AYGM

HALKALI-ISPARTAKULE-CERKEZKOY RAILWAY LINE

Environmental and Social Impact Assessment

70069878-ESIA
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CUMULATIVE EFFECTS

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17.1 INTRODUCTION

17.1.1. This chapter reports the likely significant cumulative environmental and social effects (both effect interactions and in-combination effects) associated with the Project.

17.2 SCOPE AND METHODOLOGY FOR ASSESSMENT

17.2.1. This section should be read in conjunction with the cumulative effects section of **Chapter 5: Approach to ESIA.**

17.2.2. At present, there is no single widely accepted or best practice methodology for the assessment of cumulative effects although there are several guidance documents available, such as the IFC Good Practice Handbook on Cumulative Impacts Assessment and Management[313]. The following approach is based on the principles of the relevant guidance, previous experience and professional judgement, the types of receptors being assessed, the nature of the Project, the other developments under consideration, and the environmental and social information available to inform the assessment.

17.2.3. PR1 requires the appraisal of areas and communities potentially impacted by cumulative impacts from further planned development of the project or other sources of similar impacts in the geographical area, any existing project or condition, and other project-related developments that can realistically be expected at that time.

17.2.4. The EU EIA Directive requires an assessment of:

"Direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project".

17.2.5. Two types of cumulative effects have been considered within this assessment:

- Effect interactions – cumulative impacts from the Project; and
- In-combination effects – cumulative impacts from different projects (in combination with the Project).

17.2.6. In addition, and further to each of the Technical Chapters, the potential for transboundary effects has been considered relative to the location of the Project, its characteristics, and the environmental importance of the receiving environment. The western boundary of the Project is located approximately 80km from the nearest national border (Bulgaria) in a region that lacks major trans-national river systems. As a result, it is considered that the Project is unlikely to have significant effects either alone or cumulatively on the environment in either an adjacent or close by country.

[313] IFC (2013). Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets.

EFFECT INTERACTIONS

17.2.7. The approach to the assessment of effect interactions considers effects arising from the combined action of a number of different environmental and social topic specific effects upon a common receptor due to the Project.

17.2.8. The assessment is based upon residual effects (of minor or greater significance) on the common receptors (identified in **Section 17.4**). The study area for the assessment is informed by the study areas for the individual topic assessments as set out in Technical Chapters 6 –16.

IN-COMBINATION EFFECTS

17.2.9. The approach to the assessment of in-combination effects considers effects arising from the combined action of a number of different projects ('planned developments'), in combination with the Project, on a single receptor.

17.2.10. The assessment is based upon residual effects (minor or greater significance) on the common receptors that have been identified in Technical Chapters 6 – 16 as well as available environmental information for the applicable 'planned developments'.

17.2.11. There is not a standard definition for 'planned developments' and as such developments are assessed using professional judgement and on a case by case basis. For the purposes of this assessment, 'planned developments' are defined as those projects meeting one or more of the following criteria:

- Submitted within the Turkish Planning Portal[314];
- Within a relevant geographical boundary with common sensitive receptors to the Project; and
- Of a nature and scale that is likely to impact common sensitive receptors to the Project during its construction and / or operation.

17.3 DETERMINING SIGNIFICANT EFFECTS

17.3.1. There is no formal guidance on the criteria for determining significance of cumulative effects. The following principles have been considered when assessing the significance of cumulative effects in relation to both effect interactions and in-combination effects:

- The nature of the receptors affected;
- How the effects identified combine to affect the condition of the receptor;
- The probabilities of the effects occurring in relation to each other in such a way so as to produce cumulative effects; and
- The ability of the receptor to absorb further effects.

17.3.2. The resulting determination of significance is therefore an illustration of how multiple effects may lead to an increased residual effect compared to viewing the effects in isolation. For example, nearby residential receptors during the construction phase may see a moderate adverse effect from

[314] Available at: https://eced-duyuru.csb.gov.tr/eced-prod/duyurular.xhtml.

noise and vibration due to construction activities, a moderate adverse effects from social due to severance of access to community facilities, a minor adverse effect from the effects on air quality from construction activities and a minor adverse effect from landscape and visual due to views of construction facilities. In this case it may be determined that these effects, when combined and acting on the same receptor, may degrade the ability of the receptor to absorb further effects and magnify the effect on said receptor, which would not be the case if the effects had occurred in isolation. The effect interaction determination in this case may be concluded to be moderate adverse as a result. There is a notable heightened effect, and in this case, the cumulative effect is significant, as it is a magnification of significant effects on the same receptor.

17.3.3. The determination of significance for the purposes of this assessment is therefore made on a receptor basis, taking account of the assessments in Technical Chapters 6 – 16, available environmental and social information, professional judgement and experience. Levels of significance have been made in accordance with the definitions set out in **Chapter 5: Approach to ESIA**.

17.4 ASSESSMENT OF EFFECT INTERACTIONS

EXCLUDED RECEPTORS

17.4.1. There are a number of interactions between topics that are taken into account in each of the Technical Chapters, these interactions are identified within the Technical Chapter text. Where effect interactions have already been considered in a technical assessment, the reported findings are not repeated here. These effects are as follows:

- All effect interactions in relation to ecological receptors are considered in **Chapter 8: Ecology**;
- All effect interactions in relation to landscape designations and character areas are considered in **Chapter 10: Landscape and Visual**;
- All effect interactions in relation to heritage assets are considered in **Chapter 9: Cultural Heritage**;
- All effect interactions in relation to materials and waste are considered in Chapter **13: Materials and Waste**; and
- All effect interactions in relation to greenhouse gas emissions are considered in **Chapter 14: Climate Change**.

17.4.2. The exclusions listed above apply to both the construction and operation phases.

17.4.3. The following topics are excluded from the cumulative effects assessment as all residual effects relating to the topic are classified as Neutral:

- **Chapter 6: Air Quality** (construction and operation phases);
- **Chapter 12: Geology and Hydrogeology** (operation phase); and
- **Chapter 14: Climate Change** (climate change resilience) (construction and operation phases).

17.4.4. **Chapter 16: Major Accidents and Disasters** is excluded from the assessment, as it required a different assessment approach, which considers the vulnerability of the Project to major events. It does not assess the potential effects on sensitive receptors, including cumulative effects.

COMMON RECEPTORS

17.4.5. Receptors or resources that could be affected by more than one environmental or social topic, and therefore be subject to more than one residual effect, are known as common receptors. The

common receptors, with residual effects of minor and above, and their corresponding environmental topics are identified and displayed in **Table 17-1** below.

17.4.6. The nature of the Project, a major rail development, considers the impacts on rail users in both the construction and operation phases in **Chapter 15: Social**. The assessment of rail users as a receptor has not been considered further in the effect interaction assessment as it is not identified as a common receptor, as this receptor is assessed in **Chapter 15: Social** only. During construction, the existing railway will be closed when construction works are in close proximity to the existing railway, so the effects on existing rail users will be restricted to social effects, such as disruption, reduced access and severance. During operation, existing rail users will benefit from the rail services facilitated by the Project, which will have beneficial outcomes.

Table 17-1 - Common Receptors

Receptor	Environmental Topics
Residents and Residential Properties	▪ Noise and Vibration (construction and operation); ▪ Landscape and Visual (construction and operation); ▪ Surface Water Environment (operation); ▪ Geology and Hydrogeology (construction); and ▪ Social (construction and operation).
Non-motorised Users (users of public rights of way, active transport users such as pedestrians and cyclists, and animal drawn vehicles (agriculture))	▪ Landscape and Visual (construction); and ▪ Social (construction and operation).
Motorised Users (motorised road vehicles, both private and public)	▪ Landscape and Visual (construction and operation); and ▪ Social (construction and operation).
Commercial Facilities / Recreational Areas (and their users)	▪ Landscape and Visual (construction); ▪ Geology and Hydrogeology (construction); and ▪ Social (construction and operation).
Construction workers, Operational Staff and Maintenance workers	▪ Geology and Hydrogeology (construction); and ▪ Social (construction and operation).
Surface Water Bodies	▪ Surface Water Environment (construction and operation); and ▪ Geology and Hydrogeology (construction).

CONSTRUCTION

17.4.7. **Table 17-2** comprises a summary matrix for the construction phase of the Project showing the residual effect interactions between the topics, following the implementation of the required

mitigation measures set out in Technical Chapters 6 – 16. This enables a qualitative assessment of the interactions of residual effects outlining the overall significance to the identified common receptor.

17.4.8. Any residual effects identified in Technical Chapters 6 – 16, that do not affect the common receptors identified, have not been presented below, as no effects interactions are anticipated.

OPERATION

17.4.9. **Table 17-3** comprises a summary matrix for the operation phase of the Project showing the residual effect interactions between environmental / social topics, following the implementation of the required mitigation measures set out in Technical Chapters 6 – 16. This enables a qualitative assessment of the interactions of residual effects outlining the overall significance to the identified common receptors.

17.4.10. Residual effects that have been identified in Technical Chapters 6 – 16 that do not affect the common receptors identified have not been presented below, as no effects interactions are anticipated.

Table 17-2 - Matrix of Effect Interactions (Construction Phase)

Technical Topic / Effect	Common Sensitive Receptors					
	Residents and Residential Properties	Non-Motorised Users	Motorised Users	Commercial Facilities / Recreational Areas and their Users	Construction Workers, Operational Staff and Maintenance Workers	Surface Water Bodies
Noise and Vibration	Large Adverse for Noise (at Bahçeşehir, Kaleiçi, İnceğiz, Kabakça and İstasyon, during periods of intense activity only) Large Adverse for Vibration (at Halkali, Bahçeşehir, Ömerli, Kaleiçi, Gökçeali, İnceğiz, Kabakça, Çayırdere and İstasyon, during periods of intense activity only) Not Significant (for all other receptor locations)	n/a	n/a	n/a	n/a	n/a
Landscape and Visual	Neutral (not significant) to Large (significant) Adverse (Moderate to Large adverse in Bahçeşehir, Ömerli, Kabakça, Çayırdere and İstasyon).	Minor Adverse (not significant)	Negligible to Minor Adverse (not significant)	Minor Adverse (not significant)	n/a	n/a
Surface Water Environment	n/a	n/a	n/a	n/a	n/a	Neutral to Minor Adverse (not significant)
Geology and Hydrogeology	n/a	n/a	n/a	Minor Adverse (not significant)	Neutral to Minor Adverse (not significant)	Minor Adverse (not significant)
Social	Minor Adverse (not significant) to Large Beneficial (significant) (depending on the receptor considered)	Minor Adverse (not significant)	Minor Adverse (not significant)	Minor Adverse (not significant) to Very Large Beneficial (significant) (depending on the receptor considered)	Minor Adverse (not significant) to Very Large Beneficial (significant) (depending on the receptor considered)	n/a
Overall Effect Interactions	**Moderate Adverse (significant)** – Significant adverse effects are anticipated from multiple environmental topics, Noise and Vibration and Landscape and Visual. The residential receptors experiencing these effects are located in different areas along the Project. A Moderate Adverse effect is anticipated at the following	**Minor Adverse (not significant)** – Adverse effects as a result of construction activities are anticipated as a result of Landscape and Visual and Social effects. As these effects will be temporary and limited in scope to areas with access restrictions, a Minor Adverse effect interaction is anticipated.	**Minor Adverse (not significant)** – Adverse effects as a result of construction activities are anticipated as a result of Landscape and Visual and Social effects. As these effects will be temporary and limited in scope to areas of existing road crossings and those used by construction traffic, a Minor Adverse effect interaction is anticipated.	**Minor Adverse (not significant)** – Adverse effects as a result of construction activities are anticipated as a result of Landscape and Visual, Geology and Hydrogeology and Social effects. As these effects will be temporary there is limited scope for a magnification of effects on receptors, a Minor	**Minor Adverse (not significant)** – Adverse effects are anticipated to be experienced as a result of Geology and Hydrology and Social, while significant beneficial effects are anticipated in the form of employment. The nature of the adverse effects, potential pollution and exposure to contaminants, construction	**Minor Adverse (not significant)** – Adverse effects are anticipated to be experienced on surface water receptors from multiple environmental topics. The Geology and Hydrogeology assessment anticipates residual effects associated with contaminated soils and the Surface Water assessment anticipates

Technical Topic / Effect	Common Sensitive Receptors					
	Residents and Residential Properties	Non-Motorised Users	Motorised Users	Commercial Facilities / Recreational Areas and their Users	Construction Workers, Operational Staff and Maintenance Workers	Surface Water Bodies
	locations: Bahçeşehir, Ömerli, Kabakça, Çayırdere and İstasyon. Mitigation measures for these effects have been proposed within the technical chapters and additional measures to those already proposed are not practicable.			Adverse effect interaction is anticipated.	accommodation conditions and worker health and safety, all have the potential to result in an effect interaction on worker health and safety. This effect interaction is anticipated to be Minor Adverse.	residual effects from pollution risks. These adverse effects, may affect the same surface water receptors throughout the construction phase of the Project, a Minor Adverse effect interaction is anticipated.

Table 17-3 - Matrix of Effect Interactions (Operation Phase)

Technical Topic / Effect	Common Sensitive Receptors		
	Residents and Residential Properties	Motorised Users	Non-Motorised Users
Noise and Vibration	For noise effects: ▪ Large Adverse (significant) for receptors at Kaleiçi and İnceğiz; and ▪ Moderate Adverse (significant) for receptors at Halkali, Kabakça and Çayırdere. ▪ Not Significant at all other receptor locations (Minor Adverse at Ömerli, Çatalca, Gökçeali and İstasyon).	n/a	n/a
Landscape and Visual (Visual)	Neutral (not significant) to Moderate Adverse (significant) (Moderate Adverse effects between Ömerli and Kabakca).	Neutral to Minor Adverse (not significant)	Neutral to Minor Adverse (not significant)
Surface Water Environment	Neutral to Minor Adverse (not significant)	n/a	n/a
Social	Large Beneficial (significant) to Minor Adverse (not significant)	Large Beneficial (significant) to Minor Adverse (not significant)	Large Beneficial (significant) to Minor Adverse (not significant)
Overall Effect Interactions	**Moderate Adverse (significant)** - Significant adverse effects are anticipated from Vibration and Landscape and Visual. There is the potential for significant effect interactions, with a Moderate Adverse effect anticipated at Kabakca where receptors will experience a magnification of effects due to adverse visual effects. Mitigation measures for these effects have been proposed within the	**Minor Adverse (not significant)** – Adverse and beneficial Social effects as well as adverse Landscape and Visual effects are anticipated to be experienced as a result of the Project. The nature of the interaction of these effects, such as adverse effects on views experienced by motorised road users and changes to access as a result of the Project, are not anticipated to have the potential for the magnification of effects with the capacity to lead to a significant	**Minor Adverse (not significant)** – Adverse and beneficial Social effects as well as adverse Landscape and Visual effects are anticipated to be experienced as a result of the Project. The nature of the interaction of these effects, such as adverse effects on views experienced by non-motorised road users and changes to access as a result of the Project, are not anticipated to have the potential for the magnification of effects with the capacity to lead to a

Technical Topic / Effect	Common Sensitive Receptors		
	Residents and Residential Properties	Motorised Users	Non-Motorised Users
	technical chapters and will reduce the effects as far as practically possible.	effect interaction. As a result, a Minor Adverse effect interaction is anticipated.	significant effect interaction. As a result, a Minor Adverse effect interaction is anticipated.

17.5 ASSESSMENT OF IN-COMBINATION EFFECTS

17.5.1. An overview of the planned development(s) and supporting environmental documentation used for the assessment of in-combination effects is presented below. The discussion of in-combination effects has been approached on a topic by topic basis, dependent upon the availability of relevant information. Where environmental and/or social information is not presented within the available documents relating to the planned development(s), a high-level appraisal using publicly available sources has been undertaken to supplement the available information to enable a qualitative assessment of in-combination effects. If insufficient information in the public domain has been identified, this is clearly outlined.

PLANNED DEVELOPMENTS

17.5.2. Developments within 10km of the expropriation corridor were identified, and used to establish a list of planned developments[315] deemed, due to the nature and scale of said developments, to have potential for in-combination effects (see **Table 17-4**). The locations of the planned developments in relation to the Project are shown on **Figure 17-1**. This 10km geographical extent was considered sufficient to reflect the ecologically appropriate area of analysis in the ecology chapter and consideration of downstream features within 5km of the expropriation corridor in the surface water chapter.

[315] https://eced-duyuru.csb.gov.tr/eced-prod/duyurular.xhtml

Table 17-4 - Planned Developments

Reference	Planned Development	Status	Distance from Project	Approximate Project Chainage
Project Section: Halkali – Ispartakule				
1	Hospital development (unnamed)	Hospital development with a 300-bed capacity. The construction programme for this development is currently not known.	9.4 km southeast (Halkali)	0+000
2	Sevketiye 1242-2 Housing and Commercial Development	Mass housing development consisting of 242 residences and 12 commercial units. The construction programme for this development is currently not known.	5.5 km southeast (Halkali)	0+000
3	Keles Centre Airport Housing Development	Mixed-use residential development consisting of 498 residential units, 220 office units and 52 commercial units in the form of three tower blocks (A, B and C). The development is currently under construction.	4.9 km south-east (Halkali)	0+000
4	Torkam E5 Housing and Commercial Development	Mass housing development consisting of 234 residential units and 427 commercial units. The construction programme for this development is currently not known.	4.3 km southeast (Halkali)	0+000
5	Sefakoy Oerlikon Housing and Commercial Development	Mass housing development consisting of 500 residential units and 29 commercial units. The construction programme for this development is currently not known.	4.2 km southeast (Halkali)	0+000
6	Garaj Istanbul Housing and Commercial Development	Mass housing development consisting of 572 residential units and 69 commercial units. The construction programme for this development is currently not known.	3.6 km southeast (Halkali)	0+000
7	Atakent 4B&4C Housing and Commercial Developments	Mass housing developments consisting of residential units (362 in 4B and 298 in 4C) and commercial units (9 in 4B and 11 in 4C). The construction programme for this development is currently not known.	2.4 km southeast (Halkali)	0+000
8	Emlak Konut Halkali 884-1 Housing and Commercial Development	Mass housing development consisting of 670 residential units and 113 commercial units. The construction programme for this development is currently not known.	1.1 km southeast (Halkali)	0+000
9	Government 363-10 Housing Shops	Mass housing development consisting of 363 residential units and 10 commercial units. Construction of the development has already commenced.	3.5 km north (Basaksehir)	2+000
10	Mavera Comfort Housing and Commercial Development	Mass housing development consisting of 705 residential units and 33 commercial units. Construction of the development has already commenced.	4.0 km north (Basaksehir)	2+500
11	Mavera Residence Housing and Commercial Development	Mixed-use residential development consisting of 485 residential units and 11 commercial units. Construction has not yet commenced.	4.9 km north (Basaksehir)	2+500

Reference	Planned Development	Status	Distance from Project	Approximate Project Chainage
12	Oyak Residences and Commercial Areas	Mass housing development consisting of 1,349 residential units and 109 commercial units. Construction of the development has not yet commenced.	8.6 km north (Basaksehir)	2+500
13	Toplu Konut Kayabasi 968/5-7, 969/1 and 970/4-6-8 Housing and Commercial Development	Mass housing developments divided into two components (658 residential and 6 commercial units; and 802 residential and 16 commercial units). The construction programme for this development is currently not known.	7.7km north (Basaksehir)	2+500
14	Emlat Konut Kayabasi 993-4 Housing and Commercial Development	Mass housing development consisting of 453 residential units and 58 commercial units. Construction of the development has not yet commenced.	5.4 km north (Halkali)	2+500
15	Basaksehir 963 Island 14 Parcel Mass Housing, Social Infrastructure and Landscaping	Mass housing development consisting of 399 residential units, 2 sports facilities, 3 playgrounds and 4 commercial units. Construction of the development has already commenced.	9.8 km north (Basaksehir)	2+500
16	Kayaşehir Fenertepe Metro Line Extension	Third extension of the M3 line of the Istanbul Metro. The extension adds 4km of 2 parallel lines (2-way), 3 metro stations, connecting Kayasehir to Fenertepe. Construction of the development has already commenced.	5 km north, at the closest point (Kayasehir)	2+500
17	Vmall Shopping Centre	Shopping centre development consisting of 207 commercial units. The construction programme for this development is currently not known.	7.0 km north (Basaksehir)	2+500
18	Kayasehir 22nd District Mass Housing Constructions, Infrastructure and Landscaping	Mass housing development consisting of 854 residential units, 6 housekeeping units, indoor parking (592 vehicle capacity), 2 recreational facility buildings and 2 security units. Construction of the development has already commenced.	8.1 km north (Basaksehir)	2+500
19	Basaksehir 443 Island 59-60-61 Parcel Mass Housing	Mass housing development consisting of 500 residential units. The construction programme for this development is currently not known.	8.3 km north (Basaksehir)	2+500
20	GOB West Section Housing and Commercial Development	Mass housing development consisting of 1,013 residential units and 12 commercial units. The construction programme for this development is currently not known.	8.5 km north (Basaksehir)	2+500
21	Mavera Homes Housing and Commercial Development	Mass housing development consisting of 200 residential and 10 commercial units. The construction programme for this development is currently not known.	7.2km north (Basaksehir)	2+500
22	Istanbul's 3rd Bridge – 3rd Airport – Halkali Railway Project	The project will connect Halkali with the Yavuz Sultan Selim Bridge, via the new Istanbul Airport. It aims to provide rail connections for existing railway infrastructure between the Thracian region and Anatolia, as well as existing port infrastructure. Within the scope of the development, there are 2 metro stations whose locations are determined located by the 3rd Airport. Construction of the project has not yet commenced.	Adjacent to the Project, at the closest point (Halkali)	2+500
23	Kanal Istanbul	Kanal Istanbul project is the proposed construction of a 45km artificial canal on the European side of Istanbul, connecting the Black Sea and Marmara Sea. The project will start from the Küçükçekmece Lake near the Marmara Sea, pass along the Sazlıdere Dam Basin, then follow an alignment to the east of Terkos	Intersects Project (proposed tunnel under the Kanal Istanbul) at the closest point (Basaksehir)	Between 3+700 and 4+060

Reference	Planned Development	Status	Distance from Project	Approximate Project Chainage
		Lake, before finishing at the Black Sea. It will be located in the districts of Avcılar, Küçükçekmece, Başakşehir and Arnavutköy. The project aims to relieve naval congestion in the Bosphorus. The National EIA for the Kanal Istanbul project was approved by the Ministry of Environment and Urbanisation in January 2020. Construction of the project has not yet commenced.		
24	Aston Avcilar Residence and Trade Centre	Mixed-use development consisting of 269 residential units, 50 office units and 77 commercial units. Construction of the development has already commenced.	4.5km south-west (Esenyurt)	6+700
25	Esenyurt 625/40 Housing and Commercial Development	Mass housing development consisting of 286 residential and 10 commercial units. The construction programme for this development is currently not known.	7.1km southwest (Esenyurt)	7+000
26	'Delta Dubai Integrated' Residential Project	3 tower blocks consisting of 1,068 residential units, 102 hotel units, 102 office units, 77 commercial units, a school, a sports area, greenspace and parking facilities. Construction of the development has already commenced.	4.6 km south (Ispartakale)	7+500
27	Arena Nuans Housing and Commercial Development	Mass housing development consisting of 238 residential and 13 commercial units. The construction programme for this development is currently not known.	6.4 km southwest (Esenyurt)	7+500
28	Istanbul Yasam Konutlari Housing and Commercial Development	Mass housing development consisting of 217 residential and 6 commercial units. The construction programme for this development is currently not known.	6 km southwest (Esenyurt)	7+500
29	Buyukcekmece Shopping Mall and Residences Development	Commercial-residential development consisting of a Shopping mall (49,806 m^2) development and 760 residential units. Construction of the development has not yet commenced.	7.4 km south-west (Buyukcekmece)	7+500
30	Esenyurt 243/8 Housing and Commercial Development	Mass housing development consisting of 337 residential and 70 commercial units. The construction programme for this development is currently not known.	2.4km west (Esenyurt)	8+000
Project Section: Ispartakule – Çerkezköy				
31	Bizim Evler 8 Konut Projesi	Residential housing development consisting of 254 residential units, 8 commercial units, parking and recreational facilities. Construction of the development has already commenced.	0.9 km east (Ispartakule)	9+000
32	Esenyurt 382/33 Hotel Development	Hotel development consisting of 268 units. The construction programme for this development is currently not known.	2.4km west (Esenyurt)	9+500
33	Suryapi Ispartakule Development	Housing development consisting of 355 residential units, 12 commercial units, parking facilities and recreational facilities. The construction programme for this development is currently not known.	1.7 km northeast (Ispartakale)	12+500

Reference	Planned Development	Status	Distance from Project	Approximate Project Chainage
34	Revenue Sharing Work for 415 Flats/Apartments and 20 Shops	Mixed-use development consisting of 415 residential and 20 commercial units. Construction of the development has already commenced.	1.7 km northeast (Ispartakule)	12+500
35	Hosdere 1968-2 Housing and Commercial Development	Mass housing development consisting of 547 residential and 5 commercial units. The construction programme for this development is currently not known.	0.6km west (Ispartakule)	14+500
36	Hosdere 645/1 and 646/2 Housing and Commercial Development	Mass housing development consisting of 353 residential and 8 commercial units. The construction programme for this development is currently not known.	1.4km west (Ispartakule)	14+500
37	Hosdere Residences	Mass housing project consisting of 1,000 residential and 30 commercial facilities across 15 tower blocks. The construction programme for this development is currently not known.	0.1 km west (Ispartakule)	14+500
38	Mass Housing 123/1 Parcel	Mass housing development consisting of 1,128 residential units. Construction activities have already commenced. The construction programme for this development is currently not known.	0.6 km east (Omerli)	14+500
39	Government 353-8 Housing Shops	Mass housing development consisting of 353 houses and 8 commercial units. The construction programme for this development is currently not known.	1.5km south-west (Omerli)	14+500
40	Hadimköy Mass Housing Project	Residential housing development consisting of 1,544 residential units. The construction programme for this development is currently not known.	Adjacent to the Project (Omerli)	16+000
41	Istanbul Airport – Muselles - Çatalca Railway Line	This rail development aims to connect Istanbul's new 3rd airport to the wider rail network at Çatalca, with a newly constructed rail line. The construction programme for this development is currently not known.	Adjacent to the Project, at the closest point (Çatalca)	31+800
42	Kuptepe Wind Power Plant Project	Wind power plant project in planning phase having energy generation license for 10 MW capacity. The construction programme for this development is currently not known.	0.3km north (Kabakca)	40+000
43	Akalan Wind Power Plant Project	Wind power plant project in planning phase having energy generation license for 14 MW capacity. The construction programme for this development is currently not known.	5.7km north (Kabakca)	45+000
44	Çerkezköy – Subasi Road Project Part 2	Highway between Çerkezköy and Subasi, including major structures such as viaducts, bridges and tunnels. Crosses the Project at chainage 57+000. The construction programme for this development is currently not known.	Intersects Project	57+000
45	Tayakadin to Gaziosmanpasa WPP Switchyard Energy Transmission Line	Energy transmission line having 154kV capacity of 9.2km length planned to be constructed between Tayakadin WPP switchyard and Gaziosmanpasa WPP switchyard. The construction programme for this development is currently not known.	4km north, at the closest point (Cayirdere)	67+500

Reference	Planned Development	Status	Distance from Project	Approximate Project Chainage
46	Çerkezköy – Kapikule Railway	The Çerkezköy – Kapikule Railway high speed railway is currently under construction and will provide a high-speed double track rail link from Çerkezköy to Kapikule, at the Turkish/Bulgarian border. It will connect to the eastern end of the Project, at a location approximated 1.5km east of Çerkezköy station. This railway will have full interoperability with the Project.	Adjacent to Project, at the closest point (Cerkezkoy)	76+000

ZONES OF INFLUENCE

17.5.3. The planned developments have different Study Areas for each of the environmental and social topics, within which the potential for in-combination effects has been assessed. These Study Areas are shown in **Table 17-5** and are known herein as 'Zones of Influence' (ZOI). Topics excluded from the assessment (see **paragraph 17.5.6** and **17.5.7**) are not included in the table.

Table 17-5 - ZOI for Assessment of In-Combination Effects

Environmental and Social Topic	Zone of Influence
Noise and Vibration	Noise The ZOI includes all construction noise receptors within 300m of the expropriation corridor and operation noise receptors within 300m of the expropriation corridor. Vibration The ZOI includes all construction vibration receptors within 100m of the expropriation corridor and all operation vibration receptors within 100m of the expropriation corridor.
Ecology	The ZOI is 500m from the expropriation corridor, this is the area used to describe the potential area over which impacts of the Project will be experienced, recognising the wider context provided by the western Black Sea Region and the Marmara Transitional Region study area.
Landscape and Visual	For the purpose of this ESIA, a ZOI of 1km has been identified on either side of the expropriation corridor.
Surface Water Environment	**Surface and Groundwater** The ZOI typically encompasses surface water features up to 500m from the expropriation corridor that have the potential to be affected directly by the proposed works. The ZOI also includes surface water features that are in hydraulic connectivity with the study area, such as those downstream of features that are within 5km of the expropriation corridor and that may therefore be affected by indirect impacts. **Flood Risk** The ZOI for the assessment of flood risk is defined by the extent by which flood risk may be influenced. An extent of approximately 1km upstream and downstream of the expropriation corridor is considered appropriate.
Geology and Soils	**Geology and Soils** The ZOI consists of the area within the expropriation corridor and a 25m wide buffer on each side of the expropriation corridor. **Groundwater** The ZOI encompasses groundwater aquifers up to 1km from the expropriation corridor that have the potential to be affected directly by the Project. **Human Health and Surface Water**

Environmental and Social Topic	Zone of Influence
	The ZOI also includes human health receptors (such as local communities) and surface water features that are within 500m of the Project and are in hydraulic connectivity with the study area which may therefore be affected by direct or indirect impacts.
Social	A 1km ZOI from the expropriation corridor has been considered, which aligns with the approach in the social assessment, and is considered a sufficient area to identify significant effects. Adverse significant effects are unlikely to be able to occur on receptors outside of this area.

17.5.4. Timescales for the planned developments identified in **Table 17-4** were unknown at the time of writing, it has been assumed that the construction and operation phases of these developments could overlap with the Project so as to represent a 'worst-case' scenario.

RESIDUAL EFFECTS

17.5.5. **Table 17-6** below contains details of the assessment of the in-combination effects between the Project and the planned developments. The in-combination effects are categorised by planned development and environmental topic. Any development that does not fall within the ZOI for an environmental or social topic is not assessed for that topic, as it does not have the potential for an in-combination effect. Where appropriate, planned developments of a similar nature, that will be subject to similar effects, have been grouped.

17.5.6. The IFC Handbook[316] advises that residual effects on receptors that were not considered significant in the ESIA should not be included in the cumulative assessment. The following environmental topics have not been included in the in-combination assessment as all residual effects were assessed to be Negligible or Not Significant:

- **Chapter 6: Air Quality** – construction and operation phases;
- **Chapter 9: Cultural Heritage** – operation phase;
- **Chapter 12: Geology and Hydrogeology** – operation phase;
- **Chapter 13: Materials and Waste** – construction and operation phases; and
- **Chapter 14: Climate Change** (Climate Change Resilience) – construction and operation phases.

17.5.7. The following environmental topics have not been included in the in-combination assessment as the nature of the assessment or uncertainties do not allow for an appropriate assessment of in-combination effects:

- **Chapter 9: Cultural Heritage** – construction phase, is excluded from the assessment. The only residual effects for this topic relate to effects on undiscovered below-ground heritage assets

[316] IFC (2013). Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets.

during construction. For below-ground heritage assets, it is not feasible to quantify accurately the nature of resources across the study area, which would enable the identification of any in-combination effect. As a result, cultural heritage is excluded from the assessment;

- **Chapter 14: Climate Change** (Greenhouse Gases) is excluded from the assessment. The impact of greenhouse gases (GHG) emissions, in terms of their contribution to climate change, are global and cumulative in nature, with every tonne contributing to impacts on natural and human systems. There is a scientific consensus that the major increase in the atmospheric concentration of GHGs since the industrial revolution, is contributing to climate change. As such it is the cumulative effect of all GHG-emitting human activities that cause climate change, and therefore the assessment of the GHGs due to the Project implicitly assesses the cumulative effect of GHG emissions. Therefore, the quantification of emissions from the Project in the assessment of significance or effects inherently assesses the combined and cumulative impacts; and
- **Chapter 16: Major Accidents and Disasters** is excluded from the assessment, as it required a different assessment approach, which considers the vulnerability of the Project to major events. It does not assess the potential effects on sensitive receptors, including cumulative effects.

Table 17-6 - Assessment of In-Combination Effects

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
Noise and Vibration As identified in **Chapter 7: Noise and Vibration**, the Project will have significant residual effects during both construction and operation. The receptors likely to experience these effects are residents of properties. The impacts causing these potential effects on the Project, and potential in-combination effects, are prolonged and excessive exposure to both noise and vibration. The significant residual effects during construction phase are associated with construction vibration in Halkali, Bahçeşehir, Ömerli, Kaleiçi, Gökçeali, İnceğiz, Kabakça, Çayırdere and İstasyon and equate to a Large Adverse residual effect. The significant effects associated with construction noise are in Bahçeşehir, Kaleiçi, İnceğiz, Kabakça and İstasyon and equate to a Large Adverse residual effect. All construction effects at other receptor locations are not significant. The residual effects during operation are associated with noise and are anticipated to be as follows: ▪ Large Adverse (significant) for receptors at Kaleiçi and İnceğiz; ▪ Moderate Adverse (significant) for receptors at Halkali, Kabakça and Çayırdere; ▪ Minor Adverse (not significant) for receptors at Ömerli, Çatalca, Gökçeali and İstasyon; and ▪ Neutral (not significant) for all other receptor locations. All operation effects associated with re-radiated noise and vibration are not significant.			
22 – Istanbul's 3rd Bridge – 3rd Airport – Halkali Railway Project	This planned development adjoins the Project at Halkali, the eastern-most point of the Project, which is in the vicinity of Bahçeşehir. Due to the nature of the planned development being similar to that of this Project, it is likely to result in similar adverse effects. This planned development is in the ZOI for the Project, near Halkali Station. If these two projects are constructed at the same time there is likely to be an in-combination noise effect. As a result, a **Moderate Adverse** in-combination effect is anticipated during construction (due to the proximity to Bahçeşehir). During the operation phase, a **Minor Adverse** in-combination effect is anticipated due to the increased residual vibration levels in Halkali from the proximity of the planned development and the Project.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise the adverse noise effects on receptors through measures such as coordinating temporary noise barriers and scheduling of noise generating activities. With these subsequent measures, the construction phase residual effects will be reduced to a **Minor Adverse** in-combination effect.	Construction: Minor Adverse Operation: Minor Adverse
23 – Kanal Istanbul	The proposed Kanal Istanbul will intersect the Project at the Küçükçekmece Basin, in the vicinity of Bahçeşehir and Ispartakule. The Kanal Istanbul's EIA anticipates that significant residual noise and vibration effect are likely during the construction phase, associated with the operation of construction plant for excavations, and Heavy Goods Vehicles (HGVs) transporting plant, materials and waste, and piling activites. As this Project is also expected to have significant residual effects in Bahçeşehir nearby residential receptors have to potential to be subject to significant in-combination effects, due to the combined effect of this Project and the planned development. As a result, the in-combination effects are anticipated to be **Moderate Adverse** during the construction phase, without mitigation. The Kanal Istanbul's EIA anticipates that significant residual noise and vibration effect are unlikely during the operational phase. Effect would be limited noise generated by the shipping movements. Therefore, during operation a **Minor Adverse** in-combination effect is anticipated. The planned development is in close proximity to Bahçeşehir, while the Project will pass underneath the receptors affected by the planned development in the form of the tunnel. As the effects of the Project on receptors in Bahçeşehir are already anticipated to be significant the non-signficant adverse effects from the planned development are not anticipated to significantly magnify the effects on these receptors.	If the construction phases for both projects overlap, the Contractors for the projects will be required to liaise and plan their construction activities to minimise the adverse noise effects on receptors through measures such as coordinating temporary noise barriers and scheduling of noise generating activities. With these subsequent measures, the construction phase residual effects will be reduced to a **Minor Adverse** in-combination effect.	Construction: Minor Adverse Operation: Minor Adverse

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
40 – Hadimköy Mass Housing Project	The planned development is directly adjacent to the Project in the vicinity of Omerli. Due to the large scale of both the planned development and this Project there is the potential for in-combination effects during the construction phase. The project is likely to result in large scale noise generating activities, whereas the receptor locations are subject to significant vibration effects from the project. The resulting in-combination effect is anticipated to be **Minor Adverse**. During the operation phase, no in-combination effect is anticipated. Although Bahcesehir is in the vicinity of the planned development (and is anticipated to experience significant residual effects as a result of the Project), the planned development is not anticipated to generate significant noise generating activities.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise the adverse noise effects on receptors through measures such as coordinating temporary noise barriers and scheduling of noise generating activities.	Construction: Minor Adverse Operation: Neutral
41 – Istanbul Airport – Muselles – Çatalca Railway Line	The planned development is adjacent to the Project at Çatalca station. Receptors in Catalca are not anticipated to experience significant residual effects from the Project in either the construction of operation phase. Due to the similar nature of the Project and the planned development, there is the potential for in-combination effect due to construction activities and operational trains associated with the Project and planned development. A **Minor Adverse** in-combination effect is anticipated in both the construction and operation phases.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise the adverse noise effects on receptors through measures such as coordinating temporary noise barriers and scheduling of noise generating activities.	Construction: Minor Adverse Operation: Minor Adverse
42 – Kuptepe Wind Power Plant Project	The planned development is in close proximity to this Project in the vicinity of Kabakça and Çayırdere. Receptors in Kabakça and Çayırdere are anticipated to experience significant residual effects as a result of the Project in both the construction and operation phases. During the construction phase, the nature and scale of the planned development and this Project would result in large scale construction activities acting in-combination on receptors in Kabakça and Çayırdere. As a result of this a **Moderate Adverse** in-combination effect is anticipated. Although the Project is anticipated to result in significant effects in during operation, these are associated with vibration and re-radiated noise. During operation the planned development is not expected significantly magnify these vibration and re-radiated effects, due to the operational activities of the wind power plant. As a result, a **Neutral** In-combination effects are anticipated with the Project.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise the adverse noise effects on receptors through measures such as coordinating temporary noise barriers and scheduling of noise generating activities. With these subsequent measures, the construction phase residual effects will be reduced to a **Minor Adverse** in-combination effect.	Construction: Minor Adverse Operation: Neutral
44 - Çerkezköy – Subasi Road Project Part 2	The planned development runs in parallel to this Project and intersects it to the north-east of Sinekli. Due to the nature of the planned development being similar to that of this Project (a major infrastructure project), similar adverse effects are likely to be experienced. The planned development is not in the vicinity of receptors anticipated to see significant effects as a result of this Project (the nearest receptor location being Kucuksinekli), as a result the in-combination effects are not anticipated to be significant, resulting in a **Minor Adverse** in-combination noise effect. During operation the development is not located in the vicinity of receptors likely to experience significant effects as a result of the Project. Due to the likely similar adverse effects of the planned development, a **Minor Adverse** in-combination effect is anticipated.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise the adverse noise effects on receptors	Construction: Minor Adverse Operation: Minor Adverse

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
		through measures such as coordinating temporary noise barriers and scheduling of noise generating activities.	
46 – Çerkezköy – Kapikule Railway	The planned development adjoins this Project in Cerkezkoy, the eastern-most point of the Project, in the vicinity of İstasyon. Due to the nature of the planned development being similar to that of this Project, similar adverse effects are likely to be experienced. The planned development is near to receptors anticipated to see significant effects as a result of the Project during the construction phase (at İstasyon) with the potential to result in a **Moderate Adverse** pre-mitigation in-combination noise effect, prior to mitigation. During operation a **Minor Adverse** in-combination effect is anticipated as the likely magnification on nearby adversely affected receptors (İstasyon) will lead to increased adverse effects but these effects are not anticipated to have an increased order of magnitude.	If the construction phases for both projects overlap, the Contractors for the projects will be required to liaise and plan their construction activities to minimise the adverse noise effects on receptors through measures such as coordinating temporary noise barriers and scheduling of noise generating activities. TCDD who are responsible for constructing this project, are already in liaison with AYGM. With these subsequent measures, the construction phase residual effects will be reduced to a **Minor Adverse** in-combination effect.	Construction: Minor Adverse Operation: Minor Adverse
Ecology As discussed in **Chapter 8: Ecology** the receptors experiencing potential impacts as a result of the Project, and with the potential for in-combination effects, are as follows: ▪ Three Important Bird Areas (IBAs) which all intersect the Project (see Figure 17-1). These are as follows: Terkos Basin, spanning the region north of Sinekli and Catalca; Büyükçekmece Lake (east and south-east of Catalca); and Küçükçekmece Basin (encompassing the region of Halkali and Ispartakule); ▪ Habitats comprising agricultural land, urban areas, woodland, scrubland and aquatic habitats; ▪ Rare plants (6 rare plants, including 5 endemics recorded across the ZOI); ▪ Notable fauna of conservation value (European ground squirrel, marbled polecat, bat species and spur-thighed tortoise); ▪ General Fauna across the expropriation corridor including some species of slightly elevated conservation such as fire-bellied toad; and ▪ Widespread bird assemblage across the ZOI (inclusive of notable and threatened species). The impacts causing these potential effects are: habitat loss, disturbance of species, injury/mortality, loss of plants and the spread of invasive species. During construction, the Project will have Minor Adverse effects on notable fauna, general fauna and birds. During operation, the Project will have Minor Adverse effects relation to protected areas and birds. All other effects are anticipated to be Negligible.		
22 – Istanbul's 3rd Bridge – 3rd Airport – Halkali Railway Project	The planned development consists of the similar construction activities and operation conditions as this Project. As the planned development does not geographically overlap this Project or ZOI in the vicinity of protected areas there is no potential for in-combination effects on protected areas. No in-combination effect on fauna is anticipated in the construction and operation phases due to the urban nature of the environment and lack of potential habitats and geographical overlap with sensitive fauna.	None Required	Construction: Neutral Operation: Neutral
23 – Kanal Istanbul	According to the Kanal Istanbul EIA, it is anticipated to have significant effects in relation to both terrestrial and maritime ecology assets. In particular there is the potential for significant adverse risks on maritime and coastal ecosystems in the Küçükçekmece Basin IBA, an important wetland bird habitat.	None Required	Construction: Minor Adverse Operation: Netural

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
	Construction activities associated with the planned development are likely to result in significant adverse effects on ecological receptors. The planned development occupies a large area, resulting in significant land take and will be directly interacting with the Küçükçekmece Basin IBA (see Figure 17-1), and these effects are anticipated to be significant. Conversely, the construction effects of this Project are not anticipated to be significant at this location, due to it being located in a tunnel beneath the proposed Kanal and also the mitigation measures relating to surface water and hydrogeology. It is therefore anticipated that the in-combination effect during construction will be **Minor Adverse** due to the regional impacts on disturbances to general fauna and birds. During operation, the planned development will intersect the Küçükçekmece Basin IBA, a protected area for wintering waterbirds. This Project passes underneath this area in a tunnel. The effects of the Kanal Istanbul on this protected area are likely to be significant, through the alteration of the channel, impacts on groundwater, creation of a barrier and introduction of shipping movements. However, the effects on protected areas and birds are not anticipated to not be magnified by this Project, due to the Project being in a tunnel in this location and of a significant distance from nesting areas. As a result, a **Neutral** in-combination effect is anticipated during operation, due to disturbance to birds and protected areas.		
37 – Hosodere Residences and 40 – Hadimköy Mass Housing Project	The planned developments are located in the vicinity of Omerli (see Figure 17-1) on the boundary of an expanding urban environment. The planned developments are located within a highly urbanised area and are unlikely to result in adverse effects on fauna and bird populations due to this unsuitable habitat. In addition, the planned developments do not intersect identified protected areas. As a result, a **Neutral** in-combination effect is anticipated during both the construction and operation phases.	None Required	Construction: Neutral Operation: Neutral
41 – Istanbul Airport – Muselles – Çatalca Railway Line	The planned development is adjacent the Project at Çatalca station. The planned development consists of similar construction activities and operation conditions as the Project. As the planned development does not geographically overlap this Project in the vicinity of protected areas there is no potential for in-combination effects on protected areas. No in-combination effect on notable fauna, general fauna and birds is anticipated in both the construction and operation phases due to the urban environment and lack of potential habitats and contact areas for said fauna and birds.	None Required	Construction: Neutral Operation: Neutral
42 – Kuptepe Wind Power Plant Project & 44 - Çerkezköy – Subasi Road Project Part 2	The planned developments are located to the north of the Project and within the Terkos Basin IBA (see Figure 17-1). There is the potential for in-combination effects on this area during the construction phase, as the Project has a minor effect on landtake. The Project has no further effects on this protected area during construction and operation. As a result of concurrent construction activities to construct these infrastructure developments, a **Minor Adverse** in-combination effect is anticipated during construction due to the increased land take. During the operation phase a **Neutral** in-combination effect is anticipated, as the Project does not have residual operational effects on this protected area.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries, and plan their construction activities to minimise the adverse noise effects in receptors.	Construction: Minor Adverse Operation: Minor Adverse
46 – Çerkezköy – Kapikule Railway	The planned development consists of similar construction activities and operation conditions as this Project. There is no potential for in-combination effects on protected areas, as the planned development does not geographically overlap this Project in the vicinity of any protected areas. A **Minor Adverse** in-combination effect on notable fauna, general fauna and birds is anticipated in both the construction and operation phases due to the increased in-combination footprint over potential habitats and contact areas for said fauna and birds.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractors, as well as the relevant Turkish ministries, and plan their construction activities to minimise the adverse noise effects in receptors. TCDD who are responsible for constructing this project, are already in liaison with AYGM, so they can ensure their contractors liaise to minimise effects	Construction: Minor Adverse Operation: Minor Adverse

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
Landscape and Visual The receptors affected by Landscape and Visual impacts of the Project, and with the potential for in-combination effects, are: ▪ Three Landscape Character Areas (Marmara, Province of Istanbul and Province of Tekirdağ); and ▪ Residential properties, road users, users of public open spaces and footpaths (represented across 15 viewpoints in the ZOI). The potential impacts experienced by these receptors include permanent change of land use (introducing detracting physical features and removing large areas of wood and scrubland) and a visual awareness of both the construction and operation of the Project. As discussed in **Chapter 10: Landscape and Visual**, the Project will have the following residual effects: ▪ Minor Adverse on Landscape Character Area 1: Marmara; ▪ Moderate Adverse on Landscape Character Area 2: Province of Istanbul (construction and operation); ▪ Negligible to Minor Adverse (construction) on viewpoint 2 (views of Küçükçekmece Lake); ▪ Moderate Adverse (construction) and Minor Adverse (operation) on viewpoint 4 (views from gravel roads at chainage 6+000); ▪ Minor Adverse (construction) on viewpoint 5 (views looks east from Bahcesehir Golet Park); ▪ Minor Adverse (construction) on viewpoints 6 and 7 (views between Ispartakule and Omerli); ▪ Minor to Large Adverse (construction) and Minor to Moderate Adverse (operation) on viewpoint 8 (views northeast from unnamed road towards the Project at chainage 20+500); ▪ Minor to Moderate Adverse (construction and operation) on viewpoint 9 (views northwest from unnamed road towards the Project at chainage 20+500); ▪ Minor Adverse (construction) on viewpoint 10 (view looking south-west from Suleyman Bingol Cd towards the Project); ▪ Minor to Moderate Adverse (construction) and Negligible to Moderate Adverse (operation) on viewpoint 11 (views south to southeast between Berfin Street and Büyükkarıştıran Creek); ▪ Moderate Adverse (construction and operation) on viewpoint 12 (views southeast from Akincik Sk on the eastern edge of Bekirli); ▪ Negligible to Moderate Adverse (construction) and Negligible to Minor Adverse (operation) on viewpoint 13 (receptors in and around Sinekli);Minor Adverse (construction) on viewpoint 15 (western extent of the Project); ▪ Large Adverse (construction) on visual amenity in Omerli; ▪ Moderate Adverse (construction) on 24+800 Farmstead; ▪ Large Adverse (construction) and Minor Adverse (operation) on 36+499 residential properties; ▪ Moderate Adverse (construction and operation) on 42+150-42+246 residential properties; ▪ Large Adverse (construction) and Minor Adverse (operation) on 44+600 residential properties; ▪ Large Adverse (construction) on residential properties (north of Akoren and along Bekirli Yolu); and ▪ Large Adverse (construction) and Minor Adverse (operation) on 76+00-76+700 residential properties. All other residual effects are anticipated to be Neutral or Negligible.			
22 – Istanbul's 3rd Bridge – 3rd Airport – Halkali Railway Project	This planned development will introduce an additional major rail connection, as a result there will be an increased change in character beyond this Project in isolation, resulting in a **Minor Adverse** in-combination effect in both the construction and operation phase.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as timing of key visually intrusive activities, storage of plant and materials, and coordination landscape mitigation provision such as screening and planting.	Construction: Minor Adverse Operation: Minor Adverse
23 – Kanal Istanbul	The proposed Kanal Istanbul is a major infrastructure project, which will significantly alter the landscape character, views and visual amenity of the local area as well as physically altering the landscape and water bodies throughout its alignment. The Kanal Istanbul EIA anticipates that this development has the potential to have significant adverse effects on the landscape.	If the construction phases for both projects overlap, AYGM should liaise with the planned development	Construction: Minor Adverse

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
	The proposed Kanal Istanbul and this Project will only have overlapping visibility where they intersect to the north of the Kucukcekmece Basin. This Project will have no significant residual landscape and visual effects in this area, as it will be located in a tunnel throughout most of the area of overlapping visibility, with the construction of the tunnel portals being the main visible activities with the potential for a cumulative effect. The likely significant visual effects of the planned development in both the construction and operation phase will far outweigh any impact of this Project's tunnel portals and result in no magnification of effect compared to the planned development in isolation. As a result, a **Minor Adverse** effect in anticipated in the construction phase and a **Neutral** effect is anticipated in the operation phase.	contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as timing of key visually intrusive activities and coordination landscape mitigation provision such as screening and planting.	Operation: Neutral
Housing and commercial developments: 31 – Bizim Evler 8 Konut Projesi; 35 – Hosdere 1968-2 Housing and Commercial Development; 37 – Hosdere Residences; 38 – Mass Housing 123/1 Parcel; and 40 – Hadimköy Mass Housing Project.	These planned developments make up the expanding urban landscape between the Bahçeşehir area and Ömerli. The construction of the Project and planned developments is anticipated to increase disruption to visual receptors in the construction phase, resulting in a **Minor Adverse** in-combination effect. This is due to the visual amenity effects of increased construction activities associated with the planned development and this Project in the Bahçeşehir area, which is undergoing urban expansion. During operation the planned developments will extend the urban character of a transforming environment (from rural to urban). However, the resulting in-combination effects are anticipated to be **Neutral** due to the absence of residual effects from this Project in this area.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as timing of key visually intrusive activities and coordination landscape mitigation provision such as screening and planting.	Construction: Minor Adverse Operation: Neutral
41 – Istanbul Airport – Muselles – Çatalca Railway Line	There are potential in-combination effects associated with the landscape character area 2 and visual receptors at viewpoint 10. As the planned development will introduce additional rail connections through a previously rural / agricultural setting there will be an increased change beyond the Project in isolation, resulting in a **Minor Adverse** in-combination effect in both the construction and operation phase.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as timing of key visually intrusive activities and coordination landscape mitigation provision such as screening and planting.	Construction: Minor Adverse Operation: Minor Adverse
42 – Kuptepe Wind Power Plant Project	The planned development is located to the north of the Project and within the vicinity of Kabaca. This portion of the Project chainage is anticipated to see numerous residual significant effects in relation to viewpoints (11 and 12), Landscape Character 2 and on nearby residential properties. During the construction phase, in-combination effects from activities will likely result in a significant pre-mitigation in-combination effect (**Moderate Adverse**) on nearby receptors and viewpoint locations. The operation phase effects of the planned development, a major power plant, in close proximity to this operational Project will similarly result in a **Minor Adverse** in-combination effect.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as timing of key visually intrusive activities, storage of plant and materials, and coordination landscape mitigation provision such as screening	Construction: Minor Adverse Operation: Minor Adverse

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
		and planting. With these subsequent measures, the construction phase residual effects will be reduced to a **Minor Adverse** in-combination effect.	
44 - Çerkezköy – Subasi Road Project Part 2	The planned development is similar in nature and scale to this Project and adds to the existing road and rail infrastructure when considering the landscape character and visual amenity. As with this Project, the planned development is likely to see significant residual effects in the construction phase due to this similarity in nature and scale. The effects on visual amenity for residential receptors at viewpoints 11, 12 and 13 and Landscape Character Area 2 and visual amenity (construction phase) will be heightened resulting in a **Moderate Adverse**, pre-mitigation in-combination effect compared to the Project in isolation due to the significant increase and spatial scope of construction activities. In addition, the in-combination effects of the Project on Landscape Character Area 2 in the operation phase will be **Minor Adverse**, due to the presence of both Projects heightening the amount of hard infrastructure present in the area.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as timing of key visually intrusive activities, storage of plant and materials, and coordination landscape mitigation provision such as screening and planting.With these subsequent measures, the construction phase residual effects will be reduced to a **Minor Adverse** in-combination effect.	Construction: Minor Adverse Operation: Minor Adverse
46 – Çerkezköy – Kapikule Railway	The planned development is similar in nature and scale to the Project and continues the footprint of railway infrastructure when considering the landscape character and visual amenity. The effects on visual amenity for residential receptors at viewpoint 15 and other residential receptor locations (construction phase) will be heightened resulting in a **Minor Adverse** in-combination effect compared to this Project in isolation. In addition, the in-combination effects of the Project on Landscape Character Area 3 and viewpoint 15 (in operation phase) will be **Minor Adverse** in both the construction and operation phase, due to the presence of both Projects.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as timing of key visually intrusive activities storage of plant and materials, and coordination landscape mitigation provision such as screening and planting. TCDD who are responsible for constructing this project, are already in liaison with AYGM, so they can ensure their contractors liaise to minimise effects.	Construction: Minor Adverse Operation: Minor Adverse

Surface Water Environment

The receptors effected by Surface Water Environment impacts of the Project, and with the potential for in-combination effects, are as follows:

- Surface Water Bodies (Sazli Stream, Hadimkoy Stream / Camasir Creek, Karausa Stream, Ambar Creek and 70 smaller tributaries and water courses) intersected by the Project are downstream from the Project; and
- Lakes and Ponds (the Project is in the catchment area of Küçükçekmece Lake and Büyükçekmece Lake and is within 4km of Bahçeşehir Pond, İnceğiz Pond, Sinekli Pond, Çayirdere Pond and Sazlıdere Dam).

The impacts potentially experienced by these receptors are flooding, pollution from various sources and impacts to hydrology, hydrogeology and flow dynamics.

As discussed in **Chapter 11: Surface Water Environment**, the Project will have residual effects of Neutral to Minor Adverse on surface water receptors during both the construction and operation phases. The Minor Adverse effects being associated with increased pollution risk from sedimentation and surface water discharge (construction) and increased flood risk and impacts to hydrology, hydromorphology and flow dynamics (operation).

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
Housing and commercial developments: 3 - Keles Centre Airport Housing Development; 4 – Tokam E5 Housing and Commercial Development; 5 – Sefakoy Oerlikon Housing and Commercial Development; 6 – Garaj Istanbul Housing and Commercial Development; 7 – Atakent 4B&4C Housing and Commercial Developments; 8 – Emlak Konut Halkali 884-1 Housing and Commercial Development; 9 – Government 363-10 Housing Shops; 10 – Mavera Comfort Housing and Commercial Development; and 11 – Mavera Residence Housing and Commercial Development.	The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface waterbodies as a result of sedimentation and overland flow / discharge. In the operation phase the potential for in-combination effects is in relation to changes to hydrology, hydromorphology and flow dynamics due to developments crossing or altering watercourses. The planned developments are located south-east and north-east of Halkali and nearest to the Menekse and Hasanoglu watercourses. Any adverse effects on watercourses as a result of the developments are likely to impact these watercourses. It is anticipated that the Project will not cause adverse effects to these watercourses, as a result the in-combination effects are anticipated to be **Neutral** during the construction phase. In addition, changes to the hydrology / hydromorphology are not anticipated, resulting in a **Neutral** in-combination effect in the operation phase.	None Required	Construction: Neutral Operation: Neutral
16 - Kayaşehir Fenertepe Metro Line Extension	The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface water bodies as a result of sedimentation and overland flow / discharge. In the operation phase the potential for in-combination effects is in relation to changes to hydrology, hydromorphology and flow dynamics due to developments crossing or altering watercourses. The planned development (located north of Halkali) has the potential to result in adverse surface water effects to the nearest watercourses (Menekse and Hasanoglu watercourses) during construction and would particularly impact groundwater due to the underground nature of the planned development. The development is located in an urban setting not in close proximity to any surface water bodies effected by this Project. As a result, in-combination effects are anticipated to be **Neutral** in both the construction and operation phases.	None Required	Construction: Neutral Operation: Neutral
22 – Istanbul's 3rd Bridge – 3rd Airport – Halkali Railway Project	The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface water bodies as a result of sedimentation and overland flow / discharge. In the operation phase the potential for in-combination effects is in relation to changes to hydrology, hydromorphology and flow dynamics, due to developments crossing or altering watercourses.	None Required	Construction: Neutral Operation: Neutral

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
	Due to the nature of the planned development it has the potential to result in adverse effects on the surface water environment. The planned development will be in the ZOI of the Project near Halkali Station and is not anticipated to cause a heightened adverse effect compared to this Project in isolation, due to the lack of watercourses in the immediate vicinity of Halkali Station (the nearest being Kucukcekmece Lake). As a result, in-combination effects are anticipated to be **Neutral** in both the construction and operation phases.		
23 – Kanal Istanbul	According to the Kanal Istanbul EIA,, it is anticipated to have multiple significant residual effects in relation to surface water. The development will adversely alter the water quality in both the Black Sea and Marmara Sea, influence sediment transport along the new water course, remove existing infrastructure in the form of the Salzidare Dam and consequently alter existing water bodies and intersect lake protection zones and drinking water supplies. In addition, there is the potential significant residual effects from dredging activities, such as in Küçükçekmece Basin, and storage of excavated materials near waterbodies (a significant pollution risk). The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface water bodies as a result of sedimentation and overland flow / discharge in the Küçükçekmece Basin. In the operation, due to its nature, the planned development is likely to result in significant adverse effects on the surface water environment. The Project passes under this planned development in a tunnel, so will not have any effects on watercourses and hydrology in this location. As a result, in-combination effects are anticipated to be **Minor Adverse** in the construction phase and **Neutral** in the operation phase.	Not Required	Construction: Minor Adverse Operation: Neutral
24 – Aston Avilcar Residence and Trade Centre	The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface water bodies as a result of sedimentation and overland flow / discharge. In the operation phase the potential for in-combination effects is in relation to changes to hydrology, hydromorphology and flow dynamics due to developments crossing or altering watercourses. The planned development is located south-west of Ispartakule and nearest to the Haramidere watercourse. Adverse effects as a result of the Project are unlikely to impact this watercourse, therefore in-combination effects are anticipated to be **Neutral** in both the construction and operation phases.	None Required	Construction: Neutral Operation: Neutral
Housing and commercial developments: 26 – 'Delta Dubai Integrated' Residential Project 30 – Esenyurt 243/8 Housing and Commercial Development; 31 - Bizim Evler 8 Konut Projesi; 32 – Esenyurt 382/33 Hotel Development; 35 – Hosdere 1968-2 Housing and Commercial Development; 36 – Hosdere 645/1 and 642/2 Housing and Commercial Development;	The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface waterbodies as a result of sedimentation and overland flow / discharge. In the operation phase the potential for in-combination effects is in relation to changes to hydrology, hydromorphology and flow dynamics due to the crossing or altercation watercourses. The planned developments are located in the vicinity of Ispartakule and nearest to the Sazildere, Hadimköy (discharging into the Küçükçekmece Lake) and Bahaceshir Pond watercourses. Any adverse effects on watercourses as a result of the planned developments are likely to impact these watercourses. It is anticipated that this Project cause adverse effects in the construction phase (due to pollution risk) and as a result the in-combination effects are anticipated to be **Minor Adverse**. In addition, adverse effects to the hydrology / hydromorphology are in the operation phase are anticipated from this Project, resulting in a **Neutral** in-combination effect in the operation phase.	None Required	Construction: Minor Adverse Operation: Neutral

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
38 – Mass Housing 123/1 Parcel; 39 – Government 353-8 housing shops; and 40 – Hadimköy Mass Housing Project			
33 - Suryapi Ispartakule Development & 34 – Revenue Sharing Work for 415 Flats/Apartments and 20 Shops	The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface waterbodies as a result of sedimentation and overland flow / discharge. In the operation phase the potential for in-combination effects is in relation to changes to hydrology, hydromorphology and flow dynamics due to developments crossing or altering watercourses. The planned development is located in the vicinity of Ispartakule and nearest to the Hakimköy stream or Haramidere watercourse. However, this watercourse is not hydrologically connected to those affected by the Project. As a result, the in-combination effects are anticipated to be **Neutral** in both the construction and operation phases.	None Required	Construction: Neutral Operation: Neutral
37 – Hosdere Residences	The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface waterbodies as a result of sedimentation and overland flow / discharge. In the operation phase the potential for in-combination effects is in relation to changes to hydrology, hydromorphology and flow dynamics due to developments crossing or altering watercourses. The planned development is located west of Ispartakule in the vicinity of Hadimköy stream and Bahaceshir Pond. The construction phases of both the planned development and this Project have the potential to result in adverse effects on these watercourses, which drain into Küçükçekmece lake. As a result, the in-combination effect in the construction phase is anticipated to be **Minor Adverse**. The in-combination effect in the operation phase is anticipated to be **Minor Adverse** as the operational residential development is expected to have no more than minor adverse effects on the nearby watercourse.	None Required	Construction: Minor Adverse Operation: Minor Adverse
41 – Istanbul Airport – Muselles – Çatalca Railway Line	The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface waterbodies as a result of sedimentation and overland flow / discharge. In the operation phase the potential for in-combination effects is in relation to changes to hydrology, hydromorphology and flow dynamics due to the crossing or altercation of watercourses. Due to the nature of the planned development it is likely to result in adverse effects on the surface water environment. These effects would be of a similar nature to that of the Project and during construction they have the potential to result in a heightened adverse effect compared to the Project in isolation, at the nearest surface water receptor (Karasu stream). As a result, in-combination effects are anticipated to be **Minor Adverse** during construction. The planned development and this Project are expected to have a **Neutral** in-combination effect during operation and they will not alter any watercourses where the ZOIs overlap.	None Required	Construction: Minor Adverse Operation: Neutral
42 – Keptepe Wind Power Plant Project	The planned development is located north of this Project in the vicinity of İnceğiz Pond and Büyükkariştiran Stream. Both of these watercourses are not anticipated to be adversely affected by this Project. Downstream of these watercourses is Karasu Stream, which is anticipated to be adversely affected by the Project. Construction phase effects would likely be of a significant scale with the potential for adverse effects on watercourse from pollution risks, as a result a **Minor Adverse** in-combination effect is anticipated in the Construction Phase. A **Neutral** in-combination effect is anticipated in the operation phase as no change is expected to the hydrology, hydromorphology and flow dynamics of Karasu Stream as the planned development does not cross or intersect it.	None Required	Construction: Minor Adverse Operation: Neutral

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
44 - Çerkezköy – Subasi Road Project Part 2	The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface waterbodies as a result of sedimentation and overland flow / discharge. In the operation phase the potential for in-combination effects is in relation to changes to hydrology, hydromorphology and flow dynamics due to the crossing or altercation of watercourses. The planned development is located in Sinekli, with the nearest surface waterbody being Sinekli Lake. The planned development will be separated from this waterbody at its closest point by this Project and is unlikely to result in adverse effects on it. As a result, the in-combination effects are anticipated to be **Neutral** in both the construction and operation phases.	None Required	Construction: Neutral Operation: Neutral
45 – Tayakadin to Gaziosmanpasa WPP Switchyard Energy Transmission Line	The planned development is located to the north of this Project and the nearest watercourse is Çayirdere Pond. Residual effects are unlikely to occur on this watercourse as a result of the Project as migration of pollutants to the pond are unlikely. The planned development is approximately 2km north of the watercourse and as a result, in-combination effects are unlikely from either direct pollution risk in the construction phase or from changes to hydrology, hydromorphology and flow dynamics in the operation phase. As a result, a **Neutral** in-combination effect is anticipated for both the construction and operation phase.	None Required	Construction: Neutral Operation: Neutral
46 – Çerkezköy – Kapikule Railway	The potential for in-combination effects is present at the construction phase in relation to the increased pollution risk to surface waterbodies as a result of sedimentation and overland flow / discharge. In the operation phase the potential for in-combination effects is in relation to changes to hydrology, hydromorphology and flow dynamics due to developments crossing or altering watercourses. The nature of the planned development is likely to result in adverse effects on the surface water environment. These effects would be of a similar nature to that of this Project and are not anticipated to cause a significant heightened adverse effect compared to this Project in isolation, though there is the potential for in-combination adverse effects on Ambar Creek. As a result, in-combination effects are anticipated to be **Minor Adverse** in both the construction and operation phases. Geology and Soils The receptors effected by impacts of the Project, and with the potential for in-combination effects, are as follows: ▪ Construction workers and maintenance workers; ▪ Surrounding soils and geology; ▪ Surface water bodies; ▪ Offsite users in the vicinity of the Project; ▪ Residences; and ▪ Underground utilities. The impacts potentially experienced by these receptors are: ▪ Pollution to soils and groundwater from various sources and excavation of contaminated soils; ▪ Soil erosion and degradation; ▪ Loss of fertile topsoil and removal/erosion of soil; ▪ Soil stability and landslide risks; ▪ Degradation of groundwater flow, quality and discharge; and ▪ Seismic activity. As discussed in **Chapter 12: Geology and Hydrogeology**, the Project will have Neutral to Minor Adverse residual effects during the construction phase. The Minor Adverse effects will be associated with the following (all other residual effects are anticipated to be Neutral: ▪ Potential soil loss and degradation; ▪ Potential loss of fertile topsoil; and The excavation of potentially contaminated soils and effects on groundwater quality, flow and recharge.	If the construction phases for both projects overlap, the Contractors for the projects will be required to liaise and plan their construction activities to minimise adverse effects. TCDD who are responsible for constructing this project, are already in liaison with AYGM, so they can ensure their contractors liaise to minimise effects.	Construction: Minor Adverse Operation: Minor Adverse

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
22 – Istanbul's 3rd Bridge – 3rd Airport – Halkali Railway Project	The planned development is likely to see similar adverse effects to the Project due to the similar nature of the development (a rail development). There are likely to be similar adverse effects on mobilisation and potential excavation of contaminated soils and potential degradation of groundwater. This, when in-combination with the Project would see localised increased adverse effects, resulting in **Minor Adverse** in-combination effects in the construction phase.	If the construction phases for both projects overlap, the Contractors for the projects will be required to liaise and plan their construction activities to minimise adverse effects.	Construction: Minor Adverse
23 – Kanal Istanbul	According to the Kanal Istanbul EIA, it is anticipated to result in significant geological and hydrogeological risks during the construction. As well as these risks, the planned development intersects known drinking water utilities, with a risk of potential contamination. As identified above the planned development has the potential to have significant adverse effects on groundwater and contaminated soil, due to the nature of the planned development requiring significant excavation and mobilisation of soils. The effects of the planned development are anticipated to be of an order of magnitude greater than those of the Project. As a result, the anticipated in-combination effects would be **Minor Adverse** in the construction phase, due to the increased area at risk of potential contamination and potential pathways to groundwater reserves, which are used for surface irrigation, potable and industrial water provision.	If the construction phases for both projects overlap, the Contractors for the projects will be required to liaise and plan their construction activities to minimise adverse effects.	Construction: Minor Adverse
Housing and commercial developments: 31 – Bizim Evler 8 Konut Projesi; 35 – Hosodere 1968-2 Housing and Commercial Development; 37 – Hosodere Residences; 38 – Mass Housing 123/1 Parcel; and 40 – Hadimköy Mass Housing Project	These planned developments are located in the vicinity of Ispartakule Station. Due to the nature and location of the developments there is the potential for excavation of contaminated soils during the construction phase. The scale of the planned developments and this Project in the area would result in a **Minor Adverse** in-combination effect in the construction phase. Due to the distance of the planned developments from the Project these in-combination effects would be limited to pollution to groundwater from excavation and spills of potential contaminants.	None Required	Construction: Minor Adverse
41 – Istanbul Airport – Muselles – Çatalca Railway Line; 42 – Kuptepe Wind Power Plant Project; and 44 - Çerkezköy – Subasi Road Project Part 2	The planned developments are likely to result in similar adverse effects to this Project due to the similar nature of the planned developments (a major infrastructure project of rail, energy or road). There are likely to be similar adverse effects on mobilisation and potential excavation of contaminated soils and potential degradation of groundwater. This, when in-combination with this Project would see localised increased adverse effects, resulting in **Minor Adverse** in-combination effects in the construction phase.	If the construction phases for both projects overlap, the Contractors for the projects will be required to liaise and plan their construction activities to minimise adverse effects.	Construction: Minor Adverse
46 – Çerkezköy – Kapikule Railway	The planned development is likely to result in similar adverse effects to this Project due to the similar nature of the planned development (a rail development). There are likely to be similar adverse effects on mobilisation and potential excavation of contaminated soils and potential degradation of groundwater. This, when in-combination with this Project would see localised increased adverse effects, resulting in **Minor Adverse** in-combination effects in the construction phase.	If the construction phases for both projects overlap, the Contractors for the projects will be required to liaise and plan their construction activities to minimise adverse effects. TCDD who are responsible for constructing this project, are already in liaison with	Construction: Minor Adverse

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
		AYGM, so they can ensure their contractors liaise to minimise effects.	
Social As discussed in **Chapter 15: Social**, the effects of the Project, and potential in-combination effects, will likely be experienced on various groupings of human receptors in communities throughout the ZOI. The potential effects experienced by these receptors are as follows: ▪ Acquisition and replacement of privately-owned land (such as houses and farms) and the resulting physical displacement of people; ▪ Induced employment opportunities; ▪ Interaction, disturbance, traffic increases and social pressures on local communities from the proximity of construction activities, compounds and workers; ▪ Community and health disturbances from an influx of migrant workers; ▪ Decreased community health, safety and wellbeing, and increased gender-based discrimination, due to safety concerns due to presence of the construction workforce; and ▪ Rail safety impacts. The Project is anticipated to result in the following residual effects: ▪ Construction Phase: • Minor Adverse: Land acquisition / use and livelihood restoration, land take and location of construction compounds, labour and working conditions, occupational health and safety, community health, safety and security, community access rights, gender and community wellbeing; and • Very Large Beneficial: Employment. ▪ Operation Phase: • Minor Adverse: Labour and working conditions, supply chain monitoring and community access rights; • Moderate Beneficial: Gender and community wellbeing; • Large Beneficial: Employment and economy and community health, safety and security; and Significant Beneficial: occupational health and safety and rail safety.			
22 – Istanbul's 3rd Bridge – 3rd Airport – Halkali Railway Project	The planned development is of a similar nature to that of this Project, a major rail connection. As a result of these it is anticipated that residual effects will be of a similar nature to that of this Project, in both the construction and operation phases. In the construction phase, similar construction activities have the potential to result in a magnified effect on land acquisition (as both Project require the construction of rail infrastructure to connect to Halkali Station), labour and working conditions, employment and economy, community access, well-being and health and safety. The in-combination effect of this is not anticipated to be significant due to similarly implemented mitigation measures. Furthermore, there will not be a magnification of effects on the same communities, other than at Halkali. As a result, a **Minor Adverse** in-combination effect is anticipated in the construction phase. In the operation phase, the planned development, due to its nature as a connected rail link with similar mitigation measures, is anticipated to see similar beneficial and adverse residual effects. The magnification of residual adverse effects is anticipated to result in a **Minor Adverse** in-combination effect of the planned development and Project due to the increased presence of new restricted access areas and the heightened labour demand increasing the potential for force/child labour within the supply chain.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as coordination of access routes, and considering the other project in the location of facilities. If the programmes permit it, it may be possible to re-use construction areas once either project is complete, and for local workers completing one project to be given information on job opportunities with the other project.	Construction: Minor Adverse Operation: Minor Adverse
23 – Kanal Istanbul	The proposed Kanal Istanbul is a large-scale infrastructure project that intersects the Project in the region of the Küçükçekmece Basin. Due to the scale of this it is likely to lead to significant residual effects in regard to land acquisition, employment and economic, labour and working conditions, health and safety, access and well-being in both the construction and operation phases.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant	Construction: Minor Adverse Operation: Minor Adverse

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
	The Kanal Istanbul EIA identifies increased traffic on road networks during the construction and a potential significant effect on local communities. The construction of this Project and the planned development would have similar adverse effects in regard to land acquisition, working conditions, labour influx and health and safety on the residential communities within The Bahçeşehir municipality (Altınşehir), Küçükçekmece municipality (Yarımburgaz) and Avcilar municipality (Firuzköy, Tahtakale and Yeşilkent)where the Project and planned development intersect. These effects are of a nature and scale with the potential to magnify the residual effects to result in an adverse in-combination effect in the construction phase. However, these effects are not anticipated to be significant for this Project and are likely to be of greater significance for the planned development. As a result, they are not likely to be magnified to become a significant in-combination effect. A **Minor Adverse** in-combination effect is anticipated for the construction phase. The operation phase of the planned development, along with this Project, is likely to see a mixture of adverse and beneficial residual effects. It is anticipated that the planned development alongside the Project, will have adverse in-combination effects associated with labour and working conditions, supply chain monitoring (assuming both developments draw on local labour and resources) and community access rights (notably where the Project enters / emerges from the tunnel in the Avcilar municipality (Firuzköy, Tahtakale and Yeşilkent)). As a result, a **Minor Adverse** in-combination operational effect is anticipated.	Turkish ministries and plan their construction activities to minimise adverse effects through measures such as coordination of alternate access routes and considering the other project in the location of facilities.	
Housing and commercial developments: 31 – Bizim Evler 8 Konut Projesi; 35 – Hosdere 1968-2 Housing and Commercial Development; 38 – Mass Housing 123/1 Parcel; and 40 – Hadimköy Mass Housing Project.	Due to the nature of the planned development, that of a large-scale mixed-residential development, during construction it is likely to result in adverse effects in relation to community access (as a result of road closures and access restrictions during construction activities) and beneficial effects for employment and economy. As these Projects also have the potential to result in residual effects of this nature, there is the potential for in-combination effects, although the likelihood will be reduced by the limited spatial extent of the effects associated with the planned developments. It is anticipated that this in-combination effect would be **Minor Adverse** in the construction phase and **Minor Beneficial** in the operation phase (due to benefits to employment and economy).	None Required	Construction: Minor Adverse Operation: Minor Beneficial
37 – Hosdere Residences	The nature of the planned development, that of a large-scale residential development, would likely result in both adverse and beneficial residual effects, particularly in the operation phase. The nature of the planned development is likely to see adverse effects in relation to community access (in both phases) and beneficial effects for employment and economy. As this Project will also result in residual effects of this nature there is the potential for in-combination effects. As the planned development is limited in its spatial scope of effects, it is anticipated that this in-combination effect would be **Minor Adverse** in the construction phase and **Minor Beneficial** in the operation phase (as a result of benefits to employment and economy).	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as coordination of alternate access routes and considering the other project in the location of facilities.	Construction: Minor Adverse Operation: Minor Beneficial
41 – Istanbul Airport – Muselles – Çatalca Railway Line	The planned development is of a similar nature to that of this Project, a major infrastructure project, and intersects the project at Çatalca station. As a result of these it is anticipated that social and health and safety residual effects will be of a similar nature to that of this Project, in both the construction and operation phases. During construction, similar construction activities in close proximity to one another will result in a magnified effect on land acquisition (as both Projects require the construction of rail infrastructure to connect to Catalca Station), labour and working	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise	Construction: Minor Adverse Operation: Minor Adverse

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
	conditions, employment and economy, community access, well-being and health and safety. The in-combination effect of this is not anticipated to be significant due to similarly implemented mitigation measures, and the development affecting different communities, with the exception of the intersection point at Çatalca. As a result, a **Minor Adverse** in-combination effect is anticipated in the construction phase in Çatalca. In the operation phase, the planned development, due to its nature as a connected rail link with similar mitigation measures, is anticipated to see similar residual effect of both a beneficial and adverse nature. The magnification of the residual adverse effects is anticipated to result in a **Minor Adverse** in-combination effect in the operation phase.	adverse effects through measures such as coordination of alternate access routes and considering the other project in the location of facilities.	
42 – Kuptepe Wind Power Plant Project	The planned development is a large-scale renewable energy power plant, a major piece of local infrastructure. As a result of the required large scale construction activities it is anticipated that similar social and health and safety effects will be experienced by local communities in the construction phase (in the vicinity of Kabakca). There is the potential for an in-combination effect during construction to result in a magnified effect on labour and working conditions, employment and economy, community access, well-being and health and safety. The in-combination effect of this is not anticipated to be significant due to similarly implemented mitigation measures and that there are limited residential receptors in the vicinity (the nearest settlements, İnceğiz and Gökçeali, are 1.5km south and east respectively). As a result, a **Minor Adverse** in-combination effect is anticipated during the construction phase. During operation, the planned development's effects are likely to be limited to benefits to local employment due to the relative distance of receptors from the planned development. As a result, a **Minor Beneficial** in-combination effect is anticipated in the operation phase.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as coordination of alternate access routes and considering the other project in the location of facilities.	Construction: Minor Adverse Operation: Minor Beneficial
44 - Çerkezköy – Subasi Road Project Part 2	The planned development is of a similar nature to that of this Project, a major infrastructure project (in this case a road development). As a result of these it is anticipated that social and health and safety residual effects will be of a similar nature to that of the Project, in both the construction and operation phases. During construction, in particular around Sinekli, similar construction activities have the potential to result in a magnified effect on land acquisition (as this planned development intersect the Project and will require land acquisition), labour and working conditions, employment and economy, community access, well-being and health and safety. The in-combination effect of this is not anticipated to be significant, due to similarly implemented mitigation measures and because Sinekli is the only residential area in the vicinity of both this Project and the planned development. As a result, a **Minor Adverse** in-combination effect is anticipated in the construction phase. During operation, the planned development, due to its nature as a highway, is anticipated to see similar residual effect of both a beneficial and adverse nature such as facilitating travel and economic benefits, while it also has the potential to adversely affect community access rights. The magnification of residual adverse effects is anticipated to result in a **Minor Adverse** in-combination effect in the operation phase.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as coordination of alternate access routes and considering the other project in the location of facilities.	Construction: Minor Adverse Operation: Minor Adverse
46 – Çerkezköy – Kapikule Railway	The planned development is of a similar nature to that of this Project, a major rail connection. As a result of these it is anticipated that social and health and safety residual effects will be of a similar nature to that of this Project, in both the construction and operation phases. During construction, similar construction activities will result in a magnified effect on land acquisition (as some landowners will be subject to land acquisition effects due to both Projects, although there are mitigation measures in the **RAP** to reduce the effect on these landowners), labour and working conditions, employment and economy, community access, well-being and health and safety. The in-combination effect of this is not anticipated to be significant due to similarly implemented mitigation measures and the effects not magnifying the same communities other than at Çerkezköy. As a result, a **Minor Adverse** in-combination effect is anticipated in the construction phase at Çerkezköy.	If the construction phases for both projects overlap, AYGM should liaise with the planned development contractor, as well as the relevant Turkish ministries and plan their construction activities to minimise adverse effects through measures such as coordination of alternate access routes and considering the other project in the location of facilities. TCDD who are responsible for constructing this project, are already in	Construction: Minor Adverse Operation: Minor Adverse

Planned Development	Assessment of In-Combination Effects with the Project	Mitigation	Residual in-combination Effect
	During operation, the planned development, due to its nature as a connected rail link with similar mitigation measures, is anticipated to see similar residual effect of both a beneficial and adverse nature. The magnification of residual adverse effects is anticipated to result in a **Minor Adverse** in-combination effect in the operation phase.	liaison with AYGM, so they can ensure their contractors liaise to minimise effects.	

CONCLUSIONS

17.5.8. **Table 17-7** and **Table 17-8** below summarise the In-Combination Effects in each phase of the Project. An overall in-combination effect is given for each environmental and social topic. This overall in-combination effect is based on the assumption that all planned developments are constructed.

Table 17-7 - Summary of Construction Phase In-Combination Effects

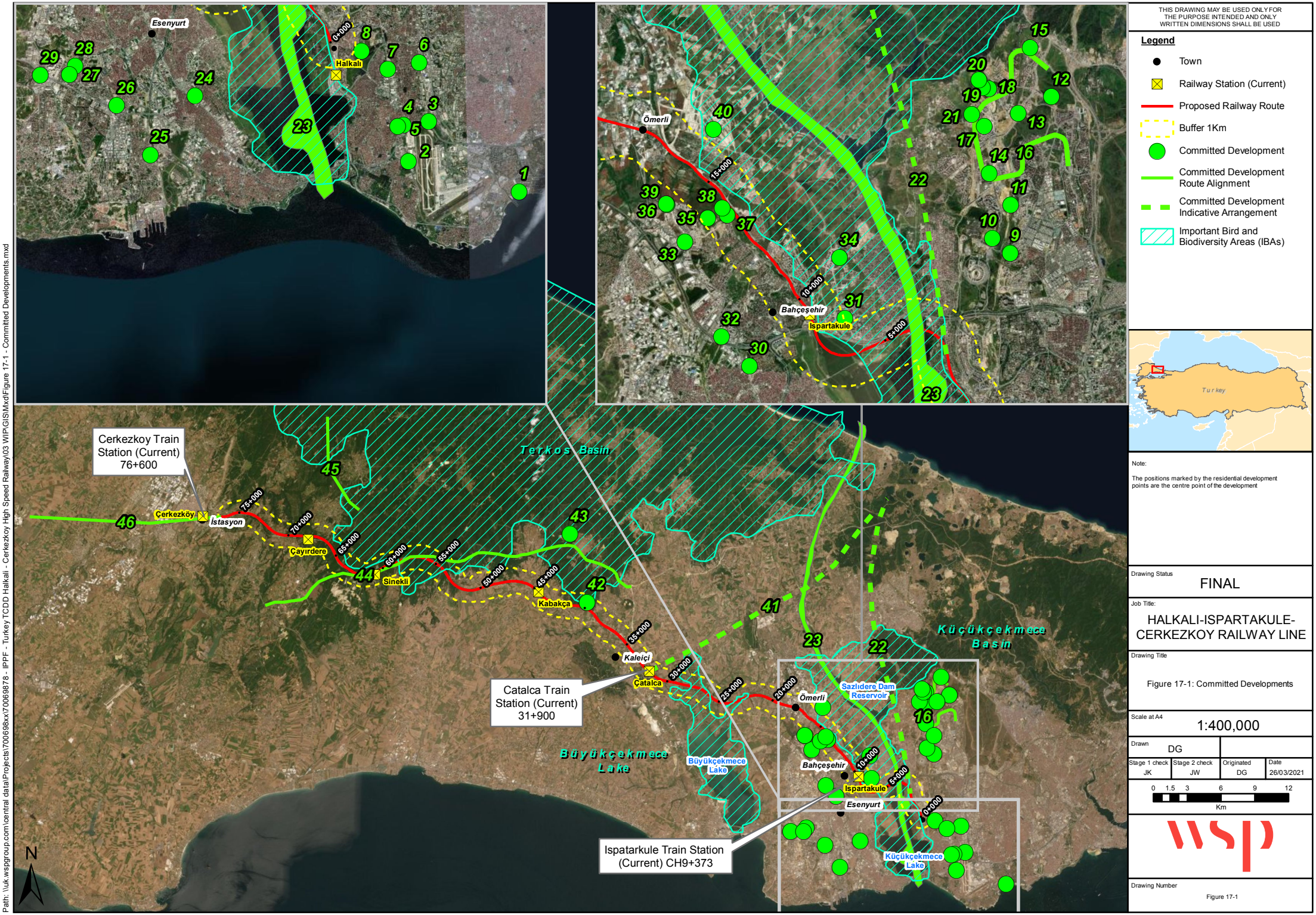
Environmental Topic	In-Combination Effects Range for Planned Developments	Mitigation Requirements	Overall Residual In-Combination Effects
Noise and Vibration	Minor Adverse (not significant): ▪ Infrastructure Projects (22, 23, 41, 42, 44 and 46); and ▪ Housing and Commercial Developments (40).	If the construction phases for the Project and these planned developments overlap the Contractors for the developments will be required to liaise and plan their construction activities to minimise the adverse effects on receptors.	Minor Adverse (not significant)
Ecology	Minor Adverse (not significant): ▪ Infrastructure Projects (42, 44 and 46) Neutral (not significant): ▪ Rail Projects (22, 23 and 41); and ▪ Housing and Commercial Developments (37 and 40)	If the construction phases for this Project and planned developments 42 and 46 overlap the Contractors for the developments will be required to liaise and plan their construction activities to minimise the adverse effects on receptors.	Minor Adverse (not significant)
Landscape and Visual	Minor Adverse (not significant): ▪ Infrastructure Projects (22, 23, 41, 42, 44 and 46); and ▪ Housing and Commercial Developments (31, 35, 37, 38 and 40).	If the construction phases for this Project and planned developments 22, 23, 31, 37, 41, 42, 44 and/or 46 overlap the Contractors for the developments will be required to liaise and plan their construction activities to minimise the adverse effects on receptors.	Minor Adverse (not significant)
Surface Water Environment	Minor Adverse (not significant): ▪ Infrastructure Projects (23, 41, 42 and 46); and ▪ Housing and Commercial Developments (26, 30, 31, 32, 35, 36, 37, 38, 39 and 40). Neutral (not significant): ▪ Housing and Commercial Developments (3, 4, 5, 6, 7, 8, 9, 10, 11, 16, 24, 33 and 34); and ▪ Infrastructure Projects (22 and 45).	None Required	Minor Adverse (not significant)
Geology and Hydrogeology	Minor Adverse (not significant): ▪ Infrastructure Projects (22, 23, 41, 42, 44 and 46); and ▪ Residential Developments (31, 35, 37, 38 and 40).	If the construction phases for the Project and planned developments 22, 23, 37, 41, 42, 44 and/or 46 overlap the Contractors for the developments will be required to liaise	Minor Adverse (not significant)

Environmental Topic	In-Combination Effects Range for Planned Developments	Mitigation Requirements	Overall Residual In-Combination Effects
		and plan their construction activities to minimise the adverse effects on receptors.	
Social	Minor Adverse (not significant): ▪ Infrastructure Projects (22, 23, 41, 42, 44 and 46); and ▪ Housing and Commercial Developments (31, 35, 37, 38 and 40).	If the construction phases for the Project and planned developments 22, 23, 37, 41, 42, 44 and/or 46 overlap the Contractors for the developments will be required to liaise and plan their construction activities to minimise the adverse effects on receptors.	Minor Adverse (not significant)

Table 17-8 - Summary of Operation Phase In-Combination Effects

Environmental Topic	In-Combination Effects range for Planned Developments	Mitigation Requirements	Overall Residual In-Combination Effects
Noise and Vibration	Minor Adverse (not significant): ▪ Infrastructure Projects (22, 23, 41, 44 and 46). Neutral (not significant): ▪ Housing and Commercial Development (40); and ▪ Energy Project (42).	None Required	Minor Adverse (not significant)
Ecology	Minor Adverse (not significant): ▪ Infrastructure Projects (23, 42, 44 and 46). Neutral (not significant): ▪ Infrastructure Projects (22 and 41); and ▪ Housing and Commercial Developments (37 and 40).	None Required	Minor Adverse (not significant)
Landscape and Visual	Minor Adverse (not significant): ▪ Residential Development (37); and ▪ Infrastructure Projects (42 and 46). Neutral (not significant): ▪ Housing and Commercial Developments (3, 4, 5, 6, 7, 8, 9, 10, 11, 24, 26, 30, 31, 32, 33, 34, 35, 36, 38, 39 and 40; and ▪ Infrastructure Projects (16, 22, 23, 41, 44 and 45).	None Required	Minor Adverse (not significant)
Surface Water Environment	Minor Adverse (not significant): ▪ Housing and Commercial Development (37); and ▪ Railway Project (46). Neutral (not significant): ▪ Residential Developments (3, 4, 5, 6, 7, 8, 9, 10, 11, 24, 26, 30, 31, 32, 33, 34, 35, 36, 38, 39 and 40)	None Required	Neutral (not significant)

Environmental Topic	In-Combination Effects range for Planned Developments	Mitigation Requirements	Overall Residual In-Combination Effects
	▪ Infrastructure Projects (16, 22, 23, 41, 42, 44 and 45).		
Social	Minor Adverse (not significant): ▪ Infrastructure Projects (22, 23, 41, 44 and 46). Minor Beneficial (not significant): ▪ Housing and Commercial Developments (31, 35, 37, 38, 40 and 42).	None Required	Minor Adverse (not significant)



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

Legend

- Town
- Railway Station (Current)
- Proposed Railway Route
- Buffer 1Km
- Committed Development
- Committed Development Route Alignment
- Committed Development Indicative Arrangement
- Important Bird and Biodiversity Areas (IBAs)

Note:

The positions marked by the residential development points are the centre point of the development

Drawing Status: FINAL

Job Title: HALKALI-ISPARTAKULE-CERKEZKOY RAILWAY LINE

Drawing Title: Figure 17-1: Committed Developments

Scale at A4: 1:400,000

Drawn			
DG			
Stage 1 check	Stage 2 check	Originated	Date
JK	JW	DG	26/03/2021

0 1.5 3 6 9 12 Km

wsp

Drawing Number: Figure 17-1

Path: \\uk.wspgroup.com\central data\Projects\700698xx\700698878 - IPPF - Turkey TCDD Halkali - Cerkezkoy High Speed Railway\03 WIP\GIS\Mxd\Figure 17-1 - Committed Developments.mxd