I
1
3
2.1 3
2.2 3
2.3 4
2.3.1 4
2.3.2 4
2.3.3 5
2.4 5
2.5 7
2.6 7
10
3.1 10
3.1.1 10
3.1.2 12
3.1.3 12
3.1.4 13
3.1.5 13
3.1.6 14
3.2 20
3.3 21
3.3.1 21
3.3.2 22
3.3.3 24
3.3.4 31
3.3.5 35
3.3.6 36
3.4 37
3.5 38
39
4.1 39
4.1.1 39
4.1.2 39
4.2 47
48
5.1 48
5.1.1 48
5.1.2 49
5.2 51
5.2.1 51

5.2.2 51
5.2.3 52
5.2.4 53
5.2.5 53
5.3 53
5.4 55
5.4.1 55
5.4.2 55
5.4.3 55
59
6.1 59
6.1.1 59
6.1.2 60
6.1.3 62
6.2 63
6.2.1 63
6.2.2 64
6.3 66
6.3.1 66
6.3.2 69
74
7.1 74
7.2 74

1 1000

2 As
3 As
4 F
5 F
6 Ni
7 Ni
8 Pb
9 Pb
10 Cr
11 Cr

1
2
3
4
5

2018 6 26

pH

a 屈 b k a 123-cd

a h g,h,i C10 C40 28

2018 8 1

GB36600-2018

28 30

1,1- 1,2- 1,1- -1,2-

-1,2- 1,2- 1,1,1,2- 1,1,2,2-

1,1,1- 1,1,2- 1,2,3-

1,2- 1,4-

+ 2-

30

30

2018 8

1 2018 8 1

1

30

2018 9 30

1958

2006 7

p 00 2

,

2.1

1

2

3

2.2

2-1

150m 300m 200 250m

83.957



2-1

2.3

2.3.1

1 2015 1 1

2 2018 1 1

3 2016 1 1

4 1996 4 1

2016 11 7

5 2016

42

6 2005 39

7 2008 39

8

2013 7

9 - ᵀ ر x ŧ ï ΅A Ệ ρ 220 ŭ 22

خه 6 0 2 4

10 HJ/T 166-2004

11

12 JBJ89-92

13 — DB44 T 1415-2014

14 B50021

15 GBJ 145

16 GB/T50123-1999

17 2015 10

2.3.3

1

[2004]47

2

[2012]140

3

[2014]66

4 [2008]48

5 2014

11

2.4

HJ 25.1-2014

——

—— ——

——

2-2



2.5

1

2

ρ ρ

13

Fe Mn As Cd Cr

Cr^{6+} Cu Hg Ni Pb Zn F pH 21

a 屈 b

k a 123-cd a h

g,h,i 16 C10 C40 1

2-1 2-2

2-1

%

1	2000		230	230	100
		m	280	280	100

2-2

1 1:5

2 1:20

3 1:5 1:10

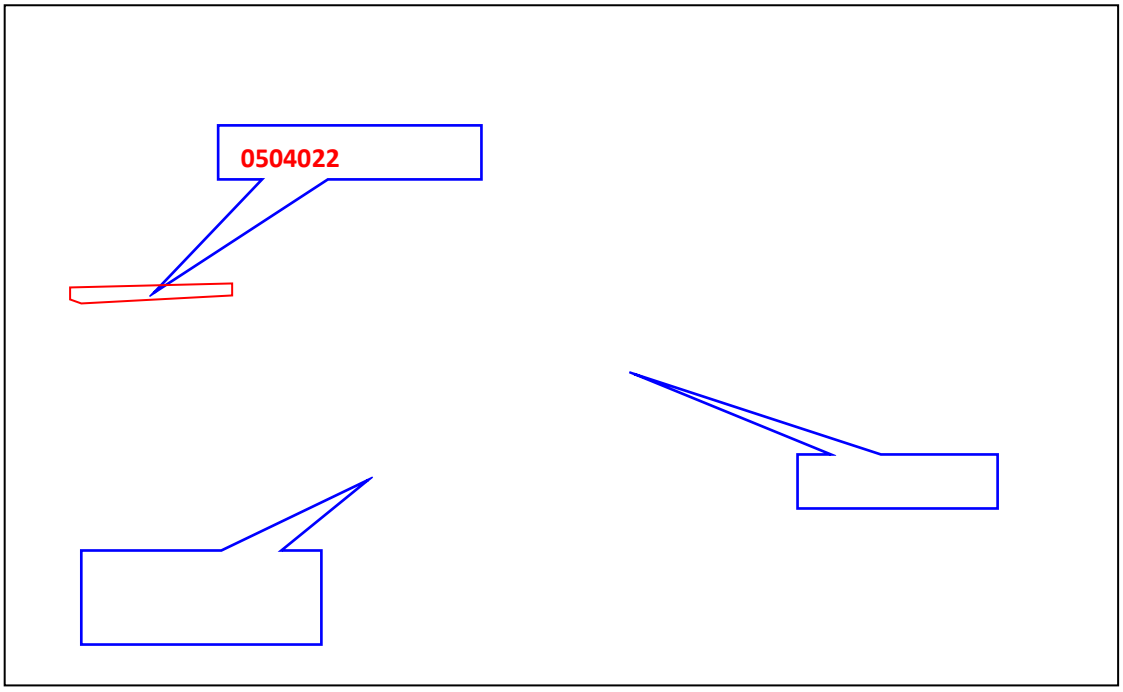
	X	Y	m
13	2521250.346	36530784.551	5.14
14	2521250.554	36530779.413	13.46
15	2521250.384	36530765.954	101.36
16	2521250.003	36530664.598	31.80
17	2521249.863	36530632.799	60.09
18	2521189.772	36530632.963	23.14
19	2521191.012	36530609.852	12.70
20	2521190.763	36530597.152	7.83
21	2521198.563	36530596.452	32.35
22	2521195.334	36530564.263	11.63
23	2521194.930	36530552.644	131.05
24	2521325.737	36530544.660	6.56
25	2521325.852	36530538.097	83.48
26	2521409.336	36530538.074	8.22
27	2521414.680	36530531.823	4.35

10+1

3

2019

3-2



3-2

3.1.2

5 ° 7 ° 90 116m

30m Y

3.1.4

1.3km

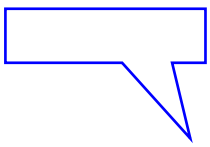
300 380m

15 20m 63.30m $418 \times 10^8 m^3$

3.1.5

1:100

3-3



3-3

2014

430 430 0.8mg/kg

693mg/kg 45.03mg/kg 20mg/kg 216

66.2 3-2

60mg/kg

(m)

	Q_4				
	Q_4	0.6-9			
	Q_4	20-30			0.20-3cm
	Q_3^2	0-35		-	
Q			0.5 5		
	Q_3^1	6-12		0.2-2cm 3-4cm	
	Q_2	2-16	14 22.38		
	Q_2	2-20			
	Q_1n	1-2		60-80%	0.5-2cm
	E_3	>650			
	E_3	>165			
	E_{2-3}	130 -350			
	E_{2-3}	0-221			
	E_{2-3}	0-277			
	K_2	<485			

	(m)
K_1x	<315
C_2pm	<583
C_2h	114
$C_{1\text{-}2}d^2$	207
$C_{1\text{-}2}d^1$	-877 178
C_1yt	92
D_3w	-310 115
$D_{1\text{-}3}l^3$	c

5 £ 5 £

—

2

(3-4)

45km 5 15km 5 20 °

25 30 °

3

3-5

1

Q_3W^2

5 15m 20 25m K=8 30m/d

10 15m 100 1000m^3/d

5 8m

100 m^3/d 8 20m

2

0.1 1L/s

0.1L/s

3

1000 m^3/d

4

3.2

3-4

3-6

3-4

3.3

3.3.1

1958

55 2018

3-2 3-7

3-2 3-3

3-4 3-5

3-6 3-7

3.3.2

1958

1968 1982

1983

2004

2010

2000 5

2002 2017

3-7



3-7 2010 2018 6

3-5

		H_2SO_4	

3.3.3

1

1

5 10

CNC

3-9

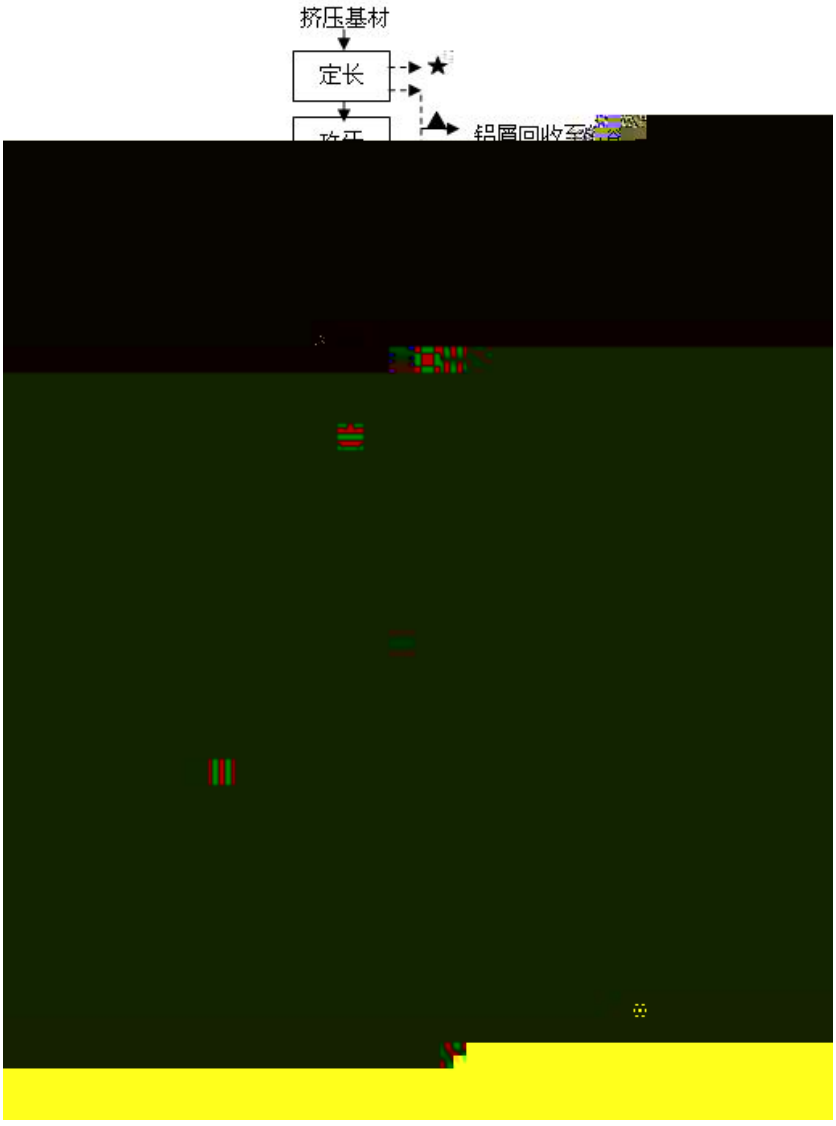
30t/d

4t/d

2

5

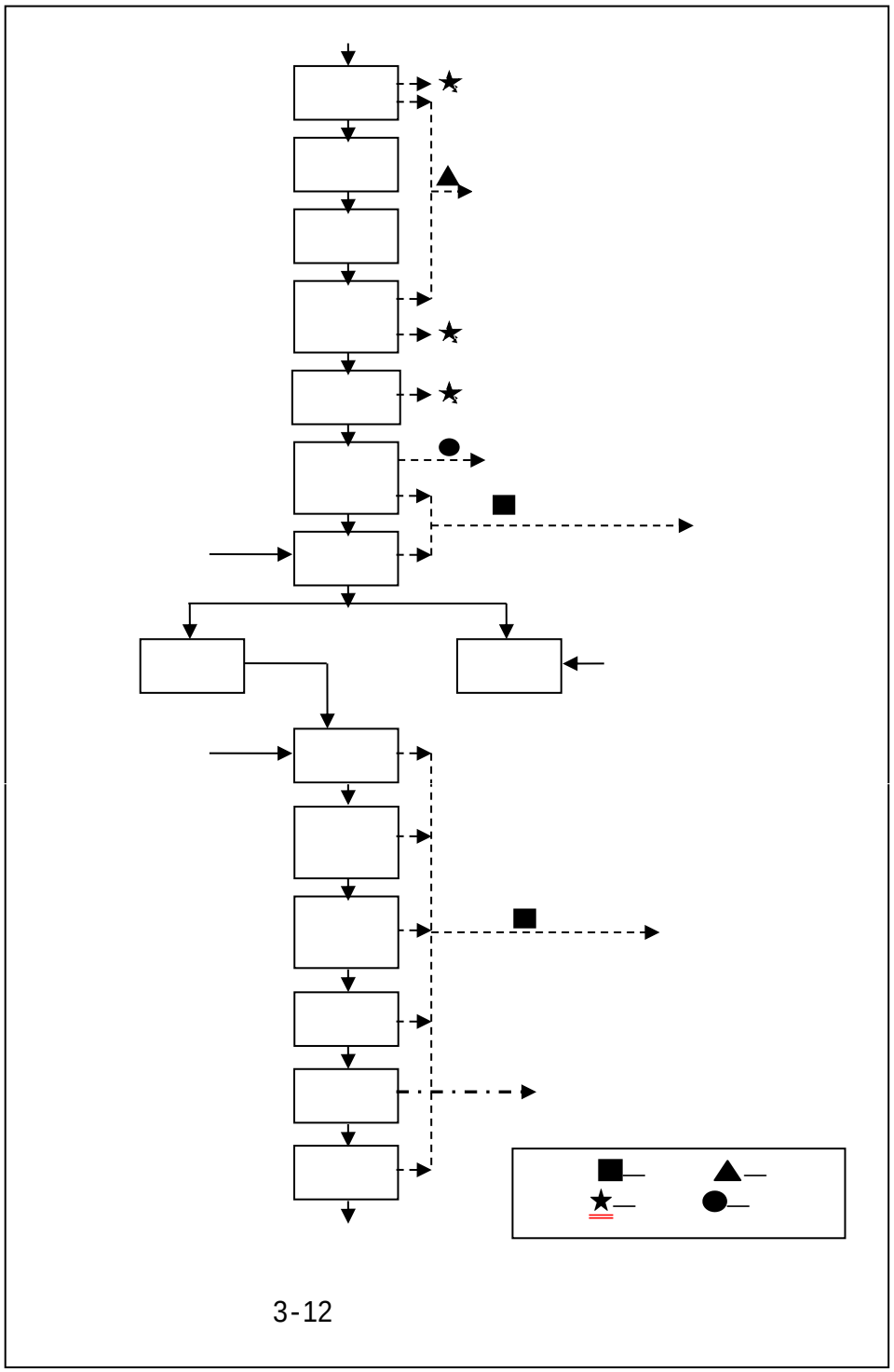
3-10



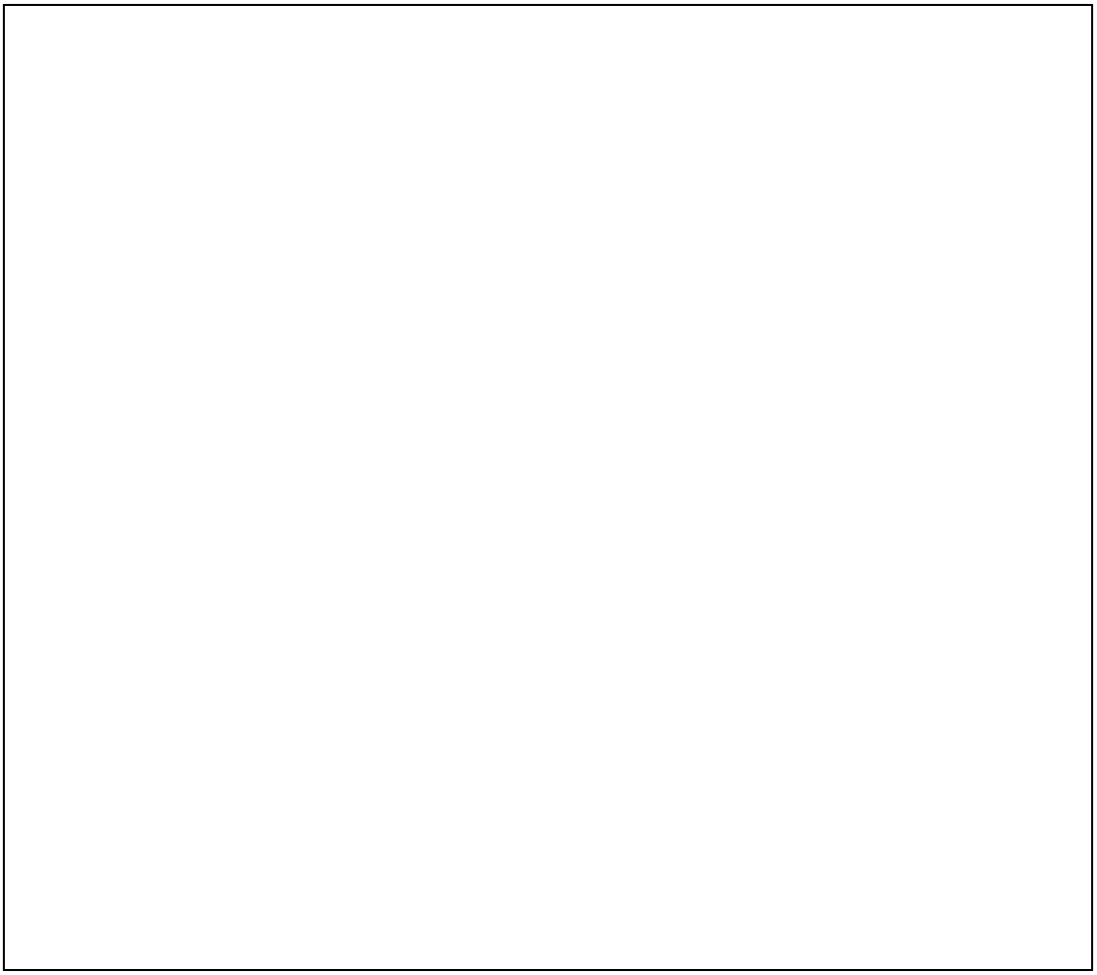
3-10

200

3-12



3-12



3-13

9

3.3.4

1

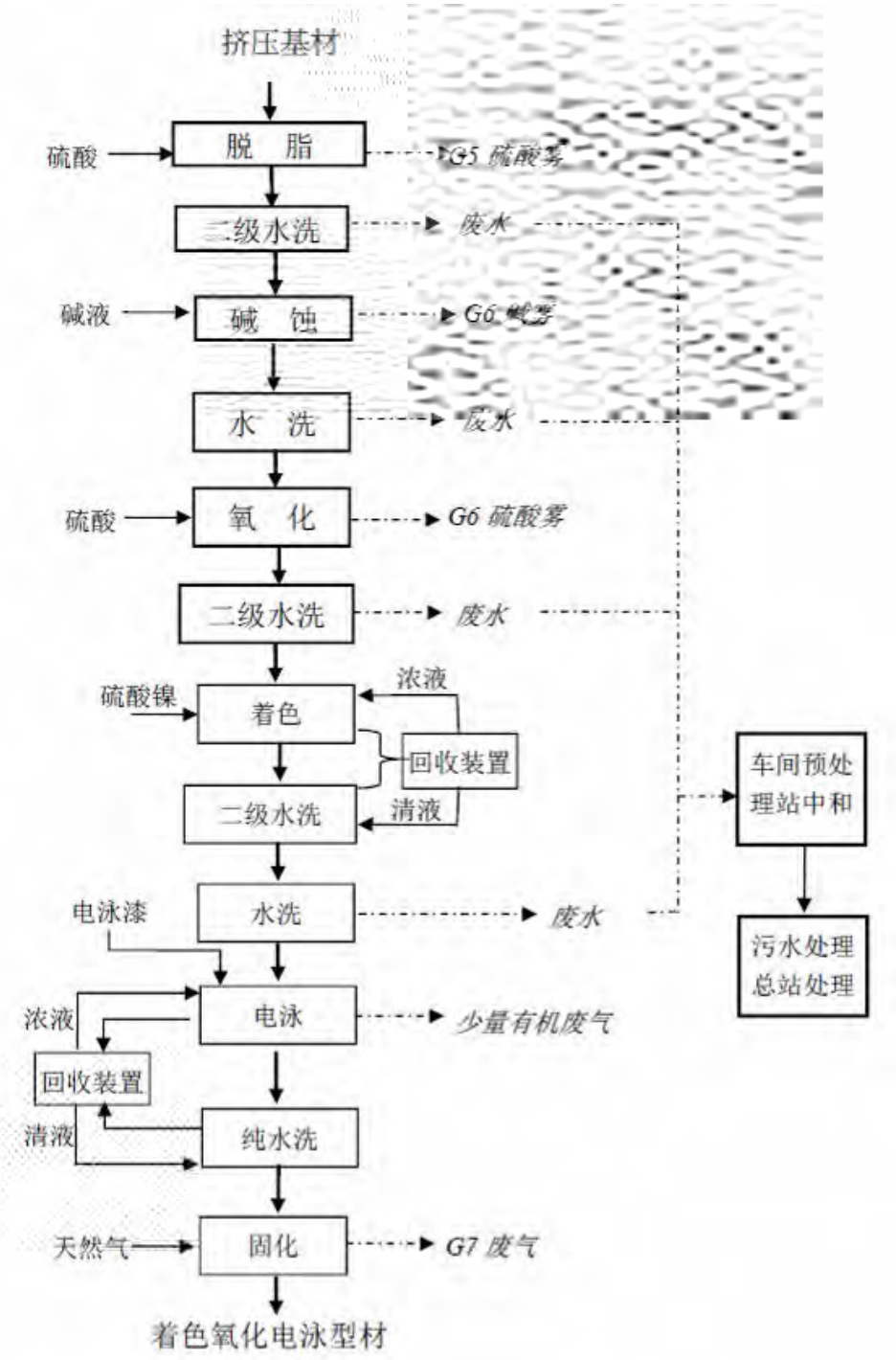
2

3

3-14 3-16

3-14

3-15


挤压基材
硫酸
脱　脂
G5 硫酸雾
二级水洗
废水
碱液
碱　蚀
G6 碱雾
水　洗
废水
硫酸
氧　化
G6 硫酸雾
二级水洗
废水
硫酸镍
着色
浓液
回收装置
清液
二级水洗
车间预处理站中和
电泳漆
水洗
废水
污水处理总站处理
浓液
电泳
少量有机废气
回收装置
清液
纯水洗
天然气
固化
G7 废气
着色氧化电泳型材

3-16

3

1

Ni

GB8978-1996

GB8978-1996

2

4

6

	2016	2016	
26.67%	20.0	30%	15.0

43.33% 115.0 pH

5

1958

55

3.3.5

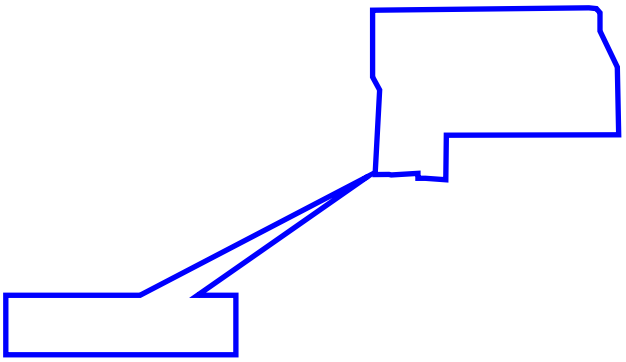
3-6

3.3.6

1.

2011-2020

2.



3.4

2018 6

4-1

5

4-2 0.5 1.0m 0.20

0.50m 0.20m 1.00 1.15m 2.00 2.15m 3.00

3.15m 4.00 4.15m 1kg

4-2

42 254 219

15 15 6 24 8

8 8

4-1 4-2

4-1

		m
		2.00-2.15
		3.00-3.15
		4.00-4.15
ZK07609	X:2521332 Y:36530484	0.20-0.50
		1.00-1.15
		2.00-2.15
		3.00-3.15
		4.00-4.15
ZK07613	X:2521292 Y:36530484	0.20-0.50
		1.00-1.15
		2.00-2.15
		3.00-3.15
		4.00-4.15
ZK07617	X:2521252 Y:36530484	0-0.50
		1.00-1.15
		2.00-2.15
		3.00-3.15
		4.00-4.15
ZK07621		

		m
		2.00-2.15
		3.00-3.15
		4.00-4.15
		0.20-0.50
		1.00-1.15
ZK08401	X:2521412 Y:36530564	2.00-2.15
		3.00-3.15
		4.00-4.15
		0.20-0.50
		z z
ZK08405	X:2521372 Y:36530564	

		m
		2.00-2.15
		3.00-3.15
		4.00-4.15
ZK08813	X:2521292 Y:36530604	0.20-0.50
		1.00-1.15
		2.00-2.15
		3.00-3.15
		4.00-4.15
ZK08817	X:2521252 Y:36530604	0.20-0.50
		1.00-1.15
		2.00-2.15
		3.00-3.15
		4.00-4.15
ZK09201	X:2521412 Y:36530644	0.20-0.50
		1.00-1.15
		2.00-2.15
		3.00-3.15
		4.00-4.15
ZK09205	X:2521372 Y:36530644	0.20-0.50
		1.00-1.15
		2.00-2.15
		3.00-3.15
		4.00-4.15
ZK09209	X:2521332 Y:36530644	0.20-0.50

m

"%ûqŠPP E ÆU ' TPP uY‡ PÆÐ à 5' G TQà" ÊôPP E ÔU ' $PP ÿE PPÝ2V00ãA.15 V Õâ® V L rGCL–˜ W ™ð SX •p0020èÆF3

3.00-3.15

ë !Â ™ð T$' p 4.00-4.15 2 21 A



2.

7 15m

1.0m 7 1

1 1 1

1 8

1000ml 9 10m 1.0m

4.2

CMA

CNAS

5.1

1

2

3

5.1.1

XRF

5-1

XRF

X X

5-1 XRF 5-2 XRF

4	48 h

5-3 5-4 pH

pH

± 10%

50 24

pH

2

GPS

“ S ”

ZK09614 S09614

“ SD ” ZK09614

SD09614 “ SSC ”

ZK09614 SSC09614

5.2.4

1 HJ/T166-2004

(HJ/T164-2004

2

4

5.2.5

5.3

pH 5-1

pH 5-2

5-1

1	As		GB/T 22105.2-2008
2	Hg		GB/T 22105.1-2008
3	Cr Ni Cu Zn		GB/T 14506.30-2010
4	pH		LY/T 1239-1999
5	Cd Pb		GB/T 14506.30-2010
6	Cr^{6+}		GB/T 15555.4-1995
7	F		GB/T 14506.30-2010
8		-	2017 1625
9			2017 1625

5-2

1	As		GB/T 5750-2006
2	Hg		GB/T 5750-2006
3	Cr		GB/T 5750-2006
4	pH		GB/T 5750-2006
5	Cd Pb		GB/T 5750-2006
6	Fe F Cr^{6+}		GB/T 5750-2006
7	Ni		GB/T 5750-2006
8	Zn Cu Mn		GB/T 5750-2006
9			GB/T 5750-2006
10		108	GB/T 5750-2006
11			GB/T 5750-2006
12			

5.4

5.4.1

20 20 20

208 11

5-3

		mg/kg	mg/kg	%	%
	Cr^{6+}			/	/
	As	3.17	2.84	5.5	±20
	Cd	0.02	0.024	9.1	±30
	Cr	34.7	35.4	1.0	±10
T07205-5	Cu	10.5	10	2.4	±10
T07205-6	F	319	286	5.5	±5
4.00-4.15m	Hg	0.021	0.021	0.0	±30
	Ni	11.2	10.8	1.8	±10
	Pb	11.8	11.5	1.3	±10
	Zn	18.3	17.6	1.9	±10
	Cr^{6+}			/	/
	As	3.37	3.3	1.0	±20
	Cd	0.025	0.025	0.0	±30
	Cr	58.6	54.1	4.0	±10
T07209-5	Cu	13	13.5	1.9	±10
T07209-6	F	452	442	1.1	±5
4.00-4.15m	Hg	0.024	0.032	14.3	±30
	Ni	14.3	13.9	1.4	±10
	Pb	14.5	14.6	0.3	±10
	Zn	23.3	23.3	0.0	±10
	Cr^{6+}			/	/
	As	8.03	8.5	2.8	±20
	Cd	0.033	0.024	15.8	±30
	Cr	82.2	82.4	0.1	±10
T08413-2	Cu	21.5	21.1	0.9	±10
T08413-3	F	381	389	1.0	±5
2.00-2.15m	Hg	0.0479	0.072	20.1	±30
	Ni	11.7	12.1	1.7	±10
	Pb	13.5	14.1	2.2	±10
	Zn	30.2	29.7	0.8	±10
	Cr^{6+}				
T08801-5					
T08801-6					
4.00-4.15m					

				%	
		mg/kg	mg/kg		%
T08809-5 T08809-6 4.00-4.15m	Pb	13.6	13.6	0.0	±10
	Zn	29.2	27.4	3.2	±10
	Cr^{6+}			/	/
	As	11.5	10.7	3.6	±10
	Cd	0.032	0.029	4.9	±30
	Cr	51.4	51.2	0.2	±10
	Cu	19	17.1	5.3	±10
	F	288	332	7.1	±5
	Hg	0.042	0.034	10.5	±30
	Ni	12.8	12.1	2.8	±10
	Pb	11.5	11.1	1.8	±10
	Zn	30.4	28.6	3.1	±101

		mg/kg	mg/kg	%	%
	Pb	9.3	9.2	0.5	±20
	Zn	27.4	27.4	0.0	±10
	Cr^{6+}			/	/
	As	6.15	4.69	13.5	±20
	Cd	0.033	0.026	11.9	±30
	Cr	60.7	54.5	5.4	±10
T09605-5	Cu	12.7	13.2	1.9	±10
T09605-6	F	424	424	0.0	±5
4.00-4.15m	Hg	0.0166	0.0163	0.9	±30
	Ni	13.2	13.8	2.2	±10
	Pb	14.2	14	0.7	±10
	Zn	22.5	21.9	1.4	±10
	Cr^{6+}			/	/
	As	10	10	0.0	
	Cd	0.028	0.024	7.7	±30
	Cr	87	87.2	0.1	±10
T10009-5	Cu	12.6	12.7	0.4	±10
T10009-6	F	459	407	6.0	±5
4.00-4.15m	Hg	0.167	0.183	4.6	±25
	Ni	17.9	17.1	2.3	±10
	Pb	14.8	15	0.7	±10
	Zn	29.9	29.2	1.2	±10
	Cr^{6+}			/	/
	As	15.5	15.8	1.0	±10
	Cd	0.037	0.033	5.7	±30
	Cr	102	103	0.5	±5
T10017-2	Cu	4			
T10017-3					
2.00-2.15m					

6.1

6.1.1

42

1 Q_4^{ml}

3

0.10 0.30m 0.10 0.20m

0.20 0.30m

2

0.20 3.90m

ZK09217 3.90m ZK08813

2.00m

2 Q_3w^1

Q_3 1

3

1.50 4.80m

ZK09201 ZK09617 4.80m

ZK09601 4.30m

2

,

0.90 6.60m ZK07209

6.60m ZK08411 5.50m

$$^{1}_{3}e\ p$$

6.1.3

1.

2

Q_4^{ml} Q_3^{1}

15m

E_{2-3}

350m

2.

42

7m 8m 90m

25m

100m^3/d

E_{2-3}

0.36L/s

3.

6.2.2

1

GB36600-2018

GB36600-2018

φ ً خم

y ‖ Ώ

	mg/kg	mg/kg	mg/kg	mg/kg
F	/	/	1000	--
pH	/	/	/	/
	25	255	/	--
	/	/	/	367
	/	/	/	679
	/	/	/	644
	/	/	/	381
	/	/	/	5037
	/	/	/	508
	/	/	/	381
a	5.5	55	/	--
屈	490	4900	/	--
b	5.5	55		

Cd	≤0.0001	≤0.001	≤0.005	≤0.01	0.01
Cr^{6+}	≤0.005	≤0.01	≤0.05	≤0.10	0.10
Cu	≤0.01	≤0.05	≤1.00	≤1.50	1.50
Hg	≤0.0001	≤0.0001	≤0.001	≤0.002	0.002
Ni	≤0.002	≤0.002	≤0.02	≤0.10	0.10
Pb	≤0.005	≤0.005	≤0.01	≤0.10	0.10
Zn	≤0.05	≤0.5	≤1.00	≤5.00	5.00
F^-	≤1.0	≤1.0	≤1.0	≤2.0	2.0
pH	6.5≤pH≤8.5			5.5≤pH 6.5 8.5 pH≤9.0	pH 5.5 pH 9.0
	≤1	≤10	≤100	≤600	600
	≤1	≤360	≤1800	≤3600	3600
	≤1	≤50	≤240	≤480	480
b	≤0.1	≤0.4	≤4.0	≤8.0	8.0
a	≤0.002	≤0.002	≤0.01	≤0.5	0.5

3

6.3

6.3.1

5 6-4 6-5

	GB36600-2018
	GB36600-2018
0	GB36600-2018
	GB36600-2018
	GB36600-2019
	GB36600-2020
	GB36600-2021

					%						
	23.0	96.1	8	8	100	≤ 150	≤ 300	≤ 450	≤ 650	650	0
	69	503	8	8	100	≤ 300	≤ 500	≤ 1000	≤ 2000	2000	0
(N)	0.06	42.02	8	8	100	≤ 0.02	≤ 0.10	≤ 0.50	≤ 1.50	1.50	6
(N)	0.82	28.25	8	8	100	≤ 2.0	≤ 5.0	≤ 20.0	≤ 30.0	30.0	2
(N)	0.005	0.252	8	8	100	≤ 0.01	≤ 0.10	≤ 1.00	≤ 4.80	4.80	0
			8	0	/	≤ 0.001	≤ 0.001	≤ 0.002	≤ 0.01	0.01	0

6.3.2

1.

As Cd Cr Cr^{6+} Cu Hg Ni Pb Zn

F 10

a 屈 b k a

123-cd a h g,h,i 16

C10 C40 1

5

GB36600-2018 —

DB44 T 1415-2014

6-6 6-1 6-2

6-6

		mg/kg	mg/kg	mg/kg		m
T08409-1		252	60	120	ZK08409	0.20-0.50
T08417-2		64.8	60	120	ZK08417	1.00-1.15
T07609-1		1630	1000	/	ZK07609	0.20-0.50
T07617-1		591	150	600	ZK07617	0-0.50
T07617-1		437	350	/	ZK07617	0-0.50
T08009-1		234	150	600	ZK08009	0.15-0.50
T07213-1		481	400	800	ZK07213	0.15-0.50

6-6 7

ZK07213 ZK7609 ZK07617 ZK08009 ZK08409 ZK08417

252mg/kg ZK08409 0.20 0.50m

1630mg/kg ZK07609 0.20 0.50m 591mg/kg

ZK07617 0 0.50m 437mg/kg ZK07617

0 0.50m 481mg/kg ZK07213 0.15

0.50m 5 0.70m

0 0.70m 6 1.00 1.60m

1

6-7

6-7

m		%	m
0-0.50	6	85.7	0-0.70
1.00-1.15	1	14.3	1.00-1.60

6-7 0 0.70m

85.7% 1.00 1.60m

5

2 11

0 0.70m 1.00 1.60m

5

GB36600-2018 — DB44

T 1415-2014

HJ/T 25.1-2014 4.2.2.3

2.

Fe Mn As Cd Cr Cr^{6+}

Cu Hg Ni Pb Zn F pH 21

a b

k a 123-cd a h g,h,i

pH

7

(GB14848-2017)

Fe Mn Fe

Mn

pH pH 1988

pH 4.75 5.49 8

pH 4.93 5.90 pH

7 0.02 0.14

mg/kg 0.02 mg/kg

ZK08009

0.20-0.50m 234mg/kg, 150mg/kg 1 4m

48.6 70.7 mg/kg

6

10.4 47.9mg/kg

7.1

1

2 5

252mg/kg ZK08409 1630mg/kg

ZK07609 591mg/kg ZK07617

481mg/kg ZK07213

3 0 0.70m

1.00 1.60m 5

0.70m

4 pH 7

pH pH

5 GB36600-2018

5.3.3

HJ 25.1-2014

HJ 25.2-2014

7.2