3.2.3 ASSESSMENT OF POST MITIGATION SIGNIFICANCE OF IDENTIFIED POTENTIAL IMPACTS - QUALITATIVE

A. PROSPECTING ACTIVITY

			PHASE	PRE MITIGATION SIGNIFICANCE		MITIGATION					POST MITIGATION SIGNIFICANCE	
SUB-ACTIVITY	Identification of Impact of Activity Assessed	Description	Phase of the planned Activity	Quantitative Score	SIGNIFICANCE RATING	Manage, Mitigate, Avoid	Industry accepted Mitigation Measures	Mitigation Measure agreed during Consultation	SEF Mitigation in Approved EMPlan, 2011 (those specific to drilling are excluded)	EPA determined mitigation measures to be added	Quantitative Score	P.M. SIGNIFICANCE
SUMMARY OF LIST 1 ACTIVITY	**Prospecting Right**	**Year 1-3 complete - principally involving non-invasive prospecting methods. PWP amendment for Year 4 + Year 5 for invasive trenching and bulk sampling.**	Planning/Construction , Operational & Decommission Phases	**-56**	**INSIGNIFICANT MINOR**	**Manage & Mitigate**	**Manage Consultation + effective communication with I&AP's Rehabilitation of Bulk Sample site**	**Undertakings provided in the Info Letter during PPP Surface-user & Compensation Agreements**	**Various as per original Approved EMPlan, 2011**	**Mitigate as below if bulk sampling proceeds**	**-42**	**INSIGNIFICANT NEGLIGIBLE**
Participation in Regulation; DMR Site Visits; Consultation; Logistics			Planning & Operational Phases									
	Social Inconvenience Factor	access to site		-5	INSIGNIFICANT NEGLIGIBLE	Manage & Mitigate	Consultation + effective communication with Affected Parties	Notification to land owner/user prior to prospecting on site. Surface-user and compensation agreements	Land owners must be contacted prior to the prospecting team entering their property. Strict control must be in place to prevent (third) parties loitering into areas restricted to prospecting staff. Mr Lubbe must be notified of anticipated numbers and names of staff employed to work on the bulk sample site on his property.	Closing of farm gates where normally closed to prevent damage to livestock which may venture into another camp/road. Poaching on site by prospecting staff/contractors is not tolerated. Similarly, care must be taken to not spread fires. Access Agreements (optional)	-2	INSIGNIFICANT NEGLIGIBLE
	Social Inconvenience Factor	Documents required by and visits to site by Authorities		-5	INSIGNIFICANT NEGLIGIBLE	Manage	Consultation + effective communication with Affected Parties	Notification to land owner prior to DMR site visits		Nil	-2	INSIGNIFICANT NEGLIGIBLE
	I&AP Concern: Safety	Some of the farmers feel that their safety is at risk if the exploration company is allowed access to their properties.[SEF,2008]		0	Addressed under "Access to site"	Addressed under "Access to site"	Addressed under "Access to site"	Addressed under "Access to site"	Addressed under "Access to site"	Addressed under "Access to site"	0	Addressed under "Access to site"
	I&AP Concern: Access to site by prospectors	The landowners are concerned about how the prospecting team will access the site.[SEF, 2008]		0	Addressed under "Access to site"	Addressed under "Access to site"	Addressed under "Access to site"	Addressed under "Access to site"	Addressed under "Access to site"	Addressed under "Access to site"	0	Addressed under "Access to site"

	I&AP Concern: Request to be kept informed of Activities on their properties	Property owners requested to be kept informed on planned activities on their properties		0	Addressed above	Addressed above	Addressed above	Addressed above	Addressed above	Addressed above	0	Addressed above
Desk-top studies		off-site	off-site									
Re-evaluation of Existing Data		Data Synthesis, database, map generation and development of geological model; Concept Study, economic, geological & resource models etc.	off-site									
Geological Mapping	No Impacts	A geologist and assistant/s walking over the surface noting spatial data (using GPS) of prospecting and geological significance (usually rock type, structure such as fold or faults, shear zones etc.) which are later compiled into a geological map at the office, usually but not always on a graphics computer. Grab samples are often collected.	Planning & Operational Phases	-5	INSIGNIFICANT NEGLIGIBLE	Nil Required	Nil	Notification to land owner/user prior to prospecting on site		Nil	-3	INSIGNIFICANT NEGLIGIBLE
Geophysics (other)	No Impacts	A magnetic survey involves a small geophysics team of 2-3 persons walking a grid positioned by a hand-held GPS; using a portable magnetics instrument and taking readings. The data is down-loaded back at the office; processed, analysed and generally presented in a image format. The results are used in conjunction with other prospecting results to interpret geological structures.	Planning & Operational Phases	-5	INSIGNIFICANT NEGLIGIBLE	Nil Required	Nil	Notification to land owner/user prior to prospecting on site		Nil	-3	INSIGNIFICANT NEGLIGIBLE
Soil sampling (loam)	Neutral Impacts	Small 10-30cm deep holes which are filled in immediately with soil. The soil sample is removed to a lab for assay or KIMs or a Niton Gun may be used in situ.	Planning & Operational Phases	-5	INSIGNIFICANT NEGLIGIBLE	Nil Required	Nil	Nil	The area of disturbance must be kept to a minimum. Soil samples must be restricted to 0,5kg	Soil samples may be larger than 0,5kg without significant impact on the environment	-3	INSIGNIFICANT NEGLIGIBLE

Actual Trenching as part of the Bulk Sampling	Trenches are dug using a Tractor Loader Backhoe (TLB). The excavation will be made from surface to below the bottom of the target horizon. These trenches will typically have vertical sides with the width related to the TLB spade width. Each trench will be mapped, sampled and surveyed prior to rehabilitation. The material removed from the trenches will be bulk sampled.	Operational Phase	-63	INSIGNIFICANT MINOR	Manage & Mitigate	Use of specialist contractors who routinely use compliant environmental and health and safety precautions and training Rehabilitation of trenches by backfilling with waste material (which was originally taken from the trench / bulk sample pits	Notification+ explanation of planned bulk sample operations to land owner/user prior to prospecting on site	Excavations to a maximum depth of 100m. The water table has been depressed by local mining activities and is currently estimated to be at a depth of more than 500m; therefore excavation will not intercept the water table. There will therefore be no ingress of water into dolomitic compartments.	Notification & explanation of planned prospecting operations to land owner/user prior to prospecting on site. No prospecting operations outside of daylight hours without consultation with immediately affected party/ies.	-35	INSIGNIFICANT NEGLIGIBLE
Trench/Bulk Sample Placement and number of excavations	The optimal number & position for a borehole/bulk sample is determined from the results of previous prospecting and is based on geological and economic parameters. The "proposed" site is then checked against the access, environmental parameters and taking mitigation measures into account. A marker is then placed on site . At this point another check should be made to ensure compliance with the environmental and land-use factors (e.g. any issues that the land user may have raised). Also see "heritage" and "gravesites" below.	Operational Phase	-49	INSIGNIFICANT MINOR	Manage & Mitigate	In terms of the law the land-user must be compensated for any damage. It is recommended that this is taken into account and agreed prior to the start of invasive prospecting on the ground. AGRI-SA acts as a good source for up-to-date acceptable compensation rates for both parties to agree on.	Undertakings provided in the Info Letter during PPP which should have included grievance procedure and right-holder contact details	The prospecting team must negotiate with the landowners prior to starting any drilling (read bulk sampling) activities on their properties. It is envisaged that no (invasive) prospecting (excluding the bulk sampling area for which the EMPlan is amended) will take place closer than 100m from any building, power lines or roads. However if prospecting does take place closer than 100m and if "damage is caused" to infrastructure, WRE is responsible to compensate the landowner for any damage.	Mitigation measures must be applied to prevent impact and sites moved where necessary or the necessary permissions sought. Farm buildings and equipment is avoided. Invasive prospecting in crop circles is not recommended as damage to underground pipes may occur. No invasive prospecting within 50m of a residential dwelling without consultation & agreement with the affected party.	-35	INSIGNIFICANT NEGLIGIBLE
Trench/Bulk Sample Footprint and	The trench/bulk sample footprint is the area where an excavation is dug. This includes the area of overburden.					During invasive prospecting, industry compliant health &			Rehabilitation of the bulk sample pits and footprint is necessary. This takes place during the operational phase		

	Rehabilitation of Trench / Bulk Sample Footprint	This takes place during the operational phase of the activity. The hole is back-filled in reverse order to which they are excavated using material removed from the excavation. It is estimated that approximately 50% of the material will be available for infill after processing. It is anticipated that the remainder, the "ore" would be removed from site and sold. The post-bulk-sample surface will therefore be indented compared to the pre-trenching surface. Subsidence is anticipated in the excavation area around, where it occurs is filled in. Where necessary the removed topsoil is returned and contoured and allowed to seed naturally. A rehabilitation check is done by the responsible person at the end of the bulk-sampling campaign and any discrepancies fixed immediately.	Operational Phase	-63	INSIGNIFICANT NEGLIGIBLE	Mitigate	safety procedures are adhered to which includes visitors to the demarcated footprint area. Hard hats and safety boots are the minimum requirements Workers should be congnisant of protecting the environment. At the end of the operation for each hole the pit is permanently filled in The site must be rehabilitated on completion of invasive prospecting or on completion of the invasive prospecting campaign. A rehabilitation check must be done and any discrepancies rectified. immediately. The area is checked regularly throughout the life of the activity and any new impacts rectified.	Grievance procedure and right-holder contact details are provided in the consultation info letter	The area of disturbance must be kept to a minimum. Continual monitoring should take place to ensure that no soil degradation takes place. The site must be fully rehabilitated once prospecting activities cease. The site camp should be demarcated by a fence.	of the activity. The hole is back-filled in reverse order to which they are excavated using material removed from the excavation. It is estimated that approximately 50% of the material will be available for infill after processing. It is anticipated that the remainder, the "ore" would be removed from site and sold. The post-bulk-sample surface will therefore be indented compared to the pre-trenching surface. Subsidence is anticipated in the excavation area around, where it occurs is filled in. Where necessary the removed topsoil is returned and contoured and allowed to seed naturally. A rehabilitation check is done by the responsible person at	-42	INSIGNIFICANT NEGLIGIBLE
	Topsoil, Fauna & Flora and Soil Erosion	Topsoil is minimal over the sub-surface pebble deposit but may reach up to 0,5m thick. The topsoil for the temporary access tracks may need to be cleared and/or levelled for TLB and truck access purposes. In these instances the topsoil (fauna and flora) is scraped off by hand shovel or bulldozer and stored at the higher edge of the site ready to be replaced and re-contoured on rehabilitation of the footprint. The area is normally left to be seeded naturally but re-seeding may be necessary. The farmer would be consulted where this applies to cultivated land. Soil erosion especially by stormwater may result in an increase in total suspended solids and total dissolved solids in local water as well as the potential to create small donga's. Erosion is managed by creating run-off channels.	Operational Phase	-42	INSIGNIFICANT MINOR	Mitigate	When bulk sample footprints are prepared there should be minimal vegetation removal as far as practicable. Where topsoil has been removed; the soil must be replaced, contoured and left to reseed naturally. If the natural vegetation hasn't recuperated adequately (or shows no signs of recuperation) then at closure the area is to be reseeded with flora appropriate and indigenous to the area (as determined by a qualified expert). Weeds and exotic alternatives are not acceptable.		Vegetation clearance must only occur in the demarcated area. A berm must be constructed below the site to prevent stormwater runoff and to contain water carrying silt.	To prevent soil erosion during and post invasive prospecting operation, the topsoil should be stored uphill and storm-water re-directed away from temporary roads or cleared footprints. The sites should be checked for erosion at intervals throughout the activity and repairs made where necessary.. Slopes should be stabilised using geotextiles if necessary.	-30	INSIGNIFICANT NEGLIGIBLE

Large Indigenous Trees and protected trees	Erring on the side of caution, large trees, especially indigenous, are detoured around and should not be destroyed. A few branches may be cut to allow access for tall vehicles.	Operational Phase	-5	INSIGNIFICANT NEGLIGIBLE	Avoid	In prospecting it is common practise to avoid all large indigenous trees and detour around them. Branches may be cut within reason, to allow access for tall vehicles.			Destruction of certain indigenous trees carries a hefty fine	-21	INSIGNIFICANT NEGLIGIBLE
Fluids & potential water pollution	These are not anticipated to be used. Where used, biodegradable fluids are preferred.	Operational Phase	-28	INSIGNIFICANT NEGLIGIBLE	Mitigate	Use of a sump to recycle water Use of biodegradable fluids where applicable is preferred.				-24	INSIGNIFICANT NEGLIGIBLE
Oil and Grease Hydrocarbon Storage	Soil, fauna, flora and possible groundwater may be damaged or contaminated by oils and grease spilled onto the land. Where practical, P.V.C liners should be installed under all portable machinery (carrying grease or fuel), fuel containers, lubricators, sumps etc. Storage of: oil & grease is stored separately and should be protected from spillage. From time to time containers will be taken to recycling facilities or recognised dumping terrains. Spills: Machinery is usually protected and often plastic sheeting used to protect the soil however some small oil or grease spills sometimes occur. Any accidentally spilled grease and possible contaminated soil will be removed and taken to recycling facilities or recognised dumping facilities such as the nearest municipal dumping site or other approved site. Storage Facilities for Fluids All fuels, hydraulic fluids and grease should be stored in closed containers. Hydrocarbons should be stored in containers with an additional 10% above full available for expansion. Containers will be stored on P.V.C liners.	Operational Phase	-36	INSIGNIFICANT MINOR	Manage & Mitigate	Storage should be in a protected, safe and spill reducing environment. Protect soil from machinery and vehicle spills. Often plastic sheeting is used. Vehicles are generally maintained off-site where-ever possible.		Soil contamination by oil, fuel or chemical leakage shall be removed and disposed of as hazardous waste. (Hydrocarbons) diesel will be stored in a standard raised tank with a pre-constructed water tight trough capable of retaining 110% of the total quantity of the fuel. Further, the base of the trough is lined with an impermeable plastic lining to prevent spillage onto the soils. All other hydrocarbons such as grease and oil will e stored within a large plastic trough.	Where small spills occur, the contaminated soil should be removed and disposed of in a recognised waste facility. Where vehicle / machinery maintenance is required, care should be employed and at the rehabilitation check stage; the area should be checked and repaired where necessary.	-25	INSIGNIFICANT NEGLIGIBLE

Trenching + Bulk sampling - GENERAL	Litter, Rubbish & Waste Management	Domestic waste will be collected in rubbish containers and deposited in municipal rubbish collection area in the nearest towns of Carletonville, Oberholzer or Randfontein. or alternatively, at the operation-contractors base town. Other rubbish will be collected in leak-proof containers and from time to time containers will be taken to recycling facilities or recognised dumping terrains. Consideration should be given to recycling where-ever practical. Waste material (i.e. mineral matter removed from the trenches but excluded as it is not economically classified as "ore" is anticipated to be used directly to backfill the trenches; this may be stockpiled temporarily prior to being returned to the excavation.	Operational Phase	-24	INSIGNIFICANT NEGLIGIBLE	Manage & Mitigate	Appropriate and adequate waste bins should be provided and water removed off-site and correctly disposed of. (also see oil & grease). Recycling is encouraged.	Grievance procedure and right-holder contact details are provided in the consultation info letter	Domestic waste must be disposed of at a registered landfill site. There must be no littering on the site.	The site must be checked and all litter removed to prevent fauna and livestock from ingesting it as well as for environmental integrity. The rehab check should be done by the geologist on site and any discrepancies rectified.	-15	INSIGNIFICANT NEGLIGIBLE
	Noise	Machinery is anticipated to make a low to medium-level noise common to running machinery. The movement of the manganese pebbles against one-another is also anticipated to contribute to site noise. During machinery operation; it is anticipated that noise-levels would be below accepted threshold levels.	Operational Phase	-28	INSIGNIFICANT NEGLIGIBLE	Manage & Mitigate	Staff should be provided with ear plugs when working close to machinery.	Grievance procedure and right-holder contact details are provided in the consultation info letter	Working hours are restricted to daylight hours. Employees must keep noise levels to a minimum. (General invasive) prospecting (the bulk sample site is under a separate agreement) will not take place in close proximity to residential areas. The employees must keep noise levels to a minimum at the site camp.	Noise should be controlled and kept to acceptable levels. Staff should be provided. Machinery must be maintained to prevent or stop unacceptable noise levels and noises fixed immediately as far as practicable. invasive prospecting should be kept to daylight hours as far as possible. Affected parties should be consulted prior to undertaking after-hours prospecting.	-18	INSIGNIFICANT NEGLIGIBLE

Dust	Visual observation. Caused by vehicles and during bulk sampling and trenching procedures. During TLB and truck operation; anticipated to be below accepted threshold levels	Operational Phase	-28	INSIGNIFICANT NEGLIGIBLE	Manage & Mitigate	Dust should be kept within reasonable levels. As the dust is very localised - practical measures to contain the dust should be utilised when necessary.. While dust can be suppressed with water this needs to be weighed against water saving. In extreme cases chemical suppressants can be used Staff should be provided with dust masks when working in dusty areas.	Grievance procedure and right-holder contact details are provided in the consultation info letter	Dust suppression will take place by spraying water as required. Dust must be controlled and managed on site. The speed limit and movement of vehicles on site must be monitored and appropriately managed to reduce the generation of excessive dust.		-18	INSIGNIFICANT NEGLIGIBLE
Access Roads	N/A The existing public roads, the R500, R41 and N14 will be used to traverse and exit the prospecting right area.	Operational Phase	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A
Temporary Access Track	Existing roads, farm roads, farm tracks and firebreaks are used where-ever possible. Short tracks may be required to access the site. The existing track/fire-break would be re-enforced with gravel to protect the surface erosion from trucks. Truck movement is anticipated to be around a maximum of 5 trucks per day. Generally these are not cleared and the same track is used for the duration of the activity period. See "topsoil" for further information on circumstances where tracks need to be cleared. Also see "trees". Temporary access tracks are usually only rehabilitated at the end of the activity as the access is used for the duration of the activity. As this is an existing track it will remain after the duration of the prospecting activity.	Operational Phase	-42	INSIGNIFICANT MINOR	Manage, Mitigate or Avoid	Existing routes used where-ever possible. Avoid environmentally sensitive areas, crops and crop circles where-ever possible. For bulk sampling crops and existing cattle camps and fences will be damaged. Rehabilitation of access tracks where necessary - on closure of the activity in accordance with procedures outlined for topsoil and the drill footprint. And in consultation with the land user if they wish the tracks to remain. For the bulk sample an existing track will be used and this will remain post-closure.		The number of tracks on site must be kept to a minimum.	It is recommended that any long new expensive tracks be agreed with the land user prior to establishment where it is thought that the land user may object to the new feature.	-30	INSIGNIFICANT NEGLIGIBLE

Short-term Temporary Offices	Temporary containers or similar such as prefabricated or caravans of similar size will be placed on a levelled footprint. These would also be used for storage and equipment storage. Workshops are anticipated to be principally offsite at the offices of contractors and/or machinery and plant rental companies. (see topsoil above).	Operational Phase	-14	INSIGNIFICANT NEGLIGIBLE	Manage		N/A		Mitigation of the footprint addressed above. Temporary offices and their contents are to be removed in its entirety from site when the operation is complete or on prospecting right closure.	-14	INSIGNIFICANT NEGLIGIBLE
Short-term Temporary Accommodation	Temporary fly-camps (short-term prospecting accommodation & ablution facilities such as containers, caravans or tents). Commonly off-site or use of rented existing farm facilities on site. At the end of sampling the containers (or similar) will be removed from site.	Operational Phase	-15	INSIGNIFICANT NEGLIGIBLE	Mitigation	As per other aspects/factors			a rental agreement where existing farm facilities are used	-9	INSIGNIFICANT NEGLIGIBLE
Short-term Temporary Ablution Facilities	Serviced chemical toilets are typically used. The faecal matter is taken off-site and processed by the toilet service provider at its facilities.	Operational Phase	-21	INSIGNIFICANT NEGLIGIBLE	Manage	Use of existing permanent facilities or serviced chemical ablutions.		Dedicated wash areas must be situated away from water courses and areas of shallow groundwater. The contractor is responsible for providing all sanitary arrangements for his and the sub-contractors team. A minimum of one chemical toilet must be provided per 15 persons. The contractor must keep the toilet toilets in a clean, neat and hygienic condition. The contractor must supply toilet paper at all toilets at all times.	The right holder is responsible to ensure that the contractor is aware of minimum ablution requirements. No ablutions in or near watercourses. The placement of ablutions must be out of the 100m buffer zone.	-12	INSIGNIFICANT NEGLIGIBLE

Short-term Temporary Sample Processing Plant	A dry screening plant will be built on site (the equipment/plant may be rented). Screens to separate ore into different size fractions. The resulting material is transported to existing plants off-site where it is processed further - this may include Dense Medium Separator (DMS) to dispose of impurities. Once bulk sampling is completed, the temporary plant is dismantled and removed from site.	Operational Phase	-56	INSIGNIFICANT MINOR	Manage & Mitigate				Mitigation of the footprint addressed above. Temporary offices and their contents are to be removed in its entirety from site when the operation is complete or on prospecting right closure. All temporary stockpiles and waste piles pre- or post processing must have been returned to the excavations as backfill material. No stockpiles or waste piles may remain. This EMPlan does not allow for stock piles or waste to remain on site for extended periods of time. Should this situation change then the required assessments are to be done and the necessary permissions sought.	-42	INSIGNIFICANT MINOR
Fires	Discouraged but where used practical fir-prevention methods must be used. Cooking is typically done off-site or on gas or suitable alternative.	Operational Phase	-28	INSIGNIFICANT NEGLIGIBLE	Manage & Mitigate	Fire prevention procedures must be in place. In the event of accidental fire destruction, compensation in the event of loss is due to the land user. It is suggested that the amounts be recommended by Agri-SA which can provide recent, relevant compensation amounts.	Fires will only be allowed subject to negotiations with landowners. Fire breaks will be built around camps and offices where necessary.	Fires will only be allowed subject to negotiations with landowners. Fires will be made in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a firebreak shall be cleared around the perimeter of the site camp.		-12	INSIGNIFICANT NEGLIGIBLE
Potable Water for staff	Potable water is brought onto site from a source for domestic consumption.	Operational Phase	0	NEUTRAL	N/A	N/A	N/A		N/A	0	NEUTRAL
Visual Impact	The bulk sample machinery, trucks and its entourage is not out of place in this environment where there are other existing, similar, but larger (sand) operations within a 5km radius. Will be visible from the N14 and R42/R500	Operational Phase	-21	INSIGNIFICANT NEGLIGIBLE	Mitigate				All machinery to removed from site Bulk sample pits to be rehabilitated taking the surrounding area and visual impact into consideration	-21	INSIGNIFICANT NEGLIGIBLE
I&AP Concern: Visual Appearance	The effect of adits/trenches/open pits etc. to the safety of visitors	Operational Phase	0	Addressed above	Addressed above	Addressed above	Addressed above	Addressed above	Addressed above	0	Addressed above

	I&AP Concern:Other: contractors on site, number of employees, waste material, sewerage, fires, access to property and roads, sludge dams, safety precautions, fencing.	See above	Operational Phase	0	Addressed above	Addressed above	Addressed above	Addressed above	Addressed above	Addressed above	0	Addressed above
Trenching + Bulk sampling - GENERAL	Water for bulk-sampling & the processing plant	Water is not used for the trenching or bulk sampling. At this point of planning water is not anticipated to be required for the dry screening process but may become necessary at a later stage; if this is required then a small water sump would be created and the water recycled similarly to the invasive prospecting process. Typical amounts of water used are relatively low, in the region of 2-5000 litres per trench provided water can be recycled. Water is generally drawn from a commercial source or nearby open water source. Rarely, borehole water is used. Typically the water is pumped into a temporary dam/container or water bowser and transported to the site as required. For environmental and practical reasons water is recycled using sump technology where-ever possible. If needed a water spray bowser would be brought in to keep down dust levels. The relatively low water-use is not anticipated to impact the other land-users or water requirements or significantly affected the needs of the natural environment.	Planning & Operational Phases	-49	INSIGNIFICANT MINOR	Manage & Mitigate	If it becomes obvious that water becomes required for the bulk sampling process on site for either processing or dust control; then it is recommended that water is recycled where possible. A temporary sump is created and lined with plastic/or made of plastic. This is used to recycle water and allow particles to sink out of suspension. The sump is removed or filled in as part of the footprint rehabilitation. If necessary, a water permit application must be submitted to DWA prior to using significant amounts of water..		Water can only be abstracted from the groundwater or taken from the surface water resources if there is sufficient water available. Any water utilised from the site must be agreed to by the landowner. During the consultation process in 2008, the following undertaking was reported: Review of the Far West Rand Dolomitic Water Association (FWDWA) database will be undertaken, and the groundwater table will be depicted. Any additional information gathered during prospecting will be provided to the FWRDWA to enhance their database.	The surface owner must be included in the planning if it becomes necessary for underground water to be used or pumped from the proposed bulk sample site. Care and consideration must be made when choosing a water source. Water must be recycled where-ever practical. The EPA recommends that the FWRDWA review only need be undertaken in the event of drilling deeper than the water table which is set at 500m. Drilling is not included in the amendment and bulk sampling is restricted to ±4m, close to surface.	-28	INSIGNIFICANT NEGLIGIBLE
Closure	Closure Reports & processing by Competent Authorities	This process Field checks of site condition, consultation and DMR visits. Involves Desk-top work to compile and submit required documents.	Decommission Phase	28	INSIGNIFICANT NEGLIGIBLE +TIVE	No additional mitigation required					28	INSIGNIFICANT NEGLIGIBLE +TIVE

	I&AP Concern: Nil		Decommission Phase									
B. ENVIRONMENTAL ASSESSMENT RELATED TO RELEVANT ANTICIPATED ENVIRONMENTAL ATTRIBUTES												
			PHASE	PRE MITIGATION SIGNIFICANCE							POST MITIGATION SIGNIFICANCE	
ENVIRONMENTAL ATTRIBUTE GROUP	Environmental Attribute	Description	Phase of the planned Activity	Quantitative Score	SIGNIFICANCE RATING	Manage, Mitigate, Avoid	Industry accepted Mitigation Measures	Mitigation Measure agreed during Consultation	SEF Mitigation in Approved EMPlan, 2011 (those specific to drilling are excluded)	EPA determined mitigation measures to be added	P.M. SIGNIFICANCE RATING	P.M. SIGNIFICANCE
Environmental aspects which are the responsibility of other parties												
	Watercourses / Pans	Specific to the bulk sample area: no surface watercourses are shown. The presence of a sinkhole suggests sub-surface dolomitic water may be present close to the bulk sample area. In the focus area: a large pan, De Pan on the farm De Pan as well as a series of small pans/dams on the north-western boundary of the prospecting right, for the purposes of this document these are called " The Sand-Mine Dam". Out of the focus area: The Wonderfonteinspruit and MooiRiviersloop to the south. A number of smaller pans are dotted around.	Operational Phase	-12	INSIGNIFICANT NEGLIGIBLE	Avoid	In terms of legislation; no invasive prospecting may take place within 100m of the edge of a watercourse	Nil	No prospecting will take place within 100m of water bodies or water courses.	100m buffer zone marked on the plan, where applicable. No invasive prospecting within the buffer zone without the necessary permissions in terms of NEMA (and associated legislation)	-2	NEUTRAL
	Wetlands	Small, very localised wetland associated with " The Sand Mine Dam" which has prolific birdlife and is unofficially used by locals for fishing. No anticipated impacts of the activity on this environmental aspect as the area can be avoided by any invasive prospecting methods/technologies. If, at a later stage, this becomes a challenge - then the necessary environmental permits and authorisations will be sought.	Operational Phase	-12	INSIGNIFICANT NEGLIGIBLE	Avoid	In terms of legislation; no invasive prospecting may take place within a wetland area	Nil		10 - 30m buffer zone marked on the plan, where applicable	-2	NEUTRAL

Ground-water	Trenching and bulk sampling operations are anticipated to reach the maximum depth of bedrock (dolomite) within 3 to 4m which is above the water-table. Ground-water flows through tunnels formed in weaknesses within the dolomite rock. Prospecting is therefore not expected to impact on the groundwater. SEF details that the groundwater water table has been depressed to depths of 300m and 500m are mentioned. The farmer on Wildfontein abstracts borehole water from between 80m and 100m. This operation is too small and according to the PWP and WRE does not involve the significant use of - , pumping out of -, or redistribution of groundwater.	Operational Phase	-30	INSIGNIFICANT NEGLIGIBLE	Avoid			Mr Lubbe (& Foster), 2008, requested in-depth groundwater surveys to be done on the adjacent farm of Holfontein prior to drilling as there was a concern that removal of groundwater in the underlying dolomites by the original prospecting work programme would affect the ground water and thereby increase the possibility of sinkholes.	While not anticipated, if an impact on the groundwater occurs then the cause of the impact should be removed immediately and prevention mechanisms and procedures instituted.	-3	INSIGNIFICANT NEGLIGIBLE
Sink holes	Sinkholes and the sudden collapse thereof are a common feature in the area. Both the commercial farmer on the proposed bulk sample site and other interested and affected parties in the area were concerned about the use of groundwater for prospecting because of (I) the availability of groundwater, and (ii) the potential of sink-holes forming. The site visit as well as consultations with interested and affected parties confirmed the presence of sink holes in the dolomites which may form in this area and care should be exercised not to exacerbate this situation as well as for safety reasons during bulk sampling and processing. If necessary, the rock strength investigations of the underlying dolomite-rock should be done. It is noted that this is a regularly ploughed /ripped cultivated field and farm machinery is routinely used. At the same time, the site visit revealed a sink-hole in this or the adjacent field so this safety precaution is real and must be emphasised	Operational Phase	-44	INSIGNIFICANT NEGLIGIBLE	Mitigate	Extensive research is done in both the Mining and Environmental Industries and together with government and NGO bodies solutions are being sought to this challenge.			The site visit as well as consultations with interested and affected parties confirmed the presence of sink holes in the dolomites which may form in this area and care should be exercised not to exacerbate this situation as well as for safety reasons during bulk sampling and processing. If necessary, the rock strength investigations of the underlying dolomite-rock should be done. The practical impacts of both prospecting and commercial farming operations should be considered by the prospector-farmer partnership as both operations may have a cumulative impact on this aspect.	-22	NEUTRAL

Physical & Biolog	Biodiversity	The coverage is predominantly comprised of areas that "no longer remain natural" with some remaining natural areas which are used for grazing. The Gauteng Conservation Pan 3.3 marks the area surrounding certain pans and dams as Critical Biodiversity areas (irreplaceable) and buffer zones supporting those areas. SEF identifies small pockets of remaining threatened vegetation types (see the Environmental Base Plan for detailed information), No anticipated significant impacts of the activity on this environmental aspect is anticipated as the pans are avoided and in addition, the area impacted by any invasive prospecting methods/technologies will be small compared to the overall coverage of the vulnerable vegetated area/s. The vegetation will most likely recover from any invasive prospecting planned.	Operational Phase	-30	INSIGNIFICANT NEGLIGIBLE	Manage	An EA amendment is necessary if the PWP is amended to include significant additional Invasive prospecting			Large indigenous trees should avoided and should not be removed. Poaching an, apart from that required for prospecting operations, wilful destruction of natural fauna and flora on site by prospecting staff/contractors is not tolerated.	-18	INSIGNIFICANT NEGLIGIBLE
	Protected Fauna & Flora in terms of NEMBA (2007)	List as per Baseline Study. No anticipated impacts of the activity on this environmental aspect as invasive prospecting can be planned to avoid any known areas. Also the area of each impact is relatively small so as not to cause permanent damage to all of the species should it be inadvertently damaged.	Operational Phase	-16	INSIGNIFICANT NEGLIGIBLE	Manage & Avoid			Sites of high sensitivity must be avoided.	Cognisance must be taken by the prospecting right holder of the list of possible threatened species. If seen the project must be managed to avoid and/or protect these species. If inadvertently damaged; they must be re-instated with a specialist acting in an advisory capacity. For academic study purposes DEA should be notified of the occurrence of any critically endangered species (listed in Appendix 5.3)	-6	INSIGNIFICANT NEGLIGIBLE

	Protected areas - National Parks, etc.	Nil on the planned bulk sample area. Nil on the Focus Area. For the granted prospecting right, part of The Abe Bailey Nature Reserve overlaps part of the right. In terms of NEMA, commercial prospecting is not legal within the reserve. No prospecting is planned on the surface within the reserve boundary.	Operational Phase	-10	POTENTIAL SIGNIFICANT	**AVOID**	In terms of NEMA, commercial prospecting is not legal within the reserve. No prospecting may be planned or undertaken on the surface within the reserve boundary.	N/A		In terms of NEMA, commercial prospecting is not legal within the reserve. No prospecting may be planned or undertaken on the surface within the reserve boundary.	-2	NEUTRAL
	I&AP Concern: Groundwater	I&AP's are concerned about the impact of prospecting on the groundwater resources. The impact on groundwater resources is expected to be minimal as water is not planned to be abstracted from groundwater at this stage; if water is abstracted it will be of relatively low volumes compared to that required for mining or farming.[SEF, 2008]	Operational Phase	0	Addressed above	Addressed above	Addressed above	Addressed above		Addressed above	0	Addressed above
	I&AP Concern: Sinkholes	I&AP's are concerned about the formation of sinkholes due to prospecting. While the formation of sinkholes is not anticipated due to water abstraction for prospecting; the formation of sinkholes must be considered when planning and operating during prospecting operations.[SEF, 2008]	Operational Phase	0	Addressed above	Addressed above	Addressed above	Addressed above		Addressed above	0	Addressed above
	I&AP Concern: Nil											
	Prospecting on an existing area of commercial farming cultivated land and controlled grazing of specialised cattle.	Operations will directly impact the commercial farming of the land owner. Trenching, bulk sampling and associated structures are planned straddling land that is presently used as a cultivated field for maize and controlled camps for specialised cattle. A land user and compensation agreement is being negotiated with the land owner; followed by consultation. At the time of preparation of the amended EMPlan, the land owner was only available to set up a meeting at the end of September 2015 (Shango Solutions, September 2015). This is an important consultation and will form part of this report either included here or as a separate report.	Planning, Operational & Decommission Phases	-70	INSIGNIFICANT MINOR	Manage & Mitigate	Land-use agreement and, in terms of existing legislation, compensation for loss of income due to damage to existing land use structures / land is applicable			A land-sue and Compensation Agreement to be legally drawn-up and agreed between the farming and prospecting parties. Final placement of bulk sampling, processing plant and associated machinery and structures to be planned in conjunction with the existing land user or his/her representative. The bulk sampling team must keep their activities within the agreed area.	-56	INSIGNIFICANT MINOR

Socio-economic Environmental Aspects	Prospecting on an existing area traversed by Eskom powerlines	The servitude for three Eskom power lines intersect the proposed bulk sample area (see 1.2). Consultation (by Shango Solutions on behalf of the prospecting right holder, WRE, 19 January 2015) with Eskom determined that Eskom allows mining within 6m of powerlines (Shango Solutions). The trench positions will be planned to comply.. Consultation so ongoing.	Planning, Operational & Decommission Phases	-63	INSIGNIFICANT MINOR	Avoid	Mining may take place within 6m of a powerline (Shango Solutions in consultation with Eskom, 2015)	Mining may take place within 6m of a powerline (Shango Solutions in consultation with Eskom, 2015)		Trenching must be planned so as not to undermine the Eskom powerline structures. Vehicle parking, offices, processing plant, ablutions etc. must be placed away from the overhanging powerlines for safety purposes.	-5	INSIGNIFICANT NEGLIGIBLE
	known Socio-Economic / Land use concerns - Game & Hunting	If Game on the farms. Need to manage access in conjunction with the surface owners – this includes the sport of hunting where it occurs.	Operational Phase	-15	INSIGNIFICANT NEGLIGIBLE	Manage				If dangerous game is on the farms. Need to managed access in conjunction with the surface owners – this includes the sport of hunting where it occurs. Poaching during prospecting is not tolerated.	-6	INSIGNIFICANT NEGLIGIBLE
	Support of local business	On a small scale, a community-conscious right holder will endeavour to use local businesses where possible and may employ a few unskilled labour. Labour may also under go training and up skilling. Rental agreements etc. are often undertaken with the land user for accommodation or use of equipment, etc. Local hardware and grocery stores are usually used and even transport companies or entrepreneurial outfits.	Operational Phase	25	INSIGNIFICANT NEGLIGIBLE +TIVE	Manage					30	INSIGNIFICANT NEGLIGIBLE +TIVE

	Ubuntu	While it is understood that prospecting is capital intensive and is expense based not income based; on a small scale, a community-conscious right holder will endeavour to assist communities in small ways such as career advice to learners, talks on scientific and social concerns, small contributions to community requirements such as computers, paper, monetary contributions, assisting the poor, etc. When working in an area the right holder often has the opportunity to informally ascertain community needs from the community itself.	Operational Phase	25	INSIGNIFICANT NEGLIGIBLE +TIVE	Manage					45	SIGNIFICANT MINOR +TIVE
	I&AP Concern: Loss of agricultural land with high potential - Loss of Income	I&AP's are concerned about the loss of high potential agricultural land. Any land disturbed by invasive prospecting will be rehabilitated. Compensation must be agreed with surface owners/land users where agricultural land is damaged.[SEF, 2008]	Operational Phase	Addresses above	Addresses above	Addresses above	Addresses above	Addresses above	Addresses above	Addresses above	Addresses above	Addresses above
	I&AP Concern: Topsoil Damage	I&AP's are concerned about the damage to topsoil. Any land disturbed by invasive prospecting will be rehabilitated. Compensation must be agreed with surface owners/land users where agricultural land is damaged.[SEF, 2008]	Operational Phase	Addresses above	Addresses above	Addresses above	Addresses above	Addresses above	Addresses above	Addresses above	Addresses above	Addresses above
	I&AP Concern: Lowering of property values	This is an issue that has been raised by I&AP's. Past experience indicates that property values would not be affected however it is not possible to determine the impact on property values at this stage (SEF). At this point, property purchase by the prospector is not anticipated.[SEF, 2008]	Operational Phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cultural Environmental Aspects	Known Cultural concerns	No known cultural concerns	Operational Phase	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A
	I&AP Concern: Nil		Operational Phase									

Heritage Environmental Aspects	Farm Graveyards / gravesites	Small gravesites may occur on farms. Invasive prospecting will avoid all gravesites. No gravesites are known to occur in the area of the invasive trenching and bulk-sampling site.	Operational Phase	-36	INSIGNIFICANT MINOR	Avoid	Well marked gravesites must be avoided during prospecting. Where activities are planned and a grave occurs, the prospecting activity layout (e.g. drill collar position) must be changed to avoid the grave/s and leave a reasonable distance from that site.			Prospecting in a phased approach will provide the opportunity to the right holder to demarcate and avoid areas of potential cultural and/or heritage significance (such as graves and stone kraals).	-2	NEUTRAL
	known Heritage sites	No known heritage sites. SAHRA classifies the area as having potential palaeontological significance due to the underlying geological dolomite formation. Specific to this EMPlan Amendment for Bulk Sampling. It is not expected that heritage artefacts would be found on the bulk-sample area as the area is flat, has no caves and is either completely cultivated or the land is composed of small camps used for controlled grazing of specialised cattle breeds and is extensively worked and grazed. ESKOM powerlines also cut through. There are no anticipated impacts of the activity on this environmental aspect as the invasive prospecting is planned on a distinct area which is previously disturbed and the likelihood of heritage remaining is very low. SAHRA has been contacted to determine if they require a Heritage Assessment. It is noted that the area is > 5Ha; but the excavation area is < 5ha.	Operational Phase	-4	INSIGNIFICANT NEGLIGIBLE	Manage & Avoid	Indications of heritage artefacts are noticed by the prospecting right holder (above minimum threshold) where invasive prospecting such as bulk-sampling or trenching is planned should be reported. The area should be avoided till a heritage specialist can ascertain the significance. Pans in the Free State have a higher significance - avoidance (as above).	Nil		Guidance from SAHRA has been sought as to whether a heritage Impact Study would be required for the area impacted by the trenching and bulk sample. If a heritage study is required then it must be completed and any mitigation measures recommended therein must be followed by the prospector.	-2	NEUTRAL
	I&AP Concern: Damage to geological outcrops	I&AP's are concerned about the impact of prospecting on the geological outcrops. No protected geological outcrops occur in the area where invasive prospecting is planned.[SEF, 2008]	Operational Phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C. OTHER - ASPECTS RAISED BY INTERESTED AND AFFECTED PARTIES THAT DON'T FALL INTO TABLE A OR TABLE B												
Other I&AP Concerns	I&AP Concern: Nil											