

Preliminary Environmental Information Report

Volume 3 Part C Route-wide Assessments

Chapter 8 Health and Wellbeing

Appendices

June 2025



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Grimsby to Walpole

Document control

Document Properties	
Organisation	Arup AECOM
Approved by	National Grid
Title	Preliminary Environmental Information Report Volume 3 Part C Route-wide Assessments Chapter 8 Health and Wellbeing Appendices
Document Register ID	GWNC-ARUP(AEC)-ENV-REP-0002
Data Classification	Public

Version History			
Date	Version	Status	Description / Changes
June 2025	1.0	Final	First Issue

8A. Health and Wellbeing Baseline Statistics

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8A. Health and Wellbeing Baseline Statistics

8A.1 Introduction

- 8A.1.1 This appendix has been produced to support **PEI Report Volume 2 Part C Chapter 8 Health and Wellbeing** in. It sets out the baseline for the basis of population, deprivation, and local health parameters.

8A.2 Health and Wellbeing Assessment

Assessment Methodology

- 8A.2.1 The Health and Wellbeing assessment has been conducted following the Institute of Environmental Management and Assessment (IEMA) guidance for Determining the Significance of Health in Environmental Impact Assessment (EIA) (Ref 1) and Effective Scoping of Human Health in EIA (Ref 2). These provide guidance for the assessment of Health and Wellbeing for addressing health inequalities and population health as environmental outcomes.

Data Sources

- 8A.2.2 The baseline information has drawn on the following key sources:
- i. Ministry of Housing, Communities and Local Government (2019) Indices of Multiple Deprivation (Ref 3);
 - ii. Office of National Statistics (ONS), (2022) Census 2021 (Ref 4);
 - iii. ONS (2023) Annual Population Survey (Ref 5);
 - iv. Office for Health Improvement and Disparities (OHID) (2022) Local Health, August 2022 Update (Ref 6);
 - v. Ordnance Survey (Accessed 2024) AddressBase Plus (Ref 7);
 - vi. Public Health England (2021-2023) Local Health, public health data for small geographic areas. (Ref 8); and
 - vii. Sustrans (Accessed 2024) Open Data Portal (Ref 9).

Study Area

- 8A.2.3 The route-wide Study Area for the assessment will vary by the type of health impact being assessed, but will include the whole spatial extent of the Grimsby to Walpole Project (the Project) given this a route-wide assessment.
- 8A.2.4 The Study Area will comprise of electoral wards in which the Project is located and residential, community and healthcare facilities and open spaces within 500 m of the

draft Order Limits and Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone). This area is considered to cover the likely extent of environmental effects arising from the construction, maintenance and/or operational activities of the Project that are likely to give rise to Health and Wellbeing impacts. Where data for the Study Area is not available at an electoral ward level, local authority level data will be provided.

- 8A.2.5 The electoral wards and local authorities are aligned with the seven ‘Sections’ of the Project route that comprise the Study Area for this assessment, as detailed in **PEI Report Volume 2 Part A Chapter 5 Project Description**. The Sections are split from north to south by the geographical proposed alignment of the draft Order Limits and Refined Siting Zone and are listed as follows:
- i. Section 1 – New Grimsby West Substation;
 - ii. Section 2 – New Grimsby West Substation to New Lincolnshire Connection Substation A;
 - iii. Section 3 – New Lincolnshire Connection Substations A and B;
 - iv. Section 4 – New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone;
 - v. Section 5 – Refined Weston Marsh Substation Siting Zone;
 - vi. Section 6 – Refined Weston Marsh Substation Siting Zone to New Walpole B Substation; and
 - vii. Section 7- New Walpole B Substation.
- 8A.2.6 The Study Area sits alongside corresponding regions of Yorkshire and the Humber (region for North East Lincolnshire), East Midlands (region for East Lindsey, West Lindsey, Boston and South Holland) and East of England (region for Fenland and King’s Lynn and West Norfolk) and the national comparator of England.
- 8A.2.7 **Table 8A.1** below sets out the electoral wards and local authorities each Section of the Project passes through.

Table 8A.1 Electoral wards and local authorities within Grimsby to Walpole Sections 1-7

Section	Section Name	Ward	Local Authority
1	New Grimsby West Substation	<ul style="list-style-type: none"> Wolds Freshney Caistor and Yarborough 	North East Lincolnshire West Lindsey
2	New Grimsby West Substation to New Lincolnshire Connection Substation A	<ul style="list-style-type: none"> Wolds Waltham South (North East Lincolnshire) Holton-le-Clay and North Thoresby Fulstow Grimoldby 	North East Lincolnshire East Lindsey

Section	Section Name	Ward	Local Authority
		<ul style="list-style-type: none"> Legbourne Withern and Theddlethorpe 	
3	New Lincolnshire Connection Substations A and B	<ul style="list-style-type: none"> Withern and Theddlethorpe Alford 	East Lindsey
4	New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone	<ul style="list-style-type: none"> Alford Willoughby with Sloothby Chapel St. Leonards Ingoldmells Burgh le Marsh Croft Wainfleet Friskney Halton Holegate Sibsey and Stickney Swineshead and Holland Fen Kirkton and Frampton Five Village Old Leake and Wrangle Donington, Quadring and Gosberton Pinchbeck and Surfleet Mouton, Weston and Cowbit 	East Lindsey Boston South Holland
5	Refined Weston Marsh Substation Siting Zone	<ul style="list-style-type: none"> Mouton, Weston and Cowbit Pinchbeck and Surfleet 	South Holland
6	Refined Weston Marsh Substation Siting Zone to New Walpole B Substation	<ul style="list-style-type: none"> Mouton, Weston and Cowbit Spalding St Paul's Ward Whaplode and Holbeach St John's Fleet Gedney The Saints Leverington Long Sutton Walsoken, West Walton and Walpole 	South Holland Fenland King's Lynn and West Norfolk

Section	Section Name	Ward	Local Authority
7	New Walpole B Substation	<ul style="list-style-type: none"> Walsoken, West Walton and Walpole 	King's Lynn and West Norfolk

8A.2.8 **Table 8A.2** below provides a summary of the communities based within each Section.

Table 8A.2 Communities within Grimsby to Walpole Sections 1-7

Section	Section Name	Communities
1	New Grimsby West Substation	<ul style="list-style-type: none"> Grimsby
2	New Grimsby West Substation to New Lincolnshire Connection Substation A	<ul style="list-style-type: none"> Laceby Barnoldby le Beck Brigsley Ashby cum fenby North Thoresby Covenham St Mary Yarburgh Alvingham Little Carlton Withern Tothill
3	New Lincolnshire Connection Substation A and B	<ul style="list-style-type: none"> Saleby Thoresthorpe Bilsby Asserby Turn
4	New Lincolnshire Connection Substation B to Refined Weston Marsh Substation	<ul style="list-style-type: none"> Thurlby Sloothby Hogsthorpe Small settlements east of Burgh Le Marsh Irby in the March Thorpe Fendyke Hobhole Drain and Fodder Dike Bank Northlands Frithville Gipsey Bridge Langrick Bridge Brothertoft Hubberts Bridge

Section	Section Name	Communities
		<ul style="list-style-type: none"> • Kirton End • Wigtoft • Burtoft • Bicker Haven
5	Refined Weston Marsh Substation	<ul style="list-style-type: none"> • Weston
6	Refined Weston Marsh Substation to New Walpole B Substation	<ul style="list-style-type: none"> • Weston • Spalding • Low Fulney • Moulton • Whaplode • Whaplode Fen • Whaplode St Catherine • Holbeach St Johns • Newton- in - the Isle • Tydd St Giles • Tydd Gote • Four Gotes • Ingleborough
7	New Walpole B Substation	<ul style="list-style-type: none"> • Walton

8A.3 Health and Wellbeing Baseline

- 8A.3.1 The results of the baseline data collection are presented below in **Table 8A.3 – 8A.24**. These results are discussed within **PEI Report Volume 2 Part C Chapter 8 Health and Wellbeing**.

Section 1: New Grimsby West Substation

Table 8A.3 Electoral wards and local authorities within Section 1 - Population breakdown by age

	Wolds	Freshney	Caistor and Yarborough	North East Lincolnshire	West Lindsey	East Midlands	Yorkshire and the Humber	England
Population (2021)	7,800	9,300	5,600	157,000	95,000	4,880,000	5,480,800	56,490,000
Population under 16 (per cent) (2021)	17	17	16	19	17	18	19	19
Population 16 – 64 (per cent) (2021)	60	60	57	60	58	63	62	63
Population aged 65 and over (per cent) (2021)	23	23	27	21	25	19	19	18

Table 8A.4 Local authorities within Section 1 - Economic activity indicators

	North East Lincolnshire	West Lindsey	East Midlands	Yorkshire and the Humber	England
Economic activity rate (per cent) (2021)	55	54	58	56	59
Unemployment rate (per cent) (2021)	3	2	2	3	3
Average employment deprivation decile	4		-	-	6

Table 8A.5 Electoral wards and local authorities within Section 1 - Health indicators

	Wolds	Freshney	Caistor and Yarborough	North East Lincolnshire	West Lindsey	East Midlands	Yorkshire and the Humber	England
General Health – Not Good (per cent) (2021) ¹	18	22	19	22	20	19	20	18
Disability (per cent under the Equality Act) (2021)	17	19	20	20	21	18	19	18
Overweight and obese children (reception year) (per cent) (2020/21 – 2022/23)	22	25	23	21	24	22	23	22
Emergency hospital admissions for COPD standardised ratio - per 100 (2020/21)	47	121	74	116	77	-	-	100
Deaths from respiratory diseases, all ages (SMR) (2016-20)	81	90	102	106	84	-	-	100
Life expectancy at birth (Male) (2018-2020)	81	78	81	78	80	78	-	80
Life expectancy at birth (Female) (2018-2020)	83	82	86	82	84	82	-	83
Deprivation (per cent)	-	-	-	31	20	20	26	22
Personal well-being estimates: Anxiety measure	-	-	-	3	3	3	3	3
Personal well-being estimates: Happiness measure	-	-	-	8	8	7	7	7
Personal well-being estimates: Life Satisfaction measure (/10)	-	-	-	8	8	7	7	7

¹ General Health – Not good (per cent) value was calculated by adding the values: fair, bad and very bad

	Wolds	Freshney	Caistor and Yarborough	North East Lincolnshire	West Lindsey	East Midlands	Yorkshire and the Humber	England
Personal well-being estimates: Worthwhile - measure	-	-	-	8	8	8	8	8

Section 2: New Grimsby West Substation to New Lincolnshire Connection Substation A

Table 8A.6 Electoral wards and local authorities within Section 2 - Population breakdown by age

	Waltham	Wolds	South	Fulstow	Grimoldby	Holton-le-Clay and North Thoresby Legbourne	Withern and Theddlesthorpe	North East Lincolnshire	East Lindsey	East Midlands	Yorkshire and the Humber	England	
Population (2021)	6,800	7,800	12,500	2,800	2,300	5,000	2,200	2,500	157,000	157,000	4,880,000	5,480,800	56,490,000
Population under 16 (per cent) (2021)	14	17	24	14	16	15	14	11	19	15	18	19	19
Population 16 – 64 (per cent) (2021)	55	60	61	54	56	56	55	53	60	55	63	62	63
Population aged 65 and over (per cent) (2021)	32	23	16	31	28	29	31	36	21	30	19	19	18

Table 8A.7 Local authorities within Section 2 Economic activity indicators

	North East Lincolnshire	East Lindsey	East Midlands	Yorkshire and the Humber	England
Economic activity rate (per cent) (2021)	55	48	58	56	59
Unemployment rate (per cent) (2021)	3	3	2	3	3

	North East Lincolnshire	East Lindsey	East Midlands	Yorkshire and the Humber	England
Average employment deprivation decile	4	3	-	-	6

Table 8A.8 Electoral wards and local authorities within Section 2 - Health indicators

	Waltham	Wolds	South	Fulstow	Grimoldby	Holton-le-Clay and Thoresby	Legbourne	Withern and Theddlethorpe	North East Lincolnshire	East Lindsey	East Midlands	Yorkshire and the Humber	England
General Health – Not Good (per cent) (2021) ²	19	18	26	21	22	19	21	28	22	26	19	20	18
Disability (per cent under the Equality Act) (2021)	18	17	25	22	21	19	19	27	20	25	18	19	18
Overweight and obese children (reception year) (per cent) (2020/21 – 2022/23)	25	22	30	20	31	18	23	-	21	23	22	23	22
Emergency hospital admissions for COPD standardised ratio - per 100 (2020/21)	77	47	234	-	41	65	38	64	116	105	-	-	100
Deaths from respiratory diseases, all ages (SMR) (2016-20)	82	81	140	47	71	74	57	86	106	109	-	-	100

² General Health – Not good (per cent) value was calculated by adding the values: fair, bad and very bad

	Waltham	Wolds	South	Fulstow	Grimoldby	Holton-le-Clay and Thoresby	Legbourne	Withern and Theddlethorpe	North East Lincolnshire	East Lindsey	East Midlands	Yorkshire and the Humber	England
Life expectancy at birth (Male) (2018-2020)	80	81	75	81	83	82	80	80	78	79	78	-	80
Life expectancy at birth (Female) (2018-2020)	85	83	79	87	83	84	86	85	82	81	82	-	83
Deprivation (per cent)	-	-	-	-	-	-	-	-	31	30	20	26	22
Personal well-being estimates: Anxiety measure	-	-	-	-	-	-	-	-	3	2	3	3	3
Personal well-being estimates: Happiness measure	-	-	-	-	-	-	-	-	8	8	7	7	7
Personal well-being estimates: Life Satisfaction measure (/10)	-	-	-	-	-	-	-	-	8	8	7	7	7
Personal well-being estimates: Worthwhile measure	-	-	-	-	-	-	-	-	8	8	8	8	8

Section 3 – New Lincolnshire Connection Substations A and B

Table 8A.9 Electoral wards and local authorities within Section 3 - Population breakdown by age

	Alford	Withern and Theddlethorpe	East Lindsey	East Midlands	England
Population (2021)	4,900	2,500	142,300	4,880,000	56,490,000
Population under 16 (per cent) (2021)	17	11	15	18	19
Population 16-64 (per cent) (2021)	54	53	55	63	63
Populations aged 65 and over (per cent) (2021)	29	36	30	19	18

Table 8A.10 Local authorities within Section 3 - Economic activity indicators

	East Lindsey	East Midlands	England
Economic activity rate per cent (2021)	47	58	59
Unemployment rate per cent (2021)	3	2	3
Average employment deprivation decile	3	-	6

Table 8A.11 Electoral wards and local authorities within Section 3 - Health indicators

	Alford	Withern and Theddlethorpe	East Lindsey	East Midlands	England
General Health- Not good (per cent) (2021)	27	28	26	19	18
Disability (per cent under the Equality Act) (2021)	26	27	25	18	17
Reception prevalence of overweight (including obesity), 3 years data combined (2020/2021 - 2022/23)	25	-	23	22	22
Emergency hospital admissions for COPD standardised ratio -- per 100 (2020/21)	79	64	105	-	100
Deaths from Respiratory diseases, all ages (SMR) (2016- 20)	147	86	109	-	100
Life expectancy at birth (Male) (2018-20)	79	80	79	78	79
Life expectancy at birth (Female) (2018-20)	83	85	81	82	83
Deprivation (per cent)	-	-	30	20	22
Personal well-being estimates: Anxiety measure	-	-	2	3	3
Personal well-being estimates: Happiness measure	-	-	8	7	7
Personal well-being estimates: Life Satisfaction measure (/10)	-	-	8	7	7
Personal well-being estimates: Worthwhile measure	-	-	8	8	8

Section 4 – New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone

Table 8A.12 Electoral wards and local authorities within Section 4 - Population breakdown by age

	Population (2021)	Population Under 16 (per cent) (2021)	Population 16-64 (per cent) (2021)	Population Aged 65 and over (per cent) (2021)
Alford	4,900	17	54	29
Willoughby with Sloothby	2,400	10	54	36
Chapel St Leonards	4,700	10	48	42
Ingoldmells	2,300	11	56	34
Burgh le Marsh	2,600	14	51	35
Croft	2,400	13	57	31
Wainfleet	2,700	17	55	28
Friskney	2,300	15	57	29
Halton Holegate	2,600	11	55	34
Sibsey and Stickney	5,100	14	56	30
East Lindsey	142,300	15	55	30
Swineshead and Holland Fen	4,300	17	59	24
Kirton and Frampton	7,400	19	58	23

	Population (2021)	Population Under 16 (per cent) (2021)	Population 16-64 (per cent) (2021)	Population Aged 65 and over (per cent) (2021)
Five Village	4,100	16	57	27
Old Leake and Wrangle Ward	3,600	16	56	28
Boston	70,500	18	61	20
Donington, Quadring and Gosberton	7,400	17	56	27
Pinchbeck and Surfleet	7,400	17	58	25
Moulton, Weston and Cowbit	7,300	17	58	25
South Holland	95,100	17	60	23
East Midlands	48,80,100	18	63	19
England	5,6490,000	19	63	18

Table 8A.13 Local authorities within Section 4 - Economic activity indicators

	Boston	East Lindsey	South Holland	East Midlands	England
Economic activity rate (per cent) (2021)	60	48	59	58	59
Unemployment rate (per cent) (2021)	-	-	-	4	4
Average employment deprivation decile	5	3	5	-	6

Table 8A.14 Electoral wards and local authorities within Section 4 - Health indicators

	General Health- Not good (per cent) (2021)	Disability (per cent under the Equality Act) (2021)	Reception prevalence of overweight (including obesity), 3 years data combined (2020/2021 - 2022/23)	Emergency hospital admissions for COPD standardised ratio -- per 100 (2020/21)	Deaths from Respiratory diseases, all ages (SMR) (2016- 20)	Life expectancy at birth (Male) (2018-20)	Life expectancy at birth (Female) (2018-20)	Deprivation (per cent)	Personal well-being estimates: Anxiety measure	Personal well-being estimates: Happiness measure	Personal well-being estimates: Life Satisfaction measure (/10)	Personal well-being estimates: Worthwhile measure
Alford	27	26	25	79	147	79	83	-	-	-	-	-
Willoughby with Sloothby	27	26	-	56	117	78	85	-	-	-	-	-
Chapel St Leonards	39	34	29	173	163	73	79	-	-	-	-	-
Ingoldmells	39	32	-	262	200	72	76	-	-	-	-	-
Burgh le Marsh	27	23	17	91	81	76	85	-	-	-	-	-
Croft (East Lindsey)	24	22	-	51	161	79	83	-	-	-	-	-
Wainfleet	30	27	21	68	121	78	81	-	-	-	-	-
Friskney	29	27	30	58	112	78	85	-	-	-	-	-
Halton Holegate	27	27	-	112	93	81	83	-	-	-	-	-
Sibsey and Stickney	23	22	24	95	92	79	83	-	-	-	-	-

	General Health- Not good (per cent) (2021)	Disability (per cent under the Equality Act) (2021)	Reception prevalence of overweight (including obesity), 3 years data combined (2020/2021 - 2022/23)	Emergency hospital admissions for COPD standardised ratio -- per 100 (2020/21)	Deaths from Respiratory diseases, all ages (SMR) (2016- 20)	Life expectancy at birth (Male) (2018-20)	Life expectancy at birth (Female) (2018-20)	Deprivation (per cent)	Personal well-being estimates: Anxiety measure	Personal well-being estimates: Happiness measure	Personal well-being estimates: Life Satisfaction measure (/10)	Personal well-being estimates: Worthwhile measure
East Lindsey	26	25	23	105	109	79	81	30	2	8	8	8
Five Village	25	23	17	98	84	77	88	-	-	-	-	-
Kirton and Frampton	22	19	20	97	101	79	81	-	-	-	-	-
Swineshead and Holland Fen	22	20	22	129	77	80	86	-	-	-	-	-
Old Leake and Wrangle	24	22	22	109	143	78	83	-	-	-	-	-
Boston	21	18	24	98	103	78	82	20				
Donington, Quadring and Gosberton	22	21	21	49	94	78	82	-	-	-	-	-
Moulton, Weston and Cowbit	21	19	29	61	79	81	84	-	-	-	-	-
Pinchbeck and Surfleet	19	18	20	65	91	82	86	-	-	-	-	-
South Holland	20.9	18.8	24.3	82.8	93.6	79.7	83.2	18	2	8	8	8

	General Health- Not good (per cent) Disability (per cent under the Equality Act) (2021) Reception prevalence of overweight (including obesity), 3 years data combined (2020/2021 - 2022/23) Emergency hospital admissions for COPD standardised ratio -- per 100 (2020/21) Deaths from Respiratory diseases, all ages (SMR) (2016- 20) Life expectancy at birth (Male) (2018-20) Life expectancy at birth (Female) (2018-20) Deprivation (per cent) Personal well-being estimates: Anxiety measure Personal well-being estimates: Happiness measure Personal well-being estimates: Life Satisfaction measure (/10) Personal well-being estimates: Worthwhile measure											
East Midlands	19	18.3	21.8	-	-	77.8	82.4	20	3	7	7	8
England	17.9	17.3	22.1	100	100	78.9	82.8	22	3	7	7	8

Section 5 – Refined Weston Marsh Substation Siting Zone

Table 8A.15 Electoral wards and local authorities within Section 5 - Population breakdown by age

	Pinchbeck and Surfleet	Moulton, Weston and Cowbit	South Holland	East Midlands	England
Population (2021)	7,300	7,300	95,100	4,880,100	56,490,000
Population under 16 (per cent) (2021)	17	17	17	18	19
Population 16-64 (per cent) (2021)	58	58	59	63	63
Population aged 65 and over (per cent) (2021)	25	25	24	19	18

Table 8A.16 Local authorities within Section 5 - Economic activity indicators

	South Holland	East Midlands	England
Economic activity rate (per cent) (2021)	59	58	59
Unemployment rate (per cent) (2021)	-	4	4
Average employment deprivation decile	5	-	6

Table 8A.17 Electoral wards and local authorities within Section 5 - Health indicators

	Pinchbeck and Surfleet	Moulton, Weston and Cowbit	South Holland	East Midlands	England
General Health- Not good (per cent) (2021)	19	21	21	19	18
Disability (per cent under the Equality Act) (2021)	18	19	19	18	17

	Pinchbeck and Surfleet	Moulton, Weston and Cowbit	South Holland	East Midlands	England
Reception prevalence of overweight (including obesity), 3 years data combined (2020/2021 - 2022/23)	20	29	24	22	22
Emergency hospital admissions for COPD standardised ratio - per 100 (2020/21)	65	61	83	-	100
Deaths from Respiratory diseases, all ages (SMR) (2016- 20)	91	79	94	-	100
Life expectancy at birth (Male) (2018-20)	82	81	80	-	80
Life expectancy at birth (Female) (2018-20)	86	84	83	-	83
Deprivation (per cent)	-	-	18	20	22
Personal well-being estimates: Anxiety measure	-	-	2	3	3
Personal well-being estimates: Happiness measure	-	-	8	7	7
Personal well-being estimates: Life Satisfaction measure (/10)	-	-	8	7	7
Personal well-being estimates: Worthwhile measure	-	-	8	8	8

Section 6 – Refined Weston Marsh Substation Siting Zone to New Walpole B Substation

Table 8A.18 Electoral Wards within Section 6 - Population breakdown by age

	Population (2021)	Population Under 16 (per cent) (2021)	Population 16-64 (per cent) (2021)	Population Aged 65 and over (per cent) (2021)
Fleet	2,460	13	55	32
Gedney	2,310	16	57	28
Moulton, Weston and Cowbit	7,300	17	58	25
Spalding St Paul's	5,600	18	63	19
The Saints	2,700	17	60	23
Whaplode and Holbeach St John's	4,300	14	58	29
Long Sutton	7,600	15	52	32
South Holland	95,100	17	59	24
Roman Bank	6,808	15	56	30
Fenland	102,459	17	60	23
East Midlands	4,880,100	18	63	19
England	56,490,047	19	63	18

Table 8A.19 Local authorities within Section 6 - Economic activity indicators

	Fenland	South Holland	East Midlands	England
Economic activity rate (per cent) (2021)	57	59	58	59
Unemployment rate (per cent) (2021)	2	2	2	3
Average employment deprivation decile	4	5	-	6

Table 8A.20 Electoral wards and local authorities within Section 6 - Health indicators

	General Health- Not good (per cent) (2021)	Disability (per cent under the Equality Act) (2021)	Reception prevalence of overweight (including obesity), 3 years data combined	Emergency hospital admissions for COPD standardised ratio per 100 (2020/21)	Deaths from Respiratory diseases, all ages (SMR) (2016- 20)	Life expectancy at birth (Male) (2018-20)	Life expectancy at birth (Female) (2018-20)	Deprivation (per cent)	Personal well-being estimates: Anxiety measure	Personal well-being estimates: Happiness measure	Personal well-being estimates: Life Satisfaction measure (/10)	Personal well-being estimates: Worthwhile measure
Fleet	25	23	30	178	89	75	79	-	-	-	-	-
Gedney	23	23	30	143	94	80	83	-	-	-	-	-
Moulton, Weston and Cowbit	21	19	29	61	79	81	84	-	-	-	-	-
Spalding St Paul's	20	18	28	101	79	80	84	-	-	-	-	-
The Saints	22	20	23	62	108	83	85	-	-	-	-	-

	General Health- Not good (per cent) (2021)	Disability (per cent under the Equality Act) (2021)	Reception prevalence of overweight (including obesity), 3 years data combined	Emergency hospital admissions for COPD standardised ratio per 100 (2020/21)	Deaths from Respiratory diseases, all ages (SMR) (2016- 20)	Life expectancy at birth (Male) (2018-20)	Life expectancy at birth (Female) (2018-20)	Deprivation (per cent)	Personal well-being estimates: Anxiety measure	Personal well-being estimates: Happiness measure	Personal well-being estimates: Life Satisfaction measure (/10)	Personal well-being estimates: Worthwhile measure
Whaplode and Holbeach St John's	23	21	31	73	94	82	81	-	-	-	-	-
Long Sutton	26	23	24	103	119	78	84	-	-	-	-	-
South Holland	21	19	24	83	94	80	83	18	2	8	8	8
Roman Bank	24	22	24	102	100	80	85	-	-	-	-	-
Fenland	22	20	24	136	112	78	82	25	-	-	-	-
East of England	17	17	21	-	-	-	-	17	3	7	8	8
England	18	17	22	100	100	80	83	22	3	7	7	8

Section 7 – New Walpole B Substation

Table 8A.21 Electoral wards and local authorities within Section 7 - Population breakdown by age

	Walsoken, West Walton and Walpole	King's Lynn and West Norfolk	Norfolk	East of England	England
Population (2021)	6,100	154,300	916,100	6,335,100	56,490,100
Population under 16 (per cent) (2021)	16	17	16.	19	19
Population 16-64 (per cent) (2021)	59	58	59	62	63
Population aged 65 and over (per cent) (2021)	24	26	24	20	18

Table 8A.22 Local authorities within Section 7 - Economic activity indicators

	King's Lynn and West Norfolk	Norfolk	East of England	England
Economic activity rate - (per cent) (2021)	55	55	60	79
Unemployment rate - (per cent) (2021)	2	2	3	3
Average employment deprivation decile	5	-	-	6

Table 8A.23 Electoral wards and local authorities within Section 7 - Health indicators

	Walsoken, West Walton and Walpole	King's Lynn and West Norfolk	East of England	England
General Health- Not good (per cent) (2021)	22	21	17	18
Disability (per cent under the Equality Act) (2021)	21	20	17	17

	Walsoken, West Walton and Walpole	King's Lynn and West Norfolk	East of England	England
Reception prevalence of overweight (including obesity), 3 years data combined (2020/2021 - 2022/23)	34.4	24.6	20.8	22.1
Emergency hospital admissions for COPD standardised ratio - per 100 (2020/21)	194	126	-	100
Deaths from Respiratory diseases, all ages (SMR) (2016- 20)	142	105.2	-	100
Life expectancy at birth (Male) (2018-20)	78.5	79.7	-	79.5
Life expectancy at birth (Female) (2018-20)	81.6	82.7	-	83.2
Deprivation (per cent)	-	-	17	22
Personal well-being estimates: Anxiety measure	-	-	3	3
Personal well-being estimates: Happiness measure	-	-	7	7
Personal well-being estimates: Life Satisfaction measure (/10)	-	-	8	7
Personal well-being estimates: Worthwhile measure	-	-	8	8

8A.4 Health and Social Infrastructure

Table 8A.24 Health and social infrastructure receptors

Name of receptor	Type	Address
Section 1		
Healing Academy	Secondary School	Low Road, Grimsby, DN41 7QD
Diana, Princess of Wales Hospital	General Hospital	Scartho Road Grimsby
Wybers Wood Pharmacy	Pharmacy	324 Wybers Wood Pharmacy, St Nicholas Dr, Grimsby DN37 9SF
Physio Works	Physiotherapist	367 St Nicholas Dr, Grimsby DN37 9RD

Name of receptor	Type	Address
Church View Care Home	Care home	46 Aylesby Road, Grimsby DN37 9NT
Wybers Wood Academy	Primary school	Timberley Dr, Grimsby DN37 9QZ

Section 2

Cloverdale Residential Care Home	Care home	68 Butt Lane, Laceby, DN37 7AH
Emerald House Care Home	Care home	Grange Farm, Waltham Road, Barnoldby Le Beck, DN37 0AP
The Thomas Centre	Residential holiday park for people and families with extra needs	Westfield Road, Covenham, St Bartholomew, LN11 0PB
Hands-on-Therapy	Physiotherapist	Barn Cottage, Withern Roads, Aby, Alford, LN13 0DG
Fulstow County Community Primary School and Playing Fields	Primary School	Churchthorpe, Louth LN11 0XL
InShape Gym	Gym	Eastfield Farm Cottage, Manby Rd, Stewton, Louth LN11 8XG
Ashtree House Assisted Living Residence	Care Home	Church Ln, Withern, Alford LN13 0NG

Section 3

No health or social infrastructure relevant to this assessment identified.

Section 4

The Gables Care Home	Care home	Willoughby Road, Cumberworth, Alford, Lincolnshire
Frithville Primary School	Primary School	West Fen Drainside, Frithville PE22 7EX
Gipsey Bridge Academy	Primary school	2 Leagate Rd, Gipsey Bridge, Boston PE22 7BP
Gipsey Bridge Pre School	Nursery school	Leagate Rd, Gipsey Bridge, Boston PE22 7BP

Name of receptor	Type	Address
Sullivans Pallative Care	Healthcare	Little Owl Cottage, Bye Ln, Boston PE20 3SE
Bridge View Osteopath	Healthcare	Tranmead, Swineshead Rd, Frampton Fen, Boston PE20 1SG

Section 5

No health or social infrastructure relevant to this assessment identified.

Section 6

Ingleborough Care Farm (currently closed)	Therapy	Mill Road, West Walton PE14 7EU
Kinderley Community Primary School	School	Church Lane, Wisbech PE13 5LG
ABC Pre school	School	Church Lane, Wisbech PE13 5LG

Section 7

No health or social infrastructure relevant to this assessment identified.

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8B. Health and Wellbeing Evidence Review

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8B. Health and Wellbeing Evidence Review

8B.1 Summary

- 8B.1.1 This document provides a commentary on the links between the health determinants (environmental, social and economic factors that influence health) and health requirements, and provides commentary on the resulting effects on health and wellbeing based on a review of available literature. Health inequalities exist across a range of dimensions or characteristics, including but not exclusive to the Equality Act protected characteristics, socio-economic position, life course stages and geography (Ref 1). Addressing impacts on this outcome (that is each of the affected population characteristics) is useful to understand the effect on population and spatial inequalities to target where actions can be beneficial and help monitor effects on people's general health and wellbeing over time.
- 8B.1.2 The topics that have been scoped in for this evidence review are:
- i. Employment and income.
 - ii. Neighbourhood quality:
 - Air quality;
 - Traffic;
 - Noise; and
 - Visual.
 - iii. Access to services:
 - Healthcare; and
 - Education.
 - iv. Access to promoted recreational routes, green spaces and physical activity.
 - v. Electromagnetic fields (EMF).

8B.2 Commentary on Evidence for Health Determinants

Introduction

- 8B.2.1 This document provides a commentary on the links between the health determinants (environmental, social and economic factors that influence health) that are assessed in the Health and Wellbeing Assessment presented in **PEI Report Volume 2 Part C Chapter 8 Health and Wellbeing**. It provides commentary on the resulting effects on health and wellbeing based on a review of available literature.

Health Inequalities

- 8B.2.2 Health inequalities exist across a range of dimensions or characteristics, including but not exclusive to the Equality Act (Ref 1) protected characteristics, socio-economic position, life course stages and geography . These can be affected by different experiences of wider determinants of health, such as a combination of amenity, access and socio-economic effects (Ref 20)Addressing impacts on this outcome (that is each of the affected population characteristics) is useful to understand the effect on population and spatial inequalities to target where actions can be beneficial and help monitor effects on people’s general health and wellbeing over time.
- 8B.2.3 The population baseline (detailed in **PEI Report Volume 3 Appendix 8A Health and Wellbeing Baseline Statistics**) shows that the Grimsby to Walpole Project (the Project) is set in an area which has a higher than national average proportion of older people. Older people (aged 65 and over) can experience differential impacts on their health and wellbeing through factors such as increased noise and poorer air quality.
- 8B.2.4 Employment is a key factor when determining health and wellbeing, as secure jobs and wages are linked with improved mental and physical health outcomes, and work can provide social interaction and a sense of contribution. Populations within Section 1 New Grimsby West Substation and Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A of the Project both have an unemployment rate higher (please refer to **PEI Report Volume 3 Appendix 8A Health and Wellbeing Baseline Statistics**) than the national average and may then be particularly impacted by any changes to employment during the Project.
- 8B.2.5 Disabled people may experience differential impacts related to neighbourhood quality, employment, access to open space, and access to healthcare due to the intersection of their specific needs. All Sections of the Project, excluding Section 1 New Grimsby West Substation and Section 5 Refined Weston Marsh Substation Siting Zone, have a higher proportion of disabled residents.
- 8B.2.6 Protection of the public’s health through links to neighbourhood quality on issues such as air, noise and light pollution are determinants that require consideration. Addressing impacts on this outcome can help identify, assess, and control factors in the environment that protects the public’s health.

Employment and Income

- 8B.2.7 The World Health Organisation (WHO) (Ref 2) highlights income and social status as a key determinant affecting the health of individuals and communities, stating that ‘higher income and social status are linked to better health’ and ‘the greater the gap between the richest and poorest people, the greater the differences in health.’ Similarly, the Marmot Review (Ref 3) indicated that ‘being in good employment is protective of health’ and ‘conversely, unemployment contributes to poor health’. An updated review published in 2020 (Ref 4) linked a fall in life expectancy in the most deprived communities outside London to ‘the conditions in which people are born, grow, live, work and age and inequities in power, money and resources – the social determinants of health’ and also stated that the ‘poorest areas have the highest preventable mortality rates and the richest areas have the lowest’.
- 8B.2.8 The Public Health England (PHE) Health Profile for England (Ref 5) stated that ‘many physical and mental health outcomes improve incrementally as income rises’ and that ‘income is related to life expectancy, disability free life expectancy, self-reported health and a range of biomarkers’. It also states that ‘the relationship operates

through a variety of mechanisms’ and ‘financial resources determine the extent to which a person can both invest in goods and services which improve health, such as access to health foods and gym memberships and purchase goods and services which are bad for health, such as cigarettes and alcohol’. Low incomes are said to ‘prevent active participation in social life and day to day activities, affecting feelings of self-worth and status.’ Commenting on the impacts of work on health, the report states that ‘on the whole, work is good for mental and physical health’ and ‘in addition to the health benefits associated with an adequate wage, work can provide valuable social interactions, a place to develop and practice skills, and a sense of social participation and contribution to society.’

- 8B.2.9 Based on the literature reviewed, the evidence linking income and employment to health and wellbeing is considered to be strong.

Neighbourhood Quality

- 8B.2.10 The following paragraphs outline how various considerations can have an impact on people’s health and wellbeing, as found in the existing literature.

Air quality

- 8B.2.11 Poor air quality causes a wide range of negative effects on people in the immediate surroundings. Outdoor air pollution is recognised by the WHO (Ref 6) as a major environmental health problem for all countries. The health effects of air pollution are complex, and range in severity of impact. In some cases, damage can be gradual and may not become apparent for many years.
- 8B.2.12 PHE Guidance (Ref 7) states that poor air quality is the largest environmental risk to public health in the UK, noting that ‘studies have shown that long-term exposure to air pollution (over years or lifetimes) reduces life expectancy, mainly due to cardiovascular and respiratory diseases and lung cancer’. The guidance also states that ‘short-term exposure (over hours or days) to elevated levels of air pollution can also cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in respiratory and cardiovascular hospital admissions and mortality’ and that ‘air pollutants can impact the eyes, nose, throat and heart as well as the lungs as respiratory system.’
- 8B.2.13 There are three main conditions associated with air pollution, which are respiratory conditions (such as asthma), cardiovascular disease (CVD), and lung cancer, and there is emerging evidence for associations with low birth weight and type 2 diabetes (Ref 7). One third of deaths from stroke, lung cancer and heart disease are due to air pollution, with nine out of ten people throughout the globe now breathing polluted air, which kills seven million people every year globally (Ref 7). There is also emerging evidence of associations between poor air quality, and poor mental health and mental disorders including bipolar and depression and Alzheimer’s (Ref 7), with studies hypothesising that pollutants affect the human brain via neuroinflammatory pathways.
- 8B.2.14 Construction works are a major source of air pollution, and is one of the highest contributing sectors to emissions, second only to transport (Ref 7).
- 8B.2.15 Furthermore, the evidence linking air quality to health and wellbeing is considered to be strong.

- 8B.2.16 As a result, the Project could impact air pollution which may impact health and wellbeing.

Noise

- 8B.2.17 Guidance published by the WHO (Ref 8) states that ‘excessive noise seriously harms human health and interferes with people’s daily activities at school, at work, at home and during leisure time.’ The guidance also notes that ‘it can disturb sleep, cause cardiovascular and psychophysiological effects, reduce performance and provoke annoyance responses and changes in social behaviour.’
- 8B.2.18 Noise pollution affects human health most commonly through Noise Induced Hearing Loss (NIHL), and in other cases exposure to loud noise can also cause high blood pressure, heart disease, sleep disturbances, and stress. General effects include fatigue, interference with communication and sleep, reduced efficiency and damaged hearing, while biological effects include constriction of blood vessels, tightening of muscles, increased heart rate and blood pressure and changes in stomach and abdomen movement. Regular exposure to noise, or exposure to very loud noise, can cause temporary or permanent hearing damage (Ref 8).
- 8B.2.19 There is also emerging evidence suggesting a negative association between noise exposure and mental health outcomes such as emotional distress and sleep disturbance in adults and children, particularly in low-income groups (Ref 8). Moreover, a 2014 study found traffic noise exposure to be one of the greatest environmental risk factors impacting public health, citing negative health impacts including sleep disturbance and ischemic heart disease (Ref 8).
- 8B.2.20 Noise-associated health problems impact all age groups, but particularly children. Many children who live near noisy airports or streets have been found to suffer from stress and other problems, such as impairments in memory, attention and concentration levels, and reading skill (Ref 8). Furthermore, a review of inequalities in environmental noise exposure produced by the WHO indicates that noise exposure-related health impacts were greater in groups with lower economic status (Ref 8).
- 8B.2.21 Based on the literature reviewed, the evidence linking noise to health and wellbeing is considered to be strong.
- 8B.2.22 Major sites of construction can cause significant levels of noise, such as the erection of buildings and pylons. As a result, the Project could affect health and wellbeing through changes to noise pollution.

Traffic

- 8B.2.23 Literature cites several ways in which traffic can impact health outcomes, including pollution, collisions, and reduction in social capital.
- 8B.2.24 Guidance by Matz, C.J (2019) (Ref 9) on Traffic-related air pollution (TRAP) is associated with a wide range of adverse human health effects, particularly in urban areas. This comprises vehicle exhausts, secondary pollutants formed in the atmosphere, evaporative emissions from vehicles, and non-combustion emissions (e.g. road dust, tire wear). Exposure to this mixture of gases and particles can exacerbate cardiovascular health issues, including asthma, reduced lung function, myocardial infarction, progression of atherosclerosis, and cardiovascular mortality. Moreover, increased traffic heightens the chance of road traffic collisions, which can cause deaths and injuries, and impact mental health of those involved (Ref 9).

- 8B.2.25 Furthermore, road traffic may inhibit access to goods, services and people, in turn resulting in community severance. This may cause reductions in physical activity (which has strong associations with negative health outcomes (as outlined under Access to green space, recreation and physical activity)) and a reduction in social contact and access to services (Ref 9), which can result in a reduction in social capital and lead to associated negative health outcomes.
- 8B.2.26 Based on the literature reviewed, the evidence linking traffic to health and wellbeing is considered to be strong. Furthermore, construction activities can have adverse impacts on traffic in the local area as a possible result of increased traffic flows and delays. As a result, the Project could affect traffic in the local area.

Visual amenity

- 8B.2.27 The Green Infrastructure 2013 Position Statement (Ref 10) studying links between the quality of places and health and wellbeing cited evidence to suggest that health and wellbeing are influenced positively by the perceived attractiveness of the environment.
- 8B.2.28 Similarly, a study by Seresinhe et al. (Ref 11) stated that ‘inhabitants of more scenic environments report better health, across urban, suburban and rural areas, even when taking core socioeconomic indicators of deprivation into account, such as income, employment and access to services.’
- 8B.2.29 Visual pollution (relating to a negative change to the landscape) can come in many forms and is mostly caused by human action. Effects of exposure to visual pollution on physical and mental wellbeing include distraction, eye fatigue, increased risk of accidents, and loss of identity. The pollutant arises from confusion in the brain’s processing of inconsistent visual inputs, which negatively impact individual health in general, particularly psychological wellbeing (Ref 11).
- 8B.2.30 The construction of electricity pylons can be particularly contentious as a result of their visual impact, due to the regular occurrence of the pylons along a linear route, as well as their height. This can have a disrupting effect on the perception of natural and rural landscapes (Ref 11).
- 8B.2.31 Based on the literature reviewed, the evidence linking the visual environment to health and wellbeing is considered to be strong. As a result, the Project may have an impact on health and wellbeing as a result of changes to visual amenity.

Access to Promoted Recreational Routes, Green Spaces and Physical Activity

- 8B.2.32 A review by PHE (Ref 12) concluded that ‘living in a greener environment can promote and protect good health, and aid in recovery from illness and help with managing poor health’ and ‘people who have greater exposure to greenspace have a range of more favourable physiological outcomes.’ The review also states that ‘greener environments are also associated with better mental health and wellbeing outcomes including reduced levels of depression, anxiety, and fatigue, and enhanced quality of life for both children and adults.’ and ‘greenspace can help to bind communities together, reduce loneliness, and mitigate the negative effects of air pollution, excessive noise, heat and flooding.’ Disadvantaged groups ‘appear to gain a larger health benefit and have reduced socioeconomic-related inequalities in health when living in greener communities’.

- 8B.2.33 Similarly, the WHO (Ref 13) conducted an evidence review which showed that parks and vegetation have beneficial effects on health, such as improved mental health, reduced cardiovascular morbidity, obesity and risk of type 2 diabetes. Such spaces also support and facilitate social interaction, providing indirect benefits for mental health by creating opportunities for recreation and increased sense of community belonging. Such outdoor recreational opportunities also promote physical activity, which can in turn prevent noncommunicable diseases such as heart disease, stroke and diabetes and associated risk factors such as obesity. 'Active' transport choices such as walking and cycling are also facilitated through well designed and easily accessed greenspaces, which in turn reduces transport-related air pollutants, improves local air quality and therefore resulting in positive outcomes for respiratory health (Ref 13).
- 8B.2.34 Linear infrastructure projects could impact upon local peoples access to recreational routes and green spaces as a result of land take required to facilitate the Project. Furthermore, construction traffic can lead to delays which reduce peoples ability to freely access such routes and green space.
- 8B.2.35 Based on the literature reviewed, the strength of evidence is moderate for a direct causal relationship between access to recreational routes and open space and health outcomes.

Access to Services (Health Care and Education)

Health care

- 8B.2.36 Evidence indicates that access to healthcare services has a significant impact on health and wellbeing. Literature highlights that both the use of and access to these services is dependent on proximity, transport facilities and the supply of trained staff.
- 8B.2.37 Transport has been cited as a key barrier to healthcare access (Ref 14). Unreliable transport options can result in rescheduled or missed appointments, resulting in delayed or lack of care and therefore poorer health outcomes. Health services can help to prevent disease and disability, identify and treat illness, increase life expectancy and reduce the likelihood of premature death, all of which in turn increases quality of life (Ref 14). Therefore, inability to travel to healthcare providers reduces the ability to identify and treat illness, resulting in poorer health outcomes.
- 8B.2.38 Infrastructure projects may impact local peoples access to health services through increased construction traffic or diversions reducing their ability to travel easily to the service.

Education

- 8B.2.39 According to the Marmot Review (2010), education has been identified as a key determinant affecting the health of individuals and communities, with 'higher income and social status are linked to better health' and 'the greater the gap between the richest and poorest people, the greater the differences in health' (Ref 3).
- 8B.2.40 The PHE Health Profile for England (Ref 5) states that 'educational attainment is strongly linked with health behaviours and outcomes.' and 'better-educated individuals are less likely to suffer from long-term diseases, to report themselves in poor health, or to suffer from mental conditions such as depression or anxiety.' Education 'provides knowledge and capabilities that contribute to mental, physical,

and social wellbeing’ and ‘educational qualifications are also a determinant of an individual’s labour market position, which in turn influences income, housing and other material resources associated with health.’

- 8B.2.41 The National Bureau of Economic Research (NBER) (Ref 15) similarly identifies causal links between behaviours associated with health factors such as smoking, drinking, diet and exercise and length of experience in formal education. For example, those who are in longer periods of education have been identified as less likely to smoke, be heavy drinkers or be overweight or obese.
- 8B.2.42 Literature also indicates that attaining higher levels of education significantly reduces the likelihood of chronic disease (except for those with substantial genetic causes) (Ref 16), and that in higher-income countries lower educational attainment is linked to increased obesity according to a study by Cohen, A.K (2013) (Ref 17). The Project should therefore aim to avoid adverse effects to educational outcomes and consequential impacts on health.
- 8B.2.43 Infrastructure projects may impact local peoples access to education through increased construction traffic or diversions reducing their ability to travel easily to the service.
- 8B.2.44 Overall, based on the literature reviewed, the strength of evidence is strong for a causal relationship between public service access and health outcomes.

Electromagnetic Fields

Mental health

- 8B.2.45 Whilst scientific studies and governmental advice suggest that electric and magnetic fields (EMFs) are unlikely to be harmful at the levels normally found in homes (Ref 18); there can be a mental health impact for those living close to substations and pylons caused by potential increased anxiety about possible impacts.
- 8B.2.46 Many groups opposed to pylons and other transmission structures being built close to their settlements flag anxieties about increased health risks as a major reason for their opposition. However, there have been a number of epidemiological studies investigating if suicide and depression are associated with EMF exposure. Overall, the results are inconclusive (Ref 18).
- 8B.2.47 Major infrastructure built close to existing communities can also impact mental health due to a perceived loss of control and voicelessness (Ref 19). Local communities can see themselves as relatively powerless and feel like others are more likely to be heard; and that their experiences are not seen as good evidence. This can have an adverse impact on mental health both before, during, and after construction.
- 8B.2.48 The physical health impacts of construction periods are well known, with increased road traffic and demolition and construction works leading to potential increases in air and noise pollution. However, living close to construction sites can also impact peoples mental health, with increased anxieties and feelings of overwhelm related to construction activities and the length of the programme (Ref 19). Recent literature (Ref 21 and 22) has found that there is a lack of consideration of mental health impacts in major infrastructure assessment; and this in itself can also adversely impact the mental health of local communities.

- 8B.2.49 Overall, based on the literature reviewed, the strength of evidence suggests that there is a link between EMF infrastructure and increased health anxieties for local people; as well as a link between the general presence of major infrastructure and adverse mental health impacts on local communities.

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