

Table 4-6: NPA5 total summary costs

## 4.6 NPA5 - South Sector (A11-A140 Outside A47)

The cost mechanism for NPA5 is shown in Table 4-6 and is summarised below with a plan of the related estimated infrastructure, flood risk and environmental constraints shown in Figure 4-6, along with relevant traffic light where appropriate.

### Wastewater

- Four options for the provision of wastewater treatment are Whitlingham WWTW, Stoke Holy Cross WWTW, Swardeston WWTW and a new WWTW

### Water Supply

- Water would be supplied from Heigham WTW

### Water Resources

- Additional water resources are from connections to Thorpe St Andrew BH and Colney BH, GOGDS, River Wensum reuse and off line storage

### Flood Risk

- Flood risk to the site has been assigned a green traffic light as less than 10% of the PGA is within Flood Zone 2 or 3.
- Flood risk from the PGA has been assigned the following traffic lights:
  - From Whitlingham WWTW – amber (discharges to tidal reach of River Yare);
  - From Stoke Holy Cross WWTW – green (discharges to tributary of River Yare)
  - From Swardeston WWTW – green (discharges to tributary of River Yare)
  - From a new WWTW - green (discharges to tributary of River Yare)
- SUDS has been assigned a red traffic light (poor SUDS suitability)



### Environment

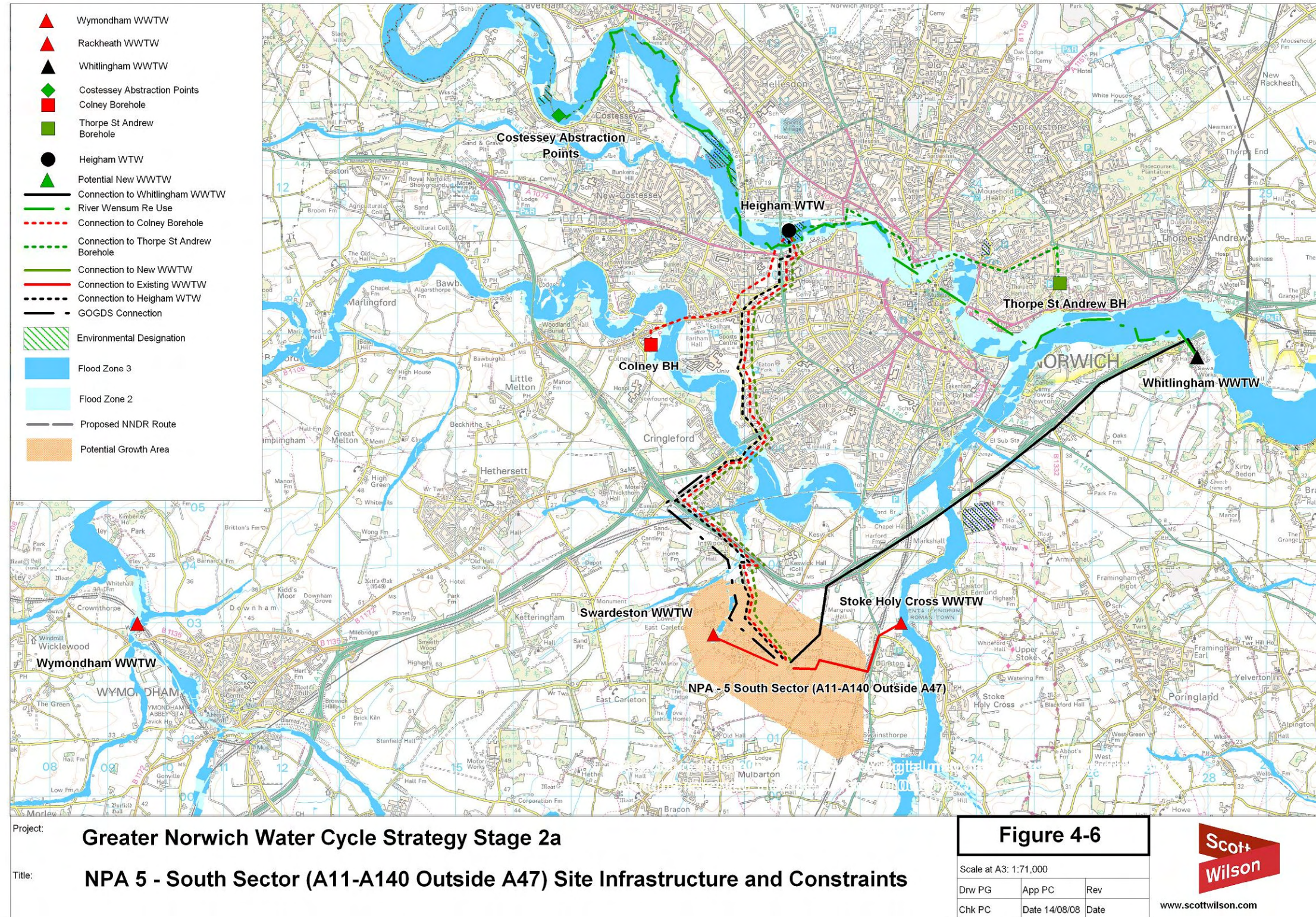
- Conservation designation has been the following traffic lights:
  - From Whitlingham WWTW - amber (no conservation designated areas within the PGA but discharge into the River Yare would flow through a designated SAC site)
  - From Stoke Holy Cross WWTW - amber (no conservation designated areas within the PGA but discharge into the River Tas would flow through a designated SAC site)
  - From Swardeston WWTW – amber (no conservation designated areas within the PGA but discharge into the River Tas would flow through a designated SAC site)
  - From a new WWTW – amber (no conservation designated areas within the PGA but discharge into the River Tas would flow through a designated SAC site)
- The PGA has been assigned an amber traffic light in relation to groundwater vulnerability.
- The PGA has been assigned an amber traffic light in relation to Source Protection Zone requirements.



Calculations									
Job Title: Norwich Water Cycle Study - Costing Calcs							Date: 01/09/2008		Section: Sheet 1 of 1
Element: NPA5							Job no. D118607		Project no.
Originator	Checked	Revision	Suffix	Orig	1	2	ND		
PC	ND		Date	Check		14/08/2008	PM		
<b>Wastewater</b>									
<b>Whitlingham</b>									
	Dist (m)	PDS	1,000	5,000	10,000	15,000	20,000		
Trunk Sewer - Rising			-	-	-	-	-		
Trunk Sewer - Gravity	9,500		3,600,000	5,000,000	6,100,000	6,500,000	6,500,000		
Pumping Stations			-	-	-	-	-		
New WWTW (vol)			-	-	-	-	-		
New WWTW (nut)			200,000	700,000	1,400,000	2,000,000	2,700,000		
<b>Total Costs (£)</b>			<b>3,800,000</b>	<b>5,700,000</b>	<b>7,500,000</b>	<b>8,500,000</b>	<b>9,200,000</b>		
<b>Upgrade Existing Stoke Holy Cross</b>									
	Dist (m)								
Trunk Sewer - Rising			-	-	-	-	-		
Trunk Sewer - Gravity	2,250		900,000	1,200,000	1,500,000	1,600,000	1,600,000		
Pumping Stations			-	-	-	-	-		
New WWTW (vol)			3,300,000	13,500,000	18,000,000	22,300,000	27,100,000		
New WWTW (nut)			200,000	700,000	1,400,000	2,000,000	2,700,000		
<b>Total Costs (£)</b>			<b>4,400,000</b>	<b>15,400,000</b>	<b>20,900,000</b>	<b>25,900,000</b>	<b>31,400,000</b>		
<b>Upgrade Existing Swardeston</b>									
	Dist (m)								
Exiting Headroom		1,000	0	4,000	9,000	14,000	19,000		
Trunk Sewer - Rising			-	-	-	-	-		
Trunk Sewer - Gravity	1,250		500,000	700,000	800,000	900,000	900,000		
Pumping Stations			-	-	-	-	-		
New WWTW (vol)			-	10,800,000	16,200,000	20,800,000	25,700,000		
New WWTW (nut)			200,000	700,000	1,400,000	2,000,000	2,700,000		
<b>Total Costs (£)</b>			<b>700,000</b>	<b>12,200,000</b>	<b>18,400,000</b>	<b>23,700,000</b>	<b>29,300,000</b>		
<b>New WWTW</b>									
	Dist (m)								
Trunk Sewer - Rising			-	-	-	-	-		
Trunk Sewer - Gravity			-	-	-	-	-		
Pumping Stations			-	-	-	-	-		
New WWTW (vol)			3,300,000	13,500,000	18,000,000	22,300,000	27,100,000		
New WWTW (nut)			200,000	700,000	1,400,000	2,000,000	2,700,000		
<b>Total Costs (£)</b>			<b>3,500,000</b>	<b>14,200,000</b>	<b>19,400,000</b>	<b>24,300,000</b>	<b>29,800,000</b>		
<b>Water Supply</b>									
<b>Heigham</b>									
	Dist (m)	PDS	1,000	5,000	10,000	15,000	20,000		
Water Main	10,000		2,300,000	2,900,000	3,600,000	4,200,000	4,800,000		
Pumping Stations			1,200,000	1,800,000	2,300,000	2,600,000	2,900,000		
<b>Total Costs (£)</b>			<b>3,500,000</b>	<b>4,700,000</b>	<b>5,900,000</b>	<b>6,800,000</b>	<b>7,700,000</b>		
<b>Maximise Boreholes</b>									
	Dist (m)	PDS	1,000	5,000	10,000	15,000	20,000		
Pipework from Thorpe St A	15,500		3,600,000	4,400,000	5,500,000	6,400,000	7,400,000		
Pumping Stations			1,800,000	2,800,000	3,500,000	4,000,000	4,500,000		
Pipework from Colney	13,250		3,100,000	3,800,000	4,700,000	5,500,000	6,300,000		
Pumping Stations			1,600,000	2,400,000	3,000,000	3,500,000	3,900,000		
<b>Total Costs (£)</b>			<b>4,700,000</b>	<b>6,200,000</b>	<b>7,700,000</b>	<b>9,000,000</b>	<b>10,200,000</b>		
<b>Water Resources</b>									
		PDS	1,000	5,000	10,000	15,000	20,000		
Wensum Reuse			6,900,000	9,200,000	11,600,000	13,400,000	15,300,000		
GOGDS			3,500,000	4,600,000	5,800,000	6,700,000	7,000,000		
Off line Storage			1,800,000	8,700,000	17,400,000	26,100,000	34,700,000		



Figure 4-6: NPA5 - South Sector (A11-A140 Outside A47) site infrastructure and constraints





## 4.7 NPA6 – Long Stratton

The cost mechanism for NPA4 is shown in Table 4-7 and is summarised below with a plan of the related estimated infrastructure, flood risk and environmental constraints shown in Figure 4-7, along with relevant traffic lights where appropriate.

### Wastewater

- Four options for the provision of wastewater treatment are Whitlingham WWTW, Wymondham WWTW, Long Stratton WWTW and a new WWTW







### Water Supply

- Water would be supplied from Heigham WTW

### Water Resources

- Additional water resources are from connections to Thorpe St Andrew BH and Colney BH, GOGDS, River Wensum reuse and off line storage

### Flood Risk

- Flood risk to the site has been assigned a green traffic light as less than 10% of the PGA is within Flood Zone 2 or 3. 
- Flood risk from the PGA has been assigned the following traffic lights:
  - From Whitlingham WWTW – amber (discharges to tidal reach of River Yare); 
  - From Wymondham WWTW– green (discharges into river Tiffey) 
  - From Long Stratton WWTW – green (discharges to River Tas) 
  - From a new WWTW - green (discharges to River Tas) 
- SUDS has been assigned a red light traffic light (poor SUDS suitability) 

### Environment







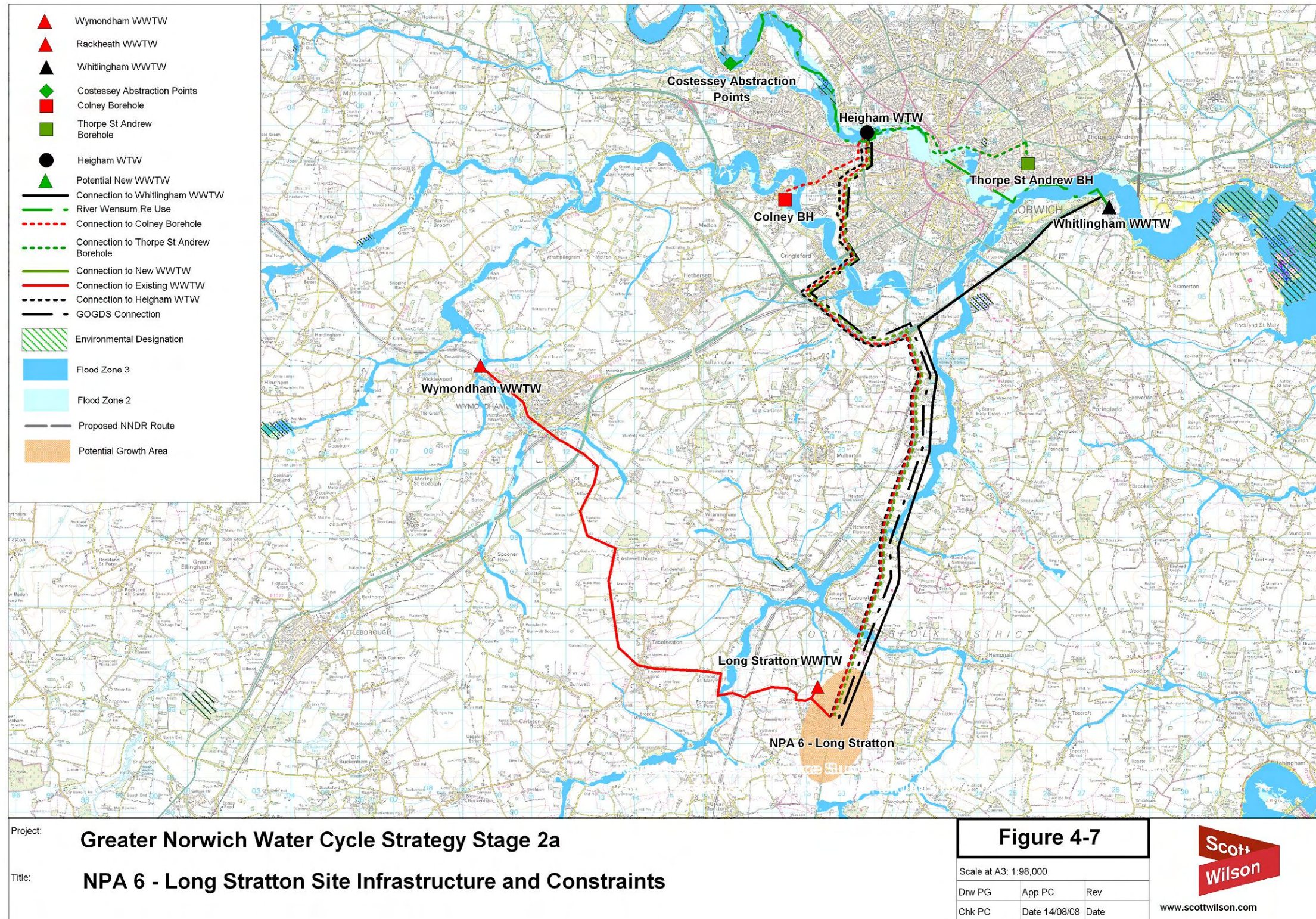
- Conservation designation has been assigned the following traffic lights
  - From Whitlingham WWTW - amber (no conservation designated areas within the PGA but discharge into the River Yare would flow through a designated SAC site) 
  - From Wymondham WWTW - amber (no conservation designated areas within the PGA but discharge into River Tiffey would flow through an SAC site further downstream). 
  - From Long Stratton WWTW - amber (no conservation designated areas within the PGA but discharge into River Tas would flow through an SAC site further downstream). 
  - From a new WWTW - amber (no conservation designated areas within the PGA but discharge into River Tas would flow through an SAC site further downstream). 
- The PGA has been assigned an amber traffic light in relation to groundwater vulnerability. 
- The PGA has been assigned a red traffic light in relation to Source Protection Zone requirements. 

Table 4-7: NPA6 total summary costs

Calculations							Section Sheet 1 of 1		Job no. D118607	
Norwich Water Cycle Study - Costing Calcs							Date		Project no.	
NPA6							01/09/2008			
Element	Checked	Revision	Suffix	Orig	1	2	ND			
PC	ND		Date	Check		14/08/2008	PM			
<b>Wastewater</b>										
<b>Whitlingham</b>										
	Dist (m)	PDS			1,000	5,000	10,000	15,000	20,000	
Trunk Sewer - Rising					-	-	-	-	-	
Trunk Sewer - Gravity	19,000				7,100,000	10,000,000	12,100,000	13,000,000	13,000,000	
Pumping Stations					-	-	-	-	-	
New WWTW (vol)					-	-	-	-	-	
New WWTW (nut)					200,000	700,000	1,400,000	2,000,000	2,700,000	
<b>Total Costs (£)</b>					<b>7,300,000</b>	<b>10,700,000</b>	<b>13,500,000</b>	<b>15,000,000</b>	<b>15,700,000</b>	
<b>Upgrade Existing Wymondham</b>										
	Dist (m)									
Exiting Headroom	4000				(3,000)	1,000	6,000	11,000	16,000	
Trunk Sewer - Rising					-	-	-	-	-	
Trunk Sewer - Gravity	18,000				6,800,000	9,500,000	11,500,000	12,300,000	12,300,000	
Pumping Stations					-	-	-	-	-	
New WWTW (vol)					-	2,700,000	10,800,000	16,400,000	21,700,000	
New WWTW (nut)					-	140,000	840,000	1,466,667	2,160,000	
<b>Total Costs (£)</b>					<b>6,800,000</b>	<b>12,340,000</b>	<b>23,140,000</b>	<b>30,166,667</b>	<b>36,160,000</b>	
<b>Upgrade Existing Long Stratton</b>										
	Dist (m)									
Exiting Headroom	1,000				0	4,000	9,000	14,000	19,000	
Trunk Sewer - Rising					-	-	-	-	-	
Trunk Sewer - Gravity	1,450				600,000	800,000	1,000,000	1,000,000	1,000,000	
Pumping Stations					-	-	-	-	-	
New WWTW (vol)					-	10,800,000	16,200,000	20,800,000	25,700,000	
New WWTW (nut)					200,000	700,000	1,400,000	2,000,000	2,700,000	
<b>Total Costs (£)</b>					<b>800,000</b>	<b>12,300,000</b>	<b>18,600,000</b>	<b>23,800,000</b>	<b>29,400,000</b>	
<b>New WWTW</b>										
	Dist (m)									
Trunk Sewer - Rising					-	-	-	-	-	
Trunk Sewer - Gravity					-	-	-	-	-	
Pumping Stations					-	-	-	-	-	
New WWTW (vol)					3,300,000	13,500,000	18,000,000	22,300,000	27,100,000	
New WWTW (nut)					200,000	700,000	1,400,000	2,000,000	2,700,000	
<b>Total Costs (£)</b>					<b>3,500,000</b>	<b>14,200,000</b>	<b>19,400,000</b>	<b>24,300,000</b>	<b>29,800,000</b>	
<b>Water Supply</b>										
<b>Heigham</b>										
	Dist (m)	PDS			1,000	5,000	10,000	15,000	20,000	
Water Main	21,000				4,900,000	5,900,000	7,400,000	8,700,000	10,000,000	
Pumping Stations					2,500,000	3,800,000	4,800,000	5,500,000	6,100,000	
<b>Total Costs (£)</b>					<b>7,400,000</b>	<b>9,700,000</b>	<b>12,200,000</b>	<b>14,200,000</b>	<b>16,100,000</b>	
<b>Maximise Boreholes</b>										
	Dist (m)	PDS			1,000	5,000	10,000	15,000	20,000	
Pipework from Thorpe St A	27,000				6,200,000	7,600,000	9,500,000	11,100,000	12,800,000	
Pumping Stations					3,200,000	4,900,000	6,100,000	7,000,000	7,800,000	
Pipework from Colney	24,250				5,600,000	6,900,000	8,600,000	10,000,000	11,500,000	
Pumping Stations					2,800,000	4,400,000	5,500,000	6,300,000	7,000,000	
<b>Total Costs (£)</b>					<b>8,400,000</b>	<b>11,300,000</b>	<b>14,100,000</b>	<b>16,300,000</b>	<b>18,500,000</b>	
<b>Water Resources</b>										
		PDS			1,000	5,000	10,000	15,000	20,000	
Wensum Reuse					6,900,000	9,200,000	11,600,000	13,400,000	15,300,000	
GOGDS					7,300,000	9,700,000	12,100,000	14,000,000	14,700,000	
Off line Storage					1,800,000	8,700,000	17,400,000	26,100,000	34,700,000	



Figure 4-7: NPA6 – Long Stratton site infrastructure and constraints





## 4.8 NPA7 – Wymondham

The cost mechanism for NPA7 is shown in Table 4-8 and is summarised below with a plan of the related estimated infrastructure, flood risk and environmental constraints shown in Figure 4-8, along with relevant traffic lights where appropriate.

### Wastewater

- Three options for the provision of wastewater treatment are Whitlingham WWTW, Wymondham WWTW and a new WWTW

### Water Supply

- Water would be supplied from Heigham WTW

### Water Resources

- Additional water resources are from connections to Thorpe St Andrew BH and Colney BH, GOGDS, River Wensum reuse and off line storage

### Flood Risk

- The area has been assigned an amber light as between 10-25% of the PGA is within Flood Zone 2 or 3. There are also known surface water flooding issues associated with Wymondham.
- Flood risk from the PGA has been assigned the following traffic lights:
  - From Whitlingham WWTW – amber (discharges to tidal reach of River Yare);
  - From Wymondham WWTW– green (discharges into River Tiffey)
  - From a new WWTW - green (discharges into River Tiffey)
- SUDS has been assigned a green traffic light (good SUDS suitability)

### Environment

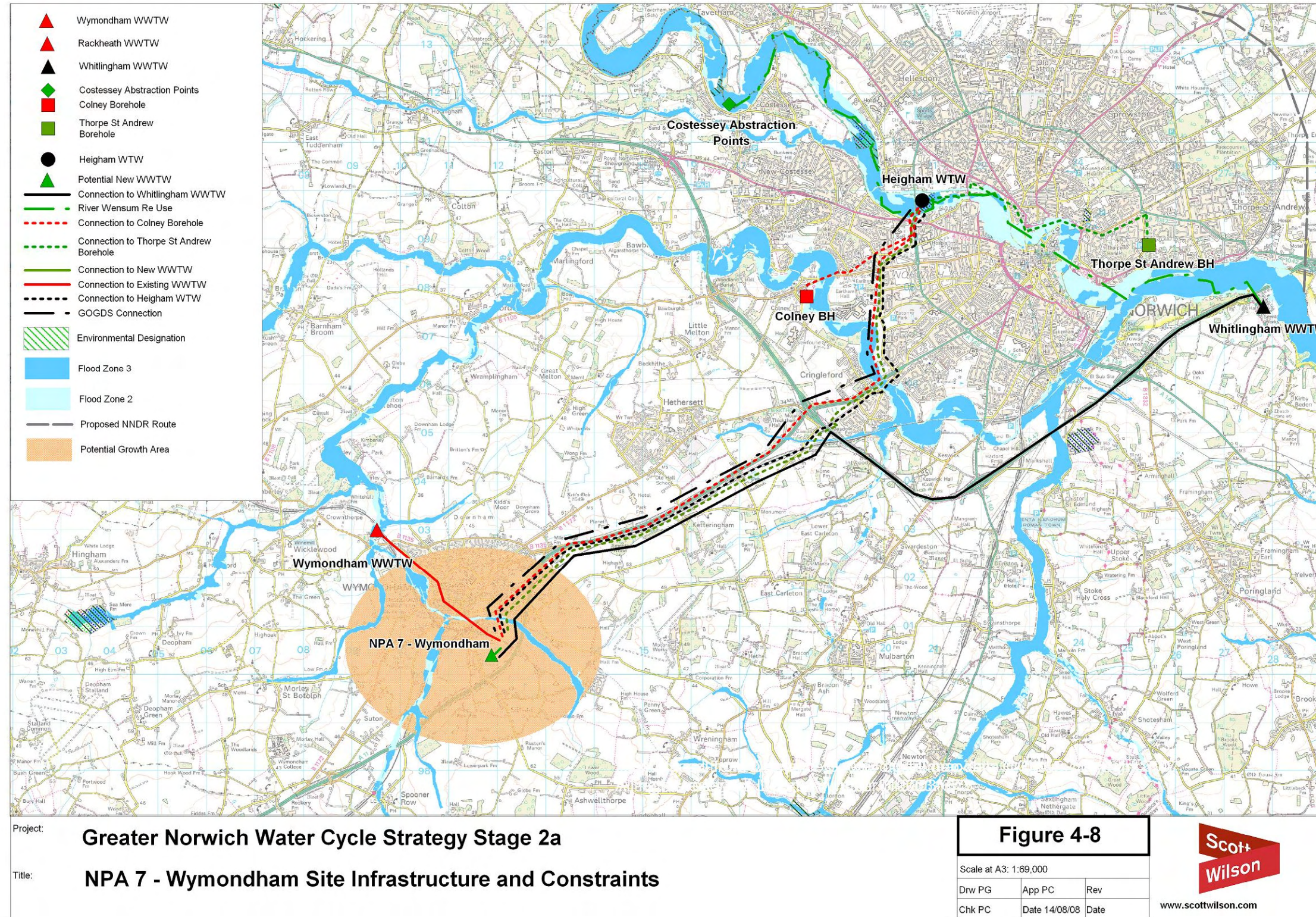
- Conservation designation has been assigned the following traffic lights:
  - From Whitlingham WWTW - amber (no conservation designated areas within the PGA but discharge into the River Yare would flow through a designated SAC site)
  - From Wymondham WWTW - amber (no conservation designated areas within the PGA but discharge into River Tiffey would flow through an SAC site further downstream).
  - From a new WWTW - amber (no conservation designated areas within the PGA but discharge into River Tiffey would flow through an SAC site further downstream).
- The PGA has been assigned an amber traffic light in relation to groundwater vulnerability.
- The PGA has been assigned a green traffic light in relation to Source Protection Zone requirements.

Table 4-8: NPA7 total summary costs

Calculations								Section Sheet 1 of 1	
Job Title <b>Norwich Water Cycle Study - Costing Calcs</b>							Date	Job no. <b>D118607</b>	
Element <b>NPA7</b>							01/09/2008	Project no.	
Originator	Checked	Revision	Suffix	Orig	1	2	ND		
PC	ND		Date	Check		14/08/2008	PM		
<b>Wastewater</b>									
<b>Whitlingham</b>									
	Dist (m)	PDS			1,000	5,000	10,000	15,000	20,000
Exiting Headroom					1,000	5,000	10,000	15,000	20,000
Trunk Sewer - Rising					-	-	-	-	-
Trunk Sewer - Gravity	19,750				7,400,000	10,400,000	12,600,000	13,500,000	13,500,000
Pumping Stations					-	-	-	-	-
New WWTW (vol)					-	-	-	-	-
New WWTW (nut)					200,000	700,000	1,400,000	2,000,000	2,700,000
<b>Total Costs (£)</b>					<b>7,600,000</b>	<b>11,100,000</b>	<b>14,000,000</b>	<b>15,500,000</b>	<b>16,200,000</b>
<b>Upgrade Existing Wymondham</b>									
	Dist (m)								
Exiting Headroom		4000			(3,000)	1,000	6,000	11,000	16,000
Trunk Sewer - Rising					-	-	-	-	-
Trunk Sewer - Gravity	3,250				1,300,000	1,800,000	2,100,000	2,300,000	2,300,000
Pumping Stations					-	-	-	-	-
New WWTW (vol)					-	2,700,000	10,800,000	16,400,000	21,700,000
New WWTW (nut)					-	140,000	840,000	1,466,667	2,160,000
<b>Total Costs (£)</b>					<b>1,300,000</b>	<b>4,640,000</b>	<b>13,740,000</b>	<b>20,166,667</b>	<b>26,160,000</b>
<b>New WWTW</b>									
	Dist (m)								
Trunk Sewer - Rising					-	-	-	-	-
Trunk Sewer - Gravity					-	-	-	-	-
Pumping Stations					-	-	-	-	-
New WWTW (vol)					3,300,000	13,500,000	18,000,000	22,300,000	27,100,000
New WWTW (nut)					200,000	700,000	1,400,000	2,000,000	2,700,000
<b>Total Costs (£)</b>					<b>3,500,000</b>	<b>14,200,000</b>	<b>19,400,000</b>	<b>24,300,000</b>	<b>29,800,000</b>
<b>Water Supply</b>									
<b>Heigham</b>									
	Dist (m)	PDS			1,000	5,000	10,000	15,000	20,000
Water Main	14,750				3,400,000	4,200,000	5,200,000	6,100,000	7,000,000
Pumping Stations					1,700,000	2,700,000	3,400,000	3,900,000	4,300,000
<b>Total Costs (£)</b>					<b>5,100,000</b>	<b>6,900,000</b>	<b>8,600,000</b>	<b>10,000,000</b>	<b>11,300,000</b>
<b>Maximise Boreholes</b>									
	Dist (m)	PDS			1,000	5,000	10,000	15,000	20,000
Pipework from Thorpe St A	20,750				4,800,000	5,900,000	7,300,000	8,600,000	9,900,000
Pumping Stations					2,400,000	3,800,000	4,700,000	5,400,000	6,000,000
Pipework from Colney	18,250				4,200,000	5,200,000	6,500,000	7,500,000	8,700,000
Pumping Stations					2,100,000	3,300,000	4,100,000	4,800,000	5,300,000
<b>Total Costs (£)</b>					<b>6,300,000</b>	<b>8,500,000</b>	<b>10,600,000</b>	<b>12,300,000</b>	<b>14,000,000</b>
<b>Water Resources</b>									
		PDS			1,000	5,000	10,000	15,000	20,000
Wensum Reuse					6,900,000	9,200,000	11,600,000	13,400,000	15,300,000
GOGDS					7,200,000	9,600,000	12,000,000	13,800,000	14,500,000
Off line Storage					1,800,000	8,700,000	17,400,000	26,100,000	34,700,000



Figure 4-8: NPA7 – Wymondham site infrastructure and constraints





## 4.9 NPA8 - South West Sector (A11-B1108)

The cost mechanism for NPA8 is shown in Table 4-9 and is summarised below with a plan of the related estimated infrastructure, flood risk and environmental constraints shown in Figure 4-9, along with relevant traffic lights where appropriate.

### Wastewater

- Three options for the provision of wastewater treatment are Whitlingham WWTW, Wymondham WWTW and a new WWTW.






### Water Supply

- Water would be supplied from Heigham WTW.

### Water Resources

- Additional water resources are from connections to Thorpe St Andrew BH and Colney BH, GOGDS, River Wensum reuse and off line storage.

### Flood Risk

- The area has been assigned a green traffic light as less than 10% of the PGA is within Flood Zone 2 or 3. 
- Flood risk from the PGA has been assigned the following traffic lights:
  - From Whitlingham WWTW – amber (discharges to tidal reach of River Yare); 
  - From Wymondham WWTW– green (discharges into River Tiffey) 
  - From a new WWTW - amber (discharges to tributary of River Yare); 
  - SUDS has been assigned a red traffic light (poor SUDS suitability) 

### Environment






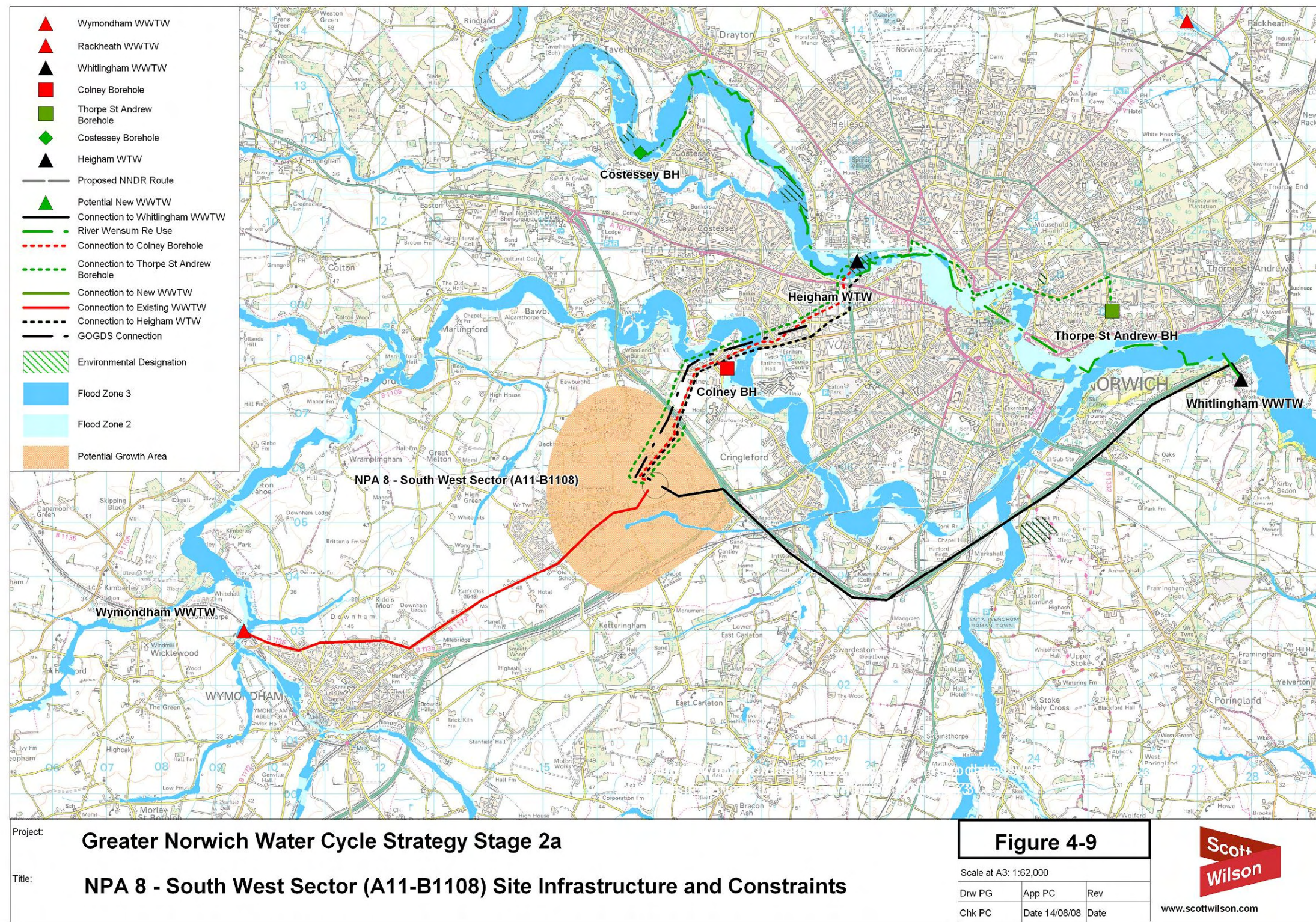
- Conservation designation has been assigned the following traffic lights:
  - From Whitlingham WWTW - amber (no conservation designated areas within the PGA but discharge into the River Yare would flow through a designated SAC site) 
  - From Wymondham WWTW - amber (no conservation designated areas within the PGA but discharge into River Tiffey would flow through an SAC site further downstream). 
  - From a new WWTW - amber (no conservation designated areas within the PGA but discharge into River Tiffey would flow through an SAC site further downstream). 
- The PGA has been assigned an amber traffic light in relation to groundwater vulnerability. 
- The PGA has been assigned a green traffic light in relation to Source Protection Zone requirements. 

Table 4-9: NPA8 total summary costs

Calculations							Section Sheet 1 of 1		Job no. D118607	
Job Title							Date		Project no.	
Element							01/09/2008			
Originator	Checked	Revision	Suffix	Orig	1	2	ND			
PC	ND		Date	Check		14/08/2008	PM			
<b>Wastewater</b>										
<b>Whitlingham</b>										
	Dist (m)	PDS	1,000	5,000	10,000	15,000	20,000			
Trunk Sewer - Rising			-	-	-	-	-			
Trunk Sewer - Gravity	13,000		4,900,000	6,900,000	8,300,000	8,900,000	8,900,000			
Pumping Stations			-	-	-	-	-			
New WWTW (vol)			-	-	-	-	-			
New WWTW (nut)			200,000	700,000	1,400,000	2,000,000	2,700,000			
<b>Total Costs (£)</b>			<b>5,100,000</b>	<b>7,600,000</b>	<b>9,700,000</b>	<b>10,900,000</b>	<b>11,600,000</b>			
<b>Upgrade Existing Wymondham</b>										
	Dist (m)	PDS								
Trunk Sewer - Rising			-	-	-	-	-			
Trunk Sewer - Gravity	8,500		3,200,000	4,500,000	5,500,000	5,800,000	5,800,000			
Pumping Stations			-	-	-	-	-			
New WWTW (vol)			3,300,000	13,500,000	18,000,000	22,300,000	27,100,000			
New WWTW (nut)			200,000	700,000	1,400,000	2,000,000	2,700,000			
<b>Total Costs (£)</b>			<b>6,700,000</b>	<b>18,700,000</b>	<b>24,900,000</b>	<b>30,100,000</b>	<b>35,600,000</b>			
<b>New WWTW</b>										
	Dist (m)	PDS								
Trunk Sewer - Rising			-	-	-	-	-			
Trunk Sewer - Gravity			-	-	-	-	-			
Pumping Stations			-	-	-	-	-			
New WWTW (vol)			3,300,000	13,500,000	18,000,000	22,300,000	27,100,000			
New WWTW (nut)			200,000	700,000	1,400,000	2,000,000	2,700,000			
<b>Total Costs (£)</b>			<b>3,500,000</b>	<b>14,200,000</b>	<b>19,400,000</b>	<b>24,300,000</b>	<b>29,800,000</b>			
<b>Water Supply</b>										
<b>Heigham</b>										
	Dist (m)	PDS	1,000	5,000	10,000	15,000	20,000			
Water Main	6,500		1,500,000	1,900,000	2,300,000	2,700,000	3,100,000			
Pumping Stations			800,000	1,200,000	1,500,000	1,700,000	1,900,000			
<b>Total Costs (£)</b>			<b>2,300,000</b>	<b>3,100,000</b>	<b>3,800,000</b>	<b>4,400,000</b>	<b>5,000,000</b>			
<b>Maximise Boreholes</b>										
	Dist (m)	PDS	1,000	5,000	10,000	15,000	20,000			
Pipework from Thorpe St A	12,500		2,900,000	3,600,000	4,400,000	5,200,000	6,000,000			
Pumping Stations			1,500,000	2,300,000	2,900,000	3,300,000	3,600,000			
Pipework from Colney	10,000		2,300,000	2,900,000	3,600,000	4,200,000	4,800,000			
Pumping Stations			1,200,000	1,800,000	2,300,000	2,600,000	2,900,000			
<b>Total Costs (£)</b>			<b>3,500,000</b>	<b>4,700,000</b>	<b>5,900,000</b>	<b>6,800,000</b>	<b>7,700,000</b>			
<b>Water Resources</b>										
<b>PDS</b>										
Wensum Reuse			6,900,000	9,200,000	11,600,000	13,400,000	15,300,000			
GOGDS			2,300,000	3,000,000	3,800,000	4,400,000	4,600,000			
Off line Storage			1,800,000	8,700,000	17,400,000	26,100,000	34,700,000			



Figure 4-9: NPA8 - South West Sector (A11-B1108) site infrastructure and constraints





## 4.10 NPA9 - West Sector (River Yare to River Wensum)

The cost mechanism for NPA9 is shown in Table 4-10 and is summarised below with a plan of the related estimated infrastructure, flood risk and environmental constraints shown in Figure 4-10, along with relevant traffic lights where appropriate.

### Wastewater

- Three options for the provision of wastewater treatment are Whittingham WWTW, Wymondham WWTW and a new WWTW

### Water Supply

- Water would be supplied from Heigham WTW

### Water Resources

- Additional water resources are from connections to Thorpe St Andrew BH and Colney BH, GOGDS, River Wensum reuse and off line storage

### Flood Risk

- The area has been assigned a green traffic light as less than 10% of the PGA is within Flood Zone 2 or 3.
- Flood risk from the PGA has been assigned the following traffic lights:
  - From Whittingham WWTW – amber (discharges to tidal reach of River Yare);
  - From Wymondham WWTW – green (discharges into River Tiffey)
  - From a new WWTW - amber (discharges to tributary of River Wensum or Yare);
- SUDS has been assigned a red traffic light (poor SUDS suitability)



### Environment

- Conservation designation has been assigned the following traffic lights:
  - From Whittingham WWTW - amber (no conservation designated areas within the PGA but discharge into the River Yare would flow through a designated SAC site)
  - From Wymondham WWTW - amber (no conservation designated areas within the PGA but discharge into River Tiffey would flow through an SAC site further downstream).
  - From a new WWTW - amber (no conservation designated areas within the PGA but discharge into River Wensum or Yare would flow through an SAC site further downstream).
- The PGA has been assigned a red traffic light in relation to groundwater vulnerability.
- The PGA has been assigned a red traffic light in relation Source Protection Zone requirements.

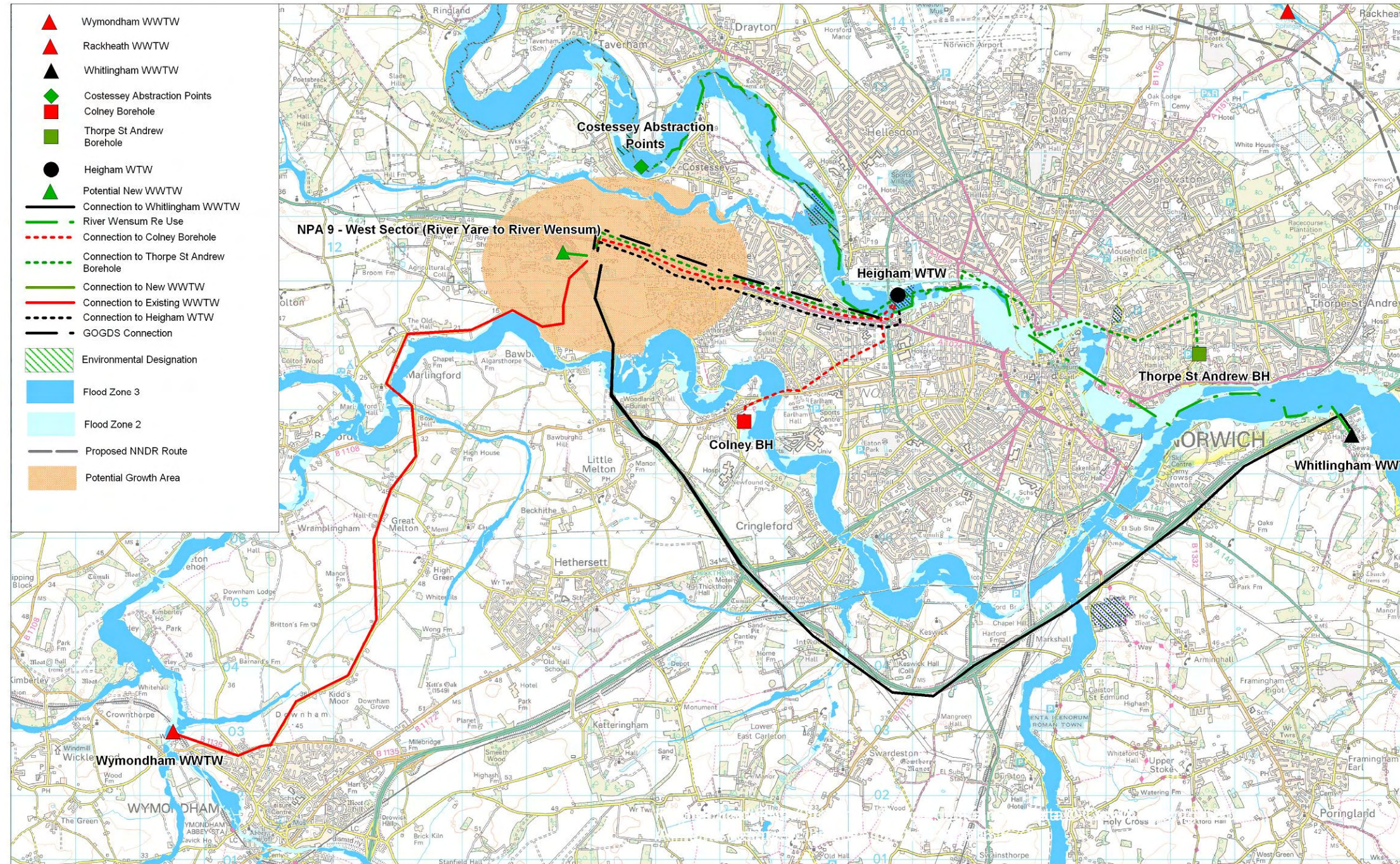


Table 4-10: NPA9 total summary costs

Calculations									
Job Title: <b>Norwich Water Cycle Study - Costing Calcs</b>							Date: 01/09/2008		Section: Sheet 1 of 1
Element: <b>NPA9</b>							Job no. <b>D118607</b>		Project no.
Originator	Checked	Revision	Suffix	Orig	1	2	ND		
PC	ND		Date	Check		14/08/2008	PM		
<b>Wastewater</b>									
<b>Whittingham</b>									
	Dist (m)	PDS	1,000	5,000	10,000	15,000	20,000		
Trunk Sewer - Rising			-	-	-	-	-		
Trunk Sewer - Gravity	17,250		6,500,000	9,100,000	11,000,000	11,800,000	11,800,000		
Pumping Stations			-	-	-	-	-		
New WWTW (vol)			-	-	-	-	-		
New WWTW (nut)			200,000	700,000	1,400,000	2,000,000	2,700,000		
<b>Total Costs (£)</b>			<b>6,700,000</b>	<b>9,800,000</b>	<b>12,400,000</b>	<b>13,800,000</b>	<b>14,500,000</b>		
<b>Upgrade Existing Wymondham</b>									
	Dist (m)								
Exiting Headroom	4000		(3,000)	1,000	6,000	11,000	16,000		
Trunk Sewer - Rising			-	-	-	-	-		
Trunk Sewer - Gravity	13,000		4,900,000	6,900,000	8,300,000	8,900,000	8,900,000		
Pumping Stations			-	-	-	-	-		
New WWTW (vol)			-	2,700,000	10,800,000	16,400,000	21,700,000		
New WWTW (nut)			200,000	700,000	1,400,000	2,000,000	2,700,000		
<b>Total Costs (£)</b>			<b>5,100,000</b>	<b>10,300,000</b>	<b>20,500,000</b>	<b>27,300,000</b>	<b>33,300,000</b>		
<b>New WWTW</b>									
	Dist (m)								
Trunk Sewer - Rising			-	-	-	-	-		
Trunk Sewer - Gravity			-	-	-	-	-		
Pumping Stations			-	-	-	-	-		
New WWTW (vol)			3,300,000	13,500,000	18,000,000	22,300,000	27,100,000		
New WWTW (nut)			200,000	700,000	1,400,000	2,000,000	2,700,000		
<b>Total Costs (£)</b>			<b>3,500,000</b>	<b>14,200,000</b>	<b>19,400,000</b>	<b>24,300,000</b>	<b>29,800,000</b>		
<b>Water Supply</b>									
<b>Heigham</b>									
	Dist (m)	PDS	1,000	5,000	10,000	15,000	20,000		
Water Main	5,500		1,300,000	1,600,000	2,000,000	2,300,000	2,700,000		
No of Pumping Stns			700,000	1,000,000	1,300,000	1,500,000	1,600,000		
<b>Total Costs (£)</b>			<b>2,000,000</b>	<b>2,600,000</b>	<b>3,300,000</b>	<b>3,800,000</b>	<b>4,300,000</b>		
<b>Maximise Boreholes</b>									
	Dist (m)	PDS	1,000	5,000	10,000	15,000	20,000		
Pipework from Thorpe St A	11,500		2,700,000	3,300,000	4,100,000	4,800,000	5,500,000		
Pumping Stations			1,400,000	2,100,000	2,600,000	3,000,000	3,400,000		
Pipework from Colney	9,000		2,100,000	2,600,000	3,200,000	3,700,000	4,300,000		
Pumping Stations			1,100,000	1,700,000	2,100,000	2,400,000	2,600,000		
<b>Total Costs (£)</b>			<b>3,200,000</b>	<b>4,300,000</b>	<b>5,300,000</b>	<b>6,100,000</b>	<b>6,900,000</b>		
<b>Water Resources</b>									
		PDS	1,000	5,000	10,000	15,000	20,000		
Wensum Reuse			6,900,000	9,200,000	11,600,000	13,400,000	15,300,000		
GOGDS			1,900,000	2,600,000	3,200,000	3,700,000	3,900,000		
Off line Storage			1,800,000	8,700,000	17,400,000	26,100,000	34,700,000		



Figure 4-10: NPA9 - West Sector (River Yare to River Wensum) site infrastructure and constraints



Project: **Greater Norwich Water Cycle Strategy Stage 2a**  
 Title: **NPA 9 - West Sector (River Yare to River Wensum) Site Infrastructure and Constraints**

**Figure 4-10**  
 Scale at A3: 1:55,000  
 Drw PG    App PC    Rev  
 Chk PC    Date 14/08/08    Date

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