S302

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S302

“ ” 2023-2035

2023 204

S302

S302

S302

S201

S202

S202

S202

S201

1.

1

18.229km 1631m/7

21 6 1

80km/h 33m S202

80km/h 32m

153.34hm^2 322.82 m^3 208.93 m^3

114.45 m^3

2

5

15

9 2

1 4

2 K8~K11

K17~K18 K23~

K11+150~K11+200

18m

BK0+560~BK0+580

28m BK0+820~BK0+845

62m

K22+100~K22+300

38m 309m

324m

GB/T 14848-2017

19 3 16

12 GB3096-

2008

3 1 2024

GB3095-2012 2018

3

19

2.

2021

2025 1 10

2025 7 S302

3.

2024

2021—2035 2023-2035

2018-2035 “ ”

2023-2035

“ ”

2020-2035 2016-2025

4.

1

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3

19

4

1 TSP NO_2 CO

5.

2023-2035

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1.1

1.1.1

S302

18.229km

1.1.2

1.1-1

1.1-1

	S302
	18.229km 11.387km S202 6.842km 80km/h 33m S202 32m
	153.34hm^2
	262385.1
	2025 10 2028 10 36

1.1.3

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5.

1.2

1.2.1

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1.2.2

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1.3

1.3.1

1. 2015.01.01
2. 2018.12.29
3. 2018.12.29
4. 2018.01.01
5. 2018.10.26
6. 2020.09.01
7. 2020.01.01
8. 2011.03.01
9. 2017.11.05
10. 2013.01.01
11. 2016.07.02
12. 2020.07.01
13. 2023.05.01

14. 2019.04.23
15. 2021.04.29
16. 2022.06.01
17. 2022.06.05
18. 2011.01.08
19. 2018.03.19
20. 2018.03.19
21. 2017.07.16
22. 2012.07.01
23. 2007.11.01
24. 2013.12.07
25. 2021.01.24
26. 2021.12.01
27. 2016.02.06

1.3.2

1. 2018 11 30
2. 2018 11 30
3. 2018 12 1
4. 2018 1 23
5. 2023 1 1
6. 2018 1 24
7. 2017 5 19
8. 2013 11 29
9. 2004 5 27
10. (2001 1 1)
11. (2017 8 1)
12. 2018 1 23
13. < > 2018 1 23
14. 2019 12 16
15. 2018 1 24
16. 2013 3 1

1.3.3

1. [2000]38

2000.11.26

2. [2015]17

2015.04.02

3. [2013]37

2013.09.10

4. [2016]31

2016.05.28

5. <“ ” > [2023]1

2013.01.03

6. 44

2021.01.01

7. 4 2019.01.01

8. <“ ” >

[2022]26 2022.04.01

9.

[2003]94 2003.05.27

10.

[2004]164 2004.04.06

11.

[2005]441 2005.09.23

12. [2007]184

2007.12.01

13.

[2025]227 2025.01.26

14. [2009]226 2009.05.12

15. [2007]37

2007.03.15

16.

2006 2 2006.04.29

17.

[2012]77 2012.07.03

18. [2012]98

2012.08.07

19. < > [2010]7

2010.01.11

20.

[2010]144 2010.12.15

21. 4 2018.07.16

22. <

> [2019]48 2019.10.24

23. 2024 7

2024.02.01

24.

[2016]161 2016.09.28

25. [2010]63

2010.12.28

26. [2013]129

2013.12.02

27. 50

2018.04.15

28.

[2019]1125 2019.06.29

29.

[2022]142 2022.08.16

30. —

[2015]112

2015.12.18

31. < >

[2022]2 2022.12.27

32. < >

[2021]5 2021.09.13

33. “ ”

[2018]86 2018.08.30

34. <

> [2017]34 2017.05.08

35.

2021 3 2021.02.01

36.

2021 15 2021.09.08

37. —

2015 32 2015.05.20

38.

[2011]22

39. [2001]100

40.

[2006]66

41. “ ”

[2021]12

42.

“ ” [2006]60

43. 2016-2020

[2016]173

44. < >

[2021]219

45.

[2023]1

46. <

>

47. “ ” [2014]58

48.

[2018]124

49. [2019]112

50. < (2021-2030)>

[2021]2

51. <

> [2023]11

52.

[2021]192

53.

2021-2025 2021-2025

2021-2025 [2021]30

54. < “ ” >

[2021]24

1.3.4

1. HJ 2.1-2016
2. HJ 2.2-2018
3. HJ 2.3-2018
4. HJ 2.4-2021
5. HJ 19-2022
6. HJ 610-2016
7. HJ 1358-2024
8. HJ 169-2018
9. HJ 964-2018
10. JTG B04-2010
11. JTG B01-2014

1.3.5

1. S302 2024.07
2. S302 2024.02
3. S302 2025.06
4. 2015.02
5. 2023-2035 2023 204
6. 2014-2030
7. 2015-2030
8. 2021.11
9. 2016-2025 2016.04
10. 2021.10
11. 2011-2020 2016.09
12. 2021-2035 2024.08
13. 2021-2035 2024.11

14. S302
2025.03.25

15. S302

16. S302

17. S302

18. S302

19. S302

1.3.6

1.4

1.4.1

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1.4.2

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1.5

1.5.1

1.5-1

1.5-1

		HJ1358-2024	7.1.1b
			7.1.1c
			7.1.1d
		5dB(A) HJ 2.4-2021 HJ1358-2024	
		HJ1358-2024	
	B	HJT2.3-2018 HJ1358-2024 B	
		HJ1358-2024 2	
		HJ1358-2024 HJ 169-2018	

1.5.2

1.5-2

1.5-2

1		1km 1km 300m 200m
2		200m 200 m 4.4.2 ~ 278.7m ~ 263.3m ~ 264.2m 200m
3		
4		200m 200m 1000m
5		
6		

1.6

1.6-1

1.6-1

											□		□		
											□	■	□		
											□	■	□		□
											□		□		□
											□				
											□	■			
											□		□		
												□		□	
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											□		□		
											□		□		
											□		□		
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												□			

□/○ / ■/● /

1.6-2 1.6-3

1.6-2

1.6-2

1

2

3

a

b

c 4 a   b   c   d

1.6-3

	pH NH$_3$-N TP COD BOD$_5$ SS COD$_{Mn}$	pH SS COD BOD$_5$ NH$_3$-N	COD BOD$_5$ pH SS NH$_3$-N
	pH	pH SS COD BOD$_5$ NH$_3$-N	SS BOD$_5$
	A L_{Aeq}	A L_{Aeq}	A L_{Aeq}
	TSP PM$_{10}$ NO$_2$ CO	TSP [α]	NO$_X$ CO
	-		

1.7

1.7.1

1.7-1

1.7-1

		50.86hm^2	
		27.7834hm^2 3.4896 hm^2 19.317 hm^2 4.9768 hm^2 K8~K11 K17~K18 K21~K22 K23~	
		37.27 hm^2 29.86 hm^2 7.41hm^2	
	5 15 9 2 1 4 2	K8~K11 K17~K18 K23~	

1.7-1

	5 15 9 2 1 4 2	K8~K11 K17~K18 K23~	
	2004 2022 2 2022 5 2020-2035 6902 hm^2	K8+000~K10+000 K17+100~K18+100 K23+300~K24+200 4.0km K10+000~K17+100 K18+100~K23+300 5.1.1	
	1993 (1993)89 2000 (2000)610 2477.3 hm^2	K23+300~K24+200 0.90km 0.6051 hm^2 205.84m 5.1.2	

1.7-1

	“ ” 2022 2207 2022 10	371002120190 371002120228 371002120218 371002120245 371002120216 814.53m 235.93 m 61.85 m 516.75m 4.1.12	

1.7.2

1.7-2

1.7-2

1		III	FLK1+162	
2		III	K12+450	
3		III	K14+550	
4		III	K22+100	
5		III		

1.7.3

2

1.7-3 1.7-1~1.7-3

1.7-3

1		30m 600	K11+150~K11+200 18m 3.4.2		
2		30m 648	BK0+560~BK0+580 28m BK0+820~ BK0+845 62m		
3		30m 300m 1130	K22+100~K22+300 38m 309m 324m		

1.7-1

1.7-2

1.7-3

1.7.4

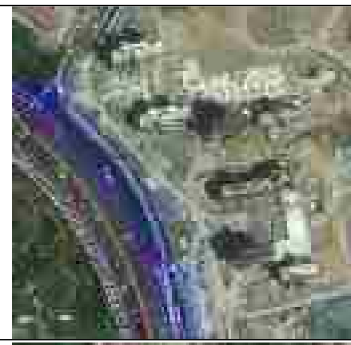
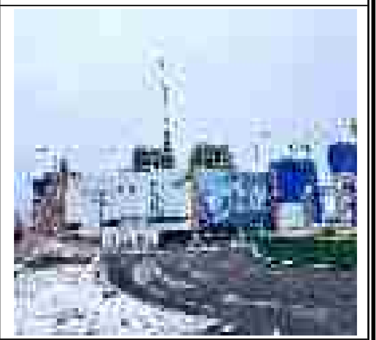
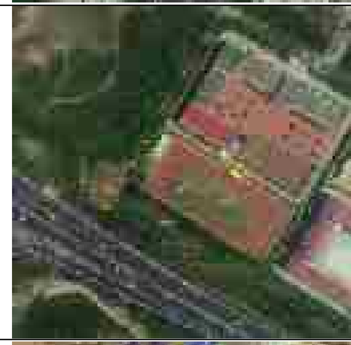
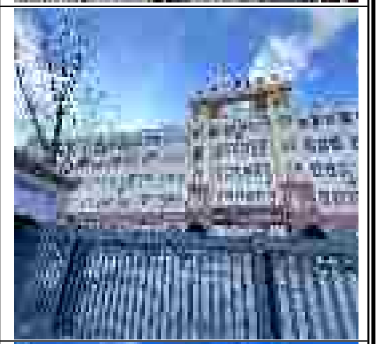
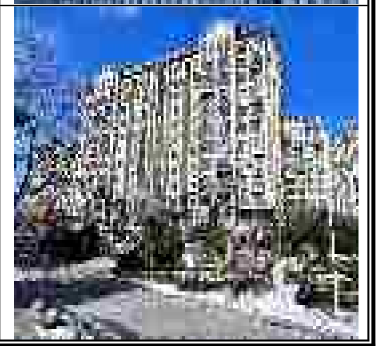
19 3 16

1.7-4

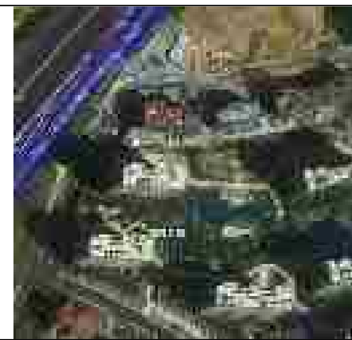
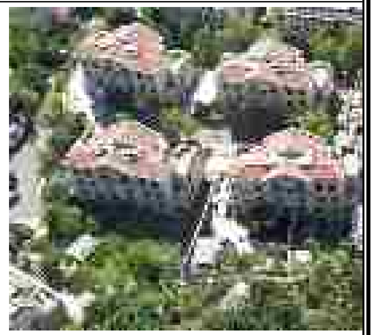
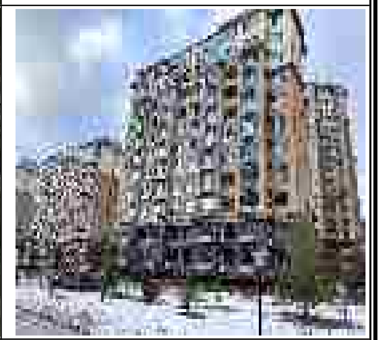
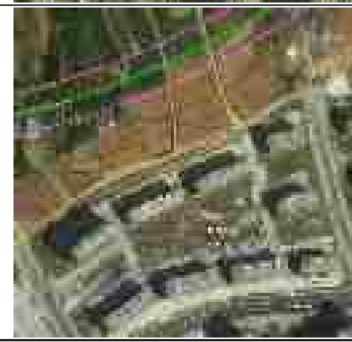
1.7.5

1 1.7-5

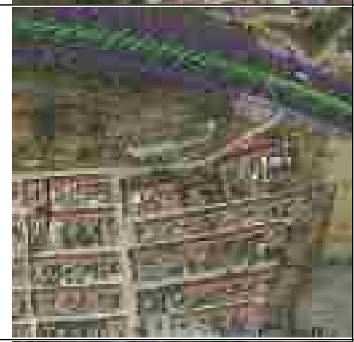
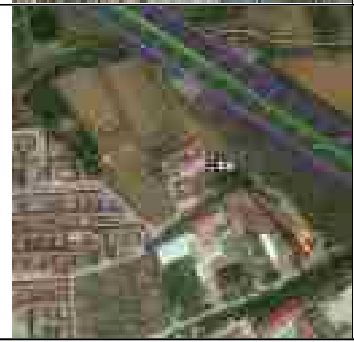
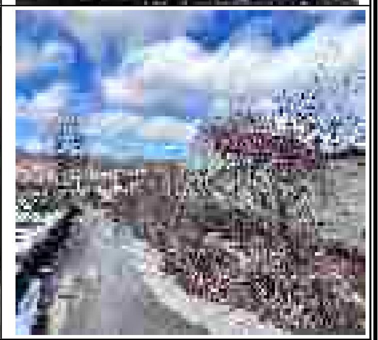
1.7-4

									-					( )				
						(m)	(m)	(m)	(m)	(m)			(m)	4a /4b	1 /2 /3			
1		FLK0+130 ~ FLK0+410				43	24	19	-11	+1.5		4a /1	74	126	1071	6 1 22 5 21 1197 4 3		
2		FLK0+430 ~ FLK0+530				194	186	8	-16	+1.8		1	63	/	1 4	1 4 457 71		
3		FLK0+550 ~ FLK0+700				190	175	15	-20	+1.5		1	70	/	1 5 1 3	1 5 1~4 5 1 3 1 1~6 2300 150		
4		FLK1+200 ~ FLK1+480				68	48	20	-2	+6.5		4a /1	75	72	608	14 7 6 7 12 680 6		

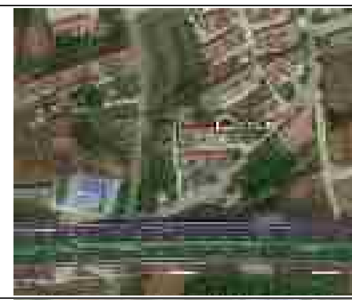
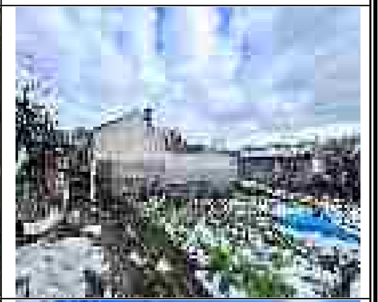
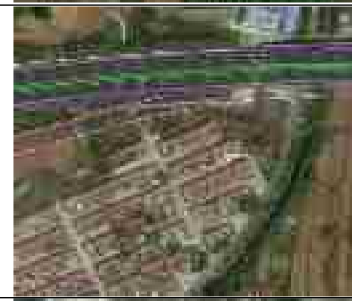
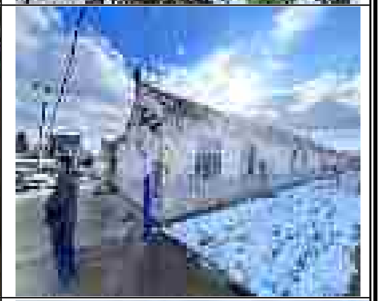
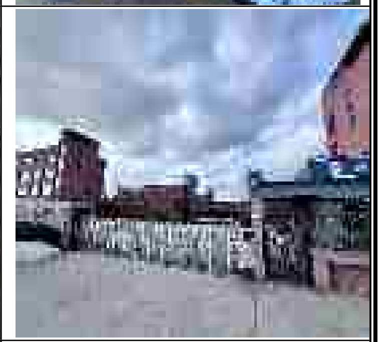
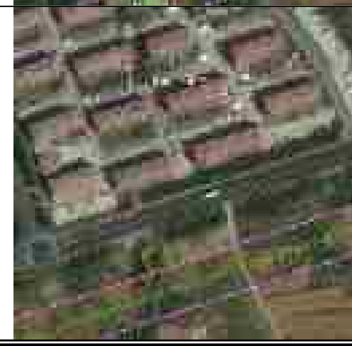
1.7-4

						(m)	(m)	(m)	- (m)	(m)			(m)	( ) 4a /4b	1 /2 /3			
5		FLK1+520 ~ FLK1+800				40	32	8	+4	-0.8		4a /1	63	792	1584	2 35 7 33 2376 3		
6		K12+176 ~ K12+470				91 50	78 18	13 32	-9	-4.8		4b /1	87	28	118	33 3 146 3		
7	~	K6+650 ~ K6+880				106	77	29	-10	-7.5		2	69	/	1524	15 13 17 3 12 1524 7 714		
		K6+880 ~ K7+000				91	62			+7.9								
8	~	K7+010 ~ K7+500				99	67	32	-6	+8.4		2	72	/	822	14 12 10 2 17 822 7 342		

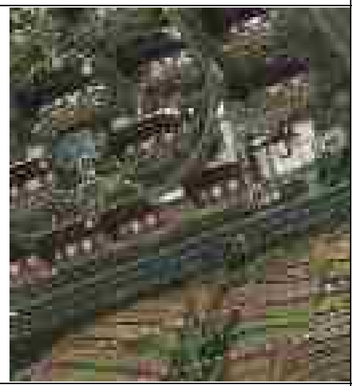
1.7-4

									-					( )				
						(m)	(m)	(m)	(m)	(m)			(m)	4a /4b	1 /2 /3			
9	~	K7+500 ~ K7+650				130	95	35	-9	+8.9		2	75	/	204	3 17 204 1 68		
10	~	CK0+380 ~ CK0+500				113 58	99 42	14 16	-17	+3.6		3	41	/	40	40 1 1 S202		
11	~	K11+200 ~ K11+600				36	19	17	-10	+4.5		4a /3	42	1	83	84 1 1 S202		
12	~	K14+200 ~ K14+600				48	32	17	0	+10	/	4a /1	72	5	60	65 1 1 S202		

1.7-4

									-					( )				
						(m)	(m)	(m)	(m)	(m)			(m)	4a /4b	1 /2 /3			
13	~	K16+000 ~ K16+200				68	51	17	0	+12		4a /1	72	3	42	45 1 3 S202		
14	~	K16+180 ~ K16+550				50 25	34 10	16 15	0	+6		4a /1	70	30	92	122 1~2 5 S202		
15	~	K19+720 ~ K19+940				100 43	70 35m	30 8	-4	+6.5		1	63	/	4 4	4 4 1~5 2200 120		
16	~	K19+980 ~ K20+200				82 25	40 17m	43 8	-4	+6.7		4a /1	117	144	432	16 576 6 4		

1.7-4

														( )				
						(m)	(m)	(m)	- (m)	(m)			(m)	4a /4b	1 /2 /3			
17	~	K20+580 ~ K20+920				80 28 71	53 20 58	33 8 13	-13	-10.8		4a /1	117	216	646	12 862 4 9 8 17 4		
18	~	K21+000 ~ K21+150				162 25 49	145 17 36	17 8 13	-2	+15.3		4a /1	63	120	120	7 6 240 3		
19	~	K22+750 ~ K23+200				72	55	17	-2	+7.6	/	4a /1	72	2	240	1 1 6 147m 242 3 48		

4

1.7-5

					(m)		
1	DK1+250~DK1+300				141		

1.7.6

1.7-6

1.7-6

1		K12+300	200m	36m	
2		K17+950	200m		
3		BK0+450	200m		
4		DK1+150	200m		

1.7.7

1.7-7

1.7-7

1		K5+900				
2		K21+200	200m 200	146m		

1.8

1.8.1

1.

2.

GB3838-2002

3.

(GB/T 18920-2020)

1.8-1~ 1.8-2

1.8-1 **mg/L pH**

	pH	COD_{Cr}	BOD_5	NH_3-N		SS*			DO
	6~9	≤20	≤4	≤1.0	≤0.2 (0.05)	≤30	≤0.05	≤6	≥5

SS SL63-94 2020 5 7

1.8-2 **mg/L pH**

	pH	BOD_5				
(GB/T 18920-2020)	6 9	≤10	≤8	≥2.0	≤0.5	≤30

1.8.2

GB/T14848-2017

1.8-3

1.8-3

	pH			**(mg/L)**	**(mg/L)**	**(mg/L)**
III	6.5~8.5	≤15	≤3	≤450	≤250	≤250
	(mg/L)	(mg/L)	(mg/ L)	(CFU/mL)	(MPNb/100mL)	(mg/L)
III	≤1000	≤20	≤1.00	≤100	≤3.0	≤3.0
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/ L)	(mg/L)
III	≤0.30	≤0.01	≤0.005	≤0.001	≤0.50	≤0.10

1.8.3

1.

[2024]24 1 2 3 4a 4b

1

55m 2 40m 3

25m GB3096-2008 4a

1

55m 2 40m 3

25m GB3096-2008 4b

2.

1

GB12523-2011

1.8-4

1.8-4 **dB A**

70	55

15dB

3

1

55m 2 40m 3

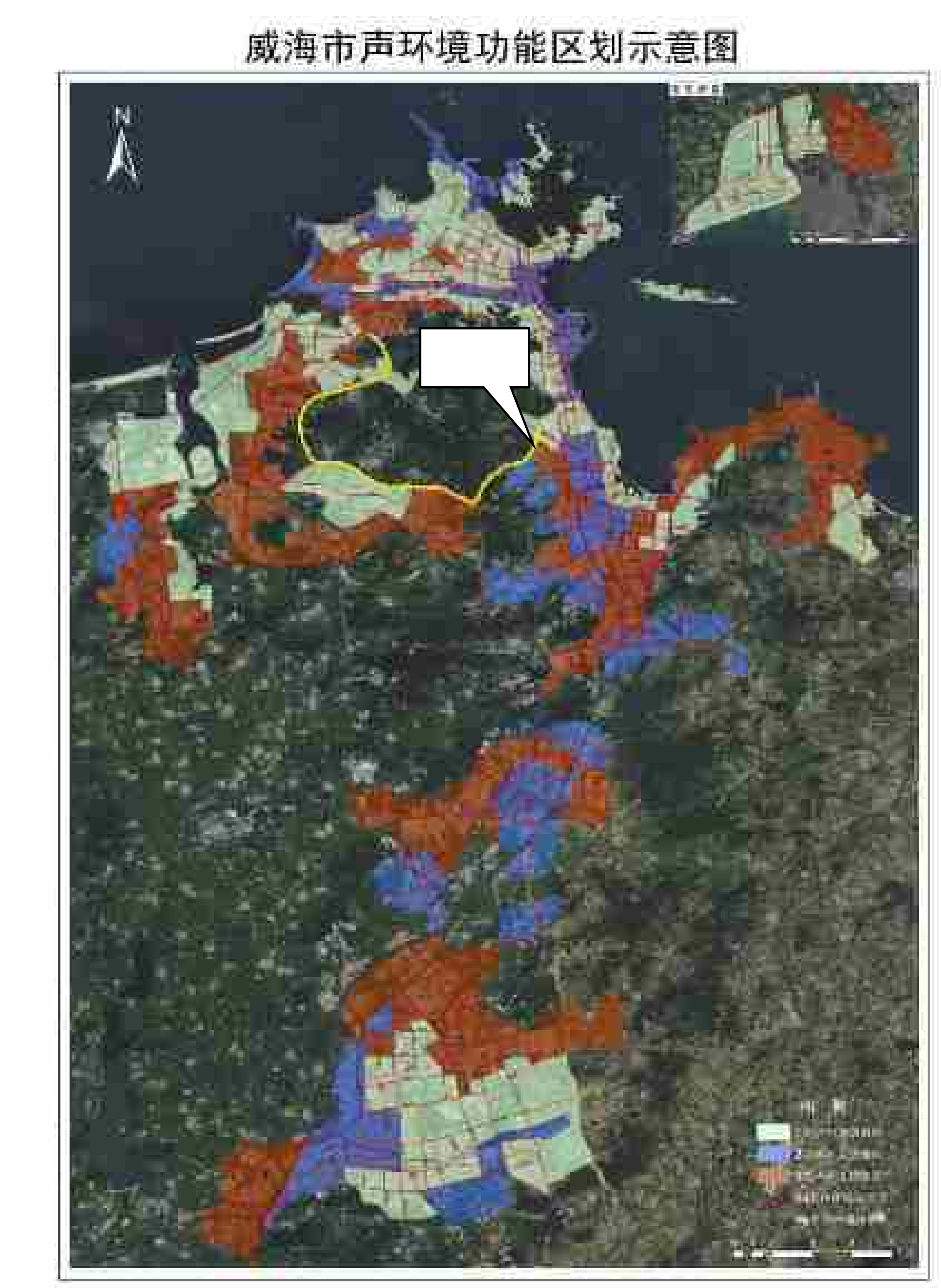
25m GB3096-2008 4a

1 55m 2

40m 3 25m

GB3096-2008 4b

1.8-1 1.8-5



1.8-1

1.8-5

	LAeq(dB)	
4b	70	60
4a	70	55
3	65	55
2	60	50
1	55	45

1.8.4

1.

2.

1

GB3095-2012 2018

2

GB16297-1996

GB16297-1996

GB4915-2013

GB16297-1996

(DB 37/597-2006)

1.8-7~ 1.8-10

1.8-7 **mg/m³**

			NO_2	SO_2	CO	O_3	PM_{10}	$PM_{2.5}$	TSP
GB3095-2012		24	0.08	0.05	4	0.10*	0.05	0.035	0.12
		1	0.20	0.15	10	0.16	/	/	/
		24	0.08	0.15	4	0.16*	0.15	0.075	0.30
		1	0.20	0.50	10	0.20	/	/	/

O_3 8

1.8-8 GB16297-1996 mg/m^3

		kg/h			
		m			
	75 40	15~80	0.18~10		
	120	15~60	3.5~85		1.0
[a]	0.30×10^{-3}	15~60	0.05×10^{-3}~1.1×10^{-3}		8×10^{-6}

1.8-9 GB 4915-2013 mg/m^3

		10	0.5

1.8-10 DB37/597-2006

	mg/m^3
	1.2

1.8.5

GB18599-2020 GB18597-2023

1.9

2028 2034 2042

2025 10 ~2028 10 36

1.10

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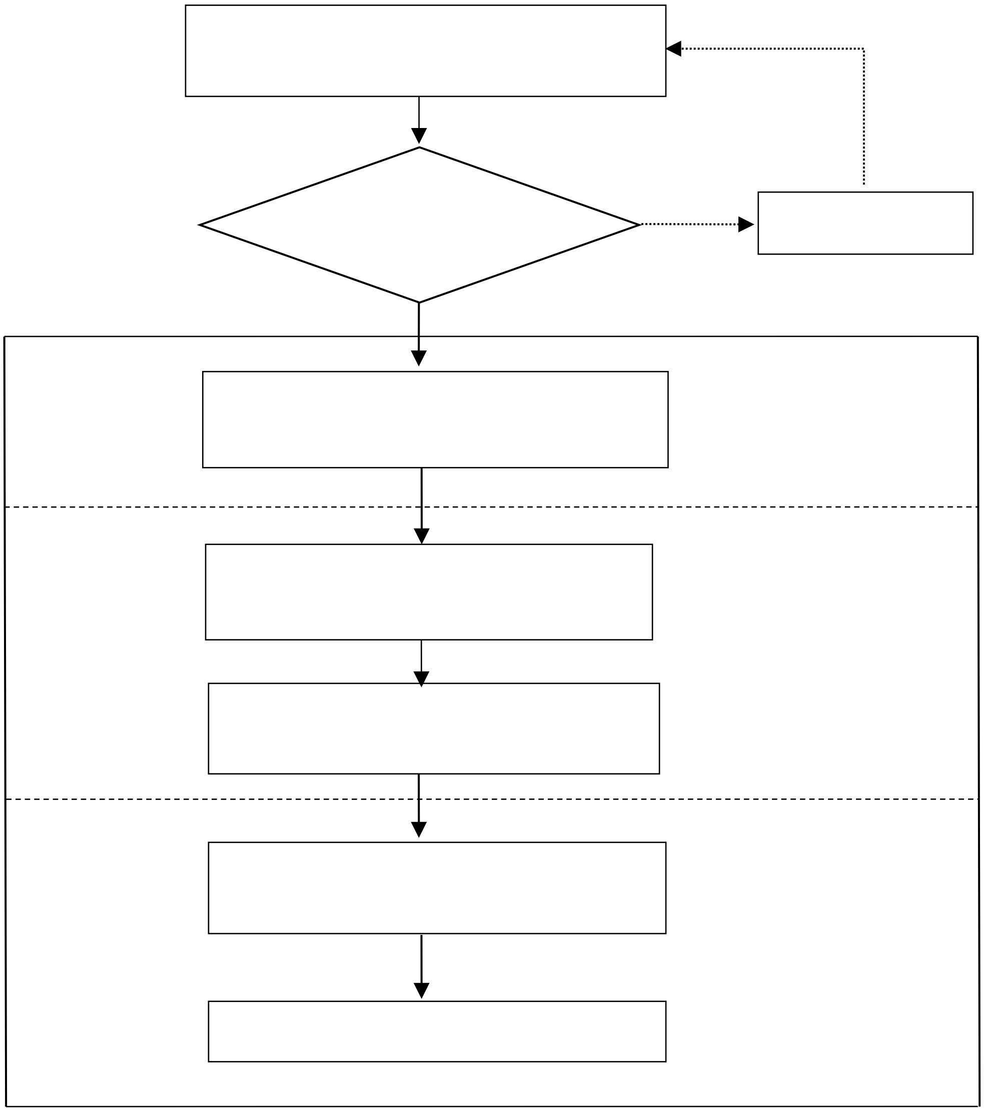
1.11

1.11-1



1.11-1

2

2.1

2.1.1

S302

2.1-1

2.1-1

S302
S201 2
S201

S201
S201

S302 S201
S201 S202 S202

S202 11.3

S302 S201
S202 S202

S302 5A

1.8 800

S302 G228
S202
G228 S202
G228 S202

S201
5A

G228 S202
S201 S202
S302 S201
S302

2.1.2

K

2.1-2

2.1-2

2.1-1

2.1-1

		A1	AK
1	km	4.022	7.828 S201 4.053
2	km	4.022	3.775
3		1.055	2.058
4	m/	1500 m /1	300 m /1
5	m/	15000 m /1	4500 m /2
6	m/	20000 m /1	3200 m /1
7	%	2.9%	3.79%
8		600	205
9	$1000m^3$	592.9	1208.9
10	$100m^3$	58.1	226.66
11	$1000m^2$	44.0	89.8
12		847m/1 24m/1	244m/4

13		2	8

2.1-1

		A1	AK
14		2	1
15		-	1
16		1	2
17		1	-
18	m/	1810m/1	490m/1
19	hm^2	30.4487	33.9970
20		69383.65	59156.13

1.

AK 7.828km S201 4.053 km 3.775 km 244m/4 2 490m/1 59156.13 15670.50

A1 4.022km 847m/1 1 1 1810 m /1 69383.65 17251.03

AK + A1 1810 m 847 m A1 1.8 800 AK

2.

AK 33.997hm^2 4.34 hm^2/km A1 30.4487 hm^2 7.57 hm^2/km AK 42.7% AK

3.

AK 2.058 A1 1.055 AK AK

4.

AK 2 + 8 + 1 A1 1 + 2 AK AK AK AK

2.1.3

2.1-2

2.1-2

		A1	**AK**	
				AK
		30.4487	33.997 S201	A1 AK 42.7%
		“ - - ”		AK
		1.8km	490m A1 3.9	AK
		5	5	
		S302	S302	AK
		1	2 S201 “ ”	AK
	AK			

1.

1 A1 5A

AK

2 58.1 m^3
AK 490m 226.66 m^3

3 " - - "

2.
1 5

2

3.
1 A1 S302
AK
S302
2 A1 1
9km AK
S201

2.1.4

A1 S302
AK

AK

2.2

2.2.1

1. S302 ~

2.
3.
4.
5. 18.229km
6. 2025 10 ~2028 10

7. 262385.1

8.

18.229km 1631m/7 21

6 1 2.2-1

2.2-1

1			km	18.229
2			m/	1631/7
3			m/	1887.75m/3
4				21
5				6
6				1
7			hm^2	153.34
8			hm^2	8.68
				2
9			m^3	322.82
			m^3	208.93
10			m	4560
11			m	2580
12			m^2	6171.71
13				262385.1

2.2.2

80km/h

33m S202

80km/h 32m 2.2-2

2.2-2

					S202
1			-		
2				6	6
3			km/h	80	80
4			m	33	32
				16.5	/
5			m	3.75	3.75
6			m	3.0	2.5
7			m	700	700
8			m	6500	6500
			m	6500	6500
9			%	3.0	4.0

2.2-2

					S202
10			m	330	460
11			-	1/100	1/100
			-	1/100	1/100
12			-	-I	-I

2.2.3

S201

S202

S202

S202

S201 1

2.2.4

2.2.4.1

1.

33m

0.75m +3.0m +3×3.75m +3m 0.5m

+2 +0.5m +3×3.75m +3.0m +0.75m

16.5m 0.75m +3.0m

+3×3.75m +0.75m +0.75m

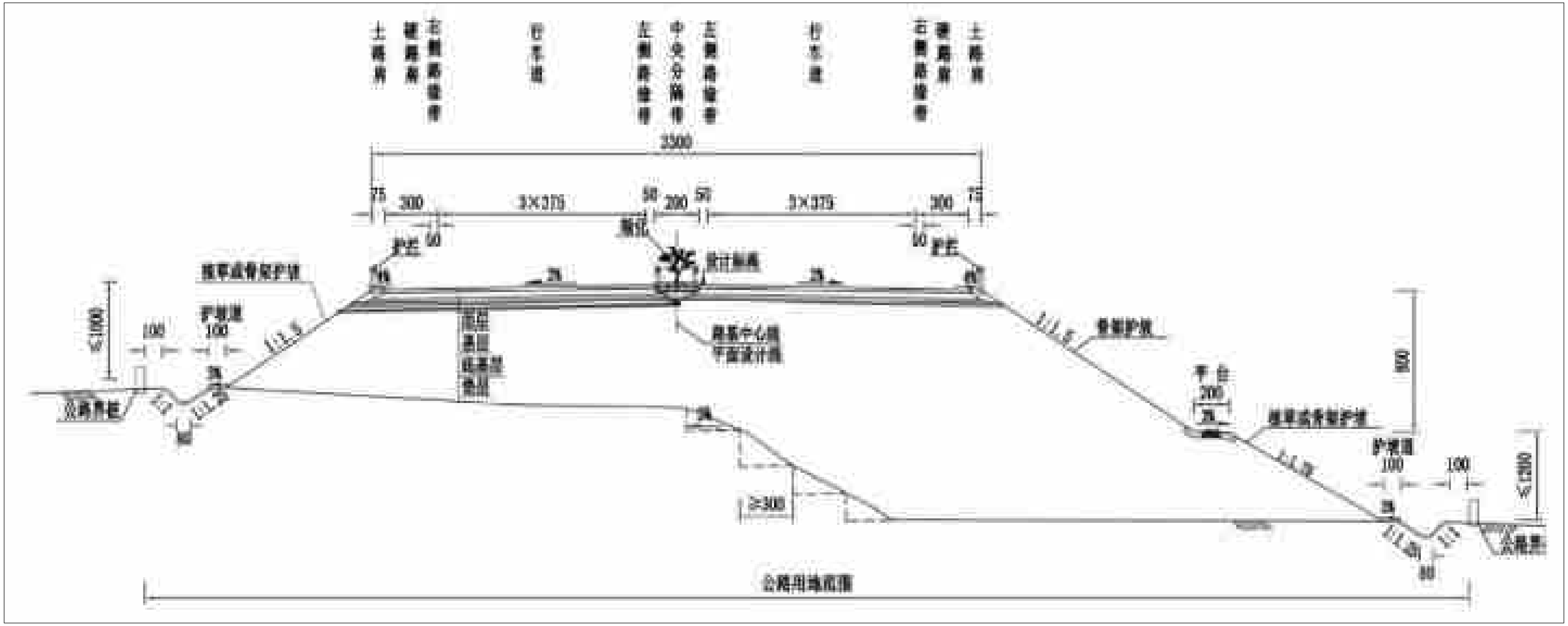
S202 32m

0.75m +2.5m +3×3.75m +0.5m

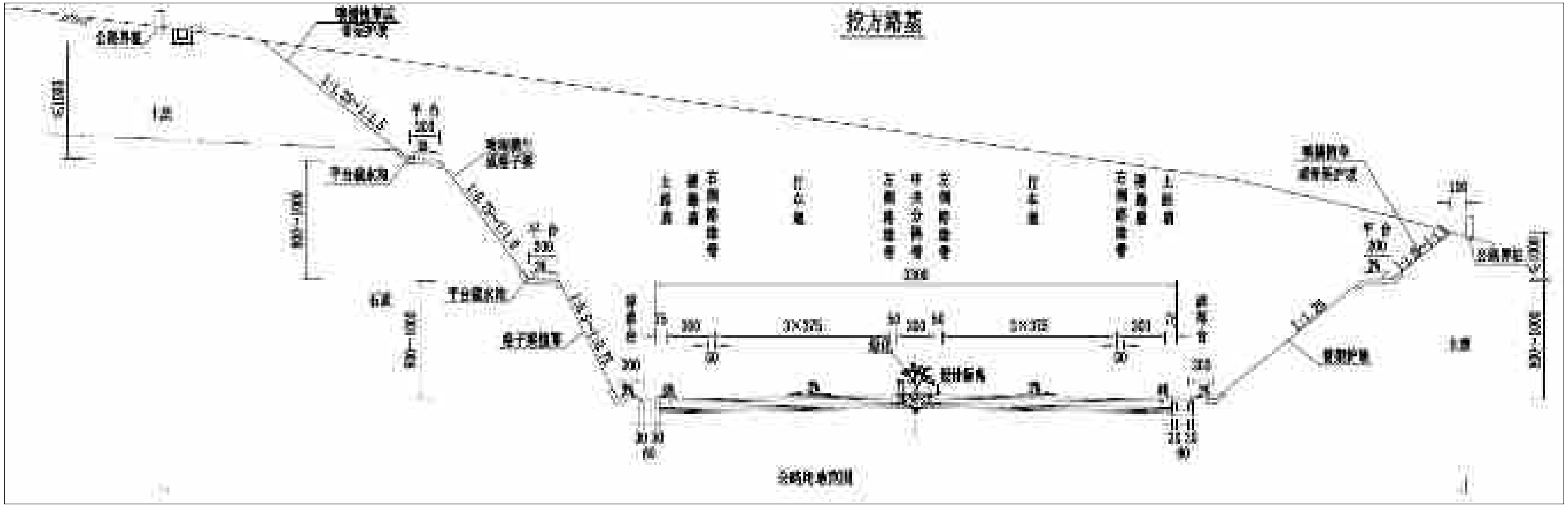
+2.0m +0.5m +3×3.75m +2.5m

+0.75m

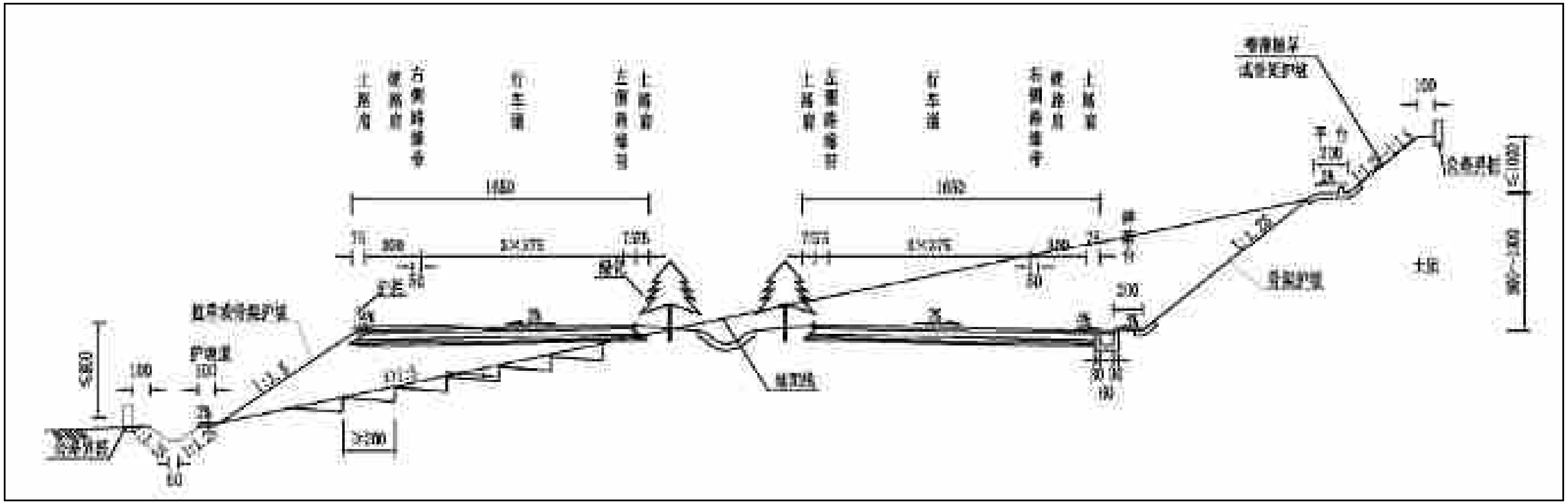
2.2-1~ 2.2-5



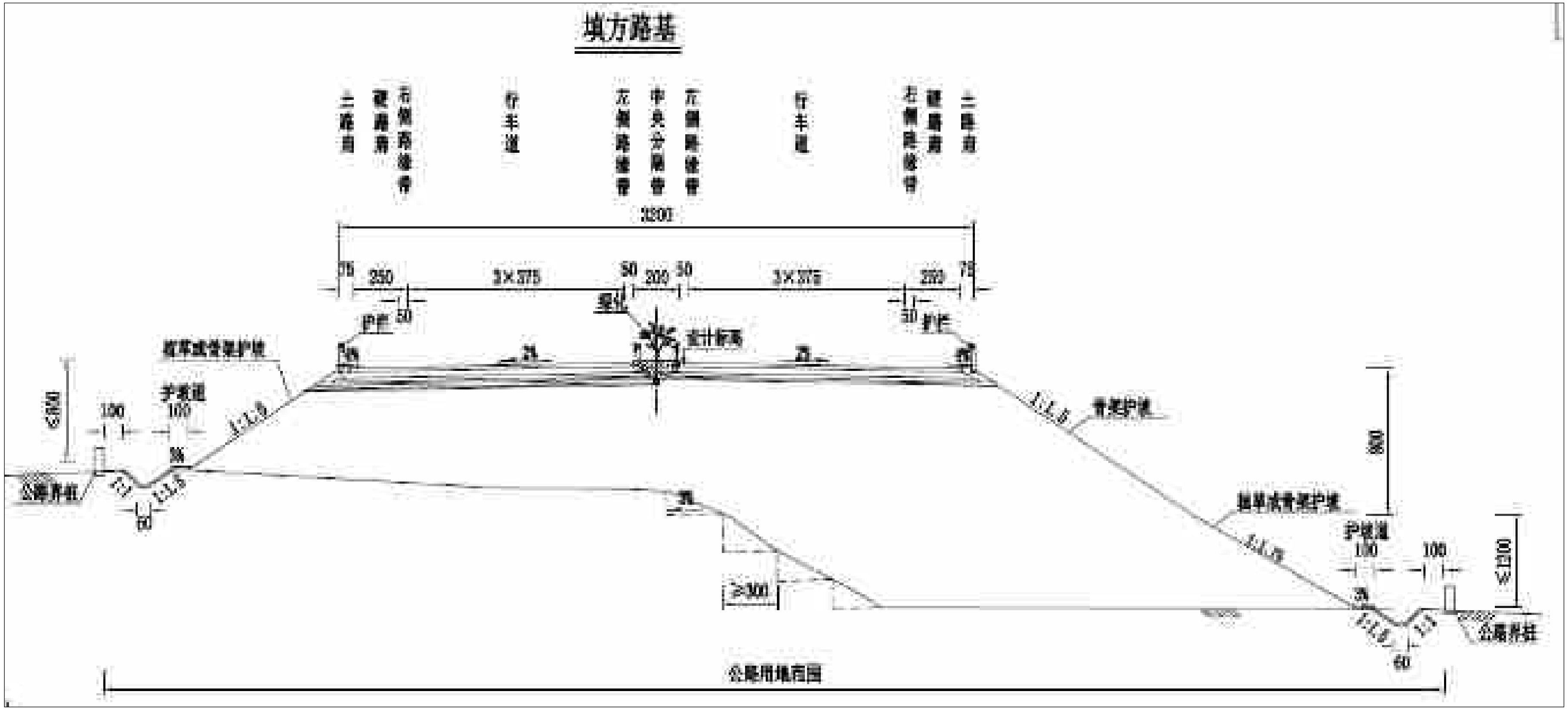
2.2-1 -



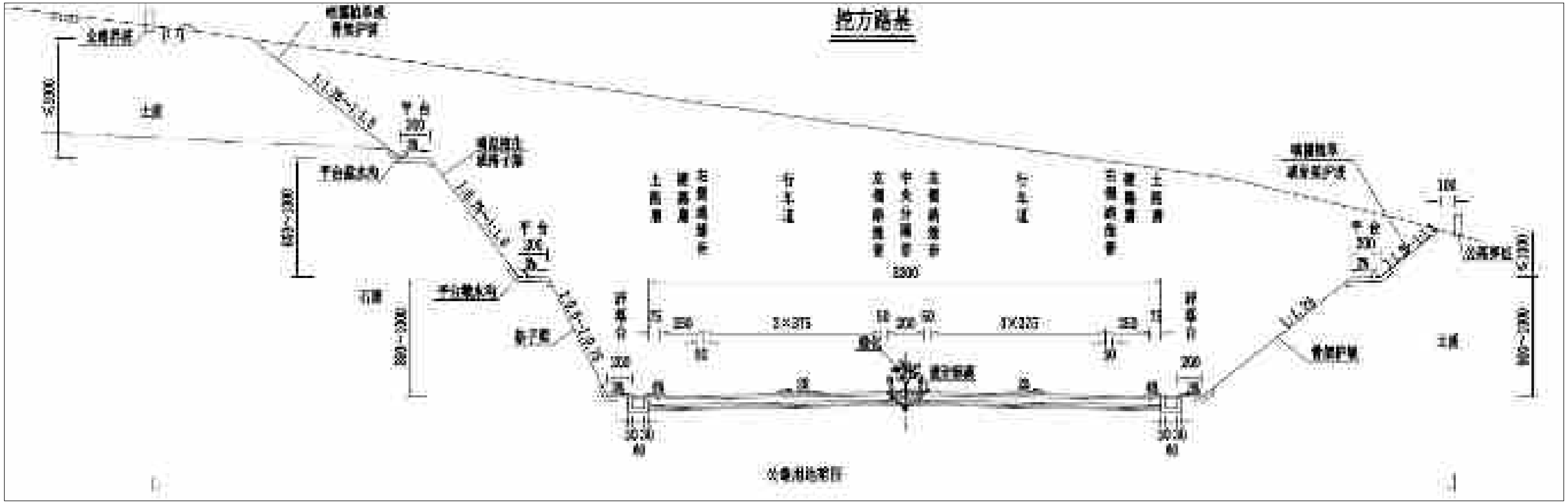
2.2-2 -



2.2-3


填方路基
二路肩
硬路肩
右侧路缘带
行车道
左侧路缘带
中央分隔带
左侧路缘带
行车道
右侧路缘带
硬路肩
二路肩
3200
75
250
3×375
50
200
50
3×375
250
75
50
50
护栏
护栏
绿化
设计标高
2%
2%
植草或骨架护坡
骨架护坡
植草或骨架护坡
护坡道
护坡道
1:1.5
1:1.5
1:1.75
800
≥300
≤1200
公路界桩
公路界桩
公路用地范围
100
100
100
100
60
60
1:1
1:1

2.2-4 S202


挖方路基
平台
200
平台
200
平台
200
行车道
中央分隔带
2300
土质
石质
200
200
2×375
2×375
30 30
60
30 30
60

2.2-5 S202

2.

8m 1 1.5 8m

8m 1 1.5 1 1.75

1m 4%

4m

4m

3.

8~10m

1 1~1 1.25

1

1~1 1.25 1 0.75~1 1 1

1

8~10m

1.0m 4%

2.0m 3%

a. H 3.5m

3.5m

H

3.5m

b.

+

c.

4.

60cm 60cm

1 1.25

+

+

5.

24m C35

C35

36m

30cm

+

PVC-U PVC-U

48m PVC-U

PVC-U C20

6.

2.2-3

2.2-3

	m	m
K6+118~K6+943	825	63

7.

2.2-4 2.2-5

2.2-4

				(m)	**(m)**	**(m)**					
							m³	**m³**	**m³**	**m²**	**m³**
1	K7+200~K7+220			20.0	12.0	2.0		72		240	1400
2	K7+216~K7+230			5.0	20.0	2.0	200		550		
3	K7+435~K7+500			30.0	45.0	0.8	1080		6063		
4	K8+270 ~K8+280			10.0	20.0	0.8	160		726		
5	ZK8+395~ZK8+430			35.0	25.0	1.0		262.5		875	3780
6	YK17+985~YK18+000			10.0	5.0	0.5		15		50	
7	ZK18+180~ZK18+190			10.0	10.0	0.5	50		300		175
8	K18+745~ K18+770			25.0	12.0	1.0		90		300	
9	K19+265~ K19+400			135.0	38.0	1.0		1539		5130	1400
10	K19+480~K19+505			30.0	35.0	0.5		315		1050	29700
11	K19+960 ~K19+980			15.0	30.0	2.0	900		2400		2775
12	C K1+390~K1+430			25.0	25.0	0.5	312.5		3037.5		
13	D DK0+495~DK0+510			10.0	15.0	0.5	75.0	45.0	510.0		
14	G GK0+470~GK0+485			15.0	10.0	0.5	75.0	45.0	720.0		
15	G GK0+570~GK0+620			50.0	10.0	0.5	250.0	150.0	1800.0		

16	A AK0+000~AK0+075			75	30.0	1.0		675.0		2250.0	10800.0

2.2-4

				(m)	(m)	(m)	m^3	m^3	m^3	m^2	m^3
17	A AK0+410~AK0+496			86.0	15.0	1.0		387.0		1290.0	5848.0
18	C CK0+240~CK0+245			5.0	20.0	1.0	100.0		330.0		
19	D DK0+550~DK0+610			60.0	5.0	1.0		90.0		300.0	1680.0
20	A AK0+010~AK0+050			40.0	12.0	0.5		144.0		480.0	1960.0
21	CRK0+120~CRK0+160			40.0	10.0	1.0		120.0		400.0	1920.0
22	CRK0+160~CRK0+240			80.0	13.0	1.0		312.0		1040.0	4800.0
23	CRK0+240~CRK0+300			60.0	16.0	1.0		288.0		960.0	4320.0
24	CRK0+410~CRK0+450			40.0	6.0	1.0		72.0		240.0	1280.0
				911.0	439.0	23.4	3252.5	4621.5	16496.5	14605.0	72323.0

2.2-5

				m	m	m^3	m^3	m^3
1	K12+565~K12+685	120.0		17.0	2.0	180.0		
2	A AK0+540~AK0+579.5	39.5		50.0	2.5	59.3		
3	B BK0+000~BK0+020	20.0		60.0	3.0	30.0		
4	B BK0+020~BK0+100	80.0		35.0	11.0	120.0	30800.0	30800.0
5	B BK0+100~BK0+200	100.0		60.0	5.0	150.0		
6	B BK0+200~BK0+240	40.0		35.0	9.0	60.0	12600.0	12600.0
		399.5			32.5	599.3	43400.0	43400.0

8

2.2-6 2.2-7

2.2-6

			m
1		K6+980	185.7
2		K7+100 K7+300	354.3
3		K7+540	191.6
4		K7+550 K7+800	330.4
5		K7+837	91.4
6		K8+460	82.6
7		K8+522	245.8
8		K18+027	163.2
9		K18+150-18+250	82.0
10		K18+300-18+620	328.1
11		K18+619	120.0
12		K19+560	73.3
13		K20+253	452.5
14		K21+900	160.0
15		AK0+170	84.1
16		AK0+200	164.6
17		DK0+100	98.3
18		AK1+360	142.4
19		DK0+600	240.0
20		K22+900 K23+130	340.1
21		K23+140 K23+290	152.2
22		K5+700	80.2
23		K6+350	207.3
24		BK0+200-BK0+350	131.4
25		BK0+600 BK0+680	65.4
26		K10+960	102.5
27		DK0+400-DK0+600	192.1
28		DK0+220	80.8
29		EK0+100	158.9
30		AK0+300-750	612.7
31		DK0+050	261.7
32		DK0+207	116.1
33		DK0+250	67.9
			6159.6

2.2-7

			(m)
1		GG1K0+000-GG1K0+061.530	61.5
2		GG2K0+000-GG2K0+065.083	65.1
3		GG3K0+000-GG3K0+019.119	19.1
			145.7

2.2.4.2

4cm SBS SMA-13

6cm SBS AC-20C

18cm

18cm

18cm 30%

64cm

S202

S202

4cm AC-13

6cm AC-20

18cm

18cm

18cm

S202 4cm SBS

SMA-13

2.2.4.3

1.

-

80km/h

32.5m 32.5m

1/100

VIII 0.10g VIII

2.

1371m/3 394m/2 977m/1 218m/3

24m/1 21 9 12

2.4-4

3. -

15 × 30+5 × 25+2 × 30+25+5 × 30+4 ×

25+2 × 30+25m 14 × 30+5 × 25+2 × 30+25+5 × 30+4 × 25+2 × 30+25m

2.2-8

			(-m)	m						
1	K11+157		6-30	187.08				/	/	
2	K14+608		8-25	207.08				/	/	
3	K22+377		15-30+5-25+2-30+25+5-30+4-25+2-30+25 14-30+5-25+2-30+25+5-30+4-25+2-30+25	1002/972			/		9	

2.2.4.4

1.

80km/h 50 km/h

-I

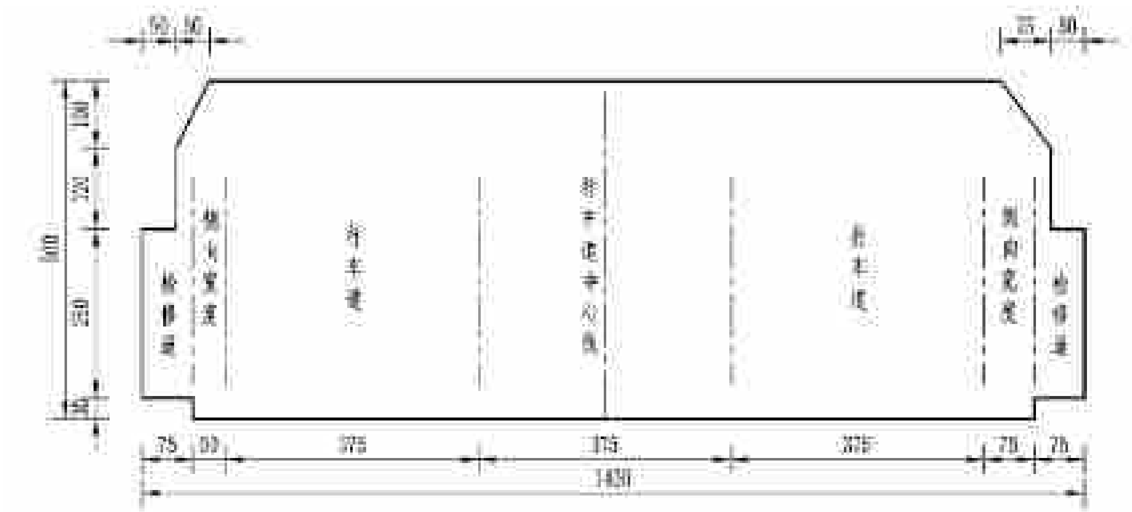
2% ( )

0.3% ≤ i ≤ 3%

2.

14.0m

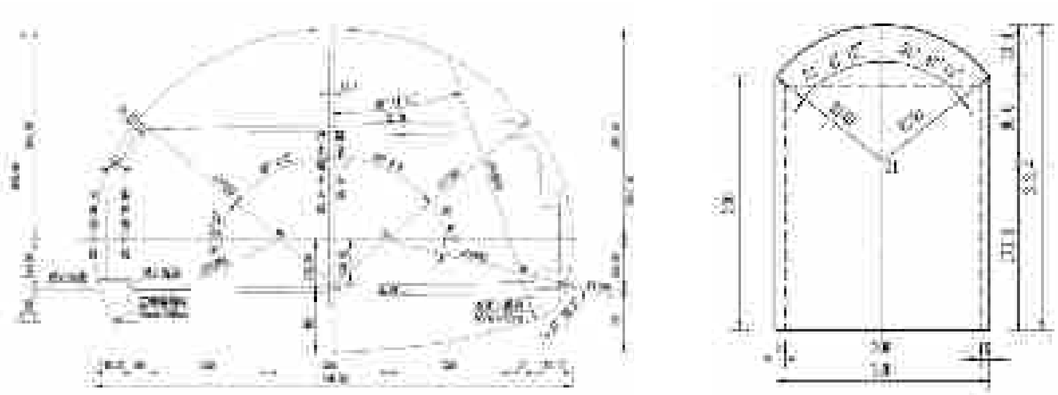
5.0m



2.2-6

3.

80km/h



2.2-7

r1=7.930m r2=5.80m

14.863m 10.020m

r1=1.40m

2.20m 3.134m

4.

3

5.

1887.75m/3 1448.25m/2 439.5m/1

2.2-9

2.2-9

				(m)				
1			ZK8+831~ZK9+250	419				
			K8+800~K9+260	460				
2			ZK17+065~ZK17+890	825				
			K17+055~K17+893	838				
3			AK0+566~AK1+120	554				
			BK0+495~BK1+118	623				
			CK0+523~CK1+235	712				
			DK0+552~DK1+130	578				

2.2.4.5

6 4 2 1

13 2.2-10

2.2-10

1		K5+978			S201
2		K9+772	T	/	S202
3		K12+521			
4		K16+614	T		S202
5		K21+048			
6		K24+208	T	/	S201

2.2.4.6

1 3

2.2-11

2.2-11

			(hm^2)
1		K12+300	0.85
2		K17+950	0.08
3		BK0+450	0.08
4		DK1+150	0.08
			1.09

2.2.5

1\.

153.34 hm^2 37.27hm^2 16.89 hm^2 50.86 hm^2 3.69 hm^2 2.6 hm^2 39.52 hm^2 0.19 hm^2 2.32 hm^2 2.2-12

2\.

8.68 hm^2 1.11 hm^2 1.39 hm^2 2.23 hm^2 0.83 hm^2 3.12 hm^2 2.2-12~2.2-13

3\.

6171.71m^2 23 66 885m 58080m

6159.6m 145.7m 5.65hm^2

2.2-12 **hm^2**

	13.37	7.64	11.71	0.04	0	34.72	0.05	0.25	67.78
	0.63	0.07	0.5		1.87	0.3		0.24	3.62
	23.13	9.18	37.98	3.65	0.73	4.5	0.14	1.55	80.85
	0.14		0.67					0.28	1.09
	37.27	16.89	50.86	3.69	2.6	39.52	0.19	2.32	153.34

2.2-13 **hm^2**

	1.11	1.39	2.23			0.83			5.56
	0							3.12	3.12
	1.11	1.39	2.23	0	0	0.83	0	3.12	8.68
	38.38	18.28	53.09	3.69	2.6	40.35	0.19	5.44	162.02

2.2.6

2.2.6.1

322.82

m³ 208.93 m³ 114.45

m³ 3.62 m³

110.27 m³

2.2-13

2.2-13

1		K9+771~K16 +313			16766			16766						0												16766		
2		K5+979~K9+ 771	51338	162898				214236	194263	216184				410447	48187	134332		146076	81852		1 146076 81852	3151	28566		2 3151 28566	0		
3		K16+313~K2 4+208	49003	211516				260520	53279	622080				675359	49003	211516		4275	410564		2 266791 3 4275 134355 6 9418					0		
4							2390	2390		51563				51563					51563		5 12854 3 38709			2390		0		
5				12854				12854						0									12854		3 12854	0		
6								0					2390	2390						2390						0		
			100342	387268	16766	0	2390	506766	247542	889827	0	0	2390	1139759	97190	345848	0	150351	543979	2390	0	3151	41420	2390	0	16766	0	0
1		K5+978	182595	1034706	4346			1221647	36519	41908				78427	36519	41908						146076	123186		2 146076 81852 7 41334	87395 8		
2		(K9+754)	35130	77146	7292			119567	40805	194722				235527	35130	77146		5676	117576		2 3151 28566 1 2525 89010					7292		

2.2-13

3		(K12+484)	11602	50841	3221			65663	16088	113410				129498	11602	50841		4486	62570		1 61129 2 4486 1441					3221		
4		(K16+578)	3592	40601	4004			48197	3592	58205				61797	3592	40601		0	17604		2 17604					4004		
5		(K21+317)	2773	52693				55466	76081	103373				179454	2773	52693		73308	50680		6 50680					0		
6		(K24+208)	163165	183560				346725	89857	19582				109439	89857	19582						73308	60098		5 73308 50680 3 9418	10388 0		
7							813	813		41334				41334					41334		1 41334			813		0		
8								0					813	813						813						0		
			398857	1439547	18863	0	813	1858079	262943	572533	0	0	813	836288	17947 3	282770	0	83470	289764	813	0	219384	183284	813	0	99235 5	0	0
1		K8+800 K9+260	2525	156838				159362						0	0	0						2525	150139		2 2525 89010 3 61129	6699		
2		K17+055 K17+893	4486	285836				290322						0	0	0						4486	285836		3 4486 1441 4 17604 3 266791	0		

2.2-13

3			4275	288788				293063						0	0	0						4275	173064		3 4275 134355 4 38709	11572 4		
			11286	731461	0	0	0	742747	0	0	0	0	0	0	0	0	0	0	0	0	0	11286	609039	0	0	12242 2	0	0
2		K7+850	107	71		739		917	107	71		739		917	107	71	739									0		
3		K11+157			224			224						0												224		
4		K14+608			248			248						0												248		
5		K19+563	424	282		1832		2538	424	282		1832		2538	424	282	1832									0		
6		K20+233	361	240		1685		2286	361	240		1685		2286	361	240	1685									0		
7		K22+362	950	634		8796		10380	950	634		8796		10380	950	634	8796									0		
			1841	1227	473	13052	0	16593	1841	1227	0	13052	0	16121	1841	1227	13052	0	0	0	0	0	0	0	0	473	0	0
1			10236	6142				16378	10236	6142				16378	10236	6142										0		
			10236	6142	0	0	0	16378	10236	6142	0	0	0	16378	10236	6142	0	0	0	0	0	0	0	0	0	0	0	0
1			49317	18809				68126	49317	11904				61221	49317	11904										6905		
2			3306	584				3890						0								3306	584			0		
3								0	3306	584				3890				3306	584									
			52623	19393	0	0	0	72016	52623	12488	0	0	0	65111	49317	11904	0	3306	584	0	0	3306	584	0	0	6905	0	0
1			9360	6240				15600	9360	6240				15600	9360	6240												
			9360	6240	0	0	0	15600	9360	6240	0	0	0	15600	9360	6240	0	0	0	0	0	0	0	0	0	0	0	0
1			100342	387268	16766	0	2390	506766	247542	889827	0	0	2390	1139759	97190	345848	0	150351	543979	2390	0	3151	41420	2390	0	16766	0	0
2			398857	1439547	18863	0	813	1858079	262943	572533	0	0	813	836288	17947 3	282770	0	83470	289764	813	0	219384	183284	813	0	99235 5	0	0
3			11286	731461	0	0	0	742747	0	0	0	0	0	0	0	0	0	0	0	0	0	11286	609039	0	0	12242 2	0	0
4			1841	1227	473	13052	0	16593	1841	1227	0	13052	0	16121	1841	1227	13052	0	0	0	0	0	0	0	0	473	0	0
5			10236	6142	0	0	0	16378	10236	6142	0	0	0	16378	10236	6142	0	0	0	0	0	0	0	0	0	0	0	0

2.2-13

6			52623	19393	0	0	0	72016	52623	12488	0	0	0	65111	49317	11904	0	3306	584	0	0	3306	584	0	0	6905	0	0
7			9360	6240	0	0	0	15600	9360	6240	0	0	0	15600	9360	6240	0	0	0	0	0	0	0	0	0	0	0	0
8			584544	2591278	36102	13052	3203	3228179	584544	1488457	0	13052	3203	2089256	347417	654132	13052	237127	834327	3203	0	237127	834327	3203	0	1138921	0	0

2.2.6.2

22.32 m³

2.2-14

2.2-14

			m³		
	m³				**m³**
	6.55	5.073	5.07		1.48
	0.24	0			0.24
	0.00	0.30		0.30	
	14.42	14.42	14.42		
	0.16	0.13	0.16	-0.03	
	0.95	0.84	0.84		0.11
	0.00	1.56		1.56	
	22.32	22.32	20.49	1.83	1.83

2.2.7

2.2.7.1

2.2.7.2

13

5.58hm² 22.32 m³ 2.2-15

2.2-15

			(m³)	**hm²**	
1			1.63	0.41	
2			1.48	0.37	
3			1.32	0.33	
4			1.78	0.45	
5			3.56	0.89	
6			2.38	0.60	
7			1.98	0.50	
8			2.15	0.54	
9			2.23	0.56	
10			2.12	0.53	

2.2-15

			(m³)	hm²	
11			0.13	0.03	
12		K5+900	0.78	0.20	
13		K21+200	0.78	0.20	
			22.32	5.58	

2.2.7.3

1.

1

0-0.3cm 0.3-0.5cm 0.5-1.0cm 1.0-1.5cm

123

112km

10km

2

5-10cm 10-20cm 20-30cm

35

3

93km

4

5

2.

S302 S201 S202

2.2.8

2.2.8.1

2025 10 2028 10

36

2.2-16

	2025				2026				2027				2028			
	1~12				1~12				1~12				1~12			

2.2.8.2

2

3.12hm^2

2.2-17

2.2-17

		(hm^2)
1	K5+900	1.57
2	K21+200	1.55
		3.12

2.2.8.3

S202 S201

2.2.8.4

1.

“ ”

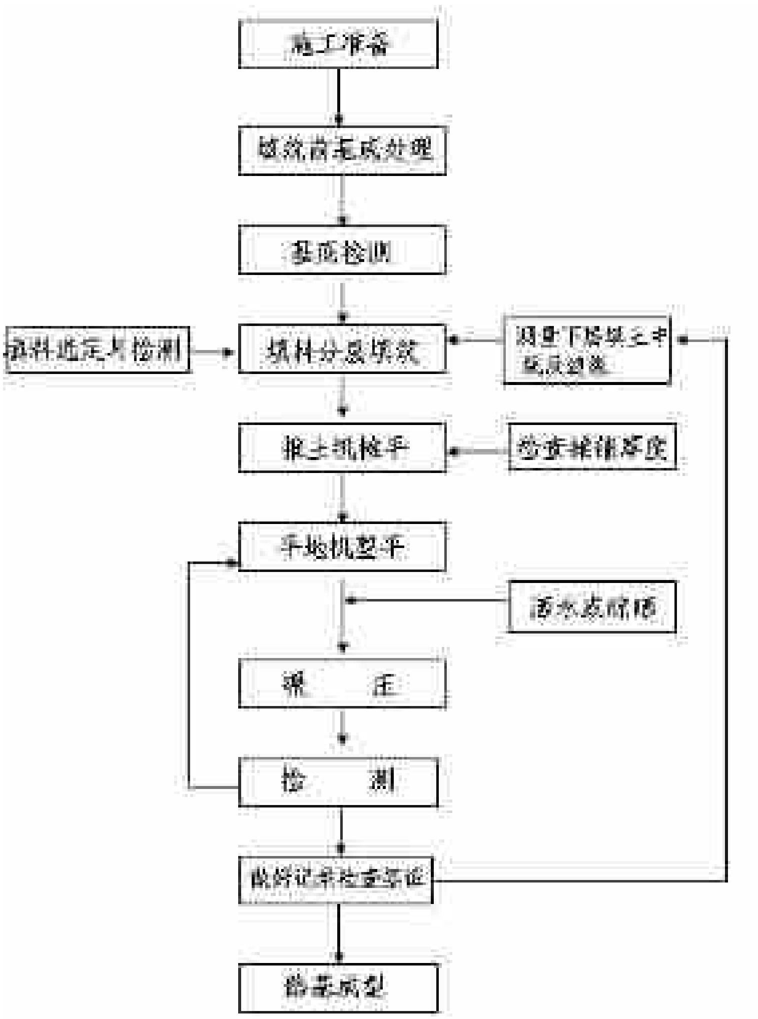
→ → → → → →

→

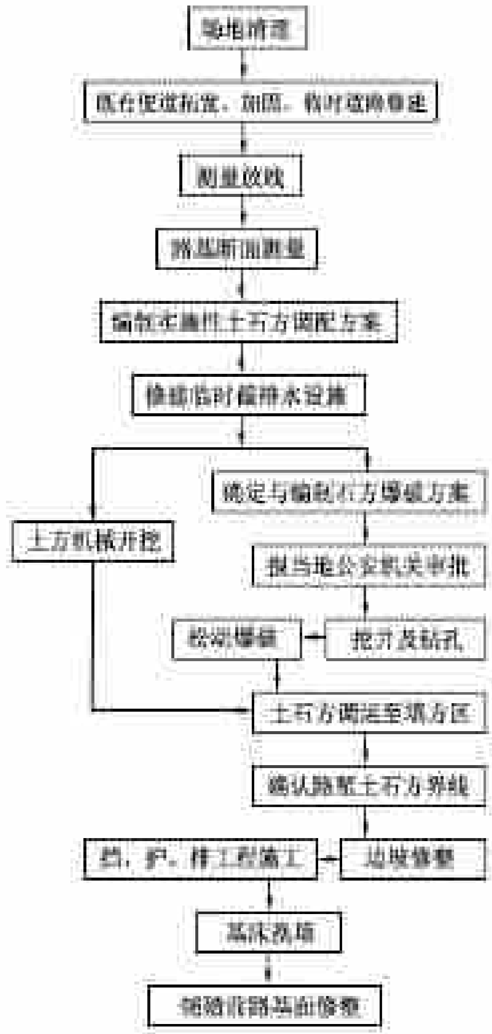
2.

1

2.2-8 2.2-9



2.2-8


场地清理
测量放线
路基断面测量
编制实施性土石方调配方案
修建临时截排水设施
确定与编制石方爆破方案
土方机械开挖
报当地公安机关审批
松动爆破
土石方调运至填方区
确认路堑土石方界线
挡、护、排工程施工
边坡修整

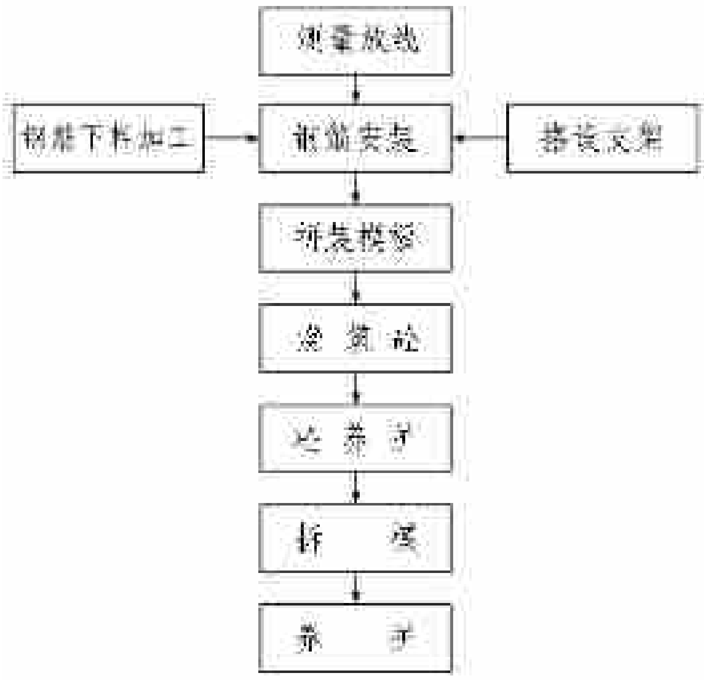
2.2-9

2

3

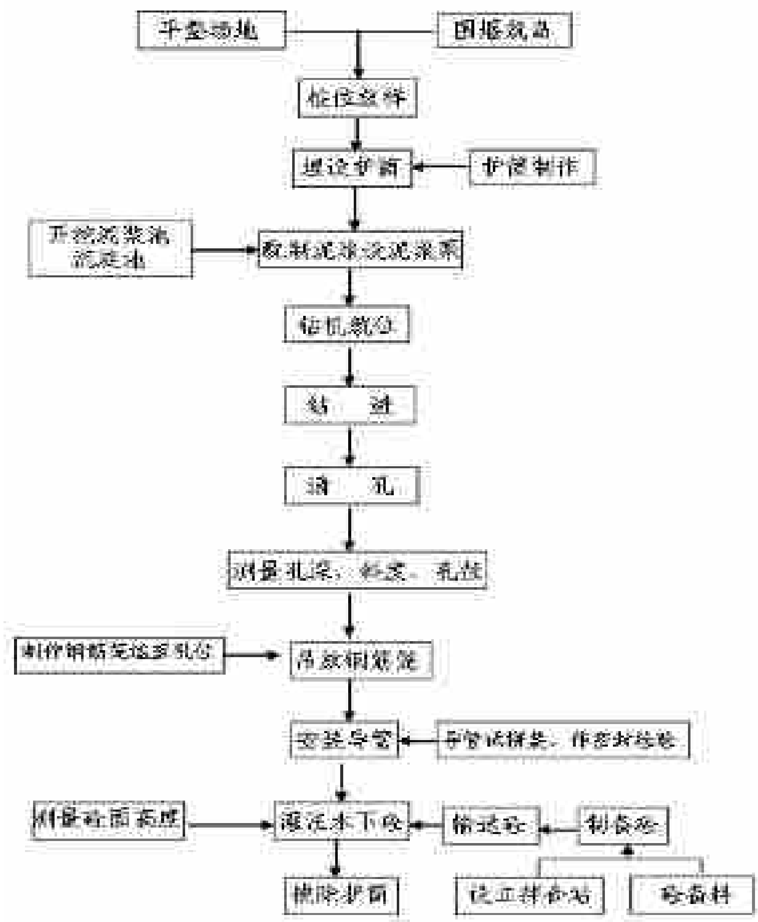
→ →

2.2-10

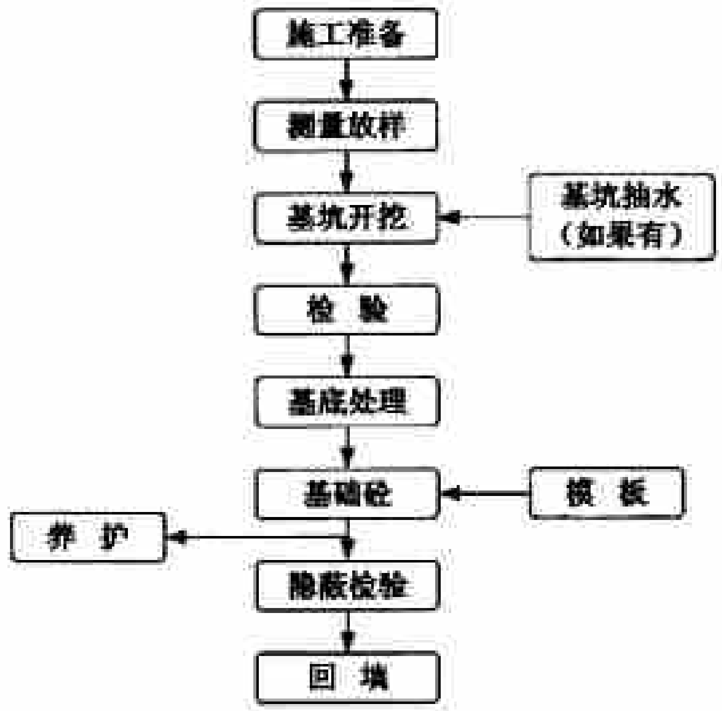


2.2-10

2.2-11 2.2-12


平整场地
桩位放样
埋设护筒
护筒制作
开挖泥浆池
沉淀池
钻机就位
钻进
清孔
测量孔深、斜度、孔径
吊放钢筋笼
安装导管
测量砼面高度
灌注水下砼
输送砼
制备砼
拆除护筒
设立拌合站
砼备料

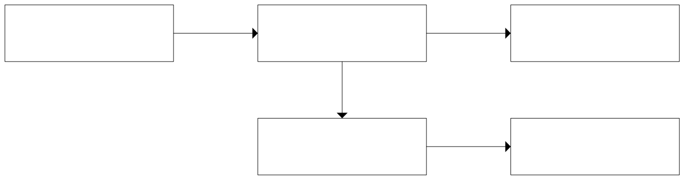
2.2-11


施工准备
测量放样
基坑开挖
基坑抽水
（如果有）
检 验
基底处理
基础砼
模 板
养 护
隐蔽检验
回 填

2.2-12

0.5~0.7m

2.2-13



2.2-13

4

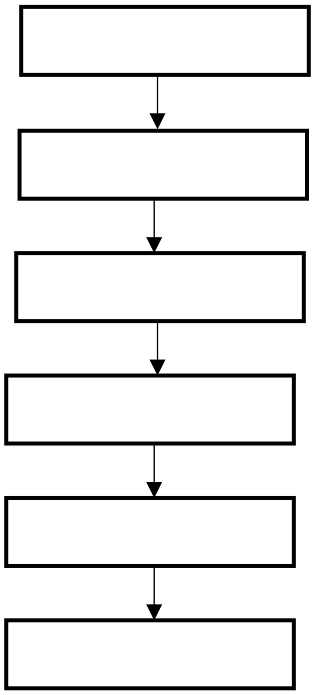
3 →

→ → →

V → → → → → →

→ → → →

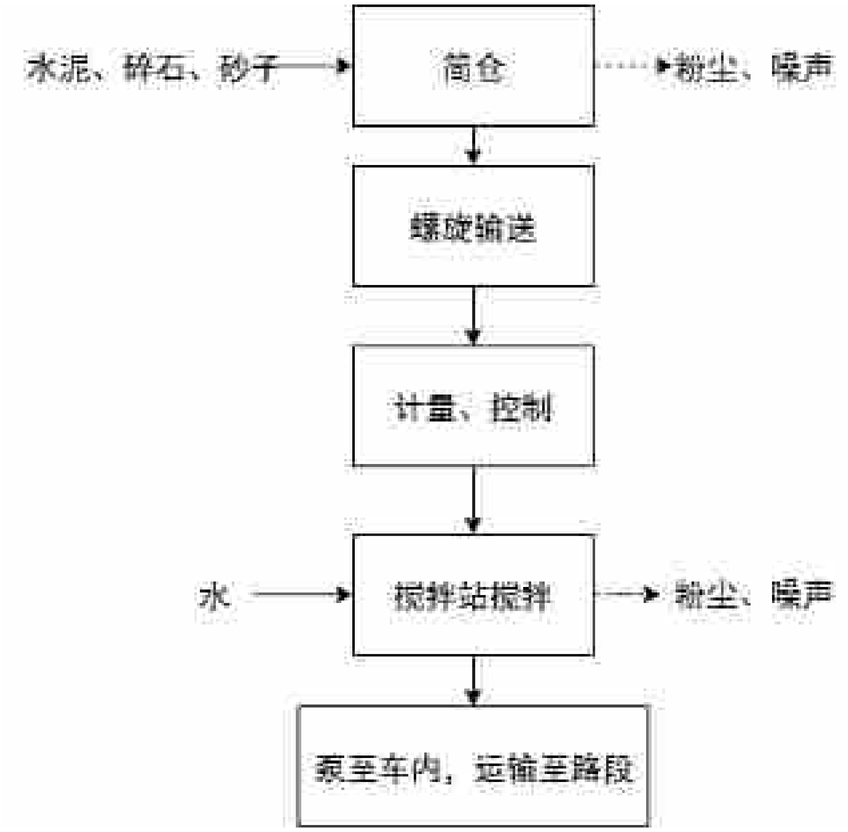
5



2.2-14

6

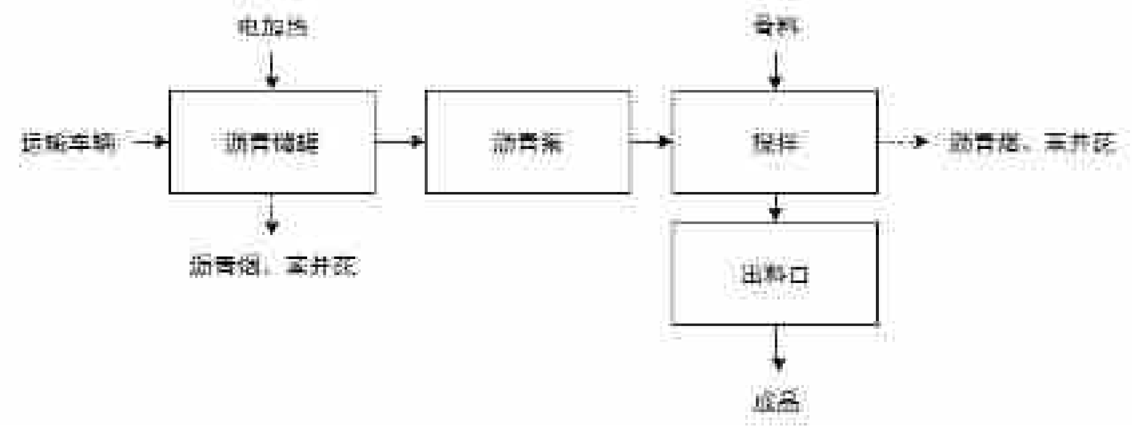
2.2-15



2.2-15

7

2.2-16



2.2-16

160~180

2.2.9

2.2.9.1

2.2.-18 2.2-19

2.2-18 **pcu/**

	2028	**2034**	**2042**
~	31287	32950	38170
~	33328	42935	52539
~	29881	39288	48288
~	26083	34287	42078
~	26294	34548	42396
	35091	37602	49785

2.2-19 **/**

	2028	**2034**	**2042**
~	23524	24543	28288
~	25059	31980	38937
~	22467	29264	35786
~	19611	25539	31184
~	19770	25734	31420
	26384	28008	36896

2.2.9.2

1.

2.2-20

2.2-20

2028	79.00%	9.30%	4.50%	7.20%
2034	79.18%	8.58%	4.50%	7.74%
2042	79.30%	8.08%	4.64%	7.98%

2.

16 0.9 6:00 22:00

2.2.10

262385.1

2.3

2.3.1

1.

2.

153.34hm^2 37.27hm^2 16.89hm^2

50.86hm^2 3.69 hm^2 2.6hm^2 39.52hm^2

0.19hm^2 2.32hm^2

6171.71m^2

SS

SS

3.

NO_X CO

2.3.2

1.

1

100L

0.9

$$Q_S = (k \bullet q_1)/1000$$

Q_S —— (t/ ·d)

k —— (0.6~0.9) 0.9

q_1 —— (L/ ·d)

0.09t

2 100

9.0t

18t

2.3-1

2.3-1

	BOD_5	COD		SS		
mg/L	200~250	400~500	40~140	500~600	2~10	15~40

2

SS

aË®µ×Ñ¹¸Ö¹ÜÎ§Ñß ⟶ b³é³öÑßÄÚ²¿·Ö»ýË® ⟶ c»úÐµ×ê¿× ⟶ d»úÐµ¹àÍÁ¡¢¹à½¬×¢×® ⟶ eÑø»¤ ⟶ f²ðÑß¢µõ×°ÔØÖÁÅå¡¢ÏäÁº ⟶ gÇÅÃæ¸½Êô³Ì ⟶ hÐÞÕû ⟶ i ÔËË

a. SS

150m

SS

b.

SS 2.3-2

2.3-2 SS

	1.33 kg/s	0.40 kg/s	$1000m^3/h$
	0.31 kg/s	0.10 kg/s	
	500~1000 mg/L	<60 mg/L	

c.

d. d~i SS

3

$$Qs=2.74a \times W \times A$$

a—

W— mm

A— km^2

“ - - - ”

“ ”

2.3-3

2.3-4

2.3-3

				m	
1			ZK8+831~ZK9+250	419	82.11
			K8+800~K9+260	460	82.15
2			ZK17+065~ZK17+890	825	118.8
			K17+055~K17+893	838	120.7
3			AK0+566~AK1+120	554	78.81
			BK0+495~BK1+118	623	89.75
			CK0+523~CK1+235	712	102.57
			DK0+552~DK1+130	578	83.26

2.3-4

	m^3/h	pH	COD mg/L	SS mg/L	NH_3-N mg/L	TN mg/L	mg/L
0	-	6.5	7.3		0.23	0.62	
1	220	9.2	54.7	341	2.89	6.15	9.52
2	400	10.1	63.4	513	3.47	7.32	10.12
3	280	9.8	57.3	445	3.35	6.58	9.87
4	14	8.7	23.9	19	1.34	2.65	5.84
5	3	8.6	17.8	12	1.25	2.04	2.31

0 1 2 3

4 5

2

2005 3

SS

4

1t/

SS 3000~5000mg/L

pH

5

SS

6

120L 0.9

108L/d 50 5.40t

2.3-5

2.3-6

2.3-5

			t/d
	K12+300	50	5.4

2.3-6 mg/L

	mg/L pH						
	pH	SS	COD_{Cr}	BOD_5			
	6.5~9.0	500~600	400~500	200~250	40~140	2~10	15~40
	6.5~9.0	500~600	800~1200	400~600	40~140	2~10	15~40

7

1h 81.6mm 1h

2.3-7

2.3-7

	5~20min	20~40min	40~60min	
pH	6.0~6.8	6.0~6.8	6.0~6.8	6.4
SS(mg/L)	231.42~158.52	158.52~90.36	90.36~18.71	125
BOD5(mg/L)	6.34~6.30	6.30~4.15	4.15~1.26	4.3
(mg/L)	21.22~12.62	12.62~0.53	0.53~0.04	11.25

1h

30min

30min

pH 40min

1h

2.

1

2.3-8~ 2.3-9

2.3-8

		5m [dB(A)]	10m [dB(A)]
1		82 90	78 86
2		80 86	75 83
3		90 95	85 91
4		83 88	80 85
5		95 102	90 98
6		80 90	76 86
7		93 99	90 95
8		100 105	95 99
9		92 100	86 94
10		100 110	95 105
11		70 75	68 73
12		88 92	83 87
13		88 95	84 90
14		85 90	82 84
15		80 88	75 84
16		90 96	84 90
17		88 92	83 88
18		90	84
19		74	68
20		74	68
21		90	84

2.3-9

		(m)	Lmax [dB(A)]
1	Parker LB1000	2	88
2	LB30	2	90
3	LB2.5	2	84
4	MARINI	2	90

GB6722-2014 2 100dB(A) 80dB(A) 170~190dB(A)

200m

2

2.2-18

2.3-10

2.3-10 **/h**

			1045	123	60	95	1323
			232	27	13	21	294
~			1093	118	62	107	1381
			243	26	14	24	307
			1262	129	74	127	1591
			280	29	16	28	354
			1114	131	63	101	1410
			247	29	14	23	313
~			1424	154	81	139	1799
			317	34	18	31	400
			1737	177	102	175	2190
			280	29	16	28	354
			998	118	57	91	1264
			222	26	13	20	281
~			1303	141	74	127	1646
			290	31	16	28	366
			1596	163	93	161	2013
			355	36	21	36	447

2.3-10 /h

~			871	103	50	79	1103
			194	23	11	18	245
			1137	123	65	111	1437
			253	27	14	25	319
			1391	142	81	140	1754
			309	31	18	31	390
~			879	103	50	80	1112
			195	23	11	18	247
			1146	124	65	112	1448
			255	28	14	25	322
			1402	143	82	141	1767
			311	32	18	31	393

80km/h

79.0%~79.3% HJ1358-2024

“ 45% 75% ”

S201 S202

2.3-11

2.3-11 :km/h

		76	58.5	58.5
		76	58.5	58.5

76km/h 58.5km/h 58.5km/h

HJ1358-2024

7.5m $(\overline{\ 0\ })_i$

$(\overline{\ 0\ })_l=22.0+36.32\lg v_l$ 48km/h 90km/h

$(\overline{\ 0\ })_m=8.8+40.48\lg v_m$ 53km/h 100km/h

$(\overline{\ 0\ })_s=12.6+34.73\lg v_s$ 63km/h 140km/h

$(\overline{\ 0\ })_l$—— dB(A)

$(\overline{\ 0\ })_m$—— dB(A)

$(\overline{\ 0\ })_s$—— dB(A)

v_l—— km/h

v_m—— km/h

v_s—— km/h

7.5m

(o)i 2.3-12

2.3-12

		km/h			dB A		
		76	58.5	58.5	77.92	80.33	86.18
		76	58.5	58.5	77.92	80.33	86.18

3.

1

a.

2.3-13

2.3-13

		m	PM$_{10}$ mg/Nm^3	TSP mg/Nm^3
	3 1 20 /	20	0.12~0.24	0.27~0.53
	2 2 2 2 1 30~40 /	100	0.139~0.212	0.232~0.272
	1 1 1	20	0.089~0.105	0.171~0.276
	30~40 /	110	0.09~0.11	0.20~0.21
	1 4 40~50 /	30	0.10~0.11	0.20~0.22
	1 2 1 40~60 /	40	0.11~0.12	0.22~0.23
	1 3	20	0.05~0.11	0.12~0.13
	1 1	20	0.10~0.12	0.18~0.19

b. 1m 20m 50m

11.03mg/m³ 2.89mg/m³ 1.15mg/m³

c.

2.3-14

2.3-14

		m/s	**m**	**TSP mg/Nm³**	
		0.9	50	0.389	0.3
			100	-	-
			150	0.271	
		1.2	50	8.849	28.5
			100	1.703	4.7
			150	0.483	0.6
				9.840	31.8
			100	1.970	5.6
			150	0.540	0.8
				0.400	0.3

200m

TSP 150m TSP GB3095-2012 150m TSP TSP 31

≥ 98%

GB16297-1996 120mg/m³

[a]

99.5%

GB16297-1996 75mg/m³

2

JTGB03—2006

$$Q_j = \sum_{i=1}^{3} 3600^{-1} B A_i E_{ij}$$

Qj —— j mg/ m·s

Ai—— i /h

B —— NOx NO2

Eij—— i j

mg/ ·m

2.3-15 g/km·

	km/h	40	50	60	70	80	90	100
	CO	39.00	31.34	23.68	17.90	14.76	10.24	7.72
	NO_2	1.17	1.77	2.37	2.96	3.71	3.85	3.99
	CO	34.17	30.18	26.19	24.76	25.47	28.55	34.78
	NO_2	4.50	5.40	6.30	7.20	8.30	8.80	9.30
	CO	6.56	5.52	4.48	4.10	4.01	4.23	4.77
	NO_2	10.40	10.44	10.48	11.1	14.71	15.64	18.38

NO_2 CO

0.8

2.3-16 mg/ s·m

~	CO	3.18	3.29	3.77
	NO_2	1.03	1.08	1.25
~	CO	3.36	4.29	5.19
	NO_2	1.09	1.41	1.72

2.3-16 mg/ s·m

~	CO	3.59	3.92	4.77
	NO2	1.17	1.29	1.58
~	CO	3.14	3.42	4.15
	NO2	1.02	1.13	1.38
~	CO	3.16	3.45	4.19
	NO2	1.03	1.13	1.39

NO_2 1.02 1.17mg/m·s NO_2 1.08 1.41mg/m·s NO_2 1.25 1.72mg/m·s CO 3.14 3.59mg/m·s CO 3.29 4.29mg/m·s CO 3.77 5.19mg/m·s CO NO2

3

35m CO NO_2 24 3.15~3.21mg/m^3 0.052~0.078mg/m^3 1 1.90~4.72mg/m^3 0.062~0.133mg/m^3 135m CO NO_2 24 1.74~1.85mg/m^3 0.032~0.033mg/m^3 1 1.75~2.39mg/m^3 0.022~0.085mg/m^3 35m 135m

4

1

6.5mg/m^3 1.2mg/m^3 90% (DB 37/597-2006)

4.

2 100

0.5kg

0.1t

1kg 0.18kg

0.059t/d

5.

1

153.34hm^2 8.68hm^2

3

2

2.4

2.4.1

2024 2023 “

” “ 1 ”

S302

[2024]267

2.4.2

2.4.2.1 “ ”

“ ”

2025 97%

“ ” - - - - - - “ ”

“1 ”

“ ”

“ ” “ ” “

97%”

“ ”

“ - ” “ 1

”

“ ”

2.4.2.2 2018-2035

2018-2035 “ ”

“ ” “ ” - - -

“ ” “ ”

700 “ ”

“ ” “ 1 ”

“ - ”

S302 S302

“ ”

S302

“ 1 ” S302 “ ”

2018-2035

2.4.2.3 2023—2035

2023-2035 “

” -

“ ”

“ ”

“ ” “ ” 1

S302 “ ”

“ ” - 1

S201 S202

“ 30 ”

2.4.2.4 “ ”

“ ” “ ”

“ ” “ ”

50% 491

“ ”

S207

G228 “ ”

26.2

“ ” “ ”

“ ”

2.4.2.5 2023-2035

2023-2035 “

” “1123 ” 1 2

3 “ ”

“ ” 1241

88% “

” 2024-2030 55

S302 G228 “

”

“

"

G228 " " "
"

2023-2035

2.4.3

1.

2011-2020 "
" " "
" "
S302 " "

≥ 15m ≥ 20-30m
—
S302
S202
" " " " S302
" "

≥ 15m

2.
2021-2035
169.77
67.84 2999.08
14

5.19
≥ 87.53

1 5

S302

2021-
2035

2.4.4

21%

“ ”

60% S202

“ ” “
”

2.4.5

1. “ ”

1

2022 11

“ ”

2022 2080 “ ”

“ ”

371002120190

371002120228 371002120218 371002120245 371002120216

814.53m

235.93 m 61.85 m 516.75m

5.3-1 5.3-1~5.3-4

[2022]142

2023 1

“ ”

“

”

“ ”

2021-2035

2024 7

“ S302 ” S302

< S302

>

“

”

S302

2023 1

2022 142

2023 1

“

”

2

3

4

2.

“ ”

“ ”

2.4-1 “ ”

“ ”						
				1.9 1.13	“ ”	
				2.5 2.9		
				3.13	III	
				4.2 4.6		
		ZH371002 10004		1.		
				1. DB37/2376-2019		

2.4-1 “ ”

“ ”						
		ZH371002 10004		1.		
				2.		
		ZH371002 10007		1.		
				1. DB37/2376-2019		
				1.		
				2. 3.		
		ZH371002 10008		1.		

2.4-1 “ ”

“ ”						
		ZH371002 10008		2. DB37/2376-2019 3. 5		
				1.		
				3. 4.		
		ZH371002 20010		1.		
				1. DB37/2376-2019		
				1.		

2.4.6

“ . ” “
”

10.65%

“ ”
“ ”
≥8.05km/km² “ ”
“15 ”

“ ”
S302
“ ”
“ ”

“ ”
S202

2.4.7

“ ”

2.4.8

2.4.8.1

5

2004 2022 2

2022 5 2020-2035

69.02

2020-2035

K8+000~K10+000 K17+100~K18+100 K23+300~K24+200 4.0km

K5+000~K8+000 K10+000~K17+100

K18+100~K23+300 20.3km

S302

(2020-2035)

(2020-

2035)

2.4-2 2.4-3

2.4-2

2.4-3

2.4-3

2.4.8.2

1959

477.3 hm^2 1993 (1993)89

2000 (2000)610

2477.3 hm^2

477.3 hm^2

10.5km

4.5km

5km

K23+300~K24+200 0.90km

0.6051 hm^2

205.84m

S302

2016-2025

2016-2025

2.4.9

3

K11+150~K11+200

18m

BK0+560~BK0+580

28m BK0+820~BK0+845

62m K22+100~K22+300

38m

309m 324m

1.

2.4-7

2.4-7

1		
2	;	
3		
4		
5		
6		
7		

2.

2010

2.4-8

2.4-8

	2

2010

2.5

2.5.1

1.

2.

3.

51.3~54.2dB 41.3~44.6dB GB3096-2008

2.5.2 “ ”

1.

S301

GB3096-2008 S301

3

1170 m 5m 3

2.

3

3.1

3.1.1

70-100m

3.1-1

3.1.2

1.

2.

3.

GB18306-2001

0.10 VII

3.1.3

11.1 ~11.2 800

70%

3.1.4

1.

3.1-2

8

5.3 201

12 59

25 9

30

3.1-2

2.

3.2

3.2.1

1.

2015 31

3 9 242

148 63 31

3.2-1

3.2-1

2.

[2016]161

3.

— — 3 -

3 9

34 28 6

- —

- - —

3.2-2

3.2-2

4.

“

” 3.2-3

3.2-3

3.2.2

3.2.2.1

3.2.2.2

1. GPS

GPS

GPS

2.

1

2

HJ 19-2022

3

20m × 20m 5m

× 5m 5m × 5m 1m × 1m

GPS

4

HJ19-2022

3

3~5

1

2024 9 2025 4

30m~300m

(HJ19-2022)

20

-

2024 9 2025 4

5

2024 9 2025

4 AK0+000 K24+000 K23+750

- K23+750 K7+400

K7+200 K23+750 K8+050 K8+400 -

K8+900 K11+800 K12+800 K13+100

K12+500 K14+000 K14+500 K15+200 K17+150

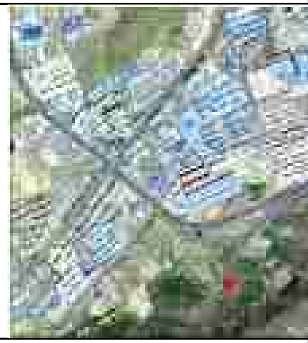
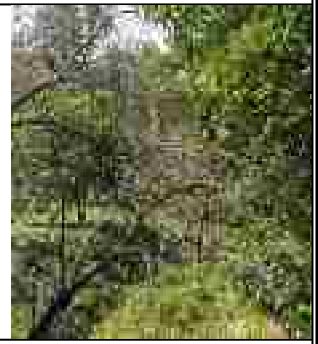
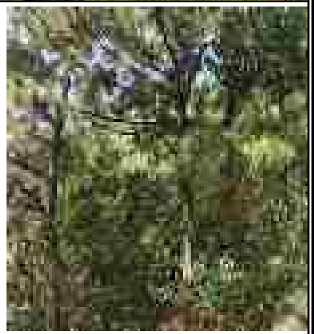
K17+705 - K18+800

-

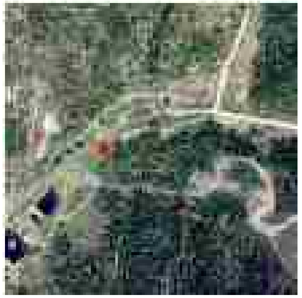
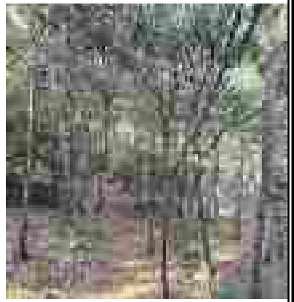
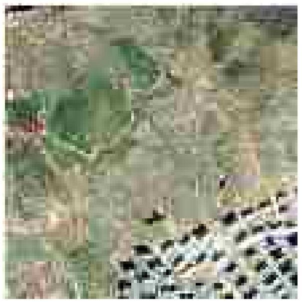
3.2-1

3.2-1

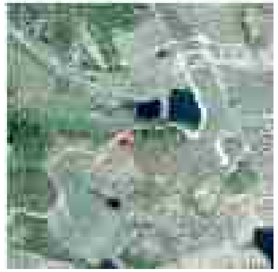
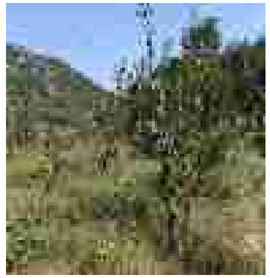
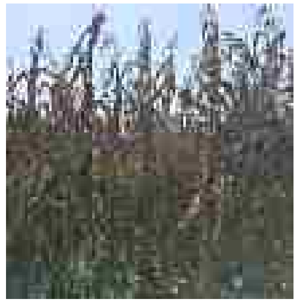
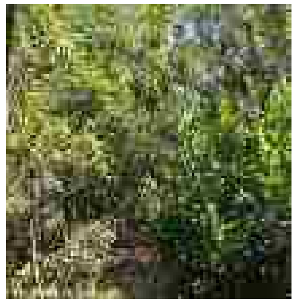
3.2-1

1	Y1	AK0+000	122°3′21″E 37°29′08″N			
2	Y2	K24+000	122°2′51″E 37°28′55″N			
3	Y3	K23+750	122°3′09″E 37°28′44″N	-		

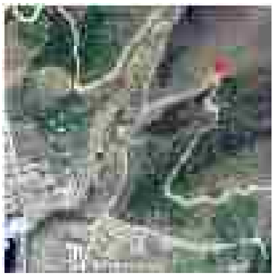
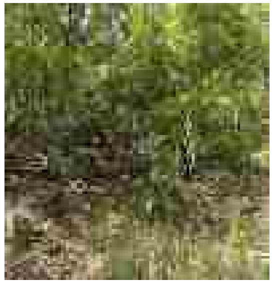
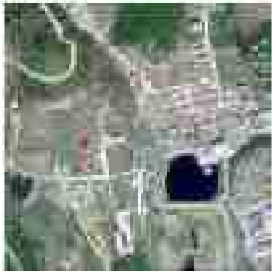
3.2-1

4	Y4	K23+750	122°3′46″E 37°28′44″N			
5	Y5	K7+400	122°6′16″E 37°26′30″N			
6	Y6	K7+200	122°6′24″E 37°26′20″N			

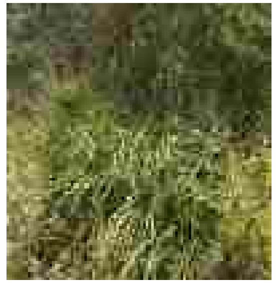
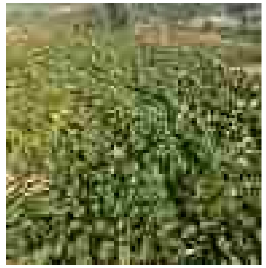
3.2-1

7	Y7	K23+750	122°6′02″E 37°26′14″N			
8	Y8	K8+050	122°5′55″E 37°26′02″N			
9	Y9	K8+400	122°6′02″E 37°25′24″N	-		

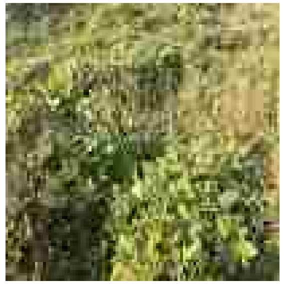
3.2-1

10	Y10	K8+900	122°4′12″E 37°26′18″N			
11	Y11	K11+800	122°3′41″E 37°26′08″N			
12	Y12	K12+800	122°3′23″E 37°26′36″N			

3.2-1

13	Y13	K13+100	122°3′38″E 37°27′01″N			
14	Y14	K12+500	122°2′53″E 37°26′31″N			
15	Y15	K14+000	122°2′39″E 37°26′38″N			

3.2-1

16	Y16	K14+500	122°1′53″E 37°26′46″N			
17	Y17	K15+200	122°1′38″E 37°26′58″N			
18	Y18	K17+150	122°0′54″E 37°26′26″N			

3.2-1

19	Y19	K17+705	122°0′39″E 37°26′19″N	-		
20	Y20	K18+800	122°1′09″E 37°27′23″N	-		

3.

1

2

HJ 19-2022

2~3

20~100m 500~1000m

2~6m

3~5

5m × 5m 10m × 10m

20m × 20m

2%

1km~3km

0

500m × 500m

25m

125m

500m

3

3.2.2.3

SL219-2013

1.

25 13

0.5m 20 30cm/s “ ∞ ”

1 3min 1.5 5.0m3

0.5m

1L 1L 25

15mL 100mL

4 5mL

1000mL 24h

20 25mL 30ml

0.1mL 10×40

0.1mL

0.1mL

30mL 0.1mL 0.1mL

2

15%

$$N = \frac{C_S}{F_S \cdot F_n} \cdot \frac{V}{v} \cdot P_n$$

N——— ind./L

Cs——— mm2

Fs——— mm2

Fn———

V——— mL

v——— mL

Pn——— ind.

2.

30mL 0.1mL 0.1mL
2 30mL 1mL
1mL 2
15% 1mL
10L

$$N = \frac{nv}{CV}$$

N——— ind/L

v——— L

V——— L

C——— mL

n——— ind.

3.

D

1/16m^2 2

60

0.01g

m^3

4.

5%

“ ”

“ ”

5.

0.2m^2

2m × 2m

3.2.2.4

1.

RS GPS GIS

NASA Landsat8 OLI

2013 2 11 15m

30m

3.2-2 Landsat8 OLI

	(μm)	(m)
Band1 Coastal	0.433–0.453	30
Band2 Blue	0.450–0.515	30
Band3 Green	0.525–0.600	30
Band4 Red	0.630–0.680	30
Band5 NIR	0.845–0.885	30
Band6 SWIR 1	1.560–1.660	30
Band7 SWIR 2	2.100–2.300	30
Band8 Pan	0.500–0.680	15
Band9 Cirrus	1.360–1.390	30

3.2-3

			m	
Landsat8 OLI	LC81230402020296LGN00	2020.10.22	30	0.02%
Landsat8 OLI	LC81230412020296LGN00	2020.10.22	30	0.03%

Landsat8 OLI 2020

6 5 4

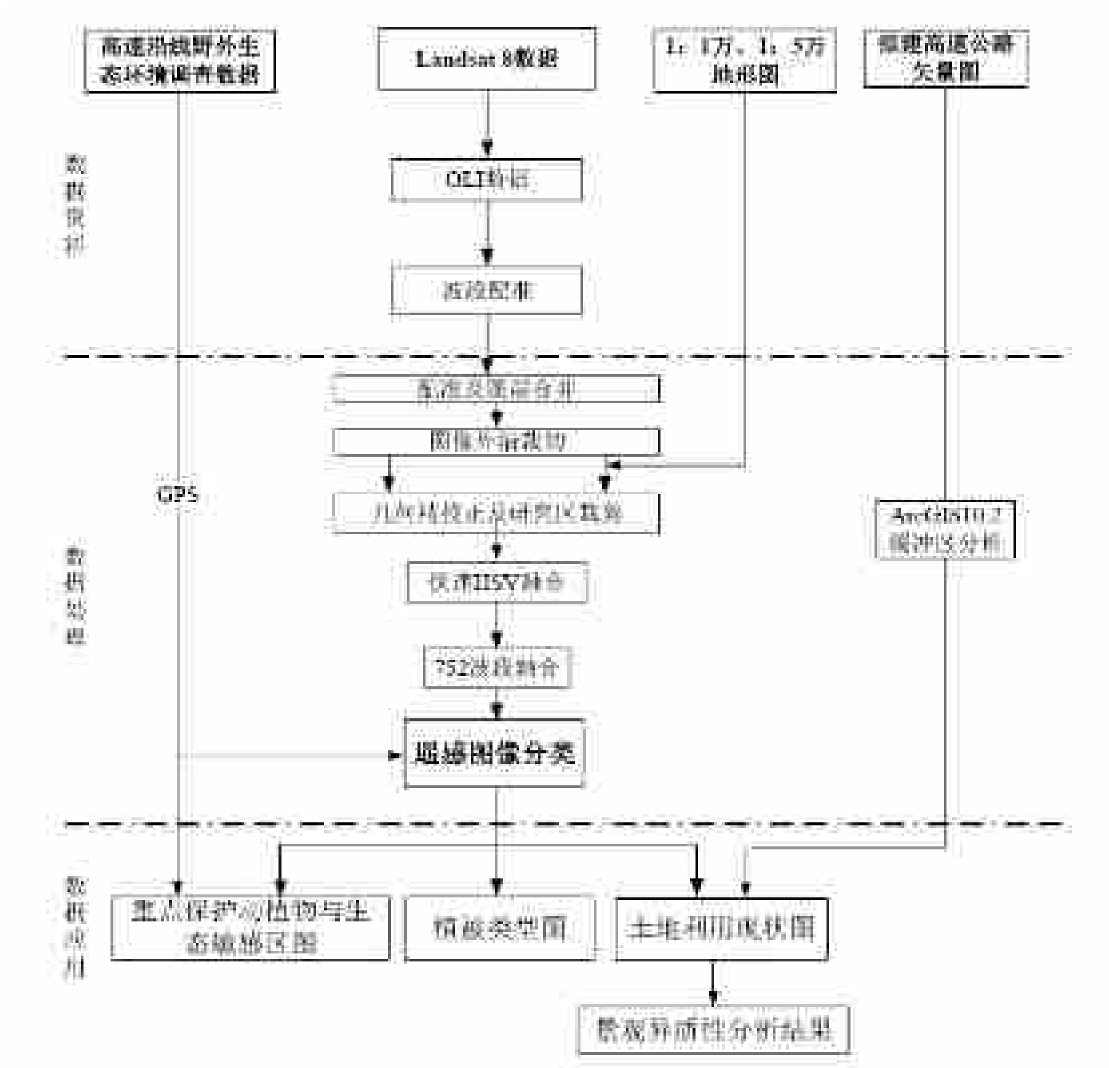
GPS

ArcGIS GIS

ArcGIS10.2 ENVI5.1

Fragstats

3.2-4



3.2-4

2.

3.

3.2.3

— HJ 1166-2021

3.2-4 3.2-5

22

3.2-4

		hm²	
1		1164.49	36.33%
2		380.41	11.87%
3		633.83	19.78%
4		65.21	2.03%
5		961.23	29.99%
		3205.17	100.00%

3.2-5

3.2-4

1164.49hm^2 36.33%

3.2.3.1

1164.49hm^2 36.33%

K8~K11 K17~K18 K21~K22 K23~

1.

1

2

2.

5

36.33%

3.2.3.2

380.41hm^2 11.87%

1.

1

2

2.

3.2.3.3

65.21hm^2 2.03%

1.

2.

“ ”

3.2.3.4

633.83hm^2 19.78%

K10+000~K18+000

1.

2.

19.78%

3.2.3.5

961.23hm^2

29.99%

1.

1

/

2

2.

( )

“ ” ( )

( )

3.2.4

3.2.4.1

——

2 70 457 ( )

3.2.4.2

1.

2.

3 3 3 16 2

1 4 1 1

70 248

12 92

70 457 315

112 30

3.2-5

		I	(+ + 3)	
			(2)	
			(2)	
			Themeda triandra	
			Bothriochloa ischaemum	
			Artemisia argyi	
			Miscanthus sinensis	
			Humulus scandens	
			Setaria viridis	
			Carex callitrichos var. nana	
			Oplismenus undulatifolius	

3.2-5

		IV	*Malus pumila*	K10+000 ~K18+000
			Pyrus sorotina	
			Amygdalus persica	
			Prunus armeniaca	

3.

1

1)

+

+ 3

(*Pinus densiflora*)

900m 700m

500m

+

(*Quercus acutissima*) (*Quercus variabilis*) (*Quercus dentata*)
(*Pistacia chinensis*) (*Sorbus alnifolia*) (*Kalopanax septemlobus*)
(*Ailanthus altissima*) (*Pinus thunbergii*)
(*Pinus tabuliformis*) (*Robinia pseudoacacia*)

(*Lespedeza bicolor*) (*Lespedeza davurica*)

(*Lespedeza tomentosa*) (*Spiraeatilobatg*) (*s, fitschiana*) (*Albizia kalkora*) (*Indieofera kirilowii*) (*Prunusjaponica*) (*Grewia biloba*) (*Euonymus alatus*) (*Forsythia suspensa*) (*Rhododendron micranthum*) (*Rhus chinensis*) (*Vitex negundo var. heterophylla*) (*Ziziphus jujuba var. spinosa*) (*Caraganaalata sinica*) (*Maclura tricuspidata*) (*Thymus mongolicus*) (*Celastrusorbiculaus*) (*Pueraria lobate*) (*Smilax china*) (*Cocculus orbiculatus*) (*Akebic quinate*) 1 (*Actinidia sp.*)

(*Themeda triandra*) (*Arundinella hirta*) (*Zoysia japonica*) (*Sanguisorbaofeinalis*) (*Dianthus chinensis*) (*Thalictruaquilegifolium var.sibiricum*) (*Potentilla chinensis*) (*Spodiopogon sibiricus*) (*Miscanthus sacchariforus*) (*Cleistogenes serotine*) (*Carex spp.*) (*Artemisia spp.*) (*Bothriochloa ischaemum*) (*Cleistogense caespitosa*) (*Platycodongrandiforus*) (*Selaginella sinensis*) (*Orostachysfmbriata*)

2)

2

(*Pinus thunbergii*) (*Quercus acutissima*) (*Robinia pseudoacacia*) (*Quercus variabilis*) (*Pinus tabuliformis*) (*Juniperus chinensis*)

(*Robinia pseudoacacia*) (*Lespedeza bicolor*) (*Ailanthus altissima*)

(*Deyeuxia pyramidalis*) (*Crepidiastrum denticulatum*) (*Patriniascabiosifolia*) (*Echinochloa crus-galli var. zelayensis*) (*Cleistogenes hancei*) (*Artemisiajaponica*) (*Ixeris chinensis*)

(*Selaginella tamariscina*) (*Gypsophila oldhamiana*) (*Panicumbisulcatum*) (*Platycodon grandiflorus*) (*Artemisia lavandulifolia*) (*Setaria viridis*) (*Capillipedium parviflorum*)

(*Viola prionantha*) (*Sporobolus fertilis*) (*Bothriochloa ischaemum*) (*Themeda triandra*)

2

3)

2

(*Quercus dentata*)

(*Quercus serrata*) (*Acer pictuam subsp.mono*)

(*Larix kaempferi*)

(*Rubuerataegifolius*) (*Rhodotyposscandens*)

(*Albiziajulibrissin*) (*Zanithoxylum simulans*)

(*Flueggea sufuticosa*)

(*Carex callitrichos var. nana*) (*Arundinella hirta*) (*Cymbopogon goeringii*) *Oplismenus undulatifolius* (*Carex humilis*)

(*Phytolacca americana*) (*Persicarialapathifolia*) (*Deyeuxia kokonorica*) (*Miscanthussinensis*) (*Setaria viridis*)

3

III.

4)

1.5m

80-

2700m

70%~80%

5)

500-1000m

70%~80%

6)

“ ”

60%~80%

7)

500-1500m

5.7-22 350-1400mm *PH* 4.0-8.5

80%~90%

8)

70%~80%

9)

50-1000m

60%~80%

10)

740-2000m

70%~80%

IV.

(*Malus pumila*) (*Pyrus sorotina*)
(*Amygdalus persica*) (*Prunus armeniaca*)

V

4.

0~150m K8~K11 K17~K18 K23~ 100m

K10+000~K18+000 100m

K8~K11 K17~K18 K23~
100~150m

3.2.4.3

1.

86
15 26
35

2.

3.2.4.4

“ ” 27.7834hm^2

4.9768 hm^2 19.317 hm^2 3.4896 hm^2

24.8645 hm^2 4.082 hm^2 17.3425 hm^2

3.44 hm^2

3.2-6

27

3.2-6 **hm^2**

	3.4896	3.44	0	0
	19.317	17.3425	0	0
	4.9768	4.0820	0	0
	27.7834	24.8645	0	0

3.2.4.5

2003

2010 2014

2016

3.2.5

3.2.5.1

-

-

3.2.5.2

3

5

15 9

K8~K11 K17~K18 K23~

3.2-7

1.

1

1 4 5 4

1 2

2 5 9 2 2

2 3 1 3

1

2

3

2.

1

250 13 31 70%

3 12

4

2

3.

6 8 13

2

2

3.2-7

						IUCN	
	Bufo gargarizans					LC	
	Pelophylax nigromaculatus					LC	
	Kaloula borealis					LC	
	Fejervarya multistriata					LC	
	Microhyla ornata					LC	
	Bombina orientalis					LC	
	Pelodiscus sinensis					VU	
	Mauremys reevesii					EN	
	Gekko japonicus					LC	
	Lycodon rufozonatus					LC	
	Gekko japonicus					LC	
	Elaphe rufodorsata					LC	
	Rhabdophis tigrinus					LC	
	Hierophis spinalis					LC	
	Takydromus septentrionalis					LC	
	Bubo bubo					LC	
	Glaucidium cuculoides					LC	

3.2-7

						IUCN	
	Athene noctua					LC	
	Asio otus					LC	
	Otus lettia					LC	
	Mergus squamatus					EN	
	Aix galericulata					LC	
|	*Myotis chinensis*					LC	
	Aquila chrysaetos					LC	
	Milvus migrans					LC	
	Accipiter gentilis					LC	
	Accipiter.virgatus					LC	
	Buteo japonicus					LC	
	Falco amurensis					LC	
	Falco tinnunculus					LC	
	Egretta garzetta					LC	
	Nycticorax nycticorax					LC	
	Alcedo atthis					LC	
	Spilopelia chinensis					LC	

3.2-7

						IUCN	
	Ciconia nigra					LC	
	Gallinula chloropus					LC	
	Phasianus colchicus					LC	
	Cuculus canorus					LC	
	Dendrocopos spp.					LC	
	Passer montanus					LC	
	Oriolus chinensis					LC	
	Acridotheres cristatellus					LC	
	Melanocorypha spp.					LC	
	Hirundo rustica					LC	
	Corvus spp.					LC	
	Pica pica					LC	
	Sus scrofa					LC	
	Cervus nippon					VU	
	Vulpes vulpes					LC	
	Prionailurus bengalensis					LC	
	Mustela sibirica					LC	

3.2-7

						IUCN	
	Meles leucurus					LC	
	Canis lupus					LC	
	Viverricula indica					UV	
	Lepus capensis					LC	
	Erinaceus amurensis					LC	
	Tscherskia triton					LC	
	Tamiops swinhoei					LC	

3.2.5.3

5

15

9 2 1

4

2 *EN* 1

CR *NT* *VU*

1

3.2-8

25

3.2-8

	/			(/)			
1	*Mergus squamatus*		EN		4		
2	*Aquila chrysaetos*		LC				
3	*Ciconia nigra*		LC				
4	*Cervus nippon*		LC				
5	*Viverricula indica*		VU				
6	*Milvus kprschun*		LC				
7	*Accipiter gentilis*		LC				
8	*Accipiter.virgatus*		LC				
9	*Falco amurensis*		LC				
10	*Falco tinnunculus*		LC				
11	*Bubo bubo*		LC				
12	*Glaucidium cuculoides*		LC				
13	*Athene noctua*		LC				
14	*Asio otus*		LC				

3.2-8

	/			(/)			
15	*Aix galericulata*		LC				
16	*Buteo japonicus*		LC				
17	*Otus lettia*		LC				
18	*Mauremys reevesii*		LC				
19	*Prionailurus bengalensis*		LC				
20	*Canis lupus*		LC				
21	*Pelophylax nigromaculatus*		LC				
22	*Bombina orientalis*		LC				
23	*Takydromus septentrionalis*		LC				
24	*Egretta garzetta*		LC				
25	*Phasianus colchicus*		LC				
26	*Dendrocopos spp.*		LC				
27	*Melanocorypha spp.*		LC				
28	*Mustela sibirica*		LC				
29	*Vulpes vulpes*		LC				

IUCN CR EN VU NT LC

3.2.6

3.2.6.1

HJ 19-2022

2025 4 K22+377

3.2-6

3.2-6

3.2.6.2

1.

3.2-9~3.2-10

4 13 5

38.46% 2 15.38% 1 7.69%

(*Navicula radiosa*) (*Navicula viridula*) (*Navicula simplex*) (*Navicula cincta*) (*Navicula carinifera*) (*Oscillatoria sp.*) (*Merismopedia minima*) (*Microcystis wesenbergii*) (*Microcystis viridis*) (*Chroococcus minor*) (*Euglena sp.*) (*Trachelomonas sp.*) (*Gymnodinium sp.*)

3.2-9

1		*Navicula radiosa*	*Bacillariophyta*	++ +
2		*Navicula viridula*		+++
3		*Navicula simplex*		++
4		*Navicula cincta*		+
5		*Navicula carinifera*		++
6		*Oscillatoria sp.*	*Cyanophyta*	+
7		*Merismopedia minima*		+++
8		*Microcystis wesenbergii*		++
9		*Microcystis viridis*		++
10		*Chroococcus minor*		++
11		*Euglena sp.*	*Euglenophyta*	+
12		*Trachelomonas sp.*		+
13		*Gymnodinium sp.*	*Pyrrophyta*	+

3.2-10

	5	5	2	1	13
%	38.46	38.46	15.38	7.69	100

2.

0.746×105 ind./L

1.34×105ind./L 1.04×105ind./L

0.314mg/L 3.2-11

3.2-11 **×104*ind./L*** ***mg/L***

	13.40	7.46
	0.482	0.145

3.

Shannon-Wiener

3.2-12

H´ 0.0~1.0

H´ 1.0~2.0 H´

2.0~3.0 H´ 3.0

1~2 2

3.2-12

Shannon-Wiener			
	1.34	1.88	1.61

3.2.6.3

1.

3.2-13~3.2-14

23 8 33.33%

11 45.83% 2 8.33% 3

12.50%

(*Difflugia corona*)

(*Brachionus calyciflorus*) (*Keratella valga*)

(*Brachionus angularis*) (*Diaphanosoma leuchtenber gianum*) (*Calanus sinicus*) (*Nauplius*)

3.2-13

Protozoa		
1 *Difflugia corona*	+	++
2 *Difflugua limnetica*	++	++
3 *Pyxidicula operculata*		++
4 *Vorticellasp.*	+	++
5 *Spirostomum minus*		+
6 *Tintinnopsis crafera*	+	
7 *Halteria grandinella*		
8 *Epistylis urceolata*	+	+
Rotatoria		
1. *Rotifer sp.*	+	
2. *Brachionus calyciflorus*	++	

3.2-13

3. *Keratella valga*	++	
4. *Brachionus angularis*	+	++
5. *Brachionus urceus*	+	+
6. *Keratella cochlearis*		+
7. *Trichocerca pusilla*	+	+
8. *Polyarthra trigla*		+++
9. *Anuraeopsis fissa*	+	++
10. *Colurella adriatica*		+
11. *Notholca labis*	+	
Cladocera		
1. *Bosminalongirostris*	+	
2. *Diaphanosoma leuchtenber gianum*	++	+
Copepoda		
1. *Nauplius*	+	+
2. *Cyclopoida sp.*	+	+
3. *Calanus sinicus*	+	+

3.2-14

	8	11	2	3	24
%	33.33	45.83	8.33	12.50	100

2.

203ind./L

0.205mg/L 40ind./L

0.086mg/L 121.5L 0.146

3.2-15

3.2-15 **ind./L** **mg/L**

	203	40
	0.205	0.086

3.

Shannon-Wiener

3.2-16

2

1-2 2

3.2-16 *shannon* *H´*

Shannon-Wiener			
	1.32	1.56	1.44

3.2.6.4

1.

31 3 9.68% 11

35.48% 17 54.84%

3.2-17~ 3.2-18

3.2-17

Annelida		
1. *Whitmania pigra*	+	+
2. *Branchiura sowerbyi*	+	+
3. *Limnodrilus hoffmeisteri*	+	
MOLLUSC		
1. *Semisulcospira sp.*	+	+
2. *Corbicula fluminea*	+	
3. *Sphaerium sp.*	+	+
4. *Bellamya purificata*	+	+
5. *Stenothyra glabra*	+	+
6. *Radix ovata*	+	+
7. *Cuneopsis celiiformis*	+	+
8. *L. caveata*	+	+
9. *L. toruosa*		+
10. *Anodonta woodiana*	+	+
11. *Lepidodesma languilati*	+	+
ARTHROPODA		
1. *Brachycentrus sp.*	+	+
2. *Cryptochironomus sp.*	+	+
3. *Tendipus sp.*		+
4. *Chironomus plumosus*	+	+

5. *Microchironomus sp.*	+	+
6. *Pelopia sp.*		+

3.2-17

7. *Orthocladius sp.*	+	
8. *Gomphidae spp.*		+
9. *Dineutus sp.*		+
10. *Ephemeridae sp.*	+	+
11. *Heptageniidaesp.*		+
12. *Baetidae sp.*	+	
13. *Hydropsyche sp.*		+
14. *Habrophlebiodes*		+
15. *Gammarid sp.*	+	++
16. *Macrobrachium sp.*		+
17. *Palaemon sp.*	+	+

3.2-18

	3	11	17	31
%	9.68	35.48	54.84	100

2.

62.73ind./m^2 27.75g/m^2

75.62ind./m^2

34.95g/ m^2 3.4-19

3.2-19 **ind./m^2** **g/ m^2**

	75.62	49.83
	34.95	20.54

3.

Shannon-Wiener

3.2-20 shannon H´

Shannon-Wiener			
	0.68	0.76	0.68

3.2.6.5

3.2.6.6

1.

153 15

31 2 3 2.0% 2 4 2.6%

4 10 6.5% 1 1 0.7% 2 79 51.6%

2 8 5.2% 1 1 0.7% 1 4

2.6% 1 2 1.3% 1 1 0.7% 1 1

0.7% 8 26 17.0% 2 2 1.3% 4

11 7.2% 1 4 2.6%

2 79 51.6%

8 26 17% 153

(*Cyprinus carpio*) (*Hypophthalmichthys molirix*) (*Ctennopharyngodon idellus*) (*Arjstjchtys nobilis*)

19

3.2-21

3.2-21

Acipenseriformes(3)	(Acipenseridae)	(*Acipenser bryanus*)	2

		(*Huso dauricus*)	2
	(Polyodontidae)	(*Psephurus gladius*)	2
		(*Harengula lunasi*)	11

3.2-21

Clupeiformes(4)	(Clupeidae)	(*Clupanodon punctatus*)	10
		(*Coilia ectenes mystus*)	17
	(Engraulidae)	(*Coilia ectenes*)	18
Salmoniformes(10)	(Salmonidae)	(*Brachymystax lenok*)	1
	(Plecoglossidae)	(*Plecoglossus altivelis*)	1
	(Salangidae)	(*Hemisalanx brachyrostralis*)	6
		(*Protosalanx hyalocranius*)	44
		(*Neosalanx tangkahkeii taihuensis*)	20
		(*Hemisalanx Prognathus*)	32
		(*Salanx longialanis*)	2
		(*Salanx aiaticeps*)	1
	(Osmeridae)	(*Hypomesus olidus*)	15
Anguilliformes(1)	(Anguillidae)	(*Anguilla japonica*)	13
Cypriniformes(79)	(Cyprinidae)	(*Mylopharyngodon Piceus*)	55
		(*Ctennopharyngodon idellus*)	106
		(*Aphyocypris chinensis*)	20
		(*Elopichtys bambusa*)	24
		(*Opsariichthys uncirostris bidens*)	29
		(*Opsriichtys bidens*)	9
		(*Squaliobarbus.curriculus*)	50
		(*Ochetobius elongatus*)	5
		(*Parapelecus engraulis*)	3
		(*Toxabramis swinhonis*)	19

		(*Hemiculter bleekeri bleekeri*)	29
		(*Hemiculter leucisculus*)	70

3.2-21

		(*Erythroculter ilishaetormis*)	88
		(*Erythroculter mongolicus*)	27
		(*Erythroculter.dabryi*)	3
		(*Erythroculter dabryi*)	3
		(*Erythroculter oxycephalus*)	5
		(*Culter erythropterus*)	25
		(*Parabamis pekinensis*)	34
		(*Carassius auratus*)	97
		(*Cyprinus carpio*)	108
		(*Arjstjchtys nobilis*)	103
		(*Hypophthalmichthys molirix*)	107
		(*Rhodeus sericeus*)	15
		(*Acanthorhodeus barbatulus*)	10
		(*Acanthorhodeus macropterus*)	22
		(*Acanthorhodeus tonkinensis*)	2
		(*Rhodeus sericeus*)	2
		(*Acanthorhodeus taenianalis*)	3
		(*Sarcocheilichthys nigripinnis nigripinnis*)	3
		(*Gnathopogon imberbis*)	1
		(*Gnathopogon wolterstorffi*)	1
		(*Gnathopogon polytaenia*)	1
		(*Gnathopogon argentatus*)	1
		(*Gnathopogon intermedius*)	2

		(*Gnathopogon sihuensis*)	2
		(*Gobio coriparoides*)	1
		(*Gobio huanhensjs*)	1
		(*Saurogobio dabryi*)	10

3.2-21

		(*Saurogobio dumerili*)	3
		(*Saurogobio gymnocheilus*)	2
		(*Ladisiavia taczanowski*)	1
		(*Saurogobio drakei*)	2
		(*Pseudogobio vaillanti vaillanti*)	1
		(*Coreius heterodon*)	8
		(*Coreius septentrionalis*)	2
		(*Abbottina rivularis*)	58
		(*Varicorhinus macolepis*)	8
	(Cobitidae)	(*Gobiobotia homalopteroidea*)	1
		(*Gobiobotia ichangensis*)	3
		(*Gobiobotia brevirostri*)	12
		(*Cobits taenia*)	33
		(*Botia wui*)	5
		(*Botia sp.*)	10
		(*Botia intermedia*)	4
		(*Botia xanthi*)	8
		(*Misgurnus mizolepis*)	21
		(*Lefua costata*)	11
		(*Misgurnus angullicaudatus*)	97
Siluriformes(8)	(Bagridae)	(*Pseudobagrus fulvidrac*)	97
		(*Pseudobagrus nitidus*)	12
		(*Leiocassis ussuriensis*)	3
		(*Leiocassis brericaudatua*)	1
		(*Leiocassis sp.*)	6
		(*Leiocassis argentivittatev*)	1
		(*Leiocassis kaifenensis*)	2
	(Ageneiosidae)	(*Parasilurus asotus*)	90
Cyprinodontiformes(	(Cyprinodontidae)	(*Oryzias latipes*)	34

1)			
Beloniformes(4)	(Belonidae)	(*Hemirhamphus kurumeus*)	22
		(*Hemirhamphus sajori*)	2

3.2-21

		(*Tylosurus anastomella*)	10
		(*Hemirhamphus imtemedius*)	1
Mugiliformes(2)	(Mugilidae)	(*Megil cepnatus*)	11
		(*Megil so-iuy*)	19
Gasterosteiformes(1)	(Gasterosteidae)	(*Pungitius sinensis*)	17
Synbranchiformes(1)	(Symbranchidae)	(*Monopterus albus*)	83
	(Serranidae)	(*Siniperca chuatsi*)	53
		(*Siniperca kneri*)	16
		(*Siniperca scherzeri*)	7
		(*Siniperea chuatsi*)	24
		(*Lateolabrax japonicus*)	26
		(*Collichtys lucidus*)	18
Perciformes(26)	(Gobiidae)	(*Ctenogobius cliffordpopei*)	24
		(*Ctenogebius giurinus*)	25
		(*Odontamblyopus rubicundus*)	23
		(*Lophiogbius ocellicauda*)	23
		(*Tridentiger trigonocephalus*)	17
		(*Tridentiger obscurus*)	16
		(*Triaenopogon barbatus*)	16
		(*Synechogobius ommaturus*)	23
		(*Chaeturichtys stigmatias*)	23
		(*Aboma lactipes*)	23
		(*Rhinogobius giurinus*)	33
		(*Rhirogobius sp.*)	69

		(*Acanthogobius hasta*)	29
		(*Acanthogobius flavimanus*)	16

3.2-21

	(Periophthalmidae)	(*Periophthalmus cantonensis*)	17
	(Stromateidae)	(*Pamspus argenteus*)	17
	(Anabantidae)	(*Macropodus chinensis*)	43
	(Channidae)	(*Ophipcephalus argus*)	95
	Eleotridae)	(*Hypseleotris swinbonis*)	10
	(Mastacembelidae)	(*Mestacembelus aculeatus*)	34
	(Platycephalidae)	(*Platycephalus indicus*)	9
	(Cottidae)	(*Trachidermus fasciatus*)	3
Pleuronectiformes(11)	(Pleuronectidae)	(*Cleisthenes*)	1
	(Soleidae)	(*Zebrias zebra*)	11
	(Cynoglossidae)	(*Cynoglossus gracilis*)	18
		(*Cynoglossus trigrammus*)	11
		(*Cynoglossus semilaeris*)	18
		(*Cynoglossus joyneri*)	18
		(*Cynoglossus abbrevatus*)	10
Tetraodontiformes(4)	(Tetraodontidae)	(*Fugu ocellatus*)	10
		(*Fugu obscurus*)	11
		(*Fugu rubripes*)	10
		(*Fugu niphoble*)	12

2.

3. “ ”

“ ”

3.2.7

1.

2018 3

" " 2019 12 31

1 5239.76 hm^2 7.86 594.57 hm^2 0.89

11.35% 4645.19 hm^2 6.97 88.65% 2 2

1081.24 hm^2 1.62 20.64% 2—6

6 1189.44 hm^2 1.78 22.70% 6—15

15 2863.51 hm^2 4.30 54.65% 15—25

25 104.80 hm^2 0.16 2.00% 25 0.77

hm^2 0.01 0.01%

2 5182.13 hm^2 7.78 5124.08 hm^2 7.69

98.88% 4.53 hm^2 0.01 0.09% 53.52 hm^2 0.08

1.03%

3 14841.22 hm^2 22.26 11025.82 hm^2 16.54

74.29% 1.08 hm^2 0.01 0.01%

638.20 hm^2 0.96 4.30% 3176.12 hm^2 4.76 21.40%

4 515.24 hm^2 0.77

5 339.90 hm^2 0.51 336.28 hm^2 0.50

98.93% 3.62 hm^2 0.01 1.07%

6 8142.68 hm^2 12.21 2657.51 hm^2

3.99 32.64% 2319.64 hm^2 3.48 28.49%

2935.69 hm^2 4.40 36.05% 76.72 hm^2 0.11

0.94% 153.12 hm^2 0.23 1.88%

7 1242.19 hm^2 1.86 43.07 hm^2

0.06 3.47% 681.93 hm^2 1.02 54.90%

458.39 hm^2 0.69 36.90% 58.80 hm^2 0.09

4.73%

8 1405.50 hm^2 2.11 304.44 hm^2

0.46 21.66% 558.40 hm^2 0.84 39.73%

374.95 hm^2 0.56 26.68% 114.83 hm^2 0.17 8.17%

52.88 hm^2 0.08 3.76%

3.2-22

		hm²	**%**
		5239.76	14.20
		5182.13	14.04
		14841.22	40.21
		515.24	1.40
		25778.35	69.84
		339.90	0.92
		1405.50	3.81
		8142.68	22.06
		1242.19	3.37
		36908.62	100

2.

7

3317.42 hm^2

575.73 hm^2 17.35% 588.76 hm^2 17.75%

380.41 hm^2 11.47% 633.83 hm^2 19.11%

961.23 hm^2 28.98% 65.21 hm^2

1.97% 112.25 hm^2 3.38%

3.2-23

3.2-23

	hm²	**%**
	575.73	17.35%
	588.76	17.75%
	380.41	11.47%
	633.83	19.11%
	961.23	28.98%

	65.21	1.97%
	112.25	3.38%
	3317.42	100.00%

3.2.8

1.

65% 26

2.

0.0109 hm²/

95.14% 3.2-24

3.2-24

	hm²	hm²		(hm²/)	
	5239.76	4984.96	48.25	0.0109	95.14%

3.2.9

3.2.9.1

3.2-25

3.2-25

		hm²	t/hm²	t	%
		575.73	43.55	25073.04	54.65
		588.76	8	4710.08	10.27
		380.41	5	1902.03	4.15
		633.83	22.4	14197.88	30.94
		2178.73		45883.03	100.00

1 1

1996 2 1999 3

2005 4

2014 5

2012

45883.03t

54.65%

3.2.9.2

Do

Do =\{(Rd+Rf)/2+Lp\}/2×100

Rd i / ×100

Rf i / ×100

Lp = i / ×100

3.2-26

3.2-26

	(Rd/%)	**(Rf%)**	**(Lp%)**	**(Do%)**
	34.92	64.63	45.08	47.43
	0.50	19.51	0.28	5.14
	57.62	7.32	51.56	42.01
	2.02	7.32	0.94	2.81
	4.93	1.22	2.14	2.61

1

2 Do

3

Do

3.2.10

3

3.2-27 29 5

3.2-27

1				2004	
2				1993	0.6051 hm^2 205.84m
3			-	2022	814.53m

3.3

3.3.1

1.

2.

GB3838-2002 1.7.2

3.

3.3.2

1.

1

2 3.3-1 2

3.3-1

1	K12+470		1 0.5m 1
2	K23+100		200m

2

3.3-2

3.3-2

pH	pH HJ1147-2020	DZB-712	/
	GB 13195-1991	DZB-712	/
	HJ 535-2009	721	0.025mg/L
	GB/T 11901-1989	GZX-9070MBE FA2204N	4mg/L
	HJ 828-2017	TC-12 COD	4mg/L
	BOD5 HJ 505-2009	JPSJ-605F	0.5mg/L
	HJ 506-2009	JPSJ-605F	/
	GB/T 11892-1989		0.125 mg/L
	GB/T 11893-1989	721	0.01mg/L
	HJ 970-2018	752	0.01mg/L

3

2025 5 6 ~9

3 1

4

3.3-3

3.3-3

		(mg/L)									
		( )	pH ( )		BOD_5						
200m	2025/5/6	9.3	7.3	5.7	3.6	14	0.13	17	0.15	0.04	4.77
	2025/5/7	8.2	7.2	5.4	3.4	15	0.1	16	0.166	0.03	5.05
	2025/5/8	9.6	7.4	5.9	3.2	14	0.11	18	0.157	0.03	5.09
	2025/5/6	9.8	7.3	6.2	2.4	11	0.01	13	0.159	0.04	4.57
	2025/5/7	9.8	7.3	6.1	2.9	12	0.01	14	0.176	0.04	4.65
	2025/5/8	9.7	7.3	6	3.2	12	0.02	15	0.171	0.04	4.53

2.

1

GB3838-2002

SL63-94

$$S_{i,j} = \frac{C_{i,j}}{C_{s,i}}$$

$S_{i\ \ j}$ —

$C_{i\ \ j}$ —i j mg/L

$C_{s\ \ i}$ —i mg/L

pH

$$S_{pH,j} = \frac{7.0 - pH_j}{7.0 - pH_{sd}} (pH_i \le 7.0)$$

$$S_{pH,j} = \frac{pH_j - 7.0}{pH_{su} - 7.0} (pH_i > 7.0)$$

$S_{pH\ \ j}$ — pH

pH_j — pH

pH_{sd} — pH

pH_{su} — pH

DO

$$S_{DO,j} = DO_s / DO_j \qquad DO_j \le DO_f$$

$$S_{DO,j} = \frac{|DO_f - DO_j|}{DO_f - DO_s} \qquad DO_j > DO_f$$

$$DO_f = 468/(31.6 + T)$$

$S_{DO,j}$—DO

DO_f— mg/L

DO_j— mg/L

DO_s— mg/L

T— ( )

>1.0

2

3.3-4

3.3-4

		pH **( )**		**BOD$_5$**						
200m	2025/5/6	0.15	0.88	0.90	0.70	0.65	0.57	0.15	0.80	0.80
	2025/5/7	0.10	0.93	0.85	0.75	0.50	0.53	0.17	0.60	0.84
	2025/5/8	0.20	0.85	0.80	0.70	0.55	0.60	0.16	0.60	0.85
	2025/5/6	0.15	0.81	0.60	0.55	0.20	0.43	0.16	0.80	0.76
	2025/5/7	0.15	0.82	0.73	0.60	0.20	0.47	0.18	0.80	0.78
	2025/5/8	0.15	0.83	0.80	0.60	0.40	0.50	0.17	0.80	0.76

3

3.3-4 1 SS

SL63-94

GB3838-2002

3.4

3.4.1

20m

3.4.2

3 ——

3.4-1

3.4-1

						( )			
1						1130	122°3'5.11"E 37°28'24.63"N	30m 300m	
2						648	122°1'18.27"E 37°26'19.53"N 122°1'28.65"E 37°26'20.44"N	30m	
3						600	122°5'1.32"E 37°25'49.80"N	30m	

1.

K11+150~K11+200

30m

600

18m BK0+560~BK0+580

28m

BK0+820~BK0+845

62m

30m 648

K22+100~K22+300

38m 309m 324m

30m

300m 1130

1.7-1~

1.7-3

2.

2m 8m

8m 15m

3.4.3

1.

3.4-2 3

3.4-2

1	K11+110		1
2	K16+430		1

2.

pH $(NH_3\text{-}N)$ NO^{3-} NO^{2-} CN^- (As) Hg (Cr^{6+}) Pb F^- (Cd) Fe Mn COD_{Mn} SO_4^{2-} Cl^- 3.4-3

3.4-3

pH	pH HJ 1147-2020	DZB-712	/
N	5 12.1 GB/T 5750.5-2023	721	0.001 mg/L
	6 13.1 GB/T 5750.6-2023	721	0.004 mg/L
	4 10.1 GB/T 5750.4-2023		1.0 mg/L
	4- HJ 503-2009	721	0.0003mg/L
	5 6.2 GB/T 5750.5-2023	CIC-D100	/
	HJ 535-2009	721	0.025 mg/L
	5 5.2 GB/T 5750.5-2023	CIC-D100	/
	5 7.1 - GB/T 5750.5-2023	721	0.002 mg/L
	HJ 694-2014	AFS-830	0.04 μg/L
	4 11.1 GB/T 5750.4-2023	GZX-9070MBE	/
	HJ 694-2014	AFS-830	0.3 μg/L
	5 8.3 GB/T 5750.5-2023	CIC-D100	/
	5 4.2 GB/T 5750.5-2023	CIC-D100	/
	7 4.1 GB/T 5750.7-2023	HH-8	0.05 mg/L
	GB/T 11911-1989	TAS-990	0.03 mg/L
	GB/T 7475-1987	TAS-990	10 ug/L

3.4-3

	GB/T 11911-1989	TAS-990	0.01 mg/L
	GB/T 7475-1987	TAS-990	1 ug/L

3.

1

4.

3.4-4

3.4-4

	( )				
	pH	7.8		6.5~8.5	
	N		mg/L	≤1.00	
			mg/L	≤0.05	
		283	mg/L	≤450	
			mg/L	≤0.002	
		0.191	mg/L	≤1.0	
		0.069	mg/L	≤0.5	
		72.6	mg/L	≤250	
			mg/L	≤0.05	
			μg/L	≤0.001	
		524	mg /L	≤1000	
		0.3L	μg/L	≤0.01	
		15.3	mg/L	≤20.0	
		85	mg/L	≤250	
		0.73	mg/L	≤3.0	
			mg/L	≤0.3	
			μg/L	≤0.01	
			mg/L	≤0.1	
			μg/L	≤0.005	
			MPN/100ml	≤3.0	
		66	CFU/ml	≤100	
	pH	7.7		6.5~8.5	
			mg/L	≤1.00	
			mg/L	≤0.05	
		209	mg/L	≤450	
			mg/L	≤0.002	
		0.4	mg/L	≤1.0	
		0.037	mg/L	≤0.5	
		33.8	mg/L	≤250	
			mg/L	≤0.05	
			μg/L	≤0.001	

3.4-4

	( )				
		444	mg /L	≤1000	
			μg/L	≤0.01	
		5.98	mg/L	≤20.0	
		36.4	mg/L	≤250	
			mg/L	≤3.0	
			mg/L	≤0.3	
			μg/L	≤0.01	
			mg/L	≤0.1	
			μg/L	≤0.005	
			MPN/100ml	≤3.0	
		53	CFU/ml	≤100	

5.

6.

GB/T 14848-2017

3.5

3.5.1

1.

[2024]24 4a

4b

3 1

2 1.7.4

2.

S202

19 3 16

1.7-4

3.5.2

1.

1

“ ” 12

a. S202

55m 4a 55m 1

55m 4b 55m 1

S302 25m 4a 25m 3

b.

c.

d.

e.

3.5-1 3

3.5-1

1	K5+450~K5+500					2 4 1m 4.2m 10.2m
2	K5+550~K5+700					1 3 5 1m 1.2m 7.2m 13.2m
3	K5+700~K5+900					1 3 5 7 12 17 27 35 1m 1.2m 7.2m 13.2m 19.2m 34.2m 49.2m 79.2m 103.2m
4	CRK12+300~CRK12+780					1 3 1m 1.2m 7.2m 55m 1 3 1m 1.2m 7.2m 1h
						300m 1 3 1m 1.2m 7.2m 300m 55m 1 3 1m 1.2m 7.2m

3.5-1

5	K7+010~ K7+500					1 3 5 7 10 15 17 1m 1.2m 7.2m 13.2m 19.2m 28.2m 43.2m 49.2m
6	K11+200~ K11+600					S202 1 1m 1.2m S202 25m 1 1m 1.2m S202
						S202 90m 1 1m 1.2m
7	K14+200~ K14+600					S202 1 1m 1.2m S202 55m 1 1m 1.2m S202
						S202 265m 1 1m 1.2m
8	K16+180~ K16+550					S202 1 1m 1.2m S202 55m 1 1m 1.2m S202
						S202 265m 1 1m 1.2m
9	K19+720~ K19+940					2 4 1m 4.2m 10.2m
10	K20+580~ K20+920					1 3 5 9 12 17 1m 1.2m 7.2m 13.2m 25.2m 34.2m 49.2m 55m 1 3 5 9 12 17 1m 1.2m 7.2m 13.2m 25.2m 34.2m 49.2m
11	K21+000~ K21+150					2 4 6 1m 4.2m 10.2m 16.2m 55m 2 4 6 1m 4.2m 10.2m 16.2m
12	K22+750~ K23+200					2 4 6 1m 4.2m 10.2m 16.2m

2

L_{10} L_{50} L_{90} L_{Aeq} S.D.

3

2 1 20

6:00 22:00 22:00 6:00

4

GB3096-2008

5 AWA6228

2.

1

3.5-2

2 A LAeq

3 GB3096

5

2

4 2 1 1 20

3.5-2

1	K13+800	S202				S202 20m 40m 60m 80m 120m 1.2m

3. 24

1 A L_{Aeq}

2 K13+800 S202

40m 1.2m

3 GB3096

2

4 24 1

3.5.3

2025 5

1.

3.5-3

3.5-3 12

GB3096-2008

3.5-3

					dB A	**/20min**				
					LAeq					
1		2	05.06		51.4	11	6	27	55	
					41.3	4	1	8	45	
			05.07		51.8	12	8	31	55	
					41.8	5	2	10	45	
		4	05.06		53.1	11	6	27	55	
					42.9	4	1	8	45	
			05.07		52.5	12	8	31	55	
					42.4	5	2	10	45	
2		1	05.06		51.2	11	6	27	55	
					39.6	4	1	8	45	
			05.07		49.6	12	8	31	55	
					40.2	5	2	10	45	
		3	05.06		52.1	11	6	27	55	
					41.1	4	1	8	45	
			05.07		51.0	12	8	31	55	
					41.6	5	2	10	45	
		5	05.06		53.7	11	6	27	55	
					44.0	4	1	8	45	
			05.07		53.1	12	8	31	55	
					43.2	5	2	10	45	
3		1	07.01		52.1	3	1	6	55	
					41.7	0	2	4	45	
			07.02		51.7	4	2	11	55	
					41.6	0	2	6	45	
		3	07.01		53.2	3	2	5	55	
					43.1	0	1	6	45	
			07.02		53.1	3	2	10	55	
					42.8	0	1	7	45	
		5	07.01		53.2	3	2	5	55	
					43.2	0	1	6	45	
			07.02		53.4	3	2	10	55	
					43.2	0	1	7	45	
		7	07.01		52.4	3	1	6	55	
					42.0	0	2	4	45	
			07.02		52.2	4	2	11	55	
					41.9	0	2	6	45	
		12	07.01		53.4	4	1	6	55	
					43.3	0	2	4	45	
			07.02		53.4	2	1	9	55	
					43.3	0	2	7	45	

3.5-3

						dB A	/20min				
						LAeq					
3			17	07.01		52.6	2	1	5	55	
						42.3	0	2	5	45	
				07.02		52.3	3	1	10	55	
						42.2	0	1	8	45	
			27	07.01		52.7	2	1	5	55	
						42.5	0	2	5	45	
				07.02		52.6	3	1	10	55	
						42.6	0	1	8	45	
			35	07.01		53.4	4	1	6	55	
						43.3	0	2	4	45	
				07.02		53.3	2	1	9	55	
						43.1	0	2	7	45	
4			1	05.06		53.1	6	/	/	70	
						43.2	0	/	/	60	
				05.07		52.0	7	/	/	70	
						43.2	0	/	/	60	
			3	05.06		54.6	6	/	/	70	
						44.6	0	/	/	60	
				05.07		54.7	7	/	/	70	
						44.7	0	/	/	60	
		55m	1	05.06		52.1	6	/	/	55	
						43.0	0	/	/	45	
				05.07		52.0	7	/	/	55	
						43.3	0	/	/	45	
			3	05.06		53.8	6	/	/	55	
						43.7	0	/	/	45	
				05.07		53.1	7	/	/	55	
						42.6	0	/	/	45	
		300m	1	05.06		51.3	/	/	/	70	
						41.5	/	/	/	60	
				05.07		40.9	/	/	/	60	
						50.7	/	/	/	70	
			3	05.06		53.6	/	/	/	70	
						38.8	/	/	/	60	
				05.07		43.1	/	/	/	60	
						52.9	/	/	/	70	
		300m 55m	1	05.06		50.4	/	/	/	55	
						39.7	/	/	/	45	
				05.07		50.3	/	/	/	55	
						39.8	/	/	/	45	

3.5-3

						dB A	/20min				
						LAeq					
4		300m 55m	3	05.06		51.6	/	/	/	55	
						41.7	/	/	/	45	
				05.07		51.8	/	/	/	55	
						42.1	/	/	/	45	
5			1	05.06		50.9	/	/	/	60	
						41.0	/	/	/	50	
				05.07		51.2	/	/	/	60	
						40.7	/	/	/	50	
			3	05.06		51.7	/	/	/	60	
						41.5	/	/	/	50	
				05.07		51.5	/	/	/	60	
						41.5	/	/	/	50	
			5	05.06		52.2	/	/	/	60	
						42.2	/	/	/	50	
				05.07		52.3	/	/	/	60	
						42.2	/	/	/	50	
			7	05.06		53.0	/	/	/	60	
						42.6	/	/	/	50	
				05.07		52.6	/	/	/	60	
						42.9	/	/	/	50	
			10	05.07		53.8	/	/	/	60	
						43.6	/	/	/	50	
				05.06		53.0	/	/	/	60	
						42.7	/	/	/	50	
			15	05.07		52.7	/	/	/	60	
						42.8	/	/	/	50	
				05.06		53.1	/	/	/	60	
						43.0	/	/	/	50	
			17	05.06		53.9	/	/	/	60	
						44.2	/	/	/	50	
				05.07		54.0	/	/	/	60	
						43.7	/	/	/	50	
6		S202		05.06		53.8	20	4	15	70	
						44.0	3	3	11	55	
				05.07		54.2	18	7	22	70	
						44.0	4	2	14	55	
		S202 25m		05.07		53.2	18	7	22	65	
						43.2	4	2	14	55	
				05.06		53.4	20	4	15	65	
						43.2	3	3	11	55	

3.5-3

						dB A LAeq	/20min				
6		S202 90m		05.07		51.5	/	/	/	65	
						42.4	/	/	/	55	
				05.06		52.3	/	/	/	65	
						42.0	/	/	/	55	
7		S202		05.06		53.6	16	9	25	70	
						44.1	6	6	12	55	
				05.07		53.8	14	8	31	70	
						44.2	4	2	13	55	
		S202 55m		05.07		53.5	14	8	31	55	
						43.4	4	2	13	45	
				05.06		53.1	16	9	25	55	
						43.3	6	6	12	45	
		S202 265m		05.07		51.8	/	/	/	55	
						42.5	/	/	/	45	
				05.06		51.7	/	/	/	55	
						42.0	/	/	/	45	
8		S202		05.06		53.5	17	6	27	70	
						44.4	6	4	10	55	
				05.07		53.7	14	5	32	70	
						44.6	5	2	15	55	
		S202 55m		05.06		52.9	17	6	27	55	
						42.6	6	4	10	45	
				05.07		52.8	14	5	32	55	
						42.2	5	2	15	45	
		S202 265m		05.06		51.9	/	/	/	55	
						41.3	/	/	/	45	
				05.07		51.3	/	/	/	55	
						41.3	/	/	/	45	
9			2	05.06		52.1	/	/	/	55	
						40.9	/	/	/	45	
				05.07		51.4	/	/	/	55	
						40.9	/	/	/	45	
			4	05.06		54.0	/	/	/	55	
						42.8	/	/	/	45	
				05.07		53.8	/	/	/	55	
						43.1	/	/	/	45	
10			1	05.08		49.0	/	/	/	70	
						40.3	/	/	/	55	
				05.09		48.7	/	/	/	70	
						39.6	/	/	/	55	

3.5-3

						dB A	**/20min**				
						LAeq					
10			3	05.08		49.8	/	/	/	70	
						40.9	/	/	/	55	
				05.09		49.7	/	/	/	70	
						40.7	/	/	/	55	
			5	05.08		50.2	/	/	/	70	
						41.6	/	/	/	55	
				05.09		50.0	/	/	/	70	
						41.7	/	/	/	55	
			9	05.08		51.9	/	/	/	70	
						42.3	/	/	/	55	
				05.09		51.6	/	/	/	70	
						42.1	/	/	/	55	
			12	05.08		51.7	/	/	/	70	
						43.1	/	/	/	55	
				05.09		52.4	/	/	/	70	
						42.7	/	/	/	55	
			17	05.08		53.7	/	/	/	70	
						43.8	/	/	/	55	
				05.09		52.2	/	/	/	70	
						43.5	/	/	/	55	
		55m	1	05.08		48.3	/	/	/	55	
						38.9	/	/	/	45	
				05.09		48.8	/	/	/	55	
						38.9	/	/	/	45	
			3	05.08		48.8	/	/	/	55	
						39.2	/	/	/	45	
				05.09		49.0	/	/	/	55	
						39.4	/	/	/	45	
			5	05.08		49.4	/	/	/	55	
						39.6	/	/	/	45	
				05.09		50.0	/	/	/	55	
						40.0	/	/	/	45	
			9	05.08		50.7	/	/	/	55	
						40.8	/	/	/	45	
				05.09		50.9	/	/	/	55	
						41.0	/	/	/	45	
			12	05.08		51.1	/	/	/	55	
						41.8	/	/	/	45	
				05.09		51.3	/	/	/	55	
						41.9	/	/	/	45	

3.5-3

						dB A	/20min				
						LAeq					
10		55m	17	05.08		52.0	/	/	/	55	
						43.2	/	/	/	45	
				05.09		51.9	/	/	/	55	
						43.4	/	/	/	45	
11			2	05.08		50.2	/	/	/	70	
						39.4	/	/	/	55	
				05.09		49.6	/	/	/	70	
						38.5	/	/	/	55	
			4	05.08		50.9	/	/	/	70	
						40.3	/	/	/	55	
				05.09		50.5	/	/	/	70	
						39.8	/	/	/	55	
			6	05.08		51.6	/	/	/	70	
						42.2	/	/	/	55	
				05.09		51.8	/	/	/	70	
						43.0	/	/	/	55	
		55m	2	05.08		48.2	/	/	/	55	
						38.6	/	/	/	45	
				05.09		49.1	/	/	/	55	
						38.2	/	/	/	45	
			4	05.08		48.9	/	/	/	55	
						38.7	/	/	/	45	
				05.09		49.0	/	/	/	55	
						39.0	/	/	/	45	
			6	05.08		50.2	/	/	/	55	
						40.6	/	/	/	45	
				05.09		50.4	/	/	/	55	
						41.1	/	/	/	45	
12			2	05.07		50.9	/	/	/	55	
						40.4	/	/	/	45	
				05.06		51.7	/	/	/	55	
						41.4	/	/	/	45	
			4	05.06		51.9	/	/	/	55	
						42.2	/	/	/	45	
				05.07		51.9	/	/	/	55	
						42.0	/	/	/	45	
			6	05.06		53.6	/	/	/	55	
						44.5	/	/	/	45	
				05.07		53.0	/	/	/	55	
						42.8	/	/	/	45	

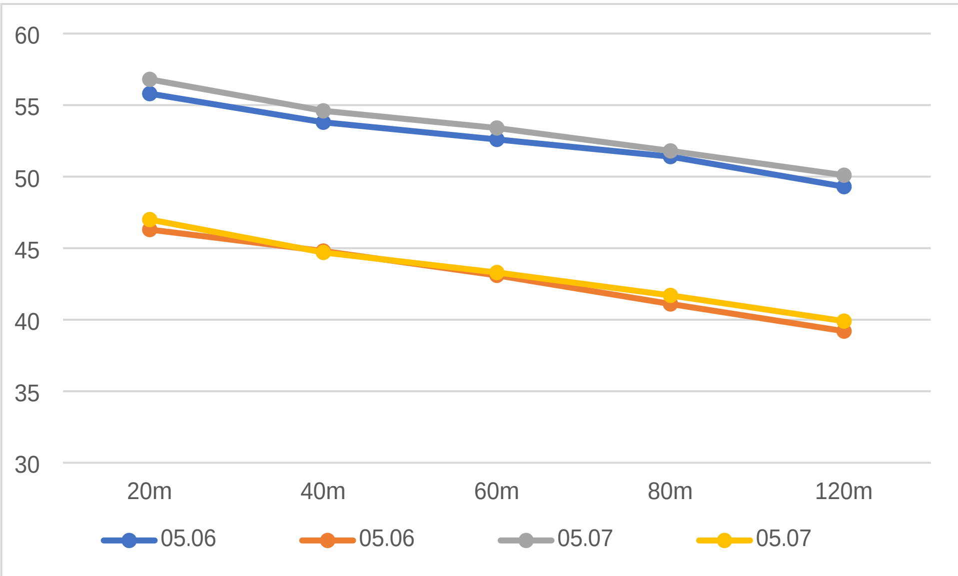
2.

3.5-4 3.5-

1

3.5-4

			LAeq dB /					20min/		
			20m	40m	60m	80m	120m			
S202 K13+800	05.06		55.8	53.8	52.6	51.4	49.3	14	9	33
			46.3	44.8	43.1	41.1	39.2	4	3	15
	05.07		56.8	54.6	53.4	51.8	50.1	15	5	35
			47.0	44.7	43.3	41.7	39.9	6	8	15



3.5-1 S202 K13+800

S202

S202 4a 20m 1

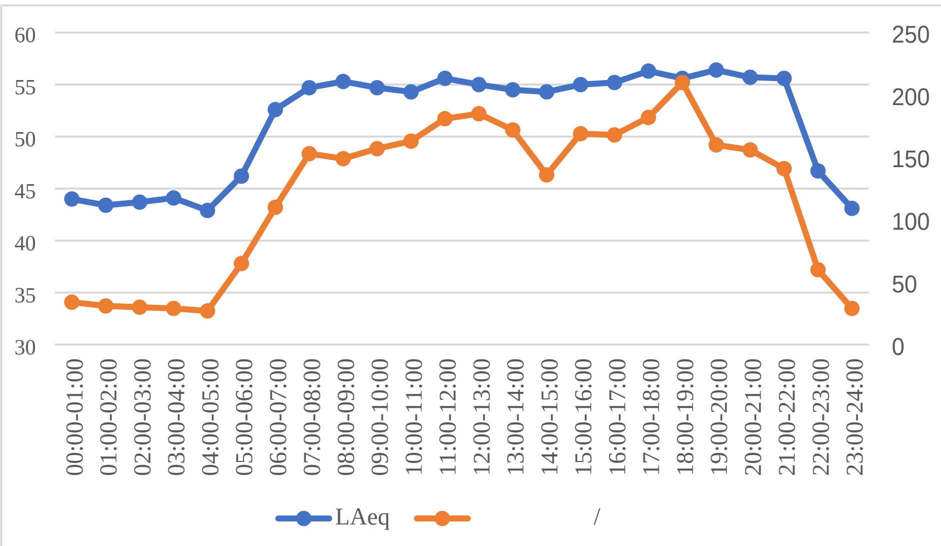
40m

3. 24

24 3.5-5 3.5-2

3.5-5 S202 24

		dB A			
		2025.05.09			
		Leq	1h/		
S202 K13+800	00:00-01:00	44.0	21	4	9
	01:00-02:00	43.4	14	7	10
	02:00-03:00	43.7	18	9	3
	03:00-04:00	44.1	21	2	6
	04:00-05:00	42.9	13	7	7
	05:00-06:00	46.2	32	22	11
	06:00-07:00	52.6	60	34	16
	07:00-08:00	54.7	78	21	54
	08:00-09:00	55.3	73	27	49
	09:00-10:00	54.7	81	15	61
	10:00-11:00	54.3	62	24	77
	11:00-12:00	55.6	86	37	58
	12:00-13:00	55.0	77	29	79
	13:00-14:00	54.5	66	23	83
	14:00-15:00	54.3	79	12	45
	15:00-16:00	55.0	64	32	73
	16:00-17:00	55.2	72	29	67
	17:00-18:00	56.3	84	19	79
	18:00-19:00	55.6	87	34	89
	19:00-20:00	56.4	67	25	68
	20:00-21:00	55.7	78	29	49
	21:00-22:00	55.6	69	35	37
	22:00-23:00	46.7	31	17	12
	23:00-24:00	43.1	17	9	3



3.5-2 S202 K13+800 24

24 S202 40m
52.6~56.4dB 42.9~46.7dB 6:00~22:00
22:00~6:00 19:00~20:00 22:00~23:00

S202

3.6

1.

2.

GB3095-2012 2018

1 1.7-6

3.

2024 3.6-

1

3.6-1

			(μg/m³)	(μg/m³)	(%)	
	SO_2		6	60	10.0	
	NO_2		15	40	37.5	
	CO	24h 95	700	4000	17.5	
	O_3	8h 90	146	160	91.3	
	$PM_{2.5}$		19	35	54.3	
	PM_{10}		36	70	51.4	

2024

GB3095-2012 2018

4

4.1

4.1.1

4.1-1

153.34hm²

4.1-1

	hm²	**%**	**hm²**	**%**	**hm²**	**%**
	1164.49	36.33%	1096.74	33.46%	-67.75	2.11%
	380.41	11.87%	376.72	11.75%	-3.69	0.12%
	633.83	19.78%	596.56	18.61%	-37.27	1.16%
	65.21	2.03%	62.61	1.95%	-2.6	0.08%
	961.23	29.99%	1072.54	33.46%	39.71	1.24%

4.1.1.1

1164.49 hm²

36.33%

1.

“ ” “ ”

2.

K8~K11 K17~K18 K21~K22 K23~

3.

67.75 hm^2 2.11%

4.1.1.2 /

380.41hm2

11.87% 3.69hm^2

0.12%

4.1.1.3

2.60 hm^2 0.08%

4.1.1.4

633.83 hm^2 19.78% 37.27 hm^2
1.16%

1.

2.

pH
pH

3.

SO_2 NO_2 CO

4.1.1.5

961.23 hm^2 29.99%

4.1.2

1.

4.1-2

4.1-2

t/hm^2		47.20	43.55	8.00	5.00	22.40
	hm^2	575.73	588.76	380.41	633.83	2178.73
	t	25073.04	4710.08	1902.03	14197.88	45883.03
	hm^2	50.86	16.89	3.69	37.27	108.70
	t	2214.95	135.12	18.40	834.85	3203.32
	hm^2	2.23	1.39	0.00	1.11	4.73
	t	97.12	11.12	0.00	24.86	133.10

3203.32t

133.10t 6.98% 0.29%

2.

1

2

153.34 hm^2

50.86hm^2 16.89 hm^2 3.69 hm^2
37.27 hm^2

3203.32t 6.98%

3.

4.

1900m/3 K8+945
K17+495 K23+690

1

/

0.1 m 1-
10m

2

3

5.

COD_{Cr} SS

1371m/3 394m/2 977m/1 218m/3

24m/1 21 9 12

K22+377 9

6.

7.

8.

4.1-3

4.1-3 **hm²**

	3.4896	3.44	0	0
	19.317	17.3425	0	0
	4.9768	4.0820	0	0
	27.7834	24.8645	0	0

27.7834 hm^2 3.4896 hm^2 19.317 hm^2 4.9768 hm^2 K8~K11 K17~K18 K21~K22 K23~

“ ”

9.

10.

1

—

15~60m

60m

2

—— habitat fragmentation

——

4.1.3

4.1-4

4.1-4

		○	○	○	●	○		●	○	○	○	
		○	○	○				●	○	○	○	
	○	●				○					○	—
	○			○	○				○		○	

1.

1

2

3

4

5

2.

1

2

3

4

5

K8~K11 K17~K18 K21~K22 K23~

4.1.4

1.

1371m/3 394m/2 977m/1

218m/3 24m/1 21 9 12

K22+377 9

2 1 3

1

2

3

4

1 K22+377

9

5

6

10mg/L

“ ”

SS

2.

1

2

4.1.5

1.

3317.42hm^2

4.1-5

4.1-5

	hm²	**%**	**hm²**	**%**	**hm²**	**%**
	575.73	17.35%	50.86	8.83%	524.87	15.82%
	588.76	17.75%	16.89	2.87%	571.87	17.24%
	380.41	11.47%	3.69	0.97%	376.72	11.36%
	633.83	19.11%	37.27	5.88%	596.56	17.98%
	961.23	28.98%	39.71	4.13%	1074.86	32.40%
	65.21	1.97%	2.60	3.99%	62.61	1.89%
	112.25	3.38%	2.32	2.07%	109.93	3.31%
	3317.42	100.00%	153.34	28.74%	3317.42	1.00

4.1-5

5.88%

1.12

8.83% 1.53

0.51 0.11 0.08 0.08

28.98%

32.40% 3.43

2.

8.68hm² 162.02 hm²

5.36%

8.68 hm^2 1.11 hm^2 1.39 hm^2 2.23 hm^2

0.83 hm^2 3.12 hm^2 2.6-2

35.94%

25.69% 16.01% 12.79%

4.1.6

1.

37.27 hm^2

4.1-6

“ ”

2.

37.27

hm^2 29.86 hm^2 7.41 hm^2

4.1-6

4.1-6

		(hm^2)	(kg/hm^2·a)	(t)	(t)	(t)
		-	10250	-	-	-
		29.86	6600	197.08	591.23	2956.14

4.1-6

197.08t 3

591.23t 15 2956.14t

3.

4.1.7

4.1.7.1

1.

322.82

m^3 208.93 m^3 114.45

m^3 3.62 m^3

110.27 m^3

2.2-13

5km

2.

3.

22.32 m^3

2.2-14

5km

“ ”

4.1.7.2

1.

2.2.8

2.

2 2.2.8 3.12hm^2

3.

4.

5.

6.

4.1.7.3

2 K5+900 K21+200

2

3.12hm^2

2.2.8

1.

1

3 K8+800~K9+260

K17+055~K17+893 AK0+566~AK1+120

21km

2

K5+900 3km

K21+200

15km

2

3

2

200m

2

2.

2

3.

2

4.1.7.4

1.

2.

4.1.7.5

22.32 m³

13

1.

13

2.

4m

1.5m ×0.5m ×1.0m

2352m 2.17hm²

2 0.64hm²

1.0m 0.5m 0.5m

450m 169m³

4.1.8

1887.75m/3 K8+945

K17+495 K23+690

2.

80%

2.

3.

K8+945

K17+495 K23+690

4.2.1

“ ”

4.

K8+945

K17+495 K23+690

800mm

“ ”

4.1.9

4.1.9.1

4.1-7 4.1-8

3203.32t

6.98%

2214.95t 4.83% 834.85t

1.82% 135.12t 0.29%
18.40t 0.04%

133.10t 0.29% 97.12t
0.21% 24.68t
0.05% 11.12t 0.02%

4.1-7

	(hm²)	**(t/hm²)**	**(t)**	**(t)**	**(%)**
	50.86	43.55	2214.95	25073.04	4.83%
	16.89	8	135.12	4710.08	0.29%
	3.69	5	18.40	1902.03	0.04%
	37.27	22.4	834.85	14197.88	1.82%
	108.71		3203.32	45883.03	6.98%

4.1-8

	(hm²)	**(t/hm²)**	**(t)**	**(t)**	**(%)**
	2.23	43.55	97.12	25073.04	0.21%
	1.39	8	11.12	4710.08	0.02%
	1.11	22.4	24.86	14197.88	0.05%
	4.73	-	133.10	45883.03	0.29%

4.1.9.2

1.

2.

1

2

3.

4.1-9

2.61% 20.48%

42.01%

32.20% 5.14% 4.22% 2.81%

1.85% 47.43% 41.26%

4.1-9

	Rd %		**Rf %**		**Lp %**		**Do %**	
	34.92	34.32	64.63	54.88	45.08	37.91	47.43	41.26
	0.50	0.50	19.51	15.85	0.28	0.26	5.14	4.22
	57.62	56.21	7.32	3.66	51.56	34.47	42.01	32.20
	2.02	2.02	7.32	3.66	0.94	0.86	2.81	1.85
	4.93	6.96	1.22	21.95	2.14	26.51	2.61	20.48

4.1.10

[2016]161

4.1.11

“ ”

“ ”

12m

1

63m

+

4.1.12

5

4.2

4.2.1

1.

K22+377 2.4-4

→ →

1

0.5~0.7m

SS

2000mg/L

100~200m

2

50m SS 196.84mg/L
SL63-94 SS >10mg/L
750m >1mg/L 1700m

3

3

2.

3.

0.5m^3

5000mg/L pH 12

4.

2 2.3-4 SS

4.2-1

4.2-1

			(m)	
1		ZK8+831~ZK9+250	419	
		K8+800~K9+260	460	
2		ZK17+065~ZK17+890	825	
		K17+055~K17+893	838	
3		AK0+566~AK1+120	554	
		BK0+495~BK1+118	623	
		CK0+523~CK1+235	712	
		DK0+552~DK1+130	578	

pH

5.

2

100

9.0t 18t

4.2-2 2.3.2

4.2-2

	L/ ·d	K	t/d	kg/d			
				SS	COD		
100 /	100	0.9	9.0	5.40	4.50	1.26	0.36

4.2-2

4.2-3

4.2-3

1	K5+900		124m
2	K21+200		146m

2 2

2.11.2

COD SS

4.2.2

2.11-6 SS SS 125 mg/L 11.25 mg/L

K11+100~K11+250 B BK0+500~BK0+800

2.11 108L/d 9L/d 5.40t/d

4.2-4

4.2-4

					t/d	t/a				
						SS	COD			
	1		K12+300	50	5.40	1.084	0.887	0.177	0.059	50m
	2		K17+980	2	/	/	/	/	/	/
	3		K23+320	2	/	/	/	/	/	/
				54	5.40	1.084	0.887	0.177	0.059	

4.2-4

5.40t/d

SS 1.084t/a COD 0.887t/a 0.177t/a

0.059t/a COD

SS GB8978-1996

III

4.3

4.3.1

1.

1887.75m/3 1448.25m/2

439.5m/1

1

2.3

SS

4.2.1

2

2.

0.4 1.5m

2006 10E-4

1.5m COD

3.

4.

4.3.2

1.

SS 1h

SS 125mg/L 11.25 mg/L

SS

80cm

1.8m

2.

1

5.40t

GB8978-1996

4.3.3

3 ——

1.

1

BK0+560~BK0+580

28m

BK0+820~BK0+845

62m

2

S302

3

BK0+560~BK0+580

BK0+820~BK0+845

a.

b.

c.

d.

e.

2m 8m

9-10m

10m

4

SS 1h

SS 125mg/L 11.25 mg/L

6

7

2.

1

K11+150~K11+200

18m

2

S302

3

K11+150~K11+200

a.

b.

c.

d.

e.

10m

4

SS 1h

SS 125mg/L 11.25 mg/L

6

7

3.

1

K22+100~K22+300

38m

309m 324m

2

a.

b.

c.

d.

e.

4

SS 1h

SS 125mg/L 11.25 mg/L

6

7

4.4

4.4.1

1.

3

90dB

2.

a

b

c.

3.

1

2

2.11-7~ 2.11-8

4.4-1

4.4-1

4.4-1

4.

$$L_i = L_0 - 20\lg\left(\frac{r_i}{r_0}\right)$$

Li——— dB(A)

Lo——— dB(A) 2.4-1~ 2.4-2

ri——— m

r0——— m

$$L = 10\lg \Sigma 10^{0.1L_i}$$

L——— dB(A)

Li——— i dB(A)

5.

4.4-2 2.2-1

4.4-2

	m									dB	
	5m	10m	20	40	60	80	100	150	200	70	55
	97.2	91.1	85.1	79.1	75.6	73.1	71.1	67.6	65.1	114.1	641.9
	94.1	88.1	82.1	76.1	72.5	70.0	68.1	64.6	62.1	80.3	451.8
	96.7	90.6	84.6	78.6	75.1	72.6	70.6	67.1	64.6	107.6	605.3
	90.3	84.3	78.3	72.3	68.8	66.3	64.3	60.8	58.3	52.0	292.4
	97.0	90.9	84.9	78.9	75.4	72.9	70.9	67.4	64.9	111.6	627.3
	91.8	85.7	79.7	73.7	70.2	67.7	65.7	62.2	59.7	61.2	344.3

115m 642m

19 1

GB6722-2014 1
90dB(A) 70dB(A)
170~190dB(A)

1

4.4.2

1.

HJ2.4-2021

1 i

$$L_{\mathrm{Aeq}}(h)_i=\left(\overline{L_{0E}}\right)_i+10\lg\left(\frac{N_i}{V_iT}\right)+\Delta L\quad+10\lg\left(\frac{\theta}{\pi}\right)+\Delta L-16$$

Leq(h)i —— i dB(A)

$\left(\overline{L_{OE}}\right)_i$ —— i Vi km/h 7.5m

A dB

Ni —— i /h

Vi —— i km/h

T —— 1h

ΔL —— dB(A)

r—— m r 7.5m

θ—— 4.4-1

θ $\frac{170\pi}{180}$

θ

ΔL—— dB(A)

4.4-1

ΔL

$$\Delta L\quad=\begin{cases}10\lg(\frac{7.5}{r}) & (N_{\max}\geq 300\quad/\mathrm{h})\\ 15\lg(\frac{7.5}{r}) & (N_{\max}\quad 300\quad/\mathrm{h})\end{cases}$$

ΔL —— dB(A)

r —— m

Nmax—— /h

Nmax≥300 /h ΔL =10lg(7.5/r)

ΔL

$$\Delta L=\Delta L_1 \quad \Delta L_2$$

ΔL—— dB(A)

ΔL_1—— dB(A)

ΔL_2—— dB(A)

$\Delta L1$

$$\Delta L_1=\Delta L \quad \Delta L$$

ΔL_1—— dB(A)

ΔL —— dB(A)

ΔL —— dB(A)

$\Delta L2$

$$\Delta L_2=A_{gr} \quad A_{bar} \quad A_{fol} \quad A_{atm}$$

ΔL_2—— dB(A)

A_{gr}—— dB(A)

A_{ba}—— dB(A)

A_{fol}—— dB(A)

A_{atm}—— dB(A)

2

$$L_{\mathrm{Aeqg}} = 10\lg\left[10^{0.1L_{\mathrm{Aeql}}} + 10^{0.1L_{\mathrm{Aeqm}}} + 10^{0.1L_{\mathrm{Aeqs}}}\right]$$

L_{Aeqg}—— dB(A)

L_{Aeql}—— dB(A)

L_{Aeqm}—— dB(A)

L_{Aeqs}—— dB(A)

3

$$L_{\mathrm{Aeq}} = 10\lg\left[10^{0.1L_{\mathrm{Aeqg}}} + 10^{0.1L_{\mathrm{Aeqb}}}\right]$$

L_{Aeq}—— dB(A)

L_{Aeqg}—— dB(A)

L_{Aeqb}—— dB(A)

2.

1 ΔL_1

ΔL

ΔL

ΔL =98×β dB(A)

ΔL =73×β dB(A)

ΔL =50×β dB(A)

β—— %

ΔL

4.4-3

4.4-3 **dB A**

	[dB (A)]		
	30 (km/h)	40 (km/h)	≥50 (km/h)
	0	0	0
	+1.0	+1.5	+2.0
	-1 dB(A) -3 dB(A)		

SMA-13 -3.0

2 (ΔL_2)

A_{bar}

A_{bar} $=\Delta L$ ΔL

A_{bar}—— dB(A)

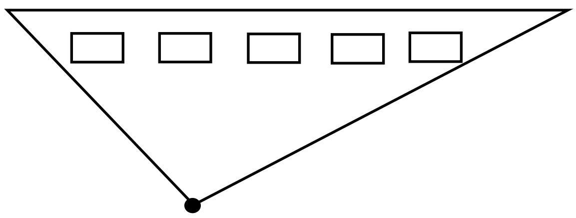
ΔL —— dB(A)

ΔL —— dB(A)

a. (ΔL)

GB/T17247.2 A3

4.4-2 4.4-4



1 S=S1+S2+……+Sn

2 S_0

4.4-2

4.4-4

S/S_0	ΔL [dB(A)]
40% 60%	3
70% 90%	5
	1.5 ≤10

b. (ΔL)

ΔL

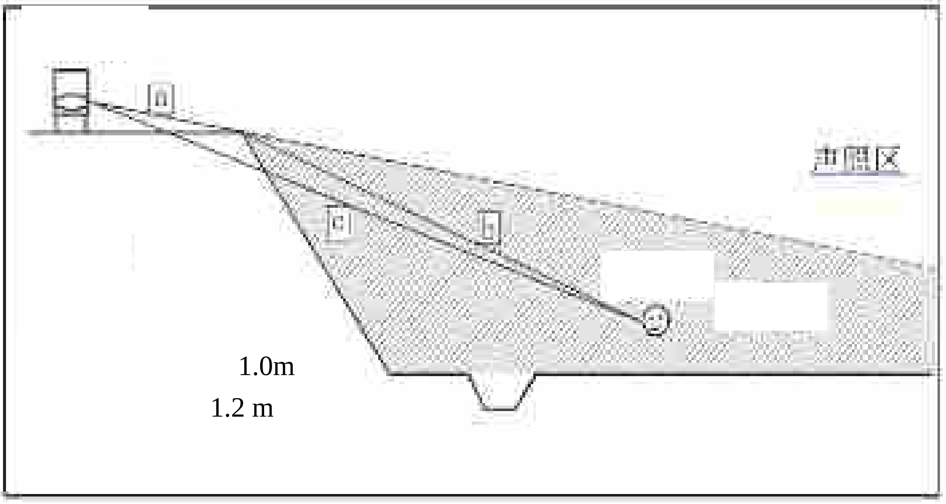
$$\Delta L = \begin{cases} 10\lg\left(\dfrac{3\pi\sqrt{(1-t^2)}}{4\tan^{-1}\sqrt{\dfrac{(1-t)}{(1+t)}}}\right) & \left(t=\dfrac{20N}{3}\le 1\right) \\ 10\lg\left(\dfrac{3\pi\sqrt{(t^2-1)}}{2\ln(t+\sqrt{(t^2-1)})}\right) & \left(t=\dfrac{20N}{3} \quad 1\right) \end{cases}$$

N——

$$N=\frac{2\delta}{\lambda}$$

δ—— m 4.4-3 δ a b c

λ—— m



4.4-3 **δ**

ΔL 0

A_{atm} A_{gr} A_{fol}

a. A_{atm}

$$A_{atm} = \frac{a(r - r_o)}{1000}$$

Aatm—— dB(A)

α—— 4.4-5

13.2

63.7%

r—— m

r_0—— m

4.4-5 α

	%	α dB/km							
		Hz							
		63	125	250	500	1000	2000	4000	8000
10	70	0.1	0.4	1.0	1.9	3.7	9.7	32.8	117.0
20	70	0.1	0.3	1.1	2.8	5.0	9.0	22.9	76.6
30	70	0.1	0.3	1.0	3.1	7.4	12.7	23.1	59.3
15	20	0.3	0.6	1.2	2.7	8.2	28.2	28.8	202.0
15	50	0.1	0.5	1.2	2.2	4.2	10.8	36.2	129.0
15	80	0.1	0.3	1.1	2.4	4.1	8.3	23.7	82.8

b. A_{gr}

$$A_{gr} = 4.8 - (\frac{2h_m}{r})\left[17 + (\frac{300}{r})\right]$$

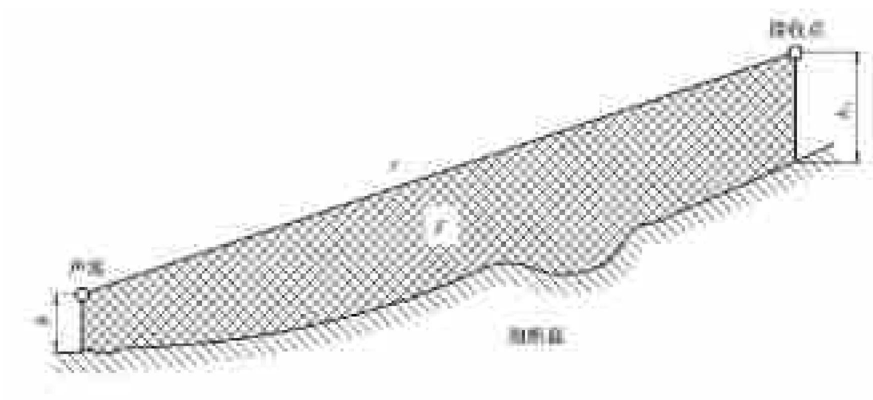
A_{gr}—— dB(A)

r—— m

hm—— m 4.4-4 hm=F/r F

m^2

A_{gr} A_{gr} 0 GB/T17247.2



4.4-4 hm

c. Afol

4.4-6

4.4-6

	df/m	/HZ							
		63	125	250	500	1000	2000	4000	8000
/dB	10≤df<20	0	0	1	1	1	1	2	3
/ dB/m	20≤df<200	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.12

3.

HJ1358-2024

$(\overline{L_{OE}})_i$ Ni Vi

T r ΔL 4.4-7

4.4-7

1	$(\overline{L_{OE}})_i$		i dB(A)	2.11-11	HJ1358-2024
2	Ni		T i /	2.3-5	
3	Vi		i	2.3-14	76km/h 58.5km/h 58.5km/h
4	T		h	1	
5	r			r= -	
6	ΔL1	ΔL	dB(A)	4.4.2	ΔL =98×β dB(A) ΔL =73×β dB(A) ΔL =50×β dB(A)
		ΔL	dB(A)	-3.0	SMA-13 -3.0

4.4-7

7	ΔL2	Aatm		4.4.2	a 1.9
8		Agr		4.4-4	r hm 1.7-6 “ ” “ ”
9		Abar		4.4-3	δ 4.4-3 Abar

4.

1

1.2m

4.4-8 4.4-9

4.4-8

			(m)								
			30	**40**	**50**	**60**	**80**	**100**	**120**	**160**	**200**
~			66.5	64.3	62.8	61.6	59.9	57.7	56.3	54.1	52.4
			60.0	57.7	56.2	55.1	53.3	51.2	49.7	47.5	45.9
			66.8	64.5	63.0	61.9	60.1	58.0	56.5	54.3	52.7
			60.3	58.0	56.5	55.3	53.6	51.5	50.0	47.8	46.1
			67.5	65.2	63.7	62.5	60.8	58.7	57.2	55.0	53.3
			60.9	58.7	57.1	56.0	54.2	52.1	50.7	48.5	46.8
~			66.7	64.5	63.0	61.8	60.1	58.2	56.7	54.5	52.8
			60.2	58.0	56.5	55.3	53.6	51.7	50.1	47.9	46.2
			67.9	65.6	64.1	63.0	61.2	59.3	57.8	55.6	53.9
			61.3	59.1	57.6	56.4	54.7	52.8	51.3	49.1	47.4
			68.8	66.5	65.0	63.9	62.1	60.2	58.7	56.5	54.8
			62.2	60.0	58.5	57.4	55.6	53.7	52.2	50.0	48.3
~			66.3	64.0	62.5	61.4	59.6	57.7	56.2	54.0	52.3
			59.7	57.5	56.0	54.8	53.1	51.2	49.7	47.5	45.8
			67.5	65.3	63.7	62.6	60.8	58.9	57.4	55.2	53.5
			61.0	58.7	57.2	56.1	54.3	52.4	50.9	48.7	47.0
			68.4	66.2	64.7	63.5	61.8	59.9	58.4	56.1	54.5
			61.9	59.6	58.1	57.0	55.2	53.3	51.8	49.6	47.9
~			65.7	63.5	62.0	60.8	59.1	57.0	55.5	53.3	51.6
			59.2	56.9	55.4	54.3	52.5	50.4	48.9	46.8	45.1
			67.0	64.7	63.2	62.0	60.3	58.2	56.7	54.5	52.8
			60.4	58.2	56.6	55.5	53.8	51.6	50.2	48.0	46.3

4.4-8

			(m)								
			30	**40**	**50**	**60**	**80**	**100**	**120**	**160**	**200**
~			67.9	65.6	64.1	62.9	61.2	59.1	57.6	55.4	53.8
			61.3	59.1	57.6	56.4	54.7	52.6	51.1	48.9	47.2
~			65.8	63.5	62.0	60.8	59.1	57.0	55.5	53.3	51.7
			59.2	57.0	55.5	54.3	52.6	50.5	49.0	46.8	45.1
			67.0	64.7	63.2	62.1	60.3	58.2	56.7	54.5	52.9
			60.5	58.2	56.7	55.5	53.8	51.7	50.2	48.0	46.3
			67.9	65.6	64.1	63.0	61.2	59.1	57.6	55.5	53.8
			61.4	59.1	57.6	56.4	54.7	52.6	51.1	48.9	47.3

4.4-9

		(m)							
		4a		**3**		**2**		**1**	
~		22.6	60.8	/	/	78.3	116.4	/	/
		23.2	63.7	/	/	81.1	119.9	/	/
		24.6	71.4	/	/	87.4	132.0	/	/
~		22.9	63.6	37.8	63.6	/	/	/	/
		25.3	76.6	44.2	76.6	/	/	/	/
		27.3	86.4	50.3	86.4	/	/	/	/
~		21.8	58.6	/	/	/	/	141.8	218.3
		24.5	72.2	/	/	/	/	165.0	247.3
		26.5	82.5	/	/	/	/	187.0	269.2

4.4-9

		(m)							
		4a		3		2		1	
~		21.0	53.7	/	/	/	/	128.6	202.0
		23.5	65.7	/	/	/	/	151.0	231.3
		25.5	76.2	/	/	/	/	170.2	253.4
~		21.0	54	/	/	/	/	129.2	202.9
		23.6	66.1	/	/	/	/	151.6	232.1
		25.6	76.6	/	/	/	/	171.0	254.2

~ 4a

22.6m 23.2m 24.6m

60.8m 63.7m 71.4m 2

78.3m 81.1m 87.4m

116.4m 119.9m 132.0m

~ 4a

22.9m 25.3m 27.3m

63.6m 76.6m 86.4m 3

37.8m 44.2m 50.3m

63.6m 76.6m 86.4m

~ 4a

21.8m 24.5m 26.5m

58.6m 72.2m 82.5m 1

141.8m 165.0m 187.0m

218.3m 247.3m 269.2m

~ 4a

21.0m 23.5m 25.5m

53.7m 65.7m 76.2m 1

128.6m 151.0m 170.2m

202.0m 231.3m 253.4m

~ 4a

21.0m 23.6m 25.6m

54m 66.1m 76.6m 1

129.2m 151.6m 171.0m

202.9m 232.1m 254.2m

2

4.4-10

4.4-11 4.4-12

4.4-10

1		2	51.6	41.6	-	-
		4	52.8	42.7		
2		1	50.4	39.9	-	-
		3	51.6	41.4		
		5	53.4	43.6		
3		1	51.9	41.7		
		3	53.2	43.0		
		5	53.3	43.2		
		7	52.3	42.0		
		12	53.4	43.3		
		17	52.5	42.3		
		27	52.7	42.6		
		35	53.4	43.2		
4		1	52.6	43.2	-	-
		3	54.7	44.7		
		1	52.1	43.2		
		3	53.5	43.2		
5		1	51.1	40.9		
		3	51.6	41.5		
		5	52.3	42.2		
		7	52.8	42.8		
		10	53.4	43.2		
		15	52.9	42.9		
		17	54.0	44.0		
6		1	51.9	42.2		S202 S202
7		1	51.8	42.3		S202 S202
8		1	51.6	41.3	-	-
9		2	51.8	40.9	-	-
		4	53.9	43.0		

4.4-10

10		1	48.9	40.0		
		3	49.8	40.8		
		5	50.1	41.7		
		9	51.8	42.2		
		12	52.1	42.9		
		17	53.0	43.7		
		1	48.6	38.9		
		3	48.9	39.3		
		5	49.7	39.8		
		9	50.8	40.9		
		12	51.2	41.9		
		17	52.0	43.3		
11		2	49.9	39.0	-	-
		4	50.7	40.1		
		6	51.7	42.6		
		2	48.7	38.4		
		4	49.0	38.9		
		6	50.3	40.9		
12		2	51.3	40.9	-	-
		4	51.9	42.1		
		6	53.3	43.7		

4.4-11

		(m)	(m)	(m)	(dB)						(dB)						(dB)						(dB)								
1		43	+1.5	-6.8	34.8	28.2	35.7	29.1	36.8	30.3	52.0	41.9	52.0	41.9	52.0	42.0							0.1	0.2	0.1	0.2	0.1	0.3	4a	51.9	41.7
				-0.8	40.3	33.8	41.2	34.7	42.4	35.9	53.4	43.5	53.5	43.6	53.5	43.8							0.2	0.5	0.3	0.6	0.3	0.8	4a	53.2	43.0
				5.2	46.0	39.4	46.9	40.3	48.0	41.5	54.0	44.7	54.2	45.0	54.4	45.4							0.7	1.5	0.9	1.8	1.1	2.2	4a	53.3	43.2
				11.2	52.8	46.3	53.7	47.2	54.9	48.4	55.6	47.7	56.1	48.3	56.8	49.3							3.3	5.7	3.8	6.3	4.5	7.3	4a	52.3	42.0
				23.2	52.6	46.1	53.5	47.0	54.7	48.2	56.0	47.9	56.5	48.5	57.1	49.4							2.6	4.6	3.1	5.2	3.7	6.1	4a	53.4	43.3
				38.2	51.6	45.1	52.5	46.0	53.7	47.2	55.1	46.9	55.5	47.5	56.1	48.4							2.6	4.6	3.0	5.2	3.6	6.1	4a	52.5	42.3
				53.2	50.2	43.7	51.1	44.6	52.3	45.7	54.6	46.2	55.0	46.7	55.5	47.5							1.9	3.6	2.3	4.1	2.8	4.9	4a	52.7	42.6
		74		-6.8	35.6	29.1	36.5	30.0	37.7	31.2	52.0	41.9	52.0	42.0	52.1	42.1							0.1	0.2	0.1	0.3	0.2	0.4	1	51.9	41.7
				-0.8	38.5	31.9	39.4	32.8	40.5	34.0	53.3	43.3	53.4	43.4	53.4	43.5							0.1	0.3	0.2	0.4	0.2	0.5	1	53.2	43.0
				5.2	41.0	34.5	41.9	35.4	43.1	36.6	53.5	43.7	53.6	43.9	53.7	44.1							0.2	0.5	0.3	0.7	0.4	0.9	1	53.3	43.2
				11.2	46.8	40.3	47.7	41.2	48.9	42.4	53.4	44.2	53.6	44.6	53.9	45.2						0.2	1.1	2.2	1.3	2.6	1.6	3.2	1	52.3	42.0
				23.2	48.1	41.6	49.0	42.5	50.2	43.6	54.5	45.5	54.7	45.9	55.1	46.5		0.5		0.9	0.1	1.5	1.1	2.2	1.3	2.6	1.7	3.2	1	53.4	43.3
				38.2	47.7	41.2	48.6	42.1	49.8	43.2	53.7	44.8	54.0	45.2	54.4	45.8				0.2		0.8	1.2	2.5	1.5	2.9	1.9	3.5	1	52.5	42.3
				53.2	47.1	40.5	48.0	41.4	49.1	42.6	53.7	44.7	54.0	45.1	54.3	45.6				0.1		0.6	1.0	2.1	1.3	2.5	1.6	3.0	1	52.7	42.6
2		194	+1.8	-11.8	30.3	23.8	31.2	24.7	32.4	25.8	51.6	41.7	51.6	41.7	51.7	41.7							0.0	0.1	0.0	0.1	0.1	0.1	1	51.6	41.6
				-5.8	31.2	24.7	32.1	25.6	33.3	26.8	52.8	42.8	52.8	42.8	52.8	42.8							0.0	0.1	0.0	0.1	0.0	0.1	1	52.8	42.7
3		190	+1.5	-18.8	29.4	22.8	30.3	23.7	31.4	24.9	50.4	40.0	50.4	40.0	50.5	40.0							0.0	0.1	0.0	0.1	0.1	0.1	1	50.4	39.9
				-12.8	30.2	23.7	31.1	24.6	32.3	25.8	51.6	41.5	51.6	41.5	51.7	41.5							0.0	0.1	0.0	0.1	0.1	0.1	1	51.6	41.4
				-6.8	30.9	24.4	31.8	25.3	33.0	26.5	53.4	43.7	53.4	43.7	53.4	43.7							0.0	0.1	0.0	0.1	0.0	0.1	1	53.4	43.6
4		68	+6.5	2.2	42.5	36.0	43.4	36.9	44.6	38.0	52.4	42.7	52.5	42.9	52.6	43.3							0.5	1.0	0.6	1.2	0.7	1.6	4a	51.9	41.7
				8.2	47.9	41.4	48.8	42.3	50.0	43.5	54.3	45.3	54.5	45.7	54.9	46.2							1.1	2.3	1.3	2.7	1.7	3.2	4a	53.2	43.0
				14.2	48.5	42.0	49.4	42.9	50.6	44.0	54.5	45.6	54.8	46.0	55.2	46.6							1.2	2.4	1.5	2.8	1.9	3.4	4a	53.3	43.2
				20.2	48.4	41.9	49.3	42.8	50.5	44.0	53.8	44.9	54.1	45.4	54.5	46.1							1.5	2.9	1.8	3.4	2.2	4.1	4a	52.3	42.0
				32.2	48.1	41.5	49.0	42.4	50.1	43.6	54.5	45.5	54.7	45.9	55.1	46.5							1.1	2.2	1.3	2.6	1.7	3.2	4a	53.4	43.3
		75		2.2	41.9	35.4	42.8	36.3	44.0	37.4	52.3	42.6	52.4	42.8	52.5	43.1							0.4	0.9	0.5	1.1	0.6	1.4	1	51.9	41.7
				8.2	46.7	40.1	47.6	41.0	48.7	42.2	54.1	44.8	54.2	45.1	54.5	45.6				0.1		0.6	0.9	1.8	1.0	2.1	1.3	2.6	1	53.2	43.0
				14.2	47.6	41.1	48.5	42.0	49.7	43.2	54.3	45.3	54.6	45.7	54.9	46.2		0.3		0.7		1.2	1.0	2.1	1.3	2.5	1.6	3.0	1	53.3	43.2
				20.2	47.6	41.0	48.5	41.9	49.6	43.1	53.6	44.6	53.8	45.0	54.2	45.6				0.0		0.6	1.3	2.6	1.5	3.0	1.9	3.6	1	52.3	42.0
				32.2	47.3	40.7	48.2	41.6	49.3	42.8	54.3	45.2	54.5	45.6	54.8	46.1		0.2		0.6		1.1	0.9	1.9	1.1	2.3	1.4	2.8	1	53.4	43.3
5		40	-0.8	5.2	51.0	44.4	51.9	45.3	53.0	46.5	54.5	46.3	54.9	46.9	55.5	47.7							2.6	4.6	3.0	5.2	3.6	6.0	4a	51.9	41.7
				11.2	51.5	45.0	52.4	45.9	53.6	47.0	55.4	47.1	55.8	47.7	56.4	48.5							2.2	4.1	2.6	4.7	3.2	5.5	4a	53.2	43.0
				17.2	51.0	44.5	51.9	45.4	53.1	46.6	55.3	46.9	55.7	47.4	56.2	48.2							2.0	3.7	2.4	4.2	2.9	5.0	4a	53.3	43.2
				23.2	50.5	43.9	51.4	44.8	52.5	46.0	54.5	46.1	54.9	46.6	55.4	47.4							2.2	4.1	2.6	4.6	3.1	5.4	4a	52.3	42.0
				38.2	48.8	42.3	49.7	43.2	50.9	44.4	54.7	45.8	55.0	46.3	55.3	46.9							1.3	2.5	1.6	3.0	1.9	3.6	4a	53.4	43.3
				53.2	47.2	40.7	48.1	41.6	49.3	42.8	53.6	44.6	53.9	45.0	54.2	45.6							1.1	2.3	1.4	2.7	1.7	3.3	4a	52.5	42.3

4.4-11

		(m)	(m)	(m)	(dB)						(dB)						(dB)						(dB)								
5		40	-0.8	83.2	44.4	37.9	45.3	38.8	46.5	40.0	53.3	43.9	53.4	44.1	53.6	44.5							0.6	1.3	0.7	1.5	0.9	1.9	4a	52.7	42.6
				107.2	42.6	36.0	43.5	36.9	44.6	38.1	53.7	44.0	53.8	44.1	53.9	44.4							0.3	0.8	0.4	0.9	0.5	1.2	4a	53.4	43.2
		63		5.2	45.3	38.8	46.2	39.7	47.4	40.9	52.8	43.5	52.9	43.8	53.2	44.3							0.9	1.8	1.0	2.1	1.3	2.6	1	51.9	41.7
				11.2	47.2	40.6	48.1	41.5	49.2	42.7	54.2	45.0	54.4	45.3	54.7	45.9				0.3		0.9	1.0	2.0	1.2	2.3	1.5	2.9	1	53.2	43.0
				17.2	47.7	41.1	48.6	42.0	49.7	43.2	54.4	45.3	54.6	45.7	54.9	46.2		0.3		0.7		1.2	1.1	2.1	1.3	2.5	1.6	3.0	1	53.3	43.2
				23.2	47.4	40.9	48.3	41.8	49.5	42.9	53.5	44.5	53.8	44.9	54.1	45.5						0.5	1.2	2.5	1.5	2.9	1.8	3.5	1	52.3	42.0
				38.2	46.5	40.0	47.4	40.9	48.6	42.1	54.2	45.0	54.4	45.3	54.6	45.7				0.3		0.7	0.8	1.7	1.0	2.0	1.2	2.4	1	53.4	43.3
				53.2	45.5	39.0	46.4	39.9	47.6	41.0	53.3	44.0	53.5	44.3	53.7	44.7							0.8	1.7	1.0	2.0	1.2	2.4	1	52.5	42.3
				83.2	43.4	36.9	44.3	37.8	45.5	38.9	53.2	43.6	53.3	43.8	53.5	44.2							0.5	1.0	0.6	1.2	0.8	1.6	1	52.7	42.6
				107.2	41.9	35.3	42.8	36.2	43.9	37.4	53.7	43.9	53.8	44.0	53.9	44.2							0.3	0.7	0.4	0.8	0.5	1.0	1	53.4	43.2
6		91	-4.8	-7.8	25.2	18.7	26.1	19.6	27.3	20.7	52.6	43.2	52.6	43.2	52.6	43.2							0.0	0.0	0.0	0.0	0.0	0.0	4b	52.6	43.2
				-1.8	27.1	20.6	28.0	21.5	29.2	22.7	54.7	44.7	54.7	44.7	54.7	44.7							0.0	0.0	0.0	0.0	0.0	0.0	4b	54.7	44.7
		100		-7.8	24.7	18.1	25.6	19.0	26.7	20.2	52.1	43.2	52.1	43.2	52.1	43.2							0.0	0.0	0.0	0.0	0.0	0.0	1	52.1	43.2
				-1.8	26.4	19.9	27.3	20.8	28.5	22.0	53.5	43.2	53.5	43.2	53.5	43.2							0.0	0.0	0.0	0.0	0.0	0.0	1	53.5	43.2
7		105	-7.5	-8.8	35.1	28.6	35.3	28.8	36.0	29.5	51.2	41.1	51.2	41.2	51.2	41.2							0.1	0.2	0.1	0.3	0.1	0.3	2	51.1	40.9
				-2.8	36.9	30.4	37.1	30.6	37.8	31.3	51.7	41.8	51.8	41.8	51.8	41.9							0.1	0.3	0.2	0.3	0.2	0.4	2	51.6	41.5
				3.2	38.8	32.3	39.1	32.5	39.7	33.2	52.5	42.6	52.5	42.6	52.5	42.7							0.2	0.4	0.2	0.4	0.2	0.5	2	52.3	42.2
				9.2	40.9	34.4	41.2	34.6	41.8	35.3	53.1	43.4	53.1	43.4	53.1	43.5							0.3	0.6	0.3	0.6	0.3	0.7	2	52.8	42.8
				18.2	44.4	37.9	44.7	38.1	45.3	38.8	53.9	44.3	53.9	44.4	54.0	44.5							0.5	1.1	0.5	1.2	0.6	1.3	2	53.4	43.2
				33.2	51.6	45.1	51.9	45.4	52.6	46.0	55.3	47.2	55.4	47.3	55.7	47.8							2.4	4.3	2.5	4.4	2.8	4.9	2	52.9	42.9
				39.2	52.8	46.3	53.1	46.5	53.7	47.2	56.5	48.3	56.6	48.5	56.9	48.9							2.5	4.3	2.6	4.5	2.9	4.9	2	54.0	44.0
		91	+7.9	-8.8	41.4	34.9	41.7	35.1	42.3	35.8	51.5	41.9	51.6	41.9	51.6	42.1							0.4	1.0	0.5	1.0	0.5	1.2	2	51.1	40.9
				-2.8	44.3	37.8	44.6	38.0	45.2	38.7	52.3	43.0	52.4	43.1	52.5	43.3							0.7	1.5	0.8	1.6	0.9	1.8	2	51.6	41.5
				3.2	47.8	41.3	48.1	41.6	48.8	42.2	53.6	44.8	53.7	44.9	53.9	45.2							1.3	2.6	1.4	2.7	1.6	3.0	2	52.3	42.2
				9.2	51.4	44.9	51.7	45.1	52.3	45.8	55.2	47.0	55.3	47.1	55.6	47.6							2.4	4.2	2.5	4.3	2.8	4.8	2	52.8	42.8
				18.2	56.5	50.0	56.8	50.2	57.4	50.9	58.2	50.8	58.4	51.0	58.9	51.6		0.8		1.0		1.6	4.8	7.6	5.0	7.8	5.5	8.4	2	53.4	43.2
				33.2	59.1	52.6	59.4	52.8	60.0	53.5	60.0	53.0	60.3	53.3	60.8	53.9		3.0	0.3	3.3	0.8	3.9	7.1	10.1	7.4	10.4	7.9	11.0	2	52.9	42.9
				39.2	59.0	52.5	59.3	52.7	59.9	53.4	60.2	53.1	60.4	53.3	60.9	53.9	0.2	3.1	0.4	3.3	0.9	3.9	6.2	9.1	6.4	9.3	6.9	9.9	2	54.0	44.0
8		99	+8.4	-4.8	44.6	38.1	44.9	38.3	45.5	39.0	52.0	42.7	52.0	42.8	52.2	43.1							0.9	1.8	0.9	1.9	1.1	2.2	2	51.1	40.9
				1.2	47.9	41.4	48.2	41.6	48.8	42.3	53.1	44.4	53.2	44.6	53.4	44.9							1.5	2.9	1.6	3.1	1.8	3.4	2	51.6	41.5
				7.2	51.0	44.5	51.3	44.8	52.0	45.4	54.7	46.5	54.8	46.7	55.1	47.1							2.4	4.3	2.5	4.5	2.8	4.9	2	52.3	42.2
				13.2	53.4	46.9	53.7	47.1	54.3	47.8	56.1	48.3	56.3	48.5	56.7	49.0							3.3	5.5	3.5	5.7	3.9	6.2	2	52.8	42.8
				22.2	58.5	52.0	58.8	52.2	59.4	52.9	59.7	52.5	59.9	52.7	60.4	53.3		2.5		2.7	0.4	3.3	6.3	9.3	6.5	9.5	7.0	10.1	2	53.4	43.2
				37.2	58.3	51.8	58.6	52.0	59.2	52.7	59.4	52.3	59.6	52.5	60.2	53.1		2.3		2.5	0.2	3.1	6.5	9.4	6.7	9.6	7.3	10.2	2	52.9	42.9
				43.2	58.2	51.7	58.5	51.9	59.1	52.6	59.6	52.4	59.8	52.6	60.3	53.2		2.4		2.6	0.3	3.2	5.6	8.4	5.8	8.6	6.3	9.2	2	54.0	44.0

4.4-11

		(m)	(m)	(m)	(dB)						(dB)						(dB)						(dB)								
9		130	8.9	-7.8	42.6	36.0	42.8	36.3	43.5	37.0	51.7	42.1	51.7	42.2	51.8	42.4							0.6	1.2	0.6	1.3	0.7	1.5	2	51.1	40.9
				-1.8	45.0	38.5	45.3	38.8	46.0	39.4	52.5	43.3	52.5	43.4	52.6	43.6							0.9	1.8	0.9	1.9	1.0	2.1	2	51.6	41.5
				4.2	47.6	41.1	47.9	41.3	48.5	42.0	53.6	44.7	53.6	44.8	53.8	45.1							1.3	2.5	1.3	2.6	1.5	2.9	2	52.3	42.2
				10.2	49.5	43.0	49.7	43.2	50.4	43.9	54.5	45.9	54.5	46.0	54.8	46.4							1.7	3.1	1.7	3.2	2.0	3.6	2	52.8	42.8
				19.2	54.5	48.0	54.8	48.2	55.4	48.9	57.0	49.2	57.2	49.4	57.6	49.9							3.6	6.0	3.8	6.2	4.2	6.7	2	53.4	43.2
				34.2	56.8	50.3	57.1	50.5	57.7	51.2	58.3	51.0	58.5	51.2	59.0	51.8		1.0		1.2		1.8	5.4	8.1	5.6	8.3	6.1	8.9	2	52.9	42.9
				40.2	56.7	50.2	57.0	50.5	57.7	51.1	58.6	51.1	58.8	51.3	59.2	51.9		1.1		1.3		1.9	4.6	7.1	4.8	7.3	5.2	7.9	2	54.0	44.0
10		113	+3.6	-15.8	38.7	32.2	39.8	33.3	40.8	34.2	52.1	42.6	52.2	42.7	52.2	42.8							0.2	0.4	0.3	0.5	0.3	0.6	3	51.9	42.2
11		36	+4.5	-8.8	41.7	35.2	42.8	36.3	43.7	37.2	52.3	43.0	52.4	43.2	52.5	43.4							0.4	0.8	0.5	1.0	0.6	1.2	4a	51.9	42.2
		72		-8.8	43.0	36.4	44.1	37.6	45.0	38.5	52.4	43.2	52.6	43.5	52.7	43.7							0.5	1.0	0.7	1.3	0.8	1.5	3	51.9	42.2
12		48	+10	1.2	52.2	45.7	53.4	46.9	54.3	47.8	55.0	47.3	55.7	48.2	56.3	48.9							3.2	5.0	3.9	5.9	4.5	6.6	4a	51.8	42.3
		72		1.2	51.8	45.3	53.0	46.5	54.0	47.4	54.8	47.1	55.5	47.9	56.0	48.6		2.1	0.5	2.9	1.0	3.6	3.0	4.8	3.7	5.6	4.2	6.3	1	51.8	42.3
13		68	+12	1.2	52.0	45.4	53.2	46.7	54.1	47.6	54.9	47.2	55.6	48.0	56.1	48.7							3.1	4.9	3.8	5.7	4.3	6.4	4a	51.8	42.3
		72		1.2	51.8	45.2	53.0	46.5	53.9	47.4	54.8	47.0	55.4	47.9	56.0	48.6		2.0	0.4	2.9	1.0	3.6	3.0	4.7	3.6	5.6	4.2	6.3	1	51.8	42.3
14		50	+6	4.2	57.5	51.0	58.8	52.2	59.7	53.2	58.5	51.4	59.5	52.6	60.3	53.4							6.9	10.1	7.9	11.3	8.7	12.1	4a	51.6	41.3
		71		4.2	54.6	48.1	55.8	49.3	56.7	50.2	56.4	48.9	57.2	49.9	57.9	50.7	1.4	3.9	2.2	4.9	2.9	5.7	4.8	7.6	5.6	8.6	6.3	9.4	1	51.6	41.3
15		100	+6.5	0.2	46.4	39.8	47.6	41.1	48.5	42.0	52.9	43.4	53.2	44.0	53.5	44.5							1.1	2.5	1.4	3.1	1.7	3.6	1	51.8	40.9
				6.2	48.6	42.1	49.8	43.3	50.7	44.2	55.0	45.6	55.3	46.1	55.6	46.6	0.0	0.6	0.3	1.1	0.6	1.6	1.1	2.6	1.4	3.1	1.7	3.6	1	53.9	43.0
16		82	+6.7	0.2	49.1	42.6	50.3	43.8	51.3	44.7	52.0	44.5	52.7	45.3	53.3	46.0							3.1	4.5	3.8	5.3	4.4	6.0	4a	48.9	40.0
				6.2	52.6	46.0	53.8	47.3	54.7	48.2	54.4	47.2	55.3	48.2	55.9	48.9							4.6	6.4	5.5	7.4	6.1	8.1	4a	49.8	40.8
				12.2	58.9	52.4	60.1	53.6	61.0	54.5	59.4	52.7	60.5	53.9	61.4	54.7							9.3	11.0	10.4	12.2	11.3	13.0	4a	50.1	41.7
		120		0.2	47.5	40.9	48.7	42.1	49.6	43.1	51.1	43.0	51.6	43.8	52.1	44.5							2.5	4.1	3.0	4.9	3.5	5.6	1	48.6	38.9
				6.2	49.0	42.5	50.3	43.7	51.2	44.6	52.0	44.2	52.6	45.1	53.2	45.8				0.1		0.8	3.1	4.9	3.7	5.8	4.3	6.5	1	48.9	39.3
				12.2	54.2	47.6	55.4	48.9	56.3	49.8	55.5	48.3	56.4	49.4	57.2	50.2	0.5	3.3	1.4	4.4	2.2	5.2	5.8	8.5	6.7	9.6	7.5	10.4	1	49.7	39.8
17		80	-10.8	-11.8	33.9	27.3	35.1	28.5	36.0	29.5	49.0	40.2	49.1	40.3	49.1	40.4							0.1	0.2	0.2	0.3	0.2	0.4	4a	48.9	40.0
				-5.8	35.3	28.8	36.5	30.0	37.4	30.9	50.0	41.1	50.0	41.1	50.0	41.2							0.2	0.3	0.2	0.3	0.2	0.4	4a	49.8	40.8
				0.2	37.3	30.8	38.5	32.0	39.4	32.9	50.3	42.0	50.4	42.1	50.5	42.2							0.2	0.3	0.3	0.4	0.4	0.5	4a	50.1	41.7
				12.2	41.8	35.2	43.0	36.4	43.9	37.4	52.2	43.0	52.3	43.2	52.5	43.4							0.4	0.8	0.5	1.0	0.7	1.2	4a	51.8	42.2
				21.2	45.7	39.1	46.9	40.4	47.8	41.3	53.0	44.4	53.2	44.8	53.5	45.2							0.9	1.5	1.1	1.9	1.4	2.3	4a	52.1	42.9
				36.2	52.9	46.4	54.1	47.6	55.1	48.5	56.0	48.3	56.6	49.1	57.2	49.8							3.0	4.6	3.6	5.4	4.2	6.1	4a	53.0	43.7
		146		-11.8	30.3	23.8	31.6	25.0	32.5	25.9	48.7	39.0	48.7	39.1	48.7	39.1							0.1	0.1	0.1	0.2	0.1	0.2	1	48.6	38.9
				-5.8	31.5	25.0	32.7	26.2	33.6	27.1	49.0	39.5	49.0	39.5	49.0	39.6							0.1	0.2	0.1	0.2	0.1	0.3	1	48.9	39.3
				0.2	32.7	26.1	33.9	27.4	34.8	28.3	49.8	40.0	49.8	40.0	49.8	40.1							0.1	0.2	0.1	0.2	0.1	0.3	1	49.7	39.8
				12.2	35.2	28.6	36.4	29.9	37.3	30.8	50.9	41.2	51.0	41.2	51.0	41.3							0.1	0.3	0.2	0.3	0.2	0.4	1	50.8	40.9
				21.2	37.1	30.6	38.4	31.8	39.3	32.7	51.4	42.2	51.4	42.3	51.5	42.4							0.2	0.3	0.2	0.4	0.3	0.5	1	51.2	41.9

4.4-11

		(m)	(m)	(m)	(dB)						(dB)						(dB)						(dB)								
17		146	-10.8	36.2	40.7	34.2	41.9	35.4	42.8	36.3	52.3	43.8	52.4	44.0	52.5	44.1							0.3	0.5	0.4	0.7	0.5	0.8	1	52.0	43.3
18		162	+15.3	2.2	45.8	39.3	47.0	40.5	48.0	41.4	51.3	42.2	51.7	42.8	52.0	43.4							1.4	3.2	1.8	3.8	2.1	4.4	4a	49.9	39.0
				8.2	47.1	40.6	48.3	41.8	49.2	42.7	52.3	43.3	52.7	44.0	53.0	44.6							1.6	3.2	2.0	3.9	2.3	4.5	4a	50.7	40.1
				14.2	48.5	42.0	49.8	43.2	50.7	44.1	53.4	45.3	53.8	45.9	54.2	46.5							1.7	2.7	2.1	3.3	2.5	3.9	4a	51.7	42.6
		222		2.2	43.1	36.6	44.3	37.8	45.2	38.7	49.8	40.6	50.1	41.1	50.3	41.6							1.1	2.2	1.4	2.7	1.6	3.2	1	48.7	38.4
				8.2	43.8	37.2	45.0	38.5	45.9	39.4	50.1	41.2	50.5	41.7	50.7	42.2							1.1	2.3	1.5	2.8	1.7	3.3	1	49.0	38.9
				14.2	45.2	38.7	46.4	39.9	47.3	40.8	51.5	42.9	51.8	43.4	52.1	43.9							1.2	2.0	1.5	2.5	1.8	3.0	1	50.3	40.9
19		147	+7.6	2.2	43.5	36.9	44.7	38.2	45.6	39.1	52.0	42.4	52.2	42.8	52.3	43.1							0.7	1.5	0.9	1.9	1.0	2.2	1	51.3	40.9
				8.2	45.4	38.9	46.7	40.1	47.6	41.0	52.8	43.8	53.0	44.2	53.3	44.6							0.9	1.7	1.1	2.1	1.4	2.5	1	51.9	42.1
				14.2	49.8	43.3	51.0	44.5	51.9	45.4	54.9	46.5	55.3	47.1	55.7	47.6		1.5	0.3	2.1	0.7	2.6	1.6	2.8	2.0	3.4	2.4	3.9	1	53.3	43.7
		72		-0.8	47.1	40.6	48.3	41.8	49.3	42.7	52.7	43.8	53.1	44.4	53.4	44.9							1.4	2.9	1.8	3.5	2.1	4.0	1	51.3	40.9

4.4-12

		(m)	(m)	- (m)	(m)				
1		74	1.5	-11	23.2		0.9	1	720
					38.2		0.2	1	
					53.2		0.1	1	
2		75	6.5	-2	8.2		0.1	1	578
					14.2		0.7	1	
					32.2		0.6	1	
3		63	-0.8	+4	11.2		0.3	1	1500
					17.2		0.7	1	
					38.2		0.3	1	
4		91	7.9	-10	18.2		1.0	2	384
					33.2	0.3	3.3	2	
					39.2	0.4	3.3	2	
5		99	8.4	-6	22.2		2.7	2	192
					37.2		2.5	2	
					43.2		2.6	2	
6		130	8.9	-9	34.2		1.2	2	108
					40.2		1.3	2	
7		72	10	0	1.2	0.5	2.9	1	60
8		72	12	0	1.2	0.4	2.9	1	42
9		71	6	0	4.2	2.2	4.9	1	92
10		100	6.5	-4	6.2	0.3	1.1	1	4 4
11		120	6.7	-4	6.2		0.1	1	216
					12.2	1.4	4.4	1	
12		147	7.6	-2	14.2	0.3	2.1	1	36

16 5 8 9

0.1~1.4dB 0.2~2.2dB 0.1~2.9dB

11 0.1~3.9dB 0.1~4.9dB 0.5~5.7dB

3

0.3dB 0.6dB

0.6dB 1.1dB 1.6dB

a.

b.

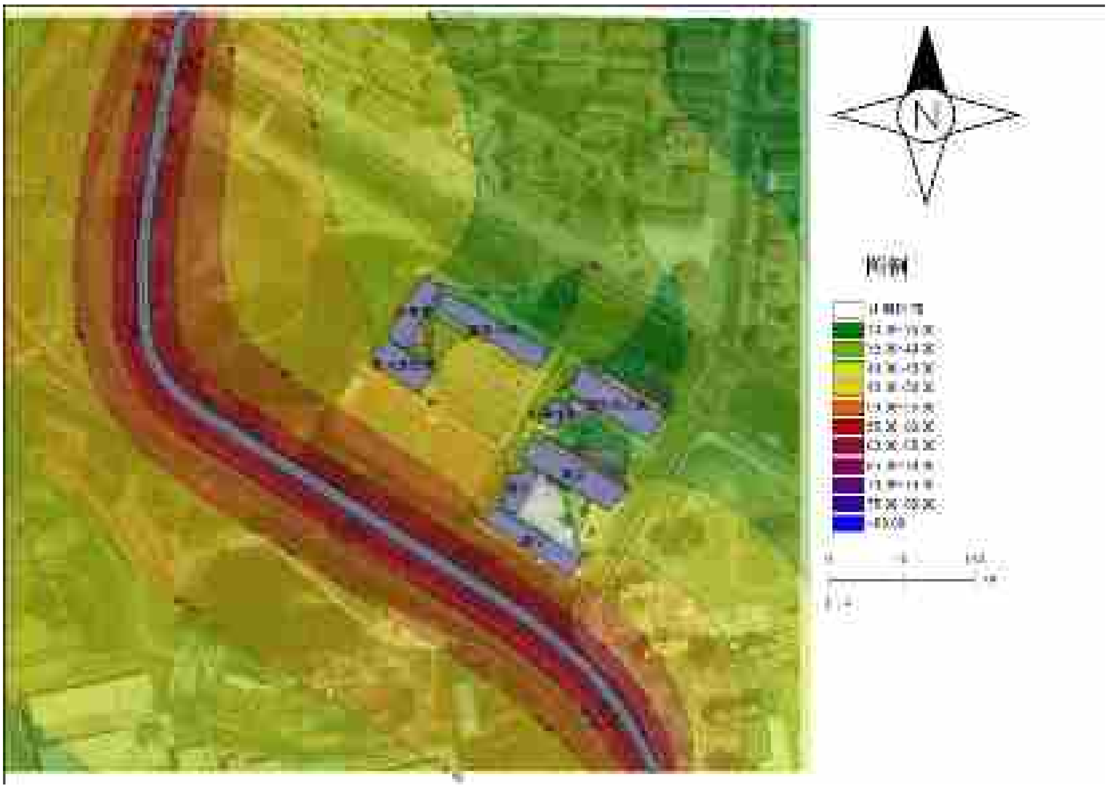
3

FLK0+430~FLK0+700

1.5m 1.2m

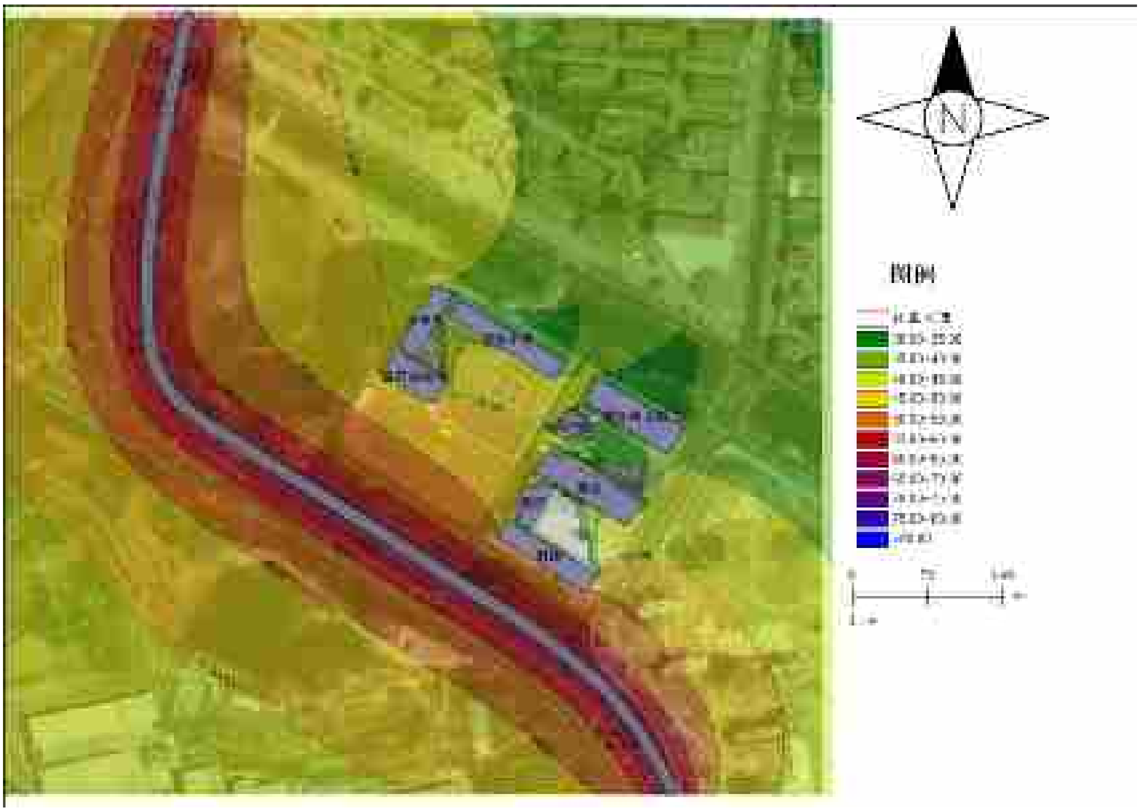
4.4-7~4.4-12

4.4-13~4.4-18

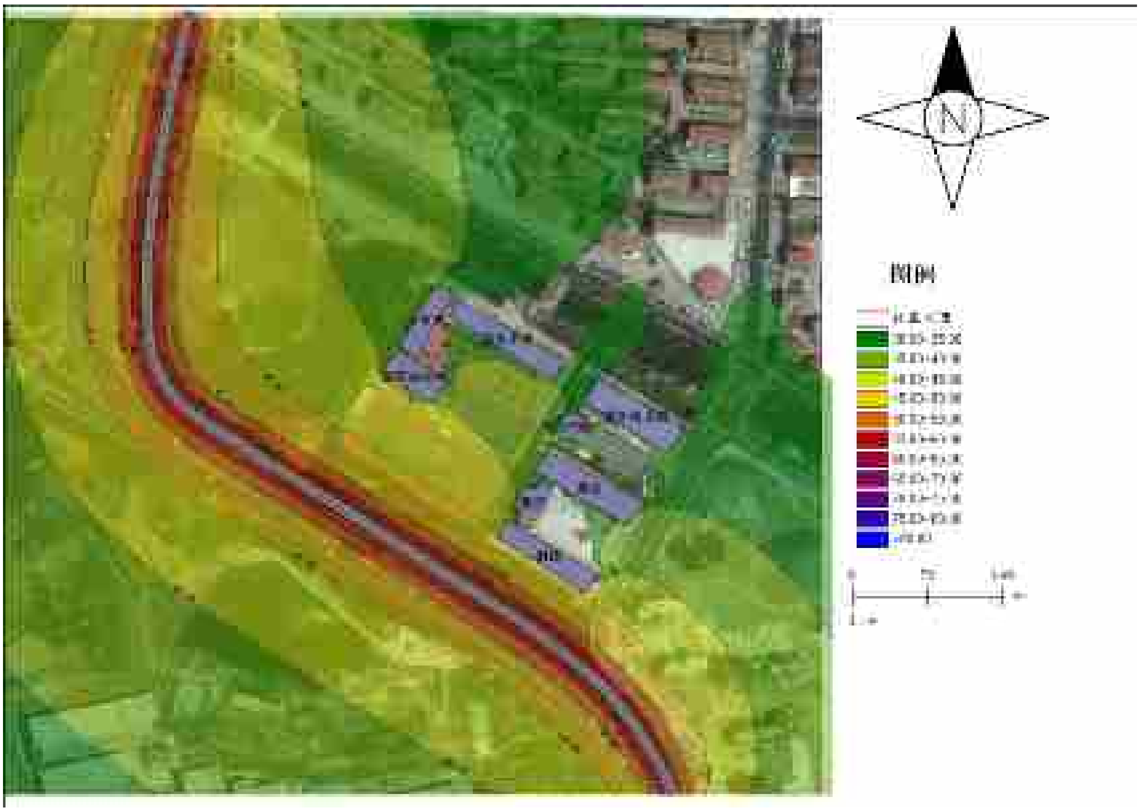


4.4-7 FLK0+430~FLK0+700

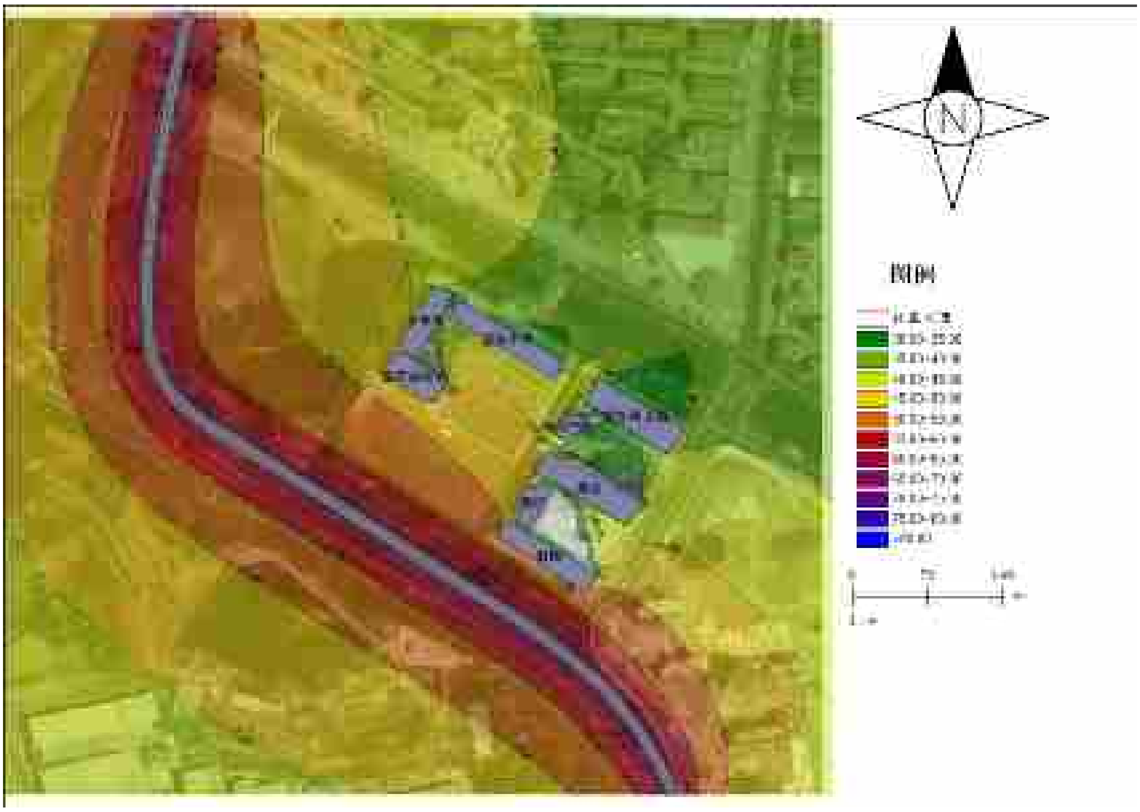
4.4-8 FLK0+430~FLK0+700



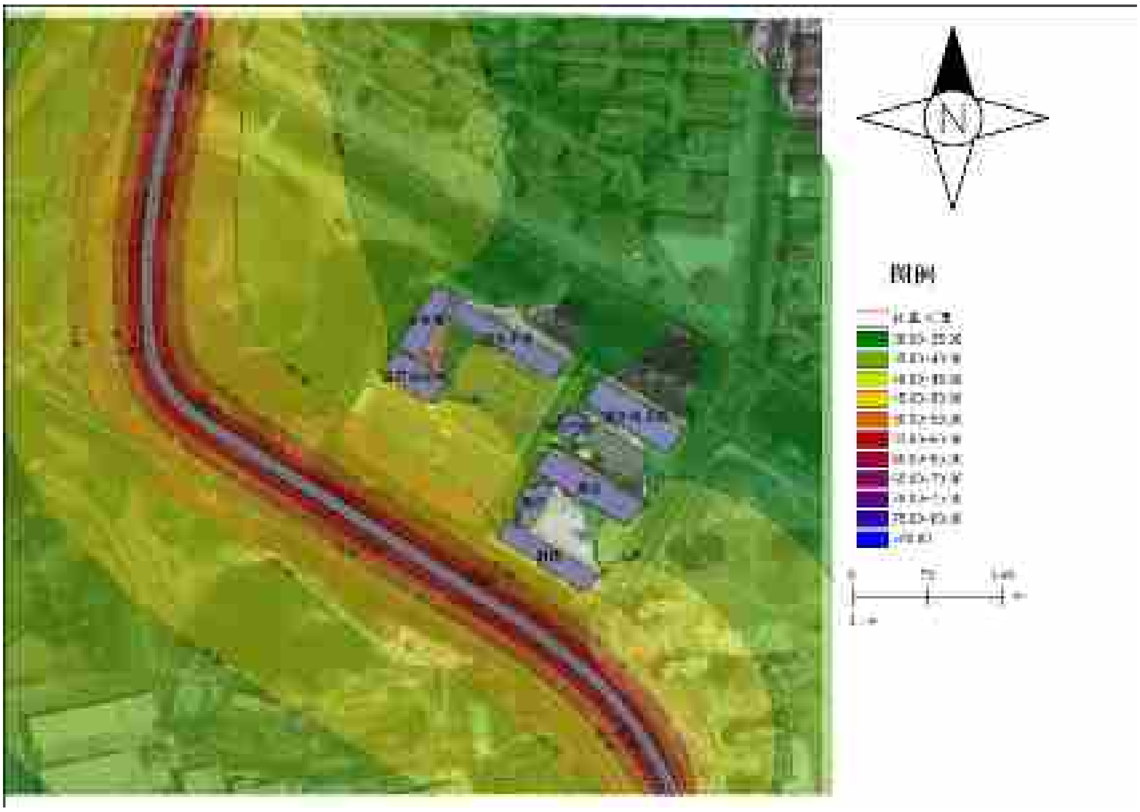
4.4-9 FLK0+430~FLK0+700



4.4-10 FLK0+430~FLK0+700



4.4-11 FLK0+430~FLK0+700

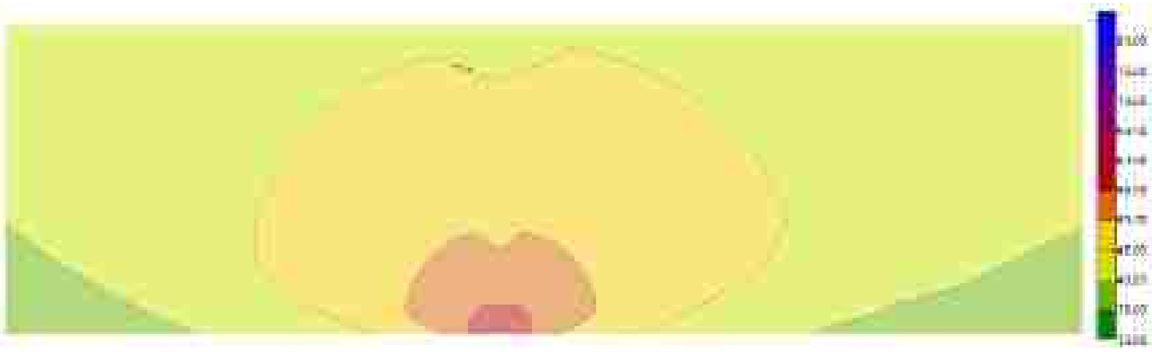


4.4-12 FLK0+430~FLK0+700

4.4-13 FLK0+430~FLK0+700

4.4-14 FLK0+430~FLK0+700

4.4-15 FLK0+430~FLK0+700



4.4-16 FLK0+430~FLK0+700

4.4-17 FLK0+430~FLK0+700

4.4-18 FLK0+430~FLK0+700

FLK0+430~FLK0+700 4a

6.0m 7.8m 10.2m

23.2m 25.0m 27.4m 1

45.5m 51.1m 59.8m 73.0m 81.9m

95.8m.

FLK0+430~FLK0+700

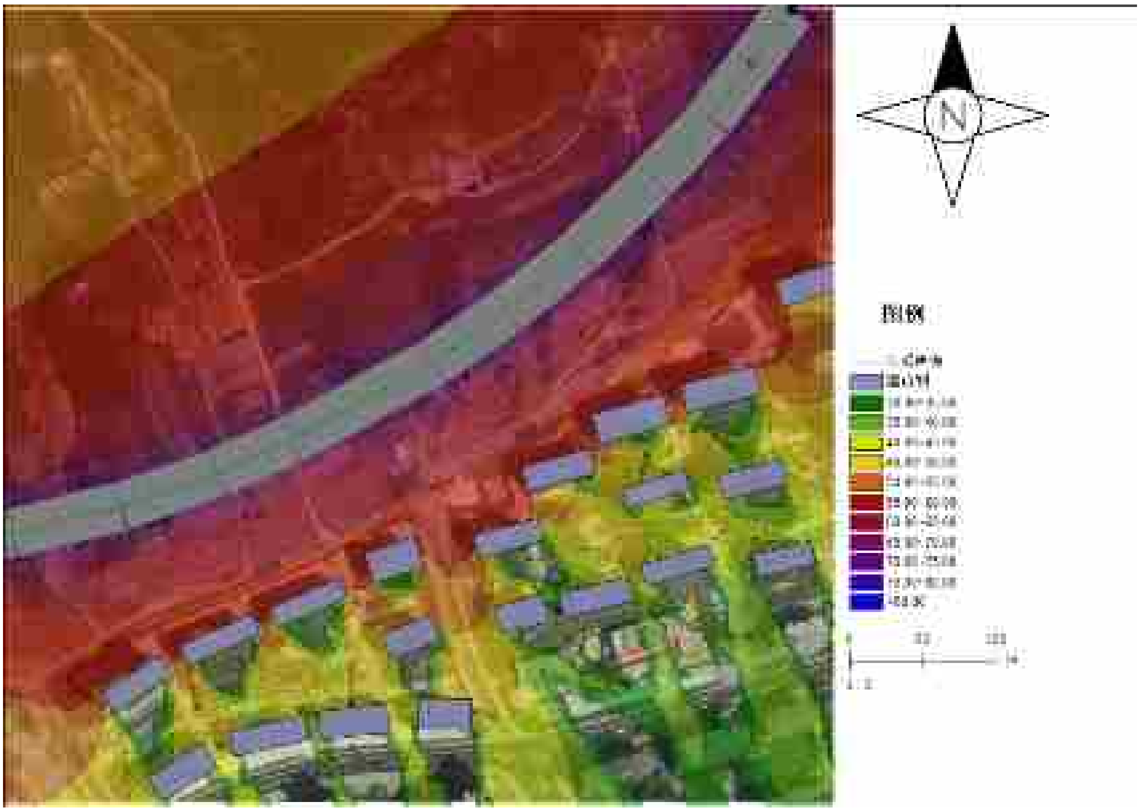
96m

K6+600~K7+600

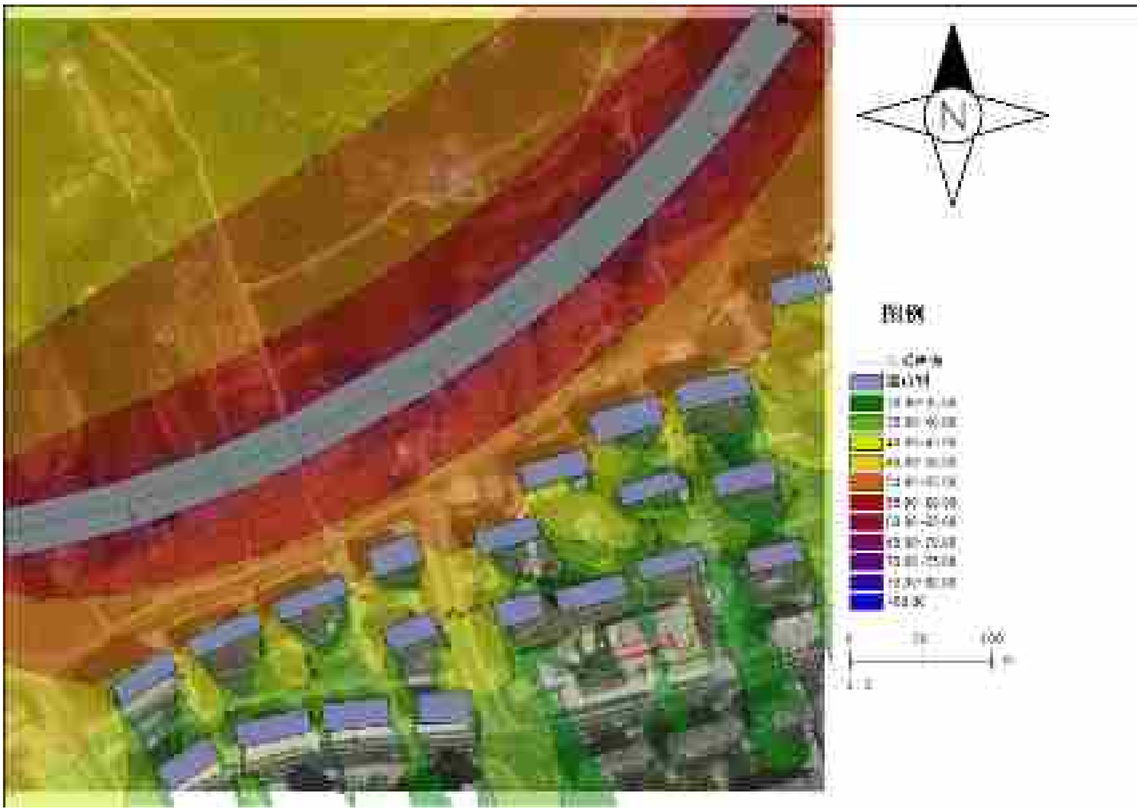
5.0m 1.2m

4.4-19~4.4-24

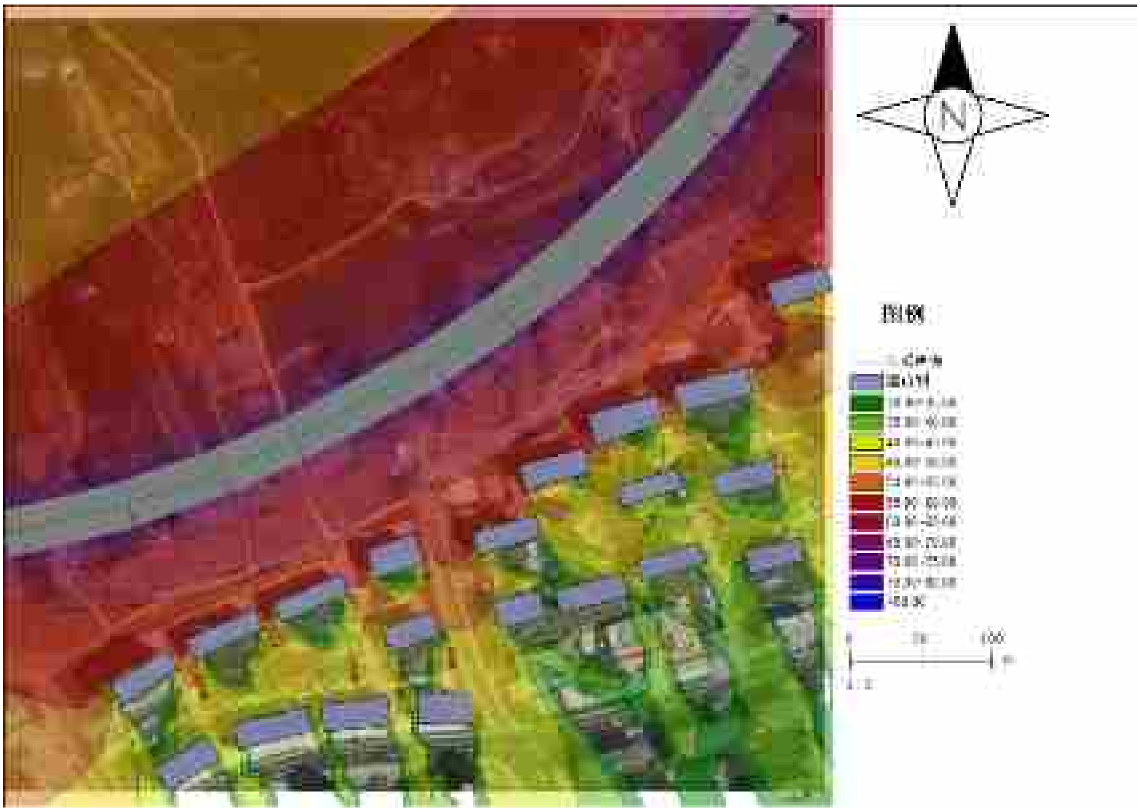
4.4-25~4.4-30



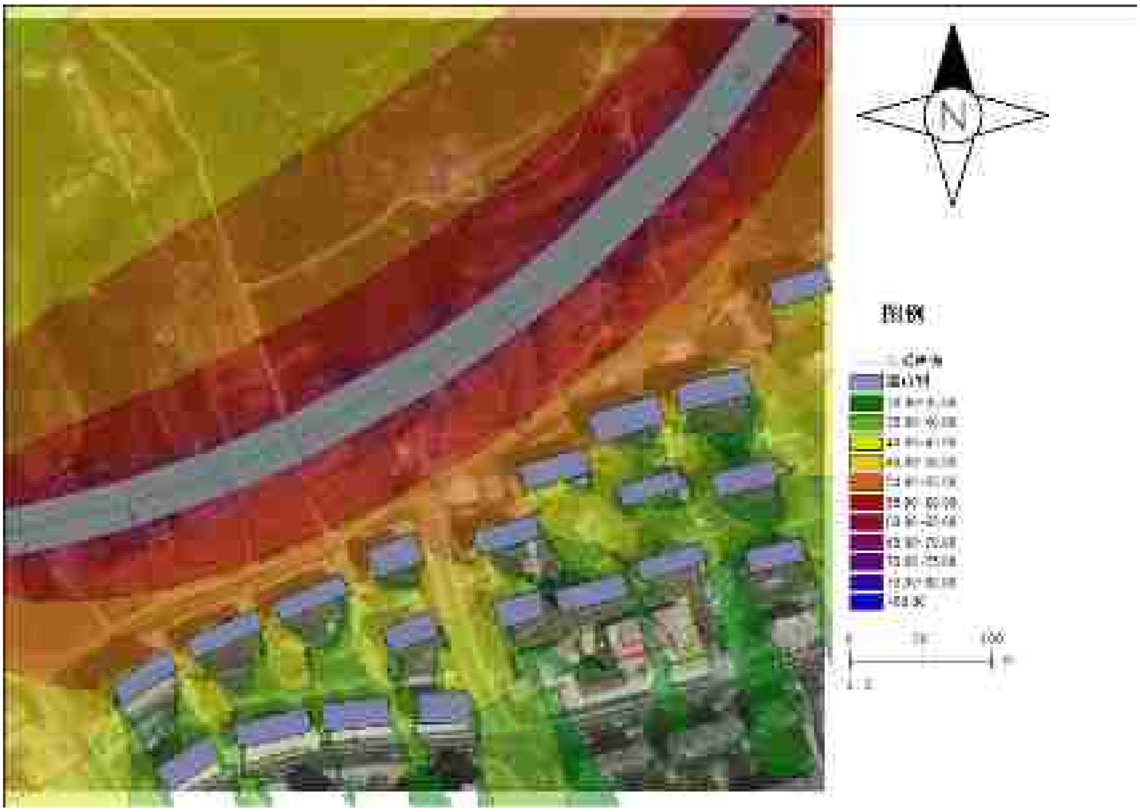
4.4-19　K6+600~K7+600



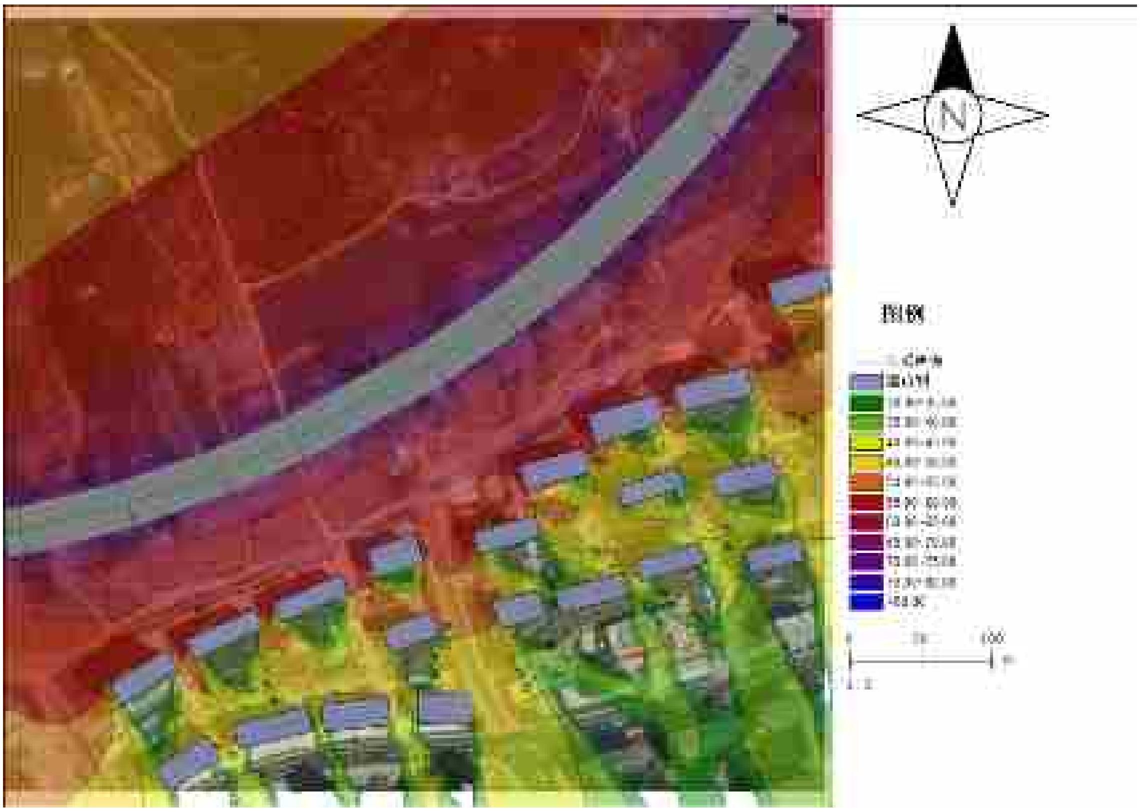
4.4-20　K6+600~K7+600



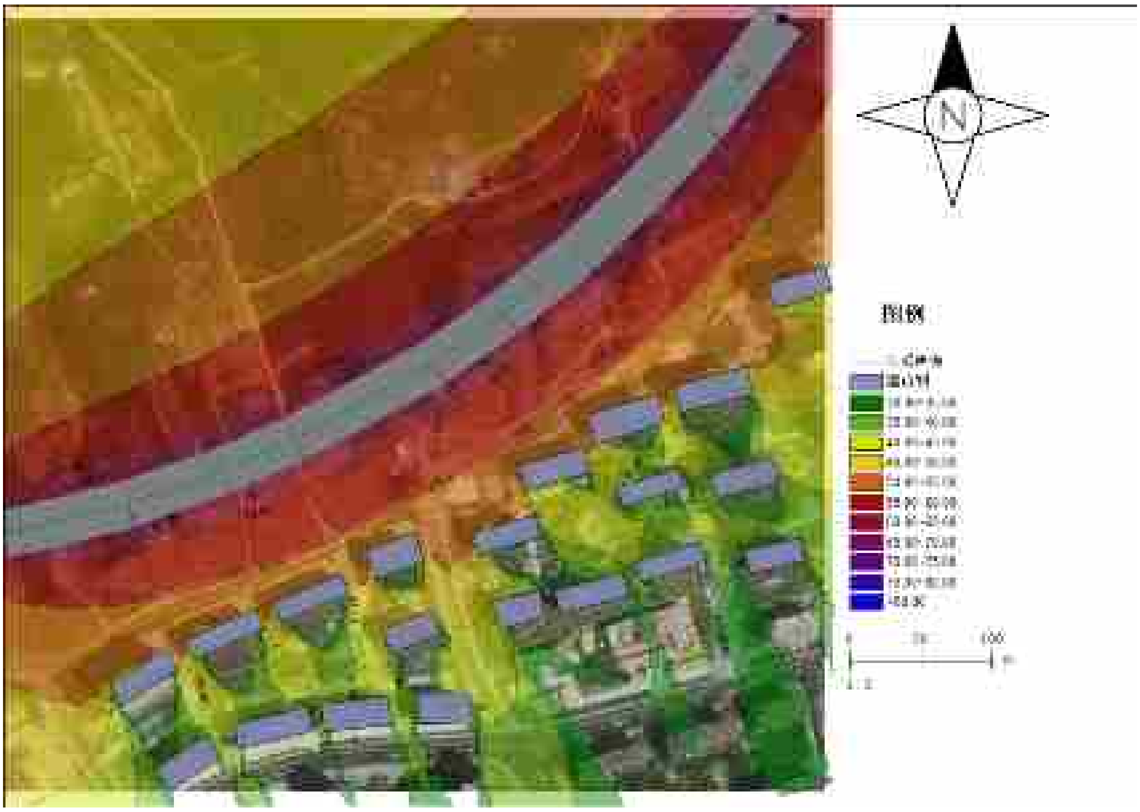
4.4-21 K6+600~K7+600



4.4-22 K6+600~K7+600

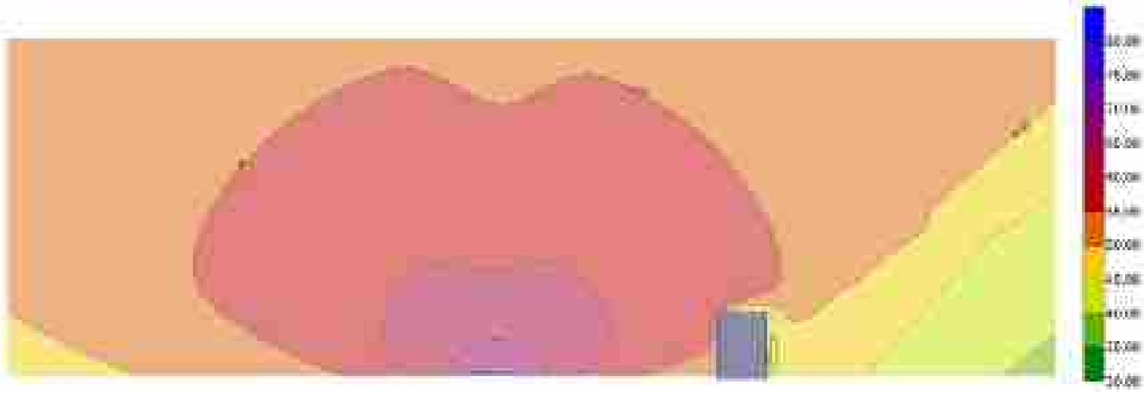


4.4-23　K6+600~K7+600



4.4-24　K6+600~K7+600

4.4-25　K6+600~K7+600



4.4-26　K6+600~K7+600

4.4-27　K6+600~K7+600

4.4-28　K6+600~K7+600

4.4-29 K6+600~K7+600

4.4-30 K6+600~K7+600

K6+600~K7+600 4a

18.5m 19.1m 33m

44.8m 46.6m 51.4m 2

57.4m 59.6m 66.9m 92.6m 95.0m

102.1m

K6+600~K7+600

103m

4.5

4.5.1

TSP

TSP

1. TSP

TSP

1

50m

150m

28

50m 150m

16

150m

2

50m TSP 8.849mg/m^3 100m 1.703mg/m^3 150m 0.483mg/m^3 200m

NNW SSE 200m

2 200

7.2.5

3

50m

4

4.5-1

4.5-1

	(m)	**(mg/m³)**	
	50	11.652	
	100	9.694	
	150	5.039	

150m 150m TSP

4 10~20μg

5μg 8% 5~10μg 24% 30μg 68%

70%

5

6

4.5-2

4.5-2

		TSP (mg/Nm^3)	
		0.11 1.94	
		0.10 1.62	
		0.36 1.06	
		0.34 2.83	
		0.26 2.97	
		0.26 0.97	

4.5-2 TSP 0.10 2.97mg/Nm^3 TSP 0.26 0.97mg/Nm^3

2. [a]

[a] 100m 1.16~1.29 mg/m^3 100m GB16297-96 200m

50m [a] 0.00001mg/m^3

0.008μg/m^3

4.5.2

1.

CO NO_2

CO NO_2 20m

GB3095-2012

20m CO

NO2

2.

1887.75m/3 200m

1

~

~

4.5-3

4.5-3

		(mg/m^3)	( )	(mg/m^3)	( )
35m	NO_2	0.062~0.133	0	0.052~0.078	0
135m	NO_2	0.022~0.085	0	0.032~0.033	0
35m	CO	1.90~4.72	0	3.15~3.21	0
135m	CO	1.75~2.39	0	1.74~1.85	0

4.5-3 35m

3.

1

6.5mg/m^3

1.2mg/m^3 90%

(DB 37/597-2006)

4.6

4.6.1

1.

2.12.2

0.1t

2.

pH

4.6.2

1 2.3.2

0.059t/d

5

5.1

S302

5.1.1

1.

5

2004 2022 2

2022 5

2020-2035

6902hm^2

2.

1

1395 hm^2 20.21%

2

1900 hm^2 27.75%

3

3592 hm^2 52.04%

4

5433hm^2

3.

418.2m

100

4.

5.1.2

K8+000~K10+000 K17+100~K18+100 K23+300~K24+200

4.0km K5+000~K8+000

K10+000~K17+100 K18+100~K23+300 17.3km

5.1-1 32

42.793hm^2

26.2642 hm^2 (2020-2035) 2022

1

(2020-2035)

(2020-2035

)

5.1-1

			km	
1	K8+000~K10+000		2.752	
3	K17+100~K18+100	K8+835~K9+260	0.425	
4	K23+300~K24+200	K17+100~K17+923	0.823	
			2.752	-
			1.248	-

5.1.3

5.1.3.1

1km

1km 42.793hm^2 8.19km

1922.9642hm^2

5.1.3.2

1.

1

-

400m

417.8m

417.5m

375m

2

5.5km

3

93%

10cm-20cm 5-10m

85%

400hm^2 16%

2.

100

3.

78

5.1.3.3

1.

3

5.1-

1

70 248

12 92

70 457 315

112 30

5.1-1

2.

20

5.1-2

5.1-2

5.1.3.4

1.

250 70%

3

12

2.

5.1.3.5

1.

3 5m

10 70m

2.

9.6km

3000hm^2 605 m^3

850hm^2 5.3km

5.1.3.6

12

1922.9642hm^2 103.1450 hm^2

5.36% 228.0745 hm^2 11.86%

1414.0152 hm^2 73.53% 18.4520 hm^2

0.96% 0.6580 hm^2 0.03%

19.9439 hm^2 1.04% 5.5360 hm^2

0.29% 0.3155 hm^2 0.02%

7.2398 hm^2 0.38% 77.1359 hm^2

4.01% 33.3862 hm^2

1.74% 15.0622 hm^2 0.78%

5.1-2

5.1-2

	hm^2	
	103.1450	5.36%
	228.0745	11.86%
	1414.0152	73.53%
	18.4520	0.96%
	0.6580	0.03%
	19.9439	1.04%
	5.5360	0.29%
	0.3155	0.02%
	7.2398	0.38%
	77.1359	4.01%
	33.3862	1.74%
	15.0622	0.78%
	1922.9642	100.00%

5.1-3

5.1-4

5.1.3.7

<

> 2013 188

2016 1

800t/ $km^2 \cdot a$ 1200t $/km^2 \cdot a$

2012 512

200t/($km^2 \cdot a$)

5.1.4

5.1.4.1

5

8

5.1-5

5.1-5

1.

10km

15-25 2500t/km² · a
2

2.
600-900m

(8-15) 3

1 150m

2

5.1.4.2
“ ”

-
1. -
1
AK S201
S202
7.828km S201 4.053km
3.775 km
A1 S201
S202
A1 20.374 km A1 4.022 km
A1 AK 5.1-6

5.1-6a A1 AK

5.1-6b AK S302

5.1-6c A1 S302

2

S302

AK S302 S201

S202 S302

A1 S302

A1 S302

2021-2035

“ ” 325km

“ ”

AK

S202

A1

AK

AK S202 490m

A1
5A 1810m

A1 1.8km
800

AK S302
A1
S302
AK A1

AK
22.519hm^2 17.2792 hm^2
466m A1 18.2088
hm^2 12.969 hm^2 476m

5.1-3

	km	
AK	7.828	1
		2 S302
		3
		4
		5 17.2792
A1	4.022	1 S302
		2
		3 1810m
		4
		5 12.969 hm^2

1.8km

5A

2.

1

3.15km 1 660m

494m

2.3km 1 320m

325m

5.1-7

2

1 660m

1 320m

494m

325m

0.5977 hm^2

494m

0.3607 hm^2

325m

S201 “ ” 2021-2035

0.85km
4

5.1-4

	km	
	3.15	1. 2. 3. 0.5977 hm^2 494m 4.
	2.3	1. 2. 3. 0.3607 hm^2 325m 4.

1km

11.43km 6.8km S302

S202

5.1.5

5.1.5.1

78

0.4-1

5.1-8

5.1.5.2

( ) (

)

1.

1

CO_2 NO_x

2

SS

SS

pH

3

4

5

2.

5.1.5.3

1.

80%

2.

3.

4.

15~60m

5.1.5.4

1.

2.

3.

5.1.5.5

1.

2.

3.

5.1.5.6

- (HJ19-2022) (HJ192-2015)

1.

153.34 hm^2 50.86 hm^2

2.

3.

25

4.

A

50dB

ISO14001

5.

5.1.6

5.1.6.1

1.

2.

3.

5.1.6.2

1.

1

;

2

2.

1

2

3

“ ”

3.

1

2

3

4

5

5.

5.1.6.3

1.

1

TSP

2

3

2.

3.

4.

1

“ ”

2

3

4

5

5.

6.

1

2

3

4

7.

“

”

5.1.6.4

1.

1

2

2.

1

2

3

4

5

6

7

8

5.1.6.5

1.

2.

5.1.6.6

1.

1

T/CECSG F64-04—2021

2

3

4

“

”

5 “ ”

(

)

6

7

8

9

JTG/T3660-

2020

2.

1

2
“

3

4

5
6

7

8 (
)

5.1.6.7

1.
10 4
2.

5.1.7

K8+000~K10+000 K17+100~K18+100 K23+300~K24+200 4.0km K10+000~K17+100 K18+100~K23+300

5.2

S302

5.2.1

1.

1959

477.3 hm^2 1993 (1993)89

2000 (2000)610

2477.3 hm^2

477.3 hm^2

10.5km

4.5km 5km

2.

2477.3 hm^2 477.3 hm^2

121°57′48″~122°07′48″ 37°26′21″~37°29′27″

121°57′48″~122°00′08″

37°28′08″~37°29′27″ 477.3 hm^2

122°01′07″~122°07′48″

37°26′21″~37°29′04″ 2000 hm^2

265m

3.

“ ”

“ ”

2014

“ ”

4.

91.09 hm^2 30~50

790.34 hm^2

187.39hm2

96.98hm2

16.34 hm^2

60.6 hm^2

201 hm^2

102.65 hm^2

1

2

1

2

750m

3

8 2

12.67 hm^2

8.5 hm^2

10.5 hm^2

48.2 hm^2

1

115.6 hm^2

2.2 hm^2

5.07 hm^2

2.5 hm^2

150m 1200 m^2

300 m^2 800 m^2

1000 m²

70.05 hm²

90.66 hm²

1

284.3 hm²

2

3

331m

403.49

hm²

4

265m

5.2-1

	hm²	**%**
	205.46	8.29%
	664.96	26.84%
	881.43	35.58%
	725.45	29.28%
	2477.3	100.00%

(5)

5.2.2

0.8253hm^2 0.8212 hm^2 0.0041 hm^2 704m 176m

0.024%

5.2-2 32

5.2-2

	hm^2			
	205.46	-	-	-
	664.96	0.6051	0.024%	
	881.43	-	-	-
	725.45	-	-	
	2477.3	0.6051	0.024%	-

5.2.3

5.2.3.1

1km

399.31hm^2

5.2.3.2

(GB/T18005-1999)

5

(1)

250m

375m

“ ”

417.5m

417.8m

404.1m

1506~1521

336m

176.1m

“ ”

“ ”

“

” “ ”

“ ”

140m

2.4m 1.2m 2.0m

2.1m 1.8m 2.5m

(2)

5.5km

30 km^2 9.6km

30m 605 m^3

5.76km

8 km^2

5.3km

1.15km

15.7 hm^2

2.2 hm^2 13.5 hm^2 375m 12m

4.8 hm^2

2.9 hm^2

200m 15m

1.1 hm^2 120m

13m

5 3600~30000 m^2

8 m^2

120m

12 m^3

(3)

1290.1 hm^2

485.54 hm^2

85%

372.20 hm^2

775 hm^2 3~50 15~20cm
7~10m 5~8m “
” 2014
685.7 hm^2

495 hm^2 15cm~25cm 8~15m

150 hm^2

8~12m 15~30cm 3m
2014
85.2 hm^2
30-50 10~30cm 5~10m 2014

137 hm^2
10 hm2 110 hm^2 4 hm^2 13 hm^2

64m 10m 2.2m
61cm 10 × 9m 500
36 76m 20m
3m 57.5cm 8 × 8m 160
36m 15m 2.5m
62 cm 14 × 14m 100
39m 8m 2m 24
cm 2 × 2m 100
6 120m
20m 10m 61 cm 4 × 5m
200
162m
15m 3m 67 cm 12 × 12m 150

142m 89
15m 1.2m 57.5 cm 11 × 9m
200

250 70%
4
12

(4)

375m

“ ” 1664

“ ” “ ” “ ” “ ” “ ” “ ” “ ”

1994

1.6m 16

500

“ ”

"

20 "

"

2008 9 50

36m — — —

—

1992

100

……

1007

11 22 11 30

“ ” “ ”

4 19. 20 21

(5)

4 6

“ ”

“ ”

“ ”

5.2.3.3

(1)

3

(2)

20 3

5.2.3.4

647

100

250 70%

4

12

5.2.3.5

(1)

3 5m

10 70m

(2)

9.6km 3000hm^2

605 m^3

5.2.3.6

2477.3 hm^2

2211.2 hm^2

326 hm^2 85.84 hm^2 82.36 hm^2

97.9 hm^2 5.2-2

2211.2 hm^2 2145.2 hm^2

2120.2 hm^2 25 hm^2

5.2-3

	2211.2	82.36	85.84	97.9	2477.3
	89.26%	3.32%	3.47%	3.95%	100.00%

5.2.3.7

5.1.3.7

5.2.4

1.

5.2-1

5.2-1

0.6051 hm^2

2.

5.1.4.2

3.

5.2.5

5.2.5.1

( )

(1)

CO_2 NO_x

a.

SS

b.

SS

pH

c.

0.6051 hm^2

0.6051 hm^2

0.024%

(2)

5.2.5.2

(1)

80%

(2)

(3)

(4)

15~60m

5.2.5.3

(1)

(2)

(3)

5.2.5.4

(1)

(2)

(3)

5.2.5.5

- (HJ19-2022) (HJ192-2015)

(1)

153.34 hm^2 50.86 hm^2

(2)

(3)

25

(4)

A

50dB

ISO14001

5.2.6

5.2.6.1

(1)

(2)

(3)

5.2.6.2

(1)

;

(2)

“ ”

(3)

(4)

5.2.6.3

(1)

TSP

4.

(2)

(3)

(4)

“ ”

(5)

(6)

(7)

“

”

5.2.6.4

(1)

(2)

5.2.6.5

(1)

(2)

5.2.6.6

(1)

“

”

“ ”

(

)

JTG/T3660-2020

(2)

“

(

)

5.2.6.7

(1)

10 4

(2)

5.2.7

K23+300~K24+200 0.90km

0.6051

hm2 205.84m

0.024%

5.3

5.3.1

2019 11

“ ”

2022 2207

2022 10

5.3.2

“ ”

371002120190 371002120228 371002120218 371002120245 371002120216

814.53m

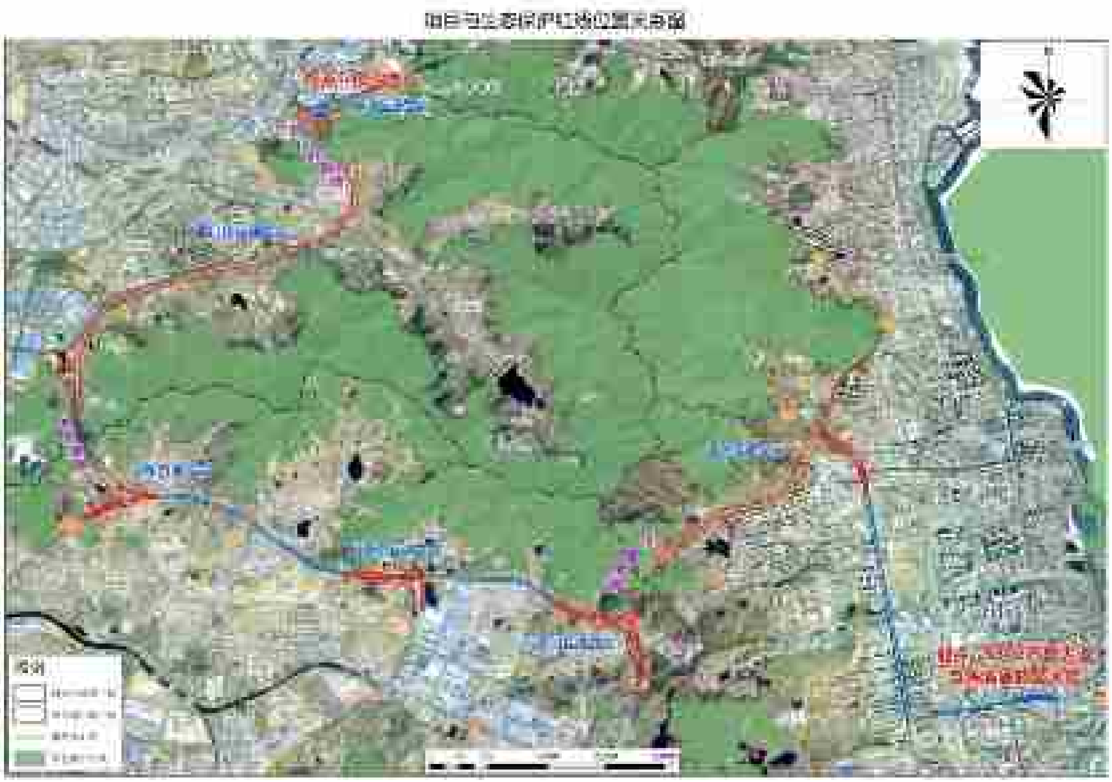
235.93 m 61.85 m

516.75m

5.3-1 5.3-1~5.3-4

5.3-1

					m
	371002120190				235.93
	371002120228				61.85
	371002120218				48.69
	371002120245				205.84
	371002120216				262.22
					814.53



5.3-1

5.3-2

5.3-3

5.3-4

5.3.3

1

1 43.3983 hm^2

1 42.7932 hm^2

5.3-2 5.3-5 5.3-6

5.3-2

		hm^2	hm^2
		42.793	26.2642
		0.6051	0.6051
		43.398	26.8693
		42.793	26.2462

5.3-5

5.3-6

5.3.4

5.3.4.1

[2022]142

2023 1

“ ”
“

”
“ ”
2021-2035

2024 7
“ S302 ” S302

< S302
>

“
”

S302

2023 1

5.3.4.2

2020-2035 “

”   “

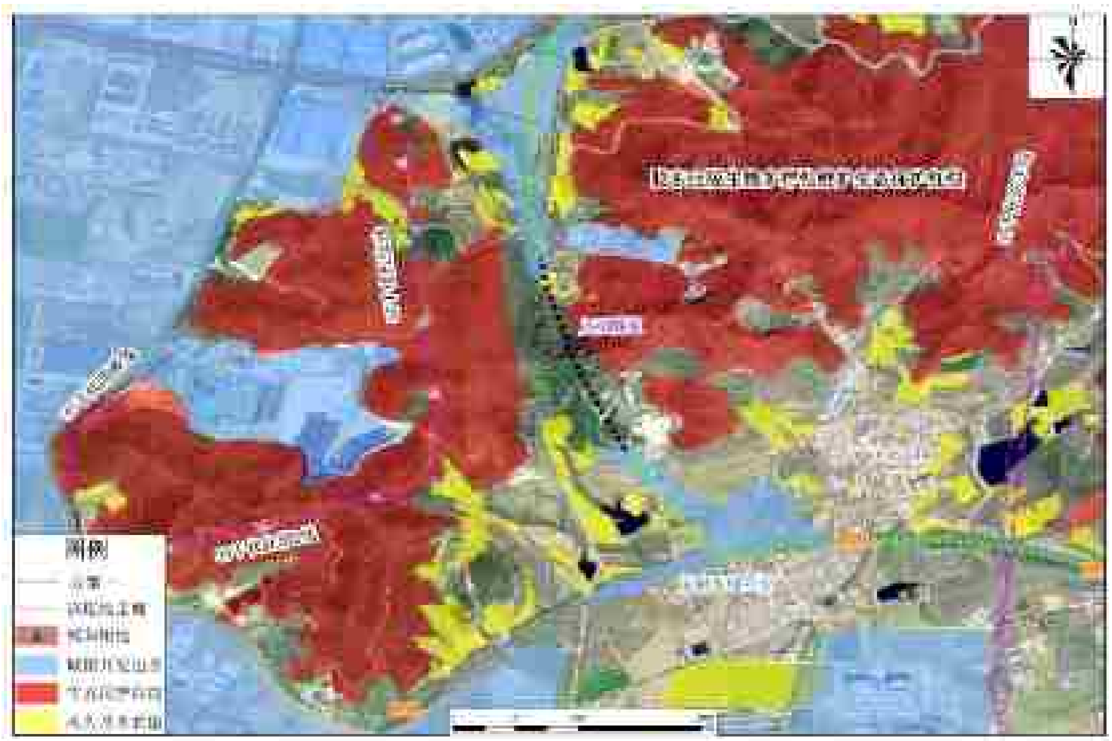
”

1.

“ ”

0.95km

60m 17m $200m^2$

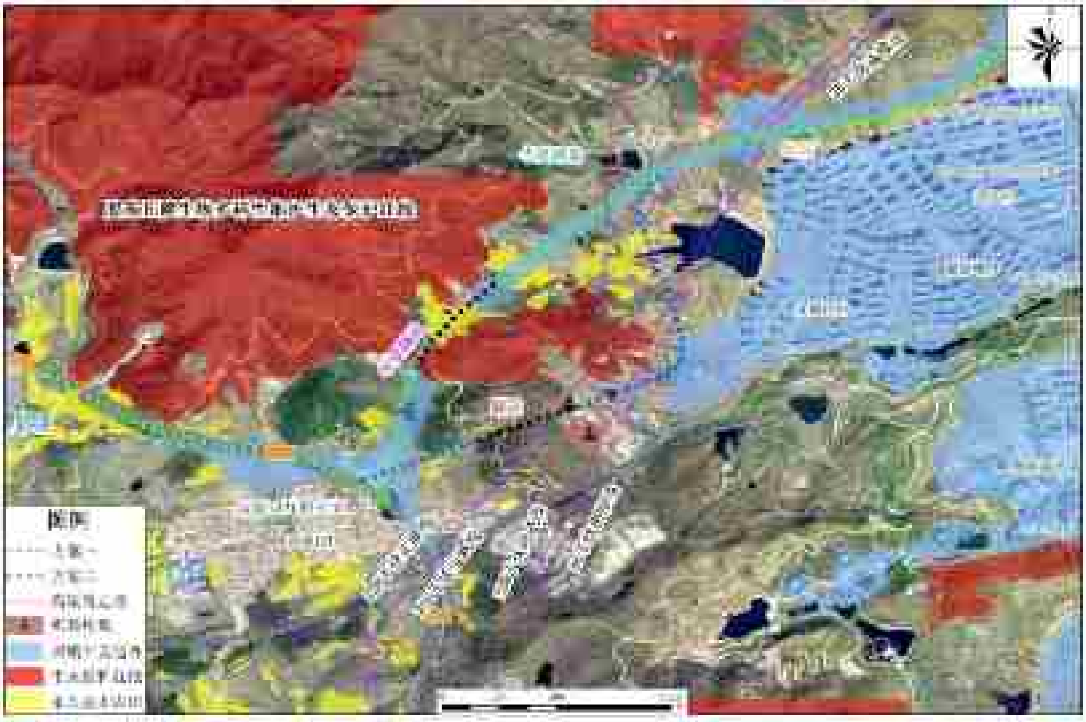


5.3-7

2.

1.5km 1 450m 230m 80m 1.41hm^2

2.2km 1 200m 0.91hm^2



5.3-8

5.3-3

	(km)	
	1.5	1. 2. 3. 450m 230m 4.
	2.2	1. 2. 3 3. 3. 200m 0.91hm^2 4.

3

1

200m 0.91hm^2

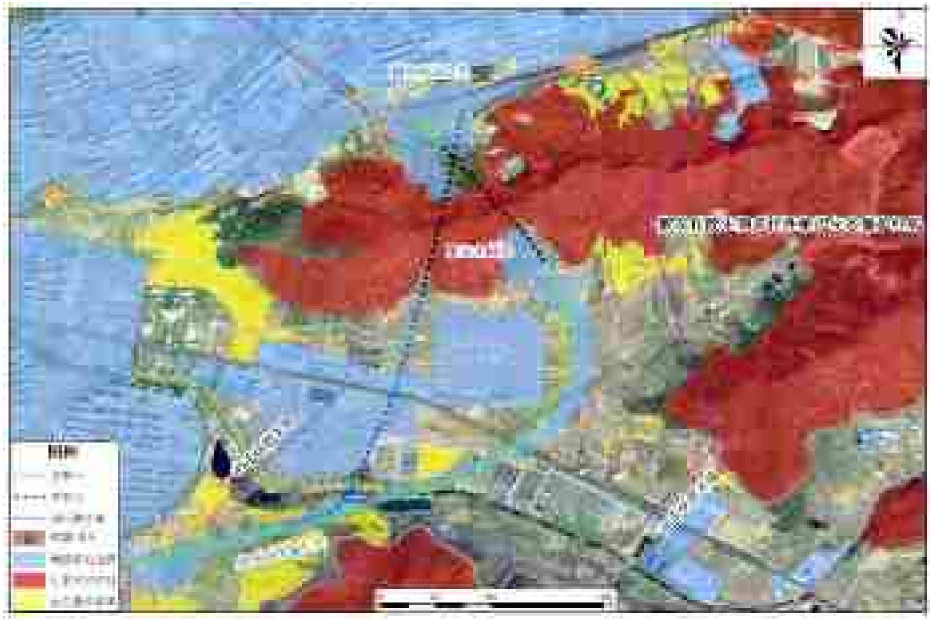
3.

3.15km 1

650m 250m 160m 4.12hm^2

2.5km 1 670m

330m 160m 5.67hm^2



5.3-9

5.3-4

	(km)	
	3.15	1. 2. 3. 650 250 4.
	2.5	1. 2. 3. 670 330 4.

1 670m

5.3.5

5.3.5.1

( )

1.

2.

1

SS

2

SS

pH

3.

4.

5.

6.

80%

7.

8.

A

50dB

ISO14001

9.

1

2

3

5.3.5.2

1.

CO_2 NO_x

2.

3.

3.

5.3.6

5.3.6.1

1.

1

;

2

2.

“ ”

3.

1

2

3

4

5

4.

5.3.6.2

1.

1

TSP

2

3

4

2.

3.

1

2

4.

1

“ ”

2

3

4

5

5.

6.

1

2

3

4

7.

“

”

5.3.7

371002120190 371002120228 371002120218 371002120245 371002120216 814.53m 235.93m 61.85m 516.75m

6

6.1

6.1-1 2

K22+377

6.1-1

1		K11+150~K11+200	
2		BK0+560~BK0+580 BK0+820~BK0+845	BK0+560~BK0+580 BK0+820~BK0+845
3		K22+100~K22+300	38m
4		K22+377	

6.2

6.2.1

1.

1

$$P = \prod_{i=1}^{6} Q_i = Q_1 \times Q_2 \times Q_3 \times Q_4 \times Q_5 \times Q_6$$

P—— /

Q1—— / •km

Q2—— /

Q3—— %

Q4—— %

Q5—— %

Q6—— km

2

Q1—— S202 S301 0.3 / ·km.

Q2——

Q3——　75%

Q4——　20.6%

Q5——

3.81%

Q6——

3

6.2-

1

6.2-1

				P		**/**
			(m)	2028	2034	2042
1		K11+150~K11+200	180	0.00080	0.00103	0.00125
2		BK0+560~BK0+580 BK0+820~BK0+845	80	0.00067	0.00074	0.00090
3		K22+100~K22+300	200	0.00301	0.00332	0.00405
4		K22+377	1030	0.01470	0.01620	0.01979

6.2.2

6.2-1

0.01470 / 0.01620 /

0.01979 /

6.3

K22+100~K22+300

324m 0.00301 /
0.00332 / 0.00405 /

0.5~2m 6.0×10^{5} cm/s
90 150m
15d

6.4

6.4.1

6.4.2

1.

K11+150~K11+200

BK0+560~BK0+580/BK0+820~BK0+845

K22+100~K22+300 K22+377

JTG D81-2017 SA

2.

2 1

3.

[2007]184

K11+150~K11+200

BK0+560~BK0+580/BK0+820~BK0+845

K22+100~K22+300 K22+377

a.

PVC

20min 50m^3

$$Q=A\times H\times \varphi\times 10^{-3}$$

Q—— (m^3)

A—— (m²)

H—— 20min

(mm)

φ—— 0.9

c.

20min 45mm

2191.39m³

2191.39m³ PVC 2580m

BK0+820~BK0+845

6.4-1~6.4-2

6.4-1

		m	**m²**	**m³**		
K11+150~K11+200		180	5940	240.57	240.57m³ PVC 360m	
BK0+560~BK0+580 BK0+820~BK0+845		80	2640	106.92	106.92m³ PVC 160m;	

6.4-1

		m	m^2	m^3		
K22+100~K22+300		200	6600	267.30		
K22+377		1030	33990	1376.6	1376.6m^3 PVC 2060m	

1. 2.

6.4-2

		m	m^3	m^3
K11+150~K11+200		180	240.57	290.57
BK0+560~BK0+580 BK0+820~BK0+845		80	106.92	156.92
K22+100~K22+300		200	267.30	317.30
K22+377		1030	1376.6	1426.60

(4)

6.4-3

6.4-3

1	
2	
3	
4	
5	
6	
7	
8	
9	10t/h

6.4.3

1.

2.

3.

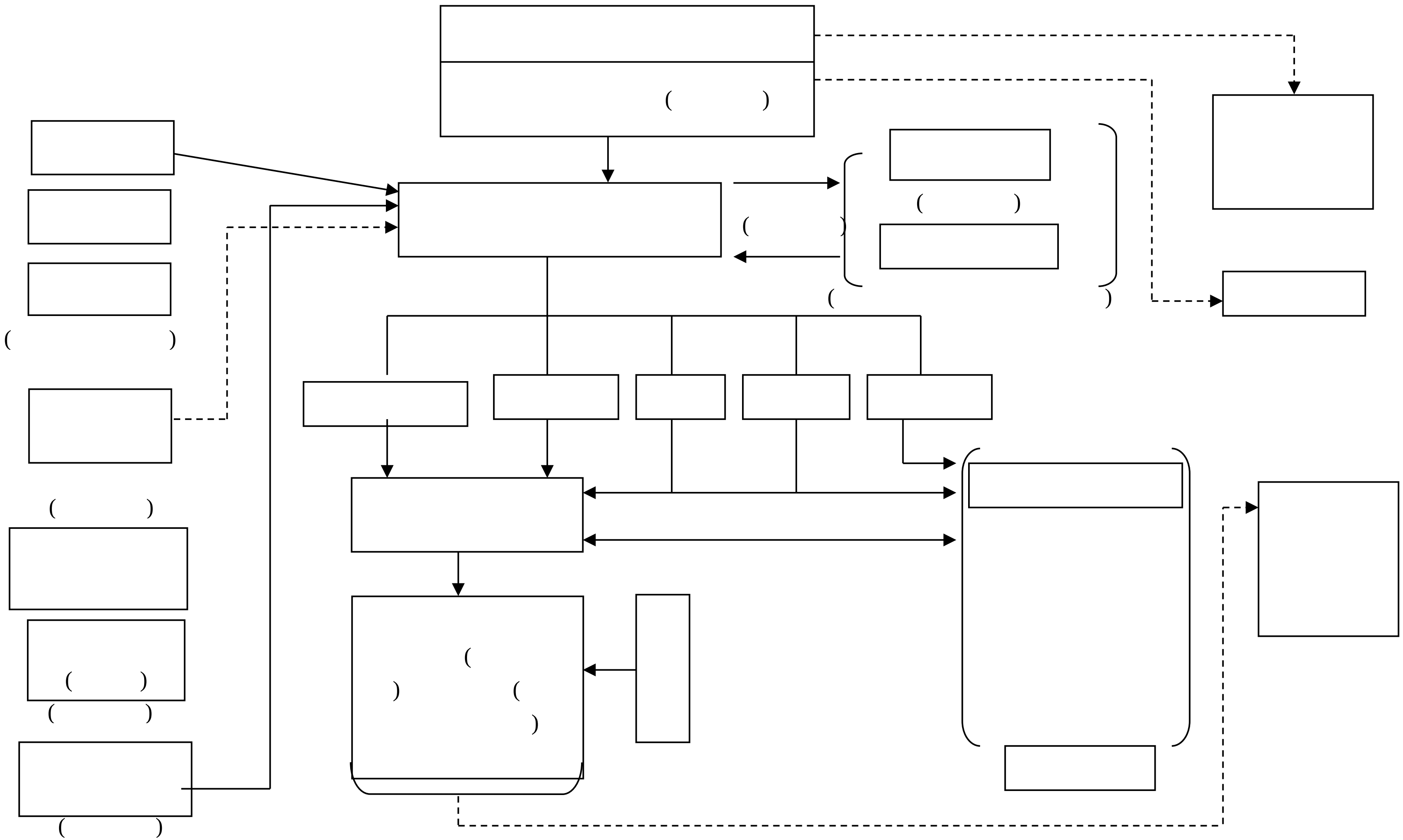
4. 0 6 0

5. “ ”
“ ” “ ” “ ” “
”

6.

6.4.4

6.4-1



6.4-1

(1)

(2)

“ ” “
”

6.4.5

(1)

(2)

(3)

6.4-3

6.4-3

	-	
	-	

(4)

V

V

(5)

(6)

a.

b.

c.

d.

e.

(7)

6.5

2

K22+377

7

7.1

7.1.1

1.

2.

3.

4.

5.

6.

7.1.2

1.

1

2

3

2.

1

13

5.58hm^2

2

GB50433-

2008

“ ”

3

3.

1

2

4.

37.27hm^2 22.74%

50.86 hm^2 31.03% 16.89 hm^2 10.31%

3.69 hm^2 2.25%

5.

1

2

6.

1

2 “ ”

3

7.

1

2

“ ”

“ ”

3

4

5

7.1.3

1.

2.

3.

4.

7.1.4

1.
2.

3.
4.

7.1.5

1.

2.

3.

4.

7.2

7.2.1

(1)

(2)

20cm 15cm

(3)

(4)

(5)

(7)

(8)

+

+

(9)

(10)

(11)

(12)

9.2

7.2.2

1.

200m

2.

1

a.

b.

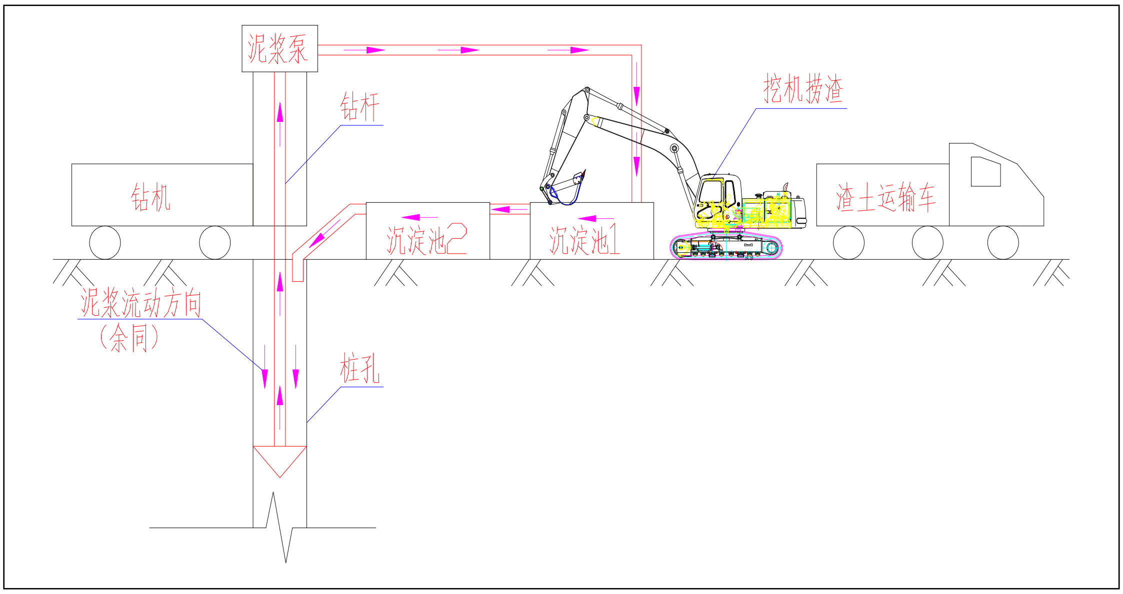
c.

a.

b.

7.2-1

c.



7.2-1

3

4

5

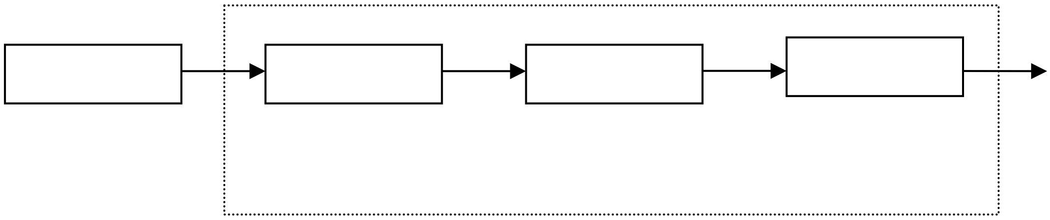
6

3.

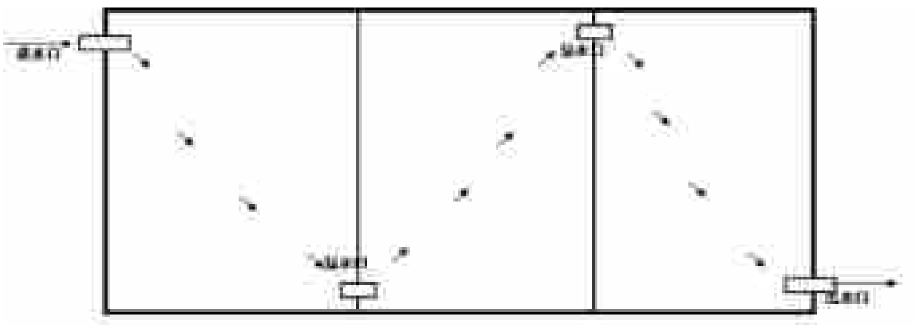
SS 80% pH

\+ +

7.2-2 7.2-3



7.2-2



7.2-3

4.

7.2-2 7.2-3

7.2.3

1.

2.

3.

4.

5.

6.

7.

8.

1

2

3

4

5

1

8.2-1

7.2.4

1.

2.

3.

90dB

06:00 22:00

4. 22:00 06:00

642m

50m

5.

6.

7.

8.

7.2.5

1.

2.

3.

4.

5.

6.

200m

7.

8. α -

1

2

3

200m

4 “

+ ”

5

9.

10.

11.

12.

13.

7.2.6

1.

2.

3.

3.

4.

5.

7.3

7.3.1

(1)

(2)

“ ” “ ”

(4)

7.3.2

1.

1

2 2.11 4.2

COD BOD5

BOD5

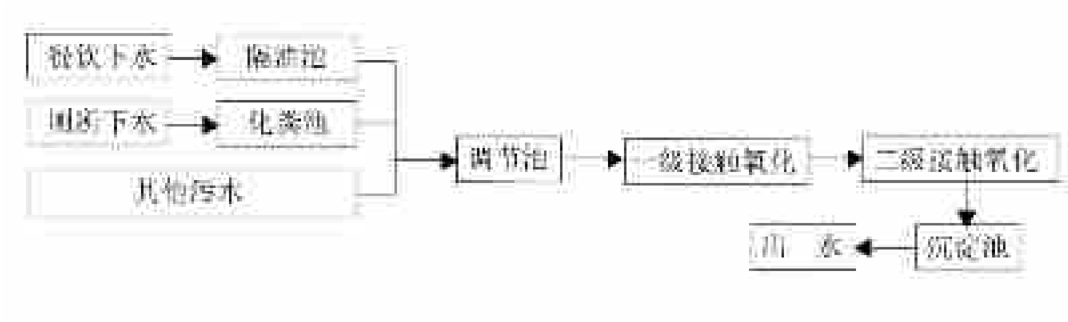
80%

GB8978-1996

7.3-1

7.3-1

7.3-1



7.3-1

7.3-1

		t/d		
1		5.40	10t/d 1	
2		/	/	
3		/	/	

2.

GB8978-1996

0.6 /t MBR

3.

GB8978-1996

4.

5.

“ ”

K11+150~K11+200

BK0+560~BK0+580 BK0+820~BK0+845

K22+100~K22+300

K22+377

6.4.2

6.

7.3.3

1.

([2010]7

)

GB3096-2008

4a

4a

GB50118-2010

1

2

3

4

270m

5

2.

1

7.3-2

7.3-2

		100m	8~10dB	2000 4000 /
			25dB	500 /m^2 1000 10 1
			3dB	20%
	“ ”			200 /
			10m 1dB 10dB	10 /m^2
			60km/h 10km/h 1~2dB	1 /

2

12

7.3-3

1816.5

1140 4m + 4 3 441

1340 4m 4 469 590

5m 1 236 1490 5m 4

670.5 SMA-13

7.3-3

				(m)	**(m)**	**- (m)**	**/**		**/ dB**							
							4a	**1 /2**	**4a**	**1 /2**	**4a**	**1 /2**				**( )**
1	FLK0+130 ~FLK0+410			49	+1.5	-11	56.5/48.5	54.7/45.9	-/-	-/0.9	126	1071	1 1197 1197 25dB 380m × 4m 3500 /m 133 2dB 2 2	+	2dB	135
2	FLK1+200 ~FLK1+480			68	+6.5	-2	54.8/46.0	54.6/45.7	-/-	-/0.7	72	608	1 680 680 25dB 380m × 4m 3500 /m 133 2dB 2 2	+	2dB	135
3	FLK1+520 ~FLK1+800			40	-0.8	4	55.8/47.7	54.6/45.7	-/-	-/0.7	792	1584	1 2376 2376 25dB 380m × 4m 4500 /m 171 2dB 2	+	2dB	171
4	K6+880~K7 +000			91	+7.9	-10	/	60.4/53.3	-/-	0.4/3.3	/	1524	1 1524 1524 25dB 220m ×4m 3500 /m 77 4dB		4dB	77
5	K7+010~K7 +500			99	+8.4	-6	/	59.9/52.7	-/-	-/2.7	/	822	1 822 822 25dB 590m ×5m 4000 /m 236 4dB		4dB	236

7.3-3

				(m)	(m)	- (m)	/		/ dB							( )
							4a	1 /2	4a	1 /2	4a	1 /2				
6	K7+500~K7 +650			130	+8.9	-9	/	58.8/51.3	-/-	-/1.3	/	204	1 204 204 25dB 250m ×4m 3500 /m 87.5 2dB		2dB	87.5
7	K14+200~K 14+600			48	+10.0	0	55.7/48.2	55.5/47.9	-/-	0.5/2.9	5	60	1 65 65 25dB 500m ×5m 4500 /m 225 6dB		6dB	225
8	K16+000~K 16+200			68	+12	0	55.6/48.0	55.4/47.9	-/-	0.4/2.9	3	42	1 45 45 25dB 300m ×5m 4500 /m 135 6dB		6dB	135
9	K16+180~K 16+550			50	+6	0	59.5/52.6	57.2/49.9	-/-	2.2/4.9	30	92	1 122 122 25dB 370m ×5m 4500 /m 166.5 6dB		6dB	166.5
10	K19+720~K 19+940			100	+6.5	-4	/	55.3/46.1	-/-	0.3/1.1	/	4 4	40 25dB 320m ×5m 4500 /m 144 2dB		2dB	144
11	K19+980~K 20+200			82	+6.7	-4	60.5/53.9	56.4/49.4	-/-	1.4/4.4	144	432	1 576 576 25dB 320m ×4m 3500 /m 112 6dB		6dB	112

7.3-3

				(m)	(m)	- (m)	/		/ dB							( )
							4a	1 /2	4a	1 /2	4a	1 /2				
12	K22+750~K 23+200			72	+7.6	-2	/	55.3/47.1	-/-	0.3/2.1	2	240	1 242 242 25dB 550m ×4m 3500 /m 192.5 3dB		3dB	192.5
													1140 + 4 3 441 3200 9 1375.5			1816.5

3

a.

b.

HJ/T90-2004

JTG B04-2010

4 5m

/

15 25%

3dB(A)

7.3-4

7.3-4

	( )		
+	3		
	9		

7.3.4

1.

2.

3.

4.

5.

(DB 37/597-2006)

6.

7.3.5

1.

2.

3.

8

8.1

8.1.1

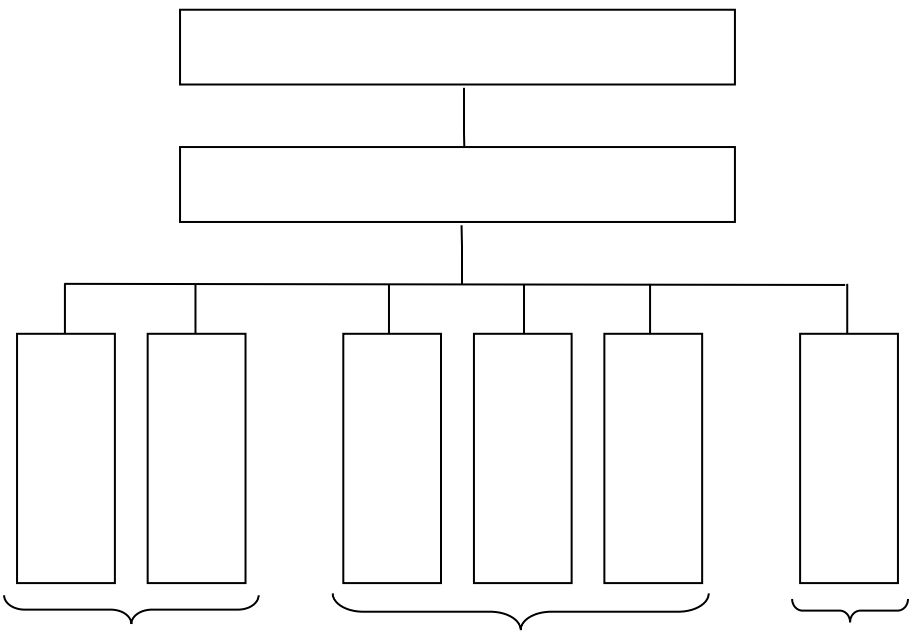
1.

“ ”

2.

8.1.2

8.1-1 8.1-1



8.1-1

8.1-1

8.1.3

8.1-2

8.1-2

/			
	200m		

8.1-2

/			
/			
	150m 22:00~6:00		

8.1-2

8.1.4

1.

2.

3.

4.

8.2

8.2.1

8.2.2

1.

TSP PM$_{10}$

2.

8.2.3

8.2.4

8.2-1

8.2.5

1.

3 1 3 30 2

15 33

2.

15 5 3 30

2 15 45

3.

6 2 3 15

1 15 21

4.

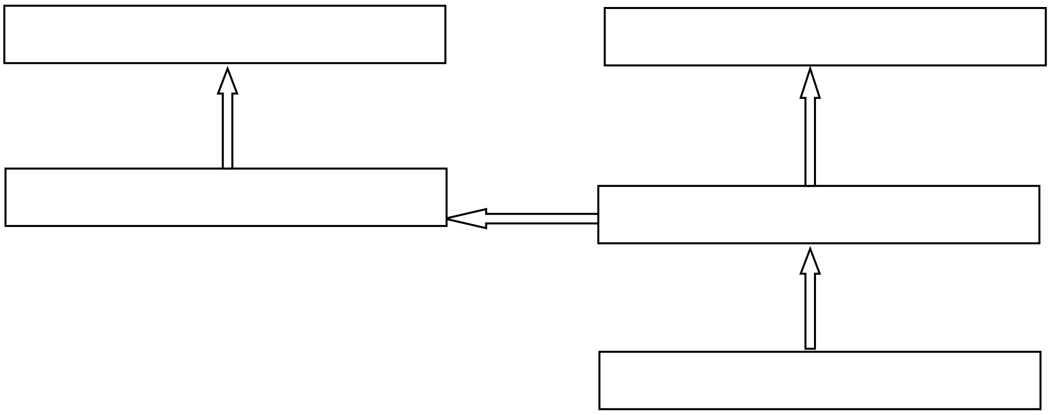
99

8.2-1

			TSP PM$_{10}$	1 / 2	3 / 12			
			CO NO$_2$	2 /	3 / 24			
				1 / 2	2 / 1			
				1 /	2 / 1			
		200m	pH SS COD	1 /	3 /			
			pH BOD$_5$ COD SS	2	2 /			

8.2.6

8.2-1



8.2-1

8.3

[2007]184

[2007]158

8.3.1

1.

2.

3.

4.

8.3.2

1.

2.

3.

1

2

3

4

5

6

4.

8.3.3

8.3-1

8.3-1

	3		

8.3-1

			200m

8.3.4

8.3.5

8.4

8.4-1

8.5

8.4-1

	(1) (2) (3) (4) (5) (6) (7) (8)	(1) (2) (3) (4) (5) (6) (7) (8)
	(1) (2) (3) (4) 12	(1) (2) (3)

8.4-1

	(1) (2) (3) (4) 1	(1) (2) (3) (4) 1
	(1) (2) (3) (4) (5)	(1) (2) (3) (3) (4)
	(1) (2) (3) (4)	(1) (2) (3) (4)

9

9.1

ENPV 63354 10.5% 1.32

9.2

9.2.1

1.

2.

3.

9.2.2

1.

153.34hm^2 37.27 hm^2

16.89 hm^2 50.86 hm^2 3.69 hm^2

3 15 18

2.

9.2.3

9.2-1

2.1

9.2-1

1			0	
2			-1	
3			+1	
4			-1	
5			-1	
6			+2	
7			+1	
8			-1	
9			+2	1 2 3 “+” “-”
10			+2	
11			-1	
12			-1	
13			+1	
14		5	+3	
15			+3	
16			-1	
		(+15) (-7) / 2.1	+9	

9.3

9.3.1

9.3-1

9.3-1

			(　　)		
		2	2		2025~2028
		6	6		2025~2028
	10t	1	50		2028
		3 1991.39m^3 380m PVC 2580m	315		2025~2028
		1	8		2028
		6	3		2028
		1	20	70%	2025~2028
		1	60	70%	
		1	30		
		1	5	75%	2028
		1	30		
	+	3	441		(2024~2028
		9	1375.5		
		2	2		

9.3-1

			(　　)		
		6 6	6		
			318.70		
		2 2	2		
			205.20		
			580.44		
		-	1887.28		
		-	50		
		-	99		
		-	100		2025~2028
		-	30		2025
		-	10		2025
		-	30		
		-	20		2028
		-	5686.12	-	-

10.3-1 5686.12 262385.1 2.17%

9.3.2

1.

2.

10

10.1

S302 ~

18.229km

80km/h 33m S202 80km/h

32m

1631m/7 1887.75m/3 21

6 1

322.82 m^3 208.93 m^3 114.45

m^3 153.34hm^2 8.68hm^2 6171.71m^2

262385.1 2025 10

2028 10 36

10.2

10.2.1

1.

[2016]161

2.

—— —— ——

3.

4. 5

15

9 2

1 4

2

K8~K11 K17~K18 K23~

5. K8+000~K10+000 K17+100~K18+100 K23+300~K24+200

4.0km K10+000~K17+100

K18+100~K23+300

6. K23+300~K24+200 0.90km

0.6051 hm^2

205.84m

7.

371002120190 371002120228 371002120218

371002120245 371002120216 814.53m

235.93 m

61.85 m 516.75m

10.2.2

1.

GB3838-2002

2. 3 ——

3. 2025 5 6 ~9

GB3838-2002

4. 2025 5 8

GB/T 14848-2017

10.2.3

1.

2. K11+150~K11+200

18m BK0+560~BK0+580

28m

BK0+820~BK0+845

62m K22+100~K22+300

38m

309m 324m

10.2.4

1.

S202

2. 19 3 16

3. 12

GB3096-2008

4. S202

S202 4a

20m 1 40m

5. 24 S202 40m

52.6~56.4dB 42.9~46.7dB 6:00~22:00

22:00~6:00 19:00~20:00 22:00~23:00

10.2.5

2024

GB3095-2012 2018

10.3

10.3.1

1. 3203.32t

133.10t 6.98% 0.29%

2. 27.7834 hm^2

3.4896hm^2

19.317 hm^2 4.9768 hm^2

K8~K11 K17~K18 K21~K22 K23~

“ ”

3.

4.

5. 37.27 hm^2 29.86 hm^2 7.41 hm^2

197.08t 3

591.23t 15 2956.14t

6. 2 3.12 hm^2

7.

1 K8+000~K10+000 K17+100~K18+100 K23+300~K24+200 4.0km K10+000~K17+100 K18+100~K23+300

2 K23+300~K24+200 0.90km 0.6051hm^2 205.84m

10.3.2

1.

2.

3. 5.40t/d COD SS GB8978-1996

10.3.3

1.

2. SS

10.3.4

1.

115m 642m

2. 16 5 8 9

0.1~1.4dB 0.2~2.2dB 0.1~2.9dB

11 0.1~3.9dB 0.1~4.9dB 0.5~5.7dB 3

0.3dB 0.6dB

0.6dB 1.1dB 1.6dB

3. FLK0+430~FLK0+700

96 K6+600~K7+600

103m

4. 1816.5 1140

4m + 4 3 441 1340

4m 4 469 590 5m 1

236 1490 5m 4 670.5

SMA-13

10.3.5

1. TSP

2.

200m

3.

10.4

1.

2

2.

0.01470 / 0.01620 / 0.01979 /

3.

4.

5.

10.5

1.

2025 1 17

2.

10.6

5686.12

262385.1 2.17%

10.7

2023-2035

“ ”

“ ”