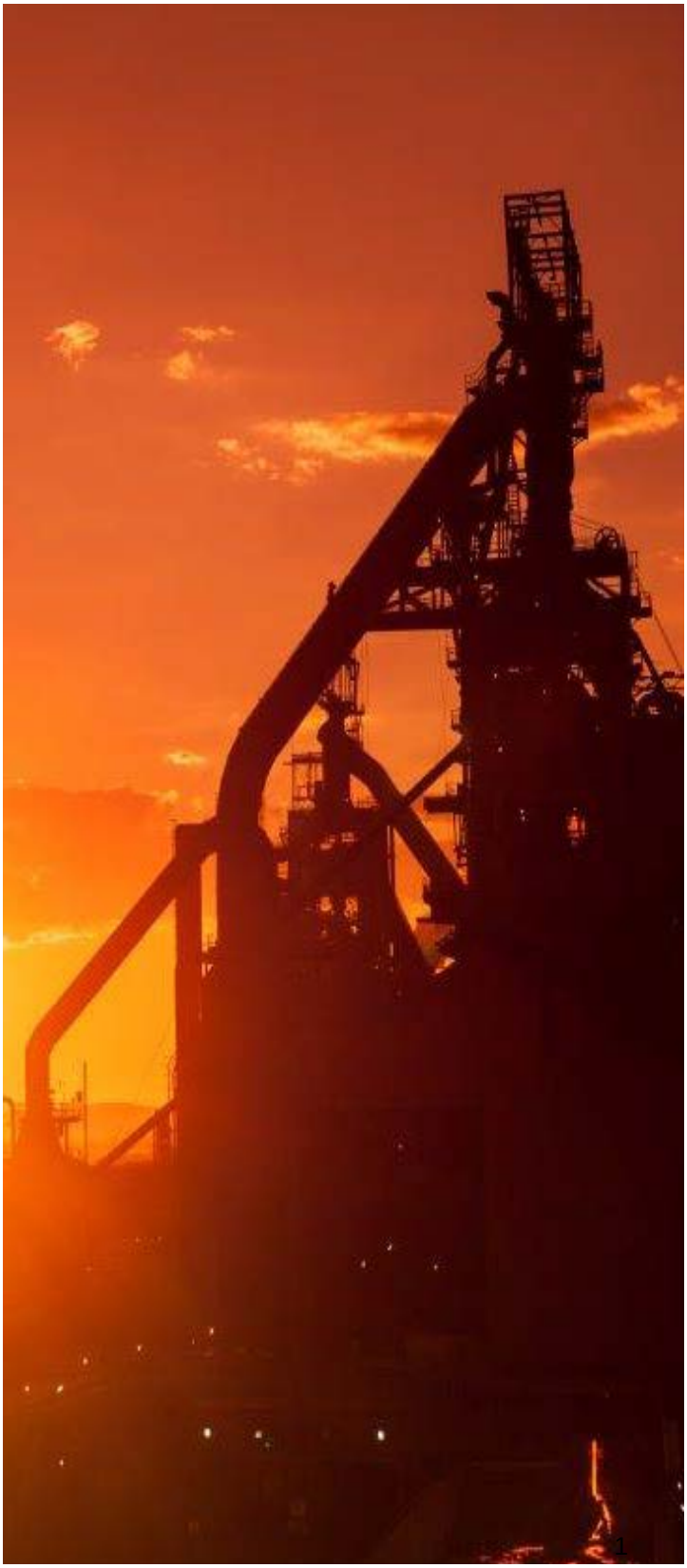
ArcelorMittal

South Africa

Limited

Vanderbijlpark Works

Environment: Summary Report December 2014



Contents

Abbreviations: 3

Executive Summary 3

1. Air Quality Management 5

Point Source Emissions 5

Stoppage of dosing with spent pickling liquor at the Sinter Plant 6

Coke Oven Clean Gas and Water Project 7

Sinter Clean Gas Project 7

Foundry Cyclone Upgrades 8

Fugitive Emission Reduction interventions 12

Tip station at waste site 12

Lancing Booths 13

Dust Extraction system for Blast Furnace D Stock house 13

Open Areas as a fugitive source 14

2. Consolidated Residue Management Facility area (CRMF) (Ref:Table 1) 20

a. Dam 10 20

b. Evaporation dams 1-4 20

c. Maturation Ponds 1-3 20

d. Sludge dams (CETP 1-2) 21

e. Blast Furnace sludge dam 22

f. By-Products storage areas 22

g. Waste Management 22

3. Ground Water Management 24

4. Surface Water Management 24

5. Perimeter and Surrounding Area 25

6. Industrial Water Management 25

7 Consolidated Process Areas (CPA) 26

8 Terrestrial and Aquatic Ecosystem 27

9 Noise management 28

10 Stakeholder and Public Engagement 28

11 Conclusion 28

Abbreviations:

AEL: Atmospheric Emissions Licence
AMVW: ArcelorMittal Vanderbijlpark Works
APPA: Atmospheric Pollution Prevention Act (45 of 1965)
BAT: Best Available Technology
BF: Blast Furnace
CETP: Central Effluent Treatment Plant
DR: Direct Reduction
EAF: Electric Arc Furnace
EPA: Environmental Protection Agency
ESP: Electrostatic Precipitator
CPA: Consolidated Plant Area
CRMF: Consolidated Residue Management Facility
MP: Master Plan
MTP: Main Treatment Plant
OSM: Oxygen Steel Making
PAIA: Promotion of Access to Information Act (2 of 2000)
PCI: Pulverised Coal Injection
RAP: Risk assessment Report
SPL: Spent Pickling Liquor
TETP: Terminal Effluent Treatment Plant
VTAPA: Vaal Triangle Airshed Priority Area
ZED: Zero Effluent Discharge

Executive Summary

As part of the PAIA request for information and the subsequent handover thereof, it was decided to compile this short document to place the so-called Vanderbijlpark "Master Plans" and the progress made in terms of Environmental Management at this facility into perspective. The "Master Plans" read in an isolated manner without the context of this executive summary would be an incomplete view.

The Vanderbijlpark Master Plans were compiled during the period 2000 to early 2003 to obtain a better understanding of the environmental risks that the company faced. From this perspective the term "Master Plans" is misleading as it was more of a risk assessment than an actual Plan that would solve all the company's risks and liabilities. It is also recommended that the term Risk Assessment Reports (2003) is rather used from now on. Like any major corporate "risk assessments" in all areas of the business are best practice so that a company can identify the risks that may result in them nor achieving their strategic objectives, and must be appropriately mitigated and managed.

The Risk Assessment Reports (2003) covered the full spectrum of the environmental disciplines, but as evident from the documents more emphasis was placed on water, ground water and waste management. Although the studies did assist with risk identification and permit applications during the initial period after their completion, the studies fell short of comprehensively guiding the company towards addressing all its risks. Any reader of the Risk Assessment Reports (2003) will conclude that the studies are rather cumbersome and various conclusions/assumptions are factually not correct. This may have resulted from not enough information and data being available at the time, necessitating the assumption of worst case scenarios. The main driver of the company's improvement initiatives has been environmental legislation, which changed significantly from 2003 onwards, combined and supported by environmental management systems certified in accordance with the ISO14001 standard.

As an example, the Risk Assessment Reports (2003) did not highlight air emissions as a major risk at the time, but with the onset of the new Air Quality Act, the playing field changed significantly and the company

embarked on significant projects in order to ensure compliance and which assisted in reducing the particulate emissions dramatically. We are pleased to state that the company did not have to rely on postponement applications in terms of the Air Quality Act to date, but admittedly there are still challenges ahead regarding 2020 standards which the company is currently working on.

It also needs to be mentioned that not all conclusions in the Risk Assessment Reports (2003) were incorrect and in the identified high risk areas of water and waste management, great strides have been made to improve on past performance. Noteworthy advances were also made in reducing most sources of ground water impacts. All unlined effluent storage facilities were phased out over the past years at ArcelorMittal Vanderbijlpark Works (AMVW). As we all know, ground water remediation remains a key drive within AMVW and does not disappear overnight, but the first encouraging signs and trends are appearing regarding an improvement in ground water quality. It is expected that most concerns that external stakeholders may have would relate to the risks mentioned in this paragraph. ArcelorMittal is more than willing to engage further regarding any concerns that stakeholders may have after perusal of the requested document. In all honesty, it needs to be admitted that ArcelorMittal understands many of the risks far better now than in the time of compilation of the Risk Assessment Reports (2003).

The PAIA request for information actually stretches further than Vanderbijlpark Works as certain documentation relating to the Vaal Disposal Site at Vereeniging Works was also requested. These documents are of an administrative nature and pertain to environmental records and the communication between ArcelorMittal and the authorities regarding the closure of the Vaal Disposal Site. In the case of Vereeniging Works great strides have also been made, especially regarding air quality and this facility is now already fully compliant with 2020 standards in terms of the Air Quality Act. The remediation of the Vaal Site remains outstanding.

ArcelorMittal South Africa Limited is proud of what has been achieved to date, but admittedly the journey is not completed yet and some challenging obstacles still need to be overcome. Should the reader of this document or the Risk Assessment Reports (2003) have any further questions, then ArcelorMittal South Africa Limited would gladly avail itself for further discussions in order to provide clarity.

Subsequent to the specialist studies conducted as part of the Risk Assessment Reports (2003) various environmental management areas were identified as priorities in need of attention to reduce AMVW's environmental footprint. The information presented in this document summarises the progress of measures implemented in the environmental management areas to achieve this goal.

Table 1 contains a summary risks pertaining to environmental issues identified in the Risk Assessment Reports (2003) (RAR).

Table 1: Interventions pertaining to environmental risks

Management area	Time schedule as per RAR	Current status quo	Planned Target date
Perimeter & Surrounding Areas	2005	Numerous cleanups	Ongoing
Old Disposal Site	2018	80% completed	Final phase 2017 and completion 2018
Dam 10	2010	Completed in 2012. Deviated from Risk Assessment Report (2003) original suggestion.	Completed 2012
S/E slag and open veld areas	2013	Completed 80%. Cleared southern site area and removed historical ramp 2013.	2014 – delay due to reusable material still lying in area

Overall CRMF	2013	Completed 2014	Completed
Rietkuilspruit & Rietspruit canal	2012	Completed 2011	Ongoing erosion management
Maturation ponds	2017	Total dam area - 80% completed Dam 2 & 3 completed	Dam 1 - 2015
TETP & MTP area	2007	Completed 2005. Upgraded in 2012, Ongoing challenges to maintain Zero Effluent Discharge	2015 upgrade of MTP
Dams 1-4	2020	Dam dried out. Salt removal occurred in 2010. Further remediation planned for 2015	2015 – awaiting MTP upgrade
CPA	2020	Closure of plant	
Blast Furnace dams	2020	Completed 2012 as part of phase 2 old disposal site.	Completed
Sludge dams	2018	CETP dam 2 – completed 2013 CETP dam 1 – 20% completed	Scheduled for 2015
S/W slag area	2016	Busy with clearing of material (skulls)	Lining of area during 2015/2016
Dam 11	2023	10% completed re storm water management. Busy with slag removal.	Scheduled for 2016
Processed material stockpiles	2015	Busy with construction of lined area	1st Quarter 2015
Raw materials stockpiles	2014	Lining of high risk areas completed	
Kiewiet area	2020	Stopped activity.	Sloping scheduled for 2015.

1. Air Quality Management

Point Source Emissions

AMVW has 54 point sources. The scheduled processes were managed by 19 APPA registration certificates which were then combined into one APPA Reviewed Registration Certificate received in June 2010, and consolidated during February 2012 into an Atmospheric Emissions License (AEL).

Quantification and reduction of Particulate Matter for point source emissions

AMVW has achieved an 82% reduction in emissions (dust) to air (Figure 1) over the past 9 years, with 2005 considered to be the baseline, through various interventions (Table 2 & 3).

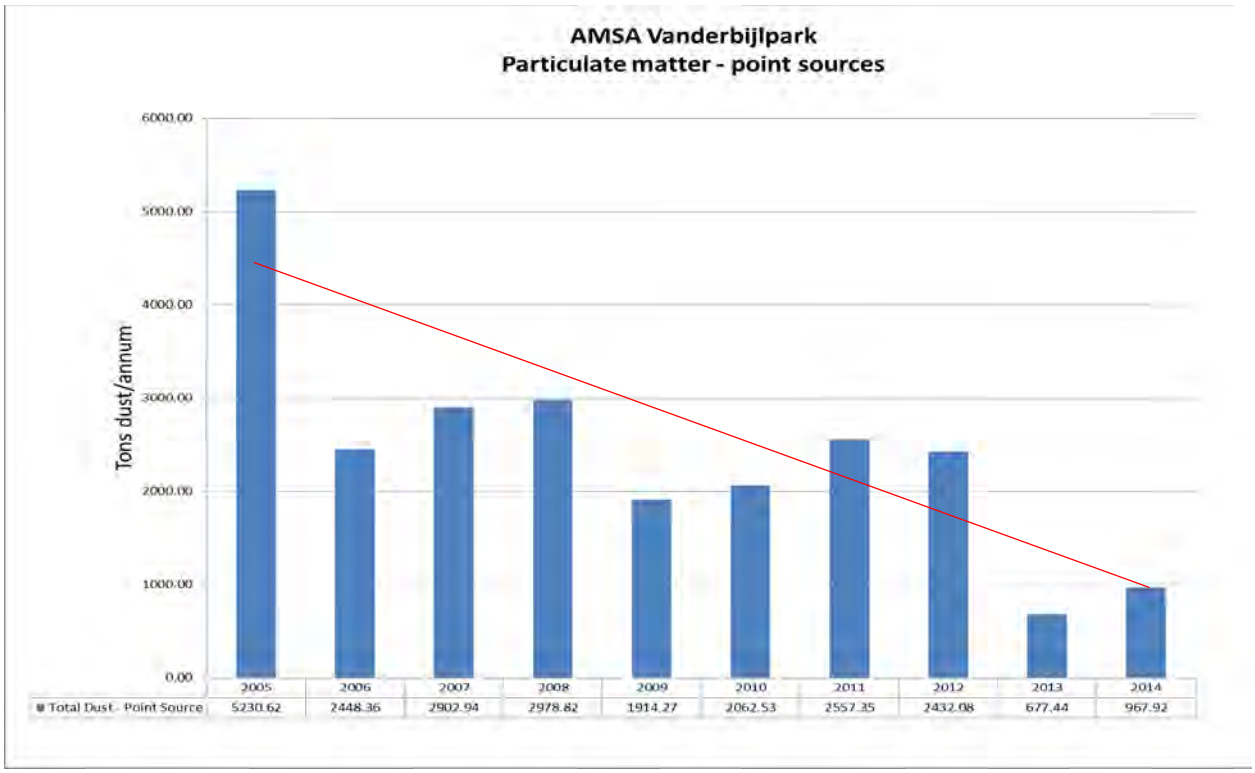


Figure 1: 82% reduction in terms of particulate matter emitted from point sources (2014 is a projected figure).

In summary, the reduction in point source emissions has been achieved through the implementation of the following actions:

- 2005 to 2006: The reduction from 2005 was as a result of the stoppage of dosing with Spent Pickling Liquor (SPL) at the Sinter Plant in 2006.

Stoppage of dosing with spent pickling liquor at the Sinter Plant

As part of operations at the Sinter plant, SPL (a mixture of iron chloride & hydrogen chloride) was used to reduce the levels of potassium in the sinter product. This practice was common in the 80's, due to the detrimental effects potassium had on the blast furnace process. The SPL was sprayed into a mixing drum and the liquor would react with the alkalis in the ore and form potassium chloride (KCl).

After careful evaluation of all related inputs and aspects, a decision was taken to stop the dosing at the end of February 2006 and after monitoring for 3 months, a final decision was taken to permanently halt this practice.

- 2006 to 2007: Increase in total emissions due to introduction of Direct Reduction, Kilns 5 and 6.
- 2007 to 2008: The slight variation between 2007 and 2008 is attributed to plant operations and improved quantification of emissions. The coke oven stack emissions were, for example, monitored in opacity percentages which were converted to mg/Nm^3 readings in the inventory. The conversion factor influences the calculation significantly and was refined from 2008 onwards.
- 2008 to 2009: This reduction was mainly due to the reduction of Sinter plant dust emissions (operational changes), taking out of operation Coke Battery #1, general improvement in performance of abatement equipment, and lower production levels due to the global economic recession.
- 2009 to 2011: Increased production from 2009 – 2011 constituted the slight increase of total dust emissions.
- 2010: The Coke Oven Clean Gas and Water project was implemented

Coke Oven Clean Gas and Water Project

The principal objective of this project is to improve the quality of the Coke Oven Gas whilst reducing emissions. The project consisted of various upgrades in the Coke Plant by-products area, as well as the installation of new technology for the reduction of SO_2.

The project commenced during January 2005 and consists of two components, namely the clean gas and water system and the Elementary Sulphur system. The plant was finally commissioned on the 20th of January 2010. Challenges have been experienced during the operational phase and further improvements are currently planned to achieve sustainable operations.

- 2011 to 2012: The Sinter bag house is one of various projects that were commissioned in 2012 as part of our planned improvements. The particulate emissions from the Sinter main stack were the single biggest point source on site. The installation of abatement equipment to capture emissions from the stack was finalized and commissioned in October 2012. This project reduced the dust load for the Sinter plant by 93%.

Sinter Clean Gas Project

Construction of the dry scrubbing technology commenced in October 2008. This project assisted AMVW to achieve the significant emission reductions as illustrated in Figure 1. Construction of the Sinter dry scrubbing equipment amounted to a total cost of roughly R 256 million.

2012: Installation of bag house at the Foundry to supplement removal of particulates from emissions

Foundry Cyclone Upgrades

An additional bag house was commissioned at the Foundry in 2012 which contributed to a 76% reduction in the point source emissions from this plant.

- 2012 to 2013: Lower emissions due to: Shut-down of Coke Battery #3; reduced production due to the OSM fire; BF D off due to OSM fire, EAF only operational for 45 days in 2013

Table 2 below indicates all the **point source emission reduction projects** implemented by AMVW from 2005 – 2014; it includes projects submitted as part of the Vaal Triangle Air Quality Management Plan as well as additional reduction measures.

Year	Project description (from 2009 to 2014)	Committed date	Progress to date	UNITS TO THE REDUCTION OF POLLUTANTS		Challenges	Interventions
	Projects implemented			Tons per annum	Concentration mg/nm3		
2006 2012	2006 - Stoppage of dosing with spent pickling liquor at the Sinter plant 2012 - Sinter Clean Gas Unit - Installation of emission abatement technology (bag filter system) to reduce particulate emissions and SO_2 from the entire Sinter Plant. The addition of lime to the off-gas will be introduced to effectively reduce SO_2.	2006* 2012*	Completed	2782 t/a PM = 1 379 t/a SO2 = 743 t/a	414 mg/Nm3 Improvement	Installation of environmental BAT technology onto existing old Sinter plant	Some adjustments and modifications had to be done onsite to ensure effectiveness of the BAT
2007	In 2007, R 6.9 Million worth of continuous gas and particulate analysers was procured to install at the biggest sources.	2007	Completed	0 t/a			
2007 2013	2007 - Decommissioning Coke Battery #1 2013 - Decommissioning Coke Battery #3	2009 2013	Completed	10 t/a 16 t/a			

2008	Direct Reduction (kilns) Electrostatic Precipitator (ESP) rebuild, and replaced the refractory linings that will improve the performance of the ESPs at the Direct Reduction kilns	2008*	Problematic kilns were rebuilt – improved maintenance	301t/a	40 mg/Nm3 Improvement	Capital constraints	Modifications on kilns done in phases kilns 2&4 and upgrade on kiln 3.
2010	Coke Oven Gas (COG) & Water Cleaning Plant Project - The technology was outdated and the COG & water cleaning project was initiated in 2003 to upgrade the system and reduce SO2, NH3 and HCN emissions.	2010*	Completed	SO2 emission reduction = 494 t/a	3950mg/Nm3 SO2 Improvement	Operational challenges	Increase maintenance, investigate new solutions, get external technical expertise , technical modifications to design
2012	Foundry Cyclone upgrade - An additional bag house was also commissioned at the Foundry in 2012 that contributed 76% reduction for the Foundry total emissions.	2012	Completed	50.6 t/a			
2014	Installation of new BAT bag filters at Blast furnace PCI plant	2014	Completed	0.74 t/a		Installation of environmental BAT technology onto existing plant	Some adjustments and modifications need to be done onsite to ensure effectiveness of the BAT

Table 2: Emission reduction projects implemented for point sources

Note: *Projects submitted as part of the Vaal Triangle Air Quality Management Plan

Fugitive Emission Reduction interventions

Due to the difficulty in quantifying fugitive emissions, quantification is based on EPA emission factors and in-house measurements. The following projects were completed to reduce fugitive emissions at AMVW

Tip station at waste site

A dust suppression system has been installed at the waste disposal site that suppresses dust when the waste material is off-loaded at the tip station before disposal. The dust suppression system is effective in reducing dust emissions during the handling of waste materials. The system is however not as effective when handling very fine dust material like DR Dolochar waste. The dust suppression system will be further improved in future.

Upgrade of existing tip station in 2012 by enclosing Tip B by 50% and installation of water-mist sprayers

Lancing Booths

Lancing is a process used for cutting oversize steel into smaller manageable fragments which can be re-used in the steel making process. In an effort to reduce the fugitive emissions from the lancing activity a new lancing hood has been designed and installed with an upgrade of extraction points. Additional mobile bag filter units were also purchased for the lancing of steel.

Dust Extraction system for Blast Furnace D Stock house

Background information:

- The Blast Furnace D Stock house was a source of fugitive dust emissions at AMVW. A significant reduction will be achieved from now onwards by an improvement in the dust collection efficiency, and the abatement of fugitive dust emissions at both the Stock house and furnace top.
- This project will achieve further emission reductions as planned by AMVW from 2014 onwards.
- Project commissioning date November 2014.

Post implementation

The fugitive dust is captured by the new extraction system

- The bag house will ensure compliance with all future Air Quality Act requirements.
- Fugitive emissions for AMVW will be reduced by 2800 tons/annum

Total Cost:

Total cost of the bag house calculates to R87.6m

Open Areas as a fugitive source

Open areas (areas not covered by natural vegetation such as grass or artificial covering such as paving) contribute towards the generation of fugitive dust emissions on site. In order to reduce the amount of fugitive emissions generated, AMVW has embarked on a drive to cover these open areas. The advantage of covering up open areas is that it contributes towards reducing fugitive dust emissions, improves storm water runoff quality and also looks aesthetically pleasing. To date approximately 470 hectares, including hydroseeding performed as part of remediation activities, has been vegetated.

Before	After
	

Before 	After 
Before 	After 
Before 	After 

Before	After
	

Table 3 below indicates all the fugitive emission reduction projects implemented by AMVW as from 2005 – 2014; it includes projects submitted as part of the Vaal Triangle Air Quality Management Plan.

Year	Project description (from 2009 to 2014)	Date completed	Progress to date	UNITS TO THE REDUCTION OF POLLUTANTS		Challenges	Interventions
	Projects implemented			Tons per annum	Concentration mg/nm3		
2005 2012	2005 - Dust suppression at waste transfer station (disposal site) - A dust suppression system, using high pressure to create a fine water mist, has been installed at the waste transfer station minimize fugitive dust emissions. 2012 - Dust suppression at waste transfer station (disposal site) - Upgrade and enclosement	2005* 2013*	Completed	44.08t/a 2 t/a	US EPA AP 42 Database (0.35mg/Nm3) Improvement	None	Alteration of existing transfer stations
2007	Roof emissions from Blast Furnace D - During the reline of BF-D, a bag house was constructed to capture a significant portion of the roof emissions from the cast house.	2007*	Completed	300 tpa	AP42 Chapter 12 (13.8mg/NM3) Improvement	Installation of BAT technology onto existing old non-compatible plants compatible	Some adjustments and modifications had to be done on site to ensure effectiveness of the BAT

						plants	
2011 2014	2011 - The rehabilitation projects on the waste site and historical contaminated land reduced the fugitive emissions considerably from 2011-2012, a total area of 273ha was vegetated. 2014 - The rehabilitation projects on the waste site and historical contaminated land reduced the fugitive emissions considerably, a total area of 127 ha was vegetated.	2011*	Completed	13 t/a 10 t/a			
2012	Upgrade lancing booth	2012	Completed	1 t/a			
2013	Emissions from Raw material stockpiles mitigation measures - application of dust suppressants to reduce windblown dust	2013	Completed	1 t/a			
2013	Secondary Dust Extraction System at EAF - Install secondary dust/fume extraction system with its own bag filter system with an average capacity of ~5,000,000 m³/hr. Thus will	2013*	Plant closure 2012	673 t/a		Capital constraints	

	capture fumes and dust currently escaping through the openings in the roof. This project was not implemented and the EAF plant is out of operation.						
2013	Removal of historical ramp at metal recovery plant – Reduction of fugitive emissions	2013	Completed	0.66 t/a			
2014	Installation of new baghouse at Blast furnace D stock house - Reduction of fugitive emissions at BF raw materials handing	2014	Completed	2847 t/a		Installation of environmental BAT technology onto existing plant	Some adjustments and modifications need to be done onsite to ensure effectiveness of the BAT

Table 3: Emission reduction projects implemented for fugitive dust

Note: *Projects submitted as part of the Vaal Triangle Air Quality Management Plan

2. Consolidated Residue Management Facility area (CRMF) (Ref:Table 1)

a. Dam 10

Dam 10 was a historic effluent evaporation pond that came into operation in 1960 and was taken out of operation in 2000. The facility needed to be rehabilitated. The remediation strategy employed at Dam 10 encompassed in-situ bioremediation. To facilitate the remediation process, a customised mixers called windrowers, was utilised to mix the micro-organisms into the soil and sediments. The mixing action significantly increased the surface area and aeration of the contaminated soil particles for the micro-organisms to efficiently achieved optimum remediation levels. Subsequent to the remediation process, the soil was ameliorated, sloped and vegetated for both improvement of storm water and fugitive dust emission management.

This remediation project was the first of its kind in South Africa and as such received a group award for its innovative nature. In-situ bioremediation was the preferred remediation option from a cost-benefit and efficiency perspective. This technique allowed for on-site remediation of soil as opposed to costly disposal of residues at a suitably licenced disposal site. The latter option would have also defeated the waste management hierarchy principle of “disposal as the last resort”. Other negative impacts associated with handling and transport were also avoided

Rehabilitation of the facility was completed in 2012, with open, indigenous veld as the subsequent end-use. A significant portion of time was expended on getting the dam dry and allowing the natural effect of the micro-organisms to take its course in order to achieve prescribed remediation targets.

b. Evaporation dams 1-4

Dam 1 – 4 was a historic storage and evaporation facility which was linked to the operation of the old waste disposal site. These dams were taken out of operation in December 2010. As the name suggests, this facility consisted of four interconnected dams, with the inlet situated at dam 1. During 2010 salts were removed from dam 1 and disposed of at Holfontein Disposal Site. Storm water management measures have been implemented at Dam 1-4 and remediation is to commence during 2015 after the upgrade of the Main Treatment Plant.

c. Maturation Ponds 1-3

The Maturation Ponds were commissioned in 1965 initially for the purpose of storing and utilizing the nitrogen-rich Coke Oven water. Three dams, with a combined storage capacity of approximately 460 000 m^3, were used to store the effluent and to allow the effects of natural biological and algal processes to moderate any plant toxicity that may be present in the water before it was re-used. From 1985, the Maturation Dams were kept in use as a buffer storage facility between the production processes and the re-use facilities which were arranged for Coke Oven related waters. Use of the dams ceased in 2008, with subsequent preparation for remediation directly thereafter.

Due to the success of the in-situ bioremediation undertaken at Dam 10, the same remediation methodology was exercised at the Maturation Ponds. Dam 3 has been fully rehabilitated. It is expected that the remediation of Dam 2 will be completed by Q1 2015, followed by Dam 1. The slight delay in completion of rehabilitation of the entire facility is attributable to the time taken for the natural decomposition processes effected by the micro-organisms.

Dam 3 before rehabilitation

Dam 3 after rehabilitation

d. Sludge dams (CETP 1-2)

Historically, CETP sludge which originated from the Central Effluent Treatment Plant as underflow of the thickeners was disposed of in dams. These dams formed part of two evaporation facilities, namely CETP 1 and CETP 2:

- CETP 1 was commissioned in 1963 and consisted of 13 dams combined into one system. Sludge disposal into Dam 1 was terminated in 1997.
- CETP 2 was commissioned in 1975 and consisted of 6 inter-connected dams. Sludge disposal into Dam 2 was terminated in 2005.

CETP 2 was successfully remediated in 2012. The residue in CETP 1 has been placed in windrows in preparation for bioremediation to commence in 2015.

CETP 2 before rehabilitation

CETP 2 after rehabilitation

e. Blast Furnace sludge dam

Historical Blast furnace sludge dams was taken out of operations during the mid-1990's and remediated during phase 2 of the old disposal site.

f. By-Products storage areas

By adhering to the waste hierarchy AMVW is continually investigating all waste recovery, recycling and re-use possibilities. A good example of the latter is AMVW's metal recovery activity which operates on a lined area and whereby waste quantities are reduced significantly. Our successes in applying the waste hierarchy as necessitated the construction of a by-product storage area. Such area is scheduled for completion by end of March 2015

g. Waste Management

The AMVW facility commenced with the disposal of waste on the old waste disposal site in the early 1960's. The disposal site was established for the disposal of solid residue and sludge emanating from production processes and emission abatement equipment at the Works. The site covers an area of 161 ha, with a volume of approximately 40 million m^3 and height of 40 m.

To minimise impacts on the receiving environment, a concerted effort was placed on rehabilitating the old disposal site in accordance with the environmental authorisation received for such activity.

Due to the massive extent of the site, a phased approach was adopted in the rehabilitation planning. The primary remediation objective was to limit the ingress of rainwater into the waste body, and thereby reduce the leachate potential. This goal was achieved by means of so-called 'capping' the disposal site.

This process entails the laying down of a series of clay layers which are subsequently compacted and overlain by a plastic liner. The next step in this rehabilitation process is to cover these layers with soil and vegetate the required area with indigenous grass species. To minimise soil erosion, the site was carefully sloped, stepped and equipped with drainage galleries to direct storm water away from site.

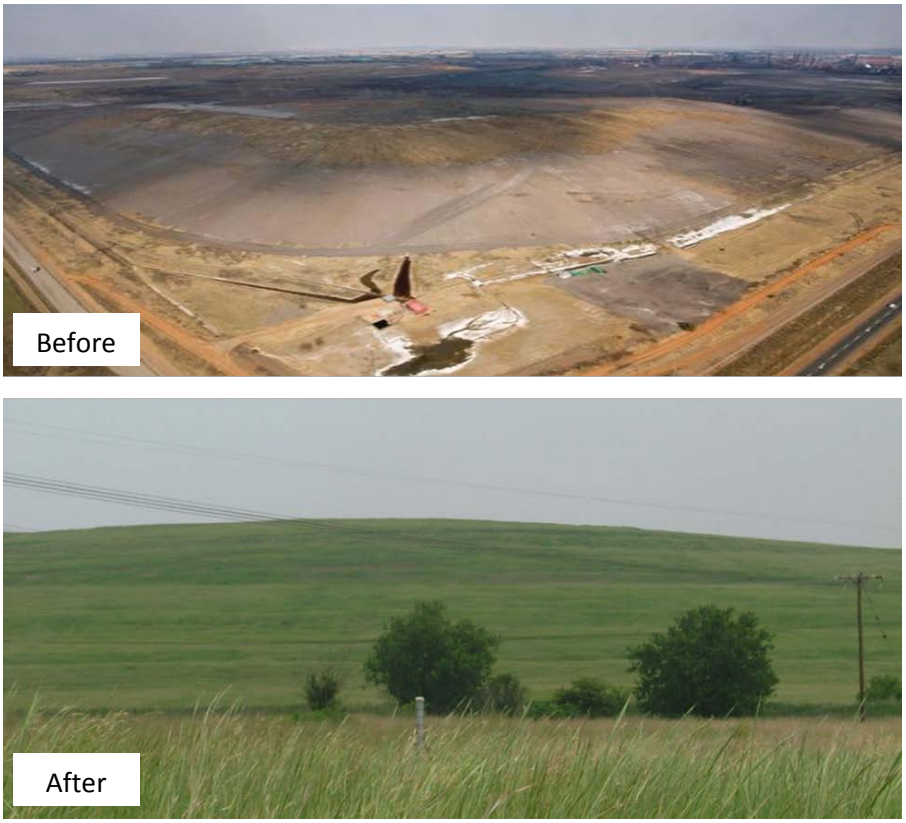
Rehabilitation of the old disposal site, thus far, has proven to be a remarkable success story, yielding positive results both in terms of surface water runoff quality and improved groundwater quality adjacent to the site. In addition, vegetating the site has reduced fugitive dust emissions which previously originated from the facility and has contributed to enhanced aesthetics of the area.

Phase 1: (55 ha) of the remediation of the old waste disposal facility commenced in September 2009 and has been successfully completed in 2010. Disposal operations at the old waste site ceased on 31 December 2010 and sufficient vegetation has been established in 2011.

Phase 2: (33 ha) of the remediation of the old waste disposal facility commenced in September 2011 and was completed in March 2012. This also entailed the reshaping and capping of the general waste site, capping of northern slopes of the transfer station and crest.

Phase 3: Remediation of a small portion (8 ha) of this phase is currently in progress. The final phase (53 ha in total), which is in progress, includes activities to slope the side walls to the desired angle and incorporates the project to crush and screen blast furnace slag for sale in the aggregate market, prior to commencement of the capping process.

Capping process – Phase 1/2 &3



Phase 1: Remediation – Before and After

Construction of a New lined Waste Disposal Site (GLB+) with a H:H leachate collection facility commenced on February 2010, completed by December 2010 and operational from January 2011 onwards. Life expectancy for the new disposal site is projected to be until 2017.

The construction of the Domestic Disposal Site (GLB-) commenced in September 2011, completed in February 2012 and operational from March 2012 onwards.

3. Ground Water Management

The elimination of sources and potential sources of ground water contamination is fundamental to ground water remediation projects. Source delineation and assessment as the initial phase provided important information for the identification of sources, other than the obvious sources observed. Mitigation actions addressing the sources noted above include the following:

- Capping of old waste disposal site – 80% completed
- Construction of new lined waste disposal site – completed
- Take all possible sources out of operation (completed)
- Remediation of historical process dams, including: Dam 10 (completed), CETP (Dam 2 completed) and Blast Furnace sludge dams (completed), Maturation ponds (dam 2 & 3 completed), new by-product storage areas (in process), and historical open areas (completed).
- Removal of potential sources in various areas (ongoing).

4. Surface Water Management

Various mitigation measures such as curbing, bunding and vegetation of open areas within the plants were implemented to improve our storm water quality. Attenuation dams, modifications and upgrades of our process water systems were implemented to prevent process water ingress into storm water systems. Open surface areas: Open areas identified as potential problem areas were addressed through the following measures:

- Removal of any material that posed a risk to contamination of storm water
- Vegetation of disturbed areas through hydroseeding
- Sloping to prevent ponding

These measures resulted in rapid, cleaner storm water run-off as well as erosion minimisation.

Area west of Maturation Ponds – sloped and vegetated

5. Perimeter and Surrounding Area

To date, approximately 178 ha of peripheral areas have been cleared of scrap material, redundant by-products and residues to mitigate potential impacts on the groundwater reserve and improve surface water run-off qualities. In addition, these areas have been sloped and vegetated to further mitigate impacts associated with barren areas, including fugitive dust emission reduction.

In 2015, an additional 51 ha of land will be vegetated to supplement the work already completed along the Works' perimeter and surrounding areas.

Before (Old By-products Area)

After (Old By-products Area)

6. Industrial Water Management

From 2004 to 2005 AMVW upgraded the Central Effluent Treatment Plant (CETP) and the Main Treatment Plant (MTP) to institute Zero Effluent Discharge (ZED) from the Works. In addition this project assisted AMVW to achieve a reduction of water abstraction volumes of 53% (graph 2) compared to the 2005 baseline . Consequent to water balance issues, AMVW has encountered problems to sustain ZED during certain periods, which prompted additional upgrades. As a result of operational changes an upgrade was required during 2012 and included the installation of an additional quality filtration system at a cost of R1 360 000 per month. Primarily due to the shutdown of Electrical Arc Furnace plant, AMVW requires a further upgrade to the MTP plant (R90 million) in 2015 in an attempt to reinstate and maintain its ZED status.

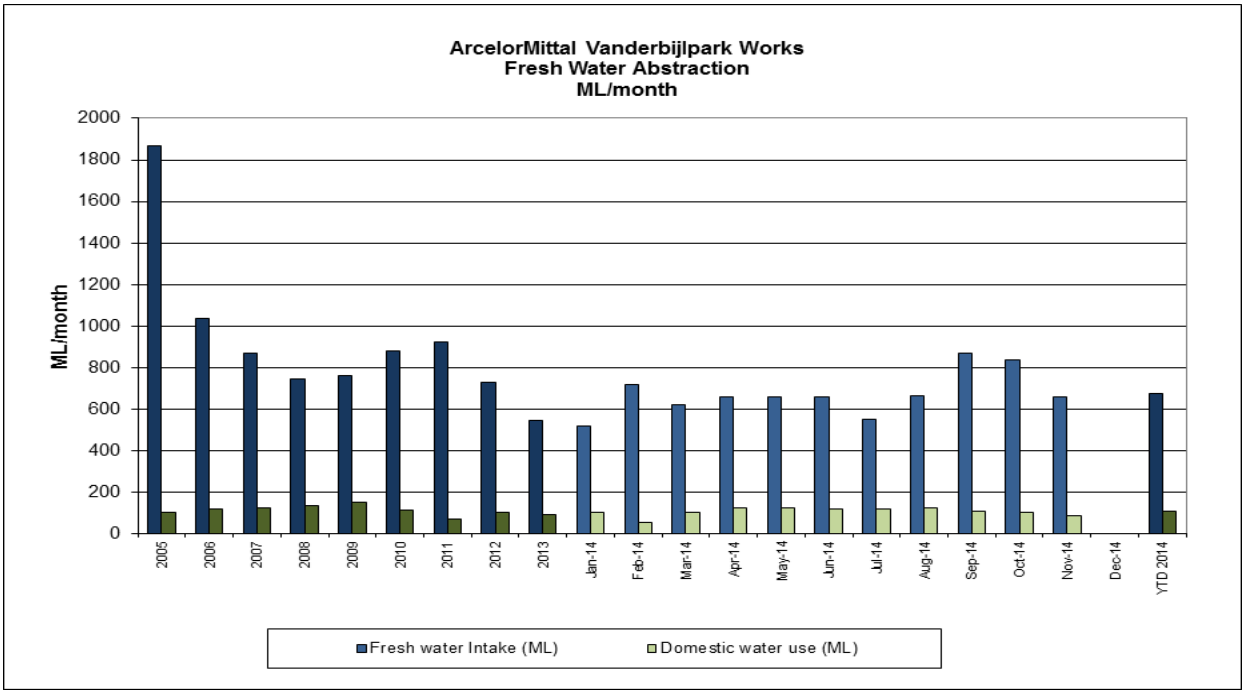


Figure 2: Reduction of water abstraction

7 Consolidated Process Areas (CPA)

To improve by-product storage practises on site, AMVW has invested in the establishment of new storage facilities. The proposed new storage areas, currently in the construction phase, have been designed to conform with best practice and regulatory guidelines. These areas will be lined, bunded and equipped with drainage facilities. The new storage areas will significantly reduce the potential impact on the environment.

In line with the waste management principle of “disposal as the last resort”, AMVW has found a market for the mill scale generated on site. Mill scale is formed on the outer surfaces of steel plates or sheets during rolling processes. The current mill scale storage area will be relocated to the new by-products storage area in the near future to reduce the operational footprint of the combined by-product facilities.

Area preparation completed for new by-product storage areas

Fine mill scale drying area

8 Terrestrial and Aquatic Ecosystem

Stemming from legislative requirements to control the spread of alien and invasive species, AMVW has embarked on a systematic programme to curb the propagation of such species which are present on site. Based on the criteria of dominance and distribution, the first phase of the eradication programme entailed the physical removal of thorn apples prior to seeding and felling pink tamarisk plants, followed by herbicide application.

Large tracts of land, densely populated with herbaceous alien species, were also cleared, leveled and hydroseeded with a variety of indigenous grass species. These areas are mowed on regular basis, including prior to the seeding cycle, to manage the growth and spread of alien and invasive plant species at the Works. Notorious for the spread of alien plant species around the world is rail transport. Fundamental to the operation of processes on site is the extensive network of railway lines which support the delivery of raw materials required for these processes. Inherently, a number of alien plant species have found their way onto the property. When required, these individual species are sprayed with a herbicide to control their proliferation.

No rare or endangered plant species have been surveyed on site.

Removal of thorn apples

Removal of pink tamarisk

Application of herbicide after felling

9 Noise management

Subsequent to the receipt of an external complaint in 2011 concerning alleged, prominent noise levels emanating from AMVW, an assessment was conducted into such claims, which reaffirmed findings that noise levels directly linked with activities on site are well within industrial standards.

Based on the results from the above-mentioned noise survey, the following conclusions were drawn by the specialist: "*The ambient noise levels at the boundary of the ArcelorMittal plant in Vanderbijlpark fall well within the limits recommended by SANS 10103 for an industrial district. Therefore, the noise emission levels comply with the new noise regulations published under the Air Quality Act*."

10 Stakeholder and Public Engagement

Various public and stakeholder engagements are hosted by AMVW in accordance with Air Emission License (AEL) and Waste Management License requirements.

Public and Stakeholder Engagement forums include:

- Bi-annual AEL open days, where the public is invited to an open communication forum; and
- Quarterly waste multi stakeholder committee where members are hosted by a presentation and or site visit to disposal site area.
- Active participation at the Rietspruit Forum,
- Vaal Triangle Airshed Priority Area (VTAPA) Multi-Stakeholder Reference Group
- Sedibeng Air Quality Implementation Task Team.
- Environmental feedback at stakeholder engagement sessions

11 Conclusion

Through reading this document, it is anticipated that the reader has a better understanding of both past and current environmental issues faced by AMVW, but at the same time realizes the concerted efforts placed in managing them. The significant progress made in the disciplines of air, surface water, groundwater and soil bears testimony to these endeavors. As with most heavy industries, operational upset conditions are inevitable at AMVW which have the potential to impact on the environment. However, it is the manner in which an organisation reacts to such incidents which determines the severity of the impact. The reader of this document can be assured that AMVW remains committed to reducing its impact on the receiving environment and continually seeks to improve on its past environmental performance. It is sincerely hoped that this new era of public engagement will improve AMVW's relationship with stakeholders in the communities in which it operates. In so doing, ArcelorMittal's universal slogan of "Transforming Tomorrow" can truly, in every sense of the phrase, be accomplished.