# 概述

# Overview

## 一、建设项目的特点

## I. Characteristics of the Construction Project

山东太阳纸业股份有限公司是山东太阳控股集团有限公司下属子公司，位于山东兖州工业园区内，前身为兖州造纸厂，始建于1982年，1994年经山东省体改委批准组建为山东太阳纸业集团总公司，1997年成立山东太阳纸业股份有限公司。经过30多年的发展，太阳纸业已发展成为一家全球先进的跨国造纸集团和林浆纸一体化企业，是中国最大的民营造纸企业、中国500强企业之一，并列为全世界造纸百强行列。

Shandong Sun Paper Co., Ltd., a subsidiary of Shandong Sun Holdings Group, is located in Yanzhou Industrial Park, Shandong Province. It was previously known as Yanzhou Paper Mill founded in 1982. In 1994, Shandong Sun Paper Group Corporation was established with the approval of Shandong Economic Restructuring Commission and in 1997, Shandong Sun Paper Co., Ltd. was established. After over three decades of development, Sun Paper has developed into a global advanced multinational paper-making group integrating timberland pulping and paper making. It is China's largest private paper-making enterprise, one of China's top 500 enterprises, and ranks among the world's top 100 paper-making enterprises.

山东太阳纸业股份有限公司拟在济宁市兖州区颜店镇王桥村太阳新材料产业园园区内新建一条年产45万吨特色文化纸生产线。拟建项目属于属于“三十十一、造纸和纸制品业”。拟建项目的特点为高能耗项目，废水污染物排放量较大，拟建项目主要污染因素重点重点关注废水。

Shandong Sun Paper Co., Ltd. plans to build a 450,000t/a special printing-and-writing paper production line in the Sun Paper New Materials Industrial Park, Wangqiao Village, Yandian Town, Yanzhou District, Jining City. The proposed project falls under the category of "31. Paper and Paper Products Industry". The proposed project is characterized by high energy consumption and large discharge of waste water pollutants. The main pollutant of the proposed project is mainly waste water.

## 二、环境影响评价的工作过程

## II. Process of Environmental Impact Assessment

2019年8月20日，山东太阳纸业股份有限公司委托山东金熙环保科技有限公司对该项目进行环境影响评价。2019年8月20日~8月22日，我公司接受委托后立即组织有关人员进行现场踏勘并收集相关技术资料。并于2019年8月23日在公司网站进行了第一次公示；2019年9月10日~9月17日进行了现状监测；2019年10月1日~2019年10月14日建设单位进行了第二次公示；2019年10月16日网上进行了报批前公示，符合《环境影响评价公众参与办法》要求。在此基

础上本单位编制完成了《山东太阳纸业股份有限公司新建年产45万吨特色文化纸项目环境影响报告书》。

On August 20, 2019, Shandong Sun Paper Co., Ltd. commissioned Shandong Jinxi Environmental Protection Technology Co., Ltd. to carry out environmental impact assessment on the project. From August 20 to August 22, 2019, our company immediately organized relevant personnel to carry out site survey and collect relevant technical data after accepting the entrustment. On August 23, 2019, we publicized the project on the company website; from September 10 to September 17, 2019, we monitored the current situation; from October 1, 2019 to October 14, 2019, the construction unit carried out the second publicity; on October 16, 2019, the publicity before approval was made online and met the requirements of the Measures for Public Participation in Environmental Impact Assessment. On this basis, our company has prepared the Environmental Impact Report of 450,000t/a Special Printing-and-writing Paper Project of Shandong Sun Paper Co., Ltd.

## 三、分析判定相关情况

## III. Analysis and Determination of Relevant Conditions

1、产业政策符合性分析

1. Industrial policy compliance analysis

拟建项目属于《产业结构调整指导目录（2013年修正本）》鼓励类项目。

The proposed project falls under the encouragement category of the Catalogue of Industrial Structure Adjustment (Revised in 2013).

2、规划符合性分析

2. Planning compliance analysis

拟建项目位于济宁市兖州区颜店镇太阳新材料产业园区内，用地为工业用地，项目为制浆和造纸项目，满足太阳新材料产业园规划布局以及产业定位。因此，项目符合《兖州市颜店镇总体规划（2017-2030年）》、《太阳新材料产业园总体规划》以及相关用地规划要求。

The proposed project is located in the Sun Paper New Materials Industrial Park in Yandian Town, Yanzhou District, Jining City. The land is industrial land, and the project is a pulping and papermaking project that meets the planning layout and industrial positioning of the Sun Paper New Materials Industrial Park. Therefore, the project meets the requirements of Yanzhou Yandian Town Master Plan (2017-2030), Sun Paper New Materials Industrial Park Master Plan and related land use planning.

## 四、关注的主要环境问题及环境影响

## IV. Major Environmental Issues and Environmental Impact

拟建项目位于济宁市兖州区颜店镇王桥村太阳新材料产业园内，项目场地不位于生活供水水源地准保护及准保护区以外的补给径流区，不位于除生活供水水源地以外的国家或地方政府

设定的与地下水环境相关的其他保护区以及特殊地下水资源保护区以外的分布区及分散居民饮用水源等其他未列入上述敏感分级的环境敏感区，区域地下水环境不敏感。拟建项目距离最近的生态保护红线区为兖州区水源涵养生态保护红线区（代码SD-08-B1-03），最近距离约为3.1km，项目建设不占用生态红线。本次主要关注环境问题为项目产生的废水对周围环境的影响。

The proposed project is located in Sun Paper New Materials Industrial Park, Wangqiao Village, Yandian Town, Yanzhou District, Jining City. The project site is not located in the recharge runoff area outside the quasi-protection areas of domestic water supply sources, nor in other protected areas related to groundwater environment set by national or local governments other than domestic water supply sources, distribution areas other than special groundwater resource protection areas, nor other environmentally sensitive areas, including scattered residents' drinking water sources, that are not listed in the above classification. The regional groundwater environment is not sensitive. The nearest ecological protection red line area of the proposed project is Yanzhou District’s water conservation ecological protection red line area (code SD-08-B1-03), with a distance of about 3.1 km. The project construction does not occupy the ecological red line. The main environmental concern of this project is the impact of the waste water generated by the project on the surrounding environment.

## 五、环境影响评价的主要结论

## V. Main Conclusions of Environmental Impact Assessment

拟建项目建成后，外排废气中粉尘排放浓度满足《区域性大气污染物综合排放标准》（DB37/2376-2019）表1重点控制区要求，排放速率满足《大气污染物综合排放标准》（GB16297-1996）表2二级排放标准要求；粉尘无组织排放浓度满足《大气污染物综合排放标准》（GB16297-1996）表2无组织排放监控浓度极限要求，恶臭满足《恶臭污染物排放标准》（GB14554-93）二级标准、《挥发性有机物排放标准第7部分：其它行业》（DB37/2801.7-2019）表2厂界浓度限值要求。项目建成后，对周围大气环境影响较小。

Upon completion of the proposed project, the dust emission concentration in the waste gas meets the requirements of the key control areas in Table 1 of the Regional and Integrated Emission Standard for Air Pollutants (DB37/2376-2019), and the emission rate meets the requirements of the Secondary Discharge Standard in Table 2 of the Integrated Emission Standard of Air Pollutants (GB16297-1996); the unorganized emission concentration of dust meets the concentration limit requirements for unorganized emission monitoring in Table 2 of the Integrated Emission Standard of Air Pollutants (GB16297-1996), and the odor pollutants meet the secondary standard of the Emission Standard for Odor Pollutants (GB14554-93) and the concentration limit requirements for plant boundaries in Table 2 of the Emission Standard for Volatile Organic Compounds Part 7: Other Industries (DB37/2801. 7-2019). Upon completion of the project, it will have little impact on the surrounding atmospheric environment.

拟建项目运行时，产生的废水全部排入太阳纸业污水处理厂进一步处理，济宁市兖州区已制

定完善的水质改善计划，在保证太阳纸业废水处理达标排放的前提下，项目建设不会对当地地表水水质造成影响。

During the operation of the proposed project, all the generated waste water will be discharged into the Sun Paper Sewage Treatment Plant for further treatment. Yanzhou District of Jining City has formulated a perfect water quality improvement plan. On the premise of ensuring that the Sun Paper waste water treatment meets the discharge standards, the project construction will not affect the local surface water quality.

场区地下水流向下游无地下水水源地，项目区域附近居民均饮用自来水，本项目发生事故不会对水源地及居民产生严重影响。项目发生“跑、冒、滴、漏”事故，及时发现事故，及时采取有效措施，对地下水的影响将大大降低。

Groundwater in the site flows to the downstream without groundwater source, and residents near the project area all drink tap water. Accidents in this project will not cause severe impact on the water source and residents. In case of any "evaporation, emission, drip or leakage", the accident will be identified in time, and effective measures will be taken in time so as to greatly reduce impact on groundwater.

拟建项目噪声贡献值可以满足《工业企业厂界环境噪声排放标准》(GB12348-2008)3类标准要求。

The noise contribution value of the proposed project will meet the requirements of Class III standard in the Emission Standard for Industrial Enterprises Noise at Boundary (GB12348-2008).

拟建工程所产固废均可得到综合利用或有效处置，拟建项目固废对周围环境影响较小。

The solid waste produced by the proposed project can be comprehensively utilized or effectively disposed of, and the solid waste of the proposed project has little impact on the surrounding environment.

综上分析，拟建项目各类污染物均可稳定达标排放。从环保角度而言，本项目是可行的。

To sum up, all kinds of pollutants in the proposed project can be discharged stably up to standard. Environmentally, this project is feasible.

# 第1章 总则

# Chapter 1 General Rules

## 1.1 编制依据

## 1.1 Preparation basis

### 1.1.1 法律法规

### 1.1.1 Laws and regulations

1、《中华人民共和国环境保护法》（2014年4月24日第十二届全国人民代表大会常务委员会第八次会议修订，自2015年1月1日起施行）；

1. Environmental Protection Law of the People's Republic of China (revised at the 8th Meeting of the Standing Committee of the 12th National People's Congress on April 24, 2014 and implemented as of January 1, 2015);

2、《中华人民共和国环境影响评价法》（2018年12月29日第十三届全国人民代表大会常务委员会第七次会议第二次修）；

2. Law of the People's Republic of China on Environmental Impact Assessment (revised for the second time at the 7th Meeting of the Standing Committee of the 13th National People's Congress on December 29, 2018);

3、《中华人们共和国大气污染防治法》（2018年10月26日第十三届全国人民代表大会常务委员会第六次会议第二次修正）；

3. Law of the People's Republic of China on the Prevention and Control of Air Pollution (revised for the second time at the 6th Meeting of the Standing Committee of the 13th National People's Congress on Friday, October 26, 2018);

4、《中华人民共和国水污染防治法》（2017年6月27日第十二届全国人民代表大会常务委员会第二十八次会议第二次修正）；

4. Law of the People's Republic of China on the Prevention and Control of Water Pollution (revised for the second time at the 28th Meeting of the Standing Committee of the 12th National People's Congress on Tuesday, June 27, 2017);

5、《中华人民共和国土壤污染防治法》（2018年8月31日第十三届全国人民代表大会常务委员会第五次会议通过，自2019年1月1日起施行）；

5. Law of the People's Republic of China on the Prevention and Control of Soil Pollution (revised at the 5th Meeting of the Standing Committee of the 13th National People's Congress on Friday, August 31, 2018 and implemented as of Tuesday, January 1, 2019);

6、《中华人民共和国固体废物污染环境防治法》（2016年11月7日主席令第57号《全国人大

常委会关于修改＜中华人民共和国对外贸易法＞等十二部法律的决定》修改）；

6. Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste (revised by Presidential Decree No.57 of Decision of the Standing Committee of the National People's Congress on Amending Twelve Laws including the Foreign Trade Law of the People's Republic of China on November 7, 2016);

7、《中华人民共和国噪声污染防治法》（2018年12月29日第十三届全国人民代表大会常务委员会第七次会议《关于修改〈中华人民共和国劳动法〉等七部法律的决定》修正）；

7. Law of the People's Republic of China on the Prevention and Control of Noise Pollution (amended by the Decision on Amending the Labor Law of the People's Republic of China and Other Seven Laws at the 7th Meeting of the Standing Committee of the 13th National People's Congress on December 29, 2018);

8、《中华人民共和国清洁生产促进法》（中华人民共和国主席令第五十四号，自2012年7月1日起施行）；

8. Law of the People's Republic of China on the Promotion of Cleaner Production (Presidential Decree No.54 of the People's Republic of China, which shall come into force on July 1, 2012);

9、《中华人民共和国循环经济促进法》（2018年10月26日第十三届全国人民代表大会常务委员会第六次会议修正）；

9. Law of the People's Republic of China on Promotion of Circular Economy (revised at the 6th Meeting of the Standing Committee of the 13th National People's Congress on October 26, 2018);

10、《中华人民共和国环境保护税法》（2018年10月26日第十三届全国人民代表大会常务委员会第六次会议修正）；

10. Environmental Protection Tax Law of the People's Republic of China (revised at the 6th Meeting of the Standing Committee of the 13th National People's Congress on October 26, 2018);

11、《建设项目环境保护管理条例》（国务院[2017]682号令，自2017年10月1日起施行）；

11. Regulations on Environmental Protection Management for Construction Projects (Decree No.682 [2017] of the State Council, which shall come into force on October 1, 2017);

12、《危险化学品管理条例》（国务院令[2002]344号文件）；

12. Regulations on the Safety Management of Dangerous Chemicals (Decree No.[2002] 344 of the State Council);

13、《山东省环境保护条例》（2018年11月30日山东省第十三届人民代表大会常务委员会第七次会议修订，自2019年1月1日起施行）；

13. Regulations of Shandong Province on Environmental Protection (revised at the 7th Meeting of the Standing Committee of the 13th Shandong Provincial People's Congress on November 30, 2018 and implemented as of January 1, 2019);

14、《山东省实施<中华人民共和国环境影响评价法>办法》（2018年11月30日山东省第十三

届人民代表大会常务委员会第七次会议第三次修正）；

14. Measures of Shandong Province for Implementing the Law of the People's Republic of China on Environmental Impact Assessment (revised for the third time at the 7th Meeting of the Standing Committee of the 13th Shandong Provincial People's Congress on November 30, 2018);

15、《山东省大气污染防治条例》（2018年11月30日山东省第十三届人民代表大会常务委员会第七次会议第三次修正）；

15. Regulations of Shandong Province on Prevention and Control of Air Pollution (revised for the third time at the 7th Meeting of the Standing Committee of the 13th Shandong Provincial People's Congress on November 30, 2018);

16、《山东省水污染防治条例》（2018年9月21日山东省第十三届人民代表大会常务委员会第五次会议通过，自2018年12月1日起施行）；

16. Regulations of Shandong Province on Water Pollution Prevention and Control (Adopted at the 5th Meeting of the Standing Committee of the 13th Shandong Provincial People's Congress on September 21, 2018 and implemented as of December 1, 2018);

17、《山东省环境噪声污染防治条例》（2018年1月23日山东省第十二届人民代表大会常务委员会第三十五次会议第二次修正）；

17. Regulations of Shandong Province on Prevention and Control of Environmental Noise Pollution (revised for the second time at the 35th Meeting of the Standing Committee of the 12th Shandong Provincial People's Congress on January 23, 2018);

18、《山东省实施<中华人民共和国固体废物污染环境防治法>办法》(2018年1月23日山东省第十二届人民代表大会常务委员会第三十五次会议修正)；

18. Measures of Shandong Province for Implementing the Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste (revised at the 35th Meeting of the Standing Committee of the 12th Shandong Provincial People's Congress on January 23, 2018);

19、《山东省清洁生产促进条例》（2010年7月30日山东省第十一届人民代表大会常务委员会第十八次会议通过，自2010年11月1日起施行）；

19. Regulations of Shandong Province on Promoting Cleaner Production (adopted at the 18th Meeting of the Standing Committee of the 11th Shandong Provincial People's Congress on July 30, 2010 and implemented as of November 1, 2010);

20、《山东省扬尘污染防治管理办法》（山东省人民政府令第248号，2012.1.4）。

20. Measures for the Prevention and Control of Dust Pollution in Shandong Province (Decree No.248 of Shandong Provincial People's Government on January 1, 2012).

### 1.1.2 相关环保文件

### 1.1.2 Relevant environmental protection documents

1、《建设项目环境影响评价分类管理名录》（国家环境保护部第44号令）；

1. Catalogue of Classified Management of Environmental Impact Assessment of Construction Projects (Decree No.44 of the Ministry of Ecology and Environment);

2、《环境影响评价公众参与办法》（国家环境保护部令第4号，自2019年1月1日起施行）；

2. Measures for Public Participation in Environmental Impact Assessment (Decree No.4 of the Ministry of Ecology and Environment, which will come into force on January 1, 2019);

3、《国务院关于印发大气污染防治行动计划的通知》（国发[2013]37号）；

3. Notice of the State Council on Issuing the Action Plan for Prevention and Control of Air Pollution (GF [2013] No.37);

4、《国务院关于印发土壤污染防治行动计划的通知》（国发[2016]31号）；

4. Notice of the State Council on Issuing the Action Plan for Prevention and Control of Soil Pollution (GF [2016] No.31);

5、《国务院办公厅关于印发近期土壤环境保护和综合治理工作安排的通知》（国办发[2013]7号）；

5. Notice of the General Office of the State Council on Issuing the Work Arrangements for Recent Soil Environmental Protection and Comprehensive Management (GBF [2013] No.7);

6、《国务院关于印发打赢蓝天保卫战三年行动计划的通知》（国发[2018]22号）

6. Notice of the State Council on Issuing the Three-Year Action Plan for Winning the Battle to Defend the Blue Sky (GF [2018] No.22)

7、《中华人民共和国水污染防治法实施细则》（中华人民共和国国务院令第284号，自2000年3月20日起实施）；

7. Detailed Rules for the Implementation of the Water Pollution Prevention Law of the People's Republic of China (Decree No.284 of the State Council of the People's Republic of China, implemented as of March 20, 2000);

8、《关于切实加强风险防范严格环境影响评价管理的通知》（环境保护部文件环发[2012]98号文）；

8. Notice of the State Council on Issuing the Action Plan for the Prevention and Control of Air Pollution (HF [2012] No.98);

9、《关于进一步加强环境影响评价管理防范环境风险的通知》（国家环保部环发[2012]77号）；

9. Notice on Further Strengthening the Management of Environmental Impact Assessment to Prevent Environmental Risks (HF [2012] No.77);

10、《关于切实加强环境影响评价监督管理工作的通知》（环办[2013]104号）；

10. Notice on Strengthening the Supervision and Management of Environmental Impact Assessment (HB [2013] No.104);

11、《关于以改善环境质量为核心加强环境影响评价管理的通知（环环评〔2016〕150号）》；

11. Notice on Strengthening the Management of Environmental Impact Assessment with Improving Environmental Quality as the Core (HHP [2016] No.150);

12、《关于做好环境影响评价制度与排污许可制衔接相关工作的通知》（环办环评[2017]84号）；

12. Notice on Promoting Integration between Environmental Impact Assessment System and Pollutant Discharge Permit System (HBHP [2017] No.84);

13、《山东省人民政府关于印发山东省土壤污染防治工作方案的通知》（鲁政发[2016]37号）；

13. Notice of the People's Government of Shandong Province on Issuing the Work Plan for Soil Pollution Prevention and Control in Shandong Province (LZF [2016] No.37);

14、《山东省落实<水污染防治行动计划>实施方案》（鲁政发〔2015〕31号）；

14. Implementation Plan for Shandong Province to Implement the Action Plan for Water Pollution Prevention and Control (LZF [2015] No.31);

15、《关于进一步加强建设项目固体废物环境管理的通知》（鲁环办函[2016]141号）；

15. Notice on Further Strengthening the Environmental Management of Solid Wastes in Construction Projects (LHBH [2016] No.141);

16、《山东省人民政府关于印发<山东省2013~2020年大气污染防治规划>》（鲁政发[2013]12号）；

16. Notice of Shandong Provincial People's Government on Issuing the Air Pollution Prevention and Control Plan of Shandong Province from 2013 to 2020 (LZF [2013] No.12);

17、《关于印发〈建设项目环境影响评价政府信息公开指南（试行）〉的通知》（环办[2013]103号）；

17. Notice on Issuing the Guidance on Government Information Disclosure for Environmental Impact Assessment of Construction Projects (for Trial Implementation) (HB [2013] No.103);

18、《关于京津冀及周边地区执行大气污染物特别排放限值的公告》（环办大气函[2017]773号）；

18. Announcement on the Implementation of Special Emission Limits for Air Pollutants in Beijing, Tianjin and Hebei and Surrounding Areas (HBDQH [2017] No.773);

19、《关于京津冀大气污染传输通道城市执行大气污染物特别排放限值的公告》（环保部公告[2018]9号）；

19. Announcement on the Implementation of Special Emission Limits for Air Pollutants in Beijing, Tianjin and Hebei Air Pollution Transmission Channel Cities (HBBGG [2018] No.9);

20、《国家危险废物名录》（2016年）；

20. Directory of National Hazardous Wastes (2016 Edition);

21、《环境保护部审批环境影响评价文件的建设项目目录》（2015年本）；

21. Catalogue of Construction Items for Examination and Approval of Environmental Impact Assessment Documents by the Ministry of Environmental Protection (2015 edition);

25、《山东省环境保护厅关于发布山东省环境保护厅审批环境影响评价文件的建设项目目录（2017年本）》的通知（鲁环发[2017]260号）；

25. Notice of the Shandong Provincial Environmental Protection Department on Issuing the Catalogue of Construction Items for Examination and Approval of Environmental Impact Assessment Documents (2017 Edition) (LHF [2017] No.260);

26、《山东省加强污染源头防治推进“四减四增”三年行动方案（2018-2020年）》；

26. Strengthening Prevention and Control of Pollution Sources in Shandong Province to Promote the Three-year Action Plan of "Four Decreases and Four Increases" (2018-2020);

27、《山东省人民政府关于印发山东省打赢蓝天保卫战作战方案暨2013—2020年大气污染防治规划三期行动计划的通知》（鲁证字[2018]17号）；

27. Notice of Shandong Provincial People's Government on Issuing Shandong Province's Action Plan for Winning the Battle to Defend the Blue Sky and the Action Plan for the Third Phase of the 2013-2020 Air Pollution Prevention and Control Plan (LZZ [2018] No.17);

31、《济宁市加强污染源头防治推进“四减四增”三年行动方案（2018-2020年）》（济发[2018]35号）；

31. Strengthening Prevention and Control of Pollution Sources in Jining City to Promote the Three-year Action Plan of "Four Decreases and Four Increases" (2018-2020) (JF [2018] No.35);

### 1.1.3 相关技术规范

### 1.1.3 Relevant technical specifications

1、《环境影响评价技术导则　总纲》（HJ2.1-2016）；

1. Technical Guideline for Environmental Impact Assessment of Construction Project General Programme (HJ2.1-2016);

2、《环境影响评价技术导则　大气环境》（HJ2.2-2018）；

2. Technical Guidelines for Environmental Impact Assessment-Atmospheric Environment (HJ2.2-

2018)

3、《环境影响评价技术导则 地表水》（HJ2.3-2018）；

3. Technical Guidelines for Environmental Impact Assessment-Surface Water (HJ2.3-2018)

4、《环境影响评价技术导则 声环境》（HJ2.4-2009）；

4. Technical Guidelines for Noise Impact Assessment (HJ2.4-2009);

5、《环境影响评价技术导则 生态影响》（HJ19-2011）；

5. Technical Guideline for Environmental Impact Assessment Ecological Impact (HJ19-2011);

6、《环境影响评价技术导则 地下水》（HJ610-2016）；

6. Technical Guidelines for Environmental Impact Assessment Groundwater Environment (HJ610-2016);

7、《建设项目环境风险评价技术导则》（HJ169-2018）；

7. Technical Guidelines for Environmental Risk Assessment on Projects (HJ169-2018);

8、《水污染治理工程技术导则》（HJ2015-2012）；

8. Technical Guidelines on Water Pollution Control Engineering (HJ2015-2012);

9、《制浆造纸建设项目环境影响评价文件审批原则（试行）》。

9. Principles for Examination and Approval of Environmental Impact Assessment Documents for Pulp and Paper Construction Projects (Trial).

### 1.1.4 相关规划

### 1.1.4 Relevant planning

1、《中华人民共和国国民经济和社会发展第十三个五年规划纲要》；

1. The 13th Five-Year Plan for Economic and Social Development of the Peoples' Republic of China

2、《"十三五"生态环境保护规划》（国发[2016]65号）；

2. The 13th Five-Year Plan for Ecological Environment Protection (GF [2016] No.65);

3、《"十三五"节能减排工作方案》；

3. The 13th Five-Year Plan for Energy Conservation and Emission Reduction;

4、《山东省国民经济和社会发展第十三个五年规划纲要》；

4. The 13th Five-Year Plan for Economic and Social Development of Shandong Province;

5、《山东省主体功能区规划》（鲁政发[2013]3号）；

5. Planning of Main Functional Areas in Shandong Province (LZF [2013] No.3);

6、《山东省生态保护红线规划（2016-2020年）》（鲁政字[2016]173号）；

6. Ecological Protection Red Line Plan of Shandong Province (2016-2020) (LZZ [2016] No.173);

7、《山东省生态环境保护“十三五”规划》（鲁政发[2017]10号）；

7. The 13th Five-Year Plan for Ecological Environment Protection in Shandong Province (LZF [2017] No.10);

8、《山东省制造业“十三五”规划》；

8. The 13th Five-Year Plan for the Manufacturing Industry in Shandong Province;

9、《中国造纸协会关于造纸工业“十三五”发展的意见》；

9. Opinions of China Paper Association on the Development of Paper Industry in the 13th Five-Year Plan;

10、《兖州市城市总体规划（2004-2020年）》；

10. Yanzhou City Master Plan (2004-2020);

11、《颜店镇土地利用规划》（2006-2020年）；

11. Land Use Plan of Yandian Town (2006-2020);

12、《颜店镇总体规划（2017-2030年）》。

12. Master Plan of Yandian Town (2017-2030).

### 1.1.5 项目依据

### 1.1.5 Project basis

1、项目有关的工程设计、可研、地勘、园区环评报告等；

1. Engineering design, feasibility study, geological exploration, park environmental impact assessment report, etc. related to the project;

2、现有工程验收监测报告等。

2. Existing project acceptance monitoring report, etc.

## 1.2 评价目的与指导思想

## 1.2 Assessment purpose and guiding ideology

### 1.2.1 评价目的

### 1.2.1 Assessment purpose

根据本项目的具体情况，结合厂址周围环境状况，本次环境影响评价工作拟达到以下目的：

According to the specific conditions of this project and the surrounding environmental conditions of the plant site, the environmental impact assessment ("EIA") is intended to achieve the following purposes:

1、通过对现有及在建工程的详细分析，明确现有及在建工程生产过程中的主要产排污环节及污染物排放量，分析主要污染物达标排放的情况，找出现有及在建工程存在的主要环境问题。结合建设单位的实际情况和工程特点，提出“以新带老”措施，并论证“以新带老”措施的技术可行性和经济合理性，以彻底解决现有及在建工程存在的环境问题。

1. Through the detailed analysis of the existing projects and construction in progress, efforts are made to clarify the main production and discharge processes and pollutant emissions in the production process of the existing projects and construction in progress, analyze the discharge standards of the main pollutants, and identify the main environmental problems in the existing projects and construction in progress. Based on the actual situation of the construction unit and the characteristics of the project, the measures of "bringing the old with the new" are put forward, and the technical feasibility and economic rationality of the measures of "bringing the old with the new" are demonstrated, so as to thoroughly solve the environmental problems in existing projects and construction in progress.

2、通过对厂址周围环境现状的调查和分析，掌握评价区域环境敏感点分布、环境质量背景及现存的主要环境问题等，确定拟建项目主要环境影响要素和环境保护目标；通过对工程项目的全面分析，掌握生产装置、辅助及公用工程设施的产污环节和污染物排放特征，确定拟建项目的环境影响因子和潜在的工程环境风险特征。

2. Through the survey and analysis of the current environmental situation around the site, efforts are made to master the distribution of environmental sensitive points, environmental quality background and existing main environmental problems in the assessment area, and determine the main environmental impact factors and environmental protection objectives of the proposed project; through a comprehensive analysis of the project, efforts are made to master the pollution production processes and pollutant emission characteristics of production plant, auxiliary and public utilities, and determine the environmental impact factors and potential engineering environmental risk characteristics of the proposed project.

3、在工程分析的基础上，分析改扩建项目对“达标排放、总量控制”原则的符合性，并通过对工程环保措施的技术可靠性和经济合理性分析，提出进一步减缓污染的对策建议。

3. On the basis of engineering analysis, efforts are made to analyze the conformity of reconstruction and expansion projects to the principle of "discharge up to standard and total pollutant control", and through the analysis of technical reliability and economic rationality of engineering environmental protection measures, countermeasures and suggestions to further slow down pollution are put forward.

4、根据项目所在区域的环境特征和项目污染物排放特征，采用适宜的模式和方法预测工程建成投产后对周围环境影响的程度和范围，说明该项目投产运行后排放的污染物所引起的周围环境质量变化情况，论证本项目建设的环境可行性。

4. According to the environmental characteristics of the project area and the pollutant emission characteristics of the project, proper modes and methods are adopted to predict the degree and scope

of the impact on the surrounding environment after the project is completed and put into operation, to explain the changes in the surrounding environmental quality caused by the pollutants discharged after the project is put into operation, and to demonstrate the environmental feasibility of the project construction.

5、通过环境影响经济损益分析，论证拟建项目在经济、社会和环境效益方面的统一性。

5. Through the analysis of economic profit and loss of environmental impact, the unity of economic, social and environmental benefits of the proposed project is demonstrated.

通过以上工作，从产业政策、发展规划和环境保护的角度充分论证拟建项目在环境方面的可行性，给出环境影响评价结论，为项目的工程设计、施工、建成投产后的环境管理和为环境管理部门决策提供基础数据及依据。

Through the above work, the feasibility of the proposed project in environmental aspects is fully demonstrated from the perspectives of industrial policy, development planning and environmental protection, and the conclusion of environmental impact assessment is given so as to provide basic data and basis for engineering design, construction, environmental management after completion and operation of the project and for decision-making of environmental management departments.

### 1.2.2 指导思想

### 1.2.2 Guiding ideology

1、贯彻可持续发展原则，以国家和地方环境保护法规为依据，以有关环境保护方针政策为指导；

1. Implement the principle of sustainable development based on national and local environmental protection laws and regulations, and under the guidance of relevant environmental protection policies;

2、根据项目特点，抓住影响环境的主要因子，有重点地进行评价；

2. Grasp the main factors affecting the environment according to the characteristics of the project and selectively carry out the assessment;

3、评价方法力求科学、严谨、客观、公正；

3. Conduct assessment in a scientific, rigorous, objective and fair manner;

4、贯彻清洁生产、达标排放、总量控制的原则；

4. Implement the principles of cleaner production, emission standards, and total pollutant control;

5、规定的环保措施技术可靠、经济合理；

5. The prescribed environmental protection measures are technically reliable, economical and reasonable;

6、评价工作达到服务于项目建设并指导项目建设的目的；

6. The evaluation serves the project construction and guides the project construction;

7、在环境影响评价工作中尽量利用现有的资料，若资料不足，可根据“缺什么补什么”的原则进行工作，全面反映环境问题。

7. Make full use of the existing data in the EIA work. In case of insufficient data, efforts should be made to "supplement what is lacking" to fully reflect the environmental problems.

## 1.3 评价因子与评价标准

## 1.3 Assessment factors and criteria

### 1.3.1 污染因素识别

### 1.3.1 Identification of pollution factors

1、施工期

1. Construction period

本项目施工期主要涉及到厂房的建设、设备的安装，仓库、事故水池、废水废气处理设施等的建设。

The construction period of this project mainly involves construction of workshops, installation of equipment, and construction of warehouses, accident pools, waste water and waste gas treatment facilities, etc.

施工期具体污染因素识别见表1.3-1。

See Table 1.3-1 for the identification of specific pollution factors during the construction period.

**表1.3-1 施工期主要污染因素识别**

**Table 1.3-1 Identification of Main Pollution Factors during Construction Period**

| 环境要素<br>Environmental elements | 产生影响的主要内容<br>Main contents of impact | 主要污染因子<br>Main pollution factors |
|---|---|---|
| 环境空气<br>Ambient air | 挖掘、土石方、建材运输、存放、使用<br>Excavation, earthwork, transportation, storage and use of building materials | 扬尘<br>Dust |
| | 施工车辆尾气<br>Exhaust gas from construction vehicles | 汽车尾气<br>Vehicle tail gas |
| 水环境<br>Water environment | 施工过程中生产废水和施工人员生活废水等<br>Production waste water and domestic waste water of construction personnel during construction, etc. | CODcr、BOD5、SS<br>CODcr, BOD5, SS |
| 声环境<br>Acoustic environment | 施工机械作业、车辆运输噪声<br>Noise from construction machinery operation and vehicle transportation | 噪声<br>Noise |

2、营运期

2. Operation period

拟建项目生产过程中将产生废水、废气、固体废物和噪声，运营期主要污染因素对环境的影响识别见表1.3-2。

Waste water, waste gas, solid waste and noise will be generated in the production process of the proposed project. See Table 1.3-2 for the identification of the impact of major pollution factors on the environment during the operation period.

**表1.3-2 运营期主要污染因素识别**

**Table 1.3-2 Identification of Main Pollution Factors during Operation Period**

| 主要污染源<br>Main pollution sources | | 环境因素和污染因子<br>Environmental factors and pollution factors | | | |
|---|---|---|---|---|---|
| | | 大气污染物<br>Air pollutants | 水污染因子<br>Water pollution factors | 固废<br>Solid waste | 噪声<br>Noise |
| 主体工程<br>Main work | 木片处理、制浆工段<br>Wood chip processing and pulping section | 颗粒物、恶臭<br>PM, malodor | CODcr、BOD、NH3-N、SS等<br>CODcr, BOD, $NH_3$-N, SS, etc. | 废包装、木片、木屑、杂质、浆渣、黑液等<br>Waste packaging, wood chips, sawdust, impurities, pulp residue, black liquor, etc. | Leq(A) |
| 环保工程<br>Environmental protection engineering | 布袋除尘器<br>Bag dust collector | 颗粒物<br>PM | / | 收集粉尘<br>Dust collection | Leq(A) |
| 办公生活区<br>Office and living area | | / | CODcr、SS、BOD5、氨氮<br>CODcr, SS, BOD5, ammonia nitrogen | 生活垃圾<br>Domestic waste | / |

### 1.3.2 评价因子的确定

### 1.3.2 Assessment factor determination

根据污染因素及识别出的污染因子，确定本次环境影响评价因子见表1.3-3。

According to the pollution factors and identified pollution factors, the environmental impact assessment factors are determined as shown in Table 1.3-3.

**表1.3-3 评价因子确定一览表**

**Table 1.3-3 List of Assessment Factor Determination**

| 项目 Item / 专题 Topic | 主要污染源 Main pollution sources | 现状评价因子 Current situation assessment factor | | 预测评价因子 Forecast evaluation factor |
|---|---|---|---|---|
| | | 常规监测因子 Routine monitoring factor | 特殊监测因子 Special monitoring factor | |
| 环境空气 Ambient air | 生产废气、无组织废气 Production waste gas, unorganized waste gas | $SO_2$, $NO_2$, TSP, $PM_{10}$, $PM_{2.5}$, CO, $O_3$ | 臭气浓度、氨硫化氢、甲硫醇等 Odor concentration, ammonia hydrogen sulfide, methyl mercaptan, etc. | 颗粒物 PM |
| 地表水 Surface water | 生活污水、制浆及造纸废水等 Domestic sewage, pulping and papermaking waste water, etc. | pH、溶解氧、高锰酸盐指数、$COD_{Cr}$、$BOD_5$、$NH_3$-N、总氮、总磷、铜、锌、氟化物、硒、砷、汞、镉、铬、铅、氰化物、挥发酚、石油类、阴离子表面活性剂、硫化物粪大肠菌群、硫酸盐、氯化物、SS、全盐量共29项<br>PH, dissolved oxygen, permanganate index, CODCr, BOD5, NH3-N, total nitrogen, total phosphorus, copper, zinc, fluoride, selenium, arsenic, mercury, cadmium, chromium, lead, cyanide, volatile phenol, petroleum, anionic surfactant, sulfide fecal coliform group, sulfate, chloride, SS, total salt content, totaling 29 items | AOX、色度 AOX, Chroma | / |
| 地下水 Groundwater | 生活污水、生产废水 Domestic sewage and production waste water | $K^+$、$Na^+$、$Ca^{2+}$、$Mg^{2+}$、$CO^{2-}$、$HCO^-$、$Cl^-$、$SO_4^{2-}$、pH、总硬度、耗氧量、溶解性总固体、挥发酚、硫化物、氨氮、硝酸盐、亚硝酸盐、硫酸盐、六价铬、氯化物、氟化物、氰化物、挥发性酚类、总大肠菌群、铅、汞、镉、六价铬、砷、铜、铁、锌、锰、镍、钴、AOX等36项<br>$K^+$, $Na^+$, $Ca^{2+}$, $Mg^{2+}$, $CO^{2-}$, $HCO^-$, $Cl^-$, $SO_4^{2-}$, pH, total hardness, oxygen consumption, total soluble solids, volatile phenols, sulfides, ammonia nitrogen, nitrates, nitrite, sulfates, hexavalent chromium, chloride, fluoride, cyanide, volatile phenols, total coliforms, lead, mercury, cadmium, hexavalent chromium, arsenic, copper, iron, zinc, manganese, nickel, cobalt, AOX, etc., totaling 36 items | / | COD、氨氮 COD, ammonia nitrogen |

| | | | | |
|---|---|---|---|---|
| 噪声<br>Noise | 设备噪声<br>Equipment noise | 等效连续A声级Leq（A）<br>Equivalent continuous A sound level Leq (A) | Leq(A) | Leq(A) |
| 环境风险<br>Environmental risk | -- | --- | --- | --- |

### 1.3.3 评价标准

### 1.3.3 Assessment standard

拟建项目环境质量标准见表1.3-4，污染物排放标准见表1.3-5。

See Table 1.3-4 for environmental quality standards and Table 1.3-5 for pollutant discharge standards of the proposed project.

**表1.3-4 环境质量标准**

**Table1.3-4 Environmental Quality Standards**

| 项目 | Item | 执行标准 | Implementation standards | 标准等级及分类 | Standard grade and classification |
|---|---|---|---|---|---|
| 环境空气 | Ambient air | 《环境空气影响评价技术导则大气环境》（HJ2.2-2018）<br>《环境空气质量标准》（GB3095-2012） | Guidelines for Environmental Impact Assessment Atmospheric Environment (HJ2.2-2018)<br>Ambient Air Quality Standard (GB3095-2012) | 附录D<br>二级标准 | Appendix D<br>Level II standard |
| 地表水 | Surface water | 《地表水环境质量标准》（GB3838-2002） | Surface Water Environmental Quality Standards (GB3838-2002) | Ⅳ类标准 | Class IV standards |
| 地下水 | Groundwater | 《地下水质量标准》（GB/T14848-2017） | Quality Standard for Ground Water (GB/T14848-2017) | 表1中III类标准 | Class III standards in Table 1 |
| 声环境 | Acoustic environment | 《声环境质量标准》（GB3096-2008） | Acoustic Environment Quality Standard (GB3096-2008) | 3类标准 | Class III standards |
| 土壤 | Soil | 《土壤环境质量标准建设用地土壤污染风险管控标准》(GB36600-2018) | Soil Environmental Quality Risk Control Standard for Soil Contamination of Development Land (GB 36600-2018) | 筛选值第二类用地 | Screening value Category II land |

**表1.3-5 污染物排放标准**

**Table 1.3-5 Pollutant Discharge Standards**

| 项目 | Item | 执行标准 | Implementation standards | 标准等级或分 | Standard grade or classification |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| | | | | 类 | |
| 废气 | Exhaust gas | 《区域性大气污染物综合排放标准》（DB37/2376-2019） | Detailed Explanation of Comprehensive Emission Standards for Regional Atmospheric Pollutants (DB37/2376-2019) | 表1重点控制区标准要求 | Table1 Standard Requirements for Key Control Areas |
| | | 《大气污染物综合排放标准》（GB16297-1996） | Integrated Emission Standard of Air Pollutants (GB16297-1996) | 表2二级标准 | Level II standard of Table 2 |
| | | 《恶臭污染物排放标准》（GB14554-93） | Emission Standard for Odor Pollutants (GB14554-93) | 表1及表2 | Table 1 and Table 2 |
| | | 《挥发性有机物排放标准第7部分：其它行业》（DB37/2801.7-2019） | Emission Standard for Volatile Organic Compounds Part 7: Other Industries (DB37/2801. 7-2019) | 表2厂界标准 | Table 2 Plant Boundary Standards |
| 废水 | Waste water | 《流域水污染物综合排放标准第1部分：南四湖东平湖流域》（DB37/3416.1-2018）中一般保护区标准 | Comprehensive Discharge Standards for Water Pollutants in Watershed Part 1: Dongping Lake Watershed of Nansi Lake (DB37/3416. 1-2018) | 表2标准 | Standards of Table 2 |
| | | 《造纸工业水污染物排放标准》（DB37/336-2003） | Discharge Standard for Water Pollutants in Paper Industry (DB37/336-2003) | 表3标准 | Standards of Table 3 |
| | | 《制浆造纸工业水污染物排放标准》（GB3544-2008） | Discharge Standard of Water Pollutants for Pulp and Paper Industry (GB3544-2008) | 表2标准 | Standards of Table 2 |
| 噪声 | Noise | 《工业企业厂界环境噪声排放标准》（GB12348-2008） | Emission Standard for Industrial Enterprises Noise at Boundary (GB12348-2008) | 3类标准 | Class III standards |
| | | 《建筑施工场界环境噪声排放标准》（GB12523-2011） | Emission Standard of Environment Noise for Boundary of Construction Site (GB12523-2011) | ---- | ---- |
| 固体废物 | Solid waste | 《一般工业固体废物贮存、处置场污染控制标准》（GB18599-2001）及修改单 | | Standard for Pollution Control on the Storage and Disposal Site for General Industrial Solid Wastes (GB18599-2001) and its amendments | |
| | | 《危险废物贮存污染控制标准》（GB18597-2001）及其修改单 | | Standard for Pollution Control on Hazardous Waste Storage (GB18597-2001) and its amendments | |

## 1.4 评价等级与评价范围

## 1.4 Assessment grade and assessment scope

### 1.4.1 评价等级

### 1.4.1 Assessment grade

根据《建设项目环境影响评价技术导则总纲》（HJ2.1-2016）、《环境影响评价技术导则大气环境》（HJ2.2-2018）、《环境影响评价技术导则地表水环境》（HJ2.3-2018）、《环境影响评价技术导则地下水环境》（HJ610-2016）、《环境影响评价技术导则声环境》（HJ2.4-2009）、《环境影响评价技术导则土壤环境（试行）》（HJ964-2018）、《建设项目环境风险评价技术导则》（HJ169-2018）的要求及拟建项目所处地理位置、环境状况、排放污染物的种类、污染物量等特点，确定本次工程环境影响评价等级，具体见表1.4-1。

According to the General Outline of Technical Guidelines for Environmental Impact Assessment of Construction Projects (HJ2.1- 2016), Technical Guidelines for Environmental Impact Assessment-Atmospheric Environment (HJ2.2- 2018), Technical Guidelines for Environmental Impact Assessment Surface Water Environment (HJ2.3-2018), Technical Guidelines for Environmental Impact Assessment Groundwater Environment (HJ610-2016), Technical Guidelines for Noise Impact Assessment (HJ2.4-2009), Technical Guidelines for Environmental Impact Assessment Soil Environment (Trial) (HJ964-2018), Technical Guidelines for Environmental Risk Assessment on Projects (HJ169-2018), and the characteristics of the proposed project, such as its geographical location, environmental status, types of pollutants discharged, amount of pollutants, the environmental impact assessment grade of this project is determined, as shown in Table 1.4-1 for details.

**表1.4-1 环境影响评价等级**

**Table 1.4-1 Environmental Impact Assessment Grade**

| 专题 | Topic | 评价等级的判据 | | Grade determination basis | | 项目评价等级 | Project assessment level |
|---|---|---|---|---|---|---|---|
| 大气环境 | Atmospheric environment | Pmax | Pmax | 采用估算模式计算，拟建项目污染物最大地面浓度占标率为P粉尘=4.35% | According to the estimation model, the maximum ground concentration of pollutants in the proposed project is Pdust=4.35% | 二级 | Level II |
| | | 评价等级判定的其他依据 | Other basis for judgment of assessment grade | $P_{粉尘}$=4.35%＜10% | $P_{dust}$=4.35%＜10% | | |
| 地表水环境 | Surface water environment | 废水排放方式 | Discharge method of waste water | 间接排放 | Indirect discharge | 三级B | Class III B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 地下水环境 | Groundwater environment | 项目类别 | Project category | II类项目 | Category II project | 三级 | Class III |
| | | 建设项目场地的地下水环境敏感程度 | Groundwater environmental sensitivity of the construction project site | 拟建项目不位于水源地保护区、准保护区范围内，不敏感 | The proposed project is not located in the water source protection area or quasi-protection area and is not sensitive. | | |
| 声环境 | Acoustic environment | 项目所在地噪声类别 | Noise category at the project site | 3类区 | Category 3 area | 三级 | Class III |
| | | 敏感点噪声增加值及受噪声影响人口数量 | Noise added value of sensitive points and population affected by noise | 受噪声影响人口数量变化不大 | The number of people affected by noise has not changed much. | | |
| 环境风险（Q<1） | Environmental risk (Q<1) | 危险物质数量与临界量比值（Q） | Ratio of quantity of hazardous substances to critical quantity (Q) | Q=0.5008<1 | Q=0.5008<1 | 简单分析 | Simple analysis |
| | | 风险潜势 | Potential risk | I | I | | |
| 土壤环境（污染影响型） | Soil environment (pollution impact) | 建设项目所属行业 | Industry to which the construction project belongs | II 类 | Category II | 三级 | Class III |
| | | 拟建项目占地规模 | Scale of land occupied by the proposed project | 拟建项目永久占地 44.22hm$^2$，占地类型属于中型。 | The proposed project covers a permanent area of 44.22 hm$^2$, which is medium-sized. | | |
| | | 建设项目 | Sensitivity of soil environment | 不敏感 | Insensitive | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 所在地周边的土壤环境敏感程度 | around the construction project site Degree | | | | |
| 生态环境 | Ecological environmental | 工程占地范围 | Coverage of the project | 0.44km$^2$（<2km$^2$） | 0.44Km$^2$ (<2km$^2$) | 三级 | Class III |
| | | 影响区域生态敏感性 | Affect regional ecological sensitivity | 工业用地，非生态敏感区，属于一般区域 | Industrial land, non-ecologically sensitive area, belongs to general area | | |

### 1.4.2 评价范围

### 1.4.2 Assessment scope

各环境要素环境影响评价范围见表1.4-2、图1.4-1。

See Table 1.4-2 and Figure 1.4-1 for the environmental impact assessment scope of each environmental factor.

**表1.4-2 评价范围**

**Table 1.4.-2 Assessment Scope**

| 名称 | Name | 评价等级 | Assessment level | 评价范围 | Assessment range |
|---|---|---|---|---|---|
| 环境空气 | Ambient air | 二级评价 | Level II assessment | 以项目厂址为中心区域，厂界外延边长为5km的矩形区域作为大气环境影响评价范围 | Take the project site as the central area and the rectangular area with a length of 5km outside the plant boundary as the scope of atmospheric environmental impact assessment. |
| 地表水 | Surface water | 三级B | Class III B | / | / |
| 地下水 | Groundwater | 三级评价 | Level III assessment | 沿地下水东北-西南流向，以下游方向外扩2km，上游外扩1km，两侧向外扩1km，形成一个面积为6km2（2km×3km）的矩形评价范围 | Along the northeast-southwest flow direction of groundwater, the rectangular evaluation range extends 2km outward in the downstream direction, 1km outward in the upstream direction and 1km outward in both sides, forming an area of |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | 6km$^2$ (2km × 3km) |
| 声环境 | Acoustic environment | 三级评价 | Level III assessment | | 厂界外200m范围 | Within 200m outside the plant boundary |
| 土壤环境 | Soil environment | 三级 | Class III | | 项目占地至厂界外50m范围内 | The project covers a range up to 50m outside the plant boundary. |
| 生态影响 | Ecological impact | 三级 | Class III | | 项目占地范围 | Coverage of the project |
| 环境风险 | Environmental risk | 大气环境 | Atmospheric environment | 简单分析 Simple analysis | 无需设置评价范围 | There is no need to set assessment range |
| | | 地表水环境 | Surface water environment | | | |
| | | 地下水环境 | Groundwater environment | | | |

## 1.5 相关规划及环境功能区划

## 1.5 Relevant planning and environmental function zoning

### 1.5.1 相关规划

### 1.5.1 Relevant planning

与本项目有关的规划主要为《兖州市颜店镇总体规划（2017-2030年）》和《太阳产业园规划》。

The planning of this project mainly includes Master Planning of Yandian Town, Yanzhou City (2017-2030) and Sun Paper Industrial Park Planning.

#### 1.5.1.1 《兖州市颜店镇总体规划（2017-2030年）》

#### 1.5.1.1 Master Planning of Yandian Town, Yanzhou City (2017-2030)

根据《兖州市颜店镇总体规划（2017-2030年）》，镇区发展方向镇区的发展方向为“东拓、西控、南联、北进”

According to the Master Planning of Yandian Town, Yanzhou City (2017-2030), the development direction of the township is "expanding development area in the east, controlling ecological control area in the west, building construction area in the south and making limited urban construction in the north".

镇区用地布局：规划形成“一轴、两心、三区”的空间布局结构。“一轴”即结合城镇公共服务

带沿建设路和九州路之间形成的对接兖州城区的城镇发展轴；“两心”—即全镇的综合公共服务中心；沿城镇发展轴；结合子渊湖和现镇驻地分别规划形成两处公共服务中心；“三区”即围绕城镇发展轴和综合公共服务中心规划布局的城镇生活片区、工业片区和生态休闲片区。

Land use layout in township areas: The spatial layout structure of "one axis, two centers and three areas" is formed in the planning. "One axis" refers to the urban development axis connecting Yanzhou City, which is formed along Jianshe Road and Jiuzhou Road in combination with the urban public service belt; "two centers" refer to the town's comprehensive public service centers along the urban development axis, which are planned and formed in combination with Ziyuan Lake and the current town residence; "three areas" refer to the urban living area, industrial area and ecological leisure area planned and laid out around the urban development axis and the comprehensive public service centers.

根据《兖州市颜店镇总体规划（2017-2030年）》，项目占地为二类工业用地，位于工业片区，符合颜店镇总体规划。

According to the Master Planning of Yandian Town, Yanzhou City (2017-2030), the project covers an area of Class II industrial land and is located in an industrial area, which conforms to the Yandian Town Master Planning.

《兖州市颜店镇总体规划（2017-2030年）》见图1.5-1。

See Figure 1.5-1 for the Master Planning of Yandian Town, Yanzhou City (2017-2030).

### 1.5.1.2 《太阳新材料产业园规划》

### 1.5.1.2 Sun Paper Industrial Park Planning

产业园规划四至范围为：北至规划道路，南至王桥村南，东至德源路，西至杨家河，规划面积为93.05hm$^2$。

The planned range of the industrial park is as follows: It connects to the planned road at the north, Wangqiao Village at the south, Deyuan Road at the east and Yangjia River at the west, with a planned area of 93.05 hm$^2$.

太阳新材料产业园功能定位为：兖州区新的经济增长点，城市总体规划区内部分制浆、造纸项目的搬迁接纳区，建设成为以特种纸、特色文化用纸为主体的特色造纸园区。

The function of Sun Paper New Materials Industrial Park is as follows: Yanzhou District is a new economic growth point, and the relocation and acceptance area for some pulping and papermaking projects in the overall urban planning area will be built into a characteristic papermaking park mainly engaged in specialty paper and special printing-and-writing paper.

产业定位：以制浆和造纸为主导产业，同时配套建设碱回收生产线、供热中心。

Industrial orientation: Pulping and papermaking are the leading industries, and alkali recovery production lines and heating centers are also being built.

本项目位于太阳新材料产业内，项目为制浆和造纸项目，满足太阳新材料产业园规划布局以

及产业定位。太阳新材料产业园用地规划见图1.5-2、规划布局见图1.5-3。

The proposed project is located in the Sun Paper New Materials Industrial Park, and is a pulping and papermaking project that meets the planning layout and industrial positioning of the Sun Paper New Materials Industrial Park. See Figure 1.5-2 for the land use planning of Sun Paper New Materials Industrial Park, and Figure 1.5-3 for the planning layout.

### 1.5.2 环境功能区划

### 1.5 Environmental function zoning

根据项目所在区域环境现状以及相关标准、规范要求，确定该区域环境功能区划如下：

According to the current environmental situation of the region where the project is located and the requirements of relevant standards and specifications, the environmental function zoning of the region is determined as follows:

1、环境空气：区域为二类环境空气质量功能区，执行《环境空气质量标准》（GB3095-2012）二级标准。

1. Ambient Air: The project is located in Category II ambient air quality functional area, which is subject to Level II standard in Ambient Air Quality Standard (GB3095-2012).

2、地表水：主要水体杨家河、泗河为Ⅳ类水体，执行《地表水环境质量标准》（GB3838-2002）Ⅳ类标准。

2. Surface water: The main water bodies Yangjia River and Si River are Class IV water bodies, which shall be subject to the Class IV standard in Environmental Quality Standards for Surface Water (GB3838-2002);

3、地下水：本项目地下水执行《地下水质量标准》（GB/T14848-2017）Ⅲ类标准。

3. Groundwater: The groundwater shall comply with Category III standard in Quality Standard for Ground Water (GB/T14848-2017).

4、声环境：项目所在区域为3类噪声功能区，执行《声环境质量标准》（GB3096-2008）3类标准。

4. Acoustic environment: The project is located in the Category 3 noise functional area, which shall be subject to the Class III standards of Environmental Quality Standard for Noise (GB3096-2008).

5、土壤环境：项目用地属于第二类用地，城市建设用地中的工业用地（M），土壤环境执行《土壤环境质量标准建设用地土壤污染风险管控标准（试行）》(GB36600-2018)表1、表2中第二类用地筛选值。

5. Soil environment: The project land belongs to the Type II land, and the industrial land (M) in the urban construction land. The soil environment shall be subject to the screening values of the Type II land in Tables 1 and 2 of the Soil Environmental Quality Risk Control Standard for Soil Contamination of Development Land (Trial) (GB36600-2018).

## 1.6 主要环境保护目标

## 1.6 Main environmental protection objectives

根据当地气象、水文、地质条件和该项目“三废”排放情况及厂址周围企事业单位、村庄、居民区等环境敏感目标分布情况，确定本次主要环境保护目标见表1.6-1及图1.4-1。

According to the local meteorological, hydrological and geological conditions, the discharge of the "three wastes" of the project and the distribution of environmentally sensitive targets such as enterprises, institutions, villages and residential areas around the plant site, the main environmental protection targets are determined as shown in Table 1.6-1 and Figure 1.4-1.

**表1.6-1 主要环境保护目标**

**Table 1.6Main Environmental Protection Objectives**

| 项目 | Item | 类型 | Type | 敏感目标 | Sensitive targets | 规模 Scale | | 相对项目厂界 Relative project plant boundary | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 人口（人） Population (person) | 户数（户） Number of households (household) | 方位 Azimuth | 距离(m)Distance (m) |
| 环境空气 | Ambient air | 村庄 | Village | 南王家屯村 | Nanwangjiatun Village | 769 | 128 | N | 1328 |
| | | 村庄 | Village | 胡家街村 | Hujiajie Village | 416 | 69 | N | 2771 |
| | | 村庄 | Village | 张家庄 | Zhangjiazhuang Village | 413 | 68 | N | 3370 |
| | | 村庄 | Village | 霍庄 | Huozhuang Village | 362 | 60 | N | 3568 |
| | | 村庄 | Village | 郭家楼村 | Guojialou Village | 561 | 93 | N | 3856 |
| | | 村庄 | Village | 天齐庙村 | Tianqimiao Village | 625 | 104 | N | 4314 |
| | | 村庄 | Village | 前海村 | Qianhai Village | 314 | 52 | NNW | 2171 |
| | | 村庄 | Village | 坊上村 | Fangshang Village | 324 | 54 | NNW | 2321 |
| | | 村庄 | Village | 毛家庙村 | Maojiamiao Village | 797 | 132 | NW | 1703 |
| | | 村庄 | Village | 翟村一村 | Zhaicunyi Village | 1036 | 172 | NW | 3213 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 村庄 | Village | 石家街村 | Shijiajie Village | 467 | 77 | WNN | 558 |
| | 村庄 | Village | 南彭村 | Nanpeng Village | 368 | 61 | WN | 645 |
| | 村庄 | Village | 屯头一村 | Tuntouyi Village | 2030 | 338 | WN | 2746 |
| | 村庄 | Village | 北刘庄村 | Beiliuzhuang Village | 420 | 70 | WWN | 4109 |
| | 村庄 | Village | 小张庄 | Xiaozhangzhuang Village | 310 | 51 | WWN | 4677 |
| | 村庄 | Village | 韩家街村 | Hanjiajie Village | 460 | 76 | W | 483 |
| | 村庄 | Village | 刘家街村 | Liujiajie Village | 480 | 80 | W | 794 |
| | 村庄 | Village | 屯头四村 | Tuntousi Village | 585 | 97 | W | 2540 |
| | 村庄 | Village | 何岗村 | Hegang Village | 349 | 58 | W | 4624 |
| | 村庄 | Village | 玄帝庙村 | Xuandimiao Village | 675 | 112 | WS | 1161 |
| | 村庄 | Village | 周家堌堆村 | Zhoujiagudui Village | 460 | 76 | WS | 1358 |
| | 村庄 | Village | 付家庙村 | Fujiamiao Village | 510 | 85 | WSS | 1027 |
| | 村庄 | Village | 皇桥村 | Huangqiao Village | 1236 | 206 | WSS | 4146 |
| | 村庄 | Village | 陈厂村 | Chenchang Village | 481 | 80 | WSS | 4526 |
| | 村庄 | Village | 岗上村 | Gangshang Village | 466 | 77 | SE | 3646 |
| | 村庄 | Village | 蒋屯村 | Jiangtun Village | 697 | 116 | SE | 3877 |
| | 村庄 | Village | 东岗村 | Donggang Village | 479 | 79 | SE | 3697 |
| | 村庄 | Village | 杨厂村 | Yangchang Village | 519 | 86 | EES | 4191 |
| | 村庄 | Village | 东稻营村 | Dongdaoying Village | 524 | 87 | E | 4772 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 村庄 | Village | 徐家营村 | Xujiaying Village | 1680 | 280 | EEN | 1087 |
| | | 村庄 | Village | 土楼闸村 | Tulouzha Village | 879 | 146 | EEN | 4941 |
| | | 村庄 | Village | 泗庄村 | Sizhuang Village | 1500 | 250 | ENN | 3668 |
| | | 村庄 | Village | 沈官屯村 | Shenguantun Village | 1200 | 200 | ENN | 4437 |
| 地表水 | Surface water | 河流 | River | 杨家河 | Yangjia River | / | / | W | 100 |
| | | 河流 | River | 泗河 | Si River | / | / | E | 10000 |

备注：评价范围内的环境保护目标环境空气执行GB3095-2012二级标准；地表水杨家河、泗河执行GB3838-2002Ⅳ类标准；评价范围内地下水执行GB/T14848-2017Ⅲ类标准。

Note: The ambient air of the environmental protection target within the evaluation scope shall be subject to GB3095-2012 Grade II standard; surface water Yangjia River and Si River shall be subject to GB3838-2002 Class IV standard; groundwater within the evaluation scope shall be subject to GB/T14848-2017 Class III standard.

# 第2章 工程分析

# Chapter 2 Engineering Analysis

## 2.1 现有及在建工程概况

## 2.1 Overview of existing projects and construction in progress

### 2.1.1 企业概况

### 2.1.1 Company profile

#### 2.1.1.1 企业基本情况

#### 2.1.1.1 General information

山东太阳纸业股份有限公司是山东太阳控股集团有限公司下属子公司，前身为兖州造纸厂，始建于1982年，1994年经山东省体改委批准组建为山东太阳纸业集团总公司，1997年成立山东太阳纸业股份有限公司（以下简称太阳纸业）。经过30多年的发展，太阳纸业已发展成为一家全球先进的跨国造纸集团和林浆纸一体化企业，是中国最大的民营造纸企业、中国500强企业之一，并列全世界造纸百强行列。太阳纸业目前共有2个厂区，一个位于山东兖州工业园区内，一个位于兖州市西南角处的徐家营氧化塘周围，厂区地理位置见图2.1-1。

Shandong Sun Paper Co., Ltd., a subsidiary of Shandong Sun Holdings Group, was previously known as Yanzhou Paper Mill founded in 1982. In 1994, Shandong Sun Paper Group Corporation was established with the approval of Shandong Economic Restructuring Commission and in 1997, Shandong Sun Paper Co., Ltd. was established (hereinafter referred to as “Sun Paper”). After over three decades of development, Sun Paper has developed into a global advanced multinational paper-making group and a forest-pulp-paper integration enterprise. It is China's largest private paper-making enterprise, one of China's top 500 enterprises, and ranks among the world's top 100 paper-making enterprises. Sun Paper currently has 2 plant areas, one located in Yanzhou Industrial Park in Shandong Province and the other located around Xujiaying Oxidation Pond in the southwest corner of Yanzhou City. See Figure 2.1-1 for the geographical location of the plant areas.

#### 2.1.1.2 现有及在建工程基本情况

#### 2.1.1.2 Basic situation of existing projects and construction in progress

太阳纸业现有4条制浆生产线、1条天然纤维浆板线、13条造纸生产线、3条碱回收线、1条石灰生产线以及配套热电工程、污水处理工程。太阳纸业现有及在建工程基本情况见**表2.1-1**。

Sun Paper now has 4 pulping production lines, 1 natural fiber pulp board line, 13 paper production lines, 3 alkali recovery lines, 1 lime production line, as well as matched supporting thermal power projects and sewage treatment projects. See Table 2.1-1 for the basic information of existing projects and construction in progress of Sun Paper.

由该表可见，太阳纸业共有24个现有项目，均已进行了环评，并已取得相关环保部门批复，

22个项目已通过环保验收或现状评估备案，其中一个项目已停运；1个项目正在进行技改，1个项目正在试生产、即将申请验收。

As can be seen from the table, Sun Paper has a total of 24 existing projects, all of which have undergone environmental impact assessment and have obtained approval from relevant environmental protection departments. A total of 22 projects have passed environmental protection acceptance or status assessment filing, and one of them has been shut down, one is undergoing technological transformation, and one is undergoing trial production and will soon apply for acceptance.

**拟建项目位于太阳新材料产业园，故本次评价对全厂污染物排放情况进行评价。**

**As the proposed project is located in Sun Paper New Materials Industrial Park, this assessment assesses the pollutant discharge of the whole plant.**

## 表2.1-1 太阳纸业现有及在建项目组成一览表

## Table 2.1-1 Composition of Existing Projects and Construction in Progress of Sun Paper

| 序号 | S/n | 项目名称 | Project name | 环评批复情况 | EIA approval | 投产时间 | Production time | 验收情况 | Acceptance situation | 建设规模及配套工程 | Construction scale and auxiliary projects | 备注 | Remarks | 位置 | Location |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 9.8万t/a化机浆一期工程 | 98,000 t/a Chemical Mechanical Pulp Phase I Project | 鲁环审[2007]35号，2007.3.14 | LHS [2007] No.35, 2007.3.14 | 2008.12 | 2008.12 | 鲁环验[2012]53号 | LHY[2012] No.53 | 采用碱性过氧化氢法生产工艺，年产热磨化学机械木浆9.8万t；精浆得率为90.9%；黑液提取率为98% | The alkaline hydrogen peroxide production process is adopted, with an annual output of 98,000 t of thermo-mill chemical mechanical wood pulp. The yield of seminal pulp is 90.9%, and the extraction rate of black liquor is 98%. | 正常运营 | Normal operation | 兖州工业园区 | Yanzhou Industrial Park |
| 2 | 2 | 9.8万t/a化学机械木浆扩建项目 | 98,000 t/a Chemical Mechanical Pulp Expansion Project | 鲁环审[2010]53号，2010.2.8 | LHS[2010] No.53, 2010.2.8 | 2010.8 | 2010.8 | 鲁环验[2012]117号 | LHY[2012] No.117 | 采用碱性过氧化氢法生产工艺，年产热磨化学机械木浆9.8万t；精浆得率为90.9%；黑液提取率为98% | The alkaline hydrogen peroxide production process is adopted, with an annual output of 98,000 t of thermo-mill chemical mechanical wood pulp. The yield of seminal pulp is 90.9%, and the extraction rate of black liquor is 98%. | 正常运营 | Normal operation | | |
| 3 | 3 | 年产30万吨高纯天然纤维技改项目 | 300,000 t/a High Purity Natural Fiber Technical Transformatio | 兖环审[2018]7号，2018.9.4 | YHS[2018] No.7, 2018.9.4 | 2019.8 | 2019.8 | 试生产 | Trial production | 高纯度天然纤维技术改造项目年产9.8万高纯度天然纤维，由济环验[2016]25号获得验 | The high purity natural fiber technical transformation project has an | 即将申请验收 | About to apply for acceptance | | |

| 序号 | S/n | 项目名称 | Project name | 环评批复情况 | EIA approval | 投产时间 | Production time | 验收情况 | Acceptance situation | 建设规模及配套工程 | Construction scale and auxiliary projects | 备注 | Remarks | 位置 | Location |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | n Project | | | | | | | 收，后扩建至年产天然高纯纤维30万吨 | annual output of 98,000 high purity natural fibers. Accepted by JHY [2016] No.25, the project is expanded to 300,000 t/a natural high purity fibers. | | | | |
| 4 | 4 | 年产40万吨化机浆及配套碱回收工程 | 400,000 t/a Chemical Mechanical Pulp and Supporting Alkali Recovery Project | 现状评估 | Status assessment | 2013.03 | 2013.03 | 已备案，兖环审[2017]4号 | Filed, YHS [2017] No.4 | 2条年产20万吨化学机械浆生产线、1条450t/d碱回收生产线、1条900t/d碱回收生产线、1条500t/d生石灰生产线 | Two 200,000 t/a chemical mechanical pulp production lines, one 450t/d alkali recovery production line, one 900t/d alkali recovery production line and one 500t/d quicklime production line | 正常运营 | Normal operation | | |
| 5 | 5 | 1000t/d碱回收生产线 | 1,000t/d alkali recovery production line | 鲁环审[2009]48号，2009.2.6 | LHS[2009] No.48, 2009.2.6 | 2010.08 | 2010.08 | 鲁环验[2012]56号 | LHY[2012] No.56 | 1000t/d碱回收生产线及余热回收发电和300t/d碱回收生产线（300t/d碱回收生产线于2008年1月建成投产、未验收，已关停） | 1,000t/d alkali recovery production line, waste heat recovery power generation and 300t/d alkali recovery production line (300t/d alkali recovery production line was completed and put into operation in January 2008, has not been accepted, and has been shut down) | 正常运营 | Normal operation | | |
| 6 | 6 | 5万t/a低定 | 50,000 t/a low- | 鲁环发 | LHF[2001] | 2001.11 | 2001.11 | 2002年1 | Passed | 配有3520mm纸机 | Equipped with a | 正常运 | Normal | | |

| 序号 | S/n | 项目名称 | Project name | 环评批复情况 | EIA approval | 投产时间 | Production time | 验收情况 | Acceptance situation | 建设规模及配套工程 | Construction scale and auxiliary projects | 备注 | Remarks | 位置 | Location |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 量涂布纸生产项目 | weight coated paper production project | [2001]257号，2001.6.22 | No. 257, 2001.6.22 | | | 月30日通过原山东省环保局验收 | acceptance of the former Shandong Provincial Environmental Protection Bureau on January 30, 2002. | 1台，车速600m/min，年产低定量涂布纸5万t | 3,520mm paper machine with a speed of 600m/min and an annual output of 50,000 t of low-weight coated paper. | 营 | operation | | |
| 7 | 7 | 12万t/a涂布白卡纸生产项目 | 120,000 t/a Coated White Cardboard Production Project | 鲁环发[2001]351号，2001.8.9 | LHF[2001] No.351, 2001.8.9 | 2001.06 | 2001.06 | 鲁环验[2005]20号 | LHY[2005] No.20 | 配有3400mm纸机1台，车速400m/min，年产涂布白卡纸12万t；配套2万m³/d中段水预处理站 | Equipped with one 3,400mm paper machine with a speed of 400m/min and an annual output of 120,000 t of coated white cardboard; and 20,000 m³/d mid-section water pretreatment station. | 2万m³/d中段水预处理站已停用 | The 20,000 m³/d mid-section water pretreatment station has been shut down. | | |
| 8 | 8 | 10万t/a高档信息用纸生产线 | 100,000 t/a High-grade Information Paper Production Line | 鲁环审[2003]149号，2003.12.23 | LHS[2003] No.149, 2003.12.23 | 2005.05 | 2005.05 | 鲁环验[2005]44号 | LHY[2005] No.44 | 配有4950mm纸机1台，车速1300m/min，年产高档高档信息用纸10万t。配套260t/d碱回收、1#纸机白水处理站及中段水处理站 | Equipped with a 4,950mm paper machine with a speed of 1,300m/min and an annual output of 100,000 t of high-grade information paper. Equipped with 260t/d alkali recovery, 1 # paper machine white water treatment station and mid-section water treatment station | 260t/d碱回收和中段水处理站目前已停用 | The 260t/d alkali recovery and mid-section water treatment station has been shut down at present. | | |
| 9 | 9 | 30万t/a高档液体包装纸 | 300,000 t/a High-grade | 国环审[2003]235 | GHS[2003] No.235, | 2005.01 | 2005.01 | 济环验[2005]15 | JHY[2005] No.15 | 配有6400mm纸机1台，车速 | Equipped with a 6,400mm paper | 正常运 | Normal operation | | |

| 序号 | S/n | 项目名称 | Project name | 环评批复情况 | EIA approval | 投产时间 | Production time | 验收情况 | Acceptance situation | 建设规模及配套工程 | Construction scale and auxiliary projects | 备注 | Remarks | 位置 | Location |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 项目 | Liquid Wrapping Paper Project | 号，2003.9.11 | 2003.9.11 | | | 号 | | 900m/min，30万t/a高档系列包装纸板调整为30万t/a高档液体包装纸板。配套3#纸机白水处理站 | machine with a speed of 900m/min, and the 300,000 t/a high-grade series packaging cardboard is adjusted to 300,000 t/a high-grade liquid packaging cardboard. Equipped with 3 # Paper Machine White Water Treatment Station | 营 | | | |
| 10 | 10 | 20万t/a涂布白卡纸生产项目 | 200,000 t/a Coated White Cardboard Production Project | 鲁环审[2005]56号，2005.4.5 | LHS[2005] No.56, 2005.4.5 | 2005.01 | 2005.01 | 鲁环验[2005]20号 | LHY[2005] No.20 | 配有3200mm纸机2台，车速600m/min，年产涂布白卡纸20万t。配套3万m³/d生化处理站 | Equipped with two 3,200mm paper machines with a speed of 600m/min and an annual output of 200,000 t of coated paper. Equipped with 30,000 m/d biochemical treatment station | 3万m³/d生化处理站已停用 | The 30,000 m³/d biochemical treatment station has been shut down. | | |
| 11 | 11 | 9.8万t/a激光打印纸项目 | 98,000 t/a Laser Printing Paper Project | 鲁环审[2006]23号，2006.3.6 | LHS[2006] No.23, 2006.3.6 | 2008.11 | 2008.11 | 鲁环验[2012]54号 | LHY[2012] No.54 | 配有4950mm纸机1台，车速1300m/min，年产激光打印纸9.8万t | Equipped with a 4,950mm paper machine with a speed of 1,300m/min and an annual output of 98,000 t of laser printing paper. | 正常运营 | Normal operation | | |
| 12 | 12 | 9.8万t/a热敏纸项目 | 98,000 t/a Thermo-Sensitive Paper Project | 鲁环审[2007]218号，2007.11.13 | LHS [2007] No.218, 2007.11.13 | 2011.04 | 2011.04 | 鲁环验[2012]119号 | LHY[2012] No.119 | 配有4860mm纸机1台，车速1300m/min，年产热敏纸9.8万t | Equipped with a 4,860mm paper machine with a speed of 1,300m/min and | 正常运营 | Normal operation | | |

| 序号 | S/n | 项目名称 | Project name | 环评批复情况 | EIA approval | 投产时间 | Production time | 验收情况 | Acceptance situation | 建设规模及配套工程 | Construction scale and auxiliary projects | 备注 | Remarks | 位置 | Location |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | an annual output of 98,000 t of thermo-sensitive paper. | | | | |
| 13 | 13 | 30万t/a轻型纸项目 | 300,000 t/a Light Paper Project | 鲁环审[2011]173号，2011.7.28 | LHS [2011] No.173, 2011.7.28 | 2016.1 | 2016.1 | 济环验[2016]23号 | JHY[2016] No.23 | 配有7280mm纸机1台，车速1000~1300m/min，年产轻型纸30万t | Equipped with a 7,280mm paper machine with a speed of 1,000~1,300m/min and an annual output of 300,000 t of light weight paper. | 正常运行 | Normal operation | | |
| 14 | 14 | 12万t/a高档生活用纸项目 | 120,000 t/a High-grade Household Paper Project | 鲁环审[2013]180号，2013.9.2 | LHS [2013] No.180, 2013.9.2 | 2016.1 | 2016.1 | 济环验[2016]24号 | JHY[2016] No.24 | 配有5600mm新型高速纸机2台，车速2000m/min，年产高档生活用纸12万t | Equipped with two 5,600mm paper machines with a speed of 2,000m/min and an annual output of 120,000 t of high-grade household paper. | 正常运营 | Normal operation | | |
| 15 | 15 | 30万t/a高松厚度纯质纸项目 | 300,000 t/a Highbulk Pure Paper Project | 鲁环审[2009]188号，2009.12.3 | LHS[2009] No.188, 2009.12.3 | 2016.6 | 2016.6 | 济环验[2016]21号 | JHY[2016] No.21 | 配有7280mm纸机1台，车速1800m/min，年产高松厚度纯质纸30万t | Equipped with a 7,280mm paper machine with a speed of 1,800m/min and an annual output of 300,000 t of highbulk pure paper. | 正常运营 | Normal operation | | |
| 16 | 16 | 40万t/a高档食品包装卡纸项目 | 400,000 t/a High-grade Food Packaging Paper Cardboard Project | 鲁环审[2011]172号，2011.7.28 | LHS [2011] No.172, 2011.7.28 | 2016..1 | 2016.1 | 济环验[2016]22号 | JHY[2016] No.22 | 配有6100mm纸机1台，纸机车速500~1000m/min，年产高档食品包装卡纸40万t，3万$m^3$/dCQJ型超效浅层离子气浮净水器，替代现有生化处理站中2.6万 | Equipped with a 6,100mm paper machine with a speed of 500 ~ 1,000m/min and an annual output of 400,000 t of high-grade food packaging cardboard. The | 正常运营 | Normal operation | 兖州工业园区 | Yanzhou Industrial Park |

| 序号 | S/n | 项目名称 | Project name | 环评批复情况 | EIA approval | 投产时间 | Production time | 验收情况 | Acceptance situation | 建设规模及配套工程 | Construction scale and auxiliary projects | 备注 | Remarks | 位置 | Location |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | m³/d的处理设施和3#纸机白水处理站 | 30,000 m³/d CQJ super-effective shallow ion air flotation water purifier replaces the 26,000 m³/d treatment facility in the existing biochemical treatment station and the 3 # paper machine white water treatment station. | | | | |
| 17 | 17 | 年产20万吨高档特种纸项目 | 200,000 t/a High-grade Specialty Paper Project | 济环审[2017]25号2017.12 | JHS[2017] No.25, 2017.12 | 2019.8 | 2019.8 | 试生产 | Trial production | 配有1条芬兰Metso公司进口的幅宽3800mm、车速1000m/min的高速纸机，年产20万吨高档特种纸 | Equipped with a high-speed paper machine imported by Finnish Metso with a width of 3,800mm and a speed of 1,000m/min, with an annual output of 200,000 tons of high-grade specialty paper. | 即将申请验收 | About to apply for acceptance | | |
| 18 | 18 | 自备热电厂三期工程 | Phase III Project of Self-provided Thermal Power Plant | 现状评估 | Status assessment | 150MW机组为2008.12 | 150MW unit, 2008.12 | 已备案，鲁环评函[2016]32号 | Filed, YHPH [2016] No.32 | 建成1台480t/h超高温高压煤粉锅炉配1×150MW抽凝机组 | Built a 480t/h ultra-high temperature and high pressure pulverized coal boiler with a 1 × 150 MW condensing unit. | 正常运营 | Normal operation | | |
| 19 | 19 | 1×480t/h流化床锅炉改扩建项目 | 1 × 480 t/h Fluidized Bed Boiler Reconstruction and Extension Project | 兖环审[2016]8号2016.12.22 | YHS[2016] No.8, 2016.12.22 | 2019.1 | 2019.1 | 兖环验[2019]16号 | YHY[2019] No.16 | 1×480t/h高温高压循环流化床锅炉配1×60MW背压式汽轮发电机组 | 1 × 480 t/h high temperature and high pressure circulating fluidized bed boiler equipped with 1 × 60 mw back pressure | 正常运营 | Normal operation | | |

| 序号 | S/n | 项目名称 | Project name | 环评批复情况 | EIA approval | 投产时间 | Production time | 验收情况 | Acceptance situation | 建设规模及配套工程 | Construction scale and auxiliary projects | 备注 | Remarks | 位置 | Location |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | turbogenerator unit | | | | |
| 20 | 20 | 1×50MW背压机组改扩建工程 | 1 × 50 MW Back Pressure Unit Reconstruction and Extension Project | 鲁环审[2009]242号，2009.12.25 | LHS[2009] No.242, 2009.12.25 | 2010.05 | 2010.05 | 鲁环验[2012]82号 | LHY[2012] No.82 | 410t/h锅炉配1×50MW背压机组 | 410t/h boiler equipped with 1 × 50 MW back pressure unit | 正常运营 | Normal operation | | |
| 21 | 21 | 1×50MW背压机组扩建工程 | 1 × 50 MW Back Pressure Unit Expansion Project | 鲁环审[2010]286号，2010.10.18 | LHS[2010] No.286, 2010.10.18 | 2011.10.26 | 2011.10.26 | 鲁环验[2012]83号 | LHY[2012] No.83 | 新增410t/h锅炉配1×50MW背压机组 | Added 410t/h boiler with 1 × 50 MW back pressure unit | 正常运营 | Normal operation | | |
| 22 | 22 | 自备热电厂4×130t/hCFB锅炉机组烟气脱硝工程 | Flue Gas Denitration Project of 4 × 130 t/h CFB Boiler Unit in Self-provided Thermal Power Plant | 国环审[2006]309号，2006.6.27 | GHS[2006] No.309, 2006.6.27 | 2009.05 | 2009.05 | 鲁环验[2012]144号 | LHY[2012] No.144 | 自备热电厂二期工程4台130t/h（三用一备）锅炉＋3×25MW机组 | Four 130t/h (three-operation and one-standby) boilers ＋ 3×25MW units in Phase II of the self-provided thermal power plant | 4×130t/h锅炉已停运 | The 4 × 130 t/h boiler has been shut down. | | |
| | | | | 兖环审报告表[2013]4号 2013.3.26 | YHS Report [2013] No.4, 2013.3.26 | 2016 | 2016 | 兖环验[2016]38号 | YHY[2016] No.38 | 对自备热电厂现有二期工程配套的4×130t/hCFB锅炉进行SNCR脱硝改造，设计脱硝效率60% | The 4 × 130 t/h CFB boiler in Phase II of the self-provided thermal power plant was revamped with SNCR denitration, and the designed denitration efficiency was 60% | | | | |
| 23 | 23 | 废水治理节能减排及资源化工程 | Waste Water Treatment, Energy Saving, Emission Reduction and Resource | 济环审[2010]74号，2010.9.26 | JHS[2010] No.74, 2010.9.26 | 2011.9 | 2011.9 | 济环验[2012]3号 | JHY[2012] No.3 | 新建8万m³/d中段水处理设施，建成后替代现有的2万m³/d中段水预处理站、6万m³/d中段 | New 80,000 m³/d mid-section water treatment facility will be built to replace the existing 20,000 | 拟建项目依托 | Proposed project | / | / |

| 序号 | S/n | 项目名称 | Project name | 环评批复情况 | EIA approval | 投产时间 | Production time | 验收情况 | Acceptance situation | 建设规模及配套工程 | Construction scale and auxiliary projects | 备注 | Remarks | 位置 | Location |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Utilization Project | | | | | | | 水处理站和生化处理站中的3万m³/d的处理设施 | m³/d mid-section water treatment station, 60,000 m³/d mid-section water treatment station and 30,000 m³/d treatment facility in the biochemical treatment station upon completion. | | | | |
| 24 | 24 | 造纸固废焚烧发电资源综合利用搬迁改造工程 | Relocation and Reconstruction Project for Comprehensive Utilization of Solid Waste Incineration Power Generation Resources | 鲁环审[2015]162号 2015.7.1 | LHS[2015] No.162, 2015.7.1 | 2017.6 | 2017.6 | 正在验收 | During acceptance | 1×180t/h高温高压循环流化床锅炉配1×50MW高温高压纯凝机组 | 1 × 180 t/h high temperature and high pressure circulating fluidized bed boiler with 1 × 50 MW high temperature and high pressure pure condensing unit | 正常运行 | Normal operation | 太阳新材料产业园 | Sun Paper New Materials Industrial Park |

### 2.1.1.4 厂区总图布置

### 2.1.1.4 General layout

山东太阳纸业股份有限公司兖州厂区包括两大部分，其中总厂区位于兖州工业园区日荷铁路以东、新兖镇政府以北、赵家村以西、九州大道以南，总厂区西南约9km处、府河北侧设置一小型厂区，位于太阳新材料产业园，包括废水治理节能减排及资源化工程、造纸固废焚烧发电资源综合利用搬迁改造工程两个项目。拟建项目位于太阳新材料产业园，现有工程重点分析位于太阳新材料产业园的厂区平面布置情况。该厂区共布置2个项目，其中废水治理节能减排及资源化工程位于厂区东北部，造纸固废焚烧发电资源综合利用搬迁改造工程位于厂区西南角。该厂区未设置生活区。该厂区的平面布置情况具体见图2.1-2。

The Yanzhou plant area of Shandong Sun Paper Co., Ltd. includes two parts. Among them, the main plant area is located in Yanzhou Industrial Park to the east of Rihe Railway, to the north of Xinyan Town Government, to the west of Zhaojia Village and to the south of Jiuzhou Avenue. A small plant area is set up at about 9km southwest of the general plant area and on the north side of Fuhe River. It is located in Sun Paper New Materials Industrial Park, including two projects: waste water treatment, energy conservation, emission reduction and recycling project, and comprehensive utilization, relocation and reconstruction project of paper-making solid waste incineration power generation resources. The proposed project is located in the Sun Paper New Materials Industrial Park, and the existing project focuses on analyzing the layout of the plant area located in the Sun Paper New Materials Industrial Park. There are two projects in the plant area, of which the waste water treatment, energy conservation, emission reduction and recycling project is located in the northeast of the plant area, and the comprehensive utilization, relocation and reconstruction project of paper-making solid waste incineration power generation resources is located in the southwest corner of the plant area. There is no living area in the plant area. See Figure 2.1-2 for the layout of the plant area.

## 2.1.2 现有工程分析

## 2.1.2 Analysis of existing project

### 2.1.2.1 给水

### 2.1.2.1 Water supply

山东太阳纸业股份有限公司供水由自备水井及南水北调地表水提供；目前自备水井共设12眼，总供水能力约为9.12万$m^3/d$（3100万$m^3/a$），南水北调供水能力为1.76万$m^3/d$（600万$m^3/a$），合计10.88万$m^3/d$（3700万$m^3/a$）。现有工程总用水量95421.91$m^3/d$（3148.9万$m^3/a$）。

The water supply of Shandong Sun Paper Co., Ltd. is provided by its own wells and surface water from the South-to-North Water Diversion Project. At present, there are 12 self-provided wells with a total water supply capacity of 91,200 $m^3/d$ (31 million $m^3/a$) and 17,600 $m^3/a$ (6 million $m^3/a$) for the South-to-North Water Diversion Project, totaling 108,800 $m^3/a$ (37 million $m^3/a$). The total

water consumption of the existing project is 95421.91 m³/d (31.489 million m³/a).

### 2.1.2.2 排水

### 2.1.2.2 Drainage

太阳纸业各生产、生活单元产生的废水总量76997.22m³/d，统一经污水管网汇入总厂区西南部的废水治理节能减排及资源化工程，再经徐家营氧化塘处理和杨家河湿地进一步处理后排入泗河，最终汇入南四湖。现有工程用水量统计见表2.1-2和图2.1-3。

The total amount of waste water generated by each production and living unit of Sun Paper is 76997.22 m³/d, which is unified into the waste water treatment, energy saving, emission reduction and recycling project in the southwest of the general plant area through the sewage pipe network, then discharged into Sihe River after treatment by Xujiaying Oxidation Pond and further treatment by Yangjiahe Wetland, and finally into Nansi Lake. See Table 2.1-2 and Figure 2.1-3 for water consumption of existing project.

**表2.1-2 全厂各工程用排水情况一览表（单位：m³/d）**

**Table 2.1-2 List of Drainage for Project of the Plant (Unit: m³/d)**

| 序号 | S/n | 用水项目或单元 | Water use project or unit | 新鲜水 | Fresh water | 排放量 Emission |
|---|---|---|---|---|---|---|
| 1 | 1 | 5万t/a双胶纸生产线 | 50,000 t/a two-side offset paper production line | 967.0 | 967.0 | 267 |
| 2 | 2 | 5万t/a低定量涂布纸生产线 | 50,000 t/a low-weight coated paper production project line | 1212.0 | 1212.0 | |
| 3 | 3 | 10万t/a高档信息用纸生产线 | 100,000 t/a high-grade information paper production line | 3450.0 | 3450.0 | 14669 |
| 4 | 4 | 9.8万t/a热敏纸生产线 | 98,000 t/a thermo-sensitive production line | 2982.5 | 2982.5 | |
| 5 | 5 | 2条9.8万t/a化机浆生产线 | Two 98,000 t/a chemical mechanical pulp production lines | 1510.5 | 1510.5 | |
| 6 | 6 | 12万t/a高档生活用纸生产线 | 120,000 t/a high-grade household paper production line | 1800.5 | 1800.5 | |
| 7 | 7 | 30万t/a轻型纸生产线 | 300,000 t/a light paper production line | 5735.5 | 5735.5 | |
| 8 | 8 | 9.8万t/a激光打印纸生产线 | 98,000 t/a laser printing paper production line | 2549.5 | 2549.5 | |
| 9 | 9 | 30万t/a高纯度天然纤维生产线 | 300,000 t/a high purity natural fiber production line | 8724 | 8724 | 9504.55 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 | 10 | 1000t/d碱回收生产线 | 1,000t/d alkali recovery production line | 2820.5 | 2820.5 | 505 |
| 11 | 11 | 30万t/a高松厚度纯质纸生产线 | 300,000 t/a highbulk pure paper production line | 5912.5 | 5912.5 | 5035.5 |
| 12 | 12 | 40万t/a化学机械浆及配套碱回收项目 | 400,000 t/a chemical mechanical pulp and supporting alkali recovery project | 22519 | 22519 | 14297 |
| 13 | 13 | 20万t/a涂布白卡纸生产线 | 200,000 t/a coated white cardboard production line | 3206.5 | 3206.5 | 24598 |
| 14 | 14 | 30万t/a高档液体包装纸生产线 | 300,000 t/a high-grade liquid wrapping paper production line | 8300.0 | 8300.0 | |
| 15 | 15 | 40万t/a高档食品包装卡纸生产线 | 400,000 t/a high-grade food packaging paper cardboard production line | 7632.0 | 7632.0 | |
| 16 | 16 | 12万t/a涂布白卡纸生产线 | 120,000 t/a coated white cardboard production line | 1068.5 | 1068.5 | |
| 17 | 17 | 20万t/a高档特种纸 | 200,000 t/a high-grade specialty paper | 3529.41 | 3529.41 | 3357.17 |
| 18 | 18 | 全厂自备热电厂工程 | Self-provided thermal power plant project in the plant | 7956 | 7956 | 3356 |
| 19 | 19 | 造纸固废焚烧发电项目 | Solid waste incineration power generation project for papermaking | 3546 | 3546 | 1408 |
| | 合计 | | Total | 95421.91 | 95421.91 | 76997.22 |

注：全厂自备热电厂工程包含自备热电厂三期工程、1×480t/h流化床锅炉改扩建项目、1×50MW背压机组改扩建工程、1×50MW背压机组扩建工程4个项目；自备热电厂4×130t/hCFB锅炉机组烟气脱硝工程已停运，不再统计。

Note: The plant's self-provided thermal power plant project includes 4 projects: Phase III of the self-provided thermal power plant project, 1 × 480 t/h fluidized bed boiler renovation and expansion project, 1 × 50 MW back pressure unit renovation and expansion project, and 1 × 50 MW back pressure unit expansion project. The flue gas denitration project of the 4 × 130 t/h CFB boiler unit in the self-provided thermal power plant has been shut down and no statistics will be made.

### 2.1.3 污染物治理及达标情况

### 2.1.3 Pollutant treatment and compliance

#### 2.1.3.1 废气

#### 2.1.3.1 Waste gas

现有工程废气排放源包括锅炉烟气、碱回收炉烟气，现有工程废气排放情况引用在线监测数据及实际监测数据。

Existing project waste gas emission sources include boiler flue gas and alkali recovery furnace flue gas. Online monitoring data and actual monitoring data are used for existing project waste gas emission.

1、2×410t/h+1×480t/h锅炉烟气

1. 2×410t/h+1×480t/h boiler flue gas

2台410t/h锅炉采用“低氮燃烧+SCR+电（四电场静电除尘器）袋复合式除尘器+白泥-石膏湿法脱硫+湿电除尘工艺”进行烟气治理（综合脱硝、脱硫和除尘效率分别为90.0%、96.0%和99.95%以上）；1台480t/h煤粉炉采用“低氮燃烧+SCR+双室1+5电场静电除尘器+白泥-石膏湿法脱硫+湿电除尘工艺”进行烟气治理（综合脱硝、脱硫和除尘效率分别为90.0%、96.0%和99.95%以上）；共用1根高180m、出口内径5.5m烟囱。太阳纸业股份有限公司已对现有1×480t/h锅炉和2×410t/h锅炉超低排放改造方案如下：（1）1×480t/h煤粉锅炉配1×150MW抽凝机组超低排放改造措施为：①除尘改造：480t/h炉配套脱硫吸收塔后部烟道加设一套卧式湿式电除尘器。②脱硫改造：原脱硫塔喷淋层、除雾器检修，更换下部两层喷淋层及喷嘴，同时在喷淋层下部增加高效脱硫装置(管式喷淋层)，修复脱硫塔内部防腐。外部附件包括pH计、液位计、密度计及相应管道等检修。③脱硝改造：更换原有脱硝催化剂；增加氨水蒸发系统，在原有反应器内，新增一层催化剂，更换一层催化剂。（2）2×410t/h煤粉锅炉配2×50MW抽凝机组超低排放改造措施为：①除尘改造：4#锅炉原电袋复合除尘器（两电两袋）现保留原两电除尘器更换两袋除尘器，并在配套脱硫吸收塔顶部出口处加设一套管式湿式电除尘器。5#锅炉现有湿电除尘器大修，静电除尘器普通电源改造为高频脉冲电源，增加除尘效率。②脱硫改造：各新增一套白泥-石膏湿法脱硫塔。③脱硝改造：更换现有两层脱硝催化剂，新上活性分子低温烟气脱硝工艺。

Two 410t/h boilers adopt "low nitrogen combustion+SCR+electric (four electric field electrostatic precipitator) bag composite precipitator+ white mud-gypsum wet desulfurization+wet electric dust removal process" for flue gas treatment (comprehensive denitration, desulfurization and dust removal efficiencies are above 90.0%, 96.0% and 99.95% respectively); one 480t/h pulverized coal boiler adopts "low nitrogen combustion+SCR+double chamber 1+5 electric field electrostatic precipitator+white mud-gypsum wet desulfurization+wet electric dust removal process" for flue gas treatment (comprehensive denitration, desulfurization and dust removal efficiencies are above 90.0%, 96.0% and 99.95% respectively); one chimney with a height of 180m and an outlet inner diameter of 5.5 m is shared. Shandong Sun Paper Co., Ltd. has made the following ultra-low emission transformation plans for the existing 1 × 480 t/h boiler and 2 × 410 t/h boiler: (1) The ultra-low emission transformation measures for 1 × 480 t/h pulverized coal boiler with 1 × 150MW condensing unit are as follows: ① Dust removal transformation: A set of horizontal wet electrostatic precipitator is added to the flue at the rear of the desulfurization absorption tower for 480t/h boiler. ②Desulfurization renovation: overhaul the spray layer and demister of the original

desulfurization tower, replace the lower two spray layers and nozzles, and add high-efficiency desulfurization device (tubular spray layer) at the lower part of the spray layer to repair the internal corrosion prevention of the desulfurization tower. External accessories include pH meter, liquid level meter, density meter and corresponding pipelines for maintenance. ③ Denitration transformation: replace the original denitration catalyst; add ammonia evaporation system and a layer of catalyst and replace a layer of catalyst in the original reactor. (2) The ultra-low emission transformation measures for 2 × 410 t/h pulverized coal boiler equipped with 2 × 50MW condensation extraction unit are as follows: ① Dust removal transformation: The original electric bag composite dust collector (two electric two bags) of 4 # boiler now retains the original two electric bags and replaces the two bags of dust collector, and adds a sleeve wet electrostatic precipitator at the top outlet of the matching desulfurization absorption tower. The existing wet electrostatic precipitator of 5 # boiler is overhauled, and the common power supply of electrostatic precipitator is transformed into high frequency pulse power supply to increase dust removal efficiency. ②Desulfurization renovation: A set of white mud-gypsum wet desulfurization tower is added. ③Denitration transformation: replace the existing two-layer denitration catalyst and introduce a new active molecule low-temperature flue gas denitration process.

2018年1×480t/h锅炉和2×410t/h锅炉超低排放改造后的在线监测数据见表2.1-3。由在线监测数据可知，现有工程烟气中二氧化硫、氮氧化物、烟尘排放浓度均可以同时满足《山东省火电厂大气污染物排放标准》（DB37/2372-2019）中表2燃煤锅炉标准及超低排放第2号修改单要求、《山东省区域性大气污染物综合排放标准》（DB/2376-2019）表1标准要求。

See Table 2.1-3 for on-line monitoring data of 1 × 480 t/h boiler and 2 × 410 t/h boiler after ultra-low emission transformation in 2018. From the online monitoring data, it can be seen that the emission concentrations of sulfur dioxide, nitrogen oxides and smoke dust in the flue gas of the existing project meet the requirements of Table 2 of the *Thermal Power Plant Air Pollutant Emission Standard of Shandong Province (DB37/2372-2019)* and the Ultra-low Emission Amendment No.2 and Table 1 of the *Regional Air Pollutant Comprehensive Emission Standard of Shandong Province (DB/2376-2019)*.

**表2.1-3 锅炉烟气2018年在线监测数据一览表（2×410t/h和1×480t/h锅炉）**

**Table 2.1-3 List of Online Monitoring Data of Boiler Flue Gas in 2018 (2 × 410 t/h and 1 × 480 t/h Boilers)**

| 时间 Time | 二氧化硫 Sulfur dioxide | | | 氮氧化物 Oxynitride | | | 烟尘 Smoke dust | | | 氧含量% Oxygen content % | 废气排放量m³ Waste gas emission m³ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 实测浓度 mg/m³ Measured concentration | 折算浓度 mg/m³ Conversion concentration | 排放量t Emission t | 实测浓度 mg/m³ Measured concentration | 折算浓度 mg/m³ Conversion concentration | 排放量t Emission t | 实测浓度 mg/m³ Measured concentration | 折算浓度 mg/m³ Conversion concentration | 排放量t Emission t | | |

| | mg/m³ | mg/m³ | | mg/m³ | mg/m³ | | mg/m³ | mg/m³ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018-01 | 10 | 9.7 | 9.6 | 25 | 24 | 24 | 1.9 | 1.8 | 1.8 | 5.4 | 961103766 |
| 2018-02 | 10 | 9.8 | 9.7 | 25 | 25 | 24 | 2.3 | 2.2 | 2.2 | 5.6 | 966445645 |
| 2018-03 | 12 | 13 | 10 | 15 | 16 | 14 | 1.8 | 1.9 | 1.6 | 6.6 | 894246946 |
| 2018-04 | 9.9 | 9.6 | 11 | 16 | 15 | 17 | 1.9 | 1.8 | 2 | 5.4 | 1060234935 |
| 2018-05 | 13 | 12 | 14 | 12 | 11 | 13 | 1.7 | 1.7 | 1.8 | 5.3 | 1066437756 |
| 2018-06 | 13 | 12 | 14 | 11 | 11 | 12 | 1.7 | 1.6 | 1.8 | 5.4 | 1068467885 |
| 2018-07 | 13 | 12 | 13 | 12 | 12 | 13 | 1.7 | 1.7 | 1.9 | 5.6 | 1078770968 |
| 2018-08 | 13 | 12 | 14 | 15 | 15 | 17 | 1.6 | 1.6 | 1.8 | 5.5 | 1096453626 |
| 2018-09 | 11 | 11 | 11 | 15 | 15 | 16 | 1.8 | 1.7 | 1.8 | 5.6 | 1030645994 |
| 2018-10 | 11 | 11 | 8.2 | 18 | 17 | 13 | 2.2 | 2.2 | 2.2 | 5.7 | 966866242 |
| 2018-11 | 6.5 | 6.2 | 1.3 | 31 | 30 | 6.6 | 2.2 | 2.2 | 2.1 | 5.5 | 935767693 |
| 2018-12 | 3.7 | 3.8 | 2.4 | 19 | 20 | 13 | 2.3 | 2.4 | 1.5 | 6.3 | 658784687 |
| Average value | 10 | 10 | 9.8 | 18 | 18 | 15 | 1.9 | 1.9 | 1.9 | 5.6 | 982018845 |
| Maximum value | 13 | 13 | 14 | 31 | 30 | 24 | 2.3 | 2.4 | 2.2 | 6.6 | 1096453626 |
| Minimum value | 3.7 | 3.8 | 1.3 | 11 | 11 | 6.6 | 1.6 | 1.6 | 1.5 | 5.3 | 658784687 |
| Cumulative value | | | 118 | | | 181 | | | 23 | | 11784226142 |
| Standard value | | 35 | | | 50 | | | 5 | | | |

注：2018年度平均运行负荷较低，故2018年在线监测统计污染物累计排放量较低。

Note: As the average operating load in 2018 was relatively low, the cumulative pollutant emissions in online monitoring in 2018 were relatively low.

2、1000t/d碱回收炉烟气

2. Flue gas from 1,000t/d alkali recovery furnace

采用四电场静电除尘器进行治理，除尘效率为99.50%，烟囱高度120m、出口内径3m，本次评价收集1000t/d碱回收炉2018年在线监测数据，具体情况见**表2.1-4**。

Four electric field electrostatic precipitator is used for treatment, with dust removal efficiency of 99.50%, chimney height of 120m and outlet inner diameter of 3m. In this assessment, online monitoring data of 1,000t/d alkali recovery furnace in 2018 were collected, as shown in Table 2.1-4 for details.

**表2.1-4 2018年1000t/d碱回收项目烟气在线监测数据一览表**

**Table 2.1-4 List of Flue Gas Online Monitoring Data for 1,000t/d Alkali Recovery Project in 2018**

| 时间 Time | 二氧化硫 Sulfur dioxide | | | 氮氧化物 Oxynitride | | | 烟尘 Smoke dust | | | 氧含量% Oxygen content % | 废气排放量 m³ Waste gas emission m³ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 实测浓度 mg/m³ Measured concentration mg/m³ | 折算浓度 mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | 实测浓度 mg/m³ Measured concentration mg/m³ | 折算浓度 mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | 实测浓度 mg/m³ Measured concentration mg/m³ | 折算浓度 mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | | |
| 2018-10 | 7.2 | 7.1 | 1.6 | 61 | 60 | 14 | 1.2 | 1.1 | 0.3 | 11 | 260050972 |
| 2018-11 | 7.2 | 9.2 | 0 | 18 | 21 | 0 | 0.1 | 0.1 | 0 | 13 | 2106183 |
| 2018-12 | 8.3 | 6.9 | 0.7 | 85 | 70 | 7.3 | 0.9 | 0.8 | 0.1 | 8.7 | 90853621 |
| 2019-01 | 7 | 5.6 | 0.9 | 92 | 73 | 11 | 0.4 | 0.3 | 0.1 | 8.4 | 135052031 |
| 2019-02 | 10 | 7.9 | 1.4 | 94 | 73 | 12 | 0.4 | 0.3 | 0.1 | 8.2 | 132360410 |
| 2019-03 | 11 | 8.6 | 1.9 | 83 | 66 | 15 | 1 | 0.8 | 0.2 | 8.5 | 176316007 |
| 2019-04 | 12 | 9.5 | 2.1 | 73 | 58 | 13 | 2.2 | 1.7 | 0.4 | 8.4 | 180431681 |
| 2019-05 | 8.9 | 7.4 | 0.3 | 60 | 52 | 1.5 | 1 | 0.8 | 0 | 9.1 | 24949814 |
| 2019-06 | 6.3 | 4.8 | 0.8 | 83 | 63 | 10 | 2.4 | 1.8 | 0.3 | 7.8 | 122857845 |
| 2019- | 3.3 | 2.6 | 0.2 | 80 | 64 | 5.1 | 1.9 | 1.5 | 0.1 | 8.6 | 656526 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 07 | | | | | | | | | | | 23 |
| 2019-08 | 9.4 | 8.2 | 1.4 | 75 | 64 | 11 | 1 | 0.9 | 0.2 | 9.3 | 141294887 |
| 2019-09 | 10 | 9.4 | 0.5 | 83 | 75 | 3.8 | 2.2 | 2.1 | 0.1 | 9.9 | 45910287 |
| 平均值 Average value | 8.4 | 7.3 | 1 | 74 | 62 | 8.7 | 1.2 | 1 | 0.1 | 9.2 | 114819697 |
| 最大值 Maximum value | 12 | 9.5 | 2.1 | 94 | 75 | 15 | 2.4 | 2.1 | 0.4 | 13 | 260050972 |
| 最小值 Minimum value | 3.3 | 2.6 | 0 | 18 | 21 | 0 | 0.1 | 0.1 | 0 | 7.8 | 2106183 |
| 累计值 Cumulative value | | | 12 | | | 105 | | | 1.7 | | 1377836361 |
| 标准值 Standard value | | 50 | | | 100 | | | 10 | | | |

由上表可见，二氧化硫、烟尘、氮氧化物目前排放浓度满足《山东省区域性大气污染物综合排放标准》（DB37/2376-2019）表1重点控制区标准要求。

As can be seen from the above table, the current emission concentrations of sulfur dioxide, smoke dust and nitrogen oxides meet the standard requirements of key control areas in Table 1 of *Regional Air Pollutant Comprehensive Emission Standard of Shandong Province (DB37/2376-2019)*.

3、900t/d碱回收炉烟气

3. Flue gas from 900t/d alkali recovery furnace

900t/d碱回收炉采用四电场静电除尘器进行治理，除尘效率为99.50%，烟囱高度150m，本次评价收集了900t/d碱回收炉2018年在线监测数据，具体情况见表2.1-5。

Four electric field electrostatic precipitator is used by 900t/d alkali recovery furnace for treatment, with dust removal efficiency of 99.50%, and chimney height of 150m. In this assessment, online

monitoring data of 900t/d alkali recovery furnace in 2018 were collected, as shown in Table 2.1-5 for details.

**表2.1-5 2018年900t/d碱回收项目烟气在线监测数据一览表**

**Table 2.1-5 List of Flue Gas Online Monitoring Data for 900t/d Alkali Recovery Project in 2018**

| 时间 Time | 二氧化硫 Sulfur dioxide | | | 氮氧化物 Oxynitride | | | 烟尘 Smoke dust | | | 氧含量% Oxygen content % | 废气排放量 m³ Waste gas emission m³ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 实测浓度 mg/m³ Measured concentration mg/m³ | 折算浓度 mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | 实测浓度 mg/m³ Measured concentration mg/m³ | 折算浓度 mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | 实测浓度 mg/m³ Measured concentration mg/m³ | 折算浓度 mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | | |
| 2018-10 | 11 | 7.3 | 1.4 | 110 | 75 | 15 | 5.7 | 4 | 0.7 | 6.4 | 137800202 |
| 2018-11 | 9.7 | 6.5 | 1.6 | 100 | 67 | 17 | 4.4 | 3 | 0.7 | 6.1 | 164632496 |
| 2018-12 | 6.6 | 4.5 | 1.1 | 90 | 62 | 15 | 5 | 3.6 | 1 | 6.7 | 195263988 |
| 2019-01 | 3.7 | 2.5 | 0.7 | 83 | 57 | 15 | 4.5 | 3.2 | 0.8 | 6.5 | 186480585 |
| 2019-02 | 3.2 | 2.2 | 0.5 | 84 | 59 | 14 | 4.7 | 3.3 | 0.8 | 6.7 | 168718088 |
| 2019-03 | 10 | 6.9 | 1.5 | 97 | 65 | 15 | 6.2 | 4.1 | 0.9 | 5.9 | 148955528 |
| 2019-04 | 14 | 10 | 2.2 | 89 | 63 | 14 | 4.6 | 3.3 | 0.7 | 7 | 159915898 |
| 2019-05 | 12 | 8.2 | 2.1 | 83 | 60 | 15 | 1.4 | 1 | 0.2 | 7.2 | 185766287 |
| 2019-06 | 16 | 12 | 2.5 | 85 | 62 | 13 | 2.3 | 1.7 | 0.3 | 7.3 | 146880426 |
| 2019-07 | 12 | 10 | 2.1 | 76 | 62 | 12 | 3.3 | 2.7 | 0.5 | 8.8 | 150346489 |
| 2019-08 | 9.4 | 8.5 | 0.4 | 69 | 63 | 2.6 | 3.3 | 3 | 0.1 | 10 | 37113410 |
| 2019-09 | 5.7 | 4.5 | 0.2 | 79 | 62 | 2.7 | 2.3 | 1.8 | 0.1 | 8.3 | 34824108 |
| Average value | 9.4 | 6.9 | 1.4 | 87 | 63 | 13 | 4 | 2.9 | 0.6 | 7.2 | 143058126 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Maximum value | 16 | 12 | 2.5 | 110 | 75 | 17 | 6.2 | 4.1 | 1 | 10 | 195263988 |
| Minimum value | 3.2 | 2.2 | 0.2 | 69 | 57 | 2.6 | 1.4 | 1 | 0.1 | 5.9 | 34824108 |
| Cumulative value | | | 16 | | | 151 | | | 6.9 | | 1716697506 |
| Standard value | / | 50 | / | / | 100 | / | / | 10 | / | / | |

由上表可见，二氧化硫、烟尘、氮氧化物2018年10月排放浓度满足《山东省区域性大气污染物综合排放标准》（DB37/2376-2013）表1其他排放源标准（即SO2200mg/m³，NOx300mg/m³，颗粒物30mg/m³）要求，自2018年11月起满足《山东省区域性大气污染物综合排放标准》（DB37/2376-2019）表1重点控制区标准要求。

As can be seen from the above table, the emission concentrations of sulfur dioxide, smoke dust and nitrogen oxides in October 2018 meet the requirements of other emission source standards (i.e. $SO_2$ 200mg/m³, NOx 300mg/m³ and particulate matter 300mg/m³) in Table 1 of the *Regional Air Pollutant Comprehensive Emission Standard of Shandong Province(DB37/2376-2013)*, and meet the requirements of key control area standards in Table 1 of the *Regional Air Pollutant Comprehensive Emission Standard of Shandong Province(DB37/2376-2019)* from November 2018.

4、450t/d碱回收炉烟气

4. Flue gas from 450t/d alkali recovery furnace

450t/d碱回收炉采用四电场静电除尘器进行治理，除尘效率为99.50%，烟囱高度150m，本次评价收集了450t/d碱回收炉2018年在线监测数据，具体情况见**表2.1-6**。

Four electric field electrostatic precipitator is used by 450t/d alkali recovery furnace for treatment, with dust removal efficiency of 99.50%, and chimney height of 150m. In this assessment, online monitoring data of 450t/d alkali recovery furnace in 2018 were collected, as shown in **Table 2.1-6** for details.

**表2.1-6 2018年450t/d碱回收项目烟气在线监测数据一览表**

**Table 2.1-6 List of Flue Gas Online Monitoring Data for 450t/d Alkali Recovery Project in 2018**

| 时间 Time | 二氧化硫 Sulfur dioxide | | | 氮氧化物 Oxynitride | | | 烟尘 Smoke dust | | | 氧含量% Oxygen content % | 废气排放量m³ Waste gas emissi |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 实测浓度 mg/m³ | 折算浓度 mg/m³ | 排放量t Emis | 实测浓度 mg/m³ | 折算浓度 mg/m³ | 排放量t Emis | 实测浓度 mg/m³ | 折算浓度 mg/m³ | 排放量t Emis | | |

| | Measured concentration mg/m³ | Conversion concentration mg/m³ | sion t | Measured concentration mg/m³ | Conversion concentration mg/m³ | sion t | Measured concentration mg/m³ | Conversion concentration mg/m³ | sion t | | on m³ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018-01 | 3.5 | 3.2 | 0.1 | 37 | 36 | 0.5 | 6.4 | 6.1 | 0.1 | 10 | 15839108 |
| 2018-03 | 11 | 9.7 | 0.9 | 35 | 33 | 2.8 | 5.8 | 5.7 | 0.4 | 10 | 78190404 |
| 2018-04 | 18 | 16 | 1.9 | 43 | 38 | 4.8 | 7.6 | 6.8 | 0.8 | 9.8 | 110284698 |
| 2018-05 | 24 | 22 | 2.6 | 41 | 37 | 4.3 | 9.7 | 8.9 | 1 | 10 | 106235101 |
| 2018-06 | 23 | 22 | 2.3 | 38 | 35 | 3.7 | 8 | 7.6 | 0.8 | 10 | 103658020 |
| 2018-07 | 31 | 28 | 3.4 | 28 | 26 | 3.2 | 8.3 | 7.6 | 0.9 | 10 | 111631809 |
| 2018-08 | 38 | 35 | 4.5 | 21 | 21 | 2.4 | 8.5 | 8.1 | 1 | 11 | 112658149 |
| 2018-09 | 34 | 32 | 0.8 | 25 | 24 | 0.6 | 7.6 | 7.1 | 0.2 | 10 | 22076452 |
| 2018-12 | | | | | | | 8.8 | 10 | 0 | | |
| Average value | 23 | 21 | 2.1 | 33 | 31 | 2.8 | 7.8 | 7.6 | 0.6 | 10 | 82571718 |
| Maximum value | 38 | 35 | 4.5 | 43 | 38 | 4.8 | 9.7 | 10 | 1 | 11 | 112658149 |
| Minimum value | 3.5 | 3.2 | 0.1 | 21 | 21 | 0.5 | 5.8 | 5.7 | 0 | 9.8 | 15839108 |
| Cumulative value | | | 16 | | | 22 | | | 5.2 | | 660573741 |
| Standard value | / | 50 | / | / | 100 | / | / | 10 | / | / | |

由上表可见，二氧化硫、烟尘、氮氧化物排放浓度满足《山东省区域性大气污染物综合排放标准》（DB37/2376-2019）表1重点控制区标准要求。

As can be seen from the above table, the current emission concentrations of sulfur dioxide, smoke dust and nitrogen oxides meet the standard requirements of key control areas in Table 1 of *Regional Air Pollutant Comprehensive Emission Standard of Shandong Province (DB37/2376-2019)*.

5、生石灰窑废气

5. Waste gas from raw lime kiln

生石灰工程产生的主要污染物为粉尘，废气通过除尘器收尘后通过管道进入美特钙业回收利用生产精制碳酸钙，除尘器后各设一个应急排放烟囱，部分石灰窑废气进入中速磨用于烘干研磨。车间内还设置三个除尘器用于处理车间粉尘：1#除尘器，用于处理粉仓顶部进料和受料仓出料产生的粉尘；2#除尘器，用于处理窑顶料仓出料和窑体底部出料产生的粉尘；3#除尘器，用于处理窑下皮带运输、成品筛分和筛分下料产生的粉尘。除尘器收集的粉料全部外售，除尘后的废气分别通过一个排气筒排放。

The main pollutant generated by quicklime project is dust. Waste gas enters Meite Calcium Industry through pipelines after dust collection by dust collectors to produce refined calcium carbonate. An emergency discharge chimney is set up after each dust collector. Some lime kiln waste gas enters medium-speed mill for drying and grinding. The workshop is also equipped with 3 dust collectors for treating workshop dust. 1 # dust collector is used for treating dust generated by feeding at the top of the powder bin and discharging from the receiving bin; 2 # dust collector for treating dust generated by discharge from the kiln top bin and discharge from the bottom of the kiln body; 3 # dust collector treating dust generated by belt transportation in processing kiln, finished product screening and screening blanking. All the powder collected by dust collectors is sold out, and the waste gas after dust removal is discharged through an exhaust funnel respectively.

根据《兖州天章纸业有限公司年产40万吨化机浆及配套碱回收项目现状环境影响评估报告》：山东嘉誉测试科技有限公司于2016年12月22日至2016年12月25日对企业排放废气进行监测（现状监测在三个排气筒上各设一个采样口）。监测期间500t/d生石灰运行工况为95%；《太阳纸业20万吨高档特种纸项目环境影响报告书》编制期间，委托山东嘉誉测试科技有限公司于2017年9月18日～19日对石灰窑排气筒中二氧化硫与氮氧化物排放浓度进行补充监测，监测结果见表2.1-7。

According to the *Environmental Impact Assessment Report on the Current Situation of 400,000 t/a of Chemical Mechanical Pulp and Supporting Alkali Recovery Project of Yanzhou Tianzhang Paper Co., Ltd.*, Shandong Jiayu Testing Technology Co., Ltd. monitored the waste gas emitted by the enterprise from December 22, 2016 to December 25, 2016 (one sampling port was set on each of the 3 exhaust funnels for current situation monitoring). During the monitoring period, the operating condition of 500t/d quicklime is 95%. During the edit of the *Environmental Impact Report of 200,000 Tons High-grade Specialty Paper Project of Sun Paper*, Shandong Jiayu Testing Technology Co., Ltd. was entrusted to carry out supplementary monitoring on the emission concentration of sulfur dioxide and nitrogen oxides in the exhaust funnel of lime kiln from September 18 to 19, 2017. The monitoring results are shown in Table 2.1-7.

**表2.1-7 废气现状监测结果一览表**

**Table 2.1-7 List of Monitoring Results of Waste Gas**

| 监测项目 Monitoring item | | 采样点位 Sampling port position | 500t/d生石灰1#除尘器后排气筒 500t/d quicklime 1 # dust collector rear exhaust funnel | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 采样时间 Sampling time | 12月23日 December 23 | | | 12月24日 December 24 | | |
| | | 采样频次 Sampling frequency | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 |
| 颗粒物 PM | 浓度 Concentration | mg/N m³ | 20.8 | 21.1 | 25.3 | 26.3 | 28.8 | 23.9 |
| | 排放量 Emission | kg/h | 0.587 | 0.568 | 0.693 | 0.682 | 0.803 | 0.679 |
| 废气量 Waste gas volume | | Nd m³/h | 28253 | 26932 | 27346 | 25925 | 27908 | 28415 |
| 监测项目 Monitoring item | | 采样点位 Sampling port position | 500t/d生石灰2#除尘器后排气筒 500t/d quicklime 2 # dust collector rear exhaust funnel | | | | | |
| | | 采样时间 Sampling time | 12月22日 December 22 | | | 12月24日 December 24 | | |
| | | 采样频次 Sampling frequency | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 |
| 颗粒物 PM | 浓度 Concentration | mg/N m³ | 24.3 | 28.0 | 21.8 | 22.1 | 23.4 | 24.3 |
| | 排放量 Emission | kg/h | 0.716 | 0.841 | 0.666 | 0.674 | 0.683 | 0.703 |
| 废气量 Waste gas volume | | Nd m³/h | 29503 | 30063 | 30557 | 30423 | 29213 | 28959 |
| 监测项目 Monitoring item | | 采样点位 Sampling port position | 500t/d生石灰3#除尘器后排气筒 500t/d quicklime 3 # dust collector rear exhaust funnel | | | | | |
| | | 采样时间 Sampling time | 12.23 | | | 12.24 | | |
| | | 采样频次 Sampling frequency | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 |
| 颗粒物 PM | 浓度 Concentration | mg/N m³ | 24 | 28.4 | 25.1 | 21.3 | 24.1 | 25.8 |
| | 排放量 Emission | kg/h | 0.451 | 0.581 | 0.504 | 0.425 | 0.476 | 0.521 |
| 废气量 | | Nd m³/h | 18813 | 20469 | 20106 | 19930 | 19717 | 20164 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Waste gas volume | | | | | | | | |
| 检测项目 Monitoring item | | 采样点位 Sampling port position | 500t/d生石灰1#环境除尘器后排气筒 500t/d quicklime 1 # environmental dust collector rear exhaust funnel | | | | | |
| | | 采样时间 Sampling time | 09月18日 September 18 | | | 09月19日 September 19 | | |
| | | 采样频次 Sampling frequency | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 |
| $SO_2$ | 浓度 Concentration | mg/N m³ | ＜3.75 | ＜3.75 | ＜3.75 | ＜3.75 | ＜3.75 | ＜3.75 |
| $NO_X$ | 浓度 Concentration | mg/N m³ | ＜3 | ＜3 | ＜3 | ＜3 | ＜3 | ＜3 |
| 排气量 Emission | | Nd m³/h | 28352 | 29407 | 29603 | 28406 | 28879 | 29181 |
| 检测项目 Monitoring item | | 采样点位 Sampling port position | 500t/d生石灰2#原料除尘器后排气筒 500t/d quicklime 2 # raw material dust collector rear exhaust funnel | | | | | |
| | | 采样时间 Sampling time | 09月18日 September 18 | | | 09月19日 September 19 | | |
| | | 采样频次 Sampling frequency | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 |
| $SO_2$ | 浓度 Concentration | mg/N m³ | ＜3.75 | ＜3.75 | ＜3.75 | ＜3.75 | ＜3.75 | ＜3.75 |
| $NO_X$ | 浓度 Concentration | mg/N m³ | ＜3 | ＜3 | ＜3 | ＜3 | ＜3 | ＜3 |
| 排气量 Emission | | Nd m³/h | 26706 | 26312 | 26270 | 26403 | 26271 | 26529 |
| 检测项目 Monitoring item | | 采样点位 Sampling port position | 500t/d生石灰3#成品除尘器后排气筒 500t/d quicklime 3 # finished product dust collector rear exhaust funnel | | | | | |
| | | 采样时间 Sampling time | 09月18日 September 18 | | | 09月19日 September 19 | | |
| | | 采样频次 Sampling frequency | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 | 频次1 Frequency1 | 频次2 Frequency2 | 频次3 Frequency3 |
| $SO_2$ | 浓度 Concentration | mg/N m³ | ＜3.75 | ＜3.75 | ＜3.75 | ＜3.75 | ＜3.75 | ＜3.75 |
| $NO_X$ | 浓度 Concentration | mg/N m³ | ＜3 | ＜3 | ＜3 | ＜3 | ＜3 | ＜3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 排气量 Emission | Nd m³/h | 18007 | 18287 | 17895 | 18071 | 18619 | 18356 |
| 注：“<”加检出限表示未检出<br>Note: “<” detection limit indicates not detected | | | | | | | |

由监测数据可见，石灰窑废气中二氧化硫与氮氧化物均未检出，生石灰项目颗粒物排放浓度不能满足《山东省区域性大气污染物综合排放标准》（DB/2376-2019）表1重点控制区标准（颗粒物10mg/m³）要求。

From the monitoring data, it can be seen that sulfur dioxide and nitrogen oxides in lime kiln waste gas have not been detected, and the particulate matter emission concentration of quicklime project cannot meet the requirements of the key control area standard (particulate matter 10mg/m$^3$) in Table 1 of *Regional Air Pollutant Comprehensive Emission Standard of Shandong Province (DB/2376-2019)*.

6、造纸固废焚烧发电项目烟气

6. Flue gas from solid waste incineration power generation project for papermaking

造纸固废焚烧发电资源综合利用搬迁改造工程目前正处于验收阶段，根据该项目环评批复：项目建设1×180t/h高温高压循环流化床锅炉配1套500MW高温高压纯凝机组，项目建成后现有造纸固废综合利用及余热发电项目全部拆除，锅炉烟气经SNCR脱硝+四电场静电除尘+布袋除尘+白泥-石膏湿法脱硫+活性炭吸附（综合除尘效率不低于99.95%，脱硫效率93%，脱硝效率60%，二噁英去除效率90%，重金属去除效率99.98%）处理后，经1根120m高、内径3.0m的烟囱排放。根据在线监测数据及验收检测数据，主要污染物排放情况见表2.1-8～9。

The relocation and reconstruction project for comprehensive utilization of papermaking solid waste incineration power generation resources is currently in the acceptance stage. According to the EIA reply of the project: 1 × 180 t/h high-te’mperature and high-pressure circulating fluidized bed boiler is equipped with a 500MW high-temperature and high-pressure pure condensing unit. Upon completion of the project, the existing papermaking solid waste comprehensive utilization and waste heat power generation projects will be completely dismantled. The boiler flue gas is treated by SNCR denitration+four electric field electrostatic dust removal+bag dust removal+white mud-gypsum wet desulfurization+activated carbon adsorption (comprehensive dust removal efficiency is not less than 99.95%, desulfurization efficiency is 93%, denitration efficiency is 60%, dioxin removal efficiency is 90%, heavy metal removal efficiency is 99.98%), and then discharged through a 120m high chimney with an inner diameter of 3.0 m. According to the online monitoring data and acceptance test data, the emission of major pollutants is shown in Table 2.1-8 ~ 9.

**表2.1-8 造纸固废焚烧项目在线监测数据**

**Table 2.1-8 Online Monitoring Data of Solid Waste Incineration Project**

| 时间 Time | 二氧化硫 Sulfur dioxide | 氮氧化物 Oxynitride | 烟尘 Smoke dust | 氧气% Oxyge | 废气排放量m³ |
|---|---|---|---|---|---|

| | 实测浓度mg/m³ Measured concentration mg/m³ | 折算浓度mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | 实测浓度mg/m³ Measured concentration mg/m³ | 折算浓度mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | 实测浓度mg/m³ Measured concentration mg/m³ | 折算浓度mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | n % | Waste gas emission m³ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018-07 | 4.94 | 4.92 | 0.756 | 16.8 | 16.7 | 2.58 | 0.207 | 0.208 | 0.033 | 11 | 165850311 |
| 2018-08 | 8.81 | 8.63 | 1.93 | 16 | 15.7 | 3.58 | 0.164 | 0.161 | 0.032 | 10.8 | 220824690 |
| 2018-09 | 7.17 | 7.69 | 1.37 | 9.72 | 11.1 | 1.89 | 1.83 | 1.96 | 0.354 | 11.8 | 197450159 |
| 2018-10 | 5.21 | 5.98 | 1.26 | 9.02 | 10.3 | 2.14 | 0.15 | 0.172 | 0.036 | 12.2 | 240229582 |
| 2018-11 | 4.53 | 5.1 | 0.876 | 12.1 | 13.8 | 2.41 | 0.151 | 0.171 | 0.029 | 12.2 | 193804242 |
| 2018-12 | 8.77 | 10.5 | 2.04 | 19.7 | 26.2 | 4.4 | 0.241 | 0.316 | 0.053 | 12.8 | 229912624 |
| 2019-01 | 6.93 | 8.45 | 1.43 | 18 | 22.1 | 3.63 | 0.307 | 0.38 | 0.064 | 12.8 | 215319755 |
| 2019-02 | 7.22 | 8.6 | 1.56 | 14 | 16.7 | 3.05 | 0.354 | 0.421 | 0.076 | 12.6 | 217832367 |
| 2019-03 | 15.2 | 17.8 | 3.42 | 9.07 | 10.5 | 2.03 | 0.454 | 0.531 | 0.102 | 12.4 | 224071094 |
| 2019-04 | 8.2 | 9.38 | 1.67 | 10.4 | 11.9 | 2.18 | 0.32 | 0.365 | 0.067 | 12.2 | 213461162 |
| 2019-05 | 14.3 | 16 | 2.92 | 6.38 | 7.13 | 1.3 | 1.32 | 1.47 | 0.27 | 12 | 206554985 |
| 2019-06 | 2.46 | 2.82 | 0.43 | 9.45 | 11.5 | 1.54 | 1.74 | 1.95 | 0.298 | 12 | 170053922 |
| Average value | 7.82 | 8.82 | 1.64 | 12.5 | 14.5 | 2.56 | 0.604 | 0.675 | 0.118 | 12.1 | 207947074 |
| Maximum value | 15.2 | 17.8 | 3.42 | 19.7 | 26.2 | 4.4 | 1.83 | 1.96 | 0.354 | 12.8 | 240229582 |
| Minimum value | 2.46 | 2.82 | 0.43 | 6.38 | 7.13 | 1.3 | 0.15 | 0.161 | 0.029 | 10.8 | 165850311 |
| Cumulative value | | | 19.7 | | | 30.7 | | | 1.41 | | 2495364892 |
| Standard value | | 50 | | | 100 | | | 10 | | | |

**表2.1-9 造纸固废焚烧项目验收检测数据**

**Table 2.1-9 Acceptance Inspection Data of Solid Waste Incineration Project in Paper Making**

| 采样点位检测项目 | Sampling point | 1#焚烧炉出口 | Outlet of 1 # | 1#焚烧炉出口 | Outlet of 1 # |
|---|---|---|---|---|---|

| | detection item | 2018.07.19 | incinerator 2018.07.19 | 2018.07.20 | incinerator 2018.07.20 |
|---|---|---|---|---|---|
| | | 根据检测结果折算最大浓度值 | The maximum concentration value is converted according to the detection result | 根据检测结果折算最大浓度值 | The maximum concentration value is converted according to the detection result |
| 铊 | Thallium | <0.008 | <0.008 | <0.008 | <0.008 |
| 汞及其化合物（ug/m³） | Mercury and its compounds (ug/m³) | / | / | / | / |
| 氨（mg/m³） | Ammonia (mg/m³) | 2.46 | 2.46 | 0.87 | 0.87 |
| 镉及其化合物（mg/m³） | Cadmium and its compounds (mg/m³) | 未检出 | Not detected | 未检出 | Not detected |
| 锑及其化合物（mg/m³） | Antimony and its compounds (mg/m³) | 1.32×10-3 | $1.32\times10^{-3}$ | 1.02×10-3 | $1.02\times10^{-3}$ |
| 砷及其化合物（mg/m³） | Arsenic and its compounds (mg/m³) | 3.82×10-2 | $3.82\times10^{-2}$ | 3.56×10-2 | $3.56\times10^{-2}$ |
| 铅及其化合物（mg/m³） | Lead and its compounds (mg/m³) | 1.26×10-2 | $1.26\times10^{-2}$ | 1.15×10-2 | $1.15\times10^{-2}$ |
| 铬及其化合物（mg/m³） | Chromium and its compounds (mg/m³) | 0.112 | 0.112 | 0.109 | 0.109 |
| 钴及其化合物（mg/m³） | Cobalt and its compounds (mg/m³) | 3.00×10-3 | $3.00\times10^{-3}$ | 未检出 | Not detected |
| 铜及其化合物（mg/m³） | Copper and its compounds (mg/m³) | 1.22×10-2 | $1.22\times10^{-2}$ | 1.25×10-2 | $1.25\times10^{-2}$ |
| 锰及其化合物（mg/m³） | Manganese and its compounds (mg/m³) | 5.90×10-2 | $5.90\times10^{-2}$ | 5.18×10-2 | $5.18\times10^{-2}$ |
| 镍及其化合物折（mg/m³） | Nickel and its compounds (mg/m³) | 0.147 | 0.147 | 0.144 | 0.144 |
| 烟气黑度（林格曼级） | Blackness of flue gas (Ringelman) | ＜1级 | ＜Grade 1 | ＜1级 | ＜Grade 1 |

根据在线监测数据可知，烟气中烟尘、SO2、NOx的排放浓度能够满足《山东省火电厂大气污染物排放标准》（DB37/664-2019）表1其他燃料锅炉标准、《生活垃圾焚烧污染控制标准》(GB18485-2014)表4标准及《山东省区域性大气污染物综合排放标准》（DB/2376-2019）表1重点控制区标准要求（烟尘10mg/m³、$SO_2$50mg/m³和$NO_x$100mg/m³）。根据验收检测数据，共及其化合物、氨、镉+铊、锑+砷+铅+铬+钴+铜+锰+镍的排放浓度能够满足《生活垃圾焚烧污染控制标准》(GB18485-2014)表4标准要求；二噁英类排放浓度能够满足《生活垃圾焚烧污染控制标准》(GB18485-2014)表5标准要求（项目焚烧处理能力为1518t/d＞100t/d，二噁英类排放浓度限值为0.1TEQng/m³）。

According to online monitoring data, the emission concentrations of smoke dust, $SO_2$ and $NO_x$ in flue gas can meet the requirements of other fuel boiler standards in Table 1 of *Thermal Power Plant Air Pollutant Emission Standard of Shandong Province (DB37/664-2019)*, Table 4 of *Domestic*

*Waste Incineration Pollution Control Standard (GB18485-2014)* and key control area standards in Table 1 of *Regional Air Pollutant Comprehensive Emission Standard of Shandong Province (DB/2376-2019)* (smoke dust 10mg/m³, $SO_2$50mg/m³ and $NO_x$ 100mg/m³). According to the acceptance test data, the emission concentrations of mercury and its compounds, ammonia, cadmium+thallium, antimony+arsenic+lead+chromium+cobalt+copper+manganese+nickel can meet the requirements of Table 4 of *Domestic Waste Incineration Pollution Control Standard (GB18485-2014)*; the dioxin emission concentration can meet the requirements of Table 5 of the *Domestic Waste Incineration Pollution Control Standard (GB18485-2014)* (the incineration treatment capacity of the project is 1518t/d > 100t/d, and the dioxin emission concentration limit is 0.1TEQng/m³).

7、1×480t/h锅炉废气

7. 1×480t/h boiler waste gas

该锅炉烟气采用SNCR/SCR混合脱硝技术+双室2电场+4仓室电袋复合除尘器+白泥-石膏湿法脱硫工艺治理，锅炉烟气经脱硝、除尘、脱硫净化后，通过高120m、内径3.5m的烟囱排放，并安装烟气在线监测系统。2018年度在线检测结果见表2.1-10。

The boiler flue gas is treated by SNCR/SCR mixed denitration technology+double chamber 2 electric fields+4 chamber electric bag composite dust collector+white mud-gypsum wet desulfurization process. After denitration, dust removal and desulfurization purification, the boiler flue gas is discharged through a chimney with a height of 120m and an inner diameter of 3.5 m, and an on-line flue gas monitoring system is installed. See Table 2.1-10 for the results of online testing in 2018.

**表2.1-10 1×480t/h锅炉2018年在线检测结果一览表**

**Table 2.1-10 List of Online Test Results of 1 × 480 t/h Boiler in 2018**

| 时间 Time | 二氧化硫 Sulfur dioxide | | | 氮氧化物 Oxynitride | | | 烟尘 Smoke dust | | | 氧含量% Oxygen content % | 废气排放量m³ Waste gas emission m³ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 实测浓度mg/m³ Measured concentration mg/m³ | 折算浓度mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | 实测浓度mg/m³ Measured concentration mg/m³ | 折算浓度mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | 实测浓度mg/m³ Measured concentration mg/m³ | 折算浓度mg/m³ Conversion concentration mg/m³ | 排放量t Emission t | | |
| 2018-02 | 0.5 | 0.4 | 0 | 37 | 31 | 0.1 | 1.3 | 1.1 | 0 | 3.2 | 2278153 |
| 2018-04 | 1.4 | 1.2 | 0.2 | 35 | 30 | 4.9 | 1.6 | 1.3 | 0.2 | 3.5 | 14081447 8 |
| 2018-05 | 4.3 | 3.6 | 1.4 | 40 | 34 | 13 | 1.5 | 1.3 | 0.5 | 3.4 | 31101667 8 |
| 2018-06 | 4.1 | 3.4 | 1.3 | 39 | 33 | 13 | 1.2 | 1 | 0.4 | 3.1 | 32902375 7 |
| 2018- | 8.7 | 7.6 | 1.8 | 37 | 33 | 7.9 | 0.6 | 0.6 | 0.1 | 3.9 | 2134508 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 07 | | | | | | | | | | | 16 |
| 2018-08 | 9.6 | 8.4 | 0.7 | 40 | 36 | 2.7 | 0.7 | 1 | 0 | 4 | 68601647 |
| 2018-09 | 6.9 | 5.9 | 2 | 40 | 34 | 12 | 0.6 | 0.6 | 0.2 | 3.6 | 292613564 |
| 2018-10 | 4 | 3.6 | 0.8 | 37 | 33 | 7.1 | 1.2 | 1.2 | 0.2 | 4 | 188360648 |
| 2018-11 | 5.5 | 4.6 | 1.7 | 41 | 35 | 13 | 1.1 | 1 | 0.3 | 3.1 | 309626677 |
| 2018-12 | 5.8 | 4.9 | 1.9 | 43 | 36 | 14 | 1.1 | 1 | 0.3 | 3.2 | 324402368 |
| Average value | 5.1 | 4.4 | 1.2 | 39 | 33 | 8.6 | 1.1 | 1 | 0.2 | 3.5 | 218018879 |
| Maximum value | 9.6 | 8.4 | 2 | 43 | 36 | 14 | 1.6 | 1.3 | 0.5 | 4 | 329023757 |
| Minimum value | 0.5 | 0.4 | 0 | 35 | 30 | 0.1 | 0.6 | 0.6 | 0 | 3.1 | 2278153 |
| Cumulative value | | | 12 | | | 86 | | | 2.3 | | 2180188785 |
| Standard value | | 35 | | | 50 | | | 5 | | | |

由上表可以看出，二氧化硫、烟尘、氮氧化物和汞排放浓度可以同时满足《山东省火电厂大气污染物排放标准》（DB37/2372-2019）中表2燃煤锅炉标准及超低排放第2号修改单要求、《山东省区域性大气污染物综合排放标准》（DB/2376-2019）表1重点控制区标准要求。

It can be seen from the above table that the emission concentrations of sulfur dioxide, smoke dust, nitrogen oxides and mercury can simultaneously meet the requirements of Table 2 of the *Thermal Power Plant Air Pollutant Emission Standard of Shandong Province (DB37/2372-2019)* and the Ultra-low Emission Amendment No.2 and the key control area standards in Table 1 of the *Regional Air Pollutant Comprehensive Emission Standard of Shandong Province (DB/2376-2019)*.

8、无组织废气

8. Unorganized waste gas

根据造纸固废焚烧发电资源综合利用搬迁改造工程验收检测报告，无组织废气无组织排放废气监测结果见表2.1-11，检测期间气象参数见表2.1-12，验收检测期间氨、臭气浓度、硫化氢厂界浓度符合《恶臭污染物排放标准》（GB14554-1993）表1二级新扩改建标准要求；厂界无组织颗粒物监控点浓度符合《大气污染物综合排放标准》（GB16297-1996）表2标准要求。

According to the acceptance and inspection report of the relocation and reconstruction project for the comprehensive utilization of papermaking solid waste incineration power generation resources, the monitoring results of unorganized waste gas and unorganized emission of waste gas are shown

in Table 2.1-11, and the meteorological parameters during the inspection are shown in Table 2.1-12. During the acceptance and inspection, ammonia, odor concentration and hydrogen sulfide plant boundary concentration meet the requirements of Table 1, Level 2, New Expansion and Reconstruction Standard for *Odor Pollutants Emission Standard (GB14554-1993)*; the concentration of unorganized PM monitoring points in the plant boundary meets the requirements of Table 2 of the *Air Pollutant Comprehensive Emission Standard (GB16297-1996)*.

**表2.1-11 无组织排放废气浓度监测结果统计表**

**Table 2.1-11 Statistics of Monitoring Results of Unorganized Exhaust Gas Concentration**

| 采样日期 | Sampling date | 检测项目 | Monitoring item | 测点位置 | Point position | 检测结果（mg/m³） Monitoring results (mg/m³) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 第一次 First time | 第二次 Second time | 第三次 Third time | 第四次 Fourth time |
| 2018.07.19 | 07/19/2018 | 氨 | Ammonia | 1#上风向 | 1 # upwind | 0.02 | 0.03 | 0.03 | 0.02 |
| | | | | 2#下风向 | 2 # downwind | 0.06 | 0.08 | 0.06 | 0.08 |
| | | | | 3#下风向 | 3# downwind | 0.08 | 0.07 | 0.09 | 0.07 |
| | | | | 4#下风向 | 4# downwind | 0.17 | 0.09 | 0.10 | 0.11 |
| | | 硫化氢 | Hydrogen sulfide | 1#上风向 | 1 # upwind | 0.001 | 0.001 | 0.002 | 0.001 |
| | | | | 2#下风向 | 2# downwind | 0.008 | 0.007 | 0.008 | 0.007 |
| | | | | 3#下风向 | 3# downwind | 0.003 | 0.004 | 0.005 | 0.004 |
| | | | | 4#下风向 | 4# downwind | 0.003 | 0.004 | 0.005 | 0.004 |
| | | 臭气浓度（无量纲） | Odor Concentration (Dimensionless) | 1#上风向 | 1 # upwind | ＜10 | ＜10 | ＜10 | ＜10 |
| | | | | 2#下风向 | 2# downwind | 17 | 15 | 13 | 17 |
| | | | | 3#下风向 | 3# downwind | 15 | 18 | 17 | 18 |
| | | | | 4#下风向 | 4# downwind | 14 | 16 | 12 | 15 |
| | | 颗粒物 | PM | 1#上风向 | 1 # upwind | 0.282 | 0.303 | 0.267 | 0.306 |
| | | | | 2#下风 | 2# downwind | 0.391 | 0.431 | 0.453 | 0.436 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 向 | | | | | |
| | | | | 3#下风向 | 3# downwind | 0.466 | 0.488 | 0.473 | 0.512 |
| | | | | 4#下风向 | 4# downwind | 0.543 | 0.528 | 0.532 | 0.572 |
| 2018.07.20 | 7/20/2018 | 氨 | Ammonia | 1#上风向 | 1 # upwind | 0.02 | 0.03 | 0.04 | 0.02 |
| | | | | 2#下风向 | 2 # downwind | 0.06 | 0.09 | 0.05 | 0.09 |
| | | | | 3#下风向 | 3# downwind | 0.09 | 0.08 | 0.07 | 0.06 |
| | | | | 4#下风向 | 4# downwind | 0.12 | 0.09 | 0.09 | 0.11 |
| | | 硫化氢 | Hydrogen sulfide | 1#上风向 | 1 # upwind | 0.001 | 0.001 | 0.002 | 0.001 |
| | | | | 2#下风向 | 2# downwind | 0.007 | 0.008 | 0.008 | 0.009 |
| | | | | 3#下风向 | 3# downwind | 0.004 | 0.003 | 0.004 | 0.004 |
| | | | | 4#下风向 | 4# downwind | 0.005 | 0.004 | 0.005 | 0.005 |
| | | 臭气浓度（无量纲） | Odor Concentration (Dimensionless) | 1#上风向 | 1 # upwind | ＜10 | ＜10 | ＜10 | ＜10 |
| | | | | 2#下风向 | 2# downwind | 14 | 17 | 12 | 15 |
| | | | | 3#下风向 | 3# downwind | 13 | 15 | 16 | 17 |
| | | | | 4#下风向 | 4# downwind | 13 | 17 | 14 | 14 |
| | | 颗粒物 | PM | 1#上风向 | 1 # upwind | 0.321 | 0.285 | 0.306 | 0.307 |
| | | | | 2#下风向 | 2# downwind | 0.429 | 0.451 | 0.416 | 0.437 |
| | | | | 3#下风向 | 3# downwind | 0.485 | 0.526 | 0.511 | 0.475 |
| | | | | 4#下风向 | 4# downwind | 0.563 | 0.529 | 0.533 | 0.544 |
| 2018.07.21 | 7/21/2018 | 氨 | Ammonia | 1#上风向 | 1 # upwind | 0.01 | 0.04 | 0.03 | 0.02 |
| | | | | 2#下风向 | 2# downwind | 0.07 | 0.07 | 0.07 | 0.08 |
| | | | | 3#下风向 | 3# downwind | 0.08 | 0.09 | 0.08 | 0.09 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 4#下风向 | 4# downwind | 0.11 | 0.10 | 0.12 | 0.09 |
| | | 硫化氢 | Hydrogen sulfide | 1#上风向 | 1 # upwind | 0.001 | 0.002 | 0.002 | 0.001 |
| | | | | 2#下风向 | 2# downwind | 0.007 | 0.007 | 0.009 | 0.009 |
| | | | | 3#下风向 | 3# downwind | 0.004 | 0.004 | 0.005 | 0.004 |
| | | | | 4#下风向 | 4# downwind | 0.004 | 0.005 | 0.006 | 0.004 |
| | | 臭气浓度（无量纲） | Odor Concentration (Dimensionless) | 1#上风向 | 1 # upwind | ＜10 | ＜10 | ＜10 | ＜10 |
| | | | | 2#下风向 | 2# downwind | 16 | 18 | 13 | 12 |
| | | | | 3#下风向 | 3# downwind | 15 | 14 | 18 | 19 |
| | | | | 4#下风向 | 4# downwind | 18 | 17 | 15 | 16 |
| | | 颗粒物 | PM | 1#上风向 | 1 # upwind | 0.301 | 0.321 | 0.266 | 0.305 |
| | | | | 2#下风向 | 2# downwind | 0.446 | 0.411 | 0.471 | 0.453 |
| | | | | 3#下风向 | 3# downwind | 0.577 | 0.543 | 0.528 | 0.566 |
| | | | | 4#下风向 | 4# downwind | 0.542 | 0.564 | 0.587 | 0.588 |

**表2.1-12 无组织排放废气监测期间气象参数表**

**Table 2.1-12 Meteorological Parameters during Monitoring of Unorganized Exhaust Gas Emission**

| 采样日期 Sampling date | | 风向 Wind direction | 风速(m/s) Wind speed (m/s) | 气温(℃) Temperature (℃) | 气压(kPa) Air pressure (kPa) | 低云量 Low cloud cover | 总云量 Total cloud cover | 天气状况 Weather conditions |
|---|---|---|---|---|---|---|---|---|
| 2018.07.19 | 09:00 | SE | 1.5 | 31.7 | 100.0 | 1 | 2 | 晴 Sunny |
| | 11:00 | SSE | 1.9 | 33.5 | 99.9 | 1 | 1 | |
| | 13:00 | SE | 1.8 | 35.9 | 99.9 | 1 | 1 | |
| | 15:00 | SSE | 1.6 | 36.6 | 99.8 | 1 | 1 | |
| 2018.07.20 | 09:00 | SSE | 2.2 | 32.1 | 99.9 | 2 | 2 | |
| | 11:00 | SSE | 1.8 | 34.3 | 99.9 | 1 | 2 | 晴 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 13:00 | S | 2.4 | 36.1 | 99.8 | 1 | 1 | Sunny |
| | 15:00 | S | 2.1 | 37.0 | 99.7 | 1 | 2 | |
| 2018.07.21 | 09:00 | SE | 1.8 | 31.3 | 100.0 | 2 | 2 | 晴 Sunny |
| | 11:00 | SE | 1.7 | 33.1 | 100.0 | 2 | 2 | |
| | 13:00 | SSE | 1.4 | 34.9 | 99.9 | 1 | 1 | |
| | 15:00 | SE | 1.8 | 35.6 | 99.9 | 1 | 1 | |

### 2.1.3.2 废水

### 2.1.3.2 Waste water

1、废水产生及治理情况

1. Production and treatment of waste water

太阳纸业废水类型包括：造纸生产线生产废水、碱回收工程废水、热电厂排污水、生活污水及造纸固废焚烧项目废水，太阳纸业各生产单元产生的废水总量76997.22m³/d。

The types of waste water from Sun Paper include: waste water from paper production line, waste water from alkali recovery project, waste water from thermal power plant, domestic waste water and waste water from solid waste incineration project of papermaking. The total amount of waste water generated by each production unit of Sun Paper is 76997.22m³/d.

2、现有废水处理设施概况

2. Overview of existing waste water treatment facilities

现有废水处理设施包括2座纸机白水处理站、1座CQJ型超效浅层离子气浮净水器以及废水治理节能减排及资源化工程和徐家营氧化塘等，具体情况见表2.1-13。

Existing waste water treatment facilities include 2 white water treatment stations for paper machines, one CQJ type ultra-effective shallow ion flotation water purifier, waste water treatment energy saving, emission reduction and recycling projects and Xujiaying oxidation pond, etc. See Table 2.1-13 for details.

**表2.1-13 太阳纸业现有废水处理设施汇总情况一览表**

**Table 2.1-13 Summary of Existing Waste Water Treatment Facilities in Sun Paper**

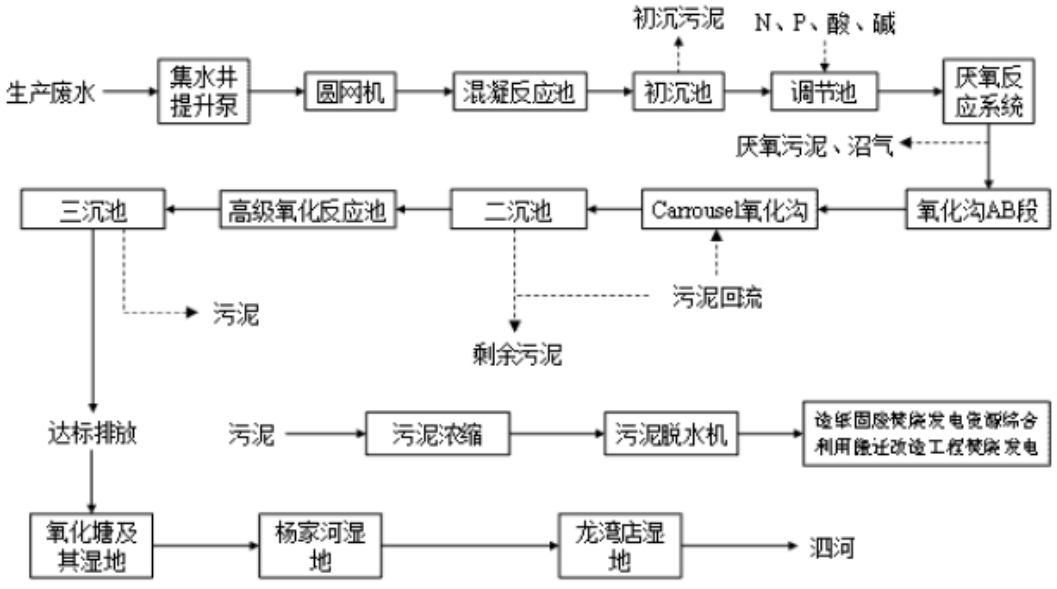
| 序号 | S/n | 废水处理设施 | Sewage treatment facilities | 处理工艺 | Treatment process | 处理规模 | Treatment scale | 备注 | Remarks | 隶属关系 | Affiliation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1#纸机白水处理站 | 1# Paper Machine White Water Treatment Station | 高效气浮 | High efficiency air flotation | 1万m³/d | 10,000 m³/d | 出水回用于化学浆技改项目生产线 | The effluent is reused in the production line of chemical pulp | 太阳纸业 | Sun Paper |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | technical transformation project. | | |
| 2 | 2 | 2#纸机白水处理站 | 2# Paper Machine White Water Treatment Station | 高效气浮 | High efficiency air flotation | 2万$m^3$/d | 20,000 $m^3$/d | 出水部分进入再生水处理工程，部分排入废水治理节能减排及资源化工程 | Part of the effluent enters the reclaimed water treatment project, and part is discharged into the waste water treatment, energy saving, emission reduction and resource utilization project. | 太阳纸业 | Sun Paper |
| 3 | 3 | CQJ型超效浅层离子气浮净水器 | CQJ superefficient shallow ion air float water purifier | 超效浅层离子气浮 | Superefficient shallow ion flotation | 3万$m^3$/d | 30,000 $m^3$/d | 出水排入废水治理节能减排及资源化工程 | The effluent is discharged into the waste water treatment, energy saving, emission reduction and resource utilization project. | 太阳纸业 | Sun Paper |
| 4 | 4 | 废水治理节能减排及资源化工程 | Waste Water Treatment, Energy Saving, Emission Reduction and Resource Utilization Project | 选择生化处理（PAFR反应器+改良型氧化沟）+深度处理（磁化-催化反应+絮凝沉淀 | Biochemical treatment (PAFR reactor+improved oxidation ditch)+advanced treatment (magnetization-catalytic reaction+flocculation precipitation) | 8万$m^3$/d | 80,000 $m^3$/d | 出水排入徐家营氧化塘进一步处理，正在进行改扩建 | The effluent is discharged into Xujiaying Oxidation Pond for further treatment and is undergoing renovation and expansion. | 太阳纸业 | Sun Paper |
| 5 | 5 | 徐家营氧化塘及其湿地 | Xujiaying oxidation pond and its wetland | 好氧生化＋物化沉淀＋氧化塘＋湿地 | Aerobic biochemistry＋physicochemical precipitation＋oxidation pond＋wetland | 30$hm^2$(蓄水量160万$m^3$) | 30 $hm^2$ (1.6 million $m^3$ water storage | 出水外排入杨家河湿地 | The effluent is discharged into Yangjiahe wetland. | 太阳纸业 | Sun Paper |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | capacity) | | | | |
| 6 | 6 | 杨家河湿地 | Yangjiahe Wetland | 自然净化+生物降解 | Natural purification+biodegradation | 52.2hm²(蓄水量240万m³) | 52.2 hm² (2.4 million m³ water storage capacity) | 出水通过管道入泗河 | The effluent enters Sihe River through pipelines. | 兖州市政工程 | Yanzhou Municipal Engineering |

太阳纸业污水处理站总体采用“厌氧-好氧-深度处理”工艺，工艺流程见图2.1-4。

The sewage treatment station of Sun Paper generally adopts the “anaerobic-aerobic-advanced treatment” process, and the process flow is shown in Figure 2.1-4.



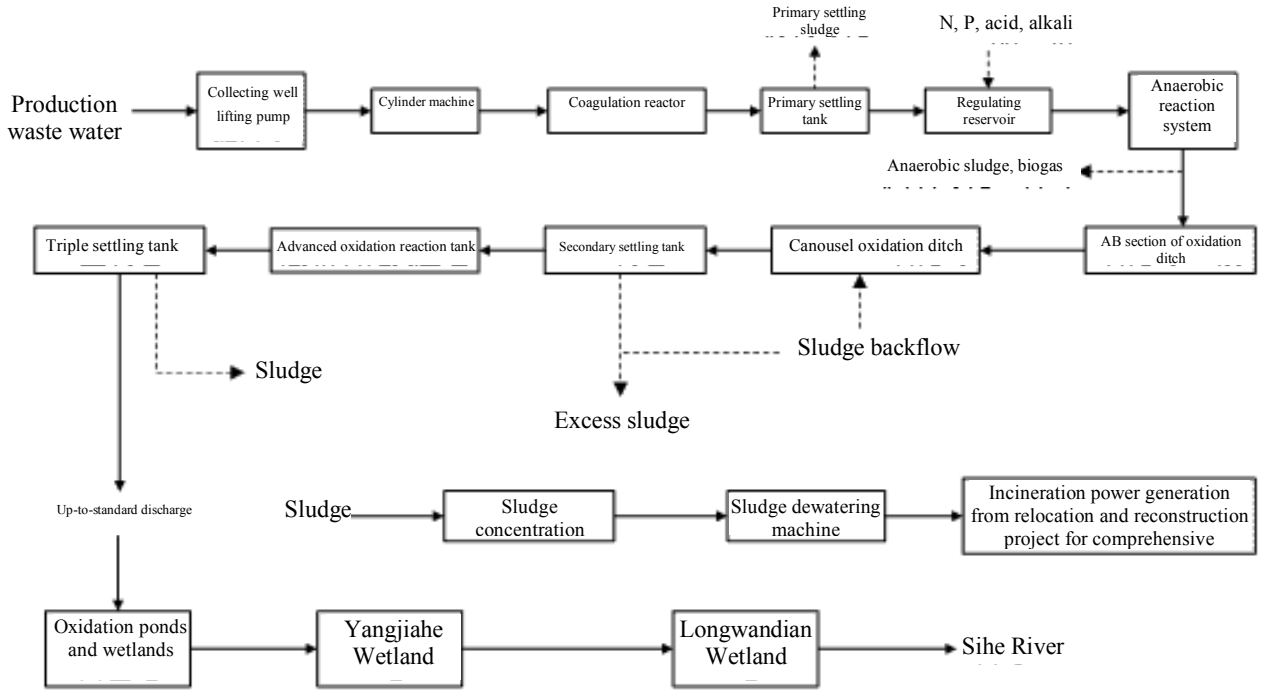



**图2.1-4 太阳纸业污水处理厂水处理工艺流程图**

**Figure 2.1-4 Water Treatment Process Flow Diagram of Sun Paper Sewage Treatment Plant**

现有污水日处理8万m³/d，出水COD可稳定达到60mg/L以下，处理后的废水继续通过后续氧化塘深度治理工程，利用湿地生态系统进一步降解，达到《流域水污染物综合排放标准第1部分：南四湖东平湖流域》（DB37/3416.1-2018）中一般保护区标准要求。处理后的中水经过杨家河湿地降解后再利用泵站通过管道输送至泗河，最后出兖州境汇入南四湖。

At present, the daily treatment of sewage is 80,000m³/d, and the effluent COD can stably reach below 60mg/L. The treated waste water continues to pass through the oxidation pond deep treatment project and is further degraded by using the wetland ecosystem to meet the requirements of the general protection zone standard in *Comprehensive Discharge Standards for Water Pollutants in Watershed Part 1: Dongping Lake Watershed of Nansi Lake (DB37/3416. 1-2018)*. The treated reclaimed water is degraded by Yangjiahe Wetland and then transported to Sihe River through pipelines by pumping stations, and finally flows out of Yanzhou into Nansi Lake.

3、达标排放情况

3. Up-to-standard discharge

本次评价收集太阳纸业8万m³/d污水处理站（改造前）氧化塘出口2018年度在线监测数据，具体情况见表2.1-14。

In this assessment, the 2018 online monitoring data of oxidation pond exit of 80,000 m³/d sewage treatment station (before renovation) of Sun Paper are collected. See Table 2.1-14 for details.

**表2.1-14 8万m³/d污水处理厂在线监测数据一览表**

**Table 2.1-14 List of Online Monitoring Data of 80,000 m³/d Sewage Treatment Plant**

| 时间 Time | 化学需氧量 Chemical oxygen demand | | 氨氮 Ammonia nitrogen | | 总磷 Total phosphorus | | 总氮 Total nitrogen | | 废水排放量 Waste water discharge |
|---|---|---|---|---|---|---|---|---|---|
| | 浓度 Concentration | 排放量 Emission | 浓度 Concentration | 排放量 Emission | 浓度 Concentration | 排放量 Emission | 浓度 Concentration | 排放量 Emission | (m³) |
| | (mg/l) | (t) | (mg/l) | (t) | (mg/l) | (t) | (mg/l) | (t) | |
| 2018-01 | 45 | 102 | 0.442 | 1.03 | | | | | 2312351 |
| 2018-02 | 44.5 | 87.1 | 0.72 | 1.42 | | | | | 1980652 |
| 2018-03 | 43.5 | 99.9 | 0.496 | 1.14 | | | | | 2295761 |
| 2018-04 | 40.9 | 89.9 | 1.48 | 3.19 | | | | | 2178012 |
| 2018-05 | 43.9 | 104 | 1.78 | 4.29 | | | | | 2363379 |
| 2018-06 | 43.6 | 97.1 | 1.98 | 3.83 | | | | | 2198806 |
| 2018-07 | 41.7 | 104 | 1.5 | 3.64 | | | | | 2450863 |
| 2018-08 | 45 | 99.8 | 1.96 | 4.4 | 0.0218 | 0.0498 | 3.22 | 6.89 | 2240260 |
| 2018-09 | 44.5 | 96.5 | 2.04 | 4.49 | 0.0319 | 0.059 | 3.2 | 6.65 | 2219618 |
| 2018-10 | 45.9 | 103 | 2.06 | 4.67 | 0.0693 | 0.144 | 3.24 | 6.76 | 2254949 |
| 2018-11 | 45.5 | 93.5 | 4.06 | 8.36 | 0.0273 | 0.0544 | 5.03 | 10.3 | 2061527 |
| 2018-12 | 45.2 | 100 | 1.41 | 3.01 | 0.0252 | 0.0453 | 2.34 | 4.22 | 2199329 |
| 平均值 Average value | 44.1 | 98.1 | 1.66 | 3.62 | 0.0351 | 0.0705 | 3.41 | 6.97 | 2229626 |
| 最大值 Maximum value | 45.9 | 104 | 4.06 | 8.36 | 0.0693 | 0.144 | 5.03 | 10.3 | 2450863 |
| 最小值 Minimum value | 40.9 | 87.1 | 0.442 | 1.03 | 0.0218 | 0.0453 | 2.34 | 4.22 | 1980652 |
| 累计值 Cumulative value | | 1177 | | 43.5 | | 0.353 | | 34.8 | 26755508 |
| 标准值 Standard value | 60 | / | 5 | / | 0.8 | | 12 | | / |

由上表可见，COD的排放浓度为40.9～45.9mg/L，氨氮排放浓度为0.442～4.06mg/L，平均排放浓度分别为44.1mg/L、1.66mg/L，达标率为100%。

As can be seen from the above table, the emission concentration of COD is 40.9 ~ 45.9 mg/L, the emission concentration of ammonia nitrogen is 0.442 ~ 4.06 mg/L, and the average emission

concentration is 44.1 mg/L and 1.66 mg/L respectively, with a compliance rate of 100%.

同时本次评价收集山东三益环境测试分析有限公司检测报告，编号：三益（检）字2019年第037-14号，于2019年7月10日对污水处理站总排口废水水质进行监测，数据汇总于表2.1-15。

Meanwhile, this assessment collected the SY(J)Z No.037-14 test report of Shandong Sanyi Environmental Test and Analysis Co., Ltd. in 2019, and monitored the waste water quality at the total discharge port of the sewage treatment station on July 10, 2019. The data are summarized in Table 2.1-15.

**表2.1-15 8万m³/d污水处理站氧化塘总排口废水监测数据一览表**

**Table 2.1-15 List of Waste Water Monitoring Data at the General Discharge Outlet of Oxidation Pond of 80,000 m³/d Sewage Treatment Station**

| 采样点位 Sampling port position | 监测时间 Monitoring time | 监测项目（单位：pH值无量纲，色度为倍，其余为mg/L） Monitoring items (unit: pH value is dimensionless, chromaticity is times, and the rest is mg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | COD | BOD5 | pH值 pH value | 悬浮物 Suspended matter | 氨氮 Ammonia nitrogen | 总氮 Total nitrogen | 总磷 Total phosphorus | 色度 Chromaticity |
| 氧化塘排水口 Oxidation pond outlet | 07/10/2019 | 40 | 10.3 | 6.76 | 9 | 2.20 | 6.49 | 0.02 | 5 |
| DB37/3416.1-2018表2一般保护区域标准 DB37/3416. 1-2018 Table 2 General Protection Zone Standards | | 60 | 20 | 6-9 | 30 | 8 | 12 | 0.5 | 30 |
| GB 3544-2008表2标准 GB 3544-2008 Table 2 Standard | | 90 | 20 | 6-9 | 30 | 8 | 12 | 0.8 | 50 |

综上，太阳纸业污水处理站出水可以满足《流域水污染物综合排放标准第1部分：南四湖东平湖流域》DB37/3416.1-2018表2一般保护区域标准、《制浆造纸工业水污染物排放标准（GB3544-2008）》、《造纸工业水污染物排放标准》（DB37/336-2003）的要求。为满足南水北调工程对沿线河道排污的水质要求，兖州市政府利用杨家河上游部分河段建设了“杨家河湿地”，将兖州市开发区和太阳纸业处理后的废水通过管道排入“杨家河湿地”进一步处理后在兖州市区北侧的龙湾店处排入泗河。根据前文分析，太阳纸业现有工程排水量共计2810.4万m³/a（单位产品基准排水量为31.37t/t浆），主要污染物COD和氨氮的排放浓度分别

以60mg/L、2.4mg/L（依据排污许可最高允许排放量推算最高允许排放浓度分别为60mg/L、2.4mg/L）计，排放量分别为1686.23t/a和67.44t/a，单位产品基准排水量满足《制浆造纸工业水污染物排放标准（GB3544-2008）》表2标准要求（40t/t浆）。

To sum up, the effluent from the sewage treatment station of Sun Paper can meet the DB37/3416. 1-2018 Table 2 General Protection Zone Standard of *Comprehensive Discharge Standards for Water Pollutants in Watershed Part 1: Dongping Lake Watershed of Nansi Lake*, *Discharge Standard for Water Pollutants in Pulp and Paper Industry (GB3544-2008)* and *Discharge Standard for Water Pollutants in Paper Industry (DB37/336-2003)*. To meet the water quality requirements of the South-to-North Water Diversion Project for sewage discharge from rivers along the route, Yanzhou Municipal Government has built "Yangjiahe Wetland" using some sections of the upper reaches of Yangjiahe River. The waste water treated by Yanzhou Development Zone and Sun Paper is discharged into Yangjiahe Wetland through pipelines and then discharged into Sihe River at Longwan Store on the north side of Yanzhou City. According to the foregoing analysis, the total project displacement of Sun Paper is 28.104 million $m^3/a$ (the benchmark displacement per unit product is 31.37t/t pulp). The discharge concentrations of major pollutants COD and ammonia nitrogen are calculated as 60mg/L and 2.4 mg/L respectively (the maximum allowable discharge concentrations are calculated as 60mg/L and 2.4 mg/L respectively according to the maximum allowable discharge permit), and the discharge amounts are 1686.23t/a and 67.44t/a respectively. The standard discharge amount per unit product meets the standard requirements (40t/t pulp) in Table 2 of the *Discharge Standard for Water Pollutants in Pulp and Paper Industry (GB3544-2008)*.

#### 2.1.3.3 噪声

#### 2.1.3.3 Noise

现有工程主要噪声源为污水处理、造纸固废焚烧发电等项目生产设备以及水泵、鼓风机、引风机、罗茨风机等，目前采取的降噪措施包括：①在厂区总体布置中统筹规划，尽量将高噪声源集中布置，远离厂界和办公区；②将噪声设备尽量置于车间内，不在车间内的高噪声设备加设隔声罩；③对高噪声设备，尤其是能固定的泵类设置减震基础，避免产生共振；④在管道布置、设计及支吊架选择上注意防震、防冲击；⑤集中控制室采用双层窗，并选用吸声性能好的墙面材料；⑥锅炉排汽口和安全阀吹管口安装高压喷注式消音器；吹管时间应尽可能避开居民休息时间；⑦风管连接处采用柔性接头并设置补偿节降低振动产生的噪声。因项目各厂界与其他项目共用，故本次评价引用《太阳新材料产业园环境影响报告书》监测数据，数据汇总见表2.1-16，监测布点见图2.1-5。

The main noise sources of the existing project are production equipment of sewage treatment, paper-making solid waste incineration power generation and other projects, as well as water pumps, blowers, induced draft fans, Roots fans, etc. The noise reduction measures currently adopted include: ① Overall planning in the overall layout of the plant area: High noise sources are centralized and kept away from the plant boundary and office area; ② Put noise equipment in workshops as far as possible, and add sound insulation covers to high noise equipment not in the

workshops; ③ Set shock absorption foundation for high noise equipment, especially pumps that can be fixed, to avoid resonance; ④ Pay attention to shock prevention and impact prevention in pipeline layout, design and supports and hangers selection; ⑤ The centralized control room adopts double-layer windows and selects wall materials with good sound absorption performance; ⑥ Install high-pressure injection silencer at boiler exhaust port and safety valve blowpipe port; blowing time should be set properly to avoid affecting residents' rest as much as possible; ⑦ Flexible joints are adopted at the joint of air ducts and compensation joints are set to reduce noise generated by vibration. As each plant boundary of the project is shared with other projects, the monitoring data of the *Environmental Impact Report of Sun Paper New Materials Industrial Park* are quoted in this assessment. The data summary is shown in Table 2.1-16, and the monitoring points are shown in Figure 2.1-5.

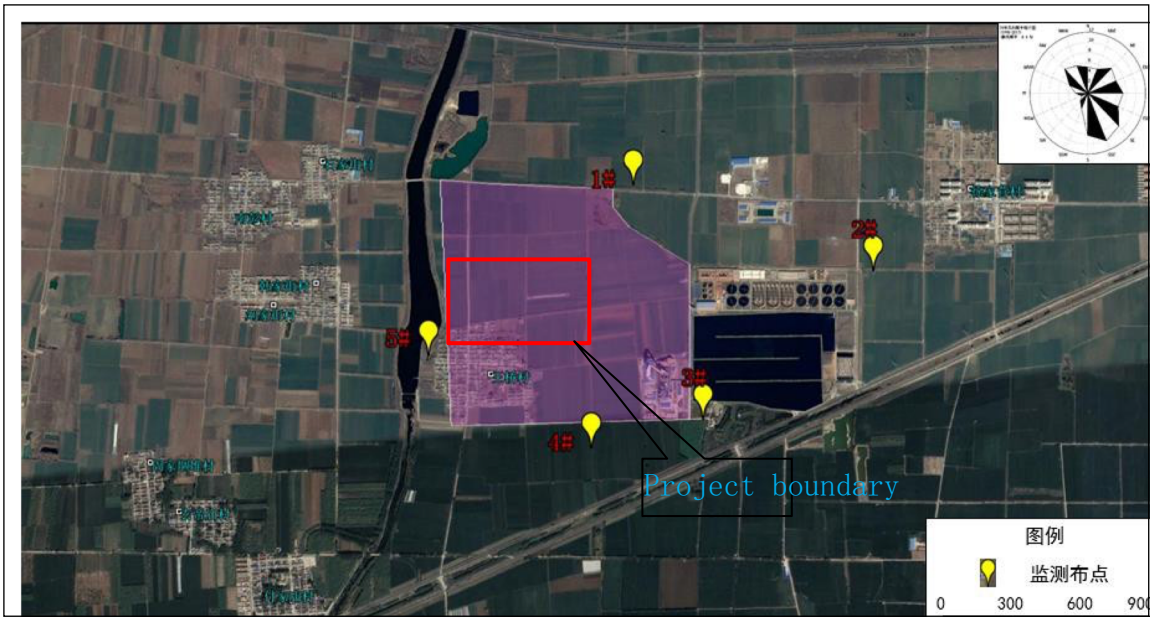



**图2.1-5 声环境现状监测布点图**

**Figure 2.1-5 Acoustic Environment Status Monitoring Point Layout Diagram**

**表2.1-16 环境噪声现状监测结果表（单位：dB(A)）**

**Figure 2.1-16 Monitoring Results of Environmental Noise Status (Unit: dB (A))**

| 监测日期 | Monitoring date | 监测时间 | Monitoring time | 监测项目 Monitoring item | 监测结果 Monitoring result | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 北厂界 North plant boundary | 北侧东厂界 East plant boundary on the north side | 南侧东厂界 East plant boundary on the south side | 南厂界 South plant boundary | 西厂界 West plant boundary |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2019.6.09 | 6/9/2019 | 昼 | Day | $L_{Aeq}$ | 52.0 | 54.5 | 53.9 | 51.7 | 54.0 |
| | | | | $L_{10}$ | 52.4 | 55.7 | 54.5 | 53.2 | 54.3 |
| | | | | $L_{50}$ | 51.8 | 54.5 | 53.9 | 51.3 | 54.0 |
| | | | | $L_{90}$ | 51.5 | 52.8 | 53.4 | 50.9 | 53.6 |
| | | 夜 | Night | $L_{Aeq}$ | 43.5 | 41.6 | 43.8 | 43.4 | 45.7 |
| | | | | $L_{10}$ | 43.9 | 42.1 | 44.2 | 45.1 | 48.7 |
| | | | | $L_{50}$ | 43.4 | 41.5 | 43.7 | 42.9 | 46.0 |
| | | | | $L_{90}$ | 43.0 | 40.6 | 43.3 | 41.9 | 43.1 |
| 2019.6.10 | 6/10/2019 | 昼 | Day | $L_{Aeq}$ | 55.5 | 55.2 | 58.3 | 56.4 | 57.0 |
| | | | | $L_{10}$ | 56.7 | 55.4 | 59.6 | 57.7 | 58.6 |
| | | | | $L_{50}$ | 55.3 | 55.2 | 58.5 | 55.9 | 56.7 |
| | | | | $L_{90}$ | 54.3 | 54.9 | 53.8 | 54.8 | 54.8 |
| | | 夜 | Night | $L_{Aeq}$ | 42.4 | 44.7 | 44.4 | 44.2 | 43.2 |
| | | | | $L_{10}$ | 44.7 | 45.5 | 45.1 | 45.4 | 43.1 |
| | | | | $L_{50}$ | 41.1 | 44.4 | 44.2 | 43.4 | 41.9 |
| | | | | $L_{90}$ | 40.7 | 43.7 | 43.9 | 39.8 | 41.4 |

可见，厂界噪声满足《工业企业厂界环境噪声排放标准》（GB12348-2008）3类标准（昼间65dB(A)，夜间55dB(A)）的要求。

It can be seen that the noise at the plant boundary meets the requirements of Class 3 standards (65dB(A) in daytime and 55dB(A) at nighttime) of the *Emission Standard for Environmental Noise Emission Standards for Industrial Enterprise Plant Boundary (GB12348-2008)*.

### 2.1.3.4 固废

### 2.1.3.4 Solid waste

现有工程固废来自制浆造纸过程中产生的损纸、木屑、浆渣、铁钉等重质杂质、废包装物、废毛布、干网，碱回收生产线产生的白泥、消化渣子、黑液杂质，污水处理系统污泥，热电工程锅炉灰渣以及职工日常生活垃圾等，现有工程固体废物产生及治理情况见表2.1-17。

The solid waste of the existing project comes from heavy impurities such as damaged paper, sawdust, pulp slag, and iron nails, as well as waste packaging materials, waste wool cloth, and dry net generated in the pulping and papermaking process, white mud, digestive residue, black liquor impurities, sewage treatment system sludge, thermal power engineering boiler ash and daily living garbage of employees, etc. generated by alkali recovery production line. See Table 2.1-17 for the generation and treatment of existing project solid wastes.

**表2.1-17 现有工程固体废物产生量及处置情况**

**Table 2.1-17 Production and Disposal of Solid Wastes in Existing Engineering**

| 项目名称 | Project name | 固废名称 | Name of solid waste | 产生量(t/a) Production (t/a) | 形态 | Form | 主要成分 | Main components | 固废性质 | Solid waste nature | 处置情况 | Disposal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 制浆造纸生产线 | Pulp and paper production line | 损纸 | Damaged paper | 45200.1 | 固 | Solid | 纸 | Paper | 一般固废 | General solid waste | 全部回用于生产 | For production |
| | | 木屑 | Sawdust | 60434 | 固 | Solid | 木屑 | Sawdust | 一般固废 | General solid waste | 进入造纸固废综合利用项目焚烧 | Incinerated in the comprehensive utilization project of solid waste in papermaking |
| | | 浆渣 | Slurry-residue | 49394 | 固 | Solid | 浆渣 | Slurry-residue | 一般固废 | General solid waste | 用于生产低档纸 | Used to produce low-grade paper |
| | | | | 136 | 固 | Solid | | | | | 外售用于制备低档纸 | Sold out for making low-grade paper |
| | | 木片洗涤废渣 | Wood chip washing waste residue | 13600 | 固 | Solid | 浆渣 | Slurry-residue | 一般固废 | General solid waste | 外售制作密度板等 | Sold out for making density board, etc. |
| | | 木片洗涤器产生的硬木结 | Hardwood knots produced by wood chip washer | 3400 | 固 | Solid | 木结 | Wood knots | 一般固废 | General solid waste | 送至集团发电厂焚烧发电 | Sent to the Group Power Plant for incineration and power generation |
| | | 纯水处理产生废活性炭 | Spent activated carbon produced by pure water treatment | 1 | 固 | Solid | 活性炭 | Activated carbon | 一般固废 | General solid waste | 生产厂家更换时回收 | Recovered during replacement by manufacturer |
| | | 纯水处理产生废反渗透膜 | Waste reverse osmosis membrane produced by pure water treatment | 0.4 | 固 | Solid | 树脂膜 | Resin film | 一般固废 | General solid waste | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 铁钉等重质杂质 | Heavy impurities such as nails | 86 | 固 | Solid | 杂质 | Impurities | 一般固废 | General solid waste | 外售给废品收购站 | Sold out to scrap purchasing stations |
| | | 废毛布、干网 | Waste wool cloth, dry net | 20 | 固 | Solid | 毛布、干网 | Wool cloth, dry net | 一般固废 | General solid waste | 外售给废品收购站 | Sold out to scrap purchasing stations |
| | | 废包装物 | Waste packaging | 0.2 | 固 | Solid | 包装桶 | Packing barrel | / | / | 厂家回收 | Manufacturer recycling |
| | | | | 53.5 | 固 | Solid | 塑料、纸 | Plastic, paper | 一般固废 | General solid waste | 外售给废品收购站 | Sold out to scrap purchasing stations |
| 天然纤维生产线 | Natural fiber production line | 石子、木片渣 | Stone, wood chip slag | 4182 | 固 | Solid | 石子、木片渣 | Stone, wood chip slag | 一般固废 | General solid waste | 送往污泥焚烧发电工程进行焚烧 | Sent to the sludge incineration power generation project for incineration |
| | | 浆渣 | Slurry-residue | 15300 | 固 | Solid | 浆渣 | Slurry-residue | 一般固废 | General solid waste | | |
| | | 细砂 | Fine sand | 17 | 固 | Solid | 细砂 | Fine sand | 一般固废 | General solid waste | 与生活垃圾一起外运 | Transported together with domestic garbage |
| | | 除尘器尘渣 | Dust of dust collector | 486.2 | 固 | Solid | 除尘器尘渣 | Dust of dust collector | 一般固废 | General solid waste | 送往污泥焚烧发电工程进行焚烧 | Sent to the sludge incineration power generation project for incineration |
| | | 重质杂质 | Heavy impurities | 10.2 | 固 | Solid | 重质杂质 | Heavy impurities | 一般固废 | General solid waste | 分类后卖给废品收购站或和生活垃圾一同处理 | Sold to scrap purchasing stations or disposed of together with domestic garbage after classification. |
| | | 浆渣 | Slurry-residue | 58390.2 | 固 | Solid | 浆渣 | Slurry-residue | 一般固废 | General solid waste | 送往污泥焚烧发电工 | Sent to sludge incineration generator |
| | | 浆渣 | Slurry-residue | 5100 | 固 | Solid | 浆渣 | Slurry-residue | 一般固废 | General solid waste | 程进行焚烧 | Incineration |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 原料废包装 | Waste packaging of raw materials | 68 | 固 | Solid | 废包装 | Waste packaging | 一般固废 | General solid waste | 分类后卖给废品收购站 | Sold to scrap purchasing stations after classification. |
| 碱回收及生石灰项目生产线 | Alkali recovery and quicklime project production line | 白泥 | White mud | 67677 | 固 | Solid | 碳酸钙 | Calcium carbonate | 一般固废 | General solid waste | 用于自备热电厂脱硫 | For desulfurization of self-provided thermal power plant |
| | | | | 194701 | | | | | | | 外售用于生产轻质碳酸钙 | Sold out for light calcium carbonate production |
| | | 消化渣子 | Digestive residue | 8840 | 固 | Solid | 杂质 | Impurities | 一般固废 | General solid waste | 进入太阳纸业股份有限公司填埋场填埋 | Enter the landfill site of Shandong Sun Paper Co., Ltd. |
| | | 黑液杂质 | Black liquor impurities | 30600 | | | 杂质 | Impurities | 一般固废 | General solid waste | | |
| | | 碎料石灰石除尘器收集的粉尘 | Dust collected by particle limestone dust collector | 30498 | 固 | Solid | 石灰粉 | Lime powder | 一般固废 | General solid waste | 出售至建筑公司或商品混凝土搅拌站作为建材使用 | Sold to construction companies or commercial concrete mixing plants for use as building materials. |
| 污水处理系统 | Sewage treatment system | 污泥 | Sludge | 298740 | 固 | Solid | 有机质 | Organic matter | 一般固废 | General solid waste | 进入造纸固废综合利用项目焚烧 | Incinerated in the comprehensive utilization project of solid waste in papermaking |
| | | | | 66755 | | | | | | | | |
| 热电厂 | Thermal power plant | 炉灰 | Furnace ash | 400139.5 | 固 | Solid | 灰渣 | Ash | 一般固废 | General solid waste | 部分外售兖州市嵫山水泥厂、用于生产水泥、建筑材料，临时无法接受的灰渣， | Part is sold out to Yanzhou Zhishan Cement Plant for the production of cement and building |
| | | 炉渣 | Slag | 136272.7 | 固 | Solid | 灰渣 | Ash | 一般固废 | General solid waste | | |
| | | 脱硫石膏 | Desulfurized gypsum | 88323.8 | 固 | Solid | 硫酸钙 | Calcium sulfate | 一般固废 | General solid waste | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 送临时灰渣场填埋 | materials. Ash that could not be accepted for the time being is sent to temporary ash yard for landfill. |
| | | 废催化剂 | Spent catalyst | 9.2* | 固 | Solid | 钒、钨 | Vanadium, tungsten | 危险废物（HW49） | Hazardous wastes (HW49) | 委托有资质单位处理 | Entrust a qualified unit |
| 造纸固体废物焚烧 | Incineration of papermaking solid waste | 炉渣 | Slag | 47592.0 | 固 | Solid | 灰渣 | Ash | 一般固废 | General solid waste | 外售作建材原料 | Sold out as raw materials for building materials |
| | | 炉灰 | Furnace ash | 71352.3 | 固 | Solid | 灰渣 | Ash | 一般固废 | General solid waste | 外售作建材原料 | Sold out as raw materials for building materials |
| | | 脱硫石膏 | Desulfurized gypsum | 8492.4 | 固 | Solid | 硫酸钙 | Calcium sulfate | 一般固废 | General solid waste | 外售作建材原料 | Sold out as raw materials for building materials |
| | | 废活性炭 | Waste activated carbon | 96.0 | 固 | Solid | 活性炭 | Activated carbon | 一般固废 | General solid waste | 供应厂家回收再生 | Recycled by supplier |
| | | 中水预处理沉砂 | Reclaimed water pretreatment grit settling | 4.0 | 固 | Solid | 砂 | Sand | 一般固废 | General solid waste | 进入太阳纸业股份有限公司填埋场填埋 | Enter the landfill site of Shandong Sun Paper Co., Ltd. |
| 生活办公 | Living and working | 生活垃圾 | Domestic waste | 1960.4 | 固 | Solid | 纸屑、餐余 | Paper scraps, meal surplus | 一般固废 | General solid waste | 由市政环卫部门统一处理 | Handled by the municipal sanitation department |
| 机修 | Machine repair | 废机油 | Used oil | 1.5 | 液 | Liquid | 机油 | Oil | 危险废物（HW08）900-249-08 | Hazardous wastes (HW08) 900-249-08 | 委托有资质单位处理 | Entrust a qualified unit |
| 合计 | | Total | | 1707924 | / | / | / | / | / | / | All have been properly disposed of. | 均得到妥善处置 |

综上所述，现有工程固体废物均得到有效处置。

To sum up, the existing engineering solid waste has been effectively disposed of.

### 2.1.3.5 排污汇总

### 2.1.3.5 Summary of sewage discharge

现有工程“三废”排放情况汇总见表2.1-18。

See Table 2.1-18 for a summary of the discharge of “three wastes” from existing project.

**表2.1-18 现有工程主要污染物排放情况汇总**

**Table 2.1-18 Summary of Main Pollutants Discharge of Existing Project**

| 项目<br>Item | | 现有工程排放量<br>Existing project emissions |
|---|---|---|
| 废气<br>Exhaust gas | 烟气量（万$m^3$/a）<br>Volume of flue gas (10,000 $m^3$/a) | 1588204.58 |
| | $SO_2$ (t/a) | 579.58 |
| | $NO_2$ (t/a) | 1445.46 |
| | 烟尘（t/a）<br>Smoke (t/a) | 158.52 |
| | 汞（kg/a）<br>Mercury (kg/a) | 62.18 |
| 废水<br>Waste water | 废水量(万$m^3$/a)<br>Waste water volume (10,000 $m^3$/a) | 2675.55 |
| | COD (t/a) | 1686.23 |
| | 氨氮（t/a）<br>Ammonia nitrogen (t/a) | 67.44 |
| Solid waste | 合计（万t/a）<br>Total (10,000 t/a) | 170.7924 |

备注：固废指产生量；根据《关于贯彻鲁政字[2015]170号文件的通知》（鲁环办[2015]36号）要求，排放总量计算以实际监测数据为准，40万t/a化机浆及配套碱回收项目污染物排放总量依据已批复环评报告书实测数据统计，造纸固废焚烧发电项目依据环评数据统计，其他现有工程污染物排放总量依据在线监测数据推算。

Note: Solid waste refers to the amount generated. According to the requirements of the *Notice on Implementing Document LZZ [2015] No.170 (LHB [2015] No.36)*, the calculation of the total emission shall be based on the actual monitoring data. The total emission of pollutants from 400,000 t/a chemical mechanical pulp and supporting alkali recovery projects shall be calculated according to the measured data in the approved EIA report. The total emission of pollutants from

papermaking solid waste incineration power generation projects shall be calculated according to the EIA data. The total emission of pollutants from other existing project shall be calculated according to the online monitoring data.

现有、在建工程总量控制指标分析结果见表2.1-19。

See Table 2.1-19 for the analysis results of total amount control indexes of existing projects and construction in progress.

**表2.1-19 现有工程总量控制指标符合性分析一览表**

**Table 2.1-19 List of Compliance Analysis of Total Amount Control Indexes of Existing Projects**

| 项目 Item | 废气 Exhaust gas | | | 废水 Waste water | |
|---|---|---|---|---|---|
| | $SO_2$ (t/a) | $NO_x$ (t/a) | 烟尘（t/a） Smoke (t/a) | COD (t/a) | $H_3$-N (t/a) |
| 现有工程 Existing project | 579.58 | 1445.46 | 158.52 | 1686.23 | 67.44 |
| 排污许可证指标（2018.6-2019.6） Sewage discharge permit (2018.6-2019.6) | 679.240 | 1487.610 | 129.74 | 1722 | 68.8 |
| 排污许可证指标（2019.6-2020.6） Sewage discharge permit (2019.6-2020.6) | 679.240 | 1487.610 | 129.74 | 1722 | 68.8 |
| 是否满足要求 Whether the requirements are met | 满足 Yes | 满足 Yes | 满足 Yes | 满足最新排污许可要求 Meet the latest emission permit requirements | |

备注：按照排污许可要求，碱回收仅对氮氧化物做总量控制要求，二氧化硫和烟尘仅许可浓度(碱回收烟气中二氧化硫和烟尘排放总量分别为105.25t/a、64.25t/a，除碱回项目外其余工程二氧化硫和烟尘排放总量为474.33t/a、94.27t/a)。

Note: According to the requirements of pollution discharge permit, alkali recovery only proposes requirements for the total amount control of nitrogen oxides, and sulfur dioxide and smoke dust shall meet the standard of permitted concentrations (the total amount of sulfur dioxide and smoke dust emissions in alkali recovery flue gas are 105.25 t/a and 64.25 t/a respectively, and the total amount of sulfur dioxide and smoke dust emissions in other engineering except alkali recovery engineering are 474.33 t/a and 94.27 t/a).

故现有工程全厂污染物排放满足排污许可的总量要求。

Therefore, the pollutant discharge of the whole plant in the existing engineering meets the total requirement of the pollutant discharge permit.

#### 2.1.3.6 现有工程存在的环境问题及拟采取的整改措施

#### 2.1.3.6 Environmental problems in existing project and rectification measures to be taken

根据前述分析可知，现有工程存在的环境问题主要是：生石灰项目颗粒物排放浓度不能满足《山东省区域性大气污染物综合排放标准》（DB/2376-2019）表1重点控制区标准（颗粒物10mg/m³）要求。

According to the above analysis, the main environmental problems in the existing project are: the particulate matter emission concentration of quicklime project cannot meet the requirements of the key control area standard (particulate matter 10mg/m$^3$) in Table 1 of *Regional Air Pollutant Comprehensive Emission Standard of Shandong Province (DB/2376-2019)*.

拟采取的整改措施是：增加一级除尘，提高除尘效率。

The rectification measures to be taken are: increase the first-level dust removal and improve the dust removal efficiency.

## 2.2 拟建工程分析

## 2.2 Analysis of the proposed project

### 2.2.1 项目概况

### 2.2.1 Project overview

#### 2.2.1.1 项目名称、建设性质及建设地点

#### 2.2.1.1 Project name, construction nature and construction site

项目名称：山东太阳纸业股份有限公司年产45万吨特色文化纸项目

Project name: 450,000t/a Special Printing-and-writing Paper Project of Shandong Sun Paper Co., Ltd.

项目性质：新建

Project nature: New construction

建设单位：山东太阳纸业股份有限公司

Construction unit: Shandong Sun Paper Co., Ltd.

建设地点：济宁市兖州区颜店镇太阳新材料产业园内，具体位置见图2.2-1。

Construction site: Sun Paper New Materials Industrial Park, Yandian Town, Yanzhou District, Jining City. See Figure 2.2-1 for the specific location.

建设内容：建设1条18万吨化机浆生产线、1条年产45万吨特色文化纸生产线，并建设辅助工程及配套设施。

Construction content: A 180,000 t/a chemical mechanical pulp production line, and a 450,000 t/a special printing-and-writing paper production line, as well as auxiliary projects and supporting facilities.

建设进度：目前项目占地为空地，还未建设，建设周期2019年12月到2020年11月，共12个月。

Construction progress: Currently, the project site is unoccupied. The construction period is from December 2019 to November 2020, totaling 12 months.

#### 2.2.1.2 项目组成及主要经济指标

#### 2.2.1.2 Project composition and main economic indicators

1、项目组成情况

1. Project composition

拟建项目由主体工程、辅助工程、储运工程、公用工程和环保工程五部分组成，具体的项目组成见表2.2-1。

The proposed project consists of five parts: main project, auxiliary project, storage and transportation project, utilities and environmental protection project. See Table 2.2-1 for the specific project composition.

**表2.2-1 拟建项目组成一览表**

**Table 2.2-1 Composition of the Proposed Project**

| 类别 Category | | | | 主要工程内容 | Main engineering content | 备注 | Remarks |
|---|---|---|---|---|---|---|---|
| 主体工程 | Main work | 碎解库 | Crushing depot | 1座，建筑面积6300m²，主要设备有：水力碎浆机、高浓除砂器和双盘磨浆机。水力碎浆机用于外购商品浆板的碎解，高浓除砂器主要用于去除浆中的杂质，双盘磨浆机主要用于打浆。 | One crushing depot, with a construction area of 6300 m², and the main equipment of hydraulic pulper, high consistency desander and double-disc refiner. Hydraulic pulp crusher is used to crush purchased commercial pulper, high consistency desander is mainly used to remove impurities in pulp, and double-disc refiner is mainly used for beating pulp. | 新建 | Newly built |
| | | 化机浆车间 | Chemical mechanical pulp workshop | 1座，建筑面积6300m²，车间内设一条生产规模为18万t/a的化机浆生产线。主要 | One chemical mechanical pulp workshop, with a construction area of 6,300 m², and a 180,000 t/a chemical mechanical | 新建 | Newly built |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | 原料为杨木原木和桉木木片。 | pulp production line. The main raw materials are poplar logs and eucalyptus chips. | | |
| | | 湿式造纸联合厂房 | Wet papermaking combined workshop | 1座，建筑面积24750m²，设计生产规模为45万t/a，主要原料为外购浆板和自制化机浆，车间内配1台宽幅为9850mm、最大工作车速1700m/min的抄纸机。 | One wet papermaking combined workshop, with a construction area of 24,750 m ² and a design production scale of 450,000 t/a. The main raw materials are purchased pulp board and self-made chemical machine pulp. The workshop is equipped with a paper machine with a width of 9,850mm and a maximum working speed of 1,700m/min. | 新建 | Newly built |
| 辅助工程 | Ancillary works | 蒸发浓缩车间 | Evaporation concentration workshop | 1座，建筑面积2700m²，主要用于制浆工段黑液蒸发浓缩。 | One evaporation concentration workshop, with a construction area of 2,700 m². It is mainly used for evaporation and concentration of black liquor in pulping section. | 新建 | Newly built |
| 储运工程 | Storage and transportation engineering | 原料堆场 | Raw material storage yard | 1座，占地面积94852m²，用于存放杨木原木和桉木木片，堆场设1个木片仓，最大储存量100000m³。 | One raw material storage yard, with an area of 94,852 m². It is used for storing poplar logs and eucalyptus wood chips. The storage yard is equipped with a wood chip warehouse with a maximum storage capacity of 100,000 m². | 新建 | Newly built |
| | | 浆板库 | Pulp board warehouse | 1座，建筑面积10575m²，用于存放外购浆板。 | One pulp board warehouse, with a construction area of 10,575 m². It is used for storing purchased pulp boards. | 新建 | Newly built |
| | | 化工库 | Chemical warehouse | 1座，建筑面积为4050m²，存放化学药品。 | One chemical warehouse, with a construction area of 4,050 m². It is used for storing chemicals. | 新建 | Newly built |
| | | 成品库 | Finished product warehouse | 1座，建筑面积14100m²，用于特色文化纸的储存。 | One finished product warehouse, with a construction area of 14,100 m². It is used for storing special printing- | 新建 | Newly built |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | and-writing paper. | | |
| | | 运输 | Transportation | 木片及一般化工原料均公路运输为主；厂内运输为仓库与各车间之间的物料运输，一般都采用装载车和叉车等运输设备。 | Wood chips and general chemical raw materials are mainly transported by road. In-plant transportation is the material transportation between the warehouse and each workshop, generally using transportation equipment such as loading trucks and forklifts. | | |
| 公用工程 | Utilities | 供水系统 | Water supply system | 水源主要为地下水及南水北调工程地表水，新鲜水用量为11941m³/d，合406万m³/a。 | The main water sources are groundwater and surface water of the South-to-North Water Diversion Project. The fresh water consumption is 11,941m³/d, accounting for 4.06 million m³/a. | | |
| | | 供电系统 | Power supply system | 供电电源为太阳新材料产业园变压站，全年用电量为2700万kWh。 | The power supply is the transformer station of Sun Paper New Materials Industrial Park, with an annual power consumption of 27 million kWh. | | |
| | | 供热系统 | Heating system | 由同期拟建的2×280t/h（一用一备）蒸汽锅炉提供，项目蒸汽用量为81万t/a。 | It is provided by the 2 × 280 t/h (one for use and one for standby) steam boiler to be built in the same period, and the steam consumption of the project is 810,000 t/a. | 新建 | Newly built |
| 环保工程 | Environmental protection engineering | 废水处理 | Waste water treatment | 纸机白水部分回收利用，剩余的纸机白水和生产废水排入同期拟建污水处理厂改扩建工程，处理后的废水经过杨家河湿地降解后再利用泵站通过管道输送至泗河，最后排入南四湖。 | The white water from the paper machine is partially recycled, and the remaining white water from the paper machine and the production waste water are discharged into the reconstruction and expansion project of the proposed sewage treatment plant at the same time. The treated wastewater is degraded by Yangjiahe wetland and then transported to Sihe by pumping station | 依托 | Dependence |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | through pipelines, and finally discharged into Nansi Lake. | | |
| | | 废气 | Exhaust gas | 木片再碎、筛分工序产生的粉尘经管道收集后进入1套布袋除尘器（除尘效率99%）后，由1根20m的高排气筒达标排放。 | The dust generated from the wood chip re-crushing and screening process is collected by pipelines, then enters a set of bag dust collector (dust removal efficiency is 99%), and then is discharged by a 20m high exhaust funnel up to the standard. | | |
| | | | | 蒸煮臭气：设置DNCG密闭收集系统。DNCG收集系统由DNCG风机驱动，将臭气推动进入DNCG洗涤塔进行洗涤和降温处理后无组织排放。 | Cooking odor: DNCG sealed collection system is set up. The DNCG collection system is driven by a DNCG fan, which pushes odor into the DNCG washing tower for washing and cooling treatment before unorganized discharge. | | |
| | | 固体废物 | Solid waste | 树皮、木屑和部分浆渣等送至供热中心燃烧处理；蒸发浓缩后的黑液由罐车拉往太阳纸业股份有限公司总厂区处理；部分浆渣送至填埋场填埋处理。 | Bark, sawdust and some slurry and slag are sent to the heating center for combustion treatment. The black liquor after evaporation and concentration is pulled by the tanker to the general plant area of Sun Paper for treatment. Part of the slurry and slag are sent to the landfill site for landfill treatment. | | |
| | | 噪声 | Noise | 采用消声、隔声、减振等降噪措施。 | Noise reduction measures such as noise elimination, sound insulation and vibration reduction shall be adopted. | | |

2、工艺经济指标

2. Technological economic indicators

拟建项目主要技术经济指标见表2.2-2

See Table 2.2-2 for the main technical and economic indicators of the proposed project.

表2.2-2 主要技术经济指标一览表

**Table 2.2-2 List of Main Technical and Economic Indicators**

| 序号 S/n | 指标名称 Indicator name | | 单位 | Unit | 指标值 Indicator value | 备注 Remarks |
|---|---|---|---|---|---|---|
| 一 I | 生产规模 Production scale | | - | - | - | |
| | 1 | 特色文化用纸 Special printing-and-writing paper | 万t/a | 10,000 t/a | 45 | |
| 二 II | 占地面积 Area | | m² | m² | 442200 | |
| 三 III | 劳动定员 Staffing | | 人 | Person | 300 | |
| 四 IV | 车间工作制度 Workshop work system | | — | I | 三班制 Three-shift system | |
| | 1 | 全年生产天数 Production days throughout the year | d/a | d/a | 340 | |
| | 2 | 每天生产时数 Production hours per day | h/d | h/d | 24 | |
| 五 V | 新鲜水总用水量 Total fresh water consumption | | 万m³/a | 10,000 m³/a | 406 | |
| | 1 | 生产用新鲜水量 Fresh water for production | 万m³/a | 10,000 m³/a | 405 | |
| | | 吨纸耗新鲜水量 Fresh water consumption per ton of paper | m³/t纸 | m³/t paper | 9.02 | |
| | 2 | 生活用新鲜水量 Fresh water for domestic use | 万m³/a | 10,000 m³/a | 1 | |
| 六 VI | 用电量 Electricity consumption | | 万kwh/a | 10,000 kwh/a | 2700 | |
| 七 VII | 用汽量 Steam consumption | | 万t/a | 10,000 t/a | 81 | |
| 八 VIII | 项目总投资 Total project investment | | 万元 | RMB10,000 | 300000 | |
| 九 IX | 环保投资 Investment in environmental protection | | 万元 | RMB10,000 | 277 | |

### 2.2.1.3 产品方案及工艺指标

### 2.2.1.3 Product scheme and process indicators

1、产品方案

1. Product scheme

拟建项目特色文化用纸主要为胶版印刷纸，主要指标方案见表2.2-3。

The special printing-and-writing paper for the proposed project is mainly offset printing paper, and the main index scheme is shown in Table 2.2-3.

**表2.2-3 产品一览表**

**Table 2.2-3 Product List**

| 产品名称<br>Products | 质量标准<br>Quality standard | 数量（万t/a）<br>Quantity (10,000 t/a) | 备注<br>Remarks |
|---|---|---|---|
| 胶版印刷纸5.0<br>Offset printing paper 5.0 | Q/0882 STZ001-2017 | 45 | 本白、米黄和高白胶版印刷纸<br>Raw white, beige and high white offset printing paper |

2、产品标准

2. Product standards

产品质量执行《山东太阳纸业股份有限公司企业标准》（Q/0882STZ001-2017）表3，主要产品质量要求详见表2.2-4。

The product quality is in accordance with Table 3 of the *Enterprise Standard of Shandong Sun Paper Co., Ltd.(Q/0882 STZ001-2017)*, and the main product quality requirements are detailed in Table 2.2-4.

**表2.2-4 主要质量指标一览表**

**Table 2.2-4 List of Main Quality Indicators**

| 指标名称<br>Indicator name | 单位<br>Unit | 要求<br>Requirement | |
|---|---|---|---|
| | | 优等品<br>Superior product | 合格品<br>Qualified product |
| 定量<br>Quantitative | g/m² | 50.0 55.0 60.0 70.0 80.0 100 | |
| 定量允许偏差 ≤<br>Quantitative allowable deviation ≤ | % | 4.0 | |
| 横幅定量差 ≤<br>Banner quantitative difference ≤ | % | 5.0 | |
| 松厚度 ＞ | cm³/g | 1.60 | |

| | | | | | |
|---|---|---|---|---|---|
| Bulk ＞ | | | | | |
| 亮度（白度）<br>Brightness (whiteness) | | | % | 68.0～80.0 | |
| 不透明度 ≥<br>Opacity ≥ | | | % | 88.0 | 85.0 |
| 抗张指数<br>Tensile index | 卷筒（纵向） ≥<br>Drum (longitudinal) ≥ | | N·m/g | 40.0 | 35.0 |
| | 平板（纵横平均） ≥<br>Plate (average vertical and horizontal) ≥ | | | 32.0 | 28.0 |
| 平滑度（正反面均）≥<br>Smoothness (average of both sides) ≥ | | | s | 10 | |
| 缩性(横向) ≤<br>Scalability (horizontal) ≤ | | | % | 2.5 | |
| 耐折次数(横向)≥<br>Number of folding resistance (horizontal) ≥ | | | time | 6 | |
| 印刷表面强度（正反面均） ≥<br>Printed surface strength (average of both sides) ≥ | | | m/s | 1.00 | |
| pH | | | — | 6.0～8.0 | |
| 油墨吸收性（正反面均）<br>Ink absorption (average of both sides) | | | % | 50～65 | |
| 吸水性（正反面均）≤<br>Water absorption (average of both sides) ≤ | | | g/m² | 50 | |
| 尘埃度<br>Dust degree | 总数 ≤<br>Total≤ | | | 60 | 200 |
| | 其中<br>Of which | 0.3mm²～0.5mm² ≤ | | 60 | 200 |
| | | ＞0.5mm²～1.5mm² ≤ | 个/m²<br>Piece/m² | 6 | 10 |
| | | ＞1.5mm² | | 不应有<br>Not expected | |
| 交货水分<br>Delivery moisture | | | % | 5.0～8.0 | |

根据市场需求状况、行业发展规划及企业自身建设条件，确定拟建项目产品为优质轻型纸，定量为70g/m²，松厚度为1.60cm³/g、交货水分以6%计。

According to the market demand situation, industry development plan and enterprise's own construction conditions, it is determined that the products of the proposed project are high-quality light paper with a quantitative value of 70g/m², a bulk of 1.60 cm³/g and a delivery moisture of 6%.

3、主要工艺指标

3. Main process indicators

本项目各生产线主要工艺技术指标见表2.2-5。

See Table 2.2-5 for the main process and technical indicators of each production line of this project.

**表2.2-5 生产线主要工艺指标**

**Table 2.2-5 Main Process Indicators of Production Line**

| 类别 | Category | 序号 | S/n | 项目 | Item | 单位 | Unit | 数量 | Quantity | 备注 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 化机浆备浆阶段 | Chemical mechanical pulp preparation stage | 1 | 1 | 化机浆浆得率 | Chemical mechanical pulp yield | % | % | 83 | 83 | | |
| | | 2 | 2 | 成浆浓度 | Pulp concentration | % | % | 3.0~3.5 | 3.0~3.5 | | |
| 商品浆备浆阶段 | Commercial pulp preparation stage | 1 | 1 | 水力碎浆机浓度 | Concentration of hydraulic pulper | % | % | 5~6 | 5~6 | | |
| | | 2 | 2 | 打浆浓度 | Beating concentration | % | % | 4~5 | 4~5 | | |
| 造纸阶段 | Papermaking stage | 1 | 1 | 纸机最大工作车速 | Maximum working speed of paper machine | m/min | m/min | 1700 | 1700 | | |
| | | 2 | 2 | 卷纸宽度 | Width of roll paper | mm | mm | 9850 | 9850 | | |
| | | 3 | 3 | 上网浓度 | Upper sieve concentration | % | % | 0.6-1.0 | 0.6-1.0 | | |
| | | 4 | 4 | 出 | Sieve outlet dryness | % | % | 20~23 | 20~23 | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 网部干度 | | | | | | | |
| 5 | 5 | 出压榨部纸页干度 | Paper dryness of press section | % | % | 48-53 | 48-53 | | |
| 6 | 6 | 施胶前纸页干度 | Paper dryness before sizing | % | % | 90~93 | 90~93 | | |
| 7 | 7 | 出施胶机干度 | Dryness of sizing machine | % | % | 70-72 | 70-72 | | |
| 8 | 8 | 复卷机切边宽度 | Trimming width of rewinder | mm | mm | 40 | 40 | | |
| 9 | 9 | 网上留着率 | Sieve retention rate | % | % | 65-75 | 65-75 | | |
| 10 | 10 | 流浆箱回流量 | Headbox reflux | % | % | 10 | 10 | | |
| 11 | 11 | 流浆箱溢流量 | Headbox overflow | % | % | 5 | 5 | | |
| 12 | 12 | 成品纸 | Dryness of finished paper | % | % | 94 | 94 | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 的干度 | | | | | | | |
| | | 13 | 13 | 复卷机车速 | Speed of rewinder | m/min | m/min | 2500 | 2500 | | |
| | | 14 | 14 | 进复卷最大直径 | Maximum diameter of rewinding | mm | mm | 3400 | 3400 | | |
| | | 15 | 15 | 复卷后直径 | Diameter after rewinding | mm | mm | 1500 | 1500 | | |
| | | 16 | 16 | 定量范围 | Quantitative range | g/m² | g/m² | 50－100 | 50－100 | 计算定量70 | Calculated quantity70 |

### 2.2.1.4 项目平面布置及合理性分析

### 2.2.1.4 Project layout and rationality analysis

1、项目平面布置

1. Project layout

本项目选址位于山东省济宁市兖州区颜店镇太阳新材料产业园西南侧，项目占地面积为442200m²，其中南北最长660m，东西最长670m，厂区呈矩形。厂区共设置2个出入口，均位于厂区南侧。厂区主要建筑物包括原料堆场、蒸发车间、化学品库、化机浆车间、商品浆车间，湿式造纸联合厂房（45万吨特色文化纸）、纸加工车间和成品仓库。原料堆场位于厂区西侧，原料堆场右侧由北至南依次是：蒸发车间、化学品库、化机浆车间、商品浆车间，湿式造纸联合厂房（45万吨特色文化纸）、纸加工车间和成品仓库。

The project is located on the southwest side of Sun Paper New Materials Industrial Park, Yandian Town, Yanzhou District, Jining City, Shandong Province. The project covers an area of 442,200m², with a south-north distance of 660m and an east-west distance of 670m. The plant area is rectangular. There are 2 entrances and exits in the plant area, all located on the south side. The main buildings in the plant area include raw material storage yard, evaporation workshop, chemical warehouse, chemical mechanical pulp workshop, commercial pulp workshop, wet papermaking joint workshop (450,000 tons of special printing-and-writing paper), paper processing workshop and finished product warehouse. The raw material storage yard is located on the west side of the

plant area. The right side of the raw material storage yard is as follows from north to south: evaporation workshop, chemical warehouse, chemical mechanical pulp workshop, commercial pulp workshop, wet papermaking joint workshop (450,000 tons of special printing-and-writing paper), paper processing workshop and finished product warehouse.

项目平面布置图见图2.2-2。

See Figure 2.2-2 for the project layout.

拟建项目主要构筑物见表2.2-6。

See Table 2.2-6 for the main structures of the proposed project.

**表2.2-6 拟建项目主要构筑物一览表**

**Table 2.2-6 List of Main Structures of the Proposed Project**

| 编号 | 建筑名称 | | 层数 | 长×宽×高（m×m×m） | 建筑面积 | 数量 |
|---|---|---|---|---|---|---|
| No. | Name of structure | | Floor | L×W×H (m×m×m) | Construction area | Quantity |
| 1 | 原料堆场 | Raw material storage yard | 1 | 239×396×12 | 94852 | 1 |
| 2 | 纸加工车间 | Paper processing workshop | 2 | 165×75×6 | 24750 | 1 |
| 3 | 成品仓库 | Finished product warehouse | 1 | 188×75×6 | 14100 | 1 |
| 4 | 湿式造纸联合厂房 | Wet papermaking combined workshop | 2 | 365×68×6 | 49640 | 1 |
| 5 | 化机浆车间 | Chemical mechanical pulp workshop | 2 | 105×30×6 | 6300 | 1 |
| 6 | 浆板库 | Pulp board warehouse | 1 | 235×45×6 | 10575 | 1 |
| 7 | 化工库 | Chemical warehouse | 2 | 45×45×6 | 4050 | 1 |
| 8 | 碎解库 | Crushing depot | 2 | 70×45×6 | 6300 | 1 |
| 9 | 蒸发浓缩车间 | Evaporation concentration workshop | 1 | 60×45×6 | 2700 | 1 |

2、项目平面布置合理性分析

2. Rationality analysis of the project layout

（1）木片仓紧靠原木片堆场布置，以便于原料的输送，减少厂内运输影响。制浆区、造纸区、纸加工区紧邻，项目工艺流程顺畅合理，布置紧凑，便于管理、减少占地并降低能耗。

(1) The wood chip warehouse is arranged close to the log chip storage yard to facilitate transportation of raw materials and reduce influence of in-plant transportation. The pulping area, papermaking area and paper processing area are close to each other. The project process flow is smooth and reasonable, and the layout is compact, which may facilitate management, reduce land

occupation land, and reduce energy consumption.

（2）事故水池位于厂区地势低处，便于事故废水的收集和处理。

(2) The emergency pool is located in the low terrain of the plant area, which is convenient for the collection and treatment of accident waste water.

（3）拟建项目的平面布置满足有关设计规范，满足工艺、电气、仪表控制、消防等各种设施的防火间距的要求，确保安全生产。

(3) The plane layout of the proposed project meets the relevant design specifications, meets the requirements of fire prevention spacing of various facilities such as processes, electricity, instrument control, fire fighting, etc., and ensures safe production.

综上所述，从安全生产、方便运输、便于管理、环境保护等方面综合考虑，拟建项目的平面布置是基本合理的。

To sum up, considering the aspects of safe production, convenient transportation, convenient management and environmental protection, the plane layout of the proposed project is basically reasonable.

### 2.2.2 工程分析

### 2.2.2 Engineering analysis

#### 2.2.2.1 工艺流程及产污环节

#### 2.2.2.1 Process flow and pollution production processes

拟建项目建设1条年产45万吨特色文化纸生产线，其中包括1条18万吨的化机浆生产线，生产过程包括备浆工段、抄纸工段两个主要工序。

The proposed project will build a 450,000 t/a special printing-and-writing paper production line, including a 180,000 t/a chemical mechanical pulp production line. The production process includes two main processes: pulp preparation section and paper making section.

1、备料

1. Material preparation

（1）商品浆的工艺流程及产污环节

(1) Process flow and pollution production of commercial pulp

购来的商品浆浆垛先运入仓库，人工拆垛后，先通过电磁除铁器，然后通过链式输送机输送至水力碎浆机，碎浆后通过高浓除砂器后送至贮浆塔，用于贮存碎解木浆。碎浆调浓后，进入双圆盘磨浆机打浆，打好的浆料进入混合浆池。

The purchased commercial pulp stacks are first transported into the warehouse. After manual dismantling, they are first transported to the hydraulic pulper through an electromagnetic iron remover and then through a chain conveyor. After pulping, they are transported to the pulp storage

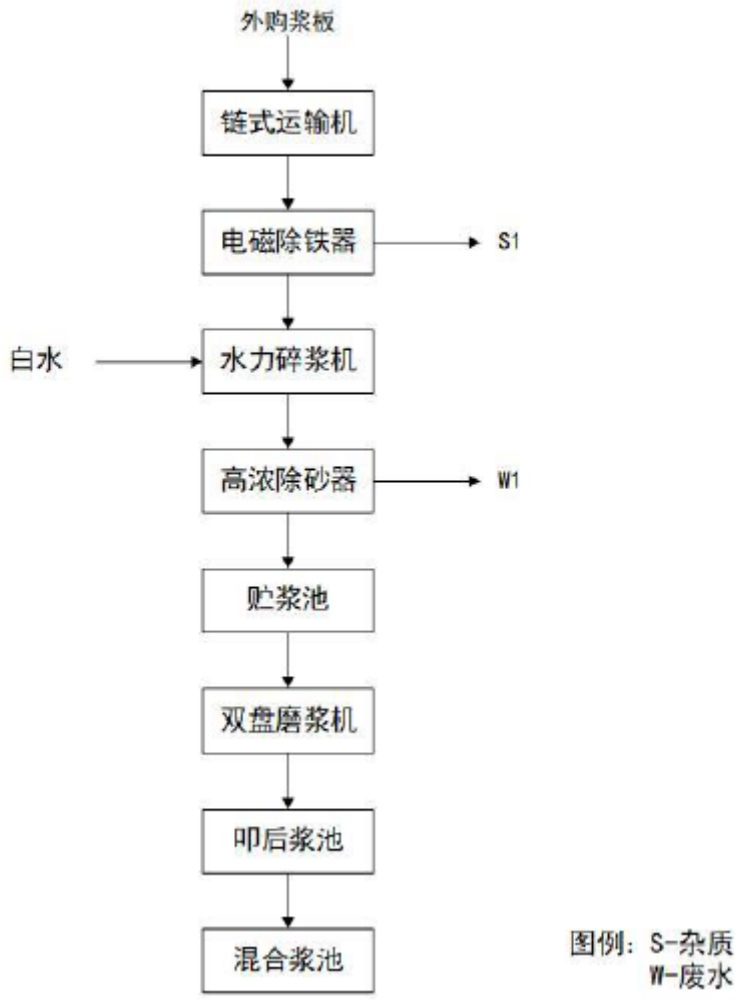
tower through a high-consistency sand remover for storing crushed wood pulp. After the pulp becomes dense, it enters the double disc refiner for beating, and the beaten pulp enters the mixing tank.

产污环节：电磁除铁器去除的铁丝等杂物（S1），高浓除砂器筛选出的含浆渣的废水（W1）。

Pollution production process: Sundries such as iron wire (S1) are removed by electromagnetic iron remover, and waste water containing slurry and slag (W1) is screened by high concentration sand remover.

详见下图2.2-3。

See Figure 2.2-3 below for details.



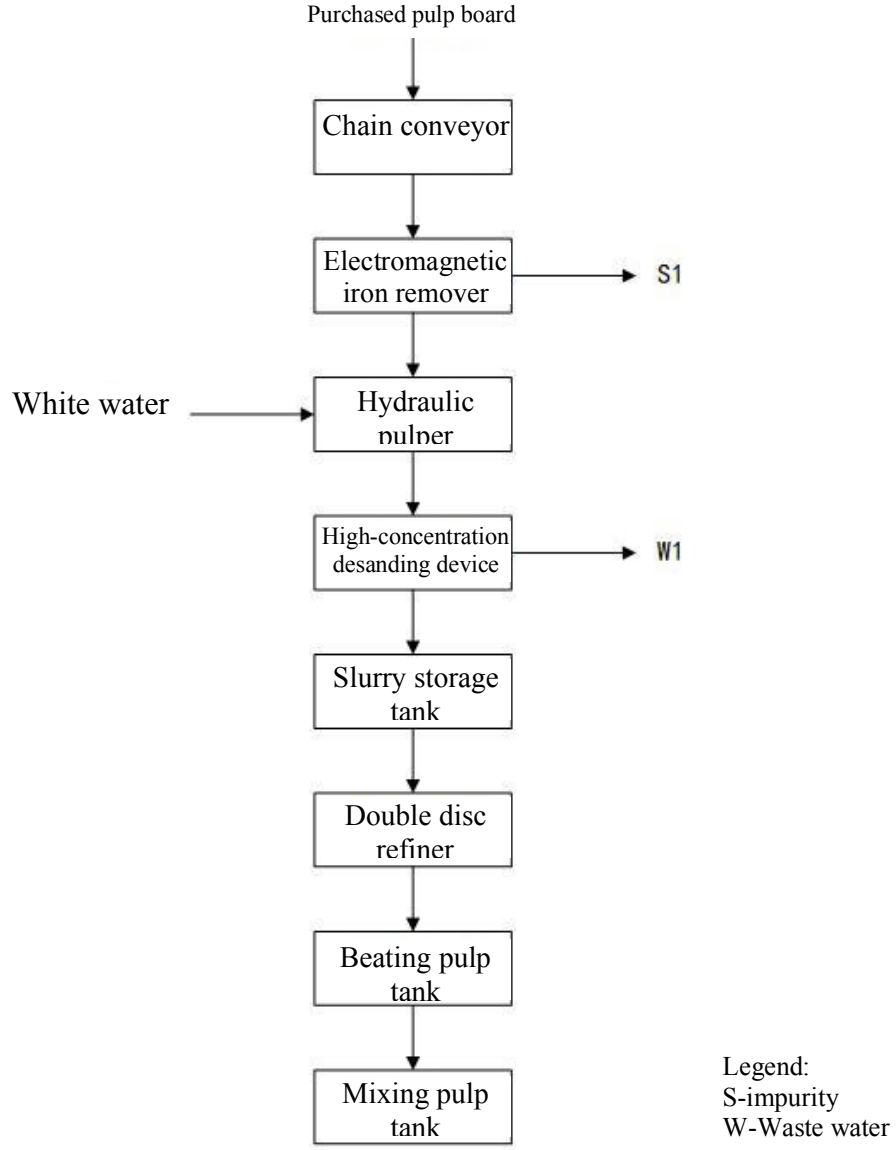



**图2.2-3 商品浆的工艺流程及产污环节**

**Figure 2.2-3 Process Flow and Pollution Production Process of Commercial Pulp**

（2）化机浆的工艺流程及产污环节

(2) Process flow and pollution production of chemical mechanical pulp

①备木工段工艺流程

①Process flow of woodworking section

本工段主要由原木剥皮、原木削片、木片筛选、再碎以及木片暂存仓等组成。外购原木运进车间后首先进行原木剥皮，去除残留树皮（原木在林区已经人工剥除外皮），树皮经粉碎后掺入锅炉中燃烧或外售；去除树皮后的原木进入削片机被加工成木片。外购桉木片和杨木加工木片一起加入均衡缓冲机中，经圆盘厚木筛筛选后，合格的木片直接进入木片仓；小木片经钻石辊木片筛进一步筛选，筛选后的木片能利用的进入木片仓，不能利用的木屑和粉碎后

的树皮燃烧或外售；过大木片经空气密度分离机分离出杂质后到木片再碎机进一步粉碎，粉碎后再返回圆盘厚木筛进行筛选。筛选后的合格木片暂存于木片暂存仓，供制浆车间使用。

This section is mainly composed of log peeling, log chipping, wood chip screening, re-crushing and wood chip temporary storage warehouse. After the purchased logs are transported into the workshop, the logs are skinned first to remove the residual bark (the logs have been manually skinned in the forest region), and the bark is crushed and mixed into a boiler for combustion or sale. The logs whose bark is removed enter the chipper and are processed into wood chips. Outsourced eucalyptus wood chips and poplar processed wood chips are added into a balancing buffer machine together, and qualified wood chips directly enter a wood chip warehouse after being screened by a disc thick wood screen; small wood chips are further screened by a diamond roller wood chip screen, the screened wood chips are put into the wood chip bin, and the unused wood chips and crushed bark are burned or sold out; over-sized wood chips are separated into impurities by an air density separator, then further crushed by a wood chip re-crusher, and then returned to a disc thick wood screen for screening after crushing. The screened qualified wood chips are temporarily stored in the wood chip temporary storage warehouse for use in the pulping workshop.

产污环节：原木去皮时产生的粉尘（G1），切片产生的粉尘（G2），过圆盘厚木筛和钻石辊木筛产生的粉尘（G3和G5），木片再碎时产生的粉尘（G4）及树皮再碎时产生的粉尘（G6）；机械削皮工段和钻石辊木屑筛工段，产生的污染物主要为树皮、木屑等固体废物（S2）；空气密度分离工段的重质杂质（S3）。

Pollution production: dust generated during log peeling (G1), dust generated during slicing (G2), dust generated during disk thick wood sieve and diamond roller wood sieve (G3 and G5), dust generated during wood chip re-crushing (G4) and dust generated during bark re-crushing (G6); the pollutants generated in the mechanical peeling section and the diamond roller sawdust screen section are mainly solid wastes such as bark and sawdust (S2); heavy impurities in the air density separation section (S3).

②制浆工段工艺流程（本工段以原木片为主，采用碱性过氧化氢法生产化学机械浆）

②Process flow of pulping section (this section is dominated by log chips and uses alkaline hydrogen peroxide method to produce chemical mechanical pulp)

从备木工段来的合格木片进入木片仓进行通汽加温，加温后的木片经木片仓底部的振动卸料器和计量螺旋输送机送到木片洗涤器，通过搅拌器振动洗去木片表面的尘土、沙子、塑料及其他杂质。洗涤后的木片到达泵前槽，再由木片泵送到斜螺旋脱水机，经脱水后的木片进入预蒸仓；脱水机排出的洗涤废水通过斜筛去除杂质后进入洗涤水槽，经沉淀后循环用于木片洗涤。

Qualified wood chips from the woodworking section enter the wood chip silo for steam heating. The warmed wood chips are sent to the wood chip scrubber through the vibrating unloader and metering screw conveyor at the bottom of the wood chip silo, and dust, sand, plastic and other impurities on the surface of the wood chips are washed off by vibrating the stirrer. The washed

wood chips reach the front tank of the pump, and then are pumped to the inclined screw dehydrator by the wood chips, and the dehydrated wood chips enter the pre-steaming bin; the waste water discharged from the dehydrator enters the washing water tank after removing impurities through an inclined screen, and is recycled for wood chip washing after precipitation.

在预蒸仓内通入蒸汽对木片进行再次预汽蒸处理，加热后的木片经计量螺旋输送机进入螺旋压榨疏解机，在此木片受压脱水，由于受挤压而形成的木片料塞随挤压机不停的运转而连续的释压后，木片显膨松状，均匀的撕裂成小木条或大纤维，并进入立式预浸器加药预浸，在预浸器的顶部经输送螺旋机进入反应仓，充分浸泡后的木片经反应仓底部的卸料螺旋机和进料螺旋机喂入高浓磨浆机，磨后浆料在喷放管处进行第二次加药，使浆料与药品均匀混合，然后通过旋风分离器、料塞螺旋喂料器和冷却输送螺旋机进入高浓漂白塔。在漂白塔内浆料停留一段时间，使浆料能够进一步与化学品充分混合，达到提高成浆白度与质量的目的。从高浓漂白塔出来的浆料经螺旋压榨、稀释，由消潜池进入低浓磨，磨后浆料经压力筛筛选，良浆经浓缩、压榨洗涤进入贮浆塔。渣浆经渣浆处理系统处理再进行浓缩、螺旋压榨洗涤后进入贮浆塔贮存。贮浆塔的浆料直接送到造纸车间用于生产。

Steam is introduced into the pre-steaming bin to carry out pre-steaming treatment on the wood chip again. The heated wood chips enter the model screw device through the metering screw conveyor. Then, they are compressed and dehydrated. After the wood chip plug formed by extrusion is continuously released with the continuous operation of the extruder, the wood chips are bulky, evenly torn into small strips or large fibers, and enter the vertical prepreg. At the top of the prepreg, the wood chips enter the reaction chamber through a screw conveyor. The fully soaked wood chips are fed to the high-concentration refiner through the unloading screw conveyor and the feeding screw conveyor at the bottom of the reaction bin, and the ground pulp is added with medicine for the second time at the spraying pipe to uniformly mix the pulp and medicine, and then enters the high-concentration bleaching tower through the cyclone separator, the material plug screw feeder and the cooling screw conveyor. The pulp stays in the bleaching tower for a period of time, so that the pulp can be further fully mixed with chemicals to improve whiteness and quality of the pulp. The pulp from the high-concentration bleaching tower is spirally pressed and diluted, and enters the low-concentration mill from the latency chest. The ground pulp is screened by a pressure screen, and the good pulp enters the pulp storage tower through concentration, pressing and washing. The slurry is treated by the slurry treatment system, then concentrated, spirally pressed and washed, and then enters the slurry storage tower for storage. The slurry from the slurry storage tower is directly sent to the papermaking workshop for production.

产污环节：弧形筛产生的杂质（S4），压力筛产生的少量浆渣（S5）；螺旋压缩疏解机产生的废水（W2），螺旋喂料机产生废水（W3），料塞螺旋喂料机产生的废水（W4）和两次螺旋压榨洗涤机产生的废水（W5和W6）。

Pollution production: impurities (S4) generated by arc screen and a small amount of slurry and slag (S5) generated by pressure screen; waste water (W2) generated by the model screw device, waste water (W3) generated by the screw feeder, waste water (W4) generated by the plug screw feeder,

and waste water (W5 and W6) generated by the two-time screw press washer.

③蒸发工段工艺流程

③Process flow of evaporation section

来自制浆车间的废水（W2、W3和W4）经收集后排入废水收集槽内，由槽底排除沉淀杂质，上清液进入压力筛将大颗粒纤维性物质筛选出后，将废水由泵打入储存槽内，然后进入蒸发工段进行电蒸发浓缩。本蒸发系统主要由MVR蒸发器、热蒸汽压缩风机、热交换器、废水循环泵组成。系统不使用蒸汽而是使用电作为主要能源，冷却水的消耗量非常低。系统的工艺过程主要是利用热泵原理及水蒸气再压缩原理，在蒸发器里的热蒸汽主要是污水蒸汽经热蒸汽压缩风机压缩后的蒸汽。蒸发器的蒸发能力由空气压缩机的转速控制，全线采用DCS控制。

The waste water (W2, W3 and W4) from the pulping workshop is collected and discharged into the waste water collection tank, and precipitated impurities are removed from the bottom of the tank. After the supernatant enters the pressure screen to screen out large-particle fibrous substances, the waste water is pumped into the storage tank by the pump, and then enters the evaporation section for electric evaporation concentration. The evaporation system is mainly composed of MVR evaporator, hot steam compression fan, heat exchanger and waste water circulation pump. The system does not use steam but electricity as the main energy source, and the consumption of cooling water is very low. The technological process of the system mainly uses the principle of heat pump and steam recompression. The hot steam in the evaporator is mainly the steam compressed by the hot steam compression fan. The evaporation capacity of the evaporator is controlled by the rotating speed of the air compressor, and the whole line is controlled by DCS.

蒸发器采用先进的芬兰技术，内部由两组降膜蒸发板组成。具体工艺流程为：来自废水储存槽内的废水经换热器预热后进入蒸发器底部，由循环泵送到蒸发器顶部的污水分配嘴，由分配嘴把污水均匀的从蒸发器顶部以水膜的形式向下分布到蒸发板内壁上，蒸汽则从蒸发板底部由下往上。在蒸发板内，废水与蒸汽进行换热，废水产生的蒸汽从蒸发器顶部排除收集；经过浓缩的废水则从在蒸发器的底部收集。

The evaporator adopts advanced Finnish technology and consists of two sets of falling film evaporation plates inside. The specific process flow is as follows: the waste water from the waste water storage tank enters the bottom of the evaporator after being preheated by the heat exchanger, and is sent to the sewage distribution nozzle at the top of the evaporator by the circulating pump. The distribution nozzle uniformly distributes the waste water from the top of the evaporator to the inner wall of the evaporation plate in the form of water film, and the steam rises from the bottom of the evaporation plate. In the evaporation plate, the waste water and steam exchange heat, and the steam generated by the waste water is removed and collected from the top of the evaporator; the concentrated waste water is collected from the bottom of the evaporator.

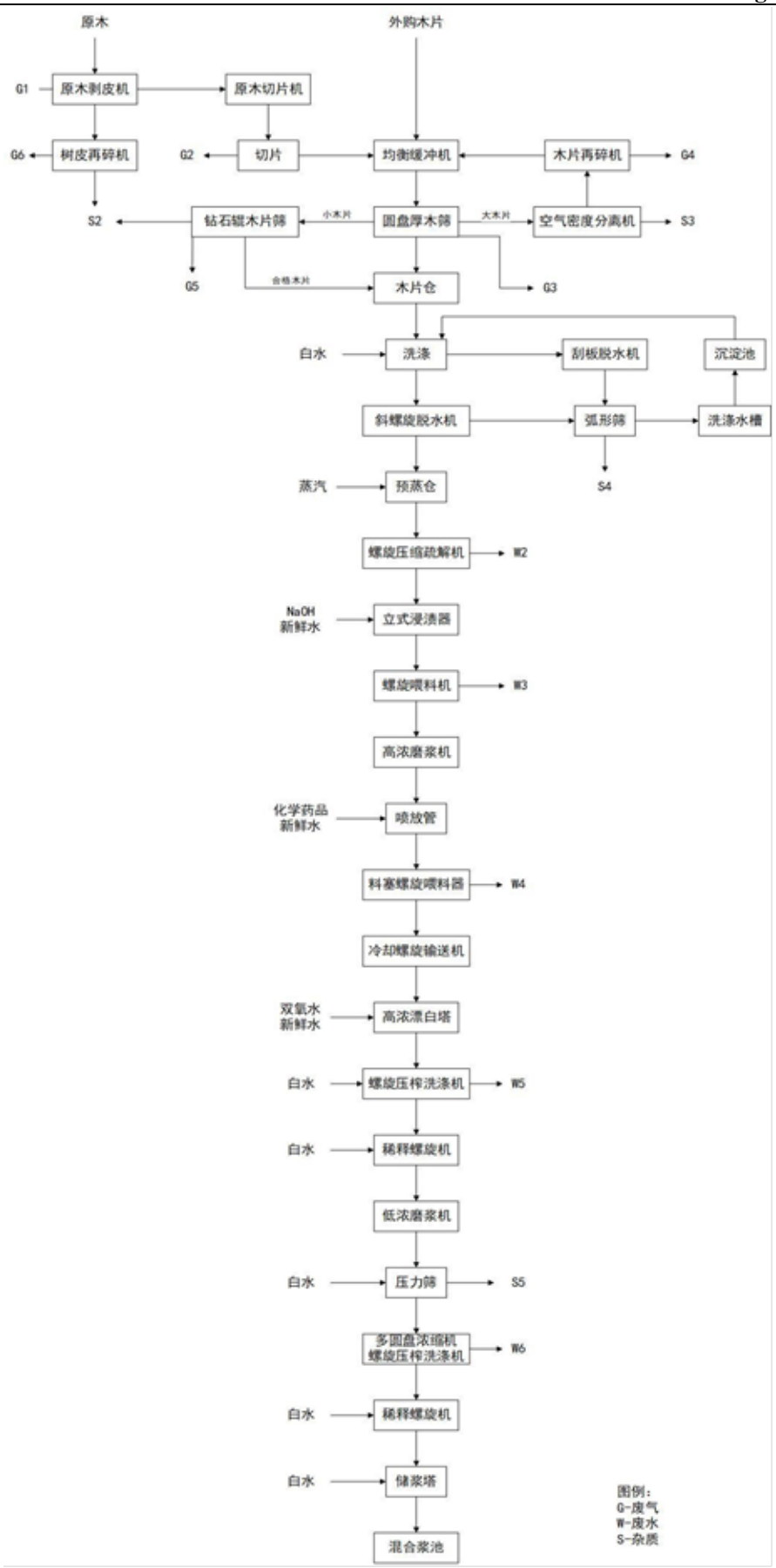
本工段的污染源主要为沉淀池产生的浆渣和蒸发后产生的冷凝水以及浓缩废液。冷凝水收集后排入污水处理厂，浓缩废液由罐车运至山东太阳纸业股份有限公司现有厂区碱回收生产线

处理。

The pollution sources in this section are mainly slurry and slag generated by sedimentation tank, condensed water generated after evaporation and concentrated waste liquid. Condensed water is collected and discharged into the sewage treatment plant, and concentrated waste liquid is transported by tanker to the existing alkali recovery production line of Shandong Sun Paper Co., Ltd. for treatment.

详见下图2.2-4。

See Figure 2.2-4 below for details.


原木
外购木片
G1
原木剥皮机
原木切片机
G6
树皮再碎机
G2
切片
均衡缓冲机
木片再碎机
G4
S2
钻石辊木片筛
小木片
圆盘厚木筛
大木片
空气密度分离机
S3
G5
合格木片
木片仓
G3
白水
洗涤
刮板脱水机
沉淀池
斜螺旋脱水机
弧形筛
洗涤水槽
S4
蒸汽
预蒸仓
螺旋压缩疏解机
W2
NaOH
新鲜水
立式浸渍器
螺旋喂料机
W3
高浓磨浆机
化学药品
新鲜水
喷放管
料塞螺旋喂料器
W4
冷却螺旋输送机
双氧水
新鲜水
高浓漂白塔
白水
螺旋压榨洗涤机
W5
白水
稀释螺旋机
低浓磨浆机
白水
压力筛
S5
多圆盘浓缩机
螺旋压榨洗涤机
W6
白水
稀释螺旋机
白水
储浆塔
混合浆池
图例：
G-废气
W-废水
S-杂质

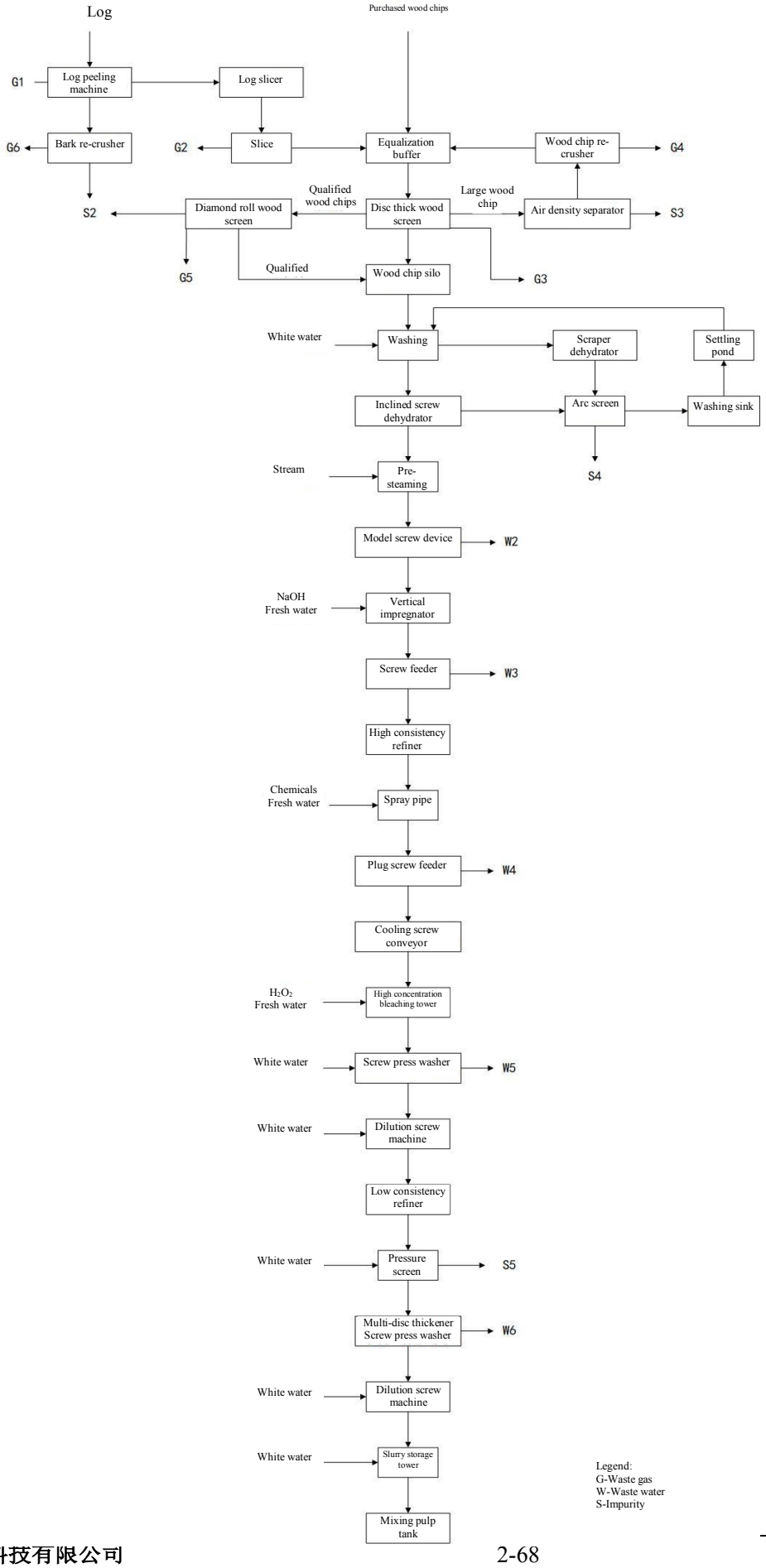

Log
Purchased wood chips
G1
Log peeling machine
Log slicer
G6
Bark re-crusher
G2
Slice
Equalization buffer
Wood chip re-crusher
G4
S2
Diamond roll wood screen
Qualified wood chips
Disc thick wood screen
Large wood chip
Air density separator
S3
G5
Qualified
Wood chip silo
G3
White water
Washing
Scraper dehydrator
Settling pond
Inclined screw dehydrator
Arc screen
Washing sink
S4
Stream
Pre-steaming
Model screw device
W2
NaOH
Fresh water
Vertical impregnator
Screw feeder
W3
High consistency refiner
Chemicals
Fresh water
Spray pipe
Plug screw feeder
W4
Cooling screw conveyor
$H_2O_2$
Fresh water
High concentration bleaching tower
White water
Screw press washer
W5
White water
Dilution screw machine
Low consistency refiner
White water
Pressure screen
S5
Multi-disc thickener
Screw press washer
W6
White water
Dilution screw machine
White water
Slurry storage tower
Mixing pulp tank
Legend:
G-Waste gas
W-Waste water
S-Impurity

图2.2-4 化机浆工艺流程及产污环节

**Figure 2.2-4 Chemical Mechanical Pulp Process Flow and Pollution Production Process**

2、抄纸工段

2. Paper-making section

①备浆工段送来的成浆经压力筛进入成浆池。浆料经过精浆机精整后，送至调浆箱调整计量，进入一次冲浆泵入口，经过一次冲浆泵叶轮的高速旋转，使浆料与浓白水充分混合，进入飞翼除渣器，一段良浆直接进入除气器除气，进入二次冲浆泵的吸入口，同时补充少量的白水，再经过压力筛引入流浆箱上网，在长网多缸造纸机上经过成型、压榨、干燥、表面施胶、干燥、压光、卷取后，由复卷机复卷分切纸卷包装入库，或者由切纸机分切平板包装入库。

①The slurry sent by the slurry preparation section enters the slurry forming tank through the pressure screen. After the slurry is finished by a refiner, it is sent to the headbox for adjustment and metering. Then, it enters the fan pump. After a high-speed rotation of the impeller of the fan pump, the slurry is fully mixed with thick white water, and enters the flying wing deslagger. The first section of good pulp directly enters the degasser for degassing, and enters the suction port of the secondary fan pump. Then, a small amount of white water is added at the same time. The slurry is introduced into the headbox through the pressure screen. After forming, squeezing, drying, surface sizing, drying, calendering and coiling on a long sieve multi-cylinder paper machine, it is rerolled and cut by the rewinder, packed and put into storage, or cut and put into storage by the paper cutter.

②抄纸工段、完成工段产生的干损纸就地处理后，送到备浆工段进入干损纸浆池。然后经过疏解机、磨浆机串联处理后，进入损纸浆池；由抄纸工段来的低浓湿损纸浆，经重力式圆网浓缩机浓缩，调好浆浓后，也进入损纸浆池。由抄纸工段来的非正常生产时所产生的湿损纸浆，直接进入损纸浆池待配浆。

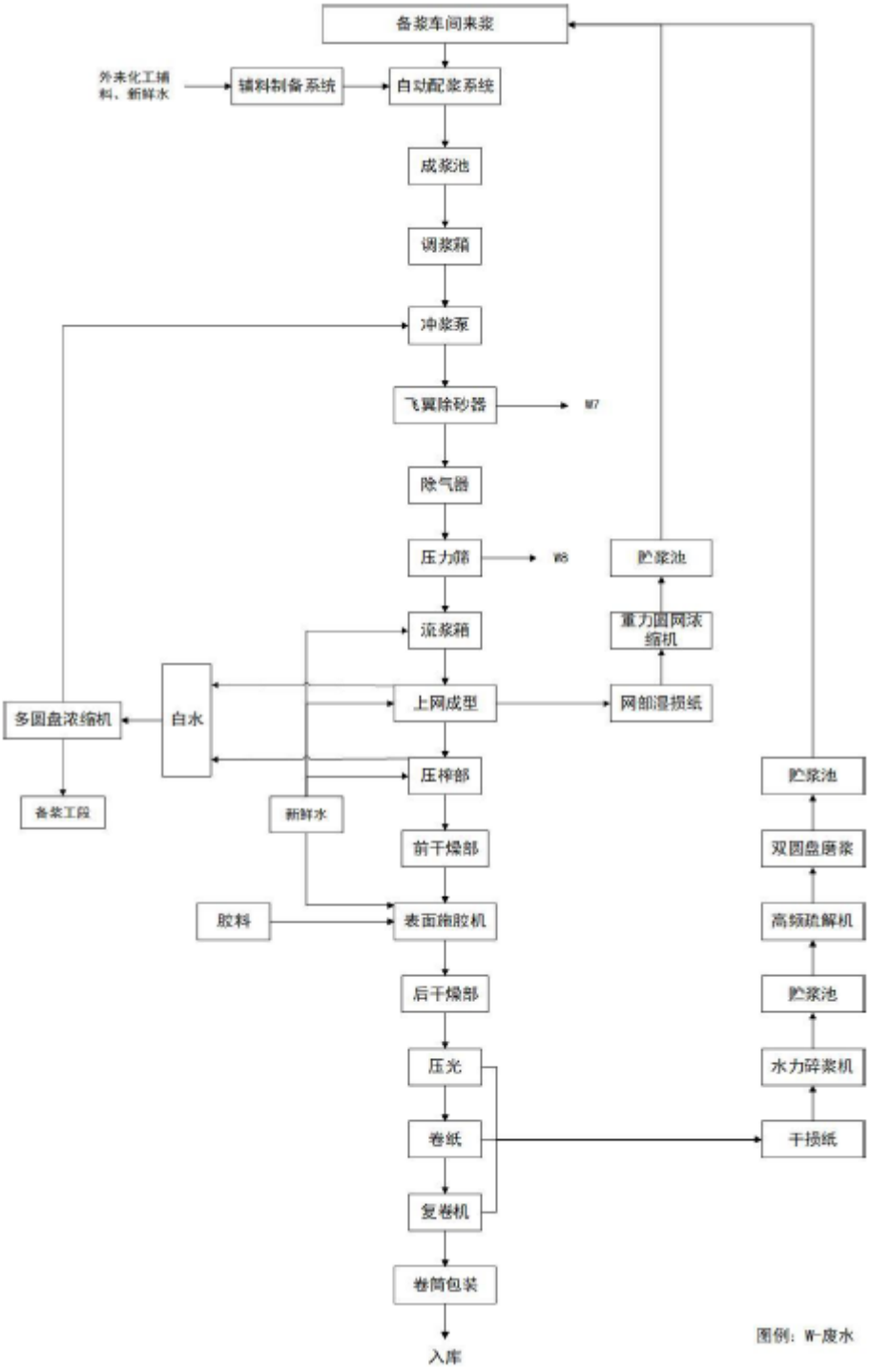
②Upon on-site treatment of dry broke in the papermaking section and the completion section, the dry broke is sent to the pulp preparation section to enter the dry broke pulp tank. Then, after being treated in series by a model screw device and a pulp refiner, the pulp enters a broke pulp tank; the low consistency wet-broke pulp from the papermaking section is concentrated by a gravity rotary screen thickener, and after the pulp concentration is adjusted, it also enters the broke pulp tank. Wet-broke pulp produced during abnormal production from the papermaking section directly enters the broke pulp tank for pulp preparation.

产污环节：除砂器筛选出的废水（W7），压力筛过滤出的含浆渣废水（W8）。

Pollution production: waste water (W7) screened by sand remover and waste water containing slurry and slag (W8) filtered by pressure screen

详见下图2.2-5。

See Figure 2.2-5 below for details.


备浆车间来浆
外来化工辅料、新鲜水
辅料制备系统
自动配浆系统
成浆池
调浆箱
冲浆泵
飞翼除砂器
W7
除气器
压力筛
W8
贮浆池
流浆箱
重力圆网浓缩机
多圆盘浓缩机
白水
上网成型
网部湿损纸
备浆工段
新鲜水
压榨部
贮浆池
前干燥部
双圆盘磨浆
胶料
表面施胶机
高频疏解机
后干燥部
贮浆池
压光
水力碎浆机
卷纸
干损纸
复卷机
卷筒包装
入库
图例：W-废水

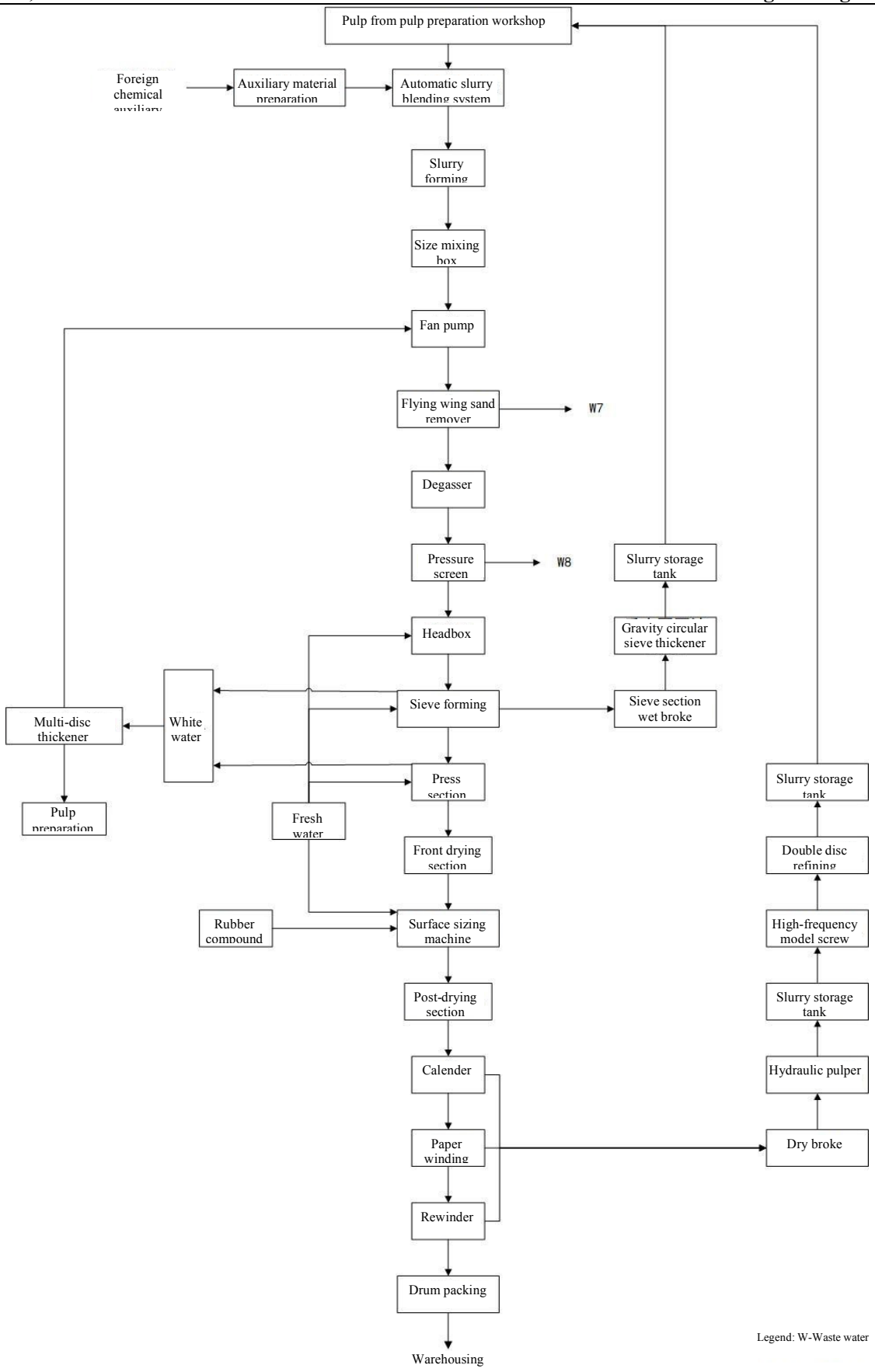

Pulp from pulp preparation workshop
Foreign chemical auxiliary
Auxiliary material preparation
Automatic slurry blending system
Slurry forming
Size mixing box
Fan pump
Flying wing sand remover
W7
Degasser
Pressure screen
W8
Slurry storage tank
Headbox
Gravity circular sieve thickener
Sieve forming
Sieve section wet broke
Multi-disc thickener
White water
Press section
Slurry storage tank
Pulp preparation
Fresh water
Front drying section
Double disc refining
Rubber compound
Surface sizing machine
High-frequency model screw
Post-drying section
Slurry storage tank
Calender
Hydraulic pulper
Paper winding
Dry broke
Rewinder
Drum packing
Warehousing
Legend: W-Waste water

**图2.2-5 抄纸阶段的工艺流程及产污环节**

**Figure 2.2-5 Process Flow and Pollution Production in Papermaking Stage**

3、产污环节汇总

3. Summary of pollution production process

详细的产污环节数据见下表2.2-7。

See Table 2.2-7 below for detailed pollution production data.

**表2.2-7 产污环节污染因子一览表**

**Table 2.2-7 List of Pollution Factors in Pollution Production Process**

| 类别 | Category | 序号 | S/n | 产生来源 | Production source | 主要污染成分 | Main pollution components | 排放及去向 | Discharge direction |
|---|---|---|---|---|---|---|---|---|---|
| 废气 | Exhaust gas | G1 | G1 | 原木去皮 | Log peeling | 粉尘 | Dust | 无组织排放 | Unorganized discharge |
| | | G2 | G2 | 原木切片 | Log slice | 粉尘 | Dust | 进入布袋除尘器+1根20m高排气筒排放 | Enter bag dust collector+one 20m high exhaust funnel for discharge |
| | | G3 | G3 | 圆盘厚木筛筛选 | Disc thick wood screen screening | 粉尘 | Dust | | |
| | | G4 | G4 | 大木片再碎 | Large wood chips re-crushing | 粉尘 | Dust | | |
| | | G5 | G5 | 钻石辊木筛筛选 | Diamond roller screen screening | 粉尘 | Dust | | |
| | | G6 | G6 | 树皮再碎 | Bark re-crushing | 粉尘 | Dust | | |
| 废水 | Waste water | W1 | W1 | 商品浆备浆阶段：高浓除砂器产生的废水 | Preparation stage of commercial pulp: Waste water generated by high concentration desander | 废水 | Waste water | 排入污水处理厂 | Discharge into sewage treatment plant |
| | | W2 | W2 | 化机浆备 | Preparation stage of chemical mechanical pulp: | 废水 | Waste water | 经蒸发车间处 | After being treated by the evaporation workshop, it will be |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 浆阶段：螺旋压缩疏解机产生的废水 | waste water produced by model screw device | | | 理后由罐车运至山东太阳纸业股份有限公司现有厂区碱回收生产线处理 | transported by tanker to the existing alkali recovery production line of Shandong Sun Paper Co., Ltd. for treatment. |
| | | W3 | W3 | 化机浆备浆阶段：螺旋喂料机产生废水 | Chemical mechanical slurry preparation stage: waste water generated by screw feeder | 废水 | Waste water | | |
| | | W4 | W4 | 化机浆备浆阶段：料塞螺旋喂料机产生的废水 | Chemical mechanical slurry preparation stage: waste water generated by plug screw feeder | 废水 | Waste water | | |
| | | W5 | W5 | 化机浆备浆阶段：螺旋压榨洗涤机产生的废水 | Preparation stage of chemical mechanical pulp: waste water produced by screw press washer | 废水 | Waste water | 排入污水处理厂 | Discharge into sewage treatment plant |
| | | W6 | W6 | 化机浆备浆阶段：螺旋压榨洗涤机产生的废水 | Preparation stage of chemical mechanical pulp: waste water produced by screw press washer | 废水 | Waste water | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | W7 | W7 | 抄纸阶段：除砂器产生的废水 | Paper making stage: waste water generated by desander | 废水 | Waste water | | |
| | | W8 | W8 | 抄纸阶段：压力筛产生的废水 | Paper making stage: waste water generated by pressure screen | 废水 | Waste water | | |
| 固体废物 | Solid waste | S1 | S1 | 电磁除铁器去除的铁丝等杂物 | Iron wire and other sundries removed by electromagnetic iron remover | 铁屑等杂质 | Impurities such as iron filings | 收集后外售给废品收购站 | Sold to the scrap purchasing station. |
| | | S2 | S2 | 原木制作成木片阶段：剥皮和辊木筛筛选 | The stage of log making into wood chips: peeling and roller screen screening | 木屑、树皮及其他 | Sawdust, bark and others | 送供热中心燃烧处理 | Combustion treatment in heating supply center |
| | | S3 | S3 | 空气密度分离工段的重质杂质 | Heavy impurities in air density separation section | 杂质 | Impurities | 收集后外售给废品收购站 | Sold to the scrap purchasing station. |
| | | S4 | S4 | 化机浆备浆阶段：弧形筛 | Preparation stage of chemical mechanical pulp: arc screen | 洗涤时产生的杂质 | Impurities generated during washing | 燃烧或外售 | Burned or sold |
| | | S5 | S5 | 化机浆备浆阶 | Chemical mechanical pulp preparation stage: | 浆渣 | Slurry residue | 送至填埋场填埋处理 | Sent to the landfill site for landfill treatment. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 段：压力筛 | pressure screen | | | | |

### 2.2.2.2 主要原辅材料及物料平衡

### 2.2.2.2 Main raw and auxiliary materials and material balance

1、主要原辅材料及消耗见表2.2-8

1. See Table 2.2-8 for main raw and auxiliary materials and consumption

**表2.2-8 原辅材料一览表**

**Table2.2-8 List of Raw and Auxiliary Materials**

| 类别 | Category | 序号 | S/n | 材料 | Material | 吨纸产品消耗定额 Consumption quota per ton of paper products | | 工程消耗量 Project consumption | | 备注 Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 单位 Unit | 数额 Amount | 单位 Unit | 每年 Per year | |
| 原材料 | Raw materials | 1 | 1 | 外购木片 | Purchased wood chips | t | 0.21 | 万t 10,000t | 9.60 | |
| | | 2 | 2 | 杨木原木 | Poplar log | t | 0.27 | 万t 10,000t | 12.21 | |
| | | 3 | 3 | 外购商品浆板 | Purchased commercial pulp board | t | 0.34 | 万t 10,000t | 15.20 | |
| 辅助材料 | Auxiliary materials | 1 | 1 | CaCO3（含水0.4%） | $CaCO_3$ (0.4% water content) | kg | 280 | t | 12.6 | 罐车 Tanker truck |
| | | 2 | 2 | ASA | ASA | Kg | 1 | t | 450 | 吨桶 Tonnage barrels |
| | | 3 | 3 | 膨润土助留剂 | Bentonite retention aid | Kg | 3 | t | 1350 | 1000kg/包 1000kg/pack |
| | | 4 | 4 | 染料 | Dye | Kg | 0.2 | t | 90 | 30kg/桶 30kg/barrel |
| | | 5 | 5 | 阴离子助留剂 | Anionic retention aid | Kg | 0.7 | t | 315 | 吨桶 Tonnage barrels |
| | | 6 | 6 | 阳离子 | Cationic | Kg | 0.5 | t | 225 | 25kg/包 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 助留剂 | retention aid | | | | | 25kg/pack |
| | | 7 | 7 | 阳离子淀粉 | Cationic starch | Kg | 10 | t | 4500 | 罐车 Tanker truck |
| | | 8 | 8 | AKD | AKD | Kg | 10 | t | 4500 | 吨桶 Tonnage barrels |
| | | 9 | 9 | 增白剂 | Whitening agent | Kg | 2.0 | t | 900 | 吨桶 Tonnage barrels |
| | | 10 | 10 | H2O2 | H2O2 | Kg | 16.50 | t | 7427.36 | 桶装 Barreled |
| | | 11 | 11 | NaOH | NaOH | Kg | 20.63 | t | 9828.21 | 袋装 Bagged |
| | | 12 | 12 | 硅酸纳 | Sodium silicate | Kg | 12.37 | t | 5570.53 | 袋装 Bagged |
| | | 13 | 13 | DTPA | DTPA | Kg | 2.73 | t | 928.42 | 袋装 Bagged |

由表2.2-8可知，拟建项目所涉及到的化学用品主要为造纸添加剂等，不属于《建设项目环境风险评价技术导则》（HJ/T169-2018）附录A中规定的有毒有害、易燃和爆炸性物质。

As can be seen from Table 2.2-8, the chemicals involved in the proposed project are mainly paper additives, etc., which do not belong to toxic, harmful, flammable and explosive substances specified in Appendix A of the Technical Guidelines for Environmental Risk Assessment on Projects (HJ/T169-2018).

2、浆纸平衡

2. Balance of pulp and paper

拟建项目平均日产纸1323.53t/d（含水率6%）。用浆量1244.12t/d。其中商品浆484.1t/d（绝干浆），化机浆529.41t/d（绝干浆），填料及胶料406.85t/a。拟建项目浆纸平衡情况具体见表2.2-9和图2.2-6。

The average daily paper production of the proposed project is 1323.53 t/d (moisture content 6%). The amount of pulp used is 1244.12 t/d, including commercial pulp 484.1 t/d (absolute dry pulp), chemical mechanical pulp 529.41 t/d (absolute dry pulp), filler and compound 406.85 t/a. See Table 2.2-9 and Figure 2.2-6 for details of pulp-paper balance of the proposed project.

**表2.2-9 拟建项目浆纸平衡情况 单位t/d**

**Table2.2-9 Pulp and Paper Balance of the Proposed Project unit: t/d**

| 项目 | 商品浆 | 化机浆 | 损纸 | 填料及胶料 | 成品纸 | 损纸 | 浆渣 | 流失 |
|---|---|---|---|---|---|---|---|---|

| Item | Commercial pulp | Chemical mechanical pulp | Broke | Filler and rubber compound | Finished paper | Broke | Slurry residue | Loss |
|---|---|---|---|---|---|---|---|---|
| 指标 | 529.41 | 395.47 | 86.29 | 406.85 | 1244.12 | 81.73 | 86.29 | 6.25 |
| Indicators | 529.41 | 395.47 | 86.29 | 406.85 | 1244.12 | 81.73 | 86.29 | 6.25 |
| 合计 | 1418.02 | | | | 1325.85 | | 92.17 | |
| Total | 1418.02 | | | | 1325.85 | | 92.17 | |

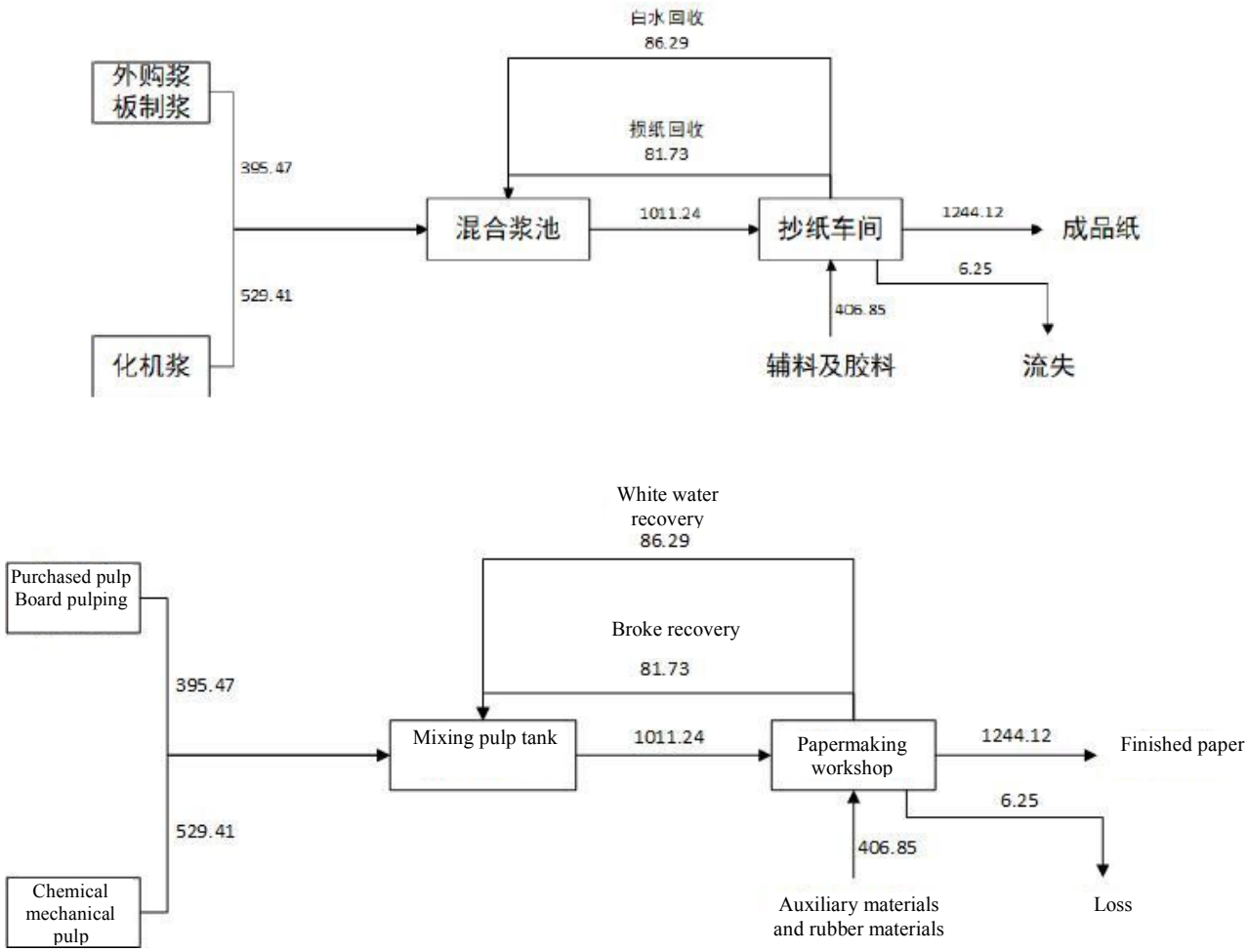



**图2.2-6 浆平衡图**

**Figure2.2-6 Pulp Balance Diagram**

### 2.2.2.3 生产设备及环保设施

### 2.2.2.3 Production equipment and environmental protection facilities

详细的生产设备见下表2.2-10。

See Table 2.2-10 below for detailed production equipment.

**表2.2-10 设备一览表**

**Table2.2-10 Equipment List**

| 类别 | Category | 序号 | S/n | 设备名称 | Equipment name | 设备型号及参数 | Equipment model and parameters | 单位 | Unit | 数量 | Quantity | 备注 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 生产主线设备 | Main production line equipment | 1 | 1 | 出料螺旋机 | Discharging screw machine | | | 台 | Set | 1 | 1 | | |
| | | 2 | 2 | 皮带输送机 | Belt conveyor | | | 台 | Set | 2 | 2 | | |
| | | 3 | 3 | 碎屑分离器 | Debris separator | | | 台 | Set | 1 | 1 | | |
| | | 4 | 4 | 螺旋脱水机 | Screw dehydrator | | | 台 | Set | 2 | 2 | | |
| | | 5 | 5 | 螺旋喂料器 | Screw feeder | | | 台 | Set | 2 | 2 | | |
| | | 6 | 6 | 立式浸渍器 | Vertical impregnator | | | 台 | Set | 2 | 2 | | |
| | | 7 | 7 | 预热器 | Preheater | | | 台 | Set | 2 | 2 | | |
| | | 8 | 8 | 高浓磨浆机 | High consistency refiner | | | 台 | Set | 2 | 2 | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9 | 9 | 压力分离器 | Pressure separator | | | 台 | Set | 2 | 2 | 包括粗浆磨浆机后1台 | Including one coarse pulp refiner |
| | 10 | 10 | 压力筛 | Pressure screen | | | 台 | Set | 5 | 5 | 包括粗浆磨浆机后1台 | Including one coarse pulp refiner |
| | 11 | 11 | 低浓磨浆机 | Low consistency refiner | | | 台 | Set | 3 | 3 | | |
| | 12 | 12 | 多圆盘浓缩机 | Multi-disc thickener | | | 台 | Set | 2 | 2 | | |
| | 13 | 13 | 双网挤浆机 | Double mesh extruder | | | 台 | Set | 3 | 3 | | |
| | 14 | 14 | 混合器 | Mixer | | | 台 | Set | 1 | 1 | | |
| | 15 | 15 | 摇摆筛 | Swing screen | | | 台 | Set | 2 | 2 | | |
| | 16 | 16 | 弧形筛 | Arc screen | | | 台 | Set | 1 | 1 | | |
| | 17 | 17 | 木片 | Wood chip | | | 台 | Set | 1 | 1 | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 泵 | pump | | | | | | | | |
| | 18 | 18 | 挤压撕裂机 | Extrusion tearing machine | | | 台 | Set | 2 | 2 | | |
| | 19 | 19 | 压力卸料器 | Pressure discharger | | | 台 | Set | 2 | 2 | | |
| | 20 | 20 | 除渣器 | Slag remover | | | 套 | Set | 1 | 1 | | |
| | 21 | 21 | 造纸机 | Paper machine | 宽幅9850mm、最大工作车速1700m/min | Width 9850mm, maximum working speed 1700m/min | 台 | Set | 1 | 1 | | |
| | 22 | 22 | 流浆箱 | Headbox | Master Jet-G | Master Jet-G | 台 | Set | 1 | 1 | | |
| | 23 | 23 | 施胶机 | Sizing machine | SpeedSizer | SpeedSizer | 台 | Set | 1 | 1 | | |
| | 24 | 24 | 软压光机 | Soft calender | | | 台 | Set | 1 | 1 | | |
| | 25 | 25 | 卷纸机Reel | Paper winding machine Reel | OptiReel center | OptiReel center | 台 | Set | 1 | 1 | | |
| | 26 | 26 | 损纸输送带 | Broke conveyor | | | 台 | Set | 1 | 1 | | |
| | 27 | 27 | 原木剥皮 | Log peeling machine | | | 台 | Set | 1 | 1 | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 机 | | | | | | | | | |
| | | 28 | 28 | 原木削皮机 | Log peeler | | | 台 | Set | 1 | 1 | | |
| | | 29 | 29 | 锥形磨浆机 | Conical refiner | RF-4i | RF-4i | 台 | Set | 6 | 6 | | |
| | | 30 | 30 | 复卷碎浆机 | Rewinding pulper | CP280C-D.G | CP280C-D.G | 台 | Set | 1 | 1 | | |
| | | 31 | 31 | MVR蒸发器 | MVR evaporator | | | 套 | Set | 1 | 1 | 引进，含两组降膜蒸发器 | Introduced, containing two sets of falling film evaporators |
| | | 32 | 32 | 热交换器 | Heat exchanger | | | 套 | Set | 2 | 2 | 引进 | Introduced |
| | | 33 | 33 | 闪蒸罐 | Flash tank | | | 套 | Set | 2 | 2 | 引进 | Introduced |
| | | 34 | 34 | 水力碎浆机 | Hydraulic pulper | | | 台 | Set | 4 | 4 | | |
| 生产辅助设 | Production auxiliary equipment | 1 | 1 | 空压机 | Air compressor | | | 台 | Set | 2 | 2 | | |
| | | 2 | 2 | 水泵 | Water pump | | | 台 | Set | 12 | 12 | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 备 | | 3 | 3 | 浆泵 | Slurry pump | | | 台 | Set | 50 | 50 | | |
| | | 4 | 4 | 风机 | Fan | | | 台 | Set | 30 | 30 | | |
| | | 5 | 5 | 浆池搅拌器 | Slurry tank agitator | | | 台 | Set | 10 | 10 | | |
| | | 6 | 6 | 输送运输机械 | Conveying machinery | | | 条 | Piece | 20 | 20 | | |

### 2.2.2.4 公用工程

### 2.2.2.4 Utilities

1、供水及水平衡

1. Water supply and water balance

本项目新鲜用水总量为11941m³/d，水源主要为地下水及南水北调工程地表水，地表水部分需新建给水处理站。详见下表2.2-11。

The total amount of fresh water for this project is 11941 m³/d. The water sources are mainly groundwater and surface water of the South-to-North Water Transfer Project. Water supply treatment stations need to be built for the surface water. See Table 2.2-11 below for details.

**表2.2-11 项目总用水量表**

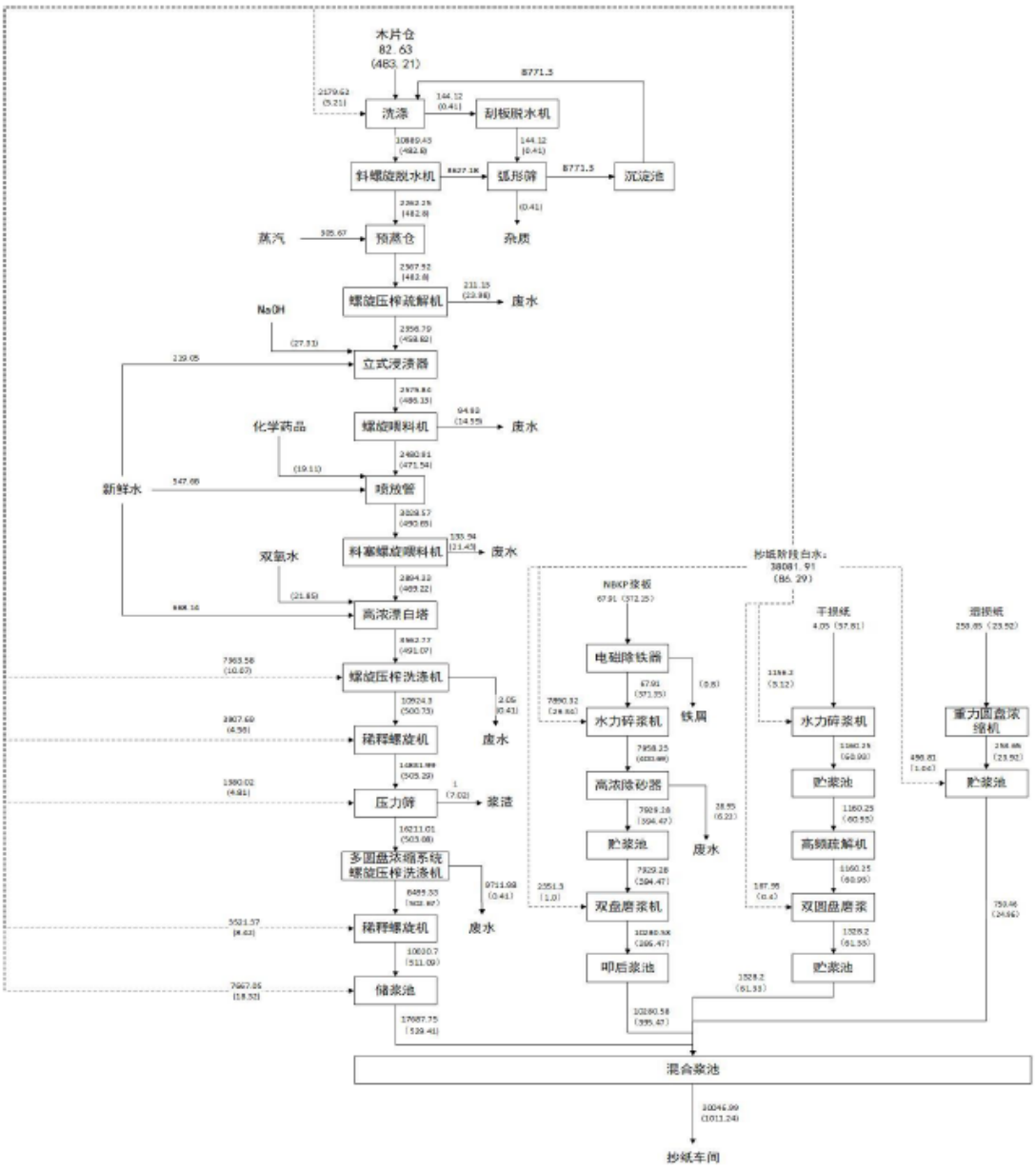
**Table2.2-11 Total Water Consumption of the Project**

| 用水单元 | Water consumption unit | 进水m³/d | | Water inflowm³/d | | 出水m³/d | | | Water outflowm³/d | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 来源 | Sources | 水量 | Water volume | 蒸发消耗 | Evaporation consumption | | 排放或带走 | Discharge or take away | | |
| | | | | | | | | | 去向 | destination | 水量 | Water volume |
| 备浆工段 | Pulp preparation section | 浆带水 | Slurry water | 150.54 | 150.54 | 蒸发量 | Evaporation capacity | 0 | 浆渣带走 | Pulp and slag removal | 1 | 1 |
| | | 损纸带水 | Broke with water | 257.7 | 257.7 | | | | 抄纸工段 | Paper-making section | 30046.99 | 30046.99 |
| | | 抄纸工段 | Paper-making section | 38081.91 | 38081.91 | | | | 黑液带走 | Black liquor take away | 59.73 | 59.73 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 | | | | | | | | |
| | | 新鲜水 | Fresh water | 1434.85 | 1434.85 | | | | 蒸发工段冷凝 | Condensation in evaporation section | 381.57 | 381.57 |
| | | 蒸汽 | Stream | 305.67 | 305.67 | | | | 污水处理厂 | Sewage treatment plant | 9742.98 | 9742.98 |
| | | 小计 | Subtotal | 40230.67 | 40230.67 | 小计 | Subtotal | 0 | 小计 | Subtotal | 40230.67 | 40230.67 |
| 抄纸工段 | Paper-making section | 新鲜水量 | Fresh water amount | 10476.15 | 10476.15 | 蒸发量 | Evaporation capacity | 1482.37 | 污水处理厂 | Sewage treatment plant | 621.75 | 621.75 |
| | | | | | | | | | 备浆工段 | Pulp preparation section | 38081.91 | 38081.91 |
| | | 备浆工段 | Pulp preparation section | 30046.99 | 30046.99 | | | | 成品纸带走 | Finished paper take away | 79.41 | 79.41 |
| | | | | | | | | | 损纸回收 | Broke recovery | 257.7 | 257.7 |
| | | 小计 | Subtotal | 40523.14 | 40523.14 | | | | 小计 | Subtotal | 39040.77 | 39040.77 |
| 生活用水 | Domestic water | 新鲜水 | Fresh water | 30 | 30 | 蒸发量 | Evaporation capacity | 6 | 污水处理厂 | Sewage treatment plant | 24 | 24 |
| 合计 | Total | — | I | 80783.81 | 80783.81 | 合计 | Total | 1488.37 | 合计 | Total | 79295.44 | 79295.44 |

备浆工段、抄纸工段浆水平衡见图2.2-7和2.2-8，项目水平衡图具体见图2.2-9。

See Figure 2.2-7 and 2.2-8 for the pulp-water balance of the pulp preparation section and paper-making section, and see Figure 2.2-9 for the water balance diagram of the project.


木片仓
82.63
(483.21)
洗漂
刮板脱水机
斜螺旋脱水机
弧形筛
沉淀池
杂质
蒸汽
预蒸仓
螺旋压榨疏解机
废水
NaOH
立式浸渍器
化学药品
螺旋喂料机
新鲜水
喷放管
双氧水
料塞螺旋喂料机
高浓漂白塔
螺旋压榨洗涤机
稀释螺旋机
压力筛
浆渣
多圆盘浓缩系统
螺旋压榨洗涤机
稀释螺旋机
储浆池
NBKP疏板
电磁除铁器
铁屑
水力碎浆机
高浓除砂器
贮浆池
双盘磨浆机
叩后浆池
抄纸除臭白水
干损纸
水力碎浆机
贮浆池
高频疏解机
双圆盘磨浆
贮浆池
湿损纸
重力圆盘浓缩机
贮浆池
混合浆池
抄纸车间

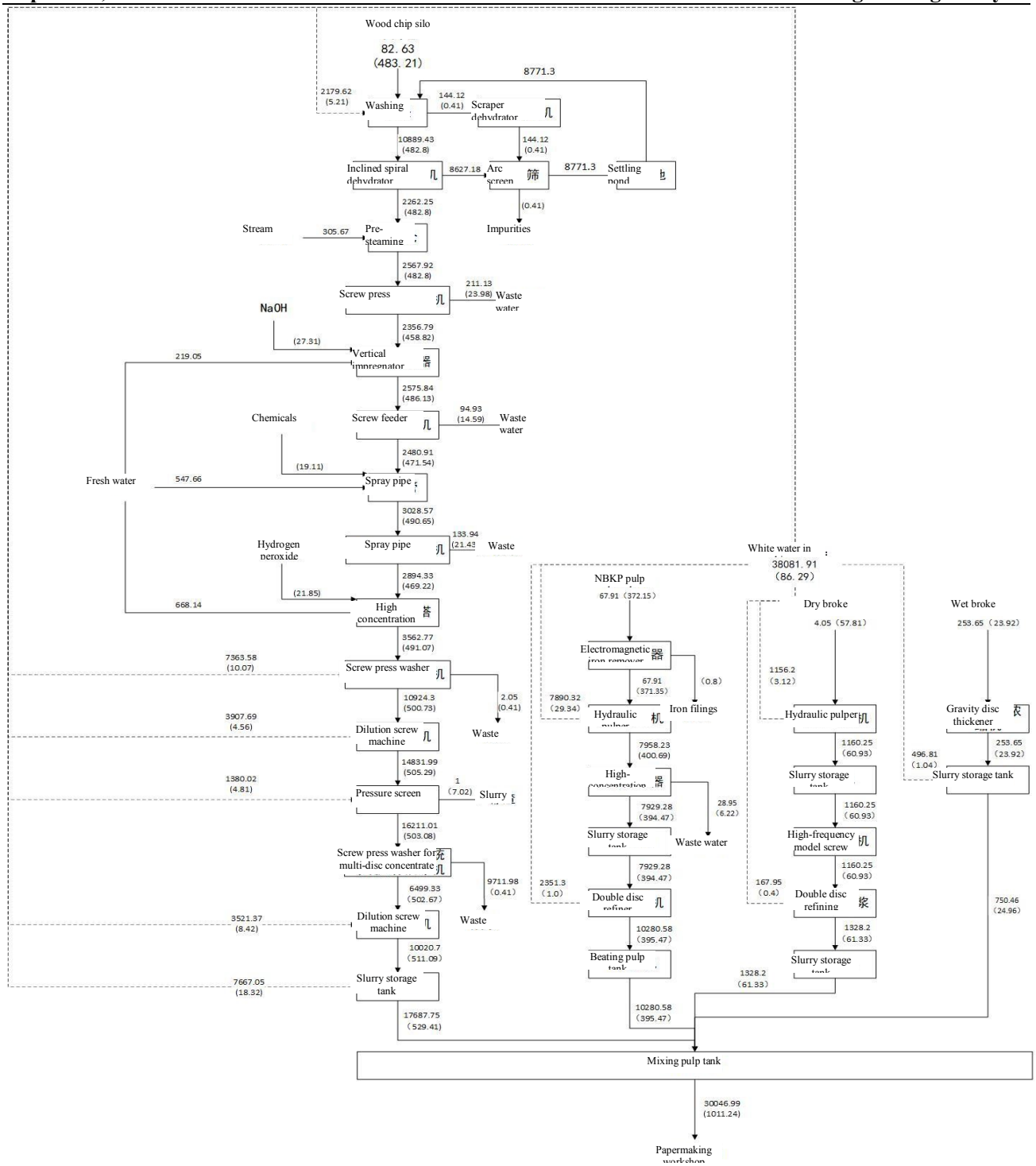
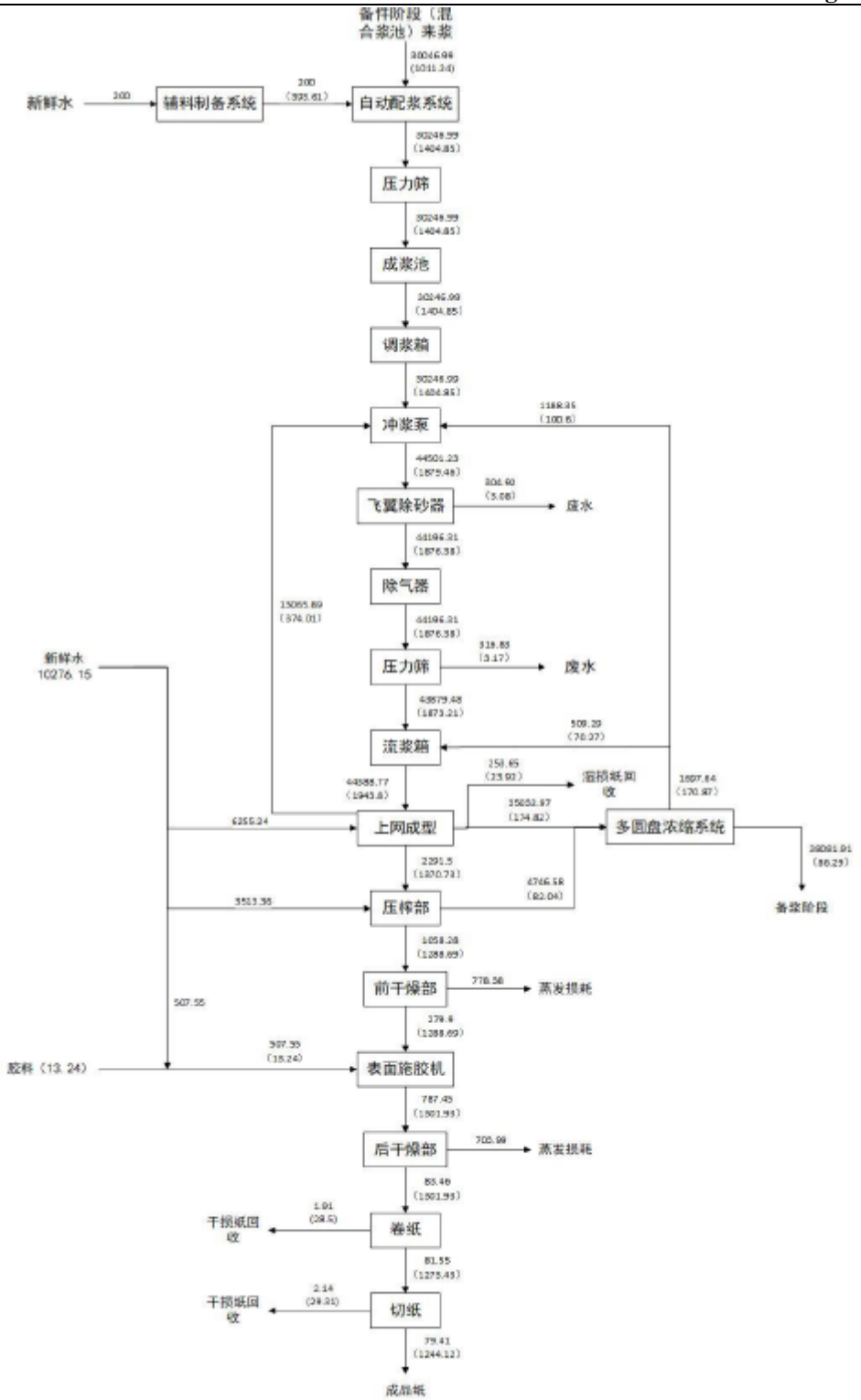



**图2.2-7 备浆阶段浆、水平衡图（括号外是水量：m³/d，括号内是浆：t/d）**

**Figure2.2-7 Slurry and Water Balance Diagram in Slurry Preparation Stage (water quantity (outside parentheses): m³/d, slurry (outside parentheses): t/d)**


备件阶段（混合浆池）来浆
新鲜水
辅料制备系统
自动配浆系统
压力筛
成浆池
调浆箱
冲浆泵
飞翼除砂器
废水
除气器
压力筛
废水
新鲜水
10276.15
流浆箱
上网成型
多圆盘浓缩系统
备浆阶段
压榨部
前干燥部
蒸发损耗
胶料（13.24）
表面施胶机
后干燥部
蒸发损耗
干损纸回收
卷纸
干损纸回收
切纸
成品纸

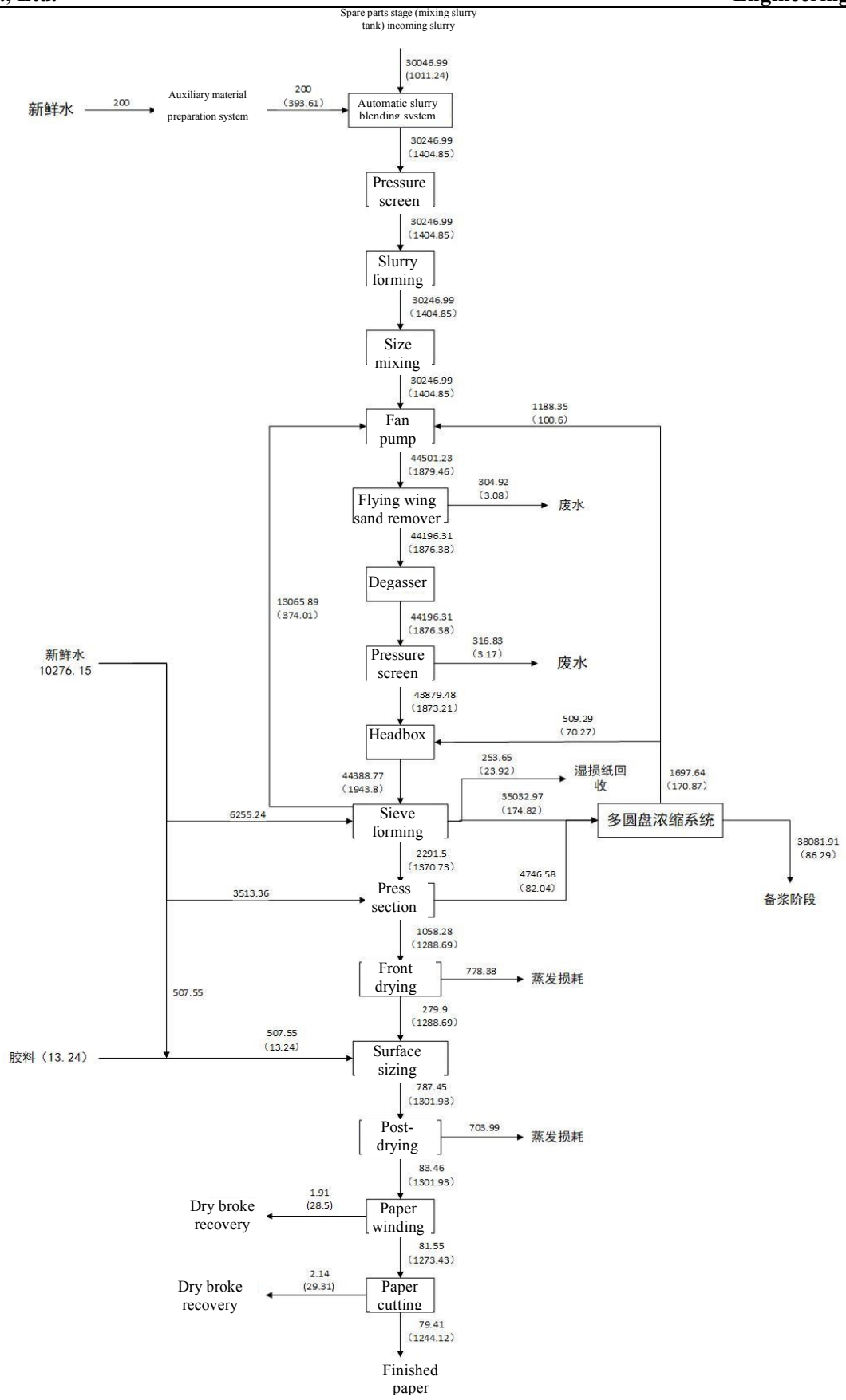
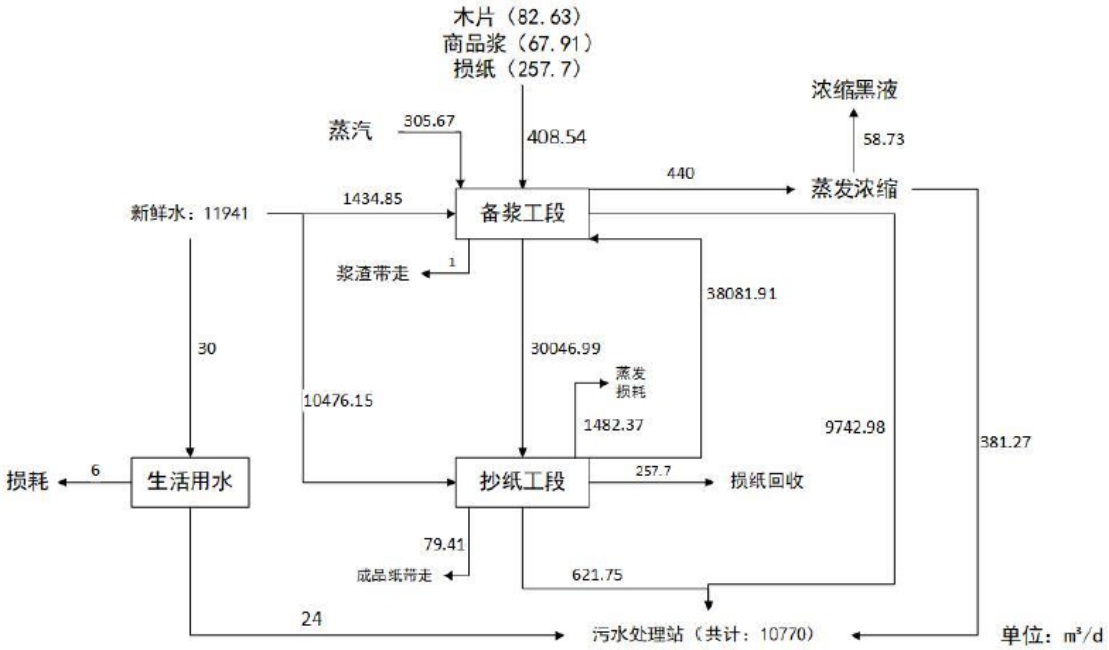



**图2.2-8 抄纸阶段浆、水平衡图（括号外是水量$m^3/d$，括号内是浆t/d）**

**Figure2.2-8 Slurry and Water Balance Diagram in Papermaking Stage (water quantity (outside parentheses): m³/d, slurry (outside parentheses): t/d)**



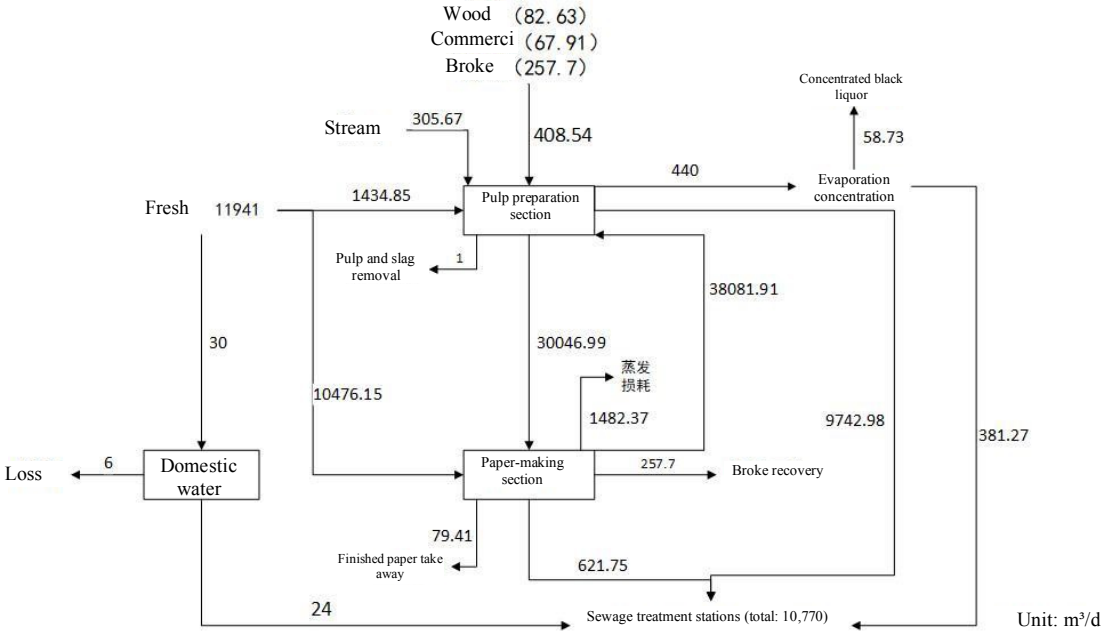




**图2.2-9 水平衡图**

**Figure2.2-9 Water Balance Diagram**

2、供汽及汽平衡

2. Steam supply and steam balance

项目生产用蒸汽由太阳新材料产业园供热中心提供，其中制浆项目蒸汽用量为0.25t/t浆，文

化用纸项目用气量1.8t/t纸，经计算，蒸汽总用量为81万t/a。

The steam for the production of the project is provided by the heating center of the Sun Paper New Materials Industrial Park, of which the steam consumption for the pulping project is 0.25 t/t pulp and the gas consumption for the cultural paper project is 1.8 t/t paper. After calculation, the total steam consumption is 810,000 t/a.

3、供电

3. Power supply

拟建项目供电电源为新材料产业园内变电站，用电量为2700万kWh/年。

The power supply for the proposed project is the substation in the new materials industrial park, with a power consumption of 27 million kWh/year.

### 2.2.3 三废产生及排放情况

### 2.2.3 Generation and discharge of three wastes

#### 2.2.3.1 废水

#### 2.2.3.1 Waste water

1、废水来源

1. Source of waste water

拟建项目废水主要为备浆工段的废水、抄纸阶段的废水、蒸发工段的废水、生活污水。

The waste water of the proposed project mainly includes the waste water from the pulp preparation section, the waste water from the papermaking stage, the waste water from the evaporation section and the domestic waste water.

（1）备浆工段的废水：备浆工段的废水主要来自经多圆盘浓缩系统处理后排入污水处理厂的废水，约为10314.99m³/d（合计350.71万m³/a）。

(1) Waste water from the pulp preparation section: The waste water from the pulp preparation section mainly comes from the waste water treated by the multi-disc concentration system and discharged into the sewage treatment plant, which is about 10314.99 m³/d (totaling 3,507,100 m³/a).

（2）：抄纸阶段的废水主要来自于锥形除砂器和压力筛过滤的废水，直接排入山东太阳纸业股份有限公司污水处理厂，约为49.74m³/d（合计1.69万m³/a）

(2) The waste water in papermaking stage mainly comes from the waste water filtered by conical desander and pressure screen, and is directly discharged into the sewage treatment plant of Shandong Sun Paper Co., Ltd., about 49.74 m³/d (total 16,900 m³/d)

（3）蒸发工段的废水：主要来自于蒸发车间的冷凝水，约为381.27m³/d（合计12.96万m³/a）。

(3) Waste water from evaporation section: mainly comes from condensed water from evaporation

workshop, about 381.27 m³/d (totaling 129,600 m³/a).

（4）生活污水：拟建生活污水产生量约为24m³/d（合计0.82万m³/a），经化粪池预处理后再进入山东太阳纸业股份有限公司污水厂进行处理。

(4) Domestic sewage: The proposed domestic sewage production is about 24 m³/d (totaling 8,200 m³/a), which will be pretreated by septic tank and then entered the sewage plant of Shandong Sun Paper Co., Ltd. for treatment.

经类比太阳纸业兖州本部厂区同类造纸项目的废水产生情况，确定建项目的废水产生量及水质情况具体见表2.2-12。

By comparing the waste water production of similar papermaking projects in Yanzhou plant area of Sun Paper, the amount of waste water production and water quality of the construction project are determined as shown in Table 2.2-12.

**表2.2-12 项目生产及生活废水污染物负荷表**

**Table2.2-12 Pollutant Load for Production and Domestic Wastewater of the Project**

| 序号 | S/n | 名称 | Name | 排放量m³/d | Discharge m³/d | pH | $BOD_5$ mg/L | CODcr mg/L | SS mg/L | 氨氮 mg/L | Ammonia nitrogen mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 生产废水 | Production waste water | 10746 | 10746 | 7～9 | 300 | 800 | 700 | 10mg/L | 10mg/L |
| 2 | 2 | 生活污水 | Domestic sewage | 24 | 24 | 7.5～8.5 | 200 | 350 | 250 | 35mg/L | 35mg/L |

2、治理措施及排放情况

2. Treatment measures and discharge

拟建项目采用的白水处理设施为多圆盘过滤机，具有浆料回收效率高、处理后白水水质分级明显、可回用部分比例高的特点。处理后的超清白水用于网部冲洗；清白水用于水力碎浆机碎浆、洗浆和调浆；浓白水用于混合浆池稀释浆料。

The white-water treatment facility used in the proposed project is a multi-disc filter, which features high slurry recovery efficiency, obvious classification of treated white water quality and high proportion of reusable parts. The treated ultra-white water is used for flushing the sieve; white water is used for pulping, washing and mixing by hydraulic pulper. Thick white water is used to dilute the slurry in the mixing slurry tank.

拟建项目产生的纸机白水经多圆盘过滤机回收纤维后有1697.64m³/d回用于抄纸工段冲浆和流

浆箱、38081.91m³/d回用于备浆工段用于水力碎浆；未经多圆盘过滤机的有13065.89m³/d直接回用于冲浆。经计算，拟建项目自身水重复利用率为97%，能满足国家发改委发布的《制浆造纸行业清洁生产评价指标体系（试行）》中“印刷书写纸”定性和定量评价指标体系中水重复利用率的指标要求（80%）。

A total of 1697.64m³/d of paper machine white water produced by the proposed project will be reused for pulp washing and headbox in the paper-making section after the fiber is recovered by the multi-disc filter; 38081.91 m³/d is reused in that pulp preparation section for hydraulic pulping; for white water that is not treated by the multi-disc filter, 13065.89m³/d is directly reused for pulp washing. After calculation, the water reuse rate of the proposed project itself is 97%, which can meet the index requirements (80%) of the water reuse rate in the qualitative and quantitative evaluation index system of "printing and writing paper" in the Cleaner Production Evaluation Index System for Pulp and Paper Industry (Trial) issued by the National Development and Reform Commission.

山东太阳纸业股份有限公司污水厂现处理能力为80000m³/d，采用“物化+厌氧+好氧”处理工艺，拟对现有8万方水处理设施进行升级扩容，以满足水处理排放要求，污水厂扩容后处理能力为13万m³/d，外排水质控制标准CODcr60mg/L、氨氮稳定达到2.4mg/L。处理后的废水排入氧化塘深度治理工程，处理后的中水经过杨家河湿地降解后再利用泵站通过管道输送至泗河，最后排入南四湖。

The sewage plant of Shandong Sun Paper Co., Ltd. currently has a treatment capacity of 80,000 m³/d. Using the “physicochemical+anaerobic+aerobic” treatment process, it is planned to upgrade and expand the existing 80,000 m³/d water treatment facility to meet the requirements of water treatment and discharge. After expansion, the treatment capacity of the sewage plant is 130,000 m³/d, the discharge water quality control standard CODcr60mg/L, and ammonia nitrogen stably reaches 2.4 mg/L. The treated waste water is discharged into the oxidation pond deep treatment project, and the treated reclaimed water is degraded by Yangjiahe Wetland and then transported to Sihe River through pipelines by pumping station, and finally discharged into Nansi Lake.

拟建项目废水经山东太阳纸业股份有限公司污水厂处理，外排废水满足《流域水污染物综合排放标准第1部分：南四湖东平湖流域》（DB37/3416.1-2018）中一般保护区标准、《制浆造纸工业水污染物排放标准（GB3544-2008）》、《造纸工业水污染物排放标准》（DB37/336-2003）的要求。拟建项目外排废水量为10770m³/d（合计366.18万m³/a），废水中各污染物排放浓度分别为CODcr60mg/L、氨氮2.4mg/L，排放量分别为CODcr219.7t/a、氨氮8.79t/a。

The waste water from the sewage treatment station of Shandong Sun Paper Co., Ltd. can meet the General Protection Zone Standard of Comprehensive Discharge Standards for Water Pollutants in Watershed Part 1: Dongping Lake Watershed of Nansi Lake (DB37/3416. 1-2018), Discharge Standard for Water Pollutants in Pulp and Paper Industry (GB3544-2008) and Discharge Standard for Water Pollutants in Paper Industry (DB37/336-2003). The amount of waste water discharged from the proposed project is 10770 m³/d (totaling 3,661,800 m³/a). The discharge concentration of

each pollutant in the waste water is CODcr60mg/L and ammonia nitrogen 2.4 mg/L respectively, and the discharge amount is CODcr219.7 t/a and ammonia nitrogen 8.79 t/a respectively.

### 2.2.3.2 废气

### 2.2.3.2 Waste gas

拟建项目废气主要为原木装卸过程和木片再碎过程中产生的粉尘、蒸煮臭气。

The waste gas of the proposed project is mainly dust and cooking odor generated during log loading and unloading and wood chip re-crushing.

1、有组织废气

1. Organized waste gas

木片处理粉尘：经类比同类木材加工项目，拟建项目木片再碎、筛分工序中产尘系数为0.32kg/m³，杨木密度为386kg/m³、桉木密度为500kg/m³，则粉尘产生量为141.02t/a、产生速率17.28kg/h、产生浓度734.41mg/m³。各工序产生的粉尘经管道收集后进入1套布袋除尘器（除尘效率99%）后，由1台60000m³/h风机引入1根20m的高排气筒排放，处理后粉尘排放量为1.41t/a、排放速率0.17kg/h、排放浓度7.34mg/m³。外排废气中粉尘排放浓度满足《区域性大气污染物综合排放标准》（DB37/2376-2019）表1重点控制区要求，排放速率满足《大气污染物综合排放标准》（GB16297-1996）表2二级排放标准要求。

Wood chip treatment dust: compared with similar wood processing projects, the dust production coefficient in the wood chip re-crushing and screening process of the proposed project is 0.32 kg/m³, the density of poplar wood is 386kg/m³, and the density of eucalyptus wood is 500kg/m³, then the dust production amount is 141.02 t/a, the production rate is 17.28 kg/h, and the production concentration is 734.41 mg/m³. The dust generated from each process is collected by pipelines and then enters a set of bag dust collector (dust removal efficiency is 99%). After that, a 60000m³/h fan is introduced into a 20m high exhaust funnel for emission. After treatment, the dust emission is 1.41 t/a, the emission rate is 0.17 kg/h, and the emission concentration is 7.34 mg/m³. The dust emission concentration in the discharged waste gas meets the standard requirements of key control areas in Table 1 of Regional Air Pollutant Comprehensive Emission Standard of Shandong Province (DB37/2376-2019), and the emission rate meets the requirements of the Secondary Discharge Standard in Table 2 of the Comprehensive Emission Standard for Air Pollutants (GB16297-1996).

2、无组织废气

2. Unorganized waste gas

（1）原木去皮产生一定粉尘，由于原木含水率为15%，并且比较分散，粉尘排放量为3.4t/a，需定期进行洒水降尘（降尘效率50%），降尘处理后粉尘排放量为1.7t/a。

(1) A certain amount of dust will be produced during log peeling. As the moisture content of the log is 15%, and the dust emission is 3.4 t/a, regular sprinkling of water is required to reduce dust (dust reduction efficiency is 50%). The dust emission after dust reduction treatment is 1.7 t/a.

（2）蒸煮臭气：制浆车间洗浆机、洗液槽、滤液槽、木片仓，蒸发工段各废液槽、冷凝水槽、苛化工段各白液槽、滤液槽等散放的臭气属于低浓不凝臭气，设置DNCG密闭收集系统。DNCG收集系统由DNCG风机驱动，将低浓臭气推动进入DNCG洗涤塔进行洗涤和降温处理后无组织排放。

Cooking odor: Odor scattered from pulp washing machine, liquid washing tank, filtrate tank, wood chip warehouse, waste liquid tank and condensation tank in evaporation section, white liquid tank and filtrate tank in caustic chemical section in pulping workshop belongs to low-concentration non-condensable odor, and DNCG sealed collection system is set up. The DNCG collection system is driven by a DNCG fan, which pushes low-concentration odor into the DNCG washing tower for washing and cooling treatment before unorganized discharge.

采取以上措施后，粉尘无组织排放浓度满足《大气污染物综合排放标准》（GB16297-1996）表2无组织排放监控浓度极限要求，恶臭满足《恶臭污染物排放标准》（GB14554-93）二级标准、《挥发性有机物排放标准第7部分：其它行业》（DB37/2801.7-2019）表2厂界浓度限值要求。

After taking the above measures, the unorganized emission concentration meets the concentration limit requirements for unorganized emission monitoring in Table 2 of the Integrated Emission Standard of Air Pollutants (GB16297-1996), and the odor pollutants meet the secondary standard of the Emission Standard for Odor Pollutants (GB14554-93) and the concentration limit requirements for plant boundaries in Table 2 of the Emission Standard for Volatile Organic Compounds Part 7: Other Industries (DB37/2801. 7-2019).

#### 2.2.3.3 固体废物

#### 2.2.3.3 Solid waste

拟建项目生产过程产生固体废物包括杨木原木的树皮、过滤浆渣、黑液、商品浆浆板的铁屑、废机油、生活垃圾。

Solid wastes generated in the production process of the proposed project include bark of poplar logs, filter pulp residue, black liquor, iron filings of commercial pulp boards, waste engine oil and domestic wastes.

1、树皮、木屑：经类比太阳纸业兖州本部厂区同类造纸项目，制浆造纸工艺产生的废渣包括木片筛选工段的树皮、木屑约76.67t/d，则全年产生2.61万t/a；树皮和木屑在不能及时外售的情况下掺入新材料产业园供热中心锅炉中焚烧。

1. Bark and sawdust: Compared with similar papermaking projects in Yanzhou plant area of Sun Paper, the waste residue generated by pulping and papermaking process includes about 76.67 t/d of bark and sawdust from the wood chip screening section, and 26,100 t/a is produced per year. Bark and sawdust are mixed into the boiler of the heating center of the new materials industrial park for incineration if they cannot be sold out in time.

2、原辅材料废包装：拟建项目原辅材料为外购商品浆板和部分辅助原料，每个包装袋重约

1kg，根据原辅材料用量进行估算，阳离子助留剂和膨润土助留剂包装产生量为1.36t/a；外购浆板包装0.26t/d，全年产生88.4t/a；共计89.56t/a。经分类收集后，塑料等全部卖给废品收购站，其余杂质全部和生活垃圾一起填埋。

2. Waste packaging of raw and auxiliary materials: The raw and auxiliary materials of the proposed project are purchased commercial pulp boards and some auxiliary raw materials. Each packaging bag weighs about 1kg. According to the estimation of the use of raw and auxiliary materials, the packaging production of cationic retention aid and bentonite retention aid is 1.36 t/a; the purchased pulp board packaging is 0.26 t/d, and 88.4 t/a is produced per year. The total is 89.56 t/a. After classified collection, all plastics are sold to waste purchasing stations, and all other impurities are buried together with domestic garbage.

3、浆渣：根据浆水平衡计算，浆渣产生量8.02t/d，全年产生0.27万t/a，浆渣送填埋场填埋处理。

3. Slurry and slag: According to the calculation of slurry-water balance, the slurry and slag production amount is 8.02 t/d, and 2,700 t/a is generated per year. The slurry and slag are sent to the landfill site for landfill treatment.

4、铁屑等重质杂质：根据物料平衡，铁屑等杂质产生量约为0.8t/d，全年产生272t/a；经分类收集后，铁丝、塑料等全部卖给废品收购站。

4. Heavy impurities such as iron filings: According to the material balance, the amount of impurities such as iron filings is about 0.8 t/d, and a total of 272t/a is produced per year. After classified collection, iron wire, plastic, etc. are all sold to scrap purchasing stations.

5、制浆黑液：根据浆水平衡计算，蒸发浓缩后产生黑液118.73t/d，全年产生4.03万t/a，通过罐车拉到山东太阳纸业股份有限公司碱回收中焚烧。

5. Pulping black liquor: According to the calculation of pulp-water balance, 118.73 t/d of black liquor is generated after evaporation and concentration, and a total of 40,300 t/a is generated per year, which is pulled by tankers to Shandong Sun Paper Co., Ltd. for incineration in alkali recovery boiler.

6、除尘器收集粉尘：木片再碎、筛分工序产生粉尘141.02t/a，经布袋除尘器收集（收集效率99%），经核算除尘器收集的粉尘量约为139.61t/a，可外售生产密度板。

6. Dust collector collects dust: 141.02 t/a of dust generated from wood chip re-crushing and screening processes is collected by bag dust collector (collection efficiency is 99%). After calculation, the amount of dust collected by dust collector is about 139.61 t/a, which can be sold to produce density board.

7、职工生活垃圾：项目定员300人，运行时间340天，通过调查相关资料，职工生活垃圾系数约为0.8~1.2kg/人d，本次取1.0kg/人d，则拟建工程职工生活垃圾产生量约为10.2t/a，由环卫部门定期清运。

7. Workers' domestic garbage: The project has a staffing of 300 people and the operation time is

340 days. Through investigation of relevant data, the workers' domestic garbage coefficient is about 0.8 ~ 1.2 kg/person/ d. If 1.0 kg/person/d is taken this time, the workers' domestic garbage in the proposed project is about 10.2 t/a, which will be cleaned up and transported regularly by the sanitation department.

8、废机油：拟建项目厂区设备维护过程中产生废机油，类比山东太阳纸业股份有限公司现有工程，废机油产生量约为2.0t/a。通过对照《国家危险废物名录（2016版）》，废机油属于危险废物（HW08废矿物油与含矿物油废物，废物代码900-214-08），委托有资质的单位处置。

8. Waste engine oil: Waste engine oil is generated during equipment maintenance in the plant area of the proposed project. Compared with the existing project of Shandong Sun Paper Co., Ltd., the output of waste engine oil is about 2.0 t/a. According to the National Hazardous Waste List (2016 Edition), waste engine oil belongs to hazardous waste (HW08 Waste Mineral Oil and Waste Containing Mineral Oil, Waste Code 900-214-08) and is entrusted to a qualified unit for disposal.

固体废物汇总表详见下表2.2-13。

Please refer to Table 2.2-13 below for details of solid waste.

**表2.2-13 拟建项目固体废物产生情况**

**Table2.2-13 Solid Waste Generation of the Proposed Project**

| 序号 | S/n | 名称 | Name | 单位 | Unit | 数量 | Quantity | 处理方式 | Processing method |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 树皮、木屑 | Bark, sawdust | 万t/a | 10,000 t/a | 2.61 | 2.61 | 送供热中心燃烧处理 | Combustion treatment in heating supply center |
| 2 | 2 | 浆渣 | Slurry residue | 万t/a | 10,000 t/a | 0.27 | 0.27 | 填埋场填埋处理 | Sent to the landfill site for landfill treatment. |
| 3 | 3 | 黑液 | Black liquid | 万t/a | 10,000 t/a | 4.03 | 4.03 | 通过罐车拉到山东太阳纸业股份有限公司碱回收中焚烧 | Pulled by tankers to Shandong Sun Paper Co., Ltd. for incineration in alkali recovery boiler. |
| 4 | 4 | 废包装 | Waste packaging | t/a | t/a | 89.56 | 89.56 | 外售给废品收购站 | Sold out to scrap purchasing stations |
| 5 | 5 | 除尘器粉尘 | Dust collector | t/a | t/a | 139.61 | 139.61 | 可外售生产密度板 | Sold out for making density boards |
| 6 | 6 | 铁屑 | Iron filings | t/a | t/a | 272 | 272 | 分类后卖给废品收购站 | Sold to scrap purchasing stations after classification. |
| 7 | 7 | 生活垃圾 | Domestic waste | t/a | t/a | 10.2 | 10.2 | 环卫部门定期清运 | Cleaned up and transported regularly by the sanitation |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | department |
| 8 | 8 | 废机油 | Used oil | t/a | t/a | 2.0 | 2.0 | 委托有资质单位处置 | Entrust a qualified unit for disposal |

### 2.2.3.4 噪声

### 2.2.3.4 Noise

1、噪声源情况

1. Noise source

拟建工程主要噪声源有螺旋机、脱水机、磨浆机、压力筛、挤浆机、弧形筛、造纸机、施胶机、压光机、卷纸机、剥皮机、削皮机、风机等，主要噪声源强在80~95dB（A）之间。各噪声源情况具体见表2.2-14。

The main noise sources of the proposed project include screw machine, dehydrator, refiner, pressure screen, pulp extruder, arc screen, paper machine, sizing machine, calender, paper reeling machine, peeling machine, skiving machine, fan, etc. The main noise source intensity is between 80 and 95dB (A). See Table 2.2-14 for details of each noise source.

**表2.2-14 拟建项目主要噪声源基本情况**

**Table2.2-14 Basic Information of Main Noise Sources of the Proposed Project**

| 序号 | S/n | 噪声源 | Noise source | 台（套）数 | Set | 噪声值 dB(A) | Noise value dB(A) | 主要噪声治理措施 | Main noise control measures | 治理后噪声值 dB(A) | Noise value after treatment dB(A) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 出料螺旋 | Discharging screw | 1 | 1 | 80 | 80 | 基础减震、车间隔声 | Basic shock absorption and workshop sound insulation | 60 | 60 |
| 2 | 2 | 碎屑分离器 | Debris separator | 3 | 3 | 85 | 85 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 65 | 65 |
| 3 | 3 | 螺旋脱水机 | Screw dehydrator | 1 | 1 | 80 | 80 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 60 | 60 |
| 4 | 4 | 螺旋喂料器 | Screw feeder | 1 | 1 | 80 | 80 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 60 | 60 |
| 5 | 5 | 高浓磨浆机 | High consistency refiner | 1 | 1 | 85 | 85 | 基础减震、隔声罩、车间隔 | Basic shock absorption, acoustic shield and workshop | 65 | 65 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 声 | sound insulation | | |
| 6 | 6 | 压力分离器 | Pressure separator | 1 | 1 | 80 | 80 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 60 | 60 |
| 7 | 7 | 压力筛 | Pressure screen | 1 | 1 | 80 | 80 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 60 | 60 |
| 8 | 8 | 低浓磨浆机 | Low consistency refiner | 1 | 1 | 80 | 80 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 60 | 60 |
| 9 | 9 | 双网挤浆机 | Double mesh extruder | 1 | 1 | 85 | 85 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 65 | 65 |
| 10 | 10 | 弧形筛 | Arc screen | 1 | 1 | 80 | 80 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 60 | 60 |
| 11 | 11 | 造纸机 | Paper machine | 1 | 1 | 90 | 90 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 70 | 70 |
| 12 | 12 | 施胶机 | Sizing machine | 1 | 1 | 85 | 85 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 65 | 65 |
| 13 | 13 | 软压光机 | Soft calender | 1 | 1 | 90 | 90 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 70 | 70 |
| 14 | 14 | 卷纸机 Reel | Paper winding machine Reel | 1 | 1 | 90 | 90 | 基础减震、车间隔声 | Basic shock absorption and workshop sound insulation | 70 | 70 |
| 15 | 15 | 原木剥皮机 | Log peeling machine | 1 | 1 | 95 | 95 | 基础减震 | Basic shock absorption | 70 | 70 |
| 16 | 16 | 原木削皮机 | Log peeler | 1 | 1 | 95 | 95 | 基础减震 | Basic shock absorption | 70 | 70 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | 17 | 风机 | Fan | 1 | 1 | 95 | 95 | 基础减震、隔声罩、车间隔声 | Basic shock absorption, acoustic shield and workshop sound insulation | 70 | 70 |

2、噪声治理措施及排放情况

2. Noise treatment measures and emission

拟建项目噪声源除原木剥皮机和原木削皮机以外全部位于车间内，车间对车间内噪声源有一定的隔声作用。除整个车间的隔声外，对各噪声源均设置减震基础；此外，对相对独立的噪声设备在其周围依空间大小设置隔声罩进行隔声；另外，将各种泵类尽量布置在车间中部，远离厂界。采取上述措施后，厂界噪声能达到《工业企业厂界环境噪声排放标准》（GB12348-2008）中3类标准的要求。

The noise sources of the proposed project are all located in the workshop except log peeling machine and log skiving machine, and the workshop has certain sound insulation effect on the noise sources in the workshop. In addition to the sound insulation of the whole workshop, shock absorption foundation shall be set for each noise source; in addition, a sound insulation cover is arranged around relatively independent noise equipment according to the size of the space for sound insulation. All kinds of pumps will be arranged in the middle of the workshop as far away from the plant boundary as possible. After taking the above measures, the noise at the plant boundary can meet the requirements of Class 3 standards of the Emission Standard for Environmental Noise Emission Standards for Industrial Enterprise Plant Boundary (GB12348-2008).

### 2.2.4非正常工况下分析

### 2.2.4 Analysis under abnormal working conditions

拟建工程非正常工况排放主要分为两类：一类是在正常开、停车、工艺设备故障或部分设备检修时会有较大量的污染物排出，另一类是环保设施达不到设计规定的指标运行，而使正常排放的污染物经过不完全处理或不经过处理直接排放而导致的超标排放。

The emission from the proposed project under abnormal working conditions is mainly divided into two categories: One is that a large amount of pollutants will be discharged during normal start-up, stop-down, process equipment failure or partial equipment overhaul. The other is that environmental protection facilities cannot meet the design specifications, resulting in over-standard discharge of pollutants that are normally discharged through incomplete treatment or direct discharge without treatment.

拟建工程非正产工况主要包括以下几点：

The abnormal production conditions of the proposed project mainly include the following points:

1、设备检修及开停车

1. Equipment overhaul and start-up and shutdown

开车时，首先启动环保装置，然后再按照规程依次启动生产线上各个设备，一般不会出现超标排污的现场；停车时，则需先按照规程依次关闭生产线上的设备，然后关闭环保设备，保证污染物达标排放。

During operation, the environmental protection equipment should be launched first, and then all the equipment on the production line should be started in turn according to the regulations. Generally, there will be no site where the pollution discharge exceeds the standard. During shut-down, the equipment on the production line should be shut down in turn according to the regulations, and then the environmental protection equipment should be shut down to ensure that the pollutants meet the discharge standards.

2、非正常工况废气排放情况

2. Waste gas emission under abnormal working conditions

拟建工程废气处理系统如发生故障，处理效率降低或完全失效，废气污染物排放量增大，造成非正常排放。拟建工程废气非正常工况考虑布袋除尘器处理效率为零，则废气排放情况见表2.2-15。

If the waste gas treatment system of the proposed project fails, the treatment efficiency will decrease or completely fail, and the emission of waste gas pollutants will increase, resulting in abnormal emission. If the treatment efficiency of bag filter is considered to be zero under abnormal working conditions of waste gas in the proposed project, see Table 2.2-15 for waste gas emission.

**表2.2-15 非正常工况下废气排放情况**

**Table2.2-15 Waste Gas Emission under Abnormal Working Conditions**

| 污染源 | Source of pollution | 故障 | Failure | 废气量万m³/a | Volume of waste gas (10,000 m³/a) | 污染物名称 | Name of pollutants | 排放速率 kg/h | Emission rate kg/h | 排放浓度 mg/m³ | Emission concentration mg/m³ | 达标情况 | Qualified or not |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 木片再碎、筛分工序产生粉尘 | Dust generated in the process of wood chip re-crushing and screening | 废气处理系统处理效率为0 | The waste gas treatment system has a treatment efficiency of 0 | 48960 | 48960 | 粉尘 | Dust | 17.28 | 17.28 | 734.41 | 734.41 | **超标** | **Exceeding the standard** |

由上表可知，非正常工况下粉尘排放浓度超过标准的要求，在生产过程中要及时对环保设施进行检查，及时维修，同时加强设备维护，防止出现污染物超标排放的现象发生。

As can be seen from the above table, the dust emission concentration exceeds the standard requirements under abnormal working conditions. In the production process, environmental protection facilities should be inspected and repaired in time, and equipment maintenance should be strengthened to prevent excessive emission of pollutants.

综上分析，为尽量避免非正常排放发生，企业应采取如下防范措施：

To sum up, in order to avoid abnormal emissions as much as possible, enterprises should take the following preventive measures:

①对非正常状态下排放的危害加强认识，建立一套完善的环保设施检修体制。

①Strengthen understanding of the hazards of emission under abnormal conditions and establish a set of perfect maintenance system for environmental protection facilities.

②建设单位应做好生产设备和环保设施的管理、维修工作，选用质量好的设备；派专人对易发生非正常排放的设备进行管理，出现异常，及时维修处理。

②The construction unit should do a good job in the management and maintenance of production equipment and environmental protection facilities, and select good quality equipment. Special personnel shall be assigned to manage the equipment prone to abnormal emission, and timely maintenance and treatment shall be carried out in case of abnormality.

③如出现事故情况，必要时应立即停产检修。

③In case of any accident, production shall be stopped immediately for overhaul when necessary.

### 2.2.5 拟建项目污染物排放汇总

### 2.2.5 Summary of Pollutant Discharge of the Proposed Project

拟建项目污染物排放汇总见表2.2-15。

See Table 2.2-15 for pollutant discharge of the proposed project.

**表2.2-15 拟建项目污染物排放汇总一览表**

**Table2.2-15 Summary of Pollutant Discharge of the Proposed Project**

| 类别 Category | 排污口 Sewage outlet | 污染物名称 | Name of pollutants | 单位 | Unit | 产生量 | Generation amount | 处理措施 | Treatment measures | 排放量 Emission |
|---|---|---|---|---|---|---|---|---|---|---|
| 废气 Exhaust gas | 有组织 Organized | 粉尘 | Dust | t/a | t/a | 141.02 | 141.02 | 集气罩收集后，由一根20m高的排气筒排放 | After being collected by the gas collecting hood, it is discharged by a 20m high exhaust funnel | 1.41 |
| | 无组织 Unorganized | 粉尘 | Dust | t/a | t/a | 3.4 | 3.4 | 定期洒水降尘 | Regular sprinkling of water to reduce | 1.7 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | dust | |
| 废水 Waste water | 废水量 | Volume of waste water | 万 $m^3/a$ | 10,000 $m^3/a$ | 366.18 | 366.18 | 山东太阳纸业股份有限公司污水处理厂处理 | Treated by sewage treatment plant of Shandong Sun Paper Co., Ltd. | 366.18 |
| | COD | COD | t/a | t/a | 2925.74 | 2925.74 | | | 219.70 |
| | 氨氮 | Ammonia nitrogen | t/a | t/a | 36.83 | 36.83 | | | 8.79 |
| 固废 Solid waste | 树皮、木屑 | Bark, sawdust | 万 t/a | 10,000 t/a | 2.61 | 2.61 | 送供热中心燃烧处理 | Combustion treatment in heating supply center | 0 |
| | 浆渣 | Slurry residue | 万 t/a | 10,000 t/a | 0.67 | 0.67 | 外运填埋处理 | Transported for landfill treatment | 0 |
| | 黑液 | Black liquid | 万 t/a | 10,000 t/a | 4.03 | 4.03 | 通过罐车拉到山东太阳纸业股份有限公司碱回收中焚烧 | Pulled by tankers to Shandong Sun Paper Co., Ltd. for incineration in alkali recovery boiler. | 0 |
| | 废包装 | Waste packaging | t/a | t/a | 89.56 | 89.56 | 收集后外售给废品收购站 | Sold to the scrap purchasing station. | 0 |
| | 除尘器粉尘 | Dust collector | t/a | t/a | 139.61 | 139.61 | 可外售生产密度板 | Sold out for making density boards | 0 |
| | 铁屑 | Iron filings | t/a | t/a | 272 | 272 | 外售废品收购站 | Sold out to scrap purchasing stations | 0 |
| | 生活垃圾 | Domestic waste | t/a | t/a | 10.2 | 10.2 | 环卫部门定期清运 | Cleaned up and transported regularly by the sanitation department | 0 |
| | 废机油 | Used oil | t/a | t/a | 2.0 | 2.0 | 委托有资质单位处置 | Entrust a qualified unit for disposal | 0 |

### 2.2.6 清洁生产小结

### 2.2.6 Summary of cleaner production

清洁生产是环境保护由末端治理转向生产全过程控制的全新污染预测策略。其实质是一种物料和能源最少化的人类生产活动的规划和管理，将废物减量化、资源化和无害化，或者消灭于生产过程中。它以科学管理、技术进步为手段，通过节能、降耗、减污，提高污染防治效果，降低污染防治费用，消除、减少工业生产对人类健康和环境的影响。

Cleaner production is a brand-new pollution prediction strategy for environmental protection from

end treatment to whole production process control. It is essentially a kind of planning and management of human production activities that minimize materials and energy, reduce, recycle and sanitize waste, or eliminate waste in the production process. By means of scientific management and technological progress, it improves pollution prevention and control, reduces cost of pollution prevention and control, and eliminates and reduces the impact of industrial production on human health and the environment through energy conservation, consumption reduction and pollution reduction.

造纸行业的项目特点是用水量大、废水量大、有机污染严重，其实现清洁生产的重要手段是选择先进的生产设备、采用先进的工艺技术，达到节水、降低物料能源消耗、提高产品的得率、减少排污的目的。本次评价根据制浆造纸行业清洁生产的有关要求，在对清洁生产指标进行对比的基础上，重点通过对本项目工艺的先进性和节能降耗措施的分析来论述本项目的清洁生产水平。

The paper industry is characterized by large water consumption, large amount of waste water and severe organic pollution. The important means to realize clean production is to select advanced production equipment and adopt advanced technology to save water, reduce material and energy consumption, improve product yield and reduce pollution discharge. According to the relevant requirements of cleaner production in pulp and paper industry, this evaluation discusses the cleaner production level of this project through the analysis of the advanced technology and energy saving and consumption reduction measures on the basis of the comparison of cleaner production indexes.

#### 2.2.6.1 重点指标评价

#### 2.2.6.1 Assessment of key indexes

由于我国目前尚未出台以商品木浆为原料进行造纸行业的清洁生产标准，根据拟建项目的产品分类，本次评价参照国家发改委发布的《制浆造纸行业清洁生产评价指标体系（试行）》中“印刷书写纸”定性和定量评价指标体系中的指标要求对拟建项目的清洁生产水平进行对比评价。

Since China has not yet issued a cleaner production standard for the papermaking industry using commercial wood pulp as raw material, according to the product classification of the proposed project, this assessment makes a comparative assessment of the cleaner production level of the proposed project with reference to the index requirements in the qualitative and quantitative assessment index system of Printing and Writing Paper in the Cleaner Production Evaluation Index System for Pulp and Paper Industry (Trial) issued by the National Development and Reform Commission.

1、评价指标

1. Assessment indexes

根据《制浆造纸行业清洁生产评价指标体系（试行）》中的“表7印刷书写纸定量评价指标项目、权重及基准值”和“表11纸产品定性评价指标项目及权重”，各定量评价指标情况具体见

表2.2-15，定性评价指标情况具体见表2.2-16。

According to Table 7 Quantitative Assessment Index Items, Weights and Benchmark Values for Printing and Writing Paper and Table 11 Qualitative Assessment Index Items and Weights for Paper Products in Cleaner Production Evaluation Index System for Pulp and Paper Industry (Trial), see Table 2.2-15 for details of each quantitative assessment index and Table 2.2-16 for details of qualitative assessment index.

**表2.2-16 印刷书写纸定量评价指标项目、权重及基准值**

**Table2.2-16 Quantitative Assessment Index Items, Weights and Benchmark Values of Printing and Writing Paper**

| 一级指标 | Level I indexes | 权重分值 Weight | 二级指标 | Level II indexes | 单位 | Unit | 权重分值 Weight | 评价基准值 Assessment benchmark value |
|---|---|---|---|---|---|---|---|---|
| （1）资源和能源消耗指标 | (1) Resource and energy consumption indexes | 40 | 取水量 | Water intake | $m^3/t$产品 | $m^3/t$ product | 20 | 30 |
| | | | 综合能耗 | Comprehensive energy consumption | kgce/t产品 | kgce/t product | 20 | 680 |
| （2）资源综合利用指标 | (2) Comprehensive utilization of resources indexes | 10 | 水重复利用率 | Water reuse rate | % | % | 10 | 80 |
| （3）污染物产生指 | (3) Pollutant production indexes | 34 | 废水产生量 | Waste water production | $m^3/t$ | $m^3/t$ | 10 | 20 |
| | | | COD产生量 | COD production | kg/t | kg/t | 8 | 15 |
| | | | $BOD_5$产生量 | $BOD_5$ production | kg/t | kg/t | 8 | 10 |
| | | | SS产生量 | SS production | kg/t | kg/t | 8 | 18 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 标 | | | | | | | | |
| （4）产品特性指标 | (4) Product characteristic index | 10 | 甲醛 | Methanal | mg/m² | mg/m² | 4 | 1 |
| | | | 白度 | Whiteness | % | % | 3 | 70 |
| | | | 不透明度 | Opacity | % | % | 3 | 75.0 |
| | | 6 | 施胶度 | Sizing degree | mm | mm | 3 | 0.75 |
| | | | 尘埃度0.3～1.5mm²>1.5mm² | Dust degree0.3～1.5mm²>1.5mm² | 个/m² | Piece/m² | 3 | 80不许有 80 not permitted |

**表2.2-17 纸产品定性评价指标项目及权重**

**Table 2.2-17 Qualitative Assessment Index Items and Weights of Paper Products**

| 一级指标 | Level I indexes | 指标分值 Index value | 二级指标 Level II indexes | | | 指标分值 Index value |
|---|---|---|---|---|---|---|
| （1）原辅材料的使用要求 | (1) Requirements for the use of raw and auxiliary materials | 15 | 染料 Dye | 新闻纸 Newsprint | 不使用附录2中所列染料 Do not use the dyes listed in Appendix 2 | 5 |
| | | | | 印刷书写纸 Printed writing paper | 不使用附录2中所列染料 Do not use the dyes listed in Appendix 2 | |
| | | | | 生活用纸 Household paper | 不使用附录2中所列染料 Do not use the dyes listed in Appendix 2 | |
| | | | | 涂布纸 Coated paper | 不使用附录2中所列染料，不使用含甲醛的涂料 Do not use the dyes listed in Appendix 2 and do not use methanal-containing coatings. | |
| | | | 增白剂 Whitening agent | 卫生纸 Toilet paper | 不使用荧光增白剂 No fluorescent whitening agent is used | 5 |
| | | | | 食品包装纸 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Food wrapping paper | | |
| | | | | 纸杯 Paper cup | | |
| | | | 使用废纸浆和高得率浆 Waste pulp and high yield pulp are used | | | 5 |
| （2）执行国家要求淘汰的落后生产能力和工艺设备的符合性 | (2) Compliance of backward production capacity and process equipment to be eliminated as required by the State | 10 | 不使用离心涂布机 Centrifugal coater is not used | | | 5 |
| | | | 不使用QZ101、QZ201、QZ301、QZ401型切纸机 QZ101, QZ201, QZ301, QZ401 paper cutters are not used | | | 5 |
| （3）环境管理体系建设及清洁生产审核 | (3) Environmental management system construction and cleaner production audit | 25 | 是否建立环境管理体系并通过认证 Is an environmental management system established and certified | | | 7 |
| | | | 是否进行清洁生产审核 Whether to conduct cleaner production audit | | | 8 |
| | | | 是否有完善的生产工艺用水、电、汽管 Is there a sound production process for water, electricity and steam | | | 3 |
| | | | 理制度 management system | | | |
| | | | 是否有完善的生产设备的使用、维护、检修管理制度 Is there a perfect management system for the use, maintenance and overhaul of production equipment | | | 3 |
| | | | 是否所有岗位进行严格培训 Are all positions subject to strict training | | | 2 |
| | | | 是否有完善的事故、非正常生产状况应急措施 Whether there are perfect emergency measures for accidents and abnormal production conditions | | | 2 |
| （4）贯彻执行环境保护法规的符合性 | (4) Compliance of implementing environmental protection laws and regulations | 25 | 有环保规章、管理机构和有效的环境监测手段 There are environmental protection regulations, management agencies and effective environmental monitoring methods. | | | 6 |
| | | | 对污染物排放实行定期和监测污水排放口规范管理 Regularly monitor the discharge of pollutants and standardize the management of sewage outfalls. | | | 5 |

| | | | | |
|---|---|---|---|---|
| | | | 对各生产单位的环保状况实行月份、年度考核<br>Conduct monthly and annual assessment on the environmental protection status of each production unit. | 5 |
| | | | 对污染物排放总量限制控制和年度考核<br>Carry out limit control of total pollutant discharge and annual assessment | 9 |
| （5）生产工艺及设备要求 | (5) Requirements for production process and equipment | 25 | 真空系统水是否循环使用<br>Is the vacuum system water recycled | 3 |
| | | | 是否有冷凝水回收系统<br>Is there a condensate recovery system | 3 |
| | | | 是否有废水再利用系统<br>Is there a waste water reuse system | 3 |
| | | | 填料回收系统（对于涂布纸还应有涂料回收系统）<br>Filler recovery system (there should also be a coating recovery system for coated paper) | 3 |
| | | | 是否采用闭式汽罩及热回收<br>Whether closed steam hood and heat recovery are used | 3 |
| | | | 是否使用变频电机<br>Are variable frequency motors used | 3 |
| | | | 热电联产<br>Combined heat and power generation | 3 |
| | | | 锅炉是否装有脱硫和除尘设施<br>Is the boiler equipped with desulfurization and dust removal facilities | 4 |

2、评价方法

2. Assessment methods

（1）定量评价指标的考核评分计算

(1) Calculation of assessment score of quantitative assessment index

企业清洁生产定量评价指标的考核评分，以企业在考核年度（一般以一个生产年度为一个考核周期，并与生产年度同步）各项二级指标实际达到的数值为基础进行计算，综合得出该企业定量评价指标的考核总分值。定量评价的二级指标从其数值情况来看，可分为两类情况：一类是该指标的数值越低（小）越符合清洁生产要求（如常用纤维原料消耗量、取水量、综合能耗、污染物产生量等指标）；另一类是该指标的数值越高（大）越符合清洁生产要求（如水的循环利用率、碱回收率、固体废物综合利用率等指标）。因此，对二级指标的考核

评分，根据其类别采用不同的计算模式。

The assessment score of the quantitative assessment index of cleaner production in an enterprise is calculated on the basis of the actual value of each secondary index in the assessment year (generally taking a production year as an assessment cycle and synchronizing with the production year), and the total assessment score of the quantitative assessment index of the enterprise is comprehensively obtained. The secondary indexes of quantitative assessment can be divided into two types according to their numerical conditions: one is that the lower (smaller) the value of the index, the more it meets the requirements of cleaner production (such as commonly used fiber raw material consumption, water intake, comprehensive energy consumption, pollutant production and other indexes); the other is that the higher (larger) the value of this index, the more it meets the requirements of cleaner production (such as water recycling rate, alkali recovery rate, comprehensive utilization rate of solid waste and other indicators). Therefore, different calculation modes are adopted for the assessment and scoring of secondary indicators according to their categories.

定量评价二级指标的单项评价指数计算：

Calculation of single assessment index for quantitative assessment of secondary indexes;

对指标数值越高（大）越符合清洁生产要求的指标，其计算公式为：

For indexes whose higher (larger) values meet the requirements of cleaner production, the calculation formula is as follows:

$$S_i = S_{xi} / S_{oi}$$ （公式1）

$$S_i = S_{xi} / S_{oi}$$ (Formula 1)

对指标数值越低（小）越符合清洁生产要求的指标，其计算公式为：

For indexes whose lower (smaller) values meet the requirements of cleaner production, the calculation formula is as follows:

$$S_i = S_{oi} / S_{xi}$$ （公式2）

$$S_i = S_{oi} / S_{xi}$$ (Formula 2)

式中：Si—第i项评价指标的单项评价指数。如采用手工计算时，其值取小数点后两位；

Where: $S_i$-the single assessment index of the assessment index of item i. If manual calculation is adopted, the value shall be round up after the second decimal point.

Sxi—第i项评价指标的实际值（考核年度实际达到值）；

$S_{xi}$-the actual value of the assessment index in item i (the actual reached value in the assessment year);

Soi—第i项评价指标的评价基准值。

$S_{oi}$-the assessment benchmark value of the assessment index in item i.

本评价指标体系各二级指标的单项评价指数的正常值一般在1.0左右，但当其实际数值远小于（或远大于）评价基准值时，计算得出的Si值就会较大，计算结果就会偏离实际，对其他评价指标的单项评价指数产生较大干扰。为了消除这种不合理影响，应对此进行修正处理。修正的方法是：当Si＞k/m时（其中k为该类一级指标的权重值，m为该类一级指标中实际参与考核的二级指标的项目数），取该Si值为k/m。

The normal value of the single assessment index of each secondary index in this assessment index system is generally about 1.0, but when its actual value is far less than (or much larger than) the assessment benchmark value, the calculated $S_i$ value will be larger, and the calculation result will deviate from the reality, causing great interference to the single assessment index of other evaluation indexes. In order to eliminate such unreasonable influence, efforts should be made for correction. The correction method is: when $S_i > k/m$ (where k is the weight value of the first-level index of this class, and m is the number of items of the second-level index actually participating in the assessment in the first-level index of this class), the $S_i$ value is taken as k/m.

（2）定量评价考核总分值计算

(2) Calculation of the total score of quantitative assessment

定量评价考核总分值的计算公式为：

The calculation formula of the total score of quantitative assessment is as follows:

$$P_1 = \sum_{i=1}^{n} S_i \bullet K_i$$

（公式3）

$$P_1 = \sum_{i=1}^{n} S_i \bullet K_i$$

(Formula 3)

式中：P1—定量评价考核总分值；

Where: P1-Total score of quantitative assessment;

n—参与定量评价考核的二级指标项目总数；

n-Total number of secondary index items participating in quantitative evaluation and assessment;

Si—第i项评价指标的单项评价指数；

$S_i$-the single assessment index of the assessment index of item i.

Ki—第i项评价指标的权重值。

$K_i$-the weight value of the assessment index in item i.

若某项一级指标中实际参与定量评价考核的二级指标项目数少于该一级指标所含全部二级指标项目数（由于该企业没有与某二级指标相关的生产设施所造成的缺项）时，在计算中应将这类一级指标所属各二级指标的权重值均予以相应修正，修正后各相应二级指标的权重值以Ki′表示：

If the number of secondary index items actually participating in quantitative evaluation and assessment in a certain primary index is less than the number of all secondary index items contained in the primary index (missing items caused by the enterprise's lack of production facilities related to a certain secondary index), in the calculation, the weight values of each secondary index to which such primary indexes belong shall be corrected accordingly, and the weight values of each corresponding secondary index after correction shall be expressed by $K_{i'}$:

$$K_i^{'} = K_i \bullet A_j$$ （公式4）

$$K_i^{'} = K_i \bullet A_j$$ (Formula 4)

式中：Aj—第j项一级指标中，各二级指标权重值的修正系数；

In the formula: $A_j$-the correction coefficient of the weight value of each secondary index in the first-level index of item j;

Aj=A1/A2。A1为第j项一级指标的权重值；A2为实际参与考核的属于该一级指标的各二级指标权重值之和。

$A_j$=A1/A2. A1 is the weight value of the first-level index in item j; A2 is the sum of the weight values of the secondary indexes that actually participate in the assessment and belong to the primary indicators.

如由于企业未统计该项指标值而造成缺项，则该项考核分值为零。

If there are missing items due to the enterprise's failure to count the index value, the appraisal score is zero.

（3）定性评价指标的考核评分计算

(3) Calculation of assessment score of qualitative assessment index

定性评价指标的考核总分值的计算公式为：

The calculation formula of the total score of qualitative assessment is as follows:

$$P_2 = \sum_{i=1}^{n} F_i$$ （公式5）

$$P_2 = \sum_{i=1}^{n} F_i$$ (Formula 5)

式中：P2—定性评价二级指标考核总分值；

Where: P2-Total score of secondary index assessment of qualitative assessment;

Fi—定性评价指标体系中第i项二级指标的得分值；

$F_i$-Score value of the secondary index of item i in the qualitative assessment index system;

n—参与考核的定性评价二级指标的项目总数。

n-Total number of projects participating in the qualitative assessment of secondary indexes.

（4）企业清洁生产综合评价指数的考核评分计算

(4) Calculation of assessment score of enterprise cleaner production comprehensive assessment index

为了综合考核制浆造纸企业清洁生产的总体水平，在对该企业进行定量和定性评价考核评分的基础上，将这两类指标的考核得分按不同权重（以定量评价指标为主，以定性评价指标为辅）予以综合，得出该企业的清洁生产综合评价指数和相对综合评价指数。

In order to comprehensively assess the overall level of cleaner production in pulp and paper-making enterprises and on the basis of quantitative and qualitative assessment scores of the enterprise, the assessment scores of these two indexes are synthesized according to different weights (quantitative assessment indexes are the main and qualitative assessment indexes are the auxiliary), and the comprehensive assessment index and relative comprehensive assessment index of cleaner production of the enterprise are obtained.

综合评价指数是描述和评价被考核企业在考核年度内清洁生产总体水平的一项综合指标。国内大中型制浆造纸企业之间清洁生产综合评价指数之差可以反映企业之间清洁生产水平的总体差距。综合评价指数的计算公式为：

The comprehensive assessment index is a comprehensive index to describe and evaluate the overall level of cleaner production of the assessed enterprise in the assessment year. The difference of comprehensive assessment index of cleaner production among large and medium-sized pulp and paper-making enterprises in China can reflect the overall difference of cleaner production level among enterprises. The calculation formula of the comprehensive assessment index is as follows:

$$P = 0.6P_1 + 0.4P_2$$ （公式6）

$$P = 0.6P_1 + 0.4P_2$$ (Formula 6)

式中：P—企业清洁生产的综合评价指数；

Where: P-Comprehensive assessment index of cleaner production in the enterprise;

P1、P2—分别为定量评价指标中各二级指标考核总分值和定性评价指标中各二级指标考核总分值。

$P_1$ and $P_2$-Total assessment scores of each secondary index in the quantitative assessment index and each secondary index in the qualitative assessment index respectively.

2、制浆造纸行业清洁生产企业的评定

2. Assessment of cleaner production enterprises in pulp and paper industry

对制浆造纸企业清洁生产水平的评价，是以其清洁生产综合评价指数为依据的，对达到一定综合评价指数的企业，分别评定为清洁生产先进企业或清洁生产企业。

The assessment of cleaner production level of pulp and paper-making enterprises is based on their comprehensive assessment index of cleaner production. Enterprises that reach a certain comprehensive assessment index are respectively evaluated as advanced cleaner production enterprises or cleaner production enterprises.

根据我国目前制浆造纸行业的实际情况，不同等级的清洁生产企业的综合评价指数分级情况具体见表2.2-18。

According to the actual situation of China's pulp and paper industry at present, the comprehensive assessment index classification of cleaner production enterprises of different grades is shown in Table 2.2-18.

**表2.2-18 清洁生产企业分级情况**

**Table2.2-18 Classification of Cleaner Production Enterprises**

| 序号 | S/n | 清洁生产企业等级 | Cleaner production enterprise grade | 清洁生产综合评价指数 | Comprehensive assessment index of cleaner production |
|---|---|---|---|---|---|
| 1 | 1 | 清洁生产先进企业 | Advanced cleaner production enterprise | P≥90 | P≥90 |
| 2 | 2 | 清洁生产企业 | Cleaner production enterprise | 75≤P<90 | 75≤P<90 |

按照现行环境保护政策法规以及产业政策要求，凡参评企业被地方环保主管部门认定为主要污染物排放未“达标”（指总量未达到控制指标或主要污染物排放超标），生产淘汰类产品或仍继续采用要求淘汰的设备、工艺进行生产的，则该企业不能被评定为“清洁生产先进企业”或“清洁生产企业”。

In accordance with the current environmental protection policies and regulations and the requirements of industrial policies, where the participating enterprise is determined by the local environmental protection department as the main pollutant emission does not "meet the standard" (referring to the total amount does not meet the control index or the main pollutant emission exceeds the standard), produces obsolete products or continues to use the equipment and technology required to be eliminated for production, the enterprise cannot be assessed as "advanced cleaner production enterprise" or "cleaner production enterprise".

3、评价结果

3. Assessment results

（1）定量指标计算结果

(1) Calculation results of quantitative indexes

拟建项目各定量指标计算结果具体见表2.2-19。

See Table 2.2-19 for the calculation results of each quantitative index of the proposed project.

**表2.2-19 拟建项目定量指标计算结果**

**Table2.2-19 Calculation Results of Quantitative Indexes of the Proposed Project**

| 序号 | S/n | 评价指标 | Assessment index | 单位 | Unit | 权重分值 | Weight | 评价基准值 | Assessment benchmark value | 拟建项目指标 | Indexes of the proposed project | 得分 | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 取水量 | Water intake | $m^3/t$产品 | $m^3/t$ product | 20 | 20 | 30 | 30 | 9 | 9 | 66.7 | 66.7 |
| 2 | 2 | 综合能耗 | Comprehensive energy consumption | kgce/t产品 | kgce/t product | 20 | 20 | 680 | 680 | 273.3 | 273.3 | 49.8 | 49.8 |
| 3 | 3 | 水重复利用率 | Water reuse rate | % | % | 10 | 10 | 80 | 80 | 86.69 | 86.69 | 10.8 | 10.8 |
| 4 | 4 | 废水产生量 | Waste water production | $m^3/t$ | $m^3/t$ | 10 | 10 | 20 | 20 | 12.65 | 12.65 | 15.8 | 15.8 |
| 5 | 5 | COD产生量 | COD production | kg/t | kg/t | 8 | 8 | 15 | 15 | 16.38 | 16.38 | 7.3 | 7.3 |
| 6 | 6 | BOD5产生量 | $BOD_5$ production | kg/t | kg/t | 8 | 8 | 15 | 15 | 10.92 | 10.92 | 11 | 11 |
| 7 | 7 | SS产生量 | SS production | kg/t | kg/t | 8 | 8 | 22 | 22 | 20.48 | 20.48 | 8.6 | 8.6 |
| 8 | 8 | 甲醛 | Methanal | mg/m² | mg/m² | 4 | 4 | 1 | 1 | 0.74 | 0.74 | 5.4 | 5.4 |
| 9 | 9 | 白度 | Whiteness | % | % | 3 | 3 | 70 | 70 | 82 | 82 | 3.5 | 3.5 |
| 10 | 10 | 不透明度 | Opacity | % | % | 3 | 3 | 75.0 | 75.0 | 80 | 80 | 3.2 | 3.2 |
| 11 | 11 | 施胶度 | Sizing degree | mm | mm | 3 | 3 | 0.75 | 0.75 | 0.5 | 0.5 | 4.5 | 4.5 |
| 12 | 12 | 尘埃度0.3～1.5mm²>1.5mm² | Dust degree0.3～1.5mm²>1.5mm² | 个/m² | Piece/m² | 3 | 3 | 80不许有 | 80not permitted | 550 | 550 | 4.4 | 4.4 |
| | 合计 | | Total | — | — | 100 | 100 | — | — | — | — | 191 | 191 |

（2）定性指标计算结果

(2) Calculation results of qualitative indexes

拟建项目各定性指标计算结果具体见表2.2-20。

See Table 2.2-20 for the calculation results of each qualitative index of the proposed project.

**表2.2-20 拟建项目定性指标计算结果**

**Table2.2-20 Calculation Results of Qualitative Indexes of the Proposed Project**

| 序号 | S/n | 评价指标 | Assessment index | 指标分值 | Index value | 拟建项目指标 | Indexes of the proposed project | 得分 | Score |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 不使用附录2中所列染料，不使用含甲醛的涂料 | Do not use the dyes listed in Appendix 2 and do not use methanal-containing coatings. | 5 | 5 | 不使用 | Not use | 5 | 5 |
| 2 | 2 | 不使用荧光增白剂 | No fluorescent whitening agent is used | 5 | 5 | 不使用 | Not use | 5 | 5 |
| 3 | 3 | 使用废纸浆和高得率浆 | Waste pulp and high yield pulp are used | 5 | 5 | 使用 | Use | 5 | 5 |
| 4 | 4 | 不使用离心涂布机 | Centrifugal coater is not used | 5 | 5 | 不使用 | Not use | 5 | 5 |
| 5 | 5 | 不使用QZ101、QZ201、QZ301、QZ401型切纸机 | QZ101, QZ201, QZ301, QZ401 paper cutters are not used | 5 | 5 | 不使用 | Not use | 5 | 5 |
| 6 | 6 | 是否建立环境管理体系并通过认证 | Is an environmental management system established and certified | 7 | 7 | 建立 | Yes | 7 | 7 |
| 7 | 7 | 是否进行清洁生产审核 | Whether to conduct cleaner production audit | 8 | 8 | 通过审核 | Yes | 8 | 8 |
| 8 | 8 | 是否有完善的生产工艺用水、电、汽管理制度 | Is there a sound production process for water, electricity and steam management system | 3 | 3 | 是 | Yes | 3 | 3 |
| 9 | 9 | 是否有完善的生产设备的使用、维护、检修管理制度 | Is there a perfect management system for the use, maintenance and overhaul of production equipment | 3 | 3 | 是 | Yes | 3 | 3 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 10 | 是否所有岗位进行严格培训 | Are all positions subject to strict training | 2 | 2 | 是 | Yes | 2 | 2 |
| 11 | 11 | 是否有完善的事故、非正常生产状况应急措施 | Whether there are perfect emergency measures for accidents and abnormal production conditions | 2 | 2 | 是 | Yes | 2 | 2 |
| 12 | 12 | 有环保规章、管理机构和有效的环境监测手段 | There are environmental protection regulations, management agencies and effective environmental monitoring methods. | 6 | 6 | 有 | Yes | 6 | 6 |
| 13 | 13 | 对污染物排放实行定期和监测污水排放口规范管理 | Regularly monitor the discharge of pollutants and standardize the management of sewage outfalls. | 5 | 5 | 是 | Yes | 5 | 5 |
| 14 | 14 | 对各生产单位的环保状况实行月份、年度考核 | Conduct monthly and annual assessment on the environmental protection status of each production unit. | 5 | 5 | 是 | Yes | 5 | 5 |
| 15 | 15 | 对污染物排放总量限制控制和年度考核 | Carry out limit control of total pollutant discharge and annual assessment | 9 | 9 | 是 | Yes | 9 | 9 |
| 16 | 16 | 真空系统水是否循环使用 | Is the vacuum system water recycled | 3 | 3 | 是 | Yes | 3 | 3 |
| 17 | 17 | 是否有冷凝水回收系统 | Is there a condensate recovery system | 3 | 3 | 是 | Yes | 3 | 3 |
| 18 | 18 | 是否有废水再利用系统 | Is there a waste water reuse system | 3 | 3 | 是 | Yes | 3 | 3 |
| 19 | 19 | 填料回收系统（对于涂布纸还应有涂料回收系统） | Filler recovery system (there should also be a coating recovery system for coated paper) | 3 | 3 | 有 | Yes | 3 | 3 |
| 20 | 20 | 是否采用闭式汽罩及热回收 | Whether closed steam hood and heat recovery are used | 3 | 3 | 是 | Yes | 3 | 3 |
| 21 | 21 | 是否使用变频电机 | Are variable frequency motors used | 3 | 3 | 是 | Yes | 3 | 3 |
| 22 | 22 | 热电联产 | Combined heat and power generation | 3 | 3 | — | — | 0 | 0 |
| 23 | 23 | 锅炉是否装有脱硫和除尘设施 | Is the boiler equipped with desulfurization and dust removal facilities | 4 | 4 | — | — | 0 | 0 |
| | 合计 | | Total | 100 | 100 | — | — | 93 | 93 |

（3）拟建项目综合评价指数值

(3) Comprehensive assessment index value of the proposed project

根据上述计算，拟建项目的定量考核得分值P1为191，定性考核得分值P2为93；经综合计算，拟建项目的综合评价指数值为151.8。通过对拟建项目各评价指标体系的计算对比，拟建项目能达到清洁生产先进企业的要求。

According to the above calculation, the quantitative assessment score $P_1$ of the proposed project is 191 and the qualitative assessment score $P_2$ is 93. After comprehensive calculation, the comprehensive assessment index value of the proposed project is 151.8. Through the calculation and comparison of each assessment index system of the proposed project, the proposed project can meet the requirements of advanced cleaner production enterprises.

#### 2.2.6.2 清洁生产措施分析

#### 2.2.6.2 Analysis of cleaner production measures

除上述有标准的清洁生产指标外，本次评价根据清洁生产的要求，拟从原辅材料及产品的清洁性、管理的先进性、生产工艺和装备、节能降耗措施、能耗指标等五个方面来进一步分析本项目的清洁生产水平。

In addition to the above-mentioned standard cleaner production indexes, according to the requirements of cleaner production, this assessment plans to further analyze the cleaner production level of this project from five aspects: cleanliness of raw and auxiliary materials and products, advanced management, production technology and equipment, energy saving and consumption reduction measures, and energy consumption indexes.

1、原辅材料及产品的清洁性

1. Cleanliness of raw and auxiliary materials and products

拟建项目主要原料为外购商品木浆和自制化机浆，具有无毒、可再生性、可循环利用等特点，原料符合清洁生产的要求。

The main raw materials of the proposed project are purchased commercial wood pulp and self-made chemical mechanical pulp, which are non-toxic, renewable and recyclable. The raw materials meet the requirements of cleaner production.

在拟建工程生产过程中还要添加一些辅助原料来调节纸张的硬度、光泽度、颜色、强度等。主要辅助原料有阳离子淀粉、碳酸钙等，其中阳离子淀粉为淀粉与胺类化合物起反应生成含有氨基和胺基的醚衍生物，氮原子带正电荷称为阳离子淀粉，在造纸、纺织、食品和其他工业应用广泛。造纸工业使用阳离子淀粉为施胶剂，纤维带有阴电荷，阳离子淀粉胶料因阳阴电荷的关系，几乎能完全被吸附，用量少，效果好，废水中含淀粉量少，减少环境污染。使用阳离子淀粉施胶的纸张其成形性及经过抄纸网的排水性好，并能改造耐破、伸长、耐折和

抗粘辊性等，此类助剂一般不会增加环保负担。填料碳酸钙：在纸料中的加入是为了改善纸页的光学性能，提高纸页的平滑度，吸收性从而提高其适印性，降低成纸成本。它一般不会对人体及环境造成不良影响。由此可见，以上辅料均为环境友好产品，无毒或低毒，用量少，可回收、易处理。

In the production process of the proposed project, some auxiliary raw materials should be added to adjust the hardness, glossiness, color and strength of the paper. The main auxiliary raw materials include cationic starch, calcium carbonate, etc. Cationic starch is an ether derivative containing amino group and amino group formed by the reaction of starch and amine compounds. The positive charge of nitrogen atom is called cationic starch, which is widely used in papermaking, textile, food and other industries. The paper industry uses cationic starch as sizing agent, and the fiber has negative charges. Due to the relationship between positive and negative charges, cationic starch sizing compound can be almost completely adsorbed, with less dosage and good effect. Waste water has less amount of starch, thus reducing environmental pollution. The paper sizing with cationic starch has good formability and drainage through the paper mesh, and can be modified to resist breaking, elongation, folding and sticking rollers. Such additives generally do not increase the burden of environmental protection. Filler calcium carbonate: It is added to the paper to improve the optical performance of the paper, improve the smoothness and absorption of the paper, thus improving its printability and reducing the paper cost. It generally does not cause adverse effects on human body and environment. It can be seen from this that the above auxiliary materials are all environmentally friendly products, non-toxic or low-toxic, with less dosage, recoverable and easy to handle.

拟建项目产品为特色文化用纸类，采用的原色调可以保护读者尤其是老人和儿童的眼睛，使他们在阅读时保护视力不受伤害，便于读者携带和阅读，具有天然特性。轻型纸的质感和松厚度好，不透明度高，印刷适应性和印刷后原稿还原性好，质感好且量轻而厚，用其印制的图书比用普通纸印制的图书重量约减轻四分之一到三分之一，方便了读者，也节约了运输和邮购费用。在完成使用功能后，纸张可回收利用或被自然界微生物和植物分解、吸收。

The products of the proposed project are special printing-and-writing paper. The original tone adopted can protect eyes of readers, especially the elderly and children. Featuring natural characteristics, they are easy to carry. Light paper has good texture and loose thickness, high opacity, good printing adaptability and reducibility of printed manuscripts, good texture and light weight. The weight of books printed with light paper is reduced by about one quarter to one third compared with books printed with ordinary paper, which facilitates reading and saves transportation and mail order costs. After completing the use function, the paper can be recycled or decomposed and absorbed by natural microorganisms and plants.

综上分析，拟建项目原辅材料和产品均符合清洁生产的要求

To sum up, the raw and auxiliary materials and products of the proposed project all meet the requirements of cleaner production.

2、管理先进性

2. Advanced management

拟建项目建设单位山东太阳纸业股份有限公司先后荣获“全国造纸十家最佳经济效益企业”、“全国最佳经济效益企业”、“AAA级特级信誉企业”、“山东省百家著名企业集团”、“山东省高新技术企业”、“全国文明企业”、“山东省污染防治工作先进单位”等荣誉称号。公司在全国造纸行业首家通过ISO9002质量体系认证、环保14000认证、HACCP食品安全卫生管理体系和GB/T28001-2001职业健康安全管理体系的四大体系的认证工作及森林FAS认证。公司质量控制、环境与安全管理、生产过程控制与国际先进管理标准接轨，为清洁生产的实施提供了管理上的保证。

The construction unit of the proposed project, Shandong Sun Paper Co., Ltd., has successively won the honorary titles of "Ten Best Economic Benefit Enterprises in China", "Best Economic Benefit Enterprises in China", "AAA Grade Super Reputation Enterprises", "100 Famous Enterprise Groups in Shandong Province", "High-tech Enterprises in Shandong Province", "Civilized Enterprises in China" and "Advanced Unit in Pollution Prevention and Control in Shandong Province". The company was the first to pass ISO9002 quality system certification, environmental protection 14000 certification, HACCP food safety and hygiene management system and GB/T28001-2001 occupational health and safety management system and forest FAS certification in the national paper industry. The company's quality control, environmental and safety management and production process control are in line with international advanced management standards, providing management guarantee for the implementation of cleaner production.

3、生产工艺和装备评价

3. Assessment of production technology and equipment

（1）采用新型打浆技术以节能并取得良好的工艺效果。

(1) New beating technology is adopted to save energy and achieve good process effect.

（2）采用带白水稀释的流浆箱新技术；除了高湍流流浆箱的一般特点外，新型流浆箱的最大特点为采用分区白水微调上网浆料浓度，从而使这种流浆箱可以得到速度、方向、厚度和上网条件的一致的浆流，这样可使横幅定量分布和横幅纤维定向分布一致，因而产生了更均匀的纸页成形。此外带白水稀释的流浆箱可有效地解决边缘流问题。因而使纸机运行更为稳定。

(2) Adopt a new headbox technology with white water dilution. In addition to the general characteristics of high turbulence headboxes, the new type of headbox slightly adjusts the concentration of the slurry on the sieve by using partition white water, so that the headbox can obtain the same slurry flow in speed, direction, thickness and sieve conditions, thus making the quantitative distribution of banners consistent with the directional distribution of banner fibers, and producing more uniform paper forming. In addition, the headbox with white water dilution can effectively solve the edge flow problem. Therefore, the paper machine can run more stably.

（3）网部成型采用立式夹网成型器，具有双面脱水量相同，纸张两面差小，单位网面积抄造

能力大，脱水性强，适应于高速纸机的特点。

(3) The sieve forming adopts a vertical sieve clamping shaper, which is characterized by the same dehydration amount on both sides, small difference between the two sides of paper, large papermaking capacity per unit sieve area, strong dehydration, and is suitable for high-speed paper machines.

（4）压榨部采用了带分区可控中高、靴式压榨的压榨技术，采用此技术，在纸机高速运转下，出压榨的干度可达到或超过46%，此外，由于采用了靴式压榨技术，尽管线压很高，但纸张仍能保持较高的松厚度。

(4) The squeezing part adopts the squeezing technology with partition controllable medium height and shoe-type squeezing. With this technology, the dryness of the squeezing can reach or exceed 46% under the high-speed operation of the paper machine. In addition, due to the adoption of shoe-type squeezing technology, the paper can still maintain a high loose thickness despite the high line pressure.

（5）烘干部采用了单排烘缸组成，烘缸下面是钻孔的导辊，与双稳定器干燥部的两端是紧凑的短烘干组，纸幅在整个烘干过程是被托着的，由于前后两组烘缸较少，纸幅的纵向伸长和横向收缩得到了补偿，从而消除了折痕和断纸现象。此外双稳定器和双清洁器可稳定干燥部的运行，始终保持干网的清洁，无绳引纸系统的运用不仅可保证纸页安全可靠地送过干燥部，而且楼下空间可得到充分的利用。

(5) The drying part is composed of a single row of drying cylinders. Under the drying cylinders are drilled guide rollers, and both ends of the drying part of the double stabilizers are compact short drying groups. The paper web is supported during the whole drying process. As there are fewer drying cylinders in the front and rear groups, the longitudinal elongation and transverse contraction of the paper web are compensated, thus eliminating creases and paper breaks. In addition, the double stabilizers and the double cleaners can stabilize the operation of the drying part and keep the dry sieve clean all the time. The application of the cordless paper introduction system can not only ensure that the paper sheets are safely and reliably sent through the drying part, but also make full use of the downstairs space.

（6）干部汽罩为全封闭式、并有真空辊通风，气罩补风和热回收系统以提高烘干部的热效率，从而提高单位烘缸面积蒸发水量、节省了蒸汽。

(6) The dry part hood is fully enclosed and is equipped with vacuum roller ventilation, air hood air supplement and heat recovery systems to improve the thermal efficiency of the dryer, thus increasing the evaporation water per unit dryer area and saving steam.

（7）卷纸机采用纸卷中心驱动技术，使纸卷张力更为均一，纸卷的直径可达3.5~3.8m，从而提高了生产效率。

(7) The paper reeling machine adopts the paper reel center drive technology, which makes the paper reel tension more uniform, and the diameter of the paper reel can reach 3.5 ~ 3.8 m, thus improving

the production efficiency.

采用以上设备和工艺可提高产品档次、节约能源、资源，因此，本项目总体技术装备居世界先进水平，技术方案先进成熟，符合清洁生产对工艺及设备的要求。

The adoption of the above equipment and technology can improve the product grade and save energy and resources. Therefore, the overall technical equipment of the project ranks among the world's advanced level, and the technical scheme is advanced and mature, meeting the requirements of cleaner production on technology and equipment.

4、能耗及节能降耗措施评价

4. Assessment of energy consumption and measures to save energy and reduce consumption

拟建项目单位产品能耗清洁生产分析对比情况具体见表2.2-21。

See Table 2.2-21 for the analysis and comparison of cleaner production of unit product energy consumption of the proposed project.

**表2.2-21 拟建项目吨产品的水耗、物耗、能耗表**

**Table2.2-21 Water Consumption, Material Consumption and Energy Consumption per Ton of Products of the Proposed Project**

| 项目 | Item | 单位 | Unit | 拟建工程水平 | Level of the proposed project | 国内先进水平 | Domestic advanced level |
|---|---|---|---|---|---|---|---|
| 水耗 | Water consumption | $m^3$/t纸 | $m^3$/t paper | 9.02 | 9.02 | 16.7 | 16.7 |
| 电耗 | Electricity consumption | kWh/t纸 | kWh/t paper | 600 | 600 | 715 | 715 |
| 蒸汽消耗 | Stream consumption | kg/t纸 | kg/t paper | 1800 | 1800 | 2140 | 2140 |

注：由于拟建项目产品和在建的高松厚度纯质纸项目产品基本相同，本次评价的现有工程水平主要类比该项目。

Note: As the products of the proposed project are basically the same as those of the high loose thickness pure paper project under construction, the existing project level evaluated in this assessment is mainly similar to that of this project.

从表2.2-19可以看出，拟建项目吨产品所消耗水量、电量和用汽量均低于国内同行业先进水平。另外，本项目产生的各类污染物均得到有效处理，污染物治理率达到100%，治理后各污染物均能达标外排。

As can be seen from Table 2.2-19, the water consumption, electricity consumption and steam consumption per ton of products of the proposed project are all lower than the advanced level of the same industry in China. In addition, all kinds of pollutants generated by this project have been

effectively treated, and the pollutant treatment rate has reached 100%. After treatment, all pollutants can reach the standard and be discharged.

从以上的能耗及排污指标和污染物治理方面来看，拟建项目清洁生产水平能够达到清洁生产国内先进水平。另外，根据《山东省重点工业产品取水定额》（DB37/1639-2010）的有关要求，印刷书写纸取水定额为17m³/t纸，拟建项目属于印刷书写纸，用水量为9.02m³/t纸，满足《山东省重点工业产品取水定额》（DB37/1639-2010）的要求。

Judging from the above energy consumption, pollution discharge indexes and pollutant treatment, the cleaner production level of the proposed project can reach the domestic advanced level of cleaner production. In addition, according to the relevant requirements of Water Quota for Key Industrial Products in Shandong Province (DB37/1639-2010), the water quota for printed writing paper is 17 m³/t paper, and the proposed project belongs to printed writing paper with a water consumption of 9.02 m³/t paper, meeting the requirements of Water Quota for Key Industrial Products in Shandong Province (DB37/1639-2010).

5、主要节能降耗措施

5. Main energy saving and consumption reduction measures

（1）总图位置

(1) General layout location

总图布置上，在满足建筑总图规范的要求下，遵循车间布置与生产流程保持一致或就近的原则，从而减少了物质运输和介质输送过程的迂回，尽可能降低能耗。

In the general layout, under the condition of meeting the requirements of the general layout specification of buildings, the principle that the workshop layout is consistent with or similar to the production process is followed, thus reducing the detour of the material transportation and medium transportation process and reducing the energy consumption as much as possible.

（2）工艺流程

(2) Process flow

本项目采用节能新工艺、新技术，关键设备从国外知名设备制造厂引进，采用国际先进的碎浆及抄纸工艺；同时全线配置自动控制仪表及质量控制系统，做到在保证质量的前提出下，节约能源及原材料，提高经济效益、社会效益及环保效益。

This project adopts new energy-saving processes and technologies. Key equipment is imported from well-known foreign equipment manufacturers and adopts international advanced pulping and papermaking processes. Meanwhile, the whole line is equipped with automatic control instruments and quality control systems to save energy and raw materials and improve economic, social and environmental benefits before ensuring quality.

（3）设备选用及保护

(3) Equipment selection and protection

高温设备及管道采用有效保温措施，降低热能损耗；通用设备等采用推荐的节能设备，禁用已淘汰的产品。

Effective heat preservation measures shall be adopted for high-temperature equipment and pipelines to reduce heat energy loss. General equipment and the like adopt recommended energy-saving equipment, and obsolete products are prohibited.

（4）节电措施

(4) Electricity-saving measures

a、做好能耗计量，各低压出线回路均装设有功电度表；

a. Carry out energy consumption measurement. Each low-voltage outgoing circuit is equipped with active watt-hour meter;

b、蒸发系统充分回收利用余热，以达到节电的目的；

b. The evaporation system fully recovers and utilizes waste heat to achieve the purpose of saving electricity;

c、照明采用高效发光灯具。

c. High-efficiency luminous lamps are used for lighting.

（5）节水措施

(5) Water-saving measures

a、本项目根据自身工程特点，尽可能多得回用自身产生的纸机白水，增加水重复利用率；

a. According to its own engineering characteristics, this project will recycle as much white water from paper machines as possible to increase the reuse rate of water.

b、采用多圆盘过滤机对纸机白水进行处理，处理后的废水分质回用，其中超清白水代替新鲜水回用于洗网，清白水用于水力碎浆机碎浆和调浆，浓白水用于混合浆池稀释浆料，有利于减少新鲜水的用量；根据处理后的废水清洁程度分质进行回用，整个系统清水用量少、废水排放量少，达到节水减污的目的；

b. A multi-disc filter is adopted to treat the white water of the paper machine, and the treated waste water is recycled in different quality. Among them, ultra-filtrate white water is used to wash sieve instead of the fresh water, the filtrate white water is used for pulping and mixing of the hydraulic pulping machine, and the enriched water is used for diluting the pulp in the mixing pulp tank, which is beneficial to reducing the dosage of fresh water. The treated waste water is reused based on the cleanliness degree. In this way, the whole system has less clean water consumption and less waste water discharge, thus achieving the purpose of saving water and reducing pollution.

c、进入车间的水、电、汽均设置流量计、做到计划使用、定量考核，达到节约能源的目的；

c. Flowmeters are set up for water, electricity and steam entering the workshop, so as to achieve the purpose of saving energy through planned use and quantitative assessment.

d、拟建项目设置专门的节能管理部门，配备专职和兼职能源管理人员，专门负责各车间能源定额计划，统计及定期巡检等具体工作。对类似的跑、冒、滴、漏等情况随时发现随时解决，并将统计数据输入微机以便于管理。

d. The proposed project will set up a special energy-saving management department equipped with full-time and part-time energy management personnel who will be specially responsible for the specific work of energy quota planning, statistics and regular inspection of each workshop. Similar situations such as evaporation, emission, drip or leakage can be found and solved at any time, and statistical data can be input into a microcomputer for easy management.

（6）热能回收

(6) Heat recovery

抄纸车间纸机烘缸采用全封闭汽罩，收集纸机汽缸散发的大量热湿气体。该部分气体湿度大，温度在80℃以上，为了进一步利用其余热，设置该部分气体的废热回收设备，采用两级热回收，将回收的热量用于纸机干燥部加热及屋面热风系统，提高了热效率10~15%。

The dryer of the paper machine in the paper-making workshop adopts a fully enclosed steam hood to collect a large amount of hot and humid gas emitted by the cylinder of the paper machine. This part of the gas has high humidity and the temperature is above 80 ℃. In order to further utilize the waste heat, a waste heat recovery equipment is set up, and two-stage heat recovery is adopted. The recovered heat is used for heating the drying part of the paper machine and the roof hot air system, thus improving the thermal efficiency by 10-15%.

综上分析，拟建项目采用的工艺和设备较先进、原料和产品较清洁，设计上采取了较好的节能降耗措施，能耗、物耗、产污较低，能满足《制浆造纸行业清洁生产评价指标体系（试行）》中清洁生产先进企业的要求。综合测评结果表明，拟建项目符合清洁生产的要求，总体达到国内先进水平。

To sum up, the proposed project adopts advanced technology and equipment, cleaner raw materials and products, better energy-saving and consumption-reducing measures in design, and lower energy consumption, material consumption and pollution production, which can meet the requirements of advanced cleaner production enterprises in the Cleaner Production Evaluation Index System for Pulp and Paper Industry (Trial). The comprehensive evaluation results show that the proposed project meets the requirements of cleaner production and generally reaches the domestic advanced level.

## 2.3 总量控制指标

## 2.3 Total amount control indexes

### 2.3.1 总量控制

### 2.3.1 Total amount control

全厂污染物产生及排放情况见表2.3-1。

See Table 2.3-1 for the generation and discharge of pollutants in the whole plant.

**表2.3-1 拟建项目建成后全厂污染物排放及变化情况**

**Table2.3-1 Discharge and Change of Pollutants of the Whole Plant after the Completion of the Proposed Project**

| 项目 | Item | 废气 Exhaust gas | | | 废水 Waste water | |
|---|---|---|---|---|---|---|
| | | $SO_2$（t/a） | $NO_x$（t/a） | 烟粉尘（t/a） Smoke dust (t/a) | COD（t/a） | $NH_3$-N（t/a） |
| 现有、在建工程建成后 | After the completion of the existing projects and construction in progress | 579.58 | 1445.46 | 158.52 | 1686.23 | 67..44 |
| 拟建项目新增 | Increase in the proposed project | 0 | 0 | 3.11 | 219.70 | 8.79 |
| 总体工程 | Overall engineering | 579.58 | 1445.46 | 161.63 | 1905.93 | 8.79 |
| 变化量 | Change amount | 0 | 0 | +3.11 | +219.70 | +8.79 |

备注：“+”表示增加或存在余量，“-”表示减少或没有余量。

Remarks: "+" indicates an increase or a margin, and "-" indicates a decrease or no margin.

拟建项目不涉及新增二氧化硫、氮氧化物，拟建项目新增COD、氨氮排放量分别为219.7t/a、8.79t/a，纳入现有污水处理厂总量控制指标。

The proposed project does not involve the addition of sulfur dioxide and nitrogen oxides. The newly added COD and ammonia nitrogen emissions of the proposed project are 219.7 t/a and 8.79 t/a respectively, which are included in the total amount control index of the existing sewage treatment plant.

### 2.3.2 污染物削减替代

### 2.3.2 Substitution for pollutant reduction

根据《山东省加强污染源头防治推进“四减四增”三年行动方案（2018-2020年）》要求，“采取“产能总量和污染物总量双平衡法”，优化整合钢铁、电解铝、地炼、焦化、轮胎、造纸、化肥、氯碱等行业产能布局。产能总量采取全市（或全县）平衡，优化整合过程中相关产能总量不能增加；污染物总量采取新产能落地县区域内平衡，通过减量或等量替代，优化整合

过程中不能增加新产能落地区域的污染物排放总量。”拟建项目需要办理总量减量或等量替代，COD、氨氮替代量分别为219.7t/a、8.79t/a。

According to the requirements of the Strengthening Prevention and Control of Pollution Sources in Shandong Province to Promote the Three-year Action Plan of "Four Decreases and Four Increases" (2018-2020), the "Double Balance Method of Total Production Capacity and Total Pollutants" is adopted to optimize and integrate the production capacity layout of steel, electrolytic aluminum, local refining, coking, tires, paper making, chemical fertilizers, chlor-alkali and other industries. The total production capacity shall be balanced in the whole city (or the whole county), and the total relevant production capacity shall not be increased in the process of optimization and integration. The total amount of pollutants shall be balanced within the new production capacity county area. Through reduction or equivalent substitution, the total amount of pollutants discharged from the new production capacity area cannot be increased in the process of optimization and integration." The proposed project needs to undergo total reduction or equivalent substitution, with COD and ammonia nitrogen substitution amounts of 219.7 t/a and 8.79 t/a respectively.

根据《建设项目主要污染物排放总量指标审核及管理暂行办法》（环发【2014】197号）：“细颗粒物（PM2.5）年平均浓度不达标的城市，二氧化硫、氮氧化物、烟粉尘、挥发性有机物四项污染物均需进行2倍削减替代（燃煤发电机组大气污染物排放浓度基本达到燃气轮机组排放限值的除外）。”拟建项目所在区域细颗粒物年平均浓度不达标，因此烟粉尘需要进行2倍削减替代，拟建项目粉尘产生量为3.11t/a，则削减替代量为6.22t/a。

According to the Interim Measures for the Examination and Management of Total Emission Indexes of Major Pollutants in Construction Projects (UNCED [2014] No.197), "In cities where the annual average concentration of fine particulate matter ($PM_{2.5}$) does not meet the standards, the four pollutants of sulfur dioxide, nitrogen oxides, smoke dust and volatile organic compounds need to be twice reduced and replaced (except for those where the emission concentration of air pollutants from coal-fired power generating units basically reaches the emission limit of gas turbine units)." The annual average concentration of fine particles in the area where the proposed project is located does not meet the standards, so smoke dust needs to be reduced twice and replaced. If the dust production of the proposed project is 3.11 t/a, the replacement reduction is 6.22 t/a.

# 第3章 环境现状调查与评价

# Chapter3 Environmental Status Survey and Assessment

## 3.1 自然环境概况

## 3.1 Overview of natural environment

### 3.1.1 地理位置

### 3.1.1 Geographical location

济宁市兖州区地处黄淮海平原，位于山东省西南部，地理坐标东经116°35′21″~116°51′36″，北纬35°23′31″~35°43′17″。兖州区北邻宁阳县，南接邹平市，东临孔孟之乡曲阜，西连济宁市，西南靠近南阳湖，兖州区素有“军事重镇、九省通衢、齐鲁咽喉”之称，属全国八大铁路枢纽之一，京沪铁路纵贯南北，新石铁路横跨东西，是鲁西南最大的货运集散地和客运中转站。兖州区公路交通十分发达，东临京福高速公路和104省道，日（照）东（明）高速公路穿境而过，出入口距市区仅3.5km；境内有327国道、汶邹公路等数十条国家级、省级高等级公路干线穿过。

Yanzhou District, Jining City is located on Huang-Huai-Hai Plain and in southwestern Shandong Province with the geographic coordinates of E116°35′21″~116°51′36″, N35°23′31″~35°43′17″. Yanzhou District is close to Ningyang County in the north, adjacent to Zouping City in the south, next to the hometown of Confucius and Mencius - Qufu in the east, connected with Jining City in the west and near Nanyang Lake in the southwest. Yanzhou District is always known as “town of military importance, nine-province thoroughfare and the throat of Shandong Province”. In addition, it is also one of the largest eight railway hubs in China with Beijing-Shanghai Railway running from south to north, and Xinxiang-Shijiu Railway running from east to west. It is the largest freight distribution center and passenger transfer station in southwestern Shandong. Yanzhou District enjoys developed highway traffic. To be specific, it is adjacent to Beijing-Fuzhou Expressway and Provincial Highway 104 in the east; Rizhao-Dongming Expressway runs through this district with the entrance/exit only 3.5km away from the urban area; there are dozens of national and provincial high-grade arterial roads passing by the district, including National Highway 327 and Wenzou Highway.

拟建项目位于济宁市兖州区颜店镇太阳新材料产业园内，项目东北距京沪铁路及兖新铁路兖州站约12.0km，东南距327国道约5km，北距日东高速公路兖州出口约0.9km，区内柏油公路连接各乡镇及村庄，交通十分方便。拟建项目地理位置图见图2.1-1。

The proposed project is located in Sun New Material Industrial Park, Yandian Town, Yanzhou District, Jining City, about 12.0km northeast from Beijing-Shanghai Railway and Yanzhou Station of Xinxiang-Yanzhou Railway, 5km southeast from National Highway 327 and 0.9km north from Yanzhou Exit of Rizhao-Dongming Expressway. All villages and towns in the district are connected by asphalt road with convenient traffic. See Fig. 2.1-1 for the geographical location of the proposed

project.

### 3.1.2 地形地貌

### 3.1.2 Topography

兖州区地处鲁中山地泰沂山区西南部的山前倾斜平原。西部由于汶水南泛，洪水冲积地貌明显；东部泗水西南向渲泄，地形东北向西南倾斜；中部洸府河、杨家河二水并行，地势低洼。地面高程60~38m，高差22m，平均海拔49m，平均坡降1/5000。东北部受构造影响，为第四系浅埋区，地面坡降较大。园区所在地属于冲洪积扇地貌单元，微地貌形态有岗地、洼地、河流及塌陷地等。

Yanzhou District is on the piedmont inclined plain in southwestern Taiyi Mountain Area of middle Shandong Province. Since the Wenshui River runs southward in the west, obvious flood alluvial landform can be seen; the Sishui River runs southwestward in the east, since the terrain is inclined from northeast to southwest; the Guangfu River and the Yangjia River are running in parallel in the center, and there is low-lying area. Ground elevation: 60~38m, altitude difference: 22m, mean altitude: 49m, mean slope: 1/5000.Owing to tectonic influence, the northeast part is Quaternary shallow buried area with a large ground slope. The park lies on an alluvial-proluvial fan geomorphic unit with microgeomorphic features, such as downland, depression, river and sunk land.

兖州区全区平原面积64670hm²，占总面积的99.77%。分为微斜平地、洼地、缓岗3个类型。拟建项目选址处地形平坦，属微斜平地，黄海高程为46.37m～47.15m，东北高，西南低。

Yanzhou District has a total plain area of 64,670hm², accounting for 99.77% of the total area.It can be classified into 3 types, i.e., slightly inclined flat land, depression and gentle downland. The site of the proposed project has flat terrain and is slightly inclined flat land with the Yellow Sea elevation of 46.37m～47.15m, which is high in the northeast and low in the southwest.

冲洪积扇示意图及项目所在区域地貌情况具体见图3.1-1。

See Fig. 3.1-1 for details of the schematic diagram of the alluvial-proluvial fan and the landform of the project area.

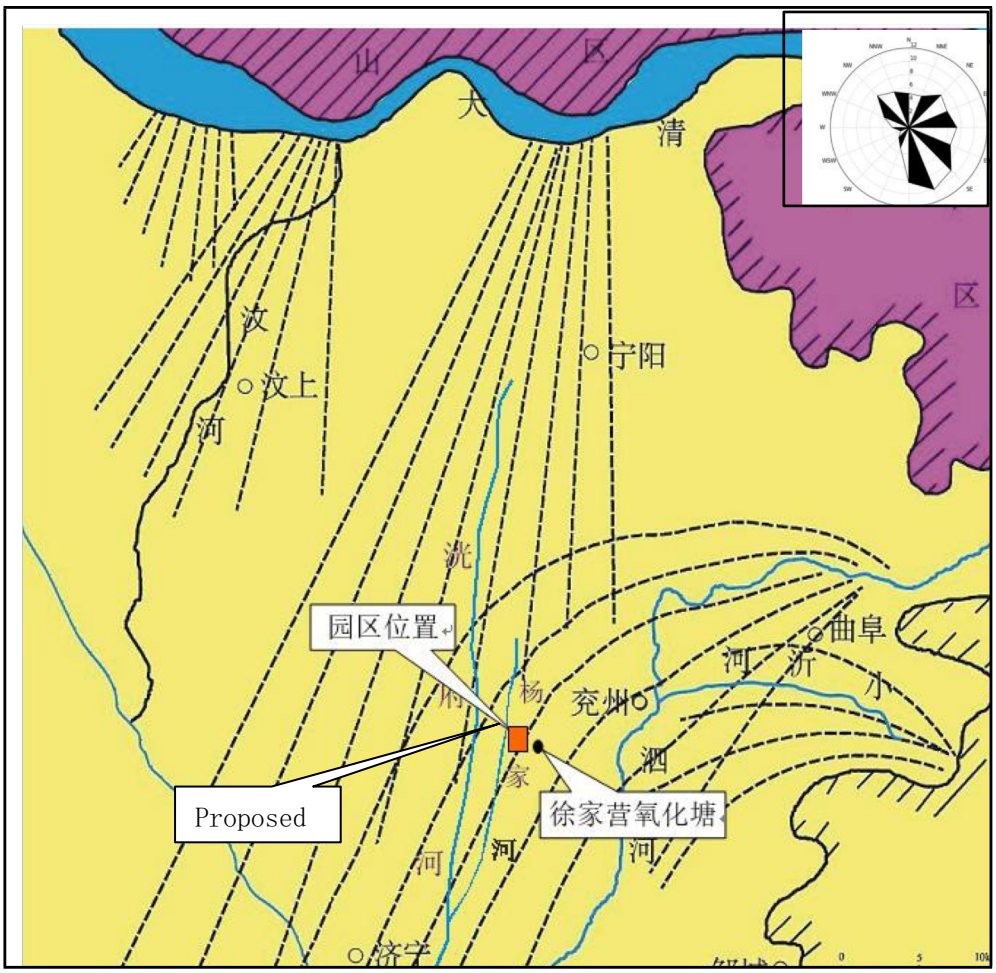



**图3.1-1 汶泗冲洪积扇示意图**

**Fig. 3.1-1Schematic Diagram of Wenshui River-Sishui River Alluvial-proluvial Fan**

### 3.1.3 区域地质条件

### 3.1.3 Regional geological conditions

#### 3.1.3.1 区域地质

#### 3.1.3.1 Regional geology

兖州位于汶、泗河冲洪积扇的中东部地带，兖西断块—郭里集单斜岩溶水系统的北部。兖西断块—郭里集单斜岩溶水系统是一个由东部峄山断裂、北部郓城断裂、西部孙氏店断裂和南部凫山断裂控制，具有独立的地下水补、径、排、存储条件的较为完整的岩溶水系统。根据岩溶水的补给、径流、排泄及区域存储特点，可划分为南、北两个相对独立又存在水力联系的水文地质子单元，即郭里集单斜水文地质单元和兖西断块水文地质单元。区域地层的分布、岩相、厚度明显受构造控制，地层发育比较齐全，按其地质年代由老到新分布有寒武—奥陶系，石炭、二叠、侏罗系及第四系。

Yanzhou is located in the middle-east of Wenshui River-Sihe River alluvial-proluvial fan and the

north of Yanxi Fault block-Guoliji monoclinic karst water system. Yanxi fault block-Guoliji monoclinic karst water system is a relatively complete karst water system having independent groundwater recharge, runoff, discharge and storage conditions controlled by Yishan Fault in the east, Yuncheng Fault in the north, Sunshidian Fault in the west and Fushan Fault in the south. It can be divided into two independent sub-hydrogeological units (south and north unit) having hydraulic connection based on karst water recharge, runoff, discharge and regional storage conditions, i.e., Guoliji monoclinic hydrogeological unit and Yanxi fault block hydrogeological unit. The stratigraphic distribution, lithofacies and thickness in the area are subject to obvious tectonic control with complete strata developed, including Cambrian-Ordovician, Carboniferous, Permian, Jurassic and Quaternary strata (the sequence is based on geologic age - from old to new).

规划园区地处泗河冲积平原，地势平坦，地质结构稳定。自上而下分布依次为：第一层为黄褐色粘土硬壳层，平均厚度1.2m；第二层为青灰色淤泥软土层，平均厚度7.9m，呈硬塑状态；第三层为灰黄褐色硬土层，平均厚度14m。

The planned park is located on Sihe River alluvial plain with flat terrain and stable geologic structure. The strata from top to bottom are as follows: Stratum 1: yellowish-brown clay crust with an average thickness of 1.2m; Stratum 2: bluish-gray silt soft soil layer with an average thickness of 7.9m, hard plastic; Stratum 3: grayish/yellowish-brown hard soil layer with an average thickness of 14m.

#### 3.1.3.2 水文地质

#### 3.1.3.2 Hydrogeology

项目所在区域地下含水层大致分孔隙水、层间岩溶裂隙水、裂隙岩溶水三种类型，主要包括第四系孔隙潜水与浅层孔隙承压水、第四系中深层孔隙承压水、深部孔隙承压水、第三系砂岩砾岩中的孔隙水、石炭二迭系层间岩溶裂隙水、奥陶系灰岩裂隙岩溶水。地下水呈东北向西南流动，水力坡度东北为0.9%左右，西南为0.6%左右。

The water in the underground aquifers of the project area can be roughly classified into pore water, interlayer karst fissure water, and fissure karst water, which mainly include Quaternary pore phreatic water & shallow pore confined water, Quaternary middle-deep pore confined water, deep pore confined water, pore water in Tertiary sandstone & conglomerate, Carboniferous-Permian interlayer karst fissure water and Ordovician limestone fissure karst water. Groundwater flows from northeast to southwest with a hydraulic slope of 0.9% approximately in the northeast and 0.6% approximately in the southwest.

### 3.1.4 水源地及其保护区分布情况

### 3.1.4 Distribution of water sources and their protection areas

《济宁市人民政府关于印发济宁市城市饮用水水源保护区划分方案的通知》（济政字[2016]8号）兖州区共有兖州东郊水源地、兖州龙湾店水源地、兖州西郊水原地、谷村水源地、小孟水源地、大安水源地、新兖镇水源地、颜店镇水源地和兴隆水源地9处地下饮用水水源地，

另外，距离规划园区较近济宁市水源地还有城北水源地。

According to the *Circular on Issuing Division Scheme of Urban Drinking Water Source Protection Areas from the People's Government of Jining City* (JZZ [2016] No. 8), there are 9 underground drinking water sources in Yanzhou District, i.e., eastern suburb water source, Longwandian water source, western suburb water source, Gucun water source, Xiaomeng water source, Da'an water source, Xinyan Town water source, Yandian Town water source and Xinglong water source. In addition, Jining City water source and Chengbei water source are not far from the planned park.

#### 3.1.4.1 兖州区饮用水水源保护区

#### 3.1.4.1 Drinking water source protection areas in Yanzhou District

1、兖州东郊水源地

1. Eastern suburb water source

一级保护区：高庙村水源地外围井的外接多边形，向外径向距离为200m的多边形区域。

Class I protection area: a circumscribing polygon with an outward radial distance of 200m of the stepout of Gaomiao Village water source.

2、兖州龙湾店水源地

2. Longwandian water source

一级保护区：以龙湾店水源地外围井的外接多边形，向外径向距离为180m的多边形区域。

Class I protection area: a circumscribing polygon with an outward radial distance of 180m of the stepout of Longwandian water source.

3、兖州西郊水源地

3. Western suburb water source

一级保护区：以西郊水源地外围井的外接多边形，向外径向距离为200m的多边形区域。

Class I protection area: a circumscribing polygon with an outward radial distance of 200m of the stepout of western water source.

4、兖州谷村水源地

4. Gucun water source

一级保护区：以谷村水源地外围井的外接多边形，向外径向距离为100m的多边形区域。

Class I protection area: a circumscribing polygon with an outward radial distance of 100m of the stepout of Gucun water source.

5、兖州小孟水源地

5. Xiaomeng water source

一级保护区：以各水井为中心，50m为半径向外径向距离为50m的圆形区域。

Class I protection area: a circular area with each well acting as the center , a radius of 50m and an outward radial distance of 50m.

6、兖州大安水源地

6. Da'an water source

一级保护区：以1#井为中心，80m为半径向外径向距离为80m的圆形区域和以2#、3#井（线性布井）外围井多边形向外径向距离为80m的多边形区域。

Class I protection area: a circular area with 1# well acting as the center, a radius of 80m and an outward radial distance of 80m as well as a polygonal area with an outward radial distance of 80m of the stepouts of 2# & 3# wells (linear well).

7、兖州新兖镇水源地

7. Xinyan Town water source

一级保护区：以新兖镇水源地外围井的外接多边形，向外径向距离为30m的多边形区域。

Class I protection area: a circumscribing polygon with an outward radial distance of 30m of the stepout of Xinyan Town water source.

8、兖州颜店镇水源地

8. Yandian Town water source

一级保护区：以1#、2#井（线性布井）外围井多边形向外径向距离为35m的多边形区域。

Class I protection area: a polygonal area with an outward radial distance of 35m of the stepouts of 1# & 2# wells (linear well).

9、兖州兴隆水源地

9. Xinglong water source

一级保护区：以水源地井为中心，3m为半径向外径向距离为30m的圆形区域.

Class I protection area: a circular area with the water source well acting as the center , a radius of 3m and an outward radial distance of 30m.

根据现场勘查，园区不在兖州区水源地保护区内，距离兖州区最近的水源地为兖州新兖镇水源地，最近距离约3.8km，园区位于新兖镇水源地下游西南方向，无水力联系。

Based on field survey, the park is not within the water source protection areas of Yanzhou District, the nearest water source from Yanzhou District is Xinyan Town water source, which is about 3.8km from Yanzhou District, and the park is located in the southwest direction downstream of Xinyan Town water source, and there is no hydraulic connection.

#### 3.1.4.2 济宁市城北水源保护区

### 3.1.4.2 Chengbei water source protection area of Jining City

1．城北水源地（高新水厂）

1. Chengbei water source (Gaoxin Water Plant)

一级保护区：以单井或以外围井的外接多边形，分别向外径向距离为130m的圆或多边形区域。

Class I protection area: a circular area or a circumscribing polygon with an outward radial distance of 130m of single well or stepout.

2．城北水源地（北水厂）

2. Chengbei water source (North Water Plant)

一级保护区：以单井或以外围井的外接多边形，分别向外径向距离为108m的圆或多边形区域。

Class I protection area: a circular area or a circumscribing polygon with an outward radial distance of 108m of single well or stepout.

3．城北水源地（西水厂）

3. Chengbei water source (West Water Plant)

一级保护区：以单井或以外围井的外接多边形，分别向外径向距离为143m的圆或多边形区域。

Class I protection area: a circular area or a circumscribing polygon with an outward radial distance of 143m of single well or stepout.

根据水源地保护图，园区不在城北水源地保护区内，园区距离城北水源地（高新水厂）约6.3km，水源地位于园区西南方向，位于园区下游方向，距离较远，不存在水力联系。

According to the water source protection map, the park is not within Chengbei water source protection area, instead, it is about 6.3km from Chengbei water source (Gaoxin Water Plant). The water source is in the southwest direction downstream of the park with a long distance, and there is no hydraulic connection.

济宁市、兖州区水源地保护区范围图见图3.1-2。

See Fig. 3.1-2 for the range of the water source protection areas of Yanzhou District, Jining City.

### 3.1.5 地表水

### 3.1.5 Surface water

兖州境内的地表水体属于淮河流域的南四湖水系，主要包括以南四湖为集水中心的泗河、洸府河、白马河、南泉河水系等；含一级支流14条、二级支流4条。干、支流总长度约648.5km，其中兖州境内河段长约245.20km。本次评价涉及到的河流主要为泗河、洸府河和洸府河的一

级支流杨家河等。

The surface water body in Yanzhou is subordinate to Nansi Lake Water System, which mainly includes Sihe River, Guangfu River, Baima River, Nanquan River water systems, etc. with Nansi Lake as the center; including 14 primary tributaries and 4 secondary tributaries. The trunk streams and the tributaries have a total length about 648.5km, of which, the length of the reaches in Yanzhou is about 245.20km. The main rivers involved in this assessment are Sihe River, Guangfu River and a primary tributary of Guangfu River - Yangjia River.

#### 3.1.5.1 泗河

#### 3.1.5.1 Sihe River

1、泗河水系概况及环境功能划分

1. Overview of Sihe River system and environmental functional partition

泗河为省内较大的山洪河道，发源于新泰市太平顶山西侧（海拔814m）。由东北向西南流经泗水、曲阜、兖州、邹城、任城、微山七县、市、区，于任城区辛闸村入南阳湖；河长159km，总流域面积2357km²。

As a large torrential flood channel in Shandong Province, Sihe River is originated from the west of Taipingding Mountain (altitude: 814m), Xintai City. It runs through seven counties/cities/districts from northeast to southwest, i.e., Sishui, Qufu, Yanzhou, Zoucheng, Rencheng and Huishan, and flows to Nanyang Lake at Xinzha Village, Rencheng District. It has a total length of 159km and a total drainage area of 2,357km².

泗河从谷村镇白家店村东流入兖州区，西至龙湾店村北突折弯南流，至京沪铁路桥下又折西流，至马家桥村北曲一弧形而南流。它沿谷村、新兖、王因三镇东部边境，至史家营村出境。根据《山东省地表水环境功能区划》，泗河各功能段的水质规划目标及主要功能区划具体见表3.1-1。

Sihe River flows to Yanzhou District from the east of Baijiadian Village, Gucun Town, flows to the north of Longwandian Village in the west and turns southward suddenly, turns westward under Beijing-Shanghai Railway Bridge, and flows southward in arc shape in the north of Majiaqiao Village. It runs along the east boundary of Gucun, Xinyan and Wangyin Towns, and leaves Yanzhou District via Shijiaying Village. Based on *Functional Zoning of Surface Water Environment of Shandong Province*, the water quality planning objectives of all functional sections of Sihe River and main functional zoning are shown in Table 3.1-1.

**表3.1-1 泗河各河段功能区划情况一览表**

**Table 3.1-1 Functional Zoning of all Reaches of Sihe River**

| 序号 | No. | 控制单元 | Control unit | 水功能区类型 | Type of water functional area | 水质目 | Water quality objective | 长度 | Length | 控制区域 | Control area |
|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | 标 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 源头—贺庄水库入口 | Source - entrance of Hezhuang Reservoir | 饮用水一级保护区 | Class I drinking water protection area | II类 | Category II | 16.6km | 16.6km | 新泰市 | Xintai City |
| 2 | 2 | 贺庄水库 | Hezhuang Reservoir | 饮用水一级保护区 | Class I drinking water protection area | II类 | Category II | 20km | 20km | 泗水县 | Sishui County |
| 3 | 3 | 贺庄水库出口—卞桥 | Exit of Hezhuang Reservoir - Bianqiao | 饮用水一级保护区 | Class I drinking water protection area | II类 | Category II | 4.4km | 4.4km | 泗水县 | Sishui County |
| 4 | 4 | 卞桥—尹沟 | Bianqiao - Yingou | 工业用水区 | Industrial water area | Ⅳ类 | Class IV | 122.5km | 122.5km | 泗水县、曲阜市、兖州区 | Sishui County, Qufu and Yanzhou District |
| 5 | 5 | 尹沟—入湖口 | Yingou - lake entrance | 渔业用水区 | Fishery water area | III类 | Class III | 16.2km | 16.2km | 济宁市任城区 | Rencheng District, Jining City |

泗河在兖州区境内河段长32.4km，流域面积仅11.6km²（河滩地），规划水体功能为工业用水区，执行《地表水环境质量标准》（GB3838-2002）中Ⅳ类标准。

The reach of Sihe River in Yanzhou District has a length of 32.4km and a drainage area of 11.6km² only (flood land), whose planned water body function is industrial water area with Class IV standard in *Environmental Quality Standards for Surface Water* (GB3838-2002) being implemented.

2、泗河人工湿地

2. Sihe artificial wetland

泗河河道走廊生态修复与水质净化工程的位置选择在兖州区城区正南的宽阔大“S”型泗河河道，即：从泗河与小沂河交汇处的金口坝至马家桥，呈东北西南走向，东北高西南低。根据泗河河道地形特点，计划在铁路大桥东侧利用原有废弃桥墩建设一道混凝土水坝，在泗河南大桥及马桥附近各建设一座橡胶坝。其中南大桥断面与杨庄断面为泗河河道走廊湿地工程实施段，该段上下游各建设一座橡胶坝，坝高3.5m，有效高度3m，坝宽为200m，全长5.3km，拦蓄水量可达270万m³。

The location of Sihe River channel corridor ecological restoration and water purification project is the wide “S-shaped” Sihe channel in the south of the urban area of Yanzhou District, namely: from Jinkou Dam (the junction between Sihe River and Xiaoxi River) to Majia Bridge, which runs from northeast to southwest and is high in northeast and low in southwest. According to the terrain characteristics of Sihe River channel, it is planned to construct a concrete dam on the basis of the original abandoned piers on the east side of the railway bridge, and a rubber dam near South Sihe

River Bridge and Maqiao Bridge respectively. Among them, South Sihe River Bridge and Yangzhuang sections are the implementation section of Sihe River channel corridor wetland project. A rubber dam with a height of 3.5m, an effective height of 3m, a width of 200m, a total length of 5.3km and a storage capacity of 2.7 million $m^3$ will be constructed upstream and downstream of the section respectively.

泗河人工湿地工程的进水为泗河的上游来水，进水水质情况为：COD60mg/L、NH3-N：8mg/L，设计处理出水水质情况为：CODCr≤30mg/L、NH3-N≤4.0mg/L。该工程目前已投入运行。

The influent for Sihe artificial wetland project is from the upstream of Sihe River, whose influent quality is as follows: COD60mg/L, NH3-N: 8mg/L, design treatment effluent quality: CODCr≤30mg/L, NH3-N≤4.0mg/L. At present, the project has been put into operation.

### 3.1.5.2 洸府河水系

### 3.1.5.2 Guangfu River system

洸府河发源于泰安市宁阳县东部和北部山区，流经济宁市的兖州、任城两市区至东石佛入南阳湖；全长47.7km，流域总面积为1367km²。根据《山东省地表水环境功能区划》，洸府河各功能段的水质规划目标及主要功能区划具体见表3.1-2。

Guangfu River is originated from the mountainous area in the east and the north of Ningyang County, Tai'an City, runs through Yanzhou and Rencheng Districts, Jining City and flows to Nanyang Lake via Dongshifo. It has a total length of 47.7km and a total drainage area of 1,367km². Based on *Functional Zoning of Surface Water Environment of Shandong Province*, the water quality planning objectives of all functional sections of Guangfu River and main functional zoning are shown in Table 3.1-2.

**表3.1-2 洸府河各河段功能区划情况一览表**

**Table 3.1-2 Functional Zoning of all Reaches of Guangfu River**

| 序号 | No. | 控制单元 | Control unit | 水功能区类型 | Type of water functional area | 水质目标 | Water quality objective | 长度 | Length | 控制区域 | Control area |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 石集水库 | Shiji Reservoir | 渔业用水区 | Fishery water area | III类 | Class III | — | - | 宁阳县 | Ningyang County |
| 2 | 2 | 宁阳 | Ningyang County - Sidian | 排污 | Blowdown control area | | | 14.9km | 14.9km | 宁阳县 | Ningyang County |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 县城—泗店桥 | Bridge | 控制区 | | | | | | | |
| 3 | 3 | 泗店桥—候店 | Sidian Bridge - Houdian | 农业用水区 | Agricultural water area | Ⅴ类 | Class V | 3.5km | 3.5km | 宁阳县 | Ningyang County |
| 4 | 4 | 候店—骆楼 | Houdian - Luolou | 工业用水区 | Industrial water area | Ⅳ类 | Class IV | 32.5km | 32.5km | 兖州区、济宁市任城区 | Yanzhou District and Rencheng District, Jining City |
| 5 | 5 | 骆楼—入湖口 | Luolou - lake entrance | 饮用水二级保护区 | Class II drinking water protection area | Ⅲ类 | Class III | 16.6km | 16.6km | 济宁市任城区 | Rencheng District, Jining City |

洸府河在兖州区境内河段长21.9km，规划水体功能为工业用水区，执行《地表水环境质量标准》（GB3838-2002）中Ⅳ类标准。洸府河一级支流有杨家河、蓼沟河、洸河、小泥河等10条，二级支流有府河、大安沟、下元沟、黄狼沟等4条。洸府河干流主河道起源于新驿镇高吴桥村东南今高吴桥闸以上，全长47.7km，总流域面积1331km²；其中境内段长21.9km，流域面积567.6km²，占全市总面积的87.6%。洸府河是纵贯兖州区腹部地带，上承曲、宁两县、市山洪客水，又纳内涝的骨干河道。

The reach of Guangfu River in Yanzhou District has a length of 21.9km, whose planned water body function is industrial water area with Class IV standard in *Environmental Quality Standards for Surface Water* (GB3838-2002) being implemented. Guangfu River has 10 primary tributaries, such as Yangjia River, Liaogou River, Guanghe River and Xiaoni River, and 4 secondary tributaries, including Fuhe River, Da'an Stream, Xiayuan Stream and Huanglang Stream. The main channel of the trunk stream of Guangfu River is originated from the southeast of Gaowuqiao Village, Xinyi Town (about Gaowuqiao Sluice at present). It has a total length of 47.7km and a total drainage area of 1,331km², of which, the section in the city has a length of 21.9km and a drainage area of 567.6km², accounting for 87.6% of the total city area. Guangfu River runs through the hinderland of Yanzhou District, which is a trunk channel that receives torrential flood from Qufu City and Ningyang County and waterlogging.

### 3.1.5.3 杨家河

### 3.1.5.3 Yangjia River

杨家河起源于大安镇西北店村西北（兖、汶公路桥），流经大安、新兖、颜店、黄屯4镇，至三仙庙村西出境入任城区，在任城区黄庄村北汇入洸府河。杨家河全长26.5km，其中境内段长18km；总流域面积207km²，均在兖州区境内。

Yangjia River is originated from the northwest of Xibeidian Village, Da'an Town (Yan-Wen Highway Bridge), passes through 4 towns, i.e., Da'an, Xinyan, Yandian and Huangtun Towns, leaves the city and enters Rencheng District via Sanxianmiao Village, and flows in Guangfu River in the north of Huangzhuang Village, Rencheng District. Yangjia River has a total length of 26.5km, of which, the section in the district has a length of 18km. Besides, it has a total drainage area of 207km², all of which is within Yanzhou District.

根据兖州区的统一布局，兖州区政府利用杨家河的上游河段建设人工湿地处理工程，对山东太阳纸业股份有限公司的外排废水进行深度处理，处理后进行农灌资源化或排入泗河。

Based on the unified arrangement of Yanzhou District, the Government of Yanzhou District plans to construct an artificial wetland treatment project with the upstream reach of Yangjia River for deep treatment of the wastewater discharged by Shandong Sun Paper Industry Joint Stock. The treated water will be used as agricultural irrigation resource or discharged to Sihe River.

拟建项目位于杨家河以东约50m，位于泗河以西约10km。兖州区境内地表水体情况具体见图3.1-2。

The proposed project is about 50m east of Yangjia River and 10km west of Sihe Rver. See Fig. 3.1-2 for detailed surface water conditions within Yanzhou District.

### 3.1.6 气候、气象

### 3.1.6 Climate & meteorology

兖州区属暖温带季风型大陆性气候区，四季分明，暖湿交替。其特点是春季多风，雨少易旱，夏季温热，多雨易涝，秋季天高气爽，旱涝相间，冬季寒冷干燥，雨雪稀少。据资料统计分析，兖州区多年平均年降水量687.8mm，年平均气温13.6℃，年平均相对湿度为77%；全年主导风为南东南（SSE）风，出现频率最高为9.74%，次主导风为东南（SE）风，出现频率为9.3%；年平均风速2.2m/s，各月平均风速4月份最大，为3.3m/s，9月份最小，为1.9m/s。

Yanzhou District is in warm temperate monsoon continental climate area that has four distinctive seasons and alternating warm and wet seasons. It has the following characteristics: spring: windy, little rain, prone to drought; summer: warm, rainy and easy to have flood; autumn: clear sky and fine weather, alternating drought and flood; winter: cold and dry with little rain/snow. Based on statistical analysis of data, Yanzhou District has a perennial average annual precipitation of 687.8mm, an annual average temperature of 13.6℃ and an annual average relative humidity of 77%. The year-round dominant wind is SSE wind, whose highest occurrence frequency is 9.74%; the

secondary dominant wind is SE wind, whose occurrence frequency is 9.3%. The annual average wind speed is 2.2m/s, and April has the highest average wind speed, which is 3.3m/s, while September has the lowest average wind speed, which is 1.9m/s.

### 3.1.7 土壤

### 3.1.7 Soil

兖州区全区土地总面积648.2km²，土壤质量较好，共分褐土、潮土、沙姜黑土三大土类，五个亚类，七个土属，三十个土种。项目所在地土壤类型为潮土，土层较深厚，土质肥沃，水源丰富，是较好的耕作土壤。

Yanzhou District has a total land of 648.2km² with relatively good soil quality. The soil can be classified into three categories (cinnamon soil, moisture soil and sand ginger black soil), five subclasses, seven soil genera and thirty soil species. The soil of the soil location is thick & fertile moisture soil with abundant water sources, which is a good cultivated soil.

### 3.1.8 植被

### 3.1.8 Vegetation

项目所在区域受人类活动的影响，缺乏天然森林植被，植被类型少，植物群落结构简单、组成单纯。区内自然植被较少，木本植物种类少，草本植物较多。主要树种为北温带区系成分的速生毛白杨。草本植物群落主要分布在评价区内河流滩地、沟道旁、路边等地。区域植物物种以小麦、玉米、蔬菜等农作物为主，野生植物主要有马齿苋、苣草、荠菜、绿穗苋、苍耳、车前、蒺藜、牵牛、蒲公英、马齿苋、艾、白羊草、狗背草等。

Due to impact from human activities, the project area has less natural forest vegetation & vegetation forms as well as simple phytocoenosium structure and pure composition. There is little natural vegetation in the area with few woody plants and many herbaceous plants. The main tree species is fast-growing populus tomentosa of the north temperate zone. Main herbaceous communities are distributed on the river shoals and along the channels and roads in the assessment area. The main plant species in the area are wheat, corn, vegetables and other crops, and the main wild plants include purslane, hispid arthraxon, shepherd's purse, amaranthus hybridus, xanthium sibiricum, snokeweed, tribulus terrestris, morning glory, dandelion, wormwood, bothriochloa ischaemum and dog back grass.

### 3.1.9 地震

### 3.1.9 Earthquake

评价区域平坦开阔，无地震活动记载，根据《建筑抗震设计规范（GB50011-2016）》标准划分，按Ⅵ度设防。设计基本地震加速度为0.1g，属设计地震第二组，不考虑液化问题。

The assessment area is flat & open and without seismic activity record. According to the standard classification in *Code for Seismic Design of Buildings* (GB50011-2016), Degree Ⅵ seismic

fortification is applied. Design basic acceleration of ground motion: 0.1g, Group II design earthquake without regard to liquefaction.

## 3.2 区域环境质量概况

## 3.2 Overview of regional environmental quality

### 3.2.1 环境空气质量现状监测

### 3.2.1 Monitoring of ambient air quality status

#### 3.2.1.1 达标区评判

#### 3.2.1.1 Judgment of up-to-standard area

2018年3月5日济宁市环境保护局下发了《2017年度济宁市环境质量状况》，根据通报数据，2017年，济宁城区开展的环境空气监测项目有二氧化硫（SO2）、二氧化氮（NO2）、可吸入颗粒物（PM10）和细颗粒物（PM2.5）4项，设置8个采样点，全部实行环境空气质量自动监测。SO2：年均浓度为0.027mg/m³，年均浓度标准为0.060mg/m³，达到《环境空气质量标准》GB3095－2012中二级标准要求；NO2：年均浓度为0.040mg/m³，年均浓度标准为0.040mg/m³，达到《环境空气质量标准》GB3095－2012中二级标准要求；PM10：年均浓度为0.106mg/m³，年均浓度标准为0.070mg/m³超标0.51倍；PM2.5:年均浓度为0.056mg/m³，年均浓度标准为0.035mg/m³，超标0.6倍。

The Environmental Protection Bureau of Jining City issued *Environmental Quality Conditions of Jining City in 2017* on March 5, 2018. Based on the reported data, the ambient air monitoring items implemented for the urban area of Jining City in 2017 include sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), inhalable particle (PM10) and fine particle (PM2.5). Besides, 8 sampling points have been set up, all of which are subject to automatic ambient air quality monitoring. $SO_2$: annual average concentration: 0.027mg/m³, standard annual average concentration: 0.060mg/m³, which meets requirements for Level II standard in *Ambient Air Quality Standards* (GB3095-2012); $NO_2$: annual average concentration: 0.040mg/m³, standard annual average concentration: 0.040mg/m³, which meets requirements for Level II standard in *Ambient Air Quality Standards* (GB3095-2012); PM10: annual average concentration: 0.106mg/m³, standard annual average concentration: 0.070mg/m³, which exceeds the standard value by 0.51 times; PM2.5: annual average concentration: 0.056mg/m³, standard annual average concentration: 0.035mg/m³, which exceeds the standard value by 0.6 times.

2017年兖州教体局例行监测点评价见表3.2-1。

See Table 3.2-1 for assessment of the routine monitoring points of the Education and Sports Bureau of Yanzhou District in 2017.

**表3.2-1 基本污染物环境质量现状评价表 单位：mg/m³**

**Table 3.2-1Assessment of Environmental Quality Status of Basic Pollutants Unit:mg/m³**

| 污染物 | Pollutants | 年评价指标 | Annual assessment indicator | 现状浓度 | Current concentration | 评价标准 | Assessment standard | 最大浓度占标率/% | Ratio of maximum concentration to standard value/% | 超标频率/% | Standard-exceeding frequency/% | 达标情况 | Qualified or not |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $SO_2$ | $SO_2$ | 年平均质量浓度 | Annual average mass concentration | 0.028 | 0.028 | 0.06 | 0.06 | 46.7 | 46.7 | / | / | 达标 | Yes |
| | | 98%保证率日平均浓度（共343个有效数据，第7大值） | Daily average concentration of 98% guarantee rate (There is 343 valid data in total, the 7th big value) | 0.0672 | 0.0672 | 0.15 | 0.15 | 44.8 | 44.8 | 0 | 0 | 达标 | Yes |
| $NO_2$ | $NO_2$ | 年平均质量浓度 | Annual average mass concentration | 0.042 | 0.042 | 0.04 | 0.04 | 105 | 105 | / | / | **不达标** | **No** |
| | | 98%保证率日平均浓度（共343有效数据，第7大值） | Daily average concentration of 98% guarantee rate (There is 343 valid data in total, the 7th | 0.0853 | 0.0853 | 0.08 | 0.08 | 107 | 107 | 2.6% | 2.6% | **不达标** | **No** |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | big value) | | | | | | | | | | |
| $PM_{10}$ | $PM_{10}$ | 年平均质量浓度 | Annual average mass concentration | 0.108 | 0.108 | 0.07 | 0.07 | 154 | 154 | / | / | 不达标 | **No** |
| | | 95%保证率日平均浓度（共343个有效数据，第18大值） | Daily average concentration of 95% guarantee rate (There is 343 valid data in total, the 7th big value) | 0.204 | 0.204 | 0.15 | 0.15 | 136 | 136 | 16.3% | 16.3% | 不达标 | **No** |
| $PM_{2.5}$ | $PM_{2.5}$ | 年平均质量浓度 | Annual average mass concentration | 0.055 | 0.055 | 0.035 | 0.035 | 157 | 157 | / | / | 不达标 | **No** |
| | | 95%保证率日平均浓度（共342个有效数据，第18大值） | Daily average concentration of 95% guarantee rate (There is 342 valid data in total, the 7th big value) | 0.107 | 0.107 | 0.075 | 0.075 | 143 | 143 | 15.8% | 15.8% | 不达标 | **No** |
| CO | CO | 95%保证率日平均浓度 | Daily average concentration of | 1.64 | 1.64 | 4 | 4 | 41 | 41 | 0 | 0 | 达标 | Yes |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | （共343个有效数据，第18大值） | 95% guarantee rate (There is 343 valid data in total, the 7th big value) | | | | | | | | | | |
| $O_3$ | $O_3$ | 90%保证率日最大8h滑动平均浓度（共343个有效数据，第35大值） | Maximum 8h sliding average concentration of 90% guarantee rate (There is 343 valid data in total, the 7th big value) | 0.139 | 0.139 | 0.16 | 0.16 | 86.9 | 86.9 | 4.7% | 4.7% | 达标 | Yes |

由上表可见，2017年兖州教体局例行监测点环境空气中SO2、CO、O3年均浓度或相应百分位数24h或8h平均质量浓度能够满足《环境空气质量标准》（GB3095-2012）二级标准，NO2、PM10、PM2.5年均浓度或相应百分位数24h平均质量浓度不达标，项目所在处于不达标区。

It can be learned from the table above that the annual average $SO_2$, CO and $O_3$ concentrations or corresponding percentile 24h or 8h average mass concentrations in the routine ambient air quality monitoring points of the Education and Sports Bureau of Yanzhou District in 2017 are able to meet Level II standard in *Ambient Air Quality Standards* (GB3095-2012), while the annual average $NO_2$, PM10 and PM2.5 concentrations or corresponding percentile 24h average mass concentrations are not up to standard, and the project is located in the non-up-to-standard area.

### 3.2.1.2 其他污染物现状监测与评价

### 3.2.1.2 Status monitoring and assessment of other pollutants

1、监测布点

1. Monitoring points

根据《环境影响评价技术导则大气环境》（HJ2.2-2018），结合本工程特点及拟建厂址周围

环境情况，本次环境空气现状监测引用《太阳新材料产业园环境影响报告书》中的监测数据，监测点的名称和位置见表3.2-2和图3.2-1。

According to Technical Guidelines for *Environmental Impact Assessment - Atmospheric Environment* (HJ2.2-2018) as well as characteristics of the project and the surrounding conditions of the proposed plant site, the monitoring data in *Environmental Impact Report of Sun New Material Industrial Park* is quoted for ambient air status monitoring.See Table 3.2-2 and Fig. 3.2-1 for the names and locations of the monitoring points.

**表3.2-2 本项目环境空气质量现状监测点一览表**

**Table 3.2-2 Ambient Air Quality Status Monitoring Points of the Project**

| 编号 | No. | 点位名称 | Name | 相对位置 | Relative location | 相对项目距离（m） | Distance from the project (m) | 布设目的 | Purpose |
|---|---|---|---|---|---|---|---|---|---|
| 1# | 1# | 污水处理厂北侧 | North side of the sewage treatment plant | - | - | 880 | 880 | 了解项目园区环境空气质量现状 | Learn ambient air quality status of the project park |
| 2# | 2# | 毛家庙村 | Maojiamiao Village | NNW | NNW | 1960 | 1960 | 主导风向下风向敏感点 | Sensitive spots down the predominant wind direction |

2、监测项目和监测方法

2. Monitoring items & methods

监测项目：氨、硫化氢、甲硫醇、臭气浓度等；同步观测风向、风速、气温、气压、湿度、总云量、低云量等常规地面气象参数。按照国家环保总局颁布的《环境空气监测技术规范》、《环境影响评价技术导则 大气环境》（HJ2.2-2018）和《空气和废气监测分析方法》进行环境空气质量监测，分析方法按《环境空气质量标准》（GB3095-2012）中的有关规定执行，拟建项目监测分析方法见表3.2-3。

Monitoring items: ammonia, hydrogen sulfide, methyl mercaptan, odor concentrations, etc.; besides, conventional ground meteorological parameters, such as wind direction, wind speed, temperature, atmospheric pressure, humidity, total cloud cover and low cloud cover shall be observed.

Ambient air quality shall be monitored as per *Technical Specification for Ambient Air Monitoring, Technical Guidelines for Environmental Impact Assessment - Atmospheric Environment* (HJ2.2-2018) and *Air and Waste Gas Monitoring & Analysis Methods* issued by State Environmental

Protection Administration, and analysis methods shall be implemented as per *Ambient Air Quality Standards* (GB3095-2012). See Table 3.2-3 for monitoring & analysis methods of the proposed project.

**表3.2-3 环境空气监测分析方法**

**Table 3.2-3 Ambient Air Monitoring & Analysis Methods**

| 检测项目 | Detection item | 分析方法 | Analytical method | 方法来源 | Method source | 检出限 | Detection limit |
|---|---|---|---|---|---|---|---|
| 硫化氢 | Hydrogen sulfide | 第三篇/第一章/十一/（二）方法亚甲蓝分光光度法亚甲蓝分光光度法 | Volume III/Chapter I/XI/Method (II) - methylene blue spectrophotometric method | 《空气和废气监测分析方法》（第四版增补版） | Air and Waste Gas Monitoring & Analysis Methods (enlarged edition of the fourth edition) | 0.001mg/m³ | 0.001mg/m³ |
| 臭气浓度 | Odor concentration | 空气质量恶臭的测定三点比较式臭袋法 | Air quality - Determination of odor - Triangle odor bag method | GB/T14675-1993 | GB/T14675-1993 | 10 | 10 |
| 氨 | Ammonia | 环境空气和废气氨的测定纳氏试剂分光光度法 | Air and exhaust gas - Determination of ammonia - Nessler's reagent spectrophotometric method | HJ533-2009 | HJ533-2009 | 0.01mg/m³ | 0.01mg/m³ |
| 甲硫醇 | Methyl mercaptan | 环境空气硫化氢、甲硫醇、甲硫醚和二甲二硫醚的测定气相色谱法 | Air quality - Determination of sulfuretted hydrogen, methyl sulfhydryl, dimethyl sulfide and dimethyl disulfide - Gas chromatographic method | GB/T14678-1993 | GB/T14678-1993 | 1.0mg/m³ | 1.0mg/m³ |

3、监测时间与频率

3. Monitoring time & frequency

本次环评现状监测于2019年6月4日至6月10日由山东中泽环境检测有限公司进行监测，连续监测7天，小时浓度每天监测4次，时间分别为02:00、08:00、14:00、20:00。

The environmental assessment status monitoring was performed by Shandong ZhongZe Environmental Testing Co., Ltd. In June 4 - 10, 2019 (7 successive days) with the hour concentration being monitored 4 times a day at 02:00, 08:00, 14:00 and 20:00 respectively.

4、监测结果

4. Monitoring results

（1）气象参数

(1) Meteorological parameters

监测期间气象参数见表3.2-4。

See Table 3.2-4 for the meteorological parameters during the monitoring period.

**表3.2-4 监测气象参数一览表**

**Table 3.2-4 Monitoring Meteorological Parameters**

| 采样日期 Sampling date | 采样时间 Sampling time | 气温(℃) Temperature (℃) | 气压（KPa） Atmospheric pressure (KPa) | 风速(m/s) Wind speed (m/s) | 风向 Wind direction | 总云 Total cloud | 低云 Low cloud |
|---|---|---|---|---|---|---|---|
| 2019.6.4 *4/6/2019* | 2:00 | 24 | 101.1 | 1.5 | S | —— | —— |
| | 8:00 | 29 | 101.5 | 1.1 | S | 1 | 0 |
| | 14:00 | 37 | 101.7 | 1.9 | S | 2 | 1 |
| | 20:00 | 30 | 101.5 | 2.0 | S | —— | —— |
| 2019.6.5 *5/6/2019* | 2:00 | 21 | 101.1 | 1.5 | SE | —— | —— |
| | 8:00 | 25 | 101.4 | 1.9 | SE | 3 | 1 |
| | 14:00 | 34 | 101.6 | 1.3 | SE | 4 | 1 |
| | 20:00 | 23 | 101.2 | 1.7 | SE | —— | —— |
| 2019.6.6 *6/6/2019* | 2:00 | 17 | 101.1 | 3.0 | N | —— | —— |
| | 8:00 | 20 | 101.3 | 3.5 | N | 3 | 1 |
| | 14:00 | 28 | 101.9 | 3.1 | N | 3 | 3 |
| | 20:00 | 21 | 101.5 | 2.8 | N | —— | —— |
| 2019.6.7 | 2:00 | 17 | 101.2 | 1.9 | S | —— | —— |

| 采样日期 Sampling date | 采样时间 Sampling time | 气温(℃) Temperature (℃) | 气压（KPa） Atmospheric pressure (KPa) | 风速(m/s) Wind speed (m/s) | 风向 Wind direction | 总云 Total cloud | 低云 Low cloud |
|---|---|---|---|---|---|---|---|
| *7/6/2019* | 8:00 | 22 | 101.3 | 2.1 | S | 4 | 2 |
| | 14:00 | 30 | 101.7 | 1.7 | S | 3 | 1 |
| | 20:00 | 23 | 101.2 | 2.6 | S | —— | —— |
| 2019.6.8 *8/6/2019* | 2:00 | 22 | 101.1 | 2.5 | S | —— | —— |
| | 8:00 | 26 | 101.3 | 2.7 | S | 2 | 0 |
| | 14:00 | 32 | 101.5 | 3.0 | S | 1 | 0 |
| | 20:00 | 25 | 101.4 | 2.9 | S | —— | —— |
| 2019.6.9 *9/6/2019* | 2:00 | 17 | 101.5 | 2.4 | N | —— | —— |
| | 8:00 | 26 | 101.6 | 2.6 | N | 4 | 2 |
| | 14:00 | 32 | 101.8 | 2.3 | N | 3 | 1 |
| | 20:00 | 23 | 101.3 | 2.5 | N | —— | —— |
| 2019.6.10 *10/6/2019* | 2:00 | 16 | 101.3 | 2.5 | N | —— | —— |
| | 8:00 | 24 | 101.5 | 1.3 | N | 2 | 1 |
| | 14:00 | 33 | 101.7 | 2.6 | N | 4 | 2 |
| | 20:00 | 24 | 101.5 | 2.2 | N | —— | —— |

（2）监测结果具体监测结果见表3.2-5。

(2) Monitoring results

See Table 3.2-5 for specific monitoring results.

**表3.2-5（1） 监测结果一览表**

**Table 3.2-5** (1) **Monitoring Results**

| 采样日期 Sampling date | 采样时间 Sampling time | 1#污水处理厂北侧 North side of 1# sewage treatment plant | | | |
|---|---|---|---|---|---|
| | | 甲硫醇 mg/m³ Methyl mercaptan mg/m³ | 氨 mg/m³ Ammonia mg/m³ | 硫化氢 mg/m³ Hydrogen sulfide mg/m³ | 臭气浓度无量纲 Odor concentration (dimensionless) |
| 2019.6.4 4/6/2019 | 2:00 | ND | 0.14 | ND | ND |
| | 8:00 | ND | 0.11 | ND | ND |

| 采样日期 Sampling date | 采样时间 Sampling time | 1#污水处理厂北侧 North side of 1# sewage treatment plant | | | |
|---|---|---|---|---|---|
| | | 甲硫醇 mg/m³ Methyl mercaptan mg/m³ | 氨 mg/m³ Ammonia mg/m³ | 硫化氢 mg/m³ Hydrogen sulfide mg/m³ | 臭气浓度无量纲 Odor concentration (dimensionless) |
| | 14:00 | ND | 0.07 | ND | ND |
| | 20:00 | ND | 0.13 | ND | 15 |
| 2019.6.5 *5/6/2019* | 2:00 | ND | 0.08 | ND | ND |
| | 8:00 | ND | 0.09 | ND | ND |
| | 14:00 | ND | 0.12 | ND | ND |
| | 20:00 | ND | 0.11 | ND | ND |
| 2019.6.6 *6/6/2019* | 2:00 | ND | 0.08 | ND | ND |
| | 8:00 | ND | 0.06 | ND | 16 |
| | 14:00 | ND | 0.1 | ND | ND |
| | 20:00 | ND | 0.15 | ND | 14 |
| 2019.6.7 *7/6/2019* | 2:00 | ND | 0.12 | ND | ND |
| | 8:00 | ND | 0.09 | ND | 12 |
| | 14:00 | ND | 0.11 | ND | ND |
| | 20:00 | ND | 0.08 | ND | ND |
| 2019.6.8 *8/6/2019* | 2:00 | ND | 0.13 | ND | ND |
| | 8:00 | ND | 0.06 | ND | ND |
| | 14:00 | ND | 0.15 | ND | 11 |
| | 20:00 | ND | 0.1 | ND | ND |
| 2019.6.9 *9/6/2019* | 2:00 | ND | 0.07 | ND | ND |
| | 8:00 | ND | 0.09 | ND | ND |
| | 14:00 | ND | 0.12 | ND | 13 |
| | 20:00 | ND | 0.1 | ND | ND |
| 2019.6.10 *10/6/2019* | 2:00 | ND | 0.08 | ND | ND |
| | 8:00 | ND | 0.12 | ND | 15 |
| | 14:00 | ND | 0.15 | ND | ND |
| | 20:00 | ND | 0.1 | ND | 14 |

**表3.2-5（2） 监测结果一览表**

**Table 3.2-5** (2) **Monitoring Results**

| 采样日期 Sampling date | 采样时间 Sampling time | 2#毛家庙村 2# Maojiamiao Village | | | |
|---|---|---|---|---|---|
| | | 甲硫醇 mg/m³ Methyl mercaptan mg/m³ | 氨 mg/m³ Ammonia mg/m³ | 硫化氢 mg/m³ Hydrogen sulfide mg/m³ | 臭气浓度 无量纲 Odor concentration Dimensionless |

| 采样日期<br>Sampling date | 采样时间<br>Sampling time | 2#毛家庙村<br>2# Maojiamiao Village | | | |
|---|---|---|---|---|---|
| | | 甲硫醇<br>mg/m³<br>Methyl mercaptan<br>mg/m³ | 氨<br>mg/m³<br>Ammonia<br>mg/m³ | 硫化氢<br>mg/m³<br>Hydrogen sulfide<br>mg/m³ | 臭气浓度<br>无量纲<br>Odor concentration<br>Dimensionless |
| 2019.6.4<br>*4/6/2019* | 2:00 | ND | 0.09 | ND | ND |
| | 8:00 | ND | 0.08 | ND | ND |
| | 14:00 | ND | 0.1 | ND | 13 |
| | 20:00 | ND | 0.05 | ND | ND |
| 2019.6.5<br>*5/6/2019* | 2:00 | ND | 0.06 | ND | 12 |
| | 8:00 | ND | 0.09 | ND | ND |
| | 14:00 | ND | 0.1 | ND | ND |
| | 20:00 | ND | 0.07 | ND | ND |
| 2019.6.6<br>*6/6/2019* | 2:00 | ND | 0.05 | ND | ND |
| | 8:00 | ND | 0.07 | ND | ND |
| | 14:00 | ND | 0.09 | ND | 15 |
| | 20:00 | ND | 0.13 | ND | ND |
| 2019.6.7<br>*7/6/2019* | 2:00 | ND | 0.05 | ND | ND |
| | 8:00 | ND | 0.1 | ND | ND |
| | 14:00 | ND | 0.1 | ND | ND |
| | 20:00 | ND | 0.14 | ND | 13 |
| 2019.6.4<br>*4/6/2019* | 2:00 | ND | 0.07 | ND | ND |
| | 8:00 | ND | 0.1 | ND | ND |
| | 14:00 | ND | 0.07 | ND | ND |
| | 20:00 | ND | 0.08 | ND | 12 |
| 2019.6.5<br>*5/6/2019* | 2:00 | ND | 0.1 | ND | ND |
| | 8:00 | ND | 0.08 | ND | ND |
| | 14:00 | ND | 0.08 | ND | 14 |
| | 20:00 | ND | 0.07 | ND | ND |
| 2019.6.6<br>*6/6/2019* | 2:00 | ND | 0.11 | ND | ND |
| | 8:00 | ND | 0.09 | ND | ND |
| | 14:00 | ND | 0.06 | ND | ND |
| | 20:00 | ND | 0.11 | ND | ND |

| 采样日期<br>Sampling date | 采样时间<br>Sampling time | 2#毛家庙村<br>2# Maojiamiao Village | | | |
|---|---|---|---|---|---|
| | | 甲硫醇<br>mg/m³<br>Methyl mercaptan<br>mg/m³ | 氨<br>mg/m³<br>Ammonia<br>mg/m³ | 硫化氢<br>mg/m³<br>Hydrogen sulfide<br>mg/m³ | 臭气浓度<br>无量纲<br>Odor concentration<br>Dimensionless |
| 2019.6.7<br>*7/6/2019* | 2:00 | ND | 0.07 | ND | ND |
| | 8:00 | ND | 0.1 | ND | ND |
| | 14:00 | ND | 0.07 | ND | ND |
| | 20:00 | ND | 0.08 | ND | 12 |

5、现状评价

5. Status assessment

采用单因子指数法进行评价，具体计算公式为：

It is assessed with single factor index method. The specific calculation formula is as follows:

$$P_i = \frac{C_i}{C_{si}}$$

式中：*Pi*——*i*污染物的单因子指数；

Where: *Pi* - Single factor index of pollutant *i*;

*Ci*——*i*污染物的实测浓度值，mg/Nm³；

*Ci* - Measured concentration of pollutant i (mg/Nm³);

*Csi*——*i*污染物的评价标准，mg/Nm³。一般选用GB3095中1h平均质量浓度的二级浓度限值，如项目位于一类环境空气功能区，应选择相应的一级浓度限值；对该标准中未包含的污染物，使用5.2确定的各评价因子1h平均质量浓度限值。对仅有8h平均质量浓度限值、日平均质量浓度限值或年平均质量浓度限值的，可分别按2倍、3倍、6倍折算为1h平均质量浓度限值。

*Csi* - Assessment standard of pollutant i (mg/Nm³). Generally, the Level II concentration limit of the 1h average mass concentration in GB3095 shall be selected. However, if the project is located in Class I ambient air functional area, corresponding Level I concentration limit shall be selected. For the pollutants that are not included in the standard, the 1h average mass concentration limits of all assessment factors determined in 5.2 shall be used. If there are only 8h average mass concentration limit, daily average mass concentration limit or annual average mass concentration limit, they can be converted into 1h average mass concentration limit as per 2 times, 3 times and 6 times.

当*Pi*≤1时，表示环境空气中该污染物不超标；*Pi*＞1时，表示该污染物超过评价标准。

If $Pi \leq 1$, the pollutant in ambient air does not exceed the standard; if $Pi > 1$, the pollutant exceeds the standard.

（3）评价标准

(3) Assessment standards

各评价因子应执行的标准见具体见表3.2-6。

See Table 3.2-6 for the standards that are needed to be implemented for all assessment factors.

**表3.2-6 环境空气质量评价采用标准 单位：mg/m³**

**Table 3.2-6Ambient Air Quality Assessment Standards Unit:mg/m³**

| 项目 | Item | 小时浓度 | Hourly concentration | 日均浓度 Daily average concentration | 年均浓度 Annual average concentration | 标准来源 | Standard source |
|---|---|---|---|---|---|---|---|
| 氨 | Ammonia | 0.20 | 0.20 | — | — | HJ2.2-2018 附录D | Appendix D of HJ2.2-2018 |
| 硫化氢 | Hydrogen sulfide | 0.01 | 0.01 | — | — | | |
| 臭气浓度 | Odor concentration | 20（无量纲） | 20 (dimensionless) | — | — | 《恶臭污染物排放标准》（GB14554-1993）二级标准 | Level II standard in *Emission Standards for Odor Pollutants* (GB14554-1993) |
| 甲硫醇 | Methyl mercaptan | 0.0007 一次值 | 0.0007 primary value | — | — | 居住区大气中甲硫醇卫生标准 GB18056-2000 | Hygienic Standard for Methylmercaptan in Air of Residential Area (GB18056-2000) |

4、评价结果

4. Assessment results

硫化氢、甲硫醇等监测项目未检出，不再评价。

Monitoring items, such as hydrogen sulfide and methyl mercaptan are not detected, which will not be assessed.

各测点监测值的单因子指数及环境空气质量现状评价结果列于表3.2-7。

See Table 3.2-7 for the single factor indexes of the measured values at all measuring points as well as ambient air quality assessment results.

**表3.2-7 各污染物监测评价结果统计表**

**Table 3.2-7 Statistics of Monitoring Assessment Results of all Pollutants**

| 监测点位 | Monitoring point | 项目 | Item | 样品数 Sample number | 小时浓度范围（mg/Nm³） Hour concentration range (mg/Nm³) | 最大占标比（%） Maximum ratio of maximum concentration to standard value (%) | 超标率（%） Standard-exceeding ratio (%) |
|---|---|---|---|---|---|---|---|
| 1# | 1# | 氨 | Ammonia | 28 | 0.06～0.15 | 0.75 | 0 |
| | | 臭气浓度 | Odor concentration | 28 | 11～16 | 0.8 | 0 |
| 2# | 2# | 氨 | Ammonia | 28 | 0.05～0.14 | 0.70 | 0 |
| | | 臭气浓度 | Odor concentration | 28 | 12～15 | 0.75 | 0 |

测结果表明：评价范围内各监测点各项监测指标均能够满足相应标准要求。

Based on the monitoring results: all monitoring indexes of all monitoring points within the assessment range are able to meet corresponding standard requirements.

### 3.2.1.3 空气质量达标规划

### 3.2.1.3 Up-to-standard planning of ambient quality

为贯彻落实国务院《大气污染防治行动计划》（国发[2013]37号），打好污染防治攻坚战，持续改善生态环境质量，不断满足人民日益增长的优美生态环境需要，切实推动济宁市生态文明建设迈上新台阶，结合实际，济宁市人民政府发布制定了《济宁市生态环境保护三年攻坚计划（2018-2020年）》。

To implement *Action Plan for Prevention and Control of Air Pollution* (GF [2013] No. 37) of the State Council, fight pollution prevention and control battle, improve eco environment quality constantly, keep meeting people's increasing demand for beautiful ecological environment and promote the ecological civilization construction of Jining City to the next step, the People's Government of Jining City prepared and issued *Three-year Ecological Environmental Protection Plan of Jining City* (2018-2020).

（1）环境空气质量改善目标

(1) Ambient air quality improvement objectives

具体目标：经过3年努力，大幅减少主要大气污染物排放总量，协同减少温室气体排放，进一步明显降低细颗粒物（PM2.5）浓度，明显减少重污染天数，明显改善大气环境质量，明

显增强人民的蓝天幸福感。

Specific objectives: reduce total emission of main air pollutants sharply, coordinate to reduce greenhouse gas emission, further reduce fine particle (PM2.5) concentration obviously, reduce heavy pollution days, improve atmospheric environment quality and increase people's blue sky happiness apparently through 3 years' endeavor.

到2020年，全市二氧化硫、氮氧化物排放总量分别比2015年下降30.4%、34.3%以上；PM2.5年均浓度较2015年降低35.7%以上，达到52.7微克/立方米以下；臭氧浓度逐年上升趋势得到明显遏制，空气质量优良率达到63.1%，重度及以上污染天数比2015年下降56.3%以上。各县（市、区）要确保全面实现本计划确定的约束性目标，在重点任务中，已经明确完成时限的，按照规定时间完成；未明确完成时限的，至少要在2020年底前完成。

By 2020, the total sulfur dioxide & nitric oxide emission of the whole city shall be reduced by more than 30.4% and 34.3% compared with 2015; the annual average PM2.5 concentration shall be reduced by more than 35.7% compared with 2015 to lower to 52.7ug/$m^3$ and below; the year-by-year ozone concentration increasing trend shall be restrained obviously with an air quality excellent rate reaching 63.1% and a number of heavy pollution days reduced by more than 56.3% compared with 2015. All counties (cities and districts) shall ensure full achievement of the binding objectives determined in the plan. As for key tasks, the ones with clear completion time limit shall be completed within the time limit; the ones without clear time limit shall at least be completed by the end of 2020.

（2）重点任务

(2) Key tasks

①优化结构与布局：着力调整产业结构。加大落后产能淘汰和过剩产能压减力度，严格执行质量、环保、能耗、安全等法规标准，推动钢铁、地炼、电解铝、焦化、轮胎、化肥、氯碱等高耗能行业转型升级。严格按照修订的《产业结构调整指导目录》，压减过剩产能。加大独立焦化企业淘汰力度，严格执行山东省"以钢定焦"措施。

①Optimize structure and layout: focus on industrial structure adjustment. Elimination of backward production capacity and reduction of excess production capacity shall be intensified, the regulations & standards regarding quality, environmental protection, energy consumption, safety, etc. shall be strictly implemented, and the transformation and upgrading of high-energy consumption industries, such as steel, refining, electrolytic aluminum, coking, tire, chemical fertilizer and chlor-alkali shall be promoted. In addition, excess production capacity shall be reduced strictly as per the revised *Industrial Structure Adjustment Directory*. Elimination efforts for independent coke making enterprises shall be intensified, and the measure of "determining coke based on steel" of Shandong Province shall be taken strictly.

②优化能源消费结构与布局：持续实施煤炭消费总量控制。到2020年，煤炭消费总量压减到4698万吨以内。制定实施全市2018-2020年煤炭消费减量替代工作方案，将全市煤炭消费总

量控制任务分解落实到各县（市、区）。各县（市、区）要编制煤炭消费总量控制实施方案，明确牵头部门和责任分工，完善工作机制，协同推进煤炭消费减量替代工作。

②Optimize energy consumption structure and layout: implement total coal consumption control constantly. By 2020, the total coal consumption shall be reduced to within 46.98 million t/a. A coal consumption reduction & replacement work scheme of the whole city in 2018-2020 shall be prepared to break down the total coal consumption task of the whole city to all counties (cities and districts). All counties (cities and districts) shall prepare a total coal consumption control scheme, clarify the leading department and division of responsibilities, perfect working mechanism and coordinate to promote coal consumption reduction & replacement.

③优化运输结构与布局：大幅减少公路货物运输量、压缩大宗物料公路运输量，新、改、扩建涉及大宗物料运输的建设项目，原则上不得采用公路运输。实施运输绿色化改造。加强铁路运输、水路运输网络建设。

③Optimize transport structure and layout: highway freight volume shall be reduced sharply, highway transport volume of bulk material shall be reduced, and highway transport shall not be applied to the new, reconstruction and expansion projects involving bulk material in principle. Green transport transformation shall be implemented. Railway and waterway transport network construction shall be reinforced.

④优化国土空间开发布局。

④Optimize land space development and layout.

⑤强化污染综合防治：全面实施排污许可管理；工业污染源全面达标排放；提高移动源污染防治水平；加强面源污染综合防治。

⑤Strengthen comprehensive pollution prevention & control: blowdown permit management shall be fully implemented; all industrial pollution sources discharged shall reach standard; prevention and control level of mobile pollution sources shall be improved; comprehensive prevention and control for non-point source pollution shall be strengthened.

⑥健全大气环境管理体系。

⑥Perfect the atmospheric environment management system.

采取以上措施后，PM10、PM2.5、NO2、O3质量标准均能满足《环境空气质量标准》（GB3095-2012）中的二级标准。

Once the measures above are taken, PM10, PM2.5, $NO_2$ and $O_3$ quality is able to meet Level II standards in *Ambient Air Quality Standards* (GB3095-2012).

### 3.2.2 地表水环境现状

### 3.2.2 Surface water environmental status

### 3.2.2.1 地表水环境质量现状监测

### 3.2.2.1 Monitoring of surface water environmental status

拟建项目废水经山东太阳纸业股份有限公司污水厂处理后排入氧化塘，经湿地进一步处理后排入泗河。本次地表水现状调查数据采用《太阳新材料产业园环境影响报告书》中监测数据，以了解泗河水质现状。具体监测断面布设见图3.2-2和表3.2-8。

The waste water of the proposed project will be treated by the sewage treatment plant of Shandong Sun Paper Industry Joint Stock, and then, be discharged to an oxidation pond, afterwards, it will be further treated by wetland and be discharged to Sihe River. The monitoring data in *Environmental Impact Report of Sun New Material Industrial Park* is used as the surface water status survey data to learn the water quality status of Sihe River. See Fig. 3.2-2 and Table 3.2-8 for detailed monitoring section layout.

**表3.2-8 地表水环境质量监测点位**

**Table 3.2-8 Surface Water Environmental Quality Monitoring Points**

| 序号 | No. | 所在河流 | River | 断面布置 | Section layout | 设置意义 | Setting meaning |
|---|---|---|---|---|---|---|---|
| 1# | 1# | 泗河 | Si River | 湿地上游、水闸下游20m | 20m upstream of the wetland and downstream of the sluice | 对照断面 | Comparative section |
| 2# | 2# | -- | -- | 龙湖湿地出口 | Exit of Longhu Wetland | 了解排污现状 | Learn blowdown status |
| 3# | 3# | 泗河 | Si River | 湿地排放口下游1200m | 1,200m downstream of the wetland discharge outlet | 混合断面 | Combined section |
| 4# | 4# | 泗河 | Si River | 古城矿业排污口下游1200m处 | 1,200m downstream of the discharge outlet of Gucheng Mining Co., Ltd. | 古城矿业排污口下游现状 | Status of the downstream of the discharge outlet of Gucheng Mining Co., Ltd. |
| 5# | 5# | 泗河 | Si River | 小沂河汇入泗河交汇处上游200m | 200m upstream of the junction between Xiaoxi River and Sihe River | 支流交汇前背景断面 | Background section before tributary confluence |
| 6# | 6# | 小沂河 | Xiaoyi River | 小沂河汇入泗河交汇处上游200m | 200m upstream of the junction between Xiaoxi River and Sihe River | 支流交汇前背景断 | Background section before tributary confluence |

| 序号 | No. | 所在河流 | River | 断面布置 | Section layout | 设置意义 | Setting meaning |
|---|---|---|---|---|---|---|---|
| | | | | | | 面 | |
| 7# | 7# | 泗河 | Si River | 小沂河与泗河交汇后下游、兴隆分厂排污口上游100m | 100m downstream of the junction between Xiaoxi River and Sihe River and upstream of the discharge outlet of Xinglong Branch | 支流交汇后背景断面 | Background section after tributary confluence |
| 8# | 8# | 泗河 | Si River | 太阳纸业兴隆分厂排污口下游1200m | 1,200m downstream of the discharge outlet of Xinglong Branch of Shandong Sun Paper Industry Joint Stock | 兴隆分厂排污口下游现状 | Status of the downstream of the discharge outlet of Xinglong Branch |
| 9# | 9# | 泗河 | Si River | 市政排污口（一污、二污混合排放口下游1200m | 1,200m downstream of the municipal discharge outlet (combined discharge outlet of primary and secondary sewage) | 市政排污口下游现状 | Status of the downstream of the municipal discharge outlet |
| 10# | 10# | 泗河 | Si River | 泗河史家营出境断面 | Shijiaying outgoing section of Sihe River | 控制断面 | Control section |

2、监测项目

2. Monitoring items

pH、溶解氧、高锰酸盐指数、CODCr、BOD5、NH3-N、总氮、总磷、铜、锌、氟化物、硒、砷、汞、镉、铬、铅、氰化物、挥发酚、石油类、阴离子表面活性剂、硫化物、粪大肠菌群、硫酸盐、氯化物、SS、全盐量、AOX、色度共29项。同步测量河宽、水深、流速、流量、水温等水文参数。

There are 29 monitoring items, including pH, dissolved oxygen, permanganate index, CODCr, BOD5, NH3-N, total nitrogen, total phosphorus, copper, zinc, fluoride, selenium, arsenic, mercury, cadmium, chromium, lead, cyanide, volatile phenol, petroleum, anionic surfactant, sulfide, fecal coliform, sulfate, chloride, SS, total salt content, AOX and chromaticity. Hydrological parameters, such as river width, depth, flow rate, flow and water temperature shall be measured synchronously.

3、监测时间及频率

3. Monitoring time & frequency

监测时间：2019年08月01日、08月03和08月04日3天

Monitoring time: August 1, 3 and 4, 2019

监测频次：地表水：监测1天，每天3次；污水：监测1次；

Monitoring frequency: surface water: to be monitored for 1 day and 3 times a day; sewage: to be monitored once;

4、监测分析方法

4. Monitoring & analysis methods

监测采样及分析方法见表3.2-9。

See Table 3.2-9 for monitoring sampling and analysis methods.

**表3.2-9 地表水监测分析方法一览表**

**Table 3.2-9 Surface Water Monitoring & Analysis Methods**

| 项目名称 | Description | 方法依据 Method basis | 分析方法 | Analytical method | 检出限 Detection limit |
|---|---|---|---|---|---|
| pH | pH | GB6920-1986 | 水质pH的测定玻璃电极法 | Water quality – Determination of PH value – Glass electrode method | -- |
| 溶解氧 | Dissolved oxygen | HJ506-2009 | 水质溶解氧的测定电化学探头法 | Water quality – Determination of dissolved oxygen – Electrochemical probe method | -- |
| 高锰酸盐指数 | Permanganate index | GB11892-89 | 水质高锰酸盐指数的测定 | Water quality – Determination of permanganate index | 0.5mg/L |
| CODCr | CODCr | HJ828-2017 | 水质化学需氧量的测定重铬酸盐法 | Water quality – Determination of the chemical oxygen demand – Dichromate method | 4mg/L |
| 阴离子表面活性剂 | Anionic surfactant | GB7494-1987 | 水质阴离子表面活性剂的测定亚甲蓝分光光度法 | Water quality – Determination of anionoc surfactants – Methylene blue spectrophotometric method | 0.05mg/L |
| BOD5 | BOD5 | HJ505-2009 | 水质五日生化需氧量（BOD5）的测定稀释与接种法 | Water quality – Determination of biochemical oxygen demand after 5 days ($BOD_5$) for dilution and seeding method | 0.5mg/L |
| 氨氮 | Ammonia nitrogen | HJ535-2009 | 水质氨氮的测定纳氏试剂分光光度法 | Water quality – Determination of ammonia nitrogen – | 0.025mg/L |

| 项目名称 | Description | 方法依据 Method basis | 分析方法 | Analytical method | 检出限 Detection limit |
|---|---|---|---|---|---|
| | | | | Nessler's reagent spectrophotometry | |
| 总磷 | Total phosphorus | GB11893-1989 | 水质总氮的测定钼酸铵分光光度法 | Water quality – Determination of total phosphorus – Ammonium molybdate spectrophotometric method | 0.01mg/L |
| 总氮 | Total nitrogen | HJ636-2012 | 水质总氮的测定碱性过硫酸钾消解紫外分光光度法 | Water quality – Determination of total nitrogen – Alkaline potassium persulfate digestion UV spectrophotometric method | 0.05mg/L |
| 氰化物 | Cyanide | HJ484-2009 | 水质氰化物的测定异烟酸-吡唑啉酮分光光度法 | Water quality – Determination of cyanide volumetric and spectrophotometric method | 0.004mg/L |
| 挥发酚 | Volatile phenol | HJ503-2009 | 水质 挥发酚的测定4-氨基安替比林分光光度法 | Water quality – Determination of volatile phenolic compounds – 4-AAP spectrophotometric method | 0.001mg/L |
| 石油类 | Petroleum | HJ970-2018 | 水质石油类的测定紫外分光光度法 | Water quality – Determination of petroleum – Ultraviolet spectrophotometric method | 0.01mg/L |
| 氟化物 | Fluoride | GB/T7484-1987 | 水质氟化物的测定离子选择电极法 | Water quality – Determination of fluorlde – Ion selective electrode method | 0.05mg/L |
| 六价铬 | Hexavalent chromium | GB/T7467-1987 | 二苯碳酰二肼分光光度法 | Water quality – Determination of chromlum (VI) – 1,5 Dlphenylcarbohydrazide spectrophotometric method | 0.004mg/L |
| 铜 | Copper | GB/T7475-1987 | 水质铜、锌、铅、镉的测定原子吸收分光光度法 | Water quality - Determination of copper, zinc, lead and cadmium - Atomic absorption spectrophotometric method | 0.05mg/L |

| 项目名称 | Description | 方法依据 Method basis | 分析方法 | Analytical method | 检出限 Detection limit |
|---|---|---|---|---|---|
| 锌 | Zinc | GB/T7475-1987 | 水质铜、锌、铅、镉的测定原子吸收分光光度法 | Water quality - Determination of copper, zinc, lead and cadmium - Atomic absorption spectrophotometric method | 0.05mg/L |
| 砷 | Arsenic | HJ694-2014 | 水质汞、砷、硒、铋和锑的测定原子荧光法 | Water quality - Determination of Mercury, Arsenic, Selenium, Bismuth And Antimony – Atomic Fluorescence Spectrometry | 0.3μg/L |
| 汞 | Mercury | HJ694-2014 | 水质汞、砷、硒、铋和锑的测定原子荧光法 | Water quality - Determination of Mercury, Arsenic, Selenium, Bismuth And Antimony – Atomic Fluorescence Spectrometry | 0.04μg/L |
| 镉 | Cadmium | GB/T7475-1987 | 水质铜、锌、铅、镉的测定原子吸收分光光度法 | Water quality - Determination of copper, zinc, lead and cadmium - Atomic absorption spectrophotometric method | 0.001mg/L |
| 铅 | Lead | GB/T7475-1987 | 水质铜、锌、铅、镉的测定原子吸收分光光度法 | Water quality - Determination of copper, zinc, lead and cadmium - Atomic absorption spectrophotometric method | 0.01mg/L |
| 硒 | Selenium | HJ694-2014 | 水质汞、砷、硒、铋和锑的测定原子荧光法 | Water quality- Determination of Mercury, Arsenic, Selenium, Bismuth And Antimony – Atomic Fluorescence Spectrometry | 0.4μg/L |
| 硫化物 | Sulfide | GB/T16489-1996 | 水质硫化物的测定亚甲蓝分光光度法 | Water quality - Determination of sulfide - Methylene blue spectrophotometric method | 0.005mg/L |
| 氯化物 | Chloride | GB11896-1989 | 水质氯化物的测定滴定法 | Water quality - Determination of chloride – Silver nitrate titration | 10mg/L |

| 项目名称 | Description | 方法依据 Method basis | 分析方法 | Analytical method | 检出限 Detection limit |
|---|---|---|---|---|---|
| | | | | method | |
| 硫酸盐 | Sulfate | GB11899-89 | 水质硫酸盐的测定重量法 | Water quality - Determination of sulfate – Gravimetric method | 10mg/L |
| 粪大肠菌群 | Fecal coliform | HJ347.2-2018 | 水质粪大肠菌群的测定多管发酵法 | Water quality - Determination of fecal coliform – Manifold zymoteechnics | 20MPN/L |
| 全盐量 | Total salt content | HJ/T51-1999 | 水质全盐量的测定重量法 | Water quality - Determination of total salt - Gravimetric method | 10mg/L |
| 可吸附有机卤素（AOX） | Adsorbable organic halogen (AOX) | HJ/T83-2001 | 水质可吸附有机卤素（AOX）的测定离子色谱法 | Water quality Adsorbable organic halogen (AOX) determination Ion chromatography | -- |
| 色度 | Chromaticity | GB/T11903-1989 | 水质色度的测定 | Water quality - Determination of colority | -- |
| SS | SS | GB/T11901-1989 | 水质悬浮物的测定 重量法 | Water quality - Determination of suspended substance - Gravimetric method | -- |
| 水温 | Water temperature | GB/T13195-1991 | 水质水温的测定温度计法 | Water quality - Determination of water temperature – Thermometer or reversing thermometer method | -- |

5、监测结果

5. Monitoring results

## 表3.2-10（1） 地表水环境质量现状监测结果

## Table 3.2-10 (1) Surface Water Environmental Quality Status Monitoring Results

| 监测项目 | Monitoring item | 单位 | Unit | 监测时间08月01日 Monitoring time: August 1 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1# | 2# | 3# | 4# | 5# | 6# | 7# | 8# |
| pH | pH | 无量纲 | Dimensionless | 7.07 | 7.14 | 7.45 | 7.09 | 7.36 | 7.14 | 7.22 | 7.09 |
| 溶解氧 | Dissolved oxygen | mg/L | mg/L | 7.1 | 7.2 | 7.3 | 7.1 | 7.3 | 7.3 | 7.2 | 7.3 |
| 高锰酸盐指数 | Permanganate index | mg/L | mg/L | 9.1 | 10.4 | 8.5 | 9.3 | 6.2 | 7.1 | 7.9 | 7.5 |
| CODCr | CODCr | mg/L | mg/L | 31 | 29 | 22 | 33 | 15 | 19 | 20 | 18 |
| 阴离子表面活性剂 | Anionic surfactant | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| BOD5 | BOD5 | mg/L | mg/L | 9.0 | 8.6 | 6.0 | 9.2 | 4.5 | 5.8 | 6.0 | 5.6 |
| 氨氮 | Ammonia nitrogen | mg/L | mg/L | 1.27 | 0.55 | 1.04 | 0.694 | 0.305 | 0.416 | 0.637 | 0.416 |
| 总磷 | Total phosphorus | mg/L | mg/L | 0.18 | 0.20 | 0.16 | 0.22 | 0.20 | 0.21 | 0.23 | 0.24 |
| 总氮 | Total nitrogen | mg/L | mg/L | 2.69 | 2.32 | 3.02 | 2.21 | 2.25 | 1.91 | 1.14 | 1.46 |
| 氰化物 | Cyanide | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| 挥发酚 | Volatile phenol | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| 石油类 | Petroleum | mg/L | mg/L | ND | ND | ND | 0.03 | ND | ND | 0.03 | ND |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 氟化物 | Fluoride | mg/L | mg/L | 0.47 | 0.26 | 0.13 | 0.15 | 0.22 | 0.16 | 0.11 | 0.09 | |
| 六价铬 | Hexavalent chromium | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 铜 | Copper | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 锌 | Zinc | mg/L | mg/L | ND | 0.15 | 0.15 | ND | ND | ND | ND | ND | |
| 砷 | Arsenic | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 汞 | Mercury | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 镉 | Cadmium | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 铅 | Lead | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |

续表3.2-10（1）

Continued table3.2-10 (1)

| 监测项目 | Monitoring item | 单位 | Unit | 监测时间08月01日 Monitoring time: August 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1# | 2# | 3# | 4# | 5# | 6# | 7# | 8# | |
| 硒 | Selenium | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 硫化物 | Sulfide | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 氯化物 | Chloride | mg/L | mg/L | 365 | 962 | 481 | 502 | 203 | 176 | 144 | 139 | |
| 硫酸盐 | Sulfate | mg/L | mg/L | 196 | 522 | 406 | 626 | 146 | 67 | 71 | 81 | |
| 粪大肠菌群 | Fecal coliform | MPN/100mL | MPN/100mL | $9.0\times10^2$ | $8.0\times10^2$ | $1.4\times10^3$ | $1.1\times10^3$ | $7.0\times10^2$ | $7.0\times10^2$ | $1.1\times10^3$ | $8.0\times10^2$ | |
| 全盐量 | Total salt | mg/L | mg/L | 1452 | 1729 | 1538 | 1840 | 1249 | 935 | 972 | 1011 | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | content | | | | | | | | | | | |
| 可吸附有机卤素（AOX） | Adsorbable organic halogen (AOX) | μg/L | μg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 色度 | Chromaticity | 倍 | Time | 8 | ND | 5 | 8 | ND | ND | 5 | ND | |
| SS | SS | mg/L | mg/L | 20 | 18 | 24 | 21 | 18 | 19 | 23 | 19 | |
| 水温 | Water temperature | ℃ | ℃ | 30.1 | 30.2 | 29.3 | 29.8 | 29.7 | 29.6 | 29.2 | 30.8 | |

备注：“ND”表示未检出。

Note: “ND” indicates it is not detected.

**表3.2-11（2） 地表水环境质量现状监测结果**

Table 3.2-11 (2) Surface Water Environmental Quality Status Monitoring Results

| 监测项目 | Monitoring item | 单位 | Unit | 监测时间08月03日 Monitoring time: August 3 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1# | 2# | 3# | 4# | 5# | 6# | 7# | 8# | |
| pH | pH | 无量纲 | Dimensionless | 7.08 | 7.15 | 7.46 | 7.10 | 7.36 | 7.15 | 7.23 | 7.08 | |
| 溶解氧 | Dissolved oxygen | mg/L | mg/L | 7.2 | 7.1 | 7.3 | 7.1 | 7.4 | 7.4 | 7.4 | 7.4 | |
| 高锰酸盐指数 | Permanganate index | mg/L | mg/L | 12.5 | 11.3 | 9.8 | 12.3 | 7.8 | 6.7 | 7.3 | 6.9 | |
| CODCr | CODCr | mg/L | mg/L | 30 | 29 | 19 | 30 | 17 | 16 | 19 | 17 | |
| 阴离子表面活 | Anionic | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 性剂 | surfactant | | | | | | | | | | | |

续表3.2-11（2）

Continued table3.2-11 (2)

| 监测项目 | Monitoring item | 单位 | Unit | 监测时间08月03日 Monitoring time: August 3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1# | 2# | 3# | 4# | 5# | 6# | 7# | |
| BOD5 | BOD5 | mg/L | mg/L | 8.8 | 9.4 | 8.0 | 8.4 | 6.0 | 5.4 | 6.0 | |
| 氨氮 | Ammonia nitrogen | mg/L | mg/L | 1.23 | 0.540 | 1.02 | 0.715 | 0.321 | 0.431 | 0.652 | 0 |
| 总磷 | Total phosphorus | mg/L | mg/L | 0.18 | 0.16 | 0.20 | 0.21 | 0.18 | 0.22 | 0.24 | |
| 总氮 | Total nitrogen | mg/L | mg/L | 2.77 | 2.41 | 3.09 | 2.46 | 2.37 | 2.04 | 1.16 | |
| 氰化物 | Cyanide | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | |
| 挥发酚 | Volatile phenol | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | |
| 石油类 | Petroleum | mg/L | mg/L | ND | ND | 0.03 | ND | ND | 0.03 | ND | |
| 氟化物 | Fluoride | mg/L | mg/L | 0.44 | 0.32 | 0.15 | 0.14 | 0.19 | 0.17 | 0.13 | |
| 六价铬 | Hexavalent chromium | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | |
| 铜 | Copper | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | |
| 锌 | Zinc | mg/L | mg/L | ND | 0.14 | 0.14 | ND | ND | ND | ND | |
| 砷 | Arsenic | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | |
| 汞 | Mercury | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | |
| 镉 | Cadmium | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 铅 | Lead | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | |
| 硒 | Selenium | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | |
| 硫化物 | Sulfide | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | |
| 氯化物 | Chloride | mg/L | mg/L | 373 | 946 | 501 | 492 | 193 | 173 | 144 | |
| 硫酸盐 | Sulfate | mg/L | mg/L | 190 | 496 | 406 | 629 | 145 | 64 | 74 | |
| 粪大肠菌群 | Fecal coliform | MPN/100mL | MPN/100mL | $8.0\times10^2$ | $7.0\times10^2$ | $1.4\times10^3$ | $1.1\times10^3$ | $8.0\times10^2$ | $8.0\times10^2$ | $1.4\times10^3$ | 1. |
| 全盐量 | Total salt content | mg/L | mg/L | 1479 | 1806 | 1581 | 1773 | 1201 | 983 | 936 | |
| 可吸附有机卤素（AOX） | Adsorbable organic halogen (AOX) | μg/L | μg/L | ND | ND | ND | ND | ND | ND | ND | |

续表3.2-11（2）

Continued table3.2-11 (2)

| 监测项目 | Monitoring item | 单位 | Unit | 监测时间08月03日 Monitoring time: August 3 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1# | 2# | 3# | 4# | 5# | 6# | 7# | 8# | 9# | 10# |
| 色度 | Chromaticity | 倍 | Time | 6 | ND | ND | 8 | ND | ND | 5 | ND | 6 | ND |
| SS | SS | mg/L | mg/L | 21 | 21 | 24 | 20 | 19 | 19 | 23 | 22 | 27 | 20 |
| 水温 | Water temperature | ℃ | ℃ | 30.1 | 30.3 | 30.4 | 29.9 | 29.6 | 29.7 | 29.8 | 30.2 | 30.4 | 30.3 |

备注：“ND”表示未检出。

Note: “ND” indicates it is not detected.

## 表3.2-12（3） 地表水环境质量现状监测结果

Table 3.2-12 (3) Surface Water Environmental Quality Status Monitoring Results

| 监测项目 | Monitoring item | 单位 | Unit | 监测时间08月04日 Monitoring time: August 4 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1# | 2# | 3# | 4# | 5# | 6# | 7# | 8# |
| pH | pH | 无量纲 | Dimensionless | 7.08 | 7.13 | 7.48 | 7.10 | 7.37 | 7.15 | 7.23 | 7.09 |
| 溶解氧 | Dissolved oxygen | mg/L | mg/L | 7.2 | 7.2 | 7.4 | 7.1 | 7.5 | 7.4 | 7.4 | 7.3 |
| 高锰酸盐指数 | Permanganate Index | mg/L | mg/L | 11.8 | 11.2 | 7.9 | 12.8 | 6.0 | 7.3 | 6.8 | 6.6 |
| CODCr | CODCr | mg/L | mg/L | 29 | 28 | 20 | 31 | 13 | 18 | 17 | 16 |
| 阴离子表面活性剂 | Anionic surfactant | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| BOD5 | BOD5 | mg/L | mg/L | 9.0 | 9.0 | 6.5 | 9.6 | 4.5 | 5.8 | 5.6 | 5.6 |
| 氨氮 | Ammonia nitrogen | mg/L | mg/L | 1.25 | 0.571 | 1.06 | 0.705 | 0.316 | 0.421 | 0.642 | 0.410 |
| 总磷 | Total phosphorus | mg/L | mg/L | 0.11 | 0.14 | 0.15 | 0.22 | 0.20 | 0.24 | 0.22 | 0.25 |
| 总氮 | Total nitrogen | mg/L | mg/L | 2.76 | 2.16 | 3.27 | 2.37 | 2.57 | 2.09 | 1.39 | 1.79 |
| 氰化物 | Cyanide | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| 挥发酚 | Volatile phenol | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| 石油类 | Petroleum | mg/L | mg/L | ND | ND | ND | ND | 0.03 | ND | ND | 0.03 |

续表3.2-12（3）

Continued table3.2-12 (3)

| 监测项目 | Monitoring item | 单位 | Unit | 监测时间08月04日 Monitoring time: August 4 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1# | 2# | 3# | 4# | 5# | 6# | 7# | 8# | |
| 氟化物 | Fluoride | mg/L | mg/L | 0.49 | 0.28 | 0.12 | 0.13 | 0.21 | 0.15 | 0.12 | 0.10 | |
| 六价铬 | Hexavalent chromium | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 铜 | Copper | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 锌 | Zinc | mg/L | mg/L | 0.06 | 0.16 | 0.14 | ND | ND | ND | ND | ND | |
| 砷 | Arsenic | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 汞 | Mercury | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 镉 | Cadmium | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 铅 | Lead | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 硒 | Selenium | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 硫化物 | Sulfide | mg/L | mg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 氯化物 | Chloride | mg/L | mg/L | 377 | 970 | 495 | 498 | 187 | 162 | 138 | 126 | |
| 硫酸盐 | Sulfate | mg/L | mg/L | 195 | 522 | 403 | 628 | 143 | 65 | 73 | 79 | |
| 粪大肠菌群 | Fecal coliform | MPN/100mL | MPN/100mL | $1.1\times10^3$ | $7.0\times10^2$ | $1.1\times10^3$ | $9.0\times10^2$ | $7.0\times10^2$ | $8.0\times10^2$ | $1.4\times10^3$ | $9.0\times10^2$ | |
| 全盐量 | Total salt content | mg/L | mg/L | 1410 | 1858 | 1569 | 1796 | 1234 | 1356 | 1469 | 1267 | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 可吸附有机卤素（AOX） | Adsorbable organic halogen (AOX) | μg/L | μg/L | ND | ND | ND | ND | ND | ND | ND | ND | |
| 色度 | Chromaticity | 倍 | Time | 8 | 5 | 5 | 12 | ND | ND | 6 | ND | |
| SS | SS | mg/L | mg/L | 22 | 19 | 25 | 22 | 19 | 18 | 25 | 20 | |
| 水温 | Water temperature | ℃ | ℃ | 30.1 | 29.4 | 30.5 | 29.6 | 30.8 | 30.7 | 30.6 | 29.3 | |

备注：“ND”表示未检出。

Note: “ND” indicates it is not detected.

**表3.2-13 地表水水文监测一览表**

**Table 3.2-13 Surface Water Hydrological Monitoring**

| 采样日期 Sampling date | 监测项目及监测结果，河宽、水深m，流速m/s，流量$m^3/s$ Monitoring items and results, river width, depth (m), flow rate (m/s), flow ($m^3/s$) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 监测项目 Monitoring item | | 1# | 2# | 3# | 4# | 5# | 6# | 7# | 8# | 9# | 10# |
| Aug. 1 | 河宽 | River width | 140 | 3.5 | 28 | 28 | 56 | 4.8 | 70 | 70 | 56 | 70 |
| Aug. 3 | 河宽 | River width | | | | | | | | | | |
| Aug. 4 | 河宽 | River width | | | | | | | | | | |
| Aug. 1 | 水深 | Depth | 2.5 | 0.4 | 0.8 | 0.8 | 0.5 | 0.6 | 1.2 | 1.4 | 1.6 | 1.5 |
| Aug. 3 | 水深 | Depth | | | | | | | | | | |
| Aug. 4 | 水深 | Depth | | | | | | | | | | |
| Aug. 1 | 流速 | Flow rate | 0 | 0.51 | 0.03 | 0.03 | 0.03 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 |
| Aug. 3 | 流速 | Flow rate | 0 | 0.52 | 0.03 | 0.02 | 0.03 | 0.30 | 0.02 | 0.01 | 0.01 | 0.01 |
| Aug. 4 | 流速 | Flow rate | 0 | 0.49 | 0.03 | 0.04 | 0.03 | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 |
| Aug. 1 | 流量 | Flow | 0 | 0.71 | 0.67 | 0.67 | 0.84 | 0.06 | 0.84 | 0.90 | 0.98 | 1.05 |
| Aug. 3 | 流量 | Flow | 0 | 0.73 | 0.67 | 0.45 | 0.84 | 0.88 | 1.70 | 0.90 | 0.98 | 1.05 |
| Aug. 4 | 流量 | Flow | 0 | 0.69 | 0.67 | 0.90 | 0.84 | 0.09 | 0.84 | 0.90 | 0.98 | 1.05 |

### 3.2.2.2 地表水环境质量现状评价

### 3.2.2.2 Status evaluation of surface water environment quality

1、现状评价

1. Status assessment

评价标准见表3.2-14。

For evaluation standard, see 3.2-14.

**表3.2-14 地表水评价执行标准**

**Table 3.2-14 Surface Water Evaluation Standard**

| 序号 | No. | 评价因子 | Evaluation factors | 单位 | Unit | IV类标准限值 | Class IV Standard Limits | 标准 | Standard |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | pH | pH | 无量 | Dimen | 6~9 | 6~9 | 《地表水 | Surface Water |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 纲 | sionless | | | 环境质量标准》（GB3838-2002） | Environmental Quality Standards (GB3838-2002) |
| 2 | 2 | 溶解氧 | Dissolved oxygen | mg/L | mg/L | ≤3 | ≤3 | | |
| 3 | 3 | 高锰酸盐指数 | Permanganate index | mg/L | mg/L | ≤10 | ≤10 | | |
| 4 | 4 | CODCr | CODCr | mg/L | mg/L | ≤30 | ≤30 | | |
| 5 | 5 | 阴离子表面活性剂 | Anionic surfactant | mg/L | mg/L | ≤0.3 | ≤0.3 | | |
| 6 | 6 | BOD5 | BOD5 | mg/L | mg/L | ≤6 | ≤6 | | |
| 7 | 7 | 氨氮 | Ammonia nitrogen | mg/L | mg/L | ≤1.5 | ≤1.5 | | |
| 8 | 8 | 总磷 | Total phosphorus | mg/L | mg/L | ≤0.3 | ≤0.3 | | |
| 9 | 9 | 氰化物 | Cyanide | mg/L | mg/L | ≤0.02 | ≤0.02 | | |
| 10 | 10 | 挥发酚 | Volatile phenol | mg/L | mg/L | ≤0.01 | ≤0.01 | | |
| 11 | 11 | 石油类 | Petroleum | mg/L | mg/L | ≤0.5 | ≤0.5 | | |
| 12 | 12 | 氟化物 | Fluoride | mg/L | mg/L | ≤1.5 | ≤1.5 | | |
| 13 | 13 | 六价铬 | Hexavalent chromium | mg/L | mg/L | ≤0.05 | ≤0.05 | | |
| 14 | 14 | 铜 | Copper | mg/L | mg/L | ≤1.0 | ≤1.0 | | |
| 15 | 15 | 锌 | Zinc | mg/L | mg/L | ≤2.0 | ≤2.0 | | |
| 16 | 16 | 砷 | Arsenic | mg/L | mg/L | ≤0.1 | ≤0.1 | | |
| 17 | 17 | 汞 | Mercury | mg/L | mg/L | ≤0.001 | ≤0.001 | | |
| 18 | 18 | 镉 | Cadmium | mg/L | mg/L | ≤0.005 | ≤0.005 | | |
| 19 | 19 | 铅 | Lead | mg/L | mg/L | ≤0.05 | ≤0.05 | | |
| 20 | 20 | 硒 | Selenium | mg/L | mg/L | ≤0.02 | ≤0.02 | | |
| 21 | 21 | 硫化物 | Sulfide | mg/L | mg/L | ≤0.5 | ≤0.5 | | |
| 22 | 22 | 粪大肠菌群 | Fecal coliform | mg/L | mg/L | ≤20000 | ≤20000 | | |
| 23 | 23 | 水温 | Water temperature | ℃ | ℃ | 人为造成的环境水温变化应 | The man-made change of environmental water | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 限制在：周平均最大温升≤1；周平均最大温降≤2。 | temperature should be limited as follows: weekly average maximum temperature rise ≤1; weekly average maximum temperature drop ≤2. | | |

采用单因子指数法进行评价，计算公式如下：

The single-factor index method is used for evaluation.The calculation formula is as follows:

$$S_i = \frac{C_i}{C_{si}}$$

$$S_i = \frac{C_i}{C_{si}}$$

式中：*Si*——污染物单因子指数；

Where: *Si*—— single factor index of the pollutant;

*Ci*——i污染物的浓度值，mg/L；

*Ci*——i concentration of pollutant, mg/L；

*Csi*——i污染物的评价标准值，mg/L。

*Csi*——i evaluation standard value of pollutants, mg/L.

pH值标准指数的计算公式：

Calculation formula of the standard pH index:

$$S_{PHj} = \frac{7.0 - pH_j}{7.0 - pH_{sd}} \qquad pH_j \le 7.0$$

$$S_{pHj} = \frac{pH_j - 7.0}{pH_{su} - 7.0} \qquad pH_{j>7.0}$$

$$S_{pHj}=\frac{7.0-pH_j}{7.0-pH_{sd}} \qquad pH_j \le 7.0$$

$$S_{pHj}=\frac{pH_j-7.0}{pH_{su}-7.0} \qquad pH_j>7.0$$

式中：$S_{pHj}$——pH单因子指数；

Where: $S_{pHj}$——pH single factor index;

$pH_j$——j断面pH值；

$pH_j$——pH value of j section;

$pH_{sd}$——地面水水质标准中规定的pH值下限；

$pH_{sd}$——Lower limit of pH value specified in surface water quality standards;

$pH_{su}$——地面水水质标准中规定的pH值上限。

$pH_{su}$——Upper limit of the pH value specified in the surface water quality standard.

对于DO的标准指数，按下式计算：

The standard index of DO should be calculated as follows:

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

$$S_{DO,j}=10-9\frac{DO_j}{DO_s}, DO_j < DO_s$$

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

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

$$S_{DO,j}=10-9\frac{DO_j}{DO_s}, DO_j < DO_s$$

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

式中：$S_{DOj}$—DO值的标准指数；

Where: $S_{DOj}$—standard index of DO;

DOj—DO值的实测值，mg/L;

DOj— measured DO value; mg/L;

$DO_f$—饱和溶解氧浓度，mg/L;

$DO_f$—concentration of saturated dissolved-oxygen, mg/L;

DOs—溶解氧的地面水质标准，mg/L;

DOs—surface water quality standard for dissolved oxygen, mg / L;

T—水温。

T—water temperature.

2、评价因子

2. Evaluation factors

阴离子表面活性剂，氰化物，挥发酚，六价铬，铜，砷，汞，镉，铅，硒，硫化物，可吸附有机卤素（AOX）数据未检出；色度没有相关评价标准，不再进行评价。水质类别评价指标包含21项基本监测指标，各监测断面评价结果见表3.2-15~3.2-16。

Anionic surfactant, cyanide, volatile phenol, hexavalent chromium, copper, arsenic, mercury, cadmium, lead, selenium, sulfide, and adsorbable organic halogen (AOX) were not detected; there is no relevant evaluation standard for chrominance and therefore no more evaluation. The water quality grades evaluation indicators include 21 basic monitoring indicators, and the evaluation results of each monitoring section are shown in Tables 3.2-15 to 3.2-16.

水质类别评价指标包含21项基本监测指标，由监测数据可见，1#监测断面高锰酸盐指数、BOD5超标，2#监测断面高锰酸盐指数、BOD5超标，3#监测断面BOD5超标，4#监测断面高锰酸盐指数、CODCr、BOD5超标，9#监测断面BOD5超标，其它各项指标均可满足《地表水环境质量标准》（GB3838-2002）中的IV类标准。高锰酸盐指数、CODCr、BOD5出现超标是由于泗河及其支流集中接纳沿岸生活污水、农业面源污水以及泗河流域企业废水排放所致。

The water quality grades evaluation indicators include 21 basic monitoring indicators. According to the monitoring data, permanganate index and BOD5 of 1 # monitoring section exceed the standards, permanganate index and BOD5 of 2 # monitoring section exceed the standards, BOD5 of 3 # monitoring section exceed the standard, permanganate index, CODCr, and BOD5 of 4 # monitoring section exceeds the standards, and BOD5 of 9 # monitoring section exceeds the standard. All other indicators can meet the Class IV standard in the Surface Water Environmental Quality Standard (GB3838-2002). The permanganate index, CODCr, and BOD5 exceed standards because the Sihe River and its tributaries intensively received coastal domestic sewage, agricultural non-point source sewage, and waste water discharge from enterprises in the Sihe River basin.

## 表3.2-15 地表水环境质量评价结果

## Table 3.2-15 Evaluation Results of Surface Water Environment Quality

| 监测因子 | Monitoring factor | 1# | | 2# | | 3# | | 4# | | 5# | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 平均值 Average value | 指数 Index | 平均值 Average value | 指数 Index | 平均值 Average value | 指数 Index | 平均值 Average value | 指数 Index | 平均值 Average value | 指数 Index |
| pH | pH | 7.08 | 0.04 | 7.14 | 0.07 | 7.46 | 0.23 | 7.1 | 0.05 | 7.36 | 0.18 |
| 溶解氧 | Dissolved oxygen | 7.2 | 0.08 | 7.2 | 0.09 | 7.3 | 0.06 | 7.1 | 0.14 | 7.4 | 0.04 |
| 高锰酸盐指数 | Permanganate index | 11.1 | **1.11** | 11 | **1.1** | 8.6 | 0.86 | 11.5 | **1.15** | 6.7 | 0.67 |
| CODCr | CODCr | 30 | 1 | 29 | 0.97 | 20 | 0.67 | 31 | **1.03** | 15 | 0.5 |
| BOD5 | BOD5 | 8.9 | **1.48** | 9 | **1.5** | 6.8 | **1.13** | 9.1 | **1.52** | 5 | 0.83 |
| 氨氮 | Ammonia nitrogen | 1.25 | 0.83 | 0.55 | 0.37 | 1.04 | 0.69 | 0.7 | 0.47 | 0.32 | 0.21 |
| 总磷 | Total phosphorus | 0.16 | 0.53 | 0.17 | 0.57 | 0.17 | 0.57 | 0.22 | 0.73 | 0.19 | 0.63 |
| 石油类 | Petroleum | ND | | ND | | ND | | 0.03 | 0.06 | 0.03 | 0.06 |
| 氟化物 | Fluoride | 0.47 | 0.31 | 0.29 | 0.19 | 0.13 | 0.09 | 0.14 | 0.09 | 0.21 | 0.14 |
| 锌 | Zinc | 0.06 | 0.03 | 0.15 | 0.075 | 0.14 | 0.07 | ND | | ND | |
| 粪大肠菌群 | Fecal coliform | 933 | 0.467 | 733 | 0.367 | 1300 | 0.115 | 1033 | 0.517 | 133 | 0.007 |

## 表3.2-16 地表水环境质量评价结果

## Table 3.2-16 Evaluation Results of Surface Water Environment Quality

| 监测因子 | Monitoring factor | 6# | | 7# | | 8# | | 9# | | 10# | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 平均值 Average value | 指数 Index | 平均值 Average value | 指数 Index | 平均值 Average value | 指数 Index | 平均值 Average value | 指数 Index | 平均值 Average value | 指数 Index |
| pH | pH | 7.15 | 0.075 | 7.23 | 0.125 | 7.09 | 0.045 | 7.35 | 0.175 | 7.28 | 0.14 |
| 溶解氧 | Dissolved oxygen | 7.4 | 0.09 | 7.4 | 0.08 | 7.3 | 0.04 | 7.3 | 0.05 | 7.4 | 0.04 |
| 高锰酸盐指数 | Permanganate index | 7 | 0.7 | 7.4 | 0.74 | 7 | 0.7 | 8.5 | 0.85 | 6.8 | 0.68 |
| CODCr | CODCr | 18 | 0.6 | 19 | 0.63 | 17 | 0.57 | 22 | 0.73 | 15 | 0.5 |
| BOD5 | BOD5 | 5.5 | 0.93 | 5.8 | 0.97 | 5.6 | 0.93 | 6.8 | **1.1** | 5.3 | 0.88 |
| 氨氮 | Ammonia nitrogen | 0.43 | 0.29 | 0.64 | 0.43 | 0.41 | 0.27 | 1 | 0.67 | 0.41 | 0.27 |
| 总磷 | Total phosphorus | 0.22 | 0.73 | 0.23 | 0.77 | 0.24 | 0.8 | 0.25 | 0.83 | 0.26 | 0.87 |
| 石油类 | Petroleum | 0.03 | 0.06 | 0.03 | 0.06 | 0.03 | 0.06 | 0.03 | 0.06 | 0.03 | 0.06 |
| 氟化物 | Fluoride | 0.16 | 0.11 | 0.12 | 0.08 | 0.09 | 0.06 | 0.37 | 0.25 | 0.14 | 0.93 |
| 锌 | Zinc | ND | / | ND | / | ND | / | ND | / | ND | / |
| 粪大肠菌群 | Fecal coliform | 767 | 0.038 | 1300 | 0.155 | 933 | 0.467 | 867 | 0.043 | 867 | 0.043 |

备注：“ND”表示未检出

Remarks: “ND” means not detected

2、区域例行监测与评价

2. Regional routine monitoring and evaluation

区域史家营例行监测断面近三年数据，具体见表3.2-17。

The data of the routine regional monitoring sections in Shijiaying for the past three years are shown in Table 3.2-17.

**表3.2-17 泗河南大桥断面2017年1月~12月水质例行监测数据单位：mg/L**

**Table 3.2-17 Routine Regional Water Quality Monitoring Data of Section of South Bridge over Sihe River during January-December 2017 Unit: mg/L**

| 时间 | Time | COD | 氨氮 Ammonia nitrogen |
|---|---|---|---|
| 1月份 | January | 22 | 0.8 |
| 2月份 | February | 21.3 | 0.76 |
| 3月份 | March | 20.5 | 0.64 |
| 4月份 | April | 20.5 | 0.82 |
| 5月份 | May | 21.3 | 0.97 |
| 6月份 | June | 20.9 | 0.81 |
| 7月份 | July | 21.1 | 0.92 |
| 8月份 | August | 21.5 | 0.78 |
| 9月份 | September | 20.7 | 0.67 |
| 10月份 | October | 21.8 | 0.87 |
| 11月份 | November | 20.9 | 0.89 |
| 12月份 | December | 21.3 | 0.97 |
| 平均值 | Average value | 21.15 | 0.82 |
| IV类水体标准值 | Standard values for Class IV Waters | ≤30 | ≤6 |
| 达标情况 | Qualified or not | 达标 Yes | 达标 Yes |

**表3.2-18 泗河南大桥断面2018年1月~12月水质例行监测数据单位：mg/L**

**Table 3.2-18 Routine Regional Water Quality Monitoring Data of Section of South Bridge over Sihe River during January-December 2018 Unit: mg/L**

| 采样日期 | Sampling date | 氨氮 Ammonia | 氟化物 Fluoride | CODcr | 五日生化需氧 | 高锰酸盐指数 | pH | 总磷 Total | 硫酸盐 |
|---|---|---|---|---|---|---|---|---|---|

| | | nitrogen | | | 量<br>BOD5 | Permanganate index | | phosphorus | Sulfate |
|---|---|---|---|---|---|---|---|---|---|
| 1月 | January | 0.23 | 1.42 | 29 | 4.96 | 5.15 | 8.05 | / | / |
| 2月 | February | 0.49 | 1.48 | 22 | 4.30 | 5.60 | 7.89 | 0.05 | / |
| 3月 | March | 1.26 | 2.03 | 27 | 4.28 | 3.84 | 7.88 | / | / |
| 4月 | April | 0.39 | 1.37 | 21 | 4.82 | 5.07 | 7.53 | / | / |
| 5月 | May | 0.63 | 1.42 | 23 | 3.79 | 5.62 | / | / | / |
| 6月 | June | 0.56 | 1.32 | 22 | 4.26 | 6.24 | / | / | / |
| 7月 | July | 0.54 | 0.94 | 27 | 4.22 | 7.04 | / | / | / |
| 8月 | August | 0.53 | 1.12 | 24 | 4.8 | / | 8.43 | / | / |
| 9月 | September | 0.107 | 0.3 | 28 | 8.4 | 4.6 | 6.21 | / | / |
| 10月 | October | 0.167 | 0.32 | 17 | 3.8 | 5.9 | 6.12 | / | / |
| 11月 | November | 0.216 | 0.57 | 22 | 4.7 | 4.9 | 7.88 | 0.04 | 177 |
| 12月 | December | 0.038 | 0.51 | 12 | 4.5 | 4.6 | 8.15 | 0.23 | 183 |
| 平均值 | Average value | 0.43 | 1.07 | 22.87 | 4.74 | 5.37 | 7.58 | 0.11 | 180 |
| 标准 | Standard | 1.5 | 1.5 | 30 | 6 | 10 | 6-9 | 0.3 | 250 |
| 达标情况 | Qualified or not | 达标<br>Yes | 达标<br>Yes | 达标<br>Yes | 达标<br>Yes | 达标<br>Yes | 达标<br>Yes | 达标<br>Yes | 达标<br>Yes |

**表3.2-19 泗河南大桥断面2019年1月~5月水质例行监测数据 单位：mg/L**

**Table 3.2-19 Routine Regional Water Quality Monitoring Data of Section of South Bridge over Sihe River during January-May 2019 Unit: mg/L**

| 采样点位 | 采样日期 | pH（无量纲） | 高锰酸盐指数（mg/L） | CODcr（mg/L） | BOD5（mg/L） | 氨氮（mg/L） | 氟化物（mg/L） |
|---|---|---|---|---|---|---|---|
| Sampling site | Sampling date | pH (dimensionless) | permanganate index (mg/L) | CODcr（mg/L） | BOD5（mg/L） | Ammonia nitrogen（mg/L） | Fluoride（mg/L） |
| 兴隆庄泗河史家营断面 Section in Shijiaying, Sihe River, Xilongzhuang | 2019/1/9 1/9/2019 | 6.74 | 9.9 | 21 | 5.2 | 0.235 | 0.55 |
| | 2019/2/13 2/13/2019 | 7.78 | 4.8 | 15 | 1.5 | 0.948 | 1.36 |
| | 2019/3/6 3/6/2019 | 8.04 | 5.5 | 22 | 3.9 | 0.811 | 0.4 |
| | 2019/4/17 | 8.35 | 5.1 | 21 | 1.9 | 0.165 | 1.42 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 4/17/2019 | | | | | | |
| | 2019/5/8<br>5/8/2019 | 7.98 | 6.6 | 23 | 2.1 | 0.372 | 1.29 |
| 平均值<br>Average value | | / | 6.38 | 20.4 | 2.92 | 0.51 | 1.0 |
| 《地表水环境质量标准》（GB3838-2002）IV类水体标准值<br>*Environmental Quality Standards for Surface Water*（GB3838-2002）Standard values of Class IV waters | | 6~9 | ≤10 | ≤30 | ≤6 | ≤1.5 | ≤1.5 |
| 达标情况<br>Qualified or not | | Yes | Yes | Yes | Yes | Yes | Yes |

根据兖州区2017-2019年泗河史家营例行监测数据，泗河各项监测因子均满足《地表水环境质量标准》（GB3838-2002）IV类水体标准要求。

According to the routine monitoring data of Sihe River in Shijiaying during 2017-2019 in Yanzhou District, the all monitoring factors of Sihe River meet the requirements of Class IV water standards of the *Environmental Quality Standards for Surface Water* (GB3838-2002).

### 3.2.2.3 区域地表水改善方案

### 3.2.2.3 Regional Surface Water Quality Improvement Program

根据《济宁市生态环境保护三年攻坚计划（2018-2020年）》，地表水环境保护实施措施：

According to the "Three-Year Plan for Ecological Environmental Protection of Jining City（2018-2020）, the following surface water environmental protection measures should be implemented:

1、实施水污染全过程综合治理提升工程。

1. To implement a comprehensive improvement project for the entire treatment process of water pollution.

2、实施水资源节约和循环利用提升工程。

2. To implement an improvement project for water conservation and recycling.

3、实施水生态环境保护和修复提升工程。

3. To implement an improvement project for water ecological environment protection and restoration.

4、实施流域环境安全防控体系提升工程。

4. To implement an improvement project for river basin environmental safety and control system.

5、实施水环境监管提升工程。

5. To implement an improvement project for water environment supervision.

6、实施南四湖流域科学保护提升工程。

6. To implement an improvement project for the scientific protection of the Nansi Lake basin.

**表3.2-20 泗河流域治理方案**

**Table 3.2-20 Sihe River Basin Control Scheme**

| 序号 | 县市区 | 关联水体 | 项目名称 | 项目内容 | 投资（万元） | 完成时限 |
|---|---|---|---|---|---|---|
| No. | Counties or cities | Associated waters | Description | Project contents | Investment (ten thousand Yuan) | Deadlines |
| 一 | 水污染源综合治理项目 | | | | | |
| I | Comprehensive treatment project for water pollution sources | | | | | |
| 1 | 泗水县 | 泗河控制单元 | 泗水县第二污水处理厂 | 建设日处理4万m³的污水处理厂。 | 9130.86 | *2019.12* |
| 1 | Sishui County | Sihe River control unit | No.2 sewage treatment plant of Sishui County | Construction of a sewage treatment plant capable of processing 40,000 m³ per day. | 9,130.86 | *Dec. 2019* |
| 2 | 泗水县 | 泗河控制单元 | 泗水第二污水处理厂配套管网建设工程 | 经济开发区规划道路污水管网。 | 13308.1 | *2020.12* |
| 2 | Sishui County | Sihe River control unit | Construction of pipe network of No.2 sewage treatment plant of Sishui County | The economic development zone plans the road sewage pipe network. | 13,308.1 | *Dec. 2020* |
| 3 | 曲阜市 | 泗河控制单元 | 曲阜高铁污水处理厂 | 新建3万吨/日污水处理厂及配套管网。 | 12040.3 | *2020.12* |
| 3 | Qufu City | Sihe River control unit | Qufu Gaotie sewage treatment plant | Newly built 30,000 tons / day sewage treatment plant and supporting pipe network. | 12,040.3 | *Dec. 2020* |
| 4 | 曲阜市 | 泗河控制单元 | 燕京啤酒（曲阜三孔）有限责任公司污水处理站技术改造项目 | 新建厌氧塔、改造调节池、改造酸化池、生化池，新建初尘池、二尘池、生化池、中水回用系统、风机系统。 | 1800 | *2018.12* |
| 4 | Qufu City | Sihe River control unit | Technological transformation project at the sewage treatment station of Yanjing Beer (Qufu | New-built anaerobic tower, transformed regulating reservoir, transformed acidification pool, biochemical pool; newly-built primary dust | 1,800 | *Dec. 2018* |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | Sankong) Co., Ltd. | pool, secondary dust pool, biochemical pool, reclaimed water system, fan system. | | |
| 二 | 生态修复与保护项目 | | | | | |
| II | Ecological restoration and protection project | | | | | |
| 1 | 泗水县 | 泗河控制单元 | 泗水县杨柳镇人工湿地项目 | 河道清淤、土方调整、水生植物种植、绿化护坡、湿地配套设施建设。 | 6000 | *2020.12* |
| 1 | Sishui County | Sihe River control unit | Artificial wetland project in Yangliu Town, Sishui County | Channel cleanout, earthwork adjustment, planting of aquatic plants, slope planting, construction of wetland supporting facilities. | 6,000 | *Dec. 2020* |
| 2 | 泗水县 | 泗河控制单元 | 泗水青龙山河段河道走廊人工湿地工程 | 河道清淤、土方调整、水生植物种植、绿化护坡、河道走廊，生态稳定塘，湿地配套设施建设。 | 3000 | *2020.12* |
| 2 | Sishui County | Sihe River control unit | Artificial wetland project for river corridor at Qinglongshan Stretch in Sishui | Channel cleanout, earthwork adjustment, planting of aquatic plants, slope planting, river corridor, ecological stabilization reservoir, construction of wetland supporting facilities. | 3,000 | *Dec. 2020* |
| 3 | 泗水县 | 泗河控制单元 | 泗水第一污水处理厂深化湿地工程 | 依托音义河泉通路至泗河南路段及周围滩地，利用泗水县第一污水处理厂4万吨/天的排水，建成1200亩强化潜流、表流结合的复合型人工湿地，其中强化潜流湿地约75亩，表流湿地约1125亩。 | 7299.2 | *2019.12* |
| 3 | Sishui County | Sihe River control unit | Deepening wetland project for the second sewage treatment plant of Sishui County | Relying on the section from Yinyihe Quantong Road to the Sihe South Road and the surrounding beaches, the 40,000 tons / day of drainage from the No. 1 Sewage Treatment Plant in Sishui County is used to build a complex artificial wetland with a combined 1,200 mu of enhanced underflow and surface flow, of which about 75 mu of enhanced underflow and about 1,125 mu of surface wetland. | 7,299.2 | *Dec. 2019* |

采取以上措施后，确保兖州区境内泗河流域断面稳定达到《地表水环境质量标准》（GB3838-2002）Ⅳ类水质要求，

Taking the above measures can ensure that the sections in the Sihe basin in the Yanzhou District meet the requirements for Class IV waters in the *Environmental Quality Standards for Surface Water* (GB3838-2002).

### 3.2.3 地下水环境现状监测与评价

### 3.2.3 Groundwater Environment Monitoring and Evaluation

#### 3.2.3.1 监测布点

#### 3.2.3.1 Distribution of monitoring sites

根据《环境影响评价技术导则地下水》（HJ610-2016）中附录A，项目属于Ⅱ类建设项目，地下水敏感程度为不敏感，项目为三级评价。根据项目特点及项目建设地周围自然和社会情况，本次地下水现状监测在厂址及周边布设3个水质监测点，6个水位监测点，本次采样《太阳新材料产业园环境影响报告书》中监测数据，监测点分布见图3.2-3，监测点功能布设见表3.2-21。

In accordance with Annex A of the *Technical Guidelines for Environmental Impact Assessment—Groundwater Environment* (HJ610-2016), the project is a Class Ⅱ construction project where the sensitivity of groundwater is insensitive, and the project is subject to a three-level assessment. According to the characteristics of the project and the natural and social conditions around the project construction site, for the current monitoring of groundwater conditions, there are 3 water quality monitoring points and 6 water level monitoring points at the site and surroundings. The monitoring data in the "Environmental Impact Report of Sun New Material Industrial Park" shall be sampled this time. The distribution of monitoring points is shown in Figure 3.2-3, and the functions of monitoring points are shown in Table 3.2-21.

**表3.2-21 地下水现状监测点布设一览表**

**Table 3.2-21 List of groundwater monitoring sites**

| 编号 | No. | 点位名称 | Name | 相对位置 Relative location | 相对园区边界距离（m） Distance from park boundary (m) | 布设目的 | Purpose |
|---|---|---|---|---|---|---|---|
| 1# | 1# | 南王家屯村 | Nanwangjiatun Village | N | 1020 | 了解项目上游地下水水质及水位情况 | Understand the quality and level of groundwater in the upstream of the project |
| 2# | 2# | 王桥村 | Wangqiao Village | - | - | 了解项目地下水水质及水位情况 | Understand the quality and level of groundwater of the project |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5# | 5# | 付家庙村 | Fujiamiao Village | SW | 870 | 了解项目下游地下水水质及水位情况 | Understand the quality and level of groundwater in the downstream of the project |
| 4# | 4# | 徐家营村 | Xujiaying Village | E | 290 | 了解周边地下水水位情况 | Understand the surrounding groundwater level |
| 8# | 8# | 石家街村 | Shijiajie Village | W | 440 | 了解周边地下水水位情况 | Understand the surrounding groundwater level |
| 10# | 10# | 鹅鸭厂村 | Eyachang Village | SE | 1050 | 了解周边地下水水位情况 | Understand the surrounding groundwater level |

### 3.2.3.2 监测项目

### 3.2.3.2 Monitoring Items

地下水监测项目为：本项目地下水环境水质监测项目为$K^+$、$Na^+$、$Ca^{2+}$、$Mg^{2+}$、$CO^{32-}$、$HCO^{3-}$、$Cl^-$、$SO_4^{2-}$、pH、总硬度、耗氧量、溶解性总固体、挥发酚、硫化物、氨氮、硝酸盐、亚硝酸盐、硫酸盐、六价铬、氯化物、氟化物、氰化物、挥发性酚类、总大肠菌群、铅、汞、镉、六价铬、砷、铜、铁、锌、锰、镍、钴、AOX等36项，同时测量水温、井深、水位和埋深等参数。

The groundwater monitoring items are: there are 36 groundwater monitoring items in this project: $K^+$, $Na^+$, $Ca^{2+}$, $Mg^{2+}$, $CO^{32-}$, $HCO^{3-}$, $Cl^-$, $SO_4^{2-}$, pH, total hardness, oxygen consumption, total dissolved solids, volatile phenols, sulfide, ammonia nitrogen, nitrate, nitrite, sulfate, hexavalent chromium, chloride, fluoride, cyanide, volatile phenols, total coliform, lead, mercury, cadmium, hexavalent chromium, arsenic, Copper, iron, zinc, manganese, nickel, cobalt, AOX. Simultaneously, such paremeters as water temperature, well depth, water level and burial depth are measured.

### 3.2.3.3 监测单位、监测频率与时间

### 3.2.3.3 Monitoring unit, monitoring frequency and time

监测单位：山东中泽环境检测有限公司

Monitoring unit: Shandong ZhongZe Environmental Testing Co., Ltd.

监测频率：每天采样1次，检测1天。

Monitoring frequency: Samples are taken once a day, testing for one day.

监测时间：2019年6月7日

Monitoring time: June 7, 2019

### 3.2.3.4 监测方法

### 3.2.3.4 Monitoring method

各因子检测方法详见表3.2-22。

Monitoring methods for each factor are detailed in Table 3.2-22.

**表3.2-22 地下水监测分析方法一览表**

**Table 3.2-22 List of groundwater monitoring methods**

| 项目名称 | Description | 方法依据 Method basis | 分析方法 | Analytical method | 检出限 Detection limit |
|---|---|---|---|---|---|
| pH | pH | GB/T 5750.4-2006 | 生活饮用水标准检验方法感官性状和物理指标 5.1玻璃电极法 | Standard examination methods for drinking water - Organoleptic and physical parameters 5.1 Glass electrode method | -- |
| 耗氧量（CODMn） | Oxygen consumption (CODMn) | GB/T 5750.7-2006 | 生活饮用水标准检验方法有机物综合指标 1.1酸性高锰酸钾滴定法 | Standard examination methods for drinking water - Aggregate organic parameters 1.1 Acidic potassium permanganate titration | 0.05mg/L |
| 硫化物 | Sulfide | GB/T 16489-1996 | 水质硫化物的测定亚甲基蓝分光光度法 | Water quality-Determination of sulfide-Methylene blue spectrophotometric method | 0.005mg/L |
| 氟化物 | Fluoride | GB/T 5750.5-2006 | 生活饮用水标准检验方法无机非金属指标 3.1离子选择电极法 | Standard examination methods for drinking water - Nonmetal parameters 3.1 Ion selective electrode method | 0.2mg/L |
| 氨氮 | Ammonia nitrogen | GB/T 5750.5-2006 | 生活饮用水标准检验方法无机非金属指标 9.1纳氏试剂分光光度法 | Standard examination methods for drinking water - Nonmetalparameters 9.1 Nessler’s reagent spectrophotometry | 0.02mg/L |
| 挥发酚 | Volatile phenol | GB/T 5750.4-2006 | 生活饮用水标准检验方法感官性状和 | Standard examination methods for drinking water - Organoleptic | 0.002mg/L |

| | | | | | |
|---|---|---|---|---|---|
| | | | 物理指标<br>9.14-氨基安替吡啉分光光度法 | and physical parameters<br>9.1 4-aminoantipyrine spectrophotometry | |
| 硝酸盐 | Nitrate | GB/T 5750.5-2006 | 生活饮用水标准检验方法无机非金属指标<br>5.2紫外分光光度法 | Standard examination methods for drinking water - Nonmetal parameters<br>5.2 Ultraviolet spectrophotometry | 0.2mg/L |
| 亚硝酸盐 | Nitrite | GB/T 5750.5-2006 | 生活饮用水标准检验方法无机非金属指标<br>10.1重氮偶合分光光度法 | Standard examination methods for drinking water - Nonmetal parameters<br>10.1 Diazamine coincidence spectrophotometry | 0.001mg/L |
| 总大肠菌群 | Total coliform group | GB/T 5750.12-2006 | 生活饮用水标准检验方法微生物指标<br>2.1多管发酵法 | Standard examination methods for drinking water - Microbioloical parameters<br>2.1 Multiple-tube fermentation technique | 2MPN/100mL |
| 溶解性总固体 | Soluble total solids | GB/T 5750.4-2006 | 生活饮用水标准检验方法感官性状和物理指标<br>8.1称量法 | Standard examination methods for drinking water - Organoleptic and physical parameters<br>8.1 Weighing method | 10mg/L |
| 总硬度 | Total hardness | GB/T 5750.4-2006 | 生活饮用水标准检验方法感官性状和物理指标<br>7.1乙二胺四乙酸二钠滴定法 | Standard examination methods for drinking water - Organoleptic and physical parameters<br>7.1 EDTA titration | 1.0mg/L |
| 六价铬 | Hexavalent chromium | GB/T 5750.6-2006 | 生活饮用水标准检验方法金属指标<br>10.1二苯碳酰二肼分光光度法 | Standard examination methods for drinking water - Metal parameters<br>10.1 Diphenylcarbazide spectrophotometry | 0.004mg/L |
| 砷 | Arsenic | GB/T 5750.6-2006 | 生活饮用水标准检验方法金属指标<br>氢化物原子荧光法 | Standard examination methods for drinking water - Metal parameters<br>Hydride generation atomic fluorescence spectrometry | 1.0μg/L |

| | | | | | |
|---|---|---|---|---|---|
| 汞 | Mercury | GB/T 5750.6-2006 | 生活饮用水标准检验方法金属指标 8.1原子荧光法 | Standard examination methods for drinking water - Metal parameters 8.1 Atomic fluorescence spectrometry | 0.1μg/L |
| 铅 | Lead | GB/T 7475-1987 | 水质铜、锌、铅、镉的测定原子吸收分光光度法 | Water quality- Determination of copper, zinc, lead and cadmium - Atomic absorption spectrophotometric method | 0.01mg/L |
| 锌 | Zinc | GB/T 5750.6-2006 | 生活饮用水标准检验方法金属指标 5.1原子吸收分光光度法 | Standard examination methods for drinking water - Metal parameters 5.1 Atomic absorption spectrophotometry | 0.05mg/L |
| 镉 | Cadmium | GB/T 7475-1987 | 水质铜、锌、铅、镉的测定原子吸收分光光度法 | Water quality- Determination of copper, zinc, lead and cadmium - Atomic absorption spectrophotometric method | 0.001mg/L |
| 铁 | Iron | GB/T 5750.6-2006 | 生活饮用水标准检验方法金属指标 2.1原子吸收分光光度法 | Standard examination methods for drinking water - Metal parameters 2.1 Atomic absorption spectrophotometry | 0.3mg/L |
| 锰 | Manganese | GB/T 5750.6-2006 | 生活饮用水标准检验方法金属指标 3.1原子吸收分光光度法 | Standard examination methods for drinking water - Metal parameters 3.1 Atomic absorption spectrophotometry | 0.1mg/L |
| 铜 | Copper | GB/T 5750.6-2006 | 生活饮用水标准检验方法金属指标 4.2火焰原子吸收分光光度法 | Standard examination methods for drinking water - Metal parameters 4.2 Flame atomic absorption spectrophotometry | 0.2mg/L |
| 氰化物 | Cyanide | GB/T 5750.5-2006 | 生活饮用水标准检验方法无机非金属指标 | Standard examination methods for drinking water - Nonmetal | 0.002mg/L |

| | | | | | |
|---|---|---|---|---|---|
| | | | 4.1异烟酸-吡唑酮分光光度法 | parameters<br>4.1 Isonicotinic acid-pyrazolone spectrophotometry | |
| 镍 | Nickel | GB/T 5750.6-2006 | 生活饮用水标准检验方法金属指标<br>15.1无火焰原子吸收分光光度法 | Standard examination methods for drinking water - Metal parameters<br>15.1 Nonflame atomic absorption spectrophotometry | 5μg/L |
| 钴 | Cobalt | GB/T 5750.6-2006 | 生活饮用水标准检验方法金属指标<br>14.1无火焰原子吸收分光光度法 | Standard examination methods for drinking water - Metal parameters<br>14.1 Nonflame atomic absorption spectrophotometry | 5μg/L |
| 可吸附有机卤素(AOX) | Absorbable Organic Halide(AOX) | HJ/T 83-2001 | 水质可吸附有机卤素（AOX）的测定离子色谱法 | Water quality Adsorbable organic halogen (AOX) determination Ion chromatography | -- |
| $K^+$ | $K^+$ | HJ812-2016 | 水质可溶性阳离子（锂、钠、铵、钾、钙、镁）的测定离子色谱法 | Water Quality - Determination of water soluble cations (Li+, Na+, NH4+, K+, Ca2+, Mg2+) - Ion chromatography | 0.02mg/L |
| $Na^+$ | $Na^+$ | HJ812-2016 | 水质可溶性阳离子（锂、钠、铵、钾、钙、镁）的测定离子色谱法 | Water Quality - Determination of water soluble cations (Li+, Na+, NH4+, K+, Ca2+, Mg2+) - Ion chromatography | 0.02mg/L |
| $Ca^{2+}$ | $Ca^{2+}$ | HJ812-2016 | 水质可溶性阳离子（锂、钠、铵、钾、钙、镁）的测定离子色谱法 | Water Quality - Determination of water soluble cations (Li+, Na+, NH4+, K+, Ca2+, Mg2+) - Ion chromatography | 0.03mg/L |
| $Mg^{2+}$ | $Mg^{2+}$ | HJ812-2016 | 水质可溶性阳离子（锂、钠、铵、钾、钙、镁）的测定离子色谱法 | Water Quality - Determination of water soluble cations (Li+, Na+, NH4+, K+, Ca2+, Mg2+) - Ion chromatography | 0.02mg/L |
| 碳酸根 | Carbonate | DZ/T0064.49-1993 | 地下水质检验方法滴定法测定碳酸 | Groundwater quality test methods - Determination of | 5mg/L |

| | | | | | |
|---|---|---|---|---|---|
| | | | 根、重碳酸根和氢氧根 | carbonate, bicarbonate and hydroxide by titration | |
| 重碳酸根 | Bicarbonate ion | DZ/T0064.49-1993 | 地下水质检验方法 滴定法测定碳酸根、重碳酸根和氢氧根 | Groundwater quality test methods - Determination of carbonate, bicarbonate and hydroxide by titration | 5mg/L |
| $SO_4^{2-}$ | $SO_4^{2-}$ | HJ84-2016 | 水质无机阴离子（$F^-$、$Cl^-$、$NO^{2-}$、$Br^-$、$NO^{3-}$、$PO_4^{3-}$、$SO_3^{2-}$、$SO_4^{2-}$）的测定离子色谱法 | Water quality - Determination of inorganic anions ($F^-$, $Cl^-$, $NO^{2-}$, $Br^-$, $NO^{3-}$, $PO_4^{3-}$, $SO_3^{2-}$, $SO_4^{2-}$) - Ion chromatography | 0.018mg/L |
| $Cl^-$ | $Cl^-$ | HJ84-2016 | 水质无机阴离子（$F^-$、$Cl^-$、$NO^{2-}$、$Br^-$、$NO^{3-}$、$PO_4^{3-}$、$SO_3^{2-}$、$SO_4^{2-}$）的测定离子色谱法 | Water quality - Determination of inorganic anions ($F^-$, $Cl^-$, $NO^{2-}$, $Br^-$, $NO^{3-}$, $PO_4^{3-}$, $SO_3^{2-}$, $SO_4^{2-}$) - Ion chromatography | 0.007mg/L |

### 3.2.3.5 地下水监测结果

### 3.2.3.5 Groundwater monitoring results

1、地下水位监测结果本次评价期地下水水位现状监测结果见表3.2-23。

1. Groundwater level monitoring results The current groundwater level monitoring results during the evaluation period are shown in Table 3.2-23.

**表3.2-23 拟建项目地下水水位现状监测结果表**

**Table3.2-23 Table of monitoring results of groundwater level of the proposed project**

| 采样日期 | Sampling date | 监测项目 | Monitoring item | 1# | 2# | 5# |
|---|---|---|---|---|---|---|
| 2019.6.7 | 7/6/2019 | pH | pH | 7.42 | 7.30 | 7.54 |
| | | 耗氧量（CODMn） | Oxygen consumption (CODMn) | 0.90 | 1.01 | 0.82 |
| | | 硫化物 | Sulfide | ND | ND | ND |
| | | 氟化物 | Fluoride | 0.5 | 0.3 | 0.4 |
| | | 氨氮 | Ammonia nitrogen | 0.112 | 0.100 | 0.142 |
| | | 挥发酚 | Volatile phenol | ND | ND | ND |
| | | 硝酸盐 | Nitrate | 8.9 | 4.0 | 2.2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 亚硝酸盐 | Nitrite | 0.006 | 0.004 | 0.006 |
| | | 总大肠菌群 | Total coliform group | ND | ND | ND |
| | | 溶解性总固体 | Soluble total solids | 1235 | 768 | 1156 |
| | | 总硬度 | Total hardness | 560.1 | 224.0 | 520.1 |
| | | 六价铬 | Hexavalent chromium | ND | ND | ND |
| | | 砷 | Arsenic | ND | ND | ND |
| | | 汞 | Mercury | ND | ND | ND |
| | | 铅 | Lead | ND | ND | ND |
| | | 锌 | Zinc | ND | ND | ND |
| 2019.6.7 | 7/6/2019 | 镉 | Cadmium | ND | ND | ND |
| | | 铁 | Iron | ND | ND | ND |
| | | 锰 | Manganese | ND | ND | ND |
| | | 铜 | Copper | ND | ND | ND |
| | | 氰化物 | Cyanide | ND | ND | ND |
| | | 镍 | Nickel | ND | ND | ND |
| | | 钴 | Cobalt | ND | ND | ND |
| | | 可吸附有机卤素(AOX) | Absorbable Organic Halide(AOX) | ND | ND | ND |
| | | $K^+$ | $K^+$ | 4.4 | 13.0 | 6.5 |
| | | $Ca^{2+}$ | $Ca^{2+}$ | 154 | 52.7 | 155 |
| | | $Na^+$ | $Na^+$ | 68.0 | 44.9 | 37.7 |
| | | $Mg^{2+}$ | $Mg^{2+}$ | 44.4 | 20.2 | 33.7 |
| | | 碳酸根 | Carbonate | ND | ND | ND |
| | | 重碳酸根 | Bicarbonate ion | 260 | 184 | 210 |
| | | 硫酸盐 | Sulfate | 116 | 34.2 | 200 |
| | | 氯化物 | Chloride | 258 | 94.1 | 174 |
| | | 水温/℃ | Water temperature/℃ | 18.3 | 19.1 | 19.3 |
| | | 井深/m | Well depth/m | 50 | 140 | 40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 埋深/m | Burial depth/m | 10 | 20 | 10 |
| | | 水位/m | Water level/m | 40 | 30 | 42 |

**表3.2-24 下水水位参数一览表**

**Table3.2-24 List of groundwater level parameters**

| 监测项目 | Monitoring item | 4# | 8# | 10# |
|---|---|---|---|---|
| 水温/℃ | Water temperature/℃ | 18.0 | 18.3 | 19.4 |
| 井深/m | Well depth/m | 108 | 37 | 35 |
| 埋深/m | Burial depth/m | 13 | 13 | 13 |
| 水位/m | Water level/m | 46 | 34 | 39 |

### 3.2.3.6 地下水质量现状评价

### 3.2.3.6 Status evaluation of groundwater quality

1、评价因子

1. Evaluation factors

本次评价选取现状监测点监测因子中Na+、pH、耗氧量、氟化物、氨氮、硝酸盐、亚硝酸盐、总硬度、溶解性总固体、硫酸盐、氯化物等作为地下水质量现状评价因子。

In this evaluation, Na, pH, oxygen consumption, fluoride, ammonia nitrogen, nitrate, nitrite, total hardness, soluble total solids, sulfate, chloride, etc. are selected as the evaluation factors of groundwater quality.

2、评价方法

2. Evaluation method

采用单因子指数法作为评价方法。对于浓度越高，危害性越大的评价因子，其计算公式为：

The single-factor index method is used for evaluation. For the evaluation factors whose danger increases proportionately to their concentration, the calculation formula is:

$$P_{ij}=\frac{C_{ij}}{C_{si}}$$

$$P_{ij}=\frac{C_{ij}}{C_{si}}$$

式中：$P_{ij}$—第i项评价因子在j点的单因子指数；＞1则表示超标。

Where: $P_{ij}$—the single-factor index of the $i^{th}$ evaluation factor at the point j; > 1 means that it

exceeds the standard.

$C_{ij}$—第i项评价因子在j点的实测浓度（mg/L）；

$C_{ij}$—the measured concentration of the $i^{th}$ evaluation factor at point j (mg / L);

$C_{si}$—第i项评价因子的评价标准值（mg/L）。

$C_{si}$—the evaluation standard value of the $i^{th}$ evaluation factor (mg / L).

pH浓度限于一定范围内的评价因子，其单因子指数按下式计算：

The pH concentration is limited to evaluation factors within a certain range, and its single factor index is calculated as follows:

$$S_{pHj} = \frac{7.0 - pH_j}{7.0 - pH_{sd}} \qquad pH_j \le 7.0$$

$$S_{pHj} = \frac{pH_j - 7.0}{pH_{su} - 7.0} \qquad pH_j > 7.0$$

$$S_{pHj} = \frac{7.0 - pH_j}{7.0 - pH_{sd}} \qquad pH_j \le 7.0$$

$$S_{pHj} = \frac{pH_j - 7.0}{pH_{su} - 7.0} \qquad pH_j > 7.0$$

式中：$S$pHj—pH的单因子指数，＞1则表示超标。；

Where: $S_{pHj}$——single factor index of pH;> 1 means that it exceeds the standard. ；

pHj—点pH的实测值；

pHj—the measured value of the point pH;

pHsd—水质标准中规定的pH下限；

pHsd—the lower pH limit specified in the water quality standard;

pHsu—水质标准中规定的pH上限。

pHsu——the upper pH limit specified in the water quality standard.

3、评价标准

3. Evaluation standard

根据《环境影响评价技术导则-地下水环境》（HJ610-2016），地下水水质现状评价标准应以GB/T14848-2017和有关法规及当地的环保要求作为基本依据。对属于GB/T14848水质指标的评价因子，应按其规定的水质分类标准值进行评价；对不属于GB/T14848水质指标的评价

因子，可参照国家（行业、地方）相关标准进行评价。

In accordance with the *Technical Guidelines for Environmental Impact Assessment—Groundwater Environment* (HJ610-2016), the groundwater quality evaluation criteria should be based on GB / T14848-2017 and relevant regulations and local environmental protection requirements. The evaluation factors subject to the GB / T14848 water quality index should be evaluated according to the specified water quality classification standards; the evaluation factors not subject to the GB / T14848 water quality index can be evaluated with reference to relevant national (industry, local) standards.

执行《地下水质量标准》（GB/T14848-2017）中的III类标准，各评价因子标准值见表3.2-25。

Class III standards in the Quality Standard for Groundwater (GB/T14848-2017) should be implemented. The standard values of each evaluation factor are shown in Table 3.2-25.

**表3.2-25 地下水质量现状评价标准**

**Table 3.2-25 Quality Evaluation Standard for Groundwater**

| 序号 | No. | 评价因子 | Evaluation factors | 单 位 | Unit | III类标准限值 Category III standard limit | 标准 Standard |
|---|---|---|---|---|---|---|---|
| 1 | 1 | pH | pH | 无量纲 | Dimensionless | 6.5~8.5 | 《地下水环境质量标准》（GB/T14848-2017） *Environmental Quality Standards for Groundwater*（GB/T14848-2017） |
| 2 | 2 | 耗氧量（CODMn） | Oxygen consumption (CODMn) | mg/L | mg/L | ≤3.0 | |
| 3 | 3 | 硫化物 | Sulfide | mg/L | mg/L | ≤0.02 | |
| 4 | 4 | 氟化物 | Fluoride | mg/L | mg/L | ≤1.0 | |
| 5 | 5 | 氨氮 | Ammonia nitrogen | mg/L | mg/L | ≤0.5 | |
| 6 | 6 | 挥发酚 | Volatile phenol | mg/L | mg/L | ≤0.002 | |
| 7 | 7 | 硝酸盐 | Nitrate | mg/L | mg/L | ≤20.0 | |
| 8 | 8 | 亚硝酸盐 | Nitrite | mg/L | mg/L | ≤1.0 | |
| 9 | 9 | 总大肠菌群 | Total coliform group | CFU/100mL | CFU/100mL | ≤3.0 | |
| 10 | 10 | 溶解性总固体 | Soluble total solids | mg/L | mg/L | ≤1000 | |
| 11 | 11 | 总硬度 | Total hardness | mg/L | mg/L | ≤450 | |
| 12 | 12 | 六价铬 | Hexavalent chromium | mg/L | mg/L | ≤0.05 | |

| 序号 | No. | 评价因子 | Evaluation factors | 单 位 | Unit | III类标准限值 Category III standard limit | 标准 Standard |
|---|---|---|---|---|---|---|---|
| 13 | 13 | 砷 | Arsenic | mg/L | mg/L | ≤0.01 | |
| 14 | 14 | 汞 | Mercury | mg/L | mg/L | ≤0.001 | |
| 15 | 15 | 铅 | Lead | mg/L | mg/L | ≤0.01 | |
| 16 | 16 | 锌 | Zinc | mg/L | mg/L | ≤1.00 | |
| 17 | 17 | 镉 | Cadmium | mg/L | mg/L | ≤0.005 | |
| 1 | 1 | 铁 | Iron | mg/L | mg/L | ≤0.3 | |
| 19 | 19 | 锰 | Manganese | mg/L | mg/L | ≤0.1 | |
| 20 | 20 | 铜 | Copper | mg/L | mg/L | ≤1.0 | |
| 21 | 21 | 氰化物 | Cyanide | mg/L | mg/L | ≤0.05 | |
| 22 | 22 | 镍 | Nickel | mg/L | mg/L | ≤0.02 | |
| 23 | 23 | 钴 | Cobalt | mg/L | mg/L | ≤0.05 | |
| 24 | 24 | 硫酸盐 | Sulfate | mg/L | mg/L | ≤250 | |
| 25 | 25 | 氯化物 | Chloride | mg/L | mg/L | ≤250 | |
| 26 | 26 | Na+ | Na+ | mg/L | mg/L | ≤200 | |

4、评价结果

4. Assessment results

依据上述方法对本次监测结果进行评价计算，地下水各项污染物的单因子指数见表3.2-26。

The monitoring results were evaluated and calculated by the above method. The single factor indexes of groundwater pollutants are shown in Table 3.2-26.

**表3.2-26 本次地下水监测各评价因子单因子指数表**

**Table 3.2-26 Table of single-factor index of each evaluation factor for this groundwater monitoring**

| 监测项目 | Monitoring item | 1# | 2# | 5# |
|---|---|---|---|---|
| pH | pH | 0.28 | 0.2 | 0.36 |
| 耗氧量（CODMn） | Oxygen consumption (CODMn) | 0.300 | 0.337 | 0.273 |
| 氟化物 | Fluoride | 0.500 | 0.300 | 0.400 |

| | | | | |
|---|---|---|---|---|
| 氨氮 | Ammonia nitrogen | 0.224 | 0.200 | 0.284 |
| 硝酸盐 | Nitrate | 0.445 | 0.200 | 0.110 |
| 亚硝酸盐 | Nitrite | 0.006 | 0.004 | 0.006 |
| 溶解性总固体 | Soluble total solids | **1.235** | 0.768 | **1.156** |
| 总硬度 | Total hardness | **1.245** | 0.498 | **1.156** |
| Na+ | Na+ | 0.340 | 0.225 | 0.189 |
| 硫酸盐 | Sulfate | 0.464 | 0.137 | 0.8 |
| 氯化物 | Chloride | **1.03** | 0.38 | 0.70 |

备注：未检出项不评价。

Remarks: the items that are not detected will not be evaluated.

由上表可知，区域监测点位1#溶解性总固体、总硬度、氯化物超标，3#溶解性总固体超标，5#溶解性总固体、总硬度超标，其余监测项目均能满足《地下水质量标准》（GB/T14848-2017）III类标准，区域地下水环境质量一般。

As can be seen from the above table, the total dissolved solids, total hardness and chloride at regional monitoring point 1# exceed the standards; the total dissolved solids at 3# exceed the standard; the total dissolved solids and total hardness at 5# exceed the standards; the monitoring items at other monitoring points all meet Class III standards in the Quality Standard for Groundwater , and the regional groundwater environment quality is average.

**超标原因：**评价区域内溶解性总固体、总硬度、氯化物超标主要与当地水文地质条件有关。

**Reasons for exceeding the standard:** The excessive total dissolved solids, total hardness, and chloride in the evaluation area are mainly related to local hydrogeological conditions.

### 3.2.4 噪声现状监测与评价

### 3.2.4 Noise Status Monitoring and Evaluation

#### 3.2.4.1 噪声现状监测

#### 3.2.4 Noise Status Monitoring

1、监测布点

1. Monitoring points

本次评价对厂界环境噪声布设4个检测点，监测内容见表3.2-27。

To evaluate the environmental noise at the plant boundary, 4 monitoring points are set up, and the monitoring content is shown in Table 3.2-27.

**表3.2-27 噪声监测布点一览表**

**Table 3.2-27 List of noise monitoring points**

| 编号 | No. | 点位名称 | Name | 布设位置 | Position | 布设目的 | Purpose |
|---|---|---|---|---|---|---|---|
| 1# | 1# | 化机浆车间北厂界 | North plant boundary of APMP workshop | 化机浆车间北厂界外1m | 1m outside the north plant boundary of APMP workshop | 了解现有声环境质量现状 | Understand the quality of the acoustic environment |
| 2# | 2# | 文化纸东厂界 | Printing-and-writing paper plant east boundary | 文化纸东厂界外1m | 1m outside the printing-and-writing paper plant east boundary | 了解现有声环境质量现状 | Understand the quality of the acoustic environment |
| 3# | 3# | 文化纸南厂界 | Printing-and-writing paper plant south boundary | 文化纸南厂界外1m | 1m outside the printing-and-writing paper plant south boundary | 了解现有声环境质量现状 | Understand the quality of the acoustic environment |
| 4# | 4# | 原料堆场西厂界 | Raw material stockyard west boundary | 文化纸西厂界外1m | 1m outside the raw material stockyard west boundary | 了解现有声环境质量现状 | Understand the quality of the acoustic environment |

2、监测时间和频率

2.Monitoring time and frequency

2019年9月10日监测1天。

Monitored for 1 day on September 10, 2019.

3、监测方法

3. Monitoring method

测量方法分别按《声环境质量标准》（GB3096-2008）进行。

The measurement method should be performed according to the *Environmental Quality Standard for Noise* (GB3096-2008).

4、监测结果

4. Monitoring results

监测结果见表3.2-28。

Monitoring results are shown in Table 3.2-28.

**表3.2-28 噪声现状监测结果表**

**Table 3.2-28 Table of noise monitoring results**

| 编号 No. | 测点位置 | Position of monitoring point | 10/9/2019 | |
|---|---|---|---|---|
| | | | 昼间 Daytime | 夜间 Nighttime |
| 1# | 1#东厂界 | 1# east plant boundary | 50.2 | 43.3 |
| 2# | 2#南厂界 | 2# south plant boundary | 55.6 | 45.5 |
| 3# | 3#西厂界 | 3# west plant boundary | 54.5 | 43.2 |
| 4# | 4#北厂界 | 4# north plant boundary | 51.4 | 42.7 |

### 3.2.4.2 噪声现状评价

### 3.2.4 Noise Status Evaluation

1、评价因子

1. Evaluation factors

评价因子为昼间、夜间等效连续A声级（LAeq）。

The evaluation factor is the equivalent continuous A-weighted sound level (LAeq) during the day and night.

2、评价方法

2. Evaluation method

评价方法采用超标值法，计算公式为：

The exceeded value method is used for evaluation, and the calculation formula is:

$$P = L_{eq} - L_b$$

式中：P—超标值，dB(A)；

Where: P— the exceeded value, dB (A);

Leq—测点等效A声级，dB(A)；

Leq—equivalent A-weighted sound level at monitoring points, dB (A);

Lb—噪声评价标准，dB(A)。3、评价标准

Lb—Noise evaluation standard, dB (A). 3. Evaluation standard

评价标准见表3.2-29。

For evaluation standard, see 3.2-29.

**表3.2-29 噪声标准值**

**Table 3.2-29 Noise standard value**

| 项目<br>Item | 限值 dB（A）<br>Limit dB（A） | |
|---|---|---|
| | 昼间<br>Daytime | 夜间<br>Nighttime |
| 《工业企业厂界环境噪声排放标准》（GB12348-2008）3类<br>Emisson standard for industrial enterprises noise at boundary (GB12348-2008) Class 3 | 65 | 55 |

4、评价结果

4. Assessment results

厂址的噪声现状评价结果见表3.2-30。

Evaluation results of the noise status of the site are shown in Table 3.2-30.

**表3.2-30 噪声现状评价结果表 单位：dB(A)**

**Table3.2-30 Table of noise evaluation results Unit: dB(A)**

| 监测点 | Monitoring points | 昼间<br>Daytime | | | 夜间<br>Nighttime | | |
|---|---|---|---|---|---|---|---|
| | | Leq | Lb | P | Leq | Lb | P |
| 1#东厂界 | 1# east plant boundary | 50.2 | 65 | -14.8 | 43.3 | 55 | -11.7 |
| 2#南厂界 | 2# south plant boundary | 55.6 | | -9.4 | 45.5 | | -9.5 |
| 3#西厂界 | 3# west plant boundary | 54.5 | | -10.5 | 43.2 | | -11.8 |
| 4#北厂界 | 4# north plant boundary | 51.4 | | -13.6 | 42.7 | | -12.3 |

根据上表现状评价结果得知：项目各监测点昼间、夜间实测值均满足《声环境质量标准》（GB3096-2008）中的3类标准要求。

It is leaned from the status evaluation results in the above table that: the measured values during the day and night at each monitoring point of the project meet the requirements of Class 3 standards in the *Environmental Quality Standard for Noise* (GB3096-2008).

### 3.2.5 土壤环境质量现状

### 3.2.5 Status of soil environment quality

#### 3.2.5.1 土壤现状监测

#### 3.2.4 Soil Status Monitoring

1、监测点位

1. Monitoring points

根据《环境影响评价技术导则土壤环境（试行）》（HJ964-2018）中造纸和制浆属于Ⅱ类项目，位于工业园内，不敏感、占地为中型，项目为三级评价，需设3个点表层样（0～20cm），本次引用《太阳新材料产业园环境影响报告书》中6#点中表层样，同时补测2个表层样，具体见表3.2-31。监测布点情况见图3.2-5。

According to the *Technical Guidelines for Environmental Impact Assessment —Soil Environment* (Trial) (HJ964-2018) , paper making and pulping are classified as Class II projects, which are located in industrial parks. They are insensitive and occupy medium-sized land. Top soil samples (0-20cm) at three points are required. This time, the top soil sample at point 6 # in the "Environmental Impact Report of Sun New Material Industrial Park" was cited, and two top soil samples were re-tested at the same time. See Table 3.2-31 for details.The layout of monitoring points is shown in Figure 3.2-5.

**表3.2-31 土壤环境检测布点一览表**

**Table 3.2-31 List of soil environment monitoring points**

| 编号 | No. | 点位名称 | Name | 布点位置 | Location | 布设目的 | Purpose | 监测因子 | Monitoring factor |
|---|---|---|---|---|---|---|---|---|---|
| 1# | 1# | 文化纸建设项目区 | Printing-and-writing paper construction project area | 建设用地范围内 | Within the scope of construction land | 了解项目区建设用地土壤环境质量现状（建设用地背景点） | Understand the current status of soil environmental quality of construction land in the project area (construction site background site) | 表层样，基本项+pH | Top soil sample, basic item +pH |
| 2# | 2# | 文化纸建设 | Printing-and-writing paper construction project area | 建设用地范 | Within the scope of construction land | 了解项目区建设用地土壤环境质量现状（建设用地背景点） | Understand the current status of soil environmental quality of construction | 表层样，基本项+pH | Top soil sample, basic item +pH |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 项目区 | | 围内 | | | land in the project area (construction site background site) | | |
| 6# | 6# | 文化纸建设项目区 | Printing-and-writing paper construction project area | 建设用地范围内 | Within the scope of construction land | 了解项目区建设用地土壤环境质量现状（建设用地背景点） | Understand the current status of soil environmental quality of construction land in the project area (construction site background site) | 表层样，基本项+pH | Top soil sample, basic item +pH |

备注：6#点引用《太阳新材料产业园环境影响报告书》中6#点中表层样。

Remarks: the top soil sample at point 6 # in the "Environmental Impact Report of Sun New Material Industrial Park" is cited

2、监测项目

2. Monitoring items

《土壤环境质量建设用地土壤污染风险管控标准》中基本因子：砷、镉、铬（六价）、铜、铅、汞、镍、四氯化碳、氯仿、氯甲烷、1,1-二氯乙烷、1,2-二氯乙烷、1,1-二氯乙烯、顺-1,2-二氯乙烯、反-1,2-二氯乙烯、二氯甲烷、1,2-二氯丙烷、1,1,1,2-四氯乙烷、1,1,2,2-四氯乙烷、四氯乙烯、1,1,1-三氯乙烷、1,1,2-三氯乙烷、三氯乙烯、1,2,3-三氯丙烷、氯乙烯、苯、氯苯、1,2-二氯苯、1,4-二氯苯、乙苯、苯乙烯、甲苯、间二甲苯+对二甲苯、邻二甲苯、硝基苯、苯胺、2-氯酚、苯并[a]蒽、苯并[a]芘、苯并[b]荧蒽、苯并[k]荧蒽、䓛、二苯并[a,h]蒽、茚并[1,2,3-cd]芘、萘共45项基本项目、pH。

The basic factors in Soil environmental quality Risk control standard for soil contamination of development land: Arsenic, cadmium, chromium (hexavalent), copper, lead, mercury, nickel, carbon tetrachloride, chloroform, methyl chloride, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-dichloroethylene, Cis-1,2-dichloroethylene, trans-1,2-Dichloroethylene, dichloromethane, 1,2-Dichloropropane, 1,1,1,2-Tetrachloroethane, 1,1,2,2-tetrachloroethane, Perchloroethylene, 1,1,1-trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, 1,2,3-trichloropropane, chloroethylene, benzene, chlorobenzene, 1,2-dichlorobenzene, 1,4-Dichlorobenzene, ethylbenzene, styrene, methylbenzene, m-xylene+p-xylene, o-xylene, nitrobenzene, aniline, 2-chlorophenol, Benz(a)anthracene, Benzo[a]pyrene, Benzo[b]fluorathene, Benzo[k]fluoranthene, Chrysene, Dibenz[a,h] anthracene, Indeno[1,2,3-cd]Pyrene, naphthalene, totaling 45 items, and pH.

3、监测频率与时间

3. Monitoring frequency and time

青岛中博华科检测科技有限公司于2019年9月10日监测一天，监测一次。

Qingdao Zhongbo Huake Testing Technology Co., Ltd.has monitored for one day on September 10, 2019, and for one time.

### 3.2.5.2 监测方法

### 3.2.5.2 Monitoring method

监测方法见表3.2-32。

Monitoring methods are shown in Table 3.2-32.

**表3.2-32 土壤检测方法一览表**

**Table 3.2-32 List of soil monitoring methods**

| 检测项目 | Detection item | 标准代号 Standard code | 分析方法 | Analytical method | 检出限 Detection limit |
|---|---|---|---|---|---|
| 汞 | Mercury | GB/T22105.1-2008 | 土壤质量总汞、总砷、总铅的测定原子荧光法第一部分：土壤中总汞的测定 | Soil quality - Analysis of total mercury, arsenic and lead contents - Atomic fluorescence spectrometry - Part 1: Analysis of total mercury contents in soils | 0.002mg/kg |
| 铅 | Lead | GB/T17141-1997 | 土壤铅、镉的测定石墨炉原子吸收分光光度法 | Soil quality-Determination of lead, cadmium-Graphite furnace atomic absorption spectrophotometry | 0.1mg/kg |
| 砷 | Arsenic | GB/T22105.2-2008 | 土壤质量总汞、总砷、总铅的测定原子荧光法第二部分：土壤中总砷的测定 | Soil quality - Analysis of total mercury, arsenic and lead contents - Atomic fluorescence spectrometry - Part 2: Analysis of total arsenic contents in soils | 0.01mg/kg |
| 镉 | Cadmium | GB/T17141-1997 | 土壤铅、镉的测定石墨炉原子吸收分光光度法 | Soil quality-Determination of lead, cadmium-Graphite furnace atomic absorption spectrophotometry | 0.01mg/kg |
| 镍 | Nickel | GB/T17139- | 土壤质量镍的测定火 | Soil quality--Determination of | 5mg/kg |

| | | | | | |
|---|---|---|---|---|---|
| | | 1997 | 焰原子吸收分光光度法 | nickel--Flame atomic absorption spectrophotometry | |
| 铜 | Copper | GB/T17138-1997 | 土壤质量铜、锌的测定火焰原子吸收分光光度法 | Soil quality--Determination of copper, zinc--Flame atomic absorption spectrophotometry | 1mg/kg |
| 六价铬 | Hexavalent chromium | HJ687-2014 | 固体废物六价铬的测定碱消解/火焰原子吸收分光光度法 | Solid waste-Determination of Hexavalent Chromium - by alkali-digestion /flame atomic absorption spectrophotometry | 2mg/kg |
| 四氯化碳 | Carbon tetrachloride | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.3μg/kg |
| 氯甲烷 | Chloromethane | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.0μg/kg |
| 1，1-二氯乙烷 | 1,1-dichloroethane | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.2μg/kg |
| 1,2-二氯乙烷 | 1,2-dichloroethane | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.3μg/kg |
| 1，1-二氯乙烯 | 1,1-dichloroethylene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.0μg/kg |

| | | | | | |
|---|---|---|---|---|---|
| 反式-1，2-二氯乙烯 | Trans-1,2-Dichloroethylene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.4μg/kg |
| 顺式1,2-二氯乙烯 | Cis-1,2-Dichloroethylene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.3μg/kg |
| 二氯甲烷 | Dichloromethane | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.5μg/kg |
| 1，2-二氯丙烷 | 1,2-Dichloropropane | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.1μg/kg |
| 1，1，1，2-四氯乙烷 | 1,1,1,2-Tetrachloroethane | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.2μg/kg |
| 1，1，2，2-四氯乙烷 | 1,1,1,2-Tetrachloroethane | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.2μg/kg |
| 1,1,1-三氯乙烷 | 1, 1, 1-Trichloroethane | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.3μg/kg |
| 1，1，2- | 1,1,2-Trichloroethane | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕 | Soil and Sediment - Determination of | 1.2μg/kg |

| | | | | | |
|---|---|---|---|---|---|
| 三氯乙烷 | | | 集/气相色谱-质谱法 | Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | |
| 三氯乙烯 | Trichloroethylene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.2μg/kg |
| 1，2，3-三氯丙烷 | 1,2,3-trichloropropane | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.2μg/kg |
| 氯乙烯 | Vinyl chloride | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.0μg/kg |
| 间，对-二甲苯 | m-, p--xylene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.2μg/kg |
| 邻二甲苯 | O-xylene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.2μg/kg |
| 乙苯 | Ethylbenzene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.2μg/kg |
| 甲苯 | Toluene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge | 1.3μg/kg |

| | | | | | |
|---|---|---|---|---|---|
| | | | | and Trap /Gas chromatography/Mass spectrometry method | |
| 氯苯 | Chlorobenzene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.2μg/kg |
| 苯 | Benzene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.9μg/kg |
| 1，2-二氯苯 | 1,2-dichlorobenzene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.5μg/kg |
| 1，4-二氯苯 | 1,4-dichlorobenzene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.5μg/kg |
| 苯乙烯 | Styrene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.1μg/kg |
| 氯仿 | Chloroform | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass spectrometry method | 1.1μg/kg |
| 四氯乙烯 | Tetrachloroethylene | HJ605-2011 | 土壤和沉积物挥发性有机物的测定吹扫捕集/气相色谱-质谱法 | Soil and Sediment - Determination of Volatile Organic Compounds - Purge and Trap /Gas chromatography/Mass | 1.4μg/kg |

| | | | | | |
|---|---|---|---|---|---|
| | | | | spectrometry method | |
| 硝基苯 | Nitrobenzene | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | 0.09mg/kg |
| 苯胺 | Aniline | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | -- |
| 2-氯酚 | 2-Chlorophenol | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | 0.06mg/kg |
| 苯并[α]蒽 | Benz[α]fluoranthene | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | 0.1mg/kg |
| 苯并[α]芘 | Benz[α]pyrene | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | 0.1mg/kg |
| 苯并[b]荧蒽 | Benz[b]fluoranthene | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | 0.2mg/kg |
| 二苯并[a,h]蒽 | Dibenz[a,h]anthracene | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | 0.1mg/kg |
| 茚并[1,2,3-cd]芘 | Indeno[1,2,3-cd]Pyrene | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | 0.1mg/kg |

| | | | | | |
|---|---|---|---|---|---|
| 苯并[k]荧蒽 | Benz[k]fluoranthene | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | 0.1mg/kg |
| 䓛 | Chrysene | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | 0.1mg/kg |
| 萘 | Naphthalene | HJ834-2017 | 土壤和沉积物半挥发性有机物的测定气相色谱-质谱法 | Soil and Sediment - Determination of Semi-volatile Organic Compounds - Purge and Trap /Mass spectrometry method | 0.09mg/kg |
| 锑 | Antimony | HJ680-2013 | 土壤和沉积物汞、砷、硒、铋、锑的测定微波消解/原子荧光法 | Soil and Sediment - Determination of mercury, arsenic, selenium, bismuth, antimony - Microwave dissolution/Atomic fluorescence Spectrometry | 0.01mg/kg |
| 铍 | Beryllium | HJ737-2015 | 土壤和沉积物铍的测定石墨炉原子吸收分光光度法 | Soil and Sediment - Determination of beryllium-Graphite furnace atomic absorption spectrophotometry | 0.03mg/kg |
| 钴 | Cobalt | HJ803-2016 | 土壤和沉积物12种金属元素的测定王水提取-电感耦合等离子体质谱法 | Soil and Sediment - Determination of aqua regia extracts of 12 metal elements - Inductively coupled plasma mass spectrometry | 0.04mg/kg |

### 3.2.5.3 监测结果

### 3.2.5.3 Monitoring result

土壤各取样点监测结果见表3.2-33。

Monitoring results of soil sampling points are shown in Table 3.2-33.

**表3.2-33（1） 6#土壤监测结果一览表**

**Table3.2-33**(1) **List of soil monitoring methods at 6#**

| 检测项目 | Monitoring item | 单位 Unit | 监测点位及结果 Monitoring point position and result |
|---|---|---|---|
| | | | 6#园区造纸区域 Paper making areas of 6# park |
| 铜 | Copper | mg/kg | 28 |
| 砷 | Arsenic | mg/kg | 9.06 |
| 镉 | Cadmium | mg/kg | 0.31 |
| 铅 | Lead | mg/kg | 12.4 |
| 汞 | Mercury | mg/kg | 0.185 |
| 镍 | Nickel | mg/kg | 72 |
| 六价铬 | Hexavalent chromium | mg/kg | ND |
| 锑 | Antimony | mg/kg | ND |
| 铍 | Beryllium | mg/kg | 0.47 |
| 钴 | Cobalt | mg/kg | 1.28 |
| 氯甲烷 | Chloromethane | μg/kg | ND |
| 1,2-二氯乙烷 | 1,2-dichloroethane | μg/kg | ND |
| 1,1-二氯乙烯 | 1,1-Dichloroethylene | μg/kg | ND |
| 氯乙烯 | Vinyl chloride | μg/kg | ND |
| 苯乙烯 | Styrene | μg/kg | ND |
| 二氯甲烷 | Dichloromethane | μg/kg | ND |
| 顺式1,2-二氯乙烯 | Cis-1,2-Dichloroethylene | μg/kg | ND |
| 1,1-二氯乙烷 | 1, 1-Dichloroethane | μg/kg | ND |
| 反式1,2-二氯乙烯 | Trans-1,2-Dichloroethylene | μg/kg | ND |
| 三氯甲烷 | Trichloromethane | μg/kg | 3.1 |
| 1,1,1-三氯乙烷 | 1, 1, 1-Trichloroethane | μg/kg | ND |
| 四氯化碳 | Carbon tetrachloride | μg/kg | 6.8 |
| 苯 | Benzene | μg/kg | 2.4 |
| 三氯乙烯 | Trichloroethylene | μg/kg | ND |
| 1,2-二氯丙烷 | 1, 2-Dichloropropane | μg/kg | 1.6 |
| 甲苯 | Toluene | μg/kg | 4.2 |

| 检测项目 | Monitoring item | 单位 Unit | 监测点位及结果 Monitoring point position and result |
|---|---|---|---|
| | | | 6#园区造纸区域 Paper making areas of 6# park |
| 1,1,2-三氯乙烷 | 1,1,2-Trichloroethane | μg/kg | ND |
| 四氯乙烯 | Tetrachloroethylene | μg/kg | ND |
| 氯苯 | Chlorobenzene | μg/kg | ND |
| 1,1,1,2-四氯乙烷 | 1, 1, 1, 2-Tetrachloroethane | μg/kg | ND |
| 乙苯 | Ethylbenzene | μg/kg | 7.0 |
| 间二甲苯；对二甲苯 | m-xylene; p-xylene | μg/kg | 8.9 |
| 邻二甲苯 | O-xylene | μg/kg | 6.2 |
| 1,1,2,2-四氯乙烷 | 1, 1, 1, 2-Tetrachloroethane | μg/kg | ND |
| 1,2,3-三氯丙烷 | 1, 2, 3-Trichloropropane | μg/kg | ND |
| 1,4-二氯苯 | 1,4-Dichlorobenzene | μg/kg | ND |
| 1,2-二氯苯 | 1, 2-Dichlorobenzene | μg/kg | ND |
| 硝基苯 | Nitrobenzene | mg/kg | ND |
| 苯胺 | Aniline | mg/kg | ND |
| 2-氯苯酚 | 2-Chlorophenol | mg/kg | ND |
| 苯并[α]蒽 | Benz[α]fluoranthene | mg/kg | ND |
| 苯并[α]芘 | Benz[α]pyrene | mg/kg | ND |
| 苯并[b]荧蒽 | Benz[b]fluoranthene | mg/kg | ND |
| 二苯并[a,h]蒽 | Dibenz[a,h]anthracene | mg/kg | ND |
| 茚并[1,2,3-cd]芘 | Indeno[1,2,3-cd]Pyrene | mg/kg | ND |
| 苯并[k]荧蒽 | Benz[k]fluoranthene | mg/kg | ND |
| 䓛 | Chrysene | mg/kg | ND |
| 萘 | Naphthalene | mg/kg | ND |

备注：6#点数据引用《太阳新材料产业园环境影响报告书》中监测数据。

Remarks: the monitoring data at point 6 # in the "Environmental Impact Report of Sun New Material Industrial Park" is cited

### 3.2.5.4 土壤现状评价

### 3.2.5.4 Soil Status Evaluation

1、评价方法

1. Evaluation method

采用单因子指数法评价。

The single-factor index method is used for evaluation.

计算公式为：

The calculation formula is:

$$S_i = \frac{C_i}{C_{0i}}$$

$$S_i = \frac{C_i}{C_{0i}}$$

式中：*Si*－第*i*种污染物的单因子指数，未检出因子，不进行计算；

Where: *Si*－the single-factor index of the$i^{th}$ pollutant, no factor is detected, and calculation is not performed

*Ci*－第*i*种污染物在土壤中的实测浓度；

*Ci*－the measured concentration of the$i^{th}$ pollutant in soils

*C0i*－第*i*种污染物的评价标准。

*C0i*－the evaluation standard for the$i^{th}$pollutant in soils.

2、评价标准

2. Evaluation standard

土壤环境质量现状评价采用《土壤环境质量标准-建设用地土壤污染风险管控标准》(GB36600-2018)表1第二类用地筛选值。土壤现状评价标准见表3.2-34。

The evaluation of soil environmental quality is based on the Class II land filter values in Table 1 of the *Soil Environmental Quality - Risk Control Standard for Soil Contamination of Development Land* (GB36600-2018). For soil status evaluation standard, see Table 3.2-34.

**表3.2-34土壤环境质量标准限值 单位：mg/kg**

**Table 3.2-34** Standard Limits for Soil Environmental Quality **Unit: mg/kg**

| 砷 | 镉 | 铬（六 | 铜 | 铅 | 汞 | 镍 | 四氯化 | 氯仿 |
|---|---|---|---|---|---|---|---|---|

| | | 价 | | | | | 碳 | |
|---|---|---|---|---|---|---|---|---|
| Arsenic | Cadmium | Chromium (hexavalent) | Copper | Lead | Mercury | Nickel | Carbon tetrachloride | Chloroform |
| 60 | 65 | 5.7 | 18,000 | 800 | 38 | 900 | 2.8 | 0.9 |
| 氯甲烷 | 1,1-二氯乙烷 | 1,2-二氯乙烷 | 1,1-二氯乙烯 | 顺-1,2-二氯乙烯 | 反-1,2-二氯乙烯 | 二氯甲烷 | 1,2-二氯丙烷 | 1,1,1,2-四氯乙烷 |
| Chloromethane | 1, 1-Dichloroethane | 1,2-dichloroethane | 1, 1-Dichloroethylene | Cis-1,2-Dichloroethylene | Trans-1,2-Dichloroethylene | Dichloromethane | 1, 2-Dichloropropane | 1, 1, 1, 2-Tetrachloroethane |
| 37 | 9 | 5 | 66 | 596 | 54 | 616 | 5 | 10 |
| 1,1,2,2-四氯乙烷 | 四氯乙烯 | 1,1,1-三氯乙烷 | 1,1,2-三氯乙烷 | 三氯乙烯 | 1,2,3-三氯丙烷 | 氯乙烯 | 苯 | 氯苯 |
| 1, 1, 1, 2-Tetrachloroethane | Tetrachloroethylene | 1, 1, 1-Trichloroethane | 1,1,2-Trichloroethane | Trichloroethylene | 1, 2, 3-Trichloropropane | Vinyl chloride | Benzene | Chlorobenzene |
| 6.8 | 53 | 840 | 2.8 | 2.8 | 0.5 | 0.43 | 4 | 270 |
| 1,2-二氯苯 | 1,4-二氯苯 | 乙苯 | 苯乙烯 | 甲苯 | 间,对二甲苯 | 邻二甲苯 | 硝基苯 | 苯胺 |
| 1, 2-Dichlorobenzene | 1,4-Dichlorobenzene | Ethylbenzene | Styrene | Toluene | m-, p-xylene | O-xylene | Nitrobenzene | Aniline |
| 560 | 20 | 28 | 1290 | 1200 | 570 | 640 | 76 | 260 |
| 2-氯酚 | 苯并(a)蒽 | 苯并(a)芘 | 苯并(b)荧蒽 | 苯并(k)荧蒽 | 䓛 | 二苯并(a,h)蒽 | 茚并(1,2,3-cd)芘 | 萘 |
| 2-Chlorophenol | Benz(a)anthracene | Benzo(a) pyrene | Benz(b)fluoranthene | Benz(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Indeno(1,2,3-cd)Pyrene | Naphthalene |
| 2,256 | 15 | 1.5 | 15 | 151 | 1,293 | 1.5 | 15 | 70 |

3、评价结果

3. Assessment results

按上述方法进行评价，评价结果列于表3.2-35。

The evaluation was performed as described above, and the evaluation results are listed in Table 3.2-35.

**表3.2-35（1） 土壤现状评价结果一览表**

**Table3.2-35**(1) **List of soil evaluation results**

| 检测项目 | Detection item | 监测点位及结果<br>Monitoring point position and result |
|---|---|---|
| | | 6#园区造纸区域<br>Papermaking areas of 6# park |
| 铜 | Copper | 0.00156 |
| 砷 | Arsenic | 0.15100 |
| 镉 | Cadmium | 0.00477 |
| 铅 | Lead | 0.01550 |
| 汞 | Mercury | 0.00487 |
| 镍 | Nickel | 0.08000 |
| 铍 | Beryllium | 0.01621 |
| 钴 | Cobalt | 0.0183 |
| 四氯化碳 | Carbon tetrachloride | 0.00243 |
| 苯 | Benzene | 0.00060 |
| 1,2-二氯丙烷 | 1, 2-Dichloropropane | 0.00032 |
| 甲苯 | Toluene | 0.00000 |
| 乙苯 | Ethylbenzene | 0.00025 |
| 间二甲苯；对二甲苯 | MX+PX | 0.00156 |
| 邻二甲苯 | O-xylene | 0.15100 |

从上表可以看出，本项目厂区内各监测因子均能达到《土壤环境质量标准-建设用地土壤污染风险管控标准》(GB36600-2018)表1第二类用地筛选值。

It can be seen from the above table that all monitoring factors in the plant of this project meet the Class II land filter values in Table 1 of the *Soil Environmental Quality - Risk Control Standard for Soil Contamination of Development Land* (GB36600-2018).