

	A	B	C	D	E	F	G	H	I	J	K	L
1	ARM Risk ID		Risk Description		Risk Owner*	Signif-icance	Black Flag	Treatment Strategy	Treatment Status		Date Due	Action Owner
2		Cause	Event	Effect					Previous	Current		
3	139	Utilities diversion outline specification only from plans	PROJECT PRIMARY Uncertainty of Utilities location and consequently required diversion work/ unforeseen utility services within LoD	Increase in MUDFA costs or delays as a result of carrying out more diversions than estimated	G Barclay	26	-	Review design information and re-measure during design workshops with Utility Companies and MUDFA.		Behind Programme	30-Nov-06	M Hutchinson
4	164	Utilities assets uncovered during construction that were not previously accounted for; unidentified abandoned utilities assets; asbestos found in excavation for utilities diversion; unknown cellars and basements intrude into works area; other physical obstructions; other contaminated land.	PROJECT PRIMARY Unknown or abandoned assets or unforeseen/contaminated ground conditions affect scope of MUDFA work	Re-design and delay as investigation takes place and solution implemented; Increase in Capex cost as a result of additional works.	G Barclay	24	-	Develop PC Sums into quantified estimates.		Behind Programme	30-Nov-06	M Hutchinson
5	RISK 139 AND 164 HAVE SAME TREATMENT PLAN							In conjunction with MUDFA, undertake trial excavations to confirm locations of Utilities		On Programme	31-May-07	A Hill
6								Identify increase in services diversions. MUDFA to resource/re-programme to meet required timescales.		On Programme	31-Aug-07	G Barclay
7	911	Scottish Power own and maintain a cable tunnel in the vicinity of Leith Walk that may or may not interfere with Tram construction and operation; exact location and depth of tunnel is unknown; condition of tunnel is unknown.	PROJECT PRIMARY Presence of Scottish Power tunnel in Leith Walk requires radical solution	Tunnel may have to be decommissioned and re-laid in a more suitable location; tram alignment may require to be adjusted; special foundation solution e.g. cantilever may be required; increased capex; potential for tunnel collapse during operation and consequent disruption for Tram.	J Low	24	-	Scottish Power to establish exact location of tunnel		On Programme	02-Apr-07	J Low
8								Scottish Power to undertake engineering feasibility study		On Programme	02-Apr-07	J Low
9								Solution to be engineered - ACTION PLAN TO BE DEVELOPED ON COMPLETION OF FEASIBILITY		Pending	03-Mar-08	D Crawley
10	342	Two data cable nests co-occur with Tram alignment at Gogar	BT Gogar data cable nest diversion - A8 crossing	Long lead and construction times	J Low	23	-	Agree design with BT and SDS		On Programme	15-Mar-07	J Low
11								Investigate the design of underpass such that duct banks are avoided by passing underneath		On Programme	31-Jul-07	D Crawley
12								Ensure adequate protection of cables will be provided during construction		Pending	31-Oct-07	G Easton
13								Undertake diversion and include costs in base estimate		Pending	30-Sep-08	G Barclay
14	923	Tram crosses high voltage transmission cables in 4 areas (Leith Walk - 275kV; 2 times bridge abutment - 132kV; 275kV at Edinburgh Park)	Very high voltage underground electricity transmission cables are encountered and damaged during MUDFA diversions	Potential to cause damage and consequent accident during work; Scottish Power delay works if cable struck; Significant injury (potential for multiple deaths) caused to workforce; Delay in project section.	J Low	22	-	Ensure AMIS understand and agree with construction requirements near to cables.		On Programme	30-Apr-07	J Low
15								Ensure method statements refer to and deal with very high voltage cables adequately		On Programme	30-Apr-07	J Sneddon
16								Ensure AMIS follow relevant safety procedures and method statements during construction		Pending	30-Sep-08	P Douglas
17	926	Major single safety incident during construction	DETAIL RISK Safety incident during MUDFA Gas/Scottish Power Diversions	Delay (potentially critical) due to HSE investigation and rework. PR risk to tie and stakeholders.	G Barclay	22	-	Specific Gas/Scottish Power Action Plan to be developed by incoming PM - see also SUMMARY RISK actions		Pending	29-Jun-07	G Barclay
18	168	Major single safety incident during construction	SUMMARY RISK Safety incident during MUDFA Utilities Diversions	Delay (potentially critical) due to HSE investigation and rework. PR risk to tie and stakeholders.	G Barclay	21	-	Site Supervisors to be appointed by tie		Complete	28-Feb-07	S Clark
19								Develop and Implement Incident Management Processes		On Programme	27-Apr-07	T Condie
20								All Site Staff to get CSCS		On Programme	30-Apr-08	P Douglas
21								Safety Induction to be carried out for all site staff		On Programme	31-Dec-10	J Sneddon
22								Site Safety Audits and Management Tours to be carried out		On Programme	31-Dec-10	P Douglas
23	912	Tram crosses high voltage transmission cables in 4 areas (2x Leith Walk - 275kV; 2 times bridge abutment - 132kV) and design requirements are not finalised especially cable depth not known, track slab depth not finalised	Very high voltage underground electricity transmission cables require special engineering solution	Significant potential capex cost and delay in areas where cable crosses over; delay in project section	D Crawley	21	-	Agree design principles with SDS and Scottish Power through completion of feasibility study		Complete	15-Mar-07	J Low

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24							SDS to make design adjustments including establishment of track slab depth tolerance		Undefined	02-Apr-07	D Crawley	
25							Costs of solution to be incorporated into base estimate		Pending	30-Apr-07	G Gilbert	
913	Russell Road BT exchange in path of Tram and interferes with location of bridge abutments	Special engineering solution or movement of bridge abutments required for Russell Road BT exchange	Capex cost for design solution; delay to design and approval; delay to construction programme	D Crawley	21	-	SDS to develop design proposals and final solution		Behind Programme	30-Apr-07	D Crawley	
26												
914	Required approval/acceptance turnaround time does not reflect SUC standard practice; SUCs do not have enough resource or process capability to achieve 20 day turnaround	Statutory Utility Companies unable to meeting design approval/acceptance turnaround time of 20 working days	Additional 40 working days required for design approval/acceptance turnaround	D Crawley	20	-	PLAN NOT AVAILABLE ON ARM					
27												
929	Ground conditions; space constraints; encountering uncharted services	MUDFA Contract encounters other services/conditions that mean Utility Diversions cannot be constructed with LoD	Increase in Capex; delay during re-design and additional diversions	G Barclay	19	-	Develop and implement process to deal with diversion of utilities quickly		On Programme	30-Apr-07	J Johnston	
28												
29							AMIS to seek to divert under Statutory Utility powers where outwith LoD		Pending	28-Dec-07	J Low	
21	Design constraints e.g. presence of other utilities, proximity of LoD boundary, diversion technical requirements etc.	Design requires that Utilities are diverted outside of LoD	Additional design; additional land purchase required and consequent contact with landowners; design may result in increased work quantities due to extent of diversions; potential increased duration of works.	D Crawley	18	-	SDS to aim to design diversions within LoD	n/a	On Programme	29-Jun-07	D Crawley	
30												
31							SDS to undertake design checks to ensure diversion in LoD	n/a	On Programme	29-Jun-07	D Crawley	
32							GIS used to identify diversions outwith LoDs and respective landowners	n/a	On Programme	31-Aug-07	E Cropley	
33							AMIS to seek to divert under Statutory Utility powers where outwith LoD	n/a	Pending	28-Dec-07	G Barclay	

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164	Utilities assets uncovered during construction that were not previously accounted for; unidentified abandoned utilities assets; asbestos found in excavation for utilities diversion; unknown cellars and basements intrude into works area; other physical obstructions; other contaminated land	PROJECT PRIMARY Unknown or abandoned assets or unforeseen/contaminated ground conditions affect scope of MUDFA work	Re-design and delay as investigation takes place and solution implemented; Increase in Capex cost as a result of additional works.	G Barclay	24	-	Develop PC Sums into quantified estimates.		Behind Programme	30-Nov-06	M Hutchinson
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							Scottish Power to undertake engineering feasibility study		On Programme	02-Apr-07	J Low
							Solution to be engineered - ACTION PLAN TO BE DEVELOPED ON COMPLETION OF FEASIBILITY		Pending	03-Mar-08	D Crawley
930	TO BE ADVISED - see also Risk 47 where capex impacts are included for.	Completion of MUDFA works is delayed (due to other matters outside of late design/approvals) - late utility diversions in advance of Infraco works.	Increase in price and time delay in the Infraco contract; Infraco could end up delay to commencement or with utility diversion and would have to price for or have to carry out unplanned re-sequencing; Claims from MUDFA as a result of being unable to proceed with works.	J Low	23	-	PLAN TO BE ADVISED				
342	Two data cable nests co-incide with Tram alignment at Gogar	BT Gogar data cable nest diversion - A8 crossing	Long lead and construction times	J Low	23	-	Agree design with BT and SDS		On Programme	15-Mar-07	J Low
							Investigate the design of underpass such that duct banks are avoided by passing underneath		On Programme	31-Jul-07	D Crawley
							Ensure adequate protection of cables will be provided during construction		Pending	31-Oct-07	G Easton
							Undertake diversion and include costs in base estimate		Pending	30-Sep-08	G Barclay
47	Poor design and review processes; cumbersome approvals process; reiterative design/approvals process.	Completion of MUDFA works is delayed (due to late design/approvals) - late utility diversions in advance of Infraco works.	Increase in price and time delay in the Infraco contract; Infraco could end up delay to commencement or with utility diversion and would have to price for or have to carry out unplanned re-sequencing; Claims from MUDFA as a result of being unable to proceed with works.	G Barclay	23	-	Review design timescales		On Programme	30-Apr-07	J McAloon
							Micro management of design		On Programme	31-May-07	J McAloon
							Revise design process		On Programme	31-May-07	R Bent
							Review the design review		On Programme	31-May-07	R Bent
923	Tram crosses high voltage transmission cables in 4 areas (Leith Walk - 275KV; 2 times bridge abutment - 132KV; 275KV at Edinburgh Park)	Very high voltage underground electricity transmission cables are encountered and damaged during MUDFA diversions	Potential to cause damage and consequent accident during work; Scottish Power delay works if cable struck; Significant injury (potential for multiple deaths) caused to workforce; Delay in project section.	J Low	22	-	Ensure AMIS understand and agree with construction requirements near to cables.		On Programme	30-Apr-07	J Low

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29								AMIS to seek to divert under Statutory Utility powers where outwith LoD		Pending	28-Dec-07	J Low
30	315	Contractors do not understand 3rd party obligations; construction methodology cause adverse impact and cost to 3rd parties; 3rd parties were not expecting construction to have an impact on them; Code of Construction Practice found to be inadequate; vibration and noise claims; claims as a result of proximity to buildings; physical damage from plant.	Significant number/magnitude of claims from 3rd parties received as a result of Utility Diversion activity	tie Project Management costs to deal with claims; negative PR	G Barclay	18	-	Appoint Site Inspectors		Complete	30-Sep-08	P Douglas
31								Agree Site Checks		Complete	28-Feb-07	P Douglas
32								Implement comms cycle and dedicated phone link		On Programme	28-Feb-07	S Waugh
33								Ensure MUDFA contractors understand 3rd party obligations		On Programme	31-Mar-07	G Barclay
34								Develop and implement 3rd Party Management system to deal with impacts		On Programme	30-Apr-07	M Connelly
35								Implement Site Check documentation system		On Programme	30-Apr-07	P Douglas
36								Ensure dilapidation surveys undertaken by SDS are suitable for expected work		On Programme	30-Apr-07	G Barclay
37								Audit performance against obligations		On Programme	30-Apr-07	P Douglas
38								Agree site specific hours of operation		On Programme	30-Sep-08	P Douglas