates. Participants at the end of the 3-day workshop expressed their heartfelt gratitude to GMC for organizing such an educative workshop since it helped enrich their knowledge about community leadership.

6.5.1 Community Consultative Meetings

- Meetings were held with the Zongo community leadership which was in accordance with their request for a quarry project and it was agreed they write officially to request for mine waste material from GMC.
- A meeting on the Zongo Quarry Project was held between GMC and the Nsuta Zongo community on the 10th of November. A MoU has been endorsed by the community leaders and GMC for the commencement of the project.
- On the Akyem Quarry Project meeting held on 16th November, community members present at the meeting could not form a quorum. It was suggested Project committee executives should be elected before the next meeting for further discussions.
- On the 24th of November, a meeting between GMC and Nsuta Zongo community was held. There was thorough discussion on the terms of contract of the Kawere Desilting Project. Final list of workers is to be submitted to the contractor for work to commence.
- On issues concerning the company's prospecting activity which could affect some farms, a meeting was held with Bonsawire. It was agreed that enumeration of the farms to be affected should begin on Wednesday, December 14th 2011.
- On the Akyem Quarry Project held on 16th November, community members present at the meeting could not form a quorum. It was therefore suggested that the Project committee executives should be elected before the next meeting for further discussions.

- On the 24th of November, a meeting by GMC and Nsuta Zongo community was held. There was thorough discussion on the terms of contract of the Kawere Desilting Project. Final list of workers is to be submitted to the contractor for work to commence.
- During the period under review, Meetings have been held with the Zongo community leadership with respect to their request for a quarry project and it has been agreed they write officially to request for mine waste material from GMC.
- Consultative meetings were held in furtherance of good relations and resolution of community issues/ complaints. Prominent were those meetings held with Tarkwa Banso in relation to operations at C' North which eventually led to the signing of an MOU. Plates 97 and 98 show GMC /Community interactive meetings with Tarkwa Banso.

Plate 97 shows GMC /Community interactions Plate 98: shows GMC meeting with Tarkwa Banso

6.6.0 Community Medical Screening

- A medical screening exercise was carried out at the Tarkwa Banso community aimed at collating baseline data on the health status of the community members for an informed decision in the future. The medical screening at Tarkwa Banso was extended for two more days at the request of the residence and EPA.

7.0 Industrial Relations

In order to ensure that the labour, Human right and anti- corruption principles are adhered to, the following procedures are followed:

7.1 Conditions of service (CA Article)

Workers of Ghana Manganese Company Limited have the free choice to join any workers' group on the mine for their own protection and economic benefits. Largely, majority of the workforce are unionized under the Ghana Mine Workers Union (GMWU) of TUC, Ghana.

Ghana Manganese Company and GMWU have a Collective agreement (CA) which guides our relations with the workers.

The Company recognizes the Union as the appropriate representative to conduct Collective bargaining on behalf of the class of workers specified in the Collective Bargaining Certificate and the appropriate negotiating body for all matters connected with employment and/or non-employment and/or with their conditions of work.

The Company's relations with the Union where the Agreement is silent shall be governed by the Labour Laws, Labour Act 651 of 2003, Social Security Law, Workmen's Compensation Law, Public Holidays Law, Income Tax Law, Mining Regulations and any amendments thereto.

It is further recognized by the parties that the Agreement is a living document and the fact that certain conditions are reduced to writing does not preclude the responsibilities of the parties to meet and negotiate on matters not specifically covered by the Agreement but which are within the scope and intent of collective bargaining.

Responsibilities of Parties to the Agreement

(a) The parties to the Agreement, who have the common goal of the successful operation of the Company, are to do all within their power to promote productivity and stability of employment by ensuring harmonious and peaceful industrial relations to the mutual benefit of the Company and its employees.

(b) The Company and the Union shall ensure that:

i. Agreement once concluded is respected, and made operational.
ii. Procedures agreed to in terms of the Agreement, regulating employer/employee relations are properly observed.
iii. Their obligation in terms of the Agreement is honoured.
iv. To discourage either party on the Mine from engaging in any unlawful industrial action referred to in Labour Act 651 of 2003.
v. That the rights of either party is respected and protected.

19.03 Awards (CA Article)

a) The Company has instituted a long service award, and establishes awards to recognize outstanding performance, safety and other meritorious achievements.
b) The conditions and types of awards are determined by the Company in consultation of the Branch Union.

ARTICLE 15 TRAINING

15.02 In-Service Training (CA Article)

a) In line with Company policy internal training in the form of periodic lectures, demonstrations and/or on the job training shall be provided by the Company to impart additional production, maintenance and administrative techniques to employees to improve upon their skills.

b) The Company undertakes to train its employees in order to maximize their potential.

c) Where an employee is being trained for promotion to a specific post, he shall be informed of the post to which he may in due course be promoted if he successfully completed the training, subject to a vacancy or arising in such post.

15.03 Financial Assistance for Education (CA Article)

a) An employee who may gain admission to University, college, technical or vocational/commercial institutions shall be sponsored by the Company, but the Company must approve of it first.

b) Where an employee is taking a correspondence course approved by the Company, 50% of the educational cost shall be borne by the Company until completion of the course. When the employee becomes successful, the rest of the 50% of the educational cost shall be paid to him upon production of certificate of prove of successful completion. If employee does not successfully complete the course, he will have to pay back the 50% he received from the Company. Time period for repayment will be decided with the Company.

15.04 Service Increments (CA Article)

a. An annual increment shall be based on appraisal and shall be granted to an employee who has completed a year's continuous service in his present category at the rate shown in the Rates of Pay Schedule.

b. In exceptional cases of outstanding ability, an employee shall be awarded an unspecified number of merit increment(s) over and above the normal increment in any one (1) year.

All engagements are at the discretion of the Company subject to security clearance and reference check with previous employers if any. Further new employee is required to pass a medical examination by the Company Medical Officer/or any Registered Medical Practitioner appointed by the Company and to supply personal details for record purposes.

8.0 STAFF CAREER DEVELOPMENT PROGRAM

8.1.0 Internal and external training objective for 2011

The company had the following training objectives for the year 2011:

- To build quality leadership and managerial skills among superintendents and supervisors as part of the succession planning processes.
- To continue with building technical skills required for mining operations.
- To educate workers on health, safety and environmental issues.
- To build capacity of youth from catchment communities in acquiring employable skills.

As a result of the above objectives, the company increased its budget for training and development activities during the year under review. The year 2011 witnessed an improvement in the number of training programs that was carried out as against that of previous years. Every department of the company had some of their workers benefitting from training programs. Training programs undertaken during the period 2011 were comprised of both internal and external trainings. Below is the breakdown of some of the training programs for 2011:

8.2.0 Technical training programs:

- 12 personnel from the Mining Department benefitted from a 3-day machine application and performance training. The training was conducted by CAT resource persons.
- 32 personnel from both the Engineering and Mining were trained on how to operate and repair the CS14 Drill Rig. The purpose was to ensure that, the company derives the maximum output from using the CS14 equipment.
- 8 persons from the Mining Department received training on use of the SURPAC software; a mining engineering tool.
- 10 workers from the Mining Department were trained, examined and certified as Blast Men and Shift Bosses. This training helped the trainees to move up on the ladder of their career as professional miners.
- Two Geologists also benefited from a 3-day training program that was conducted by Coffey Mining Consult.
- Two employees were flown to SPAIN to train on Atlas Copco drill rigs. The team is back and making tremendous contribution to the company in terms of repair and maintenance of Atlas Copco machines and helping other workers in learning the acquired skills.

8.3.0 Managerial training programs:

- 10 personnel from the HR/Admin, Engineering and Finance Departments were trained in use of the NAVISION software in enhancing the performance of their jobs.
- As part of the succession planning programs, 32 supervisors and Superintendents underwent a 3-day leadership training program. The training was provided by BB consult, an HR consulting firm.
- Two personnel from the company's Hospital Lab and Assay &Metallurgical Lab participated in a 2-day training program in "Best practices in Laboratory Management'. The training was conducted by CDM training consult based in South Africa.
- 36 personnel drawn from the HR/Administration and Finance Departments received training in Microsoft applications such as MS Project, Advanced Excel and PowerPoint. The essence was to increase or enhance efficiency in doing internal businesses.
- 24 workers also received 2-day training in financial literacy and management. The training focused on helping workers to apply cost effective methods in

performing their jobs and skills in managing their personal finances effectively for a brighter future.

8.4.0 Health, Safety & Environment training programs:

- All workers on the mine and at the Port facility were trained on how to maintain a clean and friendly environment e.g. managing oil spillages and air pollution.
- All workers that resumed from their annual leave were taken through personnel induction on health and safety best practices.
- 26 workers from the Mining Department received training in managing explosives in stores as well as during drilling and blasting activities. The training was conducted by MAXAM, a certified supplier of explosives to the company.
- RANA Motors, a third party contractor to GMC, conducted a day's training activity on safety practices regarding to use of vehicle tyres.

8.5.0 Apprenticeship training program:

As part of the company's corporate social responsibility thought of providing employable skills to the youth of its catchment communities. Regarding this, 44 people (comprised of 39 males and 5 females) were enrolled on an apprenticeship training program with recognized private institutions of their choice. Beneficiaries of the program opted for trades such as machine operating, fashion and engineering.

Twenty-four (24) went into machine operating and successfully graduated. Twelve (12) of them have been employed by GMC as operator trainees. GMC, as part of its human resource development efforts, is using internal capacity building mechanisms to provide on-the-job training to these new recruits in order to improve their efficiency and effectiveness in using the mining equipment. Those employed are operating equipment such as graders, bulldozers, dump trucks and excavators. The company bore at least 95% of the cost of training in each individual case.

8.6.0 Monitoring and evaluation result on the impact of training programs

The Training Office assists the individual departments and units under the departments to conduct competency gap analysis for their workers. Based on this exercise, training needs are identified. At the initial stages of the needs assessment exercise, baseline data is established based on some designed performance indicators.

To assess the impact of specific training programs, impact assessment exercise is conducted with the help of Heads of Departments (HoDs) or sectional heads. Heads of Departments, superintendents and supervisors are interviewed to examine changes that might have occurred after employees have undergone training. Focus group discussions are also conducted among workers to test their knowledge on any identified changes in performance.

Parties involved in the assessment exercise are made to rate current performance on a scale of 1 to 5 with 1 being the least of the performance scale for a particular indicator. For example, employees are asked to rate current performance in hydraulic repairs on a scale of 1 to 5. In this example, if the new rating is 3 and the baseline rating was say 1, the training is seen as having impacted positively on employees' performance on the job.

9.0 OUR BUSINESS TRANSACTION

GMC business transactions are conducted with due recognition for anti- corruption practices to ensure that theft and corruption do not occur. In this regard the work in the finance department has been designed in such a way as to deter and detect any of such practices. Some of the measures put in place are listed below:

- Before any payment is made we check the supporting documents to ensure they are properly authorized and approved.
- That service is performed or goods are delivered before we pay.
- Treasury will not pay any invoice without the authorization of either the Finance Manager of the Financial Controller.
- Payment vouchers are pre-checked before cheques are authorized..
- Payments made are stamped as paid to avoid double payment.
- Regular and surprise cash counts are done.
- Monthly bank reconciliations are done and issues out of this process are addressed.
- Value books like cheques, receipt books are securely kept.
- Monthly review of ledger entries and unusual amounts are investigated and corrected before the 10th of the following month.
- Payments to suppliers are strictly made by crossed cheques. Cash payments are limited to the minimum.
- Bribery and corruption are punishable by summary dismissal

9.1 commercial department policy statements

Procurement and warehousing policies and procedures follow a logical pattern and are designed to ensure that the procurement process adheres to the company's financial regulations, procurement law and supplies brought into an organization meet the sustainability goals of the organization. This also helps to ensure that a green image is not tarnished by poor supply choices. The main processes common to all procurements includes supplier selection, requesting information, tender submission, tender evaluation, contract award and inspection.

9.1.1 Supplier Selection

The procurement department manages updates and keeps a list of preferred suppliers. Suppliers on a preferred list will have undergone some form of selection process to evaluate them against criteria such as cost, quality and compliance.

9.1.2 Requesting Information

When there is a need to purchase something that the current list of suppliers cannot provide, the procurement department finds wholesalers, retailers or other businesses that can effectively deliver the new requirement. Once suppliers have been identified, the originator will develop a specification, which is a detailed description of the requirement. The specification is sent to these new suppliers who will be asked to return quotes on prices for needed goods and services.

9.1.3 Tender Returns

Tenders usually have to be returned to the procurement department on a specific day and time because we work on daily basis. The returned tenders will include the price for the service or product required, a description of the product or service, financial information detailing the suppliers accounts, delivery time etc.

9.1.4 Tender Evaluation

Typically, returned tenders are distributed to the expediting section via mail who evaluates the different parts of the tender and the final evaluation done by commercial manager / procurement officer together with the originator. Procurement will usually assess the pricing schedules and collate and prepare recommendations for approval from Managing Director. All of this is completed within a specified time span.

9.1.5 Contract Award

It is the task of the procurement department to inform all suppliers of their decision. It is best practice to offer all unsuccessful suppliers a de-brief to help them understand where their bid failed. This evaluation will better inform them for any future opportunities that may arise. Successful suppliers are notified and a purchase order is sent for supply.

9.1.6 Contract Conclusion

At the end of the contract, when the service or product has been delivered, the receiving section will check that all of the terms of the contract have been met and they are happy with the performance of the suppliers. After this has been satisfactorily completed, the commercial manager will typically authorize payment to be made.

9.1.7 Put Safety First

No matter what type of work is done at the warehouse it is important that the work be done safely. Safety should be your primary concern, and it is vital that every member of the staff understands the importance of established safety procedures. It is critical that the warehouse superintendent put strong safety procedures in place to protect himself and the members of his teams.

9.1.8 Equipment Instructions

The warehouse uses many different types of equipment such as pallet jacks, forklifts, presses and stackers. Although only trained operators should use that equipment, not every worker will have the same level of training and experience. That is why it is important for warehouse superintendent to make sure that the operating instructions, including those critical safety instructions, remain with each piece of equipment in the warehouse. Placing each set of instructions in its own weatherproof pouch and attaching it to the equipment is the best way to make sure that operators will know what steps to take when operating a new piece of equipment. Keeping the instructions with each piece of equipment also makes it easier to cross-train employees, something that is good for both safety and the bottom line.

9.1.9 Equipment Operation

It's very important that when a warehouse has heavy equipment such as forklifts or other machinery, the people operating that machinery are properly licensed

9.1.10 Smoking

As a rule, smoking is not allowed at the procurement department and in the warehouse. Given that our warehouse has a very dry atmosphere, and that a lot of material is

packaged in paper, cardboard or wood (all of which can be quite flammable), smoking inside most, if not all, warehouses is prohibited. Additionally, many warehouses have rules that people who choose to smoke outdoors (whether customers or employees) should be a certain distance away from the warehouse and they shouldn't smoke directly under doors or windows. This last part is for the comfort of other people rather than as a fire safety precaution

9.2.0 Privacy Policy

Generally speaking, information given to a warehouse by a client for business transaction purposes should be kept protected and in-house. For a warehouse to offer its clients' personal information to anyone who is interested would be a major breach of etiquette, and would likely result in a lot of customers ceasing to do business with the warehouse. However, this information is not privileged or protected by law. If for some reason a law enforcement inquiry is made, then a warehouse does have to hand over the requested information about clients it does business with.

9.2.0 Purchasing Process

9.2.1 Identify the Need

- Purchasing is an important aspect of running a business, so it's imperative that user departments make decisions to buy products and services that will enhance their operations. Before making a purchase decision, user department must identify a true need their outfit has. Often times, employees present their employers with needs while at other times; employers have to recognize a need after reviewing work flow and business goals.

9.2.2 Determine a Budget

- Whether it's small or large, a budget can help keep businesses from overspending and seemingly under spending on purchases they need to make for their operations. A budget provides the purchasing department with a guideline they can use as they research vendors and products, and weigh purchasing possibilities

9.2.3 Define Specifications

- The originator together with the purchasing team develops a clear picture of the specifications for the product or service the company plans to buy. These details can help the purchasing team identify items that fulfill the company's needs immediately versus researching options that don't fit the overall needs

9.2.4 Sourcing of Potential Supplier

- Commercial Manager / Procurement officer research options for the purchase the company wants to make. It helps to use individuals who are on the front lines and involved with the item you plan to purchase. These individuals understand the processes behind the item being purchased and are likely most familiar with the features and benefits that can add value to your organization.

9.2.5 Search for Options

- Use the product specifications to search for viable options. Find vendors and suppliers who offer the product you're in search of. Take into account vendors you've worked with in the past, those who have sales or offer discounts to businesses like yours.

9.2.6 Evaluate Your Options

- Narrow your search and identify the best options for your business. The end user work with the commercial manager / procurement officer identifies the pros and cons of each option. Consider costs, features, maintenance, delivery times, payment options, and customer service and vendor reputation.

9.2.7 Purchase

After MD's approval, the order is sent to the winner of the bid via mail and the necessary follow ups is done by the expediting section until the goods / services is delivered to the mine site.

9.3.0 Standard Purchasing Procedures

9.3.1 Purchasing Quotes

The purchasing department is responsible for finding the product, service or supplies requested. A purchasing agent finds different suppliers, requests quotes and decides which vendor meets the needs of the department requests. The purchasing procedure outlines the process by which the purchasing department makes quote requests from suppliers and vendors. Each department manager must inform the purchasing department about the exact item required the specifics of the items desired and the quantity necessary to operate the respective department.

9.3.2 Purchase Orders

Every service, material or supply requested by each department must be submitted as a purchase order. This purchase order is an accounting number to ensure the correct amount is paid to the vendor or supplier. The number also tracks the order to make sure it is received in a timely manner as well as in the desired quality and quantity needed. The purchase order is also used by the vendor or supplier when billing the company after delivery of the order.

9.4.0 Monitoring Procedure

Once the departments have given the purchasing department the information about the service, supplies or material required, the expediting section monitors the order throughout the process. The expeditor assigned to the order must follow up with the vendor in case there is a change or update and monitor the order until it has been received. After the item has been received, the receiving section ensures the order is correct and within the contracted specifications.

9.4.1 **Stores Management Practices**

Provide a constant service supply of customers' items to reduce over stocking.

- Provide high quality service to users by direct issues or internal distribution due to order placed.
- Record accurately receipts, stock holding and issues and to provide accurate information on these aspects to management and users on request.
- Protect all type of stock from damage by careful storage and handling from deterioration by providing the appropriate storage conditions from loss through unauthorized issues by strict adherence to strict security regulations
- Ensure that sufficient health and safety facilities and precautions are put in place to enable it to operate efficiently.
- Store and supply all materials and related services to ensure continuous operation of the organization.
- Plan and execute training and staff development programmes relevant to stores operations.
- Create safety or buffer stock always to prevent shortages.
- Perform internal inspection to ensure good housekeeping.
- Stock taking
- Disposal of surplus i.e. scrap components etc.

10.0 Conclusion

In spite of the huge improvements that the company witnessed in the four thematic areas, GMC believes there is still room for development. The company is therefore hoping to improve on the gains made in 2012.

In conclusion, the company believes the signing on unto the UN Global Compact has helped in diverse ways in sharpening its operations to fit into the globally accepted practices in the area of mining.

It is hoped every mining company will sign on to the UN Global Compact to ensure that mining operations will follow best practices that will make the world better than without mining.