water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

aurecon

RICHARDS BAY RECONCILIATION STRATEGY: INTERVENTIONS WORKSHOP

Minutes of the Interventions workshop held on 4 February 2015 @ 10h30 at the offices of Mhlathuze Water in Richards Bay

Item			Action
1.	**WELCOME** Mr Niel van Wyk welcomed the attendees to the interventions workshop for the Richards Bay Reconciliation Strategy Study.		
2.	**ATTENDANCE AND APOLOGIES**		
2.1	**Attendance**		
	Niel van Wyk	DWS: NWRP (East)	NvW
	Kennedy Mandaza	DWS: NWRP (East)	KM
	Adriaan Claassen	DWS: NWRP (East)	AC
	Celiwe Ntuli	DWS: D: WRPS	CN
	Sakhile Mndaweni	DWS: D: WRPS	SW
	Kobus Bester	DWS: D: OA	KB
	Zanele Maphumulo	DWS: D: WUE	ZM
	Angela Masefield	DWS: D: Water Regulation & Use	AM
	Norman Ward	DWS: CE: KZN Region	NW
	Manisha Maharaj	DWS: WRU	MM
	Dumisani Nyathi	DWS RO	DN
	Zama Zuma	Mhlathuze Water	ZZ
	Simphiwe Xulu	Mhlathuze Water	SX
	Thinus Potgieter	Mhlathuze Water	TP
	Melusi Nhleko	City of uMhlathuze	MN
	Thembinkosi Zondi	City of uMhlathuze	TZ
	Sandile Mngadi	uThungulu DM	SM
	Sagran Govindasamy	Tongaat Hulett Sugar	SG
	Nelisa Dladla	RBM	ND
	Wendy Botes	BHP Billiton	WB
	Toriso Tlou	Tlou Consulting	TT
	Frans van der Walt	QS2000 Plus	FvdW
	Dave Whittaker	ZCCI	DW
	Mike Patterson	ZCCI	MP
	Sizwe Khumalo	ZCCI	SK
	Judith Nzimande	ZCCI/ RBCT	JN
	Zanele Mthiyane	RBCT	ZM
	Alan Naidoo	RBCT	AN

Item			Action
	Gerry Barry	Tongaat Hulett	GB
	Erik van der Berg	Aurecon	EvdB
	Ceridwen Salisbury	Aurecon	CS
2.2	**Apologies**		
	Sabelo Hlela	City of uMhlathuze	SH
	Michelle Boshoff	RBM	MB
3.	**BACKGROUND AND OBJECTIVES** EvdB gave some background to the study and to the Interventions Task. He outlined the process that was followed in identifying the 'long list' of intervention options, and in reducing the 'long list' to a 'short list' of options that were evaluated in greater detail. Some additional options were added in the process, such as the raising of Goedertrouw Dam, and an off-channel dam on the Mfolozi River, in addition to the on-channel dam originally considered. It was explained that the purpose of this workshop is for the various intervention options to be presented to the stakeholders and for their inputs to be received for incorporation into the interventions report, and later the strategy. It was noted that the ongoing drought in the Richards Bay area was not the subject under discussion at the meeting, and that the aim of the study is not to solve short-term problems, but to plan so that similar issues are mitigated in the future.		
4.	**DISCUSSION OF EVALUATED INTEVENTIONS** Presentation was made on the salient technical and financial features and potential impacts of each evaluated intervention.		
4.1	**Bulk Industrial WC/WDM** In discussing the general 5% targeted bulk industrial water use savings, it was pointed out that the extent to which industries have already made savings will affect their capacity for making further savings. NW noted that a possible strategy is to establish benchmarks for industrial use and compare actual use with theoretical usage figures so that realistic savings goals can be established. WB mentioned that BHP Billiton (the aluminium smelters) have current plans to reduce water-usage. She further questioned whether all the significant industries' information should not be included, which was confirmed. Foskor, which uses harvested stormwater, have had reduced availability from this source as a result of the drought and therefore have had to increase usage from other sources. EvdB noted that the bulk industries will be approached for further information on their current WC/WDM initiative and progress. Values for specific savings targets made by the industries will be obtained and included in the Interventions Report, if available.		Aurecon
4.2.	**Urban WC/WDM** It was confirmed that a good international benchmark for non-revenue water (NRW) was 15%. The NRW is determined by a range of real and apparent losses, unbilled water etc., including losses due to leaks, illegal offtakes and general systemic losses. NW asked how the targeted 10% saving was determined. It was explained that the current figure for unaccounted-for water (UAW) for Richards Bay is 31%, and that the savings was aimed at attainable UAW, given the constraints of sometimes-inadequate maintenance, and the challenges of the allocation of adequate staff and resources in a municipal environment. DW noted that this is an area in which the municipality is most involved, and it is important that they be part of the discussion. EvdB noted that the municipality will be approached for further information on their current WC/WDM projects and initiatives and progress made. Values for specific targeted savings will be obtained and included in the Interventions Report, if available.		Aurecon

Item		Action
4.3	**Rainwater harvesting** In the presentation of this option, it was confirmed that the focus of the evaluation was on the conjunctive outdoor and indoor non-potable domestic uses for rainwater. It was evident that it was more feasible for larger houses and was limited to house owners that could afford the capital outlay. NW raised the issue of assurance of supply; rainwater harvesting gives the user a false sense of security. In times when the supply from rainwater is low (i.e. times of drought) supply from other sources will also be limited. FvdW noted that a rebate system is important in the implementation of rainwater harvesting schemes, as well as incentives. He recommended that greywater harvesting should also be promoted as it can reduce domestic water usage. NvW noted that the marginal cost of water is spread over the users, so there is a perception that water is cheaper than it is, and there is less incentive to conserve water or to explore alternative supply options such as rainwater harvesting.	
4.4	**Artificial recharge of lakes** EvdB noted that this option was evaluated further to some extent, after which it was removed from the "Short List". Lake Nsezi has a different underlying geology from the other lakes, and is already being augmented. Raising Lake Nsezi is likely to be unfeasible owing to the significant expected impacts on social and wastewater works intake infrastructure. The potential dam on the Nseleni River was the alternative evaluated. The three coastal lakes in the water supply system have strong interaction with groundwater flows, and the groundwater contribution to the yields of these lakes is still unquantified. This option has not been evaluated further as a result of lack of confidence in the hydrology of the lakes. Raising of these lakes may potentially result in stored water just seeping away. The one possibility for future evaluation could however be transfer schemes to these lakes once they are regularly and severely drawn down due to increased abstractions. It was however recommended that an effort first be made to understand the hydrology of these lakes better. The potential transfer of water to Lake Mzingazi was discussed for drought relief. NW however advised the municipal staff that it was probably better to purchase water from Mhlatuze Water. NW mentioned the possibility of filtering treated effluent or water from other sources through the coastal dunes, in the vicinity of the coastal lakes (Mzingazi, Cubhu and Nhlabane). This would create both sub-surface storage and a barrier against loss of fresh water to the sea, as well as prevent seawater intrusion.	
4.4	**Limiting supply from "over-abstracted" coastal lakes** EvdB explained that this would involve an increase in the minimum levels of abstraction to attain (aspired) sustainable abstraction from the three coastal lakes of the WSS, so as to limit the current extent of abstraction. Defined environmental maintenance and drought levels were used to undertake the system analysis and determine reduced system yields, although actual abstraction levels are lower in practice. However, the science on which the sustainable yields of the lakes were determined is weak, groundwater-lake interactions have not been quantified, and as a result the confidence in the determined sustainable lake yields is low. It was therefore recommended that more information on groundwater contributions be obtained through monitoring and further study, so that the lake yields can be better quantified. It was recommended that measurements be undertaken of the impedance of sediment layer in the lakes to obtain improved water balance measurements to calibrate groundwater models of the lakes, and so improve the confidence in the yields of the coastal lakes. It was clarified that the term 'measures of impedance of sediment layers' is essentially the speed at which groundwater moves through the sub-surface layers. NvW noted that practical observation is an importance component in studies of this kind, as modelling does not always yield the most accurate results. ND	

Item		Action
	mentioned that RBM has undertaken a similar investigation for Lake Nhlabane and that the report is available for consideration in the preparation of the interventions report.	Aurecon
	FvdW noted that the CSIR is doing a study on Lake Mzingazi for the City of uMhlathuze. This should be followed up.	Aurecon
4.5	**Increased capacity of the Thukela-Mhlathuze Transfer Scheme**	
	The emergency scheme, built in response to the 1990-1993 drought, and commissioned in 1997, is now being effectively used for the first time. JP noted that the incremental yield from the system is not the same as the augmentation volume, as a result of dam storage and other factors. Close to 1.0 m^3/s is currently being transferred.	
	It was confirmed that the building of a tunnel is preferable to a pipeline over the watershed as part of all future phases evaluated (up to three phases).	
	Regarding the availability of water from the Thukela River JP noted that the Thukela River yield modelling assumes that the full potential volume of 530 million m^3 per annum is transferred out of the upper Thukela River to Sterkfontein Dam. In reality, no significant volumes of water have been pumped to Sterkfontein for the last 10 years. Therefore to make 20 or 30 million m^3 available would not impact significantly on the transfers. CN noted that the Vaal River system model doesn't include the transfers from the Thukela River. This should be clarified.	Aurecon
	NW noted that DWS scheme charges for Spioenkop Dam need to be added to the cost of the Thukela schemes.	Aurecon
	The theoretical yield of the Thukela River is almost completely taken up, but there may be additional yield as a result of over-allocations and intermittent usage. NvW noted that the issues of operational requirements and allocations need to be separated. The future availability of water from the Thukela River was noted as a significant factor in the likelihood of developing this scheme further. The allocation made for abstraction from the Thukela River at Mandini could potentially be transferred for abstraction at Middledrift, with the associated adjustment.	
	Regarding the allowance for local rural schemes; AM confirmed that this issue needs to be considered even at this early stage, in the consideration of different options. Strategic factors need to be included in decisions about future augmentation.	
4.6	**Coastal pipeline from the lower Thukela River**	
	It was explained that this scheme entails the sharing of existing Lower Thukela Water Supply Scheme bulk water infrastructure currently being constructed by Umgeni Water in the Thukela River at Mandini, for scheme alternatives of 55Ml/d or 110Ml/d abstraction. Communities along the route can be supplied by such a pipeline, which could be either a raw water pipeline or a pipeline conveying purified water. The 110Ml/day transfer option will only be possible in the long-term if the Mvoti Dam is built which will then meet the scheme demand for the area south of the Thukela River.	
	NW pointed out that by the time the pipeline scheme can be implemented the Fairbreeze Mine will be almost exhausted and the Fairbreeze pipeline might even be available for full use by the coastal pipeline scheme.	
	The water licence issued for abstraction from the Thukela River at Mandini is for 47.3 million m^3/a, of which 45% (21.15 million m^3/a) was reserved for Fairbreeze Mine.	
	There was some discussion on the relative merits of raw water vs clear water being transferred. AM was of the opinion that the clear water option was preferable. NM noted that the cost of the clear water option seemed incorrect - it is necessary to subtract the cost of treatment from the clear-water options to ensure that all options are evaluated on an even basis.	Aurecon
	Following some discussion regarding the future availability of water from the Thukela River, NvW concluded that the existing water license provides surety regarding the availability of water for at least the 55Ml/d scheme.	

Item		Action
4.7	**Mfolozi River on-channel transfer scheme: Kwesibomvu Dam** TT agreed to supply more recent values for Mtubatuba usage volumes (up to 2013) as well as potential regional water requirements that could be met by a regional Mfolozi River scheme. NvW noted that there are large requirements for domestic usage in that area, and that they are growing quickly. There are also coal mines that have large requirements. NW noted that if Mtubatuba used some of the water from the dam, they would contribute their share of the costs. ND noted that an advantage of this scheme is that the current system of treated water being supplied from Richards Bay to areas near Mtubatuba could be replaced by the use of a closer source. Future studies would need to include all the demands for the Mtubatuba areas to give an accurate picture of the regional demand and advantages. However, this is not within the scope of this study.	TT
4.8	**Mfolozi River off-channel transfer scheme** It was noted that there is an envisaged scheme to raise Ntweni Pan for rural use, although not necessarily by a large amount. Should the off-channel dam be built, it would also be an alternate possibility to treat the water near the dam and supply the areas nearby, as well as Richards Bay with treated water. This would also mitigate the inter-basin transfer impacts. JP noted that the potential off-channel dam has the advantage of being unaffected by large floods on the Mfolozi River, which are common, although some downstream protection of the dam wall would be necessary. NvW noted that the amount that would be diverted is a small percentage of the MAR. A more significant issue is variability – there are often low-flow periods when little or no water could be abstracted. FvdW noted that a dam would open up the area for development. The IDZ development area would have a better supply and other industries that are currently constrained would have greater flexibility. NvW asked FvdW to provide the relevant information.	FvdW
4.9	**Raising Goedertrouw Dam** There was agreement was this is a very good option, and that it is possible for it to be implemented quickly, although the yield would be relatively small.	
4.10	**Dam on the Nseleni River** Comments were made on the issue of inundation by the dam; an agricultural college would be partially inundated, as well as areas of farmland, a road and Crystal Dam. The Nseleni dam seems like a good scheme from a financial perspective, and many of the impacts on social infrastructure are mitigatable. GM noted that Tongaat Hulett would be interested in such a dam. NW confirmed that the dam may well be attractive to irrigators, even though the yield is not substantial.	
4.11	**Groundwater scheme** EvdB presented the groundwater overview, but noted that key borehole information was still urgently required from uThungulu DM, to be able to adequately identify groundwater potential and potential groundwater schemes with reasonable confidence. He asked for assistance to obtain this information. NvW noted that the pollution of groundwater is less of an issue than is commonly perceived. NW noted that the coastal lakes will be influenced by groundwater schemes, because they are influenced to a significant extent by groundwater. He noted that a more feasible groundwater development area would be to the north towards Mtubatuba, where groundwater could replace some of the water currently being supplied by the Mzingazi WTW. NW noted that Jeffares & Green has information about groundwater, and that Jasmin Rajkumar of the DWS might have further information. It will be verified that this information is included in the interventions report. DW noted that there were high-yielding boreholes that were located north-east of Empangeni, and	uThun-gulu DM Geo-measure

Item		Action
	previously supplied the original sugar mill that has been closed down and replaced with the current Felixton mill.	
4.12	**Arboretum Effluent Reuse Scheme** NvW noted that indirect reuse meets much lower public resistance than direct use, although direct reuse has been implemented successfully in a number of areas. The Richards Bay area already reuses some discharge of treated effluent indirectly (e.g. treated effluent discharged by Tongaat Hulett into the Mhlatuze River is again abstracted downstream at the weir, as well as water discharged from the Empangeni WWTW). It was noted that, for the calculation of the costs of this scheme, the current cost of pumping the effluent out to sea should be subtracted as such costs would be saved. There may however be minimum flows in the pipeline that should be considered.	Aurecon
4.13	**Desalination of seawater** NW noted that, like dam yields, there is a much larger yield than is immediately apparent. EvdB responded that this will be investigated further in the scenarios task through the system modelling. NW noted that the implementation could be accelerated. NvW mentioned that for the Durban desalination scheme the implementation period is closer to five years. AM noted that detailed costs and lead-times are available for the eThekwini desalination scheme. EvdB added that the implementation time is influenced by the implementer. There was some discussion on the specific requirements for licences for seawater abstraction, given that the ocean is not within the province of the DWS. In this case if the intake works were situated within the harbour this issue might not be applicable. It was also noted that strategic advantages (i.e. 100% assurance of supply) is a significant factor. NW put forward the possibility that the brine could be used to mix with Foskor's gypsum effluent when it is discharge through pipeline C, which could lead to a further saving in costs. EvdB also noted the potential synergy with the tabled reuse scheme, where the brine from desalination could potentially be pumped from the existing Alkantstrand pump station (pipeline A). A significant cost is electricity, and this may have a significant effect on the scheme in the future.	Aurecon
5.	**IMPLEMENTATION PROGRAMME** A preliminary outline of the implementation programme, including the various components, was presented and will be included in the draft report. Refinements will be made to the programme as discussed.	Aurecon
6.	**SCENARIOS TASK** This is the following task in the study, and its purpose was explained: various implementation programme scenarios for different combinations of schemes will be formulated and tested with the Water Resources Planning Model to determine the relative merits. NvW noted that this study is not a decision-making process, but an advisory process, indicating that firm implementation decisions should not be expected in the Strategy.	
7.	**GENERAL** Flowing from a discussion on the implementation programme, NvW noted that at this early stage the ultimate implementing agents for the various potential schemes are not yet clear. He stated, however, that DWS is unlikely to implement reuse or desalination schemes as these are regarded as "local" schemes, and for such schemes the local authorities would be in charge of implementation.	

Item		Action
	Larger schemes such as dams would mostly be dealt with by DWS, but other agents are free to investigate options further, even at this stage of the strategy development. It was confirmed that this forum (stakeholder meetings) is aimed at the development of the strategy, and developments should be brought to the forum to ensure information-sharing so that duplication doesn't take place in the investigation and evaluation of options. The reconciliation strategy will provide a framework for future developments. The draft Interventions Report will be compiled and distributed around the beginning of March 2015. Workshop contributions will be included, as well as further information and clarification obtained from stakeholders.	Aurecon
8.	**CLOSURE** Mr van Wyk thanked those present for their attendance and closed the meeting.	

DISTRIBUTION LIST

Name	Organisation	Telephone	Mobile	Email
Beason Mwaka	DWA HO: CD: Operations	0213368188	0828076621	MwakaB@dwaf.gov.za
Tendani Nditwani	DWA HO: Acting D: NWRP	0123368189	0828885113	NditwaniT@dwa.gov.za
Niel van Wyk	DWA HO: D: NWRP (East)	0123368327	0828085651	vanwykn@dwa.gov.za
Kennedy Mandaza	DWA HO: D: NWRP (East)	0123367675	0826005960	MandazaK@dwa.gov.za
Adriaan Claassen	DWA HO: D: NWRP (East)		0810114001	adriaan.claassen.28@gmail.com
Khumbu Moyo	DWS HO: D: WUE	0123368293	0828030892	Moyok@dwa.gov.za
Samke Mabaso	DWA HO: D: WUE	0123367878	0828819836	Madlalas@dwa.gov.za
Zanele Maphumulo	DWA HO: D: WUE	0123368239	0826501205	MaphumuloZ@dws.gov.za
Kobus Bester	DWA HO: D: Options Analysis	0123368071	0845175560	besterk@dwa.gov.za
Salona Moodley	DWA HO: Options Analysis		0844234400	MoodleyS2@dwa.gov.za
Celiwe Ntuli	DWA HO: D: WRPS	0123367618	0828851942	ntulic@dwa.gov.za
Pieter Viljoen	DWA HO: D: WRPS	0123367500	0828080497	ViljoenP2@dwaf.gov.za
Geert Grobler	DWS HO: D: WRPS	0123368691	0828063528	groblerg@dwa.gov.za
Sakhile Mndaweni	DWA HO: D: WRPS	0123368764	0836549001	MndaweniS@dwa.gov.za
Manisha Maharaj	DWS RO: WRU	0313362750	0828081191	thakurdinm@dwa.gov.za
Gibson Gumede	DWS RO: Sc. Water Regulation & Use	0313362818	0714818634	GumedeG@dwa.gov.za
Sizwe Madlala	DWS RO: KZN Region	0313362852	0828707195	madlalas@dwa.gov.za
Angela Masefield	DWS RO: D: Water Regulation & Use	0313362763	0836256247	MasefieldA@dwa.gov.za
Jay Reddy	DWS RO: D: Institutional Establishment	0313362702	0828031817	ReddyJ@dwa.gov.za
Norman Ward	DWS RO: CE: KZN Region	0313362737	0828082721	WardN@dwa.gov.za
Ashley Starkey	DWS RO: CD: KZN Region	0313362861	0828095892	StarkeyA@dwa.gov.za
Colleen Moonsamy	DWS RO: C. Env Officer	0313362846	0828080208	MoonsamyC@dwa.gov.za
Dumisani Nyathi	DWS RO	0313362728	0823255455	nyathid@dwa.gov.za
Michael Singh	DWS RO: WUE	0313362748	0833212901	SinghM@dwa.gov.za
Melusi Nhleko	City of uMhlathuze	0359075805		Nhlekomv@umhlathuze.gov.za
Nhlanhla Sibeko	City of uMhlathuze	0359075023		sibekoNJ@umhlathuze.gov.za sibiyaFN@umhlathuze.gov.za
Sabelo Hlela	City of uMhlathuze	0359075079	0828054512	Sabelo.hlela@umhlathuze.gov.za
Tumi Gopane	City of uMhlathuze			Gopanet@umhlathuze.gov.za
Thembinkosi Zondi	City of uMhlathuze	0359075232	0761125769	ZondiTW@umhlathuze.co.za
Mduduzi Zulu	uThungulu DM	0357992685		zulum@uthungulu.co.za
Mlunggisi Mgabi	uThungulu DM	0357992513		mgabim@uthungulu.co.za
Sandile Mngadi	uThungulu DM	0357992617	0784566416	mngadis@uthungulu.co.za
Sbusiso Makhanya	Mhlathuze Water	0359021000		smakhanya@mhlathuze.co.za hlouw@mhlathuze.co.za
Simphiwe Xulu	Mhlathuze Water	0359021020		sgxulu@mhlathuze.co.za
Zama Zuma	Mhlathuze Water	0359021086	0721872272	zzuma@mhlathuze.co.za
Thinus Potgieter	Mhlathuze Water	0359021000		mjp.kzn@gmail.com
Judith Nzimande	ZCCI/ RBCT		0832779942	Judith@zcci.co.za Jnzimande@rbct.co.za
Dave Whittaker	ZCCI	0357971801	0833954000	davew@zcbf.co.za
Mike Patterson	ZCCI		0824429440	MikePatt2@gmail.com
Sizwe Khumalo	ZCCI	0357534580	0832731618	skhumalo@bingelela.com
Neels Oosterhuis	Tronox			Neels.Oosterhuis@Tronox.Com
Dinesh Moodley	Tronox	0353408180		Dinesh.Moodley@Tronox.com
Eben Scholtz	Tronox			eben.scholtz@tronox.com
Gugulethu Sibiya	Tronox			gugulethu.sibiya@tronox.com
Marius Vlok	Tronox	0353408180	0837096556	Marius.Vlok@Tronox.com
Sandra Moodley	Tronox			sandra.moodley@tronox.com
Gerry Barry	Tongaat-Hulett Sugar		0833767001	Gerry.Barry@tongaat.com

Name	Organisation	Telephone	Mobile	Email
Sagran Govindasamy	Tongaat-Hulett Sugar	0357915107		Sagran.Govindasamy@tongaat.com
Gladys Naylor	Mondi Richards Bay	0314512170	0828011950	gladys.naylor@mondigroup.co.za
Hanif Mohamed	Mondi Richards Bay			Hanif.mohamed@mondigroup.co.za
Nadia Rowling	Mondi Richards Bay			Nadia.Rowling@mondigroup.com
Zodwa Mbuli	Mondi Richards Bay			zodwa.mbuli@mondigroup.co.za
Boitumelo Motlhaba	Richards Bay Minerals (RBM)			Boitumelo.Motlhaba@riotinto.com
Johan Jacobs	Richards Bay Minerals (RBM)	0359013601	0836311724	Johan.Jacobs@rbm.co.za
Michelle Boshoff	Richards Bay Minerals (RBM)	0359014551	0828938537	Michelle.Boshoff@rbm.co.za
Nelisa Dladla	Richards Bay Minerals (RBM)	0359013259	0832395186	nelisa.dladla@rbm.co.za
Peter Eaglen	Richards Bay Minerals (RBM)			Peter.Eaglen@riotinto.com
Joe Muller	RBIDZ	0357880571	0837221352	Joe.muller@rbidz.co.za
Alan Naidoo	RBCT	0359044340	0832889395	anaidoo@rbct.co.za
Zanele Mthiyane	RBCT	0359044092	0833951905	zmthiyane@rbct.co.za
Frans van der Walt	QS2000 Plus	0357534184	0824600875	frans@qs2000plus.co.za
Carel du Plessis	Foskor	0359023159	0718251866	careldp@foskor.co.za
Dawid Zandberg	Foskor			DawidZ@foskor.co.za
Ezra Mlambo	Foskor	0359023180	0837831667	EzraM@foskor.co.za
Mahendri Krishanduth	Foskor	0359023356	0839768241	mahendrik@foskor.co.za
Mannana Ntompe	Foskor	0359023025	0828668553	mannanan@foskor.co.za
Muhammad Ali	Foskor	0359023244	0836273814	MuhammadA@foskor.co.za
Jorge Franco	BHP Billiton	0359088541	0834171112	Jorge.D.Franco@bhpbilliton.com
Shaloshini Naidoo	BHP Billiton	0359088544		Shaloshini .Naidoo@bhpbilliton.com
Wendy Botes	BHP Billiton	0359088516	0833800221	wendy.botes@bhpbilliton.com
Toriso Tlou	Tlou Consulting	0123369800	0824658781	toriso@tlouconsult.co.za
Taryn Swales	Geomeasure Group	0317651900	0827211816	taryn@geomeasuregroup.co.za
James Perkins	Aurecon	0315632785	0836256248	James.Perkins@aurecongroup.com
Ceridwen Salisbury	Aurecon	0215266982		Ceridwen.Salisbury@aurecongroup.com
Erik van der Berg	Aurecon	0215265790	0825535795	Erik.VanDerBerg@aurecongroup.com