



Table of Contents

Contents

Table of Contents - Volume 2 1

Table of Contents - Volume 2

Section	Title	Page Number
Glossary		
N/A	Glossary of Terminology, Abbreviations and Acronyms	1
Chapter 1: Introduction		
1	Introduction	1
1.1	Introduction	1
1.2	Aim and Objectives	4
1.3	Delivery of Project	5
1.4	Role of the National Transport Authority	5
1.5	EIAR – Process, Screening, Content and Methodology	6
1.5.1	Statutory Requirements	6
1.5.2	Relevant Legislation, Policy and Guidelines	6
1.5.3	EIA Process	8
1.5.4	Screening and the Legislative Requirement for EIA	8
1.5.5	Consideration of the EIAR's Scope	9
1.5.6	Contents of the EIAR	9
1.5.7	EIAR Structure	11
1.5.8	Assessment Scenarios	12
1.5.9	Assessment Criteria	13
1.5.10	Details of Competent Experts	15
1.6	Consultation	23
1.6.1	Consultation Objectives	23
1.6.2	Emerging Preferred Route Option Consultation	23
1.6.3	Preferred Route Option Consultations	26
1.7	Consultation with Prescribed Bodies and Other Consultees	30
1.7.1	Prescribed Bodies and Interested Parties	31
1.7.2	Landowners	32
1.8	Difficulties Encountered During the Preparation of the EIAR	32
1.9	References	34
Chapter 2: Need for the Proposed Scheme		
2	Need for the Proposed Scheme	1
2.1	Introduction	1
2.2	The Transport Need for the Proposed Scheme	2
2.2.1	The Regional Transport Need	2
2.2.2	The Local Transport Need	18
2.3	Policy Context	21
2.3.1	International Policy	21
2.3.2	European Union Law & Policy	22
2.3.3	National Policy	23
2.3.4	Regional Policy	43
2.3.5	Local Policy	55
2.4	Benefits of the Proposed Scheme	68
2.5	References	73
Chapter 3: Consideration of Reasonable Alternatives		
3	Consideration of Reasonable Alternatives	1
3.1	Environmental Impact Assessment Directive Requirements	1
3.2	Strategic Alternatives	1
3.2.1	Overview of the GDA Transport Strategy 2016-2035 and the new GDA Transport Strategy 2022-2042	1

Section	Title	Page Number
3.2.2	GDA Transport Strategy 2016-2035	2
3.2.3	'Do Nothing' Alternative	5
3.2.4	Bus Rapid Transit (BRT) Alternative	7
3.2.5	Light Rail Alternative	7
3.2.6	Metro Alternative	8
3.2.7	Heavy Rail Alternative	8
3.2.8	Demand Management Alternative	9
3.2.9	Technological Alternatives	10
3.3	Route Alternatives	11
3.3.1	Initial High Level Route Alternatives	12
3.3.2	Stage 2 – Route Options Assessment	18
3.3.3	Cycling Options	60
3.3.4	Emerging Preferred Route	61
3.4	Design Alternatives	62
3.4.1	Development of the Draft Preferred Route Option	62
3.4.2	Consideration following Preferred Route Option Consultation	64
3.4.3	Further Consideration following Preferred Route Option Consultation	64
3.4.4	Specific Design Alternatives	65
3.5	Conclusion	67
3.6	References	69
Chapter 4: Proposed Scheme Description		
4	Proposed Scheme Description	1
4.1	Introduction	1
4.2	Proposed Scheme Overview	1
4.3	Design Iteration	3
4.4	Design Principles	4
4.5	Description of the Proposed Scheme	5
4.5.1	Section 1: Tallaght to Ballymount	5
4.5.2	Section 2: Ballymount to Crumlin	14
4.5.3	Section 3: Crumlin to Grand Canal	20
4.5.4	Section 4: Grand Canal to Christchurch	29
4.5.5	Section 5: Woodford Walk (R113) / New Nangor Road (R134) to Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction	35
4.5.6	Section 6: Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction to Drimnagh	42
4.6	Key Infrastructure Elements	49
4.6.1	Mainline Cross-section	49
4.6.2	Pedestrian Provision	50
4.6.3	Cycling Provision	51
4.6.4	Bus Priority Provision	54
4.6.5	Accessibility for Mobility Impaired Users	58
4.6.6	Integration	59
4.6.7	Junctions	61
4.6.8	Structures	61
4.6.9	Other Street Infrastructure	65
4.6.10	Pavement	66
4.6.11	Landscape and Public Realm	69
4.6.12	Lighting	72
4.6.13	Utilities	73
4.6.14	Drainage	74

Section	Title	Page Number
4.6.15	Maintenance	78
4.6.16	Safety and Security	78
4.6.17	Traffic Monitoring	78
4.6.18	Land Use and Accommodation Works	78
4.7	References	80
Chapter 5: Construction		
5	Construction	1
5.1	Introduction	1
5.2	Construction Phasing	2
5.3	Overview of Construction Works	3
5.3.1	Section 1: Tallaght to Ballymount	4
5.3.2	Section 2: Ballymount to Crumlin	7
5.3.3	Section 3: Crumlin to Grand Canal	9
5.3.4	Section 4: Grand Canal to Christchurch	11
5.3.5	Section 5: Woodford Walk (R113) / New Nangor Road (R134) to Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction	12
5.3.6	Section 6: Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction to Drimnagh	13
5.4	Construction Programme	14
5.5	Construction Methodology	15
5.5.1	Pre-Construction	15
5.5.2	Preparatory and Site Clearance Works	15
5.5.3	Road and Street Upgrades	18
5.5.4	Structural Works	20
5.5.5	Construction Site Decommissioning	26
5.6	Construction Plant and Equipment	26
5.7	Construction Compounds	29
5.7.1	Construction Compound Locations	29
5.7.2	Construction Compound Activities	41
5.7.3	Construction Compound Services	42
5.8	Construction Traffic Management	42
5.8.1	Pedestrian and Cyclist Provisions	42
5.8.2	Public Transport Provisions	43
5.8.3	General Traffic Provisions	43
5.9	Interface with Other Projects	51
5.10	Construction Environmental Management	52
5.10.1	Construction Environmental Management Plan	52
5.10.2	Mitigation Measures	53
5.10.3	Construction Working Hours	53
5.10.4	Personnel Numbers	53
5.10.5	Construction Health and Safety	53
5.11	References	55
Chapter 6: Traffic & Transport		
6	Traffic & Transport	1
6.1	Introduction	1
6.1.1	Aim and Objectives of the Proposed Scheme	2
6.1.2	Iterative Design Process and Mitigation by Design	4
6.2	Methodology	6
6.2.1	Study Area	6
6.2.2	Relevant Guidelines, Policy and Legislations	7

Section	Title	Page Number
6.2.3	Proposed Scheme Impact Assessment Modelling Tools	8
6.2.4	Appraisal Method for the Assessment of Impacts	10
6.2.5	Data Collection and Collation	14
6.3	Baseline Environment	18
6.3.1	Overview	18
6.3.2	Section 1: Tallaght to Ballymount	18
6.3.3	Section 2: Ballymount to Crumlin	33
6.3.4	Section 3: Crumlin to Grand Canal	38
6.3.5	Section 4: Grand Canal to Christchurch	52
6.3.6	Section 5: Woodford Walk (R113) / New Nangor Road (R134) to Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction	61
6.3.7	Section 6: Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction to Drimnagh	68
6.4	Potential Impacts	75
6.4.1	Characteristics of the Proposed Scheme	75
6.4.2	'Do Nothing' Scenario	75
6.4.3	'Do Minimum' Scenario	75
6.4.4	'Do Something' Scenario	76
6.4.5	Construction Phase	76
6.4.6	Operational Phase	85
6.5	Mitigation and Monitoring Measures	177
6.5.1	Construction Phase	177
6.5.2	Operational Phase	177
6.6	Residual Impacts	178
6.7	References	179
Chapter 7: Air Quality		
7	Air Quality	1
7.1	Introduction	1
7.2	Methodology	2
7.2.1	Study Area	2
7.2.2	Relevant Guidelines, Policy and Legislation	4
7.2.3	Data Collection and Collation	7
7.2.4	Appraisal Method for the Assessment of Impacts	8
7.3	Baseline Environment	21
7.3.1	Meteorological Conditions	21
7.3.2	Baseline Ambient Air Quality	22
7.3.3	Existing Modelled Baseline Scenario	28
7.4	Potential Impacts	32
7.4.1	Characteristics of the Proposed Scheme	32
7.4.2	Construction Phase	32
7.4.3	Operational Phase	50
7.5	Mitigation and Monitoring Measures	64
7.5.1	Construction Phase	64
7.5.2	Operational Phase	64
7.6	Residual Impacts	65
7.6.1	Construction Phase	65
7.6.2	Operational Phase	65
7.7	References	66
Chapter 8: Climate		
8	Climate	1

Section	Title	Page Number
8.1	Introduction	1
8.2	Climate Assessment Considerations	2
8.3	Methodology	3
8.3.1	Study Area	3
8.3.2	Relevant Guidelines, Policy and Legislation	4
8.3.3	Data Collection and Collation	9
8.3.4	Appraisal Method for the Assessment of Impacts	9
8.4	Baseline Environment	15
8.4.1	Climate Pollutants	15
8.4.2	Vulnerability of the Proposed Scheme to Climate Change	15
8.4.3	Existing GHG Emissions Baseline	18
8.5	Potential Impacts	20
8.5.1	Construction Phase	20
8.5.2	Operational Phase	23
8.6	Sensitivity Analysis	34
8.6.1	Introduction	34
8.6.2	Sensitivity Tests	34
8.7	Mitigation and Monitoring Measures	37
8.7.1	Construction Phase	37
8.7.2	Operational Phase	37
8.8	Residual Impacts	39
8.8.1	Construction Phase	39
8.8.2	Operational Phase	39
8.9	References	40
Chapter 9: Noise & Vibration		
9.	Noise & Vibration	1
9.1	Introduction	1
9.2	Methodology	2
9.2.1	Study Area	2
9.2.2	Relevant Guidelines, Policy and Legislation	3
9.2.3	Data Collection and Collation	4
9.2.4	Appraisal Method for the Assessment of Impacts	8
9.3	Baseline Environment	19
9.3.1	Desk Study of Published Noise Data	19
9.3.2	Baseline Noise Surveys	22
9.3.3	Baseline Vibration Surveys	26
9.4	Potential Impacts	29
9.4.1	Characteristics of the Proposed Scheme	29
9.4.2	'Do Minimum' Scenario	30
9.4.3	Construction Phase	30
9.4.4	Operational Phase	52
9.5	Mitigation and Monitoring Measures	62
9.5.1	Construction Phase	62
9.5.2	Operational Phase	67
9.6	Residual Impacts	69
9.6.1	Construction Phase	69
9.6.2	Operational Phase	69
9.7	References	71
Chapter 10: Population		

Section	Title	Page Number
10	Population	1
10.1	Introduction	1
10.2	Methodology	2
10.2.1	Study Area	2
10.2.2	Relevant Guidelines, Policy and Legislation	3
10.2.3	Data Collection and Collation	4
10.2.4	Appraisal Method for the Assessment of Impacts	4
10.3	Baseline Environment	11
10.3.1	Overview	11
10.3.2	Community Baseline	11
10.3.3	Economic Baseline	14
10.4	Potential Impacts	16
10.4.1	Characteristics of the Proposed Scheme	16
10.4.2	'Do Nothing' Scenario	17
10.4.3	Construction Phase	17
10.4.4	Operational Phase	23
10.5	Mitigation and Monitoring Measures	29
10.6	Residual Impacts	29
10.6.1	Construction Phase	29
10.6.2	Operational Phase	30
10.7	References	33
Chapter 11: Human Health		
11	Human Health	1
11.1	Introduction	1
11.2	Methodology	2
11.2.1	Study Area	2
11.2.2	Relevant Guidelines, Policy and Legislation	2
11.2.3	Data Collection and Collation	6
11.2.4	Appraisal Method for the Assessment of Impacts	6
11.3	Baseline Environment	11
11.3.1	General Health	11
11.3.2	Deprivation, Disability and Health Inequalities	13
11.3.3	Air Quality, Noise and Other Pollutants	17
11.3.4	Traffic, Travel Behaviour and Health	19
11.3.5	Access to Healthcare, Employment and Education	21
11.3.6	Communicable Diseases	22
11.3.7	Summary of Key Baseline Health Issues	22
11.4	Potential Impacts	24
11.4.1	Characteristics of the Proposed Scheme	24
11.4.2	'Do Nothing' Scenario	25
11.4.3	Construction Phase	25
11.4.4	Operational Phase	29
11.5	Mitigation and Monitoring Measures	36
11.5.1	Construction Phase	36
11.5.2	Operational Phase	36
11.6	Residual Impacts	37
11.6.1	Construction Phase	37
11.6.2	Operational Phase	37
11.7	References	38

Section	Title	Page Number
Chapter 12: Biodiversity		
12	Biodiversity	1
12.1	Introduction	1
12.2	Methodology	1
12.2.1	Ecological Survey Study Area	2
12.2.2	Relevant Guidelines, Policy and Legislation	2
12.2.3	Data Collection and Collation	4
12.2.4	Appraisal Method for the Assessment of Impacts	8
12.3	Baseline Environment	11
12.3.1	Zone of Influence (Zol)	11
12.3.2	Desk Study	13
12.3.3	Biodiversity Areas	13
12.3.4	Designated Areas for Nature Conservation	14
12.3.5	Habitats	24
12.3.6	Rare and Protected Plant Species	34
12.3.7	Non-Native Invasive Plant Species	34
12.3.8	Mammals	36
12.3.9	Birds	41
12.3.10	Reptiles	50
12.3.11	Amphibians	50
12.3.12	Fish	50
12.3.13	Aquatic Invertebrates and Freshwater Molluscs	53
12.3.14	Summary Ecological Valuation and Identification of KERs	56
12.4	Potential Impacts	59
12.4.1	Characteristics of the Proposed Scheme	59
12.4.2	'Do Nothing' Scenario	74
12.4.3	Construction Phase	75
12.4.4	Operational Phase	108
12.5	Mitigation and Monitoring Measures	124
12.5.1	Construction Phase	124
12.5.2	Operational Phase	137
12.6	Residual Impacts	142
12.6.1	Construction Phase	142
12.6.2	Operational Phase	146
12.7	References	149
Chapter 13: Water		
13	Water	1
13.1	Introduction	1
13.2	Methodology	2
13.2.1	Study Area	2
13.2.2	Relevant Guidelines, Policy and Legislation	2
13.2.3	Data Collection and Collation	5
13.2.4	Appraisal Method for Assessment of Impacts	5
13.3	Baseline Environment	10
13.3.1	WFD Catchment Overview	10
13.3.2	EPA Surface Water Monitoring	10
13.3.3	Surface Water WFD Status	10
13.3.4	Field Survey	11
13.3.5	Designated Sites	16

Section	Title	Page Number
13.3.6	Drinking Water Supply (Surface Water)	17
13.3.7	Known Pressures	17
13.3.8	Existing Drainage	18
13.3.9	Surface Water Features	18
13.3.10	Flood Risk	21
13.4	Potential Impacts	23
13.4.1	Characteristics of the Proposed Scheme	23
13.4.2	'Do Nothing' Scenario	25
13.4.3	'Do Minimum' Scenario	26
13.4.4	Construction Phase	27
13.4.5	Operational Phase	33
13.5	Mitigation and Monitoring Measures	36
13.5.1	Introduction	36
13.5.2	Construction Phase	36
13.5.3	Operational Phase	37
13.6	Residual Impacts	37
13.6.1	Construction Phase	37
13.6.2	Operational Phase	39
13.6.1	Summary of WFD Assessment	40
13.7	References	42
Chapter 14: Land, Soils, Geology & Hydrogeology		
14	Land, Soils, Geology & Hydrogeology	1
14.1	Introduction	1
14.2	Methodology	1
14.2.1	Study Area	1
14.2.2	Relevant Guidelines, Policy and Legislation	1
14.2.3	Data Collection and Collation	2
14.2.4	Appraisal Method for the Assessment of Impacts	5
14.3	Baseline Environment	9
14.3.1	Introduction	9
14.3.2	Regional Overview	9
14.3.3	Site Specific Environment	16
14.3.4	Summary of Features of Importance	32
14.3.5	Conceptual Site Model	38
14.4	Potential Impacts	46
14.4.1	Characteristics of the Proposed Scheme	46
14.4.2	'Do Nothing' Scenario	48
14.4.3	Construction Phase	48
14.4.4	Operational Phase	56
14.5	Mitigation and Monitoring Measures	57
14.5.1	Construction Phase	57
14.5.2	Operational Phase	58
14.6	Residual Impacts	59
14.6.1	Construction Phase	59
14.6.2	Operational Phase	65
14.7	References	66
Chapter 15: Archaeology & Cultural Heritage		
15	Archaeological & Cultural Heritage	1
15.1	Introduction	1

Section	Title	Page Number
15.2	Methodology	2
15.2.1	Introduction	2
15.2.2	Study Area	3
15.2.3	Relevant Guidelines, Policy and Legislation	4
15.2.4	Data Collection and Collation	4
15.2.5	Appraisal Method for the Assessment of Impacts	5
15.3	Baseline Environment	8
15.3.1	Archaeological and Historical Background	8
15.3.2	Archaeological Heritage: Tallaght to Ballymount	25
15.3.3	Archaeological Heritage: Ballymount to Crumlin	30
15.3.4	Archaeological Heritage: Crumlin to Grand Canal	31
15.3.5	Archaeological Heritage: Grand Canal to Christchurch	35
15.3.6	Archaeological Heritage: Woodford Walk (R113) / New Nangor Road (R134) to Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction	41
15.3.7	Archaeological Heritage: Long Mile Road (R110) / Naas Road (R810) / New Nangor Road (R134) junction to Drimnagh	42
15.3.4	Proposed Construction Compounds	44
15.4	Potential Impacts	49
15.4.1	Characteristics of the Proposed Scheme	49
15.4.2	'Do Nothing' Scenario	49
15.4.3	Construction Phase	49
15.4.4	Operational Phase	57
15.5	Mitigation and Monitoring Measures	57
15.5.1	Construction Phase	57
15.5.2	Operational Phase	64
15.6	Residual Impacts	64
15.6.1	Construction Phase	64
15.6.2	Operational Phase	64
15.7	References	65
15.7.1	Relevant Guidelines, Policy and Legislation	68
Chapter 16: Architectural Heritage		
16	Architectural Heritage	1
16.1	Introduction	1
16.2	Methodology	1
16.2.1	Definitions	1
16.2.2	Approach	3
16.2.3	Study Area	4
16.2.4	Relevant Guidelines, Policy and Legislation	4
16.2.5	Data Collection and Collation	6
16.2.6	Assessment Methodology	7
16.2.7	Appraisal Method for the Assessment of Sensitivity	7
16.3	Baseline Environment	13
16.3.1	Results and Analysis	16
16.4	Potential Impacts	38
16.4.1	Characteristics of the Proposed Scheme	38
16.4.2	'Do Nothing' Scenario	38
16.4.3	Construction Phase	38
16.4.4	Operational Phase	48
16.5	Mitigation and Monitoring Measures	49
16.5.1	Construction Phase	49

Section	Title	Page Number
16.5.2	Operational Phase	61
16.6	Residual Impacts	61
16.6.1	Construction Phase	61
16.6.2	Operational Phase	61
16.7	References	62
16.7.1	Policy and Guidelines	69
Chapter 17: Landscape (Townscape) & Visual		
17	Landscape (Townscape) & Visual	1
17.1	Introduction	1
17.2	Methodology	2
17.2.1	Study Area	2
17.2.2	Relevant Guidelines, Policy and Legislation	2
17.2.3	Data Collection and Collation	4
17.2.4	Appraisal Method for the Assessment of Impacts	5
17.3	Baseline Environment	14
17.3.1	City Context	14
17.3.2	Overview of Route of the Proposed Scheme	14
17.3.3	Landscape, Townscape and Visual Planning Policy	14
17.3.4	Townscape / Streetscape Character	17
17.4	Potential Impacts	20
17.4.1	Characteristics of the Proposed Scheme	20
17.4.2	'Do Nothing' Scenario	28
17.4.3	Construction Phase	29
17.4.4	Operational Phase	36
17.5	Mitigation and Monitoring Measures	45
17.5.1	Construction Phase	45
17.5.2	Operational Phase	47
17.6	Residual Impacts	58
17.6.1	Construction Phase	58
17.6.2	Operational Phase	60
17.7	Conclusion	61
17.8	References	62
Chapter 18: Waste & Resources		
18	Waste & Resources	1
18.1	Introduction	1
18.2	Sustainable Resource and Waste Management Principles	2
18.2.1	Circular Economy	2
18.2.2	The Waste Hierarchy	3
18.3	Methodology	4
18.3.1	Study Area	4
18.3.2	Relevant Guidelines, Policy and Legislation	4
18.3.3	Appraisal Method for the Assessment of Impacts	5
18.3.4	Data Collection and Collation	6
18.3.5	Waste Management Principles	8
18.4	Baseline Environment	9
18.4.1	Construction Waste	10
18.4.2	Municipal Waste	12
18.5	Potential Impacts	13
18.5.1	Characteristics of the Scheme	13

Section	Title	Page Number
18.5.2	'Do Nothing' Scenario	13
18.5.3	Construction Phase	13
18.5.4	Operational Phase	17
18.6	Mitigation and Monitoring Measures	18
18.6.1	Construction Phase	18
18.6.2	Operational Phase	20
18.7	Residual Impacts	20
18.7.1	Construction Phase	20
18.7.2	Operational Phase	20
18.8	References	21
Chapter 19: Material Assets		
19	Material Assets	1
19.1	Introduction	1
19.2	Methodology	1
19.2.1	Study Area	2
19.2.2	Relevant Guidelines, Policy and Legislation	2
19.2.3	Data Collection and Collation	2
19.2.4	Appraisal Method for the Assessment of Impacts	3
19.3	Baseline Environment	5
19.3.1	Major Infrastructure and Existing Utilities	5
19.3.2	Imported Material	6
19.4	Potential Impacts	7
19.4.1	Characteristics of the Proposed Scheme	7
19.4.2	'Do Nothing' Scenario	7
19.4.3	Construction Phase	8
19.4.4	Operational Phase	15
19.5	Mitigation and Monitoring Measures	16
19.5.1	Construction Phase	17
19.5.2	Operational Phase	18
19.6	Residual Impacts	18
19.6.1	Construction Phase	18
19.6.2	Operational Phase	19
19.7	References	20
Chapter 20: Risk of Major Accidents and / or Disasters		
20	Risk of Major Accidents and / or Disasters	1
20.1	Introduction	1
20.2	Risk of Major Accidents and / or Disasters	1
20.2.1	Definitions	2
20.3	Methodology	3
20.3.1	Scope and Context	3
20.3.2	Legislation, Guidelines and Reference Material	3
20.3.3	Risk Assessment Methodology	4
20.4	Potential Impacts	7
20.4.1	'Do Nothing' Scenario	7
20.4.2	Risk Evaluation	7
20.4.3	Seveso Sites	12
20.5	Mitigation and Monitoring Measures	13
20.5.1	Inherent Design	13
20.5.2	Plans and Procedures	13

Section	Title	Page Number
20.6	Residual Impacts	16
20.7	References	17
Chapter 21: Cumulative Impacts & Environmental Interactions		
21	Cumulative Impacts and Environmental Interactions	1
21.1	Introduction	1
21.1.1	Cumulative Impacts	1
21.1.2	Environmental Interactions	1
21.1.3	Guidance	2
21.2	Methodology for Cumulative Impacts Assessment	2
21.2.1	Introduction	2
21.2.2	Stage 1: Establishing the Long List of 'Other Projects'	2
21.2.3	Stage 2: Establishing the Shortlist of 'Other Projects'	6
21.2.4	Stage 3: Information Gathering for the Shortlist of 'Other Projects'	7
21.2.5	Stage 4: Assessment	7
21.2.6	Traffic Related Cumulative Impacts: Construction Scenarios for Assessment	8
21.2.7	Operational Scenario for Assessment	9
21.2.8	Summary of Assessment Methodology for CEA	10
21.3	Assessment of Cumulative Impacts and Environmental Interactions	10
21.3.1	Construction Impacts	11
21.3.2	Operational Impacts	34
21.4	Environmental Interactions	56
21.5	Mitigation	63
21.5.1	Construction Phase	63
21.5.2	Operational Phase	63
21.6	Summary of Residual Cumulative Impacts and Environmental Interactions	63
21.6.1	Construction Phase	63
21.6.2	Operational Phase	64
21.6.3	Environmental Interactions	65
21.7	References	66
Chapter 22: Summary of Mitigation & Monitoring Measures		
22	Summary of Mitigation & Monitoring Measures	1
22.1	Introduction	1
22.2	Mitigation and Monitoring Schedules	1
22.3	General Mitigation Requirements	2
22.4	Traffic and Transport	3
22.5	Air Quality	3
22.6	Climate	4
22.7	Noise and Vibration	5
22.8	Population	7
22.9	Human Health	7
22.10	Biodiversity	8
22.11	Water	20
22.12	Land, Soils, Geology and Hydrogeology	21
22.13	Archaeological and Cultural Heritage	23
22.14	Architectural Heritage	26
22.15	Landscape (Townscape) and Visual	31
22.16	Waste and Resources	32
22.17	Material Assets	33
22.18	Major Accidents and Disasters	34

Section	Title	Page Number
22.19	Cumulative Impacts & Environmental Interactions	34
22.20	References	35
Chapter 23: Summary of Significant Residual Impacts		
23	Summary of Significant Residual Impacts	1
23.1	References	13