

Basic Assessment Report

Executive Summary



*Proposal to revise the layout of the approved IPR
Precious Metals Refinery Expansion Project*

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IMPALA 
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PREFACE

In discussions with interested parties during the review of the Draft Basic Assessment in March and April 2013, it was agreed that an additional specialist study would be undertaken, intended to consider the overall effect of the changed footprint of the refinery on surrounding property values. This study has been completed and is included in the Basic Assessment submission as Appendix H-5. In addition, there have been updates made to the following specialist studies:

- The Visual Impact Assessment, which has been updated to include, in particular, more detail about impacts during the construction phase as well as visual simulations of the effect of a landscaped buffer at the end of Mey Street, assuming that the first two rows of properties were purchased and the houses demolished.
- The Risk Assessment, which has been fairly extensively revised to consider the specifics of impacts associated with the changed footprint, in relation to the location of hazardous materials on site
- The Air Quality Impact Assessment, which has been updated to include the most recent representative emissions data as well as the latest air quality data obtained from Implats' monitoring stations.
- The Traffic Impact Assessment, prepared by independent traffic engineers, WSP, has been included as Appendix H-6 of the Basic Assessment.

The text in the Basic Assessment and in this document has been updated to reflect the findings of the study on property values and the changes to the other specialist reports.

INTRODUCTION

In 2008, the Gauteng Department of Agriculture & Rural Development (GDARD) approved Impala Platinum Refineries' (hereafter referred to as 'IPR') application for an expansion of its platinum refinery in Springs. The project was referred to at the time as "The Expansion of the Base Metal & Precious Metal Refinery", GDARD Ref 002/06-07/0593. An Environmental Impact Assessment involving a full public participation process supported this application. The EIA and stakeholder participation for the project took place during 2006 and 2007.

IPR's intention at this time was to expand both the Base Metal Refinery (BMR) and the Precious Metal Refinery (PMR). Figure E-1 shows the location of the refinery. Some of the activities applied for in the application have already been undertaken. Due to changed commercial circumstances, other approved activities have not and IPR now wishes to revise its plans for the layout of the PMR element of the expansion. Following discussions with GDARD, it has been agreed that any changes to the approved Record of Decision must be supported by a Basic Assessment, prepared in accordance with the requirements of Part 2, Sections 21-25 of the 2010 regulations under the National Environmental Management Act.

Purpose of this Report

This Executive Summary provides a brief account of the impact of the proposed changes to the layout of the PMR expansion for which amendment of the GDARD 002/06-07/0593 authorisation is being requested. It refers specifically to the findings of additional specialist studies that have been prepared in order to assess the impact of the proposed changes. The main report is included in Appendix G of the package of documentation concerning the full Basic Assessment Report.

From an initial review of the PMR project proposals, the following studies were commissioned in order to facilitate this analysis:

- **Air Quality Impact Assessment** – the repositioning of the ISS stack at the PMR could change the overall impact of the PMR expansion, when compared with the assessment for the original authorisation;
- **Noise Impact Assessment** – the closer proximity of fans and other noise sources to residents on Mey Street and the use of part of the old recreation club grounds for construction laydown

could change the overall noise impact of the PMR expansion, when compared with the assessment for the original authorisation;

- **Visual Impact Assessment** – the closer proximity of buildings to the residents on Mey Street and Greig Street and the use of part of the old recreation club grounds for construction laydown could change the visual impact of the PMR expansion, when compared with the assessment for the original authorisation;
- **Quantitative Risk Assessment** – the relocation of some of the hazardous processes could change the overall spatial dimensions of risk levels to which the surrounding community is exposed, when compared with the assessment for the original authorisation.

Subsequently, the scope of the BA was extended to include the following additional study:

- **Impact on Property Values** – the closer proximity of the buildings to Residents in Mey Street and Greig Street could impact on property values in these streets, when compared to the existing project footprint.
- **Traffic Impact** - the findings of an independent traffic impact assessment, prepared by WSP consulting engineers, has also been included.

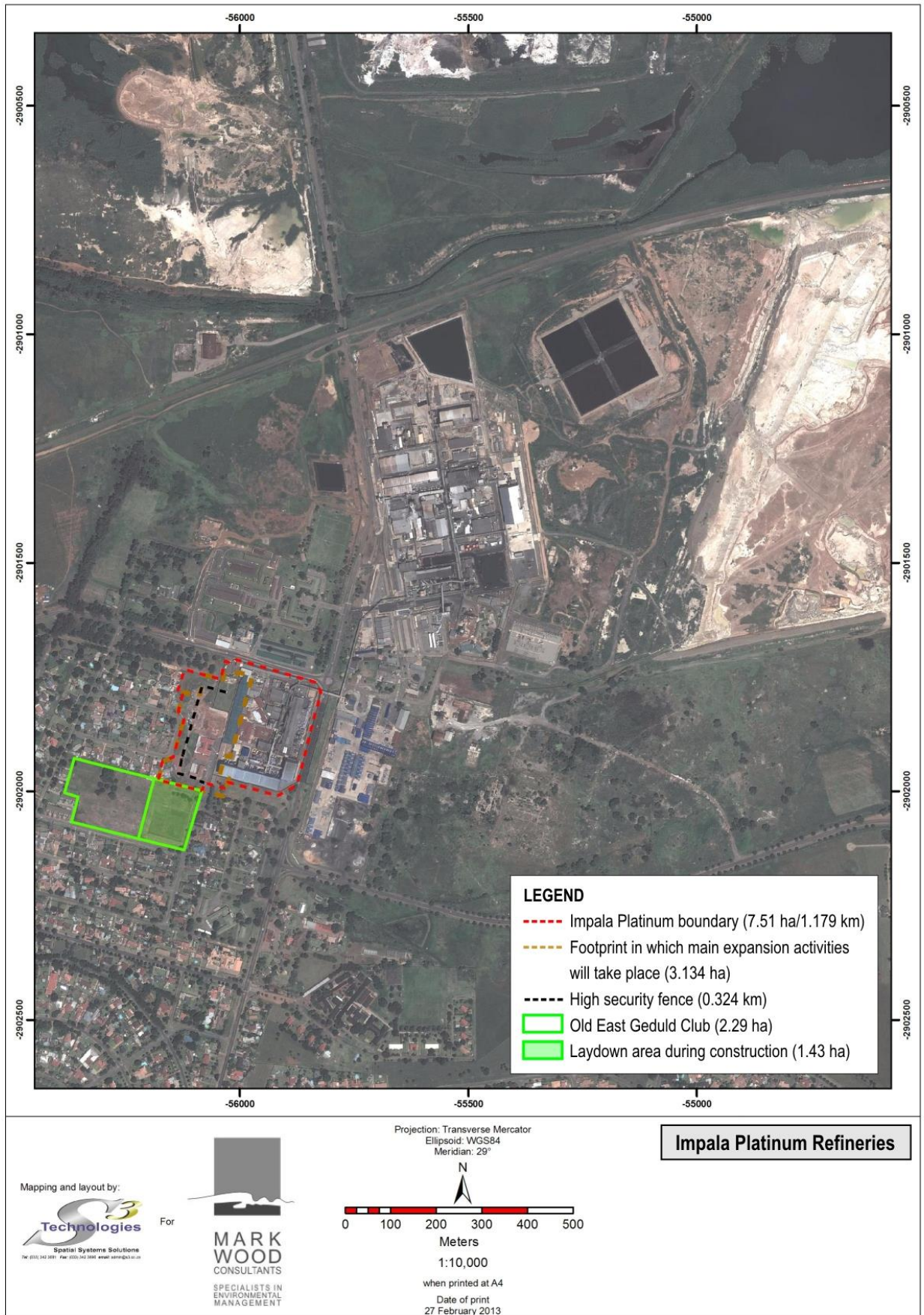
DESCRIPTION OF THE PROJECT

Original (authorised) Plans for the PMR Expansion Project

The approved IPR expansion project consisted of plans to increase the refineries' production capacity to 3,2 million ounces of platinum per year.

Figure E-2 indicates where these changes were to take place. The most visible of the changes was to be the new rhodium and iridium plant, which was planned on the south-western side of the refinery, close to the boundary with East Geduld. This plant was to be located where the Human Resources Building was situated (recently demolished).

Figure E-1: Locality plan



Revised Plans for the PMR Expansion Project

The revised planning at the PMR primarily involves changes to the location of the main buildings. Some activities will no longer be undertaken. The rhodium and iridium plant (authorised as described above) will no longer be rebuilt. The additional capacity for the salt ignition furnace has already been installed under the current authorisation but it is proposed that this, together with the additional cooling towers (already authorised), should be moved to a new location in the PMR precinct, as shown in Figure E-3. Associated with this would be the construction of a new ignition scrubbing system, which will improve on the performance of the old system, particularly with regard to particulates.

Other ancillary changes that are proposed include new packing and dispatch buildings, a new ablution block, and rebuilding and reorganisation of construction and contractor's yards. Additional security and control rooms as well as an additional substation will also be built. The proposed parking and security layout around the PMR will be revised, some of which falls outside of the existing refinery boundary but is still on IPR's property. Re-zoning of this property is currently in progress. It is noted that the proposed expansion extends into an area along the western boundary of the refinery, which was purchased on the recommendation of the 2007 EIA for the purposes of a buffer between the refinery and the adjacent residential community in Rowhill. This buffer was to be landscaped and maintained (Golder, 2007; page 7-41). Due to the requirements of the revised PMR layouts, this commitment cannot be met in the revised layout.

ALTERNATIVES TO THE PROJECT

Since the PMR expansion is a development already authorised by GDARD, the consideration of alternatives in this section relates only to the changes that are being proposed to the existing approved layout. However, since the changes in the layout involved moving some of the building infrastructure into areas not currently zoned for industrial use, IPR has considered wider options which have included a major alternative. This was to locate all of the PMR expansion on the east side of East Geduld Road in the area where the existing IPR stores are situated.

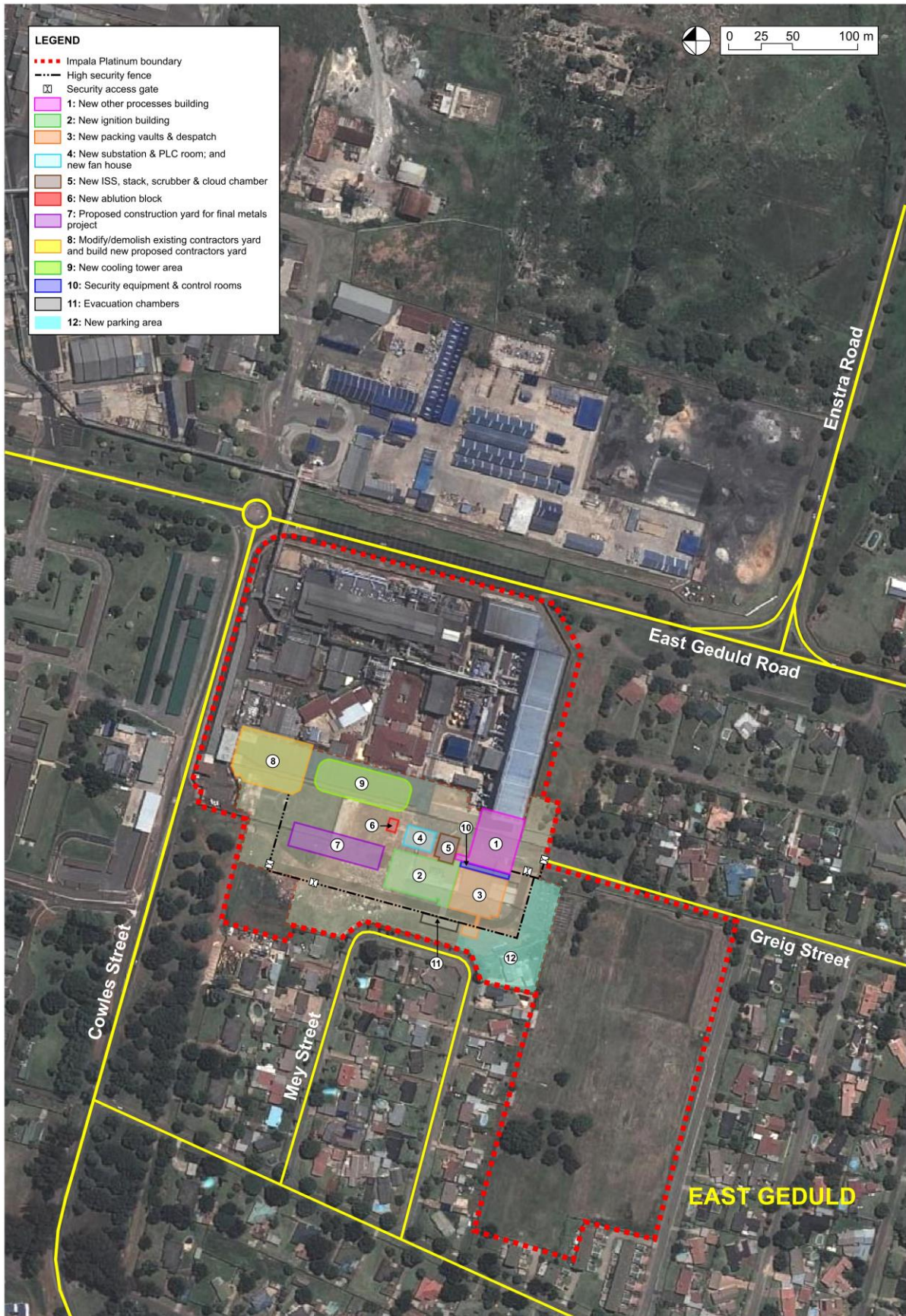
As a basis for this assessment, IPR conducted a comprehensive Cost/Benefit Evaluation, which included an in-house analysis with the assistance of plant design specialists (Lurgi (Pty) Ltd.), covering full design, project management requirements, supply and installation of all mechanical equipment with associated instrumentation – electrical, civil and structural requirements for future expansions. This includes the expansion the approved expansion to 3.2 million ounces of platinum, plus a future expansion (referred to as the “2nd EMPR Backbone Project”) that would also have to be accommodated. On the basis of this study and an associated SWOT analysis covering the alternatives, Impala identified several technical and security risks problems associated with splitting the refinery into two ‘remote’ sections across a main public road.

Based on the detailed engineering analysis, Impala estimates that the split-refinery option would cost R2,775 million for the “2nd EMPR Backbone Project”, which is approximately twice the cost of the consolidated refinery option, which is estimated at R1,396 million. Consequently, IPR do not consider splitting the refinery to be a viable financial option.

Figure E-2: Phase 4 refinery expansion as approved by GDARD in 2007



Figure E-3: Revised Phase 4 refinery expansion as currently proposed



THE AFFECTED ENVIRONMENT

Geology: The soil profile of the PMR comprises medium dense and loose collapsible aeolian sands below an upper layer of sandy topsoil and fill. Dolomite bedrock occurs at 15 m depth.

Topography: The PMR and surrounding area are flat with a gently gradient to the north (5%) in the direction of a tributary of the Blesbokspruit, which is some 850 m away.

Surface Hydrology: The primary surface water resource in close proximity to IPR activities is unnamed tributary of the Blesbokspruit (sub-quaternal code C21D-01334). This stream has been named the *Cowles stream* for the purposes of various studies, and drains into the Blesbokspruit approximately 1.2 kilometres downstream of the Cowles Dam wall.

Fauna and Flora: The PMR is a densely developed industrial site and there is no remaining vegetation within the existing precinct.

The Urban Context: The environment around the PMR is fully urbanised. Situated in the suburb of East Geduld, Springs, the PMR is bounded by the arterial roads of Cowles Street and East Geduld Road along its northern and eastern boundaries. On the western and southern boundary is the suburban neighbourhood of East Geduld. Homes in these neighbourhoods are generally single storey on ¼ acre erven. Many of them were originally built to provide accommodation for employees of the East Geduld mine, an abandoned shaft of which is situated on IPR's property in the BMR Refinery, approximately 250 m east of the PMR. When the PMR was built in 1969, the nearby houses in East Geduld were taken over by the company, but were later sold at competitive prices, mainly to IPR employees.

On the western side of the PMR, homes are on a crescent road (Mey Street), which borders on the refinery boundary. Two properties on this road form a common boundary with IPR off Mey Street (Erf 91 and 99) while two other properties (Erf 116, 117) are separated from the refinery by the width of the Mey Street road reserve. On the southern side, Greig Street and Plasket Road form dead ends on the southern refinery boundary.

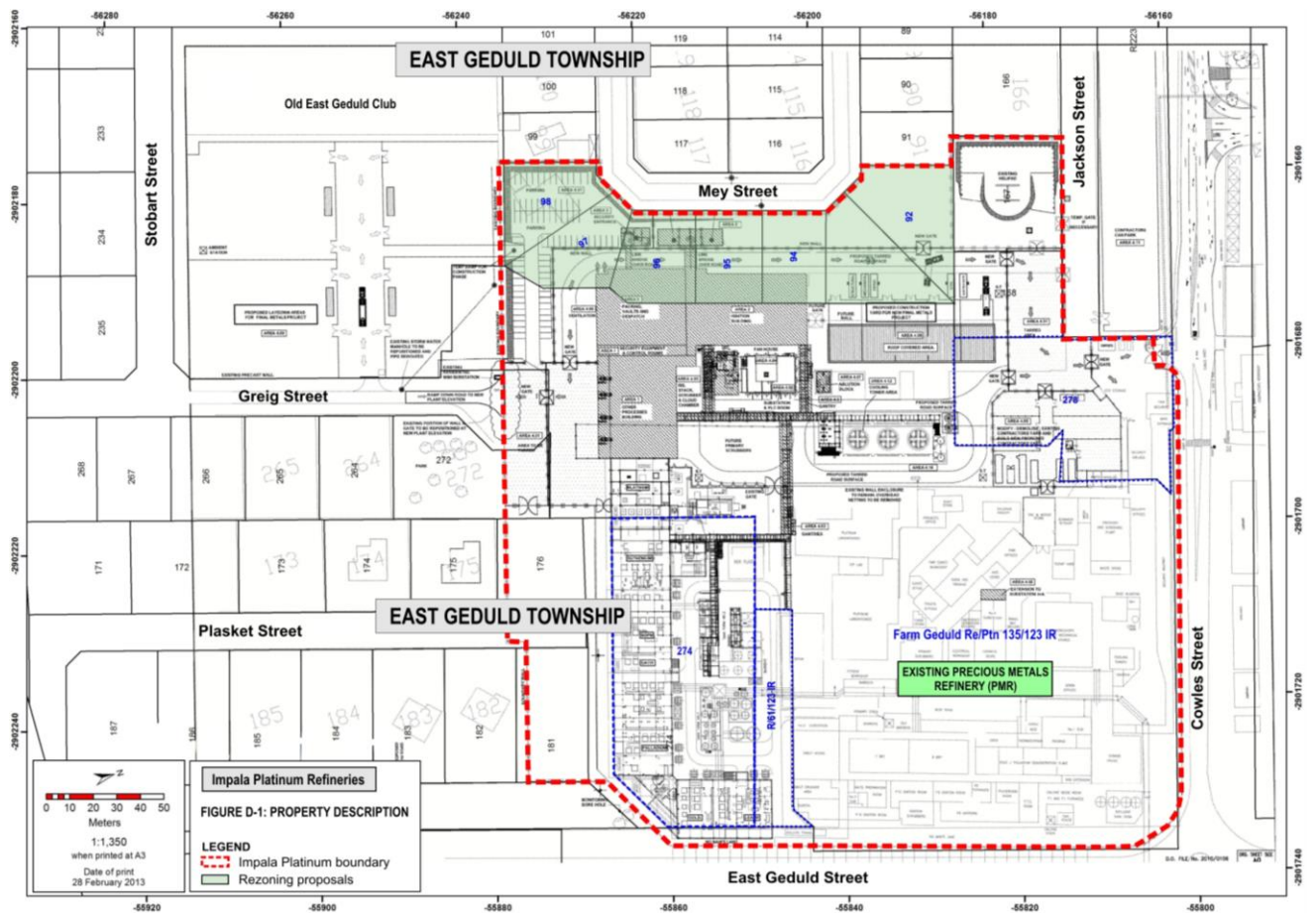
East of East Geduld Road is the IPR stores. Further east, approximately 1,5 km along Enstra Road, the townships of Gugulethu and Everest are situated.

Recent Changes in Land Use and Land Zoning around the Refinery

In 2005/2006, the East Geduld Club went into liquidation and was bought by private developers. It was the intention of the new owners to construct townhouses on the property but IPR successfully opposed this change on the grounds that densification of settlement around a Major Hazard Installation was inadvisable. IPR subsequently reached agreement with the landowner and purchased the property. In addition, the company purchased several houses off Mey Street, in compliance with a recommendation made in the 2007 Refinery Expansion EIA (Golder, 2007), which indicated the desirability of creating a landscaped buffer between the expanded PMR and the neighbourhood along Mey Street. The revised landownership of IPR in this area is shown in Figure E-4.

However, as indicated above, due to the changes in IPR plans regarding the PMR (i.e.: the current application for amendment to the existing authorisation), it is not possible to keep to this commitment, and the company is now proposing to utilise some of this land for the purposes of the expansion. Rezoning applications are in the process of being submitted to the Ekurhuleni Municipality. Currently, only the existing factory footprint is zoned for industrial purposes (Industry 1) – the area for which rezoning is being applied is shown in Figure E-4. In the interim, IPR has built a 4,5 m brick wall around the western and southern perimeter of the PMR, which has necessitated the relocation of a number of municipal services. The boundary wall backs directly onto properties on Mey Street (Figure E-4). The wall continues along the full length of the southern boundary of the refinery to East Geduld Road, then turning northward along East Geduld Road to link into the existing security wall on the south eastern corner of the refinery.

Figure E-4: Sections of property currently being rezoned by IPR



IPR has also fenced the East Geduld Club, the eastern end of which is directly adjacent to the PMR, and has built a 2,4 m concrete palisade fence around it. The Human Resources division, which was situated within the PMR precinct and which was accessed from Greig Street, has been relocated, and access into this point from Greig Street has been closed.

The houses on the southern boundary of the refinery are also exposed to changes that have occurred as a result of IPR purchase of the East Geduld Club. IPR intends to use a portion of this land as a laydown area during the construction phase of the project. The buildings in the club grounds have been demolished and IPR has erected a concrete picket fence around it (Photograph E-2).

Municipal infrastructure has also been moved to accommodate IPR's wall - in one case, for example, a city electrical junction box has been relocated outside 6 Plasket Street.

Photograph E-1: Brick wall under construction around the PMR boundary adjacent to Mey Street



Photograph E-2: The concrete fence erected along Stobart Street around the East Geduld Club



Future Land Use Plans in the Area

The neighbourhood is well established and there are no proposed changes in land use in the immediate area around the refinery, other than the long term plans for the proposed K118 provincial road. This road has been the subject of several years of discussion between IPR and Gautrans – following consultations with GDARD and legal opinion obtained by the EIA consultants, it has been concluded that the proposed road has no legal standing in its currently proposed location, routed along the southern refinery boundary. Gautrans has confirmed that the current legally constituted position of the road past IPR is along Cowles Street (refer to Appendix K).

SUMMARY OF IMPACTS

The BA report considers the impact of the proposed changes to the layout of an approved PMR expansion at Impala Platinum Refineries in Springs. The application seeks to amend the GDARD 002/06-07/0593 authorisation in which an expansion of the PMR was authorised.

The changes in layout have been considered from the point of view of a number of potential impacts. These include air quality, noise, visual aesthetics, community health and safety risk and cumulative impact on property values around the refinery. The study concludes:

With regard to air quality impact: the use of scrubbers on several of the key stacks is expected to result in the current emissions of PM₁₀, SO₂, NO₂ and HCL all reducing significantly at current levels of production. Implats HCL emissions from the ISS stack currently exceed the 2015 and 2020 emission standards set out in the Minimum Emission Standards (GNR No. 248 of 31 March 2010). Boiler emissions in the BMR are also above the future legal limit. The installation of abatement technology on both of these stacks is expected to significantly reduce emissions, bringing the stacks into compliance with the 2015 and 2020 standards. This will reduce Implats' current contribution to ground level concentrations of PM₁₀, SO₂, NO₂ and HCL in surrounding communities.

The effect of relocation of the HSS stack closer to residents in Mey Street will be more than offset by the reduction in air emissions from this stack, following installation of the 'cloud chamber'; so the overall effect should be positive, even with gradually increasing production over the years up to Implats authorised limit. HCL emissions are expected to reduce. The relocation of the ISS stack is therefore acceptable from the point of view of air pollution. Residents may expect a reduction in the corrosion of metal structures, although the precise extent of this improvement would need to be determined by a corrosion specialist, since the chemical atmospheric interactions leading to corrosion are complex and there is no direct linear relationship between a reduction in the emission of HCL from Implats' stacks and corrosion of metal in the surrounding neighbourhoods.

It should also be noted that in 2013, Implats began a pilot project to demonstrate the efficiency of the 'cloud chamber' abatement technology, the results of which have shown that the technology can

perform to full specification. The assumptions concerning the reduction in HCl and particulates from the HSS stack, included as the basis for the air quality modelling, is therefore associated with a high level of confidence.

In the long term, increases in production to the full approved capacity of 3.2 mill ounces of platinum could result in a slight increase in the overall impact of SO₂, compared with the existing situation. All other criteria pollutants should be below current atmospheric concentrations.

Recommendations made in the air quality impact report include the requirement for demonstrating continual improvement with respect to air emissions, improved management of the air quality monitoring stations so as to ensure that the recent increase in data availability meets ISO requirements, and a recommended investigation of corrosion management by a corrosion specialist once the cloud chamber of operational on the HSS stack.

With regard to noise impact: construction noise will be a potentially significant impact in the absence of comprehensive mitigation. The use of the eastern end of the old East Geduld Club for a lay down area during construction will introduce heavy vehicle noise into a previously quiet area. Construction of the refinery will take more than 5 years and the construction noise associated with the lay down area could be within 20 m of residential neighbourhoods to the west and south when vehicles are operating on the boundary. Unmitigated noise levels will exceed the SANS 10103 guideline. However, it is concluded that the construction noise impact can be reduced to tolerable levels in surrounding communities subject to stringent compliance with a number of requirements. These include strict adherence to controls over the periods during which construction may take place (no construction outside of daylight hours or construction over weekends or public holidays), training of vehicle and equipment operators to ensure considerate usage of noise - generating equipment, training of site staff to minimise shouting, unnecessary banging and other behaviour that would cause a noise nuisance, the use of concrete batching trucks in preference to a batching plant, restrictions on access of construction vehicles to the site (no access to the site except in emergencies via roads other than Cowles Street, East Geduld Road and Jackson Street), checks of noise baffling on vehicles and equipment and various other control measures. Construction noise impact will need to be carefully managed and independently monitored. Community complaints must be logged and acted upon. A Construction Environmental Management Plan (C-EMP) has been completed, providing details of the required impact measures, and is included with this Basic Assessment (Appendix J-1). This provides detailed and fully enforceable measures to manage impacts during the construction period.

Operational noise impact will also be potentially significant, although the implementation of appropriate design and operating measures should reduce this to acceptable levels. Recommended measures to minimise process noise include the inclusion of an acoustics consultant in the design team to ensure that fans and other noise generating equipment are selected with noise control in mind, that their orientation is such that directional noise impact is minimised and that where necessary, designs include for noise muffling. The acoustic specialist indicates that subject to the implementation of appropriate acoustic designs in the new plant, there should be no increase in operational noise caused by the revised footprint of the plant.

The small volumes of additional traffic caused by the PMR expansion will have a negligible impact on existing noise levels on Cowles Street and East Geduld Road. There will be light vehicle traffic on Greig Street twice a day when shifts at the refinery change. This traffic will consist of around 80 light vehicles per shift change (all delivery vehicles will access the site via Cowles Street). While refinery access via Greig Street will result in vehicle traffic noise on Greig and van den Bosch streets, twice a day, it is a lower impact proposal than the arrangement that has existed until recently, which provided vehicle access to the IPR human resource and security department via this street and involved a larger number of vehicles (including delivery vehicles) than will be the case for the proposed PMR expansion. Consequently, the overall impact of the PMR expansion on traffic noise in Greig Street will be positive, by comparison with the previous situation.

With regard to visual impact: In the absence of mitigation, the visual impact of the refinery expansion is expected to be of high significance for residential properties in the immediate vicinity of the southern and western boundaries of the PMR. The changes to the proposed layout of the approved expansion will exacerbate the local visual impact by bringing the main building structures closer to residents in Mey Street. This is as a result of expanding into the proposed landscaped buffer area on Mey Street that was authorized as a part of the 2007 PMR expansion application. The current proposals also include the use

of a portion of the East Geduld Club for laydown during construction, which while screened by a boundary wall will change the sense of place of the surrounding area and could last for a period of up to 7 years.

A range of mitigation measures can assist in reducing the impact of the expansion. Since these involve landscaping, none of them will be effective immediately, but will become more effective with time. Careful maintenance and monitoring will be required. Measures include screen planting of trees along IPR's boundary with Mey Street, setback of the laydown area so as to allow landscaping along Greig Street and Stobart Street in the vicinity of the laydown area, committing to a pavement tree planting programme to beautify the neighbourhood and various measures regarding colours schemes and roof design to minimise the impact of the buildings. With time, these measures should reduce the visual impact of the expansion to low levels of significance in properties that are not in close proximity to the refinery. For the properties considered to be in the high and high-medium impact zones the proposed mitigation will not be sufficient to reduce impacts to low levels of significance and property value impacts can be expected.

Figure E-5: Visual simulations of the proposed PMR expansion, viewed from Greig Street



View northward at Stobart & Greig St intersection - existing February 2013



View northward at Stobart & Greig St intersection without planting, integrated roof – proposed expansion



View northward at Stobart & Greig St intersection, with street planting (long term), integrated roof – proposed expansion

Figure E-6: Visual simulation of the proposed PMR expansion, viewed from Mey Street



View East from Mey St S mid-block - existing February 2013

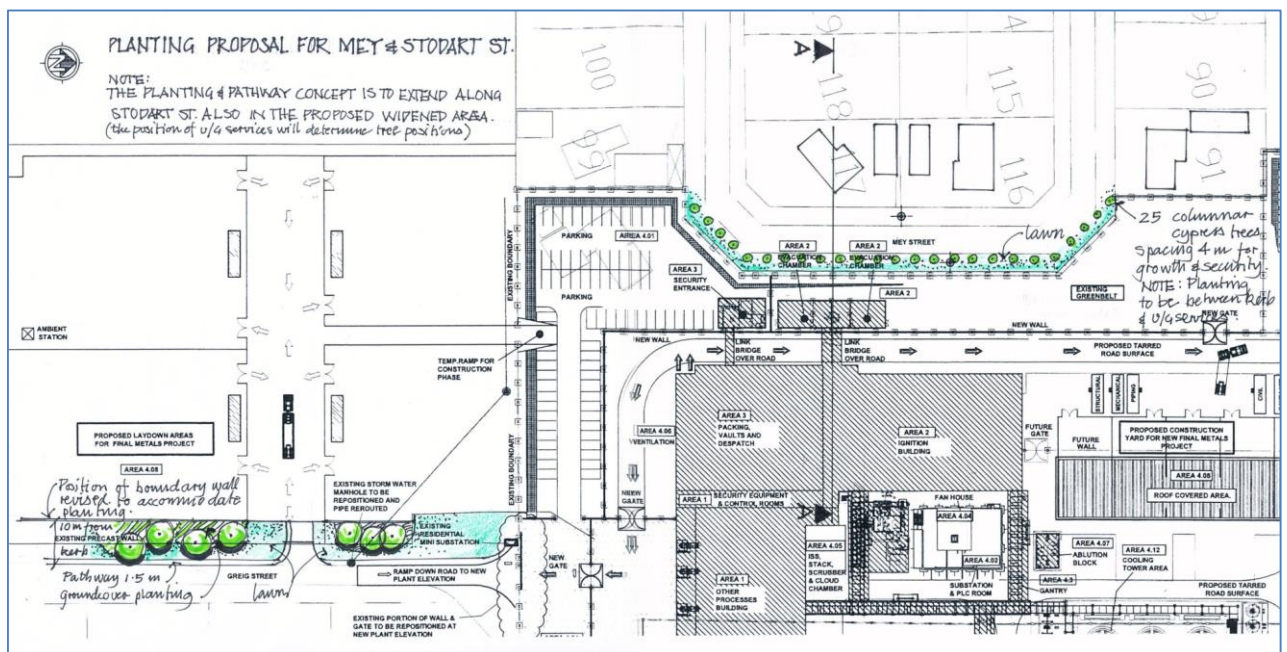


View East from Mey St, without planting, integrated roof structure – proposed expansion



View East from Mey Street, with planting, integrated roof – proposed expansion

Figure E-8: Conceptual planting proposal for Mey, Stobart and Greig Streets



With regard to **property value impact**: the expansion is expected to result in a risk of property value loss at properties nearest to the refinery along the eastern and southern boundaries, as a result of the cumulative impacts of all of the activities associated with construction and operation of the project, over an extended period of time. Mitigation for this impact is proposed by creating a mechanism for potentially affected property owners to sell their properties to IPR at market related prices. Alternatively, a mechanism for direct compensation is proposed for some landowners, should this be preferred. While this cannot compensate a family for the loss of a valued home, it should make reasonable provision to ensure that affected families do not suffer financial losses as a result of residual impacts. The following specific recommendations are made in the report:

Specific Recommendations

1. Landscaping / mitigation measures are to be implemented. Clearly, the mitigation measures, including the development of a landscaped buffer, will greatly help to reduce the long-term impacts of the IPR facilities.
2. IPR shall offer to purchase the first two rows of houses in Mey Street, closest to the plant property boundary, at fair market values (FMV) determined by an independent valuer prior to construction.

This purchase will enable IPR to implement recommendation #1 above, the development of a landscaped buffer as envisioned in this report. An outline of how the total offer should be calculated, taking into account the property value and other costs associated with relocating, is presented in Table E-3.

Table E-1: *Properties on Mey Street subject to the offer to purchase described in point 2 above*

Township	Erf Number	Street Address
East Geduld	90	35 Mey Street, East Geduld
East Geduld	91	33 Mey Street, East Geduld
East Geduld	99	17 Mey Street, East Geduld
East Geduld	100	15 Mey Street, East Geduld
East Geduld	115	20 Mey Street, East Geduld
East Geduld	116	18 Mey Street, East Geduld
East Geduld	117	16 Mey Street, East Geduld
East Geduld	118	14 Mey Street, East Geduld

In addition, two properties on Greig Street (Erfs 264 and 265 East Geduld) nearest to the refinery expansion shall be afforded the same offer as described above.

3. For the properties located between Row 3 and Row 6 (inclusive) in Mey Street (refer to Table E-2 for a list of the erven), IPR shall proceed as follows to mitigate the potential impact on property values. Which rows of properties are subject to this offer has been determined on the basis of the residual long term visual impact (Rows 3-5), plus one additional row of properties (Row 6) to ensure additional conservatism:
 - a) **Cash Compensation.** Offer cash compensation to property owners in Mey Street between Row 3 and Row 6 from the IPR boundary wall. The amount of compensation shall be equivalent to the mitigated “impact” share of 7.8% (post-construction, net of any existing pre-construction impacts) determined by this study and applied to the Full Market Values (FMVs) determined by an independent valuer. This compensation shall be considered full and final.
 - b) **Offer to Purchase.** Offer to purchase houses up front at the current Full Market Value (FMV) from any homeowners who wish to sell their properties to IPR prior to construction. The offer is to comply with the approach described in Table E-3. IPR may then re-sell these homes on the open market through property agents or use the houses for their own employees. Buyer agreements should include a “no harm” clause that stipulates that no further compensation can be claimed against IPR from impacts of IPR facilities.
 - c) **Later Purchase Only as “Last Resort”.** For those property owners in Rows 3-6 in Mey Street, as described in Table E-2, who only decide to sell their homes after construction starts, IPR offers to purchase those homes as a “last resort,” (if no other willing buyer is found by a mutually-contracted agent) and at FMV for that time. IPR may resell those homes with the “no harm” clause included in the buyer agreement or maintain them for its own employees.

Table E-2: *Properties on Mey Street subject to the offer referred to in Point 3a-c above*

Township	Erf Number	Street Address
East Geduld	86	43 Mey Street, East Geduld
East Geduld	87	41 Mey Street, East Geduld
East Geduld	88	39 Mey Street, East Geduld
East Geduld	89	37 Mey Street, East Geduld
East Geduld	101	13 Mey Street, East Geduld
East Geduld	102	11 Mey Street, East Geduld
East Geduld	103	9 Mey Street, East Geduld
East Geduld	104	7 Mey Street, East Geduld
East Geduld	111	28 Mey Street, East Geduld
East Geduld	112	26 Mey Street, East Geduld
East Geduld	113	24 Mey Street, East Geduld
East Geduld	114	22 Mey Street, East Geduld
East Geduld	119	12 Mey Street, East Geduld
East Geduld	120	10 Mey Street, East Geduld
East Geduld	121	8 Mey Street, East Geduld
East Geduld	122	6 Mey Street, East Geduld

4. The offers to purchase properties shall be subject to the conditions set out in Table E-3.

Table E-3: *The approach to purchase of properties to be followed by Impala*

- Determine the willingness of the property owners described above to negotiate the sale of their properties;
- Ascertain a fair market price, based on the value of the property with similar improvements in the same neighbourhood, using an independent property valuer agreed to by both parties;
- Make allowance for nuisance (the inconvenience of having to move), relocation and other incidental costs in the final offer to purchase. The principle is that the owner must be in a position to move to a similar house, unaffected by the impact of the refinery, in the same or similar neighbourhood within Springs, without cost and with reasonable compensation for the disruption as a result of relocation. Compensation for nuisance, relocation and other incidental costs should be calculated by the independent valuers, in consultation with the property owners, but should be a minimum of 25% of the value of the property, with improvements.
- Maintain in good condition any houses and gardens purchased in terms of the agreements with landowners, prior to sale to new buyers or for use by Implats employees, so as to ensure that the purchased properties do not become blighted or a security hazard in the neighbourhood.

5. Within the “**Low**” **Impact area** (as defined by CK&A), there is no offer to purchase, nor compensation to homeowners.

With regard to **traffic impact**: The traffic assessment has been based on an independent investigation by traffic engineers, WSP (refer to Appendix H-6). During construction, this impact is expected to be of low significance as long as access to the PMR is limited to Cowles Street, East Geduld Road and Jackson Street. The current proposal to use Greig Street for construction 'on occasions', when access via the refinery is hampered by construction activities, is insufficient guarantee that the road will not be used. The road is not designed for heavy load vehicles. Construction access to the laydown area from Greig Street should be in emergencies only.

During operations, the access for PMR personnel to the Final Metals Project parking area, via Greig Street, is acceptable, subject to this remaining for personnel use only, and not for deliveries. The proposed access will be an improvement on the pre-existing situation, which until recently included access for light and delivery vehicles to the IPR HR and Security departments, and resulted in a greater number of daily vehicle trips along Greig and van den Bosch Streets.

With regard to **health and safety hazards**: The risk of community health and safety hazards caused by the PMR expansion is not expected to increase, due to the absence of any increased inventory of hazardous materials as a result of the expansion. Risks of explosions, toxic plumes or other health hazards are expected to remain within acceptable limits, as set out by international guidelines for the management of public risk. Due to concerns raised by residents and Implats employees about the potential for additional health risks caused by the proximity of the new Ignitions building to Mey Street, and other risks associated with the revised footprint, a detailed review of the HRA was undertaken by the risk specialists and additional data concerning the revised footprint was analysed. The conclusions of the revised report remain the same – that the revised footprint of the PMR will not result in unacceptable risks in the surrounding communities.

With regards to **local and regional economic benefit**: Economic benefits are expected to be highly significant, particularly in respect of multipliers caused by the plant's monthly operating expenditure. The proposed changes to the layout of the approved expansion will not alter these benefits and they have not been further assessed in the current BA but are described in the economic specialist study accompanying the environmental assessment for the 2007 expansion.

Tables E-4 and E-5 provide a summary of the impact ranking for the revised expansion proposals during the construction and operational phases.

Table E-4: Construction impacts of the revised footprint of the Approved PMR Expansion

Impact Category	Spatial Scale	Direction	Duration	Intensity	Cumulative effects	Probability of occurrence	Significance (without mitigation / enhancement)	Significance (with mitigation/ enhancement)
Solid Waste	Local	Negative	Short – medium term	Medium	Medium	Possible	Medium	Low
Noise	Local	Negative	Short – medium term	Medium - high	Medium – high	Definite	Medium-high	Low - medium
Visual	Local	Negative	Short – medium term	Medium - high	Medium - high	Definite	High	Low - medium
Socio-economics	Regional	Positive	Short – medium term	Medium	Medium	Definite	Medium	Medium
Traffic	Local	Negative	Short – medium term	Medium	Low	Definite	Medium	Low

Grey shaded impacts are those not affected by the revised footprint – in these cases, the impacts remain the same as assessed in the previous environmental assessment (Golder, 2007)

Table E-5: Operational impacts of the revised footprint of the Approved PMR Expansion

Impact Category	Spatial Scale	Direction	Duration	Intensity	Cumulative effects	Probability of occurrence	Significance (without mitigation)	Significance (with mitigation/enhancement)
Air Quality	Local	Positive – neutral (positive for criteria pollutants)	Long-term	Medium	Medium	Likely	Medium	High (assumes installation of abatement measures)
Surface and Groundwater	Local	Negative	Long-term	Low	Low	Unlikely	Low	Low
Solid Waste	Local	Negative	Long-term	Medium	Low	Possible	Medium	Low
Noise	Local	Negative	Long-term	Low – medium (2)	Medium	Definite	Medium	Low
Visual	Local	Negative	Long-term	Medium	Medium	Definite	High	Low – medium (2)
Property Value	Local	Negative	Long-term	Low - high (2)	Low - high	Probable	High	Low
Health & Safety	Local	Negative	Long-term	Low (under existing management)	Low	Highly unlikely	Low	Low (assumes continuous improvement)
Socio-economics	Regional	Positive	Long-term	Medium	Medium	Definite	Medium-high	High
Traffic	Local	Negative	Long-term	Low	Low	Definite	Low	Low

(1) 'medium' for PM₁₀

(2) 'medium' for houses in proximity to the refinery (as defined in the report)

Grey shaded impacts are those not affected by the revised footprint – in these cases, the impacts remain the same as assessed in the previous environmental assessment (Golder, 2007)

CONCLUSION (AND COMPARISON WITH THE NO-GO ALTERNATIVE)

The negative impacts that have been identified in this report and which will affect the community surrounding the PMR (in particular, the houses immediately adjacent to the PMR to the east and south), will not be experienced in the event of the no go alternative. It is noted that most of these impacts can be reduced to low levels of significance with appropriate mitigation, with the exception of visual impact and noise for those properties in the zone defined as 'high impact' in the visual assessment. It is possible that these properties will experience a loss in property value. Property value impact can be resolved through a mechanism in which IPR offers to purchase the stands for a reasonable agreed price, which takes into consideration the un-impacted value of the property, with improvements, combined with a nuisance and relocation allowance.

Significant economic benefits will be foregone in the event that the no go alternative is implemented, both in the short term as a result of construction expenditure, and as a result of downstream multipliers during operation. These benefits have been quantified in an economic assessment prepared by Conningarth (2007). This study identifies expenditure by IPR as a more efficient deployment of capital than the average for South Africa.

Subject to the stringent implementation of all of the proposed mitigation, it is recommended that the project can be approved.